FIRST FIVE-YEAR REVIEW REPORT
PETER COOPER SUPERFUND SITE
CATARRAUGUS COUNTY, NEW YORK

Prepared by

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

April 2015

Approved by:

Walter E. Mugdan, Director
Emergency and Remedial Response Division

Date: April 1, 2015

Table of Contents

Executive Summary

This is the first five-year review for the Peter Cooper Superfund site (also known as the Peter Cooper Landfill site) located in the Village of Gowanda, Cattaraugus County, New York. The purpose of this five-year review is to review information to determine if the remedy is and will continue to be protective of human health and the environment. The triggering action for this statutory five-year review was the initiation of on-site construction at the site on October 15, 2009.

The assessment of this five-year review found that, based upon reviews of the Record of Decision, annual groundwater sampling results, and site inspection reports as prepared by the potentially responsible parties, as well as a site visit conducted by United States Environmental Protection Agency personnel on October 30, 2014, the remedy is functioning as intended by the decision document and is protective of human health and the environment. An environmental easement has been placed on the site property to address any future uses of the property which would impact contaminated soil left in place, and to prohibit groundwater use unless groundwater quality standards are met. The site management plan requires continued monitoring of the site. There are no recommendations or follow-up actions identified in this five-year review.

Five-Year Review Summary Form

SITE IDENTIFICATION		
Site Name: Peter Cooper		
EPA ID: NYD980530265		
Region: 2	**State:** NY	**City/County:** Gowanda /Cattaraugus

SITE STATUS	
NPL Status: Final	
Multiple OUs? No	**Has the site achieved construction completion?** Yes

REVIEW STATUS
Lead agency: EPA *[If "Other Federal Agency", enter Agency name]*:
Author name (Federal or State Project Manager): Sherrel Henry
Author affiliation: EPA
Review period: 10/15/2009 - 3/11/2015
Date of site inspection: 10/30/2014
Type of review: Statutory
Review number: 1
Triggering action date: 10/15/2009
Due date ***(five years after triggering action date)***: 10/15/2014

Issues/Recommendations

OU(s) without Issues/Recommendations Identified in the Five-Year Review:
01

Protectiveness Statement(s)		
Operable Unit: 01	*Protectiveness Determination:* Protective	*Addendum Due Date (if applicable):*
Protectiveness Statement: The remedy is protective of human health and the environment.		

Sitewide Protectiveness Statement	
Protectiveness Determination: Protective	*Addendum Due Date (if applicable):*
Protectiveness Statement: The implemented remedy for the site is protective of human health and the environment.	

Introduction

The purpose of a five-year review 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 and is functioning as intended by the decision documents. The methods, findings, and conclusions of reviews are documented in the five-year review. In addition, five-year review reports identify issues found during the review, if any, and document recommendations to address them.

This is the first five-year review for the Peter Cooper site, located in the Gowanda, Cattaraugus County, New York. This five-year review was conducted by the Environmental Protection Agency (EPA) Remedial Project Manager (RPM) Sherrel Henry. The review was conducted pursuant to Section 121(c) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended, 42 U.S.C. §9601 *et seq.* and 40 CFR 300.430(f)(4)(ii), and in accordance with the *Comprehensive Five-Year Review Guidance*, OSWER Directive 9355.7-03B-P (June 2001). This report will become part of the site file.

The triggering action for this statutory review is the on-site construction start date of October 15, 2009. A five-year review is required at this site due to the fact that hazardous substances, pollutants or contaminants remain at the site above levels that allow for unlimited use and unrestricted exposure. The site consists of one operable unit, which is addressed in this five-year review.

Site Chronology

See Table 1 for the site chronology.

Background

Physical Characteristics

The site is located off Palmer Street, in the Village of Gowanda, Cattaraugus County, New York (see Figure 1). The site consists of an inactive landfill and land associated with the former Peter Cooper Corporation (PCC) animal glue and adhesives manufacturing plant. The site is bounded to the north by Cattaraugus Creek, to the south by Palmer Street, to the west by a former hydroelectric dam and wetland area, and to the east by residential properties. Regionally, the Village of Gowanda is located both in Erie County and Cattaraugus County and is separated by Cattaraugus Creek. In Erie County, the Village of Gowanda is included in the Town of Collins. The Town of Collins is bordered by the Seneca Nation of Indians Cattaraugus Reservation to the west. In Cattaraugus County, the Village of Gowanda is located in the Town of Persia.

For purposes of the remedial investigation and feasibility study (RI/FS), the site was divided into two sections. The western section, called the inactive landfill area (ILA), is approximately 15.6 acres in size, and includes an additional five acres referred to as the "elevated fill subarea." The westernmost portion of the elevated fill subarea is located on property owned by the New York State Electric & Gas Corporation (NYSEG). The eastern section of the site, the former manufacturing plant area (FMPA), is approximately 10.4 acres.

Environmentally sensitive areas include three federal wetland communities delineated within the boundaries of the site. An approximately 0.25-acre wetland area, characterized as a combination forested/scrub-shrub wetland, was identified at the northeastern limit of the site. A 36-inch municipal storm water outfall pipe discharges into the southern portion of this wetland. The second wetland is an emergent wetland, located in a depression along the southern side of the elevated fill subarea that measures less than 1,200 square feet. The third wetland is a scrub-shrub wetland, located in the center portion of the site that measures approximately 3,000 square feet. This scrub-shrub wetland appears to have been created as a result of storm water drainage at the site. A 12-inch storm water outfall discharges to the site at the southern end of this scrub-shrub wetland. The thickness of the wetland sediments was found to be greater than five feet deep.

No state or federal-designated endangered species of plants or animals are known to exist at the site.

Site Geology/Hydrogeology

Geologically, the site is underlain by shale bedrock of the Canadaway Formation. Shale outcrops in and along Cattaraugus Creek, across the northern site perimeter, and the hill slope south of Palmer Street. The elevation of the bedrock surface generally slopes in a northwesterly direction, towards the Creek. The depth to the top of the bedrock across the site ranges from 4.5 feet to 25.4 feet. A topographically flat area exists between the elevated areas south of Palmer Street and the Creek and is a broad alluvial valley with a thin layer of alluvial deposits (approximately 10 feet or less) mantling the bedrock valley floor. In some areas, excavation has removed alluvial soils and fill material was used to backfill the excavations. Both the alluvial soil and the fill materials comprise the overburden at the site. The fill material is characterized as cindery fill and sludge fill. The thickness of the sludge fill ranges from five to 23 feet. The sludge fill appears to extend down to the weathered bedrock surface near the Creek side of the site.

The site includes overburden and upper bedrock water-bearing zones. Groundwater elevation data indicate that the depth to groundwater varies across the site from approximately five feet to 20 feet. Groundwater in the overburden generally flows toward the north/northwest, discharging into Cattaraugus Creek. Groundwater in the bedrock flows primarily along fractures and joint and bedding planes which tend to be strongly horizontally oriented toward the Creek. Leachate seeps are observed at the overburden/bedrock contact and in the bedrock outcrop along the Creek.

Land and Resource Use

The site is located in an area characterized by mixed industrial-commercial/residential usage. Residential zoning is the dominant parcel designation within the Village. Industrialized zones are primarily concentrated in the southeast portion of the Village, primarily along Cattaraugus Creek. The Cattaraugus Creek is a surface water body suitable for fishing and secondary recreation (not primary contact recreation such as swimming) but not as a drinking water supply. The Creek channel width is 130 feet and of variable depth in the area forming the northern site property boundary. The site is located in an area zoned industrial.
Regional groundwater is a sole source of potable water and is designated as a drinking water

source by NYSDEC, i.e., a "GA" classification. Industries, businesses, and residences obtain their drinking water from the Village of Gowanda municipal water supply.

In determining future land uses for the site, EPA considered the "Reuse Assessment and Conceptual Plan for the Peter Cooper Gowanda Superfund Site" (Reuse Assessment and Concept Plan) developed by the Village of Gowanda in association with the University of Buffalo Center for Integrated Waste Management. The Reuse Assessment and Concept Plan was funded in part by EPA through its Superfund Redevelopment Initiative. The plan envisions a publicly available site incorporating elements such as a walking/biking trail, fishing access, outdoor picnic areas, a small boat launch and other related recreational features.

History of Contamination

From 1904 to 1972, the PCC and its predecessor, Eastern Tanners Glue Company, manufactured animal glue at the site. When the animal glue product line was terminated, PCC continued to produce synthetic industrial adhesives until the plant closed in 1985. The wastes from PCC's glue production were disposed of on the elevated fill subarea. Between 1925 and October 1970, PCC used the northwest portion of the property to pile sludge remaining after the animal glue manufacturing process. These wastes, known as "cookhouse sludge" because of a cooking cycle that occurred just prior to extraction of the glue, are derived primarily from chrome-tanned hides obtained from tanneries. The waste material has been shown to contain elevated levels of chromium, arsenic, zinc, and several organic compounds.

Initial Response

In June 1971, the New York State Supreme Court (8th J.D. Cattaraugus County) ordered PCC to remove the waste pile and terminate discharges to Cattaraugus Creek. In 1972, PCC reportedly removed approximately 38,600 tons of waste pile material and transferred it to a separate site in Markhams, New York. Between 1972 and 1975, the remaining waste pile at the site was graded by PCC, covered with a 6-inch clay barrier layer and 18 to 30 inches of soil and vegetated with grass. Stone rip-rap and concrete blocks were placed along the bank of the Creek to protect the fill material from scouring or falling into the Creek.

In July 1976, the assets of the original PCC, including the manufacturing plant and property located in Gowanda, were purchased by Rousselot Gelatin Corporation and its parent company Rousselot, S.A., of France. Rousselot Gelatin was renamed Peter Cooper Corporation and this newly-formed PCC sold the site to JimCar Development, Inc., in April 1988. The property was subsequently transferred to the Gowanda Area Redevelopment Corporation (GARC) in 2009. Excluding the portion of the site owned by NYSEG, the remainder of the property is presently owned by GARC.

From 1981 to 1983, the New York State Department of Environmental Conservation (NYSDEC) conducted several investigations at the facility and identified the presence of arsenic, chromium and zinc in soil and sediment samples. As a result of this investigation, NYSDEC oversaw PCC's development of an RI/FS for the site. However, because the waste detected at the site did

not meet the New York State statutory waste definition in effect in 1991 for an inactive hazardous waste disposal site, NYSDEC removed the site from its Registry of Inactive Hazardous Waste Sites and a remedy was not selected.

In 1996, the EPA Superfund Technical and Assessment Response Team (START) collected and analyzed soil, groundwater and surface water, and sediment samples from the site. Results of the sampling and analysis confirmed contamination, including the presence of arsenic, chromium and other hazardous substances.

During the site assessments, EPA personnel observed that the existing retaining wall at the site was subject to severe erosion. It was determined that the retaining wall and rip-rap needed to be repaired or upgraded to prevent the continued erosion of landfill materials into Cattaraugus Creek. On October 24, 1996, EPA and NYSEG entered into an administrative order on consent (AOC). Pursuant to the AOC, NYSEG installed approximately 150 feet of rip-rap revetment along the south bank of the Cattaraugus Creek and adjacent to the landfill to prevent further erosion of materials from the landfill into the Creek.

Based on this information, the site was proposed to the National Priorities List (NPL) on September 25, 1997 and placed on the NPL on April 6, 1998.

Negotiations with the potentially responsible parties (PRPs) to conduct the RI/FS on consent were not successful. As a result, on March 30, 2000, EPA issued a unilateral administrative order (UAO) to fourteen PRPs directing that they complete the RI/FS for the site. The UAO became effective May 1, 2000. The RI/FS was performed by Benchmark Environmental Engineering and Science, PLLC and Geomatrix Consultants, Inc., consultants for the PRPs, with EPA oversight.

Basis for Taking Action

From 2000 to 2001, a comprehensive RI was performed to define the nature and extent of the contamination at the site. The RI field work included a groundwater investigation, including: the replacement of four wells from the existing network of 10 monitoring wells in the ILA and the installation of six new wells in the FMPA; surface water and sediment investigations of Cattaraugus Creek; sludge fill characterization of the ILA, by conducting three different activities (geophysical surveys, test pits and soil borings) to establish the limits of buried waste fill material; an existing landfill cover evaluation by excavating 24 test holes to determine cover system thickness and characteristics; a surface soil investigation of the ILA and FMPA consisting of 30 soil samples collected from zero to six inches below ground surface (bgs); a subsurface soil investigation of the ILA and FMPA consisting of 23 soil samples collected from three to 12 feet bgs; a landfill gas investigation of the elevated fill area of the ILA; and a leachate seep investigation of the elevated fill area of the ILA.

The RI determined site soils to be contaminated with metals, particularly arsenic, and chromium, and volatile organic compounds (VOCs) including carbon tetrachloride, chloroform and tetrachloroethene (PCE). Groundwater was found to be contaminated with arsenic.

A baseline human health risk assessment (HHRA) and a screening level ecological risk assessment (SLERA) were conducted to provide a quantitative assessment of the human health

risks and a qualitative assessment of risk to ecological receptors under current and future land-use scenarios. The assessment assumed no remedial actions or institutional controls (ICs) to prevent exposure.

The HHRA evaluated exposures to various reasonable maximally exposed (RME) individuals to all contaminants identified in the groundwater, soils, sediment, landfill gas and surface water. The conclusions of the risk assessment are summarized below.

- Cancer risks and noncancer health hazards associated with exposures to the ILA by the outdoor park worker from future ingestion of groundwater and soil with a cancer risk of 4 x 10^{-4} (4 in 10,000) and a noncancer hazard index (HI) = 2.3. The main contaminant was arsenic.
- Cancer risks and noncancer health hazards to the future industrial worker at the FMPA from ingestion of groundwater and surface soils. The cancer risks were 4 x 10^{-4} (4 in 10,000) and an HI =2 from future ingestion of arsenic in the groundwater and carbon tetrachloride, chloroform, and arsenic in surface soils.
- Cancer risks for the future commercial worker at the FMPA from exposures to carbon tetrachloride and chloroform and other VOCs were approximately 3 x 10^{-5} (3 in 100,000) and, for noncancer health effects, an HI = 2.3, with arsenic in groundwater as the primary risk driver.
- The hot-spot analysis found exposures to future construction workers to soil fugitive dust exposure in the ILA was an HI = 7.6. The noncancer HI to construction workers in the FMPA from soil fugitive dust exposure was an HI = 1.4.

Where potential ecological risks to benthic organisms and fish from inorganic chemicals in creek sediment and surface water occur, the associated chemical was present in upstream samples at similar concentrations to downstream samples. Therefore, this suggests that the site is not a significant contributor to the ecological risk.

The SLERA indicated no potential ecological risks from organic contaminants to receptor species including fish, terrestrial plants, wetland plants, benthic invertebrates, terrestrial invertebrates, birds, and mink. With limited exceptions, benthic organisms and fish in Cattaraugus Creek show no potential ecological risks from organic chemicals in creek sediment and surface water.

The SLERA indicated potential for ecological risk to terrestrial receptors from organic and inorganic contaminants in soils at the Site. The food web model used in the SLERA indicates potential ecological risk from exposure to semivolatile organic compounds in soil, in particular polynuclear aromatic hydrocarbons (PAHs), which are SVOCs, for terrestrial mammalian species. The SLERA also indicates potential risk to terrestrial receptors including terrestrial invertebrates and mammals from one or more inorganic chemicals in soil including arsenic, chromium, lead, and zinc. Any potential exposures to soil at the site have been interrupted by the placement of the cap. The cap prevents direct contact with the waste materials.

Based upon the results of the RI and the human health and ecological risk assessments, EPA determined that the response action selected in the ROD to be necessary to protect the public

health or welfare or the environment from actual or threatened releases of hazardous substances into the environment.

Remedial Actions

Remedy Selection

The FS was completed by the PRPs in July 2004, and was finalized in June 2005. The FS evaluated potential alternatives to address the soil contamination at the site. The remedy was memorialized in the site Record of Decision (ROD) issued on September 30, 2005.

The Remedial Action Objectives (RAO) for the site were:

- Reduce or eliminate any direct contact threat associated with the contaminated soils/fill;
- Minimize or eliminate contaminant migration from contaminated soils to the groundwater; and
- Minimize or eliminate contaminant migration from groundwater to Cattaraugus Creek.

The elements of the selected remedy are:

- Excavating three hot spot areas and consolidating waste from these areas within the elevated fill subarea, capping the five-acre elevated fill subarea of the inactive landfill area with a low permeability, equivalent design barrier cap, consistent with the requirements of 6 New York Codes, Rules and Regulations (NYCRR) Part 360, including seeding with a mixture of seeds to foster natural habitat;

- Conducting post-excavation confirmatory soil sampling;

- Backfilling the excavated areas with clean fill; collecting the leachate seeps, pretreating the leachate as necessary, then discharging the leachate to the Public Owned Treatment Works (POTW) collection system for further treatment and discharge. As a contingency, if treatment of the leachate seep at the POTW is not available, the leachate would be treated and discharged to Cattaraugus Creek. Since the installation of the cap and groundwater diversion system (described below) should reduce leachate generation, the volume of seep leachate requiring treatment is anticipated to be reduced or eliminated over time;

- Installing a groundwater diversion system to limit groundwater migration through the elevated fill subarea. The ROD provides for the potential that if additional data collected in the remedial design phase of the project support the conclusion that the installation of a diversion wall will result in a minimal increase in the collection of contaminants by the leachate collection system, the diversion wall would not be installed;

- Installing a passive gas venting system for proper venting of the five-acre elevated fill subarea of the ILA;

- Stabilizing the banks of the Cattaraugus Creek;

- Performing long-term operation and maintenance including inspections and repairs of the landfill cap, gas venting, and leachate systems;

- Performing air monitoring, surface water and groundwater quality monitoring; and

- Evaluating site conditions at least once every five years to determine if the remedy remains protective.

The remedy also included ICs such as restrictive covenants and environmental easements for limiting future use of the site and the groundwater to ensure that the implemented remedial measures will not be disturbed and that the site will not be used for purposes incompatible with the completed remedial action. The ICs include a site management plan (SMP) to ensure appropriate handling of subsurface soils during redevelopment.

To ensure that the engineering controls and ICs remain in place and effective for the protection of human health and the environment, an annual certification, commencing from the date of implementation, is required by the parties responsible for the remediation.

Consistent with the future use of the property, following issuance of the ROD, the Village of Gowanda and the PRPs entered into discussions concerning the Village's redevelopment goals. An agreement was reached and GARC took ownership of the site and agreed to perform certain post-remedial operation, maintenance and monitoring activities in exchange for provision of specific non-remedial construction activities and funding by the PRPs to facilitate park redevelopment. Non-remedial construction activities that were slated to be performed by the PRPs, concurrent with remedial activities, are listed below.

- Removal of up to 1,000 tons of non-hazardous construction and demolition debris from the former manufacturing plant area of the site, with disposal of the materials beneath the elevated fill subarea cover (in a manner to prevent settlement) or off-site disposal at a permitted disposal facility.

- Construction of a clean utility corridor (i.e., waterline) to facilitate utility service to a future multi-use building, pavilion, or other park development.

- Elevated fill subarea cover system grading and contouring to facilitate site development plans. This involved creating a benched area along the creek side of the landfill that may provide a level area for future construction of a bike or walking path.

Remedy Implementation

The ROD was implemented pursuant to a Consent Decree (CD) entered into by EPA and the performing settling defendants (PSDs, a subgroup of the PRPs). On February 12, 2009, the CD was entered in United States District Court. On March 15, 2009, Benchmark, the PSD consultant, was approved as the supervising contractor to conduct the remedial design and construction work at the site.The ROD included provisions for the evaluation of the construction

of a diversion wall around the elevated fill area in the event the wall would change the effectiveness of the planned remedial actions. In accordance with the ROD, EPA and NYSDEC concurred with the findings of an analysis performed by the PSDs prior to the entry of the CD, showing that the installation of an upgradient groundwater diversion wall around the elevated fill subarea would not materially change the effectiveness of the planned remedial measures; therefore the diversion wall component of the ROD was not implemented.

Remedial Design

In accordance with the requirements of the CD the PSDs prepared a remedial design (RD) work plan. The RD work plan outlined the following remedial construction measures: mobilization; site preparation including hotspot excavation; groundwater/seep collection; and cover system construction (barrier layer material placement and compaction, topsoil and seeding, and passive gas venting).

In 2009, the RD report and design plans and specifications were implemented under a design-build contract for site remediation. The RD report identified: materials to be employed for major remedial components; construction requirements; quality control requirements; and measures to protect workers, the surrounding community, and the environment during the remedial work.

In the summer of 2009, the PSDs conducted certain preparatory activities at the site to facilitate the remedial construction. These activities included the removal of small trees, shrubs, brush, and stumps. Clearing and grubbing in and around the area of the elevated fill area was performed with a hydro ax. The staged trees, stumps, and brush were ground into mulch and was hauled off-site for off-site processing at a permitted facility.

In addition, the excavation of the three "hotspot" areas of contaminated soil/fill began on August 24th, 2009 and was completed on August 25th, 2009. Soil excavated from these impacted areas was hauled to the elevated fill subarea of the ILA for placement and compaction prior to placing the soil cover system. The excavated areas were then backfilled with clean soil.

Confirmatory sampling of the excavation sidewalls and bottom indicated arsenic and VOC concentrations were below the site cleanup goals. Impacted arsenic-contaminated soil/fill excavated from the two arsenic contaminated hotspots totaled approximately 171 cubic yards. Results of the verification sampling indicated that arsenic concentrations ranged from nine milligrams per kilogram (mg/kg) to 86 mg/kg, which were below the cleanup goal for arsenic of 120 mg/kg based on exposures to the soils by a future construction worker. Impacted soil/fill excavated from the VOC-contaminated hotspot was approximately 196 cubic yards. Results of the verification sampling indicated VOCs were below their respective site-specific cleanup goals (carbon tetrachloride, 0.5 mg/kg; chloroform, 0.3 mg/kg; and PCE, 1.4 mg/kg).

Following these activities, construction of the remedial action commenced on October 15, 2009, for the implementation of the seep/groundwater collection system and the landfill cap.

Groundwater/Seep Collection and Conveyance

Construction of the seep/groundwater collection system began in October 2009 and was substantially completed in December 2009. The collection system includes: the creek bank re-grading and bedrock channel excavation; pump station installation; pretreatment building construction; force main piping; and sanitary sewer tie-in. The seep/groundwater collection system was placed into full-time operation in May 2010, with operation and maintenance duties transferred to GARC. A description of the seep/groundwater collection system components and construction is presented below.

The remedial measures for the elevated fill subarea involved re-grading of the adjacent bank (excluding the riprap-stabilized area on NYSEG's property) and removal of concrete blocks and boulders to provide a more uniform slope for reduced erosion potential. A seep collection trench was then excavated into the surface of the weathered shale bedrock at the toe of the slope to intercept and collect the seeps. A perforated drainage pipe and granular media envelope collect and transmit water to a packaged leachate pump station.

The slope of the regraded bank is lined with a geocomposite drainage layer, leading to the collection trench, covered by a geomembrane liner to prevent seep breakout and mitigate Creek and surface water infiltration during high water conditions. The liner extends vertically to the 100-year floodplain elevation, and is protected from erosion by a surface layer of medium and large riprap over a non-woven geotextile fabric and gravel bed.

Collected seep water and shallow groundwater are conveyed from the pump station by a force main to a pretreatment building where an oxidant delivery system is available to mitigate hydrogen sulfide odors, as needed. Pretreated seeps/groundwater is discharged to the Village of Gowanda's sanitary sewer collection system on Palmer Street for treatment at the Village POTW consistent with the approved discharge permit.

Landfill Cap Construction

The final cap includes all of the construction components in the approved remedial design report. The final landfill cap meets the grading requirements of 6 NYCCR Part 360-2.13(q)2(ii) that requires that the barrier component of the cap have a slope of no less than 4 percent to promote positive drainage and no more than 33 percent to minimize erosion. The cover system was installed from November 2 to November 18, 2010.

Containment/isolation with soil cover enhancement involved: clearing and grubbing the approximate five-acre elevated fill subarea; moderate regrading and/or filling of low spots across the five-acre area to facilitate runoff; supplementing existing cover to provide for a minimum 18-inch thickness of recompacted soil barrier layer and placement of six inches of topsoil over the five-acre area; and reseeding of the elevated fill subarea cover to provide for a good stand of grass that will foster natural habitat. Cover soils were tested to assure conformance with the lesser of the Soil Cleanup Objectives (SCOs) for commercial worker direct contact or for levels protective of groundwater quality as published in 6NYCRR Part 375-6.8.

Passive Gas Venting

Following construction of the cap, five passive gas vents were installed through the sludge fill in the elevated fill subarea to relieve gas buildup beneath the cover system. The vents were constructed with individual risers that extend to a sufficient height above ground surface to promote atmospheric dispersion of odor-causing constituents and prevent direct inhalation of vented gases by trespassers or future recreational site users.

Final Inspection

On September 9, 2010, a final inspection was conducted. Based on the results of the inspection, it was determined that the site construction was complete and the remedy was implemented consistent with the ROD. The final inspection concluded that the PSDs constructed the remedy in accordance with the RD plans and specifications, and no further response (other than maintenance of the cap and cover, and long-term groundwater monitoring) is anticipated. EPA approved the remedial action report (RAR) for the site on June 17, 2011. The RAR documented all the remedial activities conducted at the site and included as-built drawings to document site conditions at completion.

Institutional Controls

ICs have been put in place at the site consistent with the ROD. ICs were implemented by filing the Environmental Easement with the Cattaraugus County Clerk's Office on March 30, 2009. PRP counsel provided EPA with a copy of the filed Environmental Easement. The Environmental Easement and Restrictive Covenant are included with the SMP. The SMP also includes procedures for soil/fill handling during future intrusive activities, verification of institutional and engineering controls, and post-remedial operation, maintenance and monitoring (OM&M).

Site Management Plan

The SMP was approved by EPA in December 2010. The SMP assures that proper procedures are in place to provide for long-term protection of human health and the environment after remedial construction is complete. The SMP includes the following three main components:

- A post-remedial OM&M plan;
- A soil/fill management plan identifying proper management of any residual impacted subsurface soil/fill that might be encountered during future redevelopment or post-remedial construction activities at the site, if undertaken; and
- A description of the institutional and engineering controls incorporated into the remedy, including the mechanisms that will be used to implement, maintain, monitor and enforce the controls continually.

Site Construction Completion

The site achieved construction completion status with the signing of the Preliminary Close-Out report on September 17, 2010.

System Operations/Operation and Maintenance

Benchmark, under contract to the PSDs, is conducting long-term monitoring and maintenance activities in accordance with the post-remedial OM&M Plan, Part I of the SMP. During the first year of post-closure operation and monitoring, the site was inspected by Benchmark on a semi-annual basis. Based on the semi-annual results the sampling frequency was reduced to annual monitoring. The primary activities associated with OM&M include the following:

- visual inspection of the elevated fill subarea cover system with regard to vegetative cover, settlement, stability and any need for corrective action;
- inspection of the gas vents;
- inspection of the creek bank stabilization system;
- inspection of the groundwater/seep collection and pretreatment systems;[1]
- inspection of the condition of monitoring wells, including but not limited to working locks, adequate surface seals and protective casings, and sediment intrusion;
- monitoring of groundwater and surface water (semi-annually first three years, annually thereafter), and groundwater elevation; and
- submission of annual reports to EPA and NYSDEC summarizing the results of the OM&M activities.

In addition to media monitoring, O&M activities include periodic certification that the ICs established in the environmental easement attached to the site property are unchanged and that nothing has occurred that would impair the ability to protect human health and the environment or otherwise constitute a violation or failure to comply with site controls. This certification is provided in the Periodic Review Report, to be submitted annually to EPA by the site owner.

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.

Progress Since Last Five-Year Review

This is the first five-year review for this site.

Five-Year Review Process

Administrative Components

The five-year review team included Sherrel Henry (EPA-RPM), Sharissa Singh (EPA-Geologist), Marian Olsen, (EPA-Human Health Risk Assessor), Michael Clemetson (EPA-Ecological Risk Assessor) and Michael Basile (EPA-Community Involvement Coordinator). This is a PRP lead site.

[1] The leachate seep and groundwater collection and pretreatment system are monitored by the GARC, the current property owner.

Community Involvement

Village of Gowanda officials have been notified that the five-year review is being conducted. The Seneca Nation was also notified that the five-year review is being conducted.

Once the five-year review is completed, the results will be made available at the two local site repositories, the Gowanda Free Library, 56 W. Main Street, Gowanda, New York and the Seneca Nation of Indians Library, 3 Thomas Indian School Drive, Irving, New York.

In addition, efforts will be made to reach out to local public officials including the Seneca Nation to inform them of the results of the five-year review.

Document Review

The documents, data and information which were reviewed in completing this five-year review are summarized in Table 2.

Data Review

The primary objectives of the implemented remedy are to control the source of contamination at the site, to reduce and minimize the migration of contaminants into the groundwater and the Creek and to minimize any potential human health and environmental impacts resulting from exposure to contamination at the site. These objectives were accomplished by the construction of a containment system and the removal of hotspots. A long-term monitoring program was designed to ensure that the implemented remedy remains effective.

The majority of the long-term monitoring program, which is being conducted by Benchmark under contract to the PSDs, includes the annual inspection of the landfill cover system; monitoring of the gas venting system; inspection of groundwater level monitoring; collection of groundwater samples from selected wells; monitoring status of the institutional controls; and providing annual reports on these activities to NYSDEC and EPA.

The leachate and groundwater collection and pretreatment system are monitored by GARC.

Cover System Inspection

The landfill cover system is inspected for loss of slope, surface material erosion, insufficient vegetative cover growth, erosion of vegetative cover, and areas of surface settlement. The bank stabilization system is inspected to insure that the erosion control remains in place. The results of the inspections are reported in the post-closure field inspection reports which are generated by Benchmark annually and submitted to NYSDEC and EPA. The most recent inspection report, dated June 2014, indicated that the cover system is in good condition, with well-established vegetative cover; and the riprap remains in place with no visual or olfactory evidence of leachate breakout.

Gas-Venting System Inspection

Gas vents are inspected annually for physical integrity, as well as monitored for explosive gases and hydrogen sulfide at the point of vent discharge. The most recent inspection report, dated June 2014, indicated that the gas-vent monitoring system is intact and operational with no objectionable odors noted.

Groundwater Elevation Level Monitoring

Static water level measurements were collected from seven shallow monitoring wells (MW-7S, MWFP-2S, MWFP-3S, MW-2SR, MW-5, MW-6, MW-1SR) between June 2011 and June 2014 and reviewed to determine if any changes in the direction of groundwater flow occurred over this time period. Based on the results of the groundwater elevation monitoring performed from 2011 to 2014, the inferred groundwater flow directions indicate that shallow groundwater migrates north westerly towards Cattaraugus Creek, which is consistent with observations recorded during the site RI. There are no significant changes in the direction of groundwater flow and the monitoring well network is adequate for determining the groundwater gradient.

Leachate Seep/Groundwater Collection and Pretreatment System

The Village of Gowanda, on behalf of GARC, submits semi-annual reports and all reports indicate that all effluent samples collected per the Significant Industrial User (SIU) discharge permit have been in conformance with permit limits since the collection system was implemented in 2010. In addition, the ROD identified the possible use of pretreatment with oxidant but introduction of this chemical has not been required to achieve sulfide discharge limits. Consequently, the Village of Gowanda issued a revised permit reducing the requirement for pretreatment.

Groundwater Quality Monitoring

The PSDs are required to perform groundwater sampling at the site to monitor groundwater flow and quality conditions. Groundwater monitoring is being performed at the following network locations, where the "S" identifier indicates a shallow overburden monitoring well:

- Upgradient on-site monitoring well MW-7S.
- FMPA monitoring wells MWFP-2S and MWFP-3S.
- ILA monitoring wells MW-2SR, MW-5S.

All samples were analyzed for inorganic parameters (total metals), VOCs (chlorinated aliphatics only) and water quality parameters (ammonia, hardness, chloride, total sulfide).

Monitoring well MW-2SR has been consistently dry during the five-year sampling period and therefore was not sampled. Based on the results of this five-year review, changes were proposed to the OM&M program and are outlined in Table 5.

The sample results are discussed below.

Results of total metal, VOC analyses and water quality parameters

Sample results were collected in June 2011, January 2012, June 2012, January 2013, June 2013 and June 2014. The results of these sampling events are provided below. All sampling and water level measurement locations are depicted in Figures 2 and 3.

Metals. Total metals analyses included arsenic, chromium, hexavalent chromium and manganese.

The metals concentrations reported for hexavalent chromium were nondetect or below Groundwater Quality Standards and Guidance Values (GWQS/GV) at all monitoring locations. Arsenic was reported as nondetect or below the GWQS of 0.0253 milligram/liter (mg/L) at all monitoring locations, with the exception of one minor exceedance in June 2011 at well MWFP-2S (0.026 mg/L). Total chromium was reported as nondetect or below the GWQS of 0.05 mg/L at all monitored locations, with the exception of one minor exceedance in June 2012 at well MWFP-2S (0.056 mg/L).

Manganese and iron were reported above both their GWQS of 0.03 mg/L at most of the monitoring well sample locations during at least one sampling round. Manganese was detected at a maximum concentration of 1.8 mg/L at well MW-7S and iron was detected at a maximum concentration of 24 mg/L at well MW-5S. These screening criteria are secondary Maximum Contaminant Levels (MCLs). Secondary MCLs do not require regulatory actions since they represent aesthetic parameters.

VOCs. The VOC concentrations were nondetect or below the GWQS/GV at all monitoring locations, with the exception of PCE at well MWFP-3S. With the exception of the June 2012 sampling event, PCE was detected above the GWQS of 5 micrograms/liter (ug/L) during all monitoring events, with concentrations ranging from 7.9 ug/L to 13 ug/L.

Sulfide, Chloride and Ammonia. The water quality parameters reported for all sampling events were nondetect or below the GWQS for sulfide and chloride at all sampling locations. Ammonia was detected above the GWQS of 2 mg/L during all monitoring events at concentrations ranging from 3.5 mg/L to 10.8 mg/L at well MW-5S and at concentrations ranging from 9.3 mg/L to 20.3 mg/L at well MW-7S. In January 2012, ammonia was also detected slightly above the standards of 2 mg/L at well MWFP-2S (3.2 mg/L) and well MWFP-3S (3.8 mg/L).

The results from the most current round of groundwater sampling (June 2014) indicate that manganese concentration exceeded the GWQS of 0.03 mg/L at all monitoring locations, ranging from 0.42 mg/L to 4 mg/L. Ammonia concentrations exceeded the GWQS of 2 mg/L in wells MW-5S (3.5 mg/L) and MW-7S (11.7 mg/L). PCE was the only VOC detected. The PCE concentrations exceeded the GWQS of 5 ug/L in well MWFP-3S at a concentration of 10 ug/L. Table 3 presents a summary of groundwater results collected from monitoring wells for all sampling events detected above GWQS.

The groundwater data review indicates that the low levels of contamination in site groundwater are attenuating and groundwater quality has improved compared to baseline levels measured prior to commencement of remedial activities.

Results of Surface Water Samples

Table 4 presents a summary of surface water results collected from Cattaraugus Creek for all sampling events. Surface water samples were collected in June 2011, January 2012, June 2012, January 2013, June 2013 and June 2014 from three locations along Cattaraugus Creek.

In 2011 and 2013, iron was detected above the SWQS of 0.3 mg/L at all of the surface water locations at a maximum concentration of 32.1 mg/L from sample location SW-3. In June 2011, manganese was detected above the SWQS of 0.3 mg/L at all of the surface water locations at a maximum concentration of 0.62 mg/L from sample location SW-3. Although iron and manganese concentrations were reported above standards, this appears attributable to naturally occurring conditions as evidenced by their presence of concentrations above the standards in upstream surface water sample SW-1 at a maximum concentration of 19.5 mg/L. In addition, iron does not have a primary standard, and is not considered a contaminant of concern for the site. VOCs, sulfide, chloride and ammonia were not detected during any sampling event. In 2014, all of the monitored parameters were reported as nondetect or below the SWQS at all of the surface water sampling locations.

Overall the data indicate few exceedances of the standards with no observed impact from the site to Cattaraugus Creek.

Site Inspection

The inspection of the site was conducted on October 30, 2014. In attendance were Sherrel Henry, EPA-RPM; Maurice Moore, NYSDEC Project Manager; Michael Hutchinson and John Walgus, GARC Board Members; Gina Wilkolaski, GARC's park design consultant; and Jason Offerbeck, Village of Gowanda Superintendent of Public Works. Also, in attendance was a representative from Benchmark, Tom Forbes. The purpose of the inspection was to assess the protectiveness of the remedy. No issues or adverse conditions were observed.

Interviews

During the five-year review process, no interviews were conducted. Interviews were not deemed necessary because both the owner of the site and the Village are active participants at the site.

Institutional Controls Verification

ICs include provisions for limiting future use of the site and the groundwater to ensure that the implemented remedial measures will not be disturbed and that the site will not be used for purposes incompatible with the completed remedial action. These restrictions are memorialized in an environmental easement filed with the Cattaraugus County Clerk's Office on March 30, 2009. PRP counsel provided EPA with a copy of the filed Environmental Easement. The Environmental Easement and Restrictive Covenant are included with the SMP.

Technical Assessment

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

The remedy is functioning as intended by the 2005 ROD. COCs identified in the ROD include arsenic, chromium, zinc, chloroform and carbon tetrachloride. COC concentrations in groundwater and surface water samples over the past five years were either not detected or sporadically detected slightly above regulatory standards. Analysis of geochemical parameters such as ammonia, which has been consistently detected above regulatory standards in all wells, indicate that leachate may be impacting groundwater quality throughout the site. However, measurement of oxidation-reduction potential indicate that geochemical conditions have changed over time, from reducing conditions to oxidizing conditions, in two of the four wells that have been sampled during this five year period. A tendency toward a more oxidizing (less reducing) environment would result from a decreasing volume of leachate entering the groundwater beneath the landfill. Also, the leachate collection system is designed to reduce leachate generation.

Overall groundwater sampling results have demonstrated an improvement in water quality since the RI/FS was conducted in 2004. COCs were not detected in the majority of the monitoring wells sampled and surface water samples did not reveal any observed impacts from the site to Cattaraugus Creek.

The SMP for the site outlines the PSD OM&M and institutional control requirements. The institutional controls are in place and ensure that future land use is consistent with the SMP and that groundwater use is restricted.

Question B: Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives used at the time of the remedy still valid?

There are no changes in the physical conditions of the site or site uses that would affect the protectiveness of the selected remedy. The exposure assumptions and toxicity values that were used to estimate the potential cancer risks and noncancer hazards in the HHRA supporting the 2005 ROD, and the hot spot analysis, followed the Risk Assessment Guidance for Superfund. The process that was used in the HHRA remains valid. In addition, given that soils are covered with a cap, and community residents receive drinking water from the Public Water Supply of the Village of Gowanda, a municipal drinking water supply, the human exposure pathways have been interrupted.

The following sections highlight determinations based on exposures to soils and groundwater under future site conditions.

a. Soil.

The current industrial land use zoning for the site has not changed since the HHRA. The HHRA found that exposures to the future construction worker exposed to the hotspot areas in the FMPA and ILA and exposed to fugitive dust exceeded the goal of protection of a Hazard Quotient (HQ) = 1, the goal of protection for arsenic. The remedial action objectives to excavate the hot-spot

areas, consolidate soil within the elevated fill subarea, and capping to prevent potential exposure to the five-acre elevated fill subarea of the inactive landfill area are consistent with anticipate future use of the property.

The exposures to soil at the site have been interrupted by the placement of the cap. ICs and environmental easements were placed on the property to ensure that no activities are conducted on the consolidated waste area that would disturb the cap. The cap prevents direct contact with the waste materials.

Overall, the remedial action to address soil contamination continues to interrupt exposures and the soil remedy is protective of human health.

b. Groundwater.

Currently, the groundwater under the landfill is classified by the State of New York as "GA" indicating a potential potable water supply. However, groundwater at the site is not presently used as a potable water supply and is not likely to be used as such in the future since community residents receive their drinking water from the Public Water Supply of the Village of Gowanda.

The Basis for Taking Action section, describes noncancer hazards greater than an HQ = 1 and the risk range associated with future consumption of groundwater by the outdoor park worker and industrial worker. Arsenic was the main COC identified in groundwater.

Currently, the cancer and noncancer toxicity file for arsenic is being updated through the Integrated Risk Information System (IRIS) process that provides toxicity values that are used Agency-wide in the development of baseline human health risk assessments. In addition, a relative bioavailability value was developed for arsenic but this value does not significantly change the calculated cleanup goal for arsenic. The health hazards from exposure to these chemicals will need to be addressed when the IRIS toxicity values for arsenic are finalized in a subsequent five-year review.

There have been no changes in the toxicity values for chloroform. The toxicity value for carbon tetrachloride was updated but this change does not change the overall cleanup goals for this chemical in soil.

The exposures to groundwater at the site have been interrupted since residences and business in the vicinity of the site obtain potable water from the Public Water Supply of the Village of Gowanda. Groundwater standards were not adopted for the site. Rather, ICs were placed on the property to ensure that the groundwater at the site is not used for any drinking or potable purposes and that no activities are conducted on the consolidated waste area that would disturb the cap.

c. Vapor Intrusion.

This pathway was not evaluated based on the nature of the contamination (i.e., metals) and consistent with the 2002 draft OSWER Draft Guidance for Evaluating the Vapor Intrusion to

Indoor Air Pathway from Groundwater and Soil (EPA530-D-02-004). Vapor Intrusion guidance that indicates evaluation of this pathway is not appropriate when the residence is more than 100 feet from the site and where the COCs are not volatile (http://www.epa.gov/oswer/vaporintrusion/guidance.html#Item6). The closest residence is over 100 feet from the site and therefore, vapor intrusion was not further evaluated.

d. Ecological risk

The soil excavation and capping eliminate any potential risk from surface soil contaminants to terrestrial receptors. The surface water monitoring data indicated the concentrations are similar to those upgradient of the site and the exposure assumptions for aquatic receptors are still valid.

Are the Cleanup Values Selected in the ROD Still Valid?

The selected remedy was designed to prevent exposure to contaminated soil and reduce the migration of hazardous substances, pollutants and contamination from the soil to the surrounding soil or groundwater. Implementation of the selected remedy, including the excavation of the hotspot area, the construction of the cap and the placement of ICs on the property have effectively prevented exposures to COCs on the site.

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

No other information has come to light that would call into question the protectiveness of the remedy.

Technical Assessment Summary

The remedy implemented at the site is functioning as intended. There are no current exposure pathways. An environmental easement has been placed on the site property to address contaminated soil left in place and to prohibit groundwater use until groundwater quality standards are met. The SMP requires continued monitoring of the site.

Issues, Recommendations and Follow-Up Actions

This site has ongoing OM&M activities as part of the selected remedy. This report includes suggestions for improving, modifying, and/or adjusting some of these activities (see Table 5).

Protectiveness Statement

Protectiveness Statement(s)		
Operable Unit:	*Protectiveness Determination:*	*Addendum Due Date (if applicable):*
01	Protective	

	N/A
Protectiveness Statement: The remedy is protective of human health and the environment.	
Sitewide Protectiveness Statement	
Protectiveness Determination: Protective	*Addendum Due Date (if applicable):*
Protectiveness Statement: The implemented remedy for the site is protective of human health and the environment.	

Next Review

The next five-year review report for the Peter Cooper Superfund site is required five years from the completion date of this review.

Tables

Table 1: Chronology of Site Events	
Event	**Date(s)**
Initial discovery of problem or contamination	1971
Pre-NPL responses	1972-1975, 1996
Final NPL listing	April 6, 1998
Unilateral administrative order issued	March 30, 2000
Remedial Investigation/Feasibility Study complete	October 4, 2006
ROD signature	October 4, 2006
Remedial design start	April 2008
Enforcement documents (Consent Decree entry by the Court)	February 2009
Remedial action start	July 6, 2009
Remedial design complete	October 2009
RA Construction completion	August 2010
Construction completion date	September 2010
Site Management Plan completion	October 2010
Final Remedial Action Report completion	March 2012

Table 2: Documents, Data and Information Reviewed in Completing the Five-Year Review	
Document Title	**Date**
Record of Decision, Peter Cooper Landfill Site	September 2005
Preliminary Site Close Out Report	September 2010
Site Management Plan	October 2010
Post-Remedial Groundwater Monitoring and Maintenance Summary Report, First Semi-Annual Event	June 2011
Post-Remedial Groundwater Monitoring and Maintenance Summary Report, Second Semi-Annual Event	January 2012
Final Remedial Action Report	March 2012
Post-Remedial Groundwater Monitoring and Maintenance Summary Report, First Semi-Annual Event	June 2012
Post-Remedial Groundwater Monitoring and Maintenance Summary Report, Second Semi-Annual event	January 2013
Post-Remedial Groundwater Monitoring & Maintenance Summary Report June 2013 Semi-Annual Event	June 2013
Post-Remedial Groundwater Monitoring & Maintenance Summary Report June 2014 Annual Event	June 2014

Table 3: Summary of Groundwater Inorganic Compounds, VOCs and Leachate Parameters Analytical Results Detected Above GWQS

Parameters	MW 5S						MW-7S						GWQS
	06/23/11	01/11/12	6/25/12	1/10/13	6/25/13	6/23/14	06/23/11	01/11/12	6/25/12	1/10/13	6/25/13	6/23/14	
Total Inorganic Compounds (mg/L) and Leachate-Related Contaminants (mg/L)													
Manganese-Total	0.79	1	0.96 B7	1.2	0.88	0.79	.71	1.5	0.9	1.8	1.2	4	0.30
Iron-Total	24.7	ND	ND	15.1	-	NA	8.6	ND	ND	7.3	-	NA	0.30
Arsenic-Total	ND	ND	ND	ND	ND	ND	-	-	-	-	-	0.043	0.025
Ammonia (as N)	3.5	10.2	10.2	9.3	9.4	3.5	10.8	13.9	20.3	17.7	18.1	11.7	2
Parameters	**MWFP-2S**						**MWFP-3S**						**GWQS**
	06/23/11	01/11/12	6/25/12	1/10/13	6/25/13	6/23/14	06/23/11	01/11/12	6/25/12	1/10/13	6/25/13	6/23/14	
Total Inorganic Compounds (mg/L) and Leachate-Related Contaminants (mg/L)													
Manganese-Total	0.50	0.36	0.43B7	0.57	0.44	0.42	0.64	-	2.5B7	-	-	1.2	0.30
Iron-Total	8.0	ND	ND	5.2	-	NA	5.9	ND	ND	1.5	-	NA	0.30
Arsenic-Total	0.026	-	-	-	-	ND	ND	ND	ND	ND	ND	ND	0.025
Ammonia (as N)	3.2	NA	NA	NA	NA	NA	3.8	NA	NA	NA	NA	NA	2
VOCs (ug/L)													
PCE	-	-	-	-	-	-	7.9	6.9	-	13	12	10	5.0

ND=Parameter was not detected above lab reporting limits
NA=Not Analyzed
"-" =Detected below guidance values

B7=Detected in method blank or above method reporting limit
Concentration was 10 times above the concentration found in the blank.

Table 4: Summary of Surface water Inorganic Compounds, VOCs and Leachate Parameters Analytical Results Detected Above GWQS

Parameters	SW-1						SW-2						GWQS[1,2]
	06/23/11	01/11/12	6/25/12	1/10/13	6/25/13	6/23/14	06/23/11	01/11/12	6/25/12	1/10/13	6/25/13	6/23/14	
Total Inorganic Compounds (mg/L)													
Manganese-Total	0.35	-	-	-	-	-	0.44	-	-	-	-	-	0.30
Iron-Total	19.5	ND	ND	1.1	-	-	22	ND	ND	0.95	-	-	0.30
Arsenic-Total	ND	-	ND	ND	ND	ND	-	ND	ND	ND	ND	ND	.15
Parameters	SW-3												GWQS[1,2]
	06/23/11	01/11/12	6/25/12	1/10/13	6/25/13	6/23/14							
Total Inorganic Compounds (mg/L)													
Manganese-Total	0.62	-	-	-	-	-							0.3
Iron-Total	32.1	ND	ND	1	-	-							0.3
Arsenic-Total	-	ND	ND	ND	ND	ND							0.15

Notes:
1. Values per NYSDEC Division of Water Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations - GA Class (TOGS 1.1.1)
2. Values per NYSDEC Division of Water-Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations (TOGS1.1.1)- Class C (T).

Definitions:
ND = Parameter not detected above laboratory detection limit.
NA = not analyzed for these parameters.
"-" = Detected below guidance values.
B7 = Detected in method blank at or above method reporting limit. Concentration was 10 times above the concentration found in the blank.

Table 5: Other Comments on Operation, Maintenance, Monitoring	
Comment	**Suggestion**
MW-2SR, the well identified for sampling in the elevated fill area has been consistently dry for the past five years.	MW-1SR, the other well located in this area, should be sampled instead. In the event conditions change and MW-2SR consistently produces a sufficient volume of water for sampling, then the monitoring approach can revert to the original program.
There is only one surface water sample currently being collected along the site boundary in the vicinity of the ILA.	Since the highest concentrations of iron and manganese were detected at location SW-3, thought should be given to relocating SW-2 further downstream.
Additional information is needed to determine if ILA wells are being impacted by radial leachate flow.	A revised groundwater contour map is needed. In addition, all ILA wells (MW-1SR/MW-2SR, MW-5S, and MW-6) should be sampled for the following leachate parameters: pH, specific conductance, total dissolved solids, total alkalinity, sodium (dissolved) potassium (dissolved), calcium (dissolved), magnesium (dissolved), chloride (dissolved), sulfate (dissolved), ammonium, nitrite, nitrate, total kjeldahl nitrogen, iron (dissolved), manganese (dissolved), arsenic (dissolved), aluminum (dissolved), hexavalent chromium (dissolved), lead (dissolved), selenium (dissolved), and zinc (dissolved).

Attachment 1: Figures
Figure 1: Site Location Map

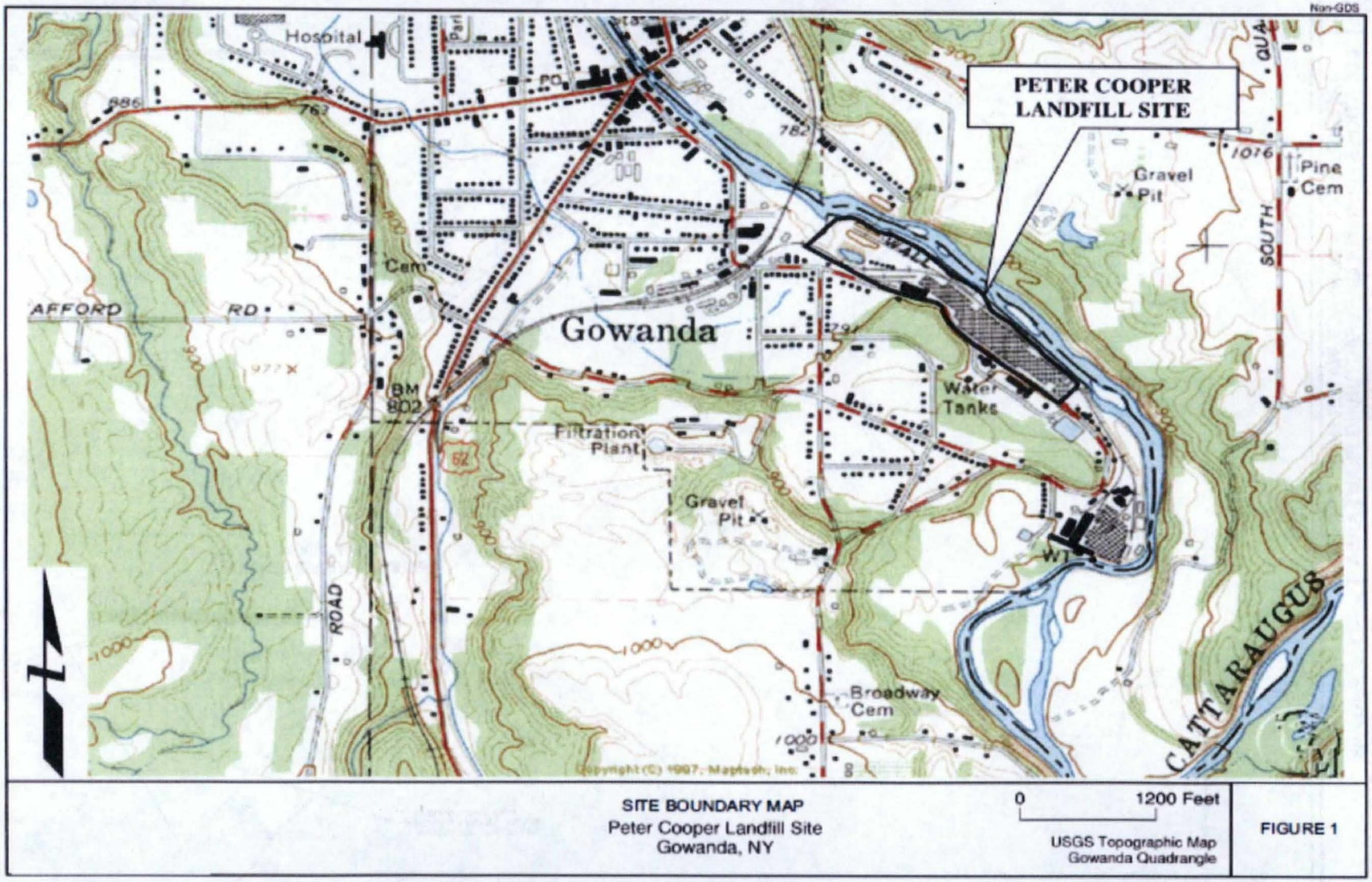

Figure 2: Groundwater and Surface Water Monitoring Location Map-FMPA

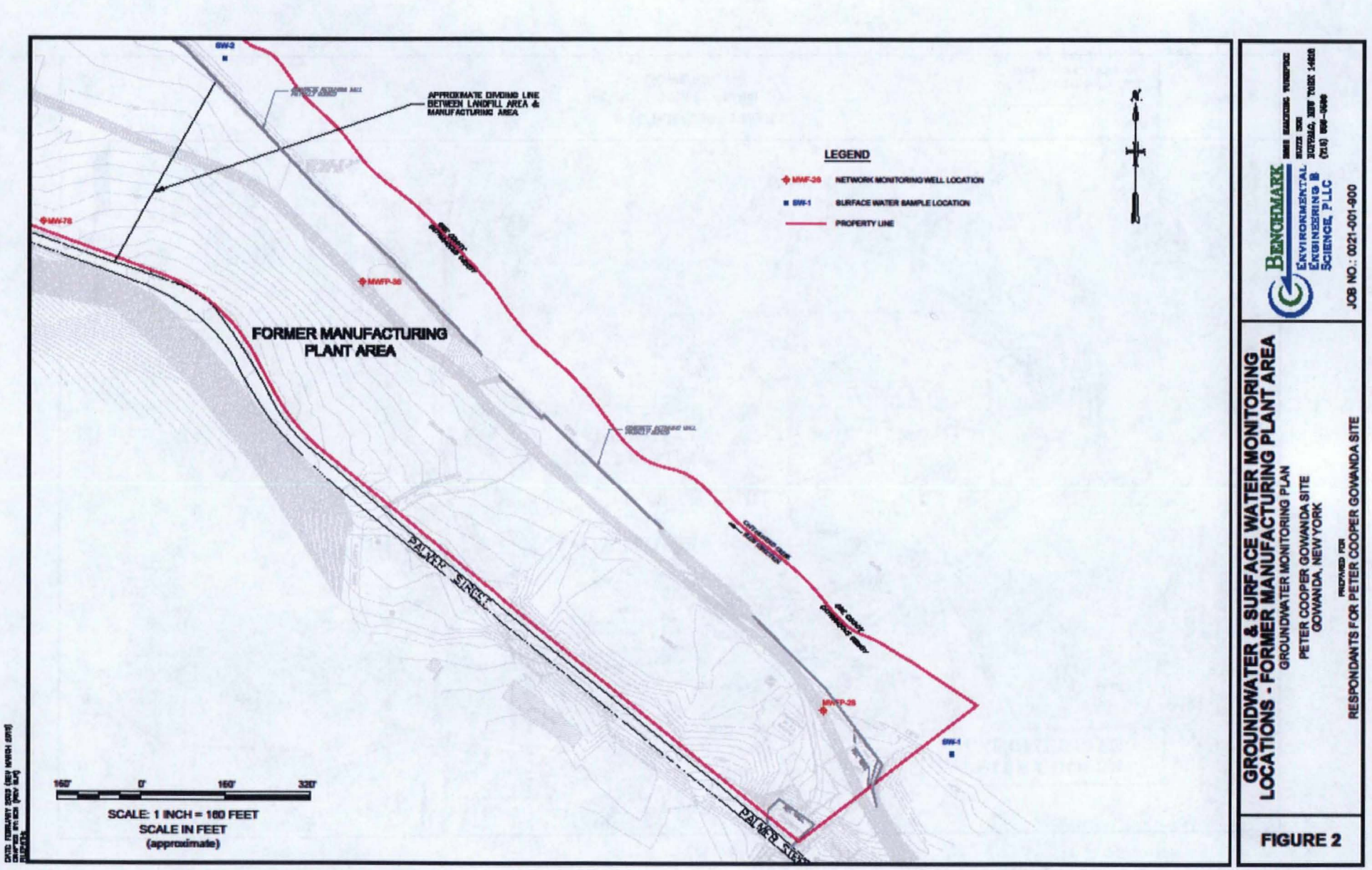

Figure 3: Groundwater and Surface Water Monitoring Location Map-ILA