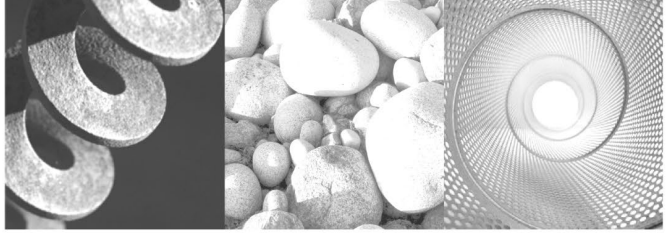

Site Management Periodic Review Report (2024)
Site No. 915141B

NFG - Iroquois Gas/Westwood Pharmaceutical Riparian Site, Buffalo, New York

Submitted to:
New York State Department of Environmental Conservation
Division of Environmental Remediation, Region 9
Buffalo, New York

Submitted by:
GEI Consultants, Inc.
100 Sylvan Parkway, Suite 400
Amherst, New York 14228
716.204.7154

On behalf of:
National Fuel Gas Distribution Corporation
Williamsville, New York 14221

January 2025, Rev. September 2025
Project No. 1403480-1000

Richard H. Frappa, P.G.
Senior Consultant

Kelly R. McIntosh, P.E., Ph.D.
Senior Consultant

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Appendices

1. Executive Summary

GEI Consultants, Inc., P.C. (GEI) was retained by National Fuel Gas Distribution Corporation (National Fuel) to conduct the Site Management Periodic Review Report (PRR) submittal for the Iroquois Gas/Westwood Pharmaceutical Riparian Site located in Buffalo, New York (Site). This PRR certifies the operation and maintenance (O&M) activities performed at the site for the reporting period between January 1, 2024 and December 31, 2024 referred to hereafter as the 2024 monitoring period.

This certification follows the NYSDEC's denial of the 2020 PRR (in correspondence dated April 29, 2021) and placement of the Site into Corrective Measures. Pursuant to direction from NYSDEC, National Fuel continued to implement O&M activities, and each was documented in 2021 and 2022 PRRs which did not include certification forms of Institutional and Engineering Controls (IC/ECs). The submission of uncertified PRRs was mutually agreed upon as the rationale for the NYSDEC denial of the 2020 PRR was in dispute. According to NYSDEC correspondence dated July 17, 2025, the Site remains in Corrective Measures. That correspondence requested a continuation of enhance DNAPL recovery. An NYSDEC email dated September 10, 2025 specified the exclusion of New York State PE certification of IC/ECs forms.

Routine O&M activities include visual inspections of the Scajaquada Creek sediment cap, the creek banks and site restoration elements, and maintenance checks on the Northern and Southern DNAPL recovery systems following the completion of remedy implementation in 2003.

In conducting this periodic review, GEI determined the components of the O&M Plan dated February 8, 2005 (which serves as the Site Management Plan or {SMP}), and amended frequencies of inspections as agreed to in NYSDEC correspondence dated December 2, 2009, were in compliance during the 2024 reporting period:

- ICs/ECs have been in place and effective.
- Inspections were performed as required and identified the need for maintenance of the erosion armor stone in select areas (repairs completed in 2024). No other deficiencies were identified.
- The two DNAPL collection systems functioned as designed during the reporting period; however, the rate of collection has substantially decreased during the certifying reporting period. Testing completed in 2024 indicates a significant reduction in volume of mobile DNAPL in the area of the collection systems.

A Site Characterization was completed in the lower portion of Scajaquada Creek in 2022 by GEI on behalf of National Fuel under a Consent Decree. The investigation did not identify DNAPL presence in sediment boring LSC-SED-8 located immediately downstream from the West Avenue bridge (closest sediment boring downstream from the Riparian Site). No evidence of a continued release from the Riparian Site was observed. Based upon the inspections and compliance with the O&M Plan and investigation completed thus far, the site remedy continues to function to meet the remedial objectives for the site. Further assessment of source control is ongoing by National Fuel as a task being completed during a Remedial Investigation of the Lower Scajaquada Creek OU under a Project Agreement with the NYSDEC and US EPA under the Great Lakes Legacy Act (GLLA).

Details of the 2024 PRR reporting period are provided in the following sections with recommendations for O&M in 2025.

2. Site Overview

2.1. Site Description

The Scajaquada Creek Site is the riparian portion of the Iroquois Gas/Westwood Pharmaceutical (IG/WP) Site and is situated in a mixed industrial and residential area of Buffalo, New York. The site comprises approximately 2.5 acres along a 1,600-foot-long reach of Scajaquada Creek. The Site location and Site layout are shown on Figure 1 and Figure 2, respectively. Manufactured gas plant (MGP) operations were conducted at a former Iroquois Gas facility situated adjacent to the Site on property at 100 Forest Avenue from the 1890s to the 1950s and gas storage continued until 1972. Investigations indicated that soil and groundwater were impacted with chemicals associated with gas manufacturing processes and that constituents were migrating into the creek. Remedial activities (i.e., sheet pile wall installation, sediment excavation, capping, and installation and operation of dense non-aqueous phase liquid (DNAPL) recovery systems) have been performed since 1999 to address these impacts.

2.2. Site Remedial Program Summary

In 1996, National Fuel constructed a sheet pile wall along the eastern bank of the creek, adjacent to the IG/WP property. The sheet pile wall was an initial component of the remedial action which separates the terrestrial remedial action (the responsibility of others) from the riparian remedial action. National Fuel conducted the riparian remedial action in two phases: 1. Sediment and soil removal and capping in Scajaquada Creek; and 2. DNAPL collection and removal from permeable soil below the creek sediment cap. The riparian remedial design was conducted in 1997/1998 and received approval in June 1998. Remedial excavation and capping began in July 1998 and completed in May 1999. Installation and startup of the southern DNAPL recovery system was completed in June 1999. Following completion of property access agreements, installation, and startup of the northern DNAPL recovery system was completed in August 2001. In summary, the components of the selected remedy include:

- Installation of a sheet pile barrier wall beneath a 70-foot width of the creek, close to West Avenue bridge.
- Installation of approximately 450 linear feet of a steel sheet pile barrier along the east bank of the creek (bordering property of former MGP operations).
- Excavation of the creek bottom and off-site disposal of 18,976 cubic yards of contaminated sediment and debris. The overall goal of excavation was to remove sediments with concentrations of PAHs greater than 50 mg/kg within the site boundary, considering the physical limitations at the site.
- Capping of the creek bottom resulting in a horizontal barrier (cap) along the 1,600-foot reach of Scajaquada Creek. The cap consists of geosynthetic clay liner (GCL), angular sand, geotextile, and anchoring (armor) stone.
- Installation of two DNAPL recovery systems near the West Avenue Bridge and the Conrail railroad bridge.

- Implementation of an O&M Plan as an institutional control to verify and ensure the performance of the remedial systems.

Excluding O&M activities (i.e., rip rap armor placement in 2015 and 2020 in select areas to protect the sediment cap from erosion), no significant changes have been made to the remedy since remedy selection. Details of the Remedial Action are presented in the Final Engineering Report (FER), prepared by ThermoRetec (August 2000) with a supplemental FER prepared by RETEC (November 2001).

In a letter dated February 12, 2021, NYSDEC formally requested National Fuel to voluntarily agreed to commit to investigate and remediate properties downstream of the Riparian Site which exhibited impacts from coal tar based on NYSDEC investigations. In the letter, NYSDEC indicated that a continuing release of contamination from the remediated Riparian Site may be occurring via a preferential pathway in creek bed sediments which may impact downstream sections of the creek. The properties listed in the February 12, 2021, letter included a downstream parcel formerly owned by a predecessor to National Fuel (identified as the "P-Site) and the lower portion of Scajaquada Creek and lands directly bordering the creek not owned by National Fuel.

After National Fuel's receipt of the request to investigate downstream areas and the submittal of the 2020 PRR to NYSDEC on March 12, 2021, the NYSDEC denied the 2020 PRR in a letter dated April 29, 2021, based on information provided in the February 12, 2021, correspondence placing the Riparian Site into Corrective Measures. As described in the 2021 PRR, GEI's engineer of record responded to the denial of the 2020 PRR on May 4, 2021 and stated that inspections described in the 2020 PRR concluded that each remedy component of the O&M Plan (SMP) was in compliance during the 2020 reporting period (i.e., no deficiencies in the capping system, no sheen observed in surface water, and north and south DNAPL recovery systems functioning properly). Following guidance from NYSDEC, PRRs were submitted for the 2021 and 2022 reporting periods (submittal dates February 10, 2023, and April 3, 2023, respectively) but did not include certification of the IC/ECs. The 2023 PRR retroactively provided certification of the 2020 through 2023 reporting periods. Based on NYSDEC correspondence dated July 17, 2025, the NYSDEC considers the site in Corrective Measures status. IC/EC certification forms are excluded from this report as requested in a NYSDEC email dated September 10, 2025. The correspondence also requests a continuation of the enhanced DNAPL recovery efforts as described in Section 3.2.2.

National Fuel entered into an Order on Consent (Order or OC) with the NYSDEC which was signed by the NYSDEC Director of Environmental Remediation on June 23, 2021. National Fuel prepared a Site Characterization Scope of Work (SOW) to investigate the P-Site and the Lower Scajaquada Creek dated August 2021 which was approved by NYSDEC on October 5, 2021. The SOW was implemented between 2021 and 2022, the results of which were documented in a June 2022 Report (revised October 2022) entitled "Site Characterization - Former Buffalo Gaslight Iroquois Gas Corp Site and Lower Scajaquada Creek, Buffalo, New York". The findings of the investigation, which are pertinent to the NYSDEC's concern for failure of the remedy, are as follows:

- The sediment boring LSC-SED-8, positioned directly downstream from the West Avenue bridge (the nearest sediment boring downstream from the Riparian Site), did not identify DNAPL presence. This observation supports the conclusion that a continuous pathway for ongoing migration beyond the containment measures of the Riparian Site was not identified.

- The presence of DNAPL observed further downstream above a deeper widespread clay layer, suggests that this DNAPL presence is historical and a result of transport that occurred before the remedial controls were installed at the Westwood Terrestrial and Riparian Sites.

To further address NYSDEC's concern, a Phased Scope of Work (SOW) for a Remedial Investigation/Feasibility Study (RI/FS) was agreed to between National Fuel and the Department in May 2022 to evaluate the full nature, extent, fate, and transport of impacts of historic DNAPL associated with former MGP operations, including the area downstream/downgradient from the Riparian Site. In 2024, preparation of a RI/FS Work Plan was initiated for the Lower Scajaquada Creek OU and includes investigation in the area of source control near the downgradient area of the Westwood Terrestrial/Riparian sites under a Project Agreement (PA) with US EPA and NYSDEC under the Great Lakes Legacy Act (GLLA). The work plan was approved by the NYSDEC in July 2025. The Remedial Investigation began in May 2025 and is expected to be completed by late 2026. The RI will assess the adequacy of existing engineering controls at the Riparian site to contain DNAPL at the West Avenue bridge.

2.3. O&M Plan

O&M requirements for the Site are documented in the NYSDEC-approved O&M Plan dated February 8, 2005 (O&M Plan) and a modification of monitoring frequency as described in a correspondence prepared by AECOM dated July 9, 2009, and approved by the NYSDEC by letter dated December 2, 2009. These documents serve as the Site Management Plan (SMP) for the site. Components of the SMP for the Scajaquada Creek Site include:

- inspection of the Scajaquada Creek sediment cap;
- inspection of the DNAPL recovery systems;
- maintenance checks on the operation of the DNAPL recovery systems with enhanced recovery testing methods to assess DNAPL mobility;
- maintenance and repair of engineering controls; and
- field observations and reporting.

Each of these elements was conducted during the 2024 monitoring period.

3. Remedy Performance Evaluation

The remedial performance is evaluated based on the following:

1. Periodic inspection and maintenance of the Scajaquada Creek sediment cap.
2. Periodic inspection and maintenance of the DNAPL recovery systems including enhanced DNAPL recovery testing completed in 2024 on a quarterly basis.

Remedy performance evaluations for the 2024 reporting period are described below.

3.1. Scajaquada Creek Sediment Cap Annual Inspections

The sediment cap inspection for the 2024 reporting period is documented in Appendix A. The 2024 annual inspection of the sediment cap was completed by Richard Frappa, P.G. of GEI on April 22, 2024. Weather conditions were sunny with temperatures in the low 40s ^{o}F with low creek water levels based on the observed wet markings on rip rap and Scajaquada Expressway bridge supports. Photographs of the inspection were discussed with and reviewed by Mr. Kelly McIntosh, P.E. of GEI and GIS referenced using ArcGIS Survey123®. The annual visual inspection was performed to evaluate remedy effectiveness in protecting human health and the environment. The annual inspection documentation is included as Appendix A.

The sediment cap remains in good condition and is effective in preventing sheen generation from ebullition transport. No sheens were observed during the inspection and sheens were not identified during any DNAPL recovery system maintenance checks. The visual inspection of the sediment cap and creek bank identified four areas on the bank where minor erosion of the creek bank armoring stone was evident from stormwater discharge through downspouts from the elevated sections of the Scajaquada Expressway and in need of improvement. In those areas, some of the armoring stone was washed away and the geotextile below the stone was occasionally visible. Also, it appeared that high-water conditions and ice flows during the winter created the scour observed along three short segments of shoreline, two on the west shoreline and one on the east shoreline. Each of these areas is identified on Figure 2. The scour partially exposed the geotextile material below the armoring stone. Damage to the sediment cap itself was not observed at any of the locations. Notification of the intent to perform the necessary repairs described above, along with an import fill request were submitted to NYSDEC on May 9, 2024. The import fill request was subsequently approved by NYSDEC via email on May 20, 2024. The repair work to the armored-stone areas was completed on June 3, 2024, by SUN Environmental under contract to National Fuel. A summary of the repair work and a figure showing the locations of the repairs is provided in Appendix B.

3.2. DNAPL Recovery Systems

Recovery of mobile DNAPL in coarse-grained creek sediments at the Riparian Site occurs through gravity drainage to sumps constructed in DNAPL recovery wells located at the South and North DNAPL recovery vaults (see Figure 2). Collected DNAPL (and groundwater) is pumped using peristaltic pumping systems

and conveyed to storage tanks located in each collection system vault having an approximate 2,100-gallon capacity.

The DNAPL recovery systems were checked during the reporting period and additional testing was initiated in 2023 continued in 2024 to enhance DNAPL recovery in each DNAPL recovery well. Enhanced recovery involved using a portable centrifugal pump for groundwater withdrawal at higher pumping rates to actively collect groundwater and potentially mobilize DNAPL if present. Gravity and enhanced collected DNAPL in 2024 is detailed below..

3.2.1. DNAPL Recovery System Inspections/Measurements

The Southern and Northern DNAPL recovery systems were checked approximately monthly by National Fuel staff with Sun Environmental facilitating confined space entry during the 2024 reporting period. GEI frequently supported monthly system checks and provided recommended improvements in system function focusing on maximizing DNAPL volume collection while minimizing water volume collection. A 5-gallon bucket is suspended in each water/DNAPL collection tank receiving discharge from the peristaltic pumps. The bucket allows for rapid observation of pump performance between tank measurements prior to overtopping into the vault's storage tank. Monthly system checks for the Southern and Northern DNAPL recovery systems included timer and pump function, tank measurements, and equipment maintenance (i.e., tubing changes, pump maintenance, etc.). DNAPL recovery system 2024 maintenance details are included in Appendix C.

Southern DNAPL Recovery System

Monthly systems checks were completed in 2024. Liquid level measurements were recorded periodically from the collection tank of the Southern DNAPL recovery system. During monthly inspection events conducted with GEI staff, depth to water and DNAPL thickness in the tank was recorded and is summarized in Appendix C1. Volumes were calculated by taking measurements in the tanks with a water level meter, measuring the length of DNAPL staining on a PVC rod lowered to the tank bottom and totaling DNAPL volumes present in the bucket hung in the tank. Maintenance activities performed on the southern DNAPL recovery system during this period included adjustments or replacement of flexible tubing or changes near the pump head during each gauging event.

On December 13, 2024, Sun Environmental removed approximately 1482 gallons of liquid from the South Vault storage tank with a vac truck and transported the liquid to a licensed facility for off-Site disposal. Disposal manifests are included in Appendix C2.

No DNAPL was recovered in the southern DNAPL recovery system during the 2024 monitoring period, whether through routine peristaltic pumping or quarterly enhanced recovery testing. Since operation startup in 1999, approximately 3,557 gallons of DNAPL have been collected by the Southern DNAPL recovery system. A summary of historical calculated quantities are reported on the DNAPL recovery system monitoring log in Appendix C3. As shown in Appendix C3, the DNAPL volume recovered from the South Vault significantly decreased over the past three years to a negligible amount in 2024.

Northern DNAPL Recovery System

Maintenance activities performed on the Northern DNAPL recovery system during this period included adjustments of flexible tubing or changes near the pump head during each gauging event. No pump run time adjustments were performed during the 2024 PRR period. Liquid level measurements were recorded periodically from the collection tank of the Northern DNAPL recovery system. During monthly inspection events conducted with GEI staff, depth to water and DNAPL thickness was recorded and presented in Appendix C1. Volumes were calculated by taking liquid level tank measurements using a water level meter, measuring the length of DNAPL staining on a PVC rod or weighted white cotton rope lowered to the tank bottom and totaling DNAPL volumes present in the bucket hung in the tank.

On December 13, 2024, Sun Environmental removed the entire contents of the North Vault with a vac truck (1493 gallons) and transported the material to a licensed facility for off-Site disposal. The disposal manifest for this removal event is provided in Appendix C2.

The DNAPL volume recorded for the 2024 monitoring period was approximately 12.9 gallons and is inclusive of enhanced recovery efforts described in Section 3.2.2. Since operation startup in 2001, approximately 1,046 gallons of DNAPL have been collected by the Northern DNAPL recovery system. A summary of historical calculated quantities are reported on the DNAPL recovery system monitoring log in Appendix C4.

3.2.2. Enhanced DNAPL Recovery Testing

National Fuel Gas and GEI initiated an enhanced recovery strategy at both the Northern and Southern DNAPL recovery systems to test for mobile DNAPL presence in the area near each recovery well. This strategy involved the use of a compact, gas-powered transfer pump, capable of pumping approximately 2 to 4 gallons per minute (gpm) of groundwater. The increased groundwater flow velocity in the area of the recovery well would induce the recovery of mobile DNAPL present near the well screen. The pump intake was directly connected to the existing down-hole recovery tubing in each system.

During the 2024 monitoring period, quarterly enhanced recovery pumping events were conducted on March 21, 2024, June 20, 2024, August 29, 2024, and December 13, 2024. Each event lasted approximately one hour at each vault location with observations of discharge. The material produced during the testing was either collected in 5-gallon buckets and moved to the storage tank or directly discharged into the storage tank at each location. Specific observations for each recovery system and each test event are described below and details can be found in the field observation reports provided in Appendix D.

3.2.2.1. Southern DNAPL Recovery System

March 21, 2024 - The Southern DNAPL recovery system was pumped at a rate of 2.5-3.25 gpm for a period of one hour. The pump discharge was initially clear to slightly silty brown water with a slight coal tar-like odor and a light sheen. The discharge water also had a moderate to strong hydrogen sulfide (H2S)/septic-like odor after the first 20 minutes of pumping. Approximately 180 gallons of groundwater were pumped, with no observations of DNAPL in the recovered water. Further details are included in Appendix D1.

June 20, 2024 - The recovery system was pumped at a rate of 2.5-3.5 gpm for a period of one hour. The pump discharge was clear with a strong hydrogen sulfide odor and light hydrocarbon sheen. Approximately 180 gallons of water and no DNAPL were recovered. Further details are included in Appendix D2.

August 29, 2024 - The recovery system was pumped at a rate of 3.0 gpm for a period of one hour. The initial pump discharge was clear to slightly turbid water with a light to heavy sheen and moderate coal-tar odor. After approximately 30 minutes, a strong hydrogen sulfide odor accompanied the discharge water. Approximately 180 gallons of water and no DNAPL were recovered. Further details are included in Appendix D3.

December 13, 2024 – The recovery system was pumped at a rate of 2.5-3.5 gpm for a period of one hour. The initial discharge consisted of clear to slightly silty water with a light sheen and no DNAPL present. After approximately 30 minutes, the water was accompanied by strong hydrogen sulfide odor and a continued light sheen and coal tar odor. Approximately 165 gallons of water and no DNAPL were recovered. Further details are included in Appendix D4.

3.2.2.2. Northern DNAPL Recovery System

March 21, 2024 - The Northern DNAPL recovery system was pumped at an average rate of 3.0 gpm for a period of one hour. The pump discharge was initially a water/DNAPL mix at approximately 25%/75% for the first 5-10 gallons which then transitioned to mainly clear water with a moderate sheen and coal tar-like odor for the duration of pumping. Approximately 176 gallons of water and an estimated 4 gallons of DNAPL were recovered. Further details are included in Appendix D1.

June 20,2024 - The recovery system was pumped at a rate of 3.0-3.5 gpm for a period of one hour. The initial discharge is 25-30% DNAPL/ with the balance being silty water for approximately the first 25 gallons. The discharge then clears significantly with mostly silty water with heavy sheen and strong coal tar-like odor. DNAPL component decreases toward the end of testing with the water only exhibiting a slight sheen. Approximately 210 gallons of water and an estimated 3 gallons of DNAPL were recovered. Further details are included in Appendix D2.

August 29, 2024 - The recovery system was pumped at a rate of 3.0 gpm for a period of one hour. The initial pump discharge contained an estimated 10% DNAPL for approximately the first 10-15 minutes. The discharge then became significantly clearer after with estimated 2-5% DNAPL with heavy sheen and strong coal tar-like odor. After 40 minutes, the discharge water became clear with moderate to heavy sheen and strong coal tar-like odor. Approximately 180 gallons of water and an estimated 1.5 gallons of DNAPL were recovered. Further details are included in Appendix D3.

December 13, 2024 – The recovery system was pumped at a rate of 2.5-3.5 gpm for a period of one hour. The initial water quality was approximately 50% water/50% DNAPL for the first several gallons and then transitioned to mainly clear water with a strong sheen and coal-tar odor. Approximately 195 gallons of water and an estimated 2 gallons of DNAPL were recovered. Further details are included in Appendix D4.

4. IC/EC Compliance

4.1. IC/EC Requirements

ICs include the following;

- Implementation of Site O&M Plan.
- Monitoring and inspection to assess the performance and effectiveness of the remedy.

The Site is a New York State waterway and property use is limited to its function as a conveyance of surface water in the City of Buffalo.

ECs include the following;

- Sediment cap consisting of GCL overlain by sand, geotextile, and anchoring/armor stone.
- Collection of mobile DNAPL below the sediment cap.
- Maintenance of the creek sediment cap and operation and maintenance of the DNAPL collection systems.

4.2. IC/EC Compliance

The NYSDEC-approved O&M Plan is in place. All required inspections and O&M activities were performed during this reporting period in accordance with the plan.

4.3. IC/EC Certification

The 2024 PRR excludes IC/ECs certification forms as the site is in Corrective Measures.

5. Conclusions and Recommendations

Each component of the Routine O&M Plan dated February 8, 2005, and amended frequencies of inspections as agreed to in NYSDEC correspondence dated December 2, 2009, collectively regarded as the SMP, were in compliance during the reporting period from January 1, 2024, through December 31, 2024. The Southern and Northern DNAPL recovery systems were maintained and included quarterly enhanced recovery tests in 2024 to remove mobile DNAPL. DNAPL collection volumes have decreased substantially since 2023. No DNAPL was removed from the Southern DNAPL recovery system in 2024 (by gravity flow or enhanced recovery) and only 8 gallons collected in the prior year. The Northern DNAPL recovery system recovered 12.9 gallons in 2024.

The sediment cap remains in good condition and is effective in preventing sheen generation from ebullition transport. The riprap armor above the cap is in good condition following repairs performed in April 2024, and petroleum-type sheens were not observed on the creek water surface upstream of the West Avenue bridge in the inspection area. The ICs/ECs have been in place and are operating effectively during the reporting period.

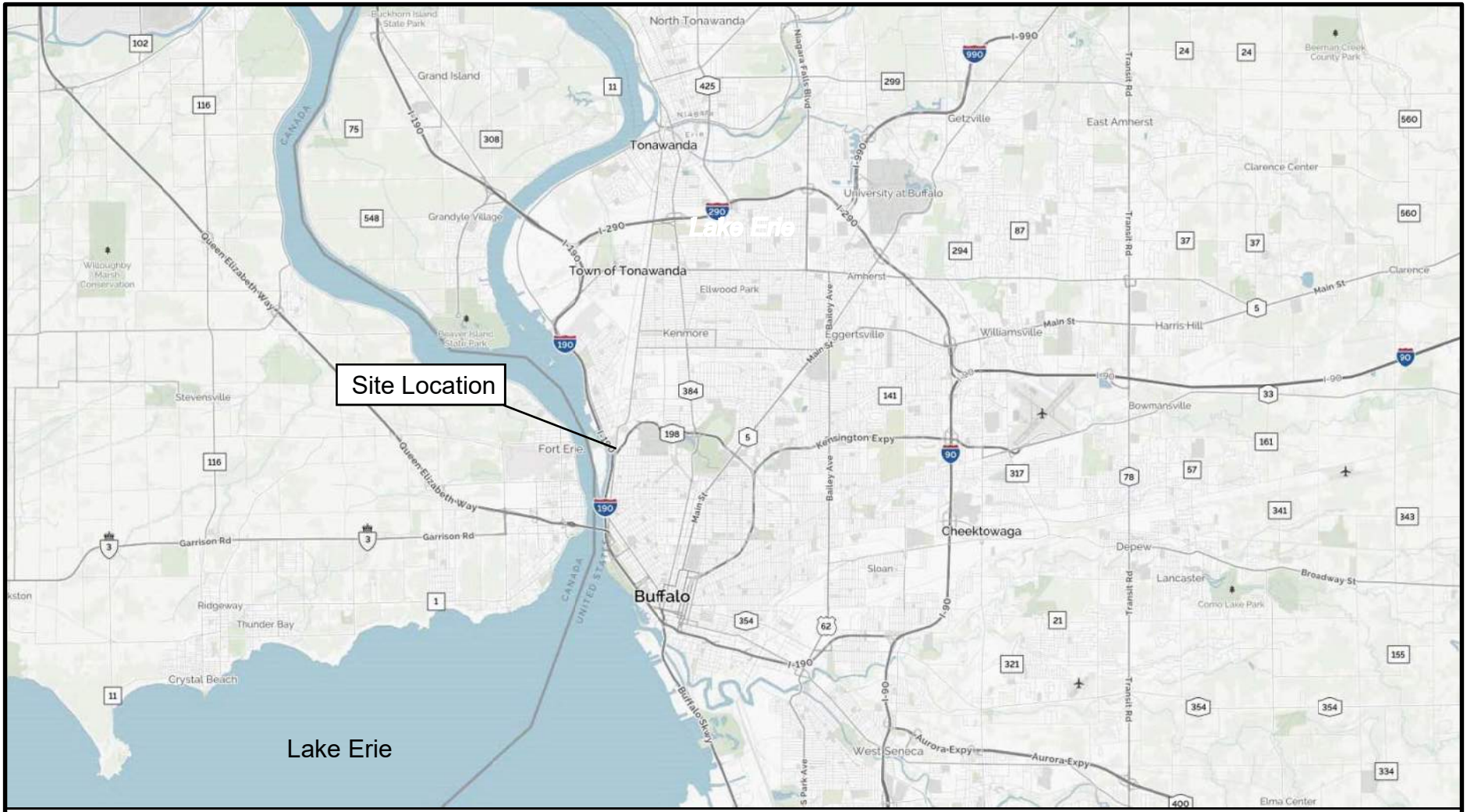
Other activities conducted during the 2024 reporting period outside of the Routine O&M scope of work concluded the following:

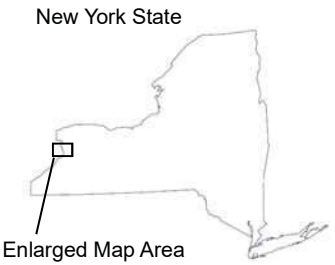
- The results of the enhanced DNAPL recovery testing conducted in 2024 suggest that the mobile DNAPL volume is becoming depleted at the Southern DNAPL recovery system. It is recommended that enhanced recovery efforts continue to be performed on a quarterly basis during the 2025 PRR period to further assess DNAPL depletion. Following the enhanced DNAPL recovery actions to be completed in 2025, and planned investigation of source control measures during the Remedial Investigation, the effectiveness of continued DNAPL recovery at the Riparian Site will be evaluated.
- An ongoing release from the Riparian Site to downstream areas was not identified during the investigation documented in the 2022 Site Characterization of the Lower Scajaquada Creek Area and the Site IC/ECs continue to operate as intended.
- The RI/FS that is being implemented in 2025 and 2026 with US EPA and NYSDEC under a Project Agreement (PA) for Interim Remedial Measures and Remedial Investigation/Feasibility Study for the Black Rock Canal and Lower Scajaquada Creek Area of Concern under the Great Lakes Legacy Act (GLLA) will investigate the adequacy of existing IC/ECs for source control at the Westwood Riparian and Terrestrial Sites.
- The O&M activities for the Riparian Site will be reviewed following continued enhanced recovery testing in 2025 and GLLA RI findings.

Figures

Figure 1. Site Location

Figure 2. Site Layout



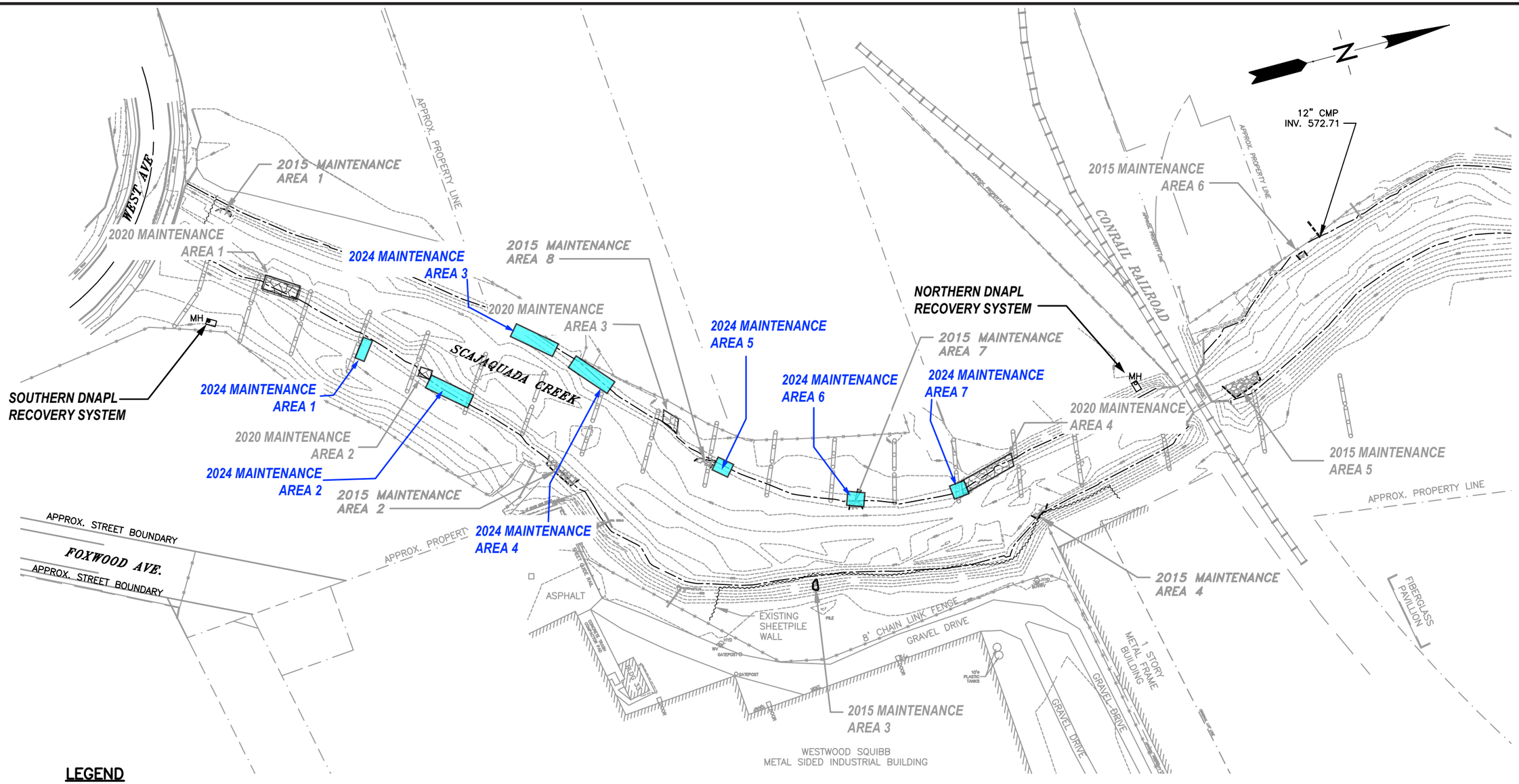


N

0 1 4

Scale
(miles, approximate)

National Fuel Gas Corporation	GEI Consultants	SITE LOCATION SCAJAQUADA CREEK SITE
Buffalo, New York	Project 1403480	January 2025 Figure 1



LEGEND

Approximate area of maintenance activities performed Nov. 18-20, 2015 and Feb. 10 and 11, 2020 Upland Boundary Surveyed

Approximate limits of Dredge Cap. (Approximated from "Sediment Remediation" Drawings, RETEC Engineering, P.C., June 1998)

COMPLETED 2024 CAP MAINTENANCE AREA

NOTES:
1. Base modified from original figure prepared by Clough, Harbour & Associates from a September 1995 field survey and presented by AECOM in the Summary of 2016 Site Inspection Activities Report.
2. Property lines shown hereon are for information purposes only, and should not be used for the transfer of property. The property lines shown are depicted from a partial field boundary survey, record deeds and map information.

100' 0 100'

SCALE IN FEET

National Fuel Gas Corporation

Buffalo, New York

GEI Consultants

Project 1403480

SITE LAYOUT

January 2025 Figure 2

Appendix A Scajaquada Creek Cap Inspection Photographs and Observations (April 22, 2024)

Photographic Log

Project: National Fuel Westwood Site Inspection
Client: National Fuel Gas Corporation **GEI Proj. No.:** 1403480

PHOTOGRAPH NO: 01	DATE: April 22, 2024	LATITUDE: 42.9302746557925	LONGITUDE: -78.8955504792548
DIRECTION: Northwest	SITE LOCATION: SCAJAQUADA CREEK SITE - BUFFALO, NEW YORK		

DESCRIPTION:

Area 1 maintenance 2015.

Water clarity is good. No sheens visible anywhere along the shoreline or surface water in the inspection area.

PHOTO BY:

RICK FRAPPA, P.G.

PHOTOGRAPH NO: 02	DATE: April 22, 2024	LATITUDE: 42.9305595019027	LONGITUDE: -78.8953575501922
DIRECTION: Southwest	SITE LOCATION: SCAJAQUADA CREEK SITE - BUFFALO, NEW YORK		

DESCRIPTION:

2020 Maintenace Area 1.

Armor stone in good condition.

PHOTO BY:

RICK FRAPPA, P.G.

Photographic Log

Project: National Fuel Westwood Site Inspection
Client: National Fuel Gas Corporation **GEI Proj. No.:** 1403480

PHOTOGRAPH NO: 03	DATE: April 22, 2024	LATITUDE: 42.9306861993883	LONGITUDE: -78.8951808417912
DIRECTION: West	SITE LOCATION: SCAJAQUADA CREEK SITE - BUFFALO, NEW YORK		

DESCRIPTION:

2020 Maintenance Area 2. Note visible geotextile to the left (north) of the 2020 Maintenance Area. The area north of the recently repaired area requires additional armoring stone.

PHOTO BY:

RICK FRAPPA, P.G.

PHOTOGRAPH NO: 04	DATE: April 22, 2024	LATITUDE: 42.9308448450195	LONGITUDE: -78.8948847452311
DIRECTION: North	SITE LOCATION: SCAJAQUADA CREEK SITE - BUFFALO, NEW YORK		

DESCRIPTION:

Exposed geotextile along the shoreline of the west bank about 15ft in length. Area requires additional armor stone.

PHOTO BY:

RICK FRAPPA, P.G.

Photographic Log

Project: National Fuel Westwood Site Inspection
Client: National Fuel Gas Corporation **GEI Proj. No.:** 1403480

PHOTOGRAPH NO: 05	DATE: April 22, 2024	LATITUDE: 42.9309044336563	LONGITUDE: -78.8948549153884
DIRECTION: West	SITE LOCATION: SCAJAQUADA CREEK SITE - BUFFALO, NEW YORK		

DESCRIPTION:

Additional exposure of geotextile on western shoreline visible through the weeds.

PHOTO BY:

RICK FRAPPA, P.G.

PHOTOGRAPH NO: 06	DATE: April 22, 2024	LATITUDE: 42.9310030423532	LONGITUDE: -78.8946990990309
DIRECTION: Southwest	SITE LOCATION: SCAJAQUADA CREEK SITE - BUFFALO, NEW YORK		

DESCRIPTION:

Exposed area of geotextile about 30 ft north of the prior area approximately 12 ft in length.

PHOTO BY:

RICK FRAPPA, P.G.

Photographic Log

Project: National Fuel Westwood Site Inspection
Client: National Fuel Gas Corporation **GEI Proj. No.:** 1403480

PHOTOGRAPH NO: 07	DATE: April 22, 2024	LATITUDE: 42.9311936764225	LONGITUDE: -78.8942537772322
DIRECTION: Northeast	SITE LOCATION: SCAJAQUADA CREEK SITE - BUFFALO, NEW YORK		
DESCRIPTION: 2020 Maintenance Area 3. Remains in good condition.			
PHOTO BY: RICK FRAPPA, P.G.			

PHOTOGRAPH NO: 08	DATE: April 22, 2024	LATITUDE: 42.9312210920381	LONGITUDE: -78.8937536910005
DIRECTION: Southeast	SITE LOCATION: SCAJAQUADA CREEK SITE - BUFFALO, NEW YORK		
DESCRIPTION: 2015 Maintenance Area 8. Portions of the geotextile are visible below the Expressway concrete splash pad. Additional armor stone is recommended.			
PHOTO BY: RICK FRAPPA, P.G.			

Photographic Log

Project: National Fuel Westwood Site Inspection
Client: National Fuel Gas Corporation **GEI Proj. No.:** 1403480

PHOTOGRAPH NO: 09	DATE: April 22, 2024	LATITUDE: 42.9314242603717	LONGITUDE: -78.8937007491115
DIRECTION: Southwest	SITE LOCATION: SCAJAQUADA CREEK SITE - BUFFALO, NEW YORK		

DESCRIPTION:

2015 Maintenance Area 7 requires additional armor stone to cover visible geotextile.

PHOTO BY:

RICK FRAPPA, P.G.

PHOTOGRAPH NO: 10	DATE: April 22, 2024	LATITUDE: 42.931702282989	LONGITUDE: -78.8933235041041
DIRECTION: Southwest	SITE LOCATION: SCAJAQUADA CREEK SITE - BUFFALO, NEW YORK		

DESCRIPTION:

South view of sheetpile.

Good condition, no seeps or sheen visible.

PHOTO BY:

RICK FRAPPA, P.G.

Photographic Log

Project: National Fuel Westwood Site Inspection
Client: National Fuel Gas Corporation **GEI Proj. No.:** 1403480

PHOTOGRAPH NO: 11	DATE: April 22, 2024	LATITUDE: 42.9319082921896	LONGITUDE: -78.8933754266153
DIRECTION: East	SITE LOCATION: SCAJAQUADA CREEK SITE - BUFFALO, NEW YORK		

DESCRIPTION:

2020 Maintenance Area 4 requires additional stone prevent erosion into creek bank soil below downspout splash pad.

PHOTO BY:

RICK FRAPPA, P.G.

PHOTOGRAPH NO: 12	DATE: April 22, 2024	LATITUDE: 42.9325125989378	LONGITUDE: -78.8934231952304
DIRECTION: South	SITE LOCATION: SCAJAQUADA CREEK SITE - BUFFALO, NEW YORK		

DESCRIPTION:

South view from RR bridge. No sheens.

PHOTO BY:

RICK FRAPPA, P.G.

Photographic Log

Project: National Fuel Westwood Site Inspection
Client: National Fuel Gas Corporation **GEI Proj. No.:** 1403480

PHOTOGRAPH NO: 13	DATE: April 22, 2024	LATITUDE: 42.9326645266368	LONGITUDE: -78.8931843869026
DIRECTION: Northwest	SITE LOCATION: SCAJAQUADA CREEK SITE - BUFFALO, NEW YORK		

DESCRIPTION:

2015 Maintenance Area is in good condition.

PHOTO BY:

RICK FRAPPA, P.G.

PHOTOGRAPH NO: 14	DATE: April 22, 2024	LATITUDE: 42.9311195680296	LONGITUDE: -78.8936448539984
DIRECTION: Northeast	SITE LOCATION: SCAJAQUADA CREEK SITE - BUFFALO, NEW YORK		

DESCRIPTION:

Flowing outfall with gabions. No sheens observed. Gabions in good condition.

PHOTO BY:

RICK FRAPPA, P.G.

Photographic Log

Project: National Fuel Westwood Site Inspection
Client: National Fuel Gas Corporation **GEI Proj. No.:** 1403480

PHOTOGRAPH NO: 15	DATE: April 22, 2024	LATITUDE: 42.9308550528024	LONGITUDE: -78.8940623495782
DIRECTION: West	SITE LOCATION: SCAJAQUADA CREEK SITE - BUFFALO, NEW YORK		
DESCRIPTION: 2015 Maintenance Area 2. Area is in good condition.			
PHOTO BY: RICK FRAPPA, P.G.			

PHOTOGRAPH NO: 16	DATE: April 22, 2024	LATITUDE: 42.9306309750423	LONGITUDE: -78.8945798075594
DIRECTION: South	SITE LOCATION: SCAJAQUADA CREEK SITE - BUFFALO, NEW YORK		
DESCRIPTION: Exposed geotextile in fore ground of photo on west bank 30 ft length a few feet north of 2020 Maintenance Area 2.			
PHOTO BY: RICK FRAPPA, P.G.			

Photographic Log

Project: National Fuel Westwood Site Inspection
Client: National Fuel Gas Corporation **GEI Proj. No.:** 1403480

PHOTOGRAPH NO: 17	DATE: April 22, 2024	LATITUDE: 42.9307807114997	LONGITUDE: -78.8946192388288
DIRECTION: West	SITE LOCATION: SCAJAQUADA CREEK SITE - BUFFALO, NEW YORK		

DESCRIPTION:

View of west bank showing geotextile exposure from photographs 4 and 5.

PHOTO BY:

RICK FRAPPA, P.G.

PHOTOGRAPH NO: 18	DATE: April 22, 2024	LATITUDE: 42.9305911044902	LONGITUDE: -78.8948762065872
DIRECTION: West	SITE LOCATION: SCAJAQUADA CREEK SITE - BUFFALO, NEW YORK		

DESCRIPTION:

Exposed geotextile downslope of splash pad from downspout. Need to add armor stone to prevent erosion into creek bank soil.

Photo shows a reflection from the Expressway and trees above. No sheens are present on the surface water.

PHOTO BY:

RICK FRAPPA, P.G.

LEGEND:

- Photo Location Points

Spatial Reference
NAD 1983 2011 StatePlane New York West FIPS 3103 Ft US

0 120
Feet
1 IN = 120 FT

Annual Site Inspection 2024
Scajaquada Creek Riparian Site
National Fuel Gas Distribution Corporation

Buffalo, New York

GEI Consultants

ANNUAL SITE INSPECTION
PHOTOGRAPH LOCATIONS

Project 1403480 | April 2024 | Fig. 1

Path: C:\Users\jhansen\OneDrive - GEI Consultants, Inc\Documents\GIS_Work\MISCELLANEOUS\National Fuel Sites\1403480 - National Fuel Westwood Site\1403480 - National Fuel Westwood Site.aprx

Appendix B 2024 Cap Maintenance Summary

FIELD OBSERVATION REPORT

Project:	Scajaquada Creek Westwood Riparian Site 2024 Cap Maintenace	**Field Date:**	06/03/2024
Engineer:	GEI Consultants Inc., P.C. (GEI)		
Contractor:	Sun Environmental Services (Sun)		
Client:	National Fuel Gas (NFG)	**Page:**	1 of 6
		GEI Proj. No.	1403480

Time of Arrival: 7:30 AM Time of Departure: 3:30 PM

Weather: Clear skies, 70-80° Fahrenheit range.

GEI Representatives

- Frank R. Clougherty, G.I.T. – Construction Observation.

Site Personnel/Visitors/Other

- Gary House, Deacon (Superintendent), and two (2) helpers – Sun,
- Steve Moeller – New York State Department of Environmental Conservation (NYSDEC),
- Matt King (NYSDEC), and
- Katie Hoelscher (NFG),

Monitoring

- None

Analytical Sampling

- None

Site Work

- Sun placed Light Stone Fill (Item #620.03) material on the 2024 Cap Maintenance Areas identified during a 2024 site inspection (see Figure 1). The material was placed using a tracked skid steer machine (see Photographs 1 through 4). Approximately 40-tons of material was used to complete the Cap repairs.

Notes and Comments

- F. Clougherty (GEI) discussed the day's construction activities with G. House (Sun), S. Moeller (NYSDEC), M. King (NYSDEC), and K. Hoelscher (NFG).
- Light Stone Fill (Item #620.03) material arrived on-site at approximately 9:30 AM. A total of four (4) loads of material was delivered to site on this date, approximately 40-tons. The material originated from the Lockport Quarry, New York State Department of Transportation (NYSDOT) source number 2985.

FIELD OBSERVATION REPORT

Project:	Scajaquada Creek Westwood Riparian Site 2024 Cap Maintenace	**Field Date:**	06/03/2024
Engineer:	GEI Consultants Inc., P.C. (GEI)		
Contractor:	Sun Environmental Services (Sun)		
Client:	National Fuel Gas (NFG)	**Page:**	2 of 6
		GEI Proj. No.	1403480

Equipment On-Site

1	Bobcat T-740 Skidsteer		

Photographs

Photograph 1: Light Stone Fill being delivered to Site (Looking south).

FIELD OBSERVATION REPORT

Project:	Scajaquada Creek Westwood Riparian Site 2024 Cap Maintenace	**Field Date:**	06/03/2024
Engineer:	GEI Consultants Inc., P.C. (GEI)		
Contractor:	Sun Environmental Services (Sun)		
Client:	National Fuel Gas (NFG)	**Page:**	3 of 6
		GEI Proj. No.	1403480

Photograph 2: Sun placing Light Stone Fill over Maintence Area No. 7 (Looking south).

FIELD OBSERVATION REPORT

Project:	Scajaquada Creek Westwood Riparian Site 2024 Cap Maintenace	**Field Date:**	06/03/2024
Engineer:	GEI Consultants Inc., P.C. (GEI)		
Contractor:	Sun Environmental Services (Sun)		
Client:	National Fuel Gas (NFG)	**Page:**	4 of 6
		GEI Proj. No.	1403480

Photograph 3: Planned maintence areas No. 3 and 4 completed (Looking northwest).

FIELD OBSERVATION REPORT

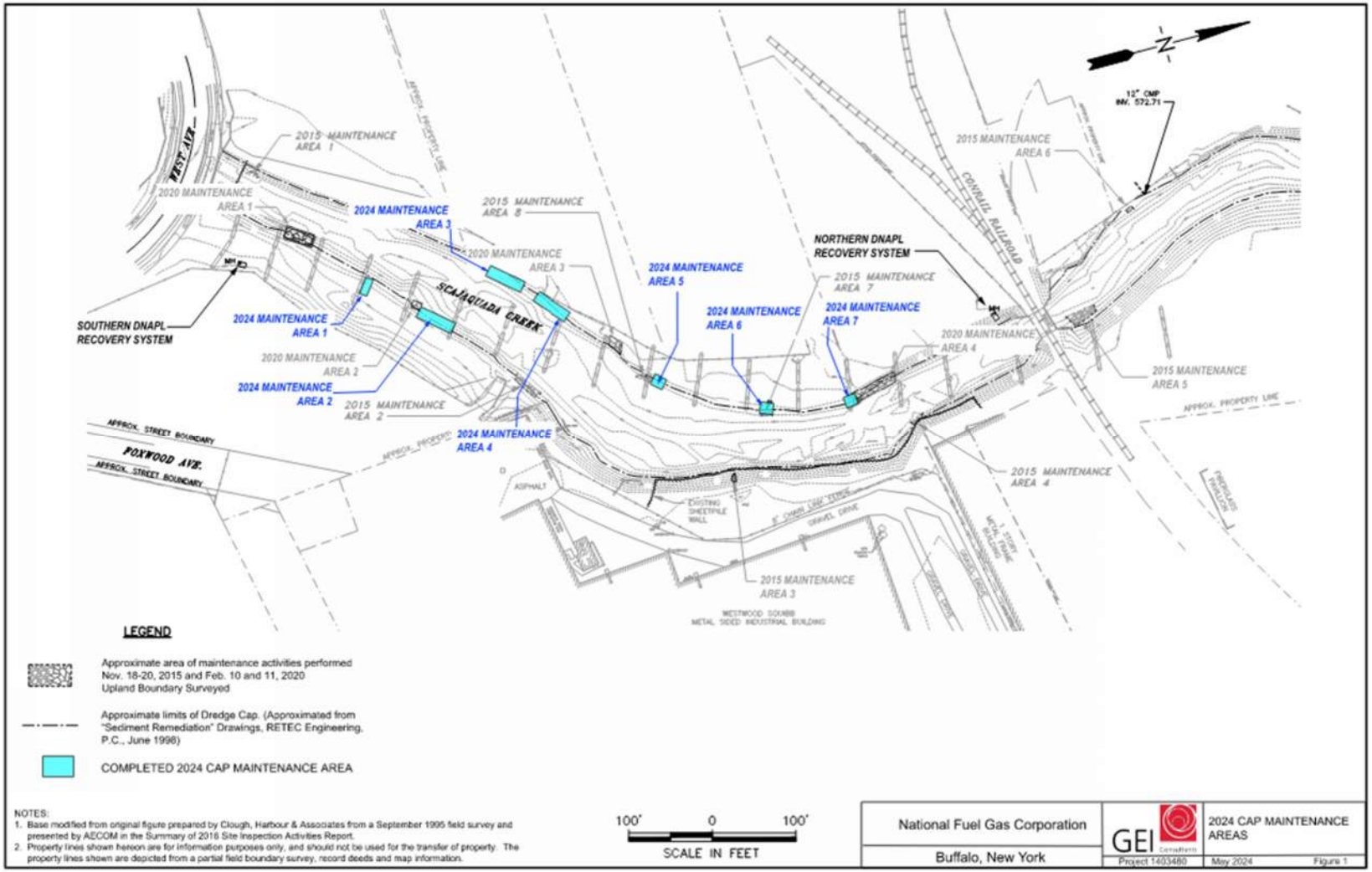
Project:	Scajaquada Creek Westwood Riparian Site 2024 Cap Maintenace	**Field Date:**	06/03/2024
Engineer:	GEI Consultants Inc., P.C. (GEI)		
Contractor:	Sun Environmental Services (Sun)		
Client:	National Fuel Gas (NFG)	**Page:**	5 of 6
		GEI Proj. No.	1403480

Photograph 4: Planned maintence areas No. 5 completed (Looking northwest).

FIELD OBSERVATION REPORT

Project:	Scajaquada Creek Westwood Riparian Site 2024 Cap Maintenace	**Field Date:**	06/03/2024
Engineer:	GEI Consultants Inc., P.C. (GEI)		
Contractor:	Sun Environmental Services (Sun)		
Client:	National Fuel Gas (NFG)	**Page:**	6 of 6
		GEI Proj. No.	1403480

Figure 1: 2024 Maintenance Areas



NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Request to Import/Reuse Fill or Soil

This form is based on the information required by DER-10, Section 5.4(e) and 6NYCRR Part 360.13. Use of this form is not a substitute for reading the applicable regulations and Technical Guidance document.

SECTION 1 – SITE BACKGROUND

The allowable site use is: Commercial or Industrial Us

Have Ecological Resources been identified? no

Is this soil originating from the site? no

How many cubic yards of soil will be imported/reused? 50-100

If greater than 1000 cubic yards will be imported, enter volume to be imported: N/A.

SECTION 2 – MATERIAL OTHER THAN SOIL

Is the material to be imported gravel, rock or stone? yes

Does it contain less than 10%, by weight, material that passes a size 100 sieve? yes

Is this virgin material from a permitted mine or quarry? yes

Is this material recycled concrete or brick from a DEC registered processing facility? no

SECTION 3 - SAMPLING

Provide a brief description of the number and type of samples collected in the space below:

N/A.

Example Text: 5 discrete samples were collected and analyzed for VOCs. 2 composite samples were collected and analyzed for SVOCs, Inorganics & PCBs/Pesticides.

If the material meets requirements of DER-10 section 5.4(e)5 (other material), no chemical testing needed.

SECTION 3 CONT'D - SAMPLING

Provide a brief written summary of the sampling results or attach evaluation tables (compare to DER-10, Appendix 5):

N/A.

Example Text: Arsenic was detected up to 17 ppm in 1 (of 5) samples; the allowable level is 16 ppm.

If Ecological Resources have been identified use the "If Ecological Resources are Present" column in Appendix 5.

SECTION 4 – SOURCE OF FILL

Name of person providing fill and relationship to the source:

Sun Environmental, Contractor.

Location where fill was obtained:

Lockport, NY

Identification of any state or local approvals as a fill source:

NYSDOT source number 2985.

If no approvals are available, provide a brief history of the use of the property that is the fill source:

N/A.

Provide a list of supporting documentation included with this request:

Product Data Attached.

The information provided on this form is accurate and complete.

Digitally signed by Richard Frappa
Date: 2024.05.09 10:27:47 -04'00'

Signature

5-9-2024

Date

Richard Frappa

Print Name

GEI Consultants, Inc.

Firm

HOLCIM

David Youngblood
400 Hinman Rd.
Lockport, NY 14094
571-752-1111 (cell)
david.youngblood@holcim.co

November 10, 2022

Pariso

Att:
Re: Scajaquda Creek
Email:

To whom it may concern:

This is to certify that the material being supplied to the above project conforms to the outlined NYSDOT requirements for Item #620.03, Light Stone Fill. The gradation of this material is as follows:

Light Stone Fill - Item #620.03	
Stone Size	**% of Total by Weight**
Lighter than 100lbs.	90 - 100
Larger than 6"	50 - 100
Smaller than 1/2" Sieve	0 - 10

Our NYSDOT Geotechnical Source # is 2985

Sincerely,

David Youngblood
Quality Control Manager
Holcim Aggregates and Asphalt

Prygon, Josh

From: Clougherty, Frank
Sent: Monday, January 6, 2025 3:20 PM
To: Cummings, Michael
Subject: Fw: Scajaquada Creek Riparian Site 915141B - Engineering Control Maintenance and NYSDEC Fill Request

Hi Mike-

Glenn* not Dan.. let me know if you need anything else's

Thanks,
Frank

Get Outlook for iOS

From: May, Glenn (DEC) <glenn.may@dec.ny.gov>
Sent: Monday, May 20, 2024 8:34:29 AM
To: Frappa, Rick <rfrappa@geiconsultants.com>
Cc: King, Matthew A (DEC) <Matthew.King@dec.ny.gov>; Radon, Stanley (DEC) <stanley.radon@dec.ny.gov>; Tanya Alexander <AlexanderT@natfuel.com>; Katie Hoelscher <HoelscherK@natfuel.com>; Clougherty, Frank <FClougherty@geiconsultants.com>
Subject: [EXT] Re: Scajaquada Creek Riparian Site 915141B - Engineering Control Maintenance and NYSDEC Fill Request

EXTERNAL EMAIL

Rick,

Your request to import stone to complete repairs is acceptable. Sorry about the delay.

Glenn M. May, PG
Professional Geologist 1
Division of Environmental Remediation

New York State Department of Environmental Conservation
Region 9
700 Delaware Avenue
Buffalo, New York 14209
P: (716) 851-7220 | glenn.may@dec.ny.gov

From: Frappa, Rick <rfrappa@geiconsultants.com>
Sent: Monday, May 20, 2024 8:07 AM
To: May, Glenn (DEC) <glenn.may@dec.ny.gov>
Cc: King, Matthew A (DEC) <Matthew.King@dec.ny.gov>; Radon, Stanley (DEC) <stanley.radon@dec.ny.gov>; Tanya Alexander <AlexanderT@natfuel.com>; Katie Hoelscher <HoelscherK@natfuel.com>; Clougherty, Frank

<FClougherty@geiconsultants.com>
Subject: RE: Scajaquada Creek Riparian Site 915141B - Engineering Control Maintenance and NYSDEC Fill Request

Hi Glenn
I am following up the import fill request.
We would like to schedule the work before the vegetation starts getting too high.
Please review the attached.
Thanks
Rick

GEI
RICHARD H. FRAPPA, P.G.
Senior Consultant
716.204.7156 cell: 716.984.5958
100 Sylvan Parkway, Suite 400, Amherst, NY 14228

From: Frappa, Rick
Sent: Thursday, May 9, 2024 12:52 PM
To: May, Glenn (DEC) <glenn.may@dec.ny.gov>
Cc: Matthew.King@dec.ny.gov; Radon, Stanley (DEC) <stanley.radon@dec.ny.gov>; Tanya Alexander (AlexanderT@natfuel.com) <alexandert@natfuel.com>; Katie Hoelscher <HoelscherK@natfuel.com>; Clougherty, Frank <FClougherty@geiconsultants.com>
Subject: Scajaquada Creek Riparian Site 915141B - Engineering Control Maintenance and NYSDEC Fill Request

Hi Glenn,
The attached letter outlines planned maintenance for the Scajaquada Creek Riparian Site following our 2024 site inspection.
Additionally, the letter includes a request for importing fill material, which necessitates approval from the NYSDEC.

Our goal is to complete the described improvements within the next 4 to 6 weeks, contingent upon contractor availability.
Once we receive your response regarding the import fill request, we will provide the Department with a schedule for the work activities.

Feel free to reach out if you have any further questions or need additional information.
Thanks
Rick

GEI
RICHARD H. FRAPPA, P.G.
Senior Consultant
716.204.7156 cell: 716.984.5958
100 Sylvan Parkway, Suite 400, Amherst, NY 14228

Appendix C 2024 DNAPL Recovery System Maintenance

Appendix C.1. 2024 NAPL Monitoring Log

Appendix C.2. Disposal Manifests

Appendix C.3. Historical Summary- South Vault DNAPL Recovery Monitoring System

Appendix C.4. Historical Summary- North Vault DNAPL Recovery Monitoring System

Appendix C.1. 2024 NAPL Monitoring Log

Appendix C1 - Scajaquada Creek Riparian Site NAPL Collection Vault Gauging, Observations, Adjustments - 2024

Date	North Vault			South Vault		
	Depth to Water/LNAPL (feet)	NAPL Thickness (feet)	Comments	Depth to Water/LNAPL (feet)	NAPL Thickness (feet)	Comments
2/22/2024	6.95	0.1	Bucket hung in tank is full with clear water and approximately 0.1 gallons of DNAPL. Advanced tubing in pump and verify pump operation.	7.00	0.1	Bucket hung in tank is full with clear water, no NAPL present. Advanced tubing in pump and verify pump operation.
3/21/2024	6.85	0.1	Bucket hung in tank is full with clear water and approximately 0.25 gallons of DNAPL. Advanced tubing in pump and verify pump operation. First Quarter 2024 Enhanced Recovery Test performed on this date. DTW after enhanced recovery testing is 6.4'	7.00	0.1	Bucket hung in tank is empty (pump malfunction). Repair pump and verify function. First Quarter 2024 Enhanced Recovery Test performed on this date. DTW following recovery test is 6.6'.
4/19/2024	6.25	0.1	Bucket hung in tank is full with clear water and approximately 0.05 gallons of DNAPL. Advanced tubing in pump and verify	6.60	0.1	Bucket hung in tank is full of clear water. Advanced tubing in pump and verify pump operation.
5/23/2024	6.18	0.1	Bucket hung in tank is full with clear water and approximately 0.05 gallons of DNAPL. Advanced tubing in pump and verify pump operation.	6.50	0.1	Bucket hung in tank is full of clear water. Advanced tubing in pump and verify pump operation.
6/20/2024	6.15	0.1	Bucket hung in tank is full with clear water and approximately 0.5 gallons of DNAPL. Advanced tubing in pump and verify pump operation. Second Quarter 2024 Enhanced Recovery Test performed on this date. DTW after enhanced recovery testing is 5.55'.	6.50	0.1	Bucket hung in tank is full of clear water. Advanced tubing in pump and verify pump operation. Second Quarter 2024 Enhanced Recovery Test performed on this date. DTW following recovery test is 6.0'.
7/25/2024	5.45	0.1	Bucket hung in tank is full with clear water and approximately 0.25 gallons of DNAPL. Advanced tubing in pump and verify pump operation.	5.50	0.1	Bucket hung in tank is full of clear water. Advanced tubing in pump and verify pump operation.
8/29/2024	5.4	0.1	Bucket hung in tank is full with clear water and approximately 0.5 gallons of DNAPL. Advanced tubing in pump and verify pump operation. Third Quarter 2024 Enhanced Recovery Test performed on this date. DTW after enhanced recovery testing is 4.9'.	5.50	0.1	Bucket hung in tank is full of clear water. Advanced tubing in pump and verify pump operation. Third Quarter 2024 Enhanced Recovery Test performed on this date. DTW following recovery test is 5.35'.
9/27/2024	4.8	0.1	Bucket hung in tank is full with clear water and approximately 0.1 gallons of DNAPL. Advanced tubing in pump and verify pump operation.	5.10	0.1	Bucket hung in tank is full of clear water. Advanced tubing in pump and verify pump operation.
10/31/2024	4.7	0.1	Bucket hung in tank is full with clear water and approximately 0.1 gallons of DNAPL. Advanced tubing in pump and verify pump operation.	5.00	0.1	Bucket hung in tank is full of clear water. Advanced tubing in pump and verify pump operation.
11/22/2024	4.62	0.1	Bucket hung in tank is full with clear water and approximately 0.24 gallons of DNAPL. Advanced tubing in pump and verify pump operation.	5.00	0.1	Bucket hung in tank is empty (pump malfunction). Repair pump and verify function.
12/13/2024	4.6	0.1	Bucket hung in tank is full with approximate 0.25 gallons of NAPL. 4Q 2024 Enhanced Recovery performed on this date, and SUN Env. Pumps contents of tank for disposal prior to ER pumping. Final DTW measurement in tank after emptying tank and then performing ER Pumping is 8.75'.	4.95	0.1	Bucket hung in tank is full of clear water. 4Q 2024 Enhanced Recovery performed on this date, and SUN Env. Pumps contents of tank for disposal prior to ER pumping. Final DTW measurement in tank after emptying tank and then performing ER Pumping is 8.70'.
2024 Summary	12.9 gallons DNAPL removed during 2024 monitoring period.			0 gallons DNAPL removed during 2024 reporting period.		

Appendix C.2. Disposal Manifests

290

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

NON-HAZARDOUS WASTE MANIFEST	1. Generator ID Number	2. Page 1 of	3. Emergency Response Phone	4. Waste Tracking Number
	NYD986930758	1	800-535-5053	57962

5. Generator's Name and Mailing Address

National Fuel Gas Attn: Katie Hoelscher
6363 Main Street
Williamsville, NY 14221
Generator's Phone: 716-857-7236

Generator's Site Address (if different than mailing address)

National Fuel Gas Distribution (Scajaquada Cr
100A Forest Avenue
Buffalo, NY 14213

6. Transporter 1 Company Name — U.S. EPA ID Number

Sun Environmental Corp — NYR000176958

7. Transporter 2 Company Name — U.S. EPA ID Number

8. Designated Facility Name and Site Address — U.S. EPA ID Number

American Recyclers Company
177 Wales Avenue
Tonawanda, NY 14150
Facility's Phone: 716 695 6720 — NYR000030809

	9. Waste Shipping Name and Description	10. Containers No.	10. Containers Type	11. Total Quantity	12. Unit Wt./Vol.
1.	Non RCRA Non DOT Regulated, -, (Petroleum Oil (DNAPL), Water)	1	TT	EST 1500	G
2.				1402 (1 x 1 x 1)	G
3.					
4.					

13. Special Handling Instructions and Additional Information

ERG:
1 -
2 -
3 -
4 -

Approval #:
1 - B-25400R
2 -
3 -
4 - J002848

Handling Codes:
1 - None
2 -
3 -
4 - PO-071794

24 Hour Emergency Contact:
INFOTRAC (Caller Must ID
ESG)

SUN-20170

14. GENERATOR'S CERTIFICATION: I certify the materials described above on this manifest are not subject to federal regulations for reporting proper disposal of Hazardous Waste.

Generator's/Offeror's Printed/Typed Name: Katie Hoelscher — Signature: K Hoelscher — Month: 12 — Day: 13 — Year: 24

15. International Shipments ☐ Import to U.S. ☐ Export from U.S. Port of entry/exit:
Transporter Signature (for exports only): Date leaving U.S.:

16. Transporter Acknowledgment of Receipt of Materials

Transporter 1 Printed/Typed Name: Austin Carson — Signature — Month: 12 — Day: 13 — Year: 24

Transporter 2 Printed/Typed Name — Signature — Month — Day — Year

17. Discrepancy

17a. Discrepancy Indication Space ☐ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection

Manifest Reference Number:

17b. Alternate Facility (or Generator) — U.S. EPA ID Number

Facility's Phone:

17c. Signature of Alternate Facility (or Generator) — Month — Day — Year

18. Designated Facility Owner or Operator: Certification of receipt of materials covered by the manifest except as noted in Item 17a

Printed/Typed Name: Laura Miss — Signature — Month: 12 — Day: 13 — Year: 24

GENERATOR — INT'L — TRANSPORTER — DESIGNATED FACILITY

299

Please Print or Type
(Form designed for use on elite (12-pitch) typewriter.)

NON-HAZARDOUS WASTE MANIFEST	1. Generator ID Number	2. Page 1 of	3. Emergency Response Phone	4. Waste Tracking Number
	NYD986930758	1	800-535-5053	57963

5. Generator's Name and Mailing Address
National Fuel Gas Attn: Katie Hoelscher
6363 Main Street
Williamsville, NY 14221
Generator's Phone: 716-857-7236

Generator's Site Address (if different than mailing address)
National Fuel Gas Distribution (Scajaquada Cr
100A Forest Avenue
Buffalo, NY 14213

6. Transporter 1 Company Name: Sun Environmental Corp
U.S. EPA ID Number: NYR000176958

7. Transporter 2 Company Name
U.S. EPA ID Number

8. Designated Facility Name and Site Address
American Recyclers Company
177 Wales Avenue
Tonawanda, NY 14150
Facility's Phone: 716.695.6720
U.S. EPA ID Number: NYR000030809

	9. Waste Shipping Name and Description	10. Containers No.	10. Containers Type	11. Total Quantity	12. Unit Wt./Vol.
1.	Non RCRA Non DOT Regulated, -, (Petroleum Oil (DNAPL), Water)	1	TT	1500 G	
2.				1493 G	
3.				EXALT	
4.					

13. Special Handling Instructions and Additional Information

ERG:	Approval #:	Handling Codes:	24 Hour Emergency Contact:
1 -	1 - B-25400R	1 - None	INFOTRAC (Caller Must ID
2 -	2 -	2 -	ESG)
3 -	3 -	3 -	
4 -	4 - J002866	4 - PH- 071794	Spw - 20171

14. GENERATOR'S CERTIFICATION: I certify the materials described above on this manifest are not subject to federal regulations for reporting proper disposal of Hazardous Waste.
Generator's/Offeror's Printed/Typed Name: Katie Hoelscher
Signature:
Month 12 Day 13 Year 24

15. International Shipments ☐ Import to U.S. ☐ Export from U.S. Port of entry/exit:
Transporter Signature (for exports only): Date leaving U.S.:

16. Transporter Acknowledgment of Receipt of Materials
Transporter 1 Printed/Typed Name: Decatur Hewitt
Signature:
Month 12 Day 13 Year 24
Transporter 2 Printed/Typed Name
Signature
Month Day Year

17. Discrepancy
17a. Discrepancy Indication Space ☐ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection
Manifest Reference Number:

17b. Alternate Facility (or Generator)
U.S. EPA ID Number
Facility's Phone:

17c. Signature of Alternate Facility (or Generator)
Month Day Year

18. Designated Facility Owner or Operator: Certification of receipt of materials covered by the manifest except as noted in Item 17a
Printed/Typed Name: Laura Muss
Signature:
Month 12 Day 13 Year 24

GENERATOR — INT'L — TRANSPORTER — DESIGNATED FACILITY

Appendix C.3. Historical Summary- South Vault DNAPL Recovery Monitoring System

APPENDIX C3 - SOUTHERN DNAPL RECOVERY SYSTEM

Date	Initials	Field Measurements (by OWI probe)				Calculations (total tank contents) *				Calculations (this period recovery highlighted)					Operator's Notes
		Manhole rim to top of LNAPL (ft)	Manhole rim to top of Water (ft) (estimated)	Manhole rim to top of DNAPL (ft)	Manhole rim to bottom of Tank (ft)	LNAPL (gal)	Water (gal)	DNAPL (gal)	Total (gal)	Water Increase (gal)	NAPL Increase (gal)	% NAPL	NAPL (gpd)	Ave Recovery in GPD	
24-Jun-99	mrh	9.05	9.05	9.05	9.05	0	0	0	0	0	0	0%		0	90% construction complete, begin initial testing
29-Jun-99	mrh/day	6.80	6.80	9.05	9.05	0	695	0	695	695	0	0%		139	Complete initial system test, PW2003 has silt damage
23-Jul-99	mrh/day	6.80	6.80	9.05	9.05	0	695	0	695	0	0	0%		0	Recommence shakedown with peristaltic pump
30-Jul-99	day	6.34	6.34	8.95	9.05	0	806	31	837	111	31	22%	4.41	20	Shakedown, flow adjustment
26-Aug-99	jhe	5.90	5.90	8.73	9.05	0	874	99	973	68	68	50%	2.52	5	Routine system check, slow drip from tank bung noted (0.5 gpd?)
16-Sep-99	mrh/bdc	5.79	5.80	8.75	9.05	3	911	93	1007	37	-3	---		2	Significant (2 gpd?) DNAPL loss through bung drip, PW2003 reinstalled
28-Sep-99	mrh/cc	3.30	3.32	8.61	9.05	6	1633	136	1775	723	46	6%	3.86	64	Tank emptied (was full, pump off), bung replaced,
28-Sep-99	mrh/cc	9.05	9.05	9.05	9.05	0	0	0	0	0	0	0%		0	vault cleaned, flow setting reduced to 4.5
3-Oct-99	mrh	8.75	8.75	9.03	9.05	0	86	6	93	86	6	7%	1.24	19	Measurements are visual estimates only, flow setting reduced to 3.5
11-Oct-99	cc	8.75	8.75	9.03	9.05	0	86	6	93	0	0	0%		0	No flow observed, flow setting increased to 5.0
29-Oct-99	cc	6.81	6.81	8.98	9.05	0	670	22	692	584	15	3%	0.86	33	Flow setting decreased to 4.0
2-Dec-99	mrh/day	6.09	6.10	8.77	9.05	3	824	86	914	154	68	31%	2.00	7	Flow setting increased to 4.7 (24 gpd), timer installed/set for 1pm to 2pm operation
16-Dec-99	cc	---	---	---	---	---	---	---	---	---	---	---		---	Pump running but no flow, Timer reset for 3 hr per day operation
9-Mar-00	mrh/day	6.09	6.10	8.89	9.05	3	861	49	914	37	-37	---		0	PW2000 running but no flow, Peristaltic installed (2 hr/day), DNAPL thickened over time
11-Apr-00	mrh/day	4.71	4.73	8.82	9.05	6	1263	71	1340	401	25	6%	0.75	13	New peristaltic purchased/installed. Flow setting #7 (for 2 hr/day).
1-May-00	mrh/dms	4.62	4.64	8.80	9.05	6	1284	77	1368	22	6	22%	0.31	1	No flow (tubing collapsed). Repaired.
4-May-00	day/jc	4.62	4.64	8.80	9.05	6	1284	77	1368	0	0	0%		0	No flow (tubing leak). Tank emptied. System turned off.
8-May-00	mrh/jtf	9.05	9.05	9.05	9.05	0	0	0	0	0	0	0%		0	Original tubing replaced with silicon. System restarted at flow setting #3 (for 2 hr/day).
8-Jun-00	mrh/day	8.55	8.56	8.98	9.05	3	130	22	154	130	25	16%	0.80	5	Backfill settled around vault. Total depth shallow; measurements estimated. Tubing adjusted.
10-Jul-00	mrh/dms	8.10	8.11	8.90	9.05	3	244	46	293	114	25	18%	0.77	4	Tubing was worn; adjusted.
25-Aug-00	day	7.30	7.31	8.80	9.05	3	460	77	540	216	31	12%	0.67	5	Tubing adjusted.
20-Oct-00	mrh	6.25	6.26	8.64	9.05	3	735	127	865	275	49	15%	0.88	6	Tubing worn; adjusted.
30-Nov-00	mrh	5.75	5.77	8.55	9.05	6	858	154	1019	124	31	20%	0.75	4	Tubing worn; adjusted. Flow rate setting reduced from 3.0 to 1.5; timer not changed.
18-Jan-01	mrh	5.75	5.77	8.55	9.05	6	858	154	1019	0	0	---		0	Pump starts rough and sounds bad. Pump removed and sent in for repairs.
7-Feb-01	mrh/hs	5.75	5.77	8.55	9.05	6	858	154	1019	0	0	0%		0	Temporary FloJet pump installed but insufficient NPSH due to low creek elevation.
30-Mar-01	mrh	5.75	5.77	8.55	9.05	6	858	154	1019	0	0	0%		0	Peristaltic (geopump) installed, full speed, 600 rpm, system OK. NAPL is hi viscocity/settled.
10-Apr-01	mrh	5.70	5.72	8.51	9.05	6	861	167	1034	3	12	80%	1.12	1.4	3/16" id tubing replaced with 3/8" id tubing. Float switch replaced (plus relay).
18-May-01	dms/jc	5.65	5.68	8.52	9.05	9	877	164	1050	15	0	0%	0.00	0.4	Tubing worn and soft; adjusted.
30-Aug-01	mrh/hs	5.53	5.55	8.39	9.05	6	877	204	1087	0	37	100%	0.36	0.4	NAPL appears to be accumulated in well. Timer set to 3 hrs/day. Original peristaltic re-installed.
3-Oct-01	hs/jc	5.46	5.48	8.35	9.05	6	886	216	1108	9	12	57%	0.36	0.6	NAPL may still be accumulated in well. Timer increased to 4 hrs/day.
6-Nov-01	hs/jc	5.30	5.32	8.27	9.05	6	911	241	1158	25	25	50%	0.73	1.5	Additional NAPL purged from well after readings taken. Timer decreased to 3 hrs/day.
7-Feb-02	hs/jc	3.89	3.91	8.22	9.05	6	1331	256	1593	420	15	4%	0.17	4.7	Adjusted peristaltic tubing.
8-Mar-02	hs/jc	3.81	3.83	8.17	9.05	6	1340	272	1618	9	15	62%	0.53	0.9	Adjusted peristaltic tubing.
10-Apr-02	mrh	3.43	3.45	7.88	9.05	6	1368	361	1735	28	90	76%	2.71	3.6	Adjusted tubing. Installed piston pump for one day test (then removed). Timer increased to 4 hrs.
7-May-02	hs/jc	3.15	3.17	7.82	9.05	6	1436	380	1822	68	19	21%	0.69	3.2	Tank full.
7-May-02		9.05	9.05	9.05	9.05	0	0	0	0	---	---	---	---	---	Tank pumped out.
25-Jun-02	cd	6.00	6.02	9.02	9.05	6	926	9	942	926	15	2%	0.32	19.2	Depth's estimated. Pump set at #4, 3 hrs/day
2-Aug-02	mrh/jc	3.15	3.17	9.00	9.05	6	1800	15	1822	874	6	1%	0.16	23.2	Tank full, mostly water.
6-Sep-02	jc	3.15	3.17	9.00	9.05	6	1800	15	1822	0	0	0%	---	0.0	Tank Emptied.
6-Sep-02		9.05	9.05	9.05	9.05	0	0	0	0	0	0	---	---	---	
8-Oct-02	mrh/jc	8.98	8.98	8.98	9.05	0	0	22	22	0	22	100%	0.68	0.7	Pump removed for repair
18-Nov-02	cd	8.98	8.98	8.98	9.05	0	0	22	22	0	0	0%	---	0.0	Pump reinstalled
4-Feb-03	mrh/jc	4.32	4.32	8.95	9.05	0	1430	31	1460	1430	9	1%	0.12	18.4	Tank again full of mostly water (timer was left on manual?). Tank emptied.
4-Feb-03		9.05	9.05	9.05	9.05	0	0	0	0	---	---	---	---	---	
12-Mar-03	jc	9.00	9.00	9.00	9.05	0	0	15	15	0	15	100%	0.43	0.4	Pump running fast, so removed for evaluation/repair.
10-Apr-03	mrh/jc	9.00	9.00	9.00	9.05	0	0	15	15	0	0	0%		0.0	Pump reinstalled: runs fast/variable with no load, runs OK with flow load. Timer set to 30 min/day, speed 8.
23-Jul-03	mrh/jc	8.78	8.78	8.78	9.05	0	0	83	83	0	68	100%	0.51	0.7	Additional system checks/adjustments made by J Clark on 5/5, 5/20, 6/12, and 6/24.
23-Apr-04	mrh	8.05	8.06	8.55	9.05	3	151	154	309	151	74	33%	0.27	0.8	Additional system checks/adjustments made by NFG on 8/01, 8/06, 9/05, 9/08, 9/11, 9/17, 9/25, 10/30, 11/18.
24-Nov-04	jl,jc	7.31	7.32	8.54	9.05	3	377	157	537	225	3	1%	0.01	1.1	O/W Interface probe not acting precisely, actual DNAPL volume probably greater.
19-Apr-05	mh,jc,jl,sh	7.19	7.20	8.43	9.05	3	380	191	574	3	34	92%	0.23	0.3	Additional system checks/adjustments made by J Clark on 11/24, 1/20/2005, 3/7, 3/11, 4/12, 4/18.
27-Oct-05	mrh, jc	6.96	6.97	8.20	9.05	3	380	262	645	0	71	100%	0.37	0.4	New OWI probe, but readings inconsistent with previous readings. System checks by NFG 5/11, 6/24, 7/28, 8/25, 10/06.
22-Mar-06	mrh, jc	6.78	6.79	8.02	9.05	3	380	318	701	0	56	100%	0.38	0.4	Additional system checks by NFG 10/26/05, 12/14/05, 1/6/06, 2/24/06.
24-Oct-06	mrh, jc	4.90	4.91	7.38	9.05	3	763	516	1281	383	198	34%	0.91	2.7	Depth to NAPL reading is approximate. Additional system checks by NFG 5/11, 6/29, 7/26, 9/07.
2-Mar-07	jc, cb	3.36	3.37	7.15	9.05	3	1167	587	1757	404	71	15%	0.55	3.7	Pump turned off 3/02/07 because tank near full. Readings taken **4/25/07**. Depth to DNAPL reading is approximate.
23-Jun-07		9.05	9.05	9.05	9.05	0	0	0	0	---	---	---	---	---	Tank pumped out.
30-Oct-07	dms, jc	8.55	8.56	9.01	9.05	3	139	12	154	139	15	10%	0.06	1.2	Depth to DNAPL reading is approximate.

Scajaquada Creek DNAPL Recovery System Monitoring Log

APPENDIX C1 - SOUTHERN DNAPL RECOVERY SYSTEM

Date	Initials	Field Measurements (by OWI probe)				Calculations (total tank contents) *				Calculations (this period recovery highlighted)					Operator's Notes
		Manhole rim to top of LNAPL (ft)	Manhole rim to top of Water (ft) (estimated)	Manhole rim to top of DNAPL (ft)	Manhole rim to bottom of Tank (ft)	LNAPL (gal)	Water (gal)	DNAPL (gal)	Total (gal)	Water Increase (gal)	NAPL Increase (gal)	% NAPL	NAPL (gpd)	Ave Recovery in GPD	
13-May-08	dms, jc	---	---	---	---	---	---	---	---	---	---	---	---	---	Data appears to be invalid.
25-Mar-09	jl, dz	7.90	7.91	8.90	9.05	3	306	46	355	167	34	17%	0.07	0.4	O/W interface probe is working accurately
10-Jul-09	tr, jc	7.73	7.74	8.71	9.05	3	300	105	408	300	108	27%	1.01	0.2	O/W interface probe is working accurately
6-Oct-09	tr, jc	7.23	7.24	9.04	9.05	3	556	3	562	556	6	1%	0.07	0.2	A skim of LNAPL and DNAPL were present, the thickness (not measureable) is estimated to be 0.01 ft.
21-Apr-10	tr, jc	6.30	6.31	8.40	9.05	3	645	201	849	645	188	23%	0.96	0.3	A skim of LNAPL was present, the thickness (not measureable) is estimated to be 0.01 ft.
7-Apr-11	tr, jc	5.40	5.40	8.05	9.05	0	818	309	1127	173	105	38%	0.30	0.8	A skim of LNAPL was present, the thickness (not measureable) is estimated to be 0.01 ft.
16-Jun-11	jc	9.05	9.05	9.05	9.05	0	0	0	0	---	---	---	---	---	Tank pumped out. Water and NAPL shipped offsite for disposal.
18-Apr-12	el	6.60	6.60	8.50	9.05	0	587	170	756	587	170	22%	0.55	2.5	Corrected depth to top of DNAPL and depth to bottom of tank measurements
29-Apr-13	tr, jc	6.12	6.12	8.50	9.05	0	735	170	905	148	0	0%	0	0.4	DNAPL measurement duplicated and accurate. Corrected depth to bottom of tank measurement.
23-May-13	jc	---	---	---	---	0	0	0	0	---	---	---	---	---	Tank pumped out. Water and NAPL shipped offsite for disposal.
23-Apr-14	el, jc	8.38	8.40	8.40	9.10	6	0	216	222	0	222	100%	0.66	0.7	Corrected depth to bottom of tank measurement.
21-May-15	kh	8.28	8.30	8.30	9.06	6	0	235	241	0	19	100%	0.05	0.0	Measurements by Op-Tech
20-Apr-16	kh	6.55	6.55	7.96	9.16	0	435	371	806	435	148	29%	0.20	0.39	Measurements by Op-Tech: weighted rope indicates 1.2 ft of DNAPL in tank. OWI probe did not sense DNAPL
20-Apr-17	kh, rf	6.55	6.55	7.73	9.06	0	364	411	775	435	188	29%	0.17	0.39	Measurements by GEI using weighted cotton string and measured stain height.
16-May-17	mc	---	---	---	---	---	---	---	---	---	---	---	---	---	Removed approximately 90 feet of collection tubing in the recovery with new 0.5 inch diameter PEX tubing . Pumped 4 gallons of water from well.
29-Jun-17	mc	---	---	---	---	---	---	---	---	---	---	---	---	---	High pressure jet cleaning (water lance) used to clean/improve hydraulic communication in well screen. NAPL collection tank emptied by Allied Env. Services, collection piping and vault flooring walls cleaned.
28-Sep-17	mc	8.86	8.86	8.86	9.06	0	0	62	62	0	62	100%	0.12	2.39	Measurements by GEI using weighted cotton string and measured stain height. Differentiation between water and NAPL difficult with this small of a quantity
26-Oct-17	mc	8.86	8.86	8.86		---	---	---	---	---	---	---	---	---	No measurements by GEI. A hole is burned through tubing at pump head. Tubing is replaced, and pumping 100% tar when started back up. Change pump sched to DST.
15-Feb-18	mc	8.86	8.86	8.86	9.06	0	0	62	62	0	trace	100%	trace	0.00	Measurements by GEI using weighted cotton string and measured stain height. Pump malfunction and less than 1/4 gallon DNAPL collected. Pump repaired.
26-Apr-18	mc	5.40	5.40	8.86	9.06	0	1068	67	1130	1	4	100%	trace	15.26	Measurements by GEI using weighted cotton string and measured stain height. 5 gal. liquid in hung bucket, ~4 gal DNAPL. >1000 gal pumped since 3/1. Turn pump rate down by 50%. Will check and re-evaluate.
12-Jul-18	mc	--	--	--	9.06	---	---	5.00	---	trace	5.00	100%	---	---	No measurements by GEI. National Fuel states approximately 5 gallons of NAPL accumulated in bucket hung in tank with bucket overflowing into tank.
16-Aug-18	mc	--	--	--	9.06	---	---	5.00	---	trace	5.00	100%	---	---	No measurements by GEI. National Fuel states approximately 5 gallons of NAPL accumulated in bucket hung in tank with bucket overflowing into tank.
20-Sep-18	mc	9.05	9.05	9.05	9.06	0	0	0	3	trace	trace	trace	trace	0.02	Measurements by GEI. No NAPL accumulated in bucket. Pump rate increased from "30" to "60". (NAPL Storage tank pumped May 2018)
25-Oct-18	mc	--	--	--	9.06	0	0	5	--	trace	5.0	trace	--	--	No measurements by GEI. National Fuel states approximately 5 gallons of NAPL accumulated in bucket hung in tank with bucket overflowing into tank.
16-Jan-19	mc	9.05	9	9.05	9.06	0	15	3	3	15	69.0	100%	0.58	0.03	Measurements by GEI. 5gal of NAPL in bucket hung in tank with bucket overflowing into tank. No adjustments to the system are recommended.
28-Feb-19	mc	8.8	8.8	8.85	9.06	0	15	65	80	0	64.8	84%	1.51	1.87	Measurements by GEI. 5gal of NAPL in bucket hung in tank with bucket overflowing into tank. No adjustments to the system are recommended.
28-Mar-19	mc	7.8	7.8	7.9	9.06	0	31	358	389	15	135.9	44%	4.85	13.89	Measurements by GEI. 5gal of NAPL in bucket hung in tank with bucket overflowing into tank. No adjustments to the system are recommended.
23-May-19	mc	7.4	7.4	7.5	9.06	0	31	482	513	0	240.8	100%	4.30	9.15	Measurements by GEI. 5gal of NAPL in bucket hung in tank with bucket overflowing into tank. No adjustments to the system are recommended.
27-Jun-19	mc	--	--	--	--	0	31	482	513	0.0	0.0	--	--	--	No measurements by GEI. National Fuel personel states that 5 gallons of NAPL present in bucket hung in tank.
18-Jul-19	mc	7.5	7.5	7.5	9.06	0	31	482	513	0	0.0	0%	0	9.16	Measurements by GEI. Bucket hung in tank contains ~ 1 gallon NAPL (minimal water). Peristaltic tubing found to be flat and inoperational. Replaced and operating correctly following inspection.
16-Nov-19	mc	7.3	7.3	7.4	9.06	0	31	513	543	0	30.9	101%	0.22	3.83	Measurements by GEI. Bucket hung in tank contains ~4.50 gallons of water and 0.25 gallons of DNAPL. **(NAPL storage tank pumped on this date.)**
23-Jan-20	mc	9	9	9.03	9.06	0	9	9	19	9	9.0	100%	0.05	0.10	Measurements by GEI. Bucket hung in tank contains ~4.50 gallons of water and 0.25 gallons of DNAPL.
4-Apr-20	mc	9	9	9.03	9.06	0	9	9	19	0	0.0	0%	0	0.13	Measurements by GEI. Bucket hung in tank contains approximately 2 gallons of water and 3 gallons of DNAPL. Tubing replaced in each peristaltic pump head. Suspected tank shift following 11/2019 alterning total tank depth measurment
25-Jun-20	mc	8.9	8.9	9	9.06	0	31	19	49	22	9.3	30%	0.06	0.32	Measurements by GEI. Bucket hung in tank contains approximately 1.5 gallons of water and 3.5 gallons of DNAPL. Peristaltic tubing in good condition.
27-Aug-20	mc	8.8	8.8	8.8	9.06	0	33	80	80	2	61.8	100%	0.43	0.55	Measurements by GEI. Bucket hung in tank contains approximately 1.5 gallons of water and 3.5 gallons of DNAPL. Peristaltic tubing in good condition.
26-Oct-20	mc	8.7	8.7	8.7	9.06	0	36	111	111	3	30.9	50%	0.25	0.90	Measurements by GEI. Bucket hung in tank contains approximately 1.0 gallons of water and 4.0 gallons of DNAPL. Peristaltic tubing in good condition.
12-Jan-21	mc	8.1	8.1	8.2	9.06	0	38	266	296	2	154.4	83%	1.98	3.80	Measurements by GEI. Bucket hung in tank contains approximately 3.0 gallons of water and 2.0 gallons of DNAPL. Tubing replaced in peristaltic pump head.
2-Mar-21	mc	NA	NA	7.68	9.06	NA	NA	426	426	NA	161	NA	3.28	2.65	Measurements by GEI. Bucket hung in tank contains approximately 2.5 gallons of water and 2.5 gallons of DNAPL. Tubing replaced in peristaltic pump head.
16-Apr-21	mc	NA	NA	NA	9.06	NA	NA		0	NA	NA	NA	NA	NA	Measurements by GEI. Bucket hung in tank contains approximately 2.5 gallons of water and 2.5 gallons of DNAPL. Tubing replaced in peristaltic pump head.
19-May-21	mc	NA	NA	7.56	9.06	NA	NA	463	463	NA	37	NA	1.12	0.09	Measurements by GEI. Bucket hung in tank contains approximately 3.0 gallons of water and 2.0 gallons of DNAPL. Tubing replaced in peristaltic pump head.
24-Jun-21	mc	NA	NA	7.56	9.06	NA	NA	463	463	NA	2	NA	0.06	0.00	Measurements by GEI. Bucket hung in tank contains approximately 3.0 gallons of water and 2.0 gallons of DNAPL. Tubing replaced in peristaltic pump head.
20-Aug-21	mc	7.50	7.50	7.46	9.06	0	53	494	547	3.0	2	NA	0.04	1.47	Measurements by GEI. Bucket hung in tank contains approximately 3.0 gallons of water and 2.0 gallons of DNAPL. Tubing replaced in peristaltic pump head.
2-Sep-21	rf	--	--	--	--	--	--		--	--	--	NA			No measurments made. Vault cleaned and downhole tubing replaced by SUN Environmental.
5-Oct-21	mc	7.40	7.40	7.46	9.06	0	57	495	552	4.0	1	NA	0.02	0.11	Measurements by GEI. Bucket hung in tank contains approximately 4 gallon of water and 1 gallon of DNAPL. Tubing replaced in peristaltic pump head.
5-Nov-21	rf	7.30	7.30	7.46	9.06	0	60	496	556	1.5	1	NA	0.02	0.13	Measurements by GEI. Bucket hung in tank contains approximately 1.5 gallon of water and 1.0 gallons of DNAPL. Tubing replaced in peristaltic pump head.
14-Jan-22	mc	--	--	--	--	--	--	--	--	--	--	--	--	--	Bucket is empty. Failure of peristaltic tubing. Tubing replaced and pump function verified.
3-Feb-22	mc	--	--	--	--	--	--	--	--	--	--	--	--	--	No measurments made. Exhaust vent installed to mitigate moisture buildup in vault.
17-Feb-23	rf	6.12	6.12	7.46	9.06	NM	414	499	913	353.8	5	<1	<0.01	<0.001	See Appendix B1 for details of 2022 Observations, measurements, adjustments
31-Dec-23	mc	7.20	7.20	8.96	9.06	0	580	3	583	580.0	3	<1	<0.01	<0.001	See Appendix B1 for details of 2023 Observations, measurements, adjustments. Measured volumes include water/DNAPL generated during enhanced recovery testing.
13-Dec-24	mc	4.60	4.60	8.96	9.06	0	1230	0	1230	1230.0	0	<1	<0.01	<0.001	See Appendix B1 for details of 2024 Observations, measurements, adjustments. Measured volumes include water/DNAPL generated during enhanced recovery testing.
								Cumulative gallons :		14,576	3,557			

NM - Not Measurable

Appendix C.4. Historical Summary- North Vault DNAPL Recovery Monitoring System

APPENDIX C4 - NORTHERN DNAPL RECOVERY SYSTEM

Date	Initials	Field Measurements (by OWI probe)				Calculations (total tank contents) *				Calculations (this period recovery highlighted)					Operator's Notes
		Manhole rim to top of LNAPL (ft)	Manhole rim to top of Water (ft) (estimated)	Manhole rim to top of DNAPL (ft)	Manhole rim to bottom of Tank (ft)	LNAPL (gal)	Water (gal)	DNAPL (gal)	Total (gal)	Water Increase (gal)	NAPL Increase (gal)	% NAPL	NAPL (gpd)	Ave. Recovery in GPD	
28-Nov-01	mrh/cd	8.89	8.89	8.89	8.89	0	0	0	0	0	0	0%	0.00	0.0	Develop well with hand operated diaphragm pump. Measurements are approximate.
7-Feb-02	hs/jc	8.62	8.62	8.85	8.89	0	71	12	83	71	12	15%	0.17	1.2	Pump well by hand.
8-Mar-02	hs/jc	8.61	8.61	8.85	8.89	0	74	12	86	3	0	0%	0.00	0.1	Pump well by hand.
10-Apr-02	mrh	8.59	8.59	8.84	8.89	0	77	15	93	3	3	50%	0.09	0.2	Pump well by hand.
7-May-02	hs/jc	8.51	8.51	8.83	8.89	0	99	19	117	22	3	12%	0.11	0.9	Hand pump not working well.
25-Jun-02	cd	8.51	8.51	8.83	8.89	0	99	19	117	0	0	0%	0.00	0.0	Hand pump not working. Discarded.
2-Aug-02	mrh/jc	8.51	8.51	8.83	8.89	0	99	19	117	0	0	0%	0.00	0.0	Begin peristaltic startup. Setting #6.5, 2hr 15 min per day
8-Oct-02	mrh/jc	7.43	7.44	8.55	8.89	3	343	105	451	244	90	27%	1.34	5.0	Additional system checks/adjustments made by J Clark on 8/15, 8/21, 8/27, 9/09, and 9/12.
4-Feb-03	mrh/jc	7.36	7.37	8.52	8.89	3	355	114	472	12	9	43%	0.08	0.2	Numbers approximate. Surface of contents frozen. Turn on heat.
10-Apr-03	mrh/jc	7.28	7.29	8.50	8.89	3	374	120	497	19	6	25%	0.10	0.4	Pumping mostly water, changed timer to 30 min/week.
23-Jul-03	mrh	7.05	7.06	8.49	8.89	3	442	124	568	68	3	4%	0.03	0.7	Additional system checks/adjustments made by J Clark on 5/5, 5/20, 6/12, and 6/24.
23-Apr-04	mrh	6.90	6.91	8.42	8.89	3	466	145	614	25	22	47%	0.08	0.2	Additional system checks/adjustments made by NFG on 8/01, 8/06, 9/05, 9/08, 9/11, 9/17, 9/25, 10/30, 11/18.
24-Nov-04	jl, jc	6.66	6.67	8.41	8.89	3	537	148	689	71	3	4%	0.01	0.3	O/W interface probe not working accurately, depth of DNAPL is estimated.
19-Apr-05	mh,jc,jl,sh	6.45	6.46	8.39	8.89	3	596	154	753	59	6	10%	0.04	0.4	Additional system checks/adjustments made by J Clark on 11/24, 1/20/2005, 3/7, 3/11, 4/12, 4/18.
26-Oct-05	mrh, jc	6.33	6.34	8.30	8.89	3	605	182	790	9	28	75%	0.15	0.2	New OWI probe, but readings inconsistent with previous readings. System checks by NFG 5/11, 6/24, 7/28, 8/25, 10/06.
22-Mar-06	mrh, jc	6.20	6.21	8.23	8.89	3	624	204	831	19	22	54%	0.15	0.3	Additional system checks by NFG 10/26/05, 12/14/05, 1/6/06, 2/24/06.
24-Oct-06	mrh, jc	5.20	5.21	7.89	8.89	3	828	309	1139	204	105	34%	0.49	1.4	Depth to NAPL reading is approximate. Additional system checks by NFG 5/11, 6/29, 7/26, 9/07.
25-Apr-07	mrh, jc	4.90	4.91	7.80	8.89	3	892	337	1232	65	28	30%	0.15	0.5	Depth to NAPL reading is approximate. Additional system checks by NFG 10/31/2006, 11/16/2006, 3/02/2007.
30-Oct-07	dms, jc	4.68	4.69	7.70	8.89	3	929	367	1300	37	31	45%	0.16	0.4	Depth to NAPL reading is approximate. Tubing changed out.
13-May-08	dms, jc	3.46	3.47	7.65	8.89	3	1291	383	1677	361	15	4%	0.08	1.9	Depth of DNAPL is estimated. Additional system checks by NFG on 1/08/08, 3/20/08 and 5/08/08. **Tank pumped out.**
25-Mar-09	jl, dz	8.75	8.76	8.88	8.89	3	37	3	43	34	9	20%	0.03	0.1	Data for depth to DNAPL changed to prevent table indicating a reduction in NAPL volume. Actual measurement 8.87.
8-Jun-09	jc	---	---	---	8.89	---	---	---	---	---	---	---	---	---	Covered exposed fabric on the bank and on the creek bed with angular stone.
10-Jul-09	tr, jc	8.46	8.47	8.88	8.89	3	127	3	133	90	0	0%	0.00	0.8	O/W interface probe is working accurately
23-Sep-09	jc	---	---	---	8.89	---	---	---	---	---	---	---	---	---	J Clark changed pum run time from 45 minutes to 30 minutes.
6-Oct-09	tr, jc	8.08	8.09	8.88	8.89	3	244	3	250	117	0	0%	0.00	1.3	A skim of LNAPL and DNAPL were present, the thickness (not measureable) is estimated to be 0.01 ft.
14-Jan-10	jc	---	---	---	8.89	---	---	---	---	---	---	---	---	---	J. Clark repaired air vent hose.
24-Feb-10	jc	---	---	---	8.89	---	---	---	---	---	---	---	---	---	Repaired hose.
26-Mar-10	jc	---	---	---	8.89	---	---	---	---	---	---	---	---	---	Fabric visible on east side of creek.
21-Apr-10	tr, jc, tc	8.00	8.01	8.88	8.89	3	269	3	275	25	0	0%	0.00	0.1	A skim of LNAPL and DNAPL were present, the thickness (not measureable) is estimated to be 0.01 ft. Damage to armor stone observed by sheet pile wall.
21-Aug-10	jc	---	---	---	8.89	---	---	---	---	---	---	---	---	---	Changed tubing.
21-Oct-10	jc	---	---	---	8.89	---	---	---	---	---	---	---	---	---	Reset time.
	jc	---	---	---	8.89	---	---	---	---	---	---	---	---	---	Additional checks made by J. Clark on 5/20, 6/24, 7/22, 9/16, 11/18, 12/17, and 1/27/11. No adjustments made.
7-Apr-11	tr, jc	4.27	4.28	8.88	8.89	3	1420	3	1427	1152	0	0%	0.00	3.3	A skim of LNAPL and DNAPL were present, the thickness (not measureable) is estimated to be 0.01 ft.
16-Jun-11	jc	8.89	8.89	8.89	8.89	0	0	0	0	---	---	---	---	---	Tank pumped out. NAPL and water transported to offsite treatment facility.
18-Apr-12	el, jc	8.85	8.85	8.83	8.89	0	-6	19	12	-6	10	81%	0.03	0.0	Measured water and NAPL levels. Corrected depth to top of DNAPL and depth to bottom of tank measurements.
29-Apr-13	tr, jc	2.87	2.87	8.83	8.89	0	1840	19	1859	1846	1	0%	0.00	4.9	Estimate approximately 1/2 inch DNAPL. Corrected depth to bottom of tank measurement.
23-May-13	jc	---	---	---	---	0	0	0	0	---	---	---	---	---	Tank pumped out. NAPL and water transported to offsite treatment facility.
23-Apr-14	el, jc	7.58	7.58	8.82	8.89	0	383	22	404	383	22	5%	0.06	1.2	Estimate approximately 3/4 inch DNAPL. Corrected depth to bottom of tank measurement.
21-May-15	kh	6.95	6.95	8.80	8.88	0	571	25	596	188	3	2%	0.01	0.5	Measurements by Op-Tech
20-Apr-16	kh,rw	6.55	6.55	8.77	8.88	0	685	34	719	114	9	7%	0.03	0.4	Measurements by Op-Tech
20-Apr-17	kh, rf	6.49	6.49	8.71	8.88	0	685	52	738	0	19	100%	0.05	0.1	Measurements by GEI weighted cotton string (stain height). Changed 62 ft of discharge tubing.
29-Jun-17	mc	---	---	---	---	---	---	---	---	---	---	---	---	---	**NAPL collection tank emptied by Allied Env. Services,**
29-Sep-17	mc	8.60	8.60	8.60	8.88	0	0	86	86	0	86	100	0.93	4	Measurements by GEI using weighted cotton string and measured stain height. Differentiation between water and NAPL difficult with this small of a quantity
26-Oct-17	mc	8.60	8.60	8.60	8.88	0				0	2				Measurements by GEI. Bucket hung in tank contains ~3.5 gallons, approximately 50% of which is NAPL, 50% water. Change pump sched to DST.
15-Feb-18	mc	8.60	8.60	8.60	8.88	0	0	86	86	4.5	0.25	0%	0.00	0.0	Measurements by GEI. Bucket hung in tank contains 4.5 gallons of water and 0.25 gallons of DNAPL.
26-Apr-18	mc	8.20	8.20	8.60	8.88	0	124	86	210	4.5	0.25	5%	0.00	1.2	Measurements by GEI. Bucket hung in tank contains ~4.75 gallons of water and 0.25 gallons of DNAPL.
12-Jul-18	mc	--	--	--	8.88	---	2.00	2	4.00	2.00	2.00	50%	---	---	No measurements by GEI. National Fuel personel states that 3-5 gallons of oil/water (50%/50%) mixture present in bucket hung in tank.
16-Aug-18	mc	--	--	--	8.88	---	2.00	2	4.00	2.00	2.00	50%	---	---	No measurements by GEI. National Fuel personel states that 3-5 gallons of oil/water (50%/50%) mixture present in bucket hung in tank.
20-Sep-18	mc	8.76	8.76	8.76	8.88	0	2	2	4	1.5	2.00	43%	--	--	Measurements by GEI. Bucket hung in tank contains ~1.5 gallons of water and 2 gallons of DNAPL. **(NAPL storage tank pumped May 2018)**
25-Oct-18	mc	--	--	--	--	--	2	2	4	2.00	2.00	50%	--	--	No measurements by GEI. National Fuel personel states that 3-5 gallons of oil/water (50%/50%) mixture present in bucket hung in tank.
16-Jan-19	mc	8.76	8.76	8.76	8.88	0	2	3	3	2.0	2.50	100%	0.02	0.8	Measurements by GEI. Bucket hung in tank contains ~2.5 gallons of NAPL. Pump was not running during inspection, but breaker was reset and was running at the close of the inspection. Consider increasing pump speed.
28-Feb-19	mc	7.80	7.80	8.60	8.88	0	247	86	333	245.0	84	25%	-	0.1	Measurements by GEI. Bucket hung in tank contains ~4 gallons NAPL (minimal water). Pump was not running during inspection. Relay reset but only works momentarily and runs pump controller at "600" setting. Pump controller removed for inspection/repair.
28-Mar-19	mc	--	--	--	--	--	--	--	--	--	--	--	--	--	No measurments made. Peristaltic pump out for repair. Rental pump acquired and placed in service on this date.
23-May-19	mc	7.80	7.80	8.60	8.88	0	247	86	333	0.0	0	0%	-	0.0	Measurements by GEI. Bucket hung in tank contains ~ 4 gallons NAPL (minimal water). Pump was reparied and placed back in service on May 16 (double check). Increase pump speed from 80 to 100.
27-Jun-19	mc	--	--	--	--	--	--	--	333	--	--	--	-	--	No measurements by GEI. National Fuel personel states that 5 gallons of NAPL present in bucket hung in tank.
18-Jul-19	mc	7.75	7.75	8.55	8.88	0	247	102	349	1.0	15	100%	-	-	Measurements by GEI. Bucket hung in tank contains ~ 5 gallons NAPL (minimal water).
26-Nov-19	mc	7.70	7.70	8.51	8.88	0	250	114	364	3.1	12	100%	-	-	Measurements by GEI. Bucket hung in tank contains ~4.50 gallons of water and 0.25 gallons of DNAPL. **NAPL storage tank pumped on this date.**
23-Jan-20	mc	8.80	8.80	8.80	8.88	0	5	0	5	5.0	0	--	0.00	-	Measurements by GEI. Bucket hung in tank contains ~4.50 gallons of water and 0.25 gallons of DNAPL.
4-Apr-20	mc	8.80	8.80	8.88	8.88	0	25	0	25	19.7	0	0%	-	-	Measurements by GEI. Bucket hung in tank contains approximately 2 gallons of water and 3 gallons of DNAPL. Tubing replaced in the peristaltic pump head. Suspected tank shift following 11/2019 alterning total tank depth measurment.
25-Jun-20	mc	8.80	8.80	8.88	8.88	0	25	0	25	0.0	0	0%	-	-	Measurements by GEI. Bucket hung in tank contains minimal water and 2 gallons of DNAPL. Tubing replaced in the peristaltic pump head.
27-Aug-20	mc	--	--	--	--	--	--	--	--	--	--	--	--	--	North vault could not be accessed due to a broken key.
26-Oct-20	mc	8.00	8.00	8.58	8.88	0	179	93	272	154.4	93	34%	-	-	Measurements by GEI. Bucket hung in tank contains approximately 1 gallon of water and 4 gallons of DNAPL. Tubing replaced in the peristaltic pump head.
23-Nov-20	mc	--	--	--	--	--	--	--	--	--	--	--	--	--	No measurements made. Inspection of creek banks following Lake Erie seche event and high water along creek corridor.
28-Dec-20	mc	--	--	--	--	--	--	--	--	--	--	--	--	--	No measurements made. Inspection of creek banks following Lake Erie seche event and high water along creek corridor.
12-Jan-21	mc	7.80	7.80	8.58	8.88	0	241	93	333	61.8	0	28%	-	-	Measurements by GEI. Bucket hung in tank contains approximately 2 gallon of water and 1 gallon of DNAPL. Tubing replaced in the peristaltic pump head.
2-Mar-21	mc	--	--	--	--	--	--	--	--	--	--	--	--	--	Peristaltic pump replacment following pump failure in February 2021. No new measurements made.
16-Apr-21	mc	8.00	8.00	8.58	8.88	0	243	96	339	2.0	3	28%	--	--	Measurements by GEI. Bucket hung in tank contains approximately 3 gallons of DNAPL and 2 gallons of water. Tubing replaced in the peristaltic pump head.
19-May-21	mc	7.95	7.95	8.58	8.88	0	246	99	345	2.5	3	29%	--	--	Measurements by GEI. Bucket hung in tank contains approximately 2.5 gallons of DNAPL and 2.5 gallons of water. Tubing replaced in the peristaltic pump head.
24-Jun-21	mc	--	--	--	--	--		--	--	--	--	--	--	--	Bucket fell in tank and was replaced. NAPL thickness measured at 0.3'.
20-Aug-21	mc	7.70	7.70	8.58	8.88	0	247	101	348	1.0	2	29%	--	--	Measurements by GEI. Bucket hung in tank contains approximately 2 gallons of DNAPL and 1 gallon of water. Tubing replaced in the peristaltic pump head. (1)
2-Sep-21	rf	--	--	--	--	--		--	--	--	--	--	--	--	No measurments made. Vault cleaned and **tank emptied** and downhole tubing replaced by SUN Environmental.
5-Oct-21	mc	8.70	8.70	8.74	8.88								--	--	Measurements by GEI. Bucket hung in tank contains approximately 2 gallons of DNAPL and 3 gallon of water. Tubing replaced in the peristaltic pump head.(1)
5-Nov-21	rf	8.70	8.70	8.70	8.88	0	0	67	67	0.0	67	100%	--	--	Measurements by GEI. Bucket hung in tank contains approximately 1 gallon of DNAPL and 0.5 gallon of water. Tubing replaced in the peristaltic pump head. (1) Corrected on 3-24-23 for transcription error.
14-Jan-22	mc	--	--	--	--	--	--	--	--	--	--	--	--	--	Bucket is empty. The power supply to the peristaltic pump failed due to excessive moisture. Active venting of both vaults recommended.
3-Feb-22	mc		--	--	--	--	--	--	--	--		--	--	--	Exhaust vent installed to mitigate moisture buildup in vault.
22-Apr-22	mc	8.15	8.15	8.23	8.88	0	25	201	225	25	134	--	--	--	Full bucket with only a trace of DNAPL. Advanced tubing in pump.
17-Feb-23	rf	7.35	7.35	8.08	8.88	0	225	247	472	225	46	--	--	--	See Appendix B1 for details of 2022 Observations, measurements, adjustments
21-Dec-23	mc	7.15	7.15	9.10	9.2	0	640	18	658	640	18	--	--	--	See Appendix B1 for details of 2023 Observations, measurements, adjustments. Measured volumes include water/DNAPL generated during enhanced recovery testing.
13-Dec-24	mc	9.20	4.60	9.10	9.2	0	1435	12.9	1435	1435	12.9	--	--	--	See Appendix B1 for details of 2024 Observations, measurements, adjustments. Measured volumes include water/DNAPL generated during enhanced recovery testing.
						Cumulative gallons :				8048	1046				Note: (1) DNAPL volume estimates were adjusted for 2021 to correct an error in volume calculation for Aug 20 2021 and measurements recorded in Oct and Nov '21 after tank was emptied in Oct.2021

Appendix D 2024 Enhanced Recovery Field Reports

Appendix D.1. March 21, 2024, Field Report

Appendix D.2. June 20, 2024, Field Report

Appendix D.3. August 29, 2024, Field Report

Appendix D.4. December 13, 2024, Field Report

Appendix D.1. March 21, 2024, Field Report

Daily Field Notes

Project Name: Scajaquada- Riparian Site	**Date:** 3/21/2024
Project Number: 1403480	**Purpose of Site Visit:** Pumping tests (High-Rate) of DNAPL collection system in north and south vaults.
Site Name/Address: West Ave, Buffalo NY	
Arrival Time: 07:45 A.M	**Departure Time:** 12:00 P.M.

Weather:	
Temperature: 19-22°F	**Sky Condition:** Cloudy
Wind: 5-10 mph	**Precipitation:** None

GEI Representatives
Frank Clougherty, G.I.T,
Michael Cummings, P.G.

Onsite Personnel	Company
Deke and two (2) helpers	Sun Environmental (Sun)
Katie Hoelscher	National Fuel Gas

Field Equipment	Equipment Make	Equipment Model	Serial #	Calibration Date	Calibration Time
Trash pump	Predator	NA	NA	NA	NA
Water level meter	Solinst	NA	NA	NA	NA
5-Gallon Buckets	NA	NA	NA	NA	NA

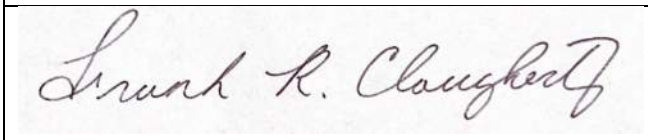
Time	Notes	Photographs
08:17 AM	North vault- Water level 6.85' (top of water), full 5-gallon bucket of clear water with ~.5- Gallons of DNAPL.	 Photograph 1: Sun gauging north vault.
08:55 AM	Pumping commenced at north vault at a flow rate of ~1 Gallons Per Minute (GPM), ~75-100% DNAPL.	 Photograph 2: Discharge from north vault.

09:04 AM	Pumping ~2 GPM. Consistency changed to ~20% DNAPL and ~80% water.	 Photograph 3: Discharge from north vault.
09:09 AM	Pumping ~3 GPM, discharge silty, light brown with moderate sheen present.	 Photograph 4: Discharge from north vault.
09:14 AM	Pumping ~3-GPM, discharge- silty, light brown, light sheen present.	 Photograph 5: Discharge from north vault.
09:26 AM	Flow rate check ~3 GPM, discharge- silty, light brown, with moderate to light sheen present.	 Photograph 6: Discharge from north vault.

09:37 AM	Flow rate check ~3 GPM, discharge- silty, light brown, with moderate to light sheen present.	 Photograph 7: Discharge from north vault.
09:50 AM	Flow rate check ~3 GPM, discharge- silty, light brown, with moderate to light sheen present.	 Photograph 8: Discharge from north vault.
09:55 AM	Pumping stopped, flow rate ~3 GPM, discharge- silty, light brown, with moderate to light sheen present. A total of ~176 gallons of water and ~4 gallons of DNAPL purged from north vault during pumping event. Sun demobilized equipment from the north vault.	
09:56 AM	Water level in north vault gauged at 6.4' to top of water.	
10:13 AM	South vault- Water level 6.9' to top of water bucket empty from pump failure.	 Photograph 9: Sun gauging south vault.

10:24 AM	Pumping commenced at south vault, flow rate ~3.25 GPM, discharge- clear to slightly brown with light sheen.	 Photograph 10: Discharge from south vault.
10:41 AM	Flow rate check ~2.5 GPM, discharge- silty, light brown, with moderate to light sheen present. Strong hydrogen sulfide odor.	 Photograph 11: Discharge from south vault.
10:53 AM	Flow rate check ~3 GPM, discharge- silty, light brown, with moderate to light sheen present. Strong Hydrogen Sulfide odor.	 Photograph 12: Discharge from south vault.
11:12 AM	Flow rate check ~3 GPM, discharge- silty, light brown, with moderate to light sheen present. Strong Hydrogen Sulfide odor	

11:24 AM	Pumping stopped, flow rate ~3 GPM, discharge- silty, light brown, light sheen present. Strong Hydrogen Sulfide odor. A total of ~180 gallons of water and no DNAPL purged from south vault during pumping event. Sun demobilized equipment from the south vault.	
11:25 AM	Water level in south vault gauged at 6.6' to top of water.	

Signed By:	**Date/Time:**
	03-21-2024 11:58 AM

Appendix D.2. June 20, 2024, Field Report

Daily Field Notes

Project Name: Scajaquada- Riparian Site	**Date:** 6/20/2024
Project Number: 1403480	**Purpose of Site Visit:** Pumping tests (High-Rate) of DNAPL collection system in north and south vaults.
Site Name/Address: West Ave, Buffalo NY	
Arrival Time: 07:40 A.M	**Departure Time:** 11:30 A.M.

Weather:	
Temperature: 76°F	**Sky Condition:** Mostly Cloudy
Wind: 0-5 mph	**Precipitation:** None

GEI Representatives
Michael Cummings, P.G.
Joshua Prygon

Onsite Personnel	Company
Gary and two (2) helpers	Sun Environmental (Sun)
Katie Hoelscher	National Fuel Gas

Field Equipment	Equipment Make	Equipment Model	Serial #	Calibration Date	Calibration Time
Trash pump	Predator	NA	NA	NA	NA
Water level meter	Solinst	NA	NA	NA	NA
5-Gallon Buckets	NA	NA	NA	NA	NA

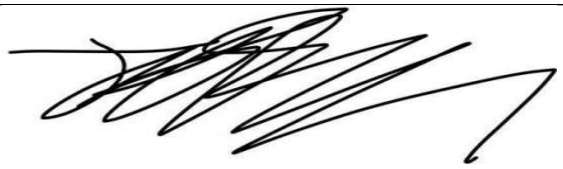
Time	Notes	Photographs
08:20 AM	Mike Cummings gives tailgate safety meeting and goes over work to be done for the day.	
08:30 AM	Full bucket of clear water was observed during NAPL check at South vault. Initial depth to top of water: 6.50’	
08:42 AM	Begin purging from South vault. Water is clear with slight hydrogen sulfide odor.	
08:45 AM	Flow rate check was completed/ Pumping ~3.5 GPM.	
09:01 AM	Water pumping clear, hydrogen sulfide odor and slight sheen present. No NAPL presence or separate phrase.	

09:11 AM	Flow rate check: 2.5 gal/min. Strong hydrogen sulfide odor, slight sheen, clear, and no NAPL	 Photograph 1: Discharge from South vault.
09:36 AM	Final flow rate check: 2.5 gal/min. Water clear with slight sheen, hydrogen sulfide odor, and no NAPL.	 Photograph 2: Discharge from South vault.
09:42 AM	End of the pumping at South Vault. Final depth to the top of water: 6.0'. Test occurred from 0842 to 0942, lasting an hour and purging approximately 180 gallons.	

10:05 AM	Arrive and set up at northern vault.	 Photograph 3: Setup at North vault.
10:10 AM	Full bucket of water in vault. Approximately half a bucket of DNAPL. DTW:6.15	
10:15 AM	Set-up pump at northern vault and prime it.	 Photograph 4: Sun purging South vault.
10:17 AM	Begin pumping at Northern Vault. First ten gallons had 25-30% DNAPL in initial purging, strong coal tar odor. Black in color.	 Photograph 5: Discharge from North vault.

10:23 AM	Flow rate check: 3 gallons/min. Strong coal tar odor, less DNAPL present approximately ~5 % Estimate a total of approximately 3 gallons DNAPL removed during enhanced recovery testing.	 Photograph 6: Discharge from South vault.
10:26 AM	Water begins to clear after ~25 gallons removed. No separate phase, but sheen present with heavy coal tar odor.	 Photograph 7: Discharge from North Vault
10:32 AM	Flow rate check: ~3gal/min.	

10:54 AM	Water quality check, clear slight sheen and coal tar odor. Flow rate check: 3.5gal/min.	 Photograph 8: Discharge from North Vault
11:17 AM	Final water quality test: clear, slight sheen and coal tar odor. Final depth to water:5.55. Test occurred from 1017 to 1117, lasting an hour and purging approximately 210 gallons.	 Photograph 9: Discharge from North Vault

Signed By:	**Date/Time:**
	06-20-2024 01:23 PM

Appendix D.3. August 29, 2024, Field Report

Daily Field Notes

Project Name: Scajaquada- Riparian Site	**Date:** 8/28/2024
Project Number: 1403480	**Purpose of Site Visit:** Pumping tests (High-Rate) of DNAPL collection system in north and south vaults.
Site Name/Address: West Ave, Buffalo NY	
Arrival Time: 07:45 A.M	**Departure Time:** 11:00 A.M.

Weather:	
Temperature: 65-75°F	**Sky Condition:** Clear Skies
Wind: 0-5 mph	**Precipitation:** None

GEI Representatives
Frank Clougherty, G.I.T, Michael Cummings, P.G. Richard Frappa, P.G.

Onsite Personnel	Company
Gary House and three (3) helpers	Sun Environmental (Sun)
Katie Hoelscher	National Fuel Gas

Field Equipment	Equipment Make	Equipment Model	Serial #	Calibration Date	Calibration Time
Trash pump	Predator	NA	NA	NA	NA
Water level meter	Solinst	NA	NA	NA	NA
5-Gallon Buckets	NA	NA	NA	NA	NA

Time	Notes	Photographs
0805	South vault: Water level 5.5' (top of water), Full 5-gallon bucket of clear water, ~0 gal DNAPL.	 Photograph 1: Sun gauging south vault.
0813	Pumping commenced at south vault at a flow rate of ~3- Gallons Per Minute (GPM), Discharge- Slightly turbid, mild coal tar odor, ~0% product.	 Photograph 2: Discharge from south vault.

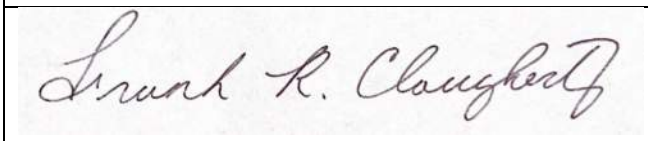
0823	Pumping Rate Check: Pumping ~3- Gallons Per Minute (GPM), Discharge- Slightly turbid, mild Coal tar odor, light sheen, 0% product.	
0833	Pumping Rate Check: Pumping ~3 GPM, Discharge- Silty, light brown, heavy sheen, mild coal tar odor, 0% product.	
0843	Pumping Rate Check: Pumping ~3-GPM, Discharge- Silty, light brown, light sheen, slight Coal tar odor, slight hydrogen sulfide odor, 0% product.	
0853	Pumping Rate Check: Pumping ~3-GPM, Discharge- Silty, light brown, slight Coal tar odor, light sheen, strong, hydrogen sulfide odor, ~0% product.	

0903	Pumping Rate Check: Pumping ~3 GPM, Discharge- Silty, light brown, light sheen, strong Hydrogen Sulfide odor, ~0% product.	
0913	Pumping Rate Check: Pumping rate ~3 GPM, Discharge- Silty, light brown, light sheen, strong Hydrogen Sulfide odor. Pumping stopped, A total of ~180 gallons of water, with ~0- Gallons of DNAPL purged from south vault during pumping event. Sun demobilized equipment from the south vault.	 Photograph 3: Discharge from south vault.
0917	Water level in south vault gauged at 5.35' to top of water.	
0937	North vault: WL 5.4' (top of water), full 5-gallon bucket of clear water .	 Photograph 4: Sun gauging north vault.

0940	Pumping commenced at north vault at a flow rate of ~3 GPM, Silty, brown, heavy sheen, strong coal tar odor present, ~10% DNAPL.	 Photograph 5: Discharge from north vault.
0950	Pumping Rate Check: Pumping rate of ~3 GPM, Silty, brown, heavy sheen, strong coal tar odor present, ~<5% DNAPL.	
1000	Pumping Rate Check: Pumping rate of ~3 GPM, silty, brown, heavy sheen, strong coal tar odor present, ~<5% DNAPL.	 Photograph 6: Discharge from north vault.

1010	Pumping Rate Check: Pumping rate of ~3 GPM, Silty, brown, heavy sheen, strong coal tar odor present, ~0% product.	
1020	Pumping Rate Check: Pumping rate of ~3 GPM, Silty, brown, heavy sheen, strong coal tar odor present, ~0% product.	 Photograph 7: Discharge from north vault.
1030	Pumping Rate Check: Pumping rate of ~3 GPM, Silty, brown, heavy sheen, strong coal tar odor present, ~0% product.	

1040	Pumping Rate Check: Pumping rate ~3 GPM, Silty, light brown, with moderate to light sheen present. Pumping stopped, A total of ~180 gallons of water and ~1.5 gallons of DNAPL purged from north vault during pumping event.	
1041	Water level in north vault gauged at 4.90' to top of water. Sun demobilized equipment from the north vault.	

Signed By:	**Date/Time:**
	08/28/2024-2024 11:00 AM

Appendix D.4. December 13, 2024, Field Report

Daily Field Notes

Project Name: Scajaquada- Riparian Site	**Date:** 12/13/2024
Project Number: 1403480	**Purpose of Site Visit:** Pumping tests (High-Rate) of DNAPL collection system in north and south vaults.
Site Name/Address: West Ave, Buffalo NY	
Arrival Time: 07:45 A.M	**Departure Time:** 12:15 P.M.

Weather:	
Temperature: 15°F	**Sky Condition:** Clear Skies
Wind: 0-5 mph	**Precipitation:** None

GEI Representatives
Michael Cummings, P.G.
Joshua Prygon

Onsite Personnel	Company
Gary, Deke and two (2) helpers	Sun Environmental (Sun)
Katie Hoelscher	National Fuel Gas

Field Equipment	Equipment Make	Equipment Model	Serial #	Calibration Date	Calibration Time
Trash pump	Predator	NA	NA	NA	NA
Water level meter	Solinst	NA	NA	NA	NA
5-Gallon Buckets	NA	NA	NA	NA	NA

Time	Notes	Photographs
0806	Vacuum truck arrives on-site.	 Photograph 1: Sun vacuum truck.

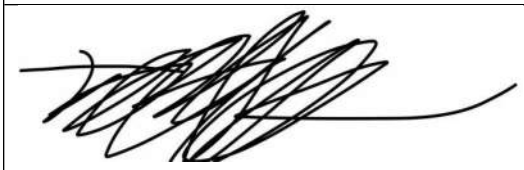
0813	Setting up vacuum truck at South Vault.	 Photograph 2: Vacuum truck at South Vault
0820	South vault depth to top of water before vacuum truck: 4.95'.	
0822	Begin vacuuming at South Vault.	
0839	Finish vacuuming at South Vault. ~1493 gallons removed according to ESG.	

0852	Begin purging with trash pump at South Vault.	 Photograph 2: Discharge at South Vault
0856	Flow rate test: ~3 gallons/min. Silty, clear water with no NAPL blebs. Hydrogen sulfide odor and light coal tar odor.	
0925	Flow rate test: ~3 gallons/minute. Light sheen, clear no NAPL blebs. Hydrogen sulfide odor and light coal tar odor.	
0939	Flow rate test: ~2.5 gallons/minute. Light sheen, clear no NAPL blebs. Hydrogen sulfide odor and light coal tar odor.	

0949	Flow rate test: ~2.5 gallons/minute. Light sheen, clear no NAPL blebs. Hydrogen sulfide odor and light coal tar odor.	
0952	Purging at South Vault finishes. Depth to water: 8.70’	
1022	Initial DTW:4.60’ at North Vault. Bucket was full of water and contained approximately a quart of DNAPL. Vacuum truck begins.	
1036	Finish vacuuming at North Vault.	

1042	Begin purging with trash pump at North Vault. Black, heavy sheen, strong coal tar odor. Approximately half DNAPL and half water.	 Photograph 3: Discharge from north vault.
		 Photograph 4: Discharge from north vault.
1049	Flow rate test: ~3.25 gallons/ minute. Black, heavy sheen, strong coal tar odor. Amount of DNAPL steadily decreasing.	
1113	Flow rate test: 3.5 gallons/minutes. Clear, heavy sheen, strong coal tar odor. DNAPL no longer present in the purge water.	 Photograph 4: Discharge from north vault.

1134	Flow rate test: ~2.5 gallons/minute. Clear, moderate sheen, and moderate coal tar odor. Estimate approximately 2 gallons of DNAPL removed during enhanced recovery testing.	
1142	Finish purging at North Vault. Final DTW: 8.75’	

Signed By:	**Date/Time:**
	12/13/2024-2024 01:24 PM