GEI Consultants

Consulting
Engineers and
Scientists

Site Management Periodic Review Report and IC/EC Certification (2016)

Iroquois Gas/Westwood Pharmaceutical Riparian Site No. 915141B
Buffalo, New York

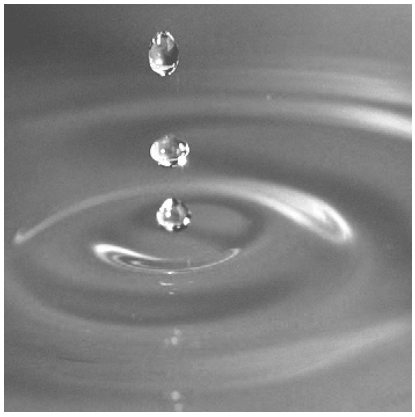
Submitted to:
New York State Department of Environmental Conservation
Division of Environmental Remediation, Region 9
Buffalo, New York

Submitted by:
GEI Consultants, Inc., P.C.
90B John Muir Drive, Suite 104
Amherst, NY 14228

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

March 2017

Project 1403480



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1. Executive Summary

GEI Consultants, Inc., P.C. (GEI) was retained to conduct the Site Management Periodic Review Report (PRR) and IC/EC Certification submittal for the Iroquois Gas/Westwood Pharmaceutical Site located in Buffalo, New York. This PRR presents and evaluates the results of O&M activities performed at the site over the past year and since the remedial action was completed in 2002. The 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.

In conducting this periodic review, GEI determined the components of the O&M Plan dated February 8, 2005, and amended frequencies of inspections as agreed to in NYSDEC correspondence dated December 2, 2009, were in compliance during this reporting period (February 15, 2016 through February 15, 2017):

- ICs/ECs have been in place and effective
- Inspections were performed as required

Based upon the inspections and compliance with the O&M Plan, the site remedy continues to meet the remedial objectives for the site.

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 upgradient of 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/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 2002. 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.

- 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, taking into account 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 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, 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).

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. The components of the O&M Plan 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

- maintenance and repair of engineering controls

- field observations and reporting

Each of these elements was conducted between February 2016 and February 2017.

3. Remedy Performance Evaluation

The remedial performance is evaluated based on the following:

1. Periodic inspection of the Scajaquada Creek sediment cap
2. Periodic inspection of the DNAPL recovery systems

3.1 Scajaquada Creek Sediment Cap

The 2016 annual inspection of the Scajaquada Creek Sediment Cap was conducted by Mr. Randolph West P.E. of AECOM on April 20, 2016. A follow-up review of the sediment cap was conducted by Mr. Kelly McIntosh, P.E. of GEI on January 19, 2017. The annual visual inspection was performed to evaluate whether the remedy remains effective in protecting human health and the environment. The remedy, including the eight repairs made in 2015 as shown on attached Figure 2 and in the photograph logs (Appendix A), is functioning as intended. AECOM noted no deficiencies in the capping system, nor any incipient problems meriting additional monitoring or corrective measures. GEI's follow-up inspection concluded the cap was maintained as provided in the O&M Plan and did not recommend any specific supplemental maintenance activities this year for the capping system at this site.

3.2 DNAPL Recovery Systems

The northern and southern DNAPL recovery systems were checked monthly by National Fuel staff between February 2016 and February 2017. GEI observed the operation of the DNAPL recovery systems in February 2017. During these visits the automatic timer was adjusted to maximize the flow of DNAPL while minimizing the flow of groundwater. Tubing was advanced or replaced as needed to optimize the performance of the system's peristaltic pump. Quantities of liquids pumped into the 2,100 gallon storage tanks were determined through measurement of liquid depths below the top of the manhole rim of the tank.

3.2.1 Southern DNAPL Recovery System

The southern DNAPL recovery system was observed to function properly during the period of this report. Maintenance activities performed on the southern DNAPL recovery system during this period included: changing flexible tubing near the pump head, resetting timers to Daylight Savings Time, and pump run time adjustments.

DNAPL level measurements were recorded periodically from the collection tank of southern DNAPL recovery system. Annual DNAPL monitoring was performed on April 20, 2016.

Depth to water and DNAPL, as well as, calculated quantities are reported on the DNAPL recovery system monitoring log presented in Appendix B. Volumes were calculated by taking measurements in the tanks with an oil/water interface probe or measuring the length of DNAPL staining on a weighted string lowered to the tank bottom. The total volume of DNAPL recovered as of April 20, 2016 was approximately 2,251 gallons. Between the 2015 and 2016 annual monitoring events, approximately 130 gallons was recovered.

3.2.2 Northern DNAPL Recovery System

The northern DNAPL recovery system was observed to function properly during this reporting period. Maintenance activities performed on the northern DNAPL recovery system during this period were routine and included: changing flexible tubing near the pump head, resetting timers to Daylight Savings Time, and pump run time adjustments.

DNAPL level measurements were recorded periodically from the collection tank of northern DNAPL recovery system. Annual DNAPL monitoring was performed on April 20, 2016. Depth to water and DNAPL, as well as calculated quantities are reported on the DNAPL recovery system monitoring log presented in Appendix B. Volumes were calculated by taking measurements in the tanks with an oil/water interface probe or measuring the length of DNAPL staining on a weighted string lowered to the tank bottom. The volume of DNAPL recovered by the Northern DNAPL recovery system as of April 20, 2016 was approximately 448 gallons. Between the 2015 and 2016 annual monitoring events, approximately 9 gallons of DNAPL were recovered.

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 discharge of surface water in the City of Buffalo.

ECs include the following;

- Sediment cap consisting of GCL overlain by sand, geotextile and anchoring stone.
- Collection of mobile DNAPL below the sediment cap
- Maintenance of the 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 were performed during this reporting period in accordance with the plan.

4.3 IC/EC Certification

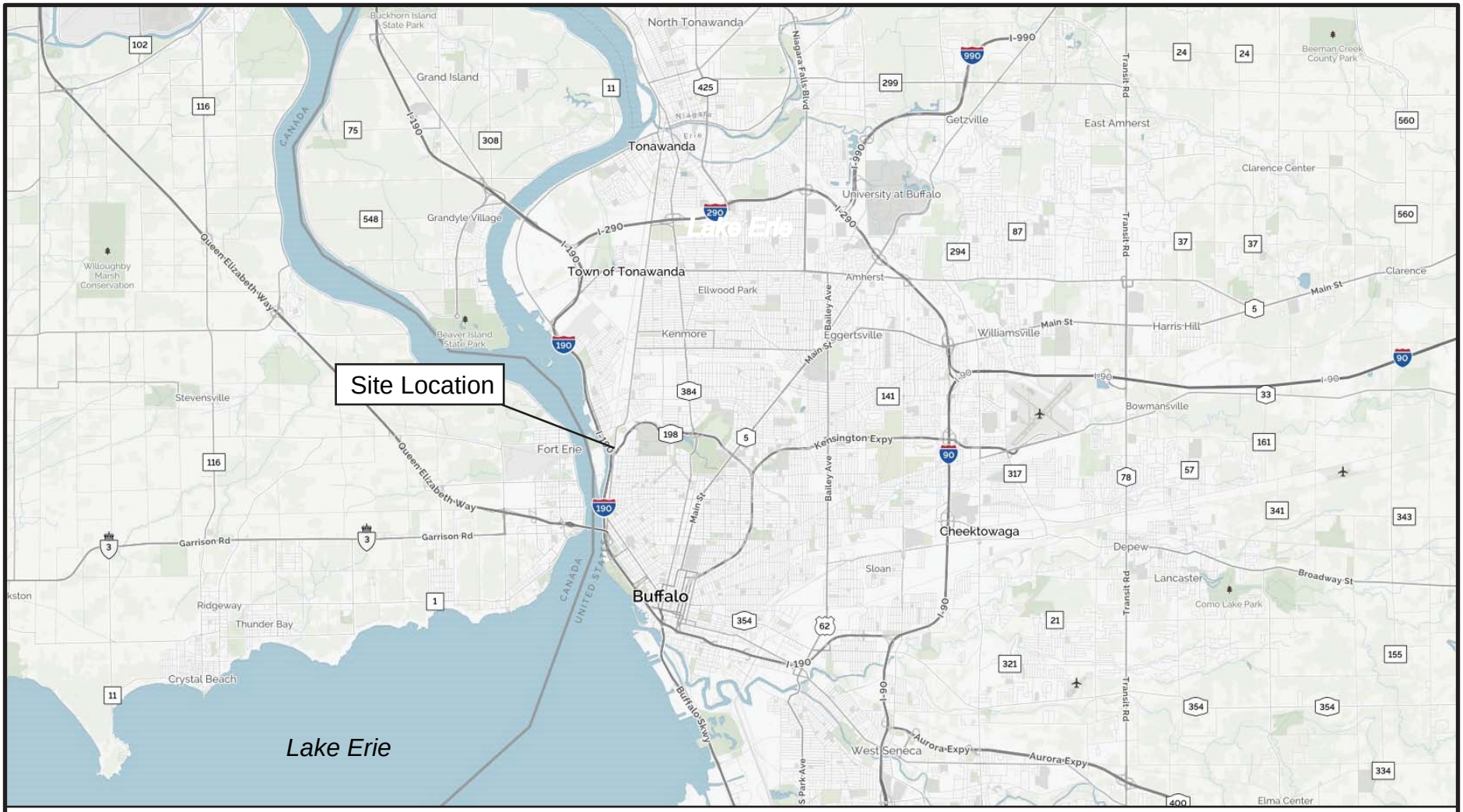
The IC/EC Certification is included in Appendix C.

5. Conclusions and Recommendations

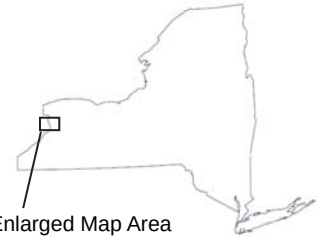
Each component of the O&M Plan dated February 8, 2005 and amended frequencies of inspections as agreed to in NYSDEC correspondence dated December 2, 2009 was in compliance during this reporting period (February 15, 2016 through February 15, 2017). The ICs/ECs have been in place and effective and inspections and maintenance were performed as required.

Based upon the inspections and compliance with the SMP, the site remedy continues to meet the remedial objectives for the site.

Figures



New York State

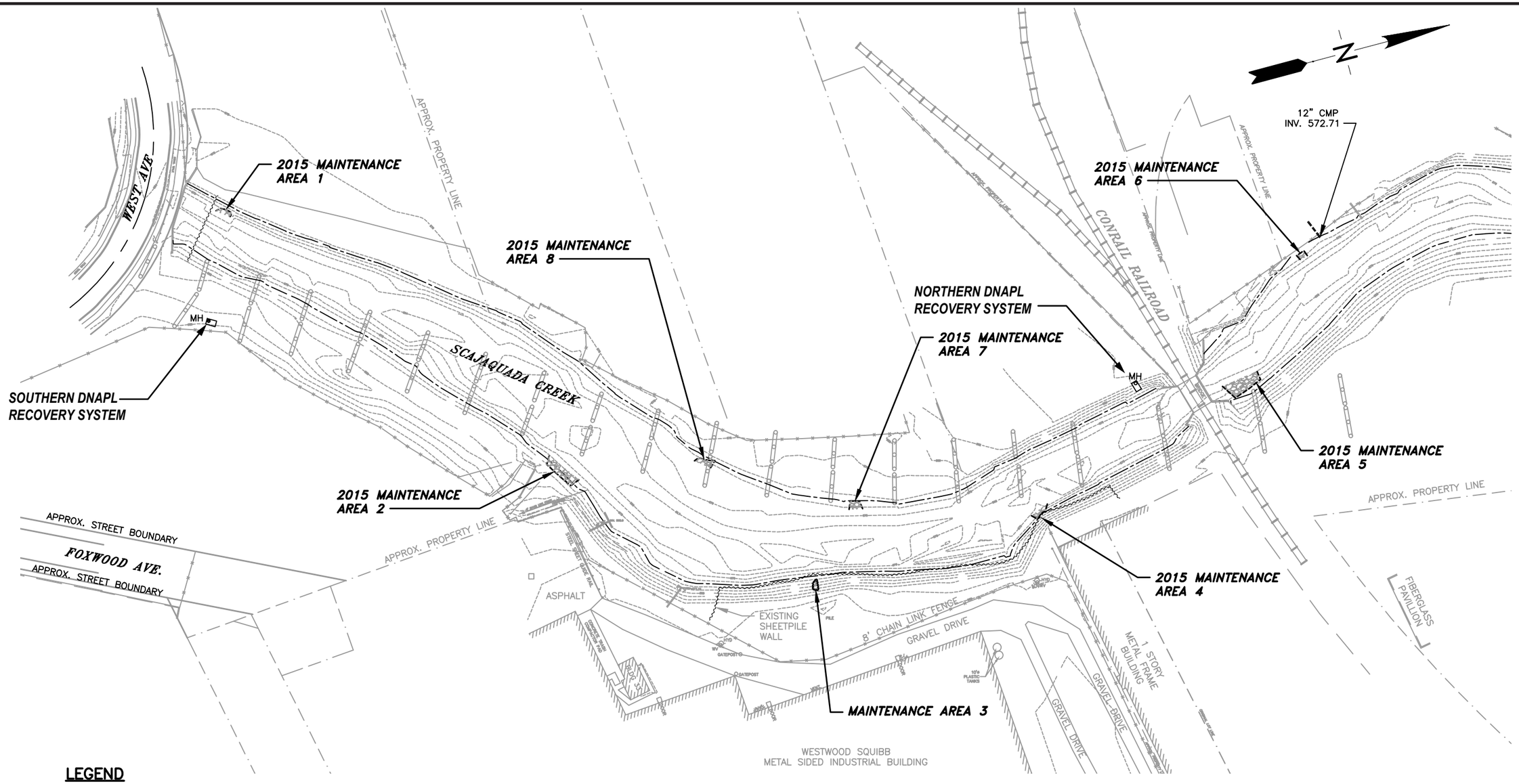


Enlarged Map Area

0 1 4

Scale
(miles, approximate)

National Fuel Gas Corporation	GEI Consultants	SITE LOCATION SCAJAQUADA CREEK SITE
Buffalo, New York	Project 1403480	March 2017 Figure 1



LEGEND

APPROXIMATE AREA OF MAINTENANCE ACTIVITIES PERFORMED NOV. 18–20, 2015. (UPLAND BOUNDARY SURVEYED)

APPROXIMATE LIMITS OF DREDGE CAP. (APPROXIMATED FROM "SEDIMENT REMEDIATION" DRAWINGS, RETEC ENGINEERING, P.C., JUNE 1998)

NOTES:

1. Base modified from original figure prepared by Clough, Harbrour & 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.
3. Maintenance areas surveyed by AECOM on December 7, 2015.

100' 0 100'

SCALE IN FEET

National Fuel Gas Corporation	GEI Consultants	SITE LAYOUT- SCAJAQUADA CREEK SITE	
Buffalo, New York	Project 1403480	March 2017	Figure 2

Appendix A

Scajaquada Creek Cap Inspection Photographs and Observations

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716 856 5636 tel
716 856 2545 fax

May 10, 2016

Katie M. Hoelscher
National Fuel Gas
Environmental Analysis
5955 New Taylor Road
Orchard Park, NY 14127

RE: Summary of 2016 Annual Site Inspection
Scajaquada Creek Site (#915141B), Buffalo, NY

Dear Ms. Hoelscher,

This letter presents a summary of the 2016 annual site inspection conducted on April 20, 2016 by AECOM at the National Fuel Gas Distribution Corporation's (National Fuel) Scajaquada Creek Site. The attachments to this report will also be presented in the 2016 Periodic Review Report (PRR).

The annual visual inspection is performed to evaluate whether the remedy remains effective in preventing human contact with, and leaching of, impacted material.

The remedy, including the eight repairs made last year as shown on attached Figure 1 and in the attached photograph log, is functioning as intended. AECOM noted no deficiencies in the capping system, nor any incipient problems meriting additional monitoring or corrective measures.

Based on our inspection, AECOM does not recommend any specific supplemental maintenance activities this year for the capping system at this site.

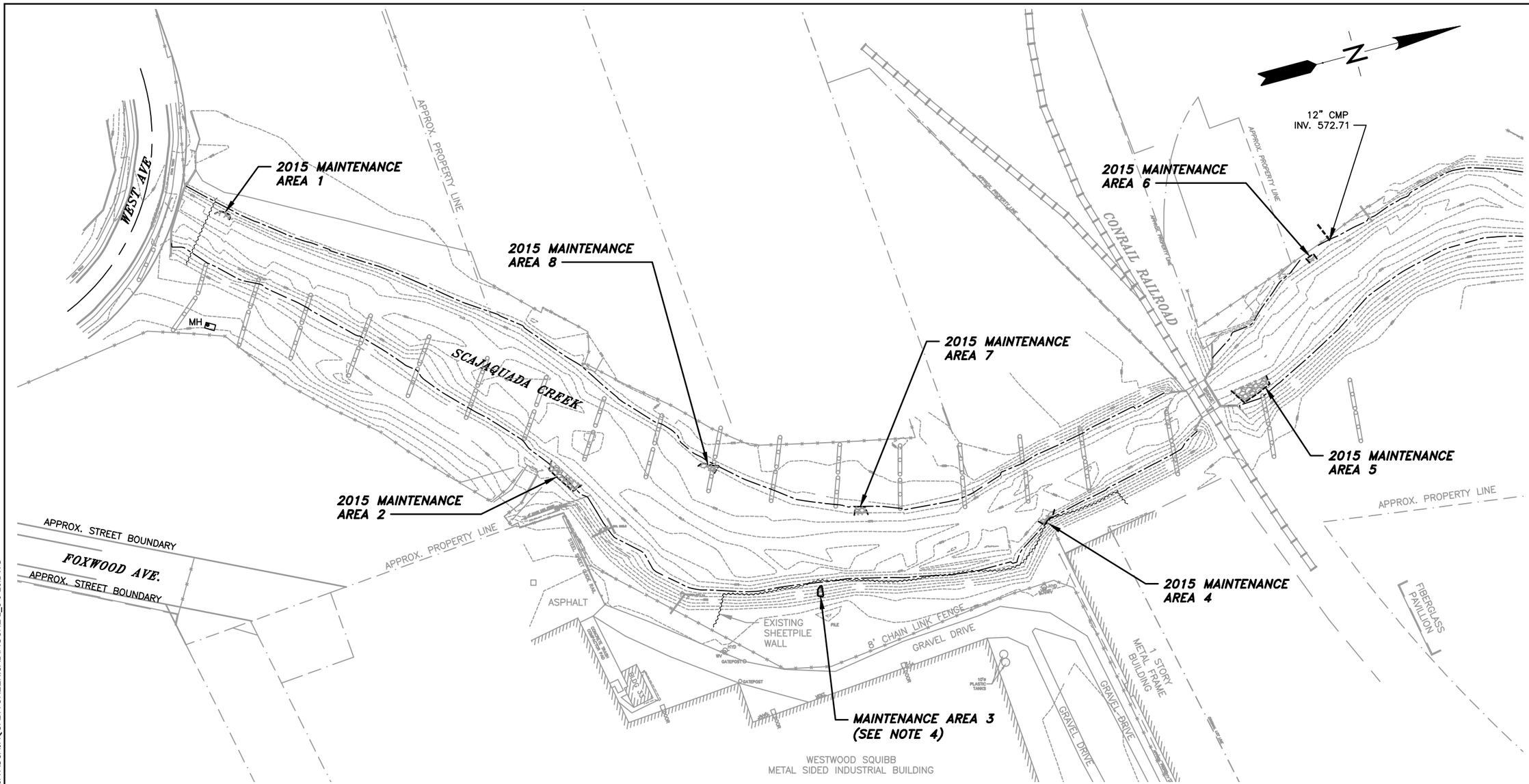
Please let me know if you have any questions or concerns on this issue.

Sincerely yours,

Randolph West. PE
Project Engineer

Encl: Figure 1
Photograph Log

cc: T. Raby – AECOM
T. Clark – AECOM
Project File



NOTES:

1. BASE MAPPING PREPARED BY CLOUGH, HARBOUR & ASSOCIATES FROM A SEPTEMBER 1995 FIELD SURVEY.
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.
3. MAINTENANCE AREAS SURVEYED BY AECOM ON DECEMBER 7, 2015.
4. NO WORK WAS PERFORMED IN 2015 AT AREA 3, WHICH IS AN AREA OF BARE SOIL LOCATED OUTSIDE OF THE LIMIT OF REMEDIATION. IT WAS SURVEYED TO FACILITATE MONITORING IN FUTURE YEARS. IT WAS INITIALLY IDENTIFIED IN THE 2014 PERIODIC REVIEW REPORT (PRR).

LEGEND

APPROXIMATE AREA OF MAINTENANCE ACTIVITIES PERFORMED NOV. 18–20, 2015. (UPLAND BOUNDARY SURVEYED)

APPROXIMATE LIMITS OF DREDGE CAP. (APPROXIMATED FROM "SEDIMENT REMEDIATION" DRAWINGS, RETEC ENGINEERING, P.C., JUNE 1998)

100' 0 100'

SCALE IN FEET

AECOM

FIGURE #1

SUMMARY OF 2016 INSPECTION ACTIVITIES

SITE LAYOUT/SCAJAQUADA CREEK
BUFFALO, NEW YORK
NATIONAL FUEL, SCAJAQUADA CREEK
Project No.: 60137321.750 2015-12-29

Looking downslope at 2015 Maintenance Area 1.

Looking east (across the Creek) at 2015 Maintenance Area 2.

Looking east (across the Creek) at 2015 Maintenance Area 2.

Looking south at 2015 Maintenance Area 8.

Looking east (across the Creek) at 2015 Maintenance Area 4. Though no vegetation has yet established itself on the slope above the maintenance area, there are no signs of erosion.

Looking northeast from the Conrail bridge at 2015 Maintenance Area 5.

Looking northwest at 2015 Maintenance Area 6.

Looking downslope (southwest) at 2015 Maintenance Area 6.

Looking downslope at slope above 2015 Maintenance Area 4. See also the comments on Photo 6.

Looking northeast at 2015 Maintenance Area 7.

Looking west at 2015 Maintenance Area 7.

Looking downslope (west) at the gabion baskets at the outlet to the stormwater discharge pipe from the Westwood property, just south of the existing sheetpile wall. The gabions are in good shape.

Looking south at the gabion baskets at the outlet to the stormwater discharge pipe from the Westwood property, just south of the existing sheetpile wall. No damage to the gabions was observed.

Looking east at Maintenance Area 3 (inspected but no work performed in 2015), and the stone armor below it (installed in 2010). All appear in good shape.

Appendix B

DNAPL Recovery System Monitoring Log

Scajaquada Creek DNAPLRecovery System Monitoring Log

NORTHERN DNAPL RECOVERYSYSTEM

Date	Initials	Field Measurements (by OWI probe)				Calculations (total tank contents) *				Calculations (this period recovery)					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	19	150%	0.06	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
								Cumulative gallons :		5233	448				
										Water	NAPL				

Scajaquada Creek DNAPL Recovery System Monitoring Log

SOUTHERN DNAPL RECOVERY SYSTEM

Date	Initials	Field Measurements (by OWI probe)				Calculations (total tank contents) *				Calculations (this period recovery)					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.

Scajaquada Creek DNAPL Recovery System Monitoring Log

SOUTHERN DNAPL RECOVERY SYSTEM

Date	Initials	Field Measurements (by OWI probe)				Calculations (total tank contents) *				Calculations (this period recovery)					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	
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.
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, rw	6.55	6.55	7.96	9.16	0	435	371	806	435	130	29%	0.39	0.39	Measurements by Op-Tech: weighted rope indicates 1.2 ft of DNAPL in tank. OWI probe did not sense DNAPL
								Cumulative gallons :		11,900	2,251			
										Water	NAPL				

Appendix C

Institutional and Engineering Controls Certification Forms

Enclosure 2
NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
Site Management Periodic Review Report Notice
Institutional and Engineering Controls Certification Form

Site Details **Box 1**

Site No. 915141B

Site Name NFG - Iroquois Gas/Westwood Pharm. Riparian

Site Address: Scajaquada Creek, Upstream of West Ave. Bridge Zip Code: 14213
City/Town: Buffalo
County: Erie
Site Acreage: 2.5

Reporting Period: February 15, 2016 to February 15, 2017

	YES	NO
1. Is the information above correct?	☒	☐
If NO, include handwritten above or on a separate sheet.		
2. Has some or all of the site property been sold, subdivided, merged, or undergone a tax map amendment during this Reporting Period?	☐	☒
3. Has there been any change of use at the site during this Reporting Period (see 6NYCRR 375-1.11(d))?	☐	☒
4. Have any federal, state, and/or local permits (e.g., building, discharge) been issued for or at the property during this Reporting Period?	☐	☒
If you answered YES to questions 2 thru 4, include documentation or evidence that documentation has been previously submitted with this certification form.		
5. Is the site currently undergoing development?	☐	☒

Box 2

	YES	NO
6. Is the current site use consistent with the use(s) listed below? Commercial and Industrial	☒	☐
7. Are all ICs/ECs in place and functioning as designed?	☒	☐

IF THE ANSWER TO EITHER QUESTION 6 OR 7 IS NO, sign and date below and DO NOT COMPLETE THE REST OF THIS FORM. Otherwise continue.

A Corrective Measures Work Plan must be submitted along with this form to address these issues.

_____ _____
Signature of Owner, Remedial Party or Designated Representative Date

SITE NO. 915141B **Box 3**

Description of Institutional Controls

Parcel	Owner	Institutional Control
	No Owner	O&M Plan Monitoring Plan

In March 1994, a Record of Decision (ROD) was issued for this site. The remedial action at this site was completed between 1996 and 2002 and included: (1) installation of the sheet pile wall along the eastern bank of Scajaquada Creek; (2) excavation of contaminated sediment and debris; (3) construction of a cap along a 1,600 foot reach of the creek; and (4) installation of two DNAPL recovery systems. There is no SBL identification for this parcel as it is a New York State waterway.

Box 4

Description of Engineering Controls

Parcel	Engineering Control
	Subsurface Barriers Cover System

Engineering controls for this site include: (1) the stream bed cap that consists of a geosynthetic clay liner overlain by sand, geotextile and anchoring stone; and two DNAPL recovery systems to extract DNAPL from the substrata of the creek. Post-closure maintenance of the cap, creek banks and DNAPL recovery systems are required to ensure long term effectiveness of the remedy.

Box 5

Periodic Review Report (PRR) Certification Statements

1. I certify by checking "YES" below that:

   a) the Periodic Review report and all attachments were prepared under the direction of, and reviewed by, the party making the certification;

   b) to the best of my knowledge and belief, the work and conclusions described in this certification are in accordance with the requirements of the site remedial program, and generally accepted engineering practices; and the information presented is accurate and compete.

YES	NO
X	☐

2. If this site has an IC/EC Plan (or equivalent as required in the Decision Document), for each Institutional or Engineering control listed in Boxes 3 and/or 4, I certify by checking "YES" below that all of the following statements are true:

   (a) the Institutional Control and/or Engineering Control(s) employed at this site is unchanged since the date that the Control was put in-place, or was last approved by the Department;

   (b) nothing has occurred that would impair the ability of such Control, to protect public health and the environment;

   (c) access to the site will continue to be provided to the Department, to evaluate the remedy, including access to evaluate the continued maintenance of this Control;

   (d) nothing has occurred that would constitute a violation or failure to comply with the Site Management Plan for this Control; and

   (e) if a financial assurance mechanism is required by the oversight document for the site, the mechanism remains valid and sufficient for its intended purpose established in the document.

YES	NO
X	☐

IF THE ANSWER TO QUESTION 2 IS NO, sign and date below and DO NOT COMPLETE THE REST OF THIS FORM. Otherwise continue.

A Corrective Measures Work Plan must be submitted along with this form to address these issues.

_____ _____

Signature of Owner, Remedial Party or Designated Representative — Date

IC CERTIFICATIONS
SITE NO. 915141B

Box 6

SITE OWNER OR DESIGNATED REPRESENTATIVE SIGNATURE

I certify that all information and statements in Boxes 1,2, and 3 are true. I understand that a false statement made herein is punishable as a Class "A" misdemeanor, pursuant to Section 210.45 of the Penal Law.

I Jay Wlesch at 6363 Main St Williamsville NY
print name print business address

am certifying as Owner (Owner or Remedial Party)

for the Site named in the Site Details Section of this form.

Signature of Owner, Remedial Party, or Designated Representative Rendering Certification

3/15/17
Date

IC/EC CERTIFICATIONS

Box 7

Professional Engineer Signature

I certify that all information in Boxes 4 and 5 are true. I understand that a false statement made herein is punishable as a Class "A" misdemeanor, pursuant to Section 210.45 of the Penal Law.

I Kelly R McIntosh (print name) at GEI 908 John Muir Drive, Amherst, NY (print business address)

am certifying as a Professional Engineer for the National Fuel Gas (Owner or Remedial Party)

STATE OF NEW YORK
KELLY R. McINTOSH
No. 68079
LICENSED PROFESSIONAL ENGINEER

Signature of Professional Engineer, for the Owner or Remedial Party, Rendering Certification

Stamp (Required for PE)

3/14/17
Date