

Tables

**TABLE 1
SAMPLE SUMMARY**

**NATIONAL FUEL
SUPPLEMENTAL SITE CHARACTERIZATION
DUNKIRK FORMER MANUFACTURED GAS PLANT SITE
DUNKIRK, NEW YORK**

Matrix	Location	Date Collected	Depth Start	Depth End	Total Cyanide	Free Cyanide	SVOCs	VOCs	TPH-DRO	PIANO
Groundwater	MW-1	6/20/2011	8	18	X		X			X
	MW-1	8/10/2011	8	18					X	
	MW-2	6/20/2011	7.8	17.8	X	X	X	X		
	MW-3	6/20/2011	5	15	X	X	X	X		
	MW-3 [BD-062011]	6/20/2011	5	15	X	X	X	X		
	MW-4	6/20/2011	8	18	X		X	X		
	MW-5	9/13/2011	9	19	X		X	X		
	MW-6	9/13/2011	7	17	X		X	X		
	MW-6 [BD-091311]	9/13/2011	7	17	X		X	X		
	SB-9	8/8/2011	1.3	1.3					X	X
	SB-9	8/8/2011	8	10					X	X
	SB-9	8/8/2011	16	18					X	X
	SB-10	8/10/2011	1	10					X	X
	SB-10	8/9/2011	14	16					X	X
	SB-11	8/10/2011	1	11					X	X
	SB-11	8/9/2011	15	17					X	X
	SB-12	8/11/2011	1	11					X	X
	SB-12	8/9/2011	16	18					X	X

Notes:

SVOCs = Semi-Volatile Organic Compounds.

VOCs = Volatile Organic Compounds.

Depths given in feet below grade.

TPH-DRO = Total petroleum hydrocarbon - Diesel Range Organics.

PIANO = Paraffin, isoparaffin, aromatic (includes BTEX compounds), naphthene, and olefin compounds.

[BD-#####] = Blind duplicate sample collected at this location.

**TABLE 2
MONITORING WELL CONSTRUCTION DETAILS**

**NATIONAL FUEL
SUPPLEMENTAL SITE CHARACTERIZATION
DUNKIRK FORMER MANUFACTURED GAS PLANT SITE
DUNKIRK, NEW YORK**

Location ID	Date Completed	Well Diameter (in.)	Casing/ Screen Type	Screen Slot Size (in.)	Screen Length (ft.)	Depth to Screened Interval (ft. bgs)		Total Well Depth
						Top	Bottom	ft. bgs
MW-1	8/6/10	2	PVC	0.01	10.0	8.0	18.0	18.2
MW-2	8/11/10	2	PVC	0.01	10.0	7.8	17.8	17.8
MW-3	8/9/10	2	PVC	0.01	10.0	5.0	15.0	15.0
MW-4	8/5/10	2	PVC	0.01	10.0	8.0	18.0	18.0
MW-5	8/10/11	2	PVC	0.02	10.0	9.0	19.0	19.0
MW-6	8/10/11	2	PVC	0.02	10.0	7.0	17.0	17.0

Notes:

in. = inches.

Depths given in feet below ground surface (ft. bgs).

**TABLE 3
GROUNDWATER ELEVATIONS**

**NATIONAL FUEL
SUPPLEMENTAL SITE CHARACTERIZATION
DUNKIRK FORMER MANUFACTURED GAS PLANT SITE
DUNKIRK, NEW YORK**

Well ID	Ref. Point Elevation (ft AMSL)	Depth to Water (ft below TIC)		Groundwater Elevation (ft AMSL)	
		9/13/2011	10/7/2011	9/13/2011	10/7/2011
MW-1	583.14	3.19	3.07	579.95	580.07
MW-2	582.91	2.15	2.14	580.76	580.77
MW-3	582.97	2.25	2.20	580.72	580.77
MW-4	585.19	2.42	2.15	582.77	583.04
MW-5	584.74	4.15	3.98	580.59	580.76
MW-6	583.52	3.33	3.30	580.19	580.22

Notes:

AMSL = above mean sea level.

ft = feet.

TIC = Top of Inner Casing.

Reference point for all wells is the top of inner casing, referenced to NAVD 1988.

TABLE 4
DISCRETE GROUNDWATER SAMPLE DETECTED RESULTS

**NATIONAL FUEL
SUPPLEMENTAL SITE CHARACTERIZATION
DUNKIRK FORMER MANUFACTURED GAS PLANT SITE
DUNKIRK, NEW YORK**

Location ID: Sample Depth(Feet): Date Collected:	NYSDEC TOGS 1.1.1 Standards/ Guidance Values ^[1]	Units	SB-09 1 - 3 08/08/11	SB-09 8 - 10 08/08/11	SB-09 16 - 18 08/08/11	SB-10 9 - 11 08/10/11	SB-10 14 - 16 08/09/11	SB-11 9 - 11 08/10/11	SB-11 15 - 17 08/09/11	SB-12 9 - 11 08/11/11	SB-12 16 - 18 08/09/11
Volatile Organics											
1-Methylnaphthalene	--	ug/L	5.0 U	8.6	6.5	25 U	25 UJ	10 U	25 UJ	5.0 U	5.0 U
Benzene	1	ug/L	43	67	99	5,400	4,100 D	3,700	5,100 D	2.0 U	51
Benzothiophene	--	ug/L	2.0 U	2.1	2.0 U	10 U	10 UJ	4.0 U	10 UJ	2.0 U	2.0 U
Ethylbenzene	5	ug/L	2.0 U	2.0 U	2.3	10 U	120 J	4.0 U	10 UJ	2.0 U	4.8
Indane	--	ug/L	26	50	41	10 U	10 UJ	4.0 U	10 UJ	2.0 U	2.0 U
Indene	--	ug/L	3.3	6.9	6.6	10 U	160 J	4.0 U	10 UJ	2.0 U	2.0 U
Naphthalene	10	ug/L	11	30	23	10 U	13 J	4.0 U	10 UJ	2.0 U	2.0 U
O-xylene	5	ug/L	2.0 U	2.5	2.8	10 U	27 J	4.0 U	10 UJ	2.0 U	2.0 U
P/m-xylene	--	ug/L	4.0 U	4.0 U	4.0 U	20 U	56 J	8.0 U	20 UJ	4.0 U	4.0 U
Thiophene	--	ug/L	2.0 U	2.0 U	2.6	250	100 J	170	260 J	2.0 U	2.0 U
Toluene	5	ug/L	2.0 U	2.0 U	2.3	10 U	13 J	4.0 U	10 UJ	2.0 U	2.0 U
Total BTEX	--	ug/L	43	69.5	106.4	5,400	4,316 J	3,700	5,100	ND	55.8
Total VOCs	--	ug/L	83.3	167.1	186.1	5,650	4,589 J	3,870	5,360	ND	55.8
Other											
Diesel Range Organics [C10-C28]	--	mg/L	2.9	1.6 UB	1.6 B	0.56	0.83 UB	0.51	0.47 UB	NA	0.46 J

Lab Qualifiers Definition

B	Analyte was also detected in the associated method blank.
D	Compound quantitated using a secondary dilution.
J	Indicates an estimated value.
ND	None detected.
U	The compound was analyzed for but not detected. The associated value is the compound quantitation limit.

Notes:

[1] Source: New York State Division of Water Technical and Operational Guidance Series (TOGS 1.1.1), Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations (June 1998).

-- = No available standard/guidance value.

NA = Not analyzed.

ug/L = micrograms per liter.

Shaded values indicate the result exceeds New York State Technical and Operational Guidance Series (1.1.1) Standards or Guidance Values.

**TABLE 5
MONITORING WELL SAMPLE DETECTED RESULTS**

**NATIONAL FUEL
SUPPLEMENTAL SITE CHARACTERIZATION
DUNKIRK FORMER MANUFACTURED GAS PLANT SITE
DUNKIRK, NEW YORK**

Location ID: Date Collected:	NYSDEC TOGS 1.1.1 Standards/ Guidance Values ^[1]	Units	MW-1 06/20/11	MW-1 08/10/11	MW-2 06/20/11	MW-3 06/20/11	MW-4 06/20/11	MW-5 09/13/11	MW-6 09/13/11
Volatile Organics									
1,2,3-Trimethylbenzene	--	ug/L	1.7 J	NA	NA	NA	NA	NA	NA
1,2,4-Trimethylbenzene	5	ug/L	3.4 J	NA	NA	NA	NA	NA	NA
Acetone	50	ug/L	NA	NA	3.8 J	26 J [19 J]	4.6 J	3.0 U	3.0 U [3.0 U]
Benzene	1	ug/L	17,000 D	NA	1.0 UB	130 [130]	1.0 UB	0.41 U	0.41 U [0.41 U]
Cyclohexane	--	ug/L	20 U	NA	1.1	0.90 U [0.90 U]	5.9	0.19 J	0.18 U [0.18 U]
Ethylbenzene	5	ug/L	20	NA	0.74 U	3.7 U [3.7 U]	0.74 U	0.74 U	0.74 U [0.74 U]
Indene	--	ug/L	10 J	NA	NA	NA	NA	NA	NA
Isopentane	--	ug/L	7.7 J	NA	NA	NA	NA	NA	NA
Methyl Tert-butyl Ether	10	ug/L	20 U	NA	0.16 U	5.5 [5.9]	0.16 U	0.16 U	0.16 U [0.16 U]
Methylcyclohexane	--	ug/L	20 U	NA	0.66 J	0.80 U [0.80 U]	4.1	0.36 J	0.16 U [0.16 U]
O-xylene	5	ug/L	12 J	NA	NA	NA	NA	NA	NA
P/m-xylene	--	ug/L	5.4 J	NA	NA	NA	NA	NA	NA
Thiophene	--	ug/L	410	NA	NA	NA	NA	NA	NA
Toluene	5	ug/L	5.3 J	NA	0.51 U	13 [12]	0.55 J	0.51 U	0.51 U [0.51 U]
Total BTEX	--	ug/L	17,042.7 J	NA	ND	143 [142]	0.55 J	ND	ND [ND]
Total VOCs	--	ug/L	17,475.5 J	NA	5.56 J	174.5 J [166.9 J]	15.15 J	0.55 J	ND [ND]
Semivolatile Organics									
2-Methylnaphthalene	--	ug/L	1.3 J	NA	0.57 U	0.58 U [0.57 UJ]	0.61 U	0.57 U	0.57 U [0.60 U]
4-Methylphenol	1	ug/L	0.34 UJ	NA	0.34 U	7.0 J [5.5 J]	0.36 U	0.34 U	0.34 U [0.36 U]
Bis(2-ethylhexyl)phthalate	5	ug/L	5.6 J	NA	1.7 U	1.7 U [1.7 UJ]	1.8 U	1.7 U	1.7 U [1.8 U]
Carbazole	--	ug/L	0.28 UJ	NA	0.29 U	0.58 J [0.28 UJ]	0.30 U	0.29 U	0.28 U [0.30 U]
Diethylphthalate	50	ug/L	0.21 UJ	NA	0.21 U	0.21 U [0.21 UJ]	0.22 U	0.25 J	0.21 U [0.22 U]
Naphthalene	10	ug/L	0.72 UJ	NA	0.72 U	1.5 J [1.2 J]	0.77 U	0.72 U	0.72 U [0.76 U]
Phenanthrene	50	ug/L	0.69 J	NA	0.42 U	0.48 J [0.42 UJ]	0.44 U	0.42 U	0.42 U [0.44 U]
Phenol	1	ug/L	11	NA	0.37 U	12 [8.8]	0.39 U	0.37 U	0.37 U [0.39 U]
Total PAHs	--	ug/L	1.99 J	NA	ND	2.98 J [1.2 J]	ND	ND	ND [ND]
Total SVOCs	--	ug/L	18.59 J	NA	ND	21.56 J [15.5 J]	ND	0.25 J	ND [ND]

See Notes on Page 2.

**TABLE 5
MONITORING WELL SAMPLE DETECTED RESULTS**

**NATIONAL FUEL
SUPPLEMENTAL SITE CHARACTERIZATION
DUNKIRK FORMER MANUFACTURED GAS PLANT SITE
DUNKIRK, NEW YORK**

Location ID: Date Collected:	NYSDEC TOGS 1.1.1 Standards/ Guidance Values ^[1]	Units	MW-1 06/20/11	MW-1 08/10/11	MW-2 06/20/11	MW-3 06/20/11	MW-4 06/20/11	MW-5 09/13/11	MW-6 09/13/11
Inorganics									
Cyanide	0.2	mg/L	0.0140 J	NA	0.560 J	0.400 J [0.160 J]	R	0.00500 U	0.00500 U [0.00500 U]
Cyanide, Free	--	ug/L	NA	NA	5.00 UB	5.00 UB [1.10 U]	NA	NA	NA
Other									
Diesel Range Organics [C10-C28]	--	mg/L	NA	0.62	NA	NA	NA	NA	NA

Lab Qualifiers Definition

B	Analyte was also detected in the associated method blank.
J	Indicates an estimated value.
ND	None detected.
R	Rejected.
U	The compound was analyzed for but not detected. The associated value is the compound quantitation limit.

Notes:

[1] Source: New York State Division of Water Technical and Operational Guidance Series (TOGS 1.1.1), Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations (June 1998).

-- = No available standard/guidance value.

NA = Not analyzed.

ug/L = micrograms per liter.

Shaded values indicate the result exceeds New York State Technical and Operational Guidance Series (1.1.1) Standards or Guidance Values.

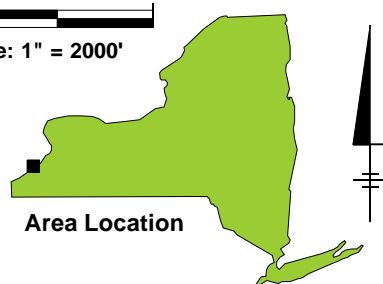
Figures



REFERENCE: BASE MAP USGS 7.5 MIN. QUAD., DUNKIRK, NEW YORK, 1954, PHOTOREVISED 1979.

2000' 0 2000'

Approximate Scale: 1" = 2000'



Area Location

NATIONAL FUEL - DUNKIRK MGP
31 WEST SECOND STREET
DUNKIRK, NEW YORK, 14048
SITE CHARACTERIZATION

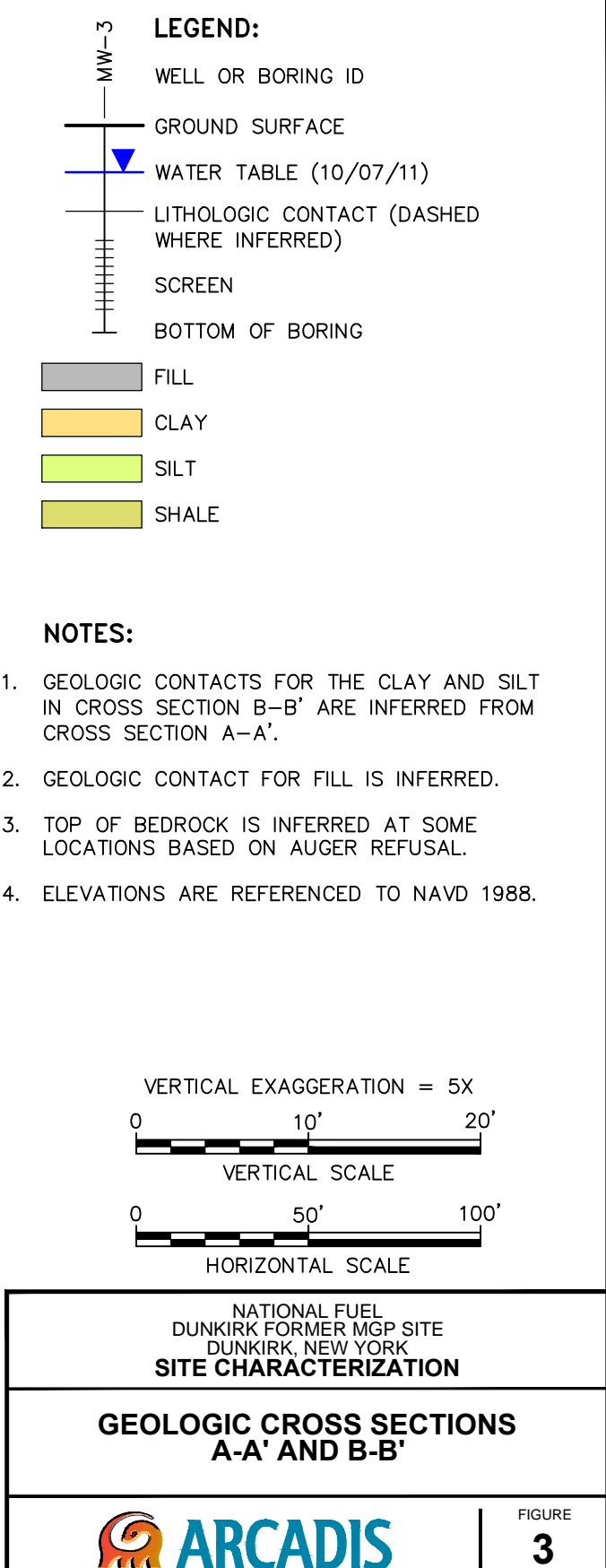
SITE LOCATION MAP

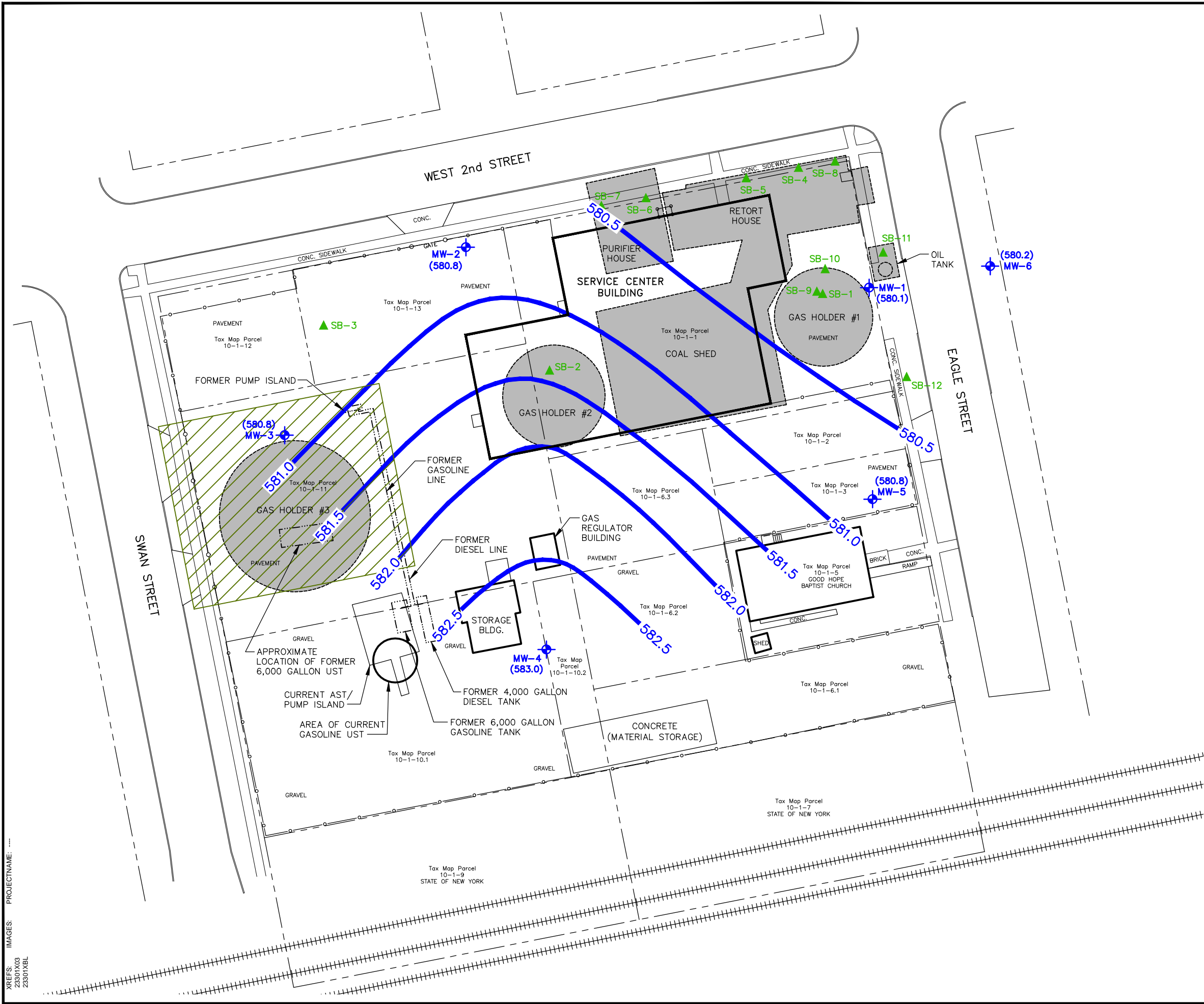










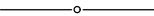

FIGURE

1

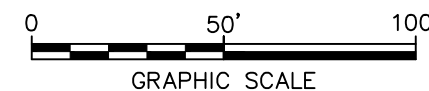






	SOIL BORING
	MONITORING WELL
	FORMER MGP STRUCTURE
	FORMER PETROLEUM DISTRIBUTION STRUCTURES
	APPROXIMATE EXTENT OF PETROLEUM REMEDIATION AREA
	APPROXIMATE PROPERTY LINE
	RAILROAD
	EXISTING BUILDING
	CHAIN LINK FENCE
582.5 	GROUND WATER ELEVATION CONTOUR
(583.0)	GROUND WATER ELEVATION

1. ALL LOCATIONS APPROXIMATE.
2. BASEMAP FORM NYS GIS CLEARINGHOUSE WEBPAGE FOR ORTHOIMAGERY AND CT MALE SURVEY OBTAINED ON SEPTEMBER 14, 2010.
3. APPROXIMATE EXTENT OF PETROLEUM REMEDIATION AREA BASED ON A HAND SKETCH MAP PROVIDED BY NATIONAL FUEL ON JANUARY 26, 2009. DATE OF REMEDIATION NOT DEFINED ON THAT MAP.
4. LOCATIONS OF GAS HOLDERS 2 AND 3 DIGITIZED FROM A MAY 10, 1956 DRAWING PROVIDED BY NATIONAL FUEL. ALL OTHER MGP STRUCTURES DIGITIZED FROM 1893 AND 1904 SANBORN FIRE INSURANCE MAPS.
5. LOCATIONS OF FORMER USTs, PUMP ISLAND, AND ASSOCIATED DISTRIBUTION LINES FROM MESCH ENGINEERING, P.C. DRAWING ENTITLED "SITE PLAN", ORIGINAL DRAWING DATED 9/17/87.
6. MONITORING WELLS MW-5 AND MW-6, AND SOIL BORINGS SB-9 THROUGH SB-12 FROM SURVEY FILE PROVIDED BY C.T. MALE ASSOCIATES, DATED 10/7/11.

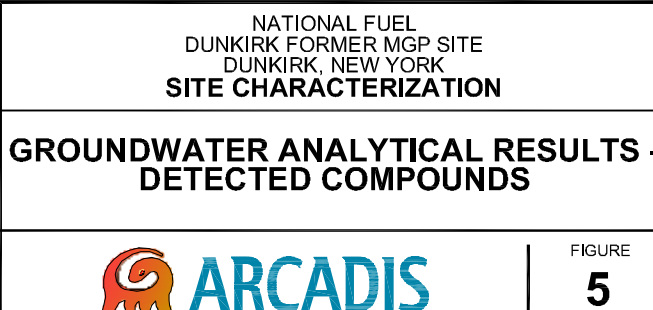


NATIONAL FUEL
DUNKIRK FORMER MGP SITE
DUNKIRK, NEW YORK
SITE CHARACTERIZATION

WATER TABLE CONTOURS - 10/7/11



FIGURE
4






**Soil Boring and
Monitoring Well Logs**

Date Start/Finish: 8/4 - 8/6/10 Drilling Company: Parratt-Wolff Driller's Name: D. Richmond/J.C. Chevalier Drilling Method: Geoprobe / HSA Sampling Method: 4' Acetate Liner & 2' x 2" SS Auger Size: 4 1/4" Rig Type: Track-Mounted Geoprobe 6620 DT & Truck-Mounted Ingersoll Rand A300	Northing: 906490.5414 Easting: 945042.6278 Casing Elevation: 583.14' AMSL Borehole Depth: 18.2' bgs Surface Elevation: 583.50' AMSL Descriptions By: L.Terrell	Well/Boring ID: MW-1 Client: National Fuel Location: National Fuel Service Center Dunkirk, New York
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DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
585									
0								Boring location hand-cleared to 5' bgs (blind drilled to 5' bgs). Soil was screened with a PID at 1' intervals.	Steel Flush Mount Curb Box
		NA	0-5	NA	0.0				Concrete Pad
					0.2				Locking J-Plug
					0.0				Sand Drain (0.5-1' bgs)
580					0.0				Grout (1-4' bgs)
					0.2				2" Sch 40 PVC Riser (0.5-8' bgs)
5		1	5-8	2.0	0.0			Brown and gray CLAY, trace Silt, mottled, high plasticity, very stiff, moist.	Bentonite Seal (4-6' bgs)
575		2	8-11	2.7	0.7	×		Gray CLAY, trace Silt, high plasticity, very stiff, moist.	
10								Gray SILT, trace Clay, non-plastic, stiff, slight coal tar-like odor, moist.	
		3	11-14	3.0	20.4	×		Gray fine to coarse SAND, trace Silt and fine to medium sub-round Gravel, coal tar-like odor, wet.	Sand Pack (6-18.2' bgs)
								Gray SILT, trace fine to coarse sub-angular Gravel and fine to coarse Sand, slight coal tar-like odor, moist to dry.	2" Sch 40 PVC 0.010" Slot Screen (8-18' bgs)
570								Gray SILT, little fine Sand, trace fine to coarse sub-round to sub-angular Gravel and Clay, moist to dry.	
15		4	14-18	3.6	0.0				

	Remarks: bgs = below ground surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; SS = Split Spoon; HSA = Hollow Stem Auger Soil samples collected for VOCs, SVOCs and Total Cyanide at 8-11' bgs and 11-14' bgs. Survey coordinates based on NYS Plane Coordinate System (NAD 83). Elevations based on NAVD 1988 obtained from GPS observations. Water elevation = 579.12' AMSL on 10/4/2010.
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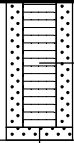
Client: National Fuel

Well/Boring ID: MW-1

Site Location:

National Fuel Service Center
Dunkirk, New York

Borehole Depth: 18.2' bgs

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
565		4	14-18	3.6	0.0			Gray SILT, little fine Sand, trace fine to coarse sub-round to sub-angular Gravel and Clay, moist to dry.	 <p>2" Sch 40 PVC 0.010" Slot Screen (8-18' bgs)</p> <p>Sand Pack (6- 18.2' bgs)</p>
20		5	18-20	NR	NA			Black to dark gray fractured SHALE in nose of sampler.	
560								Refusal with Augers at 18.2' bgs.	
25									
555									
30									
550									
35									




Remarks: bgs = below ground surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; SS = Split Spoon; HSA = Hollow Stem Auger

Soil samples collected for VOCs, SVOCs and Total Cyanide at 8-11' bgs and 11-14' bgs.
Survey coordinates based on NYS Plane Coordinate System (NAD 83).
Elevations based on NAVD 1988 obtained from GPS observations.
Water elevation = 579.12' AMSL on 10/4/2010.

Date Start/Finish: 8/9-8/11/10 Drilling Company: Parratt-Wolff Driller's Name: D. Richmond/J.C. Chevalier Drilling Method: Geoprobe / HSA Sampling Method: 2' x 2" Split Spoon Auger Size: 4 1/4" Rig Type: Truck-Mounted Ingersoll Rand A300	Northing: 906511.1924 Easting: 944836.4844 Casing Elevation: 582.91' AMSL Borehole Depth: 17.8' bgs Surface Elevation: 583.22' AMSL Descriptions By: L.Terrell	Well/Boring ID: MW-2 Client: National Fuel Location: National Fuel Service Center Dunkirk, New York
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DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
585									
580		NA	0-5	NA	0.0			Boring location hand-cleared to 5' bgs (blind drilled to 5' bgs). Soil was screened with a PID at 1' intervals.	Steel Flush Mount Curb Box
575					0.0				Concrete Pad
					0.0				Locking J-Plug
					0.0				Sand Drain (0.5-2.0' bgs)
					0.0				Grout (2-4' bgs)
					0.0				Bentonite Seal (4-6' bgs)
		1	5-7	0.3	0.0			Gray CLAY, trace Silt, fine to coarse Sand and coarse sub-round Gravel, wet.	
								Brown CLAY, trace Silt, medium plasticity, soft, wet.	
		2	7-9	1.5	0.0	×		Brown SILT, trace Clay, non-plastic, soft, moist to wet.	2" Sch 40 PVC Riser (0.5-7.8' bgs)
								Rusty orange between 0.3-0.5' of recovery, trace fine sub-angular Gravel.	
		3	9-11	1.2	0.0			Gray SILT, trace Clay and fine to medium sub-angular Gravel, non-plastic, stiff, moist.	2" Sch 40 PVC 0.010" Slot Screen (7.8-17.8' bgs)
		4	11-13	1.1	0.0				
								No Recovery.	
		5	13-15	NR	NA				Sand Pack (6-17.8' bgs)
		6	15-17	0.1	0.0		^	Gray fractured SHALE, dry.	

	Remarks: bgs = below ground surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery; HSA = Hollow Stem Auger Soil samples collected for VOCs, SVOCs and Total Cyanide at 5-9' bgs (MS/MSD) and 17-17.8' bgs. Survey coordinates based on NYS Plane Coordinate System (NAD 83). Elevations based on NAVD 1988 obtained from GPS observations. Water elevation = 581.06' AMSL on 10/4/2010.
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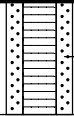
Client: National Fuel

Well/Boring ID: MW-2

Site Location:

National Fuel Service Center
Dunkirk, New York

Borehole Depth: 17.8' bgs

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
		6	15-17	0.1	0.0		^	Gray fractured SHALE, dry.	 <p>Sand Pack (6-17.8' bgs)</p>
						X	---	Yellow brown SILT, trace Clay and fine to medium sub-round Gravel, non-plastic, stiff, moist.	
							^	Dark gray fractured SHALE, dry.	
565		7	17-19	0.5	0.0			Refusal with Augers at 17.8' bgs.	
20									
560									
25									
555									
30									
550									
35									




Remarks: bgs = below ground surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery; HSA = Hollow Stem Auger

Soil samples collected for VOCs, SVOCs and Total Cyanide at 5-9' bgs (MS/MSD) and 17-17.8' bgs.
Survey coordinates based on NYS Plane Coordinate System (NAD 83).
Elevations based on NAVD 1988 obtained from GPS observations.
Water elevation = 581.06' AMSL on 10/4/2010.

Date Start/Finish: 8/9/10 Drilling Company: Parratt-Wolff Driller's Name: D. Richmond/J.C. Chevalier Drilling Method: Geoprobe / HSA Sampling Method: 2' x 2" Split Spoon Auger Size: 4 1/4" Rig Type: Truck-Mounted Ingersoll Rand A300	Northing: 906415.1166 Easting: 944743.8061 Casing Elevation: 582.97' AMSL Borehole Depth: 15.8' bgs Surface Elevation: 583.28' AMSL Descriptions By: L.Terrell	Well/Boring ID: MW-3 Client: National Fuel Location: National Fuel Service Center Dunkirk, New York
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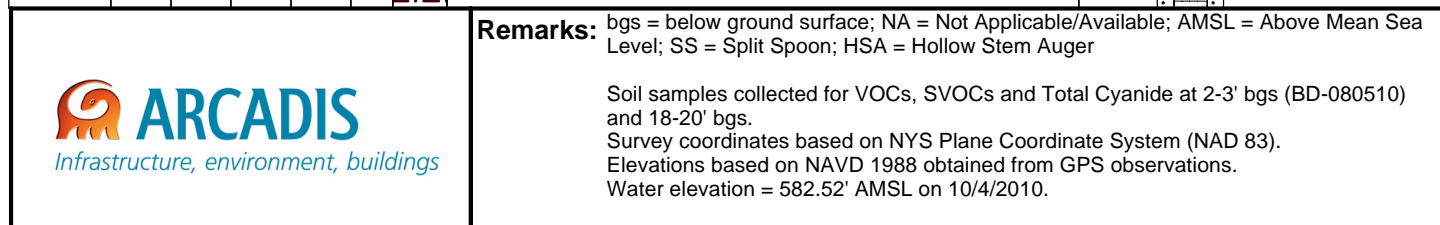
DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
585									
0								Boring location hand-cleared to 5' bgs (blind drilled to 5' bgs). Soil was screened with a PID at 1' intervals.	Steel Flush Mount Curb Box
		NA	0-5	NA	0.0				Concrete Pad
					0.0				Locking J-Plug
					0.0				Sand Drain (0.5-1.5' bgs)
580					0.0				Bentonite Seal (1.5-3.5' bgs)
					0.0				2" Sch 40 PVC Riser (0.5-5' bgs)
5		1	5-7	0.7	0.5			Gray CLAY, trace Silt, high plasticity, stiff, slight coal tar-like odor, moist.	
						×			
		2	7-9	0.8	0.0			Gray to olive green CLAY, trace Silt, mottled, high plasticity, stiff, slight coal tar-like odor, moist.	
575								Dark brown CLAY, trace Silt, medium plasticity, stiff, moist.	
10		3	9-11	0.1	0.0				2" Sch 40 PVC 0.010" Slot Screen (5-15' bgs)
		4	11-13	0.7	0.0			Gray to olive green CLAY, trace Silt, trace red Brick, fine to coarse sub-round to sub-angular Gravel, mottled, slight coal tar-like odor, dark brown last 0.1' of recovery, moist.	
						×			
570		5	13-15	0.3	0.0			Red BRICK, little Concrete and gray Clay, trace Silt, wet.	
									Sand Pack (3.5-15.8' bgs)
15		6	15-17	0.1	0.0			Dark brown SILT, CLAY, and fine to coarse SAND, trace red Brick, Wood, and fine sub-round Gravel, wet. Refusal with augers at 15.8' bgs.	

	Remarks: bgs = below ground surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; HSA = Hollow Stem Auger Soil samples collected for VOCs, SVOCs and Total Cyanide at 5-9' bgs (BD-080910) and 11-15.2' bgs. Survey coordinates based on NYS Plane Coordinate System (NAD 83). Elevations based on NAVD 1988 obtained from GPS observations. Water elevation = 580.41' AMSL on 10/4/2010.
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Well/Boring ID: MW-4

Client: National Fuel

Location: National Fuel Service Center
Dunkirk, New York



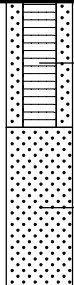
Client: National Fuel

Well/Boring ID: MW-4

Site Location:

National Fuel Service Center
Dunkirk, New York

Borehole Depth: 20.1' bgs

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
		4	14-18	3.6	0.1			Gray SILT, little fine Sand, trace fine to medium sub-round to sub-angular Gravel, moist to dry.	
20	565	5	18-22	2.0	0.0	X		Black fractured SHALE in tip of sampler.	
								Refusal with Augers at 20.5' bgs.	
25	560								
30	555								
35	550								



Remarks: bgs = below ground surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; SS = Split Spoon; HSA = Hollow Stem Auger

Soil samples collected for VOCs, SVOCs and Total Cyanide at 2-3' bgs (BD-080510) and 18-20' bgs.
Survey coordinates based on NYS Plane Coordinate System (NAD 83).
Elevations based on NAVD 1988 obtained from GPS observations.
Water elevation = 582.52' AMSL on 10/4/2010.

Well/Boring ID: MW-5

Client: National Fuel

Location: National Fuel Service Center
Dunkirk, New York

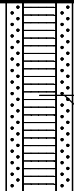
Client: National Fuel

Well/Boring ID: MW-5

Site Location:

National Fuel Service Center
Dunkirk, New York

Borehole Depth: 19' bgs

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
		4	16-19	3.0	0.0			Soils similar as above.	 <p>2" Sch 40 PVC 0.010" Slot Screen (9-19' bgs) #0 Sand Pack (7- 19' bgs)</p>
20	565							Refusal at 19' bgs.	
25	560								
30	555								
35	550								




Remarks: bgs = below ground surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; SS = Split Spoon; HSA = Hollow Stem Auger

Survey coordinates based on NYS Plane Coordinate System (NAD 83).
Elevations based on NAVD 1988 obtained from GPS observations.

Date Start/Finish: 8/9/11-8/11/11 Drilling Company: Parratt-Wolff Driller's Name: J.Price/P.Smith Drilling Method: Geoprobe / HSA Sampling Method: 4' Acetate Liner & 2' x 2" SS Auger Size: 4 1/4" Rig Type: Track-Mounted Geoprobe 6620 DT	Northing: 906501.5342 Easting: 945104.5417 Casing Elevation: 583.52' AMSL Borehole Depth: 17' bgs Surface Elevation: 583.82' AMSL Descriptions By: L.Terrell	Well/Boring ID: MW-6 Client: National Fuel Location: National Fuel Service Center Dunkirk, New York
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DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
585									
0									Steel Flush Mount Curb Box
		NA	0-3	NA	0.0			Brown SILT, little fine to coarse SAND and fine to coarse GRAVEL, trace Organics, moist.	Concrete Pad
									Locking J-Plug
									Native Material (1-3' bgs)
580		NA	3-5	NA	0.0			Grey SILTY CLAY, somewhat plastic, soft, moist.	2" Sch 40 PVC Riser (0.5-7' bgs)
5									Bentonite Seal (3-5' bgs)
		1	5-8	1.0	0.0			Grey and brown mottled SILTY CLAY, somewhat plastic, soft, moist.	
575									
		2	8-12	0.5	0.0			Grey SILT, trace fine to coarse Gravel and coarse Sand, non-plastic, soft, moist.	
10									#0 Sand Pack (5-17' bgs)
					0.6			Similar soils as above.	2" Sch 40 PVC 0.010" Slot Screen (7-17' bgs)
570		3	12-16	2.0	2.0				
15					0.6				

	Remarks: bgs = below ground surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; SS = Split Spoon; HSA = Hollow Stem Auger Survey coordinates based on NYS Plane Coordinate System (NAD 83). Elevations based on NAVD 1988 obtained from GPS observations.
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
Client: National Fuel

Well/Boring ID: MW-6

Site Location:

National Fuel Service Center
Dunkirk, New York

Borehole Depth: 17' bgs


DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
		4	16-17	0.8	0.0			Similar soils as above.	 <p>2" Sch 40 PVC 0.010" Slot Screen (7-17' bgs) #0 Sand Pack (5- 17' bgs)</p>
565								Refusal at 17' bgs.	
20									
560									
25									
555									
30									
550									
35									




Remarks: bgs = below ground surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; SS = Split Spoon; HSA = Hollow Stem Auger

Survey coordinates based on NYS Plane Coordinate System (NAD 83).
Elevations based on NAVD 1988 obtained from GPS observations.

Date Start/Finish: 8/4-8/6/10 Drilling Company: Parratt-Wolff Driller's Name: D. Richmond/J.C. Chevalier Drilling Method: Geoprobe / HSA Sampling Method: 4' Acetate Liner & 2' x 2" SS Auger Size: 3 1/4" Rig Type: Track-Mounted Geoprobe 6620 DT & Truck-Mounted Ingersoll Rand A300	Northing: 906486.8223 Easting: 945018.8745 Casing Elevation: NA Borehole Depth: 19.2' bgs Surface Elevation: 583.66' AMSL Descriptions By: L.Terrell	Well/Boring ID: SB-1 Client: National Fuel Location: National Fuel Service Center Dunkirk, New York
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DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
585									
0									
		NA	0-5	NA	0.0			Boring location hand-cleared to 5' bgs (blind drilled to 5' bgs). Soil was screened with a PID at 1' intervals.	 <p>Boring completed with cold asphalt patch (0-0.5' bgs)</p> <p>Boring backfilled to grade with bentonite/cement grout (0.5-19.2' bgs)</p>
					0.1				
580					0.0				
					0.2				
					0.2				
5		1	5-8	0.8	0.2		Dark brown medium to coarse SAND and red BRICK, little fine sub-round Gravel, trace Concrete, loose, discoloration, coal tar-like odor, wet.		
575		2	8-11	0.5	1.2	×	Black medium SAND, little coarse Sand, trace red Brick, discoloration, coal tar-like odor, wet.		
10									
		3	11-14	2.0	0.1		Red BRICK, coal tar-like odor, wet. Black fine SAND, little Silt, discoloration, coal tar-like odor, wet. Red BRICK, coal tar-like odor, wet. Gray SILT, trace Clay, coal tar-like odor, moist.		
570									
		4	14-18	3.7	0.4		Gray fine to medium SAND, trace coarse Sand and fine round Gravel, loose, coal tar-like odor, wet. Gray SILT, trace fine Sand and fine to medium sub-angular Gravel, coal tar-like odor, moist.		
15									

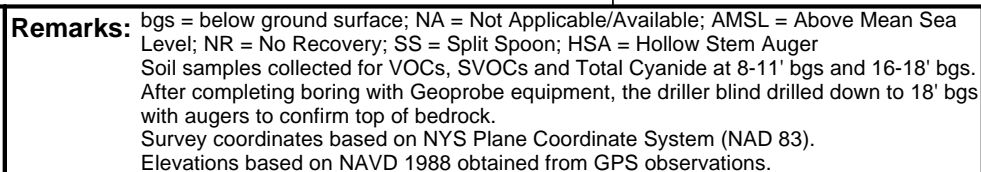
 <p>ARCADIS Infrastructure, environment, buildings</p>	Remarks: bgs = below ground surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; NR = No Recovery; SS = Split Spoon; HSA = Hollow Stem Auger Soil samples collected for VOCs, SVOCs and Total Cyanide at 8-11' bgs and 16-18' bgs. After completing boring with Geoprobe equipment, the driller blind drilled down to 18' bgs with augers to confirm top of bedrock. Survey coordinates based on NYS Plane Coordinate System (NAD 83). Elevations based on NAVD 1988 obtained from GPS observations.
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Well/Boring ID: **SB-1**

Borehole Depth: 19.2' bgs


Well/Boring
Construction

- Boring backfilled to grade with bentonite/cement grout (0.5-19.2' bgs)



Date Start/Finish: 8/3/10 Drilling Company: Parratt-Wolff Driller's Name: D. Richmond/J.C. Chevalier Drilling Method: Geoprobe / HSA Sampling Method: 4' Acetate Liner Auger Size: Rig Type: Track-Mounted Geoprobe 6620 DT	Northing: 906447.6804 Easting: 944879.2445 Casing Elevation: NA Borehole Depth: 16.8' bgs Surface Elevation: 583.75' AMSL Descriptions By: L.Terrell	Well/Boring ID: SB-2 Client: National Fuel Location: National Fuel Service Center Dunkirk, New York
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DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
585									
580		NA	0-5	NA	NA			Boring location hand-cleared to 5' bgs (blind drilled to 5' bgs). Soil was screened with PID at 1' intervals.	Boring completed with concrete (0-0.5' bgs)
575		1	5-8	1.0	0.0			Black to dark gray fine to coarse SAND, little fine angular to sub-round Gravel, loose, petroleum-like odor, wet.	
570		2	8-11	3.0	0.0	×		Black fine to medium SAND, trace yellow Brick, Concrete, and Metal, brown seam 1" thick at 2.8' of recovery, wet.	Boring backfilled with bentonite/cement grout (0.5-16.8' bgs)
565		3	11-14	3.0	0.0			Black fine to medium SAND, trace red Brick and Metal, loose, slight coal tar-like odor between 0- 2' of recovery, wet.	
560		4	14-17	2.8	0.0			Slight coal tar-like odor between 0-2.8' of recovery.	

	Remarks: bgs = below ground surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level Soil samples collected for VOCs, SVOCs and Total Cyanide at 8-10' bgs and 15.8-16.8' bgs. Survey coordinates based on NYS Plane Coordinate System (NAD 83). Elevations based on NAVD 1988 obtained from GPS observations.
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Client: National Fuel

Well/Boring ID: **SB-2****Site Location:**National Fuel Service Center
Dunkirk, New York


Borehole Depth: 16.8' bgs

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
		4	14-17	2.8	0.0	X		Trace degraded Concrete, red Brick and Metal between 2.7-2.8' of recovery.	
								Refusal at 16.8' bgs.	Boring backfilled with bentonite/cement grout (0.5-16.8' bgs)
565									
20									
560									
25									
555									
30									
550									
35									

**Remarks:** bgs = below ground surface; NA = Not Applicable/Available; AMSL = Above Mean Sea LevelSoil samples collected for VOCs, SVOCs and Total Cyanide at 8-10' bgs and 15.8-16.8' bgs.
Survey coordinates based on NYS Plane Coordinate System (NAD 83).
Elevations based on NAVD 1988 obtained from GPS observations.

Date Start/Finish: 8/4-8/5/10 Drilling Company: Parratt-Wolff Driller's Name: D. Richmond/J.C. Chevalier Drilling Method: Geoprobe / HSA Sampling Method: 4' Acetate Liner & 2' x 2" SS Auger Size: 3 1/4" Rig Type: Track-Mounted Geoprobe 6620 DT & Truck-Mounted Ingersoll Rand A300	Northing: 906470.7189 Easting: 944763.7093 Casing Elevation: NA Borehole Depth: 17.5' bgs Surface Elevation: 583.13' AMSL Descriptions By: L.Terrell	Well/Boring ID: SB-3 Client: National Fuel Location: National Fuel Service Center Dunkirk, New York
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DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
585									
0					0.0			Boring location hand-cleared to 5' bgs (blind drilled to 5' bgs). Soil was screened with a PID at 1' intervals.	Boring completed with cold asphalt patch (0-0.5' bgs)
		NA	0-5	NA	0.0	×			
580					0.5				
					0.0				
					0.0				
5		1	5-8	3.0	0.0			Brown gray SILT, little Clay, mottled, low plasticity, very stiff, slight coal tar-like odor, moist to wet.	
								Brown SILT, trace Clay and fine angular Gravel, non-plastic, medium stiff, moist to wet.	
575								Trace gray fine to coarse sub-angular Gravel.	
		2	8-11	3.0	0.0				Boring backfilled with bentonite/cement grout (0.5-17.5' bgs)
10									
		3	11-14	3.0	0.2			Gray SILT, trace fine to coarse sub-angular Gravel and fine Sand, moist to dry.	
570								Gray fine SAND and SILT, trace fine sub-angular Gravel, moist to dry.	
15		4	14-17	2.7	1.2				
						×			

	Remarks: bgs = below ground surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; SS = Split Spoon; HSA = Hollow Stem Auger Soil samples collected for VOCs, SVOCs and Total Cyanide at 2-3' bgs and 14.9-16.9' bgs. After completing boring with Geoprobe equipment, the driller blind drilled down to 17' bgs with augers to confirm top of bedrock. Survey coordinates based on NYS Plane Coordinate System (NAD 83).
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Client: National Fuel

Well/Boring ID: **SB-3****Site Location:**National Fuel Service Center
Dunkirk, New York

Borehole Depth: 17.5' bgs

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
		4	14-17	2.7	1.2			Gray fine SAND and SILT, trace fine sub-angular Gravel, moist to dry.	
								Black fractured SHALE in the nose of the sampler, slight odor.	
56.5		5	17-19	0.1	0.0			Refusal with augers at 17.5' bgs.	Boring backfilled with bentonite/cement grout (0.5-17.5' bgs)
20									
56.0									
25									
55.5									
30									
55.0									
35									




Remarks: bgs = below ground surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; SS = Split Spoon; HSA = Hollow Stem Auger

Soil samples collected for VOCs, SVOCs and Total Cyanide at 2-3' bgs and 14.9-16.9' bgs.
After completing boring with Geoprobe equipment, the driller blind drilled down to 17' bgs with augers to confirm top of bedrock.
Survey coordinates based on NYS Plane Coordinate System (NAD 83).

Date Start/Finish: 8/2/10 Drilling Company: Parratt-Wolff Driller's Name: D. Richmond/J.C. Chevalier Drilling Method: Geoprobe / HSA Sampling Method: 4' Acetate Liner Auger Size: Rig Type: Track-Mounted Geoprobe 6620 DT	Northing: 906551.3235 Easting: 945006.5616 Casing Elevation: NA Borehole Depth: 16.8' bgs Surface Elevation: 583.24' AMSL Descriptions By: L.Terrell	Well/Boring ID: SB-4 Client: National Fuel Location: National Fuel Service Center Dunkirk, New York
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DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
585									
0									
		NA	0-5	NA	0.0			Boring location hand-cleared to 5' bgs (blind drilled to 5' bgs). Soil was screened with a PID at 1' intervals.	Boring completed with grass and soil (0-0.5' bgs)
					0.0				
					0.0				
580					0.0				
					0.0				
					0.0				
5		1	5-8	3.0	0.0			Gray brown CLAY, trace Silt, mottled, medium plasticity, stiff, moist.	
575									
		2	8-11	2.8	0.0	×		Gray CLAY and SILT, slight plasticity, moist to wet.	Boring backfilled with bentonite/cement grout (0.5-16.8' bgs)
10									
		3	11-14	3.0	0.0			Gray SILT, trace fine sub-round to sub-angular Gravel, moist.	
570									
15		4	14-17	3.0	0.0			Moist to dry.	

	Remarks: bgs = below ground surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; HSA = Hollow Stem Auger Soil samples collected for VOCs, SVOCs and Total Cyanide at 8-11' bgs and 14-17' bgs (MS/MSD). Survey coordinates based on NYS Plane Coordinate System (NAD 83). Elevations based on NAVD 1988 obtained from GPS observations.
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Client: National Fuel

Well/Boring ID: SB-4

Site Location:

National Fuel Service Center
Dunkirk, New York

Borehole Depth: 16.8' bgs

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
		4	14-17	3.0	0.0	×		Gray SILT, trace fine sub-round to sub-angular Gravel, moist. Dark gray to black fractured Shale in the tip of the sampler.	
565								Refusal at 16.8' bgs.	Boring backfilled with bentonite/cement grout (0.5-16.8' bgs)
20									
560									
25									
555									
30									
550									
35									




Remarks: bgs = below ground surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; HSA = Hollow Stem Auger

Soil samples collected for VOCs, SVOCs and Total Cyanide at 8-11' bgs and 14-17' bgs (MS/MSD).
Survey coordinates based on NYS Plane Coordinate System (NAD 83).
Elevations based on NAVD 1988 obtained from GPS observations.

Date Start/Finish: 8/3/10 Drilling Company: Parratt-Wolff Driller's Name: D. Richmond/J.C. Chevalier Drilling Method: Geoprobe / HSA Sampling Method: 4' Acetate Liner Auger Size: Rig Type: Track-Mounted Geoprobe 6620 DT	Northing: 906545.9857 Easting: 944979.7888 Casing Elevation: NA Borehole Depth: 16.8' bgs Surface Elevation: 583.05' AMSL Descriptions By: L.Terrell	Well/Boring ID: SB-5 Client: National Fuel Location: National Fuel Service Center Dunkirk, New York
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DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
585									
0									
		NA	0-5	NA	0.0			Boring location hand-cleared to 5' bgs (blind drilled to 5' bgs). Soil was screened with a PID at 1' intervals.	Boring completed with grass and soil (0-0.5' bgs)
					0.0				
					0.0				
580					0.0				
					0.0				
					0.0				
5		1	5-8	2.5	0.0			Brown gray CLAY, trace Silt, mottled, high plasticity, stiff, moist.	
575									
		2	8-11	2.8	0.0	X		Gray CLAY, little Silt, medium plasticity, medium stiff, moist to wet.	Boring backfilled with bentonite/cement grout (0.5-16.8' bgs)
10									
		3	11-14	2.9	0.0			Gray SILT, trace fine to coarse sub-round to round Gravel, fine to coarse Sand and Clay, moist to wet.	
570									
15		4	14-17	3.0	0.0			No Clay, moist to dry.	

	Remarks: bgs = below ground surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; HSA = Hollow Stem Auger Soil samples collected for VOCs, SVOCs and Total Cyanide at 8-10' bgs and 15.8-16.8' bgs. Survey coordinates based on NYS Plane Coordinate System (NAD 83). Elevations based on NAVD 1988 obtained from GPS observations.
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Client: National Fuel

Well/Boring ID: **SB-5****Site Location:**National Fuel Service Center
Dunkirk, New York

Borehole Depth: 16.8' bgs

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
		4	14-17	3.0	0.0	×		Gray SILT, trace fine to coarse sub-round to round Gravel, fine to coarse Sand and Clay, moist to wet.	
565								Refusal at 16.8' bgs.	Boring backfilled with bentonite/cement grout (0.5-16.8' bgs)
20									
560									
25									
555									
30									
550									
35									




Remarks: bgs = below ground surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; HSA = Hollow Stem Auger

Soil samples collected for VOCs, SVOCs and Total Cyanide at 8-10' bgs and 15.8-16.8' bgs.
Survey coordinates based on NYS Plane Coordinate System (NAD 83).
Elevations based on NAVD 1988 obtained from GPS observations.

Date Start/Finish: 8/3-8/5/10 Drilling Company: Parratt-Wolff Driller's Name: D. Richmond/J.C. Chevalier Drilling Method: Geoprobe / HSA Sampling Method: 4' Acetate Liner & 2' x 2" SS Auger Size: 3 1/4" Rig Type: Track-Mounted Geoprobe 6620 DT & Truck-Mounted Ingersoll Rand A300	Northing: 906535.8123 Easting: 944928.5302 Casing Elevation: NA Borehole Depth: 18' bgs Surface Elevation: 582.91' AMSL Descriptions By: L.Terrell	Well/Boring ID: SB-6 Client: National Fuel Location: National Fuel Service Center Dunkirk, New York
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

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
585									
0									
580		NA	0-5	NA	0.0			Boring location hand-cleared to 5' bgs (blind drilled to 5' bgs). Soil was screened with a PID at 1' intervals.	Boring completed with grass and soil (0-0.5' bgs)
5					0.0				
					0.0				
					0.0				
					0.0				
					0.0				
575		1	5-8	2.5	0.0			Brown and gray CLAY, trace Silt, mottled, high plasticity, stiff, moist.	
10		2	8-11	3.0	0.0	×		Gray CLAY, trace Silt, high plasticity, medium stiff, moist to wet.	Boring backfilled to grade with bentonite/cement grout (0.5-18' bgs)
570		3	11-14	3.0	0.0			Gray SILT, trace fine to coarse sub-round to sub-angular Gravel, fine to coarse Sand and Clay, slight plasticity, very stiff, moist to wet.	
15		4	14-17	2.8	0.0	×		Gray SILT, trace fine to coarse sub-round to sub-angular Gravel and fine to coarse Sand, slight coal tar-like odor between 0.5-2.8' of recovery, moist to dry.	

	Remarks: bgs = below ground surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level, SS = Split Spoon; HSA = Hollow Stem Auger Soil samples collected for VOCs, SVOCs and Total Cyanide at 8-10' bgs and 14.8-16.8' bgs. After completing boring with Geoprobe equipment, the driller blind drilled down to 17' bgs with augers to confirm top of bedrock. Survey coordinates based on NYS Plane Coordinate System (NAD 83).
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Client: National Fuel

Well/Boring ID: **SB-6****Site Location:**National Fuel Service Center
Dunkirk, New York

Borehole Depth: 18' bgs

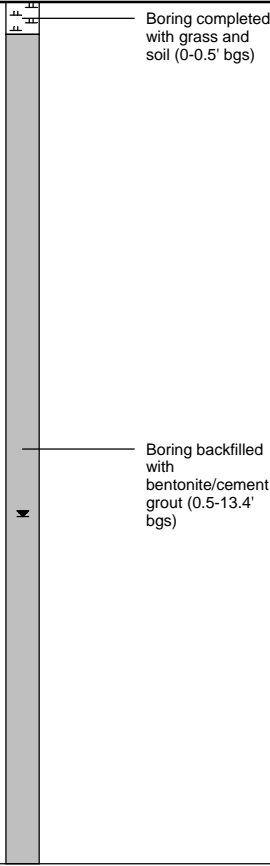
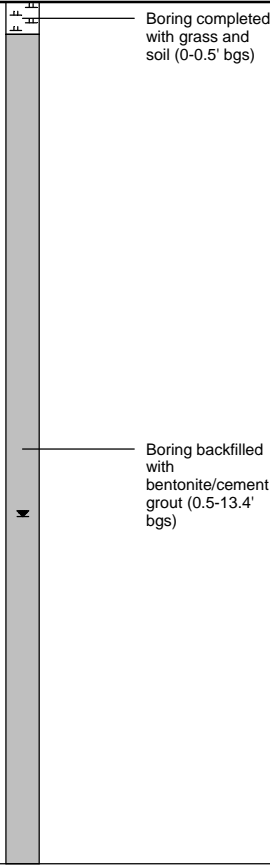
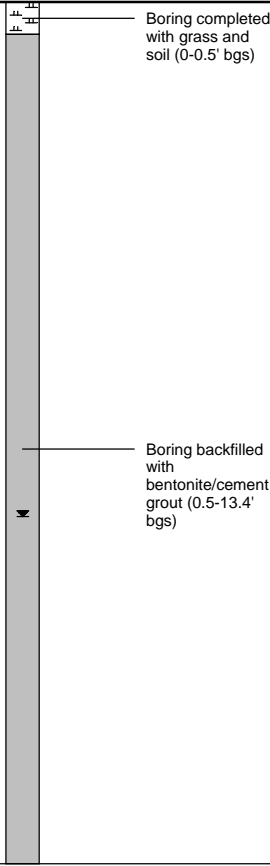
DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
		4	14-17	2.8	5.2			Gray SILT, trace fine to coarse sub-round to sub-angular Gravel and fine to coarse Sand, slight coal tar-like odor between 0.5-2.8' of recovery, moist to dry.	
56.5		5	17-19	0.1	0.0			Dark gray fractured SHALE in nose of sampler.	
								Refusal with augers at 18' bgs.	Boring backfilled to grade with bentonite/cement grout (0.5-18' bgs)
20									
56.0									
25									
55.5									
30									
55.0									
35									




Remarks: bgs = below ground surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level, SS = Split Spoon; HSA = Hollow Stem Auger

Soil samples collected for VOCs, SVOCs and Total Cyanide at 8-10' bgs and 14.8-16.8' bgs.
After completing boring with Geoprobe equipment, the driller blind drilled down to 17' bgs with augers to confirm top of bedrock.
Survey coordinates based on NYS Plane Coordinate System (NAD 83).


Date Start/Finish: 8/3/10 Drilling Company: Parratt-Wolff Driller's Name: D. Richmond/J.C. Chevalier Drilling Method: Geoprobe / HSA Sampling Method: 4' Acetate Liner Auger Size: Rig Type: Track-Mounted Geoprobe 6620 DT	Northing: 906531.8140 Easting: 944905.7168 Casing Elevation: NA Borehole Depth: 13.4' bgs Surface Elevation: 582.83' AMSL Descriptions By: L.Terrell	Well/Boring ID: SB-7 Client: National Fuel Location: National Fuel Service Center Dunkirk, New York
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DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
585									
0									
580		NA	0-5	NA	0.0			Boring location hand-cleared to 5' bgs (blind drilled to 5' bgs). Soil was screened with a PID at 1' intervals.	
					0.0				
					0.0				
					0.0				
					0.0				
5		1	5-8	2.3	0.0			Brown and gray CLAY, trace Silt, mottled, high plasticity, very stiff, slight coal tar-like odor, moist.	
575									
		2	8-11	3.0	0.0	×		Gray CLAY, trace Silt, high plasticity, stiff.	
10									
		3	11-14	2.2	0.0	×		Gray SILT, trace Clay, non-plastic, medium stiff, moist to wet.	
570								Gray SILT, trace fine to coarse sub-round to round Gravel and fine to coarse Sand, moist to wet. Gray fractured Shale in the tip of the sampler.	
								Refusal at 13.4' bgs.	
15		4							

	Remarks: bgs = below ground surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; HSA = Hollow Stem Auger Soil samples collected for VOCs, SVOCs and Total Cyanide at 8-10' bgs and 12.4-13.4' bgs. Survey coordinates based on NYS Plane Coordinate System (NAD 83). Elevations based on NAVD 1988 obtained from GPS observations.
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Date Start/Finish: 8/2/10 Drilling Company: Parratt-Wolff Driller's Name: D. Richmond/J.C. Chevalier Drilling Method: Geoprobe / HSA Sampling Method: 4' Acetate Liner Auger Size: Rig Type: Track-Mounted Geoprobe 6620 DT	Northing: 906554.5445 Easting: 945025.2347 Casing Elevation: NA Borehole Depth: 17.5' bgs Surface Elevation: 583.19' AMSL Descriptions By: L.Terrell	Well/Boring ID: SB-8 Client: National Fuel Location: National Fuel Service Center Dunkirk, New York
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DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
585									
0									
		NA	0-5	NA	0.0			Boring location hand-cleared to 5' bgs (blind drilled to 5' bgs). Soil was screened with PID at 1' intervals.	Boring completed with grass and soil (0-0.5' bgs)
					0.0				
					0.0				
580					0.0				
					0.0				
					0.0				
5		1	5-8	2.4	0.0			Gray brown CLAY, trace Silt, mottled, high plasticity, very stiff, moist to dry.	
575								Moist to wet.	Boring backfilled with bentonite/cement grout (0-17.5' bgs)
10		2	8-12	4.0	0.0				
570		3	12-15	2.5	0.0			Gray SILT, trace coarse sub-round Gravel and Clay, non-plastic, moist to wet.	
								Gray SILT, trace fine to medium sub-round to sub-angular Gravel and Clay, moist to wet.	
								Gray fine SAND, moist to wet.	
15		4	15-18	2.5	0.0			Gray medium SAND, moist to wet.	
								Gray SILT, trace fine to medium sub-round to sub-angular Gravel, hard, moist to dry.	

	Remarks: bgs = below ground surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; HSA = Hollow Stem Auger Soil samples collected for VOCs, SVOCs and Total Cyanide at 8-10' bgs and 15-17.5' bgs (Dup-1-080210). Survey coordinates based on NYS Plane Coordinate System (NAD 83). Elevations based on NAVD 1988 obtained from GPS observations.
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Client: National Fuel

Well/Boring ID: **SB-8****Site Location:**National Fuel Service Center
Dunkirk, New York

Borehole Depth: 17.5' bgs

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
		4	15-18	2.5	0.0	X		Black to dark gray fractured Shale in the tip of the sampler.	
565								Refusal at 17.5' bgs.	Boring backfilled with bentonite/cement grout (0-17.5' bgs)
20									
560									
25									
555									
30									
550									
35									




Remarks: bgs = below ground surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; HSA = Hollow Stem Auger

Soil samples collected for VOCs, SVOCs and Total Cyanide at 8-10' bgs and 15-17.5' bgs (Dup-1-080210).
Survey coordinates based on NYS Plane Coordinate System (NAD 83).
Elevations based on NAVD 1988 obtained from GPS observations.

Date Start/Finish: 8/8/11 Drilling Company: Parratt-Wolff Driller's Name: J.Price/P.Smith Drilling Method: Geoprobe / HSA Sampling Method: 4' Acetate Liner Auger Size: Rig Type: Track-Mounted Geoprobe 6620 D7	Northing: 906488.0068 Easting: 945015.9350 Casing Elevation: NA Borehole Depth: 18' bgs Surface Elevation: 583.86' AMSL Descriptions By: L.Terrell	Well/Boring ID: SB-9 Client: National Fuel Location: National Fuel Service Center Dunkirk, New York
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DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
585									
0								Dark brown to black SLAG, coarse GRAVEL, CONCRETE, RED BRICK, little medium to coarse Sand, moist.	
		NA	0-5	NA	0.0	X		Wet at 1.3' bgs.	Boring completed with grass and soil (0-0.5' bgs)
580									
5		1	5-8	0.4	0.0			Dark brown to black fine to coarse SAND, little red Brick, coal tar-like odor, wet.	
575		2	8-12	0.2	0.0	X		Red and grey RED BRICK and CONCRETE, little medium to coarse Sand, coal tar-like odor, wet.	Boring backfilled with bentonite/cement grout (0-18' bgs)
10									
								Dark brown to black medium to coarse SAND, trace red Brick, fine to medium Gravel, coal tar-like odor, wet.	
								Grey SILT, trace fine Gravel, coal tar-like odor, wet.	
570		3	12-16	3.0	0.0			Grey fine SAND, little Silt, coal tar-like odor, wet.	
15									

	Remarks: bgs = below ground surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; HSA = Hollow Stem Auger Grab groundwater samples collected for TPH-DRO(Test America Labs) & PIANO VOCs(Alpha Analytical) at 1.3' bgs, 18-10' bgs, and 16-18' bgs. Survey coordinates based on NYS Plane Coordinate System (NAD 83). Elevations based on NAVD 1988 obtained from GPS observations.
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Client: National Fuel

Well/Boring ID: SB-9

Site Location:

National Fuel Service Center
Dunkirk, New York

Borehole Depth: 18' bgs

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
		4	16-18	2.0	0.0	×		Grey SILT, trace fine Sand and fine Gravel, coal tar-like odor, wet.	
565								Refusal at 18' bgs.	Boring backfilled with bentonite/cement grout (0-18' bgs)
20									
560									
25									
555									
30									
550									
35									




Remarks: bgs = below ground surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; HSA = Hollow Stem Auger

Grab groundwater samples collected for TPH-DRO (Test America Labs) & PIANO VOCs (Alpha Analytical) at 1.3' bgs, 18-10' bgs, and 16-18' bgs.
Survey coordinates based on NYS Plane Coordinate System (NAD 83).
Elevations based on NAVD 1988 obtained from GPS observations.


Date Start/Finish: 8/8/11-8/9/11 Drilling Company: Parratt-Wolff Driller's Name: J.Price/P.Smith Drilling Method: Geoprobe / HSA Sampling Method: 4' Acetate Liner Auger Size: Rig Type: Track-Mounted Geoprobe 6620 DT	Northing: 906499.5229 Easting: 945020.1795 Casing Elevation: NA Borehole Depth: 16' bgs Surface Elevation: 584.09' AMSL Descriptions By: L.Terrell	Well/Boring ID: SB-10 Client: National Fuel Location: National Fuel Service Center Dunkirk, New York
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DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
585									
0									
		NA	0-5	NA	0.0			Brown SILT, little fine Sand and fine to coarse Gravel, trace Organics, moist.	Boring completed with grass and soil (0-0.5' bgs)
580								Grey to dark grey SILT, trace Clay and fine to medium Gravel, non-plastic, soft, coal tar-like odor, moist.	
5		1	5-8	3.0	0.0	×		Grey brown mottled SILTY CLAY, somewhat plastic, soft, moist.	Temporary Piezometer: 2" PVC riser and 10 slot screen (0-10' bgs).
								Similar soils as above.	
575								Grey SILTY CLAY, somewhat plastic, soft, moist to wet.	Boring backfilled with bentonite/cement grout (0-16' bgs)
10		2	8-12	4.0	0.0			Grey SILT, trace fine to coarse Sand, Clay, and fine Gravel, non-plastic, soft, moist to wet.	
								Similar soils as above.	
570		3	12-16	1.0	0.0				
15						×		Refusal at 16' bgs.	Temporary screen point sampler (14-16' bgs)

	Remarks: bgs = below ground surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; HSA = Hollow Stem Auger Grab groundwater sample collected for TPH-DRO(Test America Labs) & PIANO VOCs(Alpha Analytical) at 1-10' bgs and 14-16' bgs. Survey coordinates based on NYS Plane Coordinate System (NAD 83). Elevations based on NAVD 1988 obtained from GPS observations. Soil descriptions for 0-5' bgs based on first boring attempt hand clearing. 5-16' bgs soil descriptions based on second boring attempt drilling/sampling.
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Date Start/Finish: 8/9/11 Drilling Company: Parratt-Wolff Driller's Name: J.Price/P.Smith Drilling Method: Geoprobe / HSA Sampling Method: 4' Acetate Liner Auger Size: Rig Type: Track-Mounted Geoprobe 6620 DT	Northing: 906507.9815 Easting: 945049.8179 Casing Elevation: NA Borehole Depth: 17' bgs Surface Elevation: 583.70' AMSL Descriptions By: L.Terrell	Well/Boring ID: SB-11 Client: National Fuel Location: National Fuel Service Center Dunkirk, New York
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

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
585									
0		NA	0-3	NA	0.0			Brown SILT, little fine Sand and fine to coarse Gravel, trace Organics, moist.	Boring completed with grass and soil (0-0.5' bgs)
580		NA	3-5	NA	0.0			Grey SILTY CLAY, trace fine Gravel, somewhat plastic, soft, moist.	
5		1	5-8	3.0	0.0	×		Grey and brown mottled SILTY CLAY, somewhat plastic, soft, moist.	Temporary Piezometer: 2" PVC riser and 0.010" slot screen (1-11' bgs).
575		2	8-12	4.0	5.4			Grey SILTY CLAY, trace fine Gravel, somewhat plastic, soft, moist.	
10					5.7				
					5.3			Grey SILT, trace Clay, fine to coarse Sand, and fine Gravel, non-plastic, soft, moist to wet.	Boring backfilled with bentonite/cement grout (0-17' bgs)
570		3	12-16	4.0	4.7				
15					6.0	×			Temporary screen point sampler (15-17' bgs)

	Remarks: ags/bgs = above/below ground surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; HSA = Hollow Stem Auger Grab groundwater samples collected for TPH-DRO(Test America Labs) & PIANO VOCs(Alpha Analytical) at 1-11' bgs and 15-17' bgs. Survey coordinates based on NYS Plane Coordinate System (NAD 83). Elevations based on NAVD 1988 obtained from GPS observations. After 8' bgs, background PID was 4.0 ppm 2" temporary piezometer installed, 0.010" slot screen 1-11' bgs, Riser 1' ags - 1' bgs.
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Client: National Fuel

Well/Boring ID: **SB-11****Site Location:**National Fuel Service Center
Dunkirk, New York

Borehole Depth: 17' bgs


DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
		4	16-17	1.0	4.0 4.0	×		Similar soils as above, wet.	 Boring backfilled with bentonite/cement grout (0-17' bgs)
565								Refusal at 17' bgs.	
20									
560									
25									
555									
30									
550									
35									



Remarks: ags/bgs = above/below ground surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; HSA = Hollow Stem Auger
 Grab groundwater samples collected for TPH-DRO(Test America Labs) & PIANO VOCs(Alpha Analytical) at 1-11' bgs and 15-17' bgs.
 Survey coordinates based on NYS Plane Coordinate System (NAD 83).
 Elevations based on NAVD 1988 obtained from GPS observations.
 After 8' bgs, background PID was 4.0 ppm
 2" temporary piezometer installed, 0.010" slot screen 1-11' bgs, Riser 1' ags - 1' bgs.

Date Start/Finish: 8/9/11 Drilling Company: Parratt-Wolff Driller's Name: J.Price/P.Smith Drilling Method: Geoprobe / HSA Sampling Method: 4' Acetate Liner Auger Size: Rig Type: Track-Mounted Geoprobe 6620 DT	Northing: 906444.3643 Easting: 945061.8216 Casing Elevation: NA Borehole Depth: 18' bgs Surface Elevation: 584.11' AMSL Descriptions By: L.Terrell	Well/Boring ID: SB-12 Client: National Fuel Location: National Fuel Service Center Dunkirk, New York
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DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
585									
0		NA	0-3.5	NA	0.0			Brown SILT, little fine Sand and fine to coarse Gravel, trace Organics, moist.	Boring completed with grass and soil (0-0.5' bgs)
580		NA	3.5-5	NA	0.0			Grey SILTY CLAY, trace fine Gravel, somewhat plastic, soft, moist.	
5		1	5-8	0.2	0.0	X		Brown and grey medium GRAVEL, red BRICK, and SILTY CLAY, moist.	Temporary Piezometer: 2" PVC riser and 0.010" slot screen (1-11' bgs)
575								Grey SILTY CLAY, somewhat plastic, soft, moist.	
10		2	8-12	4.0	0.0			Grey SILT, trace Clay, fine to coarse Sand and fine to medium Gravel, non-plastic, soft, moist to wet.	
								Similar soils as above.	
570		3	12-16	4.0	0.0				Boring backfilled with bentonite/cement grout (0-18' bgs)
15									

	Remarks: ags/bgs = above/below ground surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; HSA = Hollow Stem Auger Grab groundwater samples collected for TPH-DRO(Test America Labs) & PIANO VOCs(Alpha Analytical) at 1-11' bgs and 16-18' bgs. Survey coordinates based on NYS Plane Coordinate System (NAD 83). Elevations based on NAVD 1988 obtained from GPS observations. 2" temporary piezometer installed, 0.010" slot screen 1-11' bgs. Riser 1' ags - 1' bgs.
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Client: National Fuel

Well/Boring ID: SB-12

Site Location:

National Fuel Service Center
Dunkirk, New York

Borehole Depth: 18' bgs

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
		4	16-18	2.0	0.0	×		Similar soils as above.	
565								Refusal at 18' bgs.	Boring backfilled with bentonite/cement grout (0-18' bgs)
20									
560									
25									
555									
30									
550									
35									



Remarks: ags/bgs = above/below ground surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; HSA = Hollow Stem Auger
 Grab groundwater samples collected for TPH-DRO(Test America Labs) & PIANO VOCs(Alpha Analytical) at 1-11' bgs and 16-18' bgs.
 Survey coordinates based on NYS Plane Coordinate System (NAD 83).
 Elevations based on NAVD 1988 obtained from GPS observations.
 2" temporary piezometer installed, 0.010" slot screen 1-11' bgs. Riser 1' ags - 1' bgs.