January 15, 2020 Reference No. 006883

Ms. Jaclyn Kondrk
Emergency Remedial Response Division
United States Environmental Protection Agency Region II
290 Broadway, 20th Floor
New York, New York
10007 1866

Dear Ms. Kondrk:

Re: Semiannual Report – 2nd Half 2019 (July through December)
Administrative Orders Hooker Chemical/Ruco Polymer Corporation Site
Index Nos. II CERCLA 80216, II CERCLA 94 0210, and II CERCLA 02 2001 2018

This submittal provides the Semiannual Progress Report covering July through December 2019 for the Hooker/Ruco Site in Hicksville, New York, on behalf of Glenn Springs Holdings, Inc. (GSH). This Report covers OU 1, OU 2, and OU 3.

Submittals During Reporting Period

The following were submitted during the period July through December 2019:

- The Semiannual Progress Report for the time period January through June 2019 was submitted to the United States Environmental Protection Agency (USEPA) on July 10, 2019.

Operable Unit 1 (On-Site Soil)

All work has been successfully completed pursuant to USEPA letter dated September 28, 2007. OU 1 is closed.

Operable Unit 2 (Soils Impacted by On-Site Release of PCBs)

All work has been successfully completed pursuant to USEPA letter dated March 12, 1993. OU 2 is closed.

Operable Unit 3 (Off Site Groundwater)

A listing of the OU 3 operation and maintenance (O&M) activities performed for this reporting period is provided in Table 1. Additional details for the primary activities are provided in the following sections.

It is noted that the selected remedy for the vinyl chloride (VCM) subplume is also based on the recognition that the Northrop groundwater extraction and treatment system (i.e., pumping of Northrop Wells 1 and 3R and treatment via the Tower 96 system) is containing and remediating a commingled plume of tetrachloroethylene (PCE) and trichloroethylene (TCE) from the Northrop, Naval Weapons Industrial Reserve Plant (NWIRP) and Hooker/Ruco sites. The VCM subplume is co-located within the commingled PCE/TCE plume. Most of the PCE and TCE located within the commingled plume is associated with the

Northrop and NWIRP sites. The Northrop system captures and treats all of the PCE, TCE and VCM, not being treated by the biosparge system, associated with the Hooker/Ruco Site.

Supplemental Treatment System (No Longer Required)

Agency concurrence to stop treatment of VCM with GSH's supplemental air treatment system was received on January 26, 2017. Operation, maintenance and monitoring of the supplemental system was thereafter taken over by Northrop. It is noted that the VCM concentrations in Well 3R ranged between 2.0 and 3.9 micrograms per liter (µg/L) from December 2016 to May 2018 with the most recent concentration from August 2019 being 1.3 µg/L. This further supports that treatment of VCM by the supplemental system is no longer needed.

Biosparge System

Figures 1 and 2 present the system layout and Figures 3 and 4 present system cross sections. Also shown on Figures 1 and 2 are the most recent VCM groundwater concentrations.

Sampler insertion for the 2nd semi-annual 2020 biosparge system performance monitoring event started on September 29, 2019. For this monitoring event, general chemistry (total organic carbon (TOC), nitrate, nitrite, ammonia, and phosphorus) were analyzed in accordance with the frequency change to annual approved by USEPA on October 9, 2018.

All samplers were inserted in September and retrieved in October. Additionally, the super sleeve samplers for MW-90D1, MW-90D2, and MW-93D2 were ripped when retrieved. The super sleeves are used to collect for samples for general chemistry (total organic carbon (TOC), nitrate, nitrite, ammonia, and phosphorus) analysis. These data are not necessary to evaluate the performance of the biosparge system. Therefore, super sleeves were not reinstalled for analysis of these parameters.

A Quality Assurance/Quality Control (QA/QC) review of the October 2019 results is provided in Attachment A. The electronic deliverables were provided electronically to the USEPA on January 14, 2019.

During the reporting period, air was injected into all north fence wells and all middle fence injection wells except for IW-6D2, IW-7D1, IW-16D1, IW-18D1, and IW-21D1. It is believed that there are physical impairments in these wells. It is also believed that air injection into these wells is not essential because air is being injected into the air injection wells immediately adjacent to and above these injection points, the dissolved oxygen (DO) concentrations in all nearby monitoring wells are greater than the target level of 2.0 milligrams per liter (mg/L) (as noted in Table 2), and VCM concentrations continue to decrease or remain low level.

Summary of Biosparge System

The DO, total volatile organic compounds (TVOC), and VCM concentration trends for the individual groundwater monitoring wells around the biosparge injection system are shown on Figures 5 through 9. It is noted that figures for well pairs in which the VCM concentrations have been less than the maximum contaminant level (MCL) of 2 µg/L for at least the last 2 years were not prepared for the First semiannual

2019 report. The wells achieving this goal were MW-61D2, MW-63, MW-72, MW-77, MW-81, MW-83, MW-84, MW-87, MW-76, MW-85S&I, MW-63S&I, MW-73D1&D2, MW-86D1&D2, and MW-90D1&D2, and MW-88D1&D2. Thus, no figures for these well pairs are included in this report. MW-82D1 had a concentration of VCM of 4 µg/L in the first half of 2019; however, a figure was not prepared as this was the first detection since 2015. In the second half of 2019, MW-82D1 had a VCM concentration of 2.1 µg/L, marginally above 2 µg/L. Since the VCM concentration is expected to continue to decrease, a figure is not included in this report.

To date, the results show that the biosparge system is operating successfully as demonstrated by the following:

i) DO levels in the groundwater are greater than the target concentration of 2 mg/L in 32 of the 49 monitoring wells measured in October 2019 (see Table 2).

ii) Groundwater VCM concentrations are non detect, low level, or decreased between the April/May 2019 and October 2019 performance monitoring events in 49 of the 52 monitoring wells for the biosparge system as a result of the microbial biodegradation processes. Minor increases were detected in MW-75D2 (4 to 5 µg/L), MW-76D1 (1 to 7.7 µg/L), and MW-89D1 (0.7J to 2 µg/L).

The wells with lowest DO concentrations are typically located in close proximity to either the north fence or the east portion of the middle fence of injection wells. It is anticipated that as the groundwater flow paths converge as they approach Northrop Well 3R, the groundwater with low DO concentrations will mix with groundwater with higher DO concentrations. This expectation is supported by the October 2019 DO concentrations in wells MW-66D2 and MW-68D which are above the target level of 2 mg/L and located between the middle fence and Well 3R (see Table 2).

The VCM concentrations upgradient of the north fence continued to decrease from 24 µg/L (October 2017) to 14.7 µg/L (October 2019) in well MW-92D1 and from 1.5 µg /L (October 2017) to non-detect (October 2019) in well MW-93D2. These wells are scheduled to be sampled again in October 2021.

The VCM concentrations along the west edge of the VCM subplume between the north fence and the middle fence remained non-detect in wells MW-63 since the April/May 2016 sampling event and MW-86 since the October 2015 sampling event.

The VCM concentrations along the west edge of the VCM subplume downgradient of the middle fence essentially remained the same as previous events. VCM was either not detected or detected at a concentration of less than 2.0 µg/L in monitoring wells MW-61, MW-81, MW-83, and MW-87.

The VCM concentrations along the east edge of the VCM subplume downgradient of the middle fence essentially remained the same as previous events. VCM was either not detected or detected at a concentration of 2.0 µg/L or less in these monitoring wells (MW-82, MW-84, MW-85, MW-88, and MW-89) except for MW-82D1 where VCM was detected at a concentration of 2.1 µg/L.

The VCM concentrations in monitoring wells located in between the middle fence and Northrop Well 3R (aka GP 3) essentially remained the same as previous events (MW-66, MW-67, and MW-68. VCM was

either not detected (MW-66, MW-67, and MW-68D) or detected at a concentration of 5.2J µg/L in MW-68S. The VCM concentration in MW-68S has continued to decrease from a high of 940 µg/L in 2013 and 42 µg/L in April 2019.

The VCM concentrations in Northrop well MW 3-1, located in close proximity to Northrop Well (south of the sub plume), increased from 14 to 36 µg/L between the last two available sampling events in October 2016 and June 2018, respectively. VCM remained not detected in nearby monitoring wells MW-58 and MW-59. The most recent concentration in Well 3R from August 2019 was 1.3 µg/L.

All of the above indicate that the extent of the VCM subplume, in general, is becoming smaller and the VCM concentrations therein are decreasing.

Table 2 also presents analytical results for the other primary VOCs in the groundwater (i.e., PCE and TCE) being sampled by the biosparge system monitoring wells. The PCE, TCE and VCM concentrations for the time period since the start of operation of the Pilot System in October 2006 (for wells which monitor the Pilot System) and since the start of the remainder of biosparge system in September 2012 (for the wells which monitor the remainder of the system) are provided in the table.

As requested by the USEPA, the listed wells have been divided into three groups:

i) Those wells which are monitored in accordance with the sampling frequency specified in Table 7.1 of the OU 3 Interim Remedial Action Report (Base Wells) (as modified on March 8, 2017).

ii) Those wells which are sampled periodically on a voluntary basis to obtain a more regional view of chemical presence in the vicinity of the VCM plume (Voluntary Wells).

iii) Those wells monitored by Northrop which aid in interpreting the chemical presence in the vicinity of the VCM plume (Northrop Wells).

For the 43 base wells listed in Table 2, the PCE concentrations since start of the biosparge system operation have:

i) Decreased in 21 wells

ii) Remained relatively constant with random fluctuations in 17 wells

iii) Increased in 5 wells (MW-77D2, MW-81D2, MW-83D2, MW-86D2, and MW- 87D2)

Similarly, the TCE concentrations have:

i) Decreased in 22 wells

ii) Remained relatively constant with random fluctuations in 20 wells

iii) Increased in one well (MW-87D2)

The well in which both PCE and TCE concentrations increased was MW-87D2. Four of these wells (MW-81D2, MW-83D2, MW-86D2, and MW-87D2) are located in proximity to the western edge of the VCM plume. MW-77D2 is located in proximity to the eastern edge of the VCM plume. The reason for the increase is uncertain but is believed to be not related to the Hooker/Ruco Site. During installation of the

north fence biosparge system injection and monitoring wells into the VCM impacted groundwater in 2011, groundwater with higher PCE and TCE concentrations were detected in the deeper groundwater below the elevation of the groundwater with VCM (see Figure 3). At that time, it was believed, and still is, that the PCE and TCE at depths below the VCM were due to sources other than the Hooker/Ruco Site. It is possible that the groundwater with higher concentrations is now impacting the groundwater chemistry in the referenced wells.

With regard to the wells which are sampled on a voluntary basis, it was noted that there was a TCE concentration increase in well nest MW-58 from the 70 to 110 µg/L range in May 2013 to the 1,910 to 7,600 µg/L range between November 2014 and April/May 2018. Recent TCE concentrations from April/May 2019 ranged between 319 to 750 µg/L and 237 to 357 µg/L in October 2019. It is believed that these increases in 2013 were due to the increased pumping rate of Northrop Well 3R drawing more of the highly TCE impacted groundwater from Northrop's OU 3 (see Figure 9).

Also of note is that the PCE and TCE concentrations in the well nests upgradient of the VCM plume (i.e., MW-92 and MW-93) have decreased significantly (e.g., PCE in MW-92D2 has decreased from 690 µg/L in April 2011 to 29.9 µg/L in October 2019 and from 110 µg/L in April 2011 to non-detect in October 2019 for MW-93D2). These results combined with the decreasing VCM results in these wells are consistent with the expectation that the north upgradient edge of the VCM plume is migrating southward.

Well Conditions Update

The operational status of the injection and monitoring wells for the biosparge system is provided in Table 3. Since the issuance of the 1st Semiannual 2019 Progress Report, air injections could not be injected into wells IW-20D1, IW-20D2, IW-21D2, and IW-15D1. Investigations into these two wells are in progress. Repairs to these wells will not be performed unless DO concentrations decrease in downgradient monitoring wells. The operational status of the injection wells was updated using observations obtained during operation of the biosparge system during this reporting period. The operational status of the monitoring wells was updated using observations obtained during operation of the biosparge system during this reporting period.

Planned 1st Half 2020 Activities

The following activities are planned for 2020:

i. Continue operation and maintenance of the biosparge system

ii. Perform the 1st Semi-annual 2020 biosparge system performance monitoring event

Should you have any questions on the above, please do not hesitate to contact the undersigned at 519-340-4313 or email john.pentilchuk@GHD.com.

Sincerely,

John Pentilchuk

JS/kf/3

Encl.

cc: P. Mannino (USEPA)
S. Scharf (NYSDEC)
B. Murray (US Navy)
T. Troutman (Covestro)
T. Kelly (Nassau County)
P. Bluestein (GSH)

HOOKER/RUCO SITE

SOUTH OYSTER BAY ROAD

NAVY SITE

SLEEPY'S

PLANT 3

MULBERRY DRIVE

AZEL STREET

PLANT 25

NORTHROP

GRUMMAN ROAD

PLANT 5

PLANT 2

HICKSVILLE ROAD

0 200 400ft

MW-64

10/19 | 14.7 MW-92

MW-93 10/19 | ND

MW-62 10/17 | 8

IW-4

10/19 | ND MW-70

IW-3

IW-2

IW-1

IW-5 IW-6 IW-7

MW-77 10/19 | ND

MW-73 10/19 | ND

10/19 | 5 MW-75

MW-90 10/19 | ND

10/19 | ND MW-72

10/19 | 7.7 MW-76

10/19 | ND MW-63

2

100

500

40

1000

IW-19

MW-82 10/19 | 2.1

IW-20

IW-21

IW-17 IW-18 IW-16

10/19 | ND MW-86

IW-15

IW-22

MW-89 10/19 | 2

10/19 | ND MW-87

MW-85 10/19 | ND

10/19 | 1.6 MW-83

MW-88 10/19 | ND

10/19 | ND MW-61

MW-84 10/19 | ND

10/19 | 1.2 MW-81

MW-60 5/13 | ND

10/19 | ND MW-66

10/19 | ND MW-67

MW-68 10/19 | 5.2 J

MW-58 10/19 | ND

10/19 | ND MW-59

06/18 | 36 MW-3-1(2)

WELL-3R (2) 08/19 | 1.3 (1)

GP-3

GP-1 (2) 08/19 | ND

LEGEND

- MW-57 — EXISTING MONITORING WELL LOCATION
- GP-3 — EXISTING EXTRACTION WELL LOCATION
- WELL-3R — REPLACEMENT EXTRACTION WELL LOCATION (DECEMBER 2013)
- IW-1 — EXISTING INJECTION WELL LOCATION
- 4/13 | 140 — VCM CONCENTRATION (µg/L); MONTH/YEAR
- 2 — VCM PLUME (µg/L)
- (1) — DATA NOT USED TO PLOT CONTOURS SINCE PUMPING WELL DRAWS GROUNDWATER FROM LARGER SURROUNDING AREA
- (2) — WELL SAMPLED AND DATA REPORTED BY NORTHROP

NOTE: CONTOURS SHOW THE ESTIMATED VCM CONCENTRATIONS BASED ON HISTORICAL KNOWLEDGE OF PLUME AND/OR PROFESSIONAL JUDGEMENT

GHD

figure 1

MOST RECENT VCM GROUNDWATER CONCENTRATION

Hooker/Ruco Site, Hicksville, New York

P:\drawings\06000s\06883\06883-CORR\06883-D23105(KOND003)\06883-D23105(KOND003)GN\06883-D23105(KOND003)GN-WA001.DWG Plot Date: JAN 10, 2020

0 40 120ft

MW-64

MW-92
14.7

MW-93
ND

MW-62
8.0

IW-7

IW-6

IW-5

MW-70
1

IW-4

IW-3

IW-2

IW-1

MW-76S/I
ND

MW-72
ND

VZ-1

MW-76D1/D2
7.7

MW-75
5

VZ-4

VZ-5

MW-73
ND

VZ-2

VZ-6

MW-77
ND

MW-90
ND

MULBERRY STREET

NEW SOUTH ROAD

SOUTH OYSTER BAY ROAD

MADISON AVENUE

JERRY AVENUE

WASHINGTON PARKWAY

HAZEL STREET

GRUMMAN ROAD WEST

MW-63
ND

MW-86
ND

2

40

100

500

1000

AREA OF PILOT SYSTEM

CONTROL BUILDING

IW-15

IW-16

IW-17

IW-18

IW-19

IW-20

IW-21

IW-22

MW-87
ND

VZ-14

MW-83
1.6

VZ-10

MW-61
ND

MW-81
1.2

VZ-15

VZ-11

MW-84
ND

MW-82
2.1

VZ-16

MW-88
ND

MW-85S/I
ND

VZ-12

MW-85D1/D2
ND

MW-89
2

VZ-17

LEGEND

2 — VCM GROUNDWATER CONCENTRATION (µg/L)

PILOT SYSTEM FORCEMAIN ALIGNMENT

REMAINDER OF FORCEMAIN

IW-17 — EXISTING INJECTION WELL

MW-81 — EXISTING GROUNDWATER MONITORING WELL

VZ-15 — EXISTING VADOSE ZONE MONITORING WELL

24 — MOST RECENT VCM CONCENTRATION (UG/L)

ND — NON-DETECT

NOTE: CONTOURS SHOW THE ESTIMATED VCM CONCENTRATIONS BASED ON HISTORICAL KNOWLEDGE OF PLUME AND/OR PROFESSIONAL JUDGEMENT

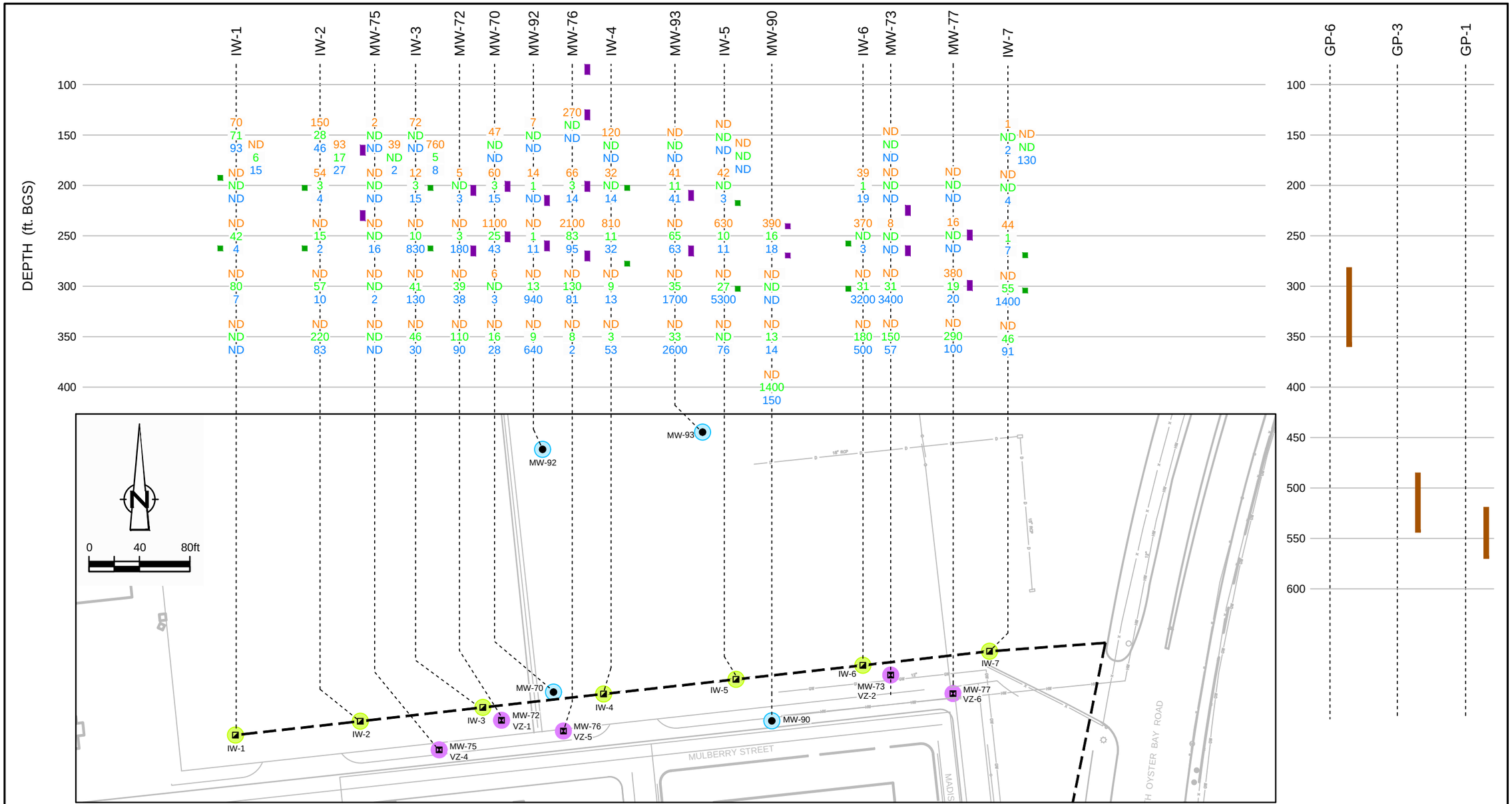
GHD

figure 2

CONSTRUCTED BIOSPARGE TREATMENT SYSTEM LAYOUT

Hooker/Ruco Site, Hicksville, New York

P:\drawings\06000s\06883\06883-CORR\06883-D23105(KOND003)\06883-D23105(KOND003)GN\06883-D23105(KOND003)GN-WA002.DWG Plot Date: JAN 09, 2020



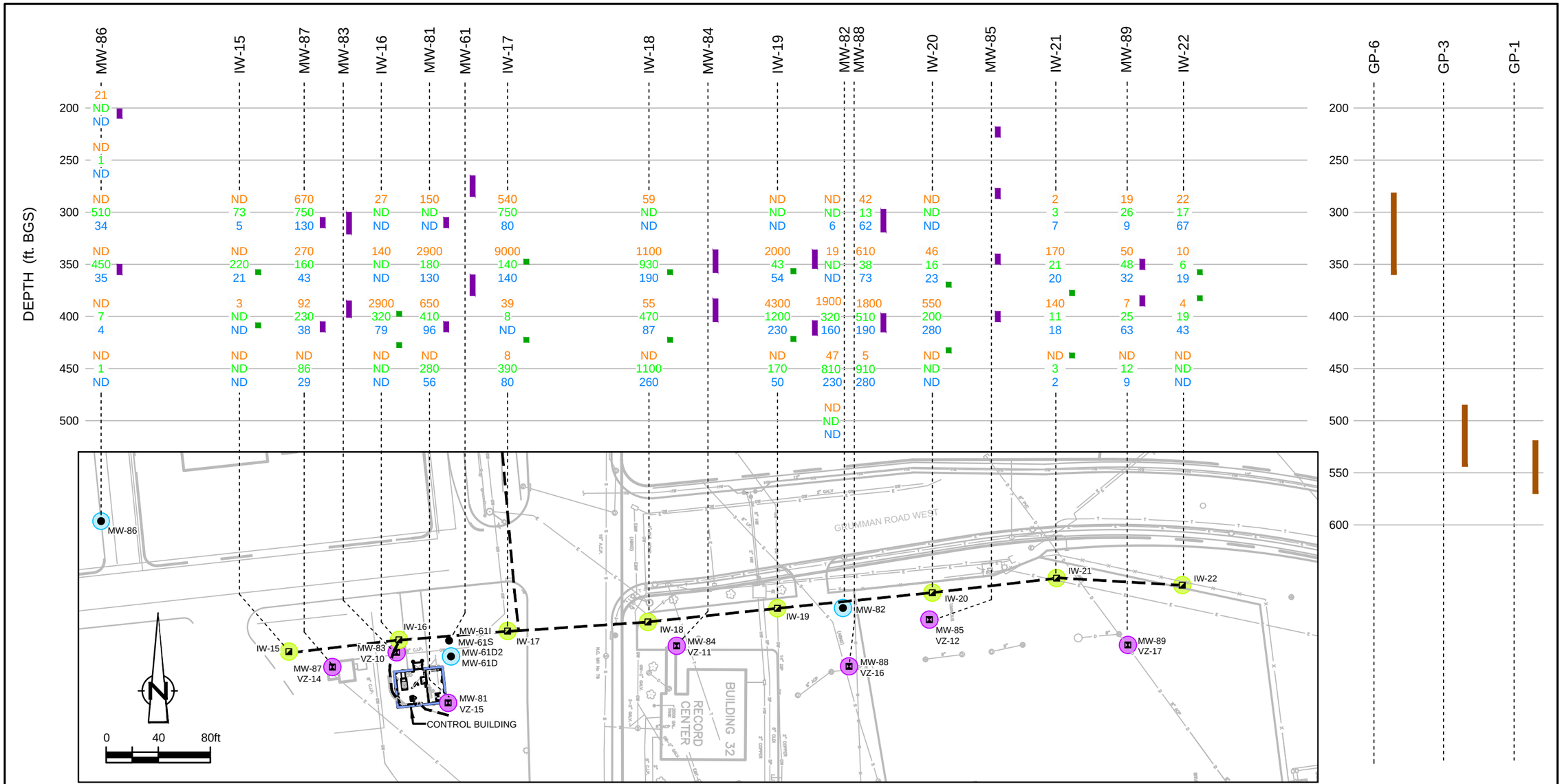
NOTE: FEBRUARY THROUGH MARCH, 2011 HYDROPUNCH RESULTS

figure 3

NORTH FENCE AIR INJECTION AND GROUNDWATER MONITORING WELL SCREENED INTERVALS

Hooker/Ruco Site, Hicksville, New York

P:\drawings\06000s\06883\06883-CORR\06883-D23105(KOND003)\06883-D23105(KOND003)GN\06883-D23105(KOND003)GN-WA003.DWG Plot Date: JAN 09, 2020



LEGEND

- FORCEMAIN ALIGNMENT
- MW-61 — GROUNDWATER MONITORING WELL LOCATION
- IW-8 — INJECTION WELL LOCATION
- MW-80 VZ-9 — GROUNDWATER AND VADOSE ZONE MONITORING WELL LOCATION
- AIR INJECTION WELL SCREENED INTERVAL
- GROUNDWATER MONITORING WELL SCREENED INTERVAL
- PUMPING WELL SCREENED INTERVAL
- 670 — HYDROPUNCH VCM CONCENTRATION (ppb)
- 750 — HYDROPUNCH TCE CONCENTRATION (ppb)
- 130 — HYDROPUNCH PCE CONCENTRATION (ppb)

OCTOBER THROUGH DECEMBER 2010 HYDROPUNCH RESULTS.

NOTE: PILOT SYSTEM: OCTOBER 2005 THROUGH APRIL 2006 ANALYTICAL RESULTS.
REMAINING COMPONENTS: OCTOBER THROUGH DECEMBER 2010
HYDROPUNCH RESULTS

figure 4

MIDDLE FENCE AIR INJECTION AND GROUNDWATER MONITORING WELL SCREENED INTERVALS

Hooker/Ruco Site, Hicksville, New York

P:\drawings\06000s\06883\06883-CORR\06883-D23105(KOND003)\06883-D23105(KOND003)GN\06883-D23105(KOND003)GN-WA004.DWG Plot Date: JAN 09, 2020

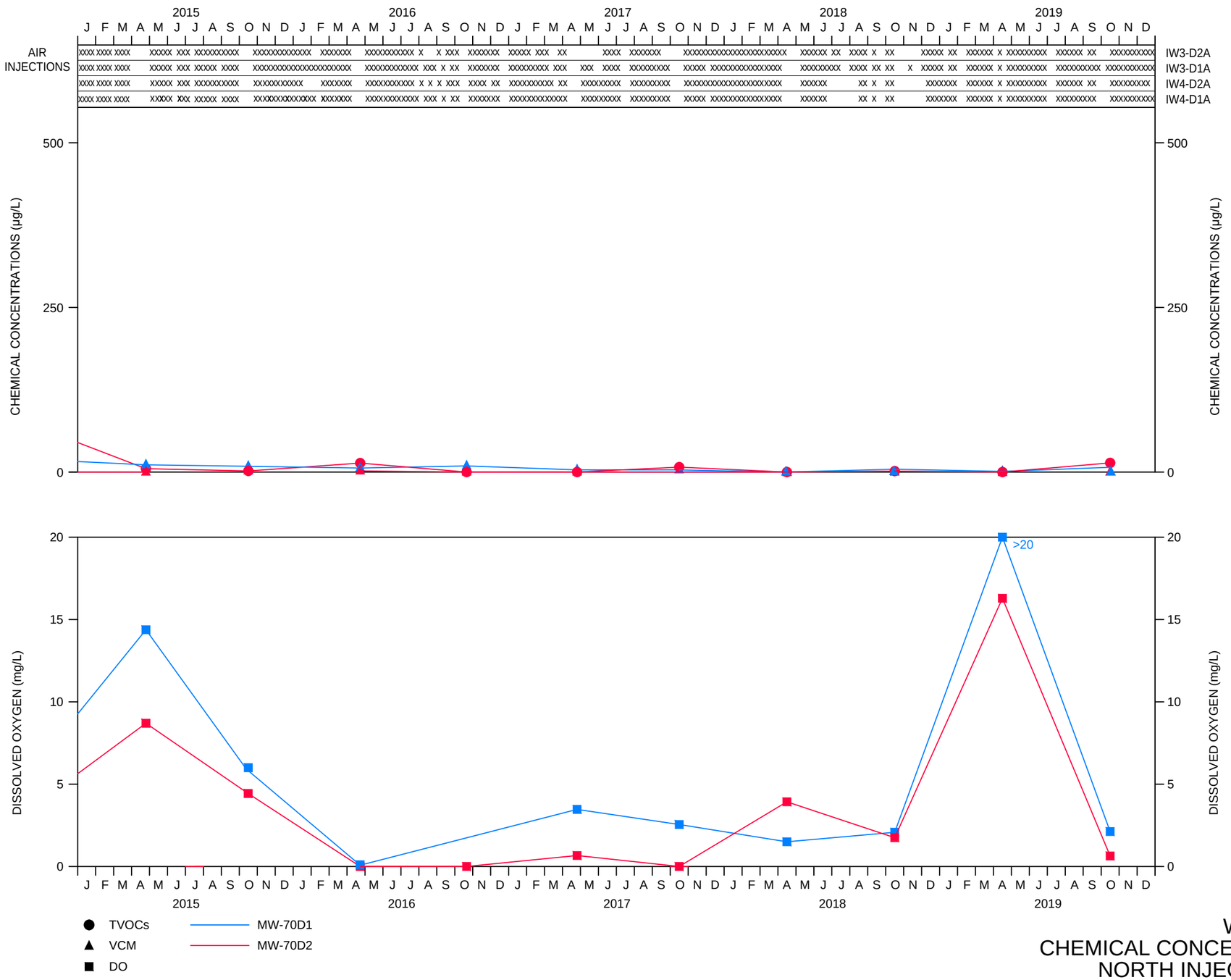


figure 5

WELL NEST MW-70
CHEMICAL CONCENTRATION PLOTS
NORTH INJECTION FENCELINE
Hooker/Ruco Site, Hicksville, New York

P:\drawings\06000s\06883\06883-CORR\06883-D23105(KOND003)\06883-D23105(KOND003)GN\06883-D23105(KOND003)GN-WA005.DWG Plot Date: JAN 09, 2020

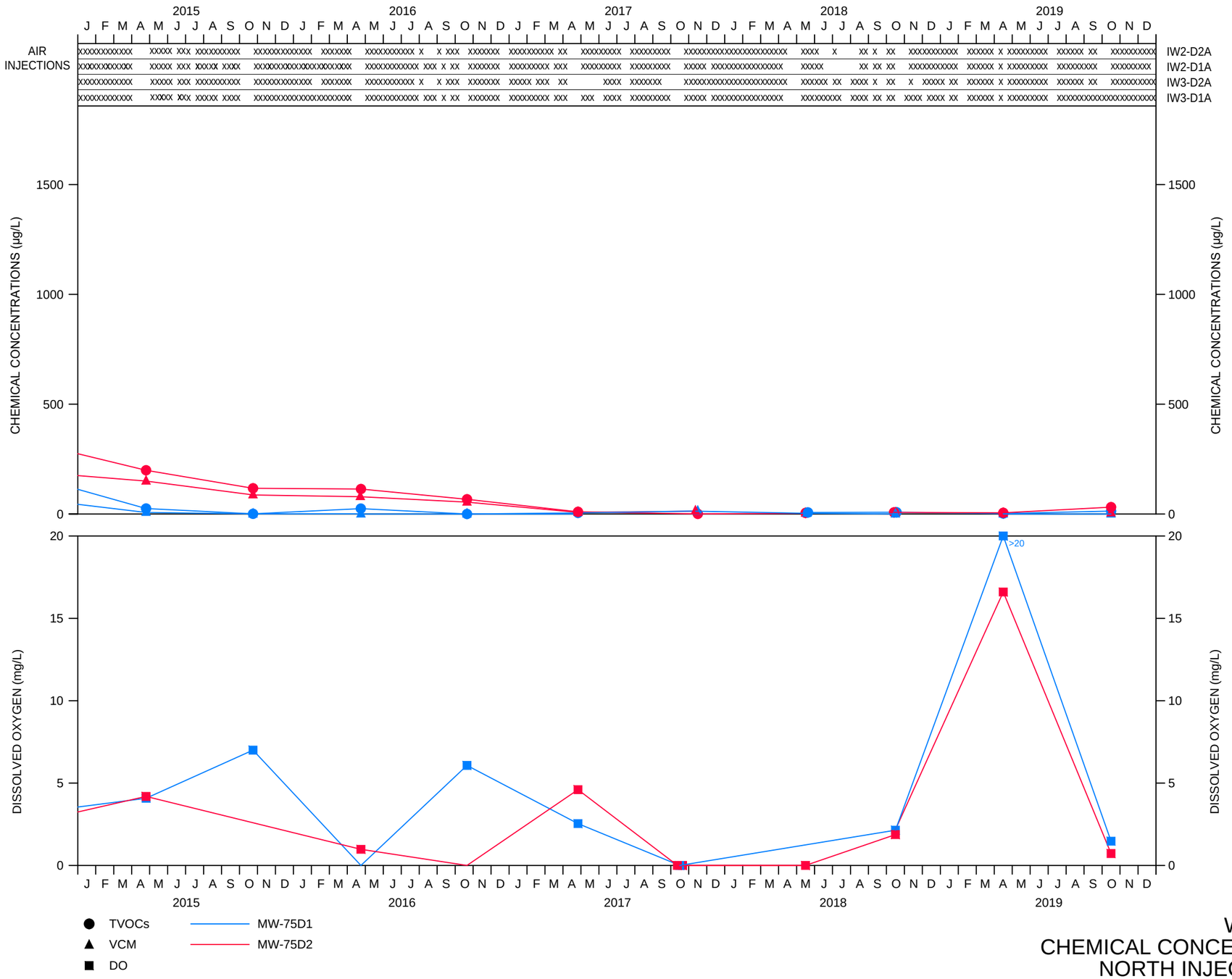


figure 6

WELL NEST MW-75
CHEMICAL CONCENTRATION PLOTS
NORTH INJECTION FENCELINE
Hooker/Ruco Site, Hicksville, New York

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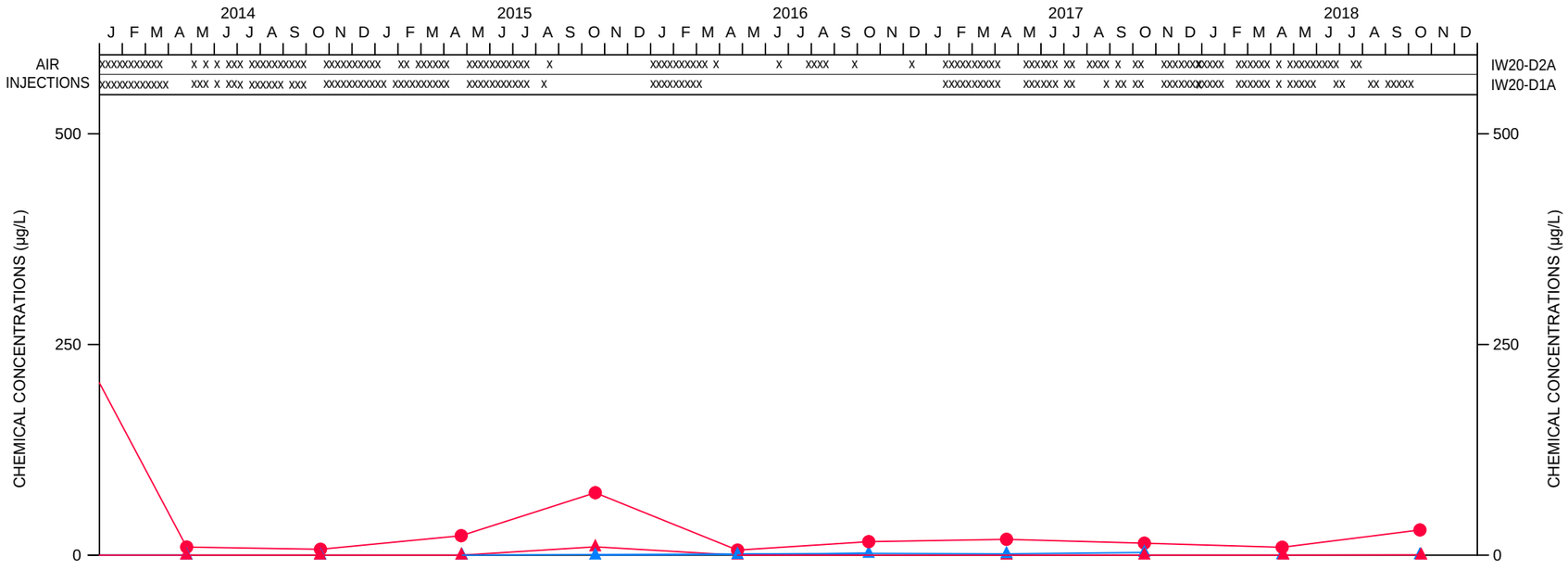

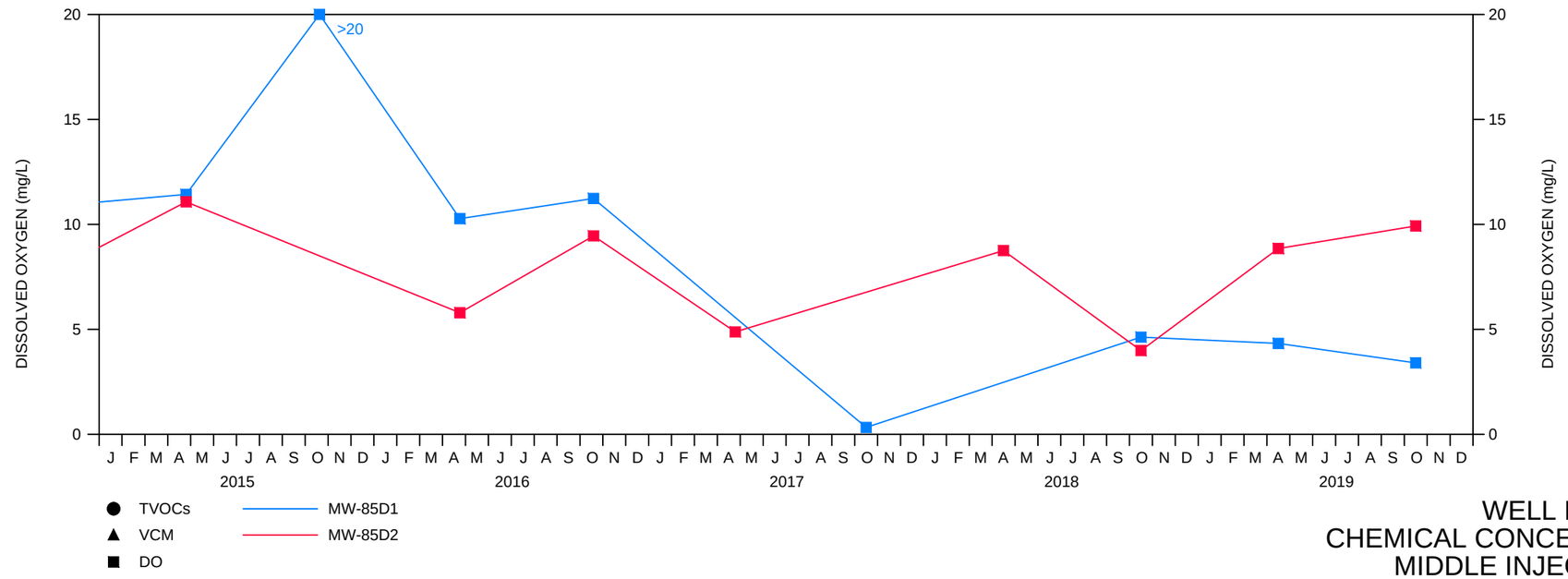

figure 7

WELL NEST MW-85D1/D2
CHEMICAL CONCENTRATION PLOTS
MIDDLE INJECTION FENCELINE
Hooker/Ruco Site, Hicksville, New York

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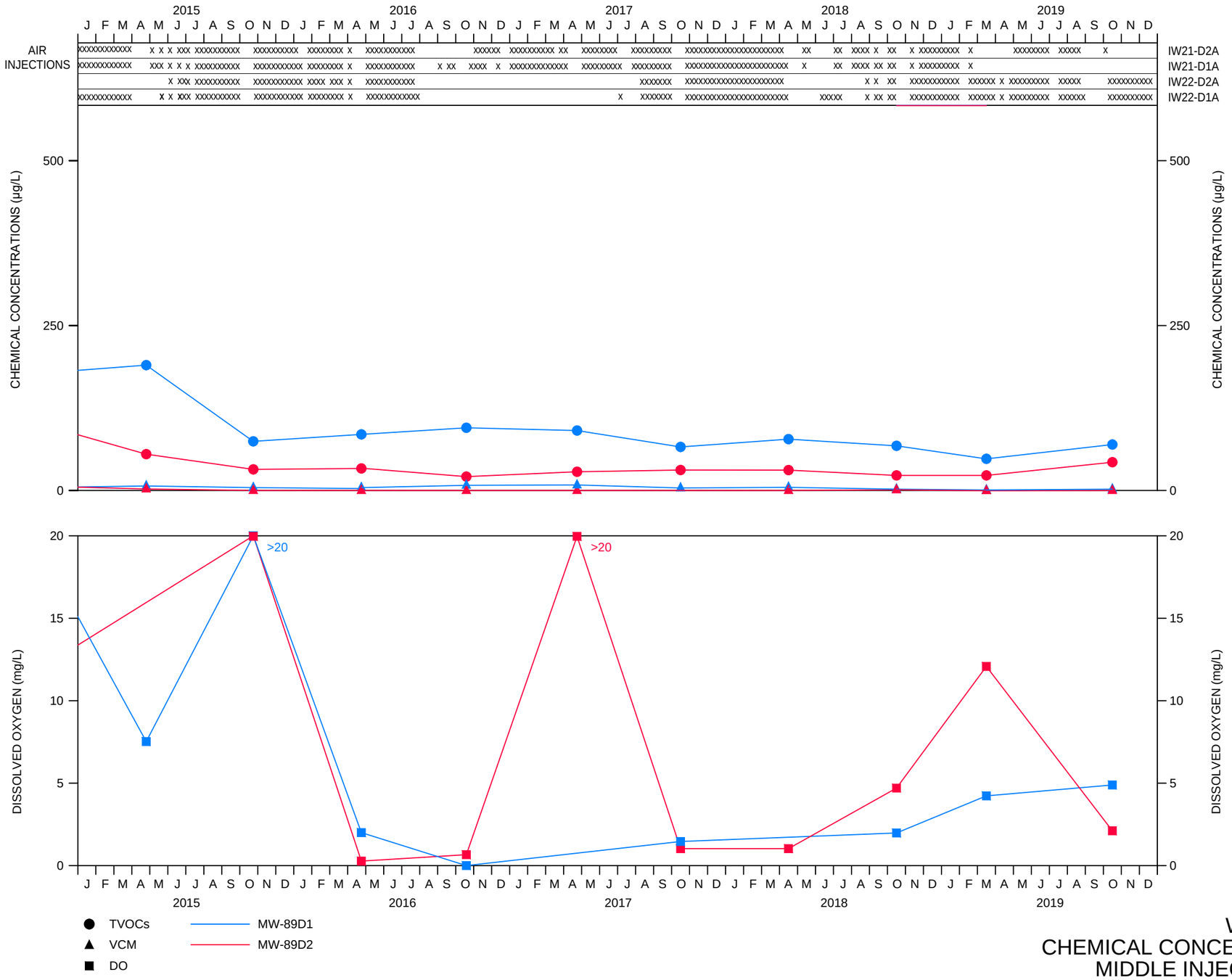

figure 8

WELL NEST MW-89
CHEMICAL CONCENTRATION PLOTS
MIDDLE INJECTION FENCELINE
Hooker/Ruco Site, Hicksville, New York

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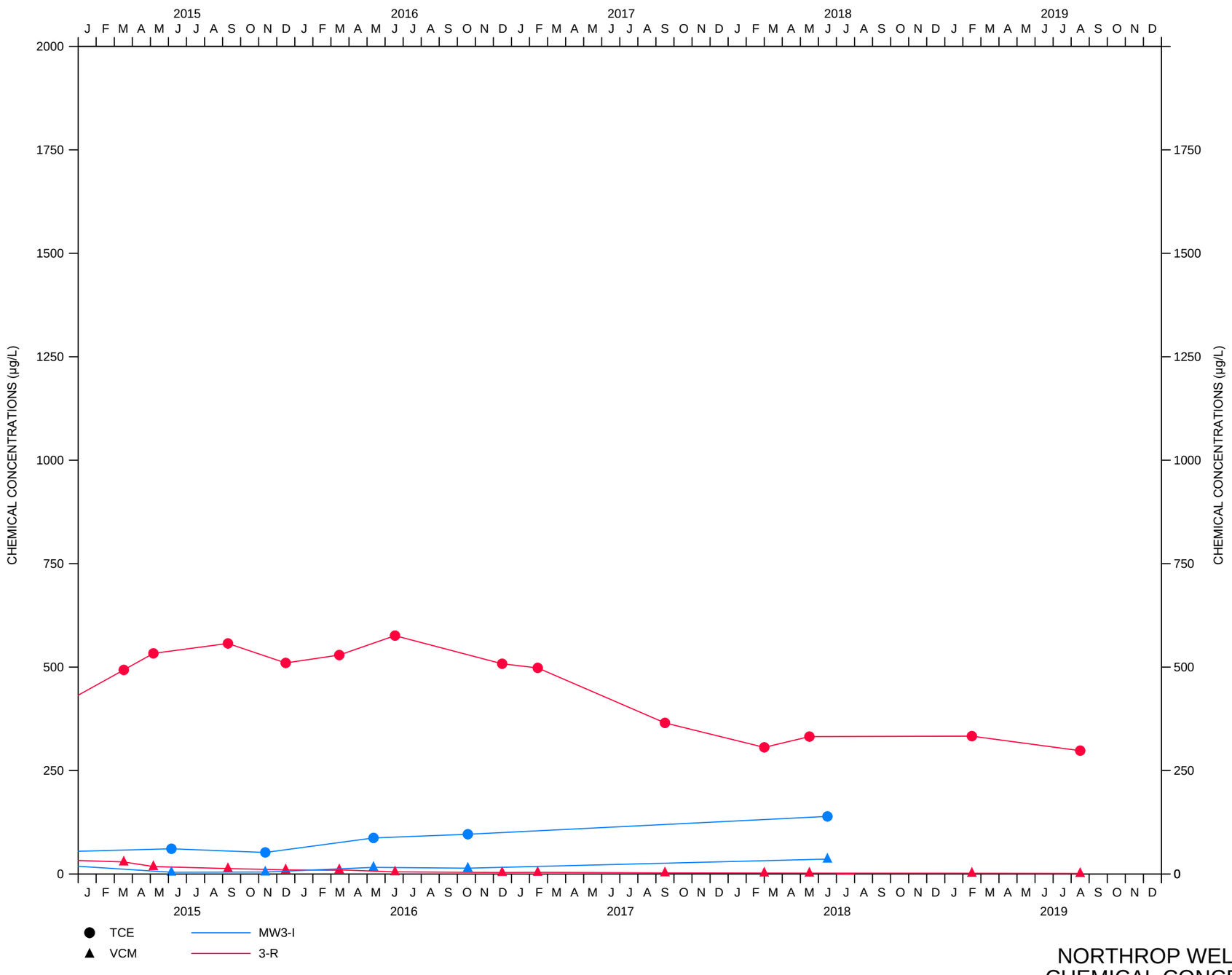

figure 9

NORTHROP WELLS MW3-1 AND 3-R
CHEMICAL CONCENTRATION PLOTS
Hooker/Ruco Site, Hicksville, New York

2019 Summary of Biosparge System O Activities
Operable Unit 3
Hooker/Ruco Site
Hicksville, New York

Date Observed	Description of Issue	Action Taken	Date of Action	Outcome of Action	Notes
1/3/19	Monthly inspection	Check all vaults and components in building on the checklist	1/3/19	No issues, system was off for sampling	
1/8/19	Vault 6 flooded	pumped out vault	1/8/19	water pumped all okay	
2/1/19	Atlas Copco Compressor maintenance due	Completed	2/1/19	Completed	
2/6/19	Monthly inspection	Check all vaults and components in building on the checklist	2/6/19	No issues	
2/8/19	Sampler stuck in MW-63	Fished sampler out of well	2/8/19	Successfully retrieved sampler	
2/22/19	IW-6 not injecting during weekly, noticed leaking water line from air dryer and air filter	inspected vault, break switched off and repaired lines	2/22/19	No leaks, and IW-6 is working again.	
3/14/19	Monthly inspection	Check all vaults and components in building on the checklist	3/14/19	Arm of the door broke due to strong winds. Arm was welded back together on 3/15/19	
4/1/19	Backflow Prevention test due	Scheduled for 4/22/19	4/22/19	Test passed, due April 2020.	
4/8/19	Monthly inspection	Check all vaults and components in building on the checklist	4/26/19	Tubing from the air compressor and and filters are leaking. Re-piped all components with copper pipe. Tested all okay.	
4/26/19	Check system after first restart after sampling. One of the air filters fitting/valve is still causing a small drip.	Resealed until new valve comes in. Ordered new valve		Will replace fitting once it is received.	Fixed 5/8/19
4/29/19	Check system after restart. IW-6, appears to have lost power.	Will check wells before restart on Friday May 3, 2019	5/3/19	equipment appears to be working, possible pressurized lines	Additional wells to test as per Brendan Shaw - •IW-21 (both), has not been working for 2019 but did at the end of 2018 •IW-17 (INT), has not been working for 2019 but did at the end of 2018 •IW-07 (DEEP), has not been working for a while but it used to early last year •IW-05 (both)

2019 Summary of Biosparge System O Activities
Operable Unit 3
Hooker/Ruco Site
Hicksville, New York

Date Observed	Description of Issue	Action Taken	Date of Action	Outcome of Action	Notes
5/3/19	Some of the injection wells will not take any air	Troubleshooting of wells to make sure there isn't flow due to equipment failure	5/3/19	equipment appears to be properly working	possible pressurized aquifer
5/8/19	One of the air filters fitting/valve is still causing a small drip.	Replaced valve on the oil filter	5/8/19	Sealed up and working	
5/10/19	Monthly inspection	Recycle power in IW-6	5/8/19	IW-6 recycled through power, appears to be working	
5/20/19	select injection wells not taking air each week	bleed any residual air off of the water lines	5/20/19	40 psi was removed	air did not repressuriaze the lines after they were bled off.
5/31/19	Troubleshoot IW-6 and IW-18	checked remotely and manually at the vault for any issues. The flow meter in IW-18 does not appear to have power, the actuator in IW-6 is not getting the 'open' command	6/4/19	JVR will be on-site for troubleshooting	
6/4/19	Troubleshoot IW-6 and IW-18	checked remotely and manually at the vault for any issues. The flow meter in IW-18 does not appear to have power, the actuator in IW-6 is not getting the 'open' command	6/4/19	JVR will be on-site for troubleshooting	Met with JVR on 6/4/19. Removed FCI metere from IW-18i. Replaced IW-6D actuator
6/7/19	Troubleshoot IW-5 and IW-17	checked remotely and manually at the vault for any issues.	6/7/19	Lines need to be pressurized prior to start up to get IW-5 working. IW-17 not taking air.	
6/14/19	Flooded vault IW-17	pumped vault	6/14/19	pumped water from vault	
6/20/19	Troubleshoot IW-20i, IW-20D, IW-21i and IW-21D	tested the four actuators	6/20/19	IW-20i - the actuator does have power but I not turning on command. This well will get flow if we get it open. IW-20D - Seems to be running okay, it needs to build up pressure. IW-21i - we can not get any air to push down the well. IW-21D Seems to be working ok.	Fixed for weekend run.
7/3/19	No remote connection to the system	Visited site immediately.	7/3/19	Multiple issues were identifed: phone lines down, alarm company could not connect, atlas compressor alarms, FCI alarm, air dryer over heating	Shut system down for the weekend, revisited on 7/8/19 to reinspect
7/8/19	No remote connection to the system	visited site	7/8/19	Cleared out FCI meter, phone lines were not working verizon needs to upgrade lines	7/15/19 - verizon upgrade lines and fixed all connections
7/23/19	Air dryer was overheating	visited site	7/23/19	On site and repaired the air dryer.	Air dryer temp should be around 35

2019 Summary of Biosparge System O Activities
Operable Unit 3
Hooker/Ruco Site
Hicksville, New York

Date Observed	Description of Issue	Action Taken	Date of Action	Outcome of Action	Notes
7/26/19	Flooded vault 16	pumped vault	7/26/19	pumped water from vault	
8/20/19	Air Dryer leaking	visited the site to inspect	8/20/19	Air dryer is operating properly, the water is condensation from the recent hot weather	
9/2/19	Troubleshooting actuators after weekend run	tested each IW to see if working properly	9/2/19	Need to reschedule with additional crew to physically check	Fixed for weekend run, additional troubleshooting scheduled for 9/13/19
9/9/19	Monthly inspection	Inspection completed	9/9/19	need additional troubleshooting	
9/13/19	Troubleshooting actuators and pressure	assess entire system for air leaks, equipment issues	9/13/19	No leaks, reset schedule in different order to try to building pressure.	Fixed for weekend run
9/27/19	Troubleshooting pressure	assess entire system for leaks, equipment issues	9/27/19	schedule with Atlas Copco for an O&M; schdeule with JVR to asses actuator issues in 16, 20, 21, 22 and to reinstall flow meter in 18	System off for sampling
10/8/19	Atlas Compressor PM	PM was completed	10/8/19	Compressor is working	
10/14/19	Troubleshooting Actuators	Met with JVR for troubleshooring	10/14/19	Adidtional followup necessary	scheduled for November 7, 2019
11/6/19	Vault Repairs - north fence	rewelded two vaults in the north fence parking lot	11/6/19	vaults are flat	Vaults IW-6 and IW-8
11/7/19	Troubleshooting actuators	troubleshooting with JVR	11/7/19	need new acutators	need to schedule replacements with JVR
11/15/19	Monthly inspection	Inspection completed	11/15/19	no additional action items	
12/11/19	Monthly inspection	Inspection completed	12/11/19	no additional action items	
12/30/19	System did not run completely over the weekend	Inspection completed on January 2, 2020	1/2/2020	The comperssor does not appear to be putting out enough pressure. It is running at 100% PRM but only putting out 50 PSI.	Contacted Atlas for them to remote in.

Select Laboratory and Field Parameter Results
Operable Unit 3
Hooker/Ruco Site
Hicksville, New York

Well	Date Sampled	PCE (µg/L)	TCE (µg/L)	VCM (µg/L)	ORP (mV)	DO (mg/L)	Fe^{+2} (mg/L)
Base Wells							
MW-61I [1]	10/24/2006	NA	NA	NA	102	0.00	2.76
	10/25/2006	NA	NA	NA	112	0.41	3.04
	10/26/2006	5 UJ	5 U	2 J	133	0.00	2.49
	11/29/2006	5 U/5U	5 U/5 U	3 J/2 J	60	0.00	1.96
	12/21/2006	5 U/5 U	5 U/5 U	3 J/4 J	118	0.00	2.17
	1/24/2007	5 U	5 U	3 J	101	1.93	1.84
	4/19/2007	19	95	140	124	3.21	0.03
	7/20/2007	5 U	5 U	4	90	0.37	5.19
	10/11/2007	5 U	5 U	2 U	50	3.56	3.12
	1/24/2008	5 UJ	5 U	4.8	86	1.44	3.11
	4/23/2008	2 J	1 J	4	60	0.45	2.83
	7/16/2008	3.7 J	4.7 J	5.0 U	69	2.78	10.82
	10/28/2008	2 J	1 J	4	351	7.11	1.11
	4/8/2009	3.7 J	4.7 J	5.0 U	306	12.18	0.05
	10/15/2009	7.7	11	1.4 J	366	17.66	0.49
	5/10/2010	6.9	7.8 U	1.6 J	120	10.65	0.0
	1/20/2011	5.6/3.7 J	3.9 J/3.7 J	5.0 U/5.0 UJ	266	11.10	0.0
	4/19/2011	4.6 J/4.6 J	3.8 J/4.0 J	5.0 U/ 5.0	249	10.10	0.0
	11/30/2011	3.7 J	3.3 J	5.0 U	NM	12.81	NM
	5/23/2012	2.3 J	3.6 J	5.0 U	NM	NM	NM
	11/5/2012	4.4 J	4.8 J	5.0 U	111	11.23	3.99
MW-61D1 [1]	10/24/2006	NA	NA	NA	110	0.00	2.30
	10/25/2006	NA	NA	NA	107	0.65	3.74
	10/26/2006	5 UJ	5 U	3 J	109	0.00	2.99
	11/29/2006	5 U	5 U	5.7	54	0.00	1.92
	12/21/2006	5 U	5 U	3 J	90	0.00	2.59
	1/23/2007	5 U	5 U	3 J	54	1.21	1.84
	4/19/2007	27	130	200	79	6.66	0.26
	7/20/2007	5 U/5 U	5 U/2 J	4.0/4.0	83	0.44	3.30
	10/10/2007	5 U	5 U	1 J	26	3.39	4.20
	1/24/2008	5 U	5 U	3	78	1.33	3.21
	4/22/2008	5 U	5 U	2 U	60	0.41	2.91
	7/16/2008	5 UJ/5 UJ	5 U/5 U	2/2	87	2.35	2.13
	10/28/2008	2 J	1 J	2 U	335	3.75	0.21
	4/8/2009	3.9J /3.7 J	4.4 J/4.3 J	5.0 U/5.0 U	267	12.77	0.08
	10/15/2009	6.7	9.3	5.0 U	336	10.11	0.96
	5/10/2010	6.3	8.0 U	1.8 J	140	10.15	0.0
	1/20/2011	5.6	3.6 J	5.0 UJ	231	18.80	0.0
	4/19/2011	3.8 J	3.0 J	5.0 U	248	10.38	0.0
	11/30/2011	3.7 J	3.1 J	5.0 U	NM	13.21	NM
	5/23/2012	2.2 J	3.1 J	5.0 U	170	13.55	1.8
	11/5/2012	4.2 J	3.9 J	5.0 U	124	11.85	3.0
MW-61D2 [1]	10/24/2006	NA	NA	NA	37	0.00	0.15
	10/25/2006	NA	NA	NA	27	1.42	5.46
	10/26/2006	150 J	450	5800	62	1.94	4.04
	11/29/2006	39	150	1500	110	11.12	1.91
	12/21/2006	130	490	3400	120	9.28	2.36
	1/23/2007	160	590	3100	131	>20	0.89
	4/23/2007	140	580 J	2000	361	>20	0.21
	7/23/2007	200	640	3500	71	13.45	1.34
	10/11/2007	62	210	610	300	11.71	0.21
	1/24/2008	26	140	46	326	>20	0.78
	4/22/2008	11	89	11	248	14.49	0.09
	7/15/2008	40 J	330	39	173	19.99	0.08

Select Laboratory and Field Parameter Results
Operable Unit 3
Hooker/Ruco Site
Hicksville, New York

Well	Date Sampled	PCE (µg/L)	TCE (µg/L)	VCM (µg/L)	ORP (mV)	DO (mg/L)	Fe^{+2} (mg/L)
MW-61D2 [1] (cont'd)	10/27/2008	25	150	33	381	>20	0.18
	4/9/2009	110	360	450	319	17.47	1.95
	10/14/2009	99	300	19	155	16.29	2.80
	5/10/2010	120	360	240	224	19.51	0.0
	11/16/2010	78	360	380	55	8.75	-2
	4/7/2011	110/70	240/240	18 J/10 J	196	17.58	(2)
	5/23/2012	13 J	110	12	123	8.54	9
	5/2/2013	30	120	13	196	16.37	>5.0
	10/29/2013[5]	30	46	1.2 J	NM	NM	NM
	4/29/2014[5]	51	73	1.2 J	NM	NM	NM
	10/30/2014[5]	40 J	59 J	0.88 J	NM	NM	NM
	4/24/2015[5]	52	150	1.3 J	NM	NM	NM
	10/22/2015	11	18	2.0 U	87	12.28	5.0
	4/26/2016	39	51	2.0 U	69	5.76	0.35
	10/21/2016[5]	28	45	2.0UJ	NM	NM	0.27
	4/28/2017[5]	59	69	1.0U	NM	NM	NM
	10/19/2017[5]	62	55	1.0U	NM	NM	NM
	4/19/2018	85.4	57.1	1.0U	NM	NM	NM
	11/12/2018	85.2	61.6	1.0U	NM	NM	NM
	4/26/2019	160	73	1.0U	NM	NM	NM
	10/16/2019	25.8	23.1	1.0U	-31	1.60	5.00
MW-63D1 [2]	5/24/2010	6.4 J	9.2	35	166	0.00	0.0
	5/1/2013	17	3.4 J	13	232	11.93	1.6
	10/24/2013	3.2 J	5.6	45	208	17.25	0.9
	4/24/2014	9.9	7.3	29	276	11.59	0.0
	7/17/2014	6.9	6	19	158	3.50	3.2
	10/21/2014	5.5	3.8 J	3.2 J	121	6.91	1.5
	4/22/2015	3.4 J	5.0 U	2.0 U	332	5.52	4.3
	10/20/2015	2.3 J	3.7 J	2.0 U	58	33.76	0.8
	4/28/2016	6.1	2.4 J	2.0 U	264	5.22	0.3
	10/19/2016	11	5.0U	2.0UJ	54	14.10	1.8
	5/11/2017	2.1	1.0U	1.0U	192	8.21	0.1
	11/1/2017	4.5	1.7	1.0U	262	5.05	0.1
	5/8/2018	3.29	2.39	1.0U	135	6.23	0.8
	11/8/2018	5.08	2.70	1.0U	62	4.90	0.1
	4/24/2019	7	3	1.0U	117	15.95	0.1
	10/15/2019	6.6	2.4	1.0U	283	11.36	1.5
MW-63D2 [2]	5/24/2010	6.4 J	9.1	46	169	0.00	0.00
	5/1/2013	21	4.0 J	13	229	9.77	1.65
	10/24/2013	3.1 J	5.2	46	-17	11.03	3.86
	4/24/2014	7.9	8.1	29	202	7.95	0.11
	7/17/2014	5.6	6.1	21	125	2.70	3.10
	10/21/2014	5.1	3.7 J	3.2 J	167	6.48	1.20
	4/22/2015	2.7 J	5.0 U	2.0 U	280	6.09	2.30
	10/20/2015	2.4 J	3.6 J	2.0 U	53	35.80	2.97
	4/28/2016	4.9 J	1.6 J	2.0 U	256	5.26	0.07
	10/19/2016	5.0J	5.0U	2.0UJ	164	8.23	0.72
	5/11/2017[5]	3.5	1.1	1.0U	NM	NM	NM
	11/1/2017	4.7	1.8	1.0U	233	6.19	0.00
	5/8/2018	2.81	1.71	1.0U	184	4.62	4.59
	11/8/2018	4.51	2.47	1.0U	205	5.06	0.00
	4/24/2019	5	3	1.0U	277	15.16	0.14
	10/15/2019	3.1	1.9	1.0U	238	16.67	1.75

Select Laboratory and Field Parameter Results
Operable Unit 3
Hooker/Ruco Site
Hicksville, New York

Well	Date Sampled	PCE (µg/L)	TCE (µg/L)	VCM (µg/L)	ORP (mV)	DO (mg/L)	Fe^{+2} (mg/L)
MW-63S [2]	5/21/2010	2.4 J	4.3 J	16	-111	0.00	0.06
	5/23/2013	10	7.8	76	74	4.53	1.33
	11/7/2013	9.4	7.7	5.0 U	7	8.91	3.16
	5/15/2014[5]	7	6	18	NM	NM	0.00
	8/6/2014	5.0 UJ	5.5	7.2	145	5.64	0.10
	11/14/2014	3.5 J	3.8 J	1.5 J	203	7.88	25.0
	5/8/2015	5.5	5.0 U	4.7 J	4	11.79	0.3
	11/9/2015[5]	3.3 J	2.5 J	2.0 U	NM	NM	NM
	5/18/2016[5]	1.9 J	5.0 U	2.0 U	NM	NM	NM
	11/2/2016	5.0UJ	5.0U	2.0UJ	201	9.74	0.3
	4/27/2017	1.0U	1.0U	1.0U	249	11.91	0.5
	10/18/2017	3.9	2.7	1.0U	75	8.82	0.0
	5/23/2018	4.68	4.33	1.0U	197	4.45	1.3
	5/8/2019	6	4	1.0U	209	26.80	0.0
	10/27/2019	2.0	1.6	1.0U	101	13.30	4.1
MW-63I [2]	5/21/2010	5.4 J	8.3	47	-102	0.00	0.0
	5/23/2013	7.9	5.5	29	75	4.40	1.7
	11/7/2013	12	8.2	5.0 U	70	11.37	0.7
	5/15/2014	1.5 J	5.0 U	3.4 J	36	2.83	0.0
	8/6/2014	5.0 UJ	5.9	15	139	2.73	0.5
	11/14/2014	4.5 J	3.3 J	4.2 J	35	8.41	14.5
	5/8/2015	5.8	5.0 U	2.0 U	87	12.34	0.8
	11/9/2015	2.3 J	2.1 J	0.97 J	265	12.19	NM
	5/18/2016	2.7 J	5.0 U	2.0 U	231	13.55	0.4
	11/2/2016	5.0UJ	5.0U	2.0UJ	201	0.46	0.4
	4/27/2017	1.4	1.3	1.0U	247	8.67	NM
	10/18/2017	1.4	1.2	1.0U	210	5.44	0.0
	5/23/2018	1.76	0.78J	1.0U	203	5.96	0.3
	11/20/2018	7.09	5.21	1.0U	149	13.98	0.0
	5/8/2019	3	3	1.0U	212	16.78	0.0
	10/27/2019	3.2	2.2	1.0U	124	12.40	1.5
MW-70D1 [2]	4/11/2011	13	2.0 J	46	-135	0.69	4.0
	10/25/2012	2.0 J	5.0 U	12	NM	NM	NM
	2/4/2013	8.8	2.1 J	43	8	4.80	3.0
	4/26/2013	6.4	2.0 J	26	170	9.35	3.5
	7/23/2013[5]	5.3	1.3 J	16	NM	NM	NM
	10/24/2013	5.8	1.1 J	21	38	12.56	2.8
	1/23/2014	4.2 J	1.9 J	17	-109	5.06	0.0
	4/23/2014	4.1 J	1.2 J	20	76	10.11	0.0
	7/21/2014	6.6	1.0 J	16	48	9.35	0.0
	10/23/2014	4.3 J	0.92 J	19	30	6.24	2.7
	4/24/2015	3.3 J	5.0 U	11	107	14.38	0.0
	10/22/2015	3.5 J	1.6 J	8.8	62	6.00	1.6
	4/27/2016	1.5 J	5.0 U	5.1	-17	0.08	0.4
	10/20/2016[5]	5.0UJ	5.0U	4.7J	NM	NM	0.0
	4/28/2017	1.3J	1.0U	3.7J	-100	3.49	0.5
	10/17/2017	1.1	0.7J	3.2	-15	2.55	0.0
	4/26/2018	1.0U	1.0U	1.0U	62	1.50	>5
	11/6/2018	1.0U	1.0U	0.51J	72	2.08	1.3
	4/25/2019	1.0U	1.0U	1	125	34.01	0.1
	10/14/2019	1.0U	1.0U	1.0U	90	1.59	3.7
MW-70D2 [2]	4/11/2011	47	56	1000	-122	0.66	2.0
	10/25/2012	32	26	190	-4	8.78	3.2
	2/4/2013	62	23	29	27	11.14	0.0
	4/26/2013	51	12	4.2 J	-19	7.89	>5.0
	7/23/2013	49	14	5.0 U	16	1.88	1.2

Select Laboratory and Field Parameter Results
Operable Unit 3
Hooker/Ruco Site
Hicksville, New York

Well	Date Sampled	PCE (µg/L)	TCE (µg/L)	VCM (µg/L)	ORP (mV)	DO (mg/L)	Fe^{+2} (mg/L)
MW-70D2 [2] (cont'd)	10/24/2013	45	13	1.6 J	-17	3.95	0.1
	1/23/2014[5]	20	8.1	5.0 U	NM	NM	NM
	4/23/2014	11	3.8 J	5.0 U	211	11.88	0.0
	7/21/2014	11	1.4 J	5.0 U	-9	9.22	0.0
	10/23/2014	1.8 J	5.0 U	5.0 U	39	3.82	4.5
	4/24/2015	1.6 J	5.0 U	2.0 U	-89	8.70	0.2
	10/22/2015	5.0 U	5.0 U	2.0 U	-21	4.44	NM
	4/27/2016	5.0 U	5.0 U	2.0 U	108	0.00	0.0
	10/20/2016	5.0UJ	5.0U	2.0UJ	59	0.00	0.3
	4/28/2017	1.0U	1.0U	1.0U	-73	0.76	0.0
	10/17/2017	1.0U	1.0U	1.0U	29	0.00	0.0
	4/26/2018	1.0U	1.0U	1.0U	154	3.93	4.9
	11/6/2018	1.0U	1.0U	1.0U	51	1.75	2.4
	4/25/2019	1.0U	1.0U	1.0U	40	16.29	0.0
	11/14/2019	1.0U	1.0U	1.0U	-28	0.64	3.1
MW-72D1 [2]	4/12/2011	13	1.9 J	21	-159	0.57	3.5
	10/25/2012	3.2 J	5.0 U	5.0 U	139	9.82	1.0
	2/4/2013	3.5 J	1.0 J	3.0 J	54	4.65	1.0
	5/1/2013	1.3 J	1.0 J	0.99 J	103	10.48	3.7
	7/23/2013	1.9 J	1.3 J	5.0 U	-11	2.37	>5.0
	10/24/2013	5.0 U	5.0 U	5.0 U	-80	4.60	4.6
	1/24/2014	5.0 U	5.0 U	5.0 U	36	10.78	NM
	4/23/2014[5]	1.3 J	1.6 J	2.9 J	NM	NM	NM
	7/21/2014	5.0 U	5.0 U	5.0 U	-21	10.13	0.0
	10/23/2014	0.74 J	5.0 U	5.0 U	37	4.41	2.6
	4/24/2015	5.0 U	5.0 U	2.0 U	97	13.26	0.5
	10/22/2015	5.0 U	5.0 U	2.0 U	6	6.38	5.0
	4/28/2016	5.0 U	5.0 U	2.0 U	122	3.94	0.1
	10/20/2016	5.0UJ	5.0U	2.0UJ	105	9.86	0.0
	4/27/2017	1.0U	1.0U	1.0U	24	6.03	0.4
	10/19/2017	1.0U	1.0U	1.0U	38	0.00	NM
	4/26/2018	1.0U	1.0U	1.0U	150	3.92	NM
	11/6/2018	1.0U	1.0U	1.0U	116	2.51	0.7
	4/25/2019	1.0U	1.0U	1.0U	12	12.04	0.0
	10/14/2019	1.0U	1.0U	1.0U	147	0.64	4.9
MW-72D2 [2]	4/13/2011	330	5.3	5.0 U	-210	0.37	2.0
	10/25/2012	380	37	5.0 U	76	7.52	0.8
	2/4/2013	850	51	5.0 U	48	7.77	0.4
	5/1/2013	540	16	5.0 U	-32	9.69	>5.0
	7/23/2013	410	35	5.0 U	-134	2.03	3.7
	10/24/2013	480	25	5.0 U	-144	3.20	3.2
	1/24/2014	400	32	5.0 U	67	12.96	NM
	4/23/2014[5]	450	43	5.0 U	NM	NM	NM
	7/21/2014	500	48	0.59 J	-2	9.43	0.3
	10/23/2014	560	54	5.0 U	52	3.03	2.8
	4/24/2015	240	37	2.0 U	42	9.51	0.5
	10/22/2015	190	29	2.0 U	9	4.73	1.9
	4/28/2016	200	23	2.0 U	284	0.72	0.1
	10/20/2016	170	19	2.0UJ	-27	0.00	0.0
	4/27/2017	78	12	1.0U	-82	1.47	0.0
	10/19/2017	85	11	5.0U	93	8.24	0.0
	4/26/2018	57	7.03	1.0U	173	0.33	>5
	11/6/2018	74.9	9.49	1.0U	33	1.97	2.01
	4/25/2019	50	8	1.0U	85	11.79	0
	10/14/2019	39.2	6.9	1.0U	204	4.66	2.82

Select Laboratory and Field Parameter Results
Operable Unit 3
Hooker/Ruco Site
Hicksville, New York

Well	Date Sampled	PCE (µg/L)	TCE (µg/L)	VCM (µg/L)	ORP (mV)	DO (mg/L)	Fe^{+2} (mg/L)
MW-73D1 [2]	4/25/2011	5.0 U	5.0 U	5.0 U	-155	2.56	3.5
	10/26/2012	5.0 U	5.0 U	2.6 J	7	11.93	5.0
	2/13/2013	5.0 U	5.0 U	5.0 U	296	9.91	0.0
	5/1/2013	5.0 U	5.0 U	5.0 U	-44	10.87	>5.0
	7/24/2013	1.9 J	5.0 U	5.0 U	-128	0.86	3.0
	10/25/2013	1.9 J	5.0 U	5.0 U	-51	2.94	0.3
	1/24/2014	5.0 U	5.0 U	5.0 U	143	14.42	NM
	4/24/2014	5.0 U	5.0 U	5.0 U	140	3.56	0.8
	7/18/2014	0.85 J	5.0 U	5.0 U	21	1.22	0.0
	10/30/2014	5.0 U	5.0 U	5.0 U	203	24.68	0.0
	4/24/2015	1.5 J	5.0 U	0.75 J	59	15.86	NM
	10/26/2015	2.5 J	5.0 U	2.0 U	63	8.44	0.1
	4/27/2016	2.9 J	5.0 U	2.0 U	134	1.70	0.9
	10/21/2016	4.3J	5.0U	2.0UJ	49	4.29	0.1
	4/28/2017	2.1J	1.0U	1.0U	16	2.23	1.6
	10/19/2017	1.7	0.5J	1.0U	22	1.61	0.0
	4/26/2018[5]	1.38/1.31	1.0U/1.0U	1.0U/1.0U	NM	NM	NM
	11/6/2018	1.25	1.0U	1.0U	80	2.94	2.6
	4/24/2019	0.2J	1.0U	1.0U	104	11.37	0.0
	10/14/2019	2.6	1.0U	1.0U	187	0.87	5.0
MW-73D2 [2]	4/25/2011	38	20	1400	-53	1.86	3.5
	10/26/2012	52	19	130	12	8.07	5.0
	2/13/2013	60	23	22	332	12.53	0.0
	5/1/2013	26	12	16	-95	7.63	>5.0
	7/24/2013	60	17	3.0 J	-29	1.95	3.6
	10/25/2013	13	6.1	0.62 J	-32	1.74	1.3
	1/24/2014[5]	6.3	5.7	1.1 J	NM	NM	NM
	4/24/2014	5.3	2.0 J	5.0 U	130	8.71	0.0
	7/18/2014	2.8 J	5.0 U	5.0 U	1	1.37	0.0
	10/30/2014	35	11	5.0 U	55	7.73	>5.0
	4/24/2015	8.5	5.0 U	2.0 U	-58	9.53	1.4
	10/26/2015	9.2	4.0 J	2.0 U	45	12.23	0.5
	4/27/2016	13	5.2	2.0 U	92	5.38	0.0
	10/21/2016	29	11	2.0UJ	24	0.93	0.0
	4/28/2017	34J	7.8J	1.0U	-37	3.86	0.0
	10/19/2017	7.2	2.5	1.0U	35	3.55	0.0
	4/26/2018	10.9	3.22	1.0U	NM	NM	NM
	11/6/2018	4.46	1.67	1.0U	147	3.24	>5
	4/24/2019	0.7J	0.4J	1.0U	NM	NM	NM
	10/14/2019	2.6	1.3	1.0U	65	0.87	5.0
MW-75D1 [2]	12/1/2011	51	23 J	960	NM	3.20	NM
	10/24/2012	32	18	1100	-35	9.41	1.6
	2/4/2013	39	16	1500	-48	6.09	0.0
	4/30/2013	25	7	510	1	11.07	4.1
	7/24/2013	17	6.3	120	-138	1.32	2.2
	10/24/2013	7	2.6 J	28	48	11.80	3.2
	1/24/2014	3.2 J	2.0 J	10	40	12.51	NM
	4/23/2014[5]	6.3	4.9 J	9	NM	NM	NM
	7/18/2014[5]	10	4.9 J	46	NM	NM	NM
	10/23/2014	9.4	2.8 J	66	47	3.23	>5.0
	4/22/2015	5.1	5.0 U	7.2	117	4.08	NM
	10/22/2015	5.0 U	5.0 U	2.0 U	191	6.86	5.0
	4/28/2016	4.2 J	2.4 J	2.0 U	194	0.00	0.1
	10/20/2016	5.0UJ	5.0U	2.0UJ	228	6.07	0.0
	4/27/2017	1.7	2.1	1.0U	-85	2.54	0.1
	10/18/2017[5]	NS	NS	NS	-61	0.00	0.0

Select Laboratory and Field Parameter Results
Operable Unit 3
Hooker/Ruco Site
Hicksville, New York

Well	Date Sampled	PCE (µg/L)	TCE (µg/L)	VCM (µg/L)	ORP (mV)	DO (mg/L)	Fe^{+2} (mg/L)
MW-75D1 [2] (cont'd)	11/1/2017	3.7	3.3	1.0U	NS	NS	NS
	5/4/2018[5]	1.55/1.68	1.21/1.0U	1.0U/1.0U	NM	NM	NM
	11/6/2018	1.25	1.11	1.0U	35	2.14	0.7
	4/25/2019	0.9J	1	1.0U	146	23.47	0.1
	10/14/2019	1.0U	1.8	1.0U	77	1.47	5.0
MW-75D2 [2]	12/1/2011	44	88	680	NM	10.91	NM
	10/24/2012	34	63	600	-23	2.63	0.0
	2/4/2013	46	76	870	-55	16.33	0.0
	4/30/2013	47	58	530	26	12.20	3.9
	7/24/2013	56	87	560	-136	1.32	2.2
	10/24/2013	27	42	460	-92	5.56	0.0
	1/24/2014	26	45	330	0	12.93	NM
	4/23/2014[5]	31	47	260	NM	NM	NM
	7/18/2014	20	32	220	-37	10.65	0.0
	10/23/2014	17 J	35 J	190 J	6	2.68	3.5
	4/22/2015	9.3	19	150	-82	4.19	1.4
	10/22/2014[5]	8.3	8.6	87	NM	NM	NM
	4/28/2016	1.5 J	5.0 U	78	-41	0.98	0.3
	10/20/2016	5.0UJ	5.0U	18J	-140	0.00	0.0
	4/27/2017	1.0U	1.6J	7.6J	-92	4.60	0.1
	10/18/2017	0.7J	0.7J	5	103	0.00	0.3
	5/4/2018	0.42J	0.46J	3.27	161	0.00	3.6
	11/6/2018	1.0U	0.86J	4.9	89	1.87	3.6
	4/25/2019	0.8J	0.6J	4	1	16.65	0.0
	10/14/2019	1.0U	1.0U	5	-104	0.72	5.0
MW-76S [2]	4/6/2011	5.0 U	5.0 U	2.4 J	-148	0.78	7.0
	10/25/2012	5.0 U	5.0 U	9.2	45	9.18	1.6
	2/6/2013	5.0 U	5.0 U	19	NM	NM	NM
	4/24/2013[5]	5.0 U	5.0 U	5.9	-70	5.76	1.25
	7/23/2013	0.95 J	5.0 U	5.0 U	-157	1.71	2.90
	10/25/2013	5.0 U	5.0 U	2.3 J	-1	4.33	0.56
	1/24/2014	1.0 J	5.0 U	2.0 J	125	12.79	0.0
	4/23/2014	2.0 J	5.0 U	5.0 U	228	4.29	0.0
	7/18/2014[5]	1.3 J	5.0 U	7.5	NM	NM	NM
	10/21/2014[5]	1.1 J	5.0 U	1.5 J	NM	NM	NM
	4/22/2015	5.0 U	5.0 U	2.0 U	236	5.52	2.2
	10/22/2015	1.4 J	5.0 U	2.0 U	42	5.77	4.8
	4/27/2016	1.4 J	5.0 U	2.0 U	180	2.26	0.0
	10/20/2016	5.0UJ	5.0U	2.0UJ	62	5.70	0.0
MW-76I [2]	4/8/2011	5.0 U	5.0 U	1000	159	1.48	4.0
	10/25/2012	1.1 J	5.0 U	240	-23	8.51	4.25
	2/6/2013	5.0 U	5.0 U	81	4	16.35	2.2
	4/24/2013	5.0 U	5.0 U	50	-74	4.9	>5.0
	7/23/2013	5.0 U	5.0 U	13	0	2.14	2.9
	10/25/2013	5.0 U	5.0 U	5.1	4	3.56	0.5
	1/24/2014	0.70 J	5.0 U	3.2 J	-8	12.62	0.7
	4/23/2014	5.0 U	5.0 U	1.5 J	106	5.08	0.05
	7/18/2014[5]	0.74 J	5.0 U	0.96 J	NM	NM	NM
	10/21/2014	0.96 J	5.0 U	0.62 J	73	3.48	3.30
	4/22/2015	5.0 U	5.0 U	2.0 U	-216	4.43	NM
	10/22/2015	1.5 J	1.2 J	2.0 U	16	5.48	5.00
	4/27/2016	1.4 J	5.0 U	2.0 U	78	4.62	0.00
	10/20/2016	5.0UJ	5.0U	2.0UJ	17	0.27	0.00
	10/17/2017	1.6	1.5	1.0U	-28	0	0.62
	11/6/2018	1.36	0.75J	1.0U	NM	NM	NM

Select Laboratory and Field Parameter Results
Operable Unit 3
Hooker/Ruco Site
Hicksville, New York

Well	Date Sampled	PCE (µg/L)	TCE (µg/L)	VCM (µg/L)	ORP (mV)	DO (mg/L)	Fe^{+2} (mg/L)
MW-76D1 [2]	4/11/2011	14	1.1 J	52	-123	0.98	2.0
	10/25/2012	6.2	5.0 U	52	-14	8.32	5.00
	2/6/2013	8.7	5.0 U	28	-16	10.47	3.00
	4/30/2013[5]	6.4	1.1 J	17	NM	NM	NM
	7/23/2013	4.6 J	1.0 J	13	-148	7.76	3.94
	10/25/2013	5.6	1.1 J	15	97	11.27	0.08
	1/24/2014	4.2 J	1.4 J	9.9	-117	5.04	NM
	4/23/2014	4.1 J	5.0 U	9.5	153	5.70	0.05
	7/21/2014	5.0 U	5.0 U	3.8 J	143	6.96	1.00
	10/21/2014	6.6	1.1 J	7	73	2.87	2.60
	4/22/2015	3.1 J	5.0 U	5.4	17	4.26	1.20
	10/22/2015	4.1 J	1.3 J	3.9	-75	19.54	1.68
	4/27/2016	2.3 J	5.0 U	2.3	-77	1.00	0.00
	10/20/2016	2.1J	5.0U	2.0UJ	-171	0.00	0.00
	4/27/2017	1.2	1.0U	1.5	-57	1.61	0.00
	10/17/2017	1.9	0.6J	1.8	-34	0.00	0.00
	4/26/2018	0.55J	0.45J	1.0U	32	1.11	>5
	11/6/2018	1.53	0.51J	0.4J	75	1.64	1.87
	4/25/2019	0.9J	0.4J	1	-120	11.83	0.07
	10/17/2019	1.0U	1.0U	7.7	-47	0.14	5.00
MW-76D2 [2]	4/8/2011	74	42	1100	-59	1.37	4.8
	10/25/2012	44	25	650	-19	8.71	0.0
	2/6/2013	63	25	1500	-76	16.45	0.0
	4/30/2013	51	12	19	15	14.13	2.2
	7/23/2013	52	27	5.0 U	-73	2.65	>5.0
	10/25/2013	45	19	4.9 J	13	5.07	5.1
	1/24/2014[5]	40	18	7.6	NM	NM	NM
	4/23/2014	78	17	5.0 U	164	6.23	0.18
	7/21/2014	80	18	0.79 J	91	8.53	0.49
	10/21/2014	26	18	0.72 J	103	7.54	>5.0
	4/22/2015	60	25	2.0 U	-66	4.25	NM
	10/22/2015	3.6 J	1.0 J	2.0 U	-60	4.10	5.00
	4/27/2016	2.8 J	1.0 J	2.0 U	51	5.90	0.00
	10/20/2016	5.0UJ	5.0U	2.0UJ	-23	1.06	0.00
	4/27/2017	4.1J	1.0J	1.0U	-23	1.14	0.38
	10/17/2017[5]	5.6	2.6	1.0U	NM	NM	NM
	4/26/2018[5]	25.8	13	1.0U	NM	NM	NM
	11/6/2018	1.40	0.74J	1.0U	23	2.84	1.76
	4/25/2019	1	0.8J	1.0U	105	9.62	0.00
	10/17/2019	1.0U	1.0U	1.0U	34	3.70	5.00
MW-77D1	4/14/2011	1.6 J	1.7 J	6.2	-194	0.24	3.5
	10/25/2012	2.4 J	5.0 U	16	5	9.93	0.0
	2/6/2013[5]	7.8	5.0 U	24	NM	NM	NM
	4/26/2013	4.1 J	1.0 J	17	-64	8.03	3.52
	7/24/2013[5]	2.6 J/2.7 J	0.54 J/0.56 J	3.5 J/3.7 J	NM	NM	NM
MW-77D2 [2]	4/14/2011	20	28	140	-111	0.72	4.0
	10/25/2012	5.2	12	80	-35	14.28	0.0
	2/6/2013[5]	17/17	11/11	99/100	NM	NM	NM
	4/26/2013	10	7.4	150	-141	5.39	>5.0
	7/24/2013	15	22	13	-79	2.06	1.46
	10/25/2013	40	18	5.0 U	27	11.71	1.17
	1/23/2014	66	28	1.4 J	-107	12.21	1.20
	4/24/2014	33	18	5.0 U	46	3.49	0.0
	7/18/2014	52	19	5.0 U	78	1.37	0.0

Select Laboratory and Field Parameter Results
Operable Unit 3
Hooker/Ruco Site
Hicksville, New York

Well	Date Sampled	PCE (µg/L)	TCE (µg/L)	VCM (µg/L)	ORP (mV)	DO (mg/L)	Fe^{+2} (mg/L)
MW-77D2 [2] (cont'd)	10/21/2014	150	21	5.0 U	174	3.71	>5.0
	4/24/2015	120	23	2.0 U	170	13.50	0.0
	10/23/2015[5]	57	21	0.74 J	NM	NM	NM
	4/27/2016	71	20	2.0 U	189	5.50	0.3
	10/21/2016	170	37	2.0UJ	99	8.05	0.1
	4/27/2017	140J	41J	1.0U	101	5.37	0.0
	10/18/2017	164	32	5.0U	101	0.46	0.1
	4/26/2018	131	25.6	1.0U	223	8.12	NM
	11/8/2018	66.2	13.3	1.0U	42	3.33	3.3
	4/24/2019	63	11	1.0U	173	10.10	0.0
	10/14/2019	47.4	9.8	1.0U	208	3.75	5.0
MW-81D1 [1]	10/24/2006	NA	NA	NA	15	2.26	3.23
	10/25/2006	NA	NA	NA	-55	3.01	9.76
	10/26/2006	15 J	18	790	-25	0.00	10.12
	1/29/2007	8	9	690	-55	2.26	2.36
	4/19/2007	20/21	61/61	580/550	-128	0.00	2.06
	7/23/2007	54	190	490	-22	0.74	5.19
	10/9/2007	39	110	620	-77	3.08	4.98
	4/21/2008	14	54	2	-99	0.92	2.69
	10/28/2008	54/54	130/130	3/2	292	17.31	2.04
	4/7/2009	14	48	71	158	0.04	5.52
	10/15/2009	28	170	2.4 J	216	8.90	0.71
	5/6/2010	16	99	180	72	0.00	2.2
	11/17/2010	24	110	1.1 J	327	3.54	0.0
	4/7/2011	20	73	190	27	0.48	2.2
	11/30/2011	13	85	0.71 J	NM	12.58	NM
	5/23/2012	7.3 J	41	0.95 J	80	9.90	0.44
	11/5/2012	14	86	310	112	12.24	2.88
	5/2/2013[5]	44	190	5.0 U	NM	NM	NM
	10/28/2013	64	190	7.5	-137	8.41	0.68
	4/29/2014	97	220	1.8 J	146	8.94	0.00
	10/30/2014	96 J	190 J	6.3 J	87	19.39	0.12
	4/24/2015[5]	97	160	1.3 J	NM	NM	NM
	10/21/2015	82	120	2.0 U	43	7.42	1.35
	4/26/2016[5]	70	110	1.8 J	NM	NM	1.03
	10/21/2016	45	53	2.1J	138	12.43	1.74
	4/28/2017	70	91	1.8	138	10.66	0.10
	10/19/2017	54	92	5.0U	117	24.82	0.00
	4/19/2018	64.6	206	5.0U	194	13.14	4.76
	11/13/2018	90.7	107	0.43J	130	5.12	2.35
	4/25/2019	68	150	1.0U	92	32.82	0.00
	10/16/2019	58	137	1.2	215	13.34	3.76
MW-81D2 [1]	10/24/2006	NA	NA	NA	78	16.87	2.37
	10/25/2006	NA	NA	NA	73	17.96	0.40
	10/26/2006	5 J	26	4 J	93	15.00	0.74
	1/24/2007	6.2	32	5	-39	2.90	0.98
	4/18/2007	1 J	14	4 J	-110	0.00	2.71
	7/19/2007	15	130	40	48	14.10	1.48
	10/10/2007	13	81	37	35	7.45	9.39
	4/18/2008	2 J	20	2 U	81	4.23	0.45
	10/22/2008	6	32	2	107	>20	0.09
	4/7/2009	13	150	2.4 J	326	10.58	0.45
	10/14/2009	6.7	53	5.5	227	18.39	0.50
	5/10/2010	14	63	5.0 U	93	9.69	0.50
	11/16/2010	21/21	130/130	5.0 U/5.0 U	254	13.28	1
	4/7/2011	67	470	25 U	85	2.92	0.0
MW-81D2 [1] (cont'd)	11/30/2011	10	130	5.0 U	NM	11.01	NM

Select Laboratory and Field Parameter Results
Operable Unit 3
Hooker/Ruco Site
Hicksville, New York

Well	Date Sampled	PCE (µg/L)	TCE (µg/L)	VCM (µg/L)	ORP (mV)	DO (mg/L)	Fe^{+2} (mg/L)
	5/23/2012	1.2 J	18	5.0 U	64	10.23	1.8
	11/5/2012	9.1	110	1.4 J	NM	NM	NM
	5/2/2013	1.9 J	11	5.0 U	46	17.28	3.9
	10/28/2013	1.4 J	12	5.0 U	NM	2.97	0.0
	4/29/2014	5.8	29	5.0 U	119	8.94	0.0
	10/30/2014	18	77	5.0 U	86	15.60	NM
	4/24/2015	150	170	2.0 U	-61	5.18	1.5
	10/21/2015	120	130	2.0 U	90	7.21	1.9
	4/26/2016	95	30	2.0 U	43	6.46	0.0
	10/21/2016(5)	43	13	2.0UJ	NM	NM	1.1
	4/28/2017	110J	30J	1.0U	37	2.76	0.2
	10/19/2017	76	13	5.0U	108	0.00	0.0
	4/19/2018	84.4	16.8	1.0U	241	1.41	2.2
	11/13/2018	4.09	0.65J	1.0U	52	1.95	3.3
	4/25/2019	61	8	1.0U	17	14.62	0.0
	10/16/2019	54.9	3.5	1.0U	207	6.57	1.8
MW-82D1 (1)	10/24/2006	NA	NA	NA	-119	1.93	6.14
	10/25/2006	NA	NA	NA	-154	0.00	9.36
	10/26/2006	8 J	4 J	1100	-142	2.77	6.32
	11/30/2006	8.8	7.9	1900	-158	0.00	1.86
	12/20/2006	8.2	15	2500	-149	0.00	1.98
	1/25/2007	50	130	5500	-145	1.21	1.94
	4/20/2007	5 U	5 U	860	-153	0.76	2.79
	7/25/2007	120	780 J	3600	95	15.15	2.58
	10/18/2007	19	24	430	125	0.73	5.25
	1/23/2008	14/14	48/49	1600/1600	-38	1.89	5.82
	4/25/2008	38	160	85	108	0.13	1.49
	7/18/2008	64	230	2.2	96	3.38	NM
	10/30/2008	110	230	790	309	<20	NM
	4/13/2009	47	160	1.7 J	328	5.35	0.21
	10/20/2009	21	84	5.0 U	231	8.08	0.26
	5/12/2010	16	64	5.0 U	53	7.01	0.0
	11/17/2010	110	63	3.2 J	307	8.00	NM
	5/19/2011	33/32	48/49	72/76	277	6.70	0.0
	12/1/2011	12	23	9.8	NM	14.35	NM
	5/23/2012	13 J	28	1.0 J	138	7.91	5.0
	10/26/2012	17	23	34	95	7.18	0.67
	5/1/2013(5)	14	18	41	NM	NM	NM
	10/25/2013(5)	14	18	12	NM	NM	NM
	4/25/2014	16	20	1.7 J	177	5.83	0.00
	10/30/2014	32 J	27 J	0.84 J	56	6.75	1.40
	4/24/2015	28	24	0.95 J	7	16.00	0.00
	10/21/2015	26	21	2.0 U	-31	11.27	1.59
	4/26/2016	37	21	2.0 U	98	9.29	1.08
	10/19/2016	24	22	2.0UJ	-7	12.23	0.14
	4/25/2017	31	18	1.0U	79	15.24	0.00
	10/17/2017	21	15	1.0U	100	14.37	0.00
	4/20/2018	NA	NA	NA	124	11.72	2.81
	11/8/2018	1.16	1.12	1.0U	37	1.04	1.04
	4/24/2019	10	14	4	126	11.54	0.47
	10/15/2019	8.4	11.5	2.1	150	15.23	5.00
MW-82D2 (1)	10/24/2006	NA	NA	NA	-166	0.38	10.44
	10/25/2006	NA	NA	NA	-95	1.98	11.64
	10/26/2006	61 J	48	1300	-110	3.37	8.60
	11/30/2006	88	78	1300	-179	0.00	2.31

Select Laboratory and Field Parameter Results
Operable Unit 3
Hooker/Ruco Site
Hicksville, New York

Well	Date Sampled	PCE (µg/L)	TCE (µg/L)	VCM (µg/L)	ORP (mV)	DO (mg/L)	Fe^{+2} (mg/L)
MW-82D2 [1] (cont'd)	12/20/2006	52	50	600	-178	0.00	0.34
	1/25/2007	150	110	180	-147	1.70	2.01
	4/20/2007	130	91	47	-183	0.61	1.91
	7/25/2007	320 J	170 J	80	-192	0.50	6.56
	10/18/2007	34	3 J	2100	-359	2.93	1.22
	1/23/2008	150	84	160	-147	1.51	4.74
	4/24/2008	25	18	5	-352	0	2.43
	7/18/2008	21	14	10	-472	0.00	16.32
	10/30/2008	110	230	790	-3	0.84	3.01
	4/13/2009	130	91	3.5 J	282	>20	0.05
	10/20/2009	86	56	96	-260	0.07	1.13
	5/12/2010	100	92	7.1	-137	0.00	1.0
	11/18/2010	71	74	8.3	276	0.83	1.2
	4/27/2011	90	58	5.0 U	-19	3.38	1
	12/1/2011	42	46	6.7	NM	11.74	NM
	5/23/2012	9.1 J	22	5.0 U	123	7.97	5
	10/26/2012	11	17	3.1 J	56	>20	3.2
	5/1/2013	7.5	5.0 J	5.0 U	238	8.33	>5.0
	10/25/2013	4.2 J	3.9 J	5.0 U	-127	11.22	0
	4/25/2014	3.0 J	3.9 J	5.0 U	73	3.38	0.13
	10/30/2014	6.2	4.7 J	5.0 U	76	0.88	0
	4/24/2015	7.3	5.0 U	2.0 U	132	15.04	0
	10/21/2015	6.0	5.3	2.0 U	-61	13.98	2.9
	4/26/2016	3.2 J	3.4 J	2.0 U	62	0.34	0.0
	10/19/2016	5.0UJ	5.0U	2.0UJ	-13	4.34	0.3
	4/25/2017	1.0U	1.0U	1.0U	89	24.76	0.2
	10/17/2017	1.0U	1.0U	1.0U	-24	2.38	0.1
	4/20/2018	0.36J	0.41J	1.0U	119	11.77	<5
	11/8/2018	13.1	11.8	1.0U	113	6.52	0.2
	4/24/2019	0.7J	0.8J	1.0U	142	10.16	0.1
	10/15/2019	1.0U	1.0U	1.0U	123	5.29	3.8
MW-83D1 [1]	10/24/2006	NA	NA	NA	70	0.00	1.94
	10/25/2006	NA	NA	NA	-146	0.00	0.23
	10/26/2006	31	290	140	-64	2.06	0.06
	1/30/2007	44	320	130	6	1.74	0.01
	4/18/2007	5 U	29	7.7	-70	0.00	0.0
	7/17/2007	130	360	310	-14	0.41	0.04
	10/12/2007	68	200	220	64	3.00	0.13
	1/22/2008	140	420	51	174	8.34	0.12
	4/17/2008	40	160	2	151	2.32	0.03
	7/15/2008	130 J	340	34	216	1.91	NM
	10/24/2008	110/110	200/200	2/2	291	8.31	0.04
	4/8/2009	80	190	4.3 J	274	1.44	0.09
	10/14/2009	110	260	3.8 J	361	13.17	0.41
	5/5/2010	96	240	260	284	3.50	NM
	11/15/2010	39	180	13	271	9.14	0.0
	4/7/2011	52 J	180 J	30 J	135	4.18	0.0
	11/30/2011	13	150	8.4	NM	>20	NM
	5/23/2012	9.8 J	120	1.2 J	132	12.32	0.0
	10/24/2012	25	180	5.0 U	276	7.22	0.0
	5/1/2013	30	290	1.4 J	212	19.10	2.9
	10/29/2013	45	200	9	NM	13.65	0.5
	4/29/2014[5]	40	210	2.1 J	NM	NM	NM
	10/30/2014	50 J	200 J	2.6 J	112	11.80	1.2
	4/24/2015	37	41	2.0 U	181	17.82	0.2
	10/22/2015	48	140	1.5 J	59	7.04	1.2
	4/26/2016	55	120	1.1 J	109	7.63	0.1

Select Laboratory and Field Parameter Results
Operable Unit 3
Hooker/Ruco Site
Hicksville, New York

Well	Date Sampled	PCE (µg/L)	TCE (µg/L)	VCM (µg/L)	ORP (mV)	DO (mg/L)	Fe^{+2} (mg/L)
MW-83D1 [1] (cont'd)	10/21/2016	59	100	2.0UJ	128	10.05	0.1
	4/28/2017	63J	110J	1.2J	68	10.60	0.7
	10/20/2017	89	173	2.0UJ	116	15.19	0.0
	4/19/2018	38.8	133	5.0U	180	10.42	4.3
	11/12/2018	51.5	67.3	1.0U	87	6.44	>5
	4/26/2019	99	66	1.0U	69	15.46	0.0
	10/16/2019	71.6	141	1.6	140	20.79	5.0
MW-83D2 [1]	10/24/2006	NA	NA	NA	241	>19.99	9.88
	10/25/2006	NA	NA	NA	179	>20	0.0
	10/26/2006	17	110	74	171	>20	0.06
	1/29/2007	13	75	22	249	13.20	0.0
	4/18/2007	3 J	23	1 J	97	0.00	0.0
	7/17/2007	7.9	43	1 J	289	>19.99	0.08
	10/15/2007	2 J	10	2 U	279	11.44	0.23
	1/22/2008	3	12	2 U	328	>20	0.14
	4/17/2008	5/4 J	22/21	2 U/2 U	295	>20	0.04
	7/15/2008	8.3 J	46	2 U	270	8.50	0.04
	10/21/2008	2 J	14	2 U	297	0.92	0.00
	4/8/2009	5.2	30	5.0 U	370	20.00	0.01
	10/13/2009	6	34	5.0 U	380	19.81	0.01
	5/6/2010	18	110	5.0 U	190	11.32	NM
	11/16/2010	6.2	42	5.0 U	370	16.45	0.0
	4/7/2011	17	96	5.0 U	249	17.54	0.0
	11/30/2011	12/12	98/150	5.0 U/8.1	NM	16.99	NM
	5/23/2012	1.8 J	21	5.0 U	79	12.67	0.0
	10/24/2012	7	71	5.0 U	225	9.81	0.0
	5/1/2013	28	74	5.0 U	162	12.34	1.0
	10/29/2013	40	170	5.0 U	-63	8.73	0.3
	4/29/2014	19	100	5.0 U	172	8.38	0.0
	10/30/2014[5]	43 J	150 J	5.0 U	NM	NM	NM
	4/24/2015	27	94	2.0 U	240	19.73	0.6
	10/22/2015[5]	53	120	2.0 U	NM	NM	NM
	4/26/2016	66	140	2.0 U	129	1.30	0.0
	10/21/2016[5]	93	170	2.0UJ	NM	NM	0.4
	4/28/2017	120J	190J	1.0U	97	4.25	0.5
	10/20/2017	104	156	2.0UJ	143	1.93	0.2
	4/19/2018	66	95.4	5.0U	223	6.97	3.7
	11/12/2018	88.2	118	1.0U	46	5.61	2.3
	4/26/2019	78	100	1.0U	162	13.60	0.0
	10/16/2019	96	127	1.0U	248	8.07	2.5
MW-84D1 [1]	10/24/2006	NA	NA	NA	50	7.89	1.44
	10/25/2006	NA	NA	NA	86	8.03	1.37
	10/26/2006	47	350	430	78	6.51	1.19
	1/30/2007	66	640	150	160	7.53	1.24
	4/24/2007	32	560	11	282	>20	0.05
	7/24/2007	47	180	12	301	>20	0.05
	10/17/2007	15/15	48/56	2.1/2.4	304	8.81	0.62
	1/28/2008	19	32	2 U	303	>20	0.0
	4/24/2008	3 J	4 J	2 U	210	0.6	0.03
	7/17/2008	7.1	12	2 U	95	14.51	0.13
	10/29/2008	7	7	2 U	319	12.18	0.0
	4/9/2009	23	24	5.0 U	214	13.34	0.0
	10/19/2009	5.0 U	2.3 J	5.0 U	271	10.98	0.19
	5/12/2010	1.4 J	5.0 U	5.0 U	127	9.85	NM
	11/18/2010	3.9 J	3.5 J	5.0 U	207	7.94	NM
	4/27/2011	27/33	8.5/10	5.0 U/5.0 U	210	7.54	NM

Select Laboratory and Field Parameter Results
Operable Unit 3
Hooker/Ruco Site
Hicksville, New York

Well	Date Sampled	PCE (µg/L)	TCE (µg/L)	VCM (µg/L)	ORP (mV)	DO (mg/L)	Fe^{+2} (mg/L)
MW-84D1 [1] (cont'd)	12/1/2011	94	35	0.52 J	NM	13.98	NM
	5/24/2012	4.3 J	4.4 J	5.0 U	185	10.30	0.00
	10/26/2012	80	54	5.0 U	72	7.29	1.08
	5/1/2013	81	29	5.0 U	250	12.62	0.72
	10/25/2013	83	35	5.0 U	23	12.48	1.50
	4/25/2014	41	30	5.0 U	134	6.86	0.26
	10/23/2014	51	25	5.0 U	110	7.66	2.00
	4/24/2015	54	21	2.0 U	169	14.19	0.00
	10/21/2015	50	23	2.0 U	-9	6.83	2.76
	4/26/2016	23	18	2.0 U	168	3.91	0.88
	10/20/2016	33	19	2.0UJ	-10	6.52	0.00
	4/25/2017	15	12	1.0U	89	17.68	0.00
	10/17/2017	21	11	1.0U	120	2.87	0.54
	4/19/2018	3.35	1.43	1.0U	162	7.29	2.57
	11/13/2018	3.6	0.72J	1.0U	195	4.39	1.80
	4/24/2019	0.5J	0.3J	1.0U	252	28.87	0.00
	10/15/2019	8.4	7.4	1.0U	148	2.56	2.34
MW-84D2 [1]	10/24/2006	NA	NA	NA	-90	4.69	1.53
	10/25/2006	NA	NA	NA	-47	2.84	0.27
	10/26/2006	19 J	92	140	-77	2.67	0.64
	1/29/2007	15	94	150	7	3.91	0.18
	4/24/2007	69	510	33	138	16.31	0.30
	7/24/2007	59	440	20	139	>20	0.21
	10/17/2007	16	170	7.1	34	4.68	0.23
	1/28/2008	27	250 J	5	97	9.91	0.79
	4/23/2008	11	100	2 U	6	3.96	0.09
	7/17/2008	20	130	2 U	13	14.05	0.27
	10/29/2008	21	110	2 U	160	8.33	0.25
	4/9/2009	15 J	74 J	5.0 U	70	10.15	0.08
	10/16/2009	14	110	5.0 U	135	14.65	1.45
	5/25/2010	23 J	190	1.6 J	-20	11.75	0.0
	11/18/2010	8.6	79	5.0 U	-21	0.79	0.0
	4/15/2011	1.0 J	9.4	5.0 U	-49	0.37	0.0
	12/1/2011	7.7	110	5.0 U	NM	11.00	NM
	5/24/2012	5.7	75	5.0 U	114	4.83	0.5
	10/26/2012	5.4	65	5.0 U	-28	3.14	5.0
	5/1/2013[5]	50	170	5.0 U	NM	NM	NM
	10/25/2013	21	120	5.0 U	-45	12.51	NA
	4/25/2014	28	150	5.0 U	21	1.72	0.26
	10/23/2014	19	100	5.0 U	54	3.49	1.30
	4/24/2015	22	92	2.0 U	89	8.35	0.00
	10/21/2015	20	78	2.0 U	-87	8.85	5.00
	4/26/2016[5]	15	58	2.0 U	NM	NM	NM
	10/20/2016[5]	15	59	2.0UJ	NM	NM	0.00
	4/25/2017	15	49	1.0U	69	0.48	0.00
	10/17/2017	7.2	27	1.0U	29	0.00	0.00
	4/19/2018	6.48	19	1.0U	59	3.40	5.00
	11/13/2018	1.94	1.11	1.0U	169	7.68	2.81
	4/24/2019	5	10	1.0U	177	9.91	0.00
	10/15/2019	1.0U	1.0U	1.0U	198	1.70	5.00
MW-85S [2]	4/20/2011	3.6 J	5.0 U	5.0 U	46	4.38	0.5
	10/26/2012	2.0 J	0.60 J	0.89 J	NM	NM	NM
	2/4/2013	2.5 J	5.0 U	5.0 U	NM	NM	NM
	4/30/2013	1.0 J	5.0 U	5.0 U	180	7.88	>5.0
	7/24/2013	5.0 U	5.0 U	5.0 U	12	1.39	0.4
	10/28/2013[5]	5.0 U	5.0 U	5.0 U	NM	NM	NM

Select Laboratory and Field Parameter Results
Operable Unit 3
Hooker/Ruco Site
Hicksville, New York

Well	Date Sampled	PCE (µg/L)	TCE (µg/L)	VCM (µg/L)	ORP (mV)	DO (mg/L)	Fe^{+2} (mg/L)
MW-85S [2] (cont'd)	1/27/2014	0.97 J	5.0 U	5.0 U	112	11.37	NM
	4/24/2014	0.99 J	5.0 U	5.0 U	161	5.97	0.0
	7/17/2014	1.1 J	5.0 U	5.0 U	26	4.98	NM
	10/31/2014	2.3 J	5.0 U	5.0 U	20	9.22	1.4
	4/23/2015[5]	5.0 U	5.0 U	2.0 U	NM	NM	NM
	10/20/2015	0.75 J	5.0 U	2.0 U	-44	29.15	0.4
	5/18/2016[5]	5.0 U	5.0 U	2.0 U	NM	NM	NM
	10/18/2016	5.0UJ	5.0U	2.0UJ	-45	2.63	0.0
MW-85I [2]	4/20/2011	5.2	5.0 U	5.0 U	93	2.90	2.4
	10/26/2012	2.6 J	0.54 J	5.0 U	NM	NM	NM
	2/4/2013	1.9 J	5.0 U	5.0 U	NM	NM	NM
	4/30/2013	1.7 J	0.68 J	5.0 U	-57	5.63	>5.0
	7/24/2013	1.3 J	0.53 J	5.0 U	-139	0.42	0.1
	10/28/2013	2.7 J	5.0 U	5.0 U	-137	10.87	1.3
	1/27/2014	2.2 J	0.78 J	5.0 U	-61	10.43	NM
	4/24/2014	1.2 J	5.0 U	5.0 U	87	10.21	0.19
	7/17/2014	1.2 J	0.67 J	5.0 U	92	5.36	2.30
	10/31/2014	1.2 J	0.68 J	5.0 U	24	9.22	>5.0
	4/23/2015	2.4 J	5.0 U	2.0 U	59	6.55	0.34
	10/20/2015	2.2 J	5.0 U	2.0 U	-3	17.60	NM
	4/25/2016	3.4 J	2.5 J	2.0 U	237	15.03	NM
	10/18/2016	5.5	5.0U	2.0UJ	-124	0.33	0.00
	10/16/2017	4.4	3.6	1.0U	NM	0.00	0.00
	11/12/2018	3.70	2.58	1.0U	57	6.43	4.46
MW-85D1 [2]	4/20/2011	34/31	10/9.9	70/70	-33	3.75	(3)
	10/26/2012	5.0 U	5.0 U	9.9	18	>20	5.0
	2/4/2013	5.8	9.2	17	1	7.26	2.0
	4/30/2013	15	14	1.4 J	28	9.02	>5.0
	7/24/2013	9.5	17	4.4 J	-130	2.06	>5.0
	10/28/2013[5]	22	26	7.9	NM	NM	NM
	1/27/2014	25	21	12	-83	11.37	NM
	4/24/2014	30	23	5.7	50	6.35	0.0
	7/17/2014	20	26	7.2	39	4.68	2.0
	10/31/2014	13	16	5.0 U	-10	11.29	>5.0
	4/23/2015	4.6 J	14	2.0 U	120	11.43	0.0
	10/20/2015	3.3 J	9.7	2.0 U	33	21.24	0.0
	4/25/2016	4.1 J	10	2.0 U	186	10.27	0.0
	10/18/2016	6.9	12	2.0UJ	19	11.24	0.0
	4/25/2017[5]	4.4	4.9	1.0	NM	NM	NM
	10/16/2017	1.4	1.6	2.1	110	0.33	1.4
	4/20/2018	5.79	9.99	1.66	NM	NM	NM
	11/12/2018	2.84	12.7	3.22	30	4.63	3.4
	4/23/2019	2	4	0.3J	150	4.33	0.1
	10/15/2019	1.5	1.9	1.0U	195	3.40	NM
MW-85D2 [2]	4/20/2011	170	160	1100	-190	1.59	4.0
	10/26/2012	66	37	280	29	14.34	5.0
	2/4/2013	21/23	24/25	40/40	NM	NM	NM
	4/30/2013	9.2	21	25	155	7.90	>5.0
	7/24/2013	27	44	15	6	1.89	1.6
	10/28/2013	5.7	8.3	2.6 J	-98	3.03	0.7
	1/27/2014	11	21	2.3 J	-98	12.81	NM
	4/24/2014	5.9	13	0.93 J	36	9.77	0.09
	7/17/2014	6.8	14	5.0 U	13	2.82	2.60
	10/31/2014	4.7 J	12	5.0 U	-46	7.77	1.60
	4/23/2015	1.8 J	5.0 U	2.0 U	141	11.07	NM

Select Laboratory and Field Parameter Results
Operable Unit 3
Hooker/Ruco Site
Hicksville, New York

Well	Date Sampled	PCE (µg/L)	TCE (µg/L)	VCM (µg/L)	ORP (mV)	DO (mg/L)	Fe^{+2} (mg/L)
MW-85D2 [2] (cont'd)	10/20/2015[5]	1.0 J	4.3 J	2.0 U	NM	NM	NM
	4/25/2016	2.3 J	5.4	2.0 U	174	5.79	0.24
	10/18/2016	11	21	4.9J	27	9.45	NM
	4/25/2017	2.4	4.6	1.0U	109	4.88	0.00
	10/16/2017[5]	4.2	5.6	1.0U	NM	NM	NM
	4/20/2018	4.17	8.04	1.0U	90	8.75	NM
	11/12/2018	2.31	4.9	1.0U	152	3.99	4.44
	4/23/2019	2	5	1.0U	172	8.85	0.00
	10/15/2019	4.1	7.4	1.0U	199	9.92	NM
MW-86D1 [2]	4/18/2011	2.7 J	5.0 U	14	-107	0.74	2.0
	10/24/2012	2.4 J	0.66 J	36	67	>20	0.68
	2/6/2013	6.3	5.0 U	44	87	14.5	1.0
	4/29/2013	6	1.5 J	62	135	5.99	2.5
	7/24/2013	3.1 J	1.3 J	24	-103	2.61	0.0
	10/29/2013[5]	5	1.8 J	78	NM	NM	NM
	1/23/2014	6.7	1.6 J	150	27	14.90	NM
	4/29/2014	8.2	1.3 J	160	25	3.56	0.1
	7/17/2014	9.5	0.89 J	180	-102	4.35	3.0
	10/31/2014	13	1.3 J	110	39	6.42	0.0
	4/24/2015	6.4	5.0 U	33	-37	7.48	0.1
	10/26/2015	3.0 J	5.0 U	2.0 U	-59	10.56	0.6
	4/28/2016	2.3 J	5.0 U	2.0 U	56	0.46	0.2
	10/21/2016	5.0UJ	5.0U	2.0UJ	87	1.30	0.1
	4/28/2017	1.1J	1.0U	1.0U	46	6.08	0.1
	10/20/2017	1.2	1.0J	1.0U	175	11.97	0.0
	4/24/2018	1.61	1.55	1.0U	126	0.00	>5
	11/8/2018	2.18	4.70	1.0U	38	1.52	4.5
	4/25/2019	2	2	1.0U	39	13.73	0.0
	10/16/2019	2.8	1.1	1.0U	322	7.22	5.0
MW-86D2 [2]	4/18/2011	19	280	5.0 U	-107	1.24	3.0
	10/24/2012	8.2	170	5.0 U	-115	2.49	0.39
	2/6/2013	17	370	0.54 J	-45	13.05	2.0
	4/29/2013	17	320	0.51 J	-64	5.44	3.4
	7/24/2013	13	270	5.0 U	-165	0.93	1.8
	10/29/2013	10	200	5.0 U	-43	4.30	0.0
	1/23/2014	14	240	5.0 U	-101	12.18	0.0
	4/29/2014	17	230	5.0 U	168	5.83	0.0
	7/17/2014[5]	15	170	0.79 J	NM	NM	NM
	10/31/2014	12	180	5.0 U	39	6.63	0.7
	4/24/2015	9.9	130	2.0 U	-89	10.90	0.0
	10/26/2015	7.4	83	2.0 U	-59	8.69	0.1
	4/28/2016	9.8	58	2.0 U	24	2.12	0.5
	10/21/2016	12	62	2.0UJ	-77	0.00	0.0
	4/28/2017	28J	71J	1.0U	-125	1.35	0.5
	10/20/2017	29	150	2.0U	-10	0.00	0.0
	4/24/2018	11	153	5.0U	NM	NM	NM
	11/8/2018	10.7	141	1.0U	152	1.31	3.2
	4/25/2019	6	75	1.0U	-72	13.12	0.0
	10/16/2019	4.3	55	1.0U	216	1.35	5.0
MW-87D1 [1]	10/24/2006	NA	NA	NA	234	0.70	0.17
	10/25/2006	NA	NA	NA	221	0.00	0.35
	10/26/2006	96 J	320	230	226	2.63	0.05
	1/24/2007	74	410	220	248	0.78	0.10
	4/17/2007	56	470	160	169	0.00	0.14
	7/17/2007	83	400	190	223	0.44	0.09

Select Laboratory and Field Parameter Results
Operable Unit 3
Hooker/Ruco Site
Hicksville, New York

Well	Date Sampled	PCE (µg/L)	TCE (µg/L)	VCM (µg/L)	ORP (mV)	DO (mg/L)	Fe^{+2} (mg/L)
MW-87D1 [1] (cont'd)	10/8/2007	37	190	190	203	4.39	0.40
	4/16/2008	52	240	4	322	8.35	0.05
	10/21/2008	99	360	10	463	>20	0.00
	4/7/2009	10	22	5.0 U	289	8.62	0.00
	10/13/2009	100	410	16	379	16.18	0.17
	5/3/2010	170/170	360/330	41/44	282	5.74	0.0
	11/29/2010	5.0 U/3.8 J	4.8 J/17	5.0 UJ/5.0 UJ	192	2.75	0.0
	4/19/2011	150	420	250	300	3.72	0.0
	11/30/2011	95	300	3.2 J	NM	13.98	NM
	5/24/2012	73 J	270	75	149	11.51	1.4
	11/5/2012	53	290	2.1 J	105	>20	1.6
	5/2/2013[5]	43	160	1.4 J	NM	NM	NM
	10/28/2013	26	36	5.0 U	-67	13.76	0.1
	4/29/2014	88	58	2.2 J	201	8.53	0.0
	7/21/2014	140	22	5.0 U	177	13.90	1.4
	10/31/2014	150	19	5.0 U	123	12.91	1.3
	4/24/2015	130	23	2.0 U	-75	19.54	1.7
	10/22/2015	130	18	2.0 U	179	8.49	3.8
	4/26/2016	99	11	2.0 U	71	9.20	0.2
	10/21/2016	66	10	2.0UJ	168	9.77	0.5
	4/26/2017	69	12	1.0U	163	12.35	0.4
	10/19/2017	49	4.3	1.0U	215	31.89	0.0
	4/19/2018	49	9.14	1.0U	238	17.12	2.9
	11/5/2018	57.4	27	1.0U	195	15.79	0.0
	4/26/2019	40	20	1.0U	191	14.49	0.0
	10/16/2019	21.1	8.3	1.0U	256	12.10	2.6
MW-87D2 [1]	10/24/2006	NA	NA	NA	212	4.00	0.08
	10/25/2006	NA	NA	NA	137	6.68	0.09
	10/26/2006	13	77	5 U	226	4.53	0.02
	1/24/2007	25	96	5 U	131	3.64	0.25
	4/17/2007	14	56	5 U	106	3.89	0.09
	7/16/2007	16	54	2 U	145	3.31	0.07
	10/9/2007	14	32	2 U	287	7.45	0.12
	4/16/2008	12	23	2 U	288	5.39	0.01
	10/21/2008	17	31	2 U	440	9.66	0.00
	4/7/2009	76	370	5.0 U	346	9.90	0.06
	10/13/2009	15	43	5.0 U	341	5.30	0.26
	5/5/2010	18	55	5.0 U	222	4.15	NM
	11/15/2010	35	470	2.7 J	397	12.41	0.0
	4/18/2011	22	75	5.0 U	234	3.46	0.0
	11/30/2011	18	110	5.0 U	NM	11.08	NM
	5/24/2012	16 J/15 J	180/180	5.0 U/5.0 U	NM	NM	2.1
	11/5/2012	25	170	5.0 U	86	>20	1.0
	5/2/2013	35	170	5.0 U	312	15.02	2.2
	10/28/2013	150	150	5.0 U	9	4.86	0.4
	4/29/2014	200	110	5.0 U	160	5.63	0.0
	7/21/2014	420	98	5.0 U	206	7.98	0.0
	10/31/2014	380	120	5.0 U	149	10.72	3.1
	4/24/2015	300	100	2.0 U	172	14.19	2.8
	10/22/2015	470	150	2.0 U	184	7.70	0.5
	4/26/2016	420	170	5.0 U	231	3.15	0.5
	10/21/2016[5]	NA	NA	NA	168	3.61	NM
	4/26/2017	940	120	1.0U	154	4.60	0.1
	10/19/2017	909	165	20U	199	2.83	0.0
	4/19/2018[5]	834	64.4	20U	NM	NM	NM
	11/5/2018	731	85.7	1.0U	277	2.89	0.1
	4/26/2019	990	100	1.0U	210	11.76	0.0
	10/16/2019	1000	85.4	1.0U	228	3.24	1.9

Select Laboratory and Field Parameter Results
Operable Unit 3
Hooker/Ruco Site
Hicksville, New York

Well	Date Sampled	PCE (µg/L)	TCE (µg/L)	VCM (µg/L)	ORP (mV)	DO (mg/L)	Fe^{+2} (mg/L)
MW-88D1 (1)	10/24/2006	NA	NA	NA	-43	0.00	11.04
	10/25/2006	NA	NA	NA	-13	0.00	10.20
	10/26/2006	39 J	9	58	33	3.36	6.56
	1/30/2007	36	7	74	-45	1.16	2.01
	4/19/2007	32	13	330	172	11.88	1.84
	7/26/2007	37	28 J	1500	232	9.48	0.74
	10/16/2007	66	270	1100	3	0.02	5.47
	4/25/2008	20	27	310	225	5.95	0.52
	10/30/2008	40	29	320	339	>20	0.00
	4/13/2009	27	17	410	205	16.71	0.31
	10/21/2009	18/14	24/24	510/330	253	>20	0.47
	5/11/2010	28	32	320	177	19.00	0.50
	11/17/2010	14	20	440	366	13.04	0.0
	4/15/2011	19	19	160	184	14.39	0.0
	12/1/2011	15	20	11	NM	17.16	NM
	5/24/2012	5.4 J	14	11	65	8.82	0.0
	10/26/2012	12	17	8.2	83	10.88	1.15
	5/1/2013	5.4	6.8	0.92 J	202	13.77	1.22
	10/28/2013(5)	12	12	3.2 J	NM	NM	NM
	4/25/2014	8.7	14	1.1 J	197	8.44	0.06
	10/30/2014	12 J	26 J	3.1 J	82	12.59	0.31
	4/24/2015	19	26	2.1	150	14.59	NM
	10/21/2015	16	23	2.0 U	31	9.74	5.00
	4/26/2016	14	17	1.2 J	136	9.45	0.36
	10/19/2016	21	14	2.0UJ	29	12.12	0.00
	4/25/2017	14	4.9	1.0U	63	6.65	0.45
	10/17/2017	11	5.4	1.4	143	17.94	0.00
	4/20/2018	10.1	3.8	0.51J	163	16.54	1.43
	11/8/2018	7.5	2.67	1.0U	83	6.67	0.14
	4/24/2019	7	2	1.0U	90	15.02	0.00
	10/17/2019	9.1	2.9	1.0U	139	13.33	2.46
MW-88D2 (1)	10/24/2006	NA	NA	NA	-282	1.44	18.96
	10/25/2006	NA	NA	NA	-253	1.97	11.40
	10/26/2006	140 J	180	3200	-212	0.00	NM
	1/25/2007	180/190	180/190	3400/2900	-315	0.82	0.16
	4/19/2007	390	330	1200	-219	0.37	2.17
	7/26/2007	97/94	57 J/56 J	2000/1800	-333	0.44	1.21
	10/16/2007	41	25	31	-291	3.04	9.39
	4/25/2008	280 J	130	230	40	8.02	2.65
	10/31/2008	250	83 J	230	45	8.94	2.70
	4/14/2009	200	86	59	41	9.94	0.98
	10/20/2009	47	43	130	-3	4.67	4.49
	5/11/2010	130	85	81	-5	5.70	0.50
	1/20/2011	56	22	160 J	232	5.58	0.00
	4/19/2011	27	10	170	-585	3.35	0
	12/1/2011	24	12	110	NM	9.81	NM
	5/24/2012	1.7 J	1.7 J	91	22	5.73	0
	10/26/2012	1.7 J	0.82 J	5.0 U	NM	NM	NM
	5/1/2013	14	17 J	38 J	154	11.30	1.56
	10/28/2013	5.0 U	5.0 U	5.0 U	52	12.83	0.46
	4/25/2014	5.0 U	5.0 U	0.85 J	62	2.83	0.00
	10/30/2014	19 J	16 J	5.0 U	91	14.22	0.86
	4/24/2015	15	11	2.0 U	26	8.59	NM
	10/21/2015	15	9.7	2.0 U	-44	9.18	5.00
	4/26/2016	9.2	8.3	2.0 U	67	1.56	0.0
	10/19/2016(5)	NA	NA	NA	-16	0.95	NM
	4/25/2017	13	11	1.0U	123	8.05	0.3

Select Laboratory and Field Parameter Results
Operable Unit 3
Hooker/Ruco Site
Hicksville, New York

Well	Date Sampled	PCE (µg/L)	TCE (µg/L)	VCM (µg/L)	ORP (mV)	DO (mg/L)	Fe^{+2} (mg/L)
MW-88D2 [1] (cont'd)	10/17/2017	17	16	1.0U	-51	0.00	0.1
	5/4/2018	41.5	34.1	0.44	NM	NM	NM
	11/8/2018	13.2	24.1	1.0U	2	2.14	2.2
	4/24/2019	14	22	1.0U	30	8.43	0.2
	10/17/2019	6.9	11.1	1.0U	38	1.72	2.5
MW-89D1 [2]	4/21/2011	37	47	63	-142	1.57	6.0
	10/24/2012	2.9 J	5.0 U	6.7	17	9.68	0.0
	2/6/2013	20	10	25	-70	8.99	0.0
	4/29/2013	12	8.3	60	-125	5.49	3.8
	7/24/2013	6.9	3.1 J	31	-198	0.43	1.8
	10/28/2013	6.2	2.8 J	51	-52	2.56	0.5
	1/27/2014	15	14	72	239	12.43	NM
	4/24/2014	7.2	3.5 J	22	-88	3.67	0.0
	7/17/2014	17	7.3	19	-45	2.42	3.6
	10/31/2014	37	23	4.6 J	51	19.08	>5.0
	4/23/2015	37	26	6.9	101	7.52	NM
	10/20/2015	12	8.2	4.3	21	22.43	1.5
	4/25/2016	8.9	12	4.2	-10	2.00	0.1
	10/18/2016	18	20	7.9J	-21	0.00	0.2
	4/25/2017[5]	16	19	9	NM	NM	NM
	10/16/2017	17	14	3.8	69	1.46	0.1
	4/20/2018[5]	16.8	18.4	4.8	NM	NM	>5
	1/12/2018	25	13.7	0.98J	70	1.98	4.7
	4/23/2019	13	12	0.7J	156	4.23	0.0
	10/15/2019	14.9	13.9	2	226	4.89	5.0
MW-89D2 [2]	4/21/2011	27	16	24	-154	2.43	1.0
	10/24/2012	1.7 J	2.4 J	21	-95	10.73	0.0
	2/6/2013	5	4.6 J	20	-122	10.05	0.0
	4/29/2013	1.2 J	1.9 J	26	-244	4.49	3.0
	7/24/2013	1.1 J	2.1 J	12	-250	0.75	2.7
	10/28/2013	1.6 J	2.4 J	13	-63	9.45	0.8
	1/27/2014[5]	2.7 J	4.0 J	12	NM	NM	NM
	4/24/2014	1.8 J	2.7 J	6.1	-27	4.26	0.0
	7/17/2014	3.9 J	5.6	3.7 J	-40	2.13	2.0
	10/31/2014	5.8	9.4	6.5	6	12.01	1.8
	4/23/2015[5]	10	13	2.3	NM	NM	NM
	10/20/2015	5.7	9.4	2.0 U	-72	19.70	2.2
	4/25/2016	6.7	6.0	2.0 U	-30	0.27	0.4
	10/18/2016	13	8.3	2.0UJ	-119	0.66	0.0
	4/25/2017	8.4	6.6	1.0U	134	20.49	0.0
	10/16/2017	10	6.5	1.0U	82	1.03	0.0
	4/20/2018	6.89	5.31	0.53J	105	1.24	>5
	11/12/2018	5.79	5.26	1.0U	37	4.70	3.7
	4/23/2019	8	7	0.6J	128	12.08	0.1
	10/15/2019	6.7	5.9	1.0U	72	2.11	NM
MW-90D1 [2]	4/25/2007	110	44	6300	-100	0.93	2.30
	4/13/2011	29	12	4100	-103	0.34	NM
	10/25/2012[5]	2.0 J	5.0 U	810	NM	NM	NM
	2/6/2013[5]	27	6.7	2500	NM	NM	NM
	4/30/2013[5]	3.9 J	2.3 J	780	NM	NM	NM
	7/23/2013[5]	32	16	290	NM	NM	NM
	10/25/2013[5]	22	13	84	NM	NM	NM
	1/23/2014[5]	17	18	1600	NM	NM	NM
	4/23/2014[5]	42	24	600	NM	NM	NM

Select Laboratory and Field Parameter Results
Operable Unit 3
Hooker/Ruco Site
Hicksville, New York

Well	Date Sampled	PCE (µg/L)	TCE (µg/L)	VCM (µg/L)	ORP (mV)	DO (mg/L)	Fe^{+2} (mg/L)
MW-90D1 [2] (cont'd)	7/18/2014[5]	33	11	27	NM	NM	NM
	10/21/2014[5]	16	9.9	37	NM	NM	NM
	4/24/2015[5]	25	9.6	3.0	NM	NM	NM
	10/23/2015[5]	23	9.5	1.9 J	NM	NM	NM
	4/27/2016[5]	5.0 U	8.4	2.0 U	NM	NM	NM
	10/21/2016[5]	21	9.6	2.0UJ	NM	NM	NM
	5/11/2017[5]	30	8.2	1.0U	NM	NM	NM
	10/19/2017[5]	17	5.8	0.6J	NM	NM	NM
	4/26/2018[5]	14.8	5.78	1.0U	NM	NM	NM
	11/6/2018	10.6	4.59	1.0U	NM	NM	NM
	4/25/2019	4	2	1.0U	NM	NM	NM
	10/14/2019	5.6	4.7	1.0U	NM	NM	NM
MW-90D2 [2]	4/25/2007	46	220 J	49	-47	1.38	1.76
	5/17/2010	26	68	2.1 J	-112	0.00	2.5
	4/14/2011	33	51	1.2 J	12	4.03	1.0
	2/6/2013[5]	120	37	3.1 J	NM	NM	NM
	4/30/2013[5]	57	25	1.8 J	NM	NM	NM
	7/23/2013[5]	43	29	5.0 U	NM	NM	NM
	10/25/2013[5]	44	23	5.0 U	NM	NM	NM
	1/23/2014[5]	39	25	2.9 J	NM	NM	NM
	4/23/2014[5]	37	26	1.5 J	NM	NM	NM
	7/18/2014[5]	22	22	5.0 U	NM	NM	NM
	10/21/2014[5]	6.1	3.5 J	5.0 U	NM	NM	NM
	4/24/2015[5]	26	21	2.0 U	NM	NM	NM
	10/23/2015[5]	74	23	2.0 U	NM	NM	NM
	4/27/2016[5]	27	11	2.0 U	NM	NM	NM
	10/21/2016[5]	6	6.9	2.0UJ	NM	NM	NM
	4/27/2017[5]	11	8.2	1.0U	NM	NM	NM
	10/19/2017[5]	12	6.6	1.0U	NM	NM	NM
	4/26/2018[5]	13	5.1	1.0U	NM	NM	NM
	11/6/2018	19	11.3	1.0U	NM	NM	NM
	4/25/2019	17	12.0	1.0U	NM	NM	NM
	10/14/2019	17	16.1	1.0U	NM	NM	NM
Voluntary Wells							
MW-52S	3/13/2007	25	19	2400	5	1.64	1.66
MW-52I	3/14/2007	14	5	6	259	5.85	0.04
MW-52D	3/14/2007	410	39	5 U	226	3.07	0.11
MW-58D	10/26/2006	20	120	5 U	21	2.42	4.30
	5/18/2010	18	47	5.0 U	30	0.00	1.8
	11/21/2011	8.6	56	5.0 U	74	0.30	NR
	5/23/2013	15 J	110	5.0 U	167	5.94	2
	11/14/2014[5]	500 U	6500	500 U	NM	NM	NM
	6/2/2016	28	6300	2.0 U	-44	9.46	0.0
	11/2/2016	38J	5000	2.0U	-12	0.00	0.1
	4/26/2017[5]	51	5200	1.0U	NM	NM	NM
	10/17/2017[5]	59	3670	50U	NM	NM	NM
	4/24/2018[5]	56	2370	50U	NM	NM	NM
	11/20/2018	17.9	319	1.0U	91	1.31	>5
	5/8/2019	36	750	1.0U	151	6.35	0
	10/27/2019	18.3	357	1.0U	153	2.35	4.02

Table 2

Select Laboratory and Field Parameter Results
Operable Unit 3
Hooker/Ruco Site
Hicksville, New York

Well	Date Sampled	PCE (µg/L)	TCE (µg/L)	VCM (µg/L)	ORP (mV)	DO (mg/L)	Fe^{+2} (mg/L)
MW-58D1	10/26/2006	20	150	5 U	-101	2.58	8.80
	5/19/2010	18	44	5.0 U	-50	0.00	2.2
	11/21/2011	2.5 J	20	5.0 U	-48	0.52	NR
	5/23/2013(5)	12 J	73	5.0 U	NM	NM	NM
	11/14/2014(5)	250 U	4300	250 U	NM	NM	NM
	6/2/2016	34	5800	2.0 U	-25	10.58	0.1
	11/2/2016	32J	4400	2.0U	46	0.00	1.6
	4/26/2017	51	4600	1.0U	-96	NM	0.0
	10/17/2017(5)	60	3300	50U	NM	NM	NM
	4/24/2018	59	2300	50U	NM	NM	NM
	11/20/2018	23.9	522	1.0U	151	3.26	2.6
	5/8/2019	32	750	1.0U	-77	6.35	0.0
	10/27/2019	18.7	244	1.0U	86	4.28	2.2
MW-58D2	10/25/2006	19 J	120	5 U	-198	0.00	5.16
	4/29/2013	13	74	5.0 U	-81	7.70	3.87
	10/24/2014	20	4900	5.0 U	-10	20.87	0.00
	5/18/2016	38	7600	2.0 U	47	9.57	0.22
	10/19/2016	37	3200	2.0UJ	-46	0.00	0.72
	5/11/2017(5)	44	2400	1.0U	NM	NM	0.00
	11/1/2017	83	4100	1.0U	64	1.69	0.52
	5/22/2018(5)	55	1910	50U	NM	NM	4.62
	11/5/2018	115	436	5.0U	253	4.40	0.10
	4/23/2019	37	319	2.0U	139	8.64	1.04
	10/13/2019	16.5	237	1.0UJ	-123	5.04	5.00
MW-59D1	10/25/2006	10 J	32	5 U	-20	0.58	3.24
	11/29/2011	3.5 J	12	5.0 U	-43	0.30	NR
MW-59D2	10/25/2006	11 J	40	5 U	-99	0.47	2.00
	11/29/2011	2.5 J	8.1	5.0 U	-128	0.10	NR
	5/18/2016(5)	5.0 U	5.5	2.0 U	NM	NM	NM
	10/19/2016	5.0U	5.7	2.0UJ	-137	1.01	0.14
	4/26/2017	1.0U	4.7	1.0U	-114	2.52	0.00
	10/19/2017	0.6J	4.4	1.0U	-64	1.59	0.14
	4/24/2018(5)	1.0U/1.0U	3.97/3.92	1.0U/1.0U	NM	NM	NM
	11/5/2018	0.33J	1.57	1.0U	42	3.18	0.08
	4/23/2019	1.0U	1	1.0U	77	13.08	0.26
	10/13/2019	1.0U	1.0U	1.0U	-32	0.46	2.73
MW-59D	10/26/2006	10	58	5 U	-108	0.00	2.65
	11/29/2011	5.3	13	5.0 U	49	0.35	NR
MW-60S	5/23/2013	45	150	5.0 U	-233	4.74	>5.0
MW-60I	5/23/2013	43	200	5.0 U	-93	3.77	>5.0
MW-60D	5/23/2013	64	99	5.0 U	-204	4.60	2.43
MW-60D1	4/30/2013	1.6 J	26	5.0 U	-108	5.84	>5.0
MW-61S	10/19/2009	7.4	10	5.0 U	372	>20	0.02
	5/10/2010	5.4	8.1 U	3.5 J	100	10.95	0.0
MW-62I	5/16/2007	5.1	1 J	3 J	59	0.00	0.69
	5/25/2010	5.1 J	5.0 U	4.2 J	14.8	0.00	4.2
	11/16/2015(5)	14	3.4 J	8.9	NM	NM	2.5
	10/18/2017	13	2.9	7.9	145	0.00	0.0

Select Laboratory and Field Parameter Results
Operable Unit 3
Hooker/Ruco Site
Hicksville, New York

Well	Date Sampled	PCE (µg/L)	TCE (µg/L)	VCM (µg/L)	ORP (mV)	DO (mg/L)	Fe^{+2} (mg/L)
MW-62D	5/16/2007	5 U	5 U	5 U	-125	0.00	0.38
	5/25/2010	2.4 J	8.2	8	-200	0.00	6.2
	11/16/2015	2.5 J	2.0 J	2.3	116	10.94	0.0
	10/18/2017	1.5	2.2	3.7	-25	0.00	0.0
MW-64S [2]	4/26/2007	3 J	2 J	8.7	-114	0.00	2.4
	5/24/2010	1.5 J	5.0 U	2.1 J	-98	0.00	4.0
MW-64I [2]	4/26/2007	5	3 J	16	-121	0.00	1.9
	5/24/2010	5.0 UJ	5.0 U	12	-110	0.00	4.0
MW-64D [2]	4/26/2007	5.1	4 J	14	-115	0.00	2.0
	5/24/2010	5.0 UJ	5.0 U	11	-107	0.00	2.3
MW-66D2 [2]	4/25/2013	100	110	5.0 U	-44	6.58	0.2
	10/29/2013	43	58	5.0 U	-111	3.88	0.3
	4/25/2014	47	61	5.0 U	53	4.55	0.7
	10/27/2014	22	25	5.0 U	166	3.42	2.8
	4/23/2015	10	15	2.0 U	161	13.98	NM
	10/21/2015[5]	5.8	10	2.0 U	NM	NM	NM
	4/25/2016	2.9 J	8.0	2.0 U	-4	13.29	0.2
	10/18/2016	1.4J	2.2J	2.0UJ	35	0.02	NM
	4/26/2017	1.0U	1.0U	1.0U	190	11.67	0.8
	10/16/2017	0.6J	0.9J	1.0U	137	7.45	0.2
	4/24/2018	3.8	6.9	1.0U	223	19.44	3.2
	11/5/2018	10.9	12.0	1.0U	84	6.40	NM
	4/23/2019	27	24.0	0.7J	177	8.12	0.1
	10/13/2019	8.4	13.4	1.0UJ	275	9.61	5.0
MW-67S [2]	5/20/2010	26/27	37/39	87/95	-170	0.00	7.0
	11/22/2011	1.5 J	8.7	47	-35	0.14	NR
	4/25/2013	2.8 J	19	140	45	5.14	1.9
	10/29/2013	4.6 J	16	100	-161	2.49	1.0
	4/25/2014	4.9 J	9.6	38	77	2.76	0.0
	10/24/2014[5]	18	19	6.2	NM	NM	NM
	4/23/2015	6	5.4	2.0 U	155	12.71	0.4
	10/21/2015	1.7 J	2.5 J	2.0 U	177	11.68	NM
	4/25/2016	58	44	2.0 U	104	20.69	0.7
	10/19/2016	41	66	2.0UJ	26	0.29	0.2
	4/26/2017	67	61	1.0U	100	4.02	NM
	10/16/2017	60	66	0.7J	87	2.77	0.0
	4/24/2018	43.8	53.4	1.0U	243	9.39	1.6
	11/5/2018	51.3	51.4	1.21	NM	NM	NM
	4/23/2019	2	0.6J	1.0U	152	7.11	0.2
	10/13/2019	1.0U	1.0	1.0U	141	0.00	4.2
MW-67D [2]	5/20/2010	74/73	280/280 J	5.0 U/5.0 U	-187	1.30	0.2
	11/22/2011	6.2	58	5.0 U	129	2.97	NR
	4/25/2013	8.6	32	5.0 U	45	11.98	1.9
	10/29/2013	11	36	5.0 U	-204	3.78	0.0
	4/25/2014	4.8 J	25	5.0 U	2	5.35	0.0
	10/24/2014[5]	1.4 J	4.3 J	5.0 U	NM	NM	NM
	4/23/2015	2.9 J	5.0 U	2.0 U	-274	9.51	NM
	10/21/2015[5]	5.0 U	2.1 J	2.0 U	NM	NM	NM

Select Laboratory and Field Parameter Results
Operable Unit 3
Hooker/Ruco Site
Hicksville, New York

Well	Date Sampled	PCE (µg/L)	TCE (µg/L)	VCM (µg/L)	ORP (mV)	DO (mg/L)	Fe^{+2} (mg/L)
MW-67D [2] (cont'd)	4/25/2016	5.0 J	1.2 J	2.0 U	53	4.62	0.3
	10/19/2016	5.0U	5.0U	2.0UJ	50	2.37	0.1
	4/26/2017	1.0U	2.1	1.0U	2	3.25	0.5
	10/16/2017	0.7J	0.8J	1.0U	NM	0.00	0.0
	4/24/2018	1.0U	1.0U	1.0U	NM	NM	NM
	11/5/2018	1.0U	0.4J	1.0U	8	2.62	NM
	4/23/2019	1.0U	1.0U	1.0U	139	6.83	0.1
	10/13/2019	1.0U	1.0U	1.0UJ	71	0.77	5.0
MW-68S [2]	11/28/2011	83	110	690	-107	0.05	NR
	4/25/2013	11	27	940	-190	6.84	1.9
	10/29/2013	6.8	11	580	-128	3.58	1.0
	4/25/2014	99	81	270	-50	2.49	0.0
	10/24/2014	67	93	400	68	21.08	0.0
	4/23/2015	77	110	2.0 U	-15	15.09	NM
	10/21/2015	65	110	260	47	9.22	NM
	4/25/2016	62	100	220	1	24.40	0.0
	10/19/2016	87	120	230J	-201	0.47	0.1
	4/26/2017[5]	50	83	190	NM	NM	NM
	10/16/2017	87	93	143	-163	0.00	0.2
	4/24/2018	60.4	84.4	66	163	3.39	0.5
	1/5/2018	67.4	83.3	27.9J	-36	1.79	1.5
	4/23/2019	58	84	42	-97	4.72	0.0
	10/13/2019	18.4	28.2	5.2J	-81	0.00	1.6
MW-68D [2]	5/19/2010	320	970	34	-29	0.00	2.4
	11/28/2011	47	290	1.2 J	-38	0.97	NR
	4/25/2013	36	160	1.3 J	-174	5.88	0.7
	10/29/2013	19	78	5.0 U	-91	4.12	0.2
	4/25/2014	7.3	47	5.0 U	-71	5.27	0.0
	10/24/2014	2.2 J	14	5.0 U	36	12.79	0.0
	4/23/2015[5]	1.8 J	6.8	1.0 J	NM	NM	NM
	10/21/2015[5]	1.7 J	5.9	2.0 U	NM	NM	NM
	4/25/2016	5.0 U	4.3 J	2.0 U	37	9.21	0.0
	10/19/2016	5.0U	4.6J	2.0UJ	-39	0.50	0.0
	4/26/2017	1.0U	4.7	1.0U	18	4.64	NM
	10/16/2017	2.5	5.4	1.0U	82	0.00	0.6
	4/24/2018	2.54	8.1	1.0U	NM	NM	>5.0
	11/5/2018	3.75	9.34	1.0U	0	1.59	0.0
	4/23/2019	3	13	1.0U	83	7.22	0.2
	10/13/2019	5.9	20.3	1.0UJ	121	4.38	5.0
MW-92D1	4/12/2011	5.7	1.3 J	100	-190	1.13	4.0
	4/24/2013	3.7 J	6.2	79	12	6.57	3.0
	10/27/2014	3.4 J	4.6 J	51	-18	2.62	4.1
	10/23/2015	3.9 J	6.2	42	32	6.61	1.0
	10/18/2017	2.4	6.8	24	-105	0.00	0.0
	10/17/2019	1.0U	3.9	14.7	-92	0.88	5.0
MW-92D2	4/25/2011	690	12	5.0 U	-156	2.00	1.5
	4/24/2013	280	17	5.0 U	-104	5.52	>5.0
	10/27/2014	92	8.2	5.0 U	-120	2.20	75.0
	10/23/2015	30	5.4	2.0 U	-77	8.07	0.1
	10/18/2017	18	2.4	1.0U	-91	0.00	0.4
	10/17/2019	29.9	4.3	1.0U	-100	2.30	5.0

Select Laboratory and Field Parameter Results
Operable Unit 3
Hooker/Ruco Site
Hicksville, New York

Well	Date Sampled	PCE (µg/L)	TCE (µg/L)	VCM (µg/L)	ORP (mV)	DO (mg/L)	Fe^{+2} (mg/L)
MW-93D1	4/26/2011	21	3.7 J	190	-191	2.18	2.5
	4/24/2013	14	4.5 J	20	-140	5.16	2.2
	10/27/2014	16	2.3 J	7.0	33	3.10	2.3
	10/23/2015	8	1.2 J	3.8	11	9.79	0.2
	10/18/2017	1.4	0.5J	1.0U	-94	0.00	0.4
	10/17/2019	1.0U	1.0U	1.0U	6	2.68	4.2
MW-93D2	4/26/2011	110	15	5.0 U	-219	2.96	2.0
	4/23/2013	24	21	5.0 U	-105	4.58	4.5
	10/27/2014	1.0 J	5.0 U	5.0 U	-12	2.98	3.4
	10/23/2015	5.0 U	5.0 U	2.0 U	-105	9.40	0.0
	10/18/2017	13	1.2	1.5	-77	3.48	0.4
	10/17/2019	1.0U	1.0U	1.0U	NM	NM	NM
Northrop Wells							
GP-1 (Well 1)	9/25/2006	NR	NA	ND	NR	NR	NR
	10/23/2006	NR	NA	ND	NR	NR	NR
	11/13/2006	NR	NA	ND	NR	NR	NR
	12/18/2006	NR	634	ND	NR	NR	NR
	1/15/2007	NR	547	ND	NR	NR	NR
	2/12/2007	NR	373	ND	NR	NR	NR
	3/12/2007	NR	439	ND	NR	NR	NR
	4/16/2007	NR	473	ND	NR	NR	NR
	5/14/2007	NR	587	ND	NR	NR	NR
	6/18/2007	NR	414	ND	NR	NR	NR
	7/23/2007	NR	410	ND	NR	NR	NR
	8/13/2007	NR	333	ND	NR	NR	NR
	9/11/2007	NR	452	ND	NR	NR	NR
	10/15/2007	NR	285	ND	NR	NR	NR
	11/12/2007	NR	428	ND	NR	NR	NR
	12/18/2007	NR	371	ND	NR	NR	NR
	1/14/2008	NR	273	ND	NR	NR	NR
	2/18/2008	NR	373	ND	NR	NR	NR
	3/17/2008	NR	212	ND	NR	NR	NR
	4/14/2008	NR	233	ND	NR	NR	NR
	5/19/2008	NR	195	ND	NR	NR	NR
	6/16/2008	NR	113	ND	NR	NR	NR
	7/15/2008	NR	353	ND	NR	NR	NR
	8/18/2008	NR	54	ND	NR	NR	NR
	9/22/2008	NR	78	ND	NR	NR	NR
	10/13/2008	NR	78	ND	NR	NR	NR
	11/18/2008	NR	145	ND	NR	NR	NR
	12/16/2008	NR	82	ND	NR	NR	NR
	1/05/2009	NR	106	ND	NR	NR	NR
	2/16/2009	NR	186	ND	NR	NR	NR
	3/16/2009	NR	202	ND	NR	NR	NR
	4/13/2009	NR	203	ND	NR	NR	NR
	5/18/2009	NR	217	ND	NR	NR	NR
	6/15/2009	NR	93	ND	NR	NR	NR
	7/21/2009	NR	156	ND	NR	NR	NR
	8/18/2009	NR	126	ND	NR	NR	NR
	9/16/2009	NR	112	ND	NR	NR	NR
	10/20/2009	NR	132	ND	NR	NR	NR
	11/16/2009	NR	173	ND	NR	NR	NR

Select Laboratory and Field Parameter Results
Operable Unit 3
Hooker/Ruco Site
Hicksville, New York

Well	Date Sampled	PCE (µg/L)	TCE (µg/L)	VCM (µg/L)	ORP (mV)	DO (mg/L)	Fe^{+2} (mg/L)
GP-1 (Well 1) (cont'd)	12/4/2009	NR	151	ND	NR	NR	NR
	1/18/2010	NR	106	ND	NR	NR	NR
	2/15/2010	NR	108	ND	NR	NR	NR
	3/15/2010	NR	149	ND	NR	NR	NR
	4/20/2010	NR	368	ND	NR	NR	NR
	7/28/2010	NR	NA	ND	NR	NR	NR
	8/20/2010	NR	101	ND	NR	NR	NR
	5/08/2012	48	410	ND	NR	NR	NR
	12/11/2012	51	410	ND	NR	NR	NR
	2/18/2013	49	360	ND	NR	NR	NR
	6/06/2013	48	380	ND	NR	NR	NR
	8/21/2013	48/44	400/390	ND/ND	NR	NR	NR
	2/24/2014	39	400	ND	NR	NR	NR
	6/10/2014	40	490	ND	NR	NR	NR
	9/11/2014	35	730	ND	NR	NR	NR
	11/13/2014	39	695	ND	NR	NR	NR
	3/16/2015	41	713	ND	NR	NR	NR
	5/05/2015	31	748	ND	NR	NR	NR
	9/09/2015	35	852	ND	NR	NR	NR
	12/12/2015	31	768	ND	NR	NR	NR
	3/14/2016	30	792	ND	NR	NR	NR
	5/12/2016	24	615	ND	NR	NR	NR
	8/17/2016	28	838	ND	NR	NR	NR
	12/15/2016	22	703	ND	NR	NR	NR
	2/22/2017	28	702	ND	NR	NR	NR
	9/12/2017	22	603	ND	NR	NR	NR
	5/10/2018	20	631	ND	NR	NR	NR
	2/13/2019	17	589	ND	NR	NR	NR
	8/6/2019	17	546	ND	NR	NR	NR
GP-3 (Well 3R)	09/25/2006	NR	NR	100	NR	NR	NR
	10/23/2006	NR	NR	122	NR	NR	NR
	11/13/2006	NR	NR	143	NR	NR	NR
	12/18/2006	NR	3968	148	NR	NR	NR
	1/15/2007	NR	3038	121	NR	NR	NR
	2/12/2007	NR	2545	81	NR	NR	NR
	3/12/2007	NR	2200	74	NR	NR	NR
	4/16/2007	NR	2476	49	NR	NR	NR
	5/14/2007	NR	3107	144	NR	NR	NR
	6/18/2007	NR	2268	92	NR	NR	NR
	7/23/2007	NR	2900	128	NR	NR	NR
	8/13/2007	NR	1964	113	NR	NR	NR
	9/11/2007	NR	2013	114	NR	NR	NR
	10/15/2007	NR	2080	117	NR	NR	NR
	11/12/2007	NR	2123	113	NR	NR	NR
	12/18/2007	NR	2264	130	NR	NR	NR
	1/14/2008	NR	1655	109	NR	NR	NR
	2/18/2008	NR	1472	143	NR	NR	NR
	3/17/2008	NR	1700	146	NR	NR	NR
	4/14/2008	NR	1717	130	NR	NR	NR
	5/19/2008	NR	985	81	NR	NR	NR
	6/16/2008	NR	1196	86	NR	NR	NR
	7/15/2008	NR	1106	89	NR	NR	NR
	8/18/2008	NR	907	51	NR	NR	NR
	9/22/2008	NR	1083	101	NR	NR	NR
	10/13/2008	NR	1130	98	NR	NR	NR
	11/18/2008	NR	846	112	NR	NR	NR
	12/16/2008	NR	1227	83	NR	NR	NR
	1/12/2009	NR	862	93	NR	NR	NR

Select Laboratory and Field Parameter Results
Operable Unit 3
Hooker/Ruco Site
Hicksville, New York

Well	Date Sampled	PCE (µg/L)	TCE (µg/L)	VCM (µg/L)	ORP (mV)	DO (mg/L)	Fe^{+2} (mg/L)
GP-3 (Well 3R) (cont'd)	2/16/2009	NR	1159	104	NR	NR	NR
	3/16/2009	NR	1082	112	NR	NR	NR
	4/13/2009	NR	1410	153	NR	NR	NR
	0/18/2009	NR	1012	151	NR	NR	NR
	6/15/2009	NR	856	94	NR	NR	NR
	7/21/2009	NR	1180	148	NR	NR	NR
	8/18/2009	NR	1226	151	NR	NR	NR
	9/16/2009	NR	1462	163	NR	NR	NR
	10/20/2009	NR	1591	178	NR	NR	NR
	11/16/2009	NR	1262	182	NR	NR	NR
	12/14/2009	NR	1262	179	NR	NR	NR
	1/18/2010	NR	1263	188	NR	NR	NR
	2/15/2010	NR	1191	177	NR	NR	NR
	3/15/2010	NR	852	134	NR	NR	NR
	4/20/2010	NR	890	173	NR	NR	NR
	6/21/2010	NR	450	135	NR	NR	NR
	7/19/2010	NR	308	137	NR	NR	NR
	8/12/2010	NR	132	155	NR	NR	NR
	5/08/2012	58	1700	140	NR	NR	NR
	12/11/2012	51	1500	84	NR	NR	NR
	2/18/2013	53	1400	72	NR	NR	NR
	6/06/2013	54	1400	60	NR	NR	NR
	8/21/2013	57	1200	58	NR	NR	NR
	2/24/2014 (6)	38	98	38	NR	NR	NR
	6/10/2014 (6)	40	140	36	NR	NR	NR
	9/11/2014 (6)	43	270	36	NR	NR	NR
	11/13/2014 (6)	44	394	35	NR	NR	NR
	3/16/2015 (6)	44	493	29	NR	NR	NR
	5/05/2015 (6)	34	533	18	NR	NR	NR
	9/09/2015 (6)	37	557	13	NR	NR	NR
	12/15/2015 (6)	34	510	10	NR	NR	NR
	3/14/2016 (6)	31	529	8.6	NR	NR	NR
	5/12/2016 (6)	29	487	7.6	NR	NR	NR
	8/17/2016 (6)	33	579	5.0	NR	NR	NR
	12/15/2016 (6)	27	508	3.5	NR	NR	NR
	2/14/2017 (6)	31	498	3.9	NR	NR	NR
	9/12/2017 (6)	31	365	2.7	NR	NR	NR
	2/28/2018 (6)	26	306	2.2	NR	NR	NR
	5/10/2018 (6)	28	332	2.0	NR	NR	NR
	2/13/2019 (6)	31	333J	1.7	NR	NR	NR
	8/6/2019	28	298	1.3	NR	NR	NR
MW-3-1	1/30/2012 (7)	150	240	170	NR	NR	NR
	3/28/2012	56	220	1300	NR	NR	NR
	6/19/2013	7.8	37	78	NR	NR	NR
	6/5/2015	12	68	4.8	NR	NR	NR
	11/11/2015	11	58	5.2	NR	NR	NR
	5/11/2016	16	87	16	NR	NR	NR
	10/18/2016	14	96	14	NR	NR	NR
	6/11/2018	19	139	36	NR	NR	NR

Table 2

Select Laboratory and Field Parameter Results
Operable Unit 3
Hooker/Ruco Site
Hicksville, New York

Well	Date Sampled	PCE (µg/L)	TCE (µg/L)	VCM (µg/L)	ORP (mV)	DO (mg/L)	Fe^{+2} (mg/L)

Notes:

(1) Pilot System Monitoring Well
(2) Remainder of System Monitoring Well
(3) Black colored water prevented reading on colorimetric meter
(4) Orange colored water prevented reading on colorimeter meter
(5) Insufficient sample volume to obtain measurement/reading
(6) Sample from replacement well 3R
(7) Sample collected from vertical profile boring at depth 439 ft bgs

NA - Not analyzed
NM - Not measured (insufficient sample volume for all samples subsequent to 11/30/2011)
NR - Not reported by Northrop
NS - Not Sampled
U - Not detected at associated value
J - Estimated concentration

Biosparge System Well Status December 31, 2019
Operable Unit 3
Hooker/Ruco Site
Hicksville, New York

Well Designation	Date Completed	Well Functional	Comments/Proposed Action
IW-1D1A	04/28/11	Y	
IW-1D1L	04/28/11	N	
IW-1D2A	04/28/11	Y	
IW-2D1A	04/8/11	Y	
IW-2D1L	04/8/11	N	
IW-2D2A	04/8/11	Y	
IW-3D1A	03/25/11	Y	
IW-3D1L	03/25/11	N	
IW-3D2A	03/25/11	Y	
IW-4D1A	01/27/11	Y	
IW-4D1L	01/27/11	N	
IW-4D2A	01/27/11	Y	
IW-5D1A	04/12/11	Y	
IW-5D1L	04/12/11	N	
IW-5D2A	04/12/11	Y	
IW-6D1A	01/17/11	Y	
IW-6D1L	01/17/11	N	
IW-6D2A	01/17/11	N	DO in downgradient MW-73 >2.0 mg/L. No action planned.
IW-7D1A	03/29/11	N	DO in downgradient MW-77 >2.0 mg/L. No action planned.
IW-7D1L	03/29/11	N	
IW-7D2A	03/29/11	Y	
IW-15D1A	10/05/10	Y	DO in downgradient MW-87 >2.0 mg/L. No action planned.
IW-15DlL	10/05/10	N	
IW-15D2A	10/05/10	Y	
IW-16D1A	11/01/05	N	DO in downgradient MW-83 >2.0 mg/L. No action planned.
IW-16D1L	11/01/05	N	
IW-16D2A	11/01/05	Y	
IW-17D1A	12/01/05	Y	
IW-17D1L	12/01/05	N	
IW-17D2A	12/01/05	N	DO in downgradient MW-81 >2.0 mg/L. No action planned.
IW-18D1A	01/09/06	N	DO in downgradient MW-84 >2.0 mg/L. No action planned.
IW-18D1L	01/09/06	N	
IW-18D2A	01/09/06	Y	
IW-19D1A	01/13/06	Y	DO in downgradient MW-82/88 >2.0 mg/L.
IW-19D1L	01/13/06	N	
IW-19D2A	01/13/06	Y	DO in downgradient MW-82/88 >2.0 mg/L.
IW-20D1A	10/13/10	Y	DO in downgradient MW-85 >2.0 mg/L.
IW-20D1L	10/13/10	N	
IW-20D2A	10/13/10	Y	DO in downgradient MW-85 >2.0 mg/L.
IW-21D1A	10/23/10	N	
IW-21D1L	10/23/10	N	
IW-21D2A	10/23/10	Y	DO in downgradient MW-89 >2.0 mg/L.
IW-22D1A	11/03/10	Y	
IW-22D1L	11/03/10	N	
IW-22D2A	11/03/10	Y	
MW-50D1	02/23/95	N	Abandoned by Bayer during site closure.
MW-50D2	02/13/95	N	Abandoned by Bayer during site closure.
MW-51D1	10/24/95	N	Well no longer needed to monitor remediation of VCM subplume.
MW-51D2	10/02/95	N	Well no longer needed to monitor remediation of VCM subplume.
MW-52S	01/17/96	N	Abandoned March 2007
MW-52I	12/14/95	N	Abandoned March 2007
MW-52D	12/12/95	N	Abandoned March 2007
MW-53I	06/08/95	Y	Well no longer needed to monitor remediation of VCM subplume.
MW-53D1	06/19/95	N	Well no longer needed to monitor remediation of VCM subplume. Well paved over.
MW-53D2	06/05/95	Y	Well no longer needed to monitor remediation of VCM subplume. Obstruction in well prevents sampler insertion.

Biosparge System Well Status December 31, 2019
Operable Unit 3
Hooker/Ruco Site
Hicksville, New York

Well Designation	Date Completed	Well Functional	Comments/Proposed Action
MW-56S	01/26/96	N	Abandoned October 2000
MW-56I	01/25/96	N	Abandoned October 2000
MW-57S	01/23/96	Y	Well no longer needed to monitor remediation of VCM subplume.
MW-57I	01/25/96	Y	Well no longer needed to monitor remediation of VCM subplume.
MW-58D	03/26/02	Y	
MW-58D1	03/26/02	Y	
MW-58D2	03/26/02	Y	
MW-59D	04/06/02	N	VCM subplume can be monitored using Northrop well MW-3-1.
MW-59D1	04/06/02	N	VCM subplume can be monitored using Northrop well MW-3-1.
MW-59D2	04/06/02	Y	Previously lodged sampler retrieved from well in April 2016 allowing well to be sampled.
MW-60D1	03/05/02	Y	Well no longer needed to monitor remediation of VCM subplume.
MW-60S	03/08/02	Y	Well no longer needed to monitor remediation of VCM subplume.
MW-60I	03/08/02	Y	Well no longer needed to monitor remediation of VCM subplume.
MW-60D	03/08/02	Y	Well no longer needed to monitor remediation of VCM subplume.
MW-61S	02/22/02	Y	Well no longer needed to monitor remediation of VCM subplume.
MW-61I	02/22/02	N	Obstruction at 130 ftbgs prevents insertion of sampler. Monitoring of MW-61D2 sufficient to monitor VCM subplume.
MW-61D1	02/22/02	N	Obstruction at 130 ftbgs prevents insertion of sampler. Monitoring of MW-61D2 sufficient to monitor VCM subplume.
MW-61D2	03/12/02	Y	
MW-62I	05/14/02	Y	
MW-62D	04/20/02	Y	
MW-63S	02/18/02	Y	
MW-63I	02/18/02	Y	
MW-63D1	02/18/02	Y	
MW-63D2	02/18/02	Y	
MW-64S	02/09/02	N	Well no longer needed to monitor remediation of VCM subplume. Sampler stuck in well.
MW-64I	02/09/02	N	Well no longer needed to monitor remediation of VCM subplume. Sampler stuck in well.
MW-64D	02/09/02	N	Well no longer needed to monitor remediation of VCM subplume. Sampler stuck in well.
MW-66D2	06/08/02	Y	
MW-66I	06/19/02	N	Remediation of VCM subplume is adequately monitored by MW-66D2. Well no longer needed.
MW-66D1	06/19/02	N	Remediation of VCM subplume is adequately monitored by MW-66D2. Well no longer needed.
MW-67S	01/11/03	Y	
MW-67D	01/11/03	Y	
MW-68S	02/09/03	Y	
MW-68D	02/09/03	Y	
MW-70D1	02/02/11	Y	
MW-70D2	02/02/11	Y	
MW-72D1	03/16/11	Y	
MW-72D2	03/16/11	Y	
MW-73D1	02/11/11	Y	
MW-73D2	02/11/11	Y	
MW-75D1	05/02/11	Y	
MW-75D2	05/02/11	Y	
MW-76S	03/03/11	Y	No future sampling of this well is recommended.
MW-76I	03/03/11	Y	No future sampling of this well is recommended.
MW-76D1	02/15/11	Y	Test weight fell and became stuck in bottom of well in October 2015; samplers were able to be inserted and retrieved properly.
MW-76D2	02/15/11	Y	
MW-77D1	02/26/11	N	Samplers stuck in well. Monitoring of MW-77D2 sufficient to monitor VCM Subplume. Abandonment of MW-77D1 could adversely impact functionality of MW-77D2. No action proposed.
MW-77D2	02/26/11	Y	
MW-81D1	11/01/05	Y	
MW-81D2	11/01/05	Y	
MW-82D1	02/15/06	Y	Manhole cover requires repair

Table 3

Biosparge System Well Status December 31, 2019
Operable Unit 3
Hooker/Ruco Site
Hicksville, New York

Well Designation	Date Completed	Well Functional	Comments/Proposed Action
MW-82D2	02/15/06	Y	Manhole cover requires repair
MW-83D1	11/06/05	Y	
MW-83D2	11/06/05	Y	
MW-84D1	04/12/06	Y	Well casing degraded, may require future repair
MW-84D2	04/12/06	Y	Well casing degraded, may require future repair
MW-85S	12/04/10	Y	No future sampling of this well is recommended.
MW-85I	12/04/10	Y	No future sampling of this well is recommended.
MW-85D1	12/02/10	Y	
MW-85D2	12/02/10	Y	
MW-86D1	11/11/10	Y	
MW-86D2	11/11/10	Y	
MW-87D1	10/04/05	Y	
MW-87D2	10/04/05	Y	
MW-88D1	03/21/06	Y	
MW-88D2	03/21/06	Y	
MW-89D1	12/19/10	Y	
MW-89D2	12/19/10	Y	
MW-90D1	03/28/06	Y	
MW-90D2	03/28/06	Y	
MW-92D1	03/11/11	Y	
MW-92D2	03/11/11	Y	
MW-93D1	03/03/11	Y	
MW-93D2	03/03/11	Y	
VZ-1S	03/15/11	Y	Well no longer scheduled to monitor remediation of VCM subplume.
VZ-1D	03/15/11	Y	Well no longer scheduled to monitor remediation of VCM subplume.
VZ-2S	02/12/11	Y	Well no longer scheduled to monitor remediation of VCM subplume.
VZ-2D	02/12/11	Y	Well no longer scheduled to monitor remediation of VCM subplume.
VZ-4S	04/30/11	Y	Well no longer scheduled to monitor remediation of VCM subplume.
VZ-4D	04/30/11	Y	Well no longer scheduled to monitor remediation of VCM subplume.
VZ-5S	03/11/11	Y	Well no longer scheduled to monitor remediation of VCM subplume.
VZ-5D	03/11/11	Y	Well no longer scheduled to monitor remediation of VCM subplume.
VZ-6S	02/26/11	Y	Well no longer scheduled to monitor remediation of VCM subplume.
VZ-6D	02/26/11	Y	Well no longer scheduled to monitor remediation of VCM subplume.
VZ-10S	01/19/06	Y	Well no longer scheduled to monitor remediation of VCM subplume.
VZ-10D	01/19/06	Y	Well no longer scheduled to monitor remediation of VCM subplume.
VZ-11S	02/28/06	Y	Well no longer scheduled to monitor remediation of VCM subplume.
VZ-11D	02/28/06	Y	Well no longer scheduled to monitor remediation of VCM subplume.
VZ-12S	12/05/10	Y	Well no longer scheduled to monitor remediation of VCM subplume.
VZ-12D	12/05/10	Y	Well no longer scheduled to monitor remediation of VCM subplume.
VZ-14S	10/07/05	Y	Well no longer scheduled to monitor remediation of VCM subplume.
VZ-14D	10/07/05	Y	Well no longer scheduled to monitor remediation of VCM subplume.
VZ-15S	11/04/05	Y	Well no longer scheduled to monitor remediation of VCM subplume.
VZ-15D	11/04/05	Y	Well no longer scheduled to monitor remediation of VCM subplume.
VZ-16S	01/23/06	Y	Well no longer scheduled to monitor remediation of VCM subplume.
VZ-16D	01/23/06	Y	Well no longer scheduled to monitor remediation of VCM subplume.
VZ-17S	12/20/10	Y	Well no longer scheduled to monitor remediation of VCM subplume.
VZ-17D	12/20/10	Y	Well no longer scheduled to monitor remediation of VCM subplume.

Note:

NA Not Applicable