Periodic Review Report No. 4
30 January 2017 – 30 January 2020
National Heatset Printing Co. Site (152140)

Town of Babylon
Suffolk County, New York

Prepared for
New York State Department of Environmental Conservation
Division of Environmental Remediation
Remedial Bureau E
625 Broadway
Albany, New York 12233-7017

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April 2021
Version: DRAFT
EA Project No. 1602518

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LIST OF ACRONYMS AND ABBREVIATIONS

°F	Degrees Fahrenheit
µg/L	Microgram(s) per liter
amsl	Above mean sea level
AWQS	Ambient Water Quality Standard
bgs	Below ground surface
CVOC	Chlorinated volatile organic compound
DCE	Dichloroethene
D&D	D&D Electric Motors & Compressors
DDC	Density driven convection
DER	Division of Environmental Remediation
EA	EA Engineering, P.C. and its affiliate EA Science and Technology
EC	Engineering control
E.I.T.	Engineer-in-Training
EN	Environmental notice
ft	Foot (feet)
FS	Feasibility study
GAC	Granular activated carbon
GHG	Greenhouse gases
H_2O	Water
HPT	Hydraulic profiling tool
Hz	Cycle per second
IC	Institutional control
in.	Inch(es)
KO	Knock out
lb	Pound(s)
mi	Miles
MIP	Membrane interface probe
MW	Monitoring well
NHP	National Heatset Printing Co.
No.	Number

LIST OF ACRONYMS AND ABBREVIATIONS (continued)

NYSDEC	New York State Department of Environmental of Conservation
NYSDOH	New York State Department of Health
O&M	Operation and maintenance
PCE	Tetrachloroethene
PID	Photoionization detection
P.E.	Professional Engineer
PES	Precision Environmental Services
P.G.	Professional Geologist
ppb	Part(s) per billion
PRR	Periodic Review Report
RA	Remedial action
RAO	Remedial action objectives
RD	Remedial design
RI	Remedial investigation
ROD	Record of decision
RSO	Remedial system optimization
SCDHS	Suffolk County Department of Health Services
SCG	Standards, Criteria, and Guidance
SMP	Site Management Plan
SVE	Soil vapor extraction
TAGM	Technical and Administrative Guidance Memorandum
TCE	Trichloroethene
VFD	Variable frequency drive
VC	Vinyl chloride
VOC	Volatile organic compound

ES. EXECUTIVE SUMMARY

The New York State Department of Environmental Conservation (NYSDEC) tasked EA Engineering, P.C. and its affiliate EA Science and Technology (EA) to provide site management services from 30 January 2017 through 30 January 2020 at the National Heatset Printing Co. site (Site Number [No.] 152140) in Babylon, Suffolk County, New York (**Figure 1**). This Work Assignment was conducted under NYSDEC Standby Engineering Services Contract No. D007624, work assignment No. 16 until February 2020. EA resumed Site Management services in November 2020 under Contract No. D009806, work assignment No. 18 which includes this Periodic Review Report as a deliverable. The delay in submittal of this PRR in comparison to the reporting period is associated with the WA approval in November 2020. .

Operation, maintenance, and monitoring program activities have been conducted at the National Heatset Printing Co. site since April 2013 in accordance with the New York State Inactive Hazardous Waste Disposal Site Remedial Program and as stipulated in the Record of Decision (NYSDEC 1999) and Site Management Plan (EA 2013a) in order to attain identified cleanup goals.

The purpose of this Periodic Review Report is to summarize the results of the January 2017 through January 2020 quarterly groundwater monitoring, system influent/effluent air monitoring, annual site inspections, and monthly operation and maintenance events; evaluate the effectiveness of the remedial actions implemented at the site; and to provide sufficient documentation that the remedy remains in place, is performing properly and effectively, and is protective of public health and the environment. Specifically, this report provides the following information:

- Results of quarterly groundwater monitoring
- Evaluation of the current groundwater quality conditions
- Results of system influent/effluent air monitoring
- Results of site inspections and operation and maintenance visits
- Maintenance activities performed
- Remedial System Optimization activities conducted.

This report also documents any problems or changes necessary for the site to be in compliance with the Site Management Plan including removal of Institutional Controls/Engineering Controls that are no longer applicable, modifications in monitoring requirements, as applicable, or a Corrective Action Work Plan and schedule, as necessary.

ES.1 EFFECTIVENESS OF REMEDIAL PROGRAM

Groundwater Monitoring

Groundwater sampling was completed at the onsite and offsite monitoring well networks on a quarterly basis during the reporting periods. Groundwater concentrations of total chlorinated volatile organic compounds (CVOCs) were generally steady, with some increasing trends in deep monitoring wells potentially tied to disrupted system operations. Onsite, concentrations in shallow

monitoring wells generally decreased while concentrations in deep monitoring wells generally increased, particularly following onsite DDC system shutdown. Offsite groundwater chlorinated volatile organic compound (CVOC) concentrations continued to decrease in the deep monitoring wells, while no clear trend was identified in the offsite shallow monitoring wells.

System Influent/Effluent Air Monitoring

Influent/effluent system air sampling at the soil vapor extraction (SVE) system, onsite density-driven convection (DDC) system, and offsite DDC system was completed on a quarterly basis. The mass recoveries calculated using system information and laboratory air results confirm that while the systems are up and running, they continue to be effective at removing primary CVOCs and daughter compounds.

Site Inspection and Maintenance

Site inspections and maintenance were completed on a monthly/quarterly basis during site visits associated with system operation and maintenance. More detailed annual inspections were performed in October 2017, April 2018, and December 2019. The fencing, locks, and access gates/doors were in good condition during each visit. Both the asphalt/concrete areas and the grassy areas were in good condition. There was no evidence of vandalism observed to the DDC wells, treatment systems, or utilities, and penetrations (including poles, posts, or stakes) were not observed. Installation of new paving was noted as having been completed behind the 1 Adams Boulevard building during the October 2017 site inspection.

The SVE system and surrounding areas were generally observed to be in good condition during each annual inspection. There was no evidence of vandalism to the SVE treatment system and new outdoor manifold, however, graffiti was found on the SVE system enclosure during the April 2018 inspection. Also, during the same inspection the SVE blower was not operational and was offsite for repairs.

During the October 2017 inspection, it was noted that damage had occurred to the onsite DDC System #2 trailer in February 2017. A snowplow hit the side of the trailer and damaged the exterior electrical conduit. Damage to the electrical conduit was repaired on 14-17 February 2017.

The DDC treatment system enclosures were observed to be in good condition during the annual inspections; no additional damage to the system enclosures or wellheads in either location was noted at that time. The heating and ventilation for the enclosures had not changed between annual inspections and since the last periodic review reporting period. The blower pressure gauge for the onsite DDC System #2 was still malfunctioning during the October 2017 and April 2018 inspection and has since been repaired by D&D Electric Motors & Compressors. At the time of the annual inspections, gauges and meters read within acceptable levels at the systems which were in operation.

DDC Treatment Systems

The DDC treatment systems required many troubleshooting and repair events during the reporting period. Onsite DDC System #1 was operational for 39 percent of period and Onsite DDC System #2 was operational for 54 percent of the period. Downtime during 2019 was associated with high local groundwater elevations. The high water table caused the system to take on more water than it was designed to handle. Moisture separators and transfer pumps for both onsite DDC systems are designed to manage incidental water generated from moisture and condensate in the process lines, but they are not designed to handle large slugs of water. Additionally, the air stripping mechanism of CVOC removal from within the DDC well heads relies upon a gap between the water table and the intake portion of the well head.

During periods of high groundwater elevations, water was entering the system at rates faster than the transfer pump rates; therefore, water accumulated quickly within the moisture separators causing the system to shut down. To prevent damage to system components, the onsite DDC systems were shut down until groundwater elevations decreased. Groundwater elevations were monitored following system shut down to determine when the systems could be restarted but did not return to low enough levels during this reporting period to allow successful operation of the systems.

Onsite DDC System #1

- Was inoperable beginning in March 2018 due to a malfunction of the moisture separator (noted below) and remained off for the rest of the reporting period (January 2020) due to high local groundwater elevations.

- The controls associated with the moisture separator had malfunctioned prior to the March 2018 site visit; water had accumulated in both the moisture separators and the granular activated carbon (GAC) vessels.

- The system was turned off, the moisture separator and GAC vessels were drained, but the system was not able to run.

- Attempts to restart the system following replacement of the moisture separators and GAC media were unsuccessful due to issues with high groundwater elevations and systems components (i.e. malfunctioning variable frequency drive (VFD) and controls associated with transfer pumps).

- High groundwater elevations were suspected to be a contributing factor to system performance.

Onsite DDC System #2

- Shut down February 2019 due to high local groundwater elevations and associated operational issues.

- Local groundwater elevations were continuously monitored but did not return to a level that would allow system operation during the reporting period.

Offsite DDC System

- Shut down December 2018 due to high local groundwater elevations and associated operational issues.

- Local groundwater elevations were continuously monitored but did not return to a level that would allow system operation during the reporting period.

ES.2 COMPLIANCE

System operation during the reporting period was limited due to issues with troubleshooting, system repair, and high groundwater table elevations. Due to low system performance and up-time during the reporting period of 30 January 2017 – 30 January 2020, the operation of the DDC treatment systems as an engineering control (EC) was not in compliance with respect to the major elements of the Site Management Plan. Pursuant to the Engineering Controls/Institutional Controls Certification Form and DER-10, a Corrective Measures Work Plan is required to evaluate effectiveness of the remedial system and address issues with system performance.

ES.3 RECOMMENDATIONS

- Additional sampling should be performed to further evaluate existing contamination beneath the site building. In addition, new permanent monitoring wells should be installed to augment the existing well network in order to further refine plume delineation efforts at the site. The conceptual site model should then be refined using the additional data obtained from these efforts.

- Depending on the outcome of additional groundwater plume delineation efforts, enhancement of the remedial approach may be warranted through the use of complementary technologies such as in situ bioremediation or chemical oxidation in order to reduce the overall remedial timeframe and achieve remedial action objectives.

- The Site Management Plan should be updated to reflect changes to the SVE system and any additional changes to the DDC systems and/or monitoring well networks.

- Site management tasks should continue during the next period (2020–2023). This includes annual site inspections, monthly operations and maintenance, system repairs (as needed),

quarterly groundwater monitoring and sampling, and quarterly DDC system influent and effluent/SVE system air monitoring.

- New dial-out units (i.e., Sensaphone) should be installed at the SVE system, incorporating a modern cellular-based setups to improve the reliability of these features. Offsite DDC PLC control panel software should also be examined to determine if it needs to be updated.

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1. SITE OVERVIEW

1.1 LOCATION

The National Heatset Printing Co. (NHP) site is currently a Class 4 site listed on the New York State Department of Environmental Conservation (NYSDEC) Registry of Inactive Hazardous Waste Sites (Number [No.] 152140). The site is located at 1 Adams Boulevard in the Hamlet of Farmingdale, Town of Babylon, Suffolk County, New York, and is identified as Block 1.00 and Lot 20.001 on the Town of Babylon Tax Map No. 132.20-1-3.2. A site location map is presented in **Figure 1**. The site is currently owned by 1 Adams Boulevard Realty Corporation, managed by Finkelstein Realty, and leased by a tenant. The site contains one industrial building and is 4.5 acres in size. The site is located in an industrial area and is bounded by railroad tracks to the north, Adams Boulevard and an industrial property to the south, an industrial property to the east, and an industrial property to the west (**Figure 2**).

NHP occupied a portion of this building from July 1983 to April 1989. Their operations consisted of lithographic tri-color printing of newspaper and periodical advertisements, and the manufacturer of lithographic printing plates. NHP had been using organic solvents at the site since 1983. An inspection by the Suffolk County Department of Health Services (SCDHS) in 1983 revealed that NHP was discharging photo-plating waste to the onsite sanitary system. In March 1986, an inspection performed by the SCDHS revealed strong evidence of dumping from staining of inks and oils on the ground. The inspection report indicated that drums were being stored improperly both inside and outside of the building.

NHP filed for bankruptcy in 1987. The SCDHS discovered that after filing for bankruptcy, NHP disposed of its chemical inventory by dumping the materials onto the soil and into a leaching pool located off the rear of the building in the northeast side of the property.

In February 1988, a water sample collected by SCDHS from the leaching pool off the northeast side of the building contained elevated levels of volatile organic compounds (VOCs) (i.e., 24,000 parts per billion [ppb] of 1,2-dichloroethene [DCE] and 1,000 ppb of p-ethyltoluene). At the request of SCDHS, the leaching pool bottom sediments were excavated to a depth of 15 feet (ft) and end-point samples were collected in November 1988. The end-point soil samples indicated that the remaining leaching pool sediment still contained elevated levels of VOCs (i.e., 13,000 parts per million of tetrachloroethene [PCE]).

1.2 GEOLOGY AND HYDROGEOLOGY

The geologic formations that underlie Suffolk County are composed of a series of thick deposits of unconsolidated water bearing sediments of late Cretaceous and Pleistocene age. These unconsolidated deposits are underlain by crystalline bedrock of Precambrian age. The site is located approximately 4 miles (mi) north of South Oyster Bay, which is just north of Jones Beach Island and the Atlantic Ocean. The site topography and surrounding area is relatively flat.

There are three primary water bearing aquifers underlying Suffolk County. These aquifers, from shallow to deep, are the Upper Glacial, Magothy, and Lloyd. The aquifers are considered to be hydraulically connected, with the Glacial and Magothy contributing recharge for the underlying Lloyd aquifer. Together, they are a federally designated sole source of drinking water for Long Island.

During the glacial retreat, the area was covered with outwash deposits that constitute most of the Upper Glacial aquifer of Long Island. Because these sand and gravel deposits contain virtually no interstitial clay and silt, the Upper Glacial aquifer is the most permeable. The estimated average horizontal hydraulic conductivity of the outwash is from 1,000 to 1,500 gallons per day/square feet. The direction of groundwater movement through Long Island's aquifers is horizontal and is generally more rapid than the movement in the vertical direction. This arises because of an anisotropic effect; the largest dimensions of particles in the interbedded fine- and coarse-grained layers tend to be oriented horizontally.

Groundwater in the Upper Glacial aquifer flows away from two major highs on the main water table divide on Long Island. The general directions of groundwater flow of the island are north toward the Long Island Sound and south toward the Great South Bay. Groundwater has been encountered onsite at depths ranging from approximately 4 to 19 ft bgs. Based on site-specific data, local groundwater flow at the site moves south to southeast toward the Great South Bay with a gradient of 0.0014 ft/ft and velocity of approximately 1.34 ft/day. Overburden groundwater flow is shown on **Figures 3 and 4**.

1.3 NATURE AND EXTENT OF CONTAMINATION – PRE-REMEDIAL ACTION

A remedial investigation (RI)/feasibility study (FS) was performed at the site in 1999 to determine the nature and extent of contamination in onsite soil, determine the onsite and offsite groundwater conditions, evaluate potential qualitative risks to human health and the environment of site-related contaminants, and determine the best remedial technology to remediate soil and groundwater contamination onsite and offsite. The results of the RI are described in detail in the RI/FS Report (H2M 1999). Potential remedial alternatives for the site were identified, screened, and evaluated in the FS. The RI/FS report is summarized below:

- Six surface soil samples were obtained from 0 to 6 inches (in.) below ground surface (bgs) at the leaching pool area and were tested for VOCs. None of the surface soils exhibited concentrations exceeding NYSDEC recommended soil cleanup objectives included in the Technical and Administrative Guidance Memorandum (TAGM) 4046: Determination of Soil Cleanup Objectives and Cleanup Levels (NYSDEC 1994).

- Subsurface soil samples were collected from saturated and unsaturated soils to characterize the extent of contamination from the leaching pool. Prior to the RI, contaminated soils in the source area were excavated down to 15 ft bgs and were backfilled with clean sand under the supervision of the SCDHS. Analytical results revealed no soil contaminants in unsaturated soils, which are above 15 ft bgs. PCE was detected in the saturated soils located directly below the leaching pool at concentrations exceeding the NYSDEC

recommended soil cleanup objective. The exceedances ranged from 8.2 to 7,700 parts per million.

- Twelve groundwater monitoring wells were sampled including 1 upgradient, 7 onsite, and 4 downgradient wells. Seventy-four Geoprobe® groundwater samples were also obtained, including 8 upgradient, 39 onsite and 27 downgradient:

  — Elevated concentrations of PCE, trichloroethene (TCE), and 1,2-DCE were detected in the Geoprobe® groundwater samples obtained below the onsite leaching pool. Concentrations of PCE (496–7,690 ppb), TCE (162–9,620 ppb), and 1,2-DCE (124–12,200 ppb) exceeded the NYSDEC groundwater standard of 5 ppb. Samples from shallow and deep monitoring wells below the leaching pool exhibited concentrations ranging from 210 to 330 ppb. CVOC-contaminated groundwater was observed to be migrating offsite in a southeast direction.

- In summary, the RI determined that, based on the Standards, Criteria, and Guidance (SCGs) for the site, subsurface soil and groundwater contained VOCs contamination that was to be addressed in the remedy selection.

Based on the RI and FS (H2M 1999), the NYSDEC issued a Record of Decision (ROD) document dated 17 June 1999 (NYSDEC 1999), which identified the selected remedy for the site, cleanup objectives/goals, and site closure criteria.

1.4 REMEDIAL ACTION OBJECTIVES

The overall remedial goal for the site is to meet all SCGs and be protective of human health and the environment.

The remedial action objectives (RAOs) for this site, as presented in the ROD, are as follows:

- Eliminate, to the extent practicable, the source area contamination by remediating the groundwater directly below the leaching pool.

- Eliminate, to the extent practicable, ingestion of groundwater affected by the site that does not attain New York State Department of Health (NYSDOH) drinking water standards.

- Eliminate, to the extent practicable, further offsite migration of groundwater that does not attain NYSDEC Class GA Ambient Water Quality Criteria (AWQS).

1.4.1 Groundwater Remedial Action Objectives

Remedial Action Objectives for Public Health Protection:

- Monitor groundwater containing contaminant levels exceeding drinking water standards and evaluate any potential public health issues.
- Prevent contact with, or inhalation of, volatiles emanating from contaminated groundwater.

Remedial Action Objectives for Environmental Protection:

- Maintain, to the extent possible, ambient groundwater quality standards by eliminating potential groundwater contamination source(s).

1.4.2 Soil Remedial Action Objectives

Remedial Action Objectives for Public Health Protection:

- Prevent ingestion/direct contact with contaminated soil.
- Prevent inhalation of or exposure to, contaminants volatizing from contaminated soil.

Remedial Action Objectives for Environmental Protection:

- Prevent migration of contaminants that would result in groundwater contamination.
- Prevent impacts to biota due to ingestion/direct contact with contaminated soil that would cause toxicity or bioaccumulation though the terrestrial food chain.

1.4.3 Surface Water Remedial Action Objectives

Not applicable.

1.4.4 Sediment Remedial Action Objectives

Not applicable.

1.5 SUMMARY OF REMEDIAL ACTIONS

Potential remedial alternatives for the site were identified, screened, and evaluated in the FS. Based on the RI and FS (H2M 1999), NYSDEC issued the ROD (NYSDEC 1999), which identified the selected remedy for the site. The remedy included groundwater treatment using pump and treat, or alternate technologies (i.e., *in situ* chemical oxidation, in-well vapor stripping) for three locations: (1) source area, (2) downgradient edge of the site, and (3) downgradient edge

of the offsite plume (**Figures 5A, 5B, and 5C**). The site is being remediated in accordance with the ROD, which was implemented via two construction contracts (awarded to EnviroTrac in 2004 and EarthTech/AECOM in 2006) and the SVE work plan (Shaw Environmental [Shaw] 2003) as described below. The following sections describe the remedial design and remedial action efforts conducted at the site.

1.5.1 Onsite Source Area

The remedy in the ROD was refined during the remedial design (RD). An additional investigation performed during the RD concluded that injection of sodium and potassium permanganate would be the most effective source area remedy. Therefore, an RD and construction contract (Contract No. D005272) was prepared by Shaw for implementation of this technology. The injection was conducted in 2005 via 24 monitoring wells in 10 locations (nested pairs or trios). CVOC concentrations in groundwater collected from within the treatment area in the year following the injection activities were observed to decrease, as described in the Permanganate Injection System Remedial Action Report (O'Brien and Gere 2007).

Sampling during the RD (obtained in 2001) revealed the presence of contaminated soil beneath the onsite building's slab. In addition, four indoor air samples (AS-1, AS-2, AS-3, and AS-4) were collected from the onsite commercial building in July 2001 and analyzed for VOCs. The concentration of PCE in sample AS-1, collected near the identified source area, exceeded the corresponding NYSDOH guidance value; no other samples reported a PCE concentration above the NYSDOH guidance value. As this CVOC contamination was affecting the indoor air, the NYSDEC installed a soil vapor extraction (SVE) system to remediate the contaminated soil beneath the building slab and address potential vapor intrusion.

The SVE system has been running since September 2002 (**Figure 5A**). In July 2014, the vertical extraction well was converted to a buried horizontal screen in order to accommodate the daily operations of a new building tenant, as well as to improve the capacity for extraction. In February 2016, soil and soil vapor sampling was performed as part of the overall Remedial System Optimization (RSO) program. Soil samples were collected from borings advanced through the building foundation at 1 Adams Boulevard. New vapor monitoring points were installed in the building based on field screening using a photoionization detector (PID) and sampled for chlorinated volatile organic compounds (CVOCs). Results of this sampling effort were presented in a memorandum (EA 2016a). The results were also incorporated into follow-on modifications to the SVE system as discussed below.

Over the course of Spring/Summer 2016, the original SVE system design was modified to include additional horizontal SVE wells to enhance the recovery of contaminants from the vadose zone in the source area, mitigate indoor air impacts, and ultimately reduce the timeframe associated with addressing potential source area mass (thereby reducing overall remedial costs). In June 2016, five new horizontal wells were installed and connected to the SVE system through a manifold mounted to the south side of the treatment trailer. The system was restarted in August 2016 using all five wells simultaneously. Operation of the horizontal well legs was adjusted periodically throughout this reporting period to target areas of high soil vapor concentrations beneath 1 Adams

Boulevard. A description of the construction activities (including as-built drawings) associated with the modification of the SVE system was presented in a Construction Completion Report (EA 2018).

1.5.2 Downgradient Onsite Area

Two in-well stripping treatment systems (density driven convection [DDC]) were installed on the downgradient edge of the onsite groundwater plume. The previous standby engineer, O'Brien and Gere, managed the in-well stripping pilot test performed in 2006, which was accepted by NYSDEC. Based on the pilot test data, the effectiveness of the DDC system was determined and full scale onsite DDC construction was implemented. For the two onsite groundwater treatment systems as well as the offsite groundwater treatment system (Section 1.5.3), the NYSDEC awarded Contract No. D005539 to EarthTech/AECOM in 2006 to construct in-well vapor stripping systems (**Figures 5B and 5C**). The system initially installed as part of the pilot test became known as onsite Treatment System #1. In 2010 as part of EarthTech/AECOM's contract, an additional DDC well was added to the pilot study system and a second onsite system (Treatment System # 2) was constructed (**Figure 5B**). Both onsite treatment systems consist of two DDC wells. Detailed descriptions of the onsite remedial systems can be found in Section 1.4.1 of the Site Management Plan (SMP) (EA 2013a).

1.5.3 Downgradient Offsite Area

In 2012, the offsite DDC system was constructed by EarthTech/AECOM under Contract No. D005539 at the Suffolk County Water Authority–Albany Avenue Well Field (**Figure 5C**). The system consists of six DDC wells and two treatment trailers. Detailed descriptions of the above remedial systems can be found in Section 1.4.1 of the Site Management Plan (SMP) (EA 2013a).

1.5.4 Environmental Notice

The NYSDEC prepared an Environmental Notice (EN) for the site, which was issued in lieu of an Environmental Easement/Deed Restriction as referenced in Division of Environmental Remediation (DER)-33. The document includes a map of the property subject to the EN, and identifies certain limitations, which apply to the cleanup of contamination disposed at the property. The EN was prepared on 28 March 2013 and recorded at the Suffolk County Clerk's Office on 16 April 2013.

1.5.5 Final Engineering Report

The Final Engineering Report (EA 2013b) was completed in August 2013 and details the remedial activities conducted at the NHP site.

1.6 REMAINING CONTAMINATION

Remedial work described in the onsite and offsite Remedial Action (RA) Work Plans (AECOM 2009, 2011) did not include soil removal; therefore, contamination was left in the subsurface soil and groundwater at this site, which is hereafter referred to as remaining contamination. The SMP (EA 2013a) was prepared to manage remaining contamination at the site.

1.6.1 Soil/Soil Vapor and Indoor Air

As previously mentioned, the SVE system was installed to remediate the remaining contaminated soil beneath the building slab and address potential vapor intrusion. The system has been remediating the soil and vadose zone since 2002 and was modified in 2014 and again in 2016.

Prior to the modification of the SVE system in 2016, EA conducted sub-slab soil and soil vapor sampling along with indoor air sampling to delineate remaining contamination within the footprint of 1 Adams Boulevard. Soil borings were advanced using direct push technology and installed to approximately 10 ft bgs. Samples were collected from the interval exhibiting the highest PID reading. PCE was detected in 15 of the samples collected at concentrations below the NYSDEC Unrestricted Soil Cleanup Objectives of 1.3 mg/kg. Other site COCs detected in samples included TCE and DCE.

Five soil boring locations within 1 Adams boulevard were used to construct soil vapor points. Sub-slab soil vapor samples and indoor air samples were collected using 8-hour regulated Summa canisters while the SVE system was not running. PCE was detected in all 5 sub-slab samples ranging from 4,600 micrograms per cubic meter of air ($\mu g/m^3$) (VP-19) to 36,000 $\mu g/m_3$ (VP-16), with exceedances of the New York State Department of Health (NYSDOH) Air Guidance Values (NYSDOH 2015) for PCE (30 $\mu g/m^3$) in all 5 samples. TCE concentrations exceeded NYSDOH standards in 4 of the 5 sub-slab samples, ranging from 24 $\mu g/m^3$ (VP-19) to 200 $\mu g/m^3$ (VP-18). PCE was the only COC detected in one of the initial indoor air samples (IA-01, a location adjacent to a soil gas sample with the highest detection of PCE) with a concentration of 6.4 $\mu g/m^3$, below the NYSDOH guidance standard of 30 $\mu g/m^3$. An indoor air sample collected on the northwest side of the building (IA-02) had no detections for site COCs. Two confirmatory indoor air samples were collected, in the same locations as previously sampled at IA-01 and IA-02 after the SVE system after the SVE system had been restarted. A full description of the sampling plan and results of the 2016 investigation was presented in the Sampling and Delineation Memorandum for 1 Adams Boulevard (EA 2016a).

During the reporting period, site CVOCs continued to be removed from the subsurface by the SVE system, based on the quarterly system sampling results and monthly operation and maintenance (O&M). Monthly screenings of vapor points within 1 Adams Boulevard also indicate remaining contamination within the vadose zone.

1.6.2 Groundwater

Groundwater contamination is present onsite and offsite. The groundwater plume extends approximately 5,700 ft downgradient of the site. Historically, the highest concentrations of PCE in groundwater have been detected at approximately 80 ft bgs. Concentrations of VOCs greater than 1,000 ppb (maximum 12,021 ppb) in groundwater have been present in the 75–85 ft sampling interval approximately 4,100 ft downgradient (south-southeast) of the site. The intent of the two onsite DDC systems is to mitigate further migration of contaminants downgradient. The intent of the offsite DDC system is to capture contamination at the end of the plume and mitigate further migration of contaminants to the south-southeast.

In May 2016, groundwater plume delineation activities were completed using a membrane interface probe (MIP) and hydraulic profiling tool (HPT) as part of a Remedial System Optimization (RSO). The MIP was advanced at 25 sample locations over a period of 2 weeks, via direct-push technology. Field data and observations from the MIP were used to select locations associated with the subsequent HPT sampling program. The HPT was advanced at 10 locations over the course of 4 weeks and groundwater samples were collected and analyzed for CVOCs. Results from the plume delineation RSO were presented in a memorandum to NYSDEC issued August 2017 (EA 2017a) and concluded the following.

- Based on the results of the 2016 and previous investigations, not additional onsite or offsite sources were identified that could be contributing to groundwater contamination.

- Groundwater beneath the site is impacted with CVOCs from the water table interface encountered at 11.41 to 18.05 ft bgs in April 2016 at onsite wells to the top of the Gardiners Clay unit at approximately 80 ft bgs.

- The highest PCE, TCE, and DCE concentrations were detected in the deepest sampling intervals collected from approximately 75 to 80 ft bgs.

- A three-dimensional interpretation of the data indicated elevated concentrations of PCE, TCE, and DCE as pockets or “hot spots” of contamination, with the highest concentration 670 ppb approximately 4,200 ft downgradient from the source area (1 Adams Boulevard).

- The offsite DDC system appears to be limiting further downgradient migration of VOCs, with PCE, TCE, and cis-1,2-DCE concentrations decreasing to below the NYSDEC AWQS of 5 ppb 400 ft south of the offsite system.

- Concentrations approximately 500–700 ft northeast of the offsite DDC wells suggest a component of eastward groundwater flow and contaminant transport in this area that is beyond the influence of the offsite treatment system; and therefore, is potentially not being addressed by the system.

Since contaminated soil, soil vapor, and groundwater remain at the onsite and offsite locations after completion of the RA, engineering controls (ECs) and institutional controls (ICs) are required

to protect human health and the environment. The SMP (EA 2013a) provides a detailed description of all procedures required to manage remaining contamination at the site after completion of the RA, including: (1) implementation and long-term management of all ECs and ICs, (2) media monitoring, (3) O&M of all treatment, collection, containment, or recovery systems, (4) performance of periodic inspections, certification of results, and submittal of this Periodic Review Report (PRR), and (5) defining criteria for termination of treatment system operations.

1.7 SITE MANAGEMENT PLAN

The SMP (EA 2013a) was originally completed in June 2013 and detailed the future management of the NHP site. The SMP specifies the methods necessary to ensure compliance with all ECs and ICs required by the EN for contamination that remains at the site. Environmental monitoring points at the NHP site have been maintained and sampled during the monitoring period in accordance with the SMP. This included collection of groundwater and system influent/effluent air samples at various locations across the site, monthly O&M of the systems, annual inspections, and treatment system and monitoring well maintenance. Sampling locations, sampling methodology, list of analytes, analytical methods, inspection methodology, and site maintenance objectives are documented in the SMP.

The objectives of the monitoring and maintenance program are to:

- Collect representative groundwater and system influent/effluent air samples and evaluate the data to confirm that the remedy continues to be effective in protecting public health and the environment.

- Assess compliance with applicable NYSDEC SCGs, particularly ambient groundwater standards and assess achievement of the remedial performance criteria.

- Periodically inspect the site and provide routine maintenance, as necessary.

- Document and report this information to the NYSDEC.

It is anticipated that the SMP will be updated in 2021 to reflect any changes to the treatment systems and associated monitoring well networks.

1.8 CRITERIA FOR COMPLETION OF REMEDIATION/TERMINATION OF REMEDIAL SYSTEM

Generally, remedial processes are considered completed when effectiveness monitoring indicates that the remedy has achieved the remediation goals identified by the ROD (NYSDEC 1999). The framework for determining when remedial processes are complete is provided in Section 6.4 of NYSDEC DER-10.

1.8.1 Soil Vapor Extraction System

The SVE system will continue to be monitored quarterly to determine whether the system remains necessary at the site, or if the RA objectives were achieved. The decision to terminate operation of the SVE system will be based upon the evaluation of whether soil remediation is complete by assessing system performance/monitoring data, soil sampling results, and soil gas results. The following is a list of factors that may influence the commencement of shut down:

- System off-gas analysis:
  - — Total influent or individual VOCs extracted from area of influence are not evident.
  - — Total influent or individual VOCs extracted from area of influence are below regulatory requirements.
  - — No rebound is observed in influent concentrations upon system restart, following reasonable system shut down period.
- Soil gas analysis:
  - — Soil gas constituents collected from the remediation area indicate levels of non-detection with reasonable detection limits and concentrations.
  - — Soil gas concentrations do not significantly rebound following reasonable system shut down period.
- Soil sample analysis:
  - — Soil constituents collected from the area being remediated indicate concentrations below regulatory requirements or are not detected (confirmatory analyses).

The SVE system will not be discontinued unless prior written approval is granted by the NYSDEC. If monitoring data indicate that the SVE system is no longer required, a proposal to discontinue the system will be submitted by the property owner.

1.8.2 Density Driven Convection Systems

The DDC systems will be monitored monthly to determine whether the systems remain necessary at the site, or if the RA objectives have been achieved. The DDC system operation will not be discontinued unless prior written approval is granted by the NYSDEC. If monitoring data indicate that the DDC systems are no longer required, or it is determined that the systems are not effective, a proposal to discontinue the systems will be submitted by the property owner. Conditions that warrant discontinuing the DDC systems include contaminant concentrations in groundwater that (1) reach levels that are consistently below NYSDEC AWQS, (2) have become asymptotic to a

low level over an extended period of time as accepted by the NYSDEC, or (3) the NYSDEC has determined that the DDC systems have reached the limit of their effectiveness.

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2. EVALUATION OF REMEDY PERFORMANCE, EFFECTIVENESS, AND PROTECTIVENESS

This section provides a brief evaluation of remedy performance, effectiveness, and protectiveness at the NHP site, based upon assessment of historical groundwater data, mass removal rates, and system operation. Groundwater data is presented in **Tables 1, 2A, and 2B**; and mass removal data is provided in **Tables 3A through 3F**. Additional discussions of remedy performance effectiveness in relation to groundwater data, system performance, and mass removal rates are provided in Sections 4 and 5 of this PRR.

2.1 SYSTEM OPERATION

The SVE system had one extended period of system downtime during the reporting period due to issues with a blower motor winding. Overall, the SVE system was operational 79 percent of the period. Monthly monitoring of differential pressures at vapor points within 1 Adams Boulevard indicated that the system was effectively mitigating potential for soil vapor intrusion.

The DDC treatment systems required many troubleshooting and repair events during the reporting period as described in Section 5.2 of this report. Onsite DDC System #1 was operational for 39 percent of the reporting period and Onsite DDC System #2 was operational for 54 percent of the reporting period. Offsite system blowers have been switched every 6 months, so a single blower is used to operate the 6 DDC wells. Blowers B-501 and B-502 were operational 39 percent and 38 percent of the reporting period, respectively.

Downtime during 2019 was associated with high local groundwater elevations. The high water table caused the systems to take on more water than they were designed to handle. Moisture separators and transfer pumps for both onsite and offsite DDC systems are designed to manage incidental water generated from moisture and condensate in the process lines, but they are not designed to handle large slugs of water. To prevent damage to system components, the onsite DDC systems were shut down until groundwater elevations decreased. Groundwater elevations were monitored following system shut down to determine when the systems could be restarted but did not return to low enough levels during this reporting period to allow successful operation of the systems.

2.2 GROUNDWATER DATA

- During this reporting period, total CVOC concentrations decreased in onsite and offsite shallow groundwater and increased in onsite and offsite deep groundwater following the shutdown of DDC Systems #1 and #2 in March and December of 2018, respectively.

- Concentrations in offsite nested wells (MW-1S/MW-1D) upgradient from the offsite DDC system have shown a decreasing trend since system installation in 2012. MW-1D has shown an order of magnitude decrease in total CVOCs since 2012, with values remaining consistent into 2019. PCE was detected in MW-1S in October 2018 and in May 2019 but were less than the water guidance value of 5 ug/L.

- From 2010 to 2020, deep groundwater monitoring data showed a general decreasing trend in CVOC concentrations. Total CVOC concentrations rebounded to baseline concentrations within onsite deep groundwater in 2019, following the extended shut down of onsite DDC Systems #1 and #2. The rebound of CVOC concentrations potentially indicates that the decreasing concentrations previously observed was not due to mass removal from system operation, rather a slower rate of desorption of CVOCs from contaminated soil into the water column than the rate of removal of volatilized contaminants by the DDC systems. Additionally, the decrease in concentration in shallow groundwater following the extended period of DDC system down time suggests that CVOC contamination in deep groundwater was circulated into shallow groundwater during system operation. Graphs showing CVOC concentration trends in site groundwater are presented in **Figures 6A, 6B, 6C, and 6D**.

2.3 MASS REMOVAL

SVE system air monitoring/sampling has been continuously performed at the site since August 2008. DDC influent/effluent air monitoring has been continuously performed on a quarterly basis at the site since June 2010 (onsite DDC systems) and July 2012 (offsite DDC system). Summaries of the CVOC mass recovery rates for the SVE and DDC systems can be found in **Tables 3A through 3F**. During the January 2017 – January 2020 reporting period, the following mass removal amounts were observed:

- Approximately 48.79 pounds (lb) of PCE, 2.84 lb of TCE, and 0.57 lb of DCE have been removed from the source area via the SVE system.

- Approximately 25.14 lb of PCE, 0.00 lb of TCE and 0.00 lb of DCE have been removed from onsite groundwater by onsite DDC System #1.

- Approximately 18.94 lb of PCE, 0.11 lb of TCE and 0.05 lb of DCE have been removed from onsite groundwater by onsite DDC System #2.

- Approximately 1.30 lb of PCE, 1.18 lb of TCE, and 0.46 lb of DCE have been removed from offsite groundwater by the offsite DDC system operating with Blower 501.

- Approximately 1.13 lb of PCE, 1.08 lb of TCE, and 2.26 lb of DCE have been removed from offsite groundwater by the offsite DDC system operating with Blower 502.

Based upon the results for groundwater monitoring and mass removal, it appears that remedial system operation is reducing total CVOC concentrations in source area soil, as well as both onsite and offsite groundwater when the systems are operational.

- Mass recovery observed at the SVE system continue to remain consistent with previous years.

- Mass recovery observed at onsite DDC System #1 and onsite DDC System #2 is similar to the previous reporting period.

- Mass recovery continues to be observed at the offsite system though at a lower rate than previous quarters.

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3. INSTITUTIONAL CONTROLS/ENGINEERING CONTROLS PLAN COMPLIANCE REPORT

The SMP (EA 2013a) was submitted and approved as final by the NYSDEC in June 2013.

3.1 INSTITUTIONAL CONTROLS/ENGINEERING CONTROLS REQUIREMENTS AND COMPLIANCE

Since contamination remains in onsite soil, soil vapor, and onsite and offsite groundwater, ICs and ECs are required to protect human health and the environment.

3.1.1 Institutional Controls

A series of ICs are required by the ROD (NYSDEC 1999) to (1) implement, maintain, and monitor EC systems, (2) prevent future exposure to remaining contamination by controlling disturbances of the subsurface contamination, and (3) limit the use and development of the site to industrial uses only. ICs consist of:

- Compliance with the SMP
- Compliance with the EN—ICs identified in the EN may not be discontinued without an amendment to or extinguishment of the EN. The site has a series ICs in the form of site restrictions which include:
  - The property may only be used for industrial use provided that the long-term ECs and ICs are employed.
  - The property may not to be used for a higher level of use, such as unrestricted, restricted residential or commercial uses without additional remediation and amendment of the EN, as approved by NYSDEC.
  - There shall be no disturbance or excavation of the property which threatens the integrity of the ECs or which results or may result in a significantly increased threat of harm or damage at any site as a result of exposure to soils.
  - The use of the groundwater underlying the property is prohibited without treatment rendering it safe for intended use unless the user first obtains permission to do so from NYSDEC.
  - The potential for vapor intrusion must be evaluated for any buildings developed within the site boundaries, and any potential impacts that are identified must be monitored or mitigated.

— Vegetable gardens and farming on the property are prohibited.

— Site owner or remedial party will submit to NYSDEC a written statement that controls employed at the Controlled Property are unchanged or any changes have approval of NYSDEC.

- Development of an Excavation Work Plan (included as an appendix to the SMP), which identifies the procedures and protocols required to be implemented should any remaining contamination be breached, penetrated, or temporarily removed.

- Compliance with O&M Plan (as defined in the SMP [EA 2013a]).

- Compliance with Monitoring Plan (as defined in the SMP).

- Compliance with IC/EC Plan (as defined in the SMP).

3.1.2 Engineering Controls

ECs, which consist of an SVE system (source area) and several DDC systems (onsite DDC Systems #1 and #2, and offsite DDC system), are fully in place. A description of each EC, their objective(s), and an explanation of how the performance of each EC is evaluated is provided below.

3.1.2.1 Soil Vapor Extraction System

Objectives

The remedial objectives for the SVE system include soil remediation and soil vapor intrusion mitigation. The SVE system was designed to operate continuously. Potential exposure to indoor air impacted with VOCs within the site building is mitigated by the SVE system. In order to achieve the remedial objectives, long-term monitoring programs are in place to monitor the effectiveness of the SVE system.

Description

The equipment associated with SVE is housed in an enclosure (20 ft long × 8 ft wide × 8 ft high) located adjacent to the north wall of the site building. Modifications to the system were made in Spring/Summer 2016. As of August 2016, five horizontal well legs were installed oriented east to west beneath the 1 Adams Boulevard building. The modified system has been in use since it was installed. The five wells are connected to the SVE system via underground piping to the manifold housed on the exterior of the system enclosure. Inside the enclosure, the 2-in. diameter SVE piping contains a ball valve and gate valve to control the airflow and vacuum, as well as sampling ports for drawing air samples and conducting flow measurements. The 2-in. piping is connected to the existing vacuum blower designed to extract a maximum of 400 cubic feet per minute of airflow from the subsurface. Vapors from the source area are extracted by applying vacuum via the blower

system. A 10-horsepower regenerative blower develops a maximum vacuum of approximately 98 in. of water. Vapors extracted from below the building foundation are treated through two treatment vessels containing granular activated carbon (GAC) before being discharged to the atmosphere. In addition, the SVE system has a dial-out telemetry system to provide notification of system alarms which has not been operational since.

Evaluation Methods

Performance monitoring data showing mass removal rates versus time will be used to evaluate trends for the source area. The SVE system is currently monitored on a monthly basis to evaluate system performance, to assure that all components are in working order, and to maintain compliance with the requirements of a NYSDEC Air Discharge Permit.

Monitoring the performance of the SVE system (i.e., off-gas samples, air concentration readings) in reducing contaminant concentrations in soils is necessary to determine the effectiveness of the SVE system. The mass removed during long-term monitoring can be calculated using vapor concentration and flow rate measurements taken at the manifold. The instantaneous and cumulative mass removal is then plotted versus time. The contaminant mass removed during an operating period can be calculated using the equation provided below.

$M = C \times Q \times t$

where: M = cumulative mass removed
C = vapor concentration
Q = extraction flow rate
t = operational period.

Remedial progress of SVE systems typically exhibits asymptotic behavior with respect to both vapor concentration reduction and cumulative mass removal. At this point, the composition of the vapor should be determined and compared with soil vapor samples. This comparison will enable confirmation that there has been a shift in composition toward less volatile components. Soil vapor samples may indicate the composition and extent of the residual contamination. When asymptotic behavior begins to occur, the operator should closely evaluate alternatives that increase mass removal rate such as pulsing. Pulsing involves the periodic shut down and start-up operation of extraction wells to allow the subsurface environment to equilibrate (shut down) and then begin extracting vapors again (start-up). Other more aggressive steps to curb asymptotic behavior can include installation of additional extraction wells.

If asymptotic behavior is persistent for periods greater than 6 months, and the concentration rebound is sufficiently small following periods of pulsing, termination of operations may be appropriate if residual levels are at or below regulatory limits.

Effectiveness

Based upon the results for mass removal, it appears that SVE system operation is reducing total CVOC concentrations in source area soil. Additional discussion of SVE system monitoring and effectiveness is presented in Section 5.

Conclusions and Recommendations for Changes

It is recommended that a new dial-out unit (i.e., Sensaphone) be installed at the SVE system with more modern cellular-based setup to improve the reliability of these features. The Sensaphone unit for the SVE system is currently inoperable and no longer provides dial-out notifications when alarm conditions occur. This can lead to period of system downtime in between monthly O&M visits. To maintain continuous system operation to ensure prevention of CVOC accumulation in indoor air, a new dial-out unit should be installed.

System operation was altered in 2017 to target areas of high CVOC concentrations as identified at vapor monitoring points inside 1 Adams Boulevard during RSO activities associated with the SVE system in 2016. Vapor points will continue to be monitored to determine if and when system operation should be modified again. Currently, modification includes changing operation of SVE well legs to target areas of higher soil vapor concentration.

3.1.2.2 Density Driven Convection Systems

Objectives

The remedial objectives for the DDC systems include achieving groundwater standards and preventing further offsite migration of contaminated groundwater. The DDC systems were designed to operate continuously. To achieve the remedial objectives, long-term monitoring programs are in place to monitor the effectiveness of the systems.

Description

The DDC systems consist of blowers that both extract and inject pressurized air into the wells, heat exchangers that reduce the blower discharge temperature, and carbon adsorbers for CVOC treatment before re-injection back into the wells. The systems are controlled by variable frequency drives (VFDs) for the blower speed and programmable logic controls for automation of the systems. The onsite DDC systems have dial-out telemetry systems to provide notification of system alarms; the offsite DDC system has a bi-directional telemetry system that enables remote control of the treatment system, as well as the ability to obtain performance data. All supplied equipment is housed in ventilated and insulated shipping containers.

Evaluation Methods

Performance monitoring data showing mass removal rates (as well as changes in groundwater concentrations) versus time will be used to evaluate trends for the source area and downgradient

area. System up-time also indicates overall system performance. The DDC systems are currently monitored on a monthly/quarterly basis to evaluate system performance and to help assure that all components are in working order. However, system repair coupled with troubleshooting issues and limited system operation due to high local groundwater elevation caused significant periods of downtime during this reporting period (30 January 2017 – 30 January 2020).

Monitoring the performance of the DDC systems (i.e., off-gas samples, air concentration readings, and groundwater sampling data) in reducing contaminant concentrations in groundwater is necessary to determine the effectiveness of the DDC systems. Similar to the SVE system, the mass removed during long-term monitoring can be calculated using vapor concentration and flow rate measurements taken at each DDC system.

Effectiveness

Based upon the results for system mass removal, it appears that DDC system operation is removing CVOCs from both onsite and offsite groundwater when the systems are in operation. While results for groundwater monitoring have shown some reduction in CVOC concentrations, this reduction is largely noted in deep groundwater while systems are operational. At the same time, increased CVOC concentrations can be seen in shallow groundwater during system operation (onsite MW-3S, MW-5S, and MW-6S) suggesting that contaminant levels are not truly being reduced but cycled between the deep and shallow zones of the aquifer. The decreasing CVOC mass removal concentrations and the decreasing concentrations of CVOCs in groundwater samples collected from DDC piezometers is potentially a result of a rate of desorption of CVOCs from contaminated soil into the water column than the rate of removal of volatilized contaminants by the DDC systems. High local groundwater elevations have also prevented the DDC systems from operating as designed, causing large periods of system downtime. Considering the trends in groundwater analytical data and reduction in system up-time, the DDC systems are not currently effectively removing site related contaminants from the groundwater. Additional discussion of DDC system monitoring and effectiveness is presented in Section 5.

Conclusions and Recommendations for Changes

The following changes are recommended for the DDC systems:

- Evaluation of strategies to increase performance and effectiveness of DDC systems including but not limited to modifications to existing DDC wellheads to enable system to operate when high water table conditions exist, and application of remedial substrate to increase degradation / treatment of COCs in groundwater.

- The offsite DDC system has enough capacity to utilize a single blower to operate all six DDC wells. EA recommends continuing to rotate blower operation every 3 months to equalize wear and tear to the blower and usage of carbon.

3.1.3 Institutional Controls/Engineering Controls Compliance

Determination of compliance with the ICs/ECs at the NHP site is made on the following criteria:

- The ICs/ECs applied at the site are in place and unchanged since completion of the remedial activities and issuance of the SMP.

- Limitations of the operation of the treatment systems have impaired the ability of site ECs (specifically the onsite and offsite DDC systems) to protect human health and the environment. This constitutes a failure to comply with the SMP for such controls. Further discussion of treatment system effectiveness is presented in Section 5.

- Access to the NHP site will continue to be provided for evaluation of the remedy, including access to the site-monitoring network and other controls (e.g., SVE/DDC systems) for continued monitoring and/or maintenance.

3.2 INSTITUTIONAL CONTROLS/ENGINEERING CONTROLS CERTIFICATION

The IC/EC certification form has been included as **Appendix A** of this PRR. Due to operational and performance issues of the DDC systems preventing the systems from operating continuously during the reporting period discussed in Section 5, EA was unable to certify that the ECs (DDC treatment systems) were in place and functioning as designed. As such, EA recommends initiating a Corrective Measures Work Plan to evaluate and address system functionality and effectiveness with respect to the RAOs.

4. MONITORING PLAN COMPLIANCE REPORT

This PRR assesses whether the NHP site is being remediated and managed as set forth in the SMP (EA 2013a) and ROD (NYSDEC 1999). The Monitoring Plan includes a description of the methods and rationale to be used for assessing the remedy effectiveness, and addresses the following elements:

- Sampling and analysis of all appropriate media (e.g., groundwater, SVE and DDC system influent/effluent air)
- Assessing compliance with applicable NYSDEC SCGs, particularly ambient groundwater standards
- Assessing achievement of the remedial performance criteria
- Evaluating site information periodically to confirm that the remedy continues to be effective in protecting public health and the environment.

Sampling and analysis of SVE and DDC system influent/effluent air is presented and discussed in Section 5 of this PRR.

4.1 GROUNDWATER MONITORING AND SAMPLING

Groundwater monitoring and sampling has been continuously performed in the vicinity of the onsite system since June 2010, as well as in the vicinity of the offsite system since July 2012. During the reporting period (January 2017 – January 2020), 12 groundwater monitoring and sampling events were completed. Prior to groundwater sampling activities, monitoring wells were gauged to measure depth to groundwater, determine potentiometric surface elevations, and evaluate groundwater flow paths.

The following table identifies the monitoring well network that is included in the monitoring plan for the site. All monitoring wells identified in this table were sampled during each quarterly sampling event for this reporting period. Quarterly sampling events took place in February, April, July and October 2017; March, April, July and October 2018; and February, May, July and November 2019.

Monitoring Plan – Monitoring Wells

Onsite System	Well Status/Notes	Offsite System	Well Status/Notes
DDC-2-PD	Good	DDC-5-PD	Good
DDC-2-PS	Good	DDC-5-PS	Good
DDC-4-PD	Good	DDC-6-PD	Good
DDC-4-PS	No well cap	DDC-6-PS	Good
MW-14D	No bolts for well cap	DDC-7-PD	Good
MW-14S	No bolts for well cap	DDC-7-PS	Good
MW-15D	No bolts for well cap	DDC-8-PD	Good
MW-15S	No bolts for well cap	DDC-8-PS	Good
MW-1D	No bolts for well cap	DDC-9-PD	Good
MW-1S	No bolts for well cap	DDC-9-PS	Good
MW-2A	Good	DDC-10-PD	Good
MW-2AD	No bolts for well cap	DDC-10-PS	Good
MW-3D	No bolts for well cap	MW-1D	Good
MW-3S	No bolts for well cap	MW-1S	Good
MW-5D	No bolts for well cap	MW-2D	Good
MW-5S	No bolts for well cap	MW-2S	Good
MW-6S	No bolts for well cap	MW-3D	Good
		MW-3S	No bolts for well cap, broken J-plug

Local groundwater flow direction based on groundwater elevation data collected both historically and during the reporting period is generally in a south-southeast direction towards the Great South Bay. Interpreted groundwater contour maps illustrating the direction of groundwater flow for the latest onsite and offsite groundwater gauging event (November 2019) are shown in **Figures 3 and 4**, respectively. A summary of groundwater gauging data for all 12 sampling events is provided in **Table 1**.

Groundwater depth at the site could potentially be influenced by temporal changes and seasonal precipitation events. Groundwater elevations changed within individual onsite shallow monitoring wells across the reporting period an average 7.35 ft. The groundwater elevation within MW-3S fluctuated from 38.45 ft above mean sea level (amsl) in February 2017 to 45.84 ft amsl in May 2019. Groundwater elevations changed within individual offsite shallow monitoring wells across the reporting period an average 5.65 ft. The groundwater elevation within MW-2S fluctuated from 25.54 ft amsl in October 2017 to 45.9 ft amsl in May 2019. A copy of the field forms completed during monitoring and sampling activities are provided in quarterly reports submitted to the NYSDEC.

4.1.1 Chlorinated Volatile Organic Compounds

The CVOCs detected in onsite monitoring wells and DDC piezometers exceeding their respective NYSDEC AWQS at least once during the reporting period include cis-1,2-DCE, TCE, PCE, and Vinyl Chloride (VC). PCE was detected exceeding its AWQS of 5 µg/L consistently within at least five of the seventeen onsite monitoring wells and DDC piezometers during each quarter throughout the reporting period. *Cis* -1,2-DCE was detected in at least one onsite monitoring well exceeding its AWQS of 5 µg/L during 7 of the 12 quarters. TCE was detected exceeding its AWQS

of 5 µg/L during 7 of the 12 quarters in deep monitoring wells. VC was detected exceeding its AWQS of 2 µg/L only twice during the reporting period. Exceedances of CVOCs were more frequent during the second half of the reporting period; concentrations of PCE increased following the 2nd quarter of 2018.

Offsite monitoring wells and DDC piezometers consistently contained concentrations of cis-1,2-DCE, TCE, and PCE exceeding their respective AWQS. PCE, TCE, and *cis*-1,2-DCE, were detected exceeding their respective AWQS of 5 µg/L consistently within at least one of the 18 offsite monitoring wells and DDC piezometers during each quarter throughout the reporting period. Exceedances of CVOCs were more frequent during the last three quarters of the reporting period, but concentrations were generally consistent throughout. A summary of VOCs detected in groundwater samples collected from site monitoring wells and DDC piezometers is provided in **Tables 2A and 2B**. Trend graphs summarizing CVOC concentrations at each monitoring location and including historical data are presented on **Figures 6A through 6D**. Full laboratory reports from quarterly groundwater sampling are provided in the quarterly reports submitted to the NYSDEC.

Onsite Monitoring Wells

The concentration of PCE exceeded the AWQS of 5 µg/L in onsite monitoring wells consistently throughout the reporting period. During the first eight quarters, exceedances were recorded in both shallow and deep monitoring wells, with the higher concentrations in the shallow monitoring wells for four of the first six quarters. Beginning with the third quarter of 2018 PCE concentrations in deep monitoring wells increased an order of magnitude, from less than 40 µg/L to concentrations ranging from 160 µg/L in MW-5D during quarter 4 of 2018 to 610 µg/L in MW-1D during quarter 4 of 2019. During the last two quarters of 2019, concentrations of PCE exceeded the AWQS in all onsite deep monitoring wells and were detected below the AWQS or non-detect in all onsite shallow monitoring wells.

The concentration of c*is*-1,2-DCE exceeded the AWQS of 5 µg/L most frequently in deep onsite monitoring wells, with concentrations ranging from 5.6 µg/L in MW-2AD during the first quarter of 2019 to 22 µg/L in MW-5D during the third quarter of 2018. *Cis*-1,2-DCE was also detected in DDC-2-PD twice and DDC-2-PS once during the reporting period, with concentrations ranging from 7.5 µg/L during the second quarter of 2018 in DDC-2-PD to 13 µg/L during the third quarter of 2019 in DDC-2-PS. The concentration of c*is*-1,2-DCE exceeded the AWQS in shallow monitoring wells only twice during the reporting period.

The concentration of TCE exceeded the AWQS of 5 µg/L only in deep monitoring wells, with concentrations ranging from 8.3 µg/L during the first quarter of 2017 to 20 µg/L during the third quarter of 2018 in MW-5D.

Vinyl chloride was detected exceeding the AWQS of 2 µg/L during the first quarter of 2017 with a concentration of 4.2 µg/L in MW-5S and during the fourth quarter of 2018 with a concentration of 6.6 µg/L in MW-1D. These are the only times vinyl chloride exceeded the AWQS during this reporting period.

Concentrations of CVOCs in the DDC piezometers remained low throughout 2017 and 2018, with PCE exceeding the AWQS six times with concentrations never exceeding 15 µg/L. However, concentrations increased to over 100 µg/L in DDC piezometers in 2019, with the concentration of PCE in DDC-4-PD reaching 340 µg/L during the second quarter.

Trend graphs for onsite shallow and deep monitoring wells and DDC piezometers are provided in **Figures 6A and 6B**. The increase in concentrations of PCE and TCE in deep onsite monitoring wells follows the shutdown of onsite DDC system #1 in March 2018; PCE was no longer detected exceeding the AWQS in shallow monitoring wells following the shutdown of onsite DDC system #2 in December 2018. This rebound in the deep aquifer zone indicates contaminant mass remains onsite and is in need of further treatment. System operation is discussed further in Section 5.

Offsite Monitoring Wells

The concentration of PCE exceeded the AWQS of 5 µg/L in only deep monitoring wells and DDC piezometers consistently throughout the reporting period. MW-1D and DDC-7-PD typically contained the highest concentrations, reaching 260 µg/L during the first quarter of 2017. The concentration of TCE exceeded the AWQS of 5 µg/L consistently in MW-1D with concentrations ranging from 8 µg/L during the fourth quarter of 2018 to 45 µg/L during the first quarter of 2017.

TCE was detected at concentrations exceeding the AWQS in up to three of the six deep DDC piezometers starting in 2018 and for the rest of the reporting period, with concentrations ranging from 5.7 µg/L during the fourth quarter of 2018 to 84 µg/L during the second quarter of 2019 in DDC-7-PD. The concentration of *cis*-1,2-DCE exceeded the AWQS of 5 µg/L in one to three of the three deep monitoring wells throughout the reporting period, with concentrations ranging from 5.2 µg/L in MW-3D to 85 µg/L in MW-1D during the first quarter of 2017.

The concentration of *cis*-1,2-DCE exceeded the AWQS of 5 µg/L in up to six of the shallow and up to five of the deep DDC piezometers starting during the third quarter of 2017 and for the rest of the reporting period. Concentrations ranged from 5.7 µg/L in DDC-10-PS during the first quarter of 2018 and DDC-8-PD during the fourth quarter of 2018 to 110 µg/L in DDC-7-PD during the second quarter of 2019.

Trend graphs for offsite shallow and deep monitoring wells and DDC piezometers are provided in **Figures 6C and 6D**. Concentrations of CVOCs did not increase as dramatically following shutdown of the offsite DDC system as compared to onsite; however, concentrations did increase moderately following shutdown and exceedances of AWQS criteria were identified in more monitoring wells and DDC piezometers than during system operation. System operation is discussed further in Section 5.

4.2 CONFIRM COMPLIANCE WITH MONITORING PLAN

The following table identifies the SMP (EA 2013a) requirements on an annual basis and demonstrates that compliance with the monitoring plan has been achieved prior to the end of January 2020.

Monitoring Program Activity	Required Frequency*		Compliance Dates
	Quarterly	Monthly	
Groundwater monitoring/sampling	x		January 2017 – January 2020
*The frequency of events will be conducted as specified until otherwise approved by NYSDEC.			

4.3 CONFIRM THAT PERFORMANCE STANDARDS ARE BEING MET

As described in Section 2, groundwater data is one of three metrics utilized to evaluate remedy performance. The groundwater monitoring plan provides measures for evaluating the performance and effectiveness of the remedy to reduce or mitigate contamination at the site and all affected site media. Groundwater monitoring was performed quarterly throughout the reporting period; **Tables 2A and 2B** provide a summary of groundwater results for the reporting periods.

From 2010 to 2018, onsite deep groundwater monitoring data showed a general decreasing trend in CVOC concentrations. In 2019, total CVOC concentrations rebounded back to 2010 baseline concentrations within onsite deep groundwater, while CVOC concentrations decreased in onsite shallow monitoring wells. Onsite groundwater concentration trends are detailed in Section 4.1 and shown on **Figures 6A and 6B**. This rebound of CVOC concentrations in deep monitoring wells followed the extended shut down of onsite DDC Systems #1 and #2, detailed in Section 5. Daughter compound VC remained at or below concentrations observed during the 2016 reporting period, indicating that degradation of PCE and TCE has slowed.

Offsite concentrations of individual CVOCs in shallow groundwater wells have remained at or below concentrations previously seen in the wells during the reporting period and display a decreasing trend. Cis 1,2-DCE was also detected consistently in offsite deep monitoring wells and both deep and shallow DDC piezometers. However, CVOC concentrations in MW-1S and MW-1D, immediately upgradient of DDC-7-PS, DDC-8-PS, and DDC-9-PS, continued to decrease, suggesting that the high baseline CVOC concentrations seen in MW-1S/1D in 2012 have migrated downgradient toward the offsite DDC treatment wells. Offsite shallow and deep wells continue to have a total CVOC mass below or close to the baseline CVOC concentrations in the former source area (1 Adams Boulevard).

4.4 CONCLUSIONS AND RECOMMEDATIONS FOR CHANGES

Overall, onsite and offsite groundwater CVOC concentrations still exceed NYSDEC AWQS following approximately nine years of continuous system operation, indicating performance standards are not being met.

Considering the trends in groundwater analytical data and reduction in system up-time, the DDC systems are not currently effectively or efficiently removing site related contaminants from the groundwater. EA recommends continuing the groundwater monitoring program and evaluating the need for additional monitoring wells beneath the site building and downgradient from the site to track plume migration and CVOC trends, particularly in relation to effectiveness of ECs and to inform future work and improvements to achieve RAOs.

5. OPERATION AND MAINTENANCE PLAN COMPLIANCE REPORT

The O&M Plan describes the measures necessary to operate, monitor, and maintain the mechanical components of the remedy in place at the site, and includes the following elements:

- The steps necessary to allow individuals unfamiliar with the site to operate and maintain the SVE and DDC systems
- An O&M Contingency Plan.

The O&M Plan will be updated periodically to reflect changes in site conditions or the manner in which the systems are operated and maintained.

5.1 SITE INSPECTION

The condition of the overall site and individual systems was noted during all monthly O&M visits, as well as during quarterly groundwater/air monitoring and sampling events. Detailed annual site-wide inspections were completed on 17 October 2017, 23 April 2018, and 5 December 2019. The fencing, locks, and access gates/doors were in good condition during each site visit. Both the asphalt/concrete areas and the grassy areas were in good condition. Paving was completed on the north side of 1 Adams Boulevard in July 2017. In February 2017, damage was observed to the onsite DDC System #2 trailer as a result of a snowplow hitting the side of the trailer and causing damage to an exterior electrical conduit, which was repaired the following week. There was no evidence of vandalism observed to the DDC wells, treatment systems, or utilities, and penetrations (including poles, posts, or stakes) were not observed. However, additional graffiti was noted on the SVE system enclosure during the April 2018 site visit. During the 2019 inspection it was noted that the parking lot near onsite DDC System #2 was repaved November 2019. Monitoring well covers were able to be located following paving.

5.1.1 Soil Vapor Extraction Treatment System

The SVE system and surrounding areas were generally observed to be in good condition during the annual inspections (**Appendix B**). There was no evidence of vandalism to the SVE treatment system and new outdoor manifold; however, additional graffiti was noted on the enclosure. Inside the building, vapor-monitoring points sustain continual wear and tear due to the daily operations of the tenant.

5.1.2 Onsite and Offsite Density Driven Convection Treatment Systems

Damage was observed at the onsite DDC System #2 trailer during the February 2017 monthly event. The trailer was damaged by a snowplow during snow removal activities. An exterior electrical conduit was also damaged during this event. Electrical conduit associated with onsite DDC System #2 was repaired the week after damage was noted.

The DDC treatment systems were observed to be in good condition during the annual inspections; no additional damage to the system enclosures or wellheads in either location was noted during the inspections. At the time of the annual inspections, all gauges and meters read within acceptable levels on the operating systems. Remote communication equipment was functional for onsite DDC System #2 and the offsite system, except for the blower pressure gauge for onsite DDC System #2, which was malfunctioning.

5.2 SUMMARY OF OPERATION AND MAINTENANCE COMPLETED DURING REPORTING PERIOD

Over the reporting period, 36 months (12 quarters) of O&M were performed between January 2017 and January 2020. Most system operating parameters are checked monthly for each system; system air samples are collected quarterly from each system in operation during that quarter.

For the SVE system, these operating parameters include:

- Temperature
- Vacuum
- Influent and effluent air CVOC concentrations (laboratory samples collected quarterly)
- Air flow rates
- Hour meter.

For the DDC systems, operating parameters include:

- Temperature
- Pressure/vacuum
- Blower operating frequency
- Total system injection and extraction rates
- Individual injection and extraction rates for each DDC well
- CVOC concentrations in system process air (laboratory samples collected quarterly)
- Hours of operations per blower
- Differential groundwater elevation between piezometers (i.e., air space available in DDC wellhead)
- Observations at each DDC wellhead (evaluating churning/bubbling of water column).

The average runtimes for the NHP systems over the 12 quarters were 79 percent for the SVE system, 39 percent for onsite DDC System #1, 54 percent for the onsite DDC System #2, and 39 percent for Blower B-501 and 38 percent for Blower B-502 at the offsite DDC treatment system. Offsite system blowers have been switched every 6 months, so a single blower is used to operate the 6 DDC wells. A detailed description of site visits is presented in **Exhibit 1** below. Summaries of system run-times are presented in **Table 3A**.

Onsite DDC System #1

Onsite DDC System #1 was inoperable beginning in March 2018 and remained off for the rest of the reporting period. The controls associated with the moisture separators had malfunctioned between the February 2018 and March 2018 monthly O&M visits. The system was shut down upon arrival in March 2018 due to water accumulation in the moisture separators and the granular activated carbon (GAC) vessels. Following system shut down, the moisture separators and GAC vessels were drained, but the system could not be restarted until the controls associated with the moisture separators were repaired and GAC was replaced. Attempts to restart the system following replacement of the moisture separators and GAC media were unsuccessful due to issues with the control panel logic and functionality of the variable frequency drive. High groundwater elevations were suspected to be a contributing factor to system performance and inability to restart.

Onsite DDC System #2

Onsite DDC System #2 was shut down for brief periods during the reporting period for repairs. Repairs were performed to address the damaged exterior electrical conduit in 2017 when the system was struck by a snowplow, replacement of switches on the control panel, and to repair the transfer pump. In February 2019, onsite DDC System #2 was shut down due to high local groundwater elevations and associated operational issues. Local groundwater elevations were continuously monitored but did not return to a level that would allow system operation during the reporting period.

Offsite DDC System

The offsite DDC system was shut down December 2018 due to high local groundwater elevations and associated operational issues. Local groundwater elevations were continuously monitored but did not return to a level that would allow system operation until December 2019, when the system was restarted.

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Exhibit 1: National Heatset Site Visits and Maintenance

Date	System	Purpose
1/20/2017	Onsite	EA onsite to check on SVE system and drain knockout (KO) tank in advance of monthly O&M visit.
1/25/17 - 1/26/17	Onsite and offsite	Monthly visit. Drained knockout tank at SVE system. Conducted monthly O&M on SVE and DDC systems. Replaced sump pump for DDC-7 at the offsite system. Replaced sump pump for DDC-4 at onsite DDC System #2.
2/6/17 – 2/8/17	Onsite and offsite	Quarterly visit and sampling. Collected groundwater and system air samples at onsite and offsite systems. Drained KO tank at SVE system. Installed diversion for roof drain behind SVE manifold. Selector switches on control panel of DDC System #2 broken.
2/13/17 – 2/14/17	Onsite	EA and D&D Electric Motors & Compressors (D&D) onsite to replace selector switch at onsite DDC System #2. Damage to exterior of system trailer observed. Electrical conduit, pump for KO tank, and side of trailer damaged. Repaired polyvinyl (PVC) line for KO tank.
2/17/2017	Onsite	PES and D&D onsite to repair conduit damaged earlier in week.
3/27/2017	Onsite and offsite	Monthly visit. Transfer pump for KO tank in onsite DDC System #2 leaking. System was shut down and a replacement was ordered to be installed following month.
4/17/17 – 4/20/17	Onsite and offsite	Quarterly visit and sampling. Collected groundwater and offsite and SVE system air samples. Onsite systems off upon arrival due to broken blower belts (System #1) and damaged transfer pump (System #2). System #2 pump repaired but would not restart due to error with VFD. Systems remained off until repairs could be completed; air samples to be collected from on-site systems during next monthly visit after repairs are complete.
5/16/2017	Onsite	PES and D&D onsite to replace belts on onsite System #1 and VFD for onsite System #2. Also preventatively replaced belts on onsite System #2.
5/23/2017	Onsite and offsite	Monthly visit. Conducted monthly O&M and collected samples of system air at all onsite systems.
6/13/17 – 6/14/17	Onsite	PES responded to a high temperature alarm at onsite System #1. System shut down until following day once ambient temperatures had decreased.
6/27/2017	Onsite and offsite	Monthly visit. Conducted monthly O&M and collected air samples from SVE system. Changed offsite system to run off Blower B-501. Excess condensation observed to be building up in system process piping. EA turned off system as a precaution until issue can be further evaluated (anticipated for week of 10 July 2017).
7/5/2017	Onsite and offsite	EA onsite to provide oversight (at request of NYSDEC) of paving activities planned for north and west sides of building. However, pavers did not actually perform site work on 7/5/17.
		Returned to offsite system to further address condensate in the offsite system. Drained process piping of excess moisture and restarted system. System was operating upon departure.
7/11/17 – 7/12/17	Onsite and offsite	Re-adjusted set-point temperature of chiller unit at offsite system. Determined low set-point temperature was the cause of generating excess condensate in process piping. Additionally, oversaw paving operations at 1 Adams Boulevard.
7/17/17 – 7/19/17	Onsite and offsite	EA onsite to perform routine quarterly O&M for SVE and DDC systems including groundwater monitoring. Collected system air samples.
		Switched operation of SVE system to run off of horizontal well legs 2 and 4. Previously using legs 1 and 5.
7/20/2017	Onsite	PES responded to a high temperature alarm at onsite System #1. System shut down until 7/25/17 once ambient temperatures had decreased.
7/25/2017	Onsite	PES restarted onsite System #1.
8/28/17-8/29/17	Onsite and offsite	Monthly visit. Conducted monthly O&M and collected air samples from SVE system. Conducted one-time groundwater sampling of select monitoring wells onsite and offsite for 1,4-dioxane.
9/21/2017	Onsite and offsite	Monthly visit. Conducted monthly O&M and collected air samples from SVE system.
10/16/17 – 10/18/17	Onsite and offsite	EA onsite to perform routine quarterly O&M for SVE and DDC systems including groundwater monitoring. Collected system air samples. Switched operation of SVE system to run off of horizontal well legs, 1, 4, and 5. Previously using wells 2 and 4. Attempted to switch blowers at offsite system. A noticeable vibration was observed with blower B502 upon restart; therefore, it was left off as a precaution until further troubleshooting can be performed with D&D; continued to run offsite DDC system using Blower B-501.
11/30/2017	Onsite and offsite	Monthly visit. Conducted O&M and collected air samples from SVE system. D&D onsite to troubleshoot vibration observed in Blower B-502 during the October quarterly visit. D&D diagnosed the problem as a faulty belt tensioner. A replacement part was ordered and will be installed at a later date (TBD) once available.
12/13/2017	Onsite and offsite	Monthly visit. Conducted O&M on the SVE and DDC systems. Knock-out tank for SVE system was ¾ full upon arrival and was drained.
12/22/2017	Onsite	Air samples collected from the SVE system, and KO tank was drained.

Exhibit 1: National Heatset Site Visits and Maintenance

Date	System	Purpose
1/23/18 – 1/24/18	Onsite and offsite	Monthly visit. SVE system and Onsite DDC System #2 were both down upon arrival. SVE system down due to a high-water level in the moisture separator. Moisture separator was drained, but system would not restart due to suspected electrical or control panel issue. Onsite DDC System #2 was off due to a momentary power loss. System #2 would not restart. EA coordinated with D&D to repair systems during next monthly visit.
2/9/2018	Onsite and offsite	Monthly visit. D&D onsite to repair the SVE system. It was determined that the windings on the SVE blower motor need to be replaced. The SVE system was left off, awaiting repair. D&D also performed troubleshooting on onsite DDC System #2. It was determined that the emergency stop on the control panel had been inadvertently activated. EA also observed that the transfer pump for the moisture separator had a cracked housing. Onsite DDC System #2 remained off awaiting further repair to the transfer pump. Lastly, D&D replaced a belt tensioner at the Off-site system on Blower B-502. Blower B-502 has been down since October 2017 due to a vibration overserved upon startup. EA restarted B-502 to test the unit; however, the same amount of vibration was observed, and the blower remained off until further repairs could be coordinated.
3/19/18 - 3/20/18	Onsite and offsite	Quarterly visit. System O&M performed, and air samples collected from onsite DDC System #2 and the offsite system (the only operational systems at the time). Groundwater samples were also collected. Onsite DDC System #1 was shut down by EA upon arrival as it was observed that the controls associated with the moisture separator had malfunctioned. Water had accumulated in the moisture separator as well as the GAC vessels. The system was drained of all water and left off until further troubleshooting could be performed. D&D assisted EA in repairing the transfer pump in onsite System #2 and the system was restarted.
3/22/2018	Offsite	PES onsite to meet D&D. D&D removed the blower motor from Blower B-502. Motor was taken offsite for repair.
4/16/2018	Onsite and offsite	Quarterly visit. System O&M performed, and air samples collected from onsite DDC System #2 and the offsite system (only operational systems at time of sampling event). Groundwater samples were also collected. Onsite DDC System #1 and the SVE system remain off pending repairs. Conducted one-time sampling of select onsite and offsite wells for perfluorinated compound analysis per request of the NYSDEC.
5/14/2018	Onsite and offsite	Monthly visit. O&M performed on onsite DDC System #2 and offsite system.
6/7/2018	Onsite and offsite	Monthly visit. O&M performed on onsite DDC System #2 and offsite system. Offsite system was down upon arrival due to a high temperature alarm. Attempted to restart the system with the chiller unit running. Chiller unit would not restart due to system error. After approximately 20 minutes of run time, a persistent vibration was observed from blower B-501. Off-site system was shut down.
7/5/2018	Onsite	Quarterly Visit. O&M performed, and air samples collected on on-site DDC system #2 (only operational system at time of sampling event). Groundwater samples were also collected from on-site wells. Offsite wells were not sampled during this visit due to high ambient temperature posing H&S concerns.
7/23/18-7/24/18	Offsite	Quarterly visit. Groundwater sampling completed at offsite wells.
8/9/2018 - 8/10/18	Onsite and offsite	Monthly visit. O&M performed on onsite DDC System #2, SVE system, and offsite system. The SVE blower motor was replaced on 8/10/2018 and the system was restarted. Blower B-502 was reinstalled and restarted at the offsite system. D&D evaluated Blower B-501 at the offsite system, which was noticed to have a persistent vibration during the June monthly visit. D&D determined the motor bearings needed to be replaced in Blower B-501. B-501 was left off and the offsite system was left running on B-502.
8/22/2018	Offsite	Unscheduled visit. “Power-failure” alarm received on 8/19/18 from onsite DDC System #1 dial-out. PES responded to ensure systems restarted properly. Offsite system had several alarms triggered. The system was left off for further troubleshooting.
9/4/2018	Onsite	Unscheduled visit. “Power-failure” alarm received on 9/4/18 from onsite DDC System #1 dial-out. PES responded to ensure systems restarted properly. Onsite DDC System #2 was restarted and operational upon departure.
9/10/18 - 9/13/18	Onsite and offsite	Monthly visit. O&M Performed on on-site DDC System #2, SVE system and offsite system. Vapor samples were collected from onsite DDC System #2 and the SVE system. Offsite system was off upon arrival on 9/10/18; system has been shut down since 8/22/18. System was restarted without issue, despite previous alarms on the last site visit.
10/22/18 -10/24/18	Onsite and offsite	Quarterly visit. Groundwater sampling conducted at onsite and offsite wells. O&M completed at SVE system, onsite DDC System #2, and offsite DDC System. Blower motor for B-501 removed by D&D to be taken offsite for repairs.
		EA started troubleshooting and preparing onsite DDC System #1 for KO tank replacement.
11/27/2018	Onsite and offsite	Monthly visit. Conducted O&M activities at onsite and offsite systems. Turned off chiller at offsite DDC system. The sump pump associated with the DDC-6 Sump was down upon arrival. EA replaced pump and restarted the offsite system.
12/19/18 – 12/20/18	Onsite and offsite	Monthly visit. Conducted O&M at onsite and offsite systems. Onsite DDC System #2 was down upon arrival due to high knock-out tank alarm. No callout was received. System appears to have gone down around 12/4/18 based on run-clock hours. Offsite system Blower B-501 motor was replaced. A submersible pump in sump vault gallery was down upon arrival. Additionally, the DDC-8 well head was observed to be leaking. The offsite system was shut down for further troubleshooting.
		Installed new KO vessels in onsite DDC System #1 and performed additional troubleshooting of electrical components.
		Carbon changeout at onsite DDC System #1 and SVE system.

Exhibit 1: National Heatset Site Visits and Maintenance

Date	System	Purpose
1/10/2019	Onsite and offsite	Monthly visit. Onsite DDC System #2 was down upon arrival due to high knock-out tank alarm. Drained knock-out tank and restarted system. Knock-out tank at onsite DDC System #2 was full, the high-level alarm was tripped, and the system was shut down again in approximately 15 minutes. Drained knock-out tank of onsite DDC System #2 again and left system off. D&D onsite later in day to troubleshoot DDC System #2. System #2 was left off; transfer pump drained of water to prevent freezing.
		SVE system down upon arrival due to full knock-out tank, drained knock-out tank, and restarted system.
		Replaced down sump pump at offsite system. The offsite system is still shut down due to high groundwater level.
1/28/2019	Onsite	EA onsite to meet waste hauler for drum pick up from carbon changeout. Checked onsite System #1, made a few repairs to KO tanks; Checked SVE system and drained KO tank. Checked offsite system.
2/19/19 – 2/21/2019	Onsite and offsite	Quarterly visit. Groundwater sampling conducted at onsite and offsite wells. O&M completed at SVE system, onsite DDC system #2, and off-site DDC System.
		SVE system down upon arrival on 2/19/19. Drained KO Tank and restarted.
		EA replaced drain plugs in transfer pump and attempted to restart onsite DDC #2 System with new float switch installed. System restarted by D&D for approximately ½ hour. High-level alarm was once again tripped, and system shut down as a result. EA drained the KO tank and attempted to restart system. Upon restart, EA noted significant water accumulation in the KO Tank. High-level alarm on the KO tank was triggered in about 5 minutes. The KO tank was drained, and the restart was attempted again, but yielded the same result. Local groundwater level appears to be elevated. System left off due to high water table.
		Replaced float switch at DDC System #2.
		Onsite DDC System #1 – installed floats in drums to troubleshoot with D&D – all but one installed; bulkhead fitting was seized.
2/26/2019	Onsite	Reinstalled new KO drums at Onsite 1; fixed float fitting that was damaged last week– troubleshoot electrical with D&D to restore power and logic to outlets that power transfer pumps.
3/26/2019	Onsite and offsite	Monthly visit. SVE system was down upon arrival due to high-high level alarm on moisture separator. Drained tank. Additionally, motor starter had tripped. Motor starter was reset, and system was restarted. Collected vapor samples from SVE System. D&D onsite to help correct electrical at control panel for moisture separator.
4/17/2019	Onsite and offsite	SVE system up upon arrival, drained about 50 gallons of H_2O from KO tank.
		All DDC Systems remain off due to high groundwater table. D&D onsite to help correct electrical at control panel for moisture separator.
5/23/2019	Onsite and offsite	All DDC Systems remain off due to high groundwater table. SVE System up upon arrival, drained H_2O for KO tank. Attempted to briefly restart onsite DDC System #1. Excessive vacuum observed in moisture separators causing vacuum release valves to pop. Return lines to blower appeared to be under pressure instead of vacuum. Suspected to be an issue with high water table / water accumulation in lines at the well head. Further troubleshooting needed for System #1.
6/26/2019	Onsite and offsite	All DDC System remain off due to high groundwater table. SVE system up upon arrival.
7/23/2019	Onsite and offsite	Quarterly visit. Conducted O&M at SVE treatment system. All DDC System remain off due to high groundwater table. SVE system up upon arrival. Collected groundwater samples and system vapor samples.
8/28/2019	Onsite and offsite	Conducted monthly O&M. All DDC System still remain off due to high groundwater table. SVE system up upon arrival. Attempted to restart onsite DDC System #1 and System #2 . System #1 restarted and was observed with excessive vacuum building up inside moisture separator. EA attempted to discern cause of vacuum build up including checking system piping at well head, checking sump pumps for dead heading, re-routing airflow to avoid carbon vessels in case of clog in carbon vessel, by passing moisture separators, etc. Tested flow rates to determine at which flow rates / blower speed the moisture separators begin popping. Turned VFD down very low, slowly increasing and decreasing. Moisture separators began popping around 8 - 13 cycle per second (Hz). During this test it was observed that there was a problem with the VFD. Reducing the speed on the VFD was observed to increase blower speed in some cases. Additionally, system was observed running properly, then would have pressure and vacuum switches, seemingly randomly. System #2 was briefly restarted. No immediate issues noted with the water accumulation in the moisture separator, unlike previous months. However, grinding noise and vibration noted emanating from blower. Brief diagnostics suggested that belt tensioner on blower appeared faulty. Both System #1 and System #2 left off for further troubleshooting. Briefly restarted offsite treatment system to run blowers
9/18/2019	Onsite and offsite	Monthly visit. Conducted O&M on SVE and offsite treatment system. Offsite treatment system was briefly restarted to run blowers and collected system measurements. D&D onsite to help EA troubleshoot onsite Systems #1 and #2. D&D determined that VFD at system #1 is malfunctioning and needs to be replaced. D&D also confirmed that the belt tensioner indicator needed replacing. The vibration and noise observed from the blower determined to be associated with blower motor. Suspected blower motor bearing issue.
10/3/2019	Onsite and offsite	Monthly visit. Conducted O&M on SVE and offsite treatment system. Offsite treatment system was briefly restarted to run blowers and collected system measurements.
11/4/2019	Onsite and offsite	Quarterly visit. Conducted O&M on SVE and offsite treatment system. Offsite treatment system briefly restarted to run blowers and collected system measurements. All DDC systems off due to high groundwater table.
12/5/2019	Onsite and offsite	Monthly visit. All DDC System were off upon arrival due to high groundwater table. Performed O&M on SVE system. Collected quarterly vapor samples from the SVE system. Restarted offsite treatment system.
1/15/2020	Onsite and offsite	Monthly visit. SVE system was down upon arrival due to high-high level alarm on moisture separator. Drained tank and restarted system. Conducted O&M at offsite system.

Notes:
DDC = Density driven convection
O&M = Operations and maintenance
SVE = Soil vapor extraction
VFD = Variable frequency drive
KO = Knock out
H_20 = Water
PES = Precision Environmental Services

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5.2.1 Detailed Onsite System Maintenance

5.2.1.1 First Quarter Maintenance (January – March 2017)

Soil Vapor Extraction System

During the reporting period, the SVE system was temporarily shut down on 20 January 2017, 25 January 2017, 6 February 2017, and 27 March 2017 to drain the knockout (KO) tank. Water was observed discharging from a roof drain at 1 Adams Boulevard in the vicinity of the horizontal well manifold. To prevent rainwater from eroding the soil cover over the horizontal wells and entering the system, EA installed a gutter to divert the water to the east of system trailer on 7 February 2017. A 4-in. Fernco fitting was attached to the roof drain and connected to a 15 ft length of 4-in. PVC pipe running along the north wall of the building.

Onsite Density Driven Convection Systems

On 25 January 2017, it was noted that the sump pump for well DDC-4 (onsite DDC System #2) might be faulty. The system was shut down briefly and the pump was replaced on the following day. On 7 February 2017, while collecting system measurements from onsite DDC System #1, it was noted that the return flow from the DDC-2 well was lower than previous quarters. Upon further inspection, EA observed a "slug" of water trapped in flex-hose piping to the DDC reducer head. The system was shut down briefly to clear water out of the hose. Once restarted, the return air flow from DDC-2 closely matched flow rates of previous quarters.

During O&M on onsite DDC System #2, the selector switches for the blower and after cooler broke. New parts were ordered, and the switches were replaced on 13 February 2017. Also, on 13 February 2017, it was observed that the southwest corner of onsite DDC System #2 enclosure was damaged including the side of the enclosure, PVC plumbing, and conduit. The transfer pump associated the KO tank inside the enclosure was also damaged. Due to the heavy snow storms the previous weekend (10–12 February 2017), it was suspected that the conduit, PVC piping, and trailer were damaged by a snowplow. The PVC plumbing to the discharge pump was repaired on 14 February 2017. D&D electric returned to the site on 17 February 2017 to repair the electrical conduit.

5.2.1.2 Second Quarter Maintenance (April – June 2017)

Soil Vapor Extraction System

During the reporting period, the SVE system was temporarily shut down on 19 April 2017, 23 May 2017, and 27 June 2017 to check the KO tank. Water was drained from the KO tank on 19 April 2017; however, no water was observed in the tank during the May and June 2017 visits.

Onsite Density Driven Convection System

On 19 April 2017, onsite DDC system #1 was found running, however, it was unable to build pressure. It was determined that the belts associated with the System #1 Blower were broken. The system was turned off until D&D and PES could return to the site on 16 May 2017 to replace the belts; the belts associated with o-site DDC System #2 blower were also replaced on the same day as a preventative measure.

On 19 April 2017, D&D also replaced the transfer pump on the KO tank in onsite System #2. When attempting to restart the system, the VFD displayed a "high temperature fault;" therefore, the blower could not be restarted. The system remained off until the VFD could be replaced with a new unit on 16 May 2017.

On 13 June 2017, EA received a high-temperature alarm call out from onsite DDC System #1 due to high ambient temperatures. EA contacted PES, who then responded to the alarm. PES shut the system down overnight and restarted the system on 14 June 2017.

5.2.1.3 Third Quarter Maintenance (July – September 2017)

Soil Vapor Extraction System

On 17 July 2017, EA isolated and tested each horizontal well leg for flow rates and total VOC concentrations. EA ran the SVE system with each horizontal leg (one at a time) for an hour each, measuring flow rates with an air velocity meter and total VOC concentrations with a ppbRAE PID every 15 minutes. It was determined that using well legs 2 and 4 resulted in the most optimized flow rates and total VOC concentrations. The SVE system was switched from operating well legs 1 and 5 to operating wells 2 and 4 for the remainder of the reporting period.

Onsite Density Driven Convection Systems

On 20 July 2017, EA received a high-temperature alarm call out from onsite DDC System #1 due to high ambient temperatures. EA contacted PES, who then responded to the alarm. PES shut the system down and restarted the system once the ambient temperature decreased on 25 July 2017.

5.2.1.4 Fourth Quarter Maintenance (October – December 2017)

Soil Vapor Extraction System

On 17 October 2017, EA switched the SVE system from operating well legs 2 and 4 to operating wells 1, 4 and 5 for the remainder of the reporting period.

Onsite Density Driven Convection System

No operational issues were observed with the onsite DDC system during the fourth quarter.

5.2.1.5 First Quarter Maintenance (January – March 2018)

Soil Vapor Extraction System

On 23 January 2018, EA arrived onsite to discover that the SVE system was down due to a high-high water level alarm from the moisture separator. No call out was received. The moisture separator was drained, and restart was attempted on 24 January 2018. The system would not restart; however, due to a suspected electrical or control panel issue. The system remained off until D&D was available to diagnose the problem on 9 February 2018. D&D concluded that the windings on the SVE blower motor were in need of repair. The motor was removed and taken offsite for repairs. The system was off for the remainder of the reporting period pending repairs.

Onsite Density Driven Convection Systems

Onsite DDC system #1 was down on 20 March 2018 upon arrival. EA observed that the controls associated with the moisture separator had malfunctioned. Water had accumulated in the moisture separators and had been transported to the GAC vessels. The system was turned off and the moisture separator and GAC vessels were drained. The system was to remain off until the moisture separator and GAC media could be replaced.

5.2.1.6 Second Quarter Maintenance (April – June 2018)

Soil Vapor Extraction System

The SVE system was not operational during this reporting period (April 2018 – June 2018). The SVE system was shut down on 23 January 2018 due to a high-high water level alarm from the moisture separator. The system has remained down due to complications with the blower motor windings.

Onsite Density Driven Convection System

Onsite DDC system #1 was shut down on 20 March 2018 upon arrival due to a malfunction of the moisture separator. The system was to remain off until the moisture separator and GAC could be replaced.

5.2.1.7 Third Quarter Maintenance (July – September 2018)

Soil Vapor Extraction System

Following system shut down due to complications with the blower motor windings, the SVE remained down until the blower motor was reinstalled on 10 August 2018 and restarted. No operational issues were observed with the SVE system during the reporting period.

Onsite Density Driven Convection Systems

Onsite DDC System #1 was shut down on 20 March 2018 upon arrival due to a malfunction of the moisture separator. The system remained off until the moisture separator and granular activated carbon could be replaced.

Power failure alarms were received via call out for Onsite DDC System #1 on 19 August and 4 September 2018. PES responded to these alarms and in each instance onsite System DDC #2 was turned off upon arrival and was restarted. It is suspected that these alarms and subsequent system shutdowns are due to temporary power outages.

5.2.1.8 Fourth Quarter Maintenance (October – December 2018)

Soil Vapor Extraction System

The SVE system was temporarily shut down during monthly O&M visits to drain the KO tank. The treatment media (GAC) at the SVE system was changed out the week of 19 December 2018 by General Carbon Corporation of Paterson, New Jersey.

Onsite Density Driven Convection System

Onsite DDC System #1 was shut down on 20 March 2018 upon arrival due to a malfunction of the moisture separator. The system remained off until the moisture separator and GAC are replaced. During the December 2018 monthly visit, EA installed new KO vessels in onsite DDC System #1 and performed additional troubleshooting of electrical components. The GAC at onsite System #1 was also changed out the week of 19 December 2018 by General Carbon Corporation of Paterson, New Jersey. Despite replacing the moisture separator tanks and GAC, the system remained down for further troubleshooting of the electrical components.

The onsite DDC System #2 was shut down briefly on 27 November 2018 because it was suspected that the pump associated with the DDC-4 sump was no longer operational. The sump pump was observed to be operational on a second evaluation, a few hours later.

Onsite DDC System #2 was shut down upon arrival on 20 December 2018 due to a high KO alarm. Based on the system runtime, it appeared that the alarm was triggered around 4 December 2018. The alarm was cleared, and the system was restarted.

5.2.1.9 First Quarter Maintenance (January – March 2019)

Soil Vapor Extraction System

The SVE system was down upon arrival due to high-high water level alarms associated with the KO tank (moisture separator) during the monthly site visits on 10 January 2019, 19 February 2019, and 26 March 2019. During each instance, the KO tank was drained, and system restarted. During the 26 March 2019 monthly visit, it was noted that the blower motor starter in

the control panel was tripped. The blower motor starter was reset and the SVE system was restarted, remaining on for the remainder of the period.

Onsite Density Driven Convection Systems

The onsite DDC System #2 was down upon arrival 10 January 2019 due to a high-level alarm in the moisture separator. EA drained the moisture separator, which was full, and restarted the system. Following the restart, the high-level alarm was triggered in approximately 15 minutes and the system shut down. The moisture separator and transfer pump were drained of liquid, and the system was turned off. D&D was available to respond the same day to help troubleshoot, determining that the float switch for the moisture separator was malfunctioning.

During the quarterly sampling visit on 19 February 2019, D&D replaced the moisture separator float switch at DDC System #2. System #2 was restarted by D&D for approximately ½ hour. The high-level alarm was once again tripped, and the system shut down as a result. EA drained the moisture separator tank and attempted to restart system. Upon restart, EA noted significant water accumulation in the moisture separator tank. The high-level alarm on the moisture separator was triggered in about 5 minutes. The tank was drained, and the system restart was attempted again, but yielded the same result. Local groundwater levels appeared to be elevated. Groundwater mounding was observed in the vicinity of the DDC well heads during system operation. System #2 was left off for the remainder of the reporting period due to the high groundwater table.

5.2.1.10 Second Quarter Maintenance (April – June 2019)

Soil Vapor Extraction System

During each O&M visit, the SVE system was briefly shut down to allow the KO tank to drain, and then the system was restarted. No operational issues were noted during the reporting period.

Onsite Density Driven Convection System

Onsite DDC System #1 was shut down on 20 March 2018 upon arrival due to a malfunction of the moisture separator. The system remained off until the moisture separator and GAC can be replaced. During the previous reporting period, EA began fitting and installing new tanks for the moisture separator. The GAC at onsite DDC System #1 was changed out in December 2018. During the January 2019 monthly visit, it was determined that there was potentially an issue with power within the system, particularly power to the outlets controlling the floats and pump operation. EA, D&D, and PES were onsite during the previous reporting period (January 2019 – March 2019) to troubleshoot issues with the control panel, float switches, and transfer pumps associated with the moisture separators. D&D was onsite during the April 2019 O&M visit to continue to troubleshoot and fix electrical issue with the moisture separators. D&D installed new relays, fixing the logic associated with the floats and transfer pumps in the control panel.

EA attempted to briefly restart onsite DDC System #1 during the May 2019 O&M visit. Immediately after starting the system, excessive vacuum was observed in moisture separators

causing vacuum release valves to open. Additionally, vacuum lines were observed to be under pressure, which was suspected to be an issue with high water table/water accumulation in lines at the well head. System #1 was shut down for further troubleshooting.

5.2.1.11 Third Quarter Maintenance (July – September 2019)

Soil Vapor Extraction System

No operational issues were noted during the reporting period.

Onsite Density Driven Convection Systems

Onsite DDC System #1 was shut down on 20 March 2018 upon arrival due to a malfunction of the moisture separator. The system was considered non-operational until May 2019 at which time the moisture separator had been replaced, the GAC tanks had been serviced and underwent GAC changeout, and electrical/control panel issues were addressed. EA attempted to briefly restart the onsite DDC System #1 during the May 2019 O&M visit; however, excessive vacuum was observed in the moisture separators and vacuum lines were observed under pressure. The system was quickly shut down for further troubleshooting. At the time, it was suspected to be caused by a high-water table or water accumulation at the sump/system piping causing flow to dead head.

During the August 2019 monthly visit, EA performed further troubleshooting on the onsite DDC System #1. EA checked and cleared system piping at the well head and sumps of water accumulation. System #1 was then restarted and excessive vacuum at the moisture separator was observed. EA attempted to discern cause of vacuum by re-routing airflow to avoid carbon vessels in case of clog in carbon vessel, by-passing moisture separators, etc. EA then tested flow rates to determine at which flow rates/blower speed the moisture separators began experiencing excessive vacuum. Frequency of the VFD was reduced and EA slowly increased and decreased frequency to change blower speed. The excessive vacuum at the moisture separators began a frequency range of 8 to 13 Hz. During this test, it was observed that there was a problem with the VFD. Reducing the frequency on the VFD should decreased blower speed; however, it was observed to increase blower speed in some cases. Additionally, the system would be observed running properly, then would have pressure and vacuum switches. The system was shut down and left off until September 2019 when D&D was onsite to assist EA in diagnosing the problems with onsite DDC System #1. During the September 2019 site visit, D&D determined that the VFD at System #1 was malfunctioning and recommended replacement. The system was left off for the remainder of the reporting period awaiting repair.

Also, during the August 2019 monthly visit, EA attempted to briefly restart the onsite DDC System #2. Onsite DDC system #2 was left off in February 2019 due to issues with water accumulation in the moisture separator. Upon restart in August 2019, no immediate issues were noted with the water accumulation; however, a grinding noise was emanating from the blower. Brief diagnostics suggested that belt tensioner on blower appeared faulty. The system was left off for further troubleshooting during the following month. In September 2019, D&D was onsite to help diagnose the grinding in System #2 blower. D&D confirmed that the belt tensioner needed to be

replaced and diagnosed the grinding as an issue with the blower motor bearing. The system was left off for the remainder of the reporting period awaiting repair.

5.2.1.12 Fourth Quarter Maintenance (October – December 2019)

Soil Vapor Extraction System

No operational issues were noted during the reporting period.

Onsite Density Driven Convection System

In September 2019, onsite DDC System #2 was determined to have a faulty belt tensioner and have an issue with the blower motor bearings. Both systems were left off for the remainder of the reporting period awaiting repair.

5.2.2 Detailed Offsite System Maintenance

5.2.2.1 First Quarter Maintenance (January – March 2017)

On 25 January 2017, the sump pump for DDC-7 was observed to be faulty. The system was briefly shut down and the pump was replaced. No other operational issues were observed with the offsite DDC systems during the reporting period.

5.2.2.2 Second Quarter Maintenance (April – June 2017)

On 27 June 2017, EA attempted to switch the operation of the blowers associated with the offsite system. After EA turned off Blower B-502 and restarted the system using Blower B-501, excess condensation was observed in the process piping and water was leaking from a pressure transmitter downstream of the heat exchanger. As a precaution, EA shut down the system until further assessment can be conducted during the third quarter.

5.2.2.3 Third Quarter Maintenance (July – September 2017)

During the previous reporting period on 27 June 2017, EA attempted to switch the operation of the blowers associated with the offsite system. After EA turned off Blower B-502 and restarted the system using Blower B-501, excess condensation was observed in the process piping and water was leaking from a pressure transmitter downstream of the heat exchanger. As a precaution, EA shut down the system until further assessment could be conducted. The system remained off into the beginning of this quarter.

On 5 July 2017, EA returned to the offsite system to address excess condensation. EA drained the condensate from the process piping and restarted the system using Blower B-501. EA returned to the offsite system with D&D on 12 July 2017 to determine the cause of excess condensation. It was determined that a low set temperature (50 degrees Fahrenheit [ºF]) on the system's chiller unit

was causing condensate to be generated in the process piping. The chiller temperature was increased to 72 ºF, and no condensate has been generated since.

5.2.2.4 Fourth Quarter Maintenance (October – December 2017)

During the quarterly O&M maintenance to the offsite system, EA attempted to switch the operation of the blowers associated with the offsite system. Shortly after EA turned on Blower B-502, a vibration was observed. As a precaution, EA shut down Blower B-502 and restarted the system with Blower B-501.

On 30 November 2017, D&D accompanied EA to the offsite system for the monthly O&M and to further diagnose the cause of the vibration in Blower B-502. It was determined that B-502 had a faulty belt tensioner. A replacement part was ordered and will be installed at a later date. In the interim, the offsite DDC system continues to run with Blower B-501.

5.2.2.5 First Quarter Maintenance (January – March 2018)

Blower B-502 has been non-operational since October 2017 due to a vibration of the motor and housing observed during system restart. In November 2017, D&D suspected a faulty belt tensioner as the cause of the vibration. On 9 February 2018, D&D replaced the belt tensioner and attempted to restart Blower B-502; however, the vibration was still present. On 22 March 2018, the B-502 motor was removed and taken to D&D's shop for repair. The offsite system continues to run using Blower B-501 while B-502 remained down pending further troubleshooting and repairs.

5.2.2.6 Second Quarter Maintenance (April – June 2018)

Blower B-502 has been non-operational since October 2017 due to a vibration of the motor and housing observed during system restart. The blower motor was removed in March 2018 and taken offsite for repair. Since Blower B-502 has been down for repair, the offsite system has been run only on Blower B-501.

On 7 June 2018, the offsite system was off upon arrival due to a high temperature alarm and VFD fault, triggered on 2 June 2018. EA restarted the system and attempted to restart the chiller unit. The chiller unit would not restart. It is suspected that the unit has a blown fuse or defective relay. Twenty minutes following restart, a persistent vibration was noticed in Blower B-501. The offsite system was shut down and remains off pending repair to both blowers and the chiller unit.

5.2.2.7 Third Quarter Maintenance (July – September 2018)

Blower B-501 remained off during this period, while B-502 was reinstalled and restarted. On 22 August 2018, the system was found down upon arrival and the following alarms tripped at the control panel; high injection temperatures at the DDC wells, high-blower temperature and high-motor temperature, and re-injection high pressure. PES was unable to restart the system in August 2018 while the Blower B-501 motor went out for repairs. The system was restarted without issue on 13 September 2018.

5.2.2.8 Fourth Quarter Maintenance (October – December 2018)

On 19 December 2018, the motor for Blower B-501 was reinstalled and restarted. The full system shut down was due to DDC-I well head leaking and an inoperable sump pump.

5.2.2.9 First Quarter Maintenance (January – March 2019)

On 10 January 2019, EA replaced the inoperable sump pump at the offsite system. The offsite system was shut down due to high groundwater levels and remained off the rest of the quarter.

5.2.2.10 Second Quarter Maintenance (April – June 2019)

The offsite system remained off this quarter due to high groundwater levels.

5.2.2.11 Third Quarter Maintenance (July – September 2019)

The offsite systems remained off this quarter due to high groundwater levels.

5.2.2.12 Fourth Quarter Maintenance (October – December 2019)

The offsite systems remained off this quarter due to high groundwater levels. System was restarted following the December 2019 monthly visit.

5.3 EVALUATION OF REMEDIAL SYSTEMS

SVE system air monitoring and sampling has been continuously performed at the NHP site since August 2008 to assure that all components are in working order, and to maintain compliance with the requirements of a NYSDEC Air Discharge Permit. From August 2008 to June 2009, monitoring and sampling were performed monthly. Between June 2009 and December 2015, O&M was performed quarterly. O&M was performed monthly starting in January 2016, and sampling was conducted monthly from August 2016 to September 2019. SVE system sampling switched to quarterly during the second quarter of 2019. DDC influent/effluent air monitoring has been continuously performed on a quarterly basis since June 2010 (onsite DDC systems) and July 2012 (offsite DDC system). During the reporting period (30 January 2017 – 30 January 2020), 21 air monitoring and sampling events were completed at the site.

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Exhibit 2. Treatment System Sampling Summary

Location Identification	Sampling Date											
	Quarter 1			Quarter 2			Quarter 3			Quarter 4		
	January	February	March	April	May	June	July	August	September	October	November	December
	2017	2017	2017	2017	2017	2017	2017	2017	2017	2017	2017	2017
SVE Influent	X	X	X	X	X	X	X	X	X	X	X	X
SVE Effluent	X	X	X	X	X	X	X	X	X	X	X	X
Treatment System #1 Influent		X			X		X			X		
Treatment System #1 Mid GAC		X			X		X			X		
Treatment System #1 Effluent		X			X		X			X		
Treatment System #2 Influent #1		X			X		X			X		
Treatment System #2 Influent #2		X			X		X			X		
Treatment System #2 Effluent		X			X		X			X		
B-501 Influent (VI-401B)							X			X		
B-501 Intermediate #1 (VI-403B)							X			X		
B-501 Intermediate #2 (VI-401A)							X			X		
B-501 Effluent (VI-501)							X			X		
B-502 Influent (VI-402B)		X		X								
B-502 Intermediate #1 (VI-403A)		X		X								
B-502 Intermediate #2 (VI-402A)		X		X								
B-502 Effluent (VI-502)		X		X								

Note: "X" indicates that the location was sampled. The SVE was sampled on a monthly basis until Q2 2019, and the DDC systems were sampled on a quarterly basis, while operational. DDC systems were not sampled if down for the entire quarter.

Exhibit 2. Treatment System Sampling Summary

Location Identification	Sampling Date											
	Quarter 1			Quarter 2			Quarter 3			Quarter 4		
	January	February	March	April	May	June	July	August	September	October	November	December
	2018	2018	2018	2018	2018	2018	2018	2018	2018	2018	2018	2018
SVE Influent										X	X	X
SVE Effluent										X	X	X
Treatment System #1 Influent												
Treatment System #1 Mid GAC												
Treatment System #1 Effluent												
Treatment System #2 Influent #1			X	X			X		X	X		
Treatment System #2 Influent #2			X	X			X		X	X		
Treatment System #2 Effluent			X	X			X		X	X		
B-501 Influent (VI-401B)			X	X								
B-501 Intermediate #1 (VI-403B)			X	X								
B-501 Intermediate #2 (VI-401A)			X	X								
B-501 Effluent (VI-501)			X	X								
B-502 Influent (VI-402B)										X		
B-502 Intermediate #1 (VI-403A)										X		
B-502 Intermediate #2 (VI-402A)										X		
B-502 Effluent (VI-502)										X		

Note: "X" indicates that the location was sampled. The SVE was sampled on a monthly basis until Q2 2019, and the DDC systems were sampled on a quarterly basis, while operational. DDC systems were not sampled if down for the entire quarter.

Exhibit 2. Treatment System Sampling Summary

Location Identification	Sampling Date												
	Quarter 1			Quarter 2			Quarter 3			Quarter 1			
	January 2019	February 2019	March 2019	April 2019	May 2019	June 2019	July 2019	August 2019	September 2019	October 2019	November 2019	December 2019	January 2020
SVE Influent	X	X	X			X	X					X	
SVE Effluent	X	X	X			X	X					X	
Treatment System #1 Influent													
Treatment System #1 Mid GAC													
Treatment System #1 Effluent													
Treatment System #2 Influent #1													
Treatment System #2 Influent #2													
Treatment System #2 Effluent													
B-501 Influent (VI-401B)													
B-501 Intermediate #1 (VI-403B)													
B-501 Intermediate #2 (VI-401A)													
B-501 Effluent (VI-501)													
B-502 Influent (VI-402B)													
B-502 Intermediate #1 (VI-403A)													
B-502 Intermediate #2 (VI-402A)													
B-502 Effluent (VI-502)													

Note: "X" indicates that the location was sampled. The SVE was sampled on a monthly basis until Q2 2019, and the DDC systems were sampled on a quarterly basis, while operational. DDC systems were not sampled if down for the entire quarter.

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System Influent/Effluent Air Monitoring

5.3.1 Soil Vapor Extraction System

A summary of the field monitoring results, air discharge analytical laboratory results, and estimated mass recovery are presented in **Table 3B**; the laboratory data reports are presented in the quarterly reports submitted to the NYSDEC.

Based on the difference between the influent and effluent sampling results, an estimated 48.79 lb of PCE, 2.84 lb of TCE, and 0.57 lb of DCE have been removed from the source area during the reporting period. Using effluent sampling results, it was determined an estimated 3.62 lb of PCE was discharged during the reporting period of January 2017 – January 2020 toward the permitted annual discharge limit of 270 lb. An estimated total of 1.36 lb of TCE has been discharged during the reporting period toward the permitted annual discharge limit of 120 lb. An estimated total of 0.3 lb of DCE has been discharge during the reporting period (the annual discharge limit is 5,510 lb).

Based on the monitoring and laboratory data obtained from the SVE system (January 2017 – December 2019), it appears the system modifications performed in Spring/Summer 2016 have been effective for increasing mass recovery from the source area soil.

5.3.2 Onsite Density Driven Convection Systems

A summary of the field monitoring results, laboratory air discharge analytical results, and estimated mass recovery are presented in **Tables 3C and 3D**; the laboratory data reports are provided in the quarterly reports.

Based on the difference between the influent and effluent sampling results, an estimated total of 25.14 lb (onsite DDC System #1) and 18.94 lb (onsite DDC System #2) of PCE were recovered from the subsurface in the vicinity of the source area during the reporting period. An estimated total of 0.11 lb (onsite DDC System #2) of TCE was recovered from the subsurface in the vicinity of the source area during the reporting period. An estimated total 0.05 lb (onsite DDC System #2) of DCE was recovered from the subsurface in the vicinity of the onsite DDC wells during the reporting period. A negligible amount of TCE and DCE were recovered from onsite DDC System #1 during the reporting period.

Mass recovery continues to be observed at the onsite DDC systems when they are running; however, the mass removed during this reporting period was limited because the systems was not running for an extended period of time in 2018 through 2019.

5.3.3 Offsite Density Driven Convection System

A summary of the field monitoring results, laboratory air discharge analytical results, and estimated mass recovery are presented in **Tables 3E and 3F**; the laboratory data reports are presented in the quarterly reports.

Based on the difference between the influent and effluent sampling results, an estimated total of 1.30 lb (offsite DDC Blower B-501) and 1.13 lb (offsite DDC Blower B-502) of PCE was recovered from the subsurface in the vicinity of the offsite DDC wells during the reporting period. An estimated total of 1.18 lb (offsite DDC Blower B-501) and 1.08 lb (offsite DDC Blower B-502) of TCE was recovered from the subsurface in the vicinity of the offsite DDC wells during the reporting period. An estimated total of 0.46 lb (offsite DDC Blower B-501) and 2.26 lb (offsite DDC Blower B-502) of DCE was recovered from the subsurface in the vicinity of the offsite DDC wells during the reporting period.

Mass recovery continues to be observed at the offsite DDC system when it is running; however, the mass removed during this reporting period was limited because the system was not running from December 2018 through December 2019.

5.4 CONFIRM COMPLIANCE WITH OPERATION & MAINTENANCE PLAN

The following table identifies the O&M Plan (EA 2013a) requirements on an annual basis and demonstrates that compliance with the monitoring plan was achieved during the reporting period.

Exhibit 3. Treatment System Sampling Schedule

Monitoring Program Activity	Required Frequency*		Compliance Dates
	Quarterly	Monthly	
SVE Influent/Effluent Air Sampling	X		January 2017 – January 2020
DDC Systems Air Sampling	X		January 2017 – January 2020
System O&M		X	January 2017 – January 2020
*The frequency of events will be conducted as specified until otherwise approved by NYSDEC. Air sampling performed as specified when systems were operational. Please see Exhibit 2 for a summary of air sampling events completed during the reporting period.			

The DDC treatment systems required many troubleshooting and repair events during the reporting period as described in Section 5.2. Onsite DDC System #1 was operational for 39 percent of the reporting period and onsite DDC System #2 was operational for 54 percent of the period. Offsite system blowers have been switched every 6 months, so a single blower is used to operate the 6 DDC wells. Blowers B-501 and B-502 were operational 39 percent and 38 percent of the reporting period, respectively.

Downtime during 2019 was associated with high local groundwater elevations. The high water table caused the systems to take on more water than they were designed to handle. Moisture separators and transfer pumps for both onsite and offsite DDC systems are designed to manage incidental water generated from moisture and condensate in the process lines, but they are not designed to handle large slugs of water. During periods of high local groundwater elevations, water was entering the system at rates faster than the transfer pump rates; therefore, water accumulated quickly within the moisture separators causing the system to shut down. Additionally, the air stripping mechanism of CVOC removal from within the DDC well heads relies upon a gap between the water table and the intake portion of the well head.

5.5 CONFIRM THAT PERFORMANCE STANDARDS ARE BEING MET

System performance standards for the SVE and DDC systems are being met when the systems are operating as designed and effectively removing contaminant mass from the subsurface. System operational performance is evaluated based on operating parameters described in Section 5.2.

Tables 3A through **3E** provide a summary of the influent/effluent system air sampling results for the SVE and DDC systems during the reporting period. The mass removed during long-term monitoring can be calculated using vapor concentration and flow rate measurements taken at the systems. The mass recoveries shown in these tables confirm that while the treatment systems are operational, they continue to remove primary CVOCs and daughter compounds.

Monthly and quarterly SVE system monitoring (i.e., off-gas samples, system air samples) is conducted to evaluate the effectiveness of the SVE system. As indicated in **Table 3B**, the SVE system continues to remove CVOCs from the vadose zone beneath 1 Adams Boulevard. It is also evident that CVOCs are treated through the SVE system's GAC units; discharge of CVOCs to the atmosphere is consistently below permit requirements, and often close to 0 lbs discharged. Monthly monitoring of vapor points inside the building also indicates that the system is achieving the goal of soil vapor intrusion mitigation by maintaining negative pressures beneath the building slab.

Monthly and quarterly DDC system monitoring (i.e., off-gas samples, system air samples, and groundwater sampling data) is conducted to evaluate the effectiveness of the DDC systems in reducing contaminant concentrations in groundwater. The mass recoveries shown in **Tables 3B through 3E** confirm that while the treatment systems are operational, they continue to remove primary CVOCs and daughter compounds. It is expected that some additional CVOC mass will be removed from the onsite and offsite groundwater system through both the operation of the treatment systems and natural attenuation. Groundwater sampling data is discussed in Section 4. The mass recoveries and lower concentrations of contaminants in deep groundwater observed during system operation suggest that functioning treatment systems may suppress the migration of the CVOCs. However, contaminant concentration rebound observed in deep groundwater during DDC system downtime indicates that the systems are not having a large impact on contaminant mass removal and would have to run continuously to reduce but not mitigate migration of CVOCs. In addition, the DDC systems can only operate under specific conditions (i.e., favorable water table elevations), which has limited system runtime during this reporting period. Should site conditions be favorable, the systems can continue to function; however, even when they are operating as designed, they are not removing groundwater contaminants efficiently enough to meet RAOs.

5.6 CONCLUSIONS AND RECOMMENDATIONS FOR IMPROVEMENT

System influent/effluent air monitoring will continue on a quarterly basis at operating DDC systems and the SVE system. Mass removal calculations show that when the systems are operational, they are removing contamination from the subsurface. In the case of the SVE system, it is operating as designed, removing CVOCs from beneath 1 Adams Boulevard, treating extracted air through GAC and discharging to the environment. The DDC systems are not operating as

designed since they were designed to operate continuously. Even though mass removal calculations during operation periods of the DDC systems demonstrate mass removal, the systems were not operational for most of the reporting period.

6. COST EVALUATION

Total costs for reporting and site management services, including groundwater monitoring and sampling, site inspection, and system air sampling was $613,140 for the reporting period. A breakdown of major costs is provided in the following table.

Site Management Activity	Cost Incurred for the period of 30 January 2017 – 30 January 2020
1.Monitoring, Sampling, Inspection, Oversight, Supplies/Equipment, Travel, and Reporting (EA)	$504,252
2. Analytical Laboratory (Eurofins Air Toxics and Hampton Clarke-Veritech)	$61,164
3. O&M Field Support (Preferred Environmental Services)	$24,400
4. Carbon Change-Out (General Carbon)	$15,341
5. Kaiser Blower Maintenance (D&D)	$2,535
6. Emerging Contaminant Sampling	$5,448
TOTAL	$613,140

The monitoring, sampling, inspection, oversight, and reporting costs, which are billed by EA, include costs associated with project management, quality assurance, and periodic reporting throughout the reporting period. These monitoring and reporting costs are based on fiscal data generated and tracked by an EA internal financial management system and includes travel expenses, equipment/supply costs, and other direct charges. The analytical costs, billed by Eurofins Air Toxics, Inc. of Folsom, California, covered monthly/quarterly system air analyses, and Hampton Clarke-Veritech of Fairfield, New Jersey, covered quarterly groundwater analyses. The activities included in items 1 through 5 are primarily reflective of the typical site management services; item number 6 is the cost of one-time emerging contaminant sampling activities.

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7. GREEN REMEDIATION

7.1 METRICS FOR SITE MANAGEMENT

NYSDEC DER-31, Green Remediation (NYSDEC 2011 [January]) provides concepts and techniques of green remediation and guidance on how to apply them to DER's remedial program and applies to all phases of the site cleanup process from investigation through completion of remediation. It is intended to be a holistic approach, which improves the sustainability of the cleanups by promoting the use of more sustainable practices and technologies. Such practices and technologies are, for example, less disruptive to the environment, generate less waste, increase reuse and recycling, and emit fewer pollutants, including greenhouse gases (GHGs), to the atmosphere.

As with prior PRRs, EA prepared a summary table, which presents green remediation metrics for site management (**Appendix C**). These metrics include energy usage, solid waste generation, transportation/shipping, water usage, and land use/ecosystems. This table is intended to be used to track the quantities established for each metric over time, with the goal of minimizing energy consumption, reducing GHG emissions, and conserving natural resources. This table will be updated in conjunction with future PRR revisions and revised accordingly.

In previous PRRs, the quantity of electricity utilized by the SVE and DDC systems was obtained from Public Service Enterprise Group-Long Island (PSEG) utility bills provided by NYSDEC. With this monitoring period (January 2017 – January 2020), EA did not have copies of the PSEG electricity bills to incorporate into the summary table. Instead, EA assumed that electricity usage from 2016 remained consistent throughout this PRR's reporting period, resulting in an estimated usage of 1,149,765 kWh. Most of the solid waste generated during the reporting period was 4,157 lbs of spent carbon from carbon changeout of the SVE system and onsite DDC #1 system.

Metrics for transportation were primarily associated with travel to and from the site for the performance of system O&M and monitoring. During the reporting period, there were 5 unscheduled visits to the site due to system alarms, mostly to respond to high ambient temperature alarms. There were 7 additional site visits to perform system repairs/maintenance outside of the regularly scheduled monthly/quarterly visits. In total, there were 12 unplanned or additional visits to the site during the reporting period, averaging about 1 visit per quarter, an increase in site visits from the 2016 PRR (EA 2017b) reporting period which averaged less than 1 unscheduled site visit per quarter. Using the site visit and maintenance log presented in Section 5.2, EA estimated the number of miles accrued by EA and local subcontractor PES during site visits for a total of 17,450 miles.

At the time of preparation of the PRR for 1 January 2016 – 31 December 2016, final quantities of disposed waste, transportation, and other metrics from the RSO effort had not been reported. EA also incorporated the RSO work performed in 2016 into this green remediation evaluation. Approximately 38,500 lb of waste was generated through performance of the RSO work in 2016. The majority of this was investigation derived waste generated during the drilling and installation of the horizontal wells at 1 Adams Boulevard. Metrics for transportation associated with the RSO

activities was calculated by estimating round trip mileage for the subcontractors and EA staff, totaling 12,440 miles. Transportation of investigation-derived waste to disposal facilities accounted for another 1,960 miles.

7.2 ENVIRONMENTAL FOOTPRINT

In previous PRRs (PRR No. 1 [EA 2015], PRR No. 2 [EA 2016b] and PRR No. 3 [EA 2017]), EA also evaluated the environmental impact of the NHP treatment systems and green remediation techniques that could be applied to the site. EA utilized SiteWise™ Tool for Green and Sustainable Remediation, developed by the U.S. Navy, U.S. Army Corps of Engineers, and Battelle to calculate the environmental footprint of the overall remedial approach. The tool consists of a series of spreadsheets, which provide a baseline assessment of several quantifiable sustainability metrics including: GHG emissions, energy usage, and electricity usage from renewable and non-renewable sources; criteria air pollutants that include sulfur oxides, oxides of nitrogen, and particulate matter; water usage; resource consumption; and accident risk (Battelle 2013).

For this reporting period, EA modeled the environmental footprint of routine site management activities conducted during the reporting period. Activities accounted for in the calculation of environmental footprint include the type of treatment media used onsite (Regenerated GAC), transportation to/from site, energy sources, and waste generation. The model was developed using run time hours for each system from 1 January 2017 through 31 December 2019. Appendix C includes the exported table and figures depicting the impact of site management activities conducted at National Heatset. EA also modeled the environmental footprint of RSO activities conducted in 2016 to compare the additional impact of the RSO investigation and horizontal well installation. As expected, three years of site management activities have a larger impact in terms of overall greenhouse gas emissions, energy usage, and water usage than the RSO activities, however, it is interesting to note that onsite emissions of greenhouse gases were higher during RSO activities likely attributed to operation and idling of diesel powered equipment.

8. OVERALL PERIODIC REVIEW REPORT CONCLUSIONS AND RECOMMENDATIONS

8.1 SITE INSPECTION AND MAINTENANCE

The SVE system and surrounding areas were observed to be in good condition with no major problems noted. The fencing, locks, and access gates/doors were in good condition during each visit. Both the asphalt/concrete areas and the grassy areas were in good condition. There was no evidence of vandalism observed to the DDC wells, treatment systems, or utilities, and penetrations (including poles, posts, or stakes) were not observed. Paving was noted as completed during the October 2017 and November 2019 site inspections. The SVE system and surrounding areas were generally observed to be in good condition during each annual inspection.

Site inspection and maintenance of the SVE system, onsite DDC systems, and offsite DDC systems will continue monthly during site visits to complete O&M. A more detailed inspection will continue to be performed on an annual basis.

8.2 PERFORMANCE AND EFFECTIVENESS OF REMEDY

Remedy performance and effectiveness was evaluated through implementation of the Monitoring Plan, discussed in Section 4, and the Operation and Maintenance plan, discussed in Section 5. The SVE system had an uptime of 79 percent for the reporting period. Based on monthly and quarterly system air monitoring results, the SVE system has been operating as designed, removing VOCs from beneath 1 Adams Boulevard, and effectively treating VOCs in the air stream before discharge to the environment. Monthly mass recovery observed at the SVE system was approximately 20% lower than the previous reporting period. System operation has also resulted in negative differential pressures between the ambient air of 1 Adams Boulevard and the sub-slab environment; meeting the stated goal of the SVE system to mitigate risk of vapor intrusion.

The DDC systems are not performing as designed because they are not operating continuously. When the onsite and offsite DDC systems are operating as designed, their effectiveness is still limited. While CVOC concentrations in deep onsite and offsite groundwater are reduced during system operation, CVOC concentrations in deep groundwater rebounded to baseline (2010) when the DDC systems were shut down for an extended period of time. The following includes a further discussion of the ways in which the DDC treatment systems are not meeting expected performance and effectiveness:

- The decrease in CVOCs in shallow onsite groundwater following system shut down is likely indicative of CVOCs circulating into shallow groundwater through convection of contaminants from deep groundwater into the shallow zone of the aquifer.

- The decreasing concentrations in onsite deep groundwater that was observed prior to system shut down was potentially also due to a rate of desorption of CVOCs that was unable to keep pace with the circulation of water and recovery generated in the DDC

wellheads, resulting in lower groundwater concentrations of CVOCs without significant mass removal.

- Monthly mass recovery observed at onsite DDC System #1 and onsite DDC System #2 when operating is higher than the previous reporting period, though overall, annual recovery was much lower than the previous reporting period due to system down time.

- Mass recovery continues to be observed at the offsite system; however, the overall mass removed during 2017–2020 has decreased more than 50 percent when compared to mass removed in 2016.

- The onsite and offsite DDC systems were unable to meet the design goal of continuous operation due to elevated groundwater table and failure of system components preventing proper system operation/performance.

- The Environmental Notice is sufficient to prevent exposure to remaining contamination by limiting access to contaminated groundwater.

8.3 SUMMARY OF RECOMMENDATIONS

The following actions are recommended for future site management activities at the NHP site:

- Additional sampling should be performed to further evaluate existing contamination beneath the site building. In addition, new permanent monitoring wells should be installed to augment the existing well network to further refine plume delineation efforts at the site. The conceptual site model should then be refined using the additional data obtained from these efforts.

- Depending on the outcome of additional groundwater plume delineation efforts, enhancement of the remedial approach may be warranted through the use of complementary technologies such as in situ bioremediation or chemical oxidation in order to reduce the overall remedial timeframe and achieve remedial action objectives.

- The Site Management Plan should be updated to reflect changes to the SVE system and any additional changes to the DDC systems and/or monitoring well networks.

- Site management tasks should continue during the next period (2020–2023). This includes annual site inspections, monthly operations and maintenance, system repairs (as needed and approved by NYSDEC), quarterly groundwater monitoring and sampling, and quarterly DDC system influent and effluent/SVE system air monitoring.

8.3.1 Soil Vapor Extraction System

- System operation should be evaluated to determine whether operations should change to different legs to maximize mass recovery.

8.3.2 Density Driven Convection Systems

- EA plans to prepare a corrective measures study to do a full evaluation of the DDC systems based on the run time and operational issues documented over the course of the reporting period.

8.4 FUTURE PERIODIC REVIEW REPORT SUBMITTALS

Future PRRs should continue to be prepared and submitted every three years until further notice to evaluate the effectiveness of the remedial actions implemented at the site; provide sufficient documentation that the remedy remains in place, is performing properly and effectively, and is protective of public health and the environment; and to capture proposed/planned follow-on activities at the site.

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9. REFERENCES

AECOM. 2009. *Onsite Remedial Action Work Plan.* July.

———. 2011. *Offsite Remedial Action Work Plan.* August.

Battelle, United States Navy, and USACE, 2013. *SiteWise ™ Tool for Green and Sustainable Remediation.* July.

EA Engineering, P.C. and its affiliate EA Science and Technology (EA). 2013a. *Site Management Plan. Final – Revision No.1 National Heatset Printing Site, Babylon, Suffolk County, New York.* June.

———. 2013b. *National Heatset Printing Co. State Superfund Site. Suffolk County, Babylon, New York. Final Engineering Report. NYSDEC Site No. 152140.* August

———. 2015. *National Heatset Printing Co. State Superfund Site. Suffolk County, Babylon, New York. Periodic Review Report No. 1. October 2013 – December 2014.* December.

———. 2016a. *Sampling and Delineation Memorandum; 1 Adams Boulevard.* May.

———. 2016b. *National Heatset Printing Co. State Superfund Site. Suffolk County, Babylon, New York. Periodic Review Report No. 2. January 2015 – December 2015.* May.

———. 2017a. *Groundwater Sampling and Delineation; National Heatset Printing Site.* 25 August.

———. 2017b. *National Heatset Printing Co. State Superfund Site. Suffolk County, Babylon, New York. Periodic Review Report No. 3. January 2016 – December 2016.* December.

Earth Tech. 2006. *Sampling and Analysis Plan.* April.

———. 2007. *Pilot Study Report DDC In-Well Stripping System.* May.

H2M. 1999. *RI/FS Report.*

O'Brien and Gere. 2007. *Permanganate Injection System Remedial Action Report.* July.

New York State Department of Environmental Conservation (NYSDEC). 1994. *TAGM 4046: Determination of Soil Cleanup Objectives and Cleanup Levels.* Note: The soil cleanup objectives in TAGM 4046 have since been replaced by 6 NYCRR Part 375.

———. 1999. *Record of Decision, National Heatset Printing Site, Babylon, Suffolk County, Site Number 152140.* June.

———. 2011. *Final Program Policy DER-31.* January 20, 2011.

New York State Department of Health (NYDOH). 2015. *Guidance for Evaluating Soil Vapor Intrusion in the State of New York.* August.

Shaw. 2003. *Soil Vapor Extraction Operation & Maintenance Manual.* October.

Figures

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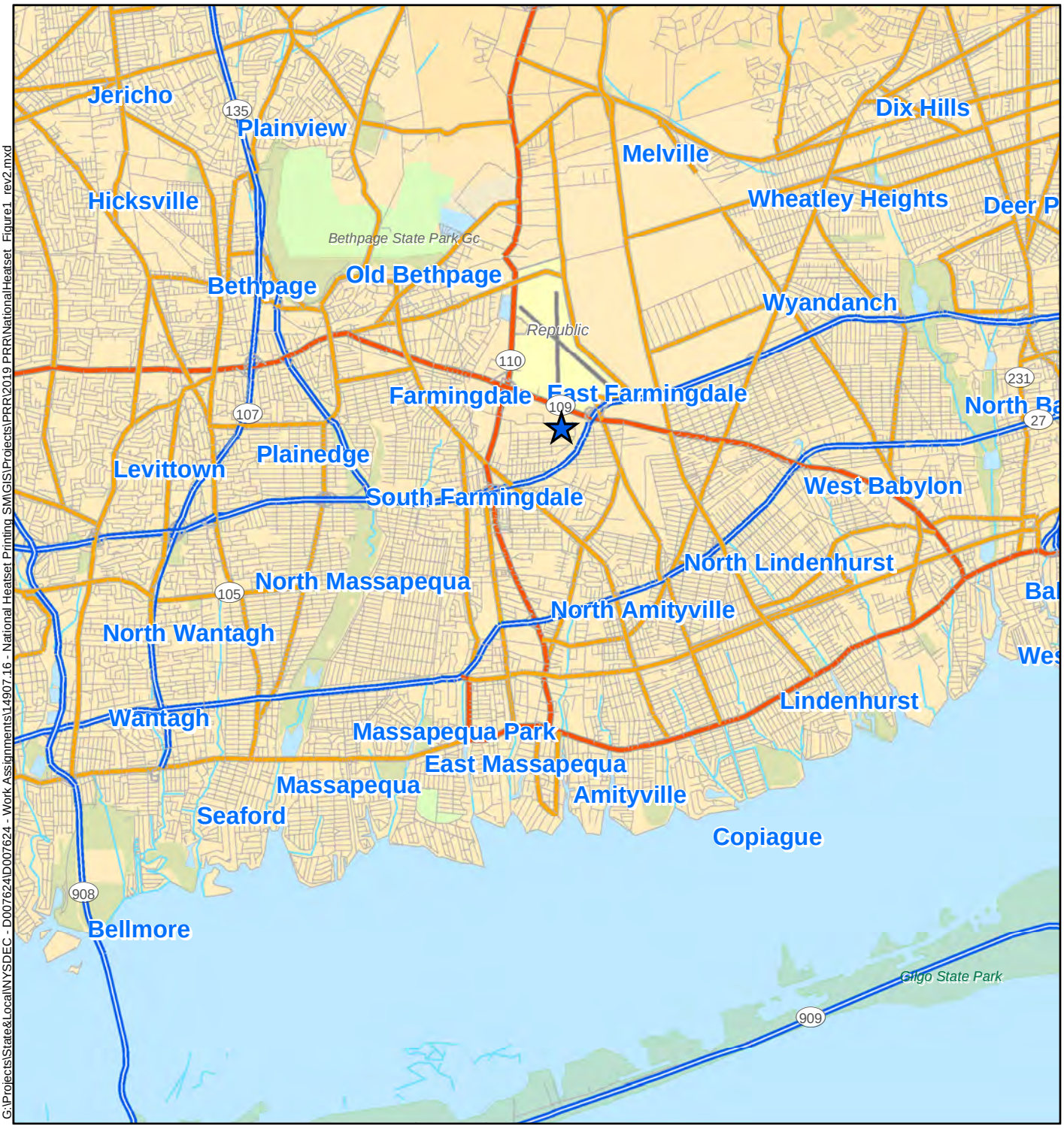

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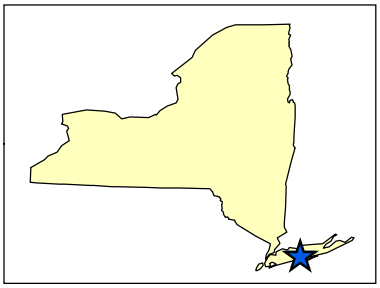

0 0.75 1.5 3
Miles

1 inch = 1.5 miles

N

Legend

★ Site Location

Figure 1
SITE LOCATION MAP
NATIONAL HEATSET SITE (152140)
BABYLON, NEW YORK
SUFFOLK COUNTY

Map Date: 1/3/2020
Source: ESRI, 2011

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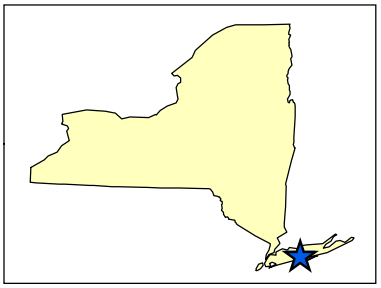

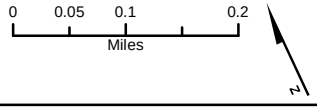

Legend

- DDC Well Cluster
- Groundwater Monitoring Well
- Vapor Extraction Point
- Site Location

Figure 2
SITE, SURROUNDING AREA, AND MONITORING WELL NETWORK
NATIONAL HEATSET SITE (152140)
BABYLON, NEW YORK
SUFFOLK COUNTY

Map Date: 1/3/2020
Source: ESRI, 2011

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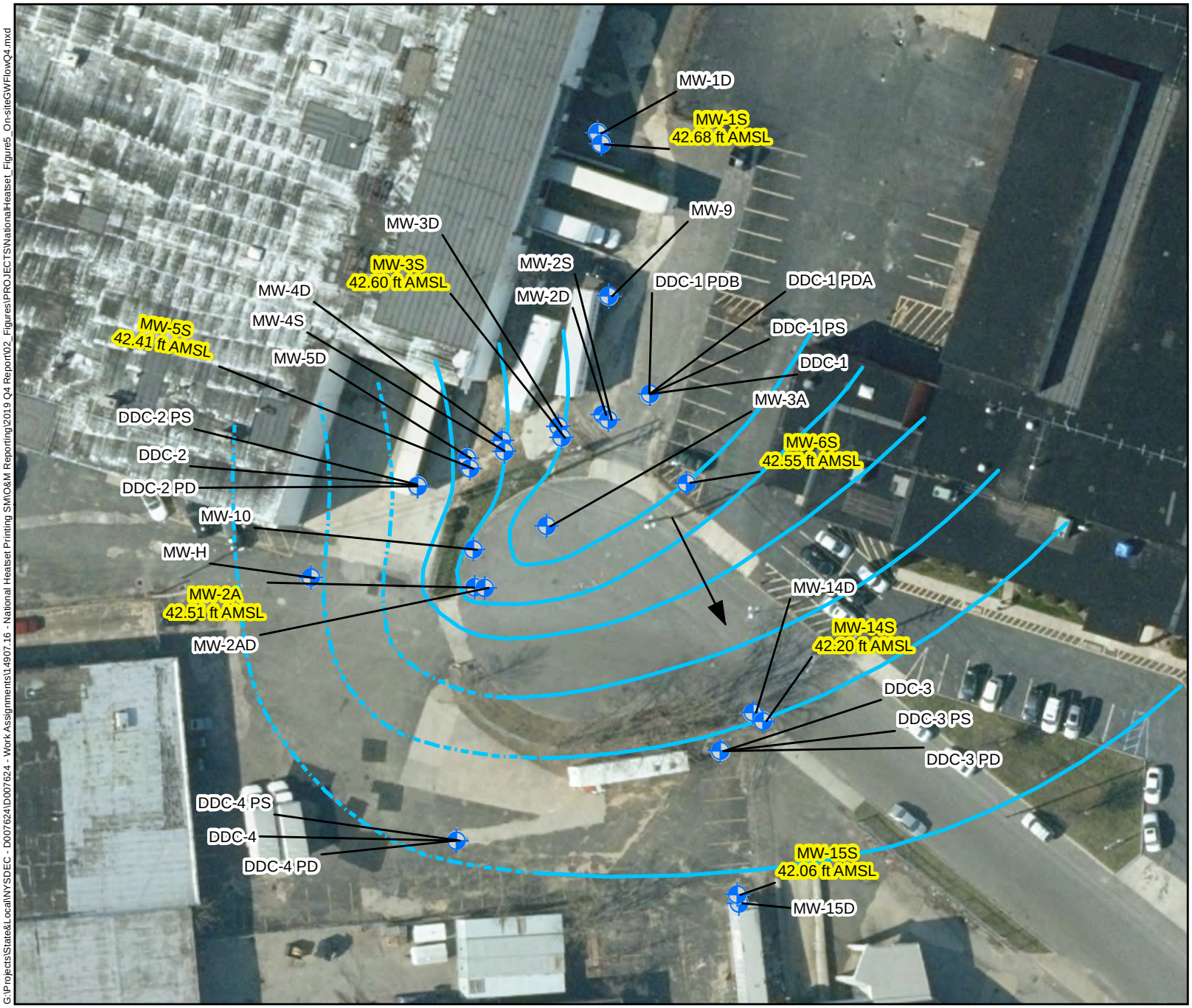

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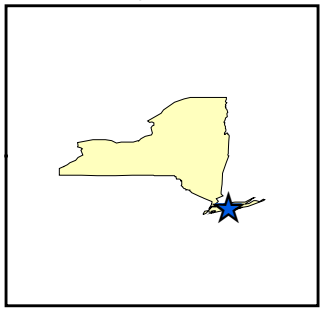

Legend

- Groundwater Monitoring Well
- Inferred Groundwater Contours
- Interpreted Groundwater Contours
- Groundwater Flow Direction

Map Date: 2/6/2020

N

0 25 50

Feet

Figure 3
ONSITE GROUNDWATER FLOW DIRECTION (November 2019)
NATIONAL HEATSET
SITE (152140)
BABYLON, NEW YORK
SUFFOLK COUNTY

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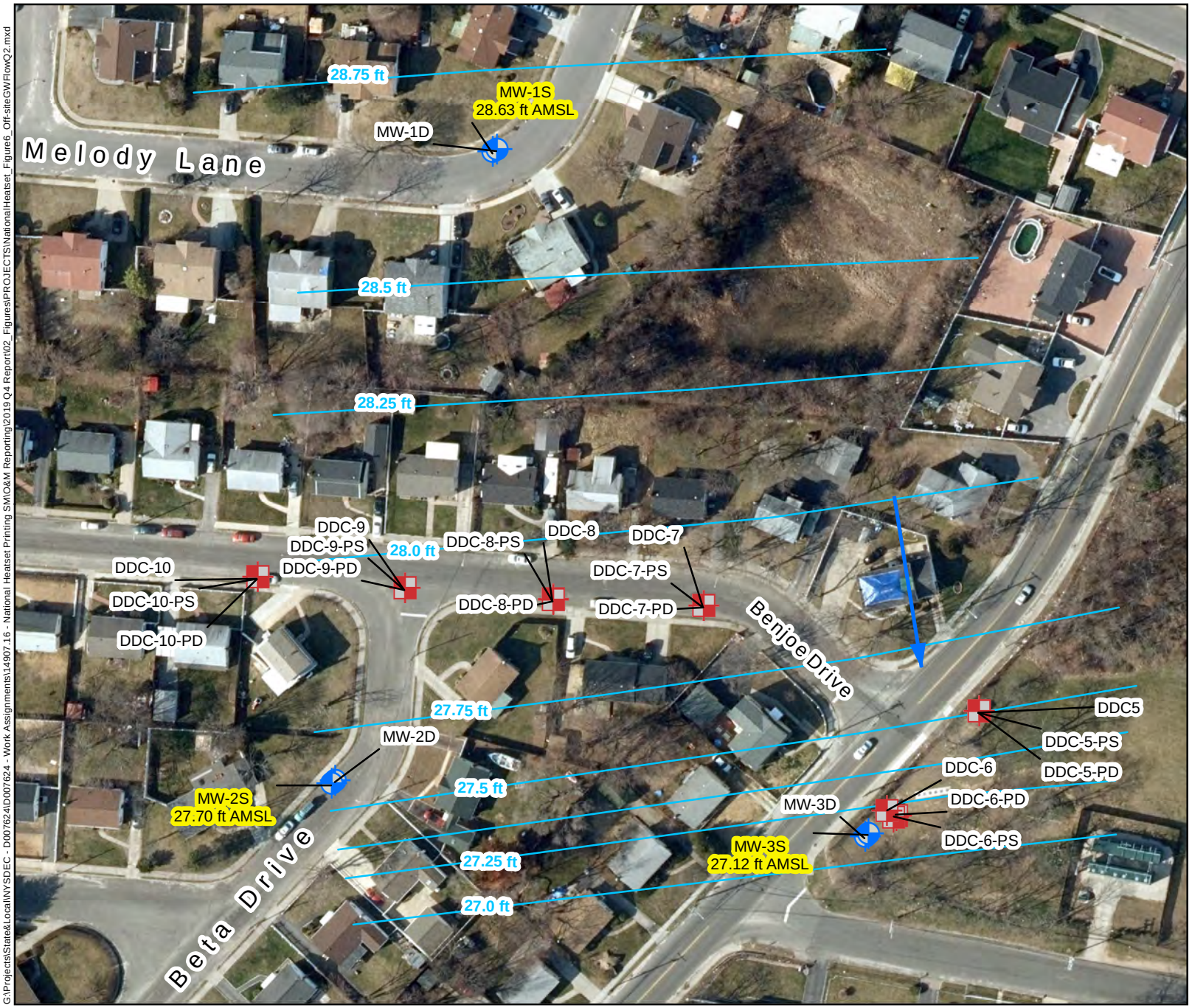

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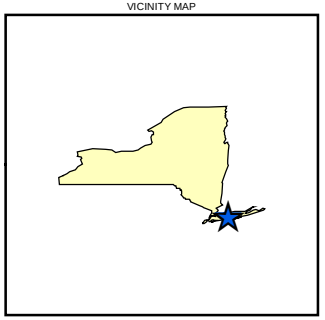

Legend

- DDC Well Cluster
- Groundwater Monitoring Well
- Inferred Groundwater Contour
- Interpreted Groundwater Contour
- Groundwater Flow Direction

Map Date: 12/8/2020

N

0 75 150

Feet

Figure 4
OFFSITE GROUNDWATER FLOW DIRECTION (November 2019)
NATIONAL HEATSET
SITE (152140)
BABYLON, NEW YORK
SUFFOLK COUNTY

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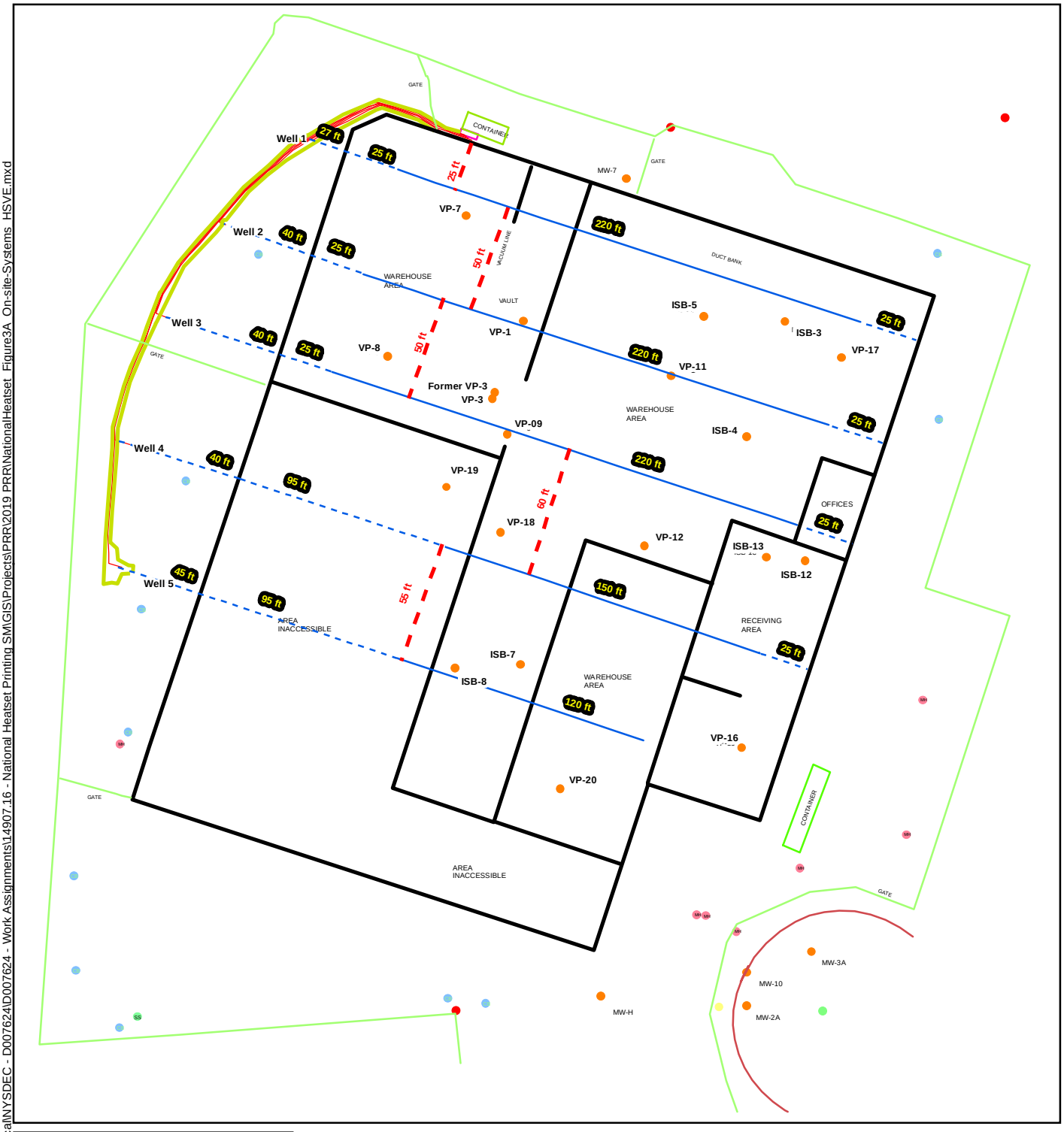

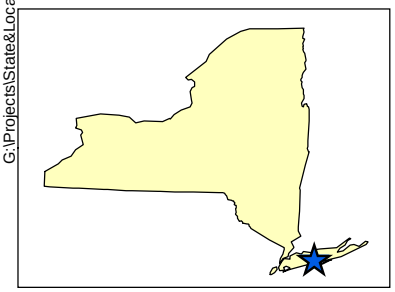

0 15 30 60
Feet

1 inch = 66.67 feet

N

Legend

- HSVE Solid PVC Pipe
- HSVE Well Screen
- HSVE Well Piping (EA Installed)
- HSVE Trench
- HSVE Manifold Shed
- 1 Adams Blvd Building Outline
- Site Location
- Catch Basin Square
- Catch Basin Round
- Manhole
- Sanitary Manhole
- Soil Boring / Vapor Point
- Soil Boring
- Monitoring Well
- Chainlink Fence

Figure 5A
ONSITE TREATMENT SYSTEM LOCATION
SVE System
NATIONAL HEATSET SITE (152140)
BABYLON, NEW YORK
SUFFOLK COUNTY

Map Date: 1/3/2020
Source: ESRI, 2011

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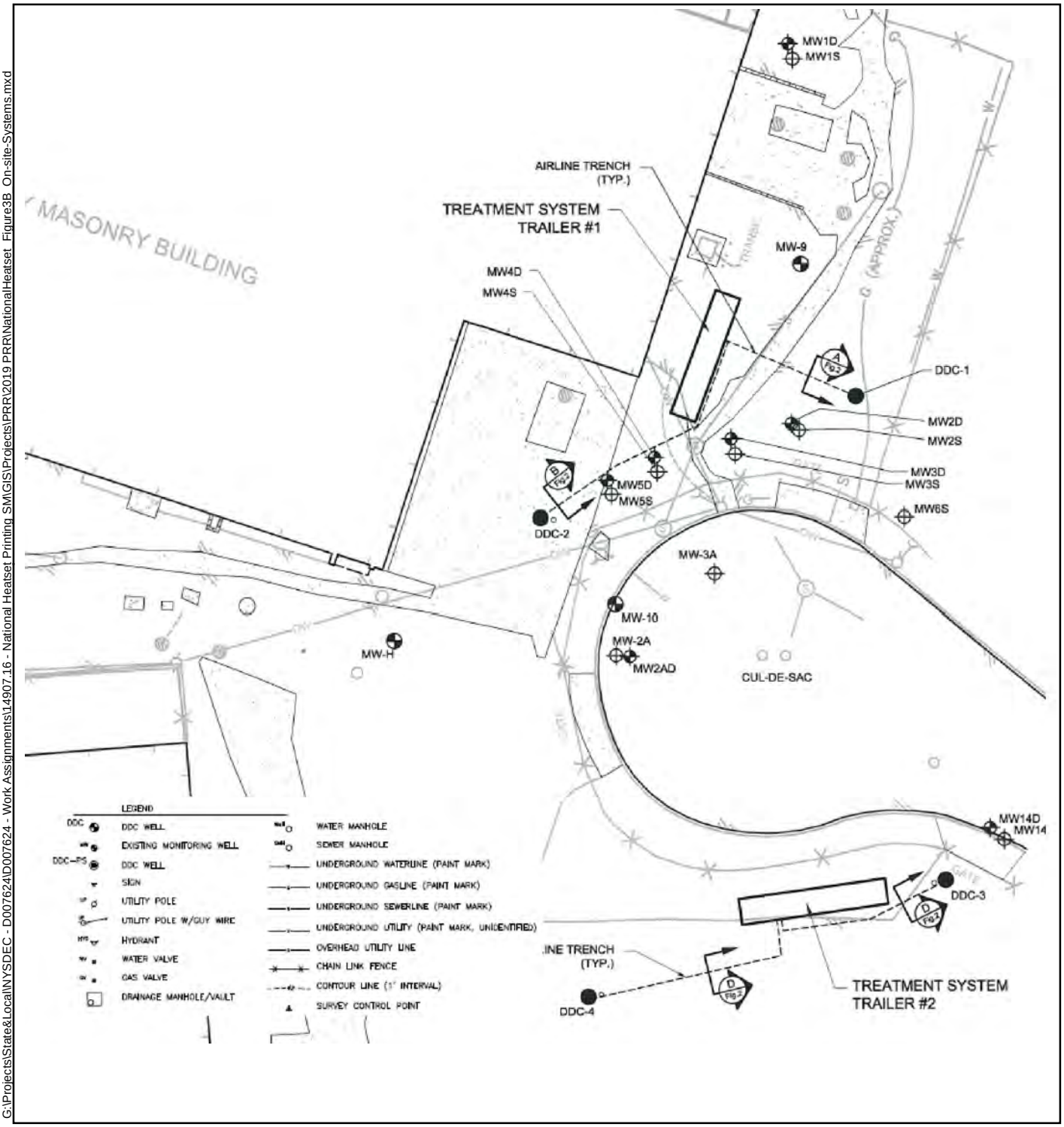

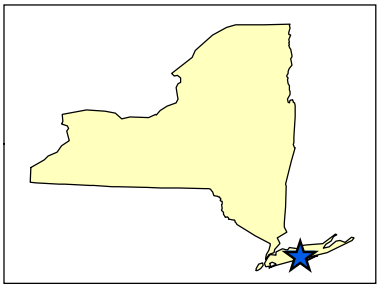

Legend

★ Site Location

0 12.5 25 50
Feet

1 inch = 50 feet

N

Figure 5B
ONSITE TREATMENT SYSTEM LOCATION
DDC #1 and DDC #2
NATIONAL HEATSET SITE (152140)
BABYLON, NEW YORK
SUFFOLK COUNTY

Map Date: 1/3/2020
Source: ESRI, 2011

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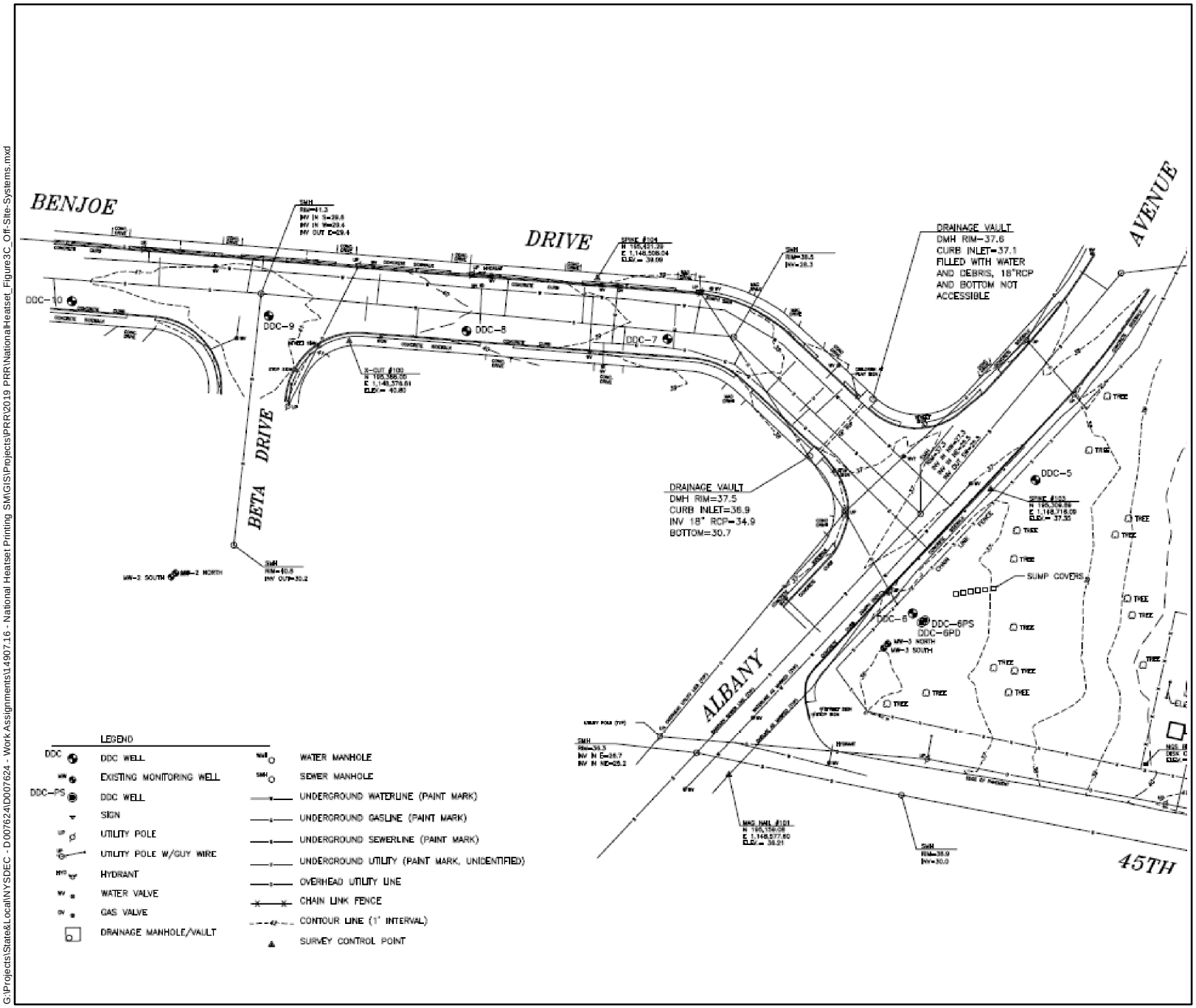

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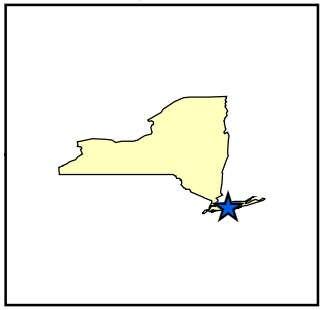

Map Date: 1/3/2020
Source:
Projection:

N

0 25 50 100
Feet

1 inch = 100 feet

Figure 5C
OFFSITE SYSTEM LOCATION
NATIONAL HEATSET
SITE (152140)
BABYLON, NEW YORK
SUFFOLK COUNTY

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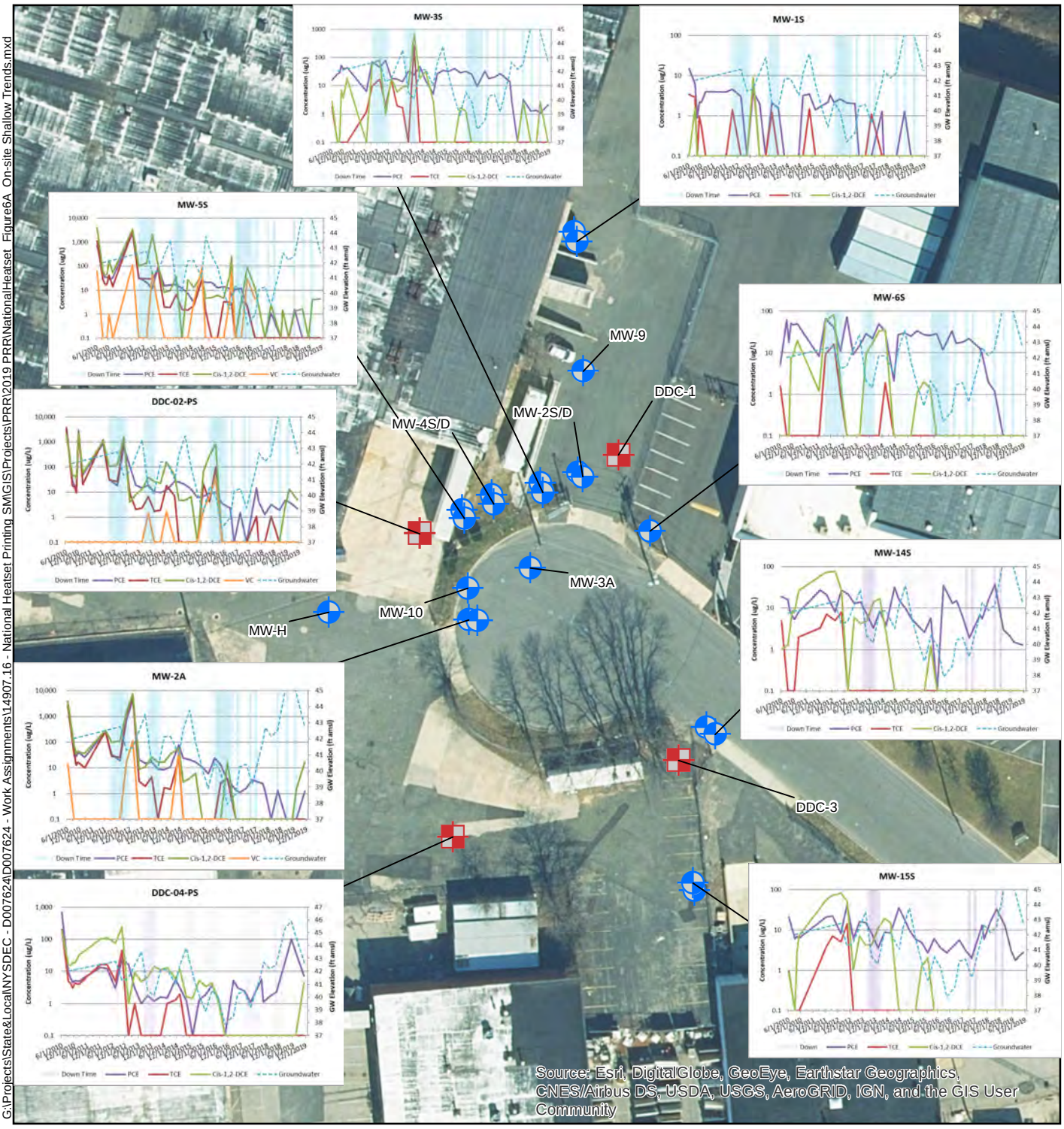

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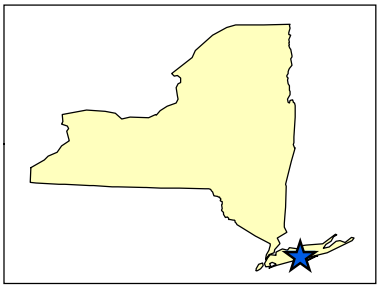

0 25 50 100
Feet

N

Legend

- DDC Well Cluster
- Groundwater Monitoring Well
- System 1 Down Time
- System 2 Down Time
- Site Location
- PCE
- TCE
- cis-1,2-DCE
- VC
- Groundwater

Figure 6A
ONSITE SHALLOW WELLS CVOC TREND GRAPHS
June 2010 - December 2019
NATIONAL HEATSET SITE (152140)
BABYLON, NEW YORK
SUFFOLK COUNTY

Map Date: 1/12/2021
Source: ESRI, 2011

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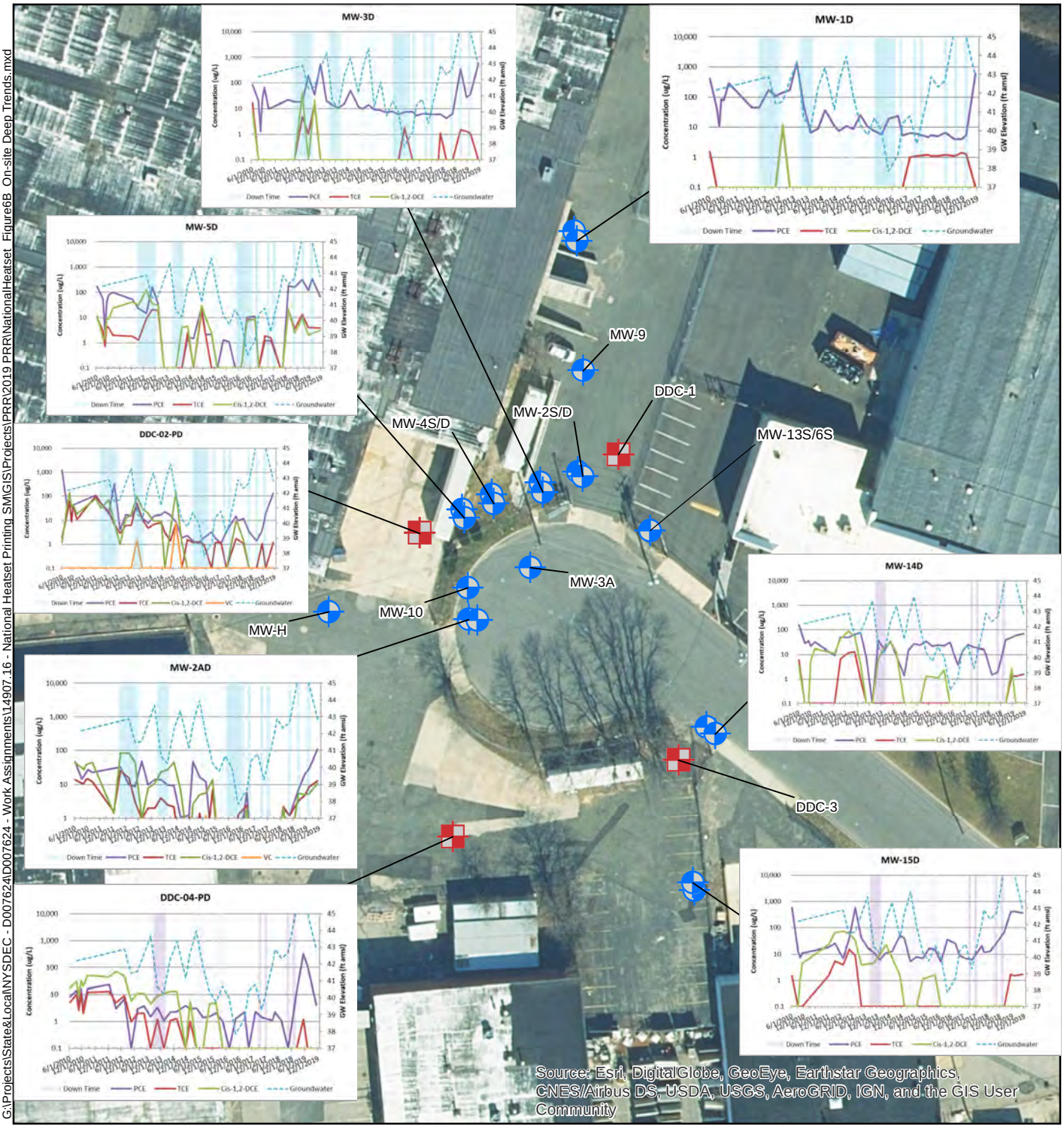

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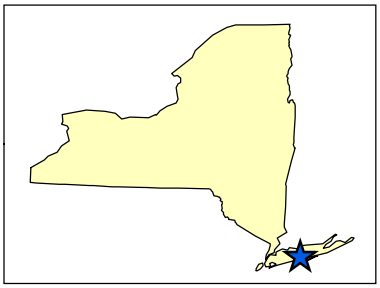

0 25 50 100
Feet

N

Legend

- DDC Well Cluster
- Groundwater Monitoring Well
- System 1 Down Time
- System 2 Down Time
- Site Location
- PCE
- TCE
- cis-1,2-DCE
- VC
- Groundwater

Figure 6B
ONSITE DEEP WELLS CVOC TREND GRAPHS
June 2010 - December 2019
NATIONAL HEATSET SITE (152140)
BABYLON, NEW YORK
SUFFOLK COUNTY

Map Date: 1/12/2021
Source: ESRI, 2011

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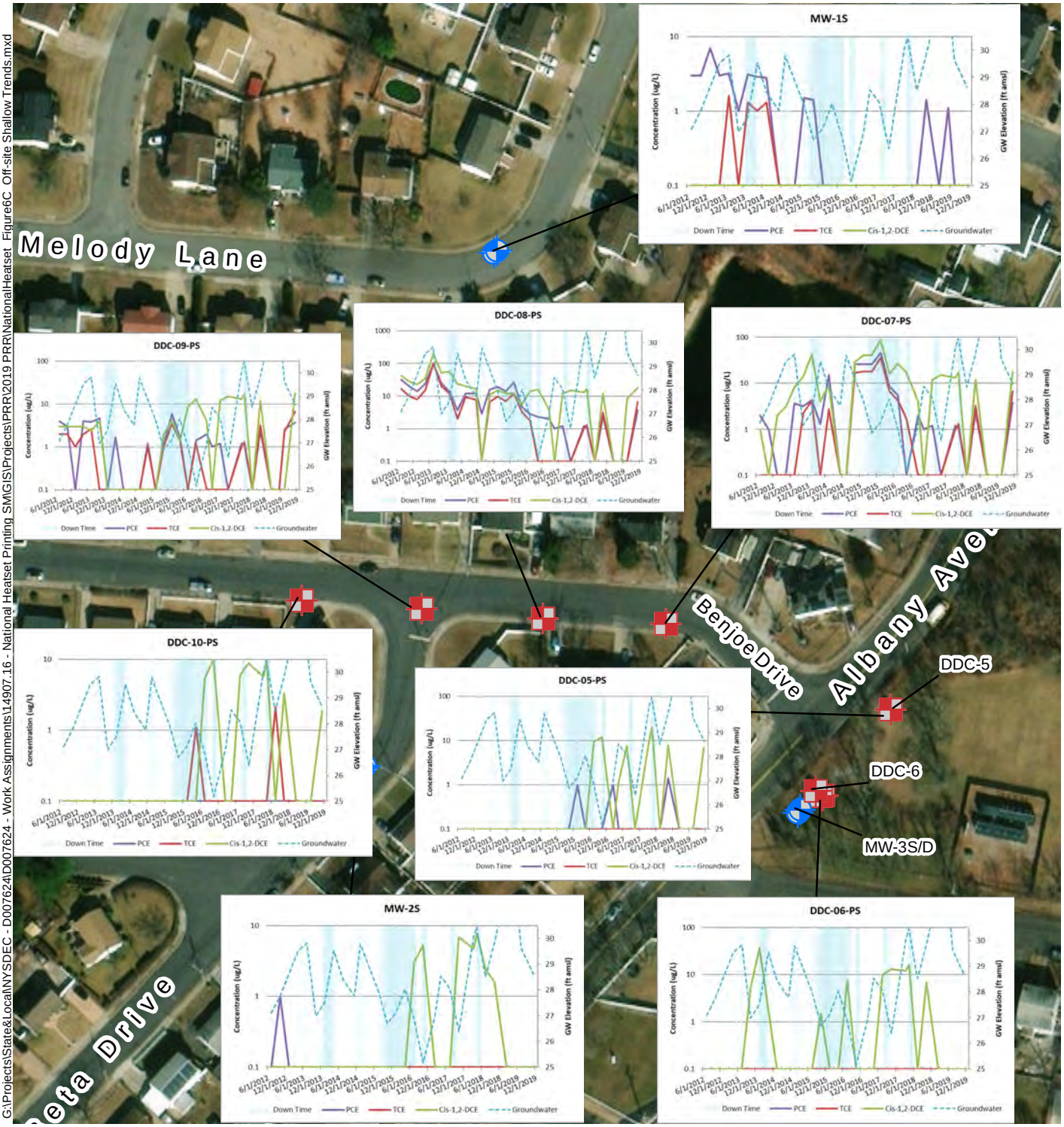

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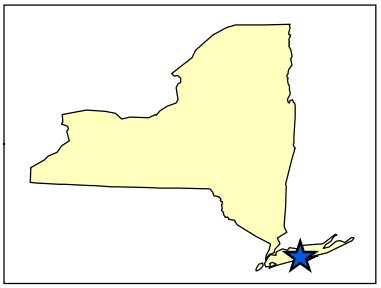

0 37.5 75 150
Feet

N

Legend

- DDC Well Cluster
- Groundwater Monitoring Well
- System 1 Down Time
- System 2 Down Time
- Site Location
- PCE
- TCE
- cis-1,2-DCE
- VC
- Groundwater

Figure 6C
OFFSITE SHALLOW WELLS CVOC TREND GRAPHS
June 2012 - December 2019
NATIONAL HEATSET SITE (152140)
BABYLON, NEW YORK
SUFFOLK COUNTY

Map Date: 1/12/2021
Source: ESRI, 2011

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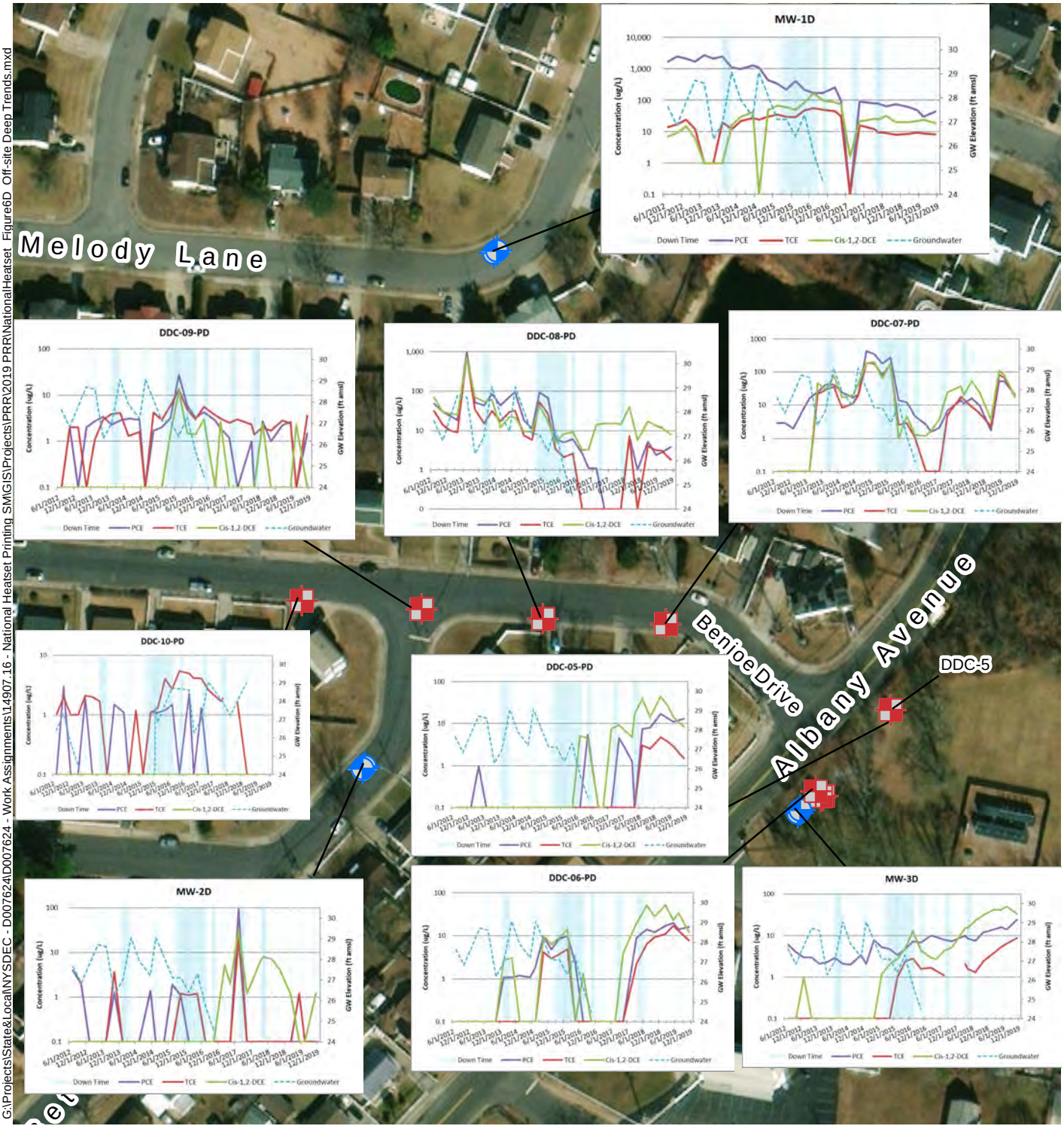

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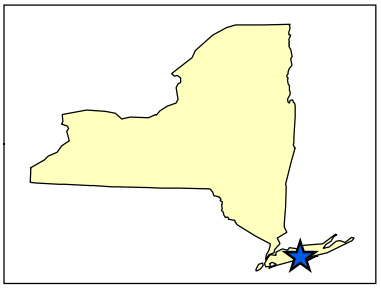

0 37.5 75 150
Feet

N

Legend

- DDC Well Cluster
- Groundwater Monitoring Well
- System 1 Down Time
- System 2 Down Time
- Site Location
- PCE
- TCE
- cis-1,2-DCE
- VC
- Groundwater

Figure 6D
OFFSITE DEEP WELLS CVOC TREND GRAPHS
June 2012 - December 2019
NATIONAL HEATSET SITE (152140)
BABYLON, NEW YORK
SUFFOLK COUNTY

Map Date: 1/12/2021
Source: ESRI, 2011

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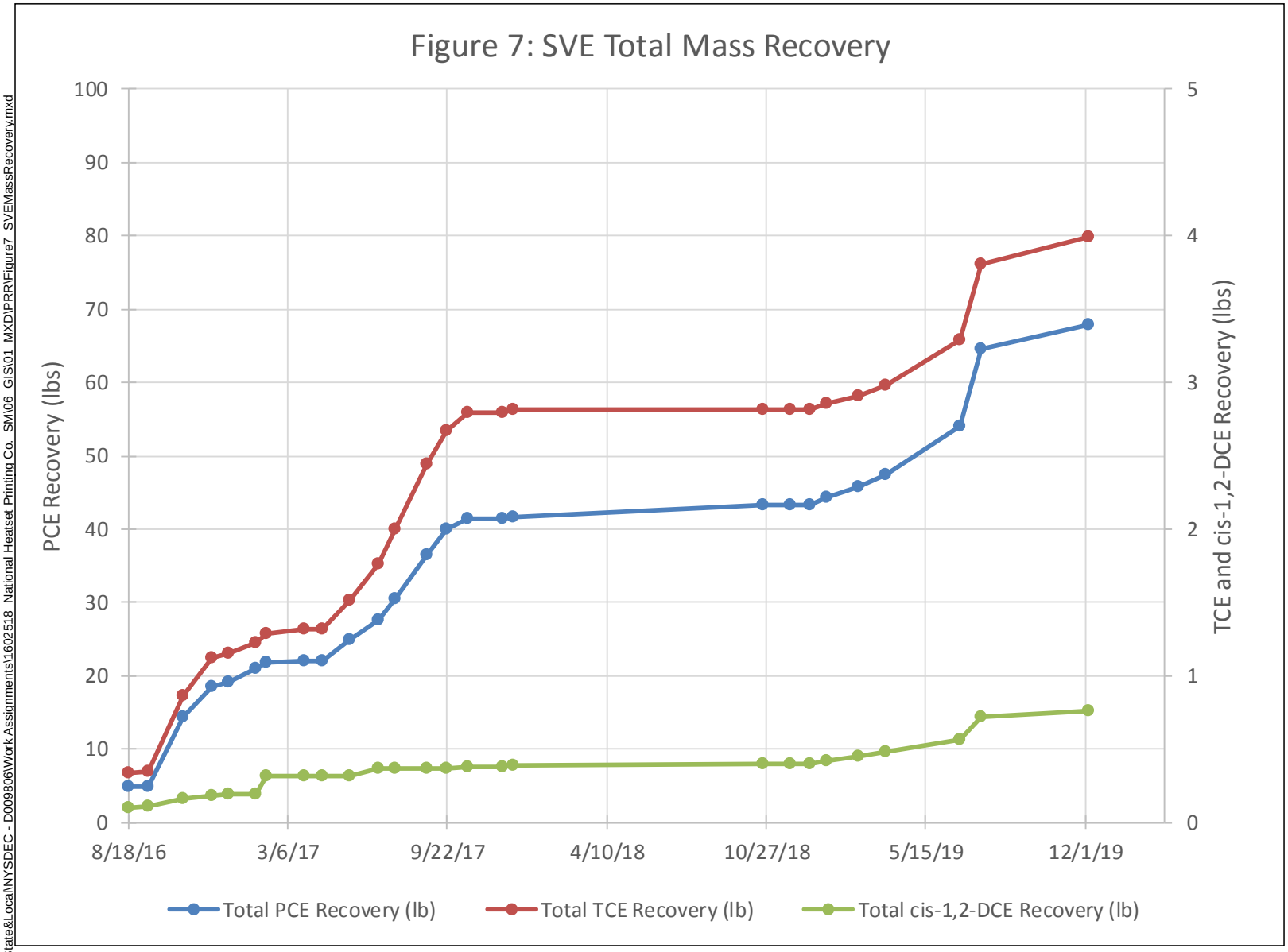
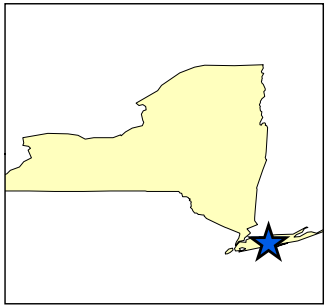


VICINITY MAP



Legend

Site Location

Map Date: 1/21/2021
Source: ESRI, 2011
Projection: NAD 1983 State Plane New York East

NEW YORK STATE OF OPPORTUNITY Department of Environmental Conservation

Figure 7
SVE Total Mass Recovery Chart
NATIONAL HEATSET SITE (152140)
BABYLON, NEW YORK SUFFOLK COUNTY

G:\Projects\State&Local\NYSDEC - D009806\Work Assignments\1602518 National Heatset Printing Co. SM\06 GIS\01 MXD\PRR\Figure7 SVEMassRecovery.mxd

Tables

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Table 1 Monitoring and DDC Well Groundwater Elevations

	Feb-2017	Apr-2017	Jul-2017	Oct-2017	Mar-2018	Apr-2018	Jul-2018	Oct-2018	Feb-2019	May-2019	Jul-2019	Nov-2019
Onsite Shallow Monitoring Wells (ft amsl)												
MW-1S	38.56	40.28	40.43	39.19	41.87	42.69	42.17	42.53	45.31	45.92	44.78	42.68
MW-2A	38.30	40.17	40.49	39.08	41.77	42.66	42.01	42.44	45.09	45.7	44.79	42.51
MW-3S	38.45	40.25	40.62	39.19	41.9	42.64	42.1	42.51	45.18	45.84	45.70	42.60
MW-5S	38.37	40.03	40.37	38.98	41.64	42.56	41.90	42.32	44.98	45.64	45.49	42.41
MW-6S	38.51	40.17	40.55	39.19	41.85	42.59	42.08	42.48	45.11	45.79	44.62	42.55
MW-14S	38.14	39.84	40.58	38.84	40.63	42.53	41.88	42.29	42.94	45.62	42.74	42.2
MW-15S	38.00	39.76	40.12	38.69	41.35	42.27	41.71	42.01	44.65	45.27	44.19	42.06
Onsite Deep Monitoring Wells (ft amsl)												
MW-1D	38.72	40.42	40.78	39.30	42.06	42.88	42.33	42.68	45.40	46.06	44.95	42.83
MW-2AD	38.21	39.91	40.26	38.84	41.52	42.4	41.72	42.18	44.91	45.51	44.37	18.29*
MW-3D	38.4	40.22	40.52	39.14	41.83	42.77	42.16	43.90	45.19	45.90	45.19	42.60
MW-5D	38.3	40.18	40.54	39.14	41.79	42.7	42.1	40.04	45.12	45.8	44.7	42.58
MW-14D	38.26	40.08	40.33	39.02	41.59	42.41	41.94	42.21	43.90	45.68	43.56	42.51
MW-15D	37.86	39.7	40.05	38.57	41.33	42.41	41.55	41.93	44.63	45.2	44.09	42
Onsite DDC Wells (ft amsl)												
DDC-2-PS	39.3	41.04	41.38	39.94	42.7	43.44	42.9	43.30	45.98	46.49	45.50	43.29
DDC-2-PD	39.05	40.92	40.22	38.82	42.48	43.39	42.74	43.16	45.73	46.43	45.39	43.29
DDC-4-PS	44	41.1	47.02	46.58	44.21	49.98	49.93	50.15	46.11	46.7	44.57	43.45
DDC-4-PD	38.21	41.01	40.11	38.93	42.78	42.51	41.82	42.37	46.20	46.6	45.44	43.43
Offsite Shallow Monitoring Wells (ft amsl)												
MW-1S	26.96	28.53	28.07	26.39	30.09	30.46	28.51	29.81	31.87	32.18	29.63	28.63
MW-2S	26.19	27.76	27.10	25.54	29.29	29.68	27.63	28.93	30.93	31.26	29.59	27.70
MW-3S	25.56	27.18	26.66	25.26	28.78	29.16	27.58	28.42	30.16	30.71	28.94	27.12
Offsite Deep Monitoring Wells (ft amsl)												
MW-1D	26.32	27.78	26.89	25.60	29.32	29.65	19.48	28.96	31.04	31.26	29.25	27.86
MW-2D	26.06	27.68	27.04	25.48	29.28	29.59	27.60	28.89	30.90	31.18	29.47	27.68
MW-3D	25.42	27.02	26.31	24.88	28.67	28.97	26.91	28.24	30.33	30.54	28.83	26.04
Offsite DDC Wells (ft amsl)												
DDC-5-PS	26.19	27.59	25.52	21.59	28.75	29.15	23.63	24.09	27.05	27.35	25.52	23.75
DDC-5-PD	20.82	22.52	21.95	21.59	24.08	24.39	23.59	27.95	26.92	27.26	25.53	22.73
DDC-6-PS	25.84	27.43	26.74	25.26	29.01	29.33	27.25	28.63	30.61	30.95	29.19	27.39
DDC-6-PD	25.79	27.26	26.55	25.10	28.84	29.27	27.22	28.73	30.56	30.87	29.10	27.26
DDC-7-PS	27.84	28.39	28.71	27.30	31.10	31.44	28.26	30.68	31.66	32.59	30.17	28.37
DDC-7-PD	25.87	28.37	26.19	25.55	28.87	29.73	28.26	28.49	31.64	31.97	30.24	28.38
DDC-8-PS	29.46	31.02	30.41	28.93	32.56	32.87	28.47	32.48	31.80	32.25	30.42	28.56
DDC-8-PD	24.72	27.77	25.92	24.57	27.77	29.16	28.45	27.57	31.86	32.24	30.32	28.52
DDC-9-PS	29.99	31.62	30.82	29.40	33.17	33.49	28.65	33.17	31.97	32.29	30.62	28.76
DDC-9-PD	25.72	27.17	26.64	25.35	28.82	28.67	28.57	29.12	31.91	32.20	29.48	28.66

* Groundwater depth recorded for MW-2AD on 4 November 2019 is inconsistent with prior and succeeding readings.

Table 2A Summary of Detected Volatile Organic Compounds in Onsite Groundwater Samples (Quarterly Sampling Events, 2017 - 2019)

February 2017

Parameters List EPA Method 8260B	Sample ID	MW-1D		MW-1S		MW-2A		MW-2AD		MW-3D		MW-3S		MW-5D		MW-5S		MW-6S		MW-14D		NYSDEC AWQS (µg/L)
	Sample Type	Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		
	Sample Date	2/6/2017		2/6/2017		2/6/2017		2/6/2017		2/7/2017		2/7/2017		2/6/2017		2/6/2017		2/7/2017		2/6/2017		
cis -1,2-Dichloroethene	(µg/L)	(<1)	U	(<1)	U	(<1)	U	2		(<1)	U	(<1)	U	**8.9**		**12**		(<1)	U	(<1)	U	5 (s)
trans -1,2-Dichloroethene	(µg/L)	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	5 (s)
Trichloroethene	(µg/L)	(<1)	U	(<1)	U	(<1)	U	2.4		(<1)	U	(<1)	U	**8.3**		(<1)	U	(<1)	U	(<1)	U	5 (s)
Tetrachloroethene	(µg/L)	**24**		2		1.4		**5.8**		**7.7**		**33**		**11**		(<1)	U	**33**		3.7		5 (s)
Vinyl Chloride	(µg/L)	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	**4.2**		(<1)	U	(<1)	U	2 (s)

Parameters List EPA Method 8260B	Sample ID	MW-14S		MW-15D		MW-15S		DDC-2-PD		DDC-2-PS		DDC-4-PD		DDC-4-PS		152140-FD-01		NYSDEC AWQS (µg/L)
	Sample Type	Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Duplicate		
	Sample Date	2/6/2017		2/6/2017		2/6/2017		2/7/2017		2/6/2017		2/6/2017		2/6/2017		2/6/2017		
cis -1,2-Dichloroethene	(µg/L)	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	5 (s)
trans -1,2-Dichloroethene	(µg/L)	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	5 (s)
Trichloroethene	(µg/L)	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	5 (s)
Tetrachloroethene	(µg/L)	**13**		**24**		4.3		3.3		2.3		2.2		**5.4**		3.9		5 (s)
Vinyl Chloride	(µg/L)	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	2 (s)

NOTE: 152140-FD-01 was a blind field duplicate quality assurance/quality control sample of onsite sample MW-15S for this sampling event.

April 2017

Parameters List EPA Method 8260B	Sample ID	MW-1D		MW-1S		MW-2A		MW-2AD		MW-3D		MW-3S		MW-5D		MW-5S		MW-6S		MW-14D		NYSDEC AWQS (µg/L)
	Sample Type	Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		
	Sample Date	4/18/2017		4/18/2017		4/17/2017		4/17/2017		4/18/2017		4/17/2017		4/17/2017		4/17/2017		4/18/2017		4/18/2017		
cis -1,2-Dichloroethene	(µg/L)	(<1)	U	(<1)	U	1.1		(<1)	U	(<1)	U	(<1)	U	(<1)	U	1.8		(<1)	U	(<1)	U	5 (s)
trans -1,2-Dichloroethene	(µg/L)	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	5 (s)
Trichloroethene	(µg/L)	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	5 (s)
Tetrachloroethene	(µg/L)	**5.2**		(<1)	U	(<1)	U	(<1)	U	**5.5**		**18**		(<1)	U	(<1)	U	**17**		**13**		5 (s)
Vinyl Chloride	(µg/L)	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	2 (s)

Parameters List EPA Method 8260B	Sample ID	MW-14S		MW-15D		MW-15S		DDC-2-PD		DDC-2-PS		DDC-4-PD		DDC-4-PS		152140-FD-01		NYSDEC AWQS (µg/L)
	Sample Type	Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Duplicate		
	Sample Date	4/18/2017		4/17/2017		4/17/2017		4/17/2017		4/17/2017		4/17/2017		4/17/2017		4/17/2016		
cis -1,2-Dichloroethene	(µg/L)	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	5 (s)
trans -1,2-Dichloroethene	(µg/L)	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	5 (s)
Trichloroethene	(µg/L)	(<1)	U	(<1)	U	(<1)	U	1.2		(<1)	U	(<1)	U	(<1)	U	(<1)	U	5 (s)
Tetrachloroethene	(µg/L)	**15**		**8.9**		**5.7**		1.8		(<1)	U	(<1)	U	3.1		**5.4**		5 (s)
Vinyl Chloride	(µg/L)	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	2 (s)

NOTE: 152140-FD-01 was a blind field duplicate quality assurance/quality control sample of onsite sample MW-15S for this sampling event.

EPA = U.S. Environmental Protection Agency
ID = Identification
NYSDEC = New York State Department of Environmental Conservation
AWQS = Ambient Water Quality Standard
µg/L = Micrograms per liter (parts per billion)
U = Analyte not detected at the listed laboratory reporting limit.
MW = Monitoring well
Bold values indicate that the analyte was detected greater than the NYSDEC AWQS.

Table 2A Summary of Detected Volatile Organic Compounds in Onsite Groundwater Samples (Quarterly Sampling Events, 2017 - 2019)

July 2017

Parameters List EPA Method 8260B	Sample ID	MW-1D		MW-1S		MW-2A		MW-2AD		MW-3D		MW-3S		MW-5D		MW-5S		MW-6S		MW-14D		NYSDEC AWQS (µg/L)
	Sample Type	Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		
	Sample Date	7/18/2017		7/17/2017		7/18/2017		7/18/2017		7/18/2017		7/18/2017		7/17/2017		7/17/2017		7/18/2017		7/17/2017		
cis -1,2-Dichloroethene	(µg/L)	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	5 (s)
trans -1,2-Dichloroethene	(µg/L)	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	5 (s)
Trichloroethene	(µg/L)	1		(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	1.9		(<1)	U	(<1)	U	(<1)	U	5 (s)
Tetrachloroethene	(µg/L)	**6.4**		(<1)	U	1.6		(<1)	U	**6.5**		**20**		1.2		(<1)	U	**18**		**24**		5 (s)
Vinyl Chloride	(µg/L)	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	2 (s)

Parameters List EPA Method 8260B	Sample ID	MW-14S		MW-15D		MW-15S		DDC-2-PD		DDC-2-PS		DDC-4-PD		DDC-4-PS		152140-FD-01		NYSDEC AWQS (µg/L)
	Sample Type	Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Duplicate		
	Sample Date	7/17/2017		7/17/2017		7/17/2017		7/18/2017		7/18/2017		7/17/2017		7/17/2017		7/17/2017		
cis -1,2-Dichloroethene	(µg/L)	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	5 (s)
trans -1,2-Dichloroethene	(µg/L)	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	5 (s)
Trichloroethene	(µg/L)	(<1)	U	(<1)	U	(<1)	U	1.2		(<1)	U	(<1)	U	(<1)	U	(<1)	U	5 (s)
Tetrachloroethene	(µg/L)	**5.8**		**7**		3.1		1.1		1.5		2.3		2.5		**5.8**		5 (s)
Vinyl Chloride	(µg/L)	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	2 (s)

NOTE: 152140-FD-01 was a blind field duplicate quality assurance/quality control sample of onsite sample MW-15S for this sampling event.

October 2017

Parameters List EPA Method 8260B	Sample ID	MW-1D		MW-1S		MW-2A		MW-2AD		MW-3D		MW-3S		MW-5D		MW-5S		MW-6S		MW-14D		NYSDEC AWQS (µg/L)
	Sample Type	Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		
	Sample Date	10/16/2017		10/16/2017		10/16/2017		10/16/2017		10/16/2017		10/16/2017		10/16/2017		10/16/2017		10/16/2017		10/16/2017		
cis -1,2-Dichloroethene	(µg/L)	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	2.5		(<1)	U	(<1)	U	5 (s)
trans -1,2-Dichloroethene	(µg/L)	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	5 (s)
Trichloroethene	(µg/L)	1.1		1.1		(<1)	U	(<1)	U	(<1)	U	(<1)	U	1.6		(<1)	U	(<1)	U	(<1)	U	5 (s)
Tetrachloroethene	(µg/L)	**5.9**		(<1)	U	3.4		(<1)	U	**6.2**		**27**		1.2		1.1		**22**		**19**		5 (s)
Vinyl Chloride	(µg/L)	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	2 (s)

Parameters List EPA Method 8260B	Sample ID	MW-14S		MW-15D		MW-15S		DDC-2-PD		DDC-2-PS		DDC-4-PD		DDC-4-PS		152140-FD-01		NYSDEC AWQS (µg/L)
	Sample Type	Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Duplicate		
	Sample Date	10/16/2017		10/17/2017		10/17/2017		10/16/2017		10/17/2017		10/17/2017		10/17/2017		10/17/2017		
cis -1,2-Dichloroethene	(µg/L)	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	5 (s)
trans -1,2-Dichloroethene	(µg/L)	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	5 (s)
Trichloroethene	(µg/L)	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	5 (s)
Tetrachloroethene	(µg/L)	1.9		**6.2**		2		3.6		(<1)	U	1.4		1.1		2		5 (s)
Vinyl Chloride	(µg/L)	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	2 (s)

NOTE: 152140-FD-01 was a blind field duplicate quality assurance/quality control sample of onsite sample MW-15S for this sampling event.

Table 2A Summary of Detected Volatile Organic Compounds in Onsite Groundwater Samples (Quarterly Sampling Events, 2017 - 2019)

March 2018

Parameters List EPA Method 8260B	Sample ID	MW-1D		MW-1S		MW-2A		MW-2AD		MW-3D		MW-3S		MW-5D		MW-5S		MW-6S		MW-14D		
	Sample Type	Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		
	Sample Date	3/20/2018		3/20/2018		3/19/2018		3/19/2018		3/19/2018		3/19/2018		3/19/2018		3/19/2018		3/19/2018		3/19/2018		NYSDEC AWQS (µg/L)
cis -1,2-Dichloroethene	(µg/L)	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	5 (s)
trans -1,2-Dichloroethene	(µg/L)	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	5 (s)
Trichloroethene	(µg/L)	1.2		(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	5 (s)
Tetrachloroethene	(µg/L)	4.6		1.3		2.4		(<1)	U	**6**		**14**		(<1)	U	(<1)	U	**13**		**16**		5 (s)
Vinyl Chloride	(µg/L)	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	2 (s)

Parameters List EPA Method 8260B	Sample ID	MW-14S		MW-15D		MW-15S		DDC-2-PD		DDC-2-PS		DDC-4-PD		DDC-4-PS		152140-FD-01		
	Sample Type	Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Duplicate		
	Sample Date	3/19/2018		3/19/2018		3/19/2018		3/19/2018		3/19/2018		3/19/2018		3/19/2018		3/19/2018		NYSDEC AWQS (µg/L)
cis -1,2-Dichloroethene	(µg/L)	(<1)	U	(<1)	U	(<1)	U	**9.2**		(<1)	U	(<1)	U	(<1)	U	(<1)	U	5 (s)
trans -1,2-Dichloroethene	(µg/L)	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	5 (s)
Trichloroethene	(µg/L)	(<1)	U	(<1)	U	(<1)	U	1.7		1.1		(<1)	U	(<1)	U	(<1)	U	5 (s)
Tetrachloroethene	(µg/L)	**6.8**		**20**		**13**		**15**		**15**		1.1		**5.7**		**12**		5 (s)
Vinyl Chloride	(µg/L)	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	2 (s)

NOTE: 152140-FD-01 was a blind field duplicate quality assurance/quality control sample of onsite sample MW-15S for this sampling event.

April 2018

Parameters List EPA Method 8260B	Sample ID	MW-1D		MW-1S		MW-2A		MW-2AD		MW-3D		MW-3S		MW-5D		MW-5S		MW-6S		MW-14D		
	Sample Type	Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		
	Sample Date	4/17/2018		4/18/2018		4/17/2018		4/17/2018		4/17/2018		4/18/2018		4/17/2018		4/17/2018		4/18/2018		4/17/2018		NYSDEC AWQS (µg/L)
cis -1,2-Dichloroethene	(µg/L)	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	1.5		(<1)	U	(<1)	U	5 (s)
trans -1,2-Dichloroethene	(µg/L)	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	5 (s)
Trichloroethene	(µg/L)	1.1		(<1)	U	(<1)	U	(<1)	U	1.1		(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	5 (s)
Tetrachloroethene	(µg/L)	**5.5**		(<1)	U	1.3		(<1)	U	**6.2**		2.9		(<1)	U	(<1)	U	**10**		**9.8**		5 (s)
Vinyl Chloride	(µg/L)	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	2 (s)

Parameters List EPA Method 8260B	Sample ID	MW-14S		MW-15D		MW-15S		DDC-2-PD		DDC-2-PS		DDC-4-PD		DDC-4-PS		152140-FD-01		
	Sample Type	Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Duplicate		
	Sample Date	4/17/2018		4/18/2018		4/17/2018		4/17/2018		4/18/2018		4/17/2018		4/17/2018		4/17/2018		NYSDEC AWQS (µg/L)
cis -1,2-Dichloroethene	(µg/L)	(<1)	U	(<1)	U	(<1)	U	**7.5**		(<1)	U	(<1)	U	(<1)	U	(<1)	U	5 (s)
trans -1,2-Dichloroethene	(µg/L)	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	5 (s)
Trichloroethene	(µg/L)	(<1)	U	(<1)	U	(<1)	U	1.6		(<1)	U	(<1)	U	(<1)	U	(<1)	U	5 (s)
Tetrachloroethene	(µg/L)	**5.5**		**12**		**5.9**		**9.5**		4.2		2.2		1.1		**5.9**		5 (s)
Vinyl Chloride	(µg/L)	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	2 (s)

NOTE: 152140-FD-01 was a blind field duplicate quality assurance/quality control sample of onsite sample MW-15S for this sampling event.

Table 2A Summary of Detected Volatile Organic Compounds in Onsite Groundwater Samples (Quarterly Sampling Events, 2017 - 2019)

July 2018

Parameters List EPA Method 8260B	Sample ID	MW-1D		MW-1S		MW-2A		MW-2AD		MW-3D		MW-3S		MW-5D		MW-5S		MW-6S		MW-14D		NYSDEC AWQS (µg/L)
	Sample Type	Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		
	Sample Date	7/5/2018		7/5/2018		7/5/2018		7/5/2018		7/5/2018		7/5/2018		7/5/2018		7/5/2018		7/5/2018		7/5/2018		
cis -1,2-Dichloroethene	(µg/L)	(<1)	U	(<1)	U	(<1)	U	2.0		(<1)	U	(<1)	U	**22**		(<1)	U	(<1)	U	(<1)	U	5 (s)
trans -1,2-Dichloroethene	(µg/L)	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	5 (s)
Trichloroethene	(µg/L)	1.1		(<1)	U	(<1)	U	2.2		(<1)	U	(<1)	U	**20**		(<1)	U	(<1)	U	(<1)	U	5 (s)
Tetrachloroethene	(µg/L)	4.9		(<1)	U	(<1)	U	2.0		4.3		(<1)	U	**180**		(<1)	U	2.0		1.5		5 (s)
Vinyl Chloride	(µg/L)	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	2 (s)

Parameters List EPA Method 8260B	Sample ID	MW-14S		MW-15D		MW-15S		DDC-2-PD		DDC-2-PS		DDC-4-PD		DDC-4-PS		152140-FD-01		152140-FD-02		NYSDEC AWQS (µg/L)
	Sample Type	Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Duplicate		Duplicate		
	Sample Date	7/5/2018		7/5/2018		7/5/2018		7/5/2018		7/5/2018		7/5/2018		7/5/2018		7/5/2018		7/5/2018		
cis -1,2-Dichloroethene	(µg/L)	(<1)	U	(<1)	U	(<1)	U	1.5		(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	5 (s)
trans -1,2-Dichloroethene	(µg/L)	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	5 (s)
Trichloroethene	(µg/L)	(<1)	U	(<1)	U	(<1)	U	1.1		(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	5 (s)
Tetrachloroethene	(µg/L)	**16**		**13**		**16**	U	**12**		1.3		1.1		1.7		**13**		**15**		5 (s)
Vinyl Chloride	(µg/L)	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	2 (s)

NOTE: 152140-FD-01 was a blind field duplicate quality assurance/quality control sample of onsite sample MW-15S for this sampling event.
152140-FD-02 was a blind field duplicate quality assurance/quality control sample of onsite sample MW-1D (onsite) for this sampling event.

October 2018

Parameters List EPA Method 8260B	Sample ID	MW-1D		MW-1S		MW-2A		MW-2AD		MW-3D		MW-3S		MW-5D		MW-5S		MW-6S		MW-14D		NYSDEC AWQS (µg/L)
	Sample Type	Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		
	Sample Date	10/23/2018		10/23/2018		10/23/2018		10/23/2018		10/23/2018		10/23/2018		10/23/2018		10/23/2018		10/23/2018		10/23/2018		
cis -1,2-Dichloroethene	(µg/L)	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	2.7		2.5		1.3		(<1)	U	(<1)	U	5 (s)
trans -1,2-Dichloroethene	(µg/L)	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	5 (s)
Trichloroethene	(µg/L)	(<1)	U	(<1)	U	(<1)	U	1.2		(<1)	U	(<1)	U	3.6		(<1)	U	(<1)	U	(<1)	U	5 (s)
Tetrachloroethene	(µg/L)	1.2		(<1)	U	1.3		1.2		**6.4**		3.3		**160**		1.6		1.2		1.9		5 (s)
Vinyl Chloride	(µg/L)	**6.6**		(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	2 (s)

Parameters List EPA Method 8260B	Sample ID	MW-14S		MW-15D		MW-15S		DDC-2-PD		DDC-2-PS		DDC-4-PD		DDC-4-PS		152140-FD-01		NYSDEC AWQS (µg/L)
	Sample Type	Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Duplicate		
	Sample Date	10/23/2018		10/23/2018		10/23/2018		10/23/2018		10/23/2018		10/23/2018		10/23/2018		10/23/2018		
cis -1,2-Dichloroethene	(µg/L)	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	5 (s)
trans -1,2-Dichloroethene	(µg/L)	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	5 (s)
Trichloroethene	(µg/L)	(<1)	U	(<1)	U	(<1)	U	(<1)	U	1.1		(<1)	U	(<1)	U	(<1)	U	5 (s)
Tetrachloroethene	(µg/L)	**37**		**24**		**33**		3.4		3.2		(<1)	U	2.3		**35**		5 (s)
Vinyl Chloride	(µg/L)	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	2 (s)

NOTE: 152140-FD-01 was a blind field duplicate quality assurance/quality control sample of onsite sample MW-15S for this sampling event.

Table 2A Summary of Detected Volatile Organic Compounds in Onsite Groundwater Samples (Quarterly Sampling Events, 2017 - 2019)

February 2019

Parameters List EPA Method 8260B	Sample ID	MW-1D		MW-1S		MW-2A		MW-2AD		MW-3D		MW-3S		MW-5D		MW-5S		MW-6S		MW-14D		
	Sample Type	Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		
	Sample Date	2/20/2019		2/20/2019		2/20/2019		2/20/2019		2/20/2019		2/20/2019		2/20/2019		2/20/2019		2/20/2019		2/21/2019		NYSDEC AWQS (µg/L)
cis -1,2-Dichloroethene	(µg/L)	(<1)	U	(<1)	U	(<1)	U	**5.6**		(<1)	U	(<1)	U	**9.3**		1.7		(<1)	U	(<1)	U	5 (s)
trans -1,2-Dichloroethene	(µg/L)	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	5 (s)
Trichloroethene	(µg/L)	1.1		(<1)	U	(<1)	U	3.3		1.5		(<1)	U	**13**		(<1)	U	(<1)	U	(<1)	U	5 (s)
Tetrachloroethene	(µg/L)	4.0		1.3		(<1)	U	**7.1**		**340**		1.3		**320**		(<1)	U	(<1)	U	**38**		5 (s)
Vinyl Chloride	(µg/L)	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	2 (s)

Parameters List EPA Method 8260B	Sample ID	MW-14S		MW-15D		MW-15S		DDC-2-PD		DDC-2-PS		DDC-4-PD		DDC-4-PS		152140-FD-01		
	Sample Type	Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Duplicate		
	Sample Date	2/21/2019		2/20/2019		2/20/2019		2/20/2019		2/20/2019		10/23/2018		2/20/2019		2/20/2019		NYSDEC AWQS (µg/L)
cis -1,2-Dichloroethene	(µg/L)	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	5 (s)
trans -1,2-Dichloroethene	(µg/L)	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	5 (s)
Trichloroethene	(µg/L)	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	5 (s)
Tetrachloroethene	(µg/L)	3.0		**68**		**13**		1.4		1.9		**12**		**18**		**14**		5 (s)
Vinyl Chloride	(µg/L)	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	2 (s)

NOTE: 152140-FD-01 was a blind field duplicate quality assurance/quality control sample of onsite sample MW-15S for this sampling event.

May 2019

Parameters List EPA Method 8260B	Sample ID	MW-1D		MW-1S		MW-2A		MW-2AD		MW-3D		MW-3S		MW-5D		MW-5S		MW-6S		MW-14D		
	Sample Type	Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		
	Sample Date	5/22/2019		5/22/2019		5/22/2019		5/22/2019		5/22/2019		5/24/2019		5/22/2019		5/22/2019		5/22/2019		5/22/2019		NYSDEC AWQS (µg/L)
cis -1,2-Dichloroethene	(µg/L)	(<1)	U	(<1)	U	(<1)	U	**5.0**		(<1)	U	(<1)	U	2.0		(<1)	U	(<1)	U	2.7		5 (s)
trans -1,2-Dichloroethene	(µg/L)	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	5 (s)
Trichloroethene	(µg/L)	1.4		(<1)	U	(<1)	U	4.8		1.3		(<1)	U	4.0		(<1)	U	(<1)	U	1.4		5 (s)
Tetrachloroethene	(µg/L)	4.0		(<1)	U	(<1)	U	**20**		**27**		1.4		**120**		(<1)	U	(<1)	U	**47**		5 (s)
Vinyl Chloride	(µg/L)	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	2 (s)

Parameters List EPA Method 8260B	Sample ID	MW-14S		MW-15D		MW-15S		DDC-2-PD		DDC-2-PS		DDC-4-PD		DDC-4-PS		152140-FD-01		
	Sample Type	Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Duplicate		
	Sample Date	5/22/2019		5/22/2019		5/24/2019		5/22/2019		5/22/2019		5/22/2019		5/22/2019		5/22/2019		NYSDEC AWQS (µg/L)
cis -1,2-Dichloroethene	(µg/L)	(<1)	U	(<1)	U	(<1)	U	(<1)	U	3.0		(<1)	U	(<1)	U	(<1)	U	5 (s)
trans -1,2-Dichloroethene	(µg/L)	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	5 (s)
Trichloroethene	(µg/L)	(<1)	U	1.7		(<1)	U	1.1		(<1)	U	1.2		(<1)	U	(<1)	U	5 (s)
Tetrachloroethene	(µg/L)	2.1		**400**		3.0		3.8		4.8		**320**		**100**		3.3		5 (s)
Vinyl Chloride	(µg/L)	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	2 (s)

NOTE: 152140-FD-01 was a blind field duplicate quality assurance/quality control sample of onsite sample MW-15S for this sampling event.

Table 2A Summary of Detected Volatile Organic Compounds in Onsite Groundwater Samples (Quarterly Sampling Events, 2017 - 2019)

July 2019

Parameters List EPA Method 8260B	Sample ID	MW-1D		MW-1S		MW-2A		MW-2AD		MW-3D		MW-3S		MW-5D		MW-5S		MW-6S		MW-14D		
	Sample Type	Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		
	Sample Date	7/23/2019		7/23/2019		7/23/2019		7/23/2019		7/23/2019		7/23/2019		7/23/2019		7/23/2019		7/23/2019		7/23/2019		NYSDEC AWQS (µg/L)
cis -1,2-Dichloroethene	(µg/L)	(<1)	U	(<1)	U	1.5		**5.4**		(<1)	U	2.7		2.3		4.1		(<1)	U	(<1)	U	5 (s)
trans -1,2-Dichloroethene	(µg/L)	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	5 (s)
Trichloroethene	(µg/L)	1.3		(<1)	U	(<1)	U	**8.5**		1.1		(<1)	U	4.0		(<1)	U	(<1)	U	1.3		5 (s)
Tetrachloroethene	(µg/L)	**5.4**		(<1)	U	(<1)	U	**30**		**35**		1.1		**340**		(<1)	U	(<1)	U	**58**		5 (s)
Vinyl Chloride	(µg/L)	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	2 (s)

Parameters List EPA Method 8260B	Sample ID	MW-14S		MW-15D		MW-15S		DDC-2-PD		DDC-2-PS		DDC-4-PD		DDC-4-PS		152140-FD-01						
	Sample Type	Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Duplicate						
	Sample Date	7/23/2019		7/23/2019		7/23/2019		7/23/2019		7/23/2019		7/23/2019		7/23/2019		7/23/2019						NYSDEC AWQS (µg/L)
cis -1,2-Dichloroethene	(µg/L)	(<1)	U	(<1)	U	(<1)	U	(<1)	U	**13**		(<1)	U	(<1)	U	(<1)	U					5 (s)
trans -1,2-Dichloroethene	(µg/L)	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U					5 (s)
Trichloroethene	(µg/L)	(<1)	U	1.5		(<1)	U	1.0		(<1)	U	(<1)	U	(<1)	U	(<1)	U					5 (s)
Tetrachloroethene	(µg/L)	1.5		**410**		1.8		**19**		4.1		**110**		**39**		2.0						5 (s)
Vinyl Chloride	(µg/L)	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U					2 (s)

NOTE: 152140-FD-01 was a blind field duplicate quality assurance/quality control sample of onsite sample MW-15S for this sampling event.

November 2019

Parameters List EPA Method 8260B	Sample ID	MW-1D		MW-1S		MW-2A		MW-2AD		MW-3D		MW-3S		MW-5D		MW-5S		MW-6S		MW-14D		
	Sample Type	Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		
	Sample Date	11/7/2019		11/7/2019		11/7/2019		11/7/2019		11/7/2019		11/7/2019		11/7/2019		11/7/2019		11/7/2019		11/7/2019		NYSDEC AWQS (µg/L)
cis -1,2-Dichloroethene	(µg/L)	(<1)	U	(<1)	U	**17**		**11**		(<1)	U	(<1)	U	3.1		4.4		(<1)	U	(<1)	U	5 (s)
trans -1,2-Dichloroethene	(µg/L)	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	5 (s)
Trichloroethene	(µg/L)	(<1)	U	(<1)	U	(<1)	U	**11**		(<1)	U	(<1)	U	3.8		(<1)	U	(<1)	U	1.6		5 (s)
Tetrachloroethene	(µg/L)	**610**		(<1)	U	1.2		**110**		**560**		2.1		**69**		(<1)	U	(<1)	U	**68**		5 (s)
Vinyl Chloride	(µg/L)	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	2 (s)

Parameters List EPA Method 8260B	Sample ID	MW-14S		MW-15D		MW-15S		DDC-2-PD		DDC-2-PS		DDC-4-PD		DDC-4-PS		152140-FD-01						
	Sample Type	Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Duplicate						
	Sample Date	11/7/2019		11/7/2019		11/7/2019		11/7/2019		11/7/2019		11/7/2019		11/7/2019		11/7/2019						NYSDEC AWQS (µg/L)
cis -1,2-Dichloroethene	(µg/L)	(<1)	U	(<1)	U	(<1)	U	(<1)	U	4.9		(<1)	U	4.6		(<1)	U					5 (s)
trans -1,2-Dichloroethene	(µg/L)	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U					5 (s)
Trichloroethene	(µg/L)	(<1)	U	1.7		(<1)	U	1.2		(<1)	U	(<1)	U	(<1)	U	(<1)	U					5 (s)
Tetrachloroethene	(µg/L)	1.3		**360**		2.8		**130**		2.2		4.1		**7.0**		2.5						5 (s)
Vinyl Chloride	(µg/L)	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U					2 (s)

NOTE: 152140-FD-01 was a blind field duplicate quality assurance/quality control sample of onsite sample MW-15S for this sampling event.

Table 2B Summary of Detected Volatile Organic Compounds in Offsite Groundwater Samples (Quarterly Sampling Events, 2017 - 2019)

February 2017

Parameters List EPA Method 8260B	Sample ID Sample Type Sample Date	MW-1D Groundwater 2/7/2017		MW-1S Groundwater 2/7/2017		MW-2D Groundwater 2/7/2017		MW-2S Groundwater 2/7/2017		MW-3D Groundwater 2/8/2017		MW-3S Groundwater 2/8/2017		DDC-5-PD Groundwater 2/7/2017		DDC-5-PS Groundwater 2/7/2017		DDC-6-PD Groundwater 2/7/2017		DDC-6-PS Groundwater 2/7/2017		NYSDEC AWQS (µg/L)
cis - 1,2-Dichloroethene	(µg/L)	**85**		(<1)	U	**5.2**		(<1)	U	2.9		(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	5 (s)
trans -1,2-Dichloroethene	(µg/L)	1.3		(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	5 (s)
Trichloroethene	(µg/L)	**45**		(<1)	U	(<1)	U	(<1)	U	1.7		(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	5 (s)
Tetrachloroethene	(µg/L)	**260**		(<1)	U	(<1)	U	(<1)	U	**10**		(<1)	U	(<1)	U	1		(<1)	U	(<1)	U	5 (s)
Vinyl Chloride	(µg/L)	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	2 (s)

Parameters List EPA Method 8260B	Sample ID Sample Type Sample Date	DDC-7-PD Groundwater 2/7/2017		DDC-7-PS Groundwater 2/7/2017		DDC-8-PD Groundwater 2/7/2017		DDC-8-PS Groundwater 2/7/2017		DDC-9-PD Groundwater 2/7/2017		DDC-9-PS Groundwater 2/7/2017		DDC-10-PD Groundwater 2/8/2017		DDC-10-PS Groundwater 2/8/2017		152140-FD-02 Duplicate 2/8/2017				NYSDEC AWQS (µg/L)
cis - 1,2-Dichloroethene	(µg/L)	1.2		4		3.2		4.1		(<1)	U	2.1		(<1)	U	(<1)	U	**83**				5 (s)
trans -1,2-Dichloroethene	(µg/L)	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	1.4	U			5 (s)
Trichloroethene	(µg/L)	(<1)	U	(<1)	U	(<1)	U	(<1)	U	3.7		1		**5**		(<1)	U	**43**	U			5 (s)
Tetrachloroethene	(µg/L)	2.7		2	U	2.6		2.2		2.8		1.4		2.3	U	(<1)	U	**230**	U			5 (s)
Vinyl Chloride	(µg/L)	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U			2 (s)

NOTE: 152140-FD-02 was a blind field duplicate quality assurance/quality control sample from off-site MW-1D for this sampling event.

April 2017

Parameters List EPA Method 8260B	Sample ID Sample Type Sample Date	MW-1D Groundwater 4/18/2017		MW-1S Groundwater 4/18/2017		MW-2D Groundwater 4/18/2017		MW-2S Groundwater 4/18/2017		MW-3D Groundwater 4/19/2017		MW-3S Groundwater 4/19/2017		DDC-5-PD Groundwater 4/18/2017		DDC-5-PS Groundwater 4/18/2017		DDC-6-PD Groundwater 4/18/2017		DDC-6-PS Groundwater 4/18/2017		NYSDEC AWQS (µg/L)
cis - 1,2-Dichloroethene	(µg/L)	**74**		(<1)	U	2		(<1)	U	2.7		(<1)	U	(<1)	U	1.2		(<1)	U	(<1)	U	5 (s)
trans -1,2-Dichloroethene	(µg/L)	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	5 (s)
Trichloroethene	(µg/L)	**31**		(<1)	U	(<1)	U	(<1)	U	1.4		(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	5 (s)
Tetrachloroethene	(µg/L)	**96**		(<1)	U	(<1)	U	(<1)	U	**9.2**		(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	5 (s)
Vinyl Chloride	(µg/L)	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	2 (s)

Parameters List EPA Method 8260B	Sample ID Sample Type Sample Date	DDC-7-PD Groundwater 4/18/2017		DDC-7-PS Groundwater 4/18/2017		DDC-8-PD Groundwater 4/18/2017		DDC-8-PS Groundwater 4/18/2017		DDC-9-PD Groundwater 4/18/2017		DDC-9-PS Groundwater 4/18/2017		DDC-10-PD Groundwater 4/18/2017		DDC-10-PS Groundwater 4/18/2017		152140-FD-02 Duplicate 4/18/2017				NYSDEC AWQS (µg/L)
cis - 1,2-Dichloroethene	(µg/L)	1.8		(<1)	U	3.3		2.9		2.6		2.7		(<1)	U	(<1)	U	**60**				5 (s)
trans -1,2-Dichloroethene	(µg/L)	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	1	U			5 (s)
Trichloroethene	(µg/L)	(<1)	U	(<1)	U	(<1)	U	(<1)	U	3.1		(<1)	U	4.1		(<1)	U	**43**	U			5 (s)
Tetrachloroethene	(µg/L)	1.6		1		1.1		1.2		1.9		(<1)	U	(<1)	U	(<1)	U	**36**	U			5 (s)
Vinyl Chloride	(µg/L)	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U			2 (s)

NOTE: 152140-FD-02 was a blind field duplicate quality assurance/quality control sample from off-site MW-1D for this sampling event.

EPA = U.S. Environmental Protection Agency
ID = Identification
NYSDEC = New York State Department of Environmental Conservation
AWQS = Ambient Water Quality Standard
µg/L = Micrograms per liter (parts per billion)
U = Analyte not detected at the listed laboratory reporting limit.
MW = Monitoring well
Bold values indicate that the analyte was detected greater than the NYSDEC AWQS.

Table 2B Summary of Detected Volatile Organic Compounds in Offsite Groundwater Samples (Quarterly Sampling Events, 2017 - 2019)

July 2017

Parameters List EPA Method 8260B	Sample ID	MW-1D		MW-1S		MW-2D		MW-2S		MW-3D		MW-3S		DDC-5-PD		DDC-5-PS		DDC-6-PD		DDC-6-PS		NYSDEC AWQS (µg/L)
	Sample Type	Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		
	Sample Date	7/18/2017		7/18/2017		7/18/2017		7/18/2017		7/19/2017		7/19/2017		7/19/2017		7/19/2017		7/19/2017		7/19/2017		
cis - 1,2-Dichloroethene	(µg/L)	**33**		(<1)	U	1.6		(<1)	U	4.3		(<1)	U	**7.5**		**7.5**		(<1)	U	**10**		5 (s)
trans -1,2-Dichloroethene	(µg/L)	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	5 (s)
Trichloroethene	(µg/L)	**21**		(<1)	U	(<1)	U	(<1)	U	1.1		(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	5 (s)
Tetrachloroethene	(µg/L)	**94**		(<1)	U	(<1)	U	(<1)	U	**7.9**		(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	5 (s)
Vinyl Chloride	(µg/L)	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	2 (s)

Parameters List EPA Method 8260B	Sample ID	DDC-7-PD		DDC-7-PS		DDC-8-PD		DDC-8-PS		DDC-9-PD		DDC-9-PS		DDC-10-PD		DDC-10-PS		152140-FD-02		NYSDEC AWQS (µg/L)
	Sample Type	Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Duplicate		
	Sample Date	7/18/2017		7/18/2017		7/18/2017		7/18/2017		7/18/2017		7/18/2017		7/18/2017		7/18/2017		7/18/2017		
cis - 1,2-Dichloroethene	(µg/L)	3.7		**12**		**14**		**15**		(<1)	U	**11**		(<1)	U	**6**		1.2		5 (s)
trans -1,2-Dichloroethene	(µg/L)	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	1	U	5 (s)
Trichloroethene	(µg/L)	(<1)	U	(<1)	U	(<1)	U	1.2		2.5		(<1)	U	4.1		(<1)	U	**43**	U	5 (s)
Tetrachloroethene	(µg/L)	2.1		1.2		1.1		1.1		1.2		(<1)	U	1.3		(<1)	U	**36**	U	5 (s)
Vinyl Chloride	(µg/L)	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	2 (s)

NOTE: 152140-FD-02 was a blind field duplicate quality assurance/quality control sample from off-site MW-1D for this sampling event.
Samples MW-1S/MW-1D were inadvertently switched with samples MW-2S/MW-2D in the field. Results have been updated to reflect correct sample designation.

October 2017

Parameters List EPA Method 8260B	Sample ID	MW-1D		MW-1S		MW-2D		MW-2S		MW-3D		MW-3S		DDC-5-PD		DDC-5-PS		DDC-6-PD		DDC-6-PS		NYSDEC AWQS (µg/L)
	Sample Type	Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		
	Sample Date	10/17/2017		10/17/2017		10/18/2017		10/18/2017		10/17/2017		10/17/2017		10/17/2017		10/17/2017		10/17/2017		10/17/2017		
cis - 1,2-Dichloroethene	(µg/L)	**21**		(<1)	U	1.2		(<1)	U	**5.3**		(<1)	U	**9.2**		(<1)	U	3.9		**13**		5 (s)
trans -1,2-Dichloroethene	(µg/L)	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	5 (s)
Trichloroethene	(µg/L)	**16**		(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	5 (s)
Tetrachloroethene	(µg/L)	**91**		(<1)	U	(<1)	U	(<1)	U	**7.3**		(<1)	U	4.5		(<1)	U	(<1)	U	(<1)	U	5 (s)
Vinyl Chloride	(µg/L)	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	2 (s)

Parameters List EPA Method 8260B	Sample ID	DDC-7-PD		DDC-7-PS		DDC-8-PD		DDC-8-PS		DDC-9-PD		DDC-9-PS		DDC-10-PD		DDC-10-PS		152140-FD-02		NYSDEC AWQS (µg/L)
	Sample Type	Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Duplicate		
	Sample Date	10/17/2017		10/17/2017		10/17/2017		10/17/2017		10/17/2017		10/17/2017		10/18/2017		7/18/2017		10/18/2017		
cis - 1,2-Dichloroethene	(µg/L)	**24**		**15**		**15**		**16**		(<1)	U	**8.8**		(<1)	U	**6**		**20**		5 (s)
trans -1,2-Dichloroethene	(µg/L)	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	5 (s)
Trichloroethene	(µg/L)	4.9		(<1)	U	(<1)	U	(<1)	U	3		(<1)	U	2.6		(<1)	U	**15**		5 (s)
Tetrachloroethene	(µg/L)	**6.8**		(<1)	U	(<1)	U	1.4		(<1)	U	(<1)	U	(<1)	U	(<1)	U	**89**		5 (s)
Vinyl Chloride	(µg/L)	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	2 (s)

NOTE: 152140-FD-02 was a blind field duplicate quality assurance/quality control sample from off-site MW-1D for this sampling event.

Table 2B Summary of Detected Volatile Organic Compounds in Offsite Groundwater Samples (Quarterly Sampling Events, 2017 - 2019)

March 2018

Parameters List EPA Method 8260B	Sample ID Sample Type Sample Date	MW-1D Groundwater 3/20/2018		MW-1S Groundwater 3/20/2018		MW-2D Groundwater 3/20/2018		MW-2S Groundwater 3/20/2018		MW-3D Groundwater 3/20/2018		MW-3S Groundwater 3/20/2018		DDC-5-PD Groundwater 3/20/2018		DDC-5-PS Groundwater 3/20/2018		DDC-6-PD Groundwater 3/20/2018		DDC-6-PS Groundwater 3/20/2018		NYSDEC AWQS (µg/L)
cis - 1,2-Dichloroethene	(µg/L)	**26**		(<1)	U	**6.7**		4.7		**15**		(<1)	U	4.7		**9.2**		**19**		**12**		5 (s)
trans -1,2-Dichloroethene	(µg/L)	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	5 (s)
Trichloroethene	(µg/L)	**12**		(<1)	U	(<1)	U	(<1)	U	2.1		(<1)	U	(<1)	U	(<1)	U	2.2		(<1)	U	5 (s)
Tetrachloroethene	(µg/L)	**81**		(<1)	U	(<1)	U	(<1)	U	**10**		(<1)	U	1.3		(<1)	U	**8.7**		(<1)	U	5 (s)
Vinyl Chloride	(µg/L)	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	2 (s)

Parameters List EPA Method 8260B	Sample ID Sample Type Sample Date	DDC-7-PD Groundwater 3/20/2018		DDC-7-PS Groundwater 3/20/2018		DDC-8-PD Groundwater 3/20/2018		DDC-8-PS Groundwater 3/20/2018		DDC-9-PD Groundwater 3/20/2018		DDC-9-PS Groundwater 3/20/2018		DDC-10-PD Groundwater 3/20/2018		DDC-10-PS Groundwater 3/20/2018		152140-FD-02 Duplicate 3/20/2018				NYSDEC AWQS (µg/L)
cis - 1,2-Dichloroethene	(µg/L)	**38**		**13**		**15**		**11**		(<1)	U	**7.9**		(<1)	U	**5.7**		**27**				5 (s)
trans -1,2-Dichloroethene	(µg/L)	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U			5 (s)
Trichloroethene	(µg/L)	**18**		1		(<1)	U	(<1)	U	2.3		(<1)	U	1.7		(<1)	U	**13**				5 (s)
Tetrachloroethene	(µg/L)	**14**		1.2		(<1)	U	(<1)	U	1		(<1)	U	(<1)	U	(<1)	U	**92**				5 (s)
Vinyl Chloride	(µg/L)	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U			2 (s)

NOTE: 152140-FD-02 was a blind field duplicate quality assurance/quality control sample from off-site MW-1D for this sampling event.

April 2018

Parameters List EPA Method 8260B	Sample ID Sample Type Sample Date	MW-1D Groundwater 4/18/2018		MW-1S Groundwater 4/18/2018		MW-2D Groundwater 4/18/2018		MW-2S Groundwater 4/18/2018		MW-3D Groundwater 4/17/2018		MW-3S Groundwater 4/17/2018		DDC-5-PD Groundwater 4/17/2018		DDC-5-PS Groundwater 4/17/2018		DDC-6-PD Groundwater 4/17/2018		DDC-6-PS Groundwater 4/17/2018		NYSDEC AWQS (µg/L)
cis - 1,2-Dichloroethene	(µg/L)	**24**		(<1)	U	**8**		**7.9**		**11**		(<1)	U	**17**		**20**		**24**		**16**		5 (s)
trans -1,2-Dichloroethene	(µg/L)	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	5 (s)
Trichloroethene	(µg/L)	**9.7**		(<1)	U	(<1)	U	(<1)	U	1.6		(<1)	U	(<1)	U	(<1)	U	2.8		(<1)	U	5 (s)
Tetrachloroethene	(µg/L)	**80**		(<1)	U	(<1)	U	(<1)	U	**8.6**		(<1)	U	(<1)	U	(<1)	U	**10**		(<1)	U	5 (s)
Vinyl Chloride	(µg/L)	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	2 (s)

Parameters List EPA Method 8260B	Sample ID Sample Type Sample Date	DDC-7-PD Groundwater 4/18/2018		DDC-7-PS Groundwater 4/18/2018		DDC-8-PD Groundwater 4/18/2018		DDC-8-PS Groundwater 4/18/2018		DDC-9-PD Groundwater 4/18/2018		DDC-9-PS Groundwater 4/18/2018		DDC-10-PD Groundwater 4/18/2018		DDC-10-PS Groundwater 4/18/2018		152140-FD-02 Duplicate 4/18/2018				NYSDEC AWQS (µg/L)
cis - 1,2-Dichloroethene	(µg/L)	**20**		**17**		**14**		**14**		(<1)	U	**10**		(<1)	U	**9.7**		**24**				5 (s)
trans -1,2-Dichloroethene	(µg/L)	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U			5 (s)
Trichloroethene	(µg/L)	**15**		1.3		(<1)	U	(<1)	U	1.4		(<1)	U	1.9		(<1)	U	**11**				5 (s)
Tetrachloroethene	(µg/L)	**11**		1.1		(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	**88**				5 (s)
Vinyl Chloride	(µg/L)	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U			2 (s)

NOTE: 152140-FD-02 was a blind field duplicate quality assurance/quality control sample from off-site MW-1D for this sampling event.

Table 2B Summary of Detected Volatile Organic Compounds in Offsite Groundwater Samples (Quarterly Sampling Events, 2017 - 2019)

July 2018

Parameters List EPA Method 8260B	Sample ID Sample Type Sample Date	MW-1D Groundwater 7/24/2018		MW-1S Groundwater 7/24/2018		MW-2D Groundwater 7/23/2018		MW-2S Groundwater 7/23/2018		MW-3D Groundwater 7/24/2018		MW-3S Groundwater 7/24/2018		DDC-5-PD Groundwater 7/24/2018		DDC-5-PS Groundwater 7/24/2018		DDC-6-PD Groundwater 7/24/2018		DDC-6-PS Groundwater 7/24/2018		NYSDEC AWQS (µg/L)
cis - 1,2-Dichloroethene	(µg/L)	**32**		(<1)	U	**7.2**		2.4		**23**		(<1)	U	**39**		(<1)	U	**51**		(<1)	U	5 (s)
trans -1,2-Dichloroethene	(µg/L)	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	5 (s)
Trichloroethene	(µg/L)	**9.1**		(<1)	U	(<1)	U	(<1)	U	1.3		(<1)	U	3.0		(<1)	U	**6.4**		(<1)	U	5 (s)
Tetrachloroethene	(µg/L)	**65**		(<1)	U	(<1)	U	(<1)	U	**7.4**		(<1)	U	**7.5**		(<1)	U	**14**		(<1)	U	5 (s)
Vinyl Chloride	(µg/L)	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	2 (s)

Parameters List EPA Method 8260B	Sample ID Sample Type Sample Date	DDC-7-PD Groundwater 7/23/2018		DDC-7-PS Groundwater 7/23/2018		DDC-8-PD Groundwater 7/23/2018		DDC-8-PS Groundwater 7/23/2018		DDC-9-PD Groundwater 7/23/2018		DDC-9-PS Groundwater 7/23/2018		DDC-10-PD Groundwater 7/23/2018		DDC-10-PS Groundwater 7/23/2018		152140-FD-01 Duplicate 7/24/2018				NYSDEC AWQS (µg/L)
cis - 1,2-Dichloroethene	(µg/L)	**54**		(<1)	U	**39**		(<1)	U	2.4		(<1)	U	(<1)	U	(<1)	U	**26**				5 (s)
trans -1,2-Dichloroethene	(µg/L)	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U			5 (s)
Trichloroethene	(µg/L)	**9.0**		(<1)	U	**7.0**		(<1)	U	2.0		(<1)	U	(<1)	U	2.1		**9.3**				5 (s)
Tetrachloroethene	(µg/L)	**16**		(<1)	U	**7.2**		(<1)	U	2.7		(<1)	U	(<1)	U	(<1)	U	**63**				5 (s)
Vinyl Chloride	(µg/L)	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U			2 (s)

NOTE: 152140-FD-02 was a blind field duplicate quality assurance/quality control sample from off-site MW-1D for this sampling event.

October 2018

Parameters List EPA Method 8260B	Sample ID Sample Type Sample Date	MW-1D Groundwater 10/24/2018		MW-1S Groundwater 10/24/2018		MW-2D Groundwater 10/23/2018		MW-2S Groundwater 10/23/2018		MW-3D Groundwater 10/22/2018		MW-3S Groundwater 10/22/2018		DDC-5-PD Groundwater 10/22/2018		DDC-5-PS Groundwater 10/22/2018		DDC-6-PD Groundwater 10/22/2018		DDC-6-PS Groundwater 10/22/2018		NYSDEC AWQS (µg/L)
cis - 1,2-Dichloroethene	(µg/L)	**20**		(<1)	U	4.1		1.6		**31**		(<1)	U	**14**		**7.8**		**28**		**6.9**		5 (s)
trans -1,2-Dichloroethene	(µg/L)	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	5 (s)
Trichloroethene	(µg/L)	**8**		(<1)	U	(<1)	U	(<1)	U	2.4		(<1)	U	2.5		(<1)	U	**9.3**		(<1)	U	5 (s)
Tetrachloroethene	(µg/L)	**76**		1.4		(<1)	U	(<1)	U	**12**		(<1)	U	**7.9**		1.4		**12**		(<1)	U	5 (s)
Vinyl Chloride	(µg/L)	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	2 (s)

Parameters List EPA Method 8260B	Sample ID Sample Type Sample Date	DDC-7-PD Groundwater 10/23/2018		DDC-7-PS Groundwater 10/23/2018		DDC-8-PD Groundwater 10/23/2018		DDC-8-PS Groundwater 10/23/2018		DDC-9-PD Groundwater 10/23/2018		DDC-9-PS Groundwater 10/23/2018		DDC-10-PD Groundwater 10/23/2018		DDC-10-PS Groundwater 10/23/2018		152140-FD-02 Duplicate 10/23/2018				NYSDEC AWQS (µg/L)
cis - 1,2-Dichloroethene	(µg/L)	**23**		**12**		**5.7**		**7**		(<1)	U	4		(<1)	U	3.4		**20**				5 (s)
trans -1,2-Dichloroethene	(µg/L)	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U			5 (s)
Trichloroethene	(µg/L)	**5.7**		3.2		(<1)	U	(<1)	U	1.7		(<1)	U	1.7		(<1)	U	**8.7**				5 (s)
Tetrachloroethene	(µg/L)	**9.5**		2.4		1		1		1		(<1)	U	(<1)	U	(<1)	U	**78**				5 (s)
Vinyl Chloride	(µg/L)	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U			2 (s)

NOTE: 152140-FD-02 was a blind field duplicate quality assurance/quality control sample from off-site MW-1D for this sampling event.

Table 2B Summary of Detected Volatile Organic Compounds in Offsite Groundwater Samples (Quarterly Sampling Events, 2017 - 2019)

February 2019

Parameters List EPA Method 8260B	Sample ID	MW-1D		MW-1S		MW-2D		MW-2S		MW-3D		MW-3S		DDC-5-PD		DDC-5-PS		DDC-6-PD		DDC-6-PS		NYSDEC AWQS (µg/L)
	Sample Type	Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		
	Sample Date	2/21/2019		2/21/2019		2/21/2019		2/21/2019		2/21/2019		2/21/2019		2/21/2019		2/21/2019		2/21/2019		2/21/2019		
cis - 1,2-Dichloroethene	(µg/L)	**20**		(<1)	U	1.1		(<1)	U	**42**		(<1)	U	**45**		(<1)	U	**52**		(<1)	U	5 (s)
trans -1,2-Dichloroethene	(µg/L)	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	5 (s)
Trichloroethene	(µg/L)	**8.5**		(<1)	U	(<1)	U	(<1)	U	3.8		(<1)	U	4.7		(<1)	U	**11**		(<1)	U	5 (s)
Tetrachloroethene	(µg/L)	**62**		(<1)	U	(<1)	U	(<1)	U	**14**		(<1)	U	**17**		(<1)	U	**17**		(<1)	U	5 (s)
Vinyl Chloride	(µg/L)	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	2 (s)

Parameters List EPA Method 8260B	Sample ID	DDC-7-PD		DDC-7-PS		DDC-8-PD		DDC-8-PS		DDC-9-PD		DDC-9-PS		DDC-10-PD		DDC-10-PS		152140-FD-02		NYSDEC AWQS (µg/L)
	Sample Type	Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Duplicate		
	Sample Date	2/20/2019		2/20/2019		2/20/2019		2/20/2019		2/21/2019		2/21/2019		2/21/2019		2/21/2019		2/21/2019		
cis - 1,2-Dichloroethene	(µg/L)	3.7		(<1)	U	**17**		(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	**21**		5 (s)
trans -1,2-Dichloroethene	(µg/L)	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	5 (s)
Trichloroethene	(µg/L)	2.4		(<1)	U	4.0		(<1)	U	2.8		(<1)	U	(<1)	U	(<1)	U	**8.5**		5 (s)
Tetrachloroethene	(µg/L)	1.8		(<1)	U	**5.2**		(<1)	U	2.2		(<1)	U	(<1)	U	(<1)	U	**62**		5 (s)
Vinyl Chloride	(µg/L)	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	2 (s)

NOTE: 152140-FD-02 was a blind field duplicate quality assurance/quality control sample from off-site MW-1D for this sampling event.

May 2019

Parameters List EPA Method 8260B	Sample ID	MW-1D		MW-1S		MW-2D		MW-2S		MW-3D		MW-3S		DDC-5-PD		DDC-5-PS		DDC-6-PD		DDC-6-PS		NYSDEC AWQS (µg/L)
	Sample Type	Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		
	Sample Date	5/23/2019		5/23/2019		5/23/2019		5/23/2019		5/23/2019		5/23/2019		5/23/2019		5/23/2019		5/23/2019		5/23/2019		
cis - 1,2-Dichloroethene	(µg/L)	**22**		(<1)	U	(<1)	U	(<1)	U	**42**		(<1)	U	**25**		(<1)	U	**53**		(<1)	U	5 (s)
trans -1,2-Dichloroethene	(µg/L)	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	5 (s)
Trichloroethene	(µg/L)	**9.3**		(<1)	U	1.2		(<1)	U	**5.4**		(<1)	U	3.6		(<1)	U	**17**		(<1)	U	5 (s)
Tetrachloroethene	(µg/L)	**49**		1.1		(<1)	U	(<1)	U	**16**		(<1)	U	**13**		(<1)	U	**20**		(<1)	U	5 (s)
Vinyl Chloride	(µg/L)	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	2 (s)

Parameters List EPA Method 8260B	Sample ID	DDC-7-PD		DDC-7-PS		DDC-8-PD		DDC-8-PS		DDC-9-PD		DDC-9-PS		DDC-10-PD		DDC-10-PS		152140-FD-02		NYSDEC AWQS (µg/L)
	Sample Type	Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Duplicate		
	Sample Date	5/23/2019		5/23/2019		5/23/2019		5/23/2019		5/23/2019		5/23/2019		5/23/2019		5/23/2019		5/23/2019		
cis - 1,2-Dichloroethene	(µg/L)	**110**		(<1)	U	**13**		(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	**20**		5 (s)
trans -1,2-Dichloroethene	(µg/L)	1.3		(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	5 (s)
Trichloroethene	(µg/L)	**84**		(<1)	U	3.2		(<1)	U	2.4		(<1)	U	(<1)	U	(<1)	U	**8.9**		5 (s)
Tetrachloroethene	(µg/L)	**53**		(<1)	U	2.4		(<1)	U	2.6		(<1)	U	(<1)	U	(<1)	U	**46**		5 (s)
Vinyl Chloride	(µg/L)	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	2 (s)

NOTE: 152140-FD-02 was a blind field duplicate quality assurance/quality control sample from off-site MW-1D for this sampling event.

Table 2B Summary of Detected Volatile Organic Compounds in Offsite Groundwater Samples (Quarterly Sampling Events, 2017 - 2019)

July 2019

Parameters List EPA Method 8260B	Sample ID	MW-1D		MW-1S		MW-2D		MW-2S		MW-3D		MW-3S		DDC-5-PD		DDC-5-PS		DDC-6-PD		DDC-6-PS		NYSDEC AWQS (µg/L)
	Sample Type	Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		
	Sample Date	7/24/2019		7/24/2019		7/24/2019		7/24/2019		7/22/2019		7/22/2019		7/22/2019		7/22/2019		7/22/2019		7/22/2019		
cis - 1,2-Dichloroethene	(µg/L)	**24**		(<1)	U	(<1)	U	(<1)	U	**51**		(<1)	U	**14**		(<1)	U	**34**		(<1)	U	5 (s)
trans -1,2-Dichloroethene	(µg/L)	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	5 (s)
Trichloroethene	(µg/L)	**8.7**		(<1)	U	(<1)	U	(<1)	U	**6.4**		(<1)	U	2.8		(<1)	U	**13**		(<1)	U	5 (s)
Tetrachloroethene	(µg/L)	**30**		(<1)	U	(<1)	U	(<1)	U	**14**		(<1)	U	**11**		(<1)	U	**14**		(<1)	U	5 (s)
Vinyl Chloride	(µg/L)	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	2 (s)

Parameters List EPA Method 8260B	Sample ID	DDC-7-PD		DDC-7-PS		DDC-8-PD		DDC-8-PS		DDC-9-PD		DDC-9-PS		DDC-10-PD		DDC-10-PS		152140-FD-02		NYSDEC AWQS (µg/L)
	Sample Type	Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Duplicate		
	Sample Date	7/23/2019		7/23/2019		7/23/2019		7/23/2019		7/24/2019		7/24/2019		7/23/2019		7/23/2019		7/24/2019		
cis - 1,2-Dichloroethene	(µg/L)	**80**		(<1)	U	**12**		**8.4**		2.3		(<1)	U	(<1)	U	(<1)	U	**21**		5 (s)
trans -1,2-Dichloroethene	(µg/L)	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	5 (s)
Trichloroethene	(µg/L)	**68**		(<1)	U	3.1		(<1)	U	(<1)	U	2.3		(<1)	U	(<1)	U	**8.9**		5 (s)
Tetrachloroethene	(µg/L)	**53**		(<1)	U	2.8		(<1)	U	(<1)	U	2.6		(<1)	U	(<1)	U	**41**		5 (s)
Vinyl Chloride	(µg/L)	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	2 (s)

NOTE: 152140-FD-02 was a blind field duplicate quality assurance/quality control sample from off-site MW-1D for this sampling event.

November 2019

Parameters List EPA Method 8260B	Sample ID	MW-1D		MW-1S		MW-2D		MW-2S		MW-3D		MW-3S		DDC-5-PD		DDC-5-PS		DDC-6-PD		DDC-6-PS		NYSDEC AWQS (µg/L)
	Sample Type	Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		
	Sample Date	11/7/2019		11/7/2019		11/7/2019		11/7/2019		11/7/2019		11/7/2019		11/7/2019		11/7/2019		11/7/2019		11/7/2019		
cis - 1,2-Dichloroethene	(µg/L)	**19**		(<1)	U	(<1)	U	(<1)	U	**33**		(<1)	U	**8.3**		**7.0**		**12**		(<1)	U	5 (s)
trans -1,2-Dichloroethene	(µg/L)	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	5 (s)
Trichloroethene	(µg/L)	**8.3**		(<1)	U	1.2		(<1)	U	**8.7**		(<1)	U	1.5		(<1)	U	**7.7**		(<1)	U	5 (s)
Tetrachloroethene	(µg/L)	**44**		(<1)	U	(<1)	U	(<1)	U	**24**		(<1)	U	**12**		(<1)	U	**12**		(<1)	U	5 (s)
Vinyl Chloride	(µg/L)	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	2 (s)

Parameters List EPA Method 8260B	Sample ID	DDC-7-PD		DDC-7-PS		DDC-8-PD		DDC-8-PS		DDC-9-PD		DDC-9-PS		DDC-10-PD		DDC-10-PS		152140-FD-02		NYSDEC AWQS (µg/L)
	Sample Type	Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Duplicate		
	Sample Date	11/7/2019		11/7/2019		11/7/2019		11/7/2019		11/7/2019		11/7/2019		11/7/2019		11/7/2019		11/7/2019		
cis - 1,2-Dichloroethene	(µg/L)	**18**		**18**		**7.9**		**12**		(<1)	U	**5.9**		(<1)	U	1.9		**17**		5 (s)
trans -1,2-Dichloroethene	(µg/L)	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	5 (s)
Trichloroethene	(µg/L)	**18**		**6.6**		1.8		(<1)	U	3.6		1.1		(<1)	U	(<1)	U	**7.6**		5 (s)
Tetrachloroethene	(µg/L)	**21**		3.7		3.9		(<1)	U	1.5		(<1)	U	(<1)	U	(<1)	U	**43**		5 (s)
Vinyl Chloride	(µg/L)	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	(<1)	U	2 (s)

NOTE: 152140-FD-02 was a blind field duplicate quality assurance/quality control sample from off-site MW-1D for this sampling event.

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Table 3A Treatment System Runtimes

		SYSTEM READINGS																								
		SVE System					Onsite DDC Treatment System										Offsite DDC Treatment System									
		SVE Blower					System #1					System #2					Blower B-501					Blower B-502				
Date	Notes	Meter Reading (Hours)	Time	Elapsed Runtime (Hours)	Elapsed Available (Hours)	Runtime (%)	Meter Reading (Hours)	Time	Elapsed Runtime (Hours)	Elapsed Available (Hours)	Runtime (%)	Meter Reading (Hours)	Time	Elapsed Runtime (Hours)	Elapsed Available (Hours)	Runtime (%)	Meter Reading (Hours)	Time	Elapsed Runtime (Hours)	Elapsed Available (Hours)	Runtime (%)	Meter Reading (Hours)	Time	Elapsed Runtime (Hours)	Elapsed Available (Hours)	Runtime (%)
Quarterly Run-Time				**2637.40**	**2651.40**	**99.47**			**2650.98**	**2650.98**	**100.00**			**2651.68**	**2651.68**	**100.00**			**1056.70**	**1057.35**	**100.00**			**1595.28**	**1595.28**	**100.00**
01/25/17		24561.53	7:00	583.02	583.02	100.00	40706.70	10:40	586.68	586.68	100.00	47393.50	8:00	584.22	584.02	100.03	23478.70	13:53	--	--	--	19620.00	13:53	589.55	589.90	99.94
02/07/17		24882.53	16:00	321.00	321.00	100.00	41021.20	12:53	314.50	314.22	100.09	47707.00	11:46	313.50	315.77	99.28	23478.70	9:45	--	--	--	19928.00	9:45	308.00	307.87	100.04
03/27/17		25928.00	8:30	1045.47	1144.50	91.35	42169.00	11:16	1147.80	1150.38	99.78	48853.00	7:30	1146.00	1147.73	99.85	23502.00	9:00				21077.00	9:00	1149.00	1151.25	99.80
Quarterly Run-Time				**1949.5**	**2048.5**	**95.2**			**2049.0**	**2051.3**	**99.9**			**2043.7**	**2047.5**	**99.8**								**2046.6**	**2049.0**	**99.9**
04/18/17		26456.00	9:00	528.00	528.50	99.91	42694.07	8:20	525.07	525.07	100.00	48853.00	9:00	0.00	529.50	0.00	23502.00	14:00	--	--	--	21610.00	14:00	533.00	533.00	100.00
05/23/17		27294.00	12:00	838.00	843.00	99.41	42860.00	9:20	165.93	841.00	19.73	49018.00	9:00	165.00	840.00	19.64	23502.00	9:49	--	--	--	22444.00	9:49	834.00	835.82	99.78
06/27/17		28137.00	12:00	843.00	840.00	100	43679.00	11:00	819.00	841.67	97.31	49859.00	10:45	841.00	841.75	99.91	23502.00	9:00	--	--	--	23283.18	9:00	839.18	839.18	100.00
Quarterly Run-Time				**2209.0**	**2211.5**	**99.9**			**1510.0**	**2207.7**	**68.4**			**1006.0**	**2211.2**	**45.5**								**2206.2**	**2208.0**	**99.9**
07/18/17		28638.06	7:30	501.06	499.50	100.00	44180.00	8:00	501.00	501.00	100.00	50360.50	8:30	501.50	501.75	99.95	23813.00	10:00	311.00	505.00	61.58	23283.18	10:00	--	--	--
08/28/17		29630.24	15:40	992.18	992.17	100.00	45050.50	14:46	870.50	990.77	87.86	51350.20	14:06	989.70	989.60	100.01	24822.90	11:42	1009.90	985.70	102.46	23283.18	11:42	--	--	--
09/21/17		30202.57	12:00	572.33	572.33	100.00	45624.00	12:40	573.50	573.90	99.93	51924.80	12:50	574.60	574.73	99.98	25376.50	13:20	553.60	577.63	95.84	23283.18	13:20	--	--	--
Quarterly Run-Time				**2064.0**	**2064.0**	**100.0**			**1945.0**	**2065.7**	**94.2**			**2065.8**	**2066.1**	**100.0**			**1874.5**	**2068.3**	**90.6**					
10/17/17		30828.62	14:15	626.05	626.3	100	46249.30	9:00	625.30	620.33	100.80	52549.50	13:20	624.70	624.50	100.0	26002.40	14:30	625.90	625.17	100	23285.00	14:30	--	--	--
11/30/17		31879.50	8:10	1050.88	1049.9	100	47301.80	9:30	1052.50	1056.50	99.62	53601.70	10:00	1052.20	1052.67	99.96	27051.10	10:30	1048.70	1052.00	99.69	23285.00	10:30	--	--	--
12/13/17		32190.12	8:00	310.62	311.8	100	47617.88	13:35	316.08	316.08	100.00	53912.00	10:00	310.30	312.00	99.46	27364.00	11:30	312.90	313.00	99.97	23285.00	11:30	--	--	--
Quarterly Run-Time				**1988**	**1988**	**100**			**1993**	**1993**	**100**			**1987**	**1989**	**99.9**			**1988**	**1990**	**99.9**					
01/24/18	A, B	32960.38	7:17	770	1007.28	76	48619.70	7:17	1002	1002	100	54664.80	7:30	753	1006	74.9	28351.80	14:00	988	1011	97.8	23285.00	14:00	--	--	--
02/09/18	A ,B	32960.38	9:30	0	386.22	0	49005.92	9:30	386	386	100	54664.80	10:00	0	386	0.0	28753.00	7:30	401	377	106.3	23285.00	7:30	--	--	--
03/20/18	C	32960.38	6:48	0	933.30	0	49939.22	6:48	933	933	100	54666.00	11:00	1	937	0.1	29688.10	7:40	935	936	99.9	23285.00	7:40	--	--	--
Quarterly Run-Time				**770**	**2327**	**33**			**2321**	**2321**	**100**			**754**	**2329**	**32**			**2324**	**2324**	**100**					
04/16/18	A	32960.38	8:20	0	649.53	0	49939.22	8:20	0.00	649.53	0.00	55311.70	8:20	646	645	100	30333.70	10:30	645.60	650.83	99.20	23285.00	10:30	--	--	--
05/14/18	A	32960.38	7:30	0	671.17	0	49939.22	7:30	0.00	671.17	0.00	55982.00	7:24	670	671	99.9	31004.00	8:17	670.30	669.78	100.08	23285.00	8:17	--	--	--
06/07/18	A, D	32960.38	12:00	0	580.50	0	49939.22	12:00	0.00	580.50	0.00	56564.40	13:15	582	582	100	31463.05	14:00	459.05	581.72	78.91	23285.00	14:00	--	--	--
Quarterly Run-Time				**0**	**1901**	**0**			**0**	**1901**	**0**			**1898**	**1898**	**100**			**1775**	**1902**	**93**					
07/05/18		32960.38	16:00	0	676.00	0	49939.22	16:00	0.00	676.00	0.00	57254.00	16:10	690	675	100	31463.05	14:00	0.00	672.00	0.00	23285.00	14:00	0.00	672.00	0.00
08/10/18		32960.38	11:00	0	859.00	0	49939.22	11:00	0.00	859.00	0.00	57803.00	11:00	549	859	63.9	31463.05	10:00	0.00	860.00	0.00	23285.50	10:00	0.50	860.00	0.06
09/13/18		33707.80	13:00	747	818.00	91	49939.22	13:00	0.00	818.00	0.00	58503.00	11:58	700	817	85.7	31510.50	14:38	47.45	820.63	5.78	23364.20	14:38	78.70	820.63	9.59
Quarterly Run-Time				**747**	**2353**	**32**			**0**	**2353**	**0**			**1939**	**2351**	**82**			**47**	**2353**	**2**			**79**	**2353**	**3**
10/23/18		34663.63	8:50	956	955.83	100	49939.22	8:50	0.00	955.83	0.00	59458.50	16:10	956	964	100	31510.50	14:45	0.00	960.12	0.00	24323.90	14:45	959.70	960.12	99.96
11/27/18		35506.47	11:00	843	842.17	100	49939.22	11:00	0.00	842.17	0.00	60298.70	11:00	840	835	101	31510.50	7:45	0.00	833.00	0.00	25156.00	7:45	832.10	833.00	99.89
12/20/18	D	36056.64	12:12	550	553.20	99	49939.22	12:12	0.00	553.20	0.00	60481.70	11:58	183	553	33	31510.50	14:38	0.00	558.88	0.00	25714.88	14:38	558.88	558.88	100.00
Quarterly Run-Time				**2349**	**2351**	**100**			**0**	**2351**	**0**			**1979**	**2352**	**84**			**0**	**2352**	**0**			**2351**	**2352**	**100**
01/10/19	D, E, F	36460.44	8:00	404	499.80	81	49939.22	8:00	0.00	499.80	0	60503.70	8:00	22	500	4	31510.50	8:00	0	497	0	25714.88	8:00	0	497	0
02/19/19	D, E, F	37385.86	10:30	925	962.50	96	49939.22	10:30	0.00	962.50	0	60504.70	10:30	1	962	0	31510.50	10:30	0	962	0	25714.88	10:30	0	962	0
03/26/19	D, E, F	38099.28	7:00	713	836	85	49939.22	7:00	0.00	836.50	0	60504.70	7:00	0	836	0	31510.50	7:00	0	836	0	25714.88	7:00	0	836	0
Quarterly Run-Time				**2043**	**2299**	**89**			**0**	**2299**	**0**			**23**	**2299**	**1**			**0**	**2296**	**0**			**0**	**2296**	**0**
04/17/19	C, D, F	38634.28	14:00	535	535.00	100	49939.22	14:00	0	535	0	60504.70	14:00	0	535	0	31510.50	8:00	0	529	0	25714.88	8:00	0	529	0
05/23/19	C, D, F	39493.61	10:05	859	860.08	100	49939.22	10:05	0	860	0	60504.70	10:05	0	860	0	31510.50	10:30	0	866	0	25714.88	10:30	0	866	0
06/26/19	C, D, F	40312.81	15:00	819	821	100	49939.22	15:00	0	821	0	60504.70	15:00	0	821	0	31510.50	7:00	0	812	0	25714.88	7:00	0	812	0
Quarterly Run-Time				**2214**	**2216**	**99.91**			**0**	**2216**	**0**			**0**	**2216**	**0**			**0**	**2208**	**0**			**0**	**2208**	**0**
07/23/19	C, D, F	40959.00	7:50	646	641	100	49939.22	13:00	0	646	0	60504.70	7:30	0	641	0	31511.10	7:30	1	649	0	25714.88	7:30	0	649	0
08/27/19	C, D, F	41799.81	12:52	841	845	100	49939.22	13:00	0	840	0	60504.70	13:00	0	845	0	31511.10	13:00	0	845	0	25714.88	13:00	0	845	0
09/18/19	C, D, F	42325.29	10:27	525	526	100	49939.22	13:00	0	528	0	60507.80	13:00	3	528	1	31511.10	13:00	0	528	0	25714.88	13:00	0	528	0
Quarterly Run-Time				**2011**	**2011**	**100**			**0**	**2014**	**0**			**3**	**2014**	**0**			**1**	**2022**	**0**			**0**	**2022**	**0**
10/03/19	C, D, F	42687.61	11:50	362	361	100	49939.22	11:50	0	359	0	60507.80	11:50	0	359	0	31511.10	11:50	0	359	0	25714.88	11:50	0	359	0
11/05/19	C, D, F	43476.89	9:00	789	789	100	49939.22	9:00	0	789	0	60507.80	9:00	0	789	0	31511.10	9:00	0	789	0	25714.88	9:00	0	789	0
12/05/19	C, D, F	44195.31	7:30	718	719	100	49939.22	7:30	0	719	0	60507.80	7:30	0	719	0	31511.80	7:30	1	719	0	25714.88	7:30	0	719	0
Quarterly Run-Time				**1870**	**1869**	**100**			**0**	**1867**	**0**			**0**	**1867**	**0**			**1**	**1867**	**0**			**0**	**1867**	**0**

NOTE:
SVE = Soil Vapor Extraction
DDC = Density Driven Convection
% = percent
--- = N/A
A = SVE System down, Hour reading only parameter collected
B = Onsite DDC System #2 down in January, was not restarted until March
C = Onsite DDC System #1 down upon arrival, remains off pending repairs
D = Offsite System shut down
E = SVE System down upon arrival; High high water level alarm
F = Onsite DDC System #2 down upon arrival, remained off pending repairs. Run clock hours estimated.
Shaded cells indicate O&M events performed during a previous reporting period.

Table 3B Summary of Estimated Recovery Rate via Soil Vapor Extraction System

	Field/System Data				Laboratory Results						Mass Discharged						Recovery based on Laboratory Results					
					SYSTEM INFLUENT			SYSTEM EFFLUENT														
Date	SVE Blower Flow Rate (cfm)	Applied Vacuum (in. H_20)	System Discharge VOC Concentration (ppmv)	Elapsed Run-Time (day)	PCE (mg/m^3)	TCE (mg/m^3)	*cis*-1,2-DCE (mg/m^3)	PCE (mg/m^3)	TCE (mg/m^3)	*cis*-1,2-DCE (mg/m^3)	PCE Discharge During Period (lb/hr)	PCE Discharge During Period (lb)	TCE Discharge During Period (lb/hr)	TCE Discharge During Period (lb)	*cis*-1,2-DCE Discharge During Period (lb/hr)	*cis*-1,2-DCE Discharge During Period (lb)	PCE Recovery During Period (lb/hr)	PCE Recovery During Period (lb)	TCE Recovery During Period (lb/hr)	TCE Recovery During Period (lb)	*cis*-1,2-DCE Recovery During Period (lb/hr)	*cis*-1,2-DCE Recovery Period (lb)
1/24/2013	200	15	0.0	70				1.7000	0.1800	0.0230	0.0013	2.14	0.0001	0.23	0.0000	0.00						
4/4/2013	206	16	2.1	70				3.3000	0.1600	0.0320	0.0025	4.28	0.0001	0.21	0.0000	0.00						
7/16/2013	250	15	0.4	103				5.3000	0.1100	0.0190	0.0050	12.27	0.0001	0.25	0.0000	0.00						
10/2/2013	314	17	0.0	78				3.1000	0.0520	0.1700	0.0036	6.83	0.0001	0.11	0.0002	0.00						
1/20/2014	416	25	0.0	110	--	--	--	2.7000	0.3100	0.0550	0.0042	11.13	0.0005	1.28	0.0001	0.00	--	--	--	--	--	--
4/23/2014	380	29	1.1	75	--	--	--	1.2000	0.1400	0.0270	0.0017	3.09	0.0002	0.36	0.0000	0.00	--	--	--	--	--	--
7/24/2014	291.30	22.00	0.00	84.00	--	--	--	2.70	0.29	0.10	0.0029	5.94	0.0003	0.64	0.0001	0.00	--	--	--	--	--	--
10/29/2014	85.00	88.00	1.43	97.93	--	--	--	1.60	0.32	0.04	0.0005	1.20	0.0001	0.24	0.0000	0.00	--	--	--	--	--	--
12/31/2014	--	--	--	63.00	--	--	--	--	--	--	0.0005	0.77	0.0001	0.15	0.0000	0.00	--	--	--	--	--	--
1/15/2015	85	88	0.083	78.00	--	--	--	0.0057	ND	ND	0.0000	0.00	0.0000	0.00	0.0000	0.00	--	--	--	--	--	--
4/21/2015	85	98	0.06	96.03	--	--	--	2.4	0.3	0.0065	0.0008	1.76	0.0000	0.00	0.0000	0.00	--	--	--	--	--	--
7/22/2015	85	97	2.4	91.89	--	--	--	28	0.32	0.13	0.0089	19.68	0.0001	0.22	0.0000	0.09	--	--	--	--	--	--
10/13/2015	85	98	6.1	83.21	--	--	--	12	0.28	0.066	0.0038	7.636	0.0001	0.18	0.0000	0.04	--	--	--	--	--	--
1/21/2016	162	96	34.0	0.91	--	--	--	0.500	0.004	ND	0.0003	0.007	0.0000	0.00	0.0000	0.00	--	--	--	--	--	--
4/12/2016	200	63	1.0	34.86	--	--	--	4.9	0.091	0.0089	0.0037	3.074	0.0001	0.06	0.0000	0.00	--	--	--	--	--	--
7/11/2016	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
8/18/2016	227	57	0.0	15.04	16.00	1.10	0.32	0.0	0.000	0.0000	0.0000	0.000	0.0000	0.00	0.0000	0.00	0.0136	4.9150	0.0009	0.3379	0.000	0.0983
9/12/2016	230	56	0.0	25	0.00	0.01	0.03	0.0	0.000	0.0000	0.0000	0.000	0.0000	0.00	0.0000	0.00	0.0000	0.0000	0.0000	0.0050	0.000	0.0129
10/26/2016	200	63	0.0	44	12.0	0.660	0.1000	0.0	0.000	0.0360	0.0000	0.000	0.0000	0.00	0.0000	0.00	0.0090	9.5015	0.0005	0.5226	0.000	0.0507
11/30/2016	200	65	0.0	35	6.60	0.41	0.07	0.0	0.000	0.0240	0.0000	0.000	0.0000	0.00	0.0000	0.00	0.0049	4.1569	0.0003	0.2582	0.000	0.0258
12/22/2016	218	62	0.0	22	1.10	0.06	0.01	0.023	0.000	0.0000	0.0000	0.010	0.0000	0.00	0.0000	0.00	0.0009	0.4648	0.0000	0.0263	0.000	0.0039
1/25/2017	215	60	0.1	34	2.90	0.12	0.02	0.000	0.000	0.0670	0.0000	0.000	0.0000	0.00	0.0000	0.00	0.0023	1.9074	0.0001	0.0789	0.000	0.0000
2/7/2017	225	50	0.1	13	3.30	0.24	0.56	0.041	0.000	0.0850	0.0000	0.011	0.0000	0.00	0.0000	0.00	0.0027	0.8577	0.0002	0.0632	0.000	0.1250
3/27/2017	160	80	0.0	48	0.35	0.03	0.01	0.000	0.000	0.0580	0.0000	0.000	0.0000	0.00	0.0000	0.00	0.0002	0.2419	0.0000	0.0235	0.000	0.0000
04/18/17	200	65	0.0	22	0.16	0.01	0.00	0.000	0.000	0.1300	0.0000	0.000	0.0000	0.00	0.0000	0.00	0.0001	0.0633	0.0000	0.0044	0.000	0.0000
05/23/17	200	65	0.0	35	4.60	0.31	0.06	0.000	0.000	0.1600	0.0000	0.000	0.0000	0.00	0.0000	0.00	0.0034	2.8972	0.0002	0.1952	0.000	0.0000
06/27/17	200	65	0.0	35	4.20	0.39	0.08	0.000	0.000	0.0000	0.0000	0.000	0.0000	0.00	0.0000	0.00	0.0031	2.6453	0.0003	0.2456	0.000	0.0510
07/18/17	200	63	0.0	21	7.40	0.63	0.16	0.024	0.000	0.2200	0.0000	0.009	0.0000	0.00	0.0000	0.00	0.0055	2.7874	0.0005	0.2381	0.000	0.0000
08/28/17	230	55	0.0	41	7.10	0.52	0.08	0.000	0.000	0.1100	0.0000	0.000	0.0000	0.00	0.0000	0.00	0.0061	6.0242	0.0004	0.4412	0.000	0.0000
09/21/17	230	55	0.1	24	6.90	0.46	0.10	0.000	0.000	0.1400	0.0000	0.000	0.0000	0.00	0.0000	0.00	0.0059	3.4270	0.0004	0.2285	0.000	0.0000
10/17/17	230	55	0.0	26	2.80	0.24	0.03	0.037	0.000	0.0000	0.0000	0.020	0.0000	0.00	0.0000	0.00	0.0024	1.4867	0.0002	0.1291	0.000	0.0161
11/30/17	180	75	0.0	44	0.00	0.00	0.00	0.000	0.000	0.0000	0.0000	0.000	0.0000	0.00	0.0000	0.00	0.0000	0.0000	0.0000	0.0000	0.000	0.0000
12/13/17	175	75	0.0	13	0.98	0.08	0.02	0.000	0.000	0.0082	0.0000	0.000	0.0000	0.00	0.0000	0.00	0.0006	0.2006	0.0000	0.0156	0.000	0.0022
01/24/18	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
02/09/18	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
03/20/18	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
04/16/18	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
05/14/18	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
06/07/18	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
07/05/18	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
08/10/18	195	65	0.0	36	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
09/13/18	185	68	0.0	34	--	--	--	0.000	0.180	0.1600	0.0000	0.000	0.0001	0.22	0.0001	0.19	--	--	--	--	--	--
10/23/18	185	70	1.13	40	4.90	0.31	0.09	2.20	1.30	0.06	0.00	1.46	0.00	0.87	0.00	0.04	0.0019	1.7977	0.0000	0.0000	0.000	0.0166
11/27/18	175	75	0.82	35	1.40	0.08	0.04	1.80	0.42	0.05	0.00	0.99	0.00	0.23	0.00	0.03	0.0000	0.0000	0.0000	0.0000	0.000	0.0000
12/20/18	175	75	0.0	23	0.01	0.00	0.00	3.10	0.13	0.06	0.00	1.12	0.00	0.05	0.00	0.02	0.0000	0.0000	0.0000	0.0000	0.000	0.0000
01/10/19	185	70	--	21	2.80	0.11	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0019	0.9788	0.0001	0.0385	0.000	0.0157
02/19/19	185	70	--	40	2.20	0.09	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0015	1.4648	0.0001	0.0613	0.000	0.0333
03/26/19	185	70	--	35	2.60	0.12	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0018	1.5147	0.0001	0.0699	0.000	0.0262
04/17/19	175	77	0.04	22	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
05/23/19	175	75	0.00	36	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
06/26/19	185	71	0.00	34	4.60	0.21	0.07	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.0031	6.7905	0.0001	0.3100	0.000	0.0911
07/23/19	155	80	0.00	27	7.00	0.34	0.11	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.0045	10.4878	0.0002	0.5094	0.000	0.1546
08/27/19	185	72	0.00	35	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
09/18/19	155	72	0.00	22	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
10/03/19	175	75	0.00	15	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
11/05/19	175	75	0.00	33	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
12/05/19	160	80	0.00	30	2.70	0.16	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0017	3.2213	0.0001	0.1909	0.000	0.0418
											PERIOD TOTALS =	**3.62**		**1.36**		**0.30**		**48.79**		**2.84**		**0.57**

NOTE:
SVE = Soil Vapor Extraction
cfm = cubic feet per minute
in. H_20 = inches of water
ppmv = parts per million (vol./vol.)
mg/m^3 = milligrams per cubic meter
lb = pounds
lb/hr = pounds per hour
PCE = Tetrachloroethylene
TCE = Trichloroethene
cis-1,2-DCE = cis-1,2-Dichloroethene
Mass Recovery (Lab Res., lb/hr) = flow (cfm)*effluent conc. (mg/cu. m.)*1g/1000mg*1lb/453.6g*1cu. m./35.31cu. ft*60min/1 hr
Mass Recovery (Lab Res., lb) = Discharge Rate (lb/hr) * # of days*24hours/day
Permit limit for PCE is 0.031 lb/hr and 270 lb/yr; TCE is 0.014 lb/hr and 120 lb/year; cis-1,2-DCE is 0.63 lb/hr and 5,510 lb/year
Shaded cells indicate O&M events performed during a previous reporting period.
Samples collected in 2/2017, 3/2017, 4/2017, 5/2017, and 6/2017 with only well legs 1 and 5 were running
Samples collected in 7/2017, 8/2017, and 9/2017 with only well legs 2 and 4 running
Samples collected in 10/2017, 11/2017, 12/2017 with legs 1, 4, and 5
No samples were collected during the first quarter of 2018. The system has been down for repairs since January 2018.
**Vacuum and flow rates for Quarter 1 2019 are estimated.

Table 3C Summary of Estimated Recovery Rate via Onsite DDC System #1

Date	Field/System Data			Elapsed Run-Time (days)	Laboratory Results									Recovery based on Laboratory Results					
					SYS1-INF1			SYS1-MIDGAC			SYS1-EFF								
	Vacuum Flow Rate (cfm)	Applied Vacuum (in. H_20)	System Influent VOC Concentration (ppmv)		PCE (mg/m^3)	TCE (mg/m^3)	*cis* -1,2-DCE (mg/m^3)	PCE (mg/m^3)	TCE (mg/m^3)	*cis* -1,2-DCE (mg/m^3)	PCE (mg/m^3)	TCE (mg/m^3)	*cis* -1,2-DCE (mg/m^3)	PCE Recovery During Period (lb/hr)	PCE Recovery During Period (lb)	TCE Recovery During Period (lb/hr)	TCE Recovery During Period (lb)	*cis* -1,2-DCE Recovery During Period (lb/hr)	*cis* -1,2-DCE Recovery During Period (lb)
1/25/2017	240	43	2.6	34	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
2/7/2017	260	44	2.321	13	2.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0017	3.9320	0.0000	0.0000	0.0000	0.0000
3/27/2017	190	44	1.302	48	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
04/18/17	-	-	-	22	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
05/23/17	100	42	1.065	35	6.1000	0.0000	0.0000	0.0000	0.0000	0.0036	0.0076	0.0000	0.0000	0.0034	7.5647	0.0000	0.0000	0.0000	0.0000
06/27/17	200	40	1.451	35	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
07/18/17	236	38	2.051	21	3.8000	0.0000	0.0000	0.0130	0.0000	0.0071	0.022	0.0000	0.0063	0.0056	11.5084	0.0000	0.0000	0.0000	0.0000
08/28/17	470	44	1.032	41	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
09/21/17	475	32	0.952	24	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
10/17/17	180	35	0	26	1.4000	0.0000	0.0000	0.3600	0.0000	0.0052	0.0087	0.0000	0.0034	0.0011	2.1300	0.0000	0.0000	0.0000	0.0000
11/30/17	220	45	0.441	44	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
12/13/17	215	44	1.583	13	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
01/24/18	221	44	1.382	42	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
02/09/18	200	44	1.39	16	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
03/20/18	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
04/16/18	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
05/14/18	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
06/07/18	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
07/05/18	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
08/10/18	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
09/13/18	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
10/23/18	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
11/27/18	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
12/20/18	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
01/10/19	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
02/19/19	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
03/26/19	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
04/17/19	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
05/23/19	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
06/26/19	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
07/23/19	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
08/27/19	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
09/18/19	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
10/03/19	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
11/05/19	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
12/05/19	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
														PERIOD TOTALS =	**25.14**		**0.00**		**0.00**

NOTE: cfm = cubic feet per minute
VOC = Volatile organic compound
in. H_20 = inches of water
lb/hr = pounds per hour
ppmv = parts per million (vol./vol.)
mg/m^3 = milligrams per cubic meter
PCE = Tetrachloroethylene
TCE = Trichloroethene
cis -1,2-DCE = cis-1,2-Dichloroethene
Mass Recovery (Lab Res., lb/hr) = flow (cfm)*effluent conc. (mg/cu. m.)*1g/1000mg*1lb/453.6g*1cu. m./35.31cu. ft*60min/1 hr
Mass Recovery (Lab Res., lb) = Discharge Rate (lb/hr) * # of days*24hours/day
Shaded cells indicate O&M events performed during a previous reporting period.
Samples were not collected from on-site DDC system #1 during this reporting period as the system was shut down for repairs.

Table 3D Summary of Estimated Recovery Rate via Onsite DDC System #2

Date	Field/System Data			Elapsed Run-Time (day)	Laboratory Results									Recovery based on Laboratory Results					
					SYS2-INF1			SYS2-INF2			SYS2-EFF								
	Vacuum Flow Rate (cfm)	Applied Vacuum (in. H_20)	System Influent VOC Concentration (ppmv)		PCE (mg/m^3)	TCE (mg/m^3)	*cis* -1,2-DCE (mg/m^3)	PCE (mg/m^3)	TCE (mg/m^3)	*cis* -1,2-DCE (mg/m^3)	PCE (mg/m^3)	TCE (mg/m^3)	*cis* -1,2-DCE (mg/m^3)	PCE Recovery During Period (lb/hr)	PCE Recovery During Period (lb)	TCE Recovery During Period (lb/hr)	TCE Recovery During Period (lb)	*cis* -1,2-DCE Recovery During Period (lb/hr)	*cis* -1,2-DCE Recovery During Period (lb)
1/25/2017	375	13.6	1.744	34	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
2/7/2017	375	13.6	1.684	13	0.38	0	0.048	0.43	0	0.047	0.13	0	0.63	0.0004	0.396	0.000	0.000	0.000	0.000
3/27/2017	350	13.6	0.969	48	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
04/18/17	-	-	-	22	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
05/23/17	230	13.6	0.64	35	1	0.0087	0.0320	0.8800	0.0069	0.0280	0.0000	0.0000	0.0000	0.0009	1.575	0.000	0.014	0.000	0.050
06/27/17	270	13.6	0.714	35	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
07/18/17	256	13.6	0.262	21	0.3	0	0.044	0.28	0	0.04	0	0	0.044	0.0003	0.6469	0.0000	0.0000	0.0000	0.0000
08/28/17	266	13.6	0.051	41	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
09/21/17	314	13.6	0.069	24	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
10/17/17	325	13.6	0	26	0.24	0	0.022	.250	0	0.024	0	0	0.027	0.000295421	0.58847903	0.0000	0.0000	0.0000	0.0000
11/30/17	340	5.4	-	44	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
12/13/17	320	13.6	0.116	13	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
01/24/18	-	-	-	42	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
02/09/18	-	-	-	16	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
03/20/18	350	54.4	0.806	39	0.61	0.013	0.047	0.43	0.011	0.046	0	0	0.053	0.0008	0.7492	0.0000	0.0160	0.0000	0.0000
04/16/18	310	40.8	0	27	0.46	0.0063	0.044	0.32	0.0052	0.043	0	0	0.043	0.0005	1.0332	0.0000	0.0142	0.0000	0.0022
05/14/18	330	1.4	0.95	28	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
06/07/18	308	34.0	4.89	24	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
07/05/18	320	2.7	0.732	28	1.4	0.0076	0.032	1.4	0.0077	0.033	0	0	0.37	0.0017	3.9174	0.0000	0.0213	-0.0004	0.0000
08/10/18	300	1.4	1.211	36	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
09/13/18	332	46.2	0.02	34	1.8	0.01	0.029	2.3	0.011	0.039	0	0	0.044	0.0021	5.0366	0.0000	0.0280	0.0000	0.0000
10/23/18	322	46.2	0.143	40	1.7	0.013	0.046	1.8	0.014	0.047	0.038	0.0063	0.057	0.0021	4.9924	0.0000	0.0201	0.0000	0.0000
11/27/18	408	40.8	1.075	35	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
12/20/18	292	40.8	8.746	23	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
01/10/19	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
02/19/19	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
03/26/19	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
04/17/19	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
05/23/19	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
06/26/19	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
07/23/19	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
08/27/19	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
09/18/19	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
10/03/19	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
11/05/19	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
12/05/19	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
														PERIOD TOTALS =	**18.94**		**0.11**		**0.05**

NOTE: cfm = cubic feet per minute
VOC = Volatile organic compound
in. H_20 = inches of water
ppmv = parts per million (vol./vol.)
mg/m^3 = milligrams per cubic meter
lb = pounds
lb/hr = pounds per hour
PCE = Tetrachloroethylene
TCE = Trichloroethene
cis -1,2-DCE = cis-1,2-Dichloroethene
Mass Recovery (Lab Res., lb/hr) = flow (cfm)*effluent conc. (mg/cu. m.)*1g/1000mg*1lb/453.6g*1cu. m./35.31cu. ft*60min/1 hr
Mass Recovery (Lab Res., lb) = Discharge Rate (lb/hr) * # of days*24hours/day
Shaded cells indicate O&M events performed during a previous reporting period.

Table 3E Summary of Estimated Recovery Rate via Offsite DDC System (Blower B-501)

Date	Field/System Data			Elapsed Run-Time (day)	Laboratory Results												Recovery based on Laboratory Results					
					B501-INF1			B501-INTER1			B501-INTER2			B501-EFF								
	Vacuum Flow Rate (cfm)	Applied Vacuum (in. H_20)	System Influent VOC Concentration (ppmv)		PCE (mg/m^3)	TCE (mg/m^3)	*cis*-1,2-DCE (mg/m^3)	PCE (mg/m^3)	TCE (mg/m^3)	*cis*-1,2-DCE (mg/m^3)	PCE (mg/m^3)	TCE (mg/m^3)	*cis*-1,2-DCE (mg/m^3)	PCE (mg/m^3)	TCE (mg/m^3)	*cis*-1,2-DCE (mg/m^3)	PCE Recovery During Period: lb/hr	PCE Recovery During Period (lb)	TCE Recovery During Period (lb/hr)	TCE Recovery During Period (lb)	cis-1,2-DCE Recovery During Period (lb/hr)	cis-1,2-DCE Recovery During Period (lb)
1/25/2017	--	--	--	34	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
2/7/2017	--	--	--	13	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
3/27/2017	--	--	--	48	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
04/18/17	--	--	--	22	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
05/23/17	--	--	--	35	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
06/27/17	--	--	--	35	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
07/18/17	541	55	--	21	0.0430	0.0500	0.7900	0.0000	0.350	0.660	0.000	0.0000	1.0000	0.0000	0.0000	0.8500	0.0001	0.1856	0.0001	0.2158	-0.0001	0.00
08/28/17	612	55	0.000	41	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
09/21/17	520	55	0.019	24	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
10/17/17	--	56	0.000	26	0.0730	0.0600	0.8400	0.0690	0.064	1.000	0.000	0.0000	1.0000	0.0000	0.0000	0.9000	0.0001	0.2878	0.0001	0.2366	0.0000	0.00
11/30/17	564	48	0.000	44	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
12/13/17	492	55	0.000	13	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1/24/2018 (1)	517	54	0.000	42	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
02/09/18	491	50	0.000	16	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
03/20/18	558	48	0.000	39	0.094	0.092	1.200	0.340	0.270	1.100	0.000	0.0230	0.1000	0.0000	0.0000	1.1000	0.0002	0.4282	0.0002	0.4191	0.0002	0.46
4/16/2018(1)	703	55	0.000	27	0.130	0.100	1.400	0.620	0.320	1.500	0.000	0.4300	1.6000	0.0000	0.0000	1.7000	0.0003	0.3979	0.0002	0.3061	0.0000	0.00
05/14/18	534	46	0.000	28	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
06/07/18	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
07/05/18	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
8/10/2018(2)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
09/13/18	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
10/23/18	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
11/27/18	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
12/20/2018 (3)	519	54	--	23	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
01/10/19	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
02/19/19	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
03/26/19	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
04/17/19	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
05/23/19	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
06/26/19	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
07/23/19	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
08/27/19	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
09/18/19	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
10/03/19	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
11/05/19	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
12/05/19	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
																	PERIOD TOTALS =	**1.30**		**1.18**		**0.46**

NOTE: cfm = cubic feet per minute
in. H_20 = inches of water
VOC = Volatile organic compound
ppmv = parts per million (vol./vol.)
lb = pounds
lb/hr = pounds per hour
mg/m^3 = milligrams per cubic meter
PCE = Tetrachloroethylene
TCE = Trichloroethene
cis-1,2-DCE = cis-1,2-Dichloroethene
Mass Recovery (Lab Res., lb/hr) = flow (cfm)*effluent conc. (mg/cu. m.)*1g/1000mg*1lb/453.6g*1cu. m./35.31cu. ft*60min/1 hr
Mass Recovery (Lab Res., lb) = Discharge Rate (lb/hr) * # of days*24hours/day
Shaded cells indicate O&M events performed during a previous reporting period.
(1) Offsite system running with Blower B-501 while blower B-502 is turned off for repairs.
(2) Blower B-502 replaced and B-501 turned off for repairs.
(3) Blower B-501 replaced; O&M readings carried over from B-501 to B-502 on Table 2E for purposes of calculation. Full system shut down shortly after restart with B-501 due to leaking well head at DDC-8.

Table 3F Summary of Estimated Recovery Rate via Offsite DDC System (Blower B-502)

	Field/System Data				Laboratory Results												Recovery based on Laboratory Results					
					B502-INF1			B502-INTER1			B502-INTER2			B502-EFF								
Date	Vacuum Flow Rate (cfm)	Applied Vacuum (in. H_20)	System Influent VOC Concentration (ppmv)	Elapsed Run-Time (day)	PCE (mg/m^3)	TCE (mg/m^3)	*cis* -1,2-DCE (mg/m^3)	PCE (mg/m^3)	TCE (mg/m^3)	*cis* -1,2-DCE (mg/m^3)	PCE (mg/m^3)	TCE (mg/m^3)	*cis* -1,2-DCE (mg/m^3)	PCE (mg/m^3)	TCE (mg/m^3)	*cis* -1,2-DCE (mg/m^3)	PCE Recovery During Period: lb/hr	PCE Recovery During Period (lb)	TCE Recovery During Period (lb/hr)	TCE Recovery During Period (lb)	*cis* -1,2-DCE Recovery During Period (lb/hr)	*cis* -1,2-DCE Recovery During Period (lb)
1/25/2017	479	54	1.147	34	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
2/7/2017	498	54	1.117	13	0.1200	0.0630	0.1600	0.0550	0.0045	0.2700	0.0400	0.0000	0.2000	0.0810	0.0000	0.0000	0.0001	0.17	0.0001	0.27	0.0003	0.68
3/27/2017	520	54	1.060	48	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
04/18/17	478	54	0.136	22	0.0850	0.0440	0.1900	0.0000	0.0160	0.3300	0.0000	0.0000	0.4200	0.0000	0.0000	0.0570	0.0002	0.40	0.0001	0.21	0.0003	0.63
05/23/17	670	47	0.230	35	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
6/27/2017[1]	--	--	--	35	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
07/18/17	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
08/28/17	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
09/21/17	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
10/17/17	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
11/30/17	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
12/13/17	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1/24/2018[2]	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
02/09/18	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
03/20/18	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
4/16/2018[2]	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
05/14/18	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
06/07/18	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
07/05/18	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
8/10/2018[3]	165	55	0.000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
09/13/18	452	62	0.000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
10/23/18	507	60	0.000	40	0.130	0.140	0.500	0.000	0.060	0.670	0.000	0.000	0.360	0.000	0.000	0.280	0.000	0.556	0.000	0.599	0.000	0.941
11/27/18	429	54	0.179	35	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
12/20/2018[4]	519	54	--	23	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
01/10/19	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
02/19/19	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
03/26/19	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
04/17/19	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
05/23/19	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
06/26/19	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
07/23/19	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
08/27/19	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
09/18/19	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
10/03/19	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
11/05/19	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
12/05/19	488	50	56.000	1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
																	PERIOD TOTALS =	**1.13**		**1.08**		**2.26**

NOTE: cfm = cubic feet per minute
VOC = Volatile organic compound
in. H_20 = inches of water
lb = pounds
lb/hr = pounds per hour
ppmv = parts per million (vol./vol.)
mg/m^3 = milligrams per cubic meter
PCE = Tetrachloroethylene
TCE = Trichloroethene
cis -1,2-DCE = cis-1,2-Dichloroethene
Mass Recovery (Lab Res., lb/hr) = flow (cfm)*effluent conc. (mg/cu. m.)*1g/1000mg*1lb/453.6g*1cu. m./35.31cu. ft*60min/1 hr
Mass Recovery (Lab Res., lb) = Discharge Rate (lb/hr) * # of days*24hours/day
Shaded cells indicate O&M events performed during a previous reporting period.
(1) Switched blowers from B-502 to B-501. Samples for the second quarter collected from B-502. System turned off due to water in lines and water leaking out of gauges when switching blowers. No readings collected.
(2) Offsite system running with Blower B-501 while blower B-502 is turned off for repairs.
(3) Blower B-502 replaced and B-501 turned off for repairs.
(4) Blower B-501 replaced; O&M readings carried over from B-501 to B-502 on Table 2E for purposes of calculation. Full system shut down shortly after restart with B-501 due to leaking well head at DDC-8.

Appendix A

Institutional/Engineering Control Certification

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Enclosure 1
Engineering Controls - Standby Consultant/Contractor Certification Form

Site Details **Box 1**

Site No. **152140**

Site Name National Heatset Printing Co.

Site Address: 1 Adams Boulevard Zip Code: 11735
City/Town: East Farmingdale
County: Suffolk
Site Acreage: 4.3

Reporting Period: January 30, 2017 to January 30, 2020

	YES	NO
1. Is the information above correct?	☒	☐
If NO, include handwritten above or on a separate sheet.		
2. To your knowledge has some or all of the site property been sold, subdivided, merged, or undergone a tax map amendment during this Reporting Period?	☐	☒
3. To your knowledge has there been any change of use at the site during this Reporting Period (see 6NYCRR 375-1.11(d))?	☐	☒
4. To your knowledge have any federal, state, and/or local permits (e.g., building, discharge) been issued for or at the property during this Reporting Period?	☐	☒

If you answered YES to questions 2 thru 4, include documentation or evidence that documentation has been previously submitted with this certification form.

	YES	NO
5. To your knowledge is the site currently undergoing development?	☐	☒

Box 2

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

IF THE ANSWER TO EITHER QUESTION 6 OR 7 IS NO, sign and date below and contact the DEC PM regarding the development of a Corrective Measures Work Plan to address these issues.

Signature of Standby Consultant/Contractor Date

SITE NO. 152140 **Box 3**

Description of Institutional Controls

Parcel	Owner	Institutional Control
100.097-0001-020.001	Michael Adamowicz III	Ground Water Use Restriction Monitoring Plan Site Management Plan O&M Plan IC/EC Plan Landuse Restriction

The environmental notice provides an alert that the groundwater use is restricted.

Box 4

Description of Engineering Controls

Parcel	Engineering Control
100.097-0001-020.001	Groundwater Treatment System Vapor Mitigation Air Sparging/Soil Vapor Extraction

The site contains a soil vapor extraction system and an in-well vapor stripping system. The soil vapor extraction system remediates soil contamination beneath the on-site building and provides vapor mitigation f the building. The in-well vapor stripping system remediates groundwater contamination.

Box 5

Periodic Review Report (PRR) Certification Statements

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

   a) the Periodic Review report and all attachments were prepared under the direction of, and reviewed by, the party making the certification, including data and material prepared by previous contractors for the current certifying period, if any;

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

YES	NO
☒	☐

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

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

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

   (c) nothing has occurred that would constitute a failure to comply with the Site Management Plan, or equivalent if no Site Management Plan exists.

YES	NO
☐	☒

IF THE ANSWER TO QUESTION 2 IS NO, sign and date below and contact the DEC PM regarding the development of a Corrective Measures Work Plan to address these issues.

Signature of Standby Consultant/Contractor

Date

Box 6

IC/EC CERTIFICATIONS

Professional Engineer Signature

I certify that all information in Boxes 2 through 5 are true. I understand that a false statement made herein is punishable as a Class "A" misdemeanor, pursuant to Section 210.45 of the Penal Law.

I _____ at _____
print name

_____

_____,
(print business address)

am certifying as a Professional Engineer.

Signature of Professional Engineer | Stamp (Required for PE) | Date

Appendix B

Annual Inspection (2017, 2018, and 2019)

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SITE-WIDE INSPECTION **Day: Wednesday Date: 10/17-18/ 2017**

NYSDEC		Temperature: (F)	50	(am)	60	(pm)
		Wind Direction:	NW	(am)	SW	(pm)
National Heatset Printing Site		Weather:	(am) Sun			
NYSDEC Site # 152140			(pm) Sun			
Contract # 1490716		Arrive at site	0800	(am)		
Babylon, New York		Leave site:	1600	(pm)		

Site Security

Evidence of vandalism (wells, protective cover damage):

None

Evidence of penetrations (poles, posts, stakes):

None

General site condition (gates, access, storm drains):

Good.

Additional Comments:

Paving at 1 Adams boulevard completed June-July 2017 around North and West portions of property

SVE System Enclosure

Is there any damage to the system enclosure?

No.

Does system piping appear to be compromised in any way? If so, describe:

No.

Do gauges and meters read within acceptable levels?

Yes. System measurements and readings within normal ranges.

Is equipment making any abnormal noises?

No

Is remote communication equipment functional?

No.

Has enclosure heating and ventilation changed since the last inspection?

No

Is there any damage to the well heads?

No.

On-Site DDC Treatment System

Is there any damage to the system enclosure?

Yes, damage to onsite DDC system #2 trailer incurred February 2017. Result of snowplow hitting side of trailer and damaging exterior electrical conduit.

Does system piping appear to be compromised in any way? If so, describe:

No.

Do gauges and meters read within acceptable levels?

Yes. However, blower pressure gauge for onsite DDC system #2 is still malfunctioning as noted in 2016 inspection report.

Is equipment making any abnormal noises?

No.

Is remote communication equipment functional?

Yes.

Has enclosure heating and ventilation changed since the last inspection?

No

Is there any damage to the well heads?

No

Off-site DDC Treatment System

Is there any damage to the system enclosure?

No

Does system piping appear to be compromised in any way? If so, describe:

No

Do gauges and meters read within acceptable levels?

Yes

Is equipment making any abnormal noises?

Yes. Blower B-502 vibrating upon restart. Blower B-502 was left off for troubleshooting by D&D Electric.

Is remote communication equipment functional?

Yes

Has enclosure heating and ventilation changed since the last inspection?

No

Is there any damage to the well heads?

No

INSPECTION PHOTOLOG

<table>
<tr><td>  </td><td>  </td></tr>
<tr><td>View of offsite system trailers</td><td>Paving completed behind 1 Adams boulevard building</td></tr>
<tr><td> 
</td><td>  </td></tr>
<tr><td>Blower in onsite DDC system #2 with faulty pressure gauge</td><td>Damage to exterior of onsite DDC system #2 incurred in winter 2017. Snowplow collided with system trailer and damaged exterior electrical conduit.</td></tr>
</table>

Additional photos of paving completed at 1 Adams Blvd

Additional photos of paving completed at 1 Adams Blvd

Additional photos of paving completed at 1 Adams Blvd

SVE System trailer

Onsite DDC System #1 trailer & general vicinity

SITE-WIDE INSPECTION **Day: Wednesday Date: 4/23/ 2018**

NYSDEC		Temperature: (F)	60	(am)	80	(pm)
		Wind Direction:	SW	(am)	WNW	(pm)
National Heatset Printing Site		Weather:	(am) Partly Cloudy			
NYSDEC Site # 152140			(pm) Partly Cloudy			
Contract # 1490716		Arrive at site	0800	(am)		
Babylon, New York		Leave site:	1600	(pm)		

Site Security

Evidence of vandalism (wells, protective cover damage):

None

Evidence of penetrations (poles, posts, stakes):

None

General site condition (gates, access, storm drains):

Good.

Additional Comments:

None

SVE System Enclosure

Is there any damage to the system enclosure?

No. Additional graffiti noted on system enclosure.

Does system piping appear to be compromised in any way? If so, describe:

No.

Do gauges and meters read within acceptable levels?

N/A

Is equipment making any abnormal noises?

N/A SVE blower not currently operational. Motor offsite for repairs.

Is remote communication equipment functional?

No.

Has enclosure heating and ventilation changed since the last inspection?

No

Is there any damage to the well heads?

No. However, interior construction at 1 Adams Boulevard is currently limiting access to soil vapor monitoring points within the building.

On-Site DDC Treatment System

Is there any damage to the system enclosure?

Yes, damage to onsite DDC system #2 trailer incurred February 2017. Result of snowplow hitting side of trailer and damaging exterior electrical conduit.

Does system piping appear to be compromised in any way? If so, describe:

No.

Do gauges and meters read within acceptable levels?

Yes. However, blower pressure gauge for onsite DDC system #2 is still malfunctioning as noted in 2016 inspection report.

Is equipment making any abnormal noises?

No.

Is remote communication equipment functional?

Yes.

Has enclosure heating and ventilation changed since the last inspection?

No

Is there any damage to the well heads?

No

Off-site DDC Treatment System

Is there any damage to the system enclosure?

No. Tire tracks noted in grass in front of treatment system. Tracks caused by D&D support van.

Does system piping appear to be compromised in any way? If so, describe:

No

Do gauges and meters read within acceptable levels?

Yes

Is equipment making any abnormal noises?

No.

Is remote communication equipment functional?

Yes.

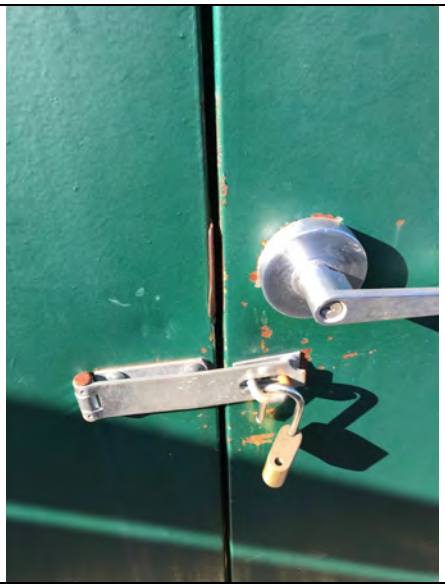
Has enclosure heating and ventilation changed since the last inspection?

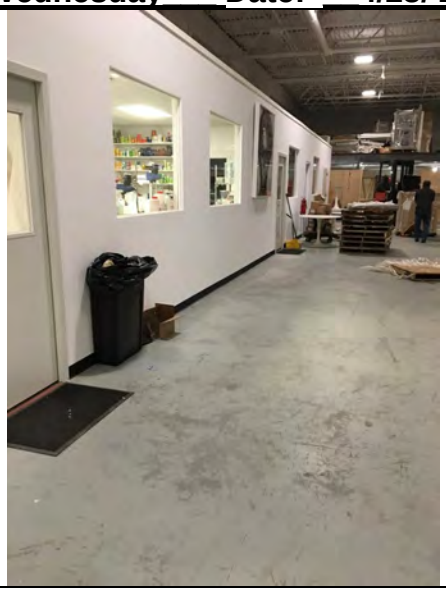
No.

Is there any damage to the well heads?

No.

INSPECTION PHOTOLOG

	
Removed door latches at offsite system trailer to prevent lock-outs.	Graffiti on SVE system enclosure
	
Door locked with exterior latch only – interior door latches removed.	Fence panels removed on northwest corner of 1 Adams Blvd property

	
Offsite System Trailer	Construction within 1 Adam Blvd.
	
Onsite DDC System #2 Trailer	Wheel tracks noted in enclosure of offsite system. Tracked caused by D&D support van during removal of B502

SITE-WIDE INSPECTION **Day: Thursday Date: 12/5/2019**

NYSDEC		Temperature: (F)	40	(am)	40	(pm)
		Wind Direction:	WNW	(am)	WNW	(pm)
National Heatset Printing Site		Weather:	(am) Partly Cloudy			
NYSDEC Site # 152140			(pm) Partly Cloudy			
Contract # 1490716		Arrive at site	0700	(am)		
Babylon, New York		Leave site:	1500	(pm)		

Site Security

Evidence of vandalism (wells, protective cover damage):

None

Evidence of penetrations (poles, posts, stakes):

None

General site condition (gates, access, storm drains):

Good.

Additional Comments:

Parking lot near onsite DDC System #2 was repaved November 2019. Checked well covers in the vicinity, all were discoverable and in good condition.

SVE System Enclosure

Is there any damage to the system enclosure?

No.

Does system piping appear to be compromised in any way? If so, describe:

No.

Do gauges and meters read within acceptable levels?

Yes.

Is equipment making any abnormal noises?

No.

Is remote communication equipment functional?

No.

Has enclosure heating and ventilation changed since the last inspection?

No

Is there any damage to the well heads?

No.

On-Site DDC Treatment System

Is there any damage to the system enclosure?

No.

Does system piping appear to be compromised in any way? If so, describe:

No.

Do gauges and meters read within acceptable levels?

N/A. Onsite DDC System #2 is currently off due to vibration in blower motor. Onsite DDC System #1 currently off due to VFD malfunction.

Is equipment making any abnormal noises?

N/A.

Is remote communication equipment functional?

N/A

Has enclosure heating and ventilation changed since the last inspection?

No

Is there any damage to the well heads?

No.

Off-site DDC Treatment System

Is there any damage to the system enclosure?

No damage to system enclosure; tree branch had fallen on fence enclosure in August 2019. Fence slightly bent.

Does system piping appear to be compromised in any way? If so, describe:

No

Do gauges and meters read within acceptable levels?

Yes. System restarted on 5 December 2019.

Is equipment making any abnormal noises?

No.

Is remote communication equipment functional?

No. Alarm systems operational, however, no callout. PLC still functioning.

Has enclosure heating and ventilation changed since the last inspection?

No.

Is there any damage to the well heads?

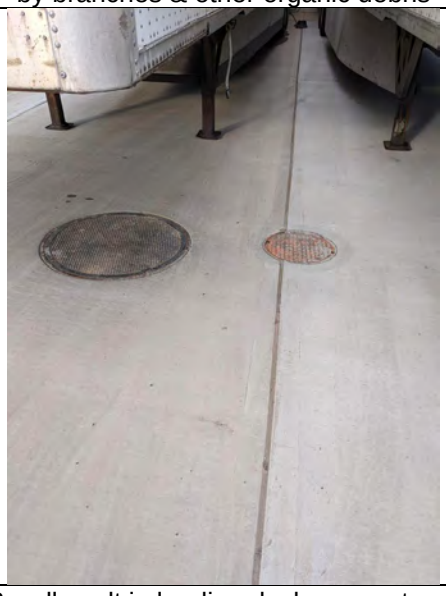
No.

INSPECTION PHOTOLOG

Tree fallen on fence at offsite fence.

Onsite DDC System #2 access door partially obstructed by branches & other organic debris

DDC-4 well vault in freshly paved parking lot



DDC-2 well vault in loading dock; concrete recently repaired.

Appendix C

Green Remediation

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Summary of Green Remediation Metrics for Site Management

Site Name: National Heatset Printing Co. Site Code: 152140
Address: 1 Adams Blvd City: Farmingdale
State: NY Zip Code: 11735 County: Nassau

Initial Report Period (Start Date of period covered by the Initial Report submittal)
Start Date: October 15, 2013

Current Reporting Period
Reporting Period From: 1 January 2017 To: 30 January 2020

Contact Information
Preparer's Name: Megan Miller Phone No.: (315) 565-6557
Preparer's Affiliation: EA Engineering

I. Energy Usage: Quantify the amount of energy used directly on-site and the portion of that derived from renewable energy sources.

Without a report of how many kWh were consumed by onsite and offsite treatment systems during the reporting period, EA assumed the annual electrical usage was consistent from the previous reporting period. The annual rate was multiplied to cover three years. Additionally, it was assumed that the same percentage of energy used at the site was derived from renewable resources.

	Current Reporting Period	**Total to Date**
Fuel Type 1 (e.g. natural gas (cf))	0	0
Fuel Type 2 (e.g. fuel oil, propane (gals))	0	0
Electricity (kWh)	1,149,765	2,349,280
Of that Electric usage, provide quantity:		
Derived from renewable sources (e.g. solar, wind, and hydropower)	171,546 (~14.9%)	289,900 (~12.3%)
Other energy sources (e.g. geothermal, solar thermal (Btu))	0	0

Provide a description of all energy usage reduction programs for the site in the space provided on Page 3.

II. Solid Waste Generation: Quantify the management of solid waste generated on-site.

	Current Reporting Period (lb)	**Total to Date (lb)**
Total waste generated on-site		
OM&M generated waste (carbon)	4,157	24,154
RSO Generated Waste (IDW)	38,500	38,500

Of that total amount, provide quantity:		
Transported off-site to landfills	16,000	16,000
Transported off-site to other disposal facilities	22,500	24,300
Transported off-site for recycling/reuse	4,157	24,154
Reused on-site	0	0

Provide a description of any implemented waste reduction programs for the site in the space provided on Page 3.

III. Transportation/Shipping: Quantify the distances travelled for delivery of supplies, shipping of laboratory samples, and the removal of waste.

	Current Reporting Period (miles)	**Total to Date (miles)**
Standby Engineer/Contractor	16,400	70,560
Laboratory Courier/Delivery Service	1,050	900
Waste Removal/Hauling (Carbon Disposal)	888	2,876
RSO Groundwater Profiling; Engineer & Contractor	5,880	5,880
RSO HSVE Install; Engineer & Contractor	6,560	6,560
Waste Removal/Hauling Drilling IDW	1,960	1,960

Provide a description of all mileage reduction programs for the site in the space provided on Page 3. Include specifically any local vendor/services utilized that are within 50 miles of the site.

IV. Water Usage: Quantify the volume of water used on-site from various sources.

	Current Reporting Period (gallons)	**Total to Date (gallons)**
Total quantity of water used on-site	1,500	1,500
Of that total amount, provide quantity:		
Public potable water supply usage	1,500	1,500
Surface water usage	0	0
On-site groundwater usage	0	0
Collected or diverted storm water usage	0	0

Provide a description of any implemented water consumption reduction programs for the site in the space provided on Page 3.

V. Land Use and Ecosystems: Quantify the amount of land and/or ecosystems disturbed and the area of land and/or ecosystems restored to a pre-development condition (i.e. Green Infrastructure).

	Current Reporting Period (acres)	**Total to Date (acres)**
Land disturbed	0	0

Land restored	0	0

Provide a description of any implemented land restoration/green infrastructure programs for the site in the space provided on Page 3.

Description of green remediation programs reported above
(Attach additional sheets if needed)

Energy Usage: The most recent report issued by PSE&G Environmental Information for Basic Generation states the following breakdown of energy sources: Coal 17.15%, Gas 37.65%, Hydroelectric 1.04%, Oil 0.11%, Solar 0.31%, Wind 2.49%, Solid Waste 0.42%, Fuel Cells 0.02%, Hydro 0.01%, Captured Methane Gas 0.26%, Wood/Biomass 0.13%.

Source: https://corporate.pseg.com/-/media/pseg/corporate/corporate-citzenship/environmentalpolicyandinitiatives/environmental_label.ashx

Waste Generation: Soil (16,000 lbs) and Liquid IDW (2700 gals [22,500 lbs using density of water]) shipped offsite following RSO work. Other waste shipped off for recycling includes spent GAC shipped off site for reactivation or blending to Darlington, PA

Transportation/Shipping:

1. Mileage for typical site work / operation includes:
    a. Transportation mileage from the standby engineer/contractor assumed to be equivalent to the following for monthly O&M and quarterly sampling:
        i. 12 monthly site trips of 1 person in 1 vehicle = 600 miles round trip, each trip = 7200 mi
        ii. Quarterly site trips of 3 people in 2 vehicle = 600 miles round trip, each trip = 4800 mi
        iii. 7 emergency/repair trips performed by EA, 1 vehicle = 600 miles RT, each trip = 4200 mi
        iv. 10 emergency / repair trips performed by PES, 1 vehicle = 20 miles RT, each trip = 200 mi
    b. Spent GAC shipped off site for reactivation or blending.
    c. Miles associated with Lab work increased when considering shipment of glassware to Syracuse office prior to sampling and shipping from site to the lab following sampling.

2. Mileage associated with the RSO tasks (Groundwater Delineation and HSVE Install include:
    a. Transportation mileage from the engineer/subcontractor for HSVE Install assumed to be the following:
        i. Weekly Trip for Drilling Contractor = 220 miles RT for 8 weeks = 1,760 miles
        ii. Weekly Trip for Engineer = 600 miles RT for 8 weeks = 4,800 miles
    b. Transportation mileage for the engineer/subcontractor for Groundwater Delineation assumed to be the following
        i. Weekly Trip for Engineer = 300 miles RT for 6 weeks = 3,600 miles

ii. Weekly Trip for Drilling Contractor = 380 miles RT for 6 weeks = 2,280 miles 3. IDW from HSVE installation shipped offsite.
Water usage:
Land Use and Ecosystems:
Other: Operation of off-site DDC system has been modified to use single 100-HP blower (vs. two), which also reduces amount of spent GAC. Use of "local" standby subcontractor to respond to system alarms (20 mi round trip for PES vs. 600 mi round trip for EA) Use of nearby GAC vendor (100 mi round trip) for changeout support.

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Appendix C: Green Remediation – SiteWise Evaluation

Remedial Alternatives	GHG Emissions	Total energy Used	Water Consumption	Electricity Usage	Onsite NO_x Emissions	Onsite SO_x Emissions	Onsite PM_{10} Emissions	Total NO_x Emissions	Total SO_x Emissions	Total PM_{10} Emissions	Accident Risk Fatality	Accident Risk Injury
	metric ton	MMBTU	gallons	MWH	metric ton	metric ton	metric ton	metric ton	metric ton	metric ton		
2017-2019_PRR+RSO	67.30	9.00E+02	1.50E+03	0.00E+00	4.68E-01	4.78E-02	4.21E-02	5.21E-01	9.84E-02	5.35E-02	7.28E-05	1.32E-02
2017-2019_PRR-O&M	612.21	1.38E+04	9.49E+05	1.86E+03	0.00E+00	0.00E+00	0.00E+00	5.84E-01	7.81E-01	4.30E-01	2.37E-05	1.91E-03

Additional Sustainability Metrics

Remedial Alternatives	Non-Hazardous Waste Landfill Space	Hazardous Waste Landfill Space	Topsoil Consumption	Costing	Lost Hours - Injury	Percent Electricity from Renewable Sources	Final Cost with Footprint Reduction
	tons	tons	cubic yards	$		%	$
2017-2019_PRR+RSO	11.50	0.00E+00	0.00E+00	0.00E+00	1.06E-01	0.0%	0.00E+00
2017-2019_PRR-O&M	0.00	0.00E+00	0.00E+00	0.00E+00	1.53E-02	6.1%	0.00E+00

Relative Impact

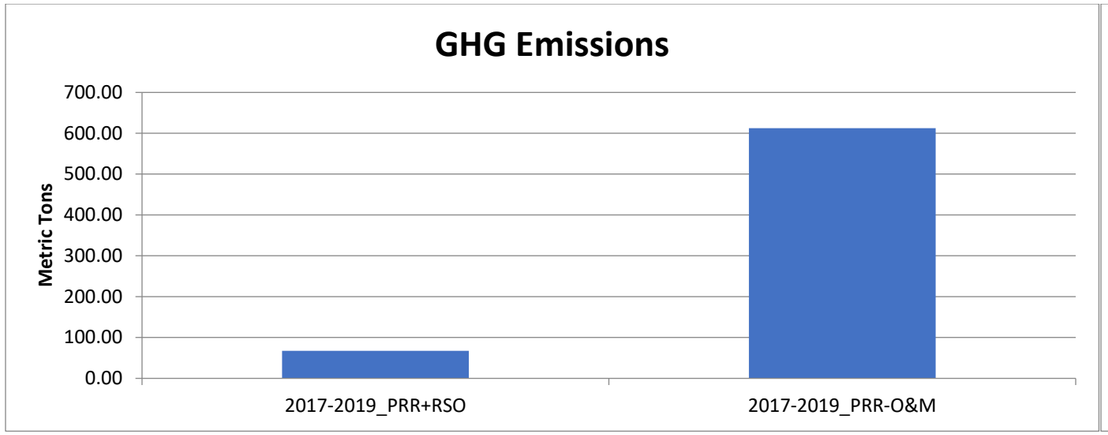
Remedial Alternatives	GHG Emissions	Energy Usage	Water Usage	Electricity Usage	Onsite NOx Emissions	Onsite SOx Emissions	Onsite PM10 Emissions	Total NOx emissions	Total SOx Emissions	Total PM10 Emissions	*Accident Risk Fatality	*Accident Risk Injury	Community Impacts	Resources Lost
2017-2019_PRR+RSO	Low	Low	Low	Low	High	High	High	High	Low	Low	Low	Low	user select	user select
2017-2019_PRR-O&M	High	High	High	High	Low	Low	Low	High	High	High	Low	Low	user select	user select

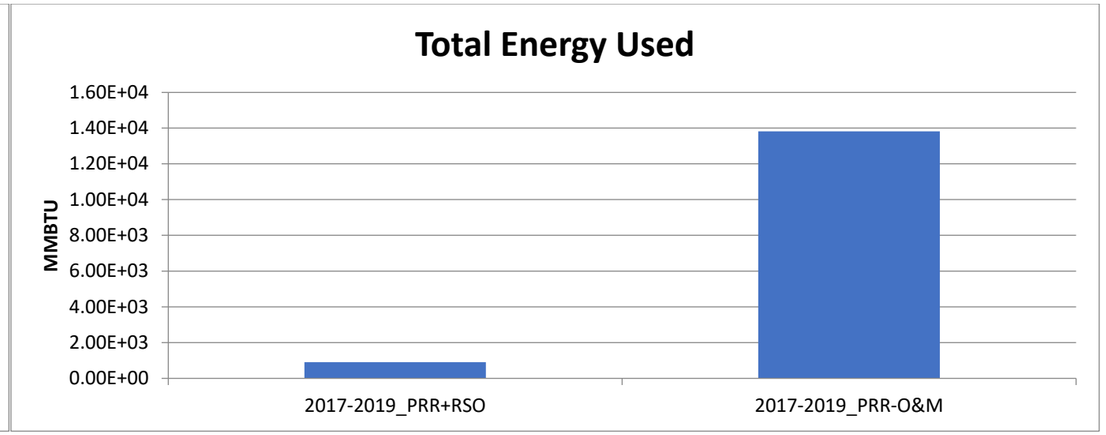
Relative Impact (User Override)

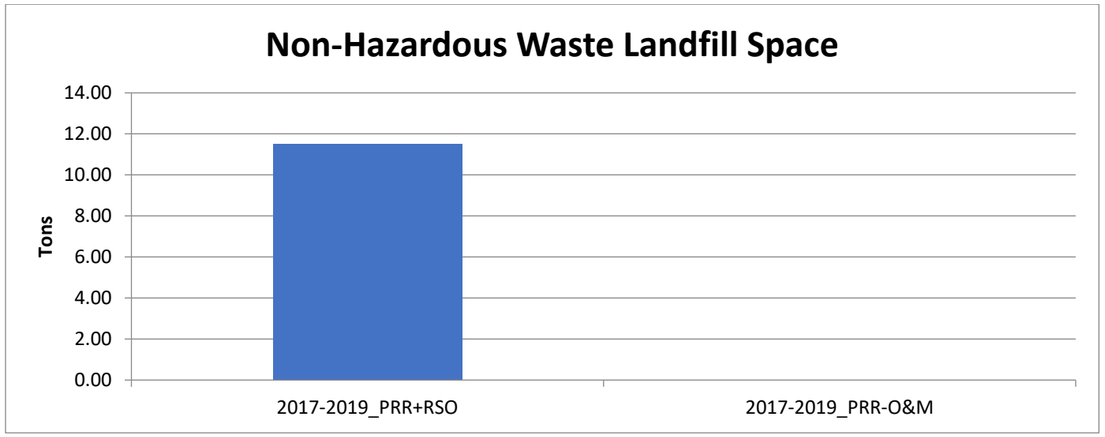
Remedial Alternatives	GHG Emissions	Energy Usage	Water Usage	Electricity Usage	Onsite NOx Emissions	Onsite SOx Emissions	Onsite PM10 Emissions	Total NOx Emissions	Total SOx Emissions	Total PM10 Emissions	*Accident Risk Fatality	*Accident Risk Injury	Community Impacts	Resources Lost
2017-2019_PRR+RSO	Low	Low	Low	Low	High	High	High	High	Low	Low	Low	Low	user select	user select
2017-2019_PRR-O&M	High	High	High	High	Low	Low	Low	High	High	High	Low	Low	user select	user select

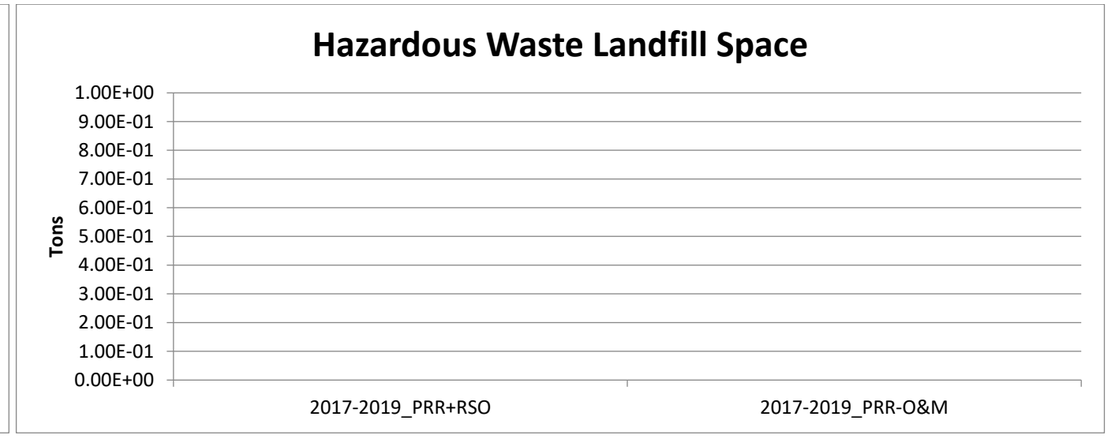
*Accident Risk is an estimate of how many accidents may occur. This risk is not the same as Cancer Risk, which is the probability (for a single person) of getting cancer. Accident risk is not comparable to Cancer Risk due to inherent fundamental differences.

Appendix C: Green Remediation – SiteWise Evaluation









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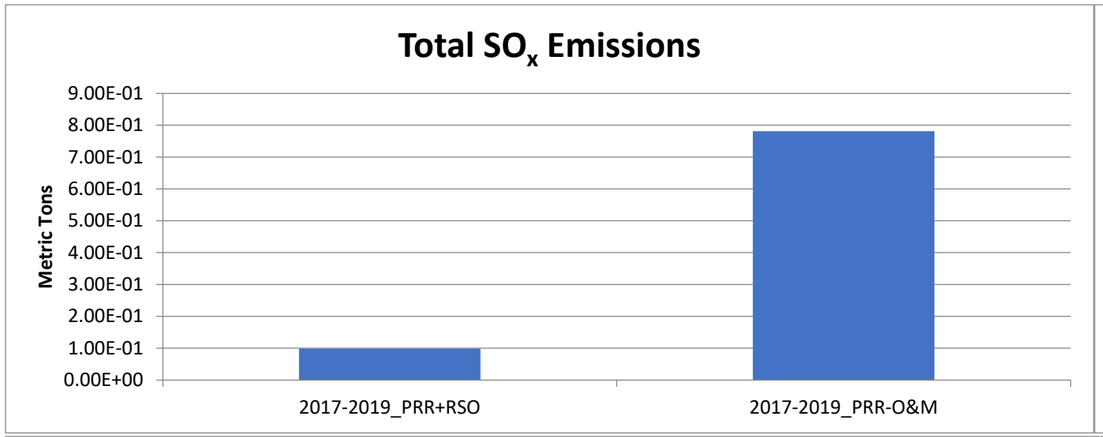

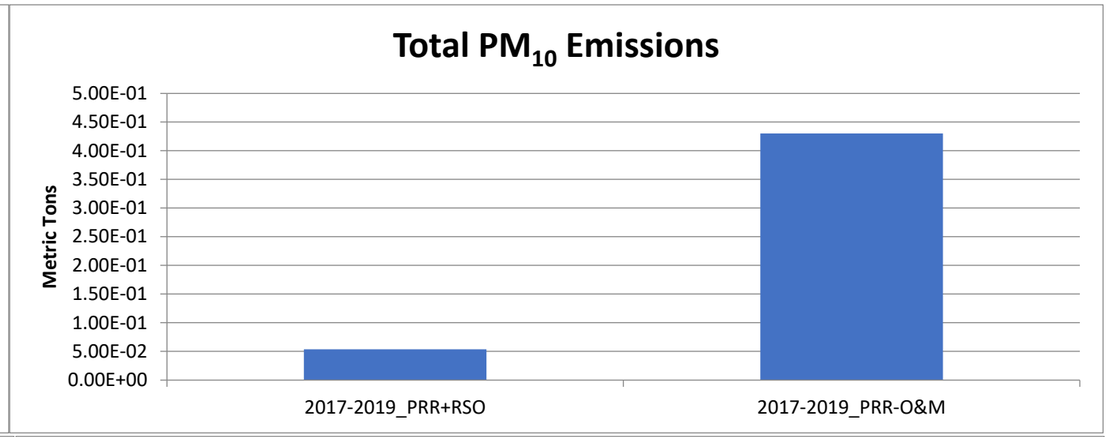

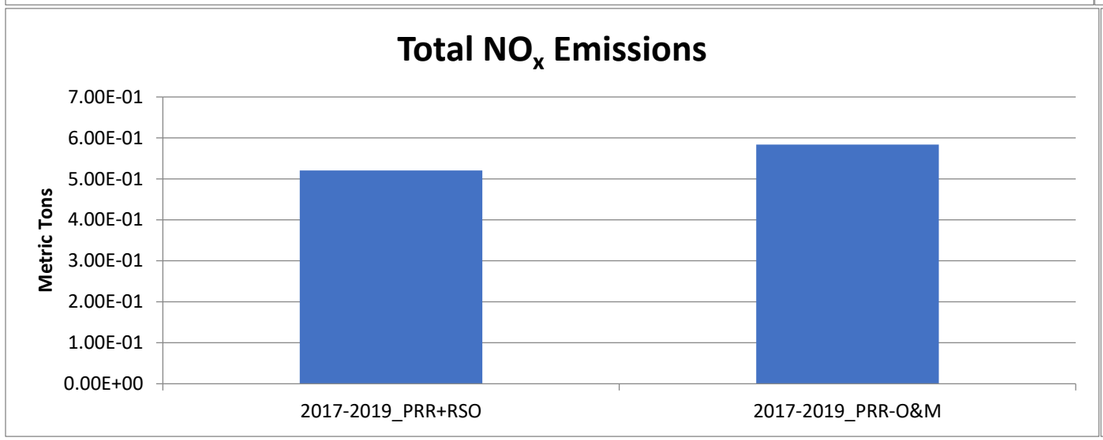

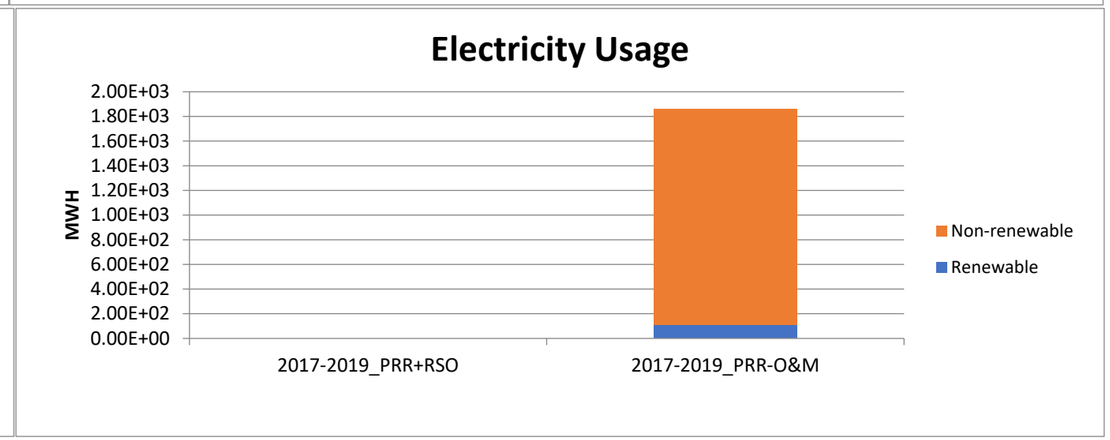

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