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GROUNDWATER EXTRACTION AND TREATMENT SYSTEM ANNUAL OPERATIONS REPORT FOR THE PERIOD JANUARY 1 THROUGH DECEMBER 31, 2020 FORMER YORK NAVAL ORDNANCE PLANT

Prepared for:

former York Naval Ordnance Plant Remediation Team

March 2021

7420 Derry Street, Harrisburg, PA 17111 717.980.5150 fax 717.980.5937

Groundwater Extraction and Treatment System
Annual Operations Report
for the Period
January 1 through December 31, 2020
Former York Naval Ordnance Plant

Prepared for:

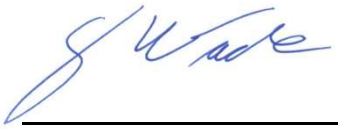
former York Naval Ordnance Plant Remediation Team

By:

Hydro-Terra Group
7420 Derry Street
Harrisburg, PA 17111
(717) 980-5150

March 2021

Respectfully submitted,



Emily M. Wade
Project Scientist

Rodney G. Myers, CHMM
Senior Program Manager

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1,1-DCE	-	1,1-dichloroethene
cfm	-	cubic feet per minute
cis-1,2-DCE	-	cis-1,2-dichloroethene
DMR	-	Discharge Monitoring Report
EPA	-	United States Environmental Protection Agency
fYNOP	-	former York Naval Ordnance Plant
GAC	-	granular-activated carbon
GIS	-	Global Information Services
gpd	-	gallons per day
gpm	-	gallons per minute
GSC	-	Groundwater Sciences Corporation
GWTS	-	groundwater extraction and treatment system
Harley-Davidson	-	Harley-Davidson Motor Company Operations, Inc.
HDPE	-	high density polyethylene
HTG	-	Hydro-Terra Group
lbs/day	-	pounds per day
NB4	-	North Building 4
NPBA	-	Northeast Property Boundary Area
NPDES	-	National Pollutant Discharge Elimination System
NP York	-	NP York 58, LLC
O&M	-	operation and maintenance
PADEP	-	Pennsylvania Department of Environmental Protection
PCE	-	tetrachloroethene
PLC	-	programmable logic controller
ppm	-	parts per million
PTA	-	packed tower aerator
SPBA	-	Southern Property Boundary Area
SRBC	-	Susquehanna River Basin Commission
TCA	-	1,1,1-trichloroethane
TCE	-	trichloroethene
µg/L	-	micrograms per liter
VFD	-	variable frequency drive
VOCs	-	volatile organic compounds
WPL	-	West Parking Lot

EXECUTIVE SUMMARY

This report presents a summary of the groundwater extraction and treatment system (GWTS) operations and maintenance (O&M) and groundwater extraction well monitoring during 2020 at the former York Naval Ordnance Plant (fYNOP). The fYNOP-GWTS is located at the Harley-Davidson Motor Company Operations, Inc. (Harley-Davidson) facility in York, Pennsylvania. The fYNOP-GWTS and has been in operation for over 30 years (since November 1990) and consists of numerous collection wells now operating in only two areas (the West Parking Lot (WPL) and Southern Property Boundary Area (SPBA)) of fYNOP.

Eight active collection wells (CW-9, CW-13, CW-15A, CW-17, CW-20, CW-21, CW-22, and CW-23) were operational in the WPL and SPBA during 2020. Other previously active collection wells were approved for shut down and are no longer required to be operational.

Approximately 682 pounds of volatile organic compounds (VOCs) were removed by the GWTS during 2020. The total amount of groundwater extracted during 2020 was approximately 122 million gallons. Cumulatively, approximately 48,701 pounds of VOCs have been removed by the GWTS since 1990.

Monthly, quarterly, and annual sampling data were collected in 2020, and site-wide groundwater elevations were collected in September 2020. These data, along with laboratory analytical data, will be presented in the 2020 fYNOP Annual Groundwater Quality Report (in preparation by Groundwater Sciences Corporation [GSC]).

1.0 INTRODUCTION

This report presents a summary of the operating record for the fYNOP GWTS and includes collection well water quality data obtained during 2020. The fYNOP facility consists of the current Harley-Davidson York facility and the West Campus property (as described below). The fYNOP is located in Springettsbury Township, York County, Pennsylvania, as shown on **Figure 1-1**. This report covers the 12-month period from January 1 through December 31, 2020. Hydro-Terra Group (HTG) operated the GWTS during the reporting period.

Harley-Davidson sold 58 acres of the western portion of the fYNOP in June 2012. NP York 58, LLC (NP York) constructed a 755,000 square-foot warehouse in 2016. The parcel—now addressed as 1445 Eden Road, York, Pennsylvania —extends from west of the current manufacturing operations through the WPL and is identified as the "West Campus". The fYNOP retains responsibility for the cleanup of the West Campus and maintains an easement agreement with the owners to continue remediation, monitoring, and maintenance activities.

The GWTS consists of a groundwater treatment plant, a groundwater extraction system, and a force main discharge system. Collectively, the fYNOP GWTS was designed to extract and treat groundwater containing VOCs of concern that consist of trichloroethene (TCE), tetrachloroethene (PCE), 1,1,1-trichloroethane (TCA), and their degradation products, including cis-1,2-dichloroethene (cis-1,2-DCE) and 1,1-dichloroethene (1,1-DCE).

During 2020, groundwater was extracted from eight (8) pumping wells (CW-9, CW-13, CW-15A, CW-17, CW-20, CW-21, CW-22, and CW-23) operating in two (2) separate areas designated as the WPL Area (which includes the former North Building 4 [NB4] Area) and the SPBA. The collection systems are shown on **Figure 1-2**. WPL collection wells (CW-9, CW-13, CW-15A, CW-17, and CW-20) were all operational during 2020. The SPBA collection wells (CW-21, CW-22, and CW-23) were also all functional in 2020. Each of these extraction systems were designed to capture and control shallow groundwater containing chlorinated VOCs and are part of the approved interim groundwater remedial actions identified in the fYNOP Site-Wide Cleanup Plan (GSC, 2019a).

The Northeast Property Boundary Area (NPBA) collection wells were shut down in mid-2013 in accordance with a work plan approved by the United States Environmental Protection Agency (EPA) and Pennsylvania Department of Environmental Protection (PADEP), and following five years of post-shutdown monitoring, are no longer required to be operational. Completion of post-shut down monitoring was documented for the NPBA in early 2019 in the 2018 Annual Monitoring Progress Report for the NPBA Extraction System Shutdown (GSC, 2019b).

Other groundwater extraction areas previously shutdown and abandoned included the former TCA Tank Area, within former Building 2 (now covered by the new West Campus warehouse) and a former Lift Station and collection well CW-19 at Building 3.

All extracted groundwater is piped to the groundwater treatment building (Building 41A) for processing through a packed tower aerator (PTA) prior to discharge to the Codorus Creek, designated as Outfall No. 003 (see **Figures 1-1** and **1-2**).

Figure 1-3 presents a schematic flow diagram for this treatment system. A chemical sequestering agent (Redux 525) injection system was installed in June 2010 to reduce mineral fouling of the GWTS PTA, effluent discharge pumps, and components. This sequestrant chemical injection system continued to operate throughout 2020. PTA off-gases are treated by a vapor phase, granular-activated carbon (GAC) filter system for removal of VOCs prior to emitting to the atmosphere.

Treated groundwater is collected in a wet well pump station located immediately north of Building 41A and pumped from the wet well through an 8-inch diameter force main, approximately 1,600 feet, to Outfall 003 near the confluence of Johnsons Run and Codorus Creek (refer to **Figure 1-2**).

The treatment system operates and discharges under a National Pollutant Discharge Elimination System (NPDES) permit No. PA0085677 issued by PADEP. A permit renewal was issued by PADEP in late 2019, with an effective date of December 1, 2019 through November 20, 2024. The GWTS operated in full compliance with the NPDES permit during 2020.

2.0 GEOLOGY AND HYDROGEOLOGY

Two geologic rock formations underlie the site. Solution-prone (karst) gray carbonate bedrock (limestone and dolostone) underlies the flat lowland (western) portion of the site (i.e. the WPL extraction area). Quartzitic sandstone underlies the more steeply sloping hills or upland area present on the eastern part of the site (which includes the NPBA groundwater collection area). The SPBA extraction area lies near a contact between the quartzitic sandstone and limestone geologic formations. Natural groundwater flow is generally westward, from the upland area at the eastern part of the site towards Codorus Creek. A detailed discussion of the regional and site geology and hydrogeology is included in the revised report entitled “Supplemental Remedial Investigation Groundwater Report (Part 2).” (GSC, 2018).

3.0 SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING

The groundwater monitoring program at the fYNOP site in 2020 consisted of:

- Measuring depth to water in all available monitoring and observation wells one time.
- Sampling and chemical analysis of groundwater from the collection wells throughout the year (see results summary in **Table A-1 in Appendix A**).
- Sampling and chemical analysis of GWTS influent from the combined active collection wells throughout the year (see results summary in **Table A-2 in Appendix A**).
- Site-wide groundwater and surface water sampling (wells onsite and offsite and Codorus Creek) was conducted monthly, quarterly, or annually during 2020 following the program detailed in the fYNOP Site-Wide Cleanup Plan (GSC, 2019a).

The results of this monitoring and sampling program, including evaluation of groundwater extraction goals, will be provided and discussed in separate annual groundwater monitoring report. GWTS-related objectives of this monitoring program are as follows:

- Demonstrate the WPL groundwater extraction system operates according to established parameters;
- Verify that a groundwater gradient exists from SPBA off-Site wells located along Canterbury Lane towards on-site wells located in the SPBA;
- Demonstrate that off-Site migration of VOCs above established limits does not occur in the NPBA; and
- Conduct surface water monitoring in Codorus Creek to verify compliance with PADEP surface water quality criteria.

4.0 GROUNDWATER TREATMENT SYSTEM

During 2020, the GWTS treated groundwater containing dissolved VOCs recovered from two areas of the site (the WPL and SPBA). This groundwater extraction portion of the system consists of eight (8) active wells (CW-9, CW-13, CW-15A, CW-17, CW-20, CW-21, CW-22, and CW-23).

4.1 System Description

Collection wells within the WPL groundwater extraction area and the SPBA remove groundwater by means of electric submersible pumps. The pumping water level within each collection well in the WPL is maintained by liquid level probes and control circuitry between the “on” and “off” probes. The pumping water level is controlled by a transducer in the SPBA wells. The extracted groundwater is conveyed via underground piping to the treatment system where the dissolved VOCs are removed from the groundwater.

The GWTS is housed in Building 41A. The process flow diagram for the system is presented on **Figure 1-3**. The treatment system consists of a 2,600-gallon equalization tank; a PTA capable of treating up to 400 gallons per minute (gpm) of groundwater; and a 10,000-pound vapor-phase GAC unit for PTA off-gas treatment.

Extracted groundwater is pumped from the equalization tank to the PTA. Redux 525 sequestering agent is injected into this flow at a rate of approximately 20 parts per million (ppm) to prevent calcium scale deposits on the packing material and effluent pumping system. Simultaneous with the downward flow of contaminated water, a 4,000-cubic-foot-per-minute (cfm) centrifugal blower directs fresh air into the lower section of the tower, and up through the packing material. VOCs present in the influent groundwater are "stripped" from the water, transferred into the air, and then adsorbed to the GAC in the air-phase. The treated groundwater flows by gravity to a wet well (effluent pump station) on the north side of Building 41A. It is then pumped approximately 1,600 feet via an 8-inch underground force main to Outfall No. 003 and discharged to Codorus Creek (see **Figure 1-2**).

Automated monitoring and control of the GWTS are facilitated through a series of control panels, Allen-Bradley programmable logic controllers (PLCs) and patented operator software packages called RS View® and Factory View Talk®. Remote computer terminals monitor collection well pumping rates and treatment processes, and the collection wells may be remotely adjusted. System operational data, recorded in an Excel® data base during 2020, are provided in **Appendix B**.

4.2 System Maintenance and Modifications

During 2020, the influent piping to the PTA was cleaned and gel coated, and repairs were completed on a section of deteriorated metal screen inside the GAC unit. Additionally, the Building 41A on-site weather station was disconnected from the Harley-Davidson Global Information Services (GIS) network and connected to a cellular unit for precipitation monitoring.

Twice a month, preventive maintenance inspections are performed when the GWTS is operating. These inspections ensure effective operation of the system. A summary of O&M data recorded during these visits is included in **Appendix C**. Inspections include the following:

- Check for system alarms and address as required.
- Inspect control panels for proper conditions and settings.
- Check water conveyance line pressures.
- Check pressure differential across the stripping tower.
- Check piping and pumps for leaks.
- Clean Y-strainers of buildup, etc., as necessary.
- Check and record amperage draw on all motors (quarterly).

- Record flow rates on recovery wells and transfer pump.

The GWTS operated under normal conditions in 2020, except for the following interruptions:

- A brief shut down occurred on January 20 to replace electrical cut-outs on the GAC duct heater.
- A brief shut down occurred on April 2 and October 6 to remove the primary and secondary effluent pump for routine annual maintenance.
- A brief shut down occurred on May 15 to complete annual maintenance checks on the GWTS.
- A shutdown occurred on July 7 and 8 to repair a deteriorated metal screen inside the GAC unit. Damage to the screen was noted when the interior of the GAC unit was inspected during a routine GAC change out.
- A shut down occurred on September 8 for a planned site-wide plant power outage.
- A brief shut down occurred on November 4 to conduct preventative maintenance on the PTA blower.
- The GWTS was shut down during scheduled GAC change-outs on January 14, April 2, July 7, and October 6.

Several noteworthy treatment system maintenance, repairs, or modifications were identified and addressed during 2020. A brief summary is presented below:

- Two GWTS effluent discharge pumps were removed for annual routine inspection, cleaning, and repair (as needed). A major pump reconstruction was required for one of the effluent pumps.
- Annual pH meter calibration was completed.
- The chemical sequestrant pump flow sensor was cleaned numerous times throughout the year.
- Samples of the GWTS influent and effluent were collected and analyzed by the sequestrant (Redux 525) chemical representative. The results verified that the desired sequestrant dosing rate should remain at 20 ppm.
- Annual maintenance was completed to clean the PTA tower windows, remove debris from the PTA sump pit, calibrate the influent pH meter, check PTA tower plumbness, exercise effluent pump valves, and verify that the sequestrant (Redux 525) chemical pump is dosing at 20 ppm.
- The external building influent pipe that feed the top of the PTA tower was cleaned and gel coated.
- Repairs were completed on the metal screen inside the GAC unit.
- Electrical cut outs were replaced inside the GAC duct heater.

4.3 Groundwater Withdrawal and VOC Removal

Table 4-1 presents the recorded monthly and annual groundwater withdrawals and VOC mass removals by the GWTS. A system-wide total of approximately 48,701 pounds of VOCs were removed since the GWTS began operation in November 1990.

The total amount of groundwater extracted during 2020 was approximately 122 million gallons (or 333,213 gallons per day [gpd] or 231 gpm average) using the PTA totalizer. The 2020 extraction volumes are lower than the previous year (2019) when the flows were approximately 127 million gallons (or 349,455 gpd, or 243 gpm). A graphical comparison of groundwater volumes treated from the two site extraction systems is presented on **Figure 4-1**. The vast majority (approximately 97%) of the treated groundwater was extracted from the WPL system during 2020.

Quarterly PTA influent (untreated) analyses (shown in **Table A-2, Appendix A**), along with the measured extraction volumes, are used to calculate the mass of VOCs removed from site groundwater during the reporting period. Quarterly influent samples were collected in January, April, July, and October 2020. These samples represent combined flow-weighted sampling of the five active collection wells in the WPL and three active collection wells in the SPBA (CW-9, CW-13, CW-15A, CW-17, CW-20, CW-21, CW-22, and CW-23). The untreated influent samples contained total VOCs ranging in concentrations from 640 micrograms per liter (µg/L) to 727 µg/L during 2020. Using these data, the total estimated mass of VOCs removed from January through December 2020 was 694 pounds. The calculated VOC mass removal rates (pounds per day [lbs/day]) extracted by the GWTS for the last four calendar years are shown below:

- 2020 – 1.9 lbs/day
- 2019 – 2.3 lbs/day
- 2018 – 2.3 lbs/day
- 2017 – 2.9 lbs/day

The predominant VOCs identified in the PTA influent samples has historically included TCE, TCA, and PCE (see **Figure 4-2)**. Levels of influent total VOCs were somewhat stable over the last few years but have decreased slightly during this reporting period. The predominant influent VOC changed from TCE to PCE during the spring of 2013, and the concentration of PCE further increased upon startup of CW-20 during 2014. Concurrent with the GWTS shutdown and restart, a spike in the influent concentration of cis-1,2-DCE was noted during 2015 and early 2016. The predominant GWTS influent VOCs observed during 2020 were similar to that observed in 2019, and included (in order of dominance) PCE, TCE/cis-1,2-DCE, and TCA (see **Figure 4-2**).

4.4 Groundwater System Inspection and Reporting

Groundwater system compliance reporting includes routine monthly and quarterly NPDES permit required monitoring reports, known as Discharge Monitoring Reports (DMRs), and an annual operations report for the GWTS. Additionally, the Susquehanna River Basin Commission (SRBC) requires submittal of quarterly groundwater withdrawal reports, and PADEP requires an annual Chapter 110 (formerly Act 220) groundwater withdrawal report for this facility.

In accordance with the NPDES permit, the PTA effluent was sampled and reported four times during 2020. Analytical testing results for the 2020 PTA effluent and influent sampling is presented in **Table A-2 (Appendix A)**. The treatment system effluent has maintained non-detectable concentrations of target VOCs during this reporting period.

On a quarterly basis, GWTS groundwater withdrawal data are submitted to the SRBC regarding non-consumptive groundwater withdrawals identified in SRBC docket Nos. 19900715-1 and 19980901-1. Docket No. 19900715-1 (NPBA and CW-8 collection wells) expired in July 2020 and was not renewed because the collection wells are no longer active or have been abandoned. Docket 19980901-1 includes the active WPL extraction wells and the SPBA extraction wells. Information provided to the SRBC includes daily groundwater withdrawal totals (i.e., groundwater volumes extracted) from all collection wells identified in the respective dockets.

5.0 WEST PARKING LOT GROUNDWATER EXTRACTION SYSTEM

Four (4) groundwater collection wells (CW-9, CW-13, CW-17, and CW-20) are in the WPL Area of the West Campus. One additional collection well (CW-15A) is located in a trailer parking area of the West Campus (formerly NB4 area).

Groundwater extraction from the five WPL wells is conducted via underground piping to the GWTS in Building 41A. The wells are individually piped to the GWTS so that flow control, flow measurements, and water samples may be obtained for each well at this central location. Water is piped the following distances from the wells to the treatment plant: CW-20 (1,600 feet), CW-9 (1,400 feet), CW-13 (890 feet), CW-15A (310 feet), and CW-17 (590 feet).

Approximately 123 million gallons of groundwater were extracted from the WPL Area during 2020 (see **Table 5-1**).

5.1 Maintenance

A brief summary of maintenance actions for the WPL Area in 2020 is presented below:

- Collection well CW-15A overload and flow faults occurred in January and July 2020. Fuses were replaced on January 20 and the well was restarted. The pump assembly was pulled, the pump motor was replaced, and the piping manifold was flushed on July 23.
- Collection well CW-17 motor overload fault occurred on November 13. The pump assembly was pulled, and the motor was replaced on November 16.
- Collection well CW-20 motor overload fault occurred on February 6. The pump assembly was pulled, and the pump and motor were replaced on February 10. The CW-20 water level transducer stopped functioning on September 17. The pump assembly was pulled, and the transducer was replaced on December 3.

5.2 Groundwater Chemistry

The groundwater quality analysis data from the 2020 collection well sampling is presented in **Table A-1 (Appendix A)**. The historical concentrations and trends of the dominant VOCs (TCE, PCE, TCA, and cis-1,2-DCE) are illustrated in **Figures 5-1 through 5-5** for CW-9, CW-13, CW-15A, CW-17, and CW-20, respectively. Generally stable VOC trends were observed in all the active WPL collection wells during 2020. The highest concentration of VOCs continues to be found at CW-15A, with the level of 1,1,1-TCA and cis-1,2-DCE (up to 4,100 µg/L) being the highest VOC detected, followed by TCE with levels around 2,800 µg/L. TCA and its degradation products are not significant in any of the other WPL extraction wells. Collection well CW-20 had the second highest levels of VOCs, dominated by PCE at concentrations as high as 700 µg/L, and TCE with maximum concentrations of 240 µg/L. Collection well CW-9 is also dominated by PCE, with maximum concentrations of 290 µg/L. Collection well CW-13 exhibited dominant concentrations of cis-1,2-DCE at 340 µg/L, followed by PCE and TCE, with maximum concentrations of 170 and 84 µg/L, respectively. VOCs detected in extraction well CW-17 were found at the lowest levels of the WPL extraction wells. PCE and TCE were the dominant VOCs detected at CW-17, with maximum concentrations of both compounds detected around 50 µg/L. VOC concentrations were generally most similar for the three last quarters of WPL extraction well sampling during 2020; whereas the lowest levels were observed at each of the wells during the March 2020 (first) quarterly sampling event.

6.0 SPBA GROUNDWATER EXTRACTION SYSTEM

The SPBA groundwater extraction system captures shallow groundwater containing PCE and TCE from the fine-grained residual soil and bedrock along the eastern-most portion of the south fYNOP property boundary. Three SPBA collection wells (CW-21, CW-22, CW-23) were installed, and the SPBA collection wells pumping started on October 31, 2018. Following startup, an effectiveness report concluded “the SPBA groundwater extraction system is currently operating as designed and meets the objective of pumping to establish a groundwater gradient that slopes from off-Site wells located along Canterbury Lane toward on-Site wells located in the

SPBA" (GSC, 2019c). Effectiveness of the SPBA system is evaluated quarterly and status updates are provided to PADEP and EPA via e-mail communications (R. Golia, personal communication).

Each SPBA collection well is fitted with an electric submersible pump controlled by variable frequency drives (VFDs) and a submersible level transducer to maintain design drawdown conditions. Groundwater extracted from the SPBA wells is conducted via underground piping from the well heads to the SPBA control building (located in the SPBA) and the combined effluent is transferred to the GWTS in Building 41A. The SPBA control building houses the PLC, control panel, and separate pressure and flow transmitters, piping and valves for each of the extraction wells. The wells are individually piped to the SPBA control building so that flow control, flow measurements, and water samples may be obtained for each well at this central location. Water is piped the following approximate distances from the wells to the SPBA control building: CW-21 (550 feet), CW-22 (400 feet), and CW-23 (300 feet). Untreated groundwater from the three SPBA collection wells are combined into a manifold in the SPBA control building, and then discharged together via a single conveyance pipe that extends approximately 3,900 feet from the SPBA control building to the treatment plant in Building 41A.

Approximately 3,420,500 gallons of groundwater were extracted from the SPBA Area during 2020 (see **Table 5-1**).

6.1 System Installation and Operational Controls

A controls building was installed in the SPBA area for the addition of the SPBA collection well network. Power for the SPBA system is fed from the nearby residential area, and not through the Harley-Davidson plant electrical system. Each well is piped to the SPBA controls building via 2-inch high density polyethylene (HDPE) underground conveyance piping. Two (2) 3-inch diameter HPDE conveyance pipes (active and spare) were installed from the building and tied into the existing GWTS conveyance piping near Gate 5 in February 2018. Each well has a level transducer to control the pumping rate. The SPBA collection well pumping rates generally range from 0.5 to 6 gpm among the three wells.

6.2 Maintenance

A brief summary of maintenance actions for the SPBA Area in 2020 is presented below:

- The SPBA system temporarily lost power in January, June, July, August, and September due to storms in the area.
- Collection well CW-21 transducer PLC settings were adjusted in April to maintain the designed drawdown.
- Collection well CW-22 VFD fault occurred in April, and CW-22 was shut down in

September during MW-162 over-drilling.

- Collection well CW-23 transmitter faults occurred in June, July, and August.
- The PLC programming was updated in March to fix the clock.
- Annual maintenance was completed on the collection wells in October. The pump assemblies were pulled and inspected for damage and mineral fouling, the transducer setting was verified, and the high-pressure switch was tested.

6.3 Groundwater Chemistry

The groundwater quality analytical data from the 2020 collection well sampling is presented in **Table A-1 (Appendix A)**. The concentrations and trends of the dominant VOCs (TCE, PCE, TCA, and cis-1,2-DCE) are also illustrated in **Figures 6-1 through 6-3** for CW-21, CW-22, and CW-23, respectively. The highest concentration of VOCs in the SPBA area are at CW-21 with a concentration of PCE up to 210 µg/L being the highest VOC detected. Extraction well CW-22 had the second highest levels of VOCs, dominated by PCE at a concentration up to 94 µg/L. The concentration of VOCs detected in extraction well CW-23 was the lowest of the SPBA extraction wells with a PCE concentration up to 48 µg/L. Generally stable VOC trends were observed at SPBA collection wells CW-21 and CW-23 during 2020. CW-22 exhibited a slightly decreasing trend for PCE during 2020, with concentrations falling from 94 to 81 µg/L during the year.

7.0 REFERENCES

Groundwater Sciences Corporation (GSC), 2018. Supplemental Remedial Investigation Groundwater Report (Part 2), Former York Naval Ordnance Plant, March (Revised).

GSC, 2019a. Site-Wide Cleanup Plan, Former York Naval Ordnance Plant, 1425 Eden Road, Springettsbury Township, York Pennsylvania, November 25.

GSC, 2019b. 2018 Annual Monitoring Progress Report for the NPBA Extraction System Shutdown, Former York Naval Ordnance Plant, 1425 Eden Road, Springettsbury Township, York Pennsylvania, April 9.

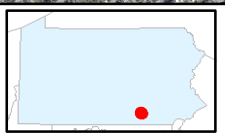
GSC, 2019c. Southern Property Boundary Area Groundwater Extraction System Operation Effectiveness Report, Former York Naval Ordnance Plant. October 28.

FIGURES

Legend

Property Boundary (Former York Naval Ordnance Plant; Approximately 229 Acres)

West Campus Boundary



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0 1,000 2,000 4,000

Feet

Former York Naval Ordnance Plant

1425 Eden Road
York, Pennsylvania

Hydro-Terra Group
www.hydro-terra.com

HDTF - Groundwater Systems Operations

Site Location Map

drawn:	LPD	03/18/21	figure: 1-1
checked:	EMW	03/18/21	
approved:	RGM	03/18/21	

Document Path: J:\Harley-Davidson\Maps\HD-Site Location Map_20210218.mxd

Coordinate System: NAD 1983 2011 StatePlane Pennsylvania South FIPS 3702 Ft US

NPBA Control Bldg

NPBA Groundwater Conveyance Pipe to Treatment Plant

Treatment System Discharge Line

Groundwater Treatment Plant (Bldg 41A)

NPBA Groundwater Collection Pipe to Control Building

Outfall No. 003

WPL Collection Pipes to Treatment Plant

SPBA Conveyance Pipe

Former Lift Station

SPBA Control Building

Codorus Creek

30

N

Legend

- Monitoring Well & Designation
- Extraction Well & Designation
- Treatment System Features
- Streams, Creeks, and Ponds
- Roads, Curbs, & Boundaries
- Railroad Tracks
- West Campus Boundary
- Property Boundary
- Existing Buildings
- Northeast Property Boundary Area
- Southern Property Boundary Area
- West Parking Lot (WPL) Area
- Stormwater Basin

0 250 500 1,000

Feet

Former York Navel Ordnance Plant

1425 Eden Road
York, Pennsylvania 17402

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Groundwater System Operations

Groundwater Treatment System Location

drawn:	LPD	02/18/21	figure: 1-2
checked:	EMW	02/18/21	
approved:	RGM	02/18/21	

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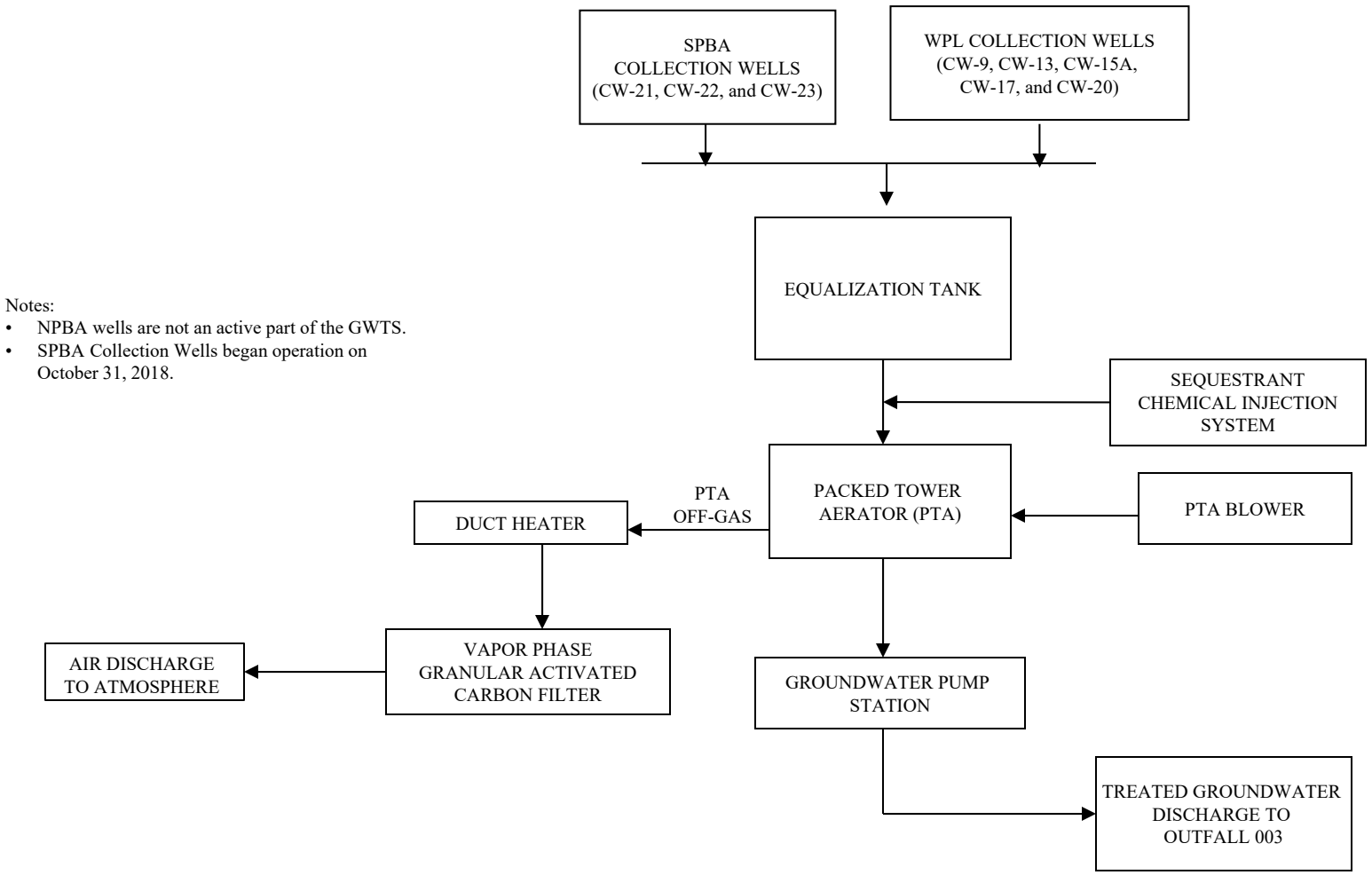
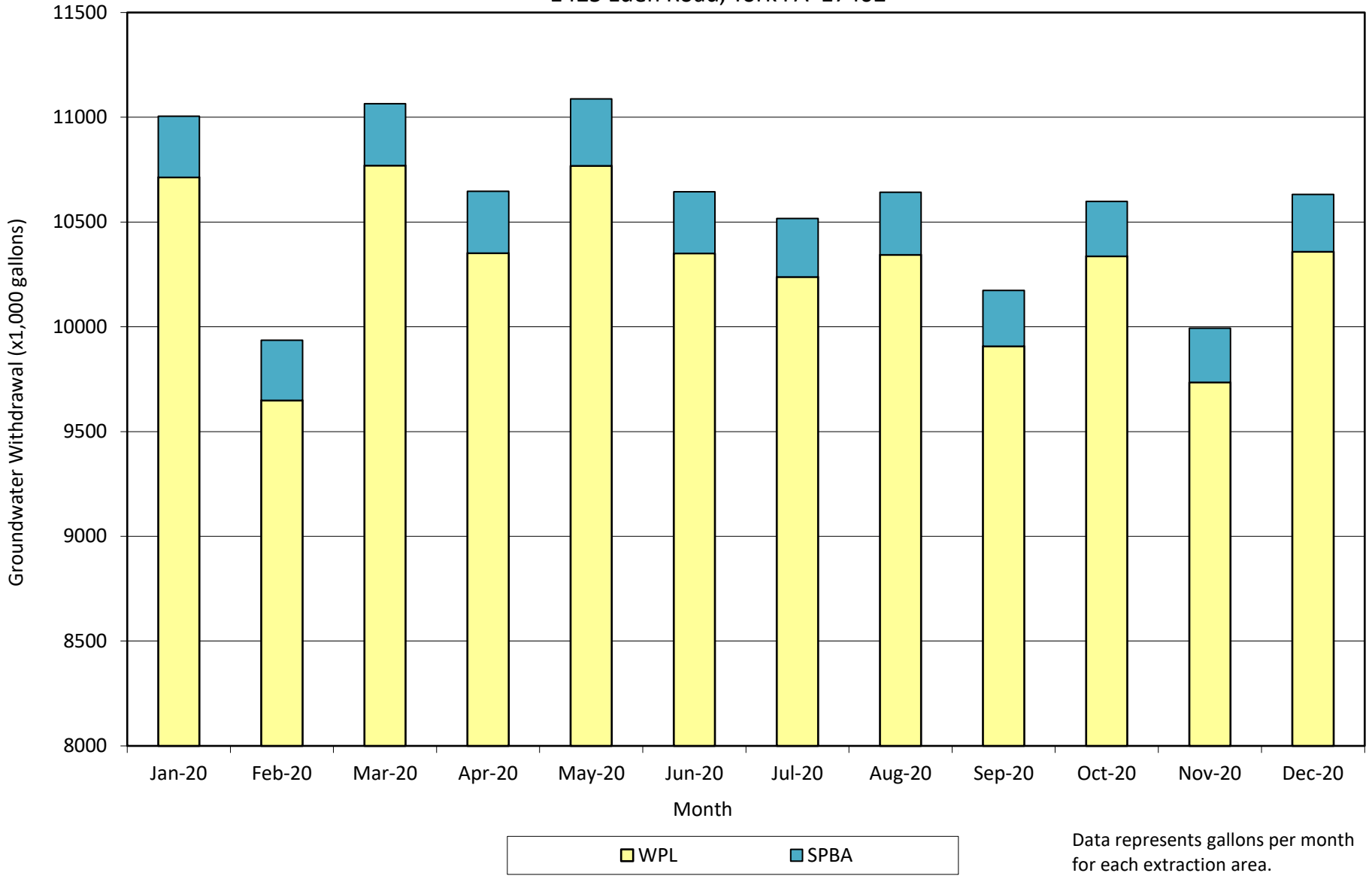
Coordinate System: NAD 1983 2011 StatePlane Pennsylvania South FIPS 3702 Ft US

FIGURE 1-3
GROUNDWATER TREATMENT SYSTEM FLOW DIAGRAM
former York Naval Ordnance Plant



Notes:
- NPBA wells are not an active part of the GWTS.
- SPBA Collection Wells began operation on October 31, 2018.

Figure 4-1
2020 Groundwater Withdrawals
Former York Naval Ordnance Plant
1425 Eden Road, York PA 17402



Data represents gallons per month for each extraction area.

Figure 4-2
Packed Tower Aerator Influent Chemistry
Former York Naval Ordnance Plant
1425 Eden Road, York PA 17402

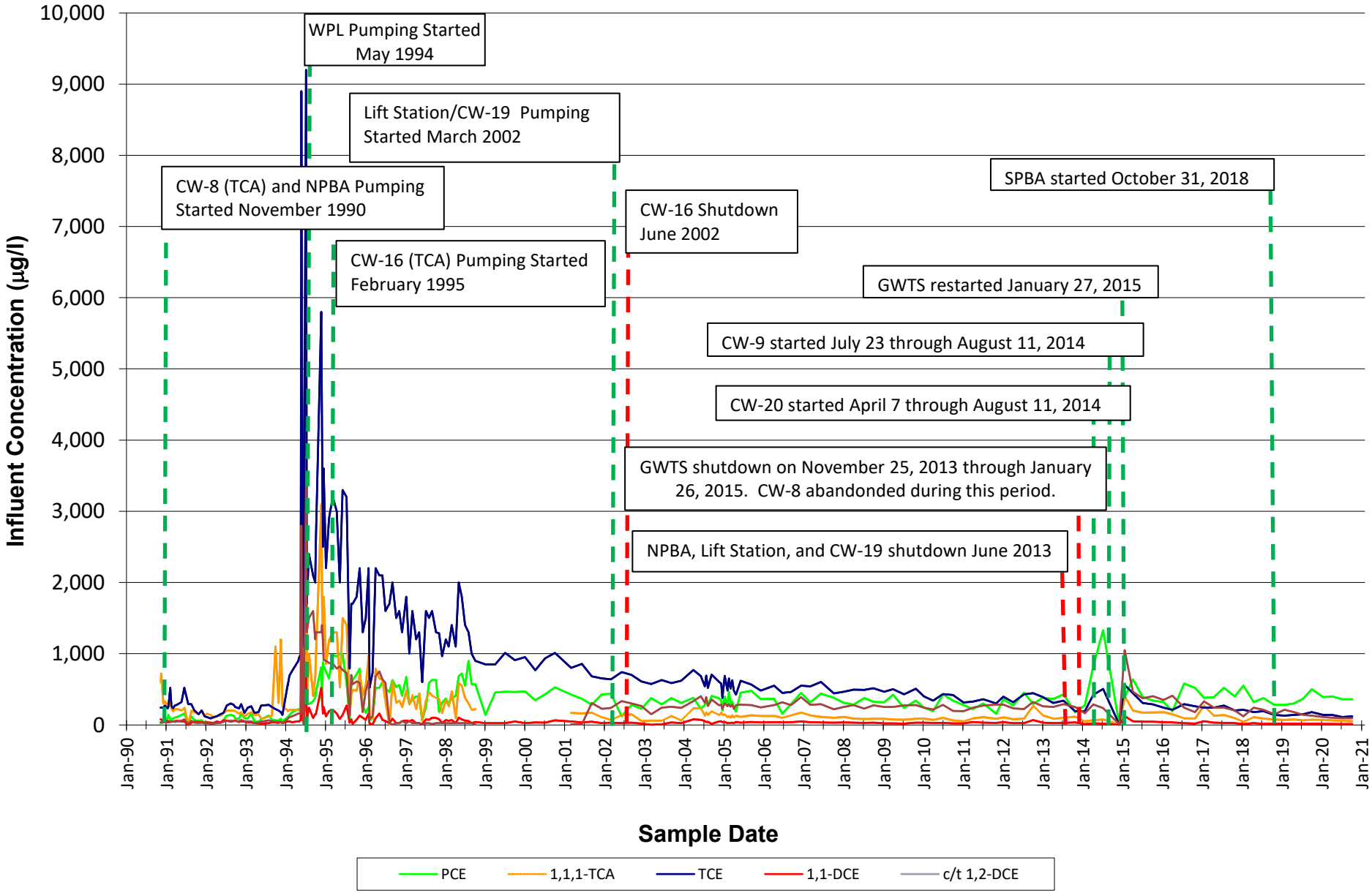


Figure 5-1
Predominant VOC Concentrations - Collection Well CW-9
Former York Naval Ordnance Plant
1425 Eden Road, York PA 17402

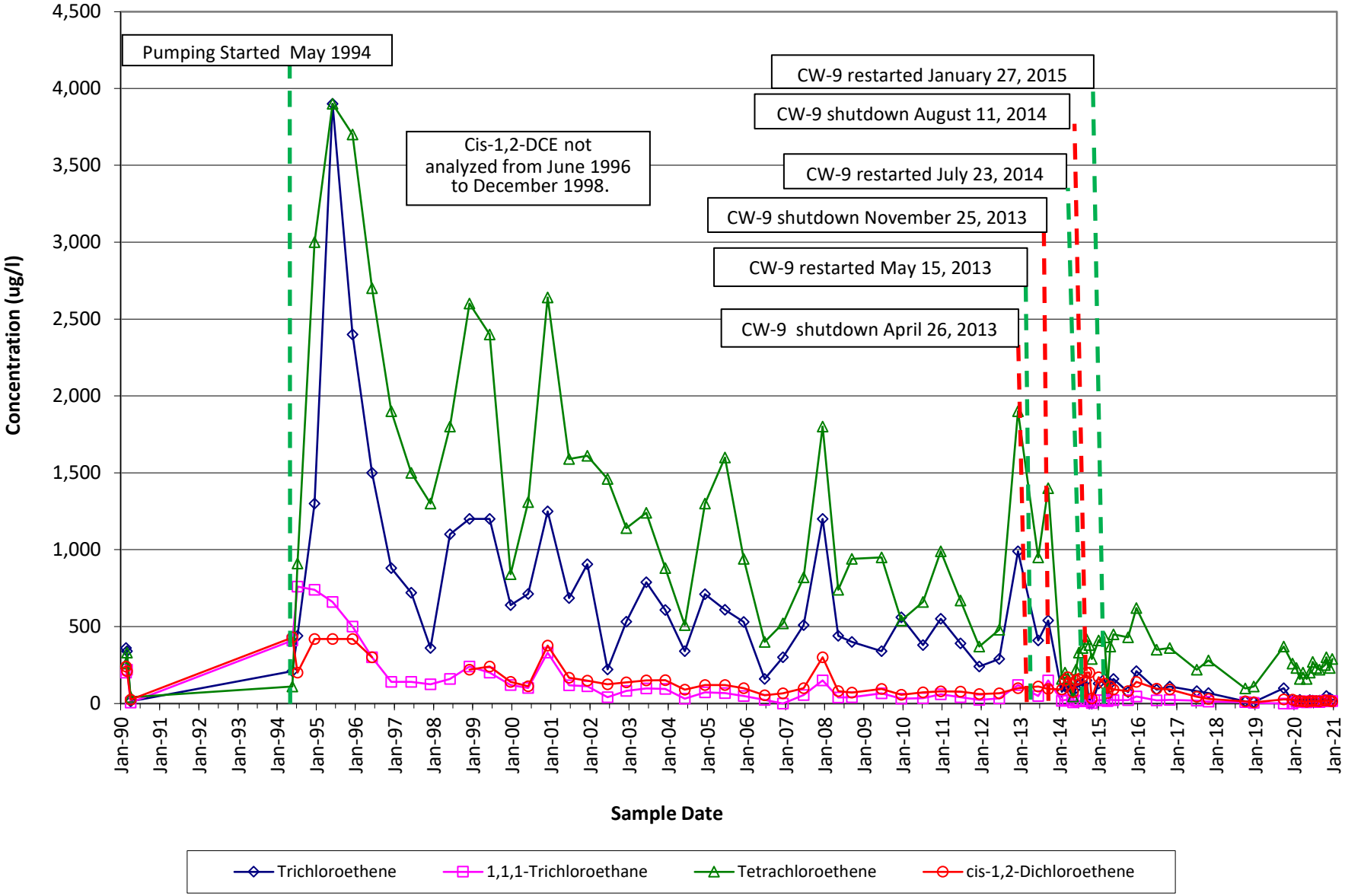


Figure 5-2
Predominant VOC Concentrations - Collection Well CW-13
Former York Naval Ordnance Plant
1425 Eden Road, York PA 17402

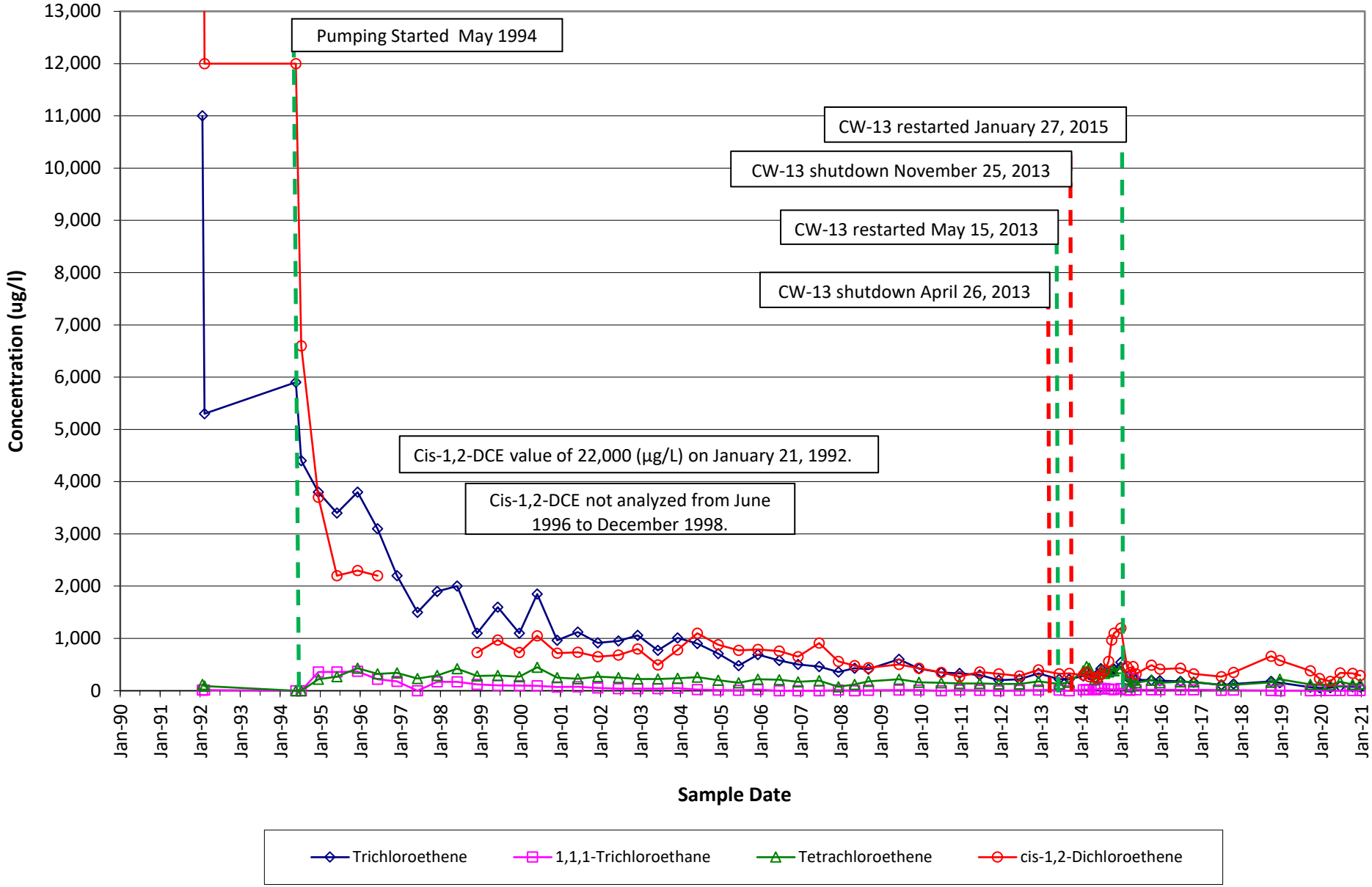


Figure 5-3
Predominant VOC Concentrations - Collection Well CW-15A
Former York Naval Ordnance Plant
1425 Eden Road, York PA 17402

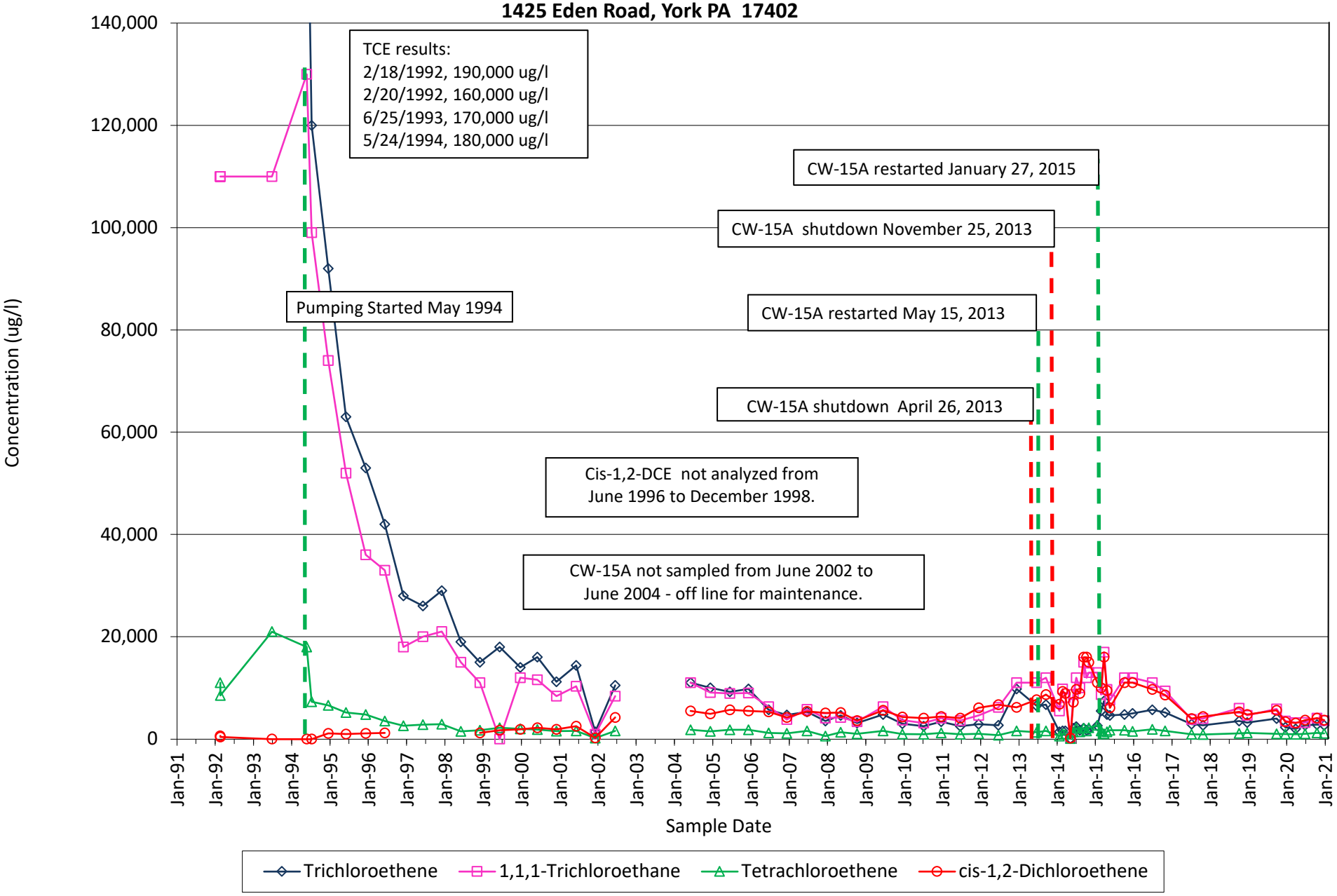


Figure 5-4
Predominant VOC Concentrations - Collection Well CW-17
Former York Naval Ordnance Plant
1425 Eden Road, York PA 17402

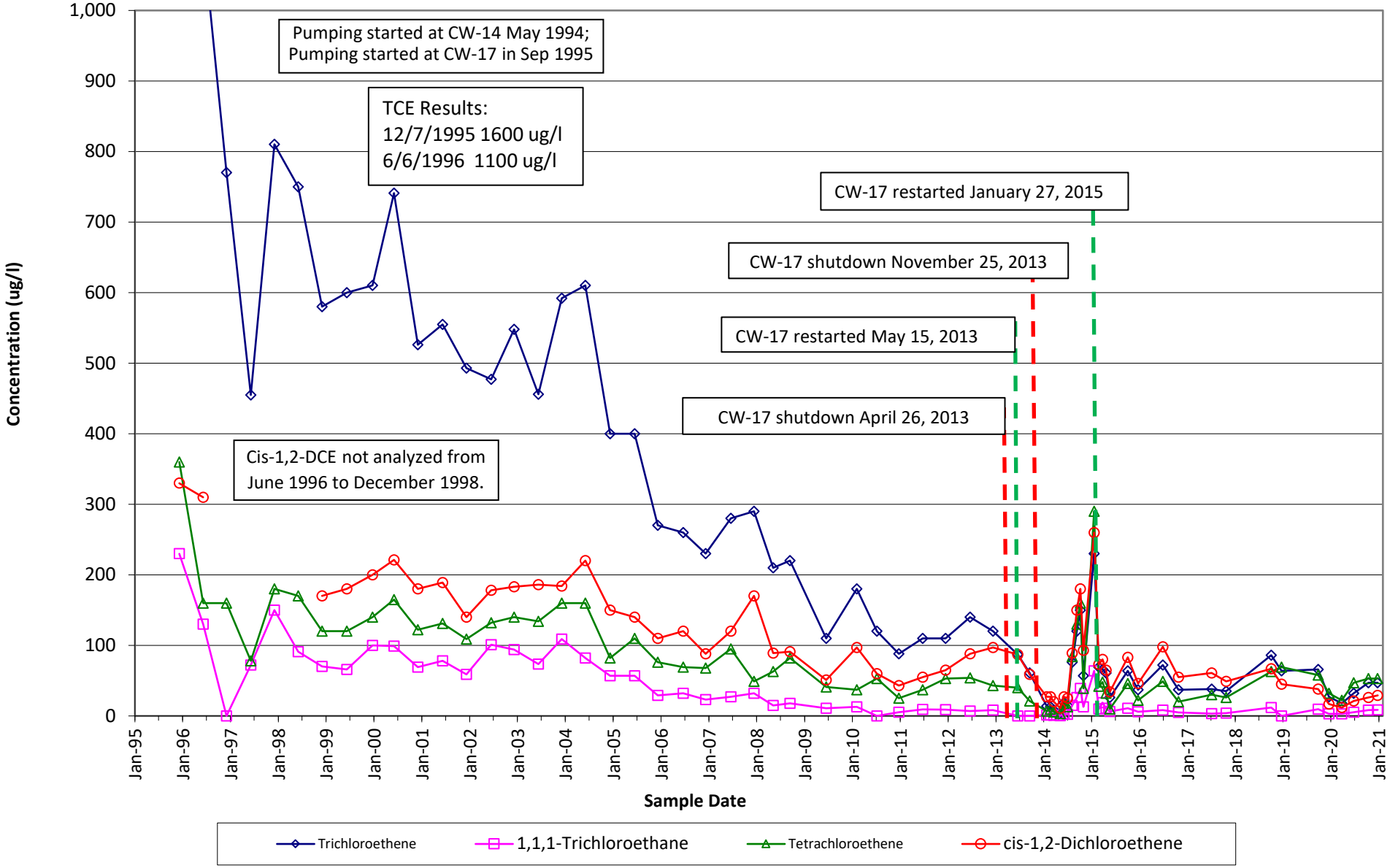


Figure 5-5
Predominate VOC Concentrations - Collection Well CW-20
Former York Naval Ordnance Plant
1425 Eden Road, York PA 17402

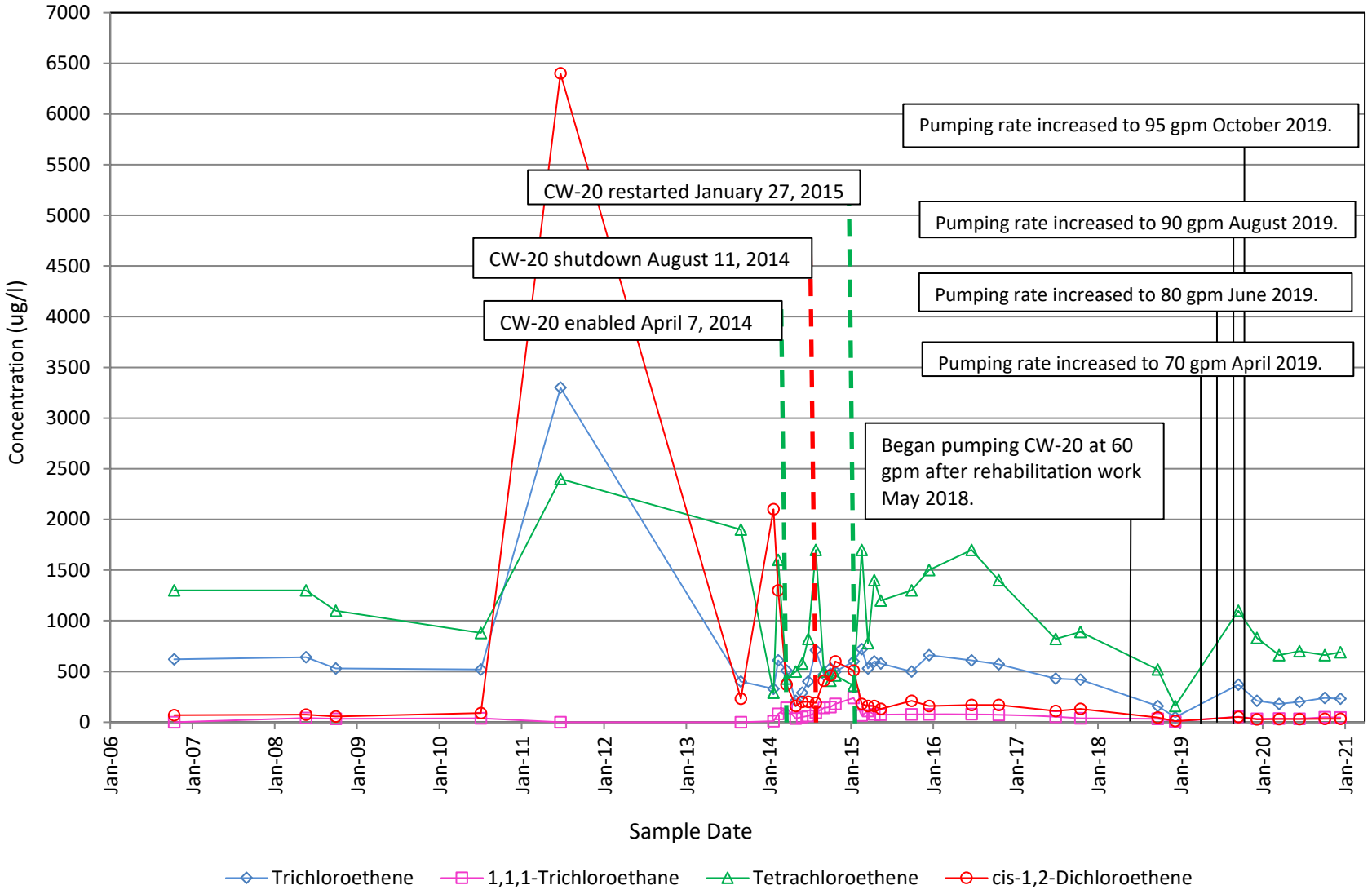


Figure 6-1
Predominate VOC Concentrations - Collection Well CW-21
Former York Naval Ordnance Plant
1425 Eden Road, York PA 17402

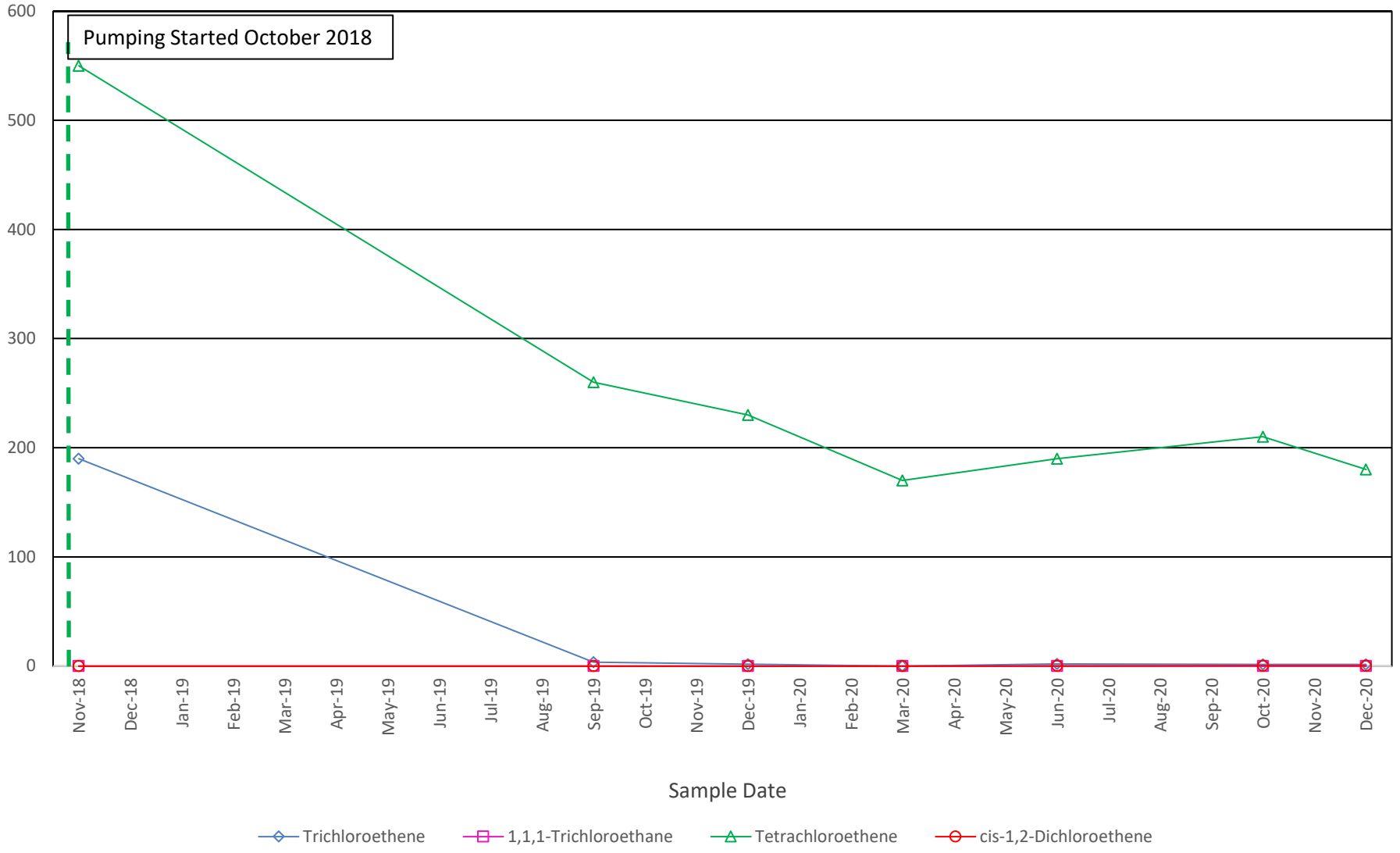


Figure 6-2
Predominate VOC Concentrations - Collection Well CW-22
Former York Naval Ordnance Plant
1425 Eden Road, York PA 17402

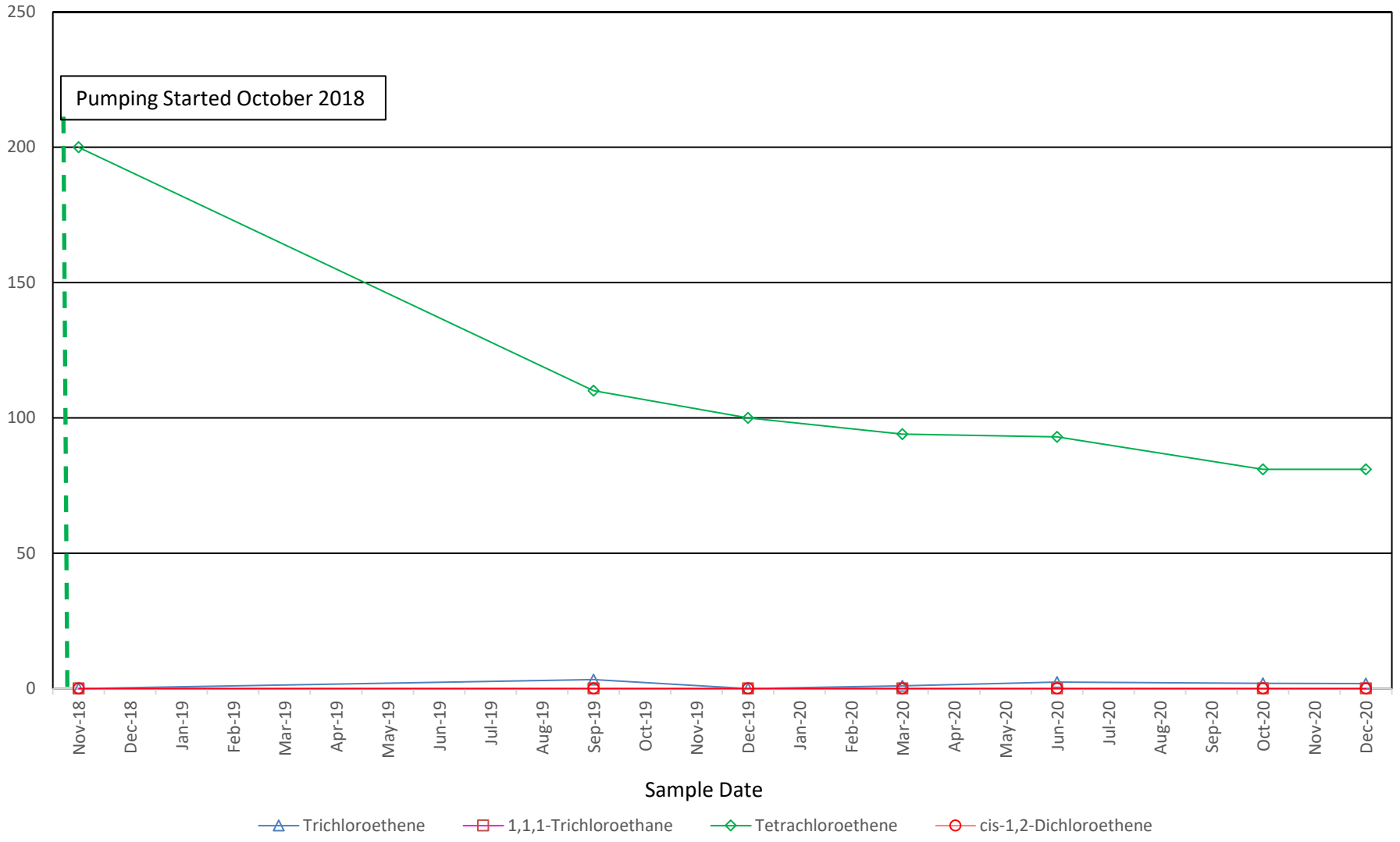
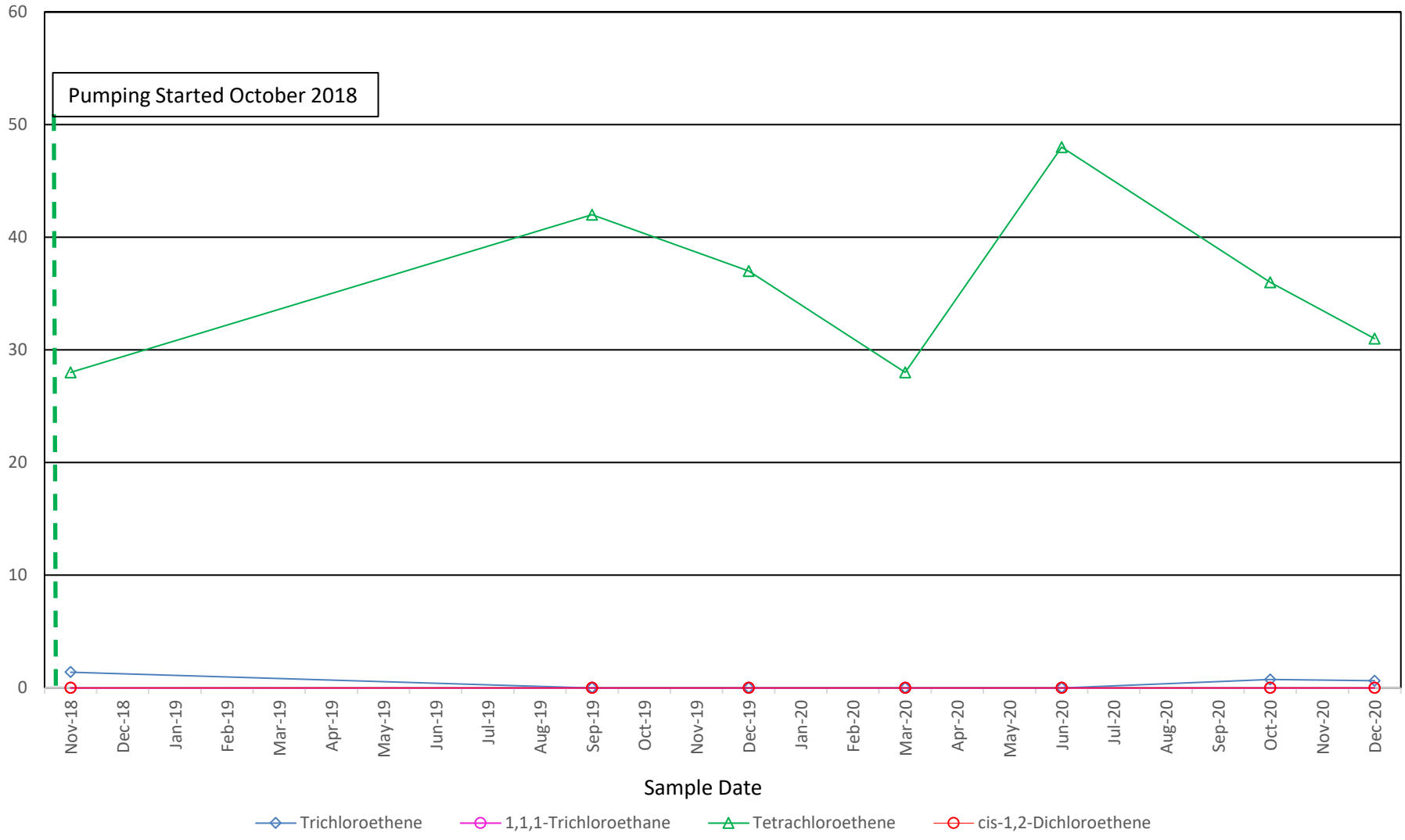


Figure 6-3
Predominate VOC Concentrations - Collection Well CW-23
Former York Naval Ordnance Plant
1425 Eden Road, York PA 17402



TABLES

TABLE 4-1
VOCs REMOVED FROM COLLECTED GROUNDWATER
Former York Naval Ordnance Plant
1425 Eden Road, York PA 17402

JANUARY 1, 2020 - DECEMBER 31, 2020				
DATE	MONTHLY GROUNDWATER WITHDRAWAL (AST Totalizer, gallons)	AVERAGE MONTHLY TOTAL VOCs (ppb)		ESTIMATED MONTHLY VOC REMOVAL (pounds)
Jan-20	10,460,612	727		64
Feb-20	9,550,462	727	*	58
Mar-20	10,465,908	727	*	64
Apr-20	10,184,849	722		61
May-20	10,698,998	722	*	65
Jun-20	10,398,982	722	*	63
Jul-20	10,216,430	640		55
Aug-20	10,194,074	640	*	54
Sep-20	9,659,661	640	*	52
Oct-20	10,118,856	640		54
Nov-20	9,510,523	640	*	51
Dec-20	10,163,571	640	*	54
TOTAL	**121,622,926**	**NA**		**694**

NOTES:

1. * - No sample collected this month; concentration is the most recent
2. NA - Not Applicable

ANNUAL TOTALS		
YEAR	GROUNDWATER WITHDRAWAL (gallons)	ESTIMATED VOC REMOVAL (pounds)
1990 (NOV & DEC)	12,954,886	92
1991	62,458,393	357
1992	66,081,120	322
1993	72,198,940	421
1994	88,387,251	3,905
1995	141,357,856	5,572
1996	152,168,899	3,631
1997	150,246,400	2,675
1998	157,461,800	2,795
1999	133,687,100	1,464
2000	152,839,477	1,785
2001	134,557,249	1,659
2002	121,290,897	1269
2003	153,097,508	1,599
2004	140,725,167	1,786
2005	134,503,508	1,550
2006	125,192,364	1,295
2007	149,331,940	1,734
2008	155,341,655	1,560
2009	161,171,721	1,584
2010	159,042,802	1,388
2011	154,368,351	1,196
2012	153,624,656	1,519
2013	145,516,783	1,321
2014	17,300,548	262
2015	105,746,121	1,501
2016	113,974,022	1,058
2017	112,873,883	1,041
2018	121,853,402	856
2019	127,551,117	821
2020	121,622,926	694
Total	**3,798,528,742**	**48,712**

TABLE 5-1
2020 RECORD OF GROUNDWATER WITHDRAWALS
Former York Naval Ordnance Plant
1425 Eden Road, York PA 17402

MONTH	WPL WELLS (gallons)						SPBA WELLS (gallons)[2]				Monthly [1] TOTAL (gallons)
	CW-9	CW-13	CW-15A	CW-17	CW-20	SUBTOTAL	CW-21	CW-22	CW-23	SUBTOTAL	
Jan-20	2,279,148	1,556,677	205,991	2,520,886	4,150,446	10,713,148	178,804	81,649	31,959	292,412	11,005,560
Feb-20	2,169,666	1,492,230	214,209	2,398,327	3,373,890	9,648,322	174,079	78,537	34,384	287,000	9,935,322
Mar-20	2,291,613	1,590,939	205,357	2,474,256	4,206,858	10,769,023	181,348	80,614	33,333	295,295	11,064,318
Apr-20	2,208,391	1,502,623	195,973	2,422,673	4,021,483	10,351,143	177,640	82,043	36,214	295,897	10,647,040
May-20	2,219,988	1,553,980	219,637	2,571,889	4,203,346	10,768,840	192,556	83,760	42,267	318,583	11,087,423
Jun-20	2,076,799	1,503,282	200,784	2,493,445	4,076,153	10,350,463	179,034	80,128	34,242	293,404	10,643,867
Jul-20	2,148,989	1,398,187	144,497	2,484,758	4,061,447	10,237,878	170,223	79,136	29,964	279,323	10,517,201
Aug-20	2,192,023	1,401,724	169,747	2,497,944	4,082,388	10,343,826	182,272	83,034	32,595	297,901	10,641,727
Sep-20	2,137,198	1,289,968	156,443	2,400,527	3,922,851	9,906,987	166,654	74,722	25,374	266,750	10,173,737
Oct-20	2,245,634	1,212,215	156,405	2,552,121	4,170,480	10,336,855	162,839	77,622	20,985	261,446	10,598,301
Nov-20	2,142,849	1,179,564	151,819	2,201,475	4,058,709	9,734,416	166,264	74,555	18,404	259,223	9,993,639
Dec-20	2,218,413	1,223,965	162,551	2,556,664	4,196,654	10,358,247	172,426	77,101	23,831	273,358	10,631,605
TOTALS	26,330,711	16,905,354	2,183,413	29,574,965	48,524,705	123,519,148	2,104,139	952,901	363,552	3,420,592	126,939,740

Notes:

[1] Monthly groundwater withdrawal value from Table 4-1 differs slightly from the monthly total. The value in Table 4-1 is taken from the PTA totalizer. The monthly total is the sum of the individual well totalizers.

[2] SPBA collection wells pumping started October 31. 2018.

APPENDIX A

Data Tables

Table A-1.
2020 Groundwater Data Summary - Collection Wells
Former York Naval Ordnance Plant
1425 Eden Road, York PA 17402

					WPL Collection Wells																			
Location/ID Sample Date Parameter	MSC UA R (ug/L)	MSC UA NR (ug/L)	Federal MCL (ug/L)	EPA RSL Tap Water (ug/L)	CW-9 3/25/2020	Qual	CW-9 6/24/2020	Qual	CW-9 10/15/2020	Qual	CW-9 12/23/2020	Qual	CW-13 3/25/2020	Qual	CW-13 6/24/2020	Qual	CW-13 10/15/2020	Qual	CW-13 12/23/2020	Qual	CW-15A 3/25/2020	Qual	CW-15A 6/24/2020	Qual
1,1,1,2-Tetrachloroethane	70	70		0.57	2.5	U	1	U	1	U	1	U	2.5	U	1	U	1	U	1	U	10	U	10	U
1,1,1-Trichloroethane	200	200	200	8000	10		14		17		23		4.6		3.8		2.2		2.8		3200		3200	
1,1,2,2-Tetrachloroethane	0.84	4.3		0.076	2.5	U	1	U	1	U	1	U	2.5	U	1	U ^c *H	1	U	1	U	10	U	10	U ^c *H
1,1,2-Trichloroethane	5	5	5	0.28	2.5	U	1	U	1	U	1	U	2.5	U	1	U	1	U	1	U	10	U	10	U
1,1-Dichloroethane	31	160		2.8	1.7	J	1.9		2.1		1.8		2.5	U	1.8		0.94	J	1.2		77		95	
1,1-Dichloroethene	7	7	7	280	1.4	J	1.7		1.7		1.4		4.1		3.5		2		2.4		810		830	
1,2-Dibromoethane	0.05	0.05	0.05	0.0075	2.5	U	1	U	1	U	1	U	2.5	U	1	U	1	U	1	U	10	U	10	U
1,2-Dichloroethane	5	5	5	0.17	2.5	U	1	U	1	U	1	U	2.5	U	1	U	1	U	1	U	10	U	10	U
1,2-Dichloropropane	5	5	5	0.44	2.5	U	1	U	1	U	1	U	2.5	U	1	U *	1	U	1	U	10	U	10	U *
2-Butanone	4000	4000		5600	13	U	10	U	10	U	10	U	13	U	10	U	10	U	10	U	50	U	100	U
2-Hexanone	63	260		38	13	U	10	U	10	U	10	U ^c	13	U	10	C	10	U	10	U ^c	50	UJ	100	U ^c
4-Methyl-2-Pentanone	3300	9300		6300	13	UJ	10	U	10	U	10	U	13	UJ	10	U	10	U	10	U	50	U	100	U
Acetone	38000	110000		14000	13	U	20	U	20	U	20	U ^c	13	U	20	U	20	U	20	U ^c	50	U	200	U
Acrylonitrile	0.72	3.7		0.052	50	U	20	U	NA		NA	U	50	U	20	U	NA		NA		200	U	200	U
Benzene	5	5	5	0.46	2.5	U	1	U	1	U	1	U	2.5	U	1	U	1	U	1	U	10	U	10	U
Bromochloromethane	90	90		83	2.5	U	5	U	NA		5	U	2.5	U	5	U	NA		5	U	10	U	50	U
Bromodichloromethane	80	80		0.13	2.5	U	1	U	1	U	1	U	2.5	U	1	U	1	U	1	U	10	U	10	U
Bromoform	80	80		3.3	2.5	UJ	4	U	4	U	4	U	2.5	UJ	4	U	4	U	4	U	10	U	40	U
Bromomethane	10	10		7.5	2.5	U	1	U	1	U	1	U	2.5	U ^c	1	U	1	U	1	U	10	U	10	U
Carbon Disulfide	1500	6200		810	2.5	U	5	U	5	U	5	U	2.5	U	5	U ^c *H	5	U	5	U	10	U	50	U ^c *H
Carbon Tetrachloride	5	5	5	0.46	2.5	U	1	U	1	U	1	U	2.5	U	1	U	1	U	1	U	10	U	10	U
Chlorobenzene	100	100	100	78	2.5	U	1	U	1	U	1	U	2.5	U	1	U	1	U	1	U	10	U	10	U
Chlorodibromomethane	80	80		0.87	2.5	U	1	U	1	U	1	U	2.5	U	1	U	1	U	1	U	10	U	10	U
Chloroethane	250	1200		21000	2.5	U	1	U	1	U	1	U	2.5	U	1	U	1	U	1	U	10	U	10	U
Chloroform	80	80		0.22	2.5	U	1	U	1	U	0.21	J	2.5	U	1	U	1	U	0.23	J	10	U	10	U
Chloromethane	30	30		190	2.5	U	1	U	1	U	1	U	2.5	U	1	U	1	U	1	U	10	U	10	U
cis-1,2-Dichloroethene	70	70	70	36	14		15		18		14		180		340	*H	330		290		3100		3700	
cis-1,3-Dichloropropene	7.3	34		0.47	2.5	U	1	U	1	U	1	U	2.5	U	1	U	1	U	1	U	10	U	10	U
Ethylbenzene	700	700	700	1.5	2.5	U	1	U	1	U	1	U	2.5	U	1	U	1	U	1	U	10	U	10	U
Methyl tert-butyl ether	20	20		14	2.5	U	1	U	1	U	1	U	2.5	U	1	U	1	U	1	U	10	U	10	U
Methylene chloride	5	5		11	2.5	U	1	U	1	U	1	U	2.5	U	1	U	1	U	1	U	10	U	10	U
Styrene	100	100	100	1200	2.5	U	5	U	5	U	5	U	2.5	U	5	U	5	U	1	U	10	U	50	U
Tetrachloroethene	5	5	5	11	200		270		250	^c	290		110		170		120	^c	130		910		1000	
Toluene	1000	1000	1000	1100	2.5	U	1	U	1	U	1	U	2.5	U	1	U	1	U	1	U	10	U	10	U
trans-1,2-Dichloroethene	100	100	100	360	2.5	U	5	U	5	U	1	U	2.5	U	1.7	J	1.8	J	1.4		10	U	8.2	J
trans-1,3-Dichloropropene	7.3	34		0.47	2.5	U	1	U	1	U	1	U	2.5	U	1	U ^c	1	U	1	U	10	U	10	U ^c
Trichloroethene	5	5	5	0.49	12		18		24		24		58		84		77		72		2000	J	2700	
Vinyl Chloride	2	2	2	0.019	2.5	U	1	U	1	U	1	U	2.5	U	1.7		1.9		1.1		10	U	8	J
Xylenes (Total)	10000	10000	10000	190	5	U	6	U	6	U	6	U	5	U	6	U	6	U	6	U	20	U	60	U

Total VOC

^c - CCV recovery is outside acceptance limits.

U - Indicates the analyte was analyzed for but not detected.

J - Result is less than the reporting limit but greater than or equal to the method detection limit and the concentration is an approximate value.

*H - LCS and/or LCSD recovery above control limits.

NA - Not Analyzed

Table A-1.
2020 Groundwater Data Summary - Collection Wells
Former York Naval Ordnance Plant
1425 Eden Road, York PA 17402

					WPL Collection Wells																					
Location/ID Sample Date Parameter	MSC UA R (ug/L)	MSC UA NR (ug/L)	Federal MCL (ug/L)	EPA RSL Tap Water (ug/L)	CW-15A 10/15/2020	Qual	CW-15A 12/23/2020	Qual	CW-17 3/25/2020	Qual	CW-17 6/24/2020	Qual	CW-17 10/15/2020	Qual	CW-17 12/23/2020	Qual	CW-20 3/25/2020	Qual	CW-20 6/24/2020	Qual	CW-20 10/15/2020	Qual	CW-20 12/23/2020	Qual
1,1,1,2-Tetrachloroethane	70	70		0.57	10	U	10	U	1	U	1	U	1	U	1	U	10	U	2	U	1	U	1	U
1,1,1-Trichloroethane	200	200	200	8000	4100		3600		2.8		5.3		8.2		8.6		35		34		49	J	46	
1,1,2,2-Tetrachloroethane	0.84	4.3		0.076	10	U	10	U	1	U	1	U * ^c *H	1	U	1	U	10	U	2	U * ^c *H	1	U	1	U
1,1,2-Trichloroethane	5	5	5	0.28	10	U	10	U	1	U	1	U	1	U	1	U	10	U	2	U	1	U	1	U
1,1-Dichloroethane	31	160		2.8	86		81		2.4		3.9		4.2		5.3		8.9	J	10		10		11	U
1,1-Dichloroethene	7	7	7	280	830		730		2.2		4.1		5.4		5.9		10	U	6		7.6		7.5	
1,2-Dibromoethane	0.05	0.05	0.05	0.0075	10	U	10	U	1	U	1	U	1	U	1	U	10	U	2	U	1	U	1	U
1,2-Dichloroethane	5	5	5	0.17	4.3	J	3.8	J	1	U	1	U	1	U	1	U	10	U	2	U	1	U	1	U
1,2-Dichloropropane	5	5	5	0.44	10	U	10	U	1	U	1	U *	1	U	1	U	10	U	2	U *	1	U	1	U
2-Butanone	4000	4000		5600	100	U	100	U	5	U	10	U	10	U	10	U	50	U	20	U	10	U	10	U
2-Hexanone	63	260		38	100	U	100	U ^c	5	UJ	10	U ^c	10	U	10	U ^c	50	U	20	U ^c	10	U	10	U ^c
4-Methyl-2-Pentanone	3300	9300		6300	100	U	100	U	5	U	10	U	10	U	10	U ^c	50	UJ	20	U	10	U	10	U
Acetone	38000	110000		14000	200	U	200	U ^c	5	U	20	U	20	U	20	U ^c	50	U	40	U	20	U	20	U ^c
Acrylonitrile	0.72	3.7		0.052	NA		NA		20	U	20	U	NA		NA		200	U	40	U	NA		NA	
Benzene	5	5	5	0.46	2.6	J	10	U	1	U	1	U	5	U	1	U	10	U	2	U	1	U	1	U
Bromochloromethane	90	90		83	NA		50	U	1	U	5	U	NA		5	U ^c	10	U	10	U	NA		5	U
Bromodichloromethane	80	80		0.13	10	U	10	U	1	U	1	U	1	U	1	U	10	U	2	U	1	U	1	U
Bromoform	80	80		3.3	40	U	40	U	1	U	4	U	4	U	4	U	10	UJ	8	U	4	U	4	U
Bromomethane	10	10		7.5	10	U	10	U ^c	1	U	1	U	1	U	1	U	10	U	2	U	1	U	1	U
Carbon Disulfide	1500	6200		810	50	U	50	U	1	U	5	U ^c *H	5	U ^c	5	U	10	U	10	U ^c *H	5	U ^c	5	U
Carbon Tetrachloride	5	5	5	0.46	10	U	10	U	1	U	1	U	1	U	1	U	10	U	2	U	1	U	1	U
Chlorobenzene	100	100	100	78	10	U	10	U	1	U	1	U	1	U	1	U	10	U	2	U	1	U	1	U
Chlorodibromomethane	80	80		0.87	10	U	10	U	1	U	1	U	1	U	1	U	10	U	2	U	1	U	1	U
Chloroethane	250	1200		21000	10	U	10	U	1	U	1	U	1	U	1	U	10	U	2	U	1	U	1	U
Chloroform	80	80		0.22	2.9	J	2.9	J	1	U	1	U	0.21	J	0.22	J	10	U	2	U	0.27	J	0.28	J
Chloromethane	30	30		190	10	U	10	U	1	U	1	U	1	U	1	U	10	U	2	U	1	U	1	U
cis-1,2-Dichloroethene	70	70	70	36	4100		3700		12		21		26		29		30		30		34		32	
cis-1,3-Dichloropropene	7.3	34		0.47	10	U	10	U	1	U	1	U	1	U	1	U	10	U	2	U	1	U	1	U
Ethylbenzene	700	700	700	1.5	10	U	10	U	1	U	1	U	1	U	1	U	10	U	2	U	1	U	1	U
Methyl tert-butyl ether	20	20		14	10	U	10	U	1	U	1	U	1	U	1	U	10	U	2	U	1	U	1	U
Methylene chloride	5	5		11	10	U	10	U	1	U	1	U	1	U	1	U	10	U	2	U	1	U	1	U
Styrene	100	100	100	1200	50	U	50	U	1	U	5	U	5	U	1	U	10	U	10	U	5	U	5	U
Tetrachloroethene	5	5	5	11	1200		1100	U	22		47		53		53		660		700		660	^c	690	
Toluene	1000	1000	1000	1100	10	U	10	U	1	U	1	U	1	U	1	U	10	U	2	U	1	U	1	U
trans-1,2-Dichloroethene	100	100	100	360	22	J	6.7	J	1	U	5	U	0.29	J	0.23	J	10	U	10	U	5	U	1	U
trans-1,3-Dichloropropene	7.3	34		0.47	10	U	10		1	U	1	U ^c	1	U	1	U	10	U	2	U ^c	1	U	1	U
Trichloroethene	5	5	5	0.49	2800		2700		18		32		47		47		180		200		240	J	230	
Vinyl Chloride	2	2	2	0.019	7.5	J	6.1	J	1	U	1	U	1	U	1	U	10	U	2	U	1	U	1	U
Xylenes (Total)	10000	10000	10000	190	60	U	60	U	2	U	6	U	6	U	6	U	20	U	12	U	6	U	6	U

Total VOC

^c - CCV recovery is outside acceptance limits.

U - Indicates the analyte was analyzed for but not detected.

J - Result is less than the reporting limit but greater than or equal to the method detection

*H - LCS and/or LCSD recovery above control limits.

NA - Not Analyzed

Table A-1.
2020 Groundwater Data Summary - Collection Wells
Former York Naval Ordnance Plant
1425 Eden Road, York PA 17402

					SPBA Collection Wells											
Location/ID Sample Date Parameter	MSC UA R (ug/L)	MSC UA NR (ug/L)	Federal MCL (ug/L)	EPA RSL Tap Water (ug/L)	CW-21 3/25/2020	Qual	CW-21 6/24/2020	Qual	CW-21 10/15/2020	Qual	CW-21 12/23/2020	Qual	CW-22 3/25/2020	Qual	CW-22 6/24/2020	Qual
1,1,1,2-Tetrachloroethane	70	70		0.57	2.5	U	1	U	1	U	1	U	1	U	1	U
1,1,1-Trichloroethane	200	200	200	8000	2.5	U	1	U	1	U	1	U	1	U	1	U
1,1,2,2-Tetrachloroethane	0.84	4.3		0.076	2.5	U	1	U	1	U	1	U	1	U	1	U
1,1,2-Trichloroethane	5	5	5	0.28	2.5	U	1	U	1	U	1	U	1	U	1	U
1,1-Dichloroethane	31	160		2.8	2.5	U	1	U	1	U	1	U	1	U	1	U
1,1-Dichloroethene	7	7	7	280	2.5	U	1	U	1	U	1	U	1	U	1	U
1,2-Dibromoethane	0.05	0.05	0.05	0.0075	2.5	U	1	U	1	U	1	U	1	U	1	U
1,2-Dichloroethane	5	5	5	0.17	2.5	U	1	U	1	U	1	U	1	U	1	U
1,2-Dichloropropane	5	5	5	0.44	2.5	U	1	U	1	U	1	U	1	U	1	U
2-Butanone	4000	4000		5600	13	U	10	U	10	U	10	U	5	U	10	U
2-Hexanone	63	260		38	13	U	10	U	10	U	10	U ^c	5	U	10	U
4-Methyl-2-Pentanone	3300	9300		6300	13	UJ	10	U	10	U	10	U	5	UJ	10	U
Acetone	38000	110000		14000	13	U	20	U	20	U	20	U ^c	5	U	20	U
Acrylonitrile	0.72	3.7		0.052	50	U	20	U	NA		NA		20	U	20	U
Benzene	5	5	5	0.46	2.5	U	1	U	1	U	1	U	1	U	1	U
Bromochloromethane	90	90		83	2.5	U	5	U	NA		5	U	1	U	5	U
Bromodichloromethane	80	80		0.13	2.5	U	1	U	1	U	1	U	1	U	1	U
Bromoform	80	80		3.3	2.5	UJ	4	U	4	U	4	U	1	UJ	4	U
Bromomethane	10	10		7.5	2.5	U	1	U	1	U	1	U	1	U	1	U
Carbon Disulfide	1500	6200		810	2.5	U	5	U	5	U	5	U	1	U	5	U
Carbon Tetrachloride	5	5	5	0.46	2.5	U	1	U	1	U	1	U	1	U	1	U
Chlorobenzene	100	100	100	78	2.5	U	1	U	1	U	1	U	1	U	1	U
Chlorodibromomethane	80	80		0.87	2.5	U	1	U	1	U	1	U	1	U	1	U
Chloroethane	250	1200		21000	2.5	U	1	U	1	U	1	U	1	U	1	U
Chloroform	80	80		0.22	2.5	U	0.41	J	0.41	J	0.44	J	1	U	0.48	J
Chloromethane	30	30		190	2.5	U	1	U	1	U	1	U	1	U	1	U
cis-1,2-Dichloroethene	70	70	70	36	2.5	U	0.25	J	0.22	J	0.23	J	1	U	1	U
cis-1,3-Dichloropropene	7.3	34		0.47	2.5	U	1	U	1	U	1	U	1	U	1	U
Ethylbenzene	700	700	700	1.5	2.5	U	1	U	1	U	1	U	1	U	1	U
Methyl tert-butyl ether	20	20		14	2.5	U	1	U	1	U	1	U	1	U	1	U
Methylene chloride	5	5		11	2.5	U	1	U	1	U	1	U	1	U	1	U
Styrene	100	100	100	1200	2.5	U	5	U	5	U	5	U	1	U	5	U
Tetrachloroethene	5	5	5	11	170		190		210		180		94		93	
Toluene	1000	1000	1000	1100	2.5	U	1	U	1	U	1	U	1	U	1	U
trans-1,2-Dichloroethene	100	100	100	360	2.5	U	5	U	5	U	1	U	1	U	5	U
trans-1,3-Dichloropropene	7.3	34		0.47	2.5	U	1	U	1	U	1	U	1	U	1	U
Trichloroethene	5	5	5	0.49	2.5	U	1.9		1.5		1.5		0.97	J	2.3	
Vinyl Chloride	2	2	2	0.019	2.5	U	1	U	1	U	1	U	1	U	1	U
Xylenes (Total)	10000	10000	10000	190	5	U	6	U	6	U	6	U	2	U	6	U

Total VOC

^c - CCV recovery is outside acceptance limits.

U - Indicates the analyte was analyzed for but not detected.

J - Result is less than the reporting limit but greater than or equal to the method detection

*H - LCS and/or LCSD recovery above control limits.

NA - Not Analyzed

Table A-1.
2020 Groundwater Data Summary - Collection Wells
Former York Naval Ordnance Plant
1425 Eden Road, York PA 17402

					SPBA Collection Wells											
Location/ID	**MSC**	**MSC**	**Federal**	**EPA RSL**	CW-22		CW-22		CW-23		CW-23		CW-23		CW-23	
Sample Date	**UA R**	**UA NR**	**MCL**	**Tap Water**	10/15/2020		12/23/2020		3/25/2020		6/24/2020		10/15/2020		12/23/2020	
Parameter	**(ug/L)**	**(ug/L)**	**(ug/L)**	**(ug/L)**		Qual		Qual		Qual		Qual		Qual		Qual
1,1,1,2-Tetrachloroethane	70	70		0.57	1	U	1	U	1	U	1	U	1	U	1	U
1,1,1-Trichloroethane	200	200	200	8000	1	U	1	U	1	U	1	U	1	U	1	U
1,1,2,2-Tetrachloroethane	0.84	4.3		0.076	1	U	1	U	1	UJ	1	U	1	U	1	U
1,1,2-Trichloroethane	5	5	5	0.28	1	U	1	U	1	U	1	U	1	U	1	U
1,1-Dichloroethane	31	160		2.8	1	U	1	U	1	U	1	U	1	U	1	U
1,1-Dichloroethene	7	7	7	280	1	U	1	U	1	U	1	U	1	U	1	U
1,2-Dibromoethane	0.05	0.05	0.05	0.0075	1	U	1	U	1	U	1	U	1	U	1	U
1,2-Dichloroethane	5	5	5	0.17	1	U	1	U	1	U	1	U	1	U	1	U
1,2-Dichloropropane	5	5	5	0.44	1	U	1	U	1	U	1	U	1	U	1	U
2-Butanone	4000	4000		5600	10	U	10	U	5	U	10	U	10	U	10	U
2-Hexanone	63	260		38	10	U	10	U ^c	5	U	10	U	10	U	10	U ^c
4-Methyl-2-Pentanone	3300	9300		6300	10	U	10	U	5	UJ	10	U	10	U	10	U
Acetone	38000	110000		14000	20	U	20	U ^c	5	U	20	U	20	U	20	U ^c
Acrylonitrile	0.72	3.7		0.052	NA		NA		20	U	20	U	NA		NA	
Benzene	5	5	5	0.46	1	U	1	U	1	U	1	U	1	U	1	U
Bromochloromethane	90	90		83	NA		5	U	1	U	5	U	NA		5	U
Bromodichloromethane	80	80		0.13	1	U	1	U	1	U	1	U	1	U	1	U
Bromoform	80	80		3.3	1	U	1	U	1	U	4	U	4	U	4	U
Bromomethane	10	10		7.5	1	U	1	U	1	U	1	U	1	U	1	U
Carbon Disulfide	1500	6200		810	5	U ^c	5	U	1	U	5	U	5	U ^c	5	U
Carbon Tetrachloride	5	5	5	0.46	1	U	1	U	1	U	1	U	1	U	1	U
Chlorobenzene	100	100	100	78	1	U	1	U	1	U	1	U	1	U	1	U
Chlorodibromomethane	80	80		0.87	1	U	1	U	1	U	1	U	1	U	1	U
Chloroethane	250	1200		21000	1	U	1	U	1	U	1	U	1	U	1	U
Chloroform	80	80		0.22	0.54	J	0.59	J	1	U	0.25	J	0.29	J	0.28	J
Chloromethane	30	30		190	1	U	1	U	1	U	1	U	1	U	1	U
cis-1,2-Dichloroethene	70	70	70	36	1	U	1	U	1	U	1	U	1	U	1	U
cis-1,3-Dichloropropene	7.3	34		0.47	1	U	1	U	1	U	1	U	1	U	1	U
Ethylbenzene	700	700	700	1.5	1	U	1	U	1	U	1	U	1	U	1	U
Methyl tert-butyl ether	20	20		14	1	U	1	U	1	U	1	U	1	U	1	U
Methylene chloride	5	5		11	1	U	1	U	1	U	1	U	1	U	1	U
Styrene	100	100	100	1200	5	U	50	U	1	U	5	U	5	U	5	U
Tetrachloroethene	5	5	5	11	81	^c	88		28		48		36	^c	31	
Toluene	1000	1000	1000	1100	1	U	1	U	1	U	1	U	1	U	1	U
trans-1,2-Dichloroethene	100	100	100	360	5	U	1	U	1	U	5	U	5	U	1	U
trans-1,3-Dichloropropene	7.3	34		0.47	1	U	1	U	1	U	1	U	1	U	1	U
Trichloroethene	5	5	5	0.49	1.9		1.8		1	U	1	U	0.73	J	0.62	J
Vinyl Chloride	2	2	2	0.019	1	U	1	U	1	U	1	U	1	U	1	U
Xylenes (Total)	10000	10000	10000	190	6	U	6	U	2	U	6	U	6	U	6	U

Total VOC

^c - CCV recovery is outside acceptance limits.

U - Indicates the analyte was analyzed for but not detected.

J - Result is less than the reporting limit but greater than or equal to the method detection

*H - LCS and/or LCSD recovery above control limits.

NA - Not Analyzed

TABLE A-2

WATER QUALITY ANALYSES

2020 PACKED TOWER AERATOR SAMPLES SUMMARY

Former York Naval Ordnance Plant

1425 Eden Road, York PA 17402

Sample ID Lab ID Sample Date Parameter	Units	Outfall #003 RW 1240451 1/16/2020	Outfall #003 RW 1295246 4/9/2020	Outfall #003 410-7065-2 7/9/2020	Outfall #003 410-16555-2 10/8/2020
1,1-DICHLOROETHENE	ug/l	N.D. @0.2	N.D. @0.2	N.D. @0.2	N.D. @0.2
CIS 1,2-DICHLOROETHENE	ug/l	N.D. @ 0.1	N.D. @ 0.1	N.D. @ 0.1	N.D. @ 0.1
TETRACHLOROETHENE	ug/l	N.D. @0.2	N.D. @0.2	N.D. @0.2	N.D. @0.2
TRICHLOROETHENE	ug/l	N.D. @0.2	N.D. @0.2	N.D. @0.2	N.D. @0.2
VINYL CHLORIDE	ug/l	N.D. @0.3	N.D. @0.3	N.D. @0.3	N.D. @0.3
TOTAL VOCs	ug/l	0	0	0	0

Sample ID Lab ID Sample Date Parameter	Units	Influent to #003 RW 1240450 1/16/2020	Influent to #003 RW 1295245 4/9/2020	Influent to #003 410-7065-1 7/9/2020	Influent to #003 410-16555-1 10/8/2020
1,1,1-TRICHLOROETHANE	ug/l	69	63	60	50
1,1-DICHLOROETHANE	ug/l	5.8	6	5.9	5.9
1,1-DICHLOROETHENE	ug/l	12	13	10	11
1,2-DICHLOROETHANE	ug/l	N.D. @ 0.5	N.D. @ 0.5	N.D. @ 0.5	N.D. @ 0.5
CHLOROBENZENE	ug/l	N.D. @ 0.5	N.D. @ 0.5	N.D. @ 0.5	N.D. @ 0.6
CHLOROFORM	ug/l	N.D. @ 0.5	N.D. @ 0.5	N.D. @ 0.5	N.D. @ 0.9
METHYLENE CHLORIDE	ug/l	N.D. @ 0.6	N.D. @ 0.6	N.D. @ 0.6	N.D. @ 0.7
TETRACHLOROETHENE	ug/l	390	400	360	360
TRICHLOROETHENE	ug/l	140	140	110	120
VINYL CHLORIDE	ug/l	N.D. @ 0.8	N.D. @ 0.8	N.D. @ 0.8	N.D. @ 0.1
CIS 1,2-DICHLOROETHENE	ug/l	110	100	94	93
TRANS 1,2-DICHLOROETHENE	ug/l	0.9 J	0.5 J	1.8 J	N.D. @ 0.6
TOTAL VOCs	ug/l	727	722	640	640

Notes:

All Analysis Performed by Eurofins Lancaster Laboratories Environmental (ELLE) - Lancaster, PA

ug/l - micrograms per liter

J - Estimated value ≥ the Method Detection Limit (MDL) aN.D. < the Limit of Quantitation (LOQ or RL)

N.D.@1 - not detected at iN.D.icated concentration

PTA Infl. - Official sample name is "influent to #003 GWTS"

PTA Effl. - Official sample name is "outfall #003 GWTS"

N.A. - Parameter not analyzed

APPENDIX B

2020 Excel® Database Summary
Groundwater Treatment Plant Operations

Table B-1
2020 Groundwater Treatment Plant Operations Summary
Former York Naval Ordnance Plant
1425 Eden Road, York, PA 17402

Date	AST Blower Cycles	AST Blower Hours	AST Pump Cycles	AST Pump Hours	Discharge Flow (gallons)	Influent pH (S.U.)	GWTS KWH	Effluent Pump P1 Cycles	Effluent Pump P2 Cycles	Effluent Pump P1 Hours	Effluent Pump P2 Hours
1/1/2020	1	23.9	1	23.9	338,846	8.698	1678	4	3	11.9	12.0
1/2/2020	1	23.9	1	23.9	340,145	9.182	1630	4	3	11.9	12.0
1/3/2020	1	23.9	1	23.9	340,078	10.537	1493	4	3	11.9	12.0
1/4/2020	1	23.9	1	23.9	339,833	11.020	1492	4	3	11.9	12.0
1/5/2020	1	23.9	1	23.9	339,834	10.298	1707	4	3	11.9	12.0
1/6/2020	1	23.9	1	23.9	340,093	12.105	1641	4	3	11.9	12.0
1/7/2020	1	23.9	1	23.9	340,116	9.769	1747	4	3	11.9	12.0
1/8/2020	1	23.9	1	23.9	339,570	11.132	1784	4	3	11.9	12.0
1/9/2020	1	23.9	1	23.9	339,550	11.449	1826	4	3	11.9	12.0
1/10/2020	1	23.9	1	23.9	339,536	11.346	1610	4	3	11.9	12.0
1/11/2020	1	23.9	1	23.9	339,355	12.495	1454	4	3	11.9	12.0
1/12/2020	1	23.9	1	23.9	336,792	11.965	1439	4	3	11.9	12.0
1/13/2020	1	23.9	1	23.9	338,433	11.809	1545	4	3	11.9	12.0
1/14/2020	3	16.1	3	16.0	228,900	6.751	1135	4	3	11.9	12.0
1/15/2020	1	23.9	1	23.9	344,103	6.751	1162	4	3	11.9	12.0
1/16/2020	1	23.9	1	23.9	342,186	6.750	1241	4	3	11.9	12.0
1/17/2020	1	23.9	1	23.9	341,539	6.752	1491	4	3	11.9	12.0
1/18/2020	1	23.9	1	23.9	343,007	6.740	1511	4	3	11.9	12.0
1/19/2020	1	23.9	1	23.9	341,578	6.737	1490	4	3	11.9	12.0
1/20/2020	2	21.3	2	21.2	304,785	6.772	1538	5	3	9.3	12.0
1/21/2020	1	23.9	1	23.9	345,250	6.771	1823	4	3	11.9	12.0
1/22/2020	1	23.9	1	23.9	344,828	6.755	1808	4	3	11.9	12.0
1/23/2020	1	23.9	1	23.9	344,845	6.755	1747	4	3	11.9	12.0
1/24/2020	1	23.9	1	23.9	344,847	6.756	1623	4	3	11.9	12.0
1/25/2020	1	23.9	1	23.9	344,634	6.755	1585	4	3	11.9	12.0
1/26/2020	1	23.9	1	23.9	345,795	6.756	1679	4	3	11.9	12.0
1/27/2020	1	23.9	1	23.9	346,359	6.763	1630	4	3	11.9	12.0
1/28/2020	1	23.9	1	23.9	346,449	6.766	1522	4	3	11.9	12.0
1/29/2020	1	23.9	1	23.9	346,187	6.786	1672	4	3	11.9	12.0
1/30/2020	1	23.9	1	23.9	346,579	6.771	1774	4	3	11.9	12.0
1/31/2020	1	23.9	1	23.9	346,560	6.772	1650	4	3	11.9	12.0
2/1/2020	1	23.9	1	23.9	346,688	6.786	1623	4	3	11.9	12.0
2/2/2020	1	23.9	1	23.9	346,554	6.782	1570	4	3	11.9	12.0
2/3/2020	1	23.9	1	23.9	344,861	6.771	1529	4	3	11.9	12.0
2/4/2020	1	23.9	1	23.9	342,614	6.757	1449	4	3	11.9	12.0
2/5/2020	1	23.9	1	23.9	342,631	6.754	1609	4	3	11.9	12.0
2/6/2020	1	23.9	1	23.9	264,865	6.725	1491	4	3	11.9	12.0
2/7/2020	1	23.9	1	23.9	224,814	6.737	1365	4	3	11.9	12.0
2/8/2020	1	23.9	1	23.9	226,722	6.724	1480	4	3	11.9	12.0
2/9/2020	1	23.9	1	23.9	228,156	6.738	1404	4	3	11.9	12.0
2/10/2020	1	23.9	1	23.9	286,234	6.766	1394	4	3	11.9	12.0
2/11/2020	1	23.9	1	23.9	347,656	6.768	1487	4	3	11.9	12.0
2/12/2020	1	23.9	1	23.9	347,517	6.771	1579	4	3	11.9	12.0
2/13/2020	1	23.9	1	23.9	347,468	6.776	1511	4	3	11.9	12.0
2/14/2020	1	23.9	1	23.9	347,270	6.763	1780	4	3	11.9	12.0
2/15/2020	1	23.9	1	23.9	347,363	6.770	1832	4	3	11.9	12.0
2/16/2020	1	23.9	1	23.9	347,829	6.773	1680	4	3	11.9	12.0
2/17/2020	1	23.9	1	23.9	349,538	6.771	1591	4	3	11.9	12.0
2/18/2020	1	23.9	1	23.9	348,869	6.798	1495	4	3	11.9	12.0
2/19/2020	1	23.9	1	23.9	348,999	6.789	1550	4	3	11.9	12.0
2/20/2020	1	23.9	1	23.9	348,652	6.786	1789	4	3	11.9	12.0
2/21/2020	1	23.9	1	23.9	348,582	6.784	1801	4	3	11.9	12.0
2/22/2020	1	23.9	1	23.9	348,486	6.801	1673	4	3	11.9	12.0
2/23/2020	1	23.9	1	23.9	348,415	6.802	1605	4	3	11.9	12.0
2/24/2020	1	23.9	1	23.9	348,283	6.802	1573	4	3	11.9	12.0
2/25/2020	1	23.9	1	23.9	348,485	6.801	1474	4	3	11.9	12.0
2/26/2020	1	23.9	1	23.9	346,405	6.818	1465	4	3	11.9	12.0
2/27/2020	1	23.9	1	23.9	342,252	6.820	1726	4	3	11.9	12.0
2/28/2020	1	23.9	1	23.9	342,292	6.817	1695	4	3	11.9	12.0
2/29/2020	1	23.9	1	23.9	341,962	6.773	1814	4	3	11.9	12.0
3/1/2020	1	23.9	1	23.9	341,955	6.820	1668	4	3	11.9	12.0
3/2/2020	1	23.9	1	23.9	341,455	6.834	1546	4	3	11.9	12.0
3/3/2020	1	23.9	1	23.9	341,747	6.833	1464	4	3	11.9	12.0
3/4/2020	1	23.9	1	23.9	341,813	6.848	1461	4	3	11.9	12.0
3/5/2020	1	23.9	1	23.9	341,276	6.849	1508	4	3	11.9	12.0
3/6/2020	1	23.9	1	23.9	341,662	6.862	1682	4	3	11.9	12.0

Table B-1
2020 Groundwater Treatment Plant Operations Summary
Former York Naval Ordnance Plant
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Date	AST Blower Cycles	AST Blower Hours	AST Pump Cycles	AST Pump Hours	Discharge Flow (gallons)	Influent pH (S.U.)	GWTS KWH	Effluent Pump P1 Cycles	Effluent Pump P2 Cycles	Effluent Pump P1 Hours	Effluent Pump P2 Hours
3/7/2020	1	23.9	1	23.9	341,339	6.862	1681	4	3	11.9	12.0
3/8/2020	1	23.9	1	23.9	327,419	6.862	1524	3	3	11.1	11.8
3/9/2020	1	23.9	1	23.9	341,997	6.863	1485	3	4	12.0	11.9
3/10/2020	1	23.9	1	23.9	342,353	6.862	1422	3	4	12.0	11.9
3/11/2020	1	23.9	1	23.9	341,420	6.846	1473	3	4	12.0	11.9
3/12/2020	1	23.9	1	23.9	340,177	6.877	1442	3	4	12.0	11.9
3/13/2020	1	23.9	1	23.9	338,631	6.861	1402	3	4	12.0	11.9
3/14/2020	1	23.9	1	23.9	335,648	6.876	1449	3	4	12.0	11.9
3/15/2020	1	23.9	1	23.9	335,197	6.879	1554	3	4	12.0	11.9
3/16/2020	1	23.9	1	23.9	334,543	6.907	1583	3	4	12.0	11.9
3/17/2020	1	23.9	1	23.9	335,132	6.892	1453	3	4	12.0	11.9
3/18/2020	1	23.9	1	23.9	335,408	6.878	1488	3	4	12.0	11.9
3/19/2020	1	23.9	1	23.9	335,103	6.906	1460	3	4	12.0	11.9
3/20/2020	1	23.9	1	23.9	335,414	6.937	1399	3	4	12.0	11.9
3/21/2020	1	23.9	1	23.9	335,090	6.906	1477	3	4	12.0	11.9
3/22/2020	1	23.9	1	23.9	334,576	6.936	1621	3	4	12.0	11.9
3/23/2020	1	23.9	1	23.9	335,246	6.938	1696	3	4	12.0	11.9
3/24/2020	1	23.9	1	23.9	334,931	6.921	1479	3	4	12.0	11.9
3/25/2020	1	23.9	1	23.9	334,717	6.939	1543	3	4	12.0	11.9
3/26/2020	1	23.9	1	23.9	335,343	6.937	1462	3	4	12.0	11.9
3/27/2020	1	23.9	1	23.9	334,726	6.947	1418	3	4	12.0	11.9
3/28/2020	1	23.9	1	23.9	335,040	6.938	1465	3	4	12.0	11.9
3/29/2020	1	23.9	1	23.9	337,451	6.953	1472	3	4	12.0	11.9
3/30/2020	1	23.9	1	23.9	337,725	6.968	1428	3	4	12.0	11.9
3/31/2020	1	23.9	1	23.9	341,374	6.936	1470	3	4	12.0	11.9
4/1/2020	1	23.9	1	23.9	342,957	6.919	1475	3	4	12.0	11.9
4/2/2020	3	14.6	3	14.5	207,074	6.737	1032	5	8	8.1	6.6
4/3/2020	1	23.9	1	23.9	345,150	6.745	1469	3	4	12.0	11.9
4/4/2020	1	23.9	1	23.9	344,940	6.738	1463	3	4	12.0	11.9
4/5/2020	1	23.9	1	23.9	345,781	6.738	1447	3	4	12.0	11.9
4/6/2020	1	23.9	1	23.9	343,825	6.737	1422	3	4	12.0	11.9
4/7/2020	1	23.9	1	23.9	343,105	6.737	1423	3	4	12.0	11.9
4/8/2020	1	23.9	1	23.9	342,925	6.737	1386	3	4	12.0	11.9
4/9/2020	1	23.9	1	23.9	342,734	6.737	1437	3	4	12.0	11.9
4/10/2020	1	23.9	1	23.9	342,545	6.737	1558	3	4	12.0	11.9
4/11/2020	1	23.9	1	23.9	342,385	6.735	1533	3	4	12.0	11.9
4/12/2020	1	23.9	1	23.9	342,045	6.750	1476	3	4	12.0	11.9
4/13/2020	1	23.9	1	23.9	342,828	6.747	1390	3	4	12.0	11.9
4/14/2020	1	23.9	1	23.9	342,895	6.722	1437	3	4	12.0	11.9
4/15/2020	1	23.9	1	23.9	343,168	6.752	1449	3	4	12.0	11.9
4/16/2020	1	23.9	1	23.9	343,008	6.771	1496	3	4	12.0	11.9
4/17/2020	1	23.9	1	23.9	342,976	6.752	1561	3	4	12.0	11.9
4/18/2020	1	23.9	1	23.9	343,507	6.750	1483	3	4	12.0	11.9
4/19/2020	1	23.9	1	23.9	343,745	6.752	1527	3	4	12.0	11.9
4/20/2020	1	23.9	1	23.9	343,937	6.752	1413	3	4	12.0	11.9
4/21/2020	1	23.9	1	23.9	344,055	6.777	1449	3	4	12.0	11.9
4/22/2020	1	23.9	1	23.9	343,684	6.767	1527	3	4	12.0	11.9
4/23/2020	1	23.9	1	23.9	343,708	6.768	1438	3	4	12.0	11.9
4/24/2020	1	23.9	1	23.9	343,795	6.781	1435	3	4	12.0	11.9
4/25/2020	1	23.9	1	23.9	345,167	6.766	1415	3	4	12.0	11.9
4/26/2020	1	23.9	1	23.9	346,138	6.783	1463	3	4	12.0	11.9
4/27/2020	1	23.9	1	23.9	346,776	6.779	1461	3	4	12.0	11.9
4/28/2020	1	23.9	1	23.9	346,826	6.747	1456	3	4	12.0	11.9
4/29/2020	1	23.9	1	23.9	346,467	6.800	1389	3	4	12.0	11.9
4/30/2020	1	23.9	1	23.9	346,703	6.737	1406	3	4	12.0	11.9
5/1/2020	1	23.9	1	23.9	346,215	6.805	1377	3	4	12.0	11.9
5/2/2020	1	23.9	1	23.9	346,757	6.793	1379	3	4	12.0	11.9
5/3/2020	1	23.9	1	23.9	347,332	6.803	1352	3	4	12.0	11.9
5/4/2020	1	23.9	1	23.9	347,802	6.841	1343	3	4	12.0	11.9
5/5/2020	1	23.9	1	23.9	347,534	6.842	1404	3	4	12.0	11.9
5/6/2020	1	23.9	1	23.9	347,299	6.904	1446	3	4	12.0	11.9
5/7/2020	1	23.9	1	23.9	347,188	6.857	1414	3	4	12.0	11.9
5/8/2020	1	23.9	1	23.9	347,506	6.857	1463	3	4	12.0	11.9
5/9/2020	1	23.9	1	23.9	346,881	6.857	1583	3	4	12.0	11.9
5/10/2020	1	23.9	1	23.9	347,142	6.857	1528	3	4	12.0	11.9
5/11/2020	1	23.9	1	23.9	347,537	6.855	1447	3	4	12.0	11.9

Table B-1
2020 Groundwater Treatment Plant Operations Summary
Former York Naval Ordnance Plant
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Date	AST Blower Cycles	AST Blower Hours	AST Pump Cycles	AST Pump Hours	Discharge Flow (gallons)	Influent pH (S.U.)	GWTS KWH	Effluent Pump P1 Cycles	Effluent Pump P2 Cycles	Effluent Pump P1 Hours	Effluent Pump P2 Hours
5/12/2020	1	23.9	1	23.9	347,038	6.827	1448	3	4	12.0	11.9
5/13/2020	1	23.9	1	23.9	347,678	6.849	1424	3	4	12.0	11.9
5/14/2020	1	23.9	1	23.9	347,337	6.827	1414	3	4	12.0	11.9
5/15/2020	2	22.5	2	22.5	326,199	6.754	1305	3	4	12.0	11.9
5/16/2020	1	23.9	1	23.9	346,598	6.771	1367	3	4	12.0	11.9
5/17/2020	1	23.9	1	23.9	345,900	6.801	1384	3	4	12.0	11.9
5/18/2020	1	23.9	1	23.9	346,124	6.805	1377	3	4	12.0	11.9
5/19/2020	1	23.9	1	23.9	345,987	6.819	1381	3	4	12.0	11.9
5/20/2020	1	23.9	1	23.9	344,683	6.819	1378	3	4	12.0	11.9
5/21/2020	1	23.9	2	23.9	343,973	6.802	1378	3	4	12.0	11.9
5/22/2020	1	23.9	1	23.9	344,603	6.802	1360	3	4	12.0	11.9
5/23/2020	1	23.9	1	23.9	344,619	6.767	1358	3	4	12.0	11.9
5/24/2020	1	23.9	1	23.9	343,944	6.786	1373	3	4	12.0	11.9
5/25/2020	1	23.9	1	23.9	344,082	6.764	1368	3	4	12.0	11.9
5/26/2020	1	23.9	1	23.9	344,022	6.737	1351	3	4	12.0	11.9
5/27/2020	1	23.9	1	23.9	343,607	6.737	1354	3	4	12.0	11.9
5/28/2020	1	23.9	1	23.9	343,284	6.738	1344	3	4	12.0	11.9
5/29/2020	1	23.9	1	23.9	343,600	6.736	1347	3	4	12.0	11.9
5/30/2020	1	23.9	1	23.9	343,700	6.752	1360	3	4	12.0	11.9
5/31/2020	1	23.9	1	23.9	342,827	6.785	1372	3	4	12.0	11.9
6/1/2020	1	23.9	1	23.9	343,336	6.790	1349	3	4	12.0	11.9
6/2/2020	1	23.9	1	23.9	344,143	6.784	1347	3	4	12.0	11.9
6/3/2020	1	23.9	1	23.9	342,305	6.736	1344	3	4	12.0	11.9
6/4/2020	1	23.9	1	23.9	345,479	6.719	1358	3	4	12.0	11.9
6/5/2020	1	23.9	1	23.9	347,218	6.721	1355	3	4	12.0	11.9
6/6/2020	1	23.9	1	23.9	348,427	6.691	1357	3	4	12.0	11.9
6/7/2020	1	23.9	1	23.9	348,383	6.736	1367	3	4	12.0	11.9
6/8/2020	1	23.9	1	23.9	348,160	6.737	1360	3	4	12.0	11.9
6/9/2020	1	23.9	1	23.9	347,942	6.704	1350	3	4	12.0	11.9
6/10/2020	1	23.9	1	23.9	347,914	6.644	1353	3	4	12.0	11.9
6/11/2020	1	23.9	1	23.9	348,007	6.703	1355	3	4	12.0	11.9
6/12/2020	1	23.9	1	23.9	347,957	6.702	1363	3	4	12.0	11.9
6/13/2020	1	23.9	1	23.9	347,824	6.752	1375	3	4	12.0	11.9
6/14/2020	1	23.9	1	23.9	347,834	6.749	1372	3	4	12.0	11.9
6/15/2020	1	23.9	1	23.9	347,803	6.735	1370	3	4	12.0	11.9
6/16/2020	1	23.9	1	23.9	347,889	6.737	1365	3	4	12.0	11.9
6/17/2020	1	23.9	1	23.9	347,703	6.736	1361	3	4	12.0	11.9
6/18/2020	1	23.9	1	23.9	347,310	6.713	1355	3	4	12.0	11.9
6/19/2020	1	23.9	1	23.9	347,599	6.724	1357	3	4	12.0	11.9
6/20/2020	1	23.9	1	23.9	347,671	6.702	1360	3	4	12.0	11.9
6/21/2020	1	23.9	1	23.9	347,554	6.698	1350	3	4	12.0	11.9
6/22/2020	1	23.9	1	23.9	347,451	6.699	1354	3	4	12.0	11.9
6/23/2020	1	23.9	1	23.9	347,458	6.653	1354	3	4	12.0	11.9
6/24/2020	1	23.9	1	23.9	347,631	6.684	1356	3	4	12.0	11.9
6/25/2020	1	23.9	1	23.9	347,187	6.702	1359	3	4	12.0	11.9
6/26/2020	1	23.9	1	23.9	344,895	6.685	1352	3	4	12.0	11.9
6/27/2020	1	23.9	1	23.9	344,284	6.653	1355	3	4	12.0	11.9
6/28/2020	1	23.9	1	23.9	343,489	6.667	1349	3	4	12.0	11.9
6/29/2020	1	23.9	1	23.9	344,102	6.654	1334	3	4	12.0	11.9
6/30/2020	1	23.9	1	23.9	344,027	6.655	1340	3	4	12.0	11.9
7/1/2020	1	23.9	1	23.9	343,293	6.654	1333	3	4	12.0	11.9
7/2/2020	1	23.9	1	23.9	341,282	6.638	1330	3	4	12.0	11.9
7/3/2020	1	23.9	1	23.9	340,257	6.608	1330	3	4	12.0	11.9
7/4/2020	1	23.9	1	23.9	341,429	6.605	1337	3	4	12.0	11.9
7/5/2020	1	23.9	1	23.9	341,308	6.576	1337	3	4	12.0	11.9
7/6/2020	1	23.9	1	23.9	340,998	6.607	1330	3	4	12.0	11.9
7/7/2020	1	7.3	1	7.3	104,622	4.878	473	3	4	12.0	11.9
7/8/2020	1	14.1	1	14.1	199,102	6.650	819	3	4	12.0	11.9
7/9/2020	1	23.9	1	23.9	338,330	6.625	1333	3	4	12.0	11.9
7/10/2020	1	23.9	1	23.9	341,858	6.686	1341	3	4	12.0	11.9
7/11/2020	1	23.9	1	23.9	334,914	6.661	1339	3	4	12.0	11.9
7/12/2020	1	23.9	1	23.9	343,427	6.669	1350	3	4	12.0	11.9
7/13/2020	1	23.9	1	23.9	343,287	6.654	1346	3	4	12.0	11.9
7/14/2020	1	23.9	1	23.9	343,212	6.640	1344	3	4	12.0	11.9
7/15/2020	1	23.9	1	23.9	343,074	6.649	1344	3	4	12.0	11.9
7/16/2020	1	23.9	1	23.9	343,327	6.656	1345	3	4	12.0	11.9

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Date	AST Blower Cycles	AST Blower Hours	AST Pump Cycles	AST Pump Hours	Discharge Flow (gallons)	Influent pH (S.U.)	GWTS KWH	Effluent Pump P1 Cycles	Effluent Pump P2 Cycles	Effluent Pump P1 Hours	Effluent Pump P2 Hours
7/17/2020	1	23.9	1	23.9	341,932	6.628	1328	3	4	12.0	11.9
7/18/2020	1	23.9	1	23.9	340,141	6.591	1337	3	4	12.0	11.9
7/19/2020	1	23.9	1	23.9	339,879	6.561	1323	3	4	12.0	11.9
7/20/2020	1	23.9	1	23.9	339,955	6.560	1311	3	4	12.0	11.9
7/21/2020	1	23.9	1	23.9	339,637	6.613	1317	3	4	12.0	11.9
7/22/2020	1	23.9	1	23.9	339,901	6.654	1324	3	4	12.0	11.9
7/23/2020	1	23.9	1	23.9	342,283	6.627	1334	3	4	12.0	11.9
7/24/2020	1	23.9	1	23.9	344,272	6.653	1335	3	4	12.0	11.9
7/25/2020	1	23.9	1	23.9	344,061	6.639	1348	3	4	12.0	11.9
7/26/2020	1	23.9	1	23.9	343,873	6.616	1347	3	4	12.0	11.9
7/27/2020	1	23.9	1	23.9	343,672	6.574	1335	3	4	12.0	11.9
7/28/2020	1	23.9	1	23.9	343,136	6.619	1332	3	4	12.0	11.9
7/29/2020	1	23.9	1	23.9	343,422	6.615	1333	3	4	12.0	11.9
7/30/2020	1	23.9	1	23.9	343,254	6.619	1335	3	4	12.0	11.9
7/31/2020	1	23.9	1	23.9	343,292	6.653	1340	3	4	12.0	11.9
8/1/2020	1	23.9	1	23.9	343,175	6.632	1347	3	4	12.0	11.9
8/2/2020	1	23.9	1	23.9	343,229	6.614	1334	3	4	12.0	11.9
8/3/2020	1	23.9	1	23.9	343,233	6.655	1337	3	4	12.0	11.9
8/4/2020	1	23.9	1	23.9	343,300	6.683	1345	3	4	12.0	11.9
8/5/2020	1	23.9	1	23.9	343,982	6.647	1356	3	4	12.0	11.9
8/6/2020	1	8.0	1	7.9	114,448	4.588	520	1	2	4.0	3.9
8/7/2020	1	17.1	1	17.1	241,588	6.683	988	2	3	8.0	9.0
8/8/2020	1	23.9	1	23.9	343,016	6.631	1355	3	4	12.0	11.9
8/9/2020	1	23.9	1	23.9	342,069	6.604	1347	3	4	12.0	11.9
8/10/2020	1	23.9	1	23.9	342,038	6.604	1331	3	4	12.0	11.9
8/11/2020	1	23.9	1	23.9	340,606	6.619	1324	3	4	12.0	11.9
8/12/2020	1	23.9	1	23.9	340,350	6.612	1327	3	4	12.0	11.9
8/13/2020	1	23.9	1	23.9	341,430	6.650	1333	3	4	12.0	11.9
8/14/2020	1	23.9	1	23.9	340,168	6.650	1332	3	4	12.0	11.9
8/15/2020	1	23.9	1	23.9	339,802	6.679	1350	3	4	12.0	11.9
8/16/2020	1	23.9	1	23.9	339,232	6.714	1344	3	4	12.0	11.9
8/17/2020	1	23.9	1	23.9	338,565	6.695	1333	3	4	12.0	11.9
8/18/2020	1	23.9	1	23.9	338,063	6.664	1347	3	4	12.0	11.9
8/19/2020	1	23.9	1	23.9	337,745	6.682	1345	3	4	12.0	11.9
8/20/2020	1	23.9	1	23.9	337,210	6.682	1357	3	4	12.0	11.9
8/21/2020	1	23.9	1	23.9	337,929	6.651	1355	3	4	12.0	11.9
8/22/2020	1	23.9	1	23.9	337,577	6.634	1351	3	4	12.0	11.9
8/23/2020	1	23.9	1	23.9	336,752	6.651	1350	3	4	12.0	11.9
8/24/2020	1	23.9	1	23.9	336,785	6.651	1334	3	4	12.0	11.9
8/25/2020	1	23.9	1	23.9	336,362	6.653	1322	3	4	12.0	11.9
8/26/2020	1	23.9	1	23.9	336,583	6.668	1347	3	4	12.0	11.9
8/27/2020	1	23.9	1	23.9	336,157	6.636	1337	3	4	12.0	11.9
8/28/2020	1	23.9	1	23.9	335,725	6.683	1341	3	4	12.0	11.9
8/29/2020	1	23.9	1	23.9	335,067	6.674	1352	3	4	12.0	11.9
8/30/2020	1	23.9	1	23.9	336,066	6.703	1361	3	4	12.0	11.9
8/31/2020	1	23.9	1	23.9	335,822	6.747	1352	3	4	12.0	11.9
9/1/2020	1	23.9	1	23.9	336,036	6.723	1345	3	4	12.0	11.9
9/2/2020	1	23.9	1	23.9	335,781	6.682	1334	3	4	12.0	11.9
9/3/2020	1	23.9	1	23.9	335,643	6.701	1339	3	4	12.0	11.9
9/4/2020	1	23.9	1	23.9	336,288	6.700	1345	3	4	12.0	11.9
9/5/2020	1	23.9	1	23.9	336,141	6.716	1368	3	4	12.0	11.9
9/6/2020	1	23.9	1	23.9	336,174	6.709	1361	3	4	12.0	11.9
9/7/2020	1	23.9	1	23.9	335,614	6.707	1367	3	4	12.0	11.9
9/8/2020	1	4.0	1	4.0	55,986	6.682	222.68	1	1	2.0	2.0
9/9/2020	1	17.0	1	17.0	238,679	6.682	949.32	3	3	8.0	9.0
9/10/2020	1	23.9	1	23.9	337,811	6.713	1330	4	3	11.9	120.0
9/11/2020	1	23.9	1	23.9	338,054	6.751	1344	4	3	11.9	120.0
9/12/2020	1	23.9	1	23.9	335,918	6.812	1355	4	3	11.9	12.0
9/13/2020	1	23.9	1	23.9	335,918	6.812	1355	4	3	11.9	12.0
9/14/2020	1	23.9	1	23.9	335,918	6.812	1355	4	3	11.9	12.0
9/15/2020	1	23.9	1	23.9	335,918	6.812	1355	4	3	11.9	12.0
9/16/2020	1	23.9	1	23.9	335,777	6.826	1349	4	3	11.9	12.0
9/17/2020	1	23.9	1	23.9	336,132	6.789	1330	4	3	11.9	12.0
9/18/2020	1	23.9	1	23.9	336,095	6.796	1342	4	3	11.9	12.0
9/19/2020	1	23.9	1	23.9	335,816	6.820	1371	4	3	11.9	12.0
9/20/2020	1	23.9	1	23.9	336,498	6.817	1388	4	3	11.9	12.0

Table B-1
2020 Groundwater Treatment Plant Operations Summary
Former York Naval Ordnance Plant
1425 Eden Road, York, PA 17402

Date	AST Blower Cycles	AST Blower Hours	AST Pump Cycles	AST Pump Hours	Discharge Flow (gallons)	Influent pH (S.U.)	GWTS KWH	Effluent Pump P1 Cycles	Effluent Pump P2 Cycles	Effluent Pump P1 Hours	Effluent Pump P2 Hours
9/21/2020	1	23.9	1	23.9	336,822	6.815	1375	4	3	11.9	12.0
9/22/2020	1	23.9	1	23.9	337,463	6.814	1366	4	3	11.9	12.0
9/23/2020	1	23.9	1	23.9	330,627	6.780	1337	4	3	11.9	12.0
9/24/2020	1	23.9	1	23.9	330,106	6.800	1343	4	3	11.9	12.0
9/25/2020	1	23.9	1	23.9	328,540	6.782	1339	4	3	11.9	12.0
9/26/2020	1	23.9	1	23.9	330,032	6.796	1347	4	3	11.9	12.0
9/27/2020	1	23.9	1	23.9	330,058	6.781	1338	4	3	11.9	12.0
9/28/2020	1	23.9	1	23.9	330,533	6.765	1322	4	3	11.9	12.0
9/29/2020	1	23.9	1	23.9	329,618	6.814	1334	4	3	11.9	12.0
9/30/2020	1	23.9	1	23.9	329,665	6.860	1348	4	3	11.9	12.0
10/1/2020	1	23.9	1	23.9	330,683	6.821	1347	4	3	11.9	12.0
10/2/2020	1	23.9	1	23.9	331,037	6.843	1354	4	3	11.9	12.0
10/3/2020	1	23.9	1	23.9	330,836	6.875	1389	4	3	11.9	12.0
10/4/2020	1	23.9	1	23.9	330,410	6.863	1382	4	3	11.9	12.0
10/5/2020	1	23.9	1	23.9	331,242	6.862	1378	4	3	11.9	12.0
10/6/2020	3	16.8	3	16.7	230,142	6.813	1003	10	17	6.7	10.2
10/7/2020	1	23.9	1	23.9	331,680	6.797	1329	3	4	12.0	11.9
10/8/2020	1	23.9	1	23.9	331,909	6.823	1344	3	4	12.0	11.9
10/9/2020	1	23.9	1	23.9	330,468	6.846	1336	3	4	12.0	11.9
10/10/2020	1	23.9	1	23.9	331,902	6.846	1340	3	4	12.0	11.9
10/11/2020	1	23.9	1	23.9	331,902	6.846	1340	3	4	12.0	11.9
10/12/2020	1	23.9	1	23.9	331,902	6.846	1340	3	4	12.0	11.9
10/13/2020	1	23.9	1	23.9	329,958	6.830	1355	3	4	12.0	11.9
10/14/2020	1	23.9	1	23.9	329,417	6.829	1362	3	4	12.0	11.9
10/15/2020	1	23.9	1	23.9	329,269	6.812	1338	3	4	12.0	11.9
10/16/2020	1	23.9	1	23.9	328,990	6.835	1343	3	4	12.0	11.9
10/17/2020	1	23.9	1	23.9	329,266	6.835	1425	3	4	12.0	11.9
10/18/2020	1	23.9	1	23.9	329,596	6.830	1420	3	4	12.0	11.9
10/19/2020	1	23.9	1	23.9	329,388	6.845	1354	3	4	12.0	11.9
10/20/2020	1	23.9	1	23.9	329,617	6.814	1331	3	4	12.0	11.9
10/21/2020	1	23.9	1	23.9	329,288	6.815	1311	3	4	12.0	11.9
10/22/2020	1	23.9	1	23.9	329,428	6.814	1312	3	4	12.0	11.9
10/23/2020	1	23.9	1	23.9	328,343	6.814	1317	3	4	12.0	11.9
10/24/2020	1	23.9	1	23.9	328,277	6.877	1341	3	4	12.0	11.9
10/25/2020	1	23.9	1	23.9	329,135	6.846	1420	3	4	12.0	11.9
10/26/2020	1	23.9	1	23.9	327,726	6.846	1405	3	4	12.0	11.9
10/27/2020	1	23.9	1	23.9	327,589	6.879	1378	3	4	12.0	11.9
10/28/2020	1	23.9	1	23.9	327,273	6.878	1371	3	4	12.0	11.9
10/29/2020	1	23.9	1	23.9	327,636	6.876	1394	3	4	12.0	11.9
10/30/2020	1	23.9	1	23.9	327,420	6.862	1429	3	4	12.0	11.9
10/31/2020	1	23.9	1	23.9	327,127	6.881	1521	3	4	12.0	11.9
11/1/2020	1	23.9	1	23.9	327,110	6.880	1561	3	4	12.0	11.9
11/2/2020	1	23.9	1	23.9	327,092	6.878	1600	3	4	12.0	11.9
11/3/2020	1	23.9	1	23.9	326,730	6.863	1509	3	4	12.0	11.9
11/4/2020	15	21.1	3	20.8	287,825	6.865	1336	3	5	12.0	8.9
11/5/2020	1	23.9	1	23.9	327,400	6.879	1381	3	4	12.0	11.9
11/6/2020	1	23.9	1	23.9	325,691	6.881	1372	3	4	12.0	11.9
11/7/2020	1	23.9	1	23.9	326,270	6.877	1378	3	4	12.0	11.9
11/8/2020	1	23.9	1	23.9	326,175	6.879	1384	3	4	12.0	11.9
11/9/2020	1	23.9	1	23.9	325,898	6.887	1367	3	4	12.0	11.9
11/10/2020	1	23.9	1	23.9	326,308	6.878	1351	3	4	12.0	11.9
11/11/2020	1	23.9	1	23.9	325,645	6.880	1306	3	4	12.0	11.9
11/12/2020	1	23.9	1	23.9	326,776	6.877	1389	3	4	12.0	11.9
11/13/2020	1	23.9	1	23.9	257,798	6.925	1272	3	4	12.0	11.9
11/14/2020	1	23.9	1	23.9	240,764	6.923	1350	3	4	12.0	11.9
11/15/2020	1	23.9	1	23.9	240,674	6.924	1293	3	4	12.0	11.9
11/16/2020	1	23.9	1	23.9	289,469	6.863	1362	3	4	12.0	11.9
11/17/2020	1	23.9	1	23.9	327,065	6.863	1603	3	4	12.0	11.9
11/18/2020	1	23.9	1	23.9	327,577	6.862	1683	3	4	12.0	11.9
11/19/2020	1	23.9	1	23.9	328,938	6.849	1579	3	4	12.0	11.9
11/20/2020	1	23.9	1	23.9	328,175	6.880	1432	3	4	12.0	11.9
11/21/2020	1	23.9	1	23.9	328,555	6.880	1388	3	4	12.0	11.9
11/22/2020	1	23.9	1	23.9	330,101	6.880	1408	3	4	12.0	11.9
11/23/2020	1	23.9	1	23.9	329,166	6.883	1410	3	4	12.0	11.9
11/24/2020	1	23.9	1	23.9	328,539	6.785	1506	3	4	12.0	11.9
11/25/2020	1	23.9	1	23.9	328,715	6.785	1428	3	4	12.0	11.9

Table B-1
2020 Groundwater Treatment Plant Operations Summary
Former York Naval Ordnance Plant
1425 Eden Road, York, PA 17402

Date	AST Blower Cycles	AST Blower Hours	AST Pump Cycles	AST Pump Hours	Discharge Flow (gallons)	Influent pH (S.U.)	GWTS KWH	Effluent Pump P1 Cycles	Effluent Pump P2 Cycles	Effluent Pump P1 Hours	Effluent Pump P2 Hours
11/26/2020	1	23.9	1	23.9	329,190	6.800	1409	3	4	12.0	11.9
11/27/2020	1	23.9	1	23.9	329,021	6.801	1428	3	4	12.0	11.9
11/28/2020	1	23.9	1	23.9	329,202	6.803	1453	3	4	12.0	11.9
11/29/2020	1	23.9	1	23.9	328,933	6.826	1536	3	4	12.0	11.9
11/30/2020	1	23.9	1	23.9	329,721	6.800	1424	3	4	12.0	11.9
12/1/2020	1	23.9	1	23.9	329,470	6.817	1578	3	4	12.0	11.9
12/2/2020	1	23.9	1	23.9	329,516	6.814	1668	3	4	12.0	11.9
12/3/2020	1	23.9	1	23.9	315,727	6.818	1552	3	4	12.0	11.9
12/4/2020	1	23.9	1	23.9	329,924	6.802	1450	3	4	12.0	11.9
12/5/2020	1	23.9	1	23.9	330,597	6.802	1459	3	4	12.0	11.9
12/6/2020	1	23.9	1	23.9	330,745	6.818	1649	3	4	12.0	11.9
12/7/2020	1	23.9	1	23.9	330,184	6.834	1732	3	4	12.0	11.9
12/8/2020	1	23.9	1	23.9	329,934	6.905	1643	3	4	12.0	11.9
12/9/2020	1	23.9	1	23.9	330,292	6.803	1637	3	4	12.0	11.9
12/10/2020	1	23.9	1	23.9	329,959	6.848	1536	3	4	12.0	11.9
12/11/2020	1	23.9	1	23.9	329,854	6.802	1558	3	4	12.0	11.9
12/12/2020	1	23.9	1	23.9	329,985	6.900	1524	3	4	12.0	11.9
12/13/2020	1	23.9	1	23.9	329,749	6.899	1444	3	4	12.0	11.9
12/14/2020	1	23.9	1	23.9	330,405	6.917	1713	3	4	12.0	11.9
12/15/2020	1	23.9	1	23.9	330,951	6.786	1738	3	4	12.0	11.9
12/16/2020	1	23.9	1	23.9	326,300	6.786	1787	3	4	12.0	11.9
12/17/2020	1	23.9	1	23.9	325,760	6.799	1763	3	4	12.0	11.9
12/18/2020	1	23.9	1	23.9	323,454	6.793	1771	3	4	12.0	11.9
12/19/2020	1	23.9	1	23.9	323,615	6.800	1795	3	4	12.0	11.9
12/20/2020	1	23.9	1	23.9	323,765	6.800	1690	3	4	12.0	11.9
12/21/2020	1	23.9	1	23.9	323,865	6.803	1674	3	4	12.0	11.9
12/22/2020	1	23.9	1	23.9	323,925	6.803	1632	3	4	12.0	11.9
12/23/2020	1	23.9	1	23.9	324,277	6.804	1597	3	4	12.0	11.9
12/24/2020	1	23.9	1	23.9	324,654	6.788	1460	3	4	12.0	11.9
12/25/2020	1	23.9	1	23.9	326,553	6.773	1713	3	4	12.0	11.9
12/26/2020	1	23.9	1	23.9	329,757	6.772	1831	3	4	12.0	11.9
12/27/2020	1	23.9	1	23.9	329,853	6.835	1733	3	4	12.0	11.9
12/28/2020	1	23.9	1	23.9	330,042	6.801	1567	3	4	12.0	11.9
12/29/2020	1	23.9	1	23.9	330,435	6.820	1699	3	4	12.0	11.9
12/30/2020	1	23.9	1	23.9	330,047	6.755	1620	3	4	12.0	11.9
12/31/2020	1	23.9	1	23.9	329,977	6.754	1527	3	4	12.0	11.9

APPENDIX C

2020 Operation and Maintenance Data Summary

Table C-1
2020 OPERATION AND MAINTENANCE DATA SUMMARY
Former York Naval Ordnance Plant
1425 Eden Road, York PA 17402

TECHNICIAN		SRL	SRL	SRL	SRL	SRL	SRL	SRL	SRL	SRL	SRL	SRL	SRL	SRL	SRL	SRL	SRL	SRL	SRL	SRL	SRL	SRL	SRL	SRL
Date		1/2/2020	1/16/2020	2/6/2020	2/27/2020	3/5/2020	3/26/2020	4/9/2020	4/23/2020	5/7/2020	5/21/2020	6/4/2020	6/18/2020	7/9/2020	7/23/2020	8/5/2020	8/20/2020	9/3/2020	9/17/2020	10/8/2020	10/22/2020	11/5/2020	11/19/2020	12/3/2020	12/16/2020
PTA INFL. PUMP																									
Full Load = 17	AMPS	NM	10.8	NM	NM	NM	NM	NM	10.40	NM	NM	NM	NM	NM	11.30	NM	NM	NM	NM	NM	9.80	NM	NM	NM	NM
	FLOW RATE gpm	235	242	243	240	236	251	249	234	245	241	254	248	242	235	240	240	243	245	233	232	232	233	233	239
PTA BLOWER																									
Full Load = 24	AMP READINGS	NM	22.12	NM	NM	NM	NM	NM	21.95	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	21.65	NM	NM	NM	NM
	PRESSURE inches water	16.6	15.6	16.2	15.9	15.1	16	15.4	16.1	15.9	16.2	15.3	15.4	14.9	14.9	15.2	15.5	15	15.6	15.6	15.4	15.8	16.4	16.6	16.6
TOWER PANEL																									
	VISUAL INSPECT	NA	OK	NA	NA	NA	NA	NA	OK	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	OK	NA	NA	NA	NA
	WARWICK SECURE	NA	OK	NA	NA	NA	NA	NA	OK	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	OK	NA	NA	NA	NA
TOWER SAMPLING																									
	AST EFFLUENT pH	7.47	NM	7.96	NM	8.3	NM	7.81	NM	7.75	NM	7.9	NM	7.95	NM	7.7	NM	7.6	NM	7.7	NM	7.5	NM	7.5	NM
	AST INFLUENT pH	6.29	6.75	6.58	6.81	6.82	6.89	6.36	6.76	6.45	6.8	6.4	6.73	6.74	6.65	6.3	6.72	6.3	6.82	6.4	6.82	6.4	6.85	6.5	6.81
REDUX CHEMICAL INJECTION																									
	LMI PUMP SPEED (%)	41	43	44	43	42	42	41	44	41	45	46	44	41	44	42	42	43	44	40	43	39	41	42	41
	LMI INJECTION RATE (milis/min)	11.8	12.8	11.5	12.4	12.6	11.8	12.3	12.3	13.2	12.6	12.4	12.8	12.6	12	12.6	12.6	12.9	12.3	12.3	12.4	12.7	11.8	12.3	11.7
WPL WELLS																									
	TOTAL FLOW RATE gpm	245	244	245	245	245	242	243	242.5	245	240	239	241	241	237	242	240	238	243	234	233	234	234	233	231
CW-9; Full Load = 5.5	AMPS	NM	3.5	NM	NM	NM	NM	NM	3.51	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	3.51	NM	NM	NM	NM
CW-9	FLOW RATE gpm	52.3	52.5	51.4	52.3	52.1	51.1	52.3	52.6	51.8	47.5	47	48.6	51.0	51.0	51.1	50.8	48.4	52.7	51.2	50.1	49.8	49.9	50.2	49.7
CW-9	PRESSURE psi	6	5	6	6	6	6	6	6	6	6	6	6	5	6	5	6	5	6	6	6	6	6	6	6
CW-9	CLEAN "Y" STRAINER	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
CW-9	HIGH LEVEL ALARM?	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
CW-13; Full Load = 11.5	AMPS	NM	9.04	NM	NM	NM	NM	NM	9.22	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	8.90	NM	NM	NM	NM
CW-13	FLOW RATE gpm	34.9	35.5	36.1	34.5	35.0	36.0	34.9	34.9	34.9	35.0	34.6	36.1	32.6	32.8	33.2	33.1	32.5	325.5	27.6	27.4	28.0	28.1	27.1	27.2
CW-13	PRESSURE psi	69	69	68	68	68	68	70	69	70	70	69	69	70	70	70	70	69	70	73	72	75	72	72	72
CW-13	CLEAN "Y" STRAINER	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
CW-13	HIGH LEVEL ALARM?	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
CW-17; Full Load = 11.5	AMPS	NM	9.17	NM	NM	NM	NM	NM	9.27	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	9.33	NM	NM	NM	NM
CW-17	FLOW RATE gpm	56.9	57.5	57.3	58.1	57.5	54.7	56.9	56.6	58	58	58.1	57.8	57.8	58.3	58.2	57.5	58.8	58.5	57.3	57.4	58.1	57.8	58.1	56.8
CW-17	PRESSURE psi	55	58	55	55	55	60	55	55	55	55	51	50	55	51	50	56	60	60	56	55	55	55	52	55
CW-17	CLEAN "Y" STRAINER	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
CW-17	HIGH LEVEL ALARM?	N	N	N	N	N	N	N	Y	Y	Y	N	N	Y	N	Y	Y	N	N	N	M	N	N	N	N
CW-15A; Full Load = 1.6	AMPS	NM	1.04	NM	NM	NM	NM	NM	1.16	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	0.96	NM	NM	NM	NM
CW-15A	FLOW RATE gpm	4.5	4.5	5.2	4.8	4.8	4.5	4.7	4.5	5.1	4.9	4.7	4.7	4.3	4.0	4.0	4.1	3.6	4.0	3.5	3.6	3.6	3.5	3.5	3.6
CW-15A	PRESSURE psi	55	54	50	48	42	40	38	40	36	34	36	30	35	50	48	42	48	42	44	40	44	42	42	41
CW-15A	CLEAN "Y" STRAINER	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
CW-15A	HIGH LEVEL ALARM?	N	N	N	N	N	N	N	N	N	N	N	N	N	Y	Y	N	Y	N	N	N	N	N	N	N
CW-20 Full Load = 17.3	AMPS	NM	13.81	NM	NM	NM	NM	NM	13.78	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	13.45	NM	NM	NM	NM
CW-20	FLOW RATE gpm	95.4	95.6	95.1	95.3	95.2	94.4	94.7	95.3	94.6	95.4	95	94.9	94.5	95.2	95.3	95	95.2	94.8	94.8	95	94.7	95.1	95.2	95.1
CW-20	PRESSURE psi	35	36	34	35	31	30	32	32	35	32	30	30	34	30	32	31	30	30	30	30	30	29	35	25
CW-20	CLEAN "Y" STRAINER	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
CW-20	HIGH LEVEL ALARM?	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
AST influent pressure	inches of water	10.7	10.2	10.5	10.4	10.6	10.5	9.9	10.5	10.4	10.6	9.7	9.8	9.4	9.1	9.4	9.7	9.4	9.9	9.8	9.6	10.3	10.7	10.5	10.5
GAC influent pressure	inches of water	8.8	8.5	8.7	8.7	8.7	8.7	8.2	8.6	8.7	8.7	7.9	8.3	7.7	7.6	7.8	8.1	7.8	8.6	8.0	7.9	8.3	8.7	8.6	8.6
AST pitot pressure	inches of water	0.32	0.29	0.29	0.3	0.3	0.29	0.27	0.28	0.28	0.29	0.27	0.27	0.27	0.27	0.28	0.28	0.26	0.27	0.29	0.23	0.28	0.32	0.3	0.3

Table C-1
2020 OPERATION AND MAINTENANCE DATA SUMMARY
Former York Naval Ordnance Plant
1425 Eden Road, York PA 17402

TECHNICIAN		SRL	SRL	SRL	SRL	SRL	SRL	SRL	SRL	SRL	SRL	SRL	SRL	SRL	SRL	SRL	SRL	SRL	SRL	SRL	SRL	SRL	SRL	SRL
Date		1/2/2020	1/16/2020	2/6/2020	2/27/2020	3/5/2020	3/26/2020	4/9/2020	4/23/2020	5/7/2020	5/21/2020	6/4/2020	6/18/2020	7/9/2020	7/23/2020	8/5/2020	8/20/2020	9/3/2020	9/17/2020	10/8/2020	10/22/2020	11/5/2020	11/19/2020	12/3/2020	12/16/2020
SPBA WELLS																									
	TOTAL FLOW RATE gpm	6.6	6.9	6.9	6.7	6.7	6.3	6.7	7	6.3	6.8	7	6.7	11.1	6.4	6.6	6.9	6.4	6.9	5.8	6	6.7	6	6.2	6.1
CW-21; Full Load = 5	AMPS	NM	2.69	NM	NM	NM	NM	NM	2.77	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	2.58	NM	NM	NM	NM
CW-21	FLOW-RATE gpm	4.2	4.2	4.2	4.2	4	4.1	4.1	4.2	4.4	4.3	4.2	4.2	6.1	3.9	3.7	4.4	4.1	3.9	3.7	3.8	4.2	3.9	3.8	3.9
CW-21	PRESSURE psi	9.1	8.6	9.4	9.2	9.2	9.4	9.8	9.7	9.8	9.9	10.3	10.4	11.9	10.7	10.9	10.9	11	10.9	9.4	10.4	9.5	9.7	9.2	9.2
CW-21	TARGET LEVEL	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95
CW-21	TRANSDUCER READING	95	95	95	95	95	95	95	95	95	95	95	95	80.1	95	95	95	95	95	95	95	95	95	95	95
CW-21	PUMP SPEED %	75	75	75	75	75	75	76	76	76	76	76	76	80	75	75	76	76	76	74	74	75	74	74	74
CW-21	CLEAN TRANSDUCER	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CW-21	WATER CLARITY	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR
CW-21	HIGH LEVEL ALARM?	N	N	N	N	N	N	N	N	N	N	N	N	Y	N	N	N	N	N	N	N	N	N	N	N
CW-22; Full Load = 3.9	AMPS	NM	1.99	NM	NM	NM	NM	NM	2.01	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	1.93	NM	NM	NM	NM
CW-22	FLOW-RATE gpm	1.9	2	2	1.7	2	1.8	1.9	1.9	1.9	1.8	1.7	2.0	3.0	2.0	2.0	2.1	1.8	2.1	1.7	1.6	2.0	1.9	1.7	1.7
CW-22	PRESSURE psi	9.2	8.6	9.4	9.2	9.2	9.5	9.9	9.7	9.9	9.9	10.3	10	12	11	12	11	11	10.9	10	10.4	10	9.9	9.5	9.6
CW-22	TARGET LEVEL	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97
CW-22	TRANSDUCER READING	97	97	96.9	96.9	97	97	97	97	97	97	97	97	79.2	97	97	97	97	97	97	97	97	97	97	97.1
CW-22	PUMP SPEED %	70	70	70	70	70	70	71	71	73	72	72	72	75	72	73	72	72	73	71	68	72	71	71	70.0
CW-22	CLEAN TRANSDUCER	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CW-22	WATER CLARITY	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR
CW-22	HIGH LEVEL ALARM?	N	N	N	N	N	N	N	N	N	N	N	N	Y	N	N	N	N	N	N	N	N	N	N	N
CW-23; Full Load = 3.9	AMPS	NM	1.52	NM	NM	NM	NM	NM	1.65	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	1.58	NM	NM	NM	NM
CW-23	FLOW-RATE gpm	0.6	0.7	0.8	1	0.8	0.7	0.8	0.7	1	1	0.9	0.9	1.9	0.8	0.6	0.8	0.5	0.6	0.5	0.4	0.4	0.5	0.4	0.5
CW-23	PRESSURE psi	9.2	8.5	9.4	9.1	9.1	9.4	9.7	9.7	10	9.8	10.3	10	12	11	11	11	11	10.9	9	10.4	10	9.8	9.4	9.4
CW-23	TARGET LEVEL	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57
CW-23	TRANSDUCER READING	57	57	56.9	56.9	57	57	57	57	57	57	57	57	53.9	57	57	57.1	57	57	57	57.1	57	57	57.1	57.1
CW-22	PUMP SPEED %	68	68	69	69	69	68	69	69	70	69	70	70	75	70	70	70	70	69	68	68	68	68	68	68
CW-23	CLEAN TRANSDUCER	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	N	N	NA
CW-23	WATER CLARITY	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR
CW-23	HIGH LEVEL ALARM?	N	N	N	N	N	N	N	N	N	N	N	N	Y	N	N	N	N	N	N	N	N	N	N	N

Notes: Y - Yes N - No NA - Not Applicable NM - Not Measured