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July 25, 2018

SENT VIA OVERNIGHT MAIL

Mr. Jeffrey Thomas
Remedial Project Manager
U.S. Environmental Protection Agency
Region III - Remedial Branch
1650 Arch Street (3HS23)
Philadelphia, PA 19103

Re: 2017 Annual Site-Wide Groundwater, Surface Water, and Sediment Monitoring Report for OU-7, OU-10, and NTCRA Basins
Avtex Fibers Superfund Site
Front Royal, Virginia

Dear Mr. Thomas:

FMC Corporation (FMC) has enclosed two copies (one bound and one unbound) of the 2017 Annual Site-Wide Groundwater, Surface Water, and Sediment Monitoring Report for OU-7, OU-10, and NTCRA Basins at the Avtex Fibers Superfund Site. The report summarizes the groundwater, surface water, and sediment sampling activities conducted during the 2017 calendar year.

Groundwater monitoring was conducted in accordance with the Site-Wide Groundwater Monitoring Plan (GWMP), OU-7, OU-10, and NTCRA – Basins, Revision 1 (February 2015). Surface water and sediment sampling was conducted in accordance with the USEPA-approved Revised Surface Water and Sediment Monitoring Plan (SW&SMP) Operable Unit 7, Revision 1 (August 2014).

Based on the results of the capture zone analysis presented in this report, we recommend elimination of the quarterly water level monitoring at OU-7. Annual water level readings will still be acquired during the annual sampling event. Quarterly water level readings will continue until we receive your concurrence in this matter.

In addition to the enclosed paper copies, the report text, figures, and appendices are included on the enclosed DVD and the entire report will be uploaded to the Virtual Data Room website (www.avtexvdr.net). If you have any questions or comments, please contact myself at 215-299-6047, or Michael Robinson with Parsons at 704-558-4255.

Sincerely,

Brian McGinnis
Manager, EHS Remediation

cc: Michelle Payne, VADEQ
S. Curran, Gannett Fleming (electronic copy only)
Heather Philip, Parsons
Mike Robinson, Parsons

PARSONS

2017 ANNUAL SITE-WIDE GROUNDWATER, SURFACE WATER, AND SEDIMENT MONITORING REPORT FOR OU-7, OU-10, AND NTCRA BASINS

AVTEX FIBERS SUPERFUND SITE
FRONT ROYAL, VIRGINIA

Prepared for:

FMC

FMC Corporation
2929 Walnut Street
Philadelphia, PA 19104

Prepared by:

PARSONS

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July 2018
Parsons PN 451099

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ACRONYMS

Acronym	Definition / Description
Avtex	Avtex Fibers, Inc.
CCV	Continuing calibration verification
cfs	Cubic feet per second
COPC	Compounds of potential concern
DMC	Deuterate monitoring compounds
DQO	Data quality objective
ERM	Environmental Resource Management, Inc.
FAB	Fly Ash Basins
FLUTe	Flexible Liner Underground Technologies
FMC	FMC Corporation
FS	Feasibility study
GWMP	Groundwater Monitoring Plan
HQ	Hazard Quotient
IS	Internal Standards
Lancaster	Eurofins Lancaster Laboratories Environmental, LLC
MDL	Method detection limit
µg/kg	Micrograms per kilogram
µg/L	Micrograms per liter
mg/kg	Milligram(s) per kilogram
mg/L	Milligram(s) per liter
MGD	Million gallons per day
mS/Cm	Milli-Siemens per centimeter
MS/MSD	Matrix spike / matrix spike duplicate
MSL	Mean Sea Level
NPL	National Priorities List
NTCRA	Non-Time Critical Removal Action
O&M	Operation and maintenance
OU	Operable Unit
QA/QC	Quality assurance / quality control
QAPP	Quality Assurance Project Plan
Pace	Pace Analytical Services, Inc.
PCB	Polychlorinated biphenyl
PCE	Tetrachloroethylene
RI	Remedial investigation
RL	Reporting limit
RSL	Regional Screening Level
SB	Sulfate Basins
SDG	Sample data group

Acronym	Definition / Description
Site	Avtex Fibers Superfund Site, Front Royal, Virginia
SVOC	Semivolatile organic compound
SW&SMP	Surface Water and Sediment Monitoring Plan
TCL	Target compound list
TOC	Total organic carbon
USEPA	United States Environmental Protection Agency
USGS	United States Geological Survey
VAC	Virginia Administrative Code
VADEQ	Virginia Department of Environmental Quality
VB	Viscose Basins
VOC	Volatile organic compound
VSWMR	Virginia Solid Waste Management Regulation

EXECUTIVE SUMMARY

Parsons has prepared this annual monitoring report on behalf of FMC Corporation (FMC) to present the results of the 2017 site-wide annual groundwater, surface water, and sediment sampling event at the Avtex Fibers Superfund Site in Front Royal, Virginia (Site). Groundwater monitoring was conducted in accordance with the Site-Wide Groundwater Monitoring Plan (GWMP) Revision 1 (Environmental Resource Management [ERM] 2015), which was approved by the United States Environmental Protection Agency (USEPA) on February 27, 2015. The following annual monitoring elements and activities are included in this report:

- Capture zone analysis for Operable Unit 7 (OU-7)
- Groundwater quality monitoring for the closed Viscose Basin (VB) 9-11 units in accordance with Virginia Solid Waste Management Regulations (VSWMRs)
- Post-closure monitoring activities for VB 1-8 and the New Landfill and Non-Time-Critical Removal Action (NTCRA) Basins in accordance with VSWMRs
- Results of the 2017 surface water and sediment sampling conducted as part of implementing the USEPA-approved Surface Water and Sediment Monitoring Plan (SW&SMP) for OU-7 (ERM 2014)

Key findings associated with the 2017 groundwater quality data for OU-7 are summarized below:

- Concentrations of carbon disulfide have shown a noticeable decrease since groundwater extraction began.
- Carbon disulfide concentrations at all of the shallow bedrock wells are below the OU-7 groundwater cleanup standard, indicating that the plume is quickly attenuating in the shallow bedrock.
- The leading edge of the carbon disulfide plume in the intermediate bedrock is still located across the Shenandoah River. However, the plume has narrowed considerably and shortened at both the upgradient and downgradient ends since pumping began.
- Concentrations of inorganic constituents in bedrock groundwater are consistent with or smaller than prior monitoring events and indicate that the groundwater plumes in the overburden, shallow, intermediate and deep bedrock flow zones are stable or decreasing in concentration.
- Various metals are present in the intermediate bedrock flow zone above the OU-7 cleanup standards. However, consistent with results from 2016, only antimony, arsenic, and cobalt concentrations exceed the OU-7 groundwater cleanup standards in intermediate bedrock wells on the west side of the river (wells 206 and GM-02B).
- For the fifth consecutive year, there were no exceedances of the OU-7 groundwater cleanup standards in wells 501A, B and C. Similarly, there were no exceedances of the OU-7 groundwater cleanup standards in wells 606A and 606B.
- The capture zone analysis indicates that:

- There is a capture zone in the shallow and intermediate bedrock created by recovery wells TW-01 and TW-02 that encompasses both wells and extends across the river.
- There is also a capture zone in the deep bedrock that encompasses wells TW-02 and TW-01 and extends across the river beyond TW-03 to the southeast.
- The effects of pumping have created capture zones that extend beyond the monitoring well field.

- Findings related to the OU-7 Capture Zone Groundwater Monitoring indicate:
  - The presence of carbon disulfide, 2-methylphenol, 3&4-methlylphenol, pentachlorophenol, phenol, naphthalene, and metals in the downgradient overburden wells at concentrations that exceed the OU-7 groundwater cleanup standards. With the exception of arsenic at WP-11, the upgradient overburden wells do not contain constituents at concentrations above the OU-7 groundwater cleanup standards.
  - Carbon disulfide and metals are also present in the downgradient shallow bedrock wells at concentrations exceeding the OU-7 groundwater cleanup standards. With the exception of manganese at well 128, the upgradient shallow bedrock wells do not contain constituents at concentrations above the OU-7 groundwater cleanup standards. Manganese concentrations appear to be similar in both upgradient and downgradient wells.

  - Control charts were developed for each downgradient well except well 024 to determine if concentrations are increasing in downgradient wells. A review of the control charts indicates that most constituents remain below their baseline concentrations, with the following exceptions:
    - MW-09: carbon disulfide, pentachlorophenol, 2-methylphenol, 3&4-methylphenol, and phenol.
    - WP-10: aluminum, chromium, cobalt, and vanadium.
    - 105: zinc.
    - 116R: arsenic, chromium, cobalt, and nickel.
    - 138: iron and manganese

Key findings associated with the 2017 OU-10 Post Closure Groundwater Sampling are summarized below:

- Overburden groundwater:
  - With the exception of benzene at downgradient well MW-12, VOCs and SVOCs were not detected in the overburden groundwater downgradient of VB 1-8. These constituents have only been detected sporadically at relatively low concentrations and have not been observed in the upgradient wells. Therefore, VB 1-8 may be contributing trace levels of benzene to groundwater in the overburden aquifer, but it is not a significant source of VOCs in overburden groundwater.

- Antimony, arsenic, cadmium, chromium, copper, lead, nickel, selenium, vanadium, and zinc were detected in the overburden groundwater downgradient of VB 1-8. However, except for zinc at GPW-15R and arsenic at wells MW-11 and MW-12, none of these constituents exceeded the RSL or their baseline range. The zinc concentration at well GPW-15R was below the upgradient concentrations measured at wells GPW-02 and GPW-03R. While arsenic was detected above the RSL at wells MW-11 and MW-12, the concentration was below the respective baselines. Therefore, VB 1-8 is not contributing metals to the overburden groundwater.
- New Landfill: the two wells that are representative of upgradient overburden groundwater quality at the New Landfill have been sampled, but all downgradient overburden monitoring wells have been dry during each of the monitoring events. Based on the dry conditions at the downgradient monitoring wells, it appears that minimal overburden groundwater is present beneath and downgradient of the New Landfill.

■ Shallow bedrock groundwater:

- Except for carbon disulfide at well 135, VOCs and SVOCs were not detected in the shallow bedrock groundwater downgradient of VB 1-8. The carbon disulfide concentration was below the RSL and baseline for this location. While acetone, PCE and xylenes have been detected in the shallow bedrock groundwater in previous sampling events, none of these constituents were detected in 2017. Therefore, VB 1-8 may be contributing trace levels of carbon disulfide to groundwater in the shallow bedrock aquifer, but it is not a significant source of VOCs in the shallow bedrock groundwater.
- Arsenic, beryllium, chromium, lead, nickel, and zinc were detected at relatively low concentrations in one or more downgradient monitoring wells. Zinc exceeded the baseline concentration at 119 but remains below the RSL. The arsenic concentration at well 132 is above the RSL and baseline for this location. This is only the second exceedance of the baseline for arsenic. Therefore, with the potential exception of arsenic, VB 1-8 do not appear to be contributing metals to groundwater in the shallow bedrock. The detected concentrations could reflect naturally occurring levels of these metals.
- New Landfill wells:
  - Carbon disulfide, ethylbenzene, toluene, vinyl chloride, and xylenes were the only VOCs detected in the shallow bedrock monitoring wells downgradient of the New Landfill during the 2017 sampling event.
  - Carbon disulfide has been intermittently detected at well 133, and vinyl chloride has been present in well MW-07 since 2013. The vinyl chloride concentration has remained relatively stable at this well since 2013 and does not appear to be increasing.
  - No SVOCs were detected in the shallow bedrock monitoring wells downgradient of the New Landfill during the 2017 sampling event. Therefore, it is concluded that the New Landfill is not contributing significant VOCs or SVOCs to groundwater in the shallow bedrock zone.
  - Zinc was detected above the baseline in the downgradient shallow bedrock groundwater wells MW-07 and MW-08. However, the concentrations in these

wells are lower than the concentrations observed in the upgradient wells. Therefore, it is concluded that the New Landfill is not contributing significant metals concentrations to groundwater in the shallow bedrock zone.

Key findings associated with the 2017 NTCRA Basin Post-Closure Groundwater Sampling are summarized below:

- Fly Ash Basins (FABs) overburden groundwater:
  - Monitoring of metals in the overburden wells indicates that the unit may be contributing to arsenic concentrations in the overburden groundwater near well 014R. Concentrations of arsenic at this location have increased since 2008.
  - There have also been notable increases in sodium and sulfate at well 014R since the inception of the monitoring program in 2001.
- FABs shallow bedrock groundwater:
  - Monitoring of metals in the shallow bedrock wells both upgradient and downgradient of the FAB units did not indicate any increasing trends in metal concentrations, with the possible exception of nickel in well 114. The control chart for this constituent shows a potential increasing trend for nickel concentrations at this well, although the concentrations remain an order of magnitude below the RSL.
  - Sulfate concentrations in downgradient well 114 was elevated relative to the upgradient wells and concentrations measured during baseline data collection.
- Sulfate Basins (SBs) overburden groundwater:
  - Results of metals monitoring in the overburden wells both upgradient and downgradient of the SB units did not indicate any increasing trends in metal concentrations. The major ion concentrations are also relatively stable.
- SBs shallow bedrock groundwater:
  - Results of metals monitoring in the shallow bedrock wells both upgradient and downgradient of the SB units did not indicate any increasing trends in metal concentrations.
- Sumps:
  - The water quality data collected from the sumps indicate that arsenic, nickel, and sulfate were present during the 2017 sampling event at concentrations exceeding Virginia's surface water quality standards (9 VAC 25-260-140). Concentrations of these constituents have decreased or remained stable over time.
  - The 2017 event represents the 12th sampling event for sumps SB 4-1 and SB 4-2, the 8th sampling event for SB 3-1, and the 6th event for sumps SB-1-1, SB-1-2, SB-1-3, and SB-1-4. The water quality data indicate that arsenic, copper, nickel, and sulfate were present at concentrations exceeding Virginia's surface water quality standards (9 VAC 25-260-140). With the exception of copper, concentrations of COPCs in these sumps has decreased or remained stable over the monitoring period. This is the first-time copper has been detected at Sump SB-4-1 above the screening criteria.

Key findings associated with the 2017 surface water and sediment sampling for OU-7 are summarized below:

- Sediment:
  - Consistent with past sampling events, carbon disulfide was detected in sediment samples near the OU-7 plume above the sediment criteria. The concentrations have generally decreased across the site.
  - No SVOCs were detected at concentrations above the sediment criteria.
  - With the exception of manganese and mercury, all metals were reported as non-detect or at concentrations below the freshwater sediment screening benchmarks. The concentrations of metals detected in sediments in 2017 are relatively consistent with results reported from 2013 through 2016.
  - The total cyanide results were rejected due to low MSD recovery. Free cyanide was not detected in any of the samples.
- Surface Water:
  - No VOCs or SVOCs were detected in river surface water samples.
  - Except for iron and zinc at two locations, concentrations of total metals in river surface water samples were reported as non-detect or at concentrations below the surface water criteria at all sampling locations. Dissolved (filtered) metals were either non-detect or below the surface water criteria at all locations. The iron and zinc results appear to be anomalies based on historical concentrations and are not believed to be related to site activities.
  - Cyanide was not detected in any of the samples.

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1.0 INTRODUCTION

Parsons has prepared this annual monitoring report on behalf of FMC Corporation (FMC) to present the results of the 2017 site-wide annual groundwater sampling event at the Avtex Fibers Superfund Site in Front Royal, Virginia (Site). The site location is shown on Figure 1. Groundwater monitoring was conducted in accordance with the Site-Wide Groundwater Monitoring Plan (GWMP) Revision 1 (Environmental Resource Management [ERM] 2015), which was approved by the United States Environmental Protection Agency (USEPA) on February 27, 2015.

As part of the 100% design submittal, the Non-Time Critical Removal Action (NTCRA) Basins and Operable Unit 10 (OU-10, consisting of Viscose Basins [VB] 1-8 and the New Landfill) monitoring programs were combined with the requirements set forth in the GWMP for OU-7 to create a single, comprehensive groundwater monitoring program. The various units are shown on Figure 1A. The 2017 annual event represents the third annual event since merging the monitoring programs.

The following annual monitoring elements and activities are included in this report:

- Capture zone analysis for OU-7
- Groundwater quality monitoring for the closed VB 9-11 units in accordance with Virginia Solid Waste Management Regulations (VSWMRs)
- Post-closure monitoring activities for VB 1-8 and the New Landfill and NTCRA Basins in accordance with VSWMRs
- Results of the 2017 surface water and sediment sampling conducted as part of implementing the USEPA-approved Surface Water and Sediment Monitoring Plan (SW&SMP) for OU-7 (ERM 2014)

1.1 Background

FMC has completed removal and remedial activities at the Site. The removal action, remedial design, and remedial action activities were performed pursuant to the 1999 Consent Decree between the United States of America and FMC Corporation (effective October 21, 1999). The Site has now transitioned into the operations and maintenance (O&M) phase of the remedy.

The approximately 440-acre Avtex Fibers Superfund Site is a former rayon manufacturing facility located in Front Royal, Virginia. The Norfolk Southern railroad runs through the middle of the Site, separating the former production facilities on the eastern side of the railroad tracks from the disposal units located on the western side of the railroad tracks. Residential areas are located to the east, south and north of the property boundaries. The South Fork Shenandoah River is located along the western portion of the property. The Site location is shown on Figure 1.

Operations at the Site began in 1940, when American Viscose opened a rayon production plant. In 1963, American Viscose sold the plant and property to FMC. FMC sold the plant and property to Avtex Fibers, Inc. (Avtex) in 1976. The State of Virginia ordered Avtex to abruptly shut the plant down in November 1989. Avtex filed for bankruptcy shortly thereafter (1990).

Plant operations generated three major waste types: a zinc sulfate sludge, fly ash, and viscose waste (a high pH cellulose material containing carbon disulfide). Most of the wastes were disposed in a series of basins located on the western portion of the

property. A significant groundwater plume resulted from chemical discharge from several of the viscose waste basins. Plant operations resulted in chemical impacts to the former manufacturing buildings and associated sewer system. Chemical releases from the plant area also resulted in soil contamination.

When groundwater contamination was discovered in residential wells, the Site was proposed for the National Priorities List (NPL) on October 15, 1984 (49 FR[1] 40320), and listed on the NPL on June 10, 1986 (51 -FR 21054). After Avtex declared bankruptcy, USEPA initiated emergency removal actions to mitigate releases from reactive and dangerous materials left in tanks, piping, and buildings. To facilitate management of the cleanup, the remediation activities were divided into 10 OUs and three removal actions. USEPA conducted emergency removal actions and remedial actions for OU2, OU3, OU4, OU5, and OU8 from 1989 until 1999. In 1999, USEPA entered into a Comprehensive Consent Decree with FMC to implement the remaining required remedial activities.

Approximately 240 acres of the Site (western side of tracks) has been designated as a conservancy area. The former plant area comprises approximately 160 acres. A portion of the plant area, a 5-acre former parking lot, was sold to the town of Front Royal with plans to construct a police station. The Front Royal Economic Development Authority now owns the former plant area and is working to redevelop the area into a commercial/light industrial area.

On August 29, 2014, USEPA issued a document titled “Superfund Preliminary Close-out Report” that documented construction completion of the Site. The completion of construction at the Site marks the transition of the Site into the O&M phase.

1.2 Monitoring Objectives

The objectives for each of the monitoring activities summarized in this report are outlined below:

OU-7 Groundwater Monitoring

The OU-7 groundwater monitoring program objectives are twofold:

1. Monitor groundwater elevations and quality to evaluate remedy performance and support plume capture zone analyses; and
2. Monitor groundwater quality for the closed VB 9-11 units in accordance with the VSWMRs.

OU-7 Surface Water and Sediment

The objective for the OU-7 river and sediment monitoring is to collect surface water quality and sediment data to determine whether there are decreasing trends in the constituent concentrations found in surface water and sediments in the area where the groundwater contamination plume from VB 9-11 is entering the Shenandoah River.

OU-10 and NTCRA-Basins Groundwater Monitoring

The objective for the groundwater monitoring program for the closed OU-10 and NTCRA-Basin units is to determine whether groundwater quality becomes further

[1] FR – Federal Register

degraded from the viscose and other waste within the units and, if so, whether there is an unacceptable risk posed by the change in water quality conditions.

1.3 Well Inspections

Section 2.4 of the OU-7 GWMP required inspection of all wells in the proposed monitoring well network to determine their integrity and accessibility. In addition, occasional depth to bottom measurements at each well are required to verify the constructed depth and measure sediment build up in the wells. The depth to bottom of most of the wells was recorded in 2014 or 2015; however, some of the wells could not be measured due to measuring equipment issues. Additional measurements were therefore collected in 2016. The depth to bottom at PW-01 was remeasured in 2017 to verify the previous reading collected in 2014. It was determined that the depth to bottom reading from 2014 was inaccurate and there is considerably less sediment in the bottom of this well than initially thought. The well construction detail and depth to bottom reading for the wells are shown on Tables 1 through 3. Depth to bottom readings cannot be obtained at several of the wells. The FLUTe[2] liners installed in wells 603 and 604 prevent measurements of depth to bottom in those wells. Wells TMW-01, TMW-02, and TMW-03 have been converted to extraction wells. In July 2017, all the wells were found to be in working condition and accessible.

1.4 Sample Collection Procedures

1.4.1 Sample Identification

Each sample was assigned a unique sample tracking number using the basic format described in Section 6.1 of the OU-7 GWMP. The sample identification numbers are coded on the format: Event-Location-Type. Each of these codes is defined below

- The Event code is always made up of the four-character Date Code + a two-character Event Code. For example, the event code for the annual monitoring event for 2017 is 2017AN.
- The Location Code is the unique well/sump identification number assigned to each location (e.g., PW-01).
- The optional Type code is used to describe special samples, as follows:
    - D (duplicate)
    - Z1, Z2, Z3, or Z4: depth code for FLUTe wells (representing zone 1, 2, 3, or 4)
    - MS/MSD (Matrix spike/matrix spike duplicate)
    - SUMP for Sumps

1.4.2 Well Purging

The wells were purged in accordance with the well purging and sampling procedures and any applicable alternative procedures outlined in Section 3.4.3 of the OU-7 GWMP (ERM 2015). Groundwater, surface water, and sediment purging and sampling began on July 11 and was completed on August 10, 2017. The purging method for each well is

[2] Flexible Liner Underground Technologies

summarized in Tables 4 through 6 for the OU-7, OU-10, and NTCRA Basin monitoring well networks, respectively.

1.4.3 Measurement of Field Parameters

Field measurements for pH, conductivity, redox potential, dissolved oxygen, turbidity, and temperature were collected from groundwater wells in accordance with the procedures described in Sections 3.4.3 and 3.4.4 of the OU-7 GWMP. Field parameters were measured by directing the pump outflow through a flow-through cell in accordance with the methods for assembly and calibration provided in Attachment C of the OU-7 GWMP.

1.4.4 Groundwater Sample Collection

Groundwater samples were collected in accordance with the procedures described in Section 3.4.3 of the OU-7 GWMP. Samples collected for dissolved metals were field filtered through a 0.45-micron in-line filter. The filtrate was placed directly into the sample container with the appropriate preservatives. The time of collection and any observable characteristics of the sample were recorded in the field notebook or on the sample log. The sampling method for each well is summarized on Tables 4 through 6 for the OU-7, OU-10, and NTCRA Basin monitoring well networks, respectively. Sample logs are included in Appendix A.

1.4.5 Surface Water and Sediment Sample Collection

Surface water and sediment samples were collected in accordance with the procedures described in Section 2.3 of the SW&SMP. The samples were collected beginning with the most downstream sample and working progressively upstream. At each location, the surface water sample was collected before the sediment sample to avoid getting disturbed sediment in the samples.

1.5 Quality Assurance

Quality assurance / quality control (QA/QC) samples were collected during the sampling event to measure and confirm the accuracy and usability of the data in accordance with the GWMP, the SW&SMP, and the Site-Wide Quality Assurance Project Plan (QAPP). The following QA/QC samples were collected in 2017.

- Five equipment rinsate blanks distributed across the monitoring units as follows:
  - Sediment: 1
  - OU-7/OU-10/Basins: 4
- Seven field duplicate samples distributed across the monitoring units as follows:
  - Surface water: 1
  - Sediment: 1
  - OU-7: 2
  - OU-10: 1
  - OU-7/Basins: 1
  - OU-7/OU-10/Basins: 1

- Seven matrix spike / matrix spike duplicate (MS/MSD) samples distributed across the units as follows:
  - Surface water: 1
  - Sediment: 1
  - OU-7: 2
  - OU-10: 1
  - OU-7/Basins: 1
  - OU-7/OU-10/Basins: 1
- One trip blank per cooler containing volatile organic compounds (VOC) samples (total of 13 trip blanks).

Groundwater samples were submitted to Test America Laboratories (Test America) in Nashville, Tennessee for analysis of the compounds of potential concern (COPCs) as presented in Section 3.6.1 of the OU-7 GWMP. Surface water and sediment samples were likewise submitted to Test America for analysis of the COPCs as presented in Section 2.5 of the SW&SMP. Test America performed the analyses using USEPA-approved analytical methods as described in the Site-Wide QAPP, the OU-7 GWMP, and the SW&SMP. GHD Services Inc., performed data review, verification and validation to Level 2 criteria as defined in Section 5.1 and Table 7 of the Site-Wide QAPP. The Level 2 verification includes a review/evaluation of blanks, retention times, mass spectra, chromatograms, raw instrument outputs, and other information, including laboratory reporting forms, run logs, and all supporting data provided by the laboratory. Data validation reports are provided as Appendix B.

1.6 Report Organization

In addition to this introduction, the report includes the following sections.

- Section 2 presents the results of the OU-7 capture zone groundwater monitoring. It describes the activities associated with the implementation of capture zone water level and groundwater quality monitoring for VB 9-11.
- Section 3 presents the results of the OU-7 post-closure groundwater monitoring. It describes groundwater sampling activities implemented as part of the post-closure maintenance of VB 9-11 conducted in accordance with the VSWMR requirements.
- Section 4 presents the results of the OU-10 post-closure groundwater monitoring. It describes the annual groundwater sampling implemented as part of the post-closure maintenance of OU-10 VB 1-8 and the New Landfill management units.
- Section 5 presents the results of the NTCRA Basins post-closure groundwater monitoring. It summarizes the annual groundwater sampling implemented as part of the post-closure maintenance of the NTCRA Basins Closure Sulfate Basins (SB) and Fly Ash Basins (FAB) management units.
- Section 6 presents the results of the OU-7 surface water and sediment monitoring. It summarizes the annual sampling of the river surface water and sediment implemented in accordance with the SW&SMP.
- Section 7 provides the references cited in the report.

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2.0 OU-7 CAPTURE ZONE GROUNDWATER MONITORING

The OU-7 groundwater monitoring was conducted concurrently with the annual sampling at OU-10 and the NTCRA Basins (Figure 1A). Groundwater, surface water, and sediment samples were collected between July 11 and August 10, 2017. The objectives of the OU-7 monitoring, as stated in the OU-7 GWMP, are to:

1. Monitor groundwater elevations and quality to evaluate remedy performance and to support plume capture zone analyses; and
2. Monitor groundwater quality for the closed VB 9-11 units in accordance with the VSWMR.

The activities described herein were completed in accordance with the protocols established by the OU-7 GWMP. Any deviations to the USEPA-approved document are noted.

2.1 Monitoring Well Network

The OU-7 monitoring well network is identified in the OU-7 GWMP and includes 74 wells for water level gauging, 55 of which are also to be sampled for groundwater quality monitoring. The locations of the 74 wells are shown on Figure 2, and the wells are listed below.

Overburden	Shallow Bedrock	Intermediate Bedrock	Deep Bedrock
Sampled Upgradient Wells (seven wells)			
WP-11, 029	103, 128, 133	203	301
Sampled Downgradient Wells (48 Wells)			
005, 024, MW-09, MW-10, WP-10	105, 114, 115, 116R, 132, 138, 162, 185, MW-03R, PZ-06, GM-02A	136, 181, 205, 206, 210, 215, 216, 232, 238, GM-02B, GM-09, PW-0, PW-02	305, 306, 316, 336, 338, 501A, 501B, 501C, 601, 602, 603*, 604*, 605A, 605B, 606A, 606B, TW-01, TW-02, TW-3
Water Level Gauging Only (19 Wells)			
012, 014R, WP-12R	110, 112, 129, 135, MW-06, PZ-03, PZ-05, PZ-09	133-Off, 141, GM-01B, PW-01, PW-04	091, 303, 315,

* Wells 603 and 604 are each fitted with FLUTe liners with sample ports in four depth zones.

For the 2017 groundwater sampling event, a total of 64 samples (including four duplicates) were collected from the 55 sampled wells. Well 005 was dry during the sampling event and could not be sampled.

2.2 Water Level Measurements

In accordance with Section 2.2 of the OU-7 GWMP quarterly water level monitoring is conducted at OU-7 to support the capture zone analysis. The first quarterly synoptic water level data for 2017 were collected on March 21-22, 2017. Three subsequent events followed on July 11 (prior to initiating the annual groundwater sampling event), September 21, and December 19, 2017. Water levels were measured using an electronic water level meter and recorded to the nearest 0.01 foot. Groundwater elevation data are presented on Table 7. The groundwater elevation contours for each monitoring interval (overburden, shallow bedrock, intermediate bedrock, and deep bedrock) are presented separately. Figures 3A, 3B, 3C, and 3D show the groundwater elevation contours for the overburden interval in March, July, September, and December 2017, respectively. Similarly, Figures 4A though 4D; 5A through 5D; and 6A through 6D show the groundwater contour intervals during the subsequent monitoring events in the shallow, intermediate, and deep bedrock intervals, respectively.

Without the influence of the groundwater extraction system, groundwater under the Site (on the east side of the river) generally flows to the west toward the river. However, groundwater within the bedrock aquifer flows parallel to geologic strike at approximately S30ºW. This flow path represents an approximate 30 degree southward departure from the piezometric gradient. In Rivermont Acres on the west side of the Shenandoah River, groundwater typically flows toward the east and southeast, toward the river. The flow path on the west side of the river is likely attributable to the higher hydraulic heads associated with groundwater recharge in the Catlett Mountains, which lie to the west.

2.3 Capture Zone Analysis

As previously mentioned, the OU-7 monitoring wells were gauged four times during 2017 (March 21-22, July 11, September 21, and December 19), and there are three operating groundwater recovery wells at the Site (TW-01, TW-02, and TW-03). Extraction wells TW-01 and TW-02 are both screened from (approximately) +200 feet above mean sea level (MSL) to +460 feet MSL, while TW-03 is screened from (approximately) +15 feet MSL to +335 feet MSL. The extraction system was operated throughout the entire year with only short periods of downtime for repairs or other issues.

Groundwater potentiometric surface maps (Figures 3A through 6D) have been created for the Overburden and the three intervals of the Bedrock (Shallow, Intermediate, and Deep), as they have been previously defined. Interpretation of the groundwater potentiometric maps indicates:

- The Overburden potentiometric surface (Figures 3A through 3D) shows a linear effect slightly off-axis to TW-01/TW-02, where the potentiometric contours are offset in the hydraulically upgradient direction, indicating a lowering of the potentiometric surface in the region (i.e., drawdown). This curvature in the potentiometric surface creates an inward gradient in the lateral directions which leads to the formation of a groundwater capture zone. There are dewatering wells in the overburden in the region of the VBs that would add to any effect pumping from TW-01/TW-02 would have on the overburden.
- The Shallow Bedrock potentiometric surface (Figures 4A through 4D) clearly shows the effect of TW-02 and TW-01 pumping throughout the year (as can be observed in the 470 MSL contour). Similar to the Overburden, the potentiometric

lines bend around the pumping wells, creating an inward gradient, leading to the formation of a capture zone.

- The Intermediate Bedrock potentiometric surface (Figures 5A through 5D) shows a zone of inward flow (cone of depression) between wells TW-01 and TW-02, and suggest that it extends to the opposite side of the river. This potentiometric surface shows that a capture zone has been created by the pumping of wells TW-01 and TW-02.
- The Deep Bedrock potentiometric surface (Figures 6A through 6D) shows a zone of inward flow (cone-of-depression) between recovery wells TW-02 and TW-01, that also extends across the river to recovery well TW-03. This potentiometric surface shows that a capture zone has been created by the pumping wells. The southern-most extent of capture appears to extend at least to well pair 606 (south of pumping well TW-03).

Maximum site-wide drawdown (as defined as the difference between the March 18, 2015, baseline hydraulic heads and those measured during the 2017 quarterly events) was observed during the July gauging event (Table 7 includes calculated drawdowns). Calculated drawdowns for the July event were contoured to be consistent with the groundwater sampling event. Maps of change in hydraulic head were created using this data for the four subsurface zones (Figures 3E, 4E, 5E, and 6E). Drawdown is represented by negative head change. Interpretation of the hydraulic head drawdown maps indicates:

- The overburden drawdown (Figure 3E) indicates that there is nearly equivalent influence on the overburden between wells TW-01 and TW-02. Average drawdown varied by less than 1.5 feet between monitoring events, indicating relatively stable influence caused by active groundwater recovery. Up to 1 foot of drawdown may be due to natural seasonal variation.
- The shallow bedrock drawdown (Figure 4E) shows a well-developed cone of depression extending between wells TW-01 and TW-02, and extending across the river. Average drawdown varied by less than 1.0 feet between monitoring events, indicating relatively stable influence caused by active groundwater recovery. Natural seasonal variation may account for 1 to 2 feet of observed drawdown.
- The intermediate bedrock drawdown (Figure 5E) shows a well-developed cone of depression extending between wells TW-01 and TW-02 and across the river. Average drawdown varied by less than 1.5 feet between monitoring events, indicating relatively stable influence caused by active groundwater recovery. Natural seasonal variation may account for 2 feet of observed drawdown.
- The deep bedrock drawdown (Figure 6E) also indicates an elongated cone of depression that extends from TW-02 through TW-01 and across the river to TW-03. Although average drawdown varied by less than 1.7 feet between monitoring events, drawdown values were more variable, possibly indicating less-well-connected fractures. Natural seasonal variation may account for 2 feet of observed drawdown (including a rise in water levels).

Four hydrogeologic cross-sections also were created using the hydraulic head data from July and groundwater sample analyses from July 2017. Cross-section A-A' (Figure 7) runs southwest-to-northeast, from the opposite side of the river, through TW-01 and TW-02, over to the railroad tracks. Cross-section B-B' (Figure 8) runs north-south

through TW-02. Cross-section C-C' (Figure 9) runs north-south, along the eastern bank of the river, through TW-01. Cross-section D-D' (Figure 10) runs north-south, along the western bank of the river, through TW-03.

Interpretation of the hydrogeologic cross-sectional flow maps indicate:

- Cross-section A-A' (Figure 7) shows a nicely defined flow toward both pumping wells TW-01 and TW-02, with an expanding capture zone between.
- Cross-section B-B' (Figure 8) shows a well-defined area of capture around TW-02, with an inflowing groundwater gradient from both ends of the cross-section.
- Cross section C-C' (Figure 9) shows a tighter zone of capture around TW-01. The southernmost region (at well pair 110/210 near C') is outside of the capture.
- Cross-section D-D' (Figure 10) shows the effects of pumping from across the river (at TW-01) in the central portion of the cross-section (at wells 602/336/ GM-02A/GM-02B). The capture zone created by pumping at TW-03 extends to the southeast of TW-03.

Interpretation of capture zones includes determining a "stagnation point" (the downgradient point where there is a groundwater divide; groundwater flows back toward the recovery well, or downgradient away from the well), and a maximum capture zone "width." These were first determined by reviewing the drawdown maps and potentiometric surface maps associated with the July gauging event. Where the capture zones for TW-01 and TW-02 have combined, there is only one stagnation point downgradient from well TW-01. Capture zones were only interpreted for zones where groundwater recovery is taking place.

- Pumping in the shallow bedrock is influenced more strongly by surface water flow in the river. The stagnation point doesn't extend to the opposite side of the river, as much as it extends "along" the river. The stagnation point appears to extend 1,500 feet in the "downstream" direction of TW-01. The stagnation point extends "across" the river in the vicinity of, and only to the distance of, TW-03. The maximum capture zone width is at over 1,000 feet at TW-02 (i.e., 500 feet cross gradient to either side of TW-02). The capture zone width extends beyond the monitoring well field at TW-02. As discussed above, the capture zone is elongated along the river, which causes a variable width (as well as direction) in the capture zone associated with pumping at TW-01. At TW-01, the width of the capture zone is at least 500 feet, but there is a much wider capture zone width on the east side of the river due to the combined influence from TW-02.
- In the intermediate bedrock, the stagnation point appears to be on the opposite side of the river, at least 1,000 feet downgradient from TW-01 (most likely beyond the extent of the monitoring well field). The maximum capture zone width is at least 1,000 feet at TW-02 and 1,000 feet at TW-01. The capture zone width extends beyond the monitoring well field at both locations.
- In the deep bedrock, the stagnation point is on the opposite side of the river, more than 1,800 feet downgradient of TW-01, extending beyond pumping well TW-03 and beyond the extent of the monitoring well field. The maximum capture zone width is at least 750 feet at TW-02, 800 feet at TW-01, and 500 feet at TW-03. The capture zone width extends beyond the monitoring well field at all three locations.

The USEPA's capture zone evaluation guidance includes formulas on how to calculate steady-state stagnation points and capture zone widths. However, the underlying assumptions to the equations do not explicitly apply to the Site. Assumptions such as homogeneous and isotropic do not apply to fractured bedrock where the fractures are oriented along a lineament. However, fractured bedrock can sometimes be considered quasi-homogeneous and isotropic in the "zone" of fractures.

The formulas require hydraulic conductivities, "aquifer" thicknesses, and pumping rates. The site conceptualization presented in the June 2013 groundwater modeling report was used to determine these values. The original conceptualization included operation of wells TW-01 and TW-02 pumping at a combined 35 GPM. During 2017, the average combined recovery rate for wells TW-01 and TW-02 was 47 GPM. The calculations presented below are based on the initial 35 GPM conceptualization; therefore, the predicted capture zone in 2017 would be greater in extent, based on the higher recovery rate. The additional 7.5 GPM average 2017 recovery rate in TW-03 would add to the extent of the capture zone on the west side of the river.

Because wells TW-01 and TW-02 are screened across all three "layers" (shallow, intermediate, and deep bedrock), the 35 GPM pumping rate was divided across the three intervals based on the weighting of the hydraulic conductivities and layer thicknesses (17% came from the shallow zone, 58% from the intermediate zone, and 25% from the deep zone). Depending on whether the fractured bedrock zones were responding as an unconfined or confined aquifer, the following results were calculated:

- Shallow bedrock: stagnation point between 118 feet and 260 feet; maximum capture zone width between 744 feet and 1,636 feet.
- Intermediate bedrock: stagnation point between 183 feet and 264 feet; maximum capture zone width between 1,150 feet and 1,656 feet.
- Deep bedrock: stagnation point between 154 feet and 413 feet; maximum capture zone width between 968 feet and 2,594 feet.

Calculations also indicated that the maximum capture zone should establish itself within 3 weeks. Again, however, this assumes that the fractured bedrock formations act in an equivalent manner as a typical porous media (i.e., sand aquifer).

2.3.1 Summary of Extraction Rates

Table 8 summarizes the extraction rates for wells TW-01, TW-02, and TW-03 by month for the last three years. As shown on the table a total of 26.2 million gallons of groundwater was extracted from these wells in 2017 at an average daily flow rate of 0.073 million gallons per day (MGD). A communication failure occurred in December 2017 resulting in no flow being recorded during this period (although the pumps were operating). The lowest average daily extraction rate recorded during 2016 and 2017 was 0.049 MGD (February 2016). The lowest average monthly flow of 1.435 MGD was also recorded at this time. Capture was maintained even at the lowest extraction rate, which indicates adequate capture/control even at lower system flow rates. The system has been operating with such consistency, that a lower threshold flow rate can't be accurately calculated at this time (i.e., a flowrate whereby capture is not maintained). We recommend elimination of the quarterly water level monitoring. Annual water level readings will still be acquired during the annual sampling event.

2.4 Sample Analysis

The analyses performed on each groundwater sample are listed below with the analytical methods identified in the OU-7 GWMP.

- Dissolved metals by USEPA Method 6020A:
  - Aluminum
  - Antimony
  - Arsenic
  - Cadmium
  - Chromium
  - Cobalt
  - Iron
  - Lead
  - Manganese
  - Nickel
  - Vanadium
  - Zinc
- Dissolved mercury by USEPA Method 7470A
- Cyanide (free) by USEPA Method 9014
- VOCs by USEPA Method 8260B:
  - Acetone
  - Carbon disulfide
- Semivolatile organic compounds (SVOCs) by USEPA Method 8270D:
  - 2-Methylphenol (o-Cresol)
  - 4-Methylphenol (p-Cresol)
  - Bis(2-ethylhexyl)phthalate
  - Naphthalene
  - Pentachlorophenol
  - Phenol

2.5 Quality Assurance

As previously mentioned in Section 1.5, QA/QC samples were collected during the sampling event to measure and confirm the accuracy and usability of the data in accordance with the GWMP, the SW&SMP, and the Site-Wide QAPP. The following QA/QC samples were collected in 2017 as part of the OU-7 Sampling.

- Five equipment rinsate blanks distributed across all three monitoring units (OU-7/OU-10/Basins)

- Four field duplicate samples
- Four matrix spike / matrix spike duplicate (MS/MSD) samples
- One trip blank per cooler containing volatile organic compounds (VOC) samples

Following laboratory analysis of the samples, GHD Services Inc., performed data review, verification and validation to Level 2 criteria as defined in Section 5.1 and Table 7 of the Site-Wide QAPP. The Level 2 verification includes a review/evaluation of blanks, retention times, mass spectra, chromatograms, raw instrument outputs, and other information, including laboratory reporting forms, run logs, and all supporting data provided by the laboratory. Data validation reports are provided as Appendix B.

Most of the 2017 OU-7 data were considered usable. The acetone results from a number of samples were rejected due to outlying laboratory control sample results (See Table 9 of the Data Validation Report in Appendix B). Data qualifiers have been added to some of the other results as well. These qualifiers provide additional details regarding the data such as QC issues or interferences. Data qualified with a “J” indicate that, while the constituent was positively identified, the associated numerical value is an estimated concentration. Examples of data that may be qualified with this flag include values below the reporting limit (RL) but above the method detection limit (MDL), or where the associated QC samples are outside acceptable ranges.

The data quality objectives (DQOs) for the post-closure monitoring are to provide data of sufficient quality to evaluate changes in groundwater quality over time, if any, associated with various units at the Site. As defined in Section 4.1 of the OU-07 GWMP and the SW&SMP, definitive quantitation of the concentrations of constituents of potential concern in groundwater by an off-site analytical laboratory is needed for 90% for the annual events to meet the DQO.

The monitoring plan calls for sampling 56 wells at OU-7. Each sample is analyzed for 22 constituents (13 metals, cyanide, two VOCs, and six SVOCs) for a total of 1,232 individual constituent results. Nineteen acetone results were rejected in OU-7; therefore, definitive quantitation for 98.5% of the constituents was achieved.

2.6 Results

The validated groundwater sample results for 2017 are presented in Table 9 and summarized in the following subsections. Laboratory reports are provided in Appendix C. Historical results are provided in Appendix D.

2.6.1 VOCs

Acetone was detected at relatively low concentrations in nine monitoring wells (138, 215, 232, 305, 306, 336, 601, PZ-06, and MW-09). Consistent with recent past results, none of the detected concentrations exceeded the OU-7 cleanup standard of 22,000 micrograms per liter (µg/L).

Carbon disulfide was detected in 39 of the sampled wells and appeared in each of the four flow zones (overburden, shallow bedrock, intermediate bedrock, and deep bedrock). The detected concentrations exceeded the OU-7 cleanup standard of 1,000 µg/L in three wells (MW-09, 206 and 305). A significant decrease in the concentrations and extent of carbon disulfide in groundwater has been observed over the last three years. In 2016, two wells (206 and 305) had concentrations of carbon disulfide exceeding the cleanup standard; while in 2015, five wells (205, 206, 305, 336, and MW-03R) had

concentrations of carbon disulfide exceeding the cleanup standard. In 2014, 11 of the wells (138, 206, 215, 216, 305, 316, 336, 603-Z1, MW-03R, MW-09, and PW-02) had concentrations exceeding the cleanup criteria.

The results are discussed by monitoring zone in more detail below.

Overburden

- Within the overburden flow zone, the maximum concentration of carbon disulfide was detected at well MW-09, located along the western edge of VB 9. The carbon disulfide concentration at well MW-09 remains significantly less than the concentrations detected since 2012 as shown below.

Well	2012	2013	2014	2015	2016	2017
MW-09 (µg/L)	5,450	1,110	1,210	750	556	1,410

- At downgradient well 024, the carbon disulfide result was reported as not detected (consistent with past results).

Shallow Bedrock

- Within the shallow bedrock zone, carbon disulfide was not detected above the OU-7 cleanup standard of 1,000 µg/L.
- Carbon disulfide has historically been detected at concentrations above the cleanup standard in shallow bedrock wells 116R, 138, and MW-03R. However, the concentrations in these wells have been below the cleanup goal for at least the last two years and the concentrations continue to decrease as shown below.

	Concentration (µg/L)		
Year	116R	138	MW-03R
2013	172	2,690	6,930
2014	183	1,310	4,290
2015	57 J	410	2,600
2016	11.6	197 J	367
2017	18.2	157	99.4

J = Estimated result.

Intermediate Bedrock

- Carbon disulfide was detected in groundwater above the OU-7 cleanup standard at one well (206). The concentration detected at this location has decreased substantially since 2013.
- The elevated concentration of carbon disulfide at well 206, located on the west side of the river, is consistent with previously observed bedrock fracture flow at the Site.
- Historically, carbon disulfide exceeded the cleanup standard in four additional intermediate bedrock wells (205, 215, 216, and PW-02). However, as shown below, the concentrations in these wells is now below the cleanup standard.

	Concentration (µg/L)				
Year	205	206	215	216	PW-02
2012	9,450	11,600	648 J	2,960 J	9.3
2013	203	12,000 L	1,400	5,320	50.4
2014	90.5	8,100	1,230	3,950	1,920
2015	1,300	7,500	930	1,000	180
2016	136	3,530	764	364	9.25
2017	35.2	2,390	408	352	8.79

L = Reported value may be biased high.
J = Estimated result.

Deep Bedrock

- Carbon disulfide was detected in the deep bedrock flow zone above the OU-7 cleanup standard at one well (305).
- Historically, four wells in the deep bedrock flow zone have had concentrations of carbon disulfide exceeding the cleanup standard (305, 316, 336, and 603-Z1). However, as shown below, the concentrations in wells 316, 336, and 603 have decreased significantly. The table also presents the results from the extraction wells since 2013.

	Concentration (µg/L)						
Year	305	316	336	603-Z1	TW-1	TW-2	TW-3
2013	39,900	4,540	9,690	1,180 J	90.7	98.3	< 2.0
2014	41,100	7,180	10,200	1,860	NS	NS	NS
2015	28,000	520	14,000	98	NS	NS	NS
2016	34,700	241	< 0.220	2.47	169	168	1.02
2017	44,300	451	363	0.648	29.9	743	0.687

The detection of carbon disulfide in the recovery wells indicates mass of the compound is being removed from the groundwater.

2.6.2 SVOCs

Two SVOCs (3&4-methylphenol and phenol) were detected in the overburden groundwater at MW-09 at concentrations above their respective OU-7 cleanup standards. No other SVOCs were detected in any of the OU-7 wells at concentrations above their OU-7 cleanup standards. Relatively low concentrations of SVOCs (below their cleanup standards) were also detected at wells 215, 305, MW-10, WP-10, and PW-02.

2.6.3 Inorganic Constituents

Eight metals (antimony, arsenic, chromium, cobalt, iron, manganese, nickel, and vanadium) were reported at concentrations exceeding their respective OU-7 cleanup

standards in at least one monitoring well (Table 9). Aluminum, cadmium, lead, mercury, and zinc were not detected in any sample above their OU-7 groundwater cleanup standards. The results are discussed by monitoring zone in more detail below.

Overburden

- At MW-09, which is near VB 9, antimony, arsenic, cobalt, nickel, and vanadium were reported at concentrations above the OU-7 groundwater cleanup standards. This is consistent with historic results at this location.
- At WP-10, which is along the northern side of VB 9, arsenic and cobalt were detected above their respective OU-7 groundwater cleanup standards. Nickel has historically exceeded the OU-7 groundwater cleanup standard at this location but was below the standard during this event. The arsenic and cobalt results are consistent with historic results at this location.
- At MW-10, downgradient of VB 10, arsenic, cobalt, iron, and manganese were detected at concentrations that exceeded their respective OU-7 groundwater cleanup standards. The results are consistent with historic results for this well.
- Historically, manganese has been detected at upgradient well WP-11 at a concentration exceeding the OU-7 groundwater cleanup standard, however, the concentration was below the standard during this event. Although not previously detected at this location, the arsenic concentration in 2017 was slightly above the cleanup standard.
- Downgradient well 005 was dry and, therefore, no sample could be obtained from this location. This is evidence of the drawdown being created by pumping at the adjacent extraction well, TW-01.
- Cyanide was not detected in any of the overburden groundwater monitoring wells. While cyanide has historically been detected above the cleanup standard at well MW-09, it was below the standard in 2014 and not detected in 2015, 2016, or 2017.

Shallow Bedrock

- Manganese was detected at concentrations exceeding the OU-7 groundwater cleanup standard in four of the 14 wells sampled (103, 114, 128, and 132). These wells represent both upgradient (103, 128, and 132) and downgradient (114) conditions. The manganese results are similar to those reported in 2013 through 2016.
- At well 114, arsenic and manganese were detected at concentrations exceeding their OU-7 groundwater cleanup standards. The results are consistent with historical concentrations.
- At well 116R the following inorganic constituents were detected at concentrations exceeding their OU-7 groundwater cleanup standards: antimony, arsenic, chromium, cobalt, and nickel. The results are similar to historic concentrations.
- Historically, arsenic, cobalt, and manganese have exceeded the OU-7 groundwater cleanup standard in groundwater at upgradient well 133. However, no metals were detected above their cleanup standard at this location in 2017.

- At well 138 arsenic and cobalt were detected in groundwater at concentrations exceeding the OU-7 cleanup standard. These results are similar to those reported in historic sampling events.
- No inorganic constituents were detected above the OU-7 cleanup standards at well GM-02A, which is downgradient and across the Shenandoah River. Several metals have been historically detected at this well exceeding the standard (antimony, arsenic, cobalt, and cyanide); however, the concentrations have decreased to below the cleanup standards.
- At well MW-03R arsenic and cobalt were detected at concentrations exceeding the OU-7 groundwater cleanup standard. The concentrations are consistent with historic results. Antimony, chromium, manganese, nickel and cyanide have also historically been detected above the cleanup standards at this location. Manganese last exceeded the standard in 2014; while mercury, nickel, and cyanide have not exceeded the standards since 2000.
- No inorganic constituents were detected at concentrations exceeding their OU-7 groundwater cleanup standards at wells: 105, 115, 162, 185, GM-02A, and PZ-06.
- Cyanide was not detected in any of the shallow bedrock groundwater monitoring wells at a concentration exceeding the OU-7 groundwater cleanup standard.

Intermediate Bedrock

- Arsenic was detected in groundwater at a concentration exceeding the OU-7 groundwater cleanup standard at downgradient well 205. The arsenic concentration has been decreasing at this location (from 884 µg/L in 2012 to 19.7 J µg/L in 2017). Antimony and cobalt have historically exceeded the cleanup standards at this location, however, their concentrations have also been decreasing. Antimony was below the cleanup standard for the first time in 2017; while cobalt has been below the standard since 2016.
- At downgradient well 206 (located across the Shenandoah River), only arsenic was detected at a concentration exceeding the OU-7 cleanup standard. The concentration of arsenic continues to decrease at this location.
- At downgradient well 216, antimony, arsenic, and cobalt were detected at concentrations exceeding their OU-7 cleanup standards. The concentrations were consistent with past sampling events.
- At downgradient well 238, antimony and arsenic were detected at concentrations exceeding the OU-7 cleanup standard. The concentrations were lower than past sampling events. Historically, cobalt has also been detected above the cleanup standard at well 238, but it has not been detected above the standard since 2013.
- At downgradient well GM-02B, antimony, arsenic, and cobalt were detected at concentrations exceeding the OU-7 cleanup standard. The concentrations have generally been decreasing at this location.
- Consistent with past results, manganese was the only constituent exceeding the OU-7 cleanup standard at downgradient wells GM-09R and PW-0.
- Concentrations at well PW-02 continue to decrease or remain stable. No constituents were detected above the OU-7 groundwater cleanup standards at

this location in 2016 or 2017. Historically, antimony, arsenic, cobalt, and cyanide have been detected at this location at concentrations exceeding the cleanup standard.

- No inorganic constituents were detected at concentrations exceeding their OU-7 groundwater cleanup standards at wells 136, 181, 203, 210, 215, 232, and PW-02.
- Cyanide was not detected in any of the intermediate bedrock groundwater monitoring wells at a concentration exceeding the OU-7 groundwater cleanup standard.

Deep Bedrock

- Consistent with historical results, antimony, arsenic, and cobalt were detected in groundwater at concentrations exceeding their OU-7 groundwater cleanup standard at downgradient well 305.
- In 2015 and 2016, arsenic and antimony were detected in groundwater at concentrations exceeding their OU-7 groundwater cleanup standard at downgradient well 336. However, no metals were detected above the cleanup standards at this location in 2017.
- The highest concentrations of dissolved inorganics continue to be observed at well 305, in the area of the VBs and SBs. As shown below, cobalt concentrations have remained relatively stable at this location. Antimony concentrations increased through 2014 but appear to have stabilized since that time. Arsenic concentrations have continued to increase. Cyanide concentrations have decreased at this well and cyanide has not been detected since 2014.

Concentration (µg/L) at Well 305

Year	Antimony	Arsenic	Cobalt
1994	526	1,840	285
1994	445	1,260	292
2000	312 L	972	467
2008	500 J	1,580 J	---
2012	550	2,300	222
2013	319	1,560	122
2014	1,100	1,720	146
2015	685	3,010	171
2016	807 J	3,510	165
2017	616	3,740	178

- Arsenic and cobalt were detected at concentrations above their OU-7 groundwater cleanup standards at source area well 316. The concentrations were consistent with recent historic results at this location.
- Arsenic was the only constituent detected at wells 306, 338, and TW-01 at concentrations exceeding the OU-7 cleanup standard.

- Well 306: arsenic concentrations decreased significantly between 2013 and 2015 and has been relatively stable since then. Cobalt has not been detected in this well at concentrations exceeding its cleanup standards since 2013.
- Well 338: arsenic concentrations decreased significantly between 2013 and 2015. The concentration in 2017 is similar to the results observed in 2015 and 2016. Antimony and cobalt concentrations also continued to decrease and no longer exceed the criteria at this location.
- Well 603: arsenic and antimony have been sporadically detected at concentrations exceeding the cleanup criteria at this well; however, the constituents were below the cleanup criteria in 2017.
- Well 605A: although below the cleanup criteria in 2017, arsenic has been sporadically detected above the cleanup standard at this location. Other inorganic constituent concentrations in this well continue to decrease or remain relatively stable (and below cleanup criteria).
- TW-01: concentrations of all constituents continue to decrease in these wells due to groundwater extraction.

- TW-02: Arsenic and cobalt were detected at pumping well TW-02 at concentrations above their OU-7 groundwater cleanup standards. The concentrations remain well below historic levels detected prior to 2013.
- As shown on the table below, the pH of groundwater at well 605A has decreased considerably since 2013 and is now in line with values from nearby wells. Similarly, the specific conductivity has also decreased. Both the pH and specific conductivity values in well 605A have been above the values measured in other wells within the leading edge of the OU-7 plume, suggesting that grout entered the well screen during installation of the nested wells. The presence of grout in the well screen would cause pH and dissolved solids to be elevated and the concomitant leaching of antimony and arsenic from the bedrock. The concentrations of these constituents have also decreased over the same period.

Well 605A

Year	pH	Specific Conductivity (mS/cm)
2013	11.98	2.439
2014	10.44	0.87
2015	9.71	0.6
2016	10.22	0.685
2017	9.78	0.666

- No inorganic constituents were detected at concentrations exceeding their OU-7 groundwater cleanup standards at wells 301, 336, 501A, 501B, 501C, 601, 602, 603 (Z1, Z2, Z3, and Z4), 604 (Z1, Z2, Z3, and Z4), 605A, 605B, 606A, 606B, and TW-03.
- Cyanide was not detected at a concentration exceeding the OU-7 groundwater cleanup standard in any of the deep bedrock groundwater monitoring wells.

2.7 Plume Delineation

Figures 11, 12, 13, and 14 present the July 2017 groundwater elevation maps for each bedrock interval (overburden, shallow, intermediate, and deep, respectively) over which the 2017 isoconcentration contours for arsenic, antimony, and carbon disulfide have been superimposed. The arsenic, antimony, and carbon disulfide plumes are shown in orange, green, and pink, respectively, on these maps. A summary of the status of each of these plumes by groundwater zone is presented below.

Carbon Disulfide

- Overburden (Figure 11): carbon disulfide was only detected at a concentration above the OU-7 groundwater cleanup standard at well MW-09. The carbon disulfide concentration at this location was below the standard in 2015 and 2016.
- Shallow Bedrock (Figure 12): carbon disulfide was not detected in the shallow bedrock groundwater at concentrations above the OU-7 groundwater cleanup standard. The last time carbon disulfide was detected in this zone above the standard was in 2014.
- Intermediate Bedrock (Figure 13): the carbon disulfide plume has shrunk considerably since pumping began and carbon disulfide concentrations above the cleanup standard are now limited to the area around TW-03 west of the Shenandoah River.
- Deep Bedrock (Figure 14): the carbon disulfide plume in the deep bedrock groundwater has decreased significantly since pumping began and is now limited to the area around wells 305 and TW-01.

Inorganic Constituents

Arsenic and antimony are the two most widespread inorganic constituents in groundwater at OU-7 and serve as reasonable indicator constituents for delineating the extent of all inorganic constituents.

- Overburden (Figure 11): the antimony plume in overburden groundwater is limited to the area around MW-09 (under and immediately downgradient of VBs 9, 10, and 11). The arsenic plume is slightly more widespread, extending upgradient to wells WP-10 and WP-11, and downgradient to well MW-10. The concentrations of both constituents are similar to those detected in past events and the plume extents have reduced slightly since 2015.
- Shallow Bedrock (Figure 12): the extent of antimony and arsenic in shallow bedrock groundwater is similar to 2016. The antimony plume is limited to the area under and immediately downgradient of VB 9, 10, and 11. Antimony was not detected in any of the shallow bedrock wells west of the Shenandoah River. The leading edge of the arsenic plume remains near PZ-06 and well 105 on the east side of the river. Arsenic was not detected above the cleanup standard west of the river.
- Intermediate Bedrock (Figure 13): the detected concentrations of arsenic, antimony and other metals at well GM-02B result from the preferential flow of the plume along the bedrock strike. The antimony plume has narrowed and shortened considerably since 2015 and the leading edge is now located near GM-02B. The arsenic plume remains relatively unchanged from 2016 and the

plume turns south from GM-02B toward well 206 once west of the river. The arsenic plume extends just south of well location 206.

- Deep Bedrock (Figure 14): similar to the intermediate bedrock, the plumes flow to the southwest parallel to the bedrock strike before moving southward once west of the river. The leading edge of the plume, as defined by the OU-7 cleanup standards, has been confirmed to the southernmost extent by well nest 501. The antimony and arsenic plumes have narrowed and decreased in length since pumping began. The antimony plume is now limited to the area around wells TW-01 and 305.

2.8 Conclusions

Key findings associated with the 2017 groundwater quality data for OU-7 are summarized below:

- Concentrations of carbon disulfide have shown a noticeable decrease since groundwater extraction began.
- Carbon disulfide concentrations at all of the shallow bedrock wells are below the OU-7 groundwater cleanup standard, indicating that the plume is quickly attenuating in the shallow bedrock.
- The leading edge of the carbon disulfide plume in the intermediate bedrock is still located across the Shenandoah River. However, the plume has narrowed considerably and shortened at both the upgradient and downgradient ends since pumping began.
- Concentrations of inorganic constituents in bedrock groundwater are consistent with or smaller than prior monitoring events and indicate that the groundwater plumes in the overburden, shallow, intermediate and deep bedrock flow zones are stable or decreasing in concentration.
- Various metals are present in the intermediate bedrock flow zone above the OU-7 cleanup standards. However, consistent with results from 2016, only antimony, arsenic, and cobalt concentrations exceed the OU-7 groundwater cleanup standards in intermediate bedrock wells on the west side of the river (wells 206 and GM-02B).
- For the fifth consecutive year, there were no exceedances of the OU-7 groundwater cleanup standards in wells 501A, B and C. Similarly, there were no exceedances of the OU-7 groundwater cleanup standards in wells 606A and 606B.
- The capture zone analysis indicates that:
    - There is a capture zone in the shallow and intermediate bedrock created by recovery wells TW-01 and TW-02 that encompasses both wells and extends across the river.
    - There is also a capture zone in the deep bedrock that encompasses wells TW-02 and TW-01 and extends across the river beyond TW-03 to the southeast.
    - The effects of pumping have created capture zones that extend beyond the monitoring well field.

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3.0 OU-7 POST-CLOSURE GROUNDWATER MONITORING

This section summarizes groundwater quality monitoring for the closed VB 9-11 units in accordance with the VSWMR groundwater monitoring requirements under 9VAC 20-80-270D and 9VAC 20-80-300 for closure of industrial waste disposal facilities. It presents the results of the 2017 annual groundwater sampling event implemented in July and August as part of the post-closure maintenance of VB 9-11. Figure 15 shows the layout of VB 9-11 and the location of the 11 OU-7 VSWMR monitoring wells. The purpose of the post-closure groundwater monitoring of these units is to determine whether groundwater quality continues to degrade and, if so, whether an unacceptable risk is posed by the change in water quality conditions. Only the uppermost groundwater quality in the overburden and shallow bedrock is monitored.

The baseline sampling for this unit was completed in December 2014, and control charts have been developed. These charts are used to determine whether groundwater quality in the downgradient monitoring wells is degraded relative to the baseline conditions.

3.1 Monitoring Well Network

VBs 9-11 form a relatively contiguous management unit of over 9.8 acres along the north portion of the Site west of the railroad tracks. Eleven wells have been identified as the monitoring network for the post-closure monitoring of these basins, meeting the intent of the VSWMR. Figure 15 shows the locations of the monitoring wells, and Table 1 summarizes the construction details for the wells. The current monitoring well network for VB 9-11 is listed below.

Overburden	Shallow Bedrock
Upgradient (four Wells)	
029, WP-11	128, 133
Downgradient (seven Wells)	
MW-09, WP-10, 024	105, 116R, 138, PZ-06

3.2 Water Level Measurements

In accordance with the OU-7 GWMP, synoptic water level measurements were obtained during each sampling event prior to purging and sampling of the monitoring wells. Water levels were measured using an electronic water level meter and recorded to the nearest 0.01 feet in the bound field book dedicated for the sampling activities. Table 7 summarizes the elevation data obtained for each well measured during the July 2017 event. The groundwater contours for both the overburden and the shallow bedrock are shown on Figures 3B (overburden July 2017) and 4B (Shallow Bedrock July 2017).

Piezometric gradients in the overburden (Figure 3B) and shallow bedrock (Figure 4B) are generally west toward the river, perpendicular to the contour lines. A linear effect slightly off-axis to pumping wells TW-01/TW-02 visible on Figure 3B results from groundwater extraction creating a zone of capture. The Shallow Bedrock map (Figure 4B) also clearly shows the effect of pumping at wells TW-01 and TW-02.

3.3 Sample Analysis

The analyses performed on each groundwater sample and the analytical methods are listed below. The analytical methods were identified in the OU-7 GWMP.

- Dissolved metals by USEPA Method 6020A:
  - Aluminum
  - Antimony
  - Arsenic
  - Cadmium
  - Chromium
  - Cobalt
  - Iron
  - Lead
  - Manganese
  - Nickel
  - Vanadium
  - Zinc
- Dissolved mercury by USEPA Method 7470A
- Cyanide (free) by USEPA Method 9014
- VOCs by USEPA Method 8260B:
  - Acetone
  - Carbon disulfide
- SVOCs by USEPA Method 8270D:
  - 2-Methylphenol (o-Cresol)
  - 4-Methylphenol (p-Cresol)
  - Bis(2-ethylhexyl)phthalate
  - Naphthalene
  - Pentachlorophenol
  - Phenol

3.4 Quality Assurance

As discussed in Section 1.5, QA/QC samples were collected during the sampling event to measure and confirm the accuracy and usability of the data in accordance with the GWMP, the SW&SMP, and the Site-Wide QAPP. Following laboratory analysis of the samples, GHD performed data review, verification and validation to Level 2 criteria as defined in Section 5.1 and Table 7 of the Site-wide QAPP. The Level 2 verification includes a review/evaluation of blanks, retention times, mass spectra, chromatograms,

raw instrument outputs, and other information, including laboratory reporting forms, run logs, and all supporting data provided by the laboratory. The results of the data validation are summarized in Section 2.5, and the data validation reports are provided as Appendix B.

The DQOs for the post-closure monitoring are to provide data of sufficient quality to evaluate changes in groundwater quality over time, if any, associated with various units at the Site. As defined in Section 4.1 of the OU-07 GWMP and in the SW&SMP, definitive quantitation of the concentrations of COPCs in groundwater by an off-site analytical laboratory is needed for 90% for the annual events to meet the DQO.

The monitoring plan calls for sampling 11 wells at OU-7. Each sample is analyzed for 22 constituents (13 metals, cyanide, two VOCs, and six SVOCs) for a total of 242 individual constituent results. Two results were rejected, therefore definitive quantitation was achieved for 99% of the constituents.

3.5 Results

The validated groundwater sample results for 2017 are presented in Table 10 and summarized in the following subsections. Laboratory reports are provided in Appendix C.

3.5.1 Upgradient Overburden Wells

Overburden monitoring wells 029 and WP-11 are intended to represent water quality conditions upgradient of VB 9-11 (background). The results from these wells are summarized below.

- Acetone has been sporadically detected at low concentrations in well WP-11 during past sampling events; however, it was not detected in either upgradient well in 2016 or 2017.
- Carbon disulfide was detected in WP-11 (0.754 µg/L).
- No SVOCs were detected in either well.
- Cobalt and nickel were detected at monitoring well 029. The concentrations were below their respective groundwater cleanup standards and established baselines at this location.
- Several metals were detected at well WP-11; however, only arsenic was detected above the groundwater cleanup standard. The arsenic concentration (10.1 µg/L) was slightly above the cleanup standard of 10 µg/L and above the baseline concentration of 3.3 µg/L. Nickel was detected at a concentration (14.2 µg/L) above the baseline (11.5 µg/L), but well below the cleanup standard (730 µg/L). In previous sampling events, manganese was detected above the groundwater cleanup criteria of 880 µg/L; however, the concentration in 2017 was 457 µg/L. This concentration is below the established baseline for this location of 1,240 µg/L.
- Cyanide was not detected in groundwater at either location.

3.5.2 Downgradient Overburden Wells

The three overburden wells located downgradient of VB 9-11 are 024, MW-09, and WP-10. The results from these wells are summarized below.

- Acetone was detected in groundwater at well MW-09; however, the concentration (2,190 J µg/L) was below the OU-7 groundwater cleanup criteria (22,000 µg/L) and the baseline established at this location (2,970 µg/L).
- Carbon disulfide was detected at wells MW-09 and WP-10 at concentrations of 1,410 µg/L and 25.7 µg/L, respectively). Carbon disulfide in MW-09 exceeds the groundwater cleanup standard of (1,000 µg/L) and the baseline established for this well (1,210 µg/L). The concentration at WP-10 does not exceed the cleanup standard or baseline (107 µg/L) for this location.
- Three SVOCs (2-methylphenol, 3&4-methylphenol, and phenol) were detected in groundwater at well MW-09 and one SVOC (naphthalene) was detected at well WP-10. The 3&4-methylphenol and phenol concentrations at well MW-09 (235 and 23,200 µg/L, respectively) exceed both the cleanup standards (180 and 11,000 µg/L, respectively) and their baseline concentrations (80.8 and 17,300 µg/L, respectively).
- No SVOCs were detected at well 024.
- Inorganic results:
    - Aluminum was detected at MW-09 (197 µg/L) and at WP-10 (53.7 µg/L). The concentrations are below the cleanup goal of 37,000 µg/L. The concentration at WP-10 is slightly above the baseline of 51.3 µg/L.
    - Antimony was detected in groundwater at well MW-09 at a concentration of 56.7 µg/L which exceeds the OU-7 groundwater cleanup standard of 6 µg/L but is lower than the baseline of 82.6 µg/L. Antimony was not detected in groundwater at wells 024 and WP-10.
    - Arsenic was detected in groundwater at wells 024, MW-09, and WP-10 at concentrations of 2.28 µg/L, 1,500 J µg/L, and 180 µg/L, respectively. Consistent with past sampling events, the concentrations at MW-09 and WP-10 exceed the cleanup standard of 10 µg/L. The arsenic concentration at well 024 does not exceed the cleanup standard but is slightly above the baseline for this location of 1.1 µg/L. The arsenic concentrations at wells MW-09 and WP-10 are within their baselines.
    - Cadmium was detected at well WP-10, but the concentration (0.178 J µg/L) is below the cleanup criteria (5 µg/L) and the baseline for this location (1.0 µg/L).
    - Chromium was detected in groundwater at wells MW-09 (79.6 µg/L) and WP-10 (19.5 µg/L). The concentrations are below the cleanup standard (100 µg/L); however, the concentration at WP-10 is slightly above the baseline of 12.5 µg/L for this location.
    - Cobalt was detected at concentrations above the cleanup standard of 11 µg/L at wells MW-09 and WP-11 (at 487 J µg/L and 192 µg/L, respectively). The detected concentration at well WP-10 is also slightly above the baseline concentration of 167 µg/L. Cobalt was detected at well 024, but the concentration was below the cleanup standard and baseline.
    - Iron and lead were detected at wells 024 and WP-10, but the concentrations are below the cleanup standards and baselines.

- Manganese was detected at all three locations, however, the concentrations are all below the cleanup standard and baselines.
- Mercury was not detected in any of the samples.
- Nickel was detected in all three wells. The concentration at well MW-09 (1,100 J µg/L) is above the cleanup standard (730 µg/L) but below the baseline for this location (1,640 µg/L). The concentration at wells 024 and WP-10 was below the cleanup standard and the baselines.
- Vanadium was detected in groundwater at MW-09 (385 J µg/L) above the OU-7 groundwater cleanup standard of 260 µg/L, but below the baseline for this well of 476 µg/L. Vanadium was not detected above the cleanup standard in wells 024 and WP-10; however, the vanadium concentration at well WP-10 (60.8 µg/L) slightly exceeded the baseline value of 39.3 µg/L.
- Zinc was not detected above the cleanup standard in any of the samples and all concentrations were near or below the established baselines.
- Cyanide was not detected at any of the wells.

- The pH reported for wells MW-09 and WP-10 ranged from 9.44 to 10.49 (similar to past results). The groundwater at these wells also exhibited a relatively high conductivity and contained no dissolved oxygen. Groundwater at well 024 was more neutral with a pH of 7.6, lower conductivity, and considerably higher dissolved oxygen.

3.5.3 Upgradient Shallow Bedrock Wells

Upgradient groundwater quality in the shallow bedrock aquifer is monitored by wells 128 and 133. The results from these wells are summarized below.

- Carbon disulfide was detected in groundwater at well 133 at a relatively low concentration of 0.346 J µg/L (below the cleanup standard of 1,000 µg/L and the baseline of 3.3 µg/L). Carbon disulfide was not detected in well 128.
- Acetone was not detected in groundwater at either of the wells.
- None of the six SVOC constituents were detected.
- Several inorganic constituents were detected in groundwater at the two upgradient shallow bedrock wells. The results are summarized below.
  - Aluminum, Antimony, cadmium, chromium, lead, mercury, vanadium, and zinc were not detected in either well.
  - The following constituents were detected but did not exceed their respective OU-7 groundwater cleanup standards: arsenic, cobalt, iron and nickel. However, the nickel concentration at well 133 (10.6 µg/L) exceeded the baseline of 8.0 µg/L.
  - Manganese was detected in groundwater at wells 128 and 133 at concentrations of 1,090 µg/L and 58.3 µg/L, respectively. The manganese concentration at well 128 exceeds the OU-7 groundwater cleanup standard of 880 µg/L but is below the baseline range of 1,170 µg/L.
  - Cyanide was not detected in either of the samples.

3.5.4 Downgradient Shallow Bedrock Wells

The water quality in the shallow bedrock downgradient of VB 9-11 is monitored by wells 105, 116R, 138, and PZ-06. The results from these wells are summarized below.

- Carbon disulfide was detected in groundwater at wells 116R, and 138. However, none of the concentrations exceeded the OU-7 groundwater cleanup standard or baseline concentrations.
- Acetone was detected at well 138, but did not exceed the OU-7 groundwater cleanup standard in either well and was within the baseline concentrations
- None of the six SVOC constituents were detected.
- The results for inorganic constituents are summarized below.
    - Consistent with the 2016 results, aluminum, cadmium, lead, and mercury were not detected in any of the wells.
    - As in 2016, iron, manganese, vanadium, and zinc were detected in at least one sample, but concentrations did not exceed the respective OU-7 groundwater cleanup standards. Of these iron and manganese at well 138 (51.2 J and 504 µg/L, respectively) and zinc at well 105 (8.63 J µg/L) were detected slightly above their baseline concentrations for these locations.
    - Antimony was detected in groundwater at well 116R at a concentration (166 µg/L) exceeding the OU-7 groundwater cleanup standard of 6 µg/L but below the baseline of 336 µg/L. Antimony was also detected at well 138, but the concentration is below the cleanup standard and baseline. Antimony was not detected at other wells.
    - Arsenic was detected in groundwater at wells 116R and 138 at concentrations (1,330 µg/L and 36.8 µg/L, respectively) exceeding the OU-7 groundwater cleanup standard of 10 µg/L. The arsenic concentration at well 116 R was above the baseline range of 1,050 µg/L for this well. Arsenic was also detected at wells 105 and PZ-06 at concentrations (2.67 and 3.79 µg/L) below the cleanup standard and baseline range.
    - Chromium was detected at well 116 R (133 µg/L) at a concentration exceding the cleanup standard of 100 µg/L and slightly above the baseline range of 104 µg/L. Chromium was also detected at relatively low concentrations below the cleanup standard and baselines at wells 105, 138, and PZ-06.
    - Cobalt was detected in groundwater at all four wells. The detected concentrations at wells 116R (923 µg/L) and 138 (13.2 µg/L) exceed the OU-7 groundwater cleanup standard of 11 µg/L. The cobalt concentration at well 116R is also above the baseline concentration of 651 µg/L.
    - Nickel was detected in groundwater at all four wells. The concentration at well 116R (3,380 µg/L) exceeds the OU-7 groundwater cleanup standard of 730 µg/L and baseline concentration of 2,350 µg/L. The remaining concentrations were below the cleanup standard and their respective baseline concentrations.

- Cyanide was not detected in any of the four wells.

- Similar to previous results, the pH reported for well 116R was slightly elevated (9.25). The groundwater at this well also contained no dissolved oxygen.

3.6 Control Charts

In accordance with the OU-7 GWMP, the control chart approach has been selected as the method to evaluate the data collected in each downgradient well. A control chart is a plot of concentration versus time, with an established concentration limit for baseline that, if exceeded, will indicate an increase in concentration over the baseline. Baseline concentrations for each parameter at each well were established from the initial four semi-annual sampling results conducted in 2013, 2014, and 2015. For detected constituents, the baseline is equal to the maximum detected value. For non-detect results, the average detection limit is used as the baseline. However, samples with significantly elevated detection limits (e.g., due to matrix interference or required dilutions) were excluded from the average calculation. Results with "B" or "R" qualifiers are considered invalid or unusable and were therefore also not included in the baseline. The baseline concentration for each constituent is shown next to the reported results on Table 10.

Control charts were developed for each downgradient well except well 024 (no exceedances of the OU-7 groundwater cleanup criteria have been observed at this well). A separate control chart was created for each constituent exceeding the respective OU-7 cleanup criteria at each well during the baseline period. Additional control charts have been added for constituents exceeding the criteria during subsequent monitoring events. The charts also show the downgradient baseline value and average concentration. Non-detect results are plotted at one-half the RL. The control charts are included in Appendix E. The following control charts were generated for the 2017 event:

- MW-09: carbon disulfide, pentachlorophenol, phenol, 2,-methylphenol, 3&4-methylphenol, Bis(2-ethylhexyl)phthalate, antimony, arsenic, cadmium, chromium, cobalt, manganese, nickel, vanadium, and cyanide
- WP-10: naphthalene, aluminum, arsenic, chromium, cobalt, nickel, and vanadium.
- 105: manganese and zinc
- 116R: antimony, arsenic, cadmium, chromium, cobalt, nickel, zinc, and cyanide
- 138: carbon disulfide, antimony, arsenic, cobalt, iron, and manganese
- PZ-06: arsenic and manganese

The control charts were reviewed to determine if the above constituents indicated signs of increasing concentrations. The results are summarized below:

- MW-09
  - Carbon disulfide: Figure E-1 shows that the upgradient and downgradient concentrations have remained stable.
  - Pentachlorophenol was not detected in either MW-09 or the upgradient well WP-11 (Figure E-2).

- 2-Methylphenol (Figure E-3) has been sporadically detected at this location for several years. The concentration measured in 2017 is consistent with the concentration reported in 2015.
- 3&4-Methylphenol and phenol: As shown on Figures E-4 and E-5, the concentrations of these two constituents has fluctuated since monitoring began with no clear trend.
- Antimony: Figure E-6 shows the upgradient and downgradient concentrations have remained stable.
- Arsenic: As shown on Figure E-7, arsenic was detected in 2015 at a concentration (2,480 µg/L) slightly above the baseline concentration of 2,180 µg/L. However, the concentrations detected in 2016 and 2017 are below the baseline concentration and there does not appear to be an increasing trend in concentrations.
- Cadmium: The cadmium concentration (Figure E-8) has fluctuated over the monitoring period (0.36 to 20 µg/L). There is no evidence of an increasing trend and the concentration detected in 2017 (0.8 µg/L) is well below the baseline.
- Chromium, cobalt, nickel, and vanadium: Each of these constituents were detected in 2015 at concentrations slightly above their baselines. However, the concentrations detected in 2016 and 2017 were below the baseline concentrations for each constituent (Figure E-9 through E12).
- Cyanide: The cyanide concentration at MW-09 decreased significantly and remains below the baseline concentration (Figure E-13).
- Bis(2-ethylhexyl)phthalate: While the concentration of this constituent exceeds the baseline value, the results are skewed due to a significant decrease in the detection limit for this constituent in recent sampling events. As shown on Figure E-14, the 2016 and 2017 results are well below the calculated rolling average for this well.
- Manganese: As shown on Figure E-15, the manganese concentration detected in 2016 (174 µg/L) was above the baseline of 133 µg/L. However, the concentration detected in 2017 (110 µg/L) is below the baseline and the concentration at this location remains well below the levels detected in the upgradient well (457 µg/L).

■ WP-10

- Naphthalene: The naphthalene concentration remains below the baseline concentration (Figure E-16).
- Aluminum: The aluminum concentration (54 µg/L) is slightly above the baseline concentration (Figure E-17). The concentration has fluctuated since monitoring began in 2013. Additional data is required to determine if there is an increasing trend at this location.
- Arsenic: While the concentration of arsenic detected at WP-10 in 2016 was slightly above the baseline, the arsenic concentration detected at this well in 2017 (180 µg/L) is below the baseline (Figure E-18). The

concentration continues to fluctuate between 143 µg/L and 261 µg/L with no discernable increasing or decreasing trend.

- Chromium: As shown on Figure E-19, the chromium concentration detected in 2017 (19.5 µg/L) is slightly above the baseline. Additional data is required to determine if there is an increasing trend at this location.
- Cobalt: As shown on Figure E-20, cobalt has been detected above the baseline concentration since 2015. However, the concentration continues to fluctuate, and additional data are required to establish a statistically significant pattern showing an increase of this constituent in groundwater.
- Nickel: As shown on Figure E-21, nickel was detected in 2016 at a concentration above the baseline; however, the concentration measured in 2017 was below the baseline level. The concentration at this location has fluctuated 358 µg/L and 847 µg/L.
- Vanadium: The concentration of vanadium detected at this location in 2016 (49.7 µg/L) was slightly above the baseline concentration of 39.3 µg/L (Figure E-22). The concentration increased again in 2017 (60.8 µg/L). Additional data is required to determine if the concentration is increasing or if the result is due to natural fluctuations over time.

■ 105:

- Consistent with past results, the manganese concentration detected at well 105 was below the baseline concentration. Figure E-23 in Appendix E shows that the manganese concentrations in the shallow bedrock groundwater are nearly identical between the upgradient well (128) and downgradient well (105).
- As shown on Figure E-24, the zinc concentration has been above the baseline level since 2015. However, the upgradient concentration is generally equal to or significantly above the downgradient concentration suggesting that the unit is not contributing to an increase in zinc levels in the groundwater.

■ 116R:

- Antimony: As shown on Figure E-25, the antimony concentration continues to remain below the baseline.
- Arsenic: Similar to 2016, the arsenic concentration detected in 2017 (1,330 µg/L) is slightly above the baseline concentration of 1,050 µg/L. This is only the second time this constituent has exceeded the baseline concentration (Figure E-26). Additional data is required to determine the concentration trend at this location.
- Cadmium: As shown on Figure E-27, the cadmium concentration continues to remain below the baseline.
- Chromium: Similar to 2016, the chromium concentration detected in 2017 (133 µg/L) is slightly above the baseline concentration of 104 µg/L. This is only the second time this constituent has exceeded the baseline concentration (Figure E-28). Additional data is required to determine the concentration trend at this location.

- Cobalt: Similar to 2016, the cobalt concentration detected in 2017 (923 µg/L) is slightly above the baseline concentration of 651 µg/L. This is only the second time this constituent has exceeded the baseline concentration (Figure E-29). Additional data is required to determine the concentration trend at this location.
- Nickel: As in 2016, the nickel concentration detected in 2017 (3,380 µg/L) is slightly above the baseline concentration of 2,350 µg/L. This is only the second time this constituent has exceeded the baseline concentration (Figure E-30). Additional data is required to determine the concentration trend at this location.
- Cyanide: As shown on Figure E-31, the cyanide concentration continues to decrease and remains below the baseline.
- Zinc: As shown on Figure E-32, although zinc was detected in 2016 at a concentration (1,160 µg/L) slightly above the baseline of 1,150 µg/L; the concentration detected in 2017 (853 µg/L) is below the baseline.

■ 138:

- The concentrations of carbon disulfide, antimony, arsenic, and cobalt at this well were all below the established baseline concentrations (Figures E-33 through E-36).
- Iron: As shown on Figure E-37, the iron concentration detected in 2017 (51.2 µg/L) is slightly above the baseline of 30 µg/L. However, the concentration is well below the cleanup standard and 2 orders of magnitude below the upgradient concentrations.
- Manganese: As shown on Figure E-38, the concentration of manganese (504 µg/L) was above the baseline of 233 µg/L; however, the concentration remains well below the concentration detected in upgradient well 128.

■ PZ-06: The concentrations of the constituents of concern at this well (arsenic and manganese) were below the established baseline concentrations (Figures E-39 and E-40). In addition, the manganese concentration in groundwater is nearly identical to or less than the concentrations found in the two upgradient wells (128 and 133).

3.7 Conclusions

The results indicate the presence of carbon disulfide, 2-methylphenol, 3&4-methlylphenol, pentachlorophenol, phenol, naphthalene, and metals in the downgradient overburden wells at concentrations that exceed the OU-7 groundwater cleanup standards. With the exception of arsenic at WP-11, the upgradient overburden wells do not contain constituents at concentrations above the OU-7 groundwater cleanup standards.

Carbon disulfide and metals are also present in the downgradient shallow bedrock wells at concentrations exceeding the OU-7 groundwater cleanup standards. With the exception of manganese at well 128, the upgradient shallow bedrock wells do not contain constituents at concentrations above the OU-7 groundwater cleanup standards.

Manganese concentrations appear to be similar in both upgradient and downgradient wells.

Control charts were developed for each downgradient well except well 024 to determine if concentrations are increasing in downgradient wells. A review of the control charts indicates that most constituents remain below their baseline concentrations, with the following exceptions:

- MW-09: carbon disulfide, pentachlorophenol, 2-methylphenol, 3&4-methylphenol, and phenol.
- WP-10: aluminum, chromium, cobalt, and vanadium.
- 105: zinc.
- 116R: arsenic, chromium, cobalt, and nickel.
- 138: iron and manganese

Additional data are required to establish a statistically significant pattern showing an increase in the groundwater concentrations.

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4.0 OU-10 POST-CLOSURE GROUNDWATER MONITORING

This section presents the results of the ninth annual monitoring event completed in July 2017 as part of the post-closure maintenance of the VB 1-8 and the New Landfill, collectively referred to as OU-10 (Figure 1A). Figure 16 shows the layout of VB 1-8 and the New Landfill. The purpose of the post-closure groundwater monitoring of these units is to determine whether groundwater quality becomes further degraded, and if so, whether an unacceptable risk is posed by the change in water quality conditions.

Groundwater monitoring was conducted in accordance with the OU-7 GWMP (Revision 1) approved by USEPA on February 27, 2015. As part of the 100% design submittal, the monitoring programs currently being conducted as part of OU-10 and the NTCRA Basin Closure (including the SBs and FABs) were combined with the requirements set forth in the OU-7 GWMP to create a single, comprehensive groundwater monitoring program. The OU-7 GWMP replaces the previously USEPA-approved monitoring plan for OU-10.

4.1 Monitoring Well Network

VB 1-8 and the New Landfill form a relatively contiguous management unit of over 20 acres along the northern portion of the Site west of the railroad tracks. A total of 19 wells have been identified as the monitoring network for the post-closure monitoring of these basins. Figures 16 and 17 show the locations of the monitoring wells, and Table 2 summarizes the construction details for the wells.

The current monitoring well network for VB 1-8 is listed in the table below:

Overburden	Shallow Bedrock
VB 1-8 Upgradient (ten Wells)	
GPW-02, GPW-03R, GPW-19, GPW-20	MW-7, MW-8, 118, 128, 130R, 133
VB 1-8 Downgradient (nine Wells)	
GPW-14, GPW-15R, MW-11, MW-12	MW-5, 119, 120R, 132, 135

The current monitoring well network for the New Landfill is listed in the table below:

Overburden	Shallow Bedrock
New Landfill Upgradient (three Wells)	
GPW-03R	128, 130R
New Landfill Downgradient (five Wells)	
GPW-19, GPW-20	MW-7, MW-8, 133

In addition to sampling the above noted wells, water level data only are collected from wells GPW-16R, GPW-17, GPW-18, GPW-21 and 134. Consistent with previous sampling events, well 133 is considered to be an upgradient well for VB 1-8 and a downgradient well for the New Landfill.

4.2 Water Level Measurements

In accordance with the OU-7 GWMP, synoptic water level measurements were obtained on July 11, 2017 prior to purging and sampling of the monitoring wells. Water levels were measured using an electronic water level meter and recorded to the nearest 0.01 feet. Table 11 summarizes the elevation data obtained for each well.

The groundwater elevation contours for both the overburden and the shallow bedrock for July 2017 are shown on Figures 16 and 17, respectively. The groundwater contours for both the overburden and the shallow bedrock are similar to contour maps from previous monitoring events.

Piezometric gradients are generally west to northwest toward the Shenandoah River, perpendicular to the contour lines. Groundwater in the overburden is expected to flow parallel to the piezometric gradient (Figure 16). However, remedial investigation (RI) and OU-7 feasibility study (FS) results have demonstrated that groundwater within the bedrock aquifer flows parallel to geologic strike at approximately S30ºW in the southern portion of the area. This flow path represents an approximate 30 degree southward departure from the piezometric gradient.

4.3 Sample Analysis

The analyses performed on each OU-10 groundwater sample are listed below with the analytical methods.

- Dissolved metals by USEPA Method 6020A:
  - Antimony
  - Arsenic
  - Beryllium
  - Cadmium
  - Chromium
  - Copper
  - Lead
  - Nickel
  - Selenium
  - Thallium
  - Vanadium
  - Zinc
- Dissolved mercury by USEPA Method 7470A
- Cyanide (free) by USEPA Method 9014
- Target Compound List (TCL) VOCs by USEPA Method 8260B:
- TCL SVOCs by USEPA Method 8270D

4.4 Quality Assurance

As previously mentioned in Section 1.5, QA/QC samples were collected during the sampling event to measure and confirm the accuracy and usability of the data in accordance with the GWMP, the SW&SMP, and the Site-Wide QAPP. The following QA/QC samples were collected in 2017.

- Four equipment rinsate blanks distributed across all three monitoring units (OU-7/OU-10/Basins)
- Two field duplicate samples distributed across the monitoring units as follows:
  - OU-10: 1
  - OU-7/OU-10/Basins: 1
- Two matrix spike / matrix spike duplicate (MS/MSD) samples distributed across the units as follows:
  - OU-10: 1
  - OU-7/OU-10/Basins: 1
- One trip blank per cooler containing volatile organic compounds (VOC) samples.

Following laboratory analysis of the samples, GHD Services Inc., performed data review, verification and validation to Level 2 criteria as defined in Section 5.1 and Table 7 of the Site-Wide QAPP. The Level 2 verification includes a review/evaluation of blanks, retention times, mass spectra, chromatograms, raw instrument outputs, and other information, including laboratory reporting forms, run logs, and all supporting data provided by the laboratory. Data validation reports are provided as Appendix B.

Most of the 2017 OU-10 data were considered usable. Data qualifiers have been added to some of the results. These qualifiers provide additional details regarding the data such as QC issues or interferences. Data qualified with a “J” indicate that, while the constituent was positively identified, the associated numerical value is an estimated concentration. Examples of data that may be qualified with this flag include values below the reporting limit (RL) but above the method detection limit (MDL), or where the associated QC samples are outside acceptable ranges. Two analytes (acetone and hexachlorocyclopentadiene) were rejected in a number of samples due to outlying LCS/LCSD results (See the Data Validation Report in Appendix B).

The DQOs for the post-closure monitoring are to provide data of sufficient quality to evaluate changes in groundwater quality over time, if any, associated with various units at the Site. As defined in Section 4.1 of the OU-07 GWMP and the SW&SMP, definitive quantitation of the concentrations of COPCs in groundwater by an off-site analytical laboratory is needed for 90% for the annual events to meet the DQOs.

The monitoring plan calls for sampling 19 wells at OU-10. Each sample is analyzed for 115 constituents (13 metals, 38 VOCs, and 64 SVOCs) for a total of 2,188 constituent results. Nine of the results were rejected and therefore definitive quantitation for 99.6% of the constituents was achieved.

4.5 Results

Tables 12 and 13 present the validated analytical results for the VB 1-8 and the New Landfill wells, respectively, for the sampling event conducted in July and August 2017.

The laboratory analytical data reports are contained in Appendix C. The data presented on Tables 12 and 13 are compared to the EPA Regional Screening Levels (RSLs) for tapwater. The RSLs are presented for Hazard Quotients (HQ) of 1.0 and 0.1. Unless otherwise indicated, RSLs referenced in this report are for a HQ = 1.0 since this was the value specified in the approved GWMP (ERM 1015).

As previously mentioned and in accordance with the OU-7 GWMP, the control chart approach was selected as the method for evaluating the data collected in each downgradient well. A baseline has been established for each well in the monitoring network with the exception of wells that have been dry since the monitoring began.

The monitoring data collected during the July and August 2017 sampling event were compared to the range of baseline concentrations (see Table 14). A control chart was generated if a parameter in a downgradient well was detected in exceedance of the range of baseline concentrations during the current or previous sampling event. Control charts were generated for the following wells:

- GPW-14: acetone and thallium
- GPW-15R: zinc
- 119: acetone, xylenes, antimony, and zinc
- 132: PCE and arsenic
- MW-7: acetone, vinyl chloride, arsenic, and zinc
- MW-9: arsenic
- 133: carbon disulfide and arsenic
- 135: thallium

The control charts are included in Appendix F. Included on the control chart is the average concentration at the corresponding upgradient monitoring well. The 2017 water quality data are compared to the baseline water quality data in qualitative terms below.

4.5.1 Viscose Basins 1-8

Upgradient Overburden

The data collected from the overburden monitoring wells GPW-02, GPW-03R, GPW-19, and GPW-20 are intended to represent water quality conditions upgradient of VB 1-8. As such, they are considered to represent background water quality concentrations. Control charts are not developed for upgradient wells.

- GPW-19 and GPW-20 have never been sampled because they have either been dry or contained insufficient water for sampling during every sampling event since February 2008.
- GPW-02
    - No VOCs or SVOCs were detected in this well.
    - Five metals (beryllium, chromium, copper, nickel selenium, and zinc) were detected at this location. All concentrations were below the RSL. The zinc concentration exceeded the baseline range for this location. All other metals were within their baseline range.

- GPW-03R
  - No VOCs or SVOCs were detected in this well.
  - Four metals (copper, lead, nickel, and zinc) were detected in groundwater at this location. All concentrations were below the RSL. The zinc concentration exceeded the baseline range for this location. All other metals were within their baseline range.

Downgradient Overburden

Overburden monitoring wells GPW-14, GPW-15R, MW-11, and MW-12 are downgradient of VB 1-8. Results for these wells are provided below.

- GPW-14
  - No VOCs or SVOCs were detected at this well. Acetone was detected in groundwater at this location in 2015 at a concentration above the baseline concentration. However, the constituent was not detected in 2016 or 2017 (Figure F-1, Appendix F).
  - Nine metals (antimony, arsenic, cadmium, chromium, copper, nickel, selenium, vanadium, and zinc) were detected at this well. All concentrations were below their baselines. Based on historical baseline exceedances, a control chart was generated for thallium at this location (Figure F-2, Appendix F).
- GPW-15R
  - No VOCs or SVOCs were detected at this well.
  - Four metals (copper, lead, nickel, and zinc) were detected at this location. All of the concentrations were below their RSLs and with the exception of zinc, within their baseline ranges. A control chart was prepared for zinc at GPW-15R (Figure F-3, Appendix F). As shown on the control chart, the concentration of zinc in the upgradient wells (GPW-02 and GPW-03R) was higher than the downgradient concentration indicating the unit is not a source of zinc to groundwater in the area.
- MW-11
  - No VOCs or SVOCs were detected at this well.
  - Four metals (arsenic, cadmium, nickel, and zinc) were detected in groundwater at well MW-11. The arsenic concentration exceeded the RSL. All constituents were within their baseline range.
- MW-12
  - Four VOCs (benzene, carbon disulfide, ethylbenzene, and xylenes) were detected in groundwater at well MW-12. The benzene concentration exceeded the RSL but was within the baseline range. The remaining constituents were below their RSLs and within their baseline range.
  - No SVOCs were detected at this well.
  - Four metals (arsenic, nickel, selenium, and vanadium) were detected in groundwater at well MW-12. The arsenic concentration exceeded the

RSL but was within the baseline range. The remaining constituents were below their RSLs and within their baseline range.

The field parameter data are unremarkable, with one exception. Consistent with historic results, the specific conductivity was elevated at wells GPW-14, MW-11, and MW-12.

Upgradient Shallow Bedrock

Upgradient groundwater quality in the shallow bedrock aquifer is represented by the data collected from wells MW-7, MW-8, 118, 128, 130R, and 133.

- MW-07
  - Four VOCs (ethylbenzene, toluene, vinyl chloride, and xylenes) were detected in groundwater at well MW-07. In 2016, acetone was detected at this location at a concentration exceeding the baseline range but below the RSL (the 2017 acetone result at this location was rejected due to laboratory quality control issues). Vinyl chloride exceeds the RSL and the baseline range. Xylenes were detected below the RSL but above the baseline range. A control chart is not required to evaluate upgradient groundwater conditions.
  - No SVOCs were detected at this location.
  - One metal (zinc) was detected in groundwater at well MW-07. Zinc is below the RSL but exceeds the baseline. A control chart is not required to evaluate upgradient groundwater conditions.
- MW-08
  - One VOC (Xylenes) was detected at this location. The concentration was below the RSL and baseline.
  - No SVOCs were detected in groundwater at well MW-08.
  - One metal (zinc) was detected. The zinc concentration is below the RSL but above the baseline range. A control chart is not required to evaluate upgradient groundwater conditions.
- 118
  - No VOCs or SVOCs were detected at this location.
  - Two metals (nickel and zinc) were detected in groundwater at well 118. Both are below their RSLs, but the zinc concentration exceeds the baseline range. A control chart is not required to evaluate upgradient groundwater conditions.
- 128
  - One VOC (toluene) was detected at this location. The concentration is below the RSL and baseline.
  - No SVOCs were detected in groundwater at this location.
  - Three metals (beryllium, nickel, and zinc) were detected in groundwater at well 128. All three are below their RSLs, but the zinc concentration exceeds the baseline range. A control chart is not required to evaluate upgradient groundwater conditions.

- 130R
  - No VOCs or SVOCs were detected at this location.
  - Three metals (copper, nickel, and zine) were detected in groundwater at well 130R. The concentrations are below the RSLs and baseline ranges.
- 133
  - One VOC (carbon disulfide) was detected in groundwater at well 133. The carbon disulfide concentration was below the RSL and the baseline range.
  - No SVOCs were detected at this location.
  - Three metals (arsenic, nickel, and selenium) were detected in groundwater at well 133. Only arsenic was detected at a concentration exceeding the RSL. All three metals were below their baseline.

Downgradient Shallow Bedrock

Downgradient water quality in the shallow bedrock is represented by the data collected from wells MW-05, 119, 120R, 132, and 135, which are downgradient of VB 1-8.

- MW-05
  - No VOCs or SVOCs were detected at this location.
  - Chromium was the only constituent detected in groundwater at this location. The concentration is below the RSL and baseline.
- 119
  - No VOCs or SVOCs were detected in groundwater at this location.
  - Acetone was detected above the baseline range in 2016; therefore, a control chart for acetone was generated for this location (Figure F-4, Appendix F). Acetone was not detected in 2017
  - A control chart was generated for xylenes at this location (Figure F-5, Appendix F) based on a baseline exceedance detected in 2015. Xylenes were not detected at this location in 2016 or 2017.
  - One metal (zinc) was detected in groundwater at this location. While the concentration is below the RSL, it exceeds the baseline range. In 2015, antimony was detected at this location at a concentration above the baseline range; however, antimony was not detected in 2016 or 2017 (Figure F-6, Appendix F). As shown on the control chart for zinc (Figure F-7, Appendix F), the zinc concentration also increased at the upgradient well (118).
- 120R
  - No VOCs, SVOCs, or metals were detected at this location.
- 132
  - No VOCs or SVOCs were detected at this location.

- While PCE was detected above the baseline value in groundwater at this well in 2014, the 2015 concentration was below the baseline value and the constituent was not detected in 2016 or 2017 (Figure F-8, Appendix F).
- Four metals (arsenic, beryllium, lead, and nickel) were detected in groundwater at this location. Except for arsenic, all concentrations were below their RSLs and baselines. The arsenic concentration exceeds the RSL and the baseline range. This is the second exceedance of the baseline for this constituent (Figure F-9, Appendix F). Continued monitoring is required to determine if an increasing trend is present at this location.

- 135
  - One VOC (carbon disulfide) was detected in monitoring well 135. The concentration is below the RSL and baseline.
  - No SVOCs were detected at this location.
  - No metals were detected in groundwater at this location. A control chart for arsenic at this location (Figure F-19, Appendix F) was generated based on baseline exceedances detected in 2015 and 2016 at this location.

The field parameter data are unremarkable, with one exception. The specific conductivity was elevated at wells 132 (2,758.2 µS/cm) and 135 (1,674 µS/cm). The elevated specific conductivity in these wells is consistent with the previous monitoring event.

4.5.2 New Landfill

Upgradient Overburden

GPW-03R is the only overburden monitoring well that is upgradient of the New Landfill. As previously noted:

- No VOCs or SVOCs were detected at this location.
- Four metals (copper, lead, nickel, and zinc) were detected in groundwater at this well. All concentrations were below the RSLs and (except for zinc) below their baselines.

Downgradient Overburden

The overburden monitoring wells located downgradient of the New Landfill are GPW-19 and GPW-20. These monitoring wells have been consistently dry or have not contained sufficient water for sampling during each sampling event from March 2008 through July 2016. They will continue to be included in water level monitoring and will be sampled if sufficient water is present.

Upgradient Shallow Bedrock

Wells 128 and 130R monitor shallow bedrock upgradient of the New Landfill. As noted above, with the exception of zinc at well 128, all of the constituents detected in these wells were below their respective RSLs and within baseline ranges. A control chart is not required to evaluate upgradient concentrations.

Downgradient Shallow Bedrock

The water quality in the shallow bedrock downgradient of the New Landfill is represented by the data collected from wells MW-07, MW-08, and 133.

- MW-07
    - Four VOCs (ethylbenzene, toluene, vinyl chloride, and xylenes) were detected in groundwater at well MW-07.
        - Ethylbenzene and toluene did not exceed their RSL or baseline concentrations.
        - In 2016, acetone was detected at this location at a concentration exceeding the baseline range but below the RSL (the 2017 acetone result at this location was rejected due to laboratory quality control issues). A control chart was generated for acetone (Figure F-10, Appendix F).
        - Vinyl chloride exceeds the RSL and the baseline range. A control chart was generated (Figure F-11, Appendix F). The concentration has been consistently above the baseline since 2015, but the concentrations do not appear to be increasing.
        - Xylenes were detected below the RSL but slightly above the baseline range. The estimated concentration at this location (1.22 J µg/L) is only slightly above the baseline of 1.0 µg/L. A control (Figure F-12, Appendix F) was generated. There is insufficient data to determine a trend at this location.
    - No SVOCs were detected at this location.
    - One metal (zinc) was detected in groundwater at well MW-07. Zinc is below the RSL but exceeds the baseline. Based on historic detections of arsenic at this location, a control chart (Figure F-13, Appendix F) was generated. A control chart was also generated for Zinc (Figure F-14, Appendix F). As shown on this figure, the upgradient zinc concentration remains above the concentration at well MW-07, suggesting that this unit is not contributing zinc to the groundwater.
- MW-08
    - One VOC (Xylenes) was detected at this location. The concentration was below the RSL and baseline.
    - No SVOCs were detected in groundwater at well MW-08.
    - One metal (zinc) was detected. The zinc concentration is below the RSL but above the baseline range. Based on historic detections of arsenic at this location a control chart (Figure F-15, Appendix F) was generated. A control chart was also generated for zinc (Figure F-16, Appendix F). As shown on this figure, the zinc concentration at downgradient well MW-08 is lower than the upgradient concentration at well 128. Therefore, the unit is not a likely source of zinc.

- 133
    - One VOC (carbon disulfide) was detected in groundwater at well 133. The carbon disulfide concentration was below the RSL and the baseline range. Based on historical exceedances at this location, a control chart was generated for carbon disulfide at this location (Figure F-17, Appendix F).
    - No SVOCs were detected at this location.
    - Three metals (arsenic, nickel, and selenium) were detected in groundwater at well 133. Only arsenic was detected at a concentration exceeding the RSL. All three metals were below their baseline. Based on historical arsenic exceedances, a control chart was generated at this location (Figure F-18, Appendix F).

4.6 Conclusions

4.6.1 Viscose Basins 1-8 Overburden Groundwater

With the exception of benzene at downgradient well MW-12, VOCs and SVOCs were not detected in the overburden groundwater downgradient of VB 1-8. These constituents have only been detected sporadically at relatively low concentrations and have not been observed in the upgradient wells. Therefore, VB 1-8 may be contributing trace levels of benzene to groundwater in the overburden aquifer, but it is not a significant source of VOCs in overburden groundwater.

Antimony, arsenic, cadmium, chromium, copper, lead, nickel, selenium, vanadium, and zinc were detected in the overburden groundwater downgradient of VB 1-8. However, except for zinc at GPW-15R and arsenic at wells MW-11 and MW-12, none of these constituents exceeded the RSL or their baseline range. The zinc concentration at well GPW-15R was below the upgradient concentrations measured at wells GPW-02 and GPW-03R. While arsenic was detected above the RSL at wells MW-11 and MW-12, the concentration was below the respective baselines. Therefore, VB 1-8 is not contributing metals to the overburden groundwater.

4.6.2 Viscose Basins 1-8 Shallow Bedrock Groundwater

Except for carbon disulfide at well 135, VOCs and SVOCs were not detected in the shallow bedrock groundwater downgradient of VB 1-8. The carbon disulfide concentration was below the RSL and baseline for this location. While acetone, PCE and xylenes have been detected in the shallow bedrock groundwater in previous sampling events, none of these constituents were detected in 2017. Therefore, VB 1-8 may be contributing trace levels of carbon disulfide to groundwater in the shallow bedrock aquifer, but it is not a significant source of VOCs in the shallow bedrock groundwater.

Arsenic, beryllium, chromium, lead, nickel, and zinc were detected at relatively low concentrations in one or more downgradient monitoring wells. Zinc exceeded the baseline concentration at 119 but remains below the RSL. The arsenic concentration at well 132 is above the RSL and baseline for this location. This is only the second exceedance of the baseline for arsenic. Therefore, with the potential exception of arsenic, VB 1-8 do not appear to be contributing metals to groundwater in the shallow bedrock. The detected concentrations could reflect naturally occurring levels of these metals.

4.6.3 New Landfill Overburden Groundwater

The two wells that are representative of upgradient overburden groundwater quality at the New Landfill have been sampled, but all downgradient overburden monitoring wells have been dry during each of the monitoring events. Based on the dry conditions at the downgradient monitoring wells, it appears that minimal overburden groundwater is present beneath and downgradient of the New Landfill.

4.6.4 New Landfill Shallow Bedrock Groundwater

Carbon disulfide, ethylbenzene, toluene, vinyl chloride, and xylenes were the only VOCs detected in the shallow bedrock monitoring wells downgradient of the New Landfill during the 2017 sampling event. Vinyl chloride exceeded the RSL and baseline at well MW-07; while xylenes were detected below the RSL but slightly above the baseline at this location. The vinyl chloride concentration has remained relatively stable at this well since 2013 and does not appear to be increasing. No SVOCs were detected in the shallow bedrock monitoring wells downgradient of the New Landfill during the 2017 sampling event. Therefore, it is concluded that the New Landfill is not contributing significant VOCs or SVOCs to groundwater in the shallow bedrock zone.

Zinc was detected above the baseline in the downgradient shallow bedrock groundwater wells MW-07 and MW-08. However, the concentrations in these wells are lower than the concentrations observed in the upgradient wells. Therefore, it is concluded that the New Landfill is not contributing significant metals concentrations to groundwater in the shallow bedrock zone.

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5.0 NTCRA BASIN POST-CLOSURE GROUNDWATER MONITORING

This section presents the results of the 16th annual groundwater sampling event implemented as part of the post-closure maintenance of the SB and FAB management units under the NTCRA Basin Closure (Figure 1A). The 2016 annual event was the 14th annual event after establishing the baseline conditions. The SB and FAB units are shown on Figures 18 and 19. Post-closure groundwater monitoring of these units is conducted to determine whether groundwater quality becomes further degraded and, if so, whether an unacceptable risk is posed by the change in water quality conditions.

Groundwater monitoring was conducted in accordance with the OU-7 GWMP approved by USEPA on February 29, 2012. During development of the 100% design submittal for OU-7, the monitoring programs conducted as part of the OU-10 and NTCRA Basins closure (including the SBs and FABs) were combined with the requirements set forth in the OU-7 GWMP to create a single, comprehensive groundwater monitoring program. The OU-7 GWMP replaces the monitoring plan for NTCRA Basins previously approved by USEPA.

5.1 Monitoring Well Network

Figures 18 and 19 show the locations of the 10 overburden and 10 shallow bedrock monitoring wells that are monitored as part of the NTCRA Basin Post-Closure groundwater monitoring. Table 3 summarizes the construction details for these wells.

5.1.1 Fly Ash Basin Monitoring Well Network

FAB 1, 2, 3, and 6, and the former fly ash stockpile form a contiguous management unit of 47 acres. Twelve wells have been identified as the monitoring network for the post-closure monitoring of these closed units.

Overburden	Shallow Bedrock
Upgradient (four Wells)	
008, 029	108, 129
Downgradient (eight Wells)	
012, 013, 014R, B-48A	110, 112, 113, 114

5.1.1 Sulfate Basin Monitoring Well Network

SB 1, 3 and 4 form another contiguous management unit of 50 acres along the Shenandoah River. The sludge formerly contained in SB 5 was removed and placed in SB 4 and therefore no longer constitutes a potential source of constituents to groundwater. SB 2 has been cleaned out and closed and also no longer constitutes a potential source of constituents to groundwater. Fourteen wells have been identified as the monitoring network for the post-closure monitoring of the closed basins.

Overburden	Shallow Bedrock
Upgradient (eight Wells)	
MW-12, 012, 013, 014R	112, 113, 114, 132
Downgradient (six Wells)	
022, 023, 025R	PZ-03, PZ-06, PZ-07

5.1.1 Fly Ash Basin Cover System Drains

The cover system drain sumps were monitored as described in the OU-7 GWMP. The fly ash basin cover system drain sumps consist of the four sumps listed below. The locations of the sumps are shown on Figures 18 and 19.

- One sump is adjacent to FAB 2 and drains both FAB 1 and 2 (FAB-1-2);
- One sump is adjacent to FAB 3 (FAB-3-1); and
- Two sumps are adjacent to FAB 6 (FAB-6-North and FAB-6-South).

Each sump has a valved outlet that has remained closed. FMC has monitored the water levels within the sumps since the closure of the FABs was completed in February 2002. No water was present in the sumps until March 2003. In March 2003, the water level in the two sumps adjacent to FAB 6 overflowed the top of the sump at an estimated rate of 1 to 2 gallons per minute in each sump. In July 2003, FMC extended the elevation of the sumps in FAB 6 to prevent the sumps from overflowing. Although sumps FAB 1-2 and FAB 3-1 filled with water, the water did not overflow.

5.1.2 Sulfate Basin Cover System Drains

The cover system drain sumps were monitored as described in the OU-7 GWMP. The SB cover system drain sumps that were included in the monitoring network during the July 2015 sampling event consist of the four original sumps and the three additional sumps listed below. The locations of the sumps are shown on Figures 18 and 19.

- Four sumps are adjacent to SB 1 (SB-1-1, SB-1-2, SB-1-3, and SB-1-4);
- One sump is adjacent to SB 3 (SB-3-1); and
- Two sumps are adjacent to SB 4 (SB-4-1 and SB-4-2).

Sump SB 3-1 was installed in June 2010 and was sampled for the first time in September 2010. Sump SB-1-1 was installed after the September 2010 sump sampling event. Sump SB-1-2 was installed during May 2011, and sumps SB-1-3 and SB-1-4 were installed in August 2011. These sumps were sampled for the first time in June 2012. All sumps produced sufficient amounts of water for sampling during the 2016 sampling event.

5.2 Water Level Measurements

In accordance with the OU-7 GWMP, synoptic water level measurements were obtained before the monitoring wells were purged and sampled. Water levels were measured using an electronic water level meter and recorded to the nearest 0.01 foot in the bound field book dedicated to the sampling activities. Table 15 summarizes the elevation data obtained for each well on July 11, 2017.

The groundwater elevation (piezometric head) contours for both the overburden and the shallow bedrock for July 11, 2017, are shown on Figures 18 and 19, respectively. Piezometric gradients are toward the river perpendicular to the contour lines. Groundwater in the overburden is expected to flow parallel to the piezometric gradient. However, as previously mentioned, RI and OU-7 FS results have demonstrated that groundwater within the bedrock aquifer flows parallel to geologic strike at approximately S30ºW. This flow path represents an approximate 30 degree southward departure from the piezometric gradient.

5.3 Sample Analysis

The analyses performed on each groundwater and sump sample are listed below with the analytical methods.

- Dissolved metals by USEPA Method 6020A:
  - Arsenic
  - Beryllium
  - Cadmium
  - Chromium
  - Copper
  - Lead
  - Nickel
  - Selenium
  - Zinc
- Dissolved mercury by USEPA Method 7470A
- Cations USEPA Method 300.0:
  - Calcium
  - Magnesium
  - Sodium
- Anions by USEPA Method 300.0:
  - Chloride
  - Sulfate

5.4 Quality Assurance

As mentioned in Section 1.5, QA/QC samples were collected during the sampling event to measure and confirm the accuracy and usability of the data in accordance with the GWMP, the SW&SMP, and the Site-Wide QAPP. The following QA/QC samples were collected at the NTCRA Basins in 2016.

- Four equipment rinsate blanks.
- Two field duplicate samples.

- Two matrix spike / matrix spike duplicate (MS/MSD) samples.
- One trip blank per cooler containing volatile organic compounds (VOC) samples.

Groundwater samples were submitted to Test America Laboratories (Test America) in Nashville, Tennessee for analysis of the compounds of potential concern (COPCs) as presented in Section 3.6.1 of the OU-7 GWMP. Test America performed the analyses using USEPA-approved analytical methods as described in the Site-Wide QAPP, the OU-7 GWMP, and the SW&SMP. GHD Services Inc., performed data review, verification and validation to Level 2 criteria as defined in Section 5.1 and Table 7 of the Site-Wide QAPP. The Level 2 verification includes a review/evaluation of blanks, retention times, mass spectra, chromatograms, raw instrument outputs, and other information, including laboratory reporting forms, run logs, and all supporting data provided by the laboratory. Data validation reports are provided as Appendix B.

All NTCRA Basin data were considered usable. Data qualifiers have been added to some of the results. These qualifiers provide additional details regarding the data such as QC issues or interferences. Data qualified with a “J” indicate that, while the constituent was positively identified, the associated numerical value is an estimated concentration. Examples of data that may be qualified with this flag include values below the reporting limit (RL) but above the method detection limit (MDL), or where the associated QC samples are outside acceptable ranges.

The DQOs for the post-closure monitoring are to provide data of sufficient quality to evaluate any changes in groundwater quality over time associated with various units at the Site. As defined in Section 4.1 of the OU-07 GWMP and in the SW&SMP, definitive quantitation of the concentrations of COPCs in groundwater by an off-site analytical laboratory is needed for 90% for the annual events to meet the DQO.

The monitoring plan calls for sampling 32 wells and sumps at the NTCRA Basins. Each of the samples is analyzed for 15 constituents (10 metals, three cations, and two anions) for a total of 480 constituent results. Since no samples were rejected, definitive quantitation for 100% of the constituents was achieved.

5.5 Results

The validated analytical results for the FAB and SB wells and sumps for the 2017 sampling event and the field parameter data are presented on Tables 16 and 17, respectively. The laboratory validation report is presented in Appendix B, and the laboratory reports can be found in Appendix C. Historical analytical results are included on Table D-3 in Appendix D. Consistent with past sampling events, arsenic was the only constituent detected in groundwater at this unit at concentrations exceeding the RSL (Table 16). The data presented on Table 16 are compared to the EPA RSLs for tap water. The RSLs are presented for HQs of 1.0 and 0.1. Unless otherwise indicated, RSLs referenced in this report are for a HQ = 1.0 since this was the value specified in the approved GWMP (ERM 1015).

As previously mentioned and in accordance with the OU-7 GWMP, the control chart approach has been selected as the method to evaluate the constituent data collected in each downgradient well. The range of baseline concentrations for each well was established from the initial four semi-annual sampling events in 2001 and 2002. The monitoring data collected during the 2017 event were compared to the range of baseline concentrations (see Tables 18 and 19). A control chart was generated if a constituent was detected in a downgradient sample at a concentration above the range of baseline

concentrations. Included on the control chart is the average concentration at the corresponding upgradient monitoring well. Control charts are included as Appendix G. The 2017 water quality is compared to the baseline water quality in qualitative terms below.

5.5.1 Fly Ash Management Unit

Upgradient Overburden

The data collected from the overburden monitoring wells 008 and 029 represent water quality conditions upgradient of the fly ash unit. As such, they can be considered to represent upgradient concentrations for metals. Although arsenic was detected slightly above the baseline at well 008 in 2016, it was not detected in 2017. Consistent with previous sampling results, the remaining metals data for wells 008 and 029 were either non-detect or below the baseline range. Consistent with the results from 2016, calcium, magnesium, and chloride were detected in groundwater at wells 008 and 029 at concentrations exceeding their respective baseline concentrations. In addition, sulfate was slightly above the baseline range at well 008. Control charts were not generated because they are not required to evaluate upgradient groundwater conditions.

Downgradient Overburden

Wells 012, 013, 014R and B-48A are the four overburden monitoring wells downgradient of the fly ash units. With one exception, metals concentrations in groundwater at wells 012,013, 014R and B-48A were either non-detect or below the baseline range. Consistent with past results, arsenic was detected in well 014R at a concentration (889 µg/L) exceeding its baseline range of 46 µg/L to 66 µg/L. A control chart for arsenic in well 014R is presented in Appendix G (Figure G-1). The control chart shows that the arsenic concentration in groundwater at well 014R has increased since 2013.

Calcium, magnesium, sodium, chloride, and sulfate were detected in one or more downgradient wells at concentrations exceeding their respective baseline concentrations. The concentrations are similar to those detected in 2015 and 2016 (Table D-4, Appendix D). For example, the 2017 sodium concentration at well 014R is approximately four times higher than the baseline level but is within the range of concentrations detected at this location between 2008 and 2016 (566 to 817 mg/L). Similarly, the sulfate concentration in groundwater at well 014R in 2017 (2,600 mg/L) is nearly twice the baseline concentration but is similar to the range of concentrations measured between 2013 and 2016 (2,410 mg/L to 2,710 mg/L). Control charts were not generated for these constituents.

Upgradient Shallow Bedrock

Upgradient shallow bedrock groundwater quality is represented by the data collected from wells 108 and 129. Metals concentrations in groundwater at wells 108 and 129 were either non-detect or below the baseline range.

The chloride concentration at well 129 (72.5 mg/L) is approximately twice the baseline range; however, the concentration is similar to the range of concentrations between 2013 and 2016 (66.9 mg/L to 75.8 mg/L). Calcium and magnesium were also detected at values slightly above their baseline ranges at well 129, but not significantly above historical levels. Calcium was also detected at well 108 at a concentration (191 mg/L)

slightly above the baseline (189 mg/L). The remaining cations and anions were reported at concentrations below baseline and are comparable to historical levels.

Downgradient Shallow Bedrock

Shallow bedrock wells 110, 112, 113, and 114 are downgradient of the FABs. With the exception of arsenic and nickel at well 114, the metals concentrations at these wells were either non-detect or below the baseline range. Although zinc was detected above the baseline range at this location in 2016, the 2017 concentration was well below the baseline. Control charts were generated for arsenic, nickel, and zinc (Figures G-2, G-3, and G-4 in Appendix G, respectively). Although higher than the 2016 result, the arsenic concentration remains below historic high concentrations detected in 2006 and 2012. The control chart for nickel (Figure G-3) shows a potential increasing trend for nickel concentrations at this well; however, the 2016 and 2017 results are below the historic high concentration detected in 2015. In addition, the concentrations remain well below the RSL of 390 µg/L.

Historically, selenium has also been detected at well 114 at concentrations exceeding the baseline range; however, the selenium concentration has been within the baseline range or below detection since 2013. Therefore, a control chart is not presented for this constituent.

Calcium, magnesium, sodium, chloride, and sulfate were detected in groundwater at well 114 at concentrations exceeding their respective baseline concentrations. With the exception of sodium, the detected concentrations were similar to those detected since 2012. There are no RSLs for these constituents and control charts were not generated.

5.5.2 Sulfate Basin Management Unit

Upgradient Overburden

Overburden monitoring wells MW-12, 012, 013, and 014R collectively represent water quality conditions upgradient of the SBs. Consistent with past sampling events, arsenic was detected in groundwater wells MW-12 and 014R at concentrations exceeding the baseline values and wells 012 and 013 did not contain detected concentrations of metals above respective baseline ranges. A control chart was not generated because one is not required to evaluate upgradient groundwater conditions.

Calcium, magnesium, sodium, chloride, and sulfate were detected in one or more of the upgradient wells at concentration exceeding their baseline values. These results are consistent with recent historical results.

Downgradient Overburden

Wells 022, 023, and 025R represent the overburden groundwater quality downgradient of the SBs. With the exception of arsenic at well 023, metals concentrations in groundwater at wells 022, 023 and 025R were either non-detect or below the baseline range. Arsenic was detected at a concentration of 10.6 µg/L. While arsenic at this well has historically exceeded the baseline range, the concentrations were within the baseline range between 2014 and 2016. In addition, the arsenic concentration is significantly higher in upgradient well 014R (889 µg/L), suggesting that the SBs are not a source of arsenic (Figure G-5, Appendix G).

Calcium was detected above the baseline at wells 023 and 025R. The calcium concentration at well 023 was within the range of concentrations detected between 2002 and 2016 (35 to 95.4 mg/L). The concentration of calcium at well 025R (146 mg/L) was slightly higher than the historic high of 144 mg/L detected in 2014. The calcium concentration at this well continues to fluctuate.

Upgradient Shallow Bedrock

Concentrations at wells 112, 113, 114, and 132 represent groundwater conditions in the shallow bedrock upgradient of the SBs. With the exception of arsenic and nickel at well 114, metals data for wells 112, 113, 114 and 132 were either non-detect or below the baseline range. Consistent with past results, several cations and anions were also detected at concentrations exceeding their baseline ranges.

Downgradient Shallow Bedrock

The downgradient water quality in the shallow bedrock is represented by the data collected from wells PZ-03, PZ-06, and PZ-07. With the exception of arsenic at well PZ-07, metals results at these wells were either non-detect or below the baseline range. A control chart was generated for arsenic at PZ-07 (Figure G-6 in Appendix G). Beginning in 2016, a lower detection limit was achieved for arsenic. While the arsenic concentration at this location exceeds the baseline, the concentrations detected in 2016 and 2017 are below the reported detection limits from 2011 to 2014 when the constituent was reported as not detected. The NTCRA basins may be contributing trace levels of arsenic to the shallow bedrock groundwater. Chloride and sulfate were detected at well PZ-03 at concentrations above their baseline range.

5.5.3 Fly Ash Basin Cover System Drain Sumps

The validated 2017 data for the samples collected from the four FAB sumps (FAB-1-2, FAB-3-1, FAB-6-North, FAB-6-South) are presented in Table 17. Historical results are presented in Appendix D. The analytical results were compared to the more stringent freshwater standards for either aquatic life or human health contained in the Virginia surface water quality standards (VAC[3] 25-260-140). The appropriate screening criteria for each constituent are listed on Table 17. Key findings are as follows:

- Arsenic was detected in all four of the sumps at concentrations exceeding the screening criteria of 10 µg/L. The arsenic concentrations at sumps FAB-1-2 and FAB-3-1 are consistent with historical results. The arsenic concentration at sump FAB-6-North is an order of magnitude above recent historical results. While FAB-1-2 is an order of magnitude lower than recent historical results.
- The concentrations of nickel exceeded the screening criteria of 20 µg/L in three of the four sumps (FAB-3-1, FAB-6-North, and FAB-6-South), with concentrations ranging from 18.2 J to 31.2 µg/L. The concentrations are consistent with the recent results (2015 and 2016) and are below the historically high levels reported in 2011.
- The concentration of zinc at sump FAB-3-1 (65.7 J µg/L) is below the RSL of 120 µg/L. This is consistent with the results from 2016 and represents a decrease from the concentration detected in 2015 (221 µg/L). The zinc

[3] VAC – Virginia Administrative Code

concentration has fluctuated significantly during the monitoring period ranging from 9.2 (2012) to 2,700 µg/L (2003).

- The concentrations of sulfate in the four sumps (ranging from 399 to 934 mg/L) exceed the screening criteria of 250 mg/L. The concentrations have remained relatively stable or have decreased slightly since monitoring began in 2003.
- Beryllium, cadmium, copper, lead, and mercury were not detected in any of the sumps.

5.5.4 Sulfate Basin Cover System Drain Sumps

The validated 2017 data for samples collected from the seven FAB sumps (SB-1-1, SB-1-2, SB-1-3, SB-1-4, SB-3-1, SB-4-1 and SB-4-2) are presented on Table 17. Historical results are presented in Appendix D. The analytical results were compared to the more stringent freshwater standards for either aquatic life or human health contained in the Virginia surface water quality standards (VAC 25-260-140). The appropriate screening criteria for each constituent are also presented on Table 17. Key findings from the SB sump sampling in 2017 are as follows:

- The concentration of arsenic at sumps SB-1-1 (44.0 J µg/L) and SB-4-2 (43.7 J µg/L) exceeded the screening criteria of 10 µg/L. The concentrations at these two sumps increased compared to the results from 2016 and are similar to the results measured in 2015.
- The concentration of nickel at sump SB-1-4 (21.3 µg/L) exceeds the screening criteria of 20 µg/L. The concentration at SB-1-4 is consistent with historical results.
- The concentration of copper at sump SB-4-1 (11.5 µg/L) exceeds the screening criteria of 9 µg/L.
- Sulfate concentrations exceed the screening criteria of 250 mg/L in three of the seven sumps (SB-1-3, SB-1-4, and SB-4-2). The sulfate concentrations in the SB sumps have generally decreased since monitoring began in 2012 (sulfate concentrations exceeded the screening criteria in six sumps in 2012).
- Consistent with historical results, beryllium, cadmium, and mercury were not detected in any of the sumps.

5.6 Conclusions

5.6.1 Fly Ash Management Unit

Monitoring of metals in the overburden wells indicates that the unit may be contributing to arsenic concentrations in the overburden groundwater near well 014R. The concentrations of arsenic at this location have increased since 2008. There have also been notable increases in sodium and sulfate at well 014R since the inception of the monitoring program in 2001.

Monitoring of metals in the shallow bedrock wells both upgradient and downgradient of the FAB units did not indicate any increasing trends in metal concentrations, with the possible exception of nickel in well 114. The control chart for this constituent shows a potential increasing trend for nickel concentrations at this well, although the concentrations remain an order of magnitude below the RSL. Sulfate concentrations in

downgradient well 114 was elevated relative to the upgradient wells and concentrations measured during baseline data collection.

5.6.2 Sulfate Basin Management Unit

Results of metals monitoring in the overburden wells both upgradient and downgradient of the SB units did not indicate any increasing trends in metal concentrations. The major ion concentrations are also relatively stable.

Results of metals monitoring in the shallow bedrock wells both upgradient and downgradient of the SB units did not indicate any increasing trends in metal concentrations.

5.6.3 Fly Ash Basin Cover System Drain Sumps

The water quality data collected from the sumps indicate that arsenic, nickel, and sulfate were present during the 2017 sampling event at concentrations exceeding Virginia's surface water quality standards (9 VAC 25-260-140). The concentrations of these constituents have decreased or remained stable over time.

5.6.4 Sulfate Basin Cover System Drain Sumps

The 2017 event represents the 12th sampling event for sumps SB 4-1 and SB 4-2, the 8th sampling event for SB 3-1, and the 6th event for sumps SB-1-1, SB-1-2, SB-1-3, and SB-1-4. The water quality data indicate that arsenic, coper, nickel, and sulfate were present at concentrations exceeding Virginia's surface water quality standards (9 VAC 25-260-140). With the exception of copper, concentrations of COPCs in these sumps has decreased or remained stable over the monitoring period. This is the first time copper has been detected at Sump SB-4-1 above the screening criteria.

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6.0 OU-7 SURFACE WATER AND SEDIMENT MONITORING

This section of the report summarizes activities conducted in 2017 as part of the implementation of the SW&SMP for OU-7 of the Site (ERM 2015). The SW&SMP was prepared and implemented in accordance with Section 11.2.8 of the Record of Decision issued by the USEPA on January 13, 2010 (USEPA 2010) to monitor the effectiveness of the OU-7 remedy. As stated in Section 1.3 of the SW&SMP, the purpose of the SW&SMP with respect to surface water and sediment monitoring is to:

- Evaluate surface water quality and sediment data from the Shenandoah River to determine whether there are decreasing trends in the concentration of constituents found in the area where the groundwater contamination plume from VB 9-11 is entering the river; and
- Evaluate surface water and sediment data to determine whether the remediation of the groundwater plume has a beneficial effect on sediment and surface water quality in the vicinity of the plume discharge.

An additional purpose of monitoring is to evaluate whether groundwater extraction is reducing or eliminating the discharge of contaminated groundwater into the river. This section presents the results of the sixth annual river surface water and sediment sampling event (July 2017), which was conducted in accordance with Section 2.0 of the SW&SMP.

6.1 Sample Collection

Surface water and sediment samples were collected on July 13, 2017, in accordance with the procedures described in the SW&SMP and as described below.

6.1.1 Sample Locations

Surface water and sediment samples were collected at eight locations (numbered SED/SW-1 through SED/SW-8) in the river (Figure 20). With the exception of location SED/SW-8, the sample locations approximately replicated the locations sampled in 2001 (Exponent 2001). The 2001 samples were collected from a seepage area that was observed to contain discolored sediment with a sulfide odor (Appendix M, Figure M-1). Sample location SED/SW-8 was added to the sampling plan at USEPA's request. The July 2015 event was the first time the location was sampled. The sampling locations represented surface water and sediment quality upstream of the Site (Location SED/SE-8), upstream of the VB 9-11 plume (Locations 6 and 7), adjacent to the plume (Locations 3, 4, and 5), and downstream of the plume (Locations 1 and 2).

Surface water samples were collected before sediment samples. The locations of the sampling stations were identified and marked by Marsh & Legge Land Surveyors based on the past surveyed locations. Marsh & Legge marked the river bank at each location and provided an off-set distance for collecting the surface water samples. Permanent markers were placed on the bank marking the location of each sample for future reference. The coordinates for the locations as provided by Marsh & Legge are presented below:

Offset Description and Distance	Northing	Easting
SW-01 35' O/S	7019406.637	11563405.654
SW-02 70' O/S	7019281.052	11563494.633
SW-03 50' O/S	7019051.766	11563678.012
SW-04 40' O/S	7018973.457	11563741.140
SW-05 50' O/S	7018939.171	11563777.939
SW-06 50' O/S	7018652.006	11563958.070
SW-07 50' O/S	7018582.984	11564015.187
SW-08 75' O/S	7016074.103	11565471.872

6.1.2 Equipment Decontamination

Sampling equipment was decontaminated following the procedures described in Section 2.3.2 of the SW&SMP. All sampling equipment used at multiple locations was decontaminated in the field prior to beginning sampling activities, after use at each sample location, and prior to leaving the Site. Any equipment that could not be decontaminated or was designated for one-time use (e.g., nitrile gloves) was properly packaged and disposed of as nonhazardous solid waste.

6.1.3 Measurement of Field Parameters

Field measurements in the Shenandoah River were collected by immersing the instrument probes into a container filled with water from each sampling location.

6.1.4 River Water Sample Collection Procedures

Samples were collected in accordance with the procedures described in Section 2.3.4 of the SW&SMP while standing in the river. The river was between 1 and 1-1/2 feet deep at each location during the sampling event. Samples were obtained from one-half the stream depth at mid-channel using new, clean laboratory-supplied containers, which were inverted and lowered into the channel. For laboratory-supplied containers that held preservatives, a separate clean container was used to collect the sample, and the contents were then transferred into the pre-preserved laboratory-supplied container.

Samples collected for dissolved metals were collected in an unpreserved bottle, then pumped through a 0.45-micron in-line filter and transferred to the bottles containing the appropriate preservative. The initial 200 milliliters of the filtered sample was discarded.

6.1.5 River Sediment Sample Collection Procedures

Sediment samples were collected from the top six inches. In order to obtain appropriate sample volumes, multiple sub-samples were collected at the sampling location and homogenized into a representative composite sample using a stainless steel spoon and mixing bowl. Samples to be analyzed for VOCs were drawn from the first aliquot, prior to homogenization. The samples were placed directly into the appropriate laboratory-supplied containers. The sediment samples were collocated with surface water sampling locations.

6.2 Sample Analysis

The samples were submitted to Lancaster for analysis using the analytical methods listed below in accordance with Section 2.5 of the SW&SMP.

- Dissolved metals (surface water) and total metals (sediment) by USEPA Method 6020:
  - Aluminum
  - Antimony
  - Arsenic
  - Cadmium
  - Chromium
  - Cobalt
  - Iron
  - Lead
  - Manganese
  - Nickel
  - Vanadium
  - Zinc
- Dissolved mercury (surface water) by USEPA Method 7470A
- Total mercury (sediment) by USEPA Method 7471B
- Free cyanide by USEPA Method 9014 (surface water)
- Total cyanide by USEPA Method 9012 (sediment)
- VOCs by USEPA Method 8260B:
  - Acetone
  - Carbon disulfide
  - Chlorobenzene
- SVOCs by USEPA Method 8270D:
  - 2-Methylphenol
  - 4-Methylphenol
  - Bis(2-ethylhexyl)phthalate
  - Naphthalene
  - Pentachlorophenol
  - Phenol

- Grain size by Method ASTM[4] D 422, percent solids by Method 2540, and TOC by Method USEPA Lloyd Kahn (sediment samples only).

6.3 Quality Assurance

As discussed in Section 1.5, QA/QC samples were collected during the sampling event to measure and confirm the accuracy and usability of the data in accordance with the GWMP, the SW&SMP, and the Site-Wide QAPP. The following QA/QC samples associated with the surface water and sediment sampling were collected in 2017.

- One equipment rinsate blank was collected with the sediment samples.
- One sediment and one surface water field duplicate samples were collected.
- One sediment and one surface water matrix spike / matrix spike duplicate (MS/MSD) samples were collected.
- One trip blank per cooler containing volatile organic compounds (VOC) samples.

Surface water and sediment samples were submitted to Test America in Nashville, Tennessee for analysis of the compounds of potential concern (COPCs) as presented in Section 2.5 of the SW&SMP. Test America performed the analyses using USEPA-approved analytical methods as described in the Site-Wide QAPP, the OU-7 GWMP, and the SW&SMP. GHD Services Inc., performed data review, verification and validation to Level 2 criteria as defined in Section 5.1 and Table 7 of the Site-Wide QAPP. The Level 2 verification includes a review/evaluation of blanks, retention times, mass spectra, chromatograms, raw instrument outputs, and other information, including laboratory reporting forms, run logs, and all supporting data provided by the laboratory. Data validation reports are provided as Appendix B.

All eight results for acetone in surface water were rejected because of low relative response factors (see validation report in Appendix B for more information). Cyanide (total) was not recovered in the sediment MS/MSD. All associated results were non-detect and were rejected due to the poor analytical efficiency. The remaining surface water and sediment data were considered usable. Data qualifiers have been added to some of the results. These qualifiers provide additional details regarding the data such as QC issues or interferences. Data qualified with a “J” indicate that, while the constituent was positively identified, the associated numerical value is an estimated concentration. Examples of data that may be qualified with this flag include values below the reporting limit (RL) but above the method detection limit (MDL), or where the associated QC samples are outside acceptable ranges.

The DQO for the surface water, sediment and biota monitoring is to provide data of sufficient quality to determine whether concentrations of chemicals of concern are decreasing. As defined in Section 4.1 of the SW&SMP, definitive quantitation of the concentrations of COPCs in groundwater by an off-site analytical laboratory is needed for 90% for the annual events to meet the DQO.

The surface water and sediment monitoring plan calls for analysis of eight surface water samples for a total of 24 constituents (13 metals, three VOCs, six SVOCs, free cyanide, and total cyanide) and eight sediment samples for a total of 26 constituents (13 metals, three VOCs, six SVOCs, free cyanide, total cyanide, TOC, and grain size). This totals

[4] ASTM – American Society for Testing and Materials

400 results. Since 16 results were rejected, definitive quantitation for 96% of the constituents was achieved (which exceeds the DQO of 90%).

6.4 Results

6.4.1 River Flow

River flow conditions were determined based on information obtained from the United States Geological Survey (USGS) gauging station for the Shenandoah River at Front Royal, Virginia (USGS Station 01631000). The average flow of the river during the sampling event on July 13, 2017, was 821 cubic feet per second (cfs). For comparison, flow ranged from a low of 271 cfs on December 31, 2017 to a high of 13,600 cfs on May 26, 2017. Based on historical flow monitoring at this gauging station, average low-flow conditions occur between mid-August and the end of October each year and typically average about 500 cfs.

6.4.2 River Sediment

The results of the river sediment samples are presented in Table 20. The sediment results were compared to the USEPA Region 3 Freshwater Sediment Screening Benchmarks (USEPA 2006). Historical sediment data are presented in Appendix H.

Consistent with past results, no SVOCs were detected above the screening criteria in any of the seven samples collected from historical sediment sampling locations. While three SVOCs were detected at the new sample location (SED-08) in 2015, no SVOCs were detected at this location in 2016 or 2017. The analytical results for specific VOCs in river sediment samples are listed below:

- Acetone was detected in seven of the eight sediment samples. With the exception of location SED-07, the concentrations were relatively low concentrations between the MDL and RL. Historically low levels of acetone have been detected at several of the locations. There is no sediment criterion for acetone.
- Carbon disulfide was detected at four of the eight locations at concentrations exceeding the screening criteria. Detected concentrations ranged from 6.19 J µg/kg (SED-03) to 34.3 µg/kg (SED-04). The results are consistent with the results from 2016. Groundwater extraction has reduced the carbon disulfide levels in sediment.
- Consistent with past results, chlorobenzene was not detected in any of the samples.
- As shown in Appendix H (Table H-1), the level of fine particles (clay and silt) observed in the sediment samples is similar or greater than those reported in previous sampling events.

The analytical results for metals and cyanide in the river sediment samples are as follows:

- Antimony, arsenic, cadmium, chromium, cobalt, iron, lead, and zinc were reported as non-detect or at concentrations below the freshwater sediment screening benchmarks in all samples.

- Aluminum and vanadium were detected in all of the samples, but there are no freshwater sediment screening benchmarks for these constituents. There was no apparent increase of concentration across the site. The results are similar to the results observed in 2015 and 2016. Therefore, their presence of these metals in sediment does not appear to be related to site activities.
- As previously mentioned, none of the iron results exceeded the screening criteria. Iron concentrations in the sediment generally decreased from upgradient to downgradient locations. Iron has been sporadically detected at several locations in the past with concentrations exceeding the benchmarks.
- Mercury was detected at four locations (SED-04, SED-05, SED-07, and SED-08) at concentrations (0.343, 0.441, 0.227, and 0.416 mg/Kg, respectively) exceeding the freshwater screening benchmark values. One of these locations is upgradient of the plume. Mercury has been sporadically detected above the standard at several locations, however, the concentrations appear to be similar or higher in upgradient locations indicating that the site is not the likely source for this constituent.
- Consistent with historic results, total cyanide was not detected in any of the samples; however, these data were rejected due to lack of recovery in the associated MSD sample. Free cyanide was not detected in any of the samples.
- Metals occur naturally in river sediment. Therefore, the presence of metals, in particular iron and manganese, above the analytical RLs is expected. Metals such as arsenic and antimony present in the VB 9-11 groundwater plume were either non-detect or detected at concentrations below benchmark values.
- The concentrations of metals detected in sediments in 2017 are relatively consistent with results reported from 2013 through 2016.

6.4.3 River Water

The results of the river water samples are presented in Table 21. The surface water data collected during the July 2017 event were compared to the Virginia Department of Environmental Quality (VADEQ) Chronic Surface Water Criteria for freshwater and human health (2017). In addition, the data were compared to the USEPA Region III Biological Technical Assistance Group Freshwater Benchmarks. Historical water quality data are presented in Appendix H.

No VOCs or SVOCs were detected in river surface water samples (although the acetone results were rejected). Except for iron and zinc at locations SW-04 and SW-05, concentrations of total metals in river surface water samples were reported as non-detect or at concentrations below the surface water criteria at all sampling locations. Dissolved (filtered) metals were either non-detect or below the surface water criteria at all locations. The iron and zinc results appear to be anomalies based on historical concentrations and are not believed to be related to site activities. Future monitoring will be evaluated to confirm this theory. Cyanide was not detected in any of the surface water samples.

6.5 Conclusions

The key findings from the river water and sediment sampling event are summarized below.

6.5.1 River Sediment

- Consistent with past sampling events, carbon disulfide was detected in sediment samples near the OU-7 plume above the sediment criteria. The concentrations have generally decreased across the site.
- No SVOCs were detected at concentrations above the sediment criteria.
- With the exception of manganese and mercury, all metals were reported as non-detect or at concentrations below the freshwater sediment screening benchmarks. The concentrations of metals detected in sediments in 2017 are relatively consistent with results reported from 2013 through 2016.
- The total cyanide results were rejected due to low MSD recovery. Free cyanide was not detected in any of the samples.

6.5.2 River Water

- No VOCs or SVOCs were detected in river surface water samples.
- Except for iron and zinc at two locations, concentrations of total metals in river surface water samples were reported as non-detect or at concentrations below the surface water criteria at all sampling locations. Dissolved (filtered) metals were either non-detect or below the surface water criteria at all locations. The iron and zinc results appear to be anomalies based on historical concentrations and are not believed to be related to site activities.
- Cyanide was not detected in any of the samples.

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7.0 REFERENCES

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FIGURES

PARSONS

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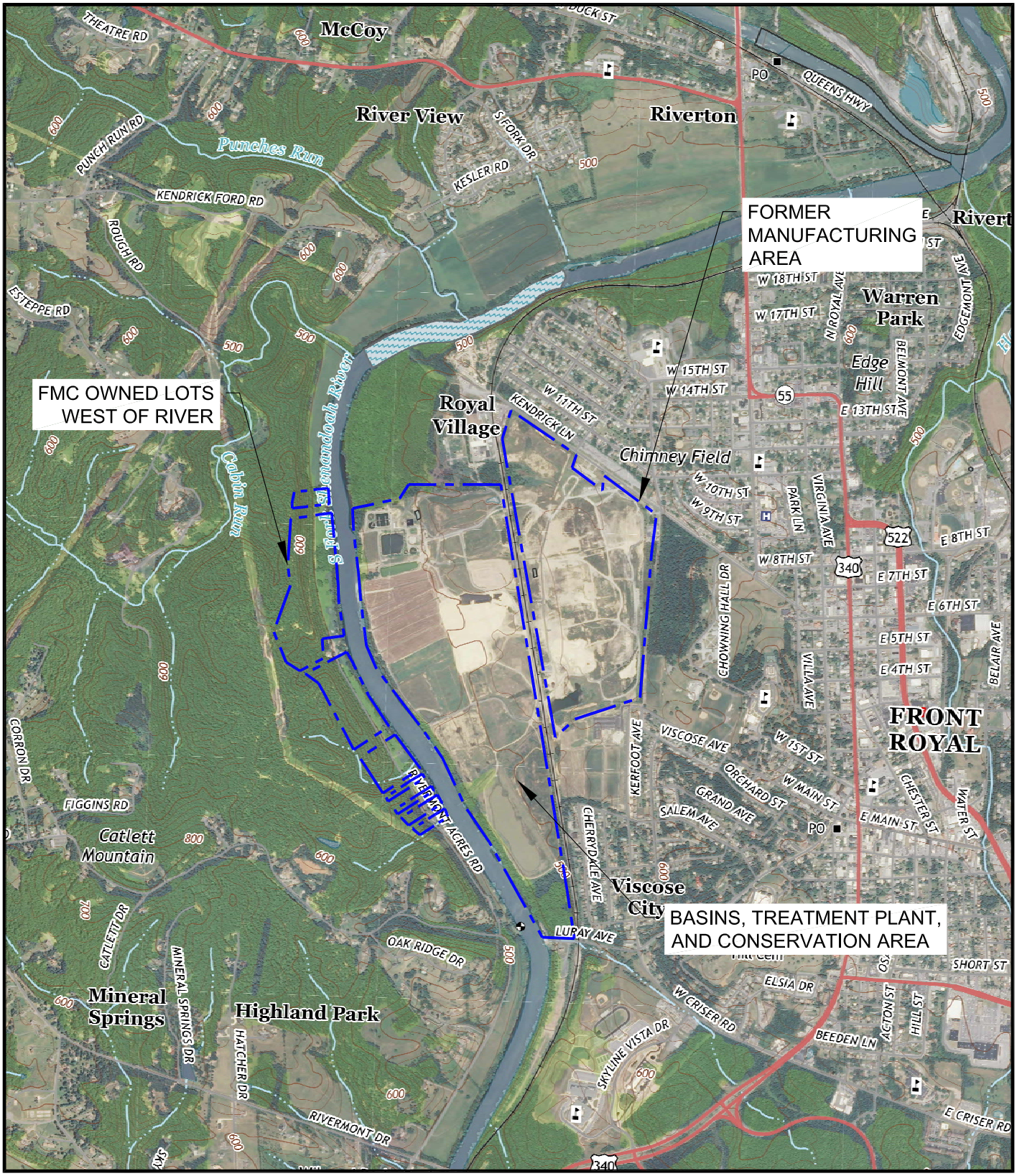

NORTH

SOURCE: U.S.G.S. TOPOGRAPHIC QUADRANGLE
FRONT ROYAL, VIRGINIA
7.5 MINUTE SERIES, 2013

2,000 0 2,000 4,000 Feet

PARSONS
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SITE LOCATION MAP

2017 ANNUAL SITE-WIDE GROUNDWATER, SURFACE WATER, AND SEDIMENT MONITORING REPORT FOR OU-7, OU-10, AND NTCRA BASINS
AVTEX FIBERS SUPERFUND SITE
FRONT ROYAL, VIRGINIA

CREATED: M. ROBINSON	CLIENT PROJECT NO.:
DATE: 2018-01-05	PARSONS PROJECT NO.: 450516
REVISION:	FIGURE NO.: 1
FILE NAME: FIG 1 – SITE_LOC_MAP.DWG	

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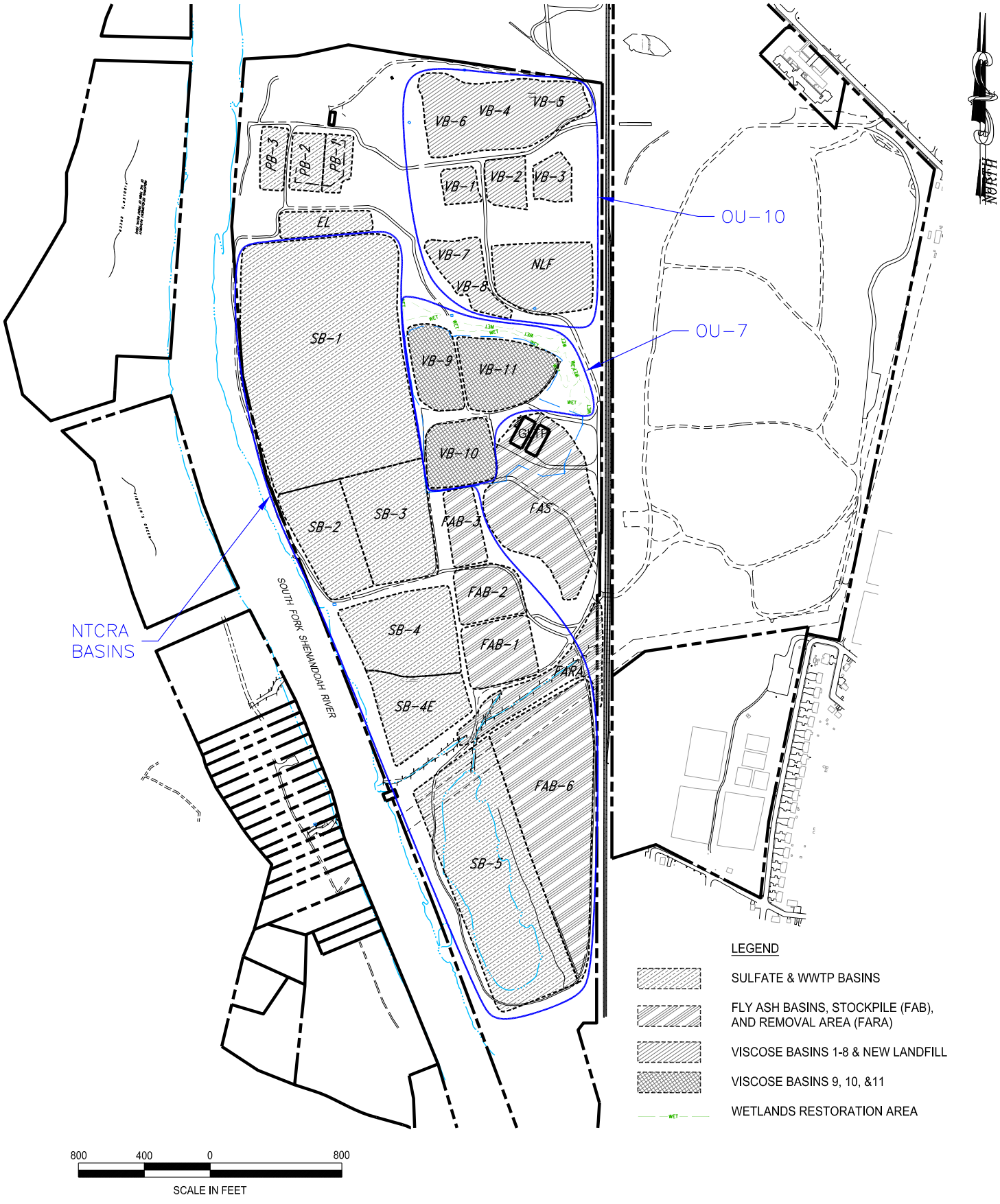

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SITE WASTE DISPOSAL IMPOUNDMENTS

2017 ANNUAL SITE-WIDE GROUNDWATER, SURFACE WATER, AND SEDIMENT MONITORING REPORT FOR OU-7, OU-10, AND NTCRA BASINS
AVTEX FIBERS SUPERFUND SITE
FRONT ROYAL, VIRGINIA

CREATED: M. ROBINSON	CLIENT PROJECT NO.:
DATE: 2018-01-18	PARSONS PROJECT NO.: 450516
REVISION:	FIGURE NO.: 1A
FILE NAME: FIG 1A – SITE WASTE IMPOUNDMENTS.DWG	

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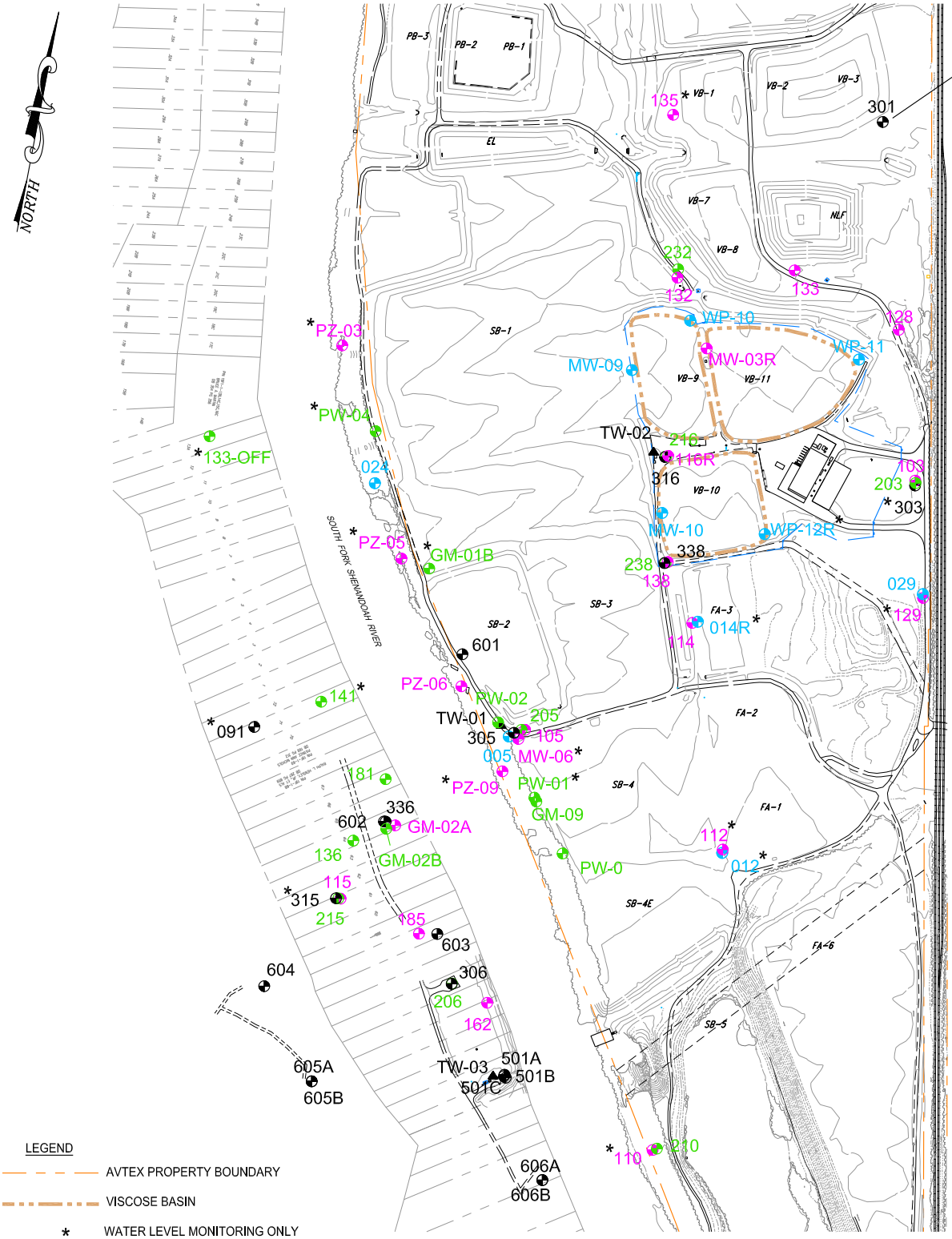

PARSONS
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OU-7 CAPTURE ZONE MONITORING WELL NETWORK

2017 ANNUAL SITE-WIDE GROUNDWATER, SURFACE WATER, AND SEDIMENT MONITORING REPORT FOR OU-7, OU-10, AND NTCRA BASINS
AVTEX FIBERS SUPERFUND SITE
FRONT ROYAL, VIRGINIA

CREATED: M. ROBINSON	CLIENT PROJECT NO.:
DATE: 2018-01-05	PARSONS PROJECT NO.: 450516
REVISION:	FIGURE NO.: 2
FILE NAME: FIG 2 – OU-7 WELLS.DWG	

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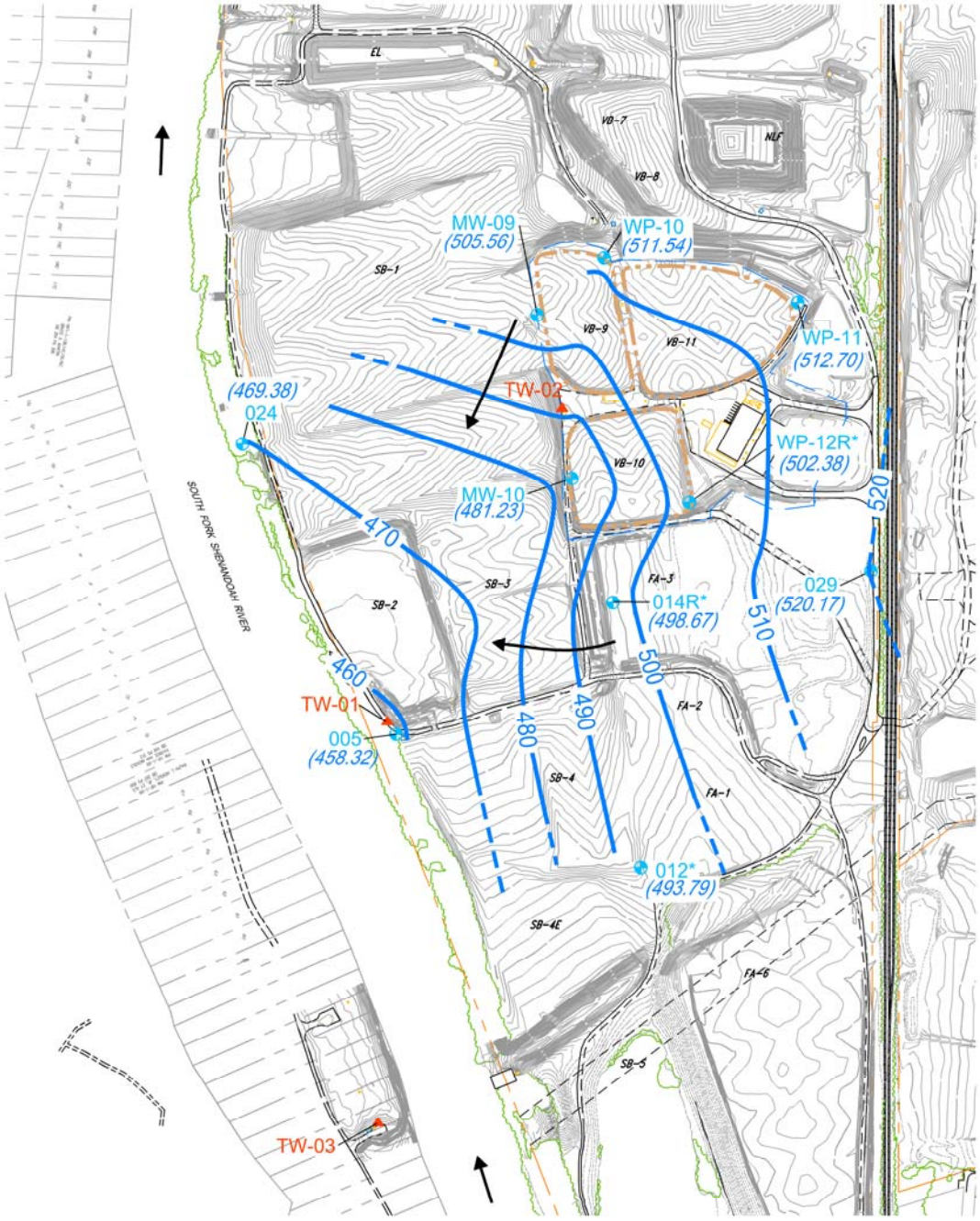

LEGEND

- AVTEX PROPERTY BOUNDARY
- OVERBURDEN MONITORING WELL
- EXTRACTION WELL
- VISCOSE BASIN
- * INDICATES WELL GAUGED FOR WATER LEVELS ONLY
- (458.32) GROUND WATER ELEVATION (FEET, MSL)
- 490 GROUND WATER CONTOUR (FEET, MSL) (DASHED WHERE INFERRED)
- GROUNDWATER / RIVER FLOW DIRECTION

600 300 0 600

SCALE IN FEET

NOTE:
WATER WAS BEING EXTRACTED FROM WELLS TW-01 (45 GPM) AND TW-02 (26 GPM) DURING THE MEASUREMENT PERIOD. TW-03 WAS NOT OPERATING.

PARSONS
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OU-7 OVERBURDEN GROUNDWATER CONTOUR MAP
(MARCH 21-22, 2017)

2017 ANNUAL SITE-WIDE GROUNDWATER, SURFACE WATER, AND SEDIMENT MONITORING REPORT FOR OU-7, OU-10, AND NTCRA BASINS
AVTEX FIBERS SUPERFUND SITE
FRONT ROYAL, VIRGINIA

CREATED: M. ROBINSON	CLIENT PROJECT NO.:
DATE: 2018-01-09	PARSONS PROJECT NO.: 450516
REVISION:	FIGURE NO.: 3A
FILE NAME: FIG 3A - OVRBDN Pot Map_2017-03-21,22.DWG	

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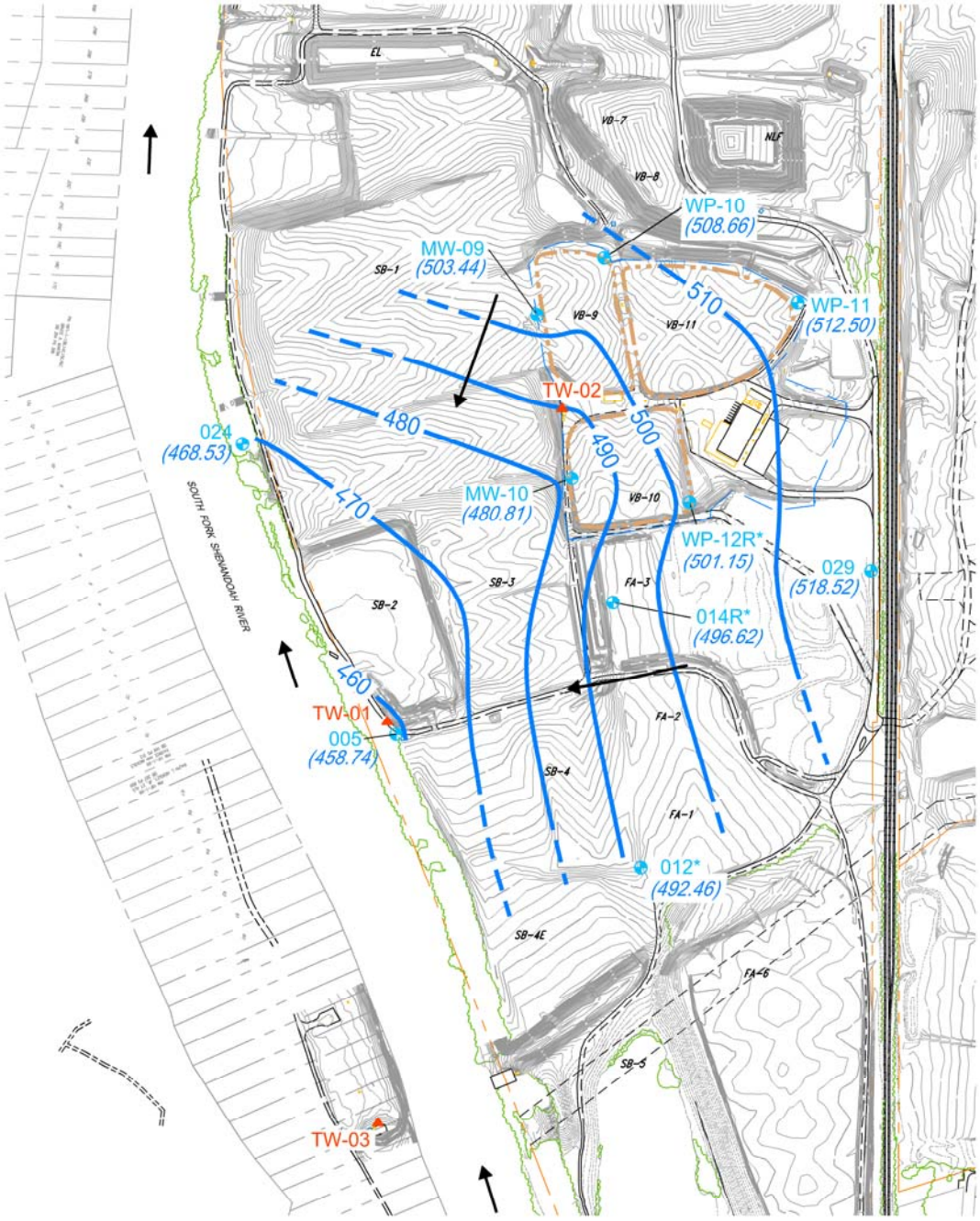

LEGEND

- AVTEX PROPERTY BOUNDARY
- OVERBURDEN MONITORING WELL
- EXTRACTION WELL
- VISCOSE BASIN
- * INDICATES WELL GAUGED FOR WATER LEVELS ONLY
- (492.46) GROUND WATER ELEVATION (FEET, MSL)
- 490 GROUND WATER CONTOUR (FEET, MSL) (DASHED WHERE INFERRED)
- GROUNDWATER / RIVER FLOW DIRECTION

600 300 0 600

SCALE IN FEET

NOTE:
WATER WAS BEING EXTRACTED FROM WELLS TW-01 AND TW-02 DURING THE MEASUREMENT PERIOD AT RATES OF 45 and 18 GPM RESPECTIVELY. TW-03 WAS NOT PUMPING ON THE DAY THE READINGS WERE MADE.

PARSONS
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OU-7 OVERBURDEN GROUNDWATER CONTOUR MAP (JULY 11, 2017)

2017 ANNUAL SITE-WIDE GROUNDWATER, SURFACE WATER, AND SEDIMENT MONITORING REPORT FOR OU-7, OU-10, AND NTCRA BASINS
AVTEX FIBERS SUPERFUND SITE
FRONT ROYAL, VIRGINIA

CREATED: M. ROBINSON	CLIENT PROJECT NO.:
DATE: 2018-04-18	PARSONS PROJECT NO.: 451099
REVISION:	FIGURE NO.: 3B
FILE NAME: FIG 3B – OVRBDN Pot Map_2017-07-11.DWG	

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LEGEND

- AVTEX PROPERTY BOUNDARY
- OVERBURDEN MONITORING WELL
- EXTRACTION WELL
- VISCOSE BASIN
- * INDICATES WELL GAUGED FOR WATER LEVELS ONLY
- (492.06) GROUND WATER ELEVATION (FEET, MSL)
- 490 GROUND WATER CONTOUR (FEET, MSL) (DASHED WHERE INFERRED)
- GROUNDWATER / RIVER FLOW DIRECTION

600 300 0 600

SCALE IN FEET

NOTE:
WATER WAS BEING EXTRACTED FROM WELL TW-01 AT A FLOW RATE OF 45 GPM DURING THE MEASUREMENT PERIOD. WELLS TW-02 AND TW-03 WERE NOT PUMPING.

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OU-7 OVERBURDEN GROUNDWATER CONTOUR MAP (SEP 21, 2017)

2017 ANNUAL SITE-WIDE GROUNDWATER, SURFACE WATER, AND SEDIMENT MONITORING REPORT FOR OU-7, OU-10, AND NTCRA BASINS
AVTEX FIBERS SUPERFUND SITE
FRONT ROYAL, VIRGINIA

CREATED: M. ROBINSON	CLIENT PROJECT NO.:
DATE: 2018-07-03	PARSONS PROJECT NO.: 451099
REVISION:	FIGURE NO.: 3C
FILE NAME: FIG 3C – OVRBDN Pot Map_2017-09-21.DWG	

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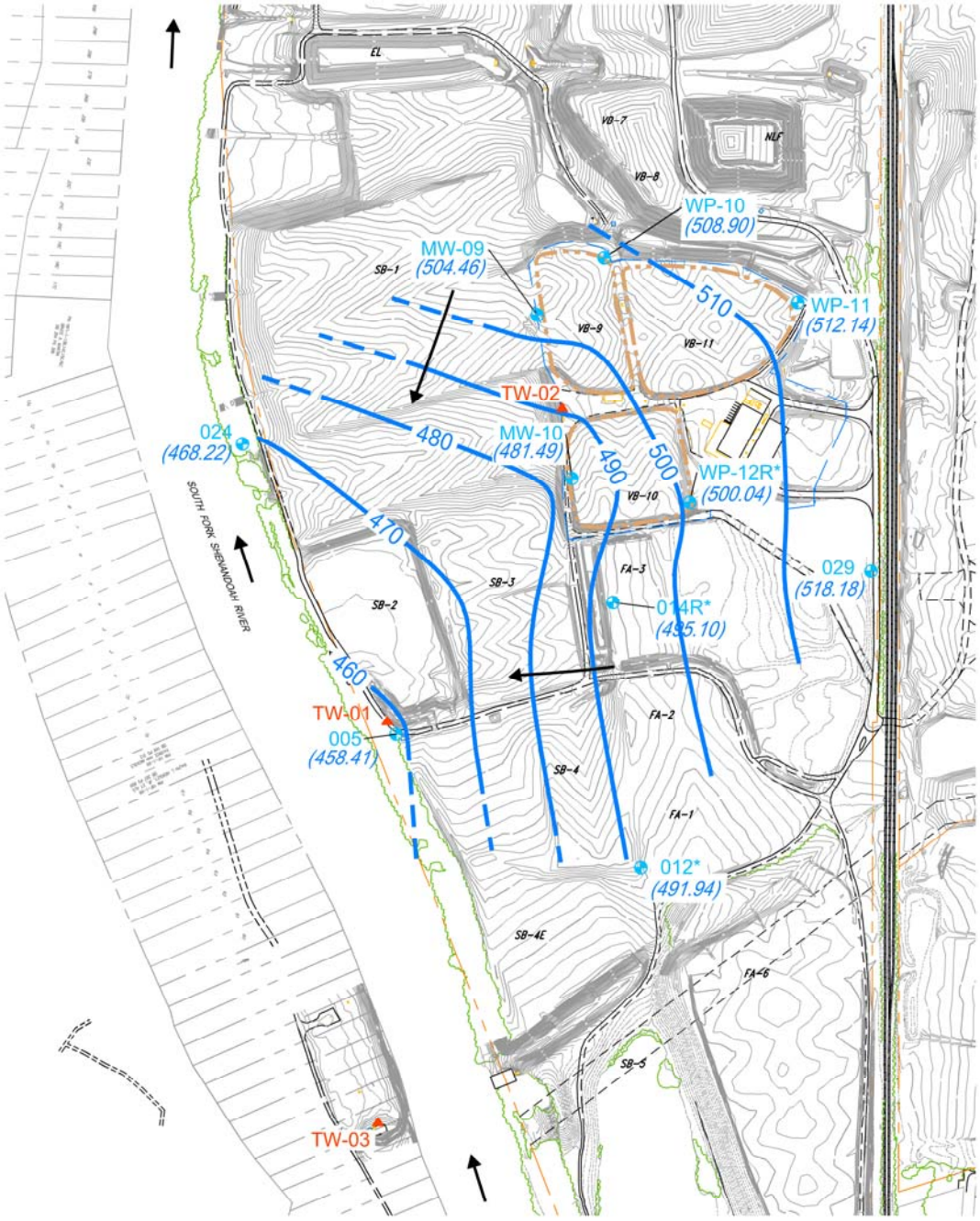

LEGEND

- AVTEX PROPERTY BOUNDARY
- OVERBURDEN MONITORING WELL
- EXTRACTION WELL
- VISCOSE BASIN
- * INDICATES WELL GAUGED FOR WATER LEVELS ONLY
- (495.66) GROUND WATER ELEVATION (FEET, MSL)
- 490 GROUND WATER CONTOUR (FEET, MSL) (DASHED WHERE INFERRED)
- GROUNDWATER / RIVER FLOW DIRECTION

600 300 0 600

SCALE IN FEET

NOTE:
WATER WAS BEING EXTRACTED FROM WELL TW-01 AT 45 GPM DURING THE MEASUREMENT PERIOD. WELLS TW-02 AND TW-03 WERE NOT PUMPING.

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OU-7 OVERBURDEN GROUNDWATER CONTOUR MAP (DEC 19, 2017)

2017 ANNUAL SITE-WIDE GROUNDWATER, SURFACE WATER, AND SEDIMENT MONITORING REPORT FOR OU-7, OU-10, AND NTCRA BASINS
AVTEX FIBERS SUPERFUND SITE
FRONT ROYAL, VIRGINIA

CREATED: M. ROBINSON	CLIENT PROJECT NO.:
DATE: 2018-07-03	PARSONS PROJECT NO.: 451099
REVISION:	FIGURE NO.: 3D
FILE NAME: FIG 3D – OVRBDN Pot Map_2017-12-19.DWG	

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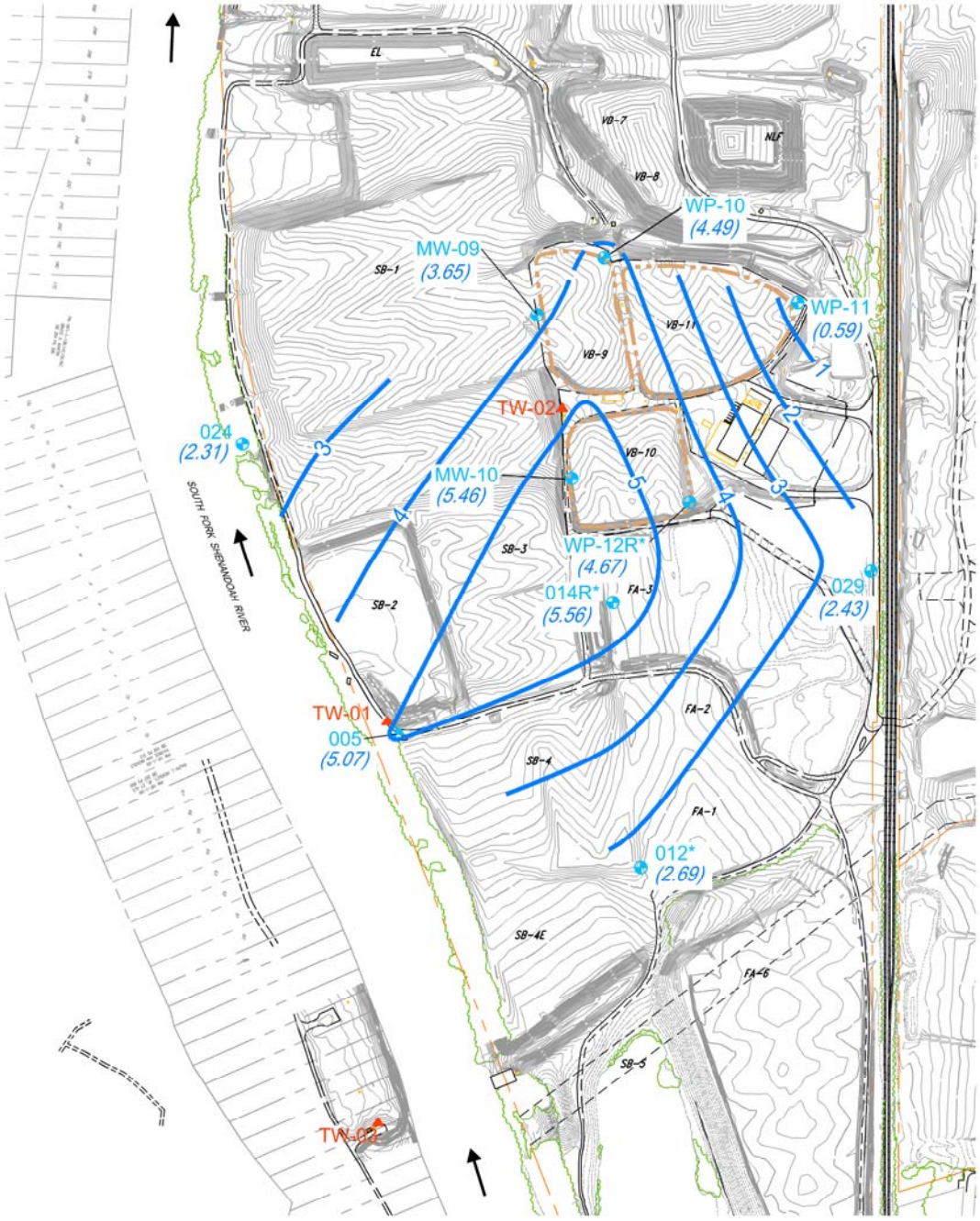

LEGEND

- AVTEX PROPERTY BOUNDARY
- OVERBURDEN MONITORING WELL
- EXTRACTION WELL
- VISCOSE BASIN
- * INDICATES WELL GAUGED FOR WATER LEVELS ONLY
- (5.07) GROUND WATER DRAWDOWN (FEET)
- 1 GROUND WATER DRAWDOWN CONTOUR (FEET) (DASHED WHERE INFERRED)
- GROUNDWATER / RIVER FLOW DIRECTION

600 300 0 600

SCALE IN FEET

NOTES:

1. DRAWDOWN ON JULY 11, 2017 COMPARED TO BASELINE WATER LEVELS MEASURED ON MARCH 18, 2015
2. ON JULY 11, 2017, WATER WAS BEING EXTRACTED FROM WELLS TW-01 AND TW-02 DURING THE MEASUREMENT PERIOD AT RATES OF 45 and 18 GPM RESPECTIVELY. TW-03 WAS NOT PUMPING ON THE DAY THE READINGS WERE MADE.

PARSONS

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OU-7 OVERBURDEN GROUNDWATER DRAWDOWM MAP (JULY 11, 2017)

2017 ANNUAL SITE-WIDE GROUNDWATER, SURFACE WATER, AND SEDIMENT MONITORING REPORT FOR OU-7, OU-10, AND NTCRA BASINS
AVTEX FIBERS SUPERFUND SITE
FRONT ROYAL, VIRGINIA

CREATED: M. ROBINSON	CLIENT PROJECT NO.:
DATE: 2018-06-07	PARSONS PROJECT NO.: 450516
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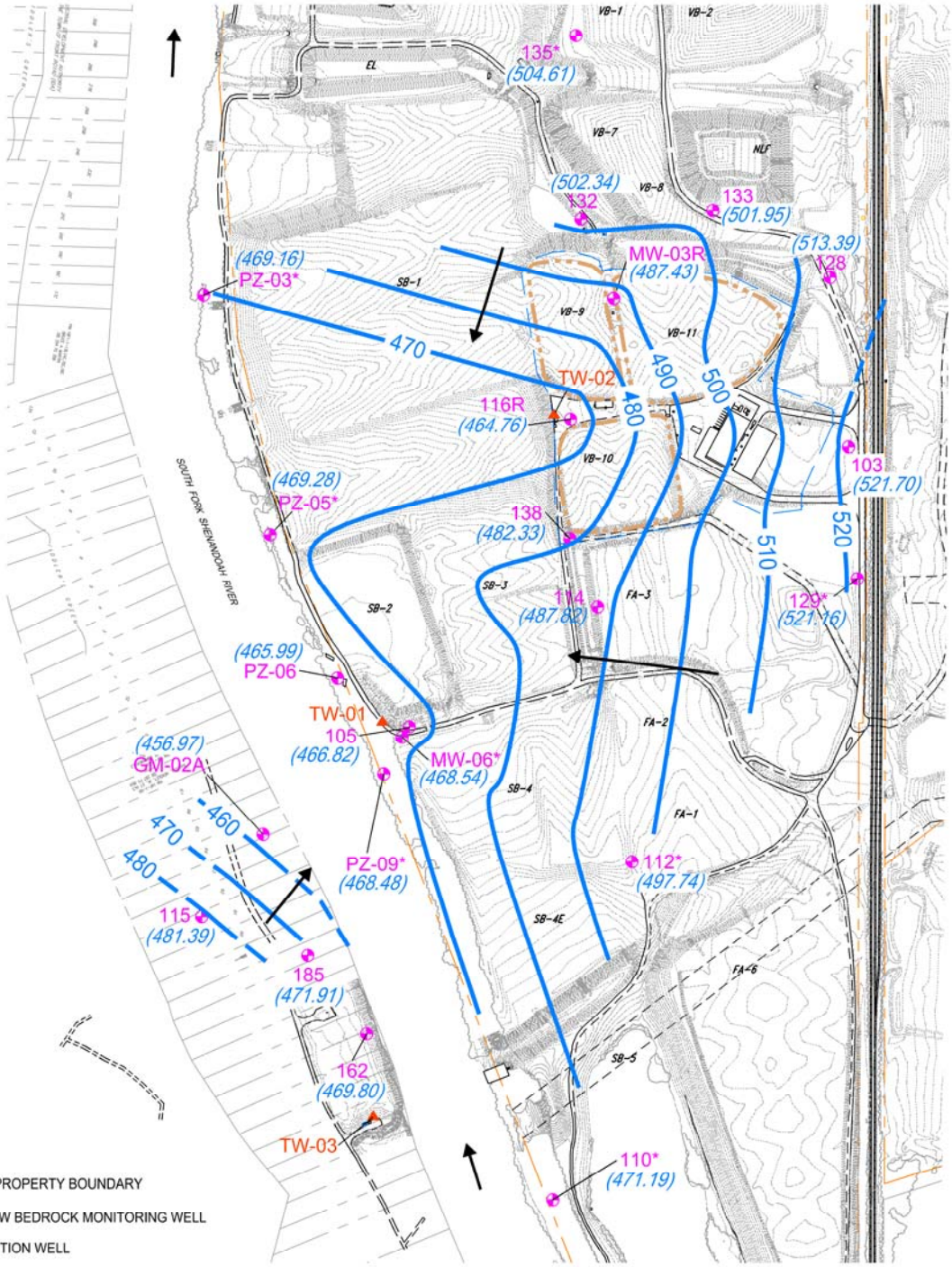

LEGEND

- AVTEX PROPERTY BOUNDARY
- SHALLOW BEDROCK MONITORING WELL
- EXTRACTION WELL
- VISCOSE BASIN
- * INDICATES WELL GAUGED FOR WATER LEVELS ONLY
- (469.80) GROUND WATER ELEVATION (FEET, MSL)
- 490 GROUND WATER CONTOUR (FEET, MSL) (DASHED WHERE INFERRED)
- GROUNDWATER / RIVER FLOW DIRECTION

NOTE:
WATER WAS BEING EXTRACTED FROM WELLS TW-01 (45 GPM) AND TW-02 (26 GPM) DURING THE MEASUREMENT PERIOD. TW-03 WAS NOT OPERATING.

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OU-7 SHALLOW BEDROCK GROUNDWATER CONTOUR MAP
(MARCH 21,22, 2017)

2017 ANNUAL SITE-WIDE GROUNDWATER, SURFACE WATER, AND SEDIMENT MONITORING REPORT FOR OU-7, OU-10, AND NTCRA BASINS
AVTEX FIBERS SUPERFUND SITE
FRONT ROYAL, VIRGINIA

CREATED: M. ROBINSON	CLIENT PROJECT NO.:
DATE: 2018-07-03	PARSONS PROJECT NO.: 451099
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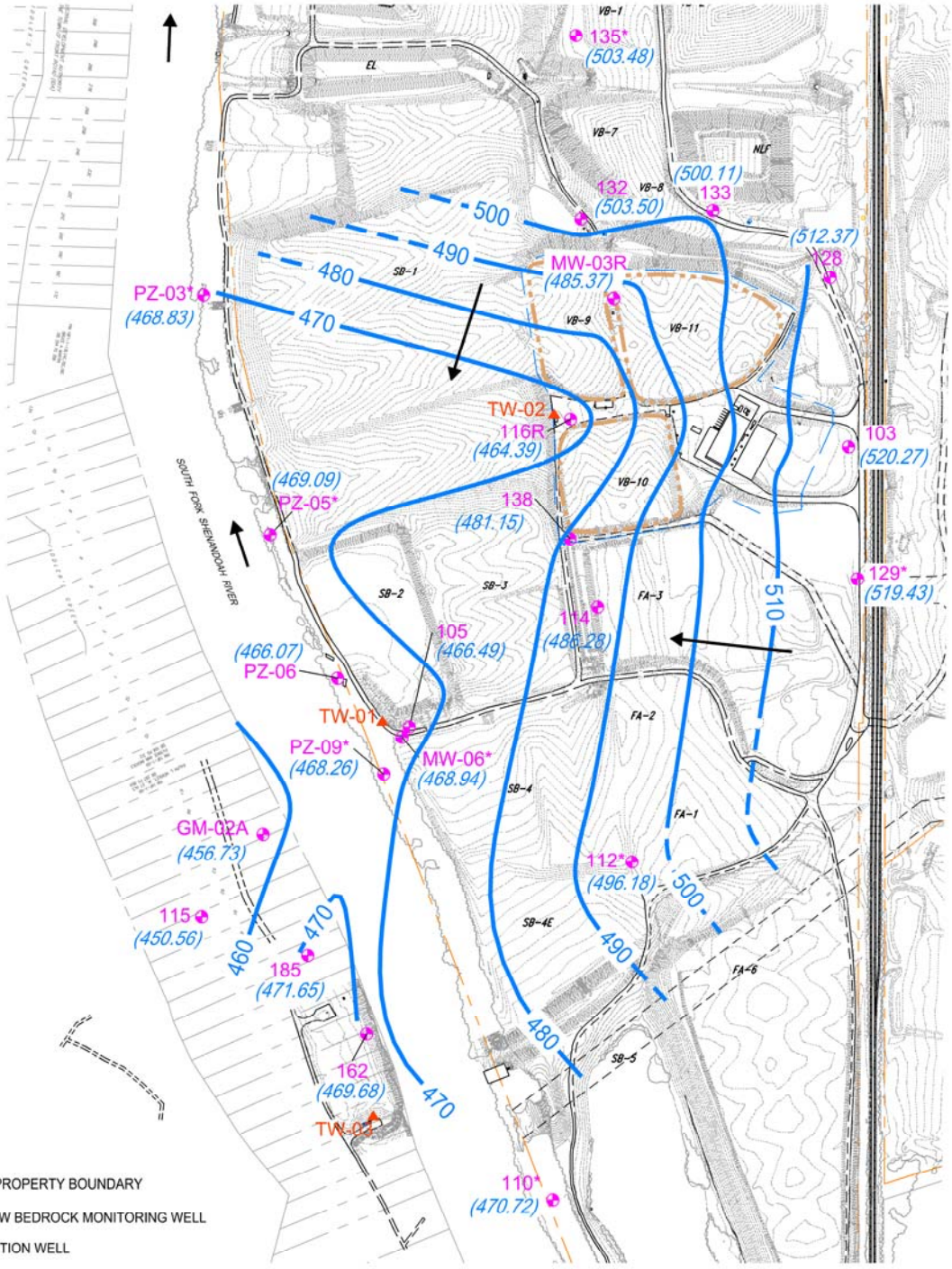

LEGEND

- AVTEX PROPERTY BOUNDARY
- SHALLOW BEDROCK MONITORING WELL
- △ EXTRACTION WELL
- VISCOSE BASIN
- * INDICATES WELL GAUGED FOR WATER LEVELS ONLY
- (470.72) GROUND WATER ELEVATION (FEET, MSL)
- 490 GROUND WATER CONTOUR (FEET, MSL) (DASHED WHERE INFERRED)
- GROUNDWATER / RIVER FLOW DIRECTION

NOTE:
WATER WAS BEING EXTRACTED FROM WELLS TW-01 AND TW-02 DURING THE MEASUREMENT PERIOD AT RATES OF 45 and 18 GPM RESPECTIVELY. TW-03 WAS NOT PUMPING ON THE DAY THE READINGS WERE MADE.

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OU-7 SHALLOW BEDROCK GROUNDWATER CONTOUR MAP
(JULY 11, 2017)

2017 ANNUAL SITE-WIDE GROUNDWATER, SURFACE WATER, AND SEDIMENT MONITORING REPORT FOR OU-7, OU-10, AND NTCRA BASINS
AVTEX FIBERS SUPERFUND SITE
FRONT ROYAL, VIRGINIA

CREATED: M. ROBINSON	CLIENT PROJECT NO.:
DATE: 2018-07-03	PARSONS PROJECT NO.: 450516
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FILE NAME: FIG 4B – OU-7 SHALLOW BR Pot Map_2017-07-11.DWG	

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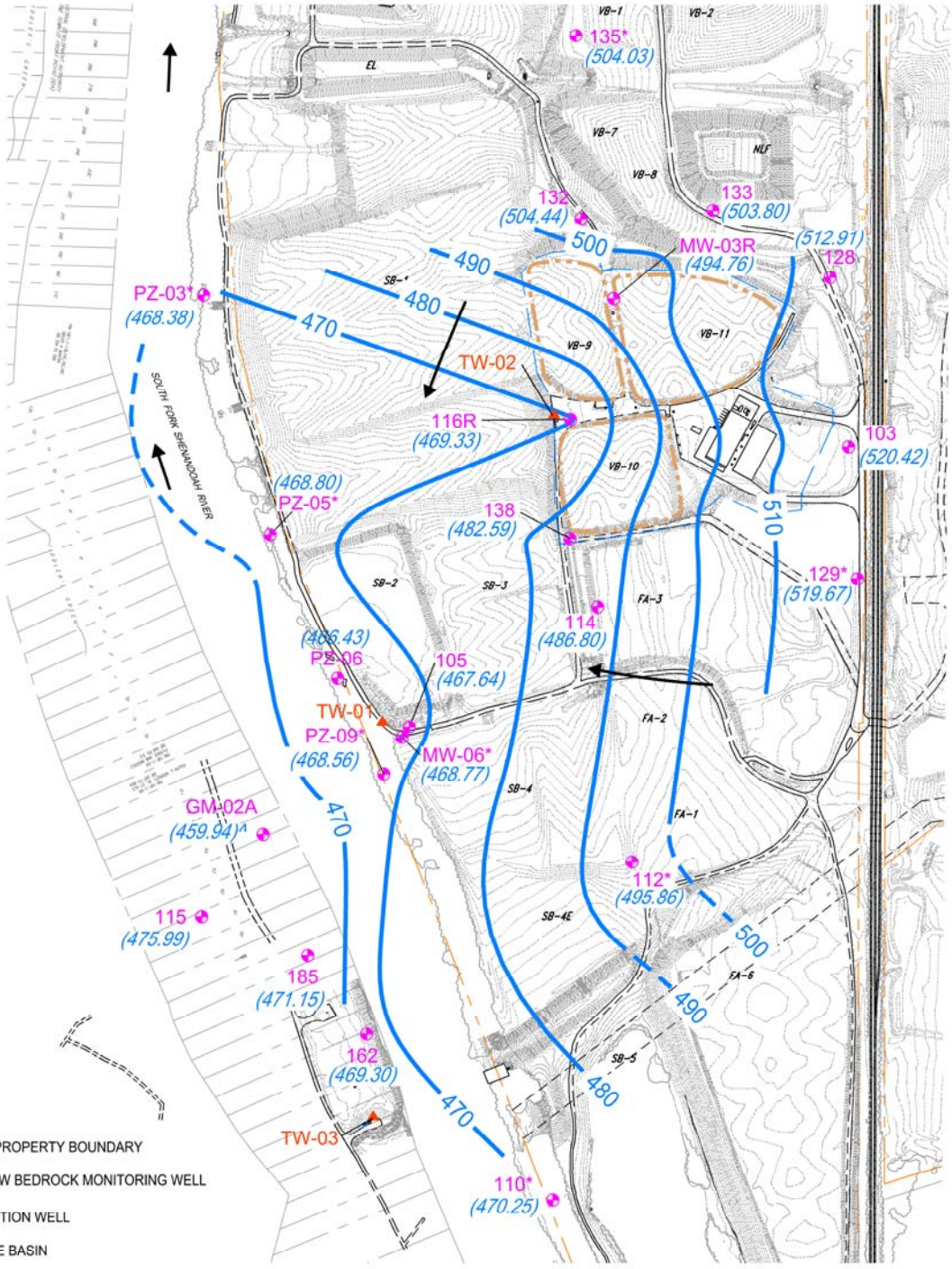

LEGEND

- AVTEX PROPERTY BOUNDARY
- SHALLOW BEDROCK MONITORING WELL
- EXTRACTION WELL
- VISCOSE BASIN
- * INDICATES WELL GAUGED FOR WATER LEVELS ONLY
- (470.33) GROUND WATER ELEVATION (FEET, MSL)
- ^ GROUND WATER ELEVATION NOT USED IN CONTOURING
- 490 GROUND WATER CONTOUR (FEET, MSL) (DASHED WHERE INFERRED)
- GROUNDWATER / RIVER FLOW DIRECTION

600 300 0 600

SCALE IN FEET

NOTE:
WATER WAS BEING EXTRACTED FROM WELL TW-01 AT A FLOW RATE OF 45 GPM DURING THE MEASUREMENT PERIOD. WELLS TW-02 AND TW-03 WERE NOT PUMPING.

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OU-7 SHALLOW BEDROCK GROUNDWATER CONTOUR MAP
(SEP 21, 2017)

2017 ANNUAL SITE-WIDE GROUNDWATER, SURFACE WATER, AND SEDIMENT MONITORING REPORT FOR OU-7, OU-10, AND NTCRA BASINS
AVTEX FIBERS SUPERFUND SITE
FRONT ROYAL, VIRGINIA

CREATED: M. ROBINSON	CLIENT PROJECT NO.:
DATE: 2018-07-03	PARSONS PROJECT NO.: 451099
REVISION:	FIGURE NO.: 4C
FILE NAME: FIG 4C – OU-7 SHALLOW BR Pot Map_2017-09-21.DWG	

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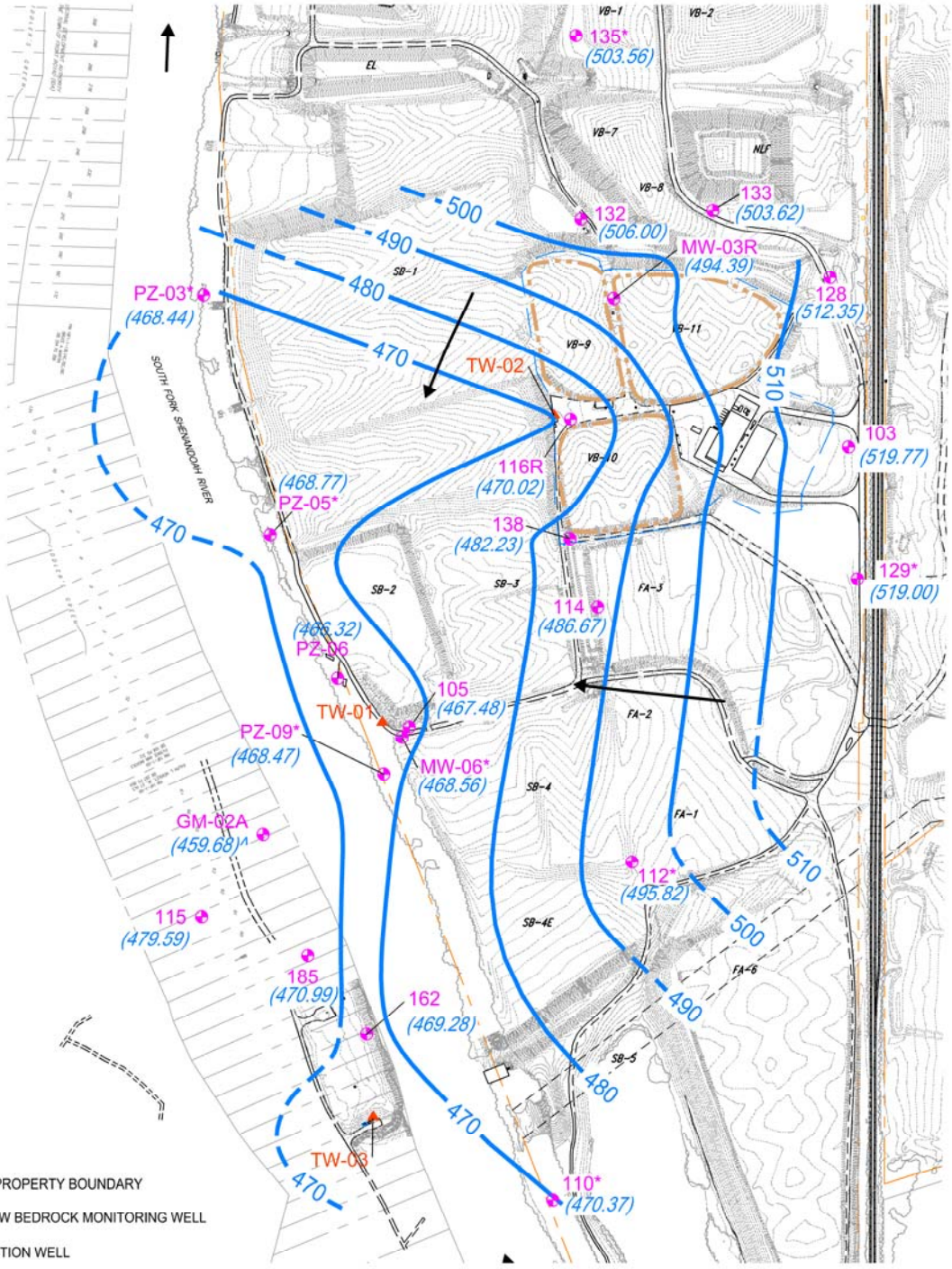

LEGEND

- AVTEX PROPERTY BOUNDARY
- SHALLOW BEDROCK MONITORING WELL
- EXTRACTION WELL
- VISCOSE BASIN
- * INDICATES WELL GAUGED FOR WATER LEVELS ONLY
- (470.94) GROUND WATER ELEVATION (FEET, MSL)
- 490 GROUND WATER CONTOUR (FEET, MSL) (DASHED WHERE INFERRED)
- GROUNDWATER / RIVER FLOW DIRECTION

600 300 0 600

SCALE IN FEET

NOTE:
WATER WAS BEING EXTRACTED FROM WELL TW-01 AT 45 GPM DURING THE MEASUREMENT PERIOD. WELLS TW-02 AND TW-03 WERE NOT PUMPING.

PARSONS
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OU-7 SHALLOW BEDROCK GROUNDWATER CONTOUR MAP
(DEC 19, 2017)

2017 ANNUAL SITE-WIDE GROUNDWATER, SURFACE WATER, AND SEDIMENT MONITORING REPORT FOR OU-7, OU-10, AND NTCRA BASINS
AVTEX FIBERS SUPERFUND SITE
FRONT ROYAL, VIRGINIA

CREATED: M. ROBINSON	CLIENT PROJECT NO.:
DATE: 2018-04-20	PARSONS PROJECT NO.: 451099
REVISION:	FIGURE NO.: 4D
FILE NAME: FIG 4D – OU-7 SHALLOW BR Pot Map_2017-12-19.DWG	

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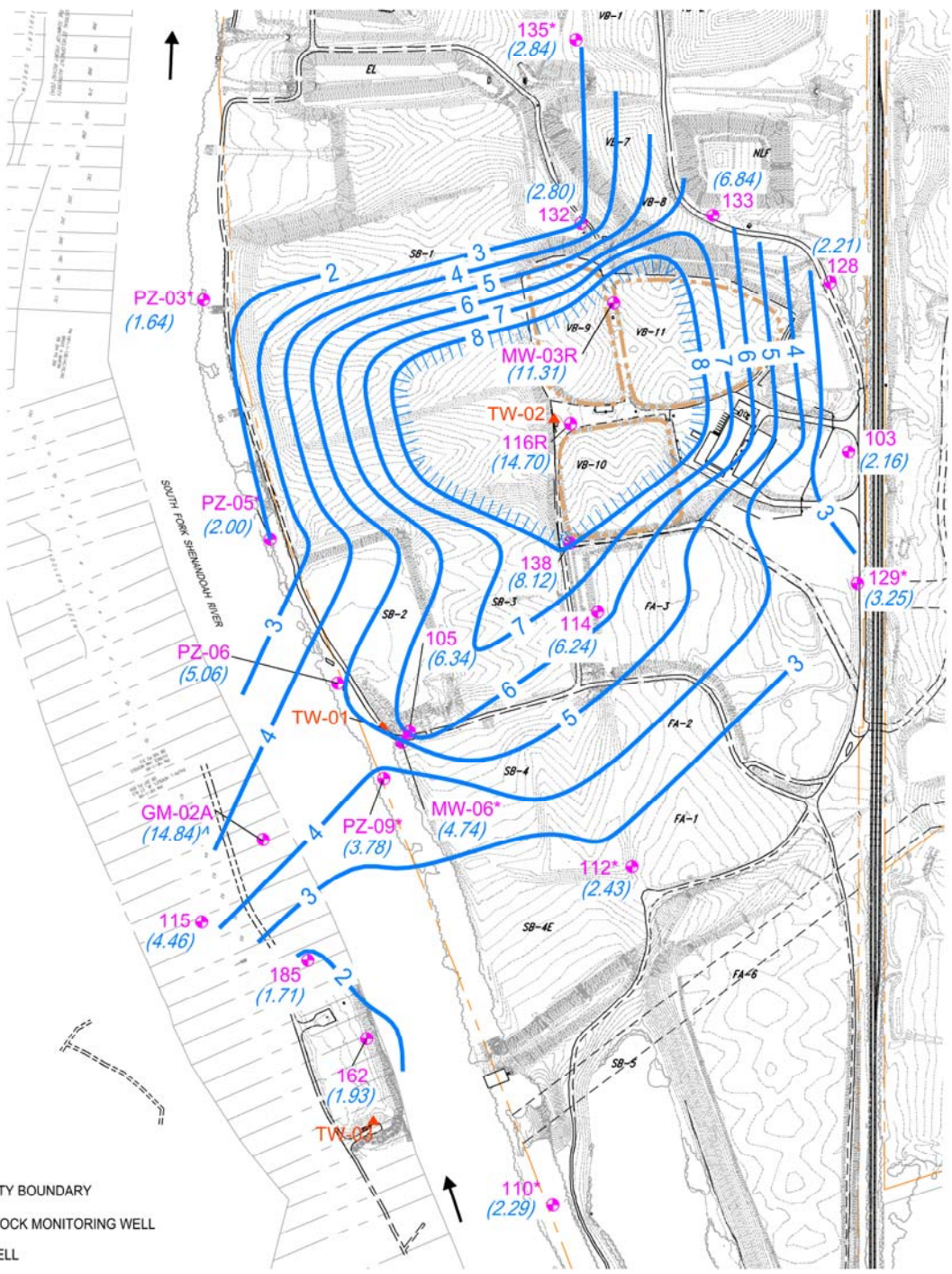

LEGEND

- AVTEX PROPERTY BOUNDARY
- SHALLOW BEDROCK MONITORING WELL
- EXTRACTION WELL
- VISCOSE BASIN
- * INDICATES WELL GAUGED FOR WATER LEVELS ONLY
- (2.16) GROUND WATER DRAWDOWN (FEET)
- 4 GROUND WATER DRAWDOWN CONTOUR (FEET) (DASHED WHERE INFERRED)
- ^ GROUND WATER DRAWDOWN NOT USED IN CONTOURING
- RIVER FLOW DIRECTION

NOTES:

1. DRAWDOWN ON JULY 11, 2017 COMPARED TO BASELINE WATER LEVELS MEASURED ON MARCH 18, 2015
2. ON JULY 11, 2017, WATER WAS BEING EXTRACTED FROM WELLS TW-01 AND TW-02 DURING THE MEASUREMENT PERIOD AT RATES OF 45 and 18 GPM RESPECTIVELY. TW-03 WAS NOT PUMPING ON THE DAY THE READINGS WERE MADE.

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OU-7 SHALLOW BEDROCK GROUNDWATER DRAWDOWN MAP
(JULY 11, 2017)

2017 ANNUAL SITE-WIDE GROUNDWATER, SURFACE WATER, AND SEDIMENT MONITORING REPORT FOR OU-7, OU-10, AND NTCRA BASINS
AVTEX FIBERS SUPERFUND SITE
FRONT ROYAL, VIRGINIA

CREATED: M. ROBINSON	CLIENT PROJECT NO.:
DATE: 2018-06-07	PARSONS PROJECT NO.: 451099
REVISION:	FIGURE NO.: 4E
FILE NAME: FIG 4E – OU-7 SHALLOW BR Drawdown_2017-07-11.DWG	

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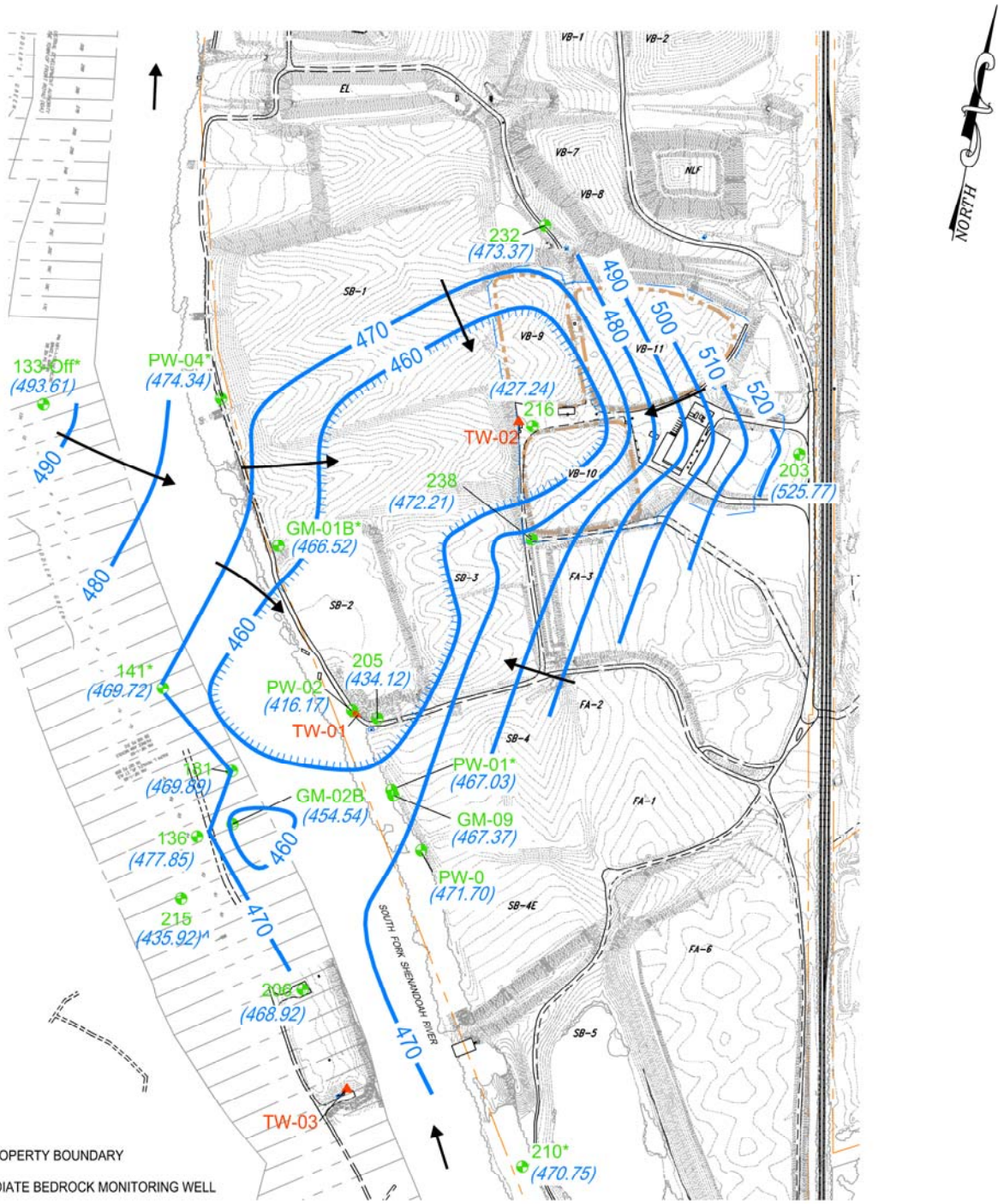

LEGEND

- AVTEX PROPERTY BOUNDARY
- INTERMEDIATE BEDROCK MONITORING WELL
- EXTRACTION WELL
- VISCOSE BASIN
- * INDICATES WELL GAUGED FOR WATER LEVELS ONLY
- (468.92) GROUND WATER ELEVATION (FEET, MSL)
- ^ GROUND WATER ELEVATION NOT USED IN CONTOURING
- 490 GROUND WATER CONTOUR (FEET, MSL) (DASHED WHERE INFERRED)
- GROUNDWATER / RIVER FLOW DIRECTION

600 300 0 600

SCALE IN FEET

NOTE:
WATER WAS BEING EXTRACTED FROM WELLS TW-01 (45 GPM) AND TW-02 (26 GPM) DURING THE MEASUREMENT PERIOD. TW-03 WAS NOT OPERATING.

PARSONS
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OU-7 INTERMEDIATE BEDROCK GROUNDWATER CONTOUR MAP (MARCH 21,22, 2017)

2017 ANNUAL SITE-WIDE GROUNDWATER, SURFACE WATER, AND SEDIMENT MONITORING REPORT FOR OU-7, OU-10, AND NTCRA BASINS
AVTEX FIBERS SUPERFUND SITE
FRONT ROYAL, VIRGINIA

CREATED: M. ROBINSON	CLIENT PROJECT NO.:
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FILE NAME: FIG 5A – OU-7 INT BR Pot Map_2017-03-21,22.DWG	

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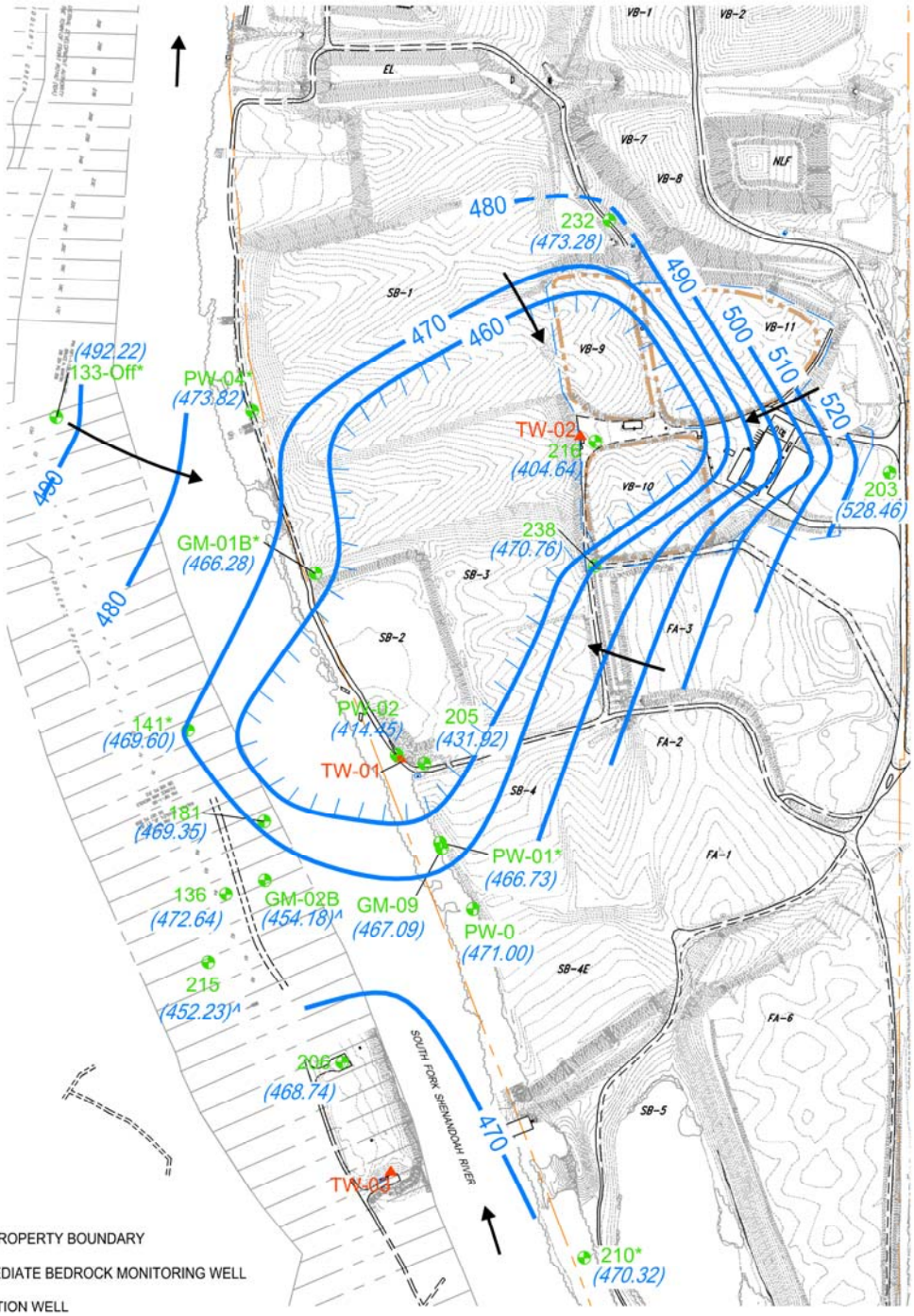

LEGEND

- AVTEX PROPERTY BOUNDARY
- INTERMEDIATE BEDROCK MONITORING WELL
- EXTRACTION WELL
- VISCOSE BASIN
- * INDICATES WELL GAUGED FOR WATER LEVELS ONLY
- (470.32) GROUND WATER ELEVATION (FEET, MSL)
- ^ GROUND WATER ELEVATION NOT USED IN CONTOURING
- 490 GROUND WATER CONTOUR (FEET, MSL) (DASHED WHERE INFERRED)
- GROUNDWATER / RIVER FLOW DIRECTION

600 300 0 600

SCALE IN FEET

NOTE:
WATER WAS BEING EXTRACTED FROM WELLS TW-01 AND TW-02 DURING THE MEASUREMENT PERIOD AT RATES OF 45 and 18 GPM RESPECTIVELY. TW-03 WAS NOT PUMPING ON THE DAY THE READINGS WERE MADE.

PARSONS
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OU-7 INTERMEDIATE BEDROCK GROUNDWATER CONTOUR MAP
(JULY 11, 2017)

2017 ANNUAL SITE-WIDE GROUNDWATER, SURFACE WATER, AND SEDIMENT MONITORING REPORT FOR OU-7, OU-10, AND NTCRA BASINS
AVTEX FIBERS SUPERFUND SITE
FRONT ROYAL, VIRGINIA

CREATED: M. ROBINSON	CLIENT PROJECT NO.:
DATE: 2018-07-03	PARSONS PROJECT NO.: 451099
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FILE NAME: FIG 5B – OU-7 INT BR Pot Map_2017-07-11.DWG	

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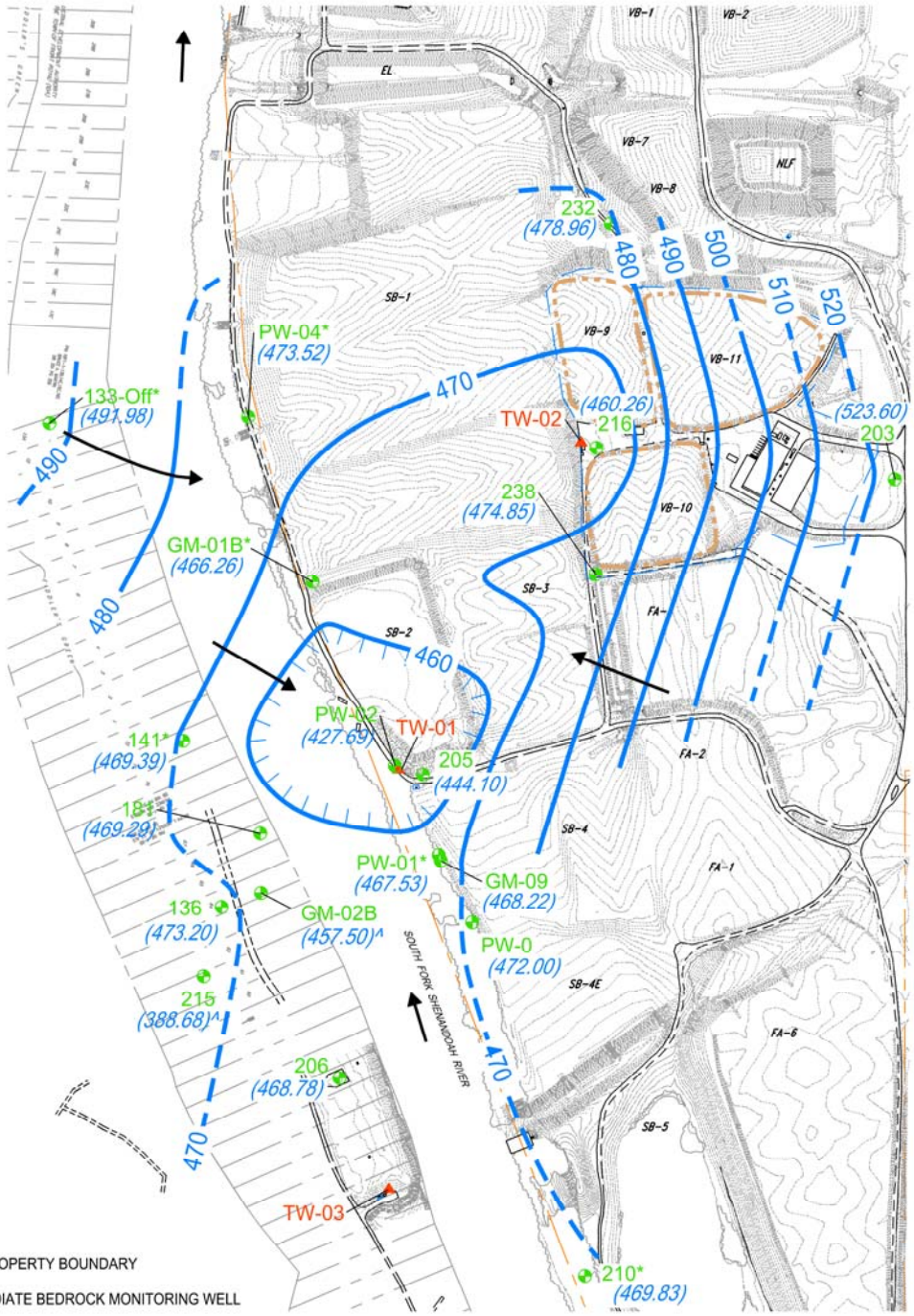

LEGEND

- AVTEX PROPERTY BOUNDARY
- INTERMEDIATE BEDROCK MONITORING WELL
- EXTRACTION WELL
- VISCOSE BASIN
- * INDICATES WELL GAUGED FOR WATER LEVELS ONLY
- (469.89) GROUND WATER ELEVATION (FEET, MSL)
- ^ GROUND WATER ELEVATION NOT USED IN CONTOURING
- 490 GROUND WATER CONTOUR (FEET, MSL) (DASHED WHERE INFERRED)
- GROUNDWATER / RIVER FLOW DIRECTION

600 300 0 600

SCALE IN FEET

NOTE:
WATER WAS BEING EXTRACTED FROM WELL TW-01 AT A FLOW RATE OF 45 GPM DURING THE MEASUREMENT PERIOD. WELLS TW-02 AND TW-03 WERE NOT PUMPING.

PARSONS
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OU-7 INTERMEDIATE BEDROCK GROUNDWATER CONTOUR MAP
(SEP 21 & 22, 2017)

2017 ANNUAL SITE-WIDE GROUNDWATER, SURFACE WATER, AND SEDIMENT MONITORING REPORT FOR OU-7, OU-10, AND NTCRA BASINS
AVTEX FIBERS SUPERFUND SITE
FRONT ROYAL, VIRGINIA

CREATED: M. ROBINSON	CLIENT PROJECT NO.:
DATE: 2018-07-03	PARSONS PROJECT NO.: 451099
REVISION:	FIGURE NO.: 5C
FILE NAME: FIG 5C – OU-7 INT BR Pot Map_2017-09-21,22.DWG	

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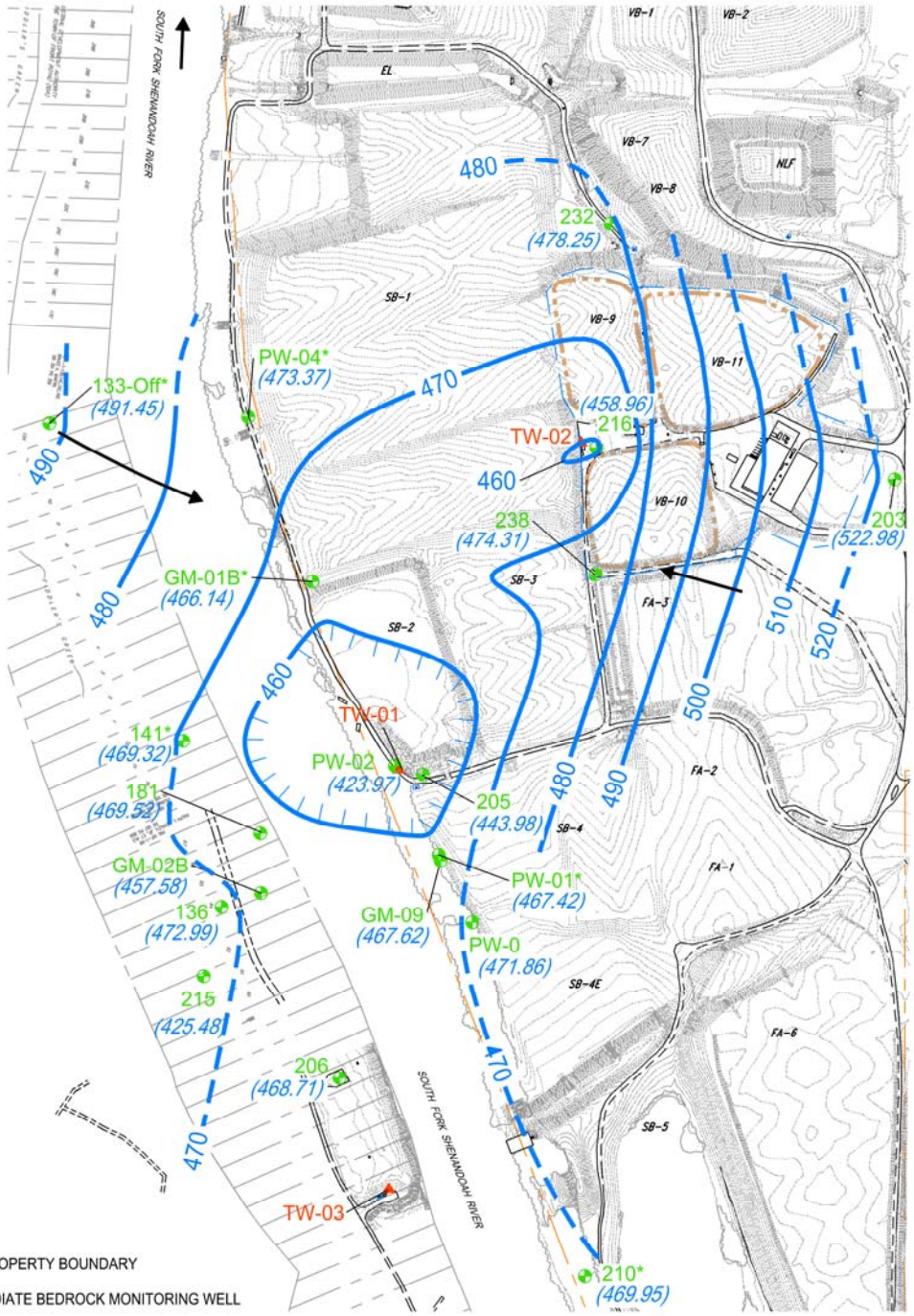

LEGEND

- AVTEX PROPERTY BOUNDARY
- INTERMEDIATE BEDROCK MONITORING WELL
- EXTRACTION WELL
- VISCOSE BASIN
- * INDICATES WELL GAUGED FOR WATER LEVELS ONLY
- (470.46) GROUND WATER ELEVATION (FEET, MSL)
- ^ GROUND WATER ELEVATION NOT USED IN CONTOURING
- 490 GROUND WATER CONTOUR (FEET, MSL) (DASHED WHERE INFERRED)
- GROUNDWATER / RIVER FLOW DIRECTION

600 300 0 600

SCALE IN FEET

NOTE:
WATER WAS BEING EXTRACTED FROM WELL TW-01 AT 45 GPM DURING THE MEASUREMENT PERIOD. WELLS TW-02 AND TW-03 WERE NOT PUMPING.

OU-7 INTERMEDIATE BEDROCK GROUNDWATER CONTOUR MAP (DEC 19, 2017)

2017 ANNUAL SITE-WIDE GROUNDWATER, SURFACE WATER, AND SEDIMENT MONITORING REPORT FOR OU-7, OU-10, AND NTCRA BASINS
AVTEX FIBERS SUPERFUND SITE
FRONT ROYAL, VIRGINIA

PARSONS
404 KENDRICK LANE, FRONT ROYAL, VA 22630

CREATED: M. ROBINSON	CLIENT PROJECT NO.:
DATE: 2018-07-03	PARSONS PROJECT NO.: 451099
REVISION:	FIGURE NO.: 5D
FILE NAME: FIG 5C – OU-7 INT BR Pot Map_2017-12-19.DWG	

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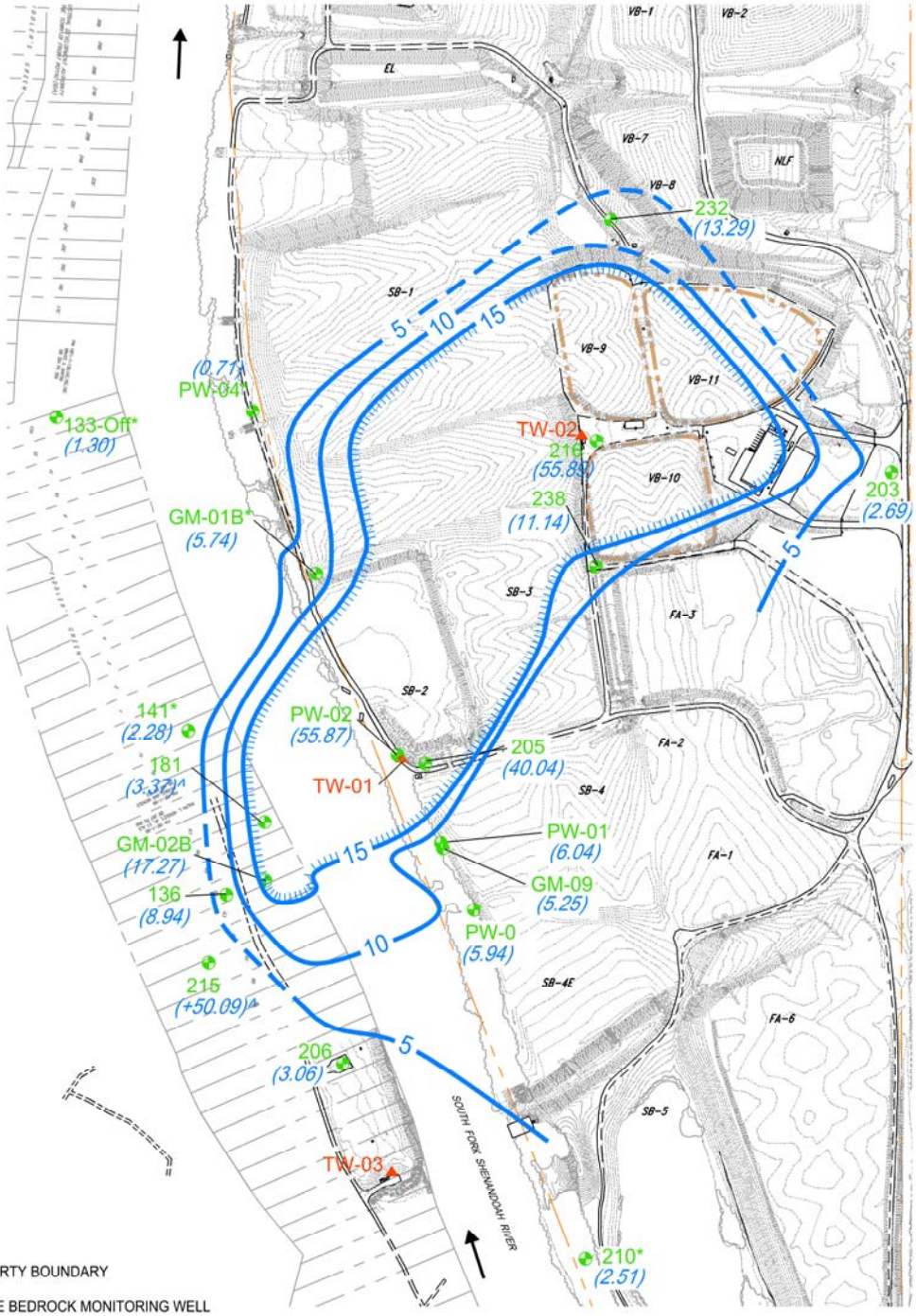

LEGEND

- AVTEX PROPERTY BOUNDARY
- INTERMEDIATE BEDROCK MONITORING WELL
- EXTRACTION WELL
- VISCOSE BASIN
- INDICATES WELL GAUGED FOR WATER LEVELS ONLY
- (1.30) GROUND WATER DRAWDOWN (FEET)
- ^ GROUND WATER DRAWDOWN NOT USED IN CONTOURING
- 2 GROUND WATER DRAWDOWN (FEET) (DASHED WHERE INFERRED)
- RIVER FLOW DIRECTION

NOTES:

1. DRAWDOWN ON JULY 11, 2017 COMPARED TO BASELINE WATER LEVELS MEASURED ON MARCH 18, 2015
2. ON JULY 11, 2017, WATER WAS BEING EXTRACTED FROM WELLS TW-01 AND TW-02 DURING THE MEASUREMENT PERIOD AT RATES OF 45 and 18 GPM RESPECTIVELY. TW-03 WAS NOT PUMPING ON THE DAY THE READINGS WERE MADE.

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OU-7 INTERMEDIATE BEDROCK GROUNDWATER DRAWDOWN MAP (JULY 11, 2017)

2017 ANNUAL SITE-WIDE GROUNDWATER, SURFACE WATER, AND SEDIMENT MONITORING REPORT FOR OU-7, OU-10, AND NTCRA BASINS
AVTEX FIBERS SUPERFUND SITE
FRONT ROYAL, VIRGINIA

CREATED: M. ROBINSON	CLIENT PROJECT NO.:
DATE: 2018-06-07	PARSONS PROJECT NO.: 451099
REVISION:	FIGURE NO.: 5E
FILE NAME: FIG 5E - OU-7 INT BR Drawdown Map_2017-10-11.DWG	

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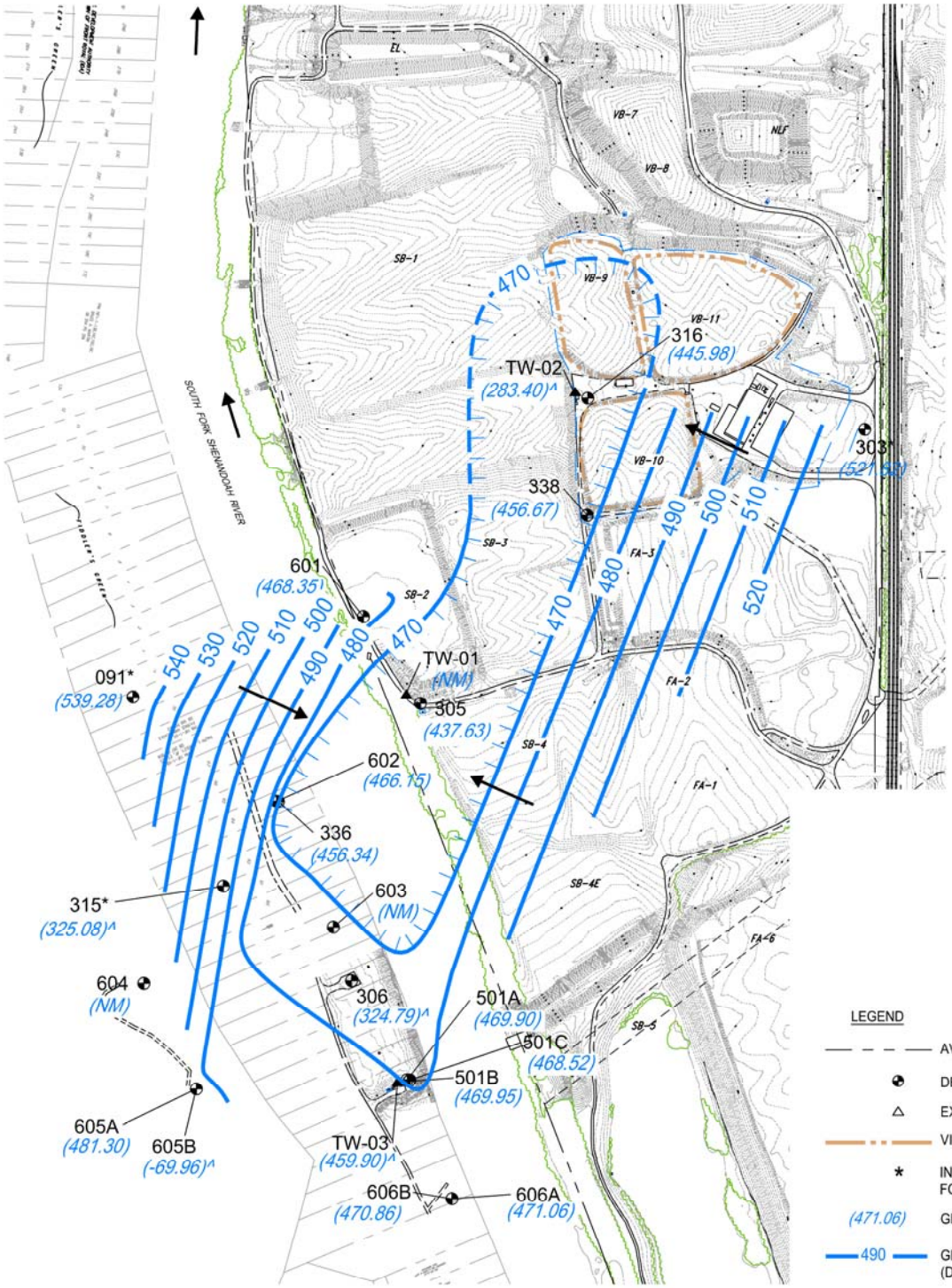

LEGEND

- AVTEX PROPERTY BOUNDARY
- DEEP BEDROCK MONITORING WELL
- EXTRACTION WELL
- VISCOSE BASIN
- * INDICATES WELL WILL BE GAUGED FOR WATER LEVELS ONLY
- (471.06) GROUND WATER ELEVATION (FEET, MSL)
- 490 GROUND WATER CONTOUR (FEET, MSL) (DASHED WHERE INFERRED)
- GROUNDWATER / RIVER FLOW DIRECTION
- ^ GROUND WATER ELEVATION NOT USED IN CONTOURING

600 300 0 600

SCALE IN FEET

NOTE:
WATER WAS BEING EXTRACTED FROM WELLS TW-01 (45 GPM) AND TW-02 (26 GPM) DURING THE MEASUREMENT PERIOD. TW-03 WAS NOT OPERATING.

PARSONS
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OU-7 DEEP BEDROCK GROUNDWATER CONTOUR MAP
(MARCH 21,22, 2017)

2017 ANNUAL SITE-WIDE GROUNDWATER, SURFACE WATER, AND SEDIMENT MONITORING REPORT FOR OU-7, OU-10, AND NTCRA BASINS
AVTEX FIBERS SUPERFUND SITE
FRONT ROYAL, VIRGINIA

CREATED: M. ROBINSON	CLIENT PROJECT NO.:
DATE: 2018-06-08	PARSONS PROJECT NO.: 450516
REVISION:	FIGURE NO.: 6A
FILE NAME: FIG 6A – OU-7 DEEP BR Pot Map_2017-03-21,22.DWG	

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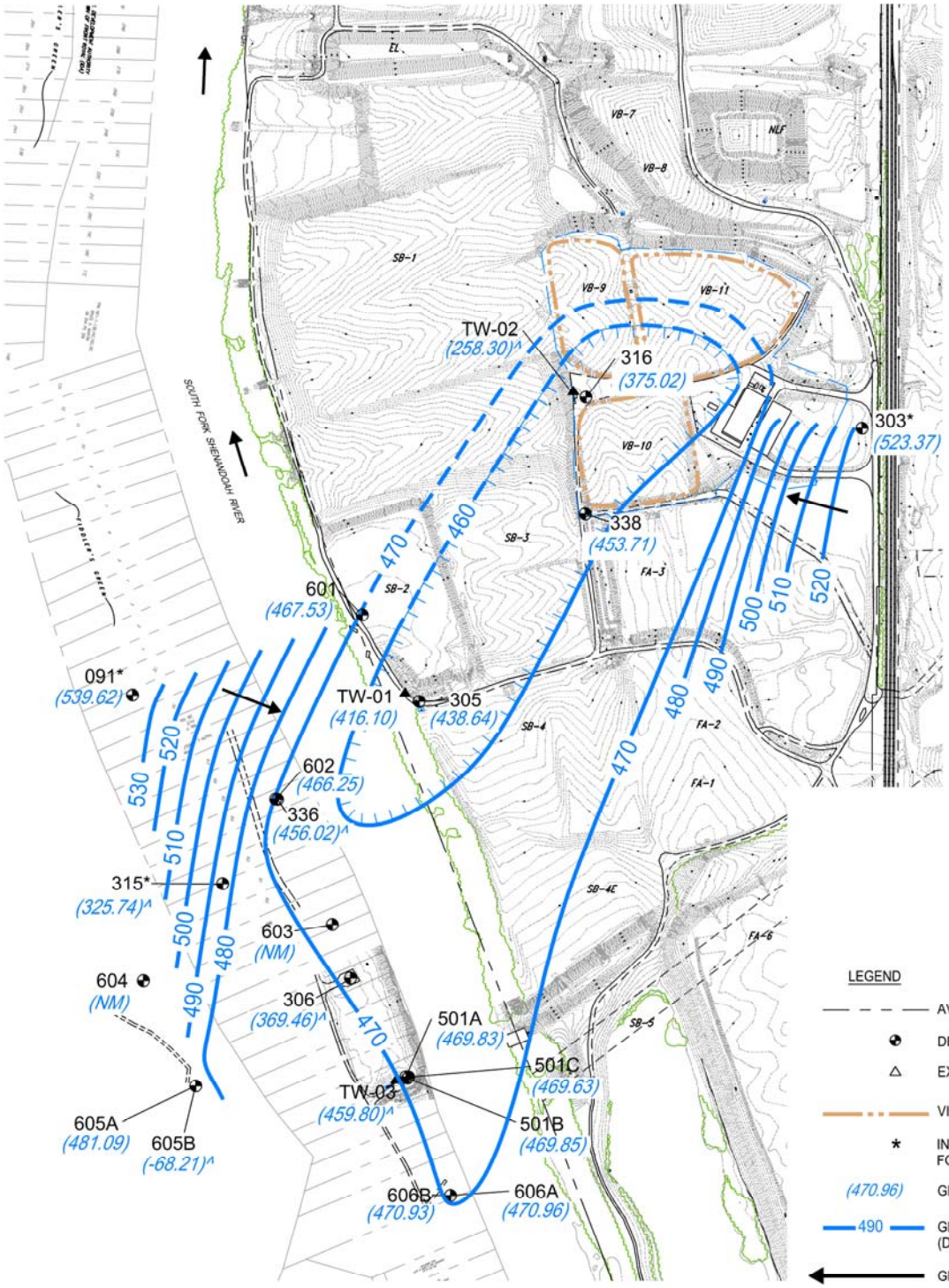

NOTE:
WATER WAS BEING EXTRACTED FROM WELLS TW-01 AND TW-02 DURING THE MEASUREMENT PERIOD AT RATES OF 45 and 18 GPM RESPECTIVELY. TW-03 WAS NOT PUMPING ON THE DAY THE READINGS WERE MADE.

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OU-7 DEEP BEDROCK GROUNDWATER CONTOUR MAP
(JULY 11, 2017)

2017 ANNUAL SITE-WIDE GROUNDWATER, SURFACE WATER, AND SEDIMENT MONITORING REPORT FOR OU-7, OU-10, AND NTCRA BASINS
AVTEX FIBERS SUPERFUND SITE
FRONT ROYAL, VIRGINIA

CREATED: M. ROBINSON	CLIENT PROJECT NO.:
DATE: 2018-07-03	PARSONS PROJECT NO.: 451099
REVISION:	FIGURE NO.: 6B
FILE NAME: FIG 6B – OU-7 DEEP BR Pot Map_2017-07-11.DWG	

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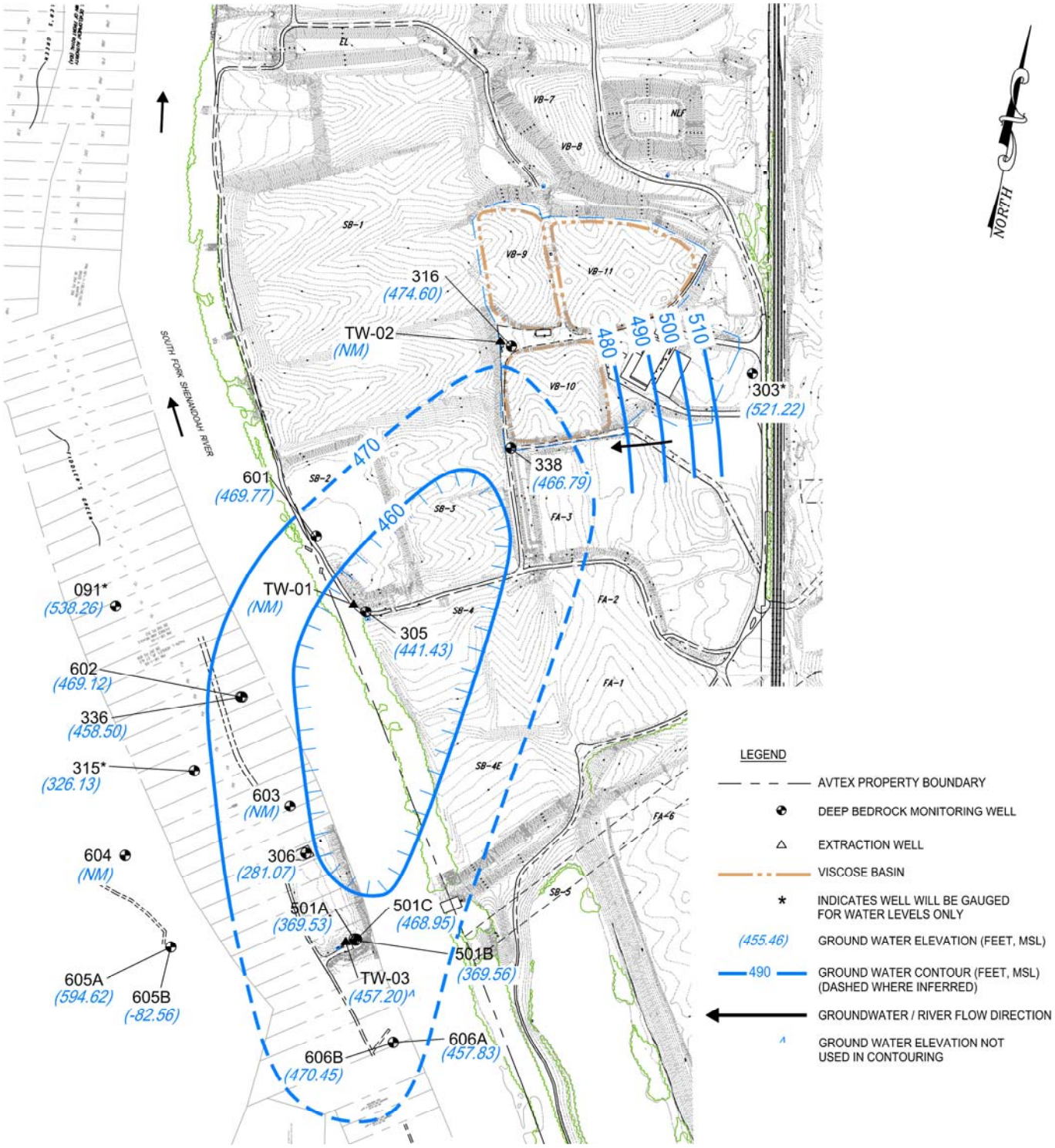

NOTE:
WATER WAS BEING EXTRACTED FROM WELL TW-01 AT A FLOW RATE OF 45 GPM DURING THE MEASUREMENT PERIOD. WELLS TW-02 AND TW-03 WERE NOT PUMPING.

PARSONS
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OU-7 DEEP BEDROCK GROUNDWATER CONTOUR MAP
(SEP 21, 2017)

2017 ANNUAL SITE-WIDE GROUNDWATER, SURFACE WATER, AND SEDIMENT MONITORING REPORT FOR OU-7, OU-10, AND NTCRA BASINS
AVTEX FIBERS SUPERFUND SITE
FRONT ROYAL, VIRGINIA

CREATED: M. ROBINSON	CLIENT PROJECT NO.:
DATE: 2018-07-03	PARSONS PROJECT NO.: 451099
REVISION:	FIGURE NO.: 6C
FILE NAME: FIG 6C – OU-7 DEEP BR Pot Map_2017-09-21.DWG	

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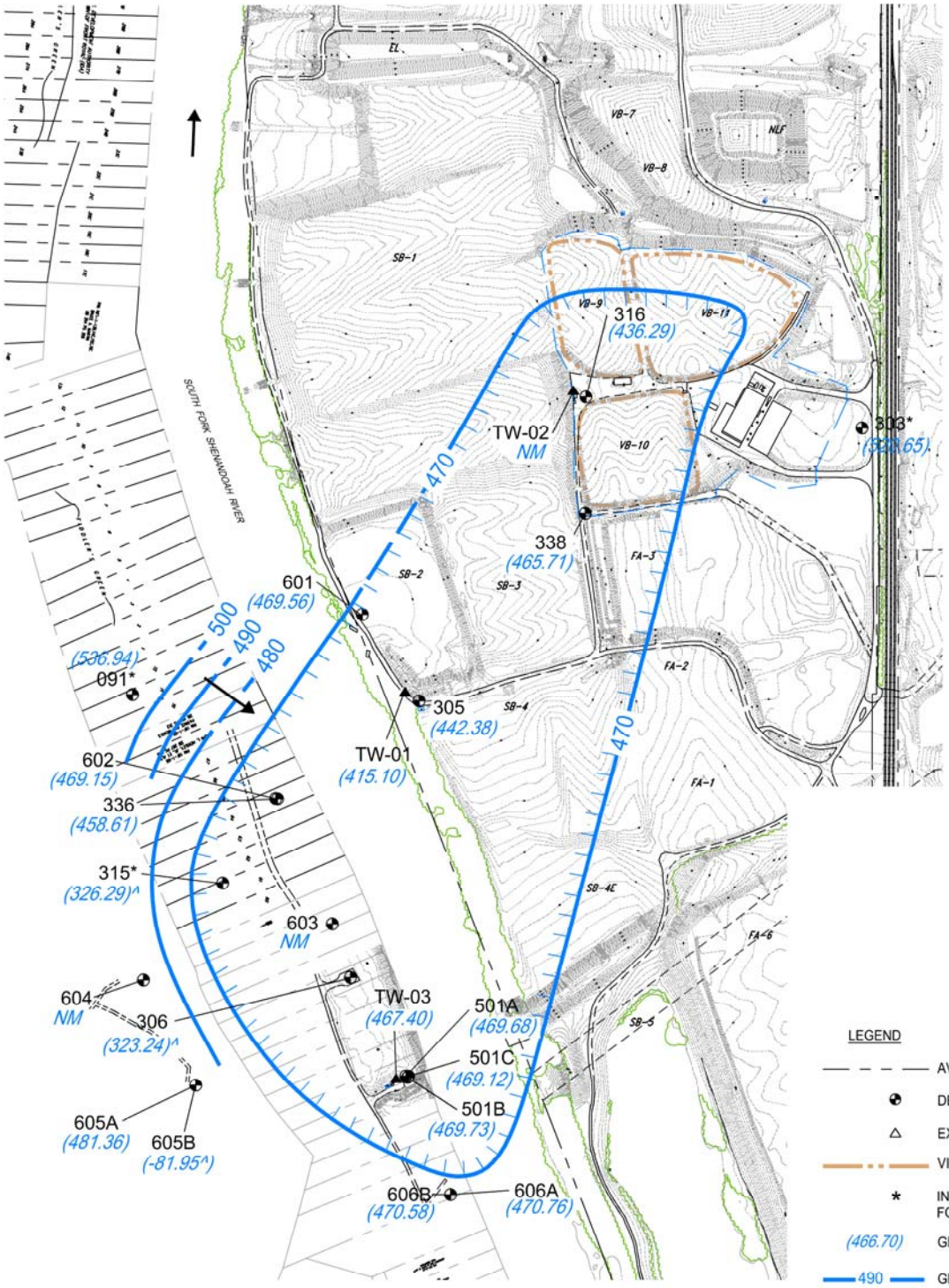

LEGEND

- AVTEX PROPERTY BOUNDARY
- DEEP BEDROCK MONITORING WELL
- EXTRACTION WELL
- VISCOSE BASIN
- * INDICATES WELL WILL BE GAUGED FOR WATER LEVELS ONLY
- (466.70) GROUND WATER ELEVATION (FEET, MSL)
- 490 GROUND WATER CONTOUR (FEET, MSL) (DASHED WHERE INFERRED)
- GROUNDWATER / RIVER FLOW DIRECTION
- ^ GROUND WATER ELEVATION NOT USED IN CONTOURING

NOTE:
WATER WAS BEING EXTRACTED FROM WELL TW-01 AT 45 GPM DURING THE MEASUREMENT PERIOD. WELLS TW-02 AND TW-03 WERE NOT PUMPING.

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OU-7 DEEP BEDROCK GROUNDWATER CONTOUR MAP
(DEC 19, 2017)

2017 ANNUAL SITE-WIDE GROUNDWATER, SURFACE WATER, AND SEDIMENT MONITORING REPORT FOR OU-7, OU-10, AND NTCRA BASINS
AVTEX FIBERS SUPERFUND SITE
FRONT ROYAL, VIRGINIA

CREATED: M. ROBINSON	CLIENT PROJECT NO.:
DATE: 2018-06-08	PARSONS PROJECT NO.: 451099
REVISION:	FIGURE NO.: 6D
FILE NAME: FIG 6D – OU-7 DEEP BR Pot Map_2017-12-19.DWG	

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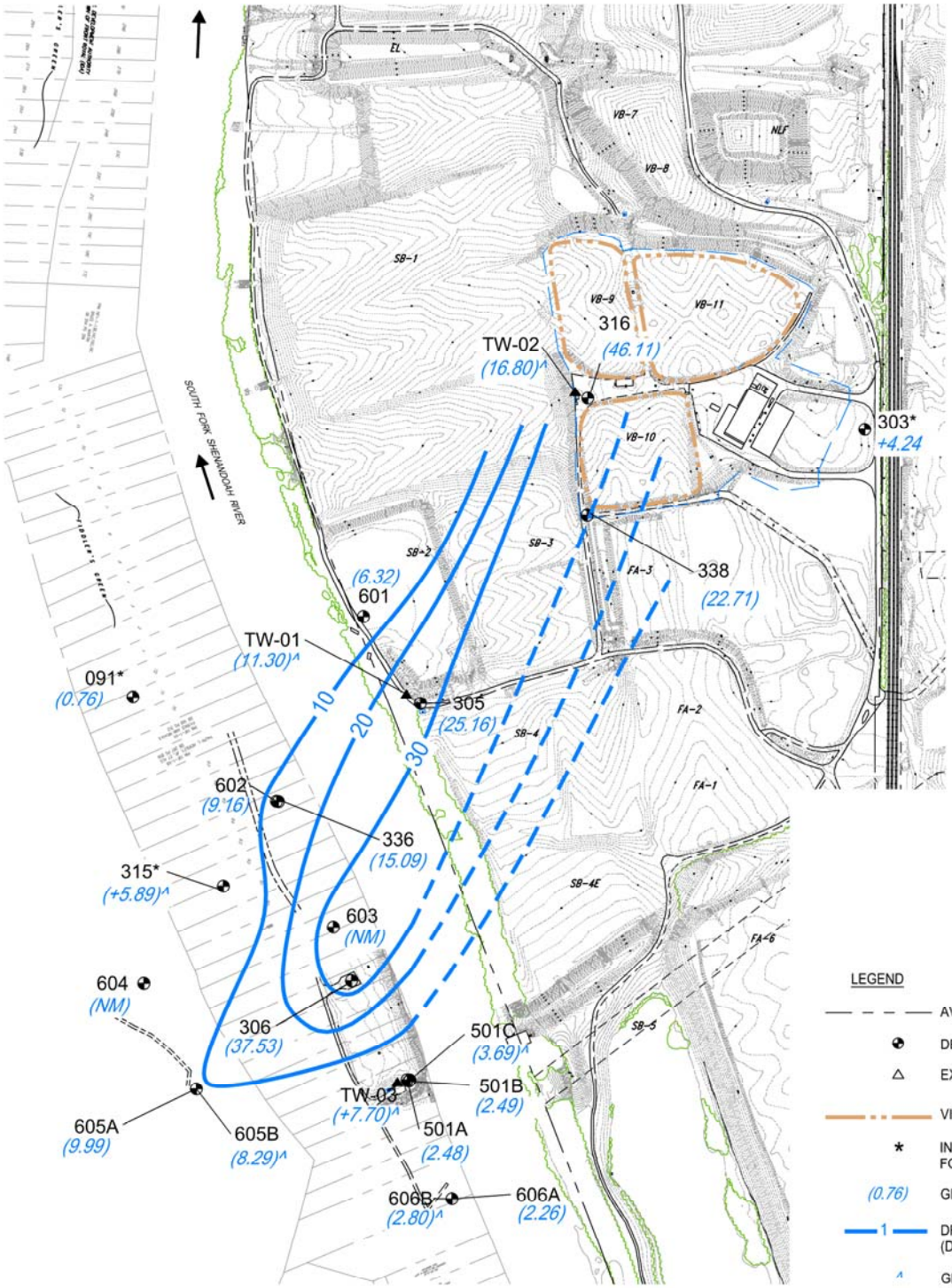

LEGEND

- AVTEX PROPERTY BOUNDARY
- DEEP BEDROCK MONITORING WELL
- EXTRACTION WELL
- VISCOSE BASIN
- * INDICATES WELL WILL BE GAUGED FOR WATER LEVELS ONLY
- (0.76) GROUND WATER DRAWDOWN (FEET, MSL)
- 1 DRAWDOWN CONTOUR (FEET, MSL) (DASHED WHERE INFERRED)
- ^ GROUND WATER DRAWDOWN NOT USED IN CONTOURING
- RIVER FLOW DIRECTION

600 300 0 600

SCALE IN FEET

NOTES:

1. DRAWDOWN ON JULY 11, 2017 COMPARED TO BASELINE WATER LEVELS MEASURED ON MARCH 18, 2015
2. ON JULY 11, 2017, WATER WAS BEING EXTRACTED FROM WELLS TW-01 AND TW-02 DURING THE MEASUREMENT PERIOD AT RATES OF 45 and 18 GPM RESPECTIVELY. TW-03 WAS NOT PUMPING ON THE DAY THE READINGS WERE MADE.

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OU-7 DEEP BEDROCK GROUNDWATER DRAWDOWN MAP
(JULY 11, 2017)

2017 ANNUAL SITE-WIDE GROUNDWATER, SURFACE WATER, AND SEDIMENT MONITORING REPORT FOR OU-7, OU-10, AND NTCRA BASINS
AVTEX FIBERS SUPERFUND SITE
FRONT ROYAL, VIRGINIA

CREATED: M. ROBINSON	CLIENT PROJECT NO.:
DATE: 2018-06-07	PARSONS PROJECT NO.: 451099
REVISION:	FIGURE NO.: 6E
FILE NAME: FIG 6E - OU-7 DEEP BR Drawdown Map_2017-07-11.DWG	

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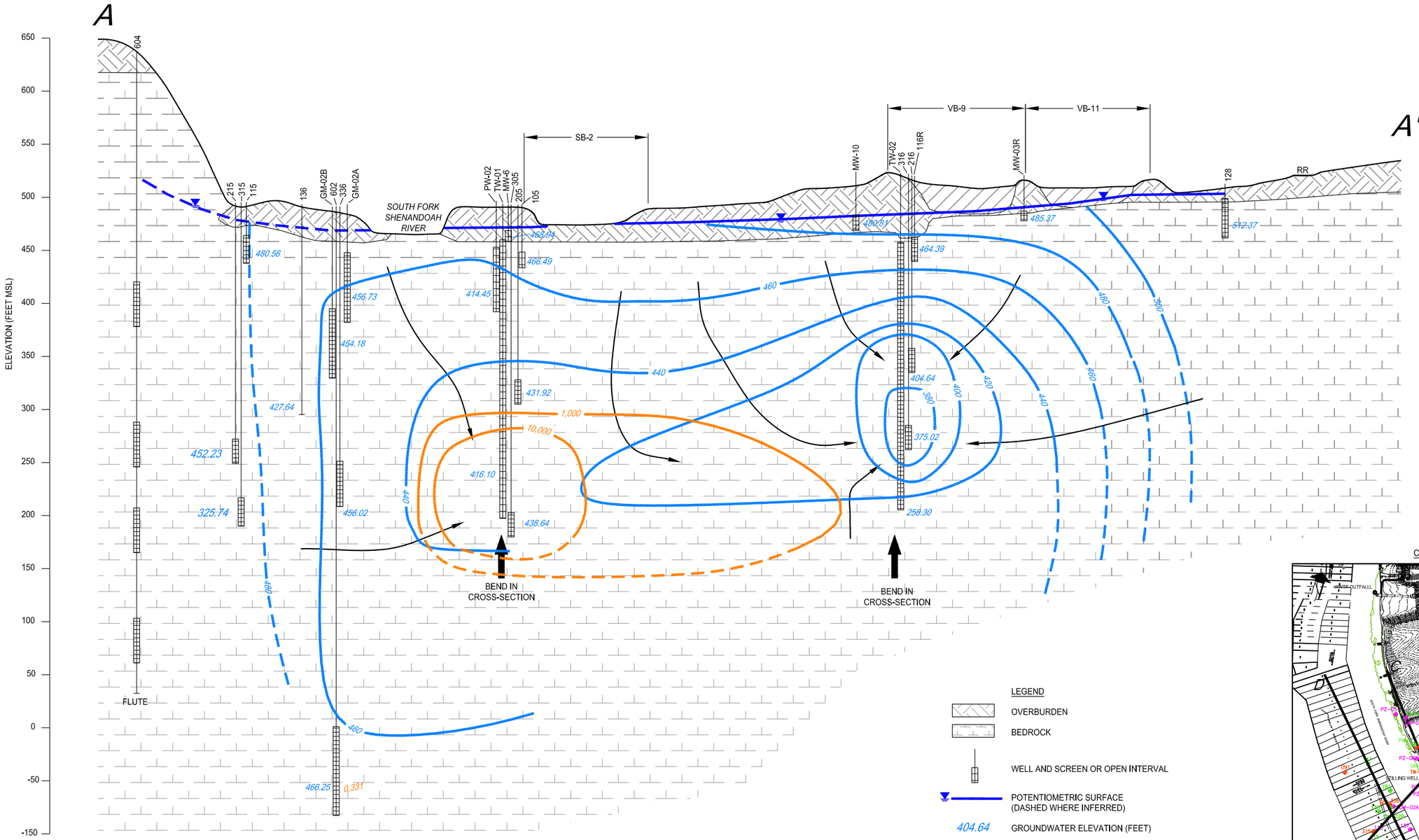
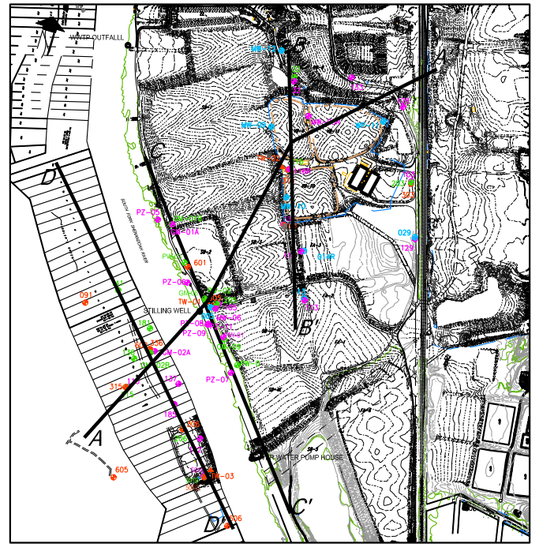


KEY MAP
CROSS-SECTION LOCATIONS



LEGEND

OVERBURDEN

BEDROCK

WELL AND SCREEN OR OPEN INTERVAL

POTENTIOMETRIC SURFACE (DASHED WHERE INFERRED)

404.64 GROUNDWATER ELEVATION (FEET)

480 EQUIPOTENTIAL CONTOUR (FEET) (DASHED WHERE INFERRED)

INFERRED GROUNDWATER FLOW DIRECTION

400 200 0 400

HORIZONTAL SCALE IN FEET
VERTICAL EXAGGERATION = 4 X

* WELL DEPTH TO WATER WAS NOT USED DUE TO SLOW RESPONSE FROM PRIOR WELL DEVELOPMENT EVENT.

10,000 JULY 2016 CARBON DISULFIDE CONCENTRATION CONTOUR (ug/L) - DASHED WHERE INFERRED

RR - RAILROAD
MSL - MEAN SEA LEVEL

G:\FMC\Front Royal\CAD\2017 GWM Report\FIG 07 - 10_Cross Sections.dwg

PARSONS
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HYDROGEOLOGIC CROSS-SECTION A - A'
JULY 2017

2017 ANNUAL SITE-WIDE GROUNDWATER, SURFACE WATER, AND SEDIMENT MONITORING REPORT FOR OU-7, OU-10, AND NTCRA BASINS
AVTEX FIBERS SUPERFUND SITE
FRONT ROYAL, VIRGINIA

CREATED: M. ROBINSON	CLIENT PROJECT NO.:
DATE: 2018-04-23	PARSONS PROJECT NO.: 451099
REVISION:	FIGURE NO.: 7
FILE NAME: FIG 07 - 10_Cross Sections.DWG	

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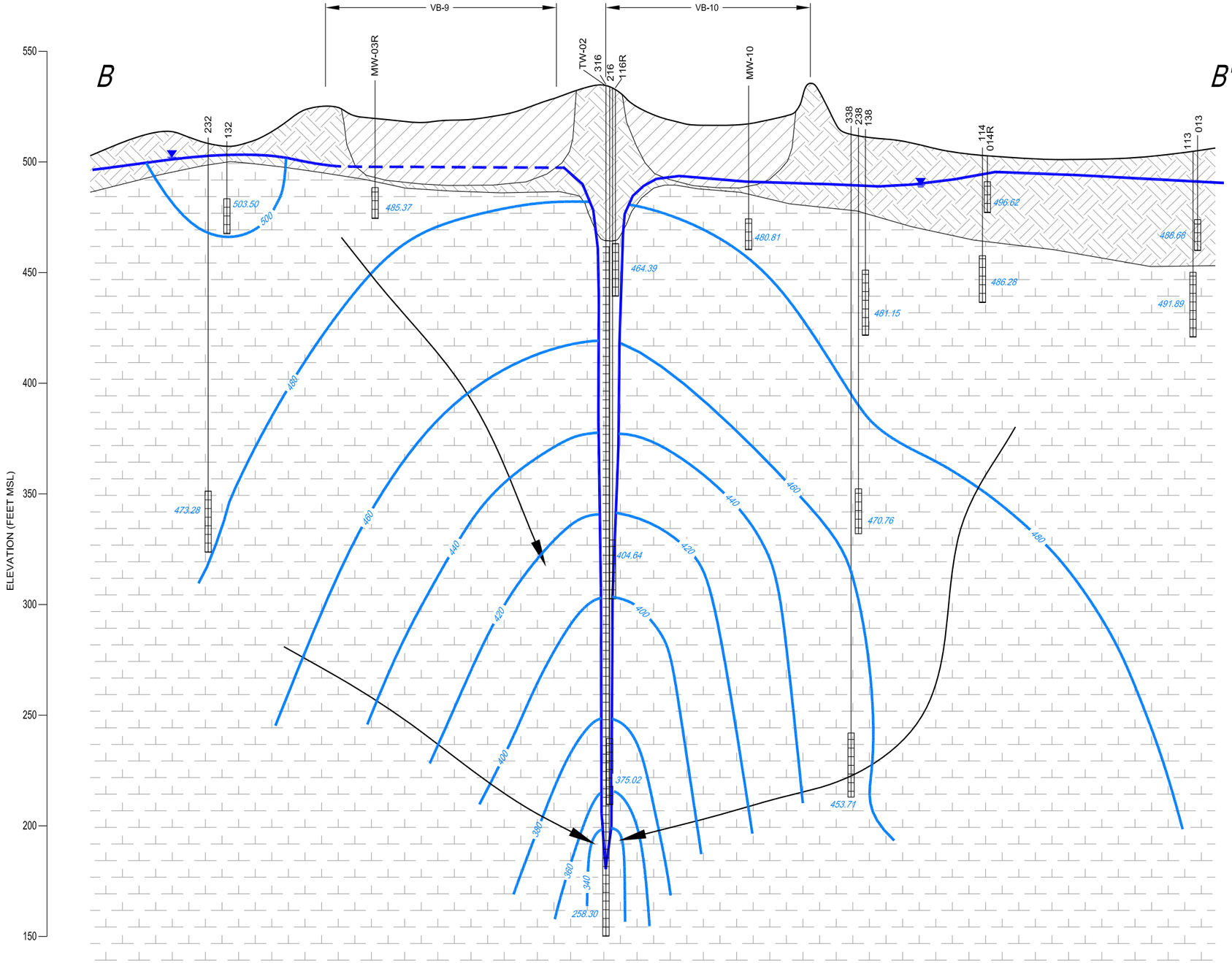
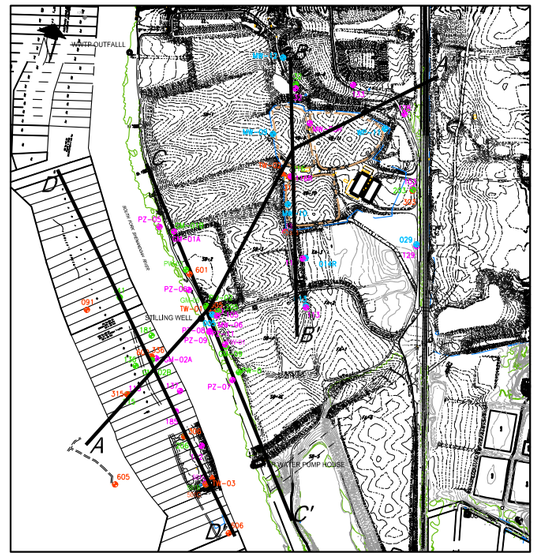


KEY MAP
CROSS-SECTION LOCATIONS



LEGEND

- OVERBURDEN
- BEDROCK
- WELL AND SCREEN OR OPEN INTERVAL
- POTENTIOMETRIC SURFACE (DASHED WHERE INFERRED)
- 453.71 GROUNDWATER ELEVATION (FEET)
- 480 EQUIPOTENTIAL CONTOUR (FEET) (DASHED WHERE INFERRED)
- INFERRED GROUNDWATER FLOW DIRECTION

RR - RAILROAD
MSL - MEAN SEA LEVEL

200 100 0 200
HORIZONTAL SCALE IN FEET
VERTICAL EXAGGERATION = 4 X

G:\FMC\Front Royal\CAD\2017 GWM Report\FIG 07 - 10_Cross Sections.dwg

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HYDROGEOLOGIC CROSS-SECTION B - B'
JULY 2017

2017 ANNUAL SITE-WIDE GROUNDWATER, SURFACE WATER, AND SEDIMENT MONITORING REPORT FOR OU-7, OU-10, AND NTCRA BASINS
AVTEX FIBERS SUPERFUND SITE
FRONT ROYAL, VIRGINIA

CREATED: M. ROBINSON	CLIENT PROJECT NO.:
DATE: 2018-04-23	PARSONS PROJECT NO.: 451099
REVISION:	FIGURE NO.: 8
FILE NAME: FIG 07 - 10_Cross Sections.DWG	

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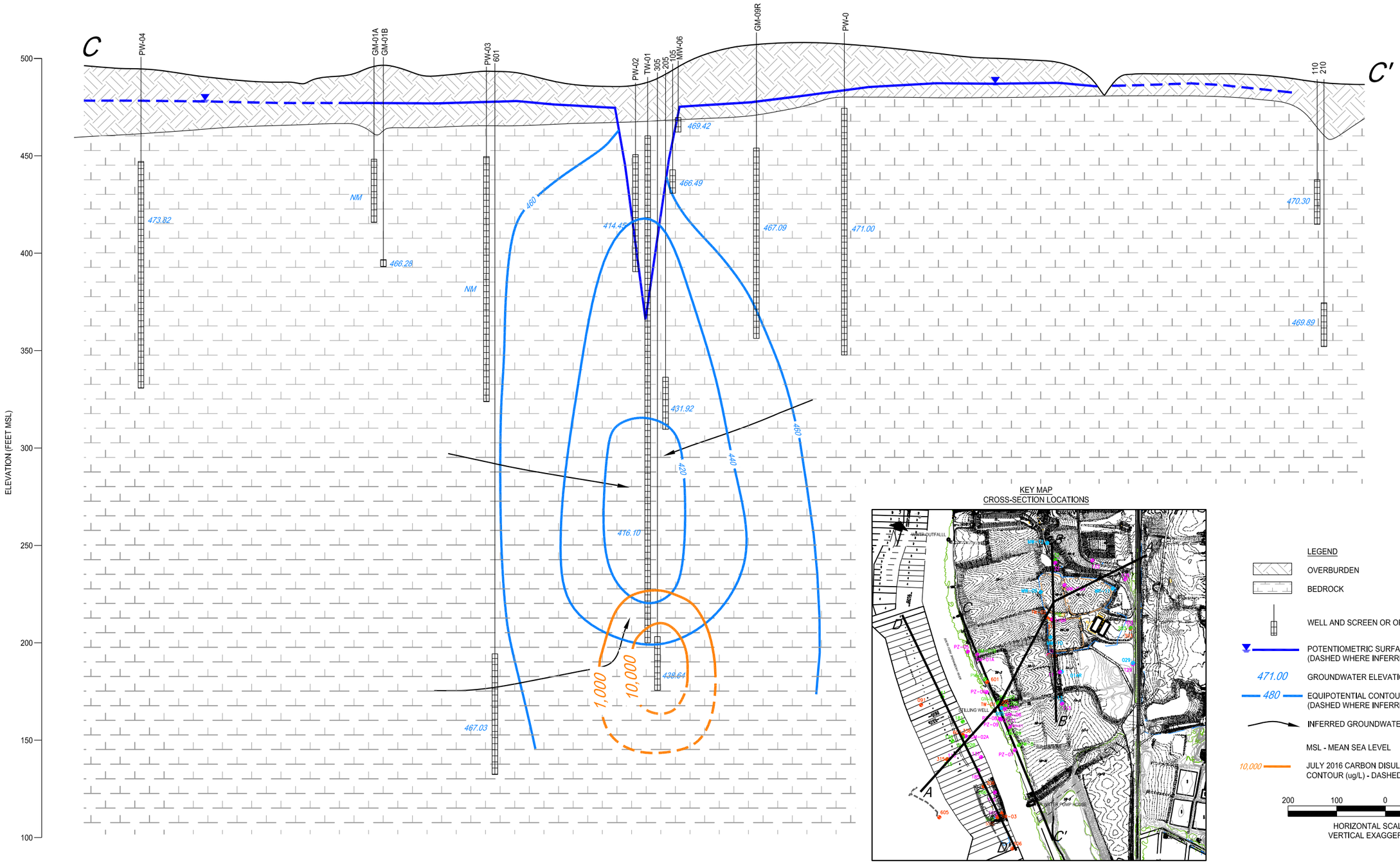

KEY MAP
CROSS-SECTION LOCATIONS

LEGEND

- OVERBURDEN
- BEDROCK
- WELL AND SCREEN OR OPEN INTERVAL
- POTENTIOMETRIC SURFACE (DASHED WHERE INFERRED)
- 471.00 GROUNDWATER ELEVATION (FEET)
- 480 EQUIPOTENTIAL CONTOUR (FEET) (DASHED WHERE INFERRED)
- INFERRED GROUNDWATER FLOW DIRECTION
- MSL - MEAN SEA LEVEL
- 10,000 JULY 2016 CARBON DISULFIDE CONCENTRATION CONTOUR (ug/L) - DASHED WHERE INFERRED

200 100 0 200

HORIZONTAL SCALE IN FEET
VERTICAL EXAGGERATION = 4 X

G:\FMC\Front Royal\CAD\2017 GWM Report\FIG 07 - 10_Cross Sections.dwg

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HYDROGEOLOGIC CROSS-SECTION C - C'
JULY 2017

2017 ANNUAL SITE-WIDE GROUNDWATER, SURFACE WATER, AND SEDIMENT MONITORING REPORT FOR OU-7, OU-10, AND NTCRA BASINS
AVTEX FIBERS SUPERFUND SITE
FRONT ROYAL, VIRGINIA

CREATED: M. ROBINSON	CLIENT PROJECT NO.:
DATE: 2018-04-23	PARSONS PROJECT NO.: 451099
REVISION:	FIGURE NO.: 9
FILE NAME: FIG 07 - 10_Cross Sections.DWG	

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D

D'

ELEVATION (FEET MSL)

550 500 450 400 350 300 250 200 150 100 50 0 -50 -100

133-OFF 141 181 602 336 GM-02B GM-02A 185 306 206 162 TW-03 501A 501B, 501C

492.22 NA

472.64 NA

469.35 NA

456.73

454.18

456.02

471.65 NA

469.68 NA

1,000

468.74

369.46*

467.10

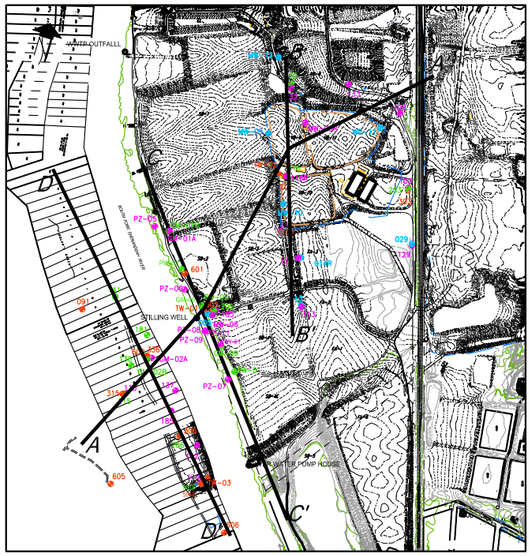
469.83

469.85

466.25

469.63

460 480 460 470 480 470



KEY MAP
CROSS-SECTION LOCATIONS

LEGEND

OVERBURDEN

BEDROCK

WELL AND SCREEN OR OPEN INTERVAL

POTENTIOMETRIC SURFACE (DASHED WHERE INFERRED)

466.25 GROUNDWATER ELEVATION (FEET)

480 EQUIPOTENTIAL CONTOUR (FEET) (DASHED WHERE INFERRED)

INFERRED GROUNDWATER FLOW DIRECTION

* WELL DEPTH TO WATER WAS NOT USED DUE TO SLOW RESPONSE FROM PRIOR WELL DEVELOPMENT EVENT.

10,000 JULY 2015 CARBON DISULFIDE CONCENTRATION CONTOUR (ug/L) - DASHED WHERE INFERRED

NA - COMPLETE WELL CONSTRUCTION INFORMATION NOT AVAILABLE
MSL - MEAN SEA LEVEL
NM - NOT MEASURED

200 100 0 200
HORIZONTAL SCALE IN FEET
VERTICAL EXAGGERATION = 2 X

G:\FMC\Front Royal\CAD\2017 GWM Report\FIG 07 - 10_Cross Sections.dwg

PARSONS
404 KENDRICK LANE, FRONT ROYAL, VA 22630

HYDROGEOLOGIC CROSS-SECTION D - D'
JULY 2017

2017 ANNUAL SITE-WIDE GROUNDWATER, SURFACE WATER, AND SEDIMENT MONITORING REPORT FOR OU-7, OU-10, AND NTCRA BASINS
AVTEX FIBERS SUPERFUND SITE
FRONT ROYAL, VIRGINIA

CREATED: M. ROBINSON	CLIENT PROJECT NO.:
DATE: 2018-04-23	PARSONS PROJECT NO.: 451099
REVISION:	FIGURE NO.: 10
FILE NAME: FIG 07 - 10_Cross Sections.DWG	

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LEGEND

- AVTEX PROPERTY BOUNDARY
- OVERBURDEN MONITORING WELL
- VISCOSE BASIN
- * INDICATES WELL GAUGED FOR WATER LEVELS ONLY
- 490 GROUND WATER CONTOUR (FEET, MSL) (DASHED WHERE INFERRED)
- GROUNDWATER / RIVER FLOW DIRECTION
- >1000 CARBON DISULFIDE PLUME (µg/L)
- >10 ARSENIC PLUME (µg/L)
- >6 ANTIMONY PLUME (µg/L)
- ND NOT DETECTED
- NS NOT SAMPLED
- J ESTIMATED CONCENTRATION
- 1,410 CARBON DISULFIDE RESULT (µg/L)
- 1,500 ARSENIC RESULT (µg/L)
- 56.7 ANTIMONY RESULT (µg/L)

600 300 0 600

SCALE IN FEET

PARSONS

404 KENDRICK LANE, FRONT ROYAL, VA 22630

OU-7 OVERBURDEN GROUNDWATER ISOCONCENTRATION CONTOUR MAP (JULY 2017)

2017 ANNUAL SITE-WIDE GROUNDWATER, SURFACE WATER, AND SEDIMENT MONITORING REPORT FOR OU-7, OU-10, AND NTCRA BASINS
AVTEX FIBERS SUPERFUND SITE
FRONT ROYAL, VIRGINIA

CREATED: M. ROBINSON	CLIENT PROJECT NO.:
DATE: 2018-07-03	PARSONS PROJECT NO.: 451099
REVISION:	FIGURE NO.: 11
FILE NAME: FIG 11 – OVRBDN Plume Map_2017.DWG	

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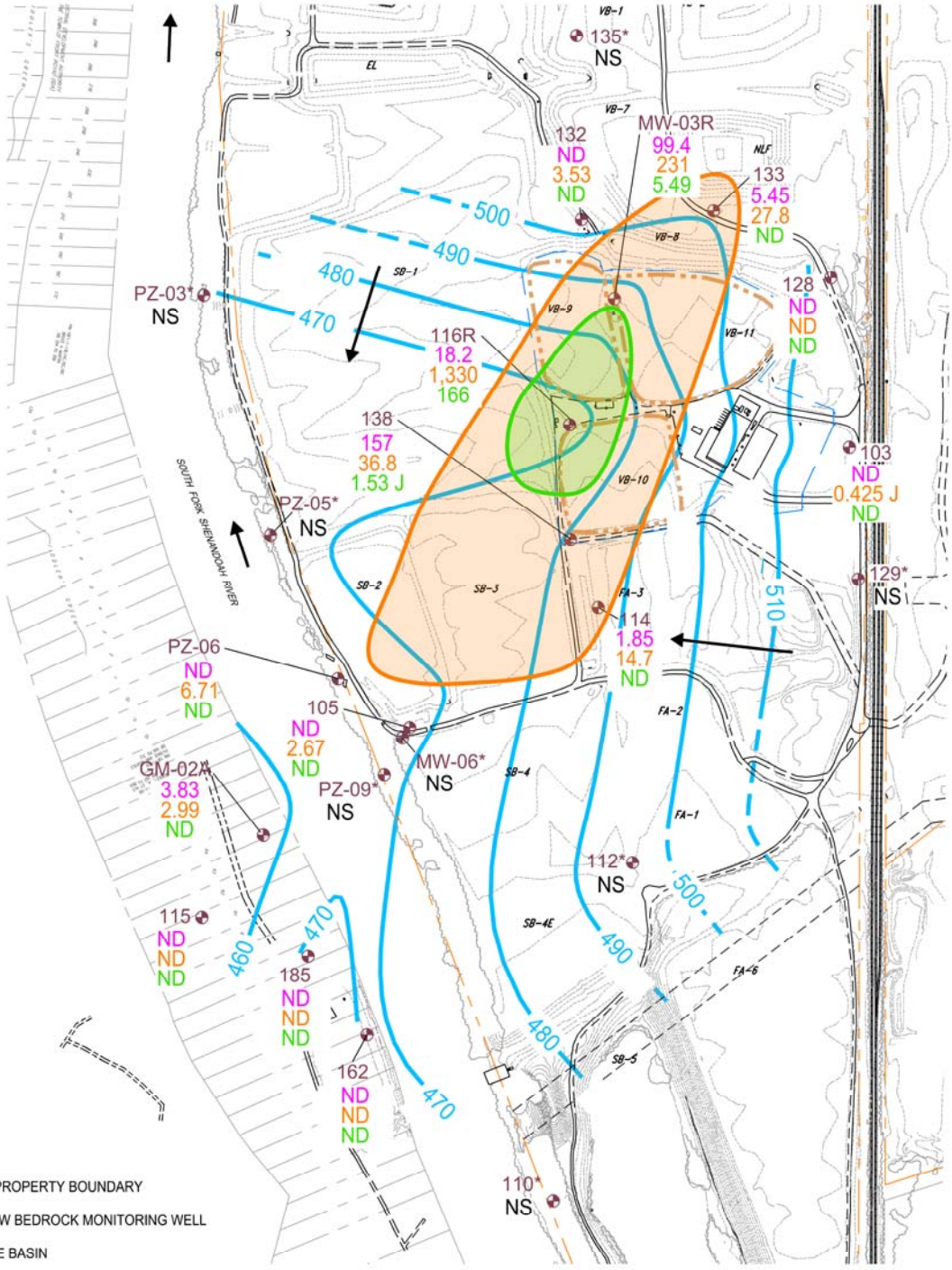

PARSONS
404 KENDRICK LANE, FRONT ROYAL, VA 22630

OU-7 SHALLOW BEDROCK GROUNDWATER ISOCONCENTRATION CONTOUR MAP (JULY 2017)

2017 ANNUAL SITE-WIDE GROUNDWATER, SURFACE WATER, AND SEDIMENT MONITORING REPORT FOR OU-7, OU-10, AND NTCRA BASINS
AVTEX FIBERS SUPERFUND SITE
FRONT ROYAL, VIRGINIA

CREATED: M. ROBINSON	CLIENT PROJECT NO.:
DATE: 2018-06-27	PARSONS PROJECT NO.: 451099
REVISION:	FIGURE NO.: 12
FILE NAME: FIG 12 – OU-7 SHALLOW BR Plume Map_2017.DWG	

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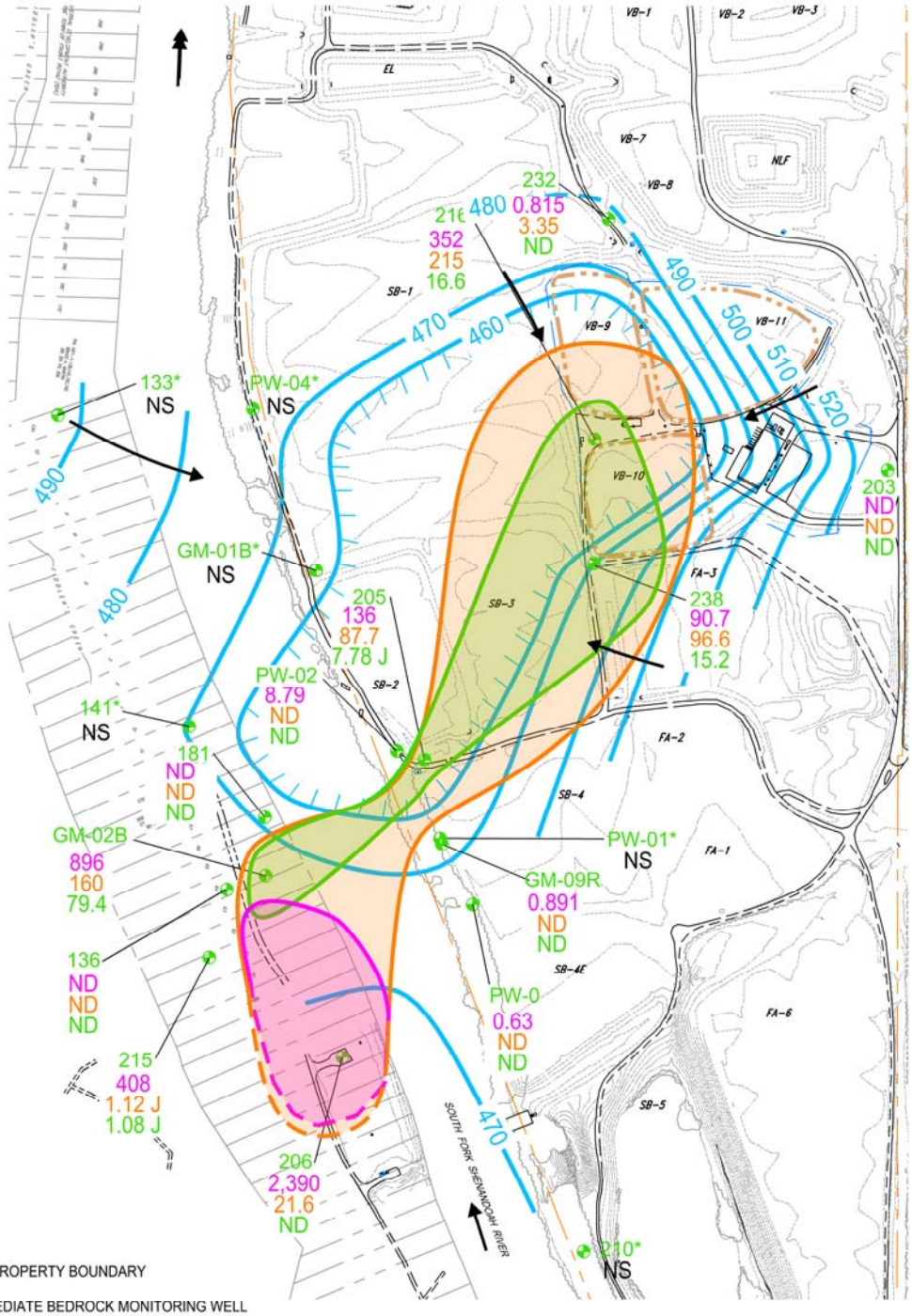

LEGEND

- AVTEX PROPERTY BOUNDARY
- INTERMEDIATE BEDROCK MONITORING WELL
- VISCOSE BASIN
- * INDICATES WELL GAUGED FOR WATER LEVELS ONLY
- 490 GROUND WATER CONTOUR (FEET, MSL) (DASHED WHERE INFERRED)
- >1000 CARBON DISULFIDE PLUME (µg/L)
- >10 ARSENIC PLUME (µg/L)
- >6 ANTIMONY PLUME (µg/L)
- GROUNDWATER / RIVER FLOW DIRECTION

90.7	CARBON DISULFIDE RESULT (µg/L)
96.6	ARSENIC RESULT (µg/L)
15.2	ANTIMONY RESULT (µg/L)
ND	NOT DETECTED
NS	NOT SAMPLED
J	ESTIMATED CONCENTRATION

600 300 0 600

SCALE IN FEET

PARSONS

404 KENDRICK LANE, FRONT ROYAL, VA 22630

OU-7 INTERMEDIATE BEDROCK GROUNDWATER ISOCONCENTRATION CONTOUR MAP (JULY 2017)

2017 ANNUAL SITE-WIDE GROUNDWATER, SURFACE WATER, AND SEDIMENT MONITORING REPORT FOR OU-7, OU-10, AND NTCRA BASINS
AVTEX FIBERS SUPERFUND SITE
FRONT ROYAL, VIRGINIA

CREATED: M. ROBINSON	CLIENT PROJECT NO.:
DATE: 2018-07-03	PARSONS PROJECT NO.: 451099
REVISION:	FIGURE NO.: 13
FILE NAME: FIG 13 - OU-7 INT BR Plume Map_2017.DWG	

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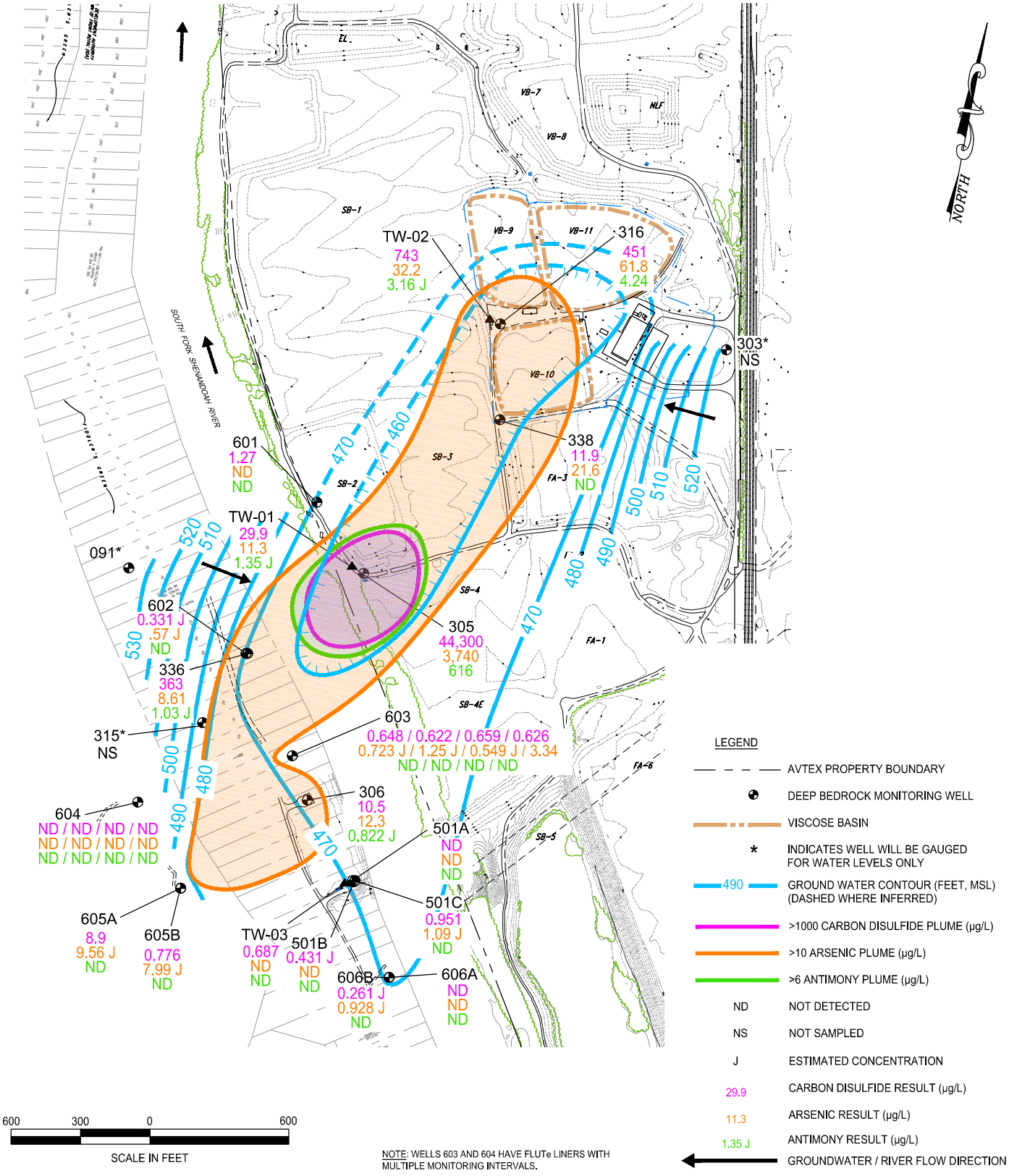

PARSONS
404 KENDRICK LANE, FRONT ROYAL, VA 22630

OU-7 DEEP BEDROCK GROUNDWATER ISOCONCENTRATION CONTOUR MAP (JULY 2017)

2017 ANNUAL SITE-WIDE GROUNDWATER, SURFACE WATER, AND SEDIMENT MONITORING REPORT FOR OU-7, OU-10, AND NTCRA BASINS
AVTEX FIBERS SUPERFUND SITE
FRONT ROYAL, VIRGINIA

CREATED: M. ROBINSON	CLIENT PROJECT NO.:
DATE: 2018-06-27	PARSONS PROJECT NO.: 451099
REVISION:	FIGURE NO.: 14
FILE NAME: FIG 14 – OU-7 DEEP BR Plume Map_2017.DWG	

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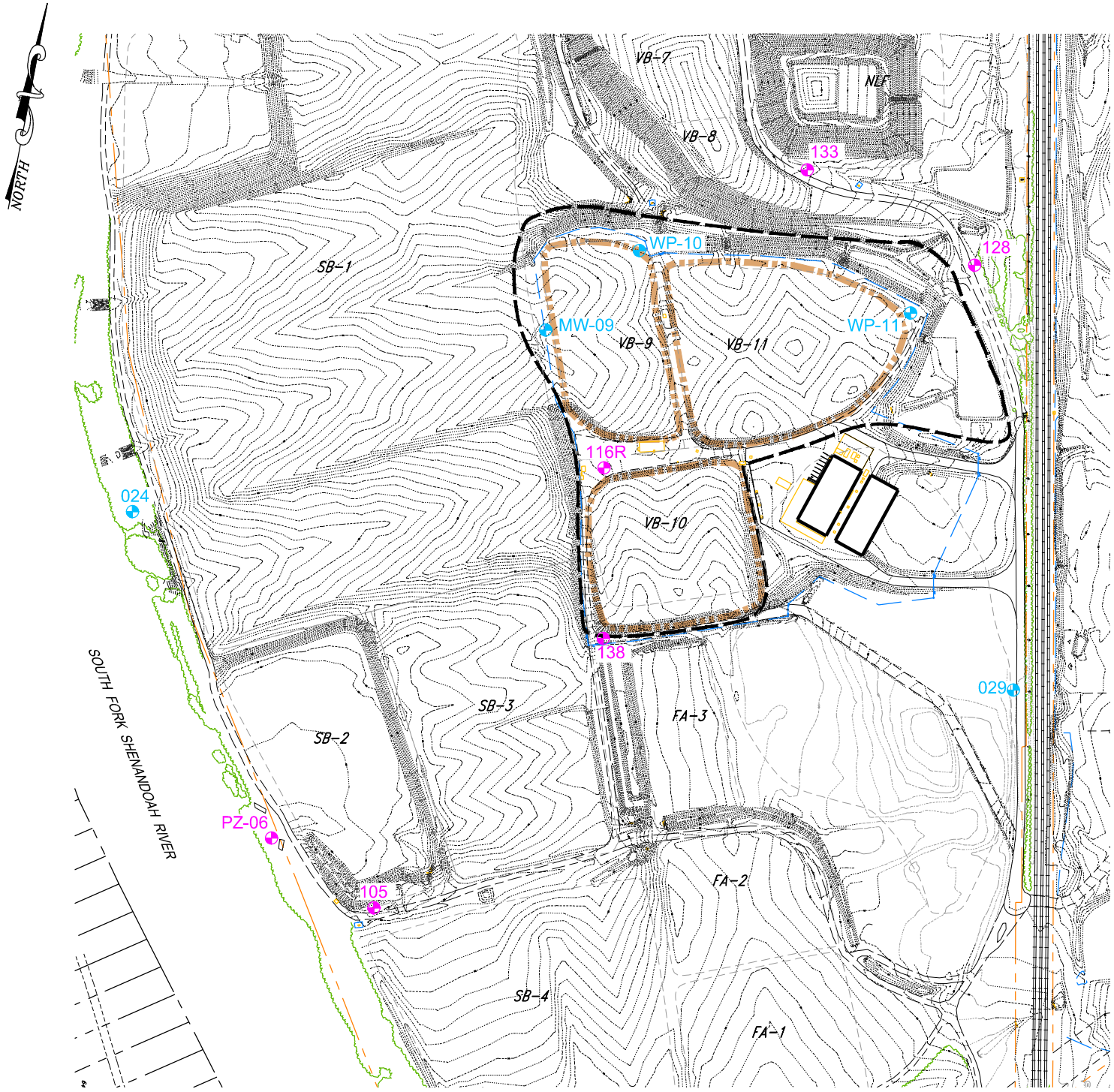

PARSONS
404 KENDRICK LANE, FRONT ROYAL, VA 22630

OU-7 VSWMR MONITORING WELL NETWORK

2017 ANNUAL SITE-WIDE GROUNDWATER, SURFACE WATER, AND SEDIMENT MONITORING REPORT FOR OU-7, OU-10, AND NTCRA BASINS
AVTEX FIBERS SUPERFUND SITE
FRONT ROYAL, VIRGINIA

CREATED: M. ROBINSON	CLIENT PROJECT NO.:
DATE: 2018-04-23	PARSONS PROJECT NO.: 451099
REVISION:	FIGURE NO.: 15
FILE NAME: FIG 15 – OU-7 VSWMR WELL MAP.DWG	

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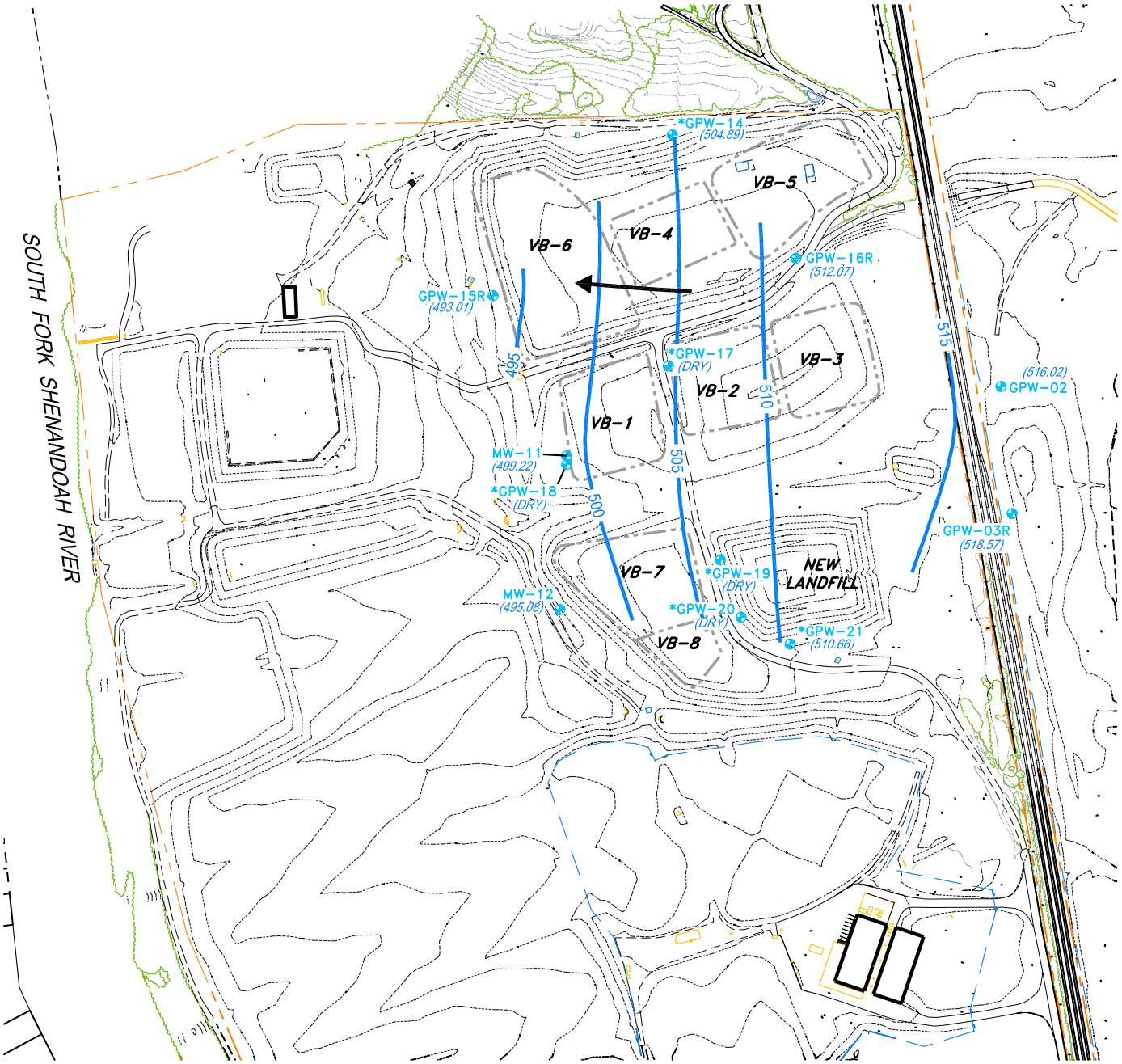

PARSONS
404 KENDRICK LANE, FRONT ROYAL, VA 22630

OU-10 VISCOSE BASINS 1-8 AND NEW LANDFILL OVERBURDEN GROUNDWATER COUNTOUR MAP (JULY 2017)

2017 ANNUAL SITE-WIDE GROUNDWATER, SURFACE WATER, AND SEDIMENT MONITORING REPORT FOR OU-7, OU-10, AND NTCRA BASINS
AVTEX FIBERS SUPERFUND SITE
FRONT ROYAL, VIRGINIA

CREATED: M. ROBINSON	CLIENT PROJECT NO.:
DATE: 2018-04-23	PARSONS PROJECT NO.: 451099
REVISION:	FIGURE NO.: 16
FILE NAME: FIG 16 - OU-10 OVRBDN Pot Map_2017-07-11.DWG	

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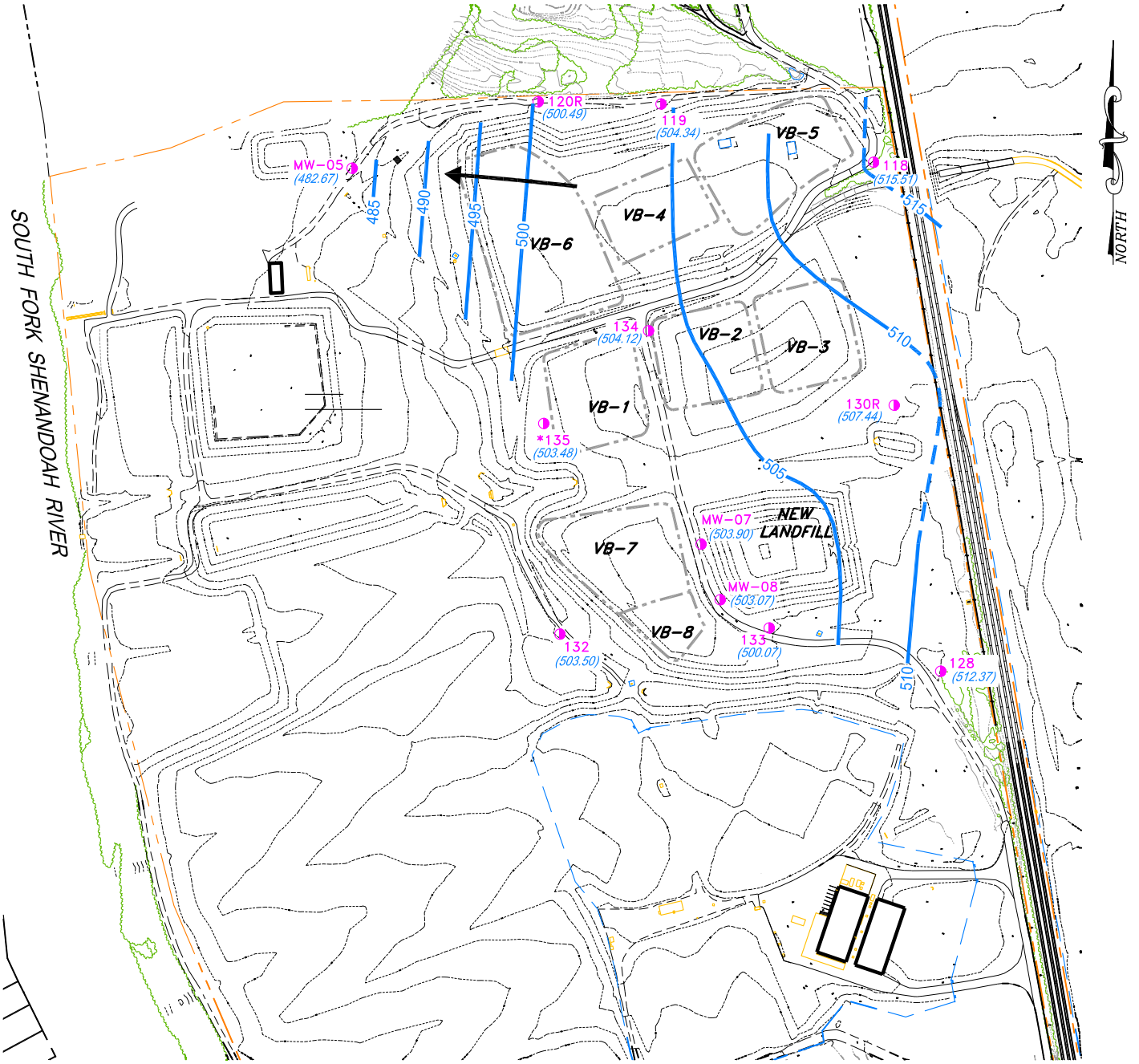

PARSONS
404 KENDRICK LANE, FRONT ROYAL, VA 22630

OU-10 VISCOSE BASINS 1-8 AND NEW LANDFILL SHALLOW BEDROCK GROUNDWATER COUNTOUR MAP (JULY 2017)

2017 ANNUAL SITE-WIDE GROUNDWATER, SURFACE WATER, AND SEDIMENT MONITORING REPORT FOR OU-7, OU-10, AND NTCRA BASINS
AVTEX FIBERS SUPERFUND SITE
FRONT ROYAL, VIRGINIA

CREATED: M. ROBINSON	CLIENT PROJECT NO.:
DATE: 2018-04-23	PARSONS PROJECT NO.: 451099
REVISION:	FIGURE NO.: 17
FILE NAME: FIG 17 - OU-10 SBR Pot Map_2017-07-11.DWG	

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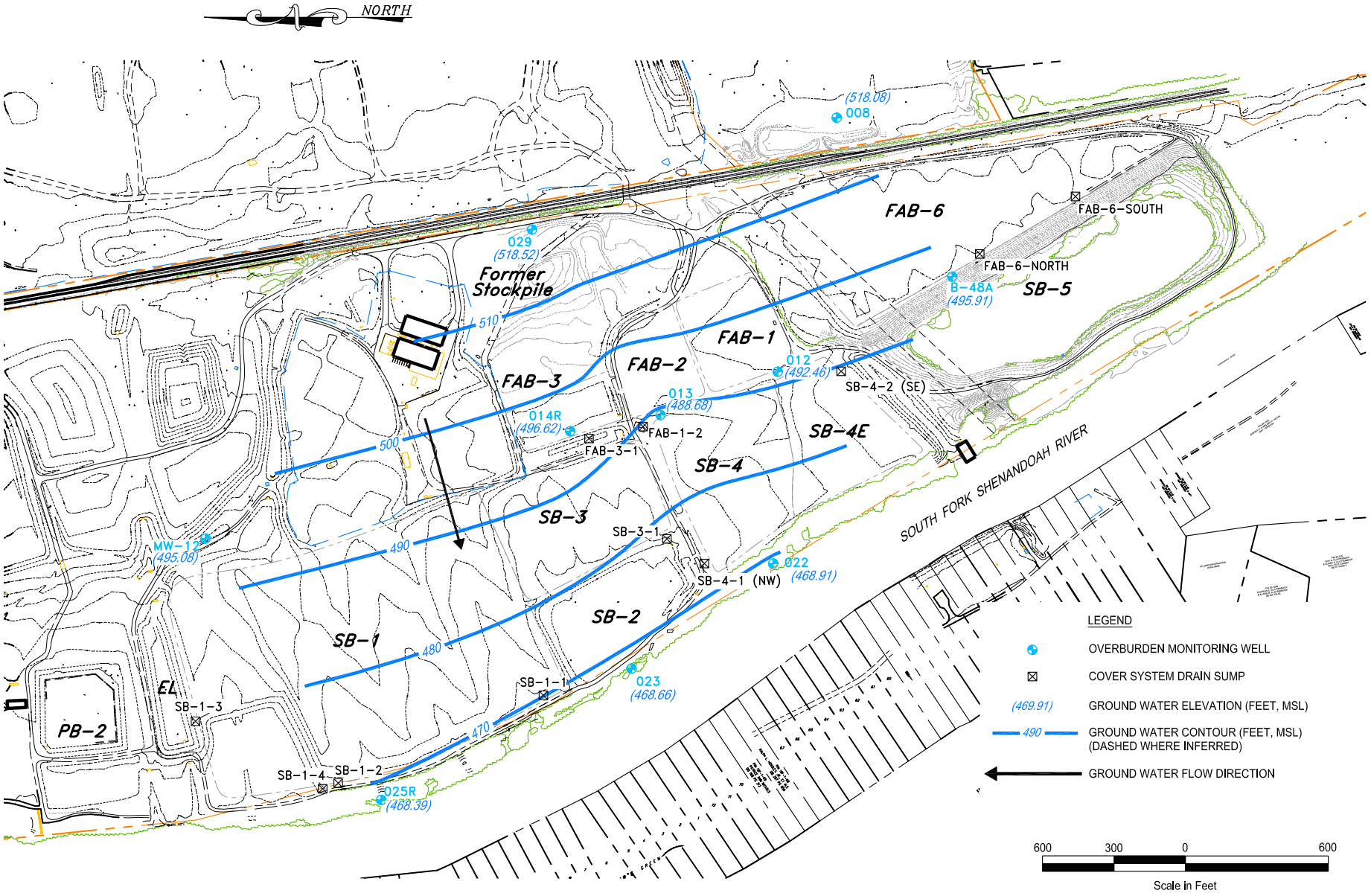

PARSONS
404 KENDRICK LANE, FRONT ROYAL, VA 22630

NTCRA BASINS OVERBURDEN GROUNDWATER COUNTOUR MAP (JULY 2017)

2017 ANNUAL SITE-WIDE GROUNDWATER, SURFACE WATER, AND SEDIMENT MONITORING
REPORT FOR OU-7, OU-10, AND NTCRA BASINS
AVTEX FIBERS SUPERFUND SITE
FRONT ROYAL, VIRGINIA

CREATED: M. ROBINSON	CLIENT PROJECT NO.:
DATE: 2018-04-23	PARSONS PROJECT NO.: 451099
REVISION:	FIGURE NO.: 18
FILE NAME: FIG 18 - Basins Overburden Pot Map_2017-07-11.DWG	

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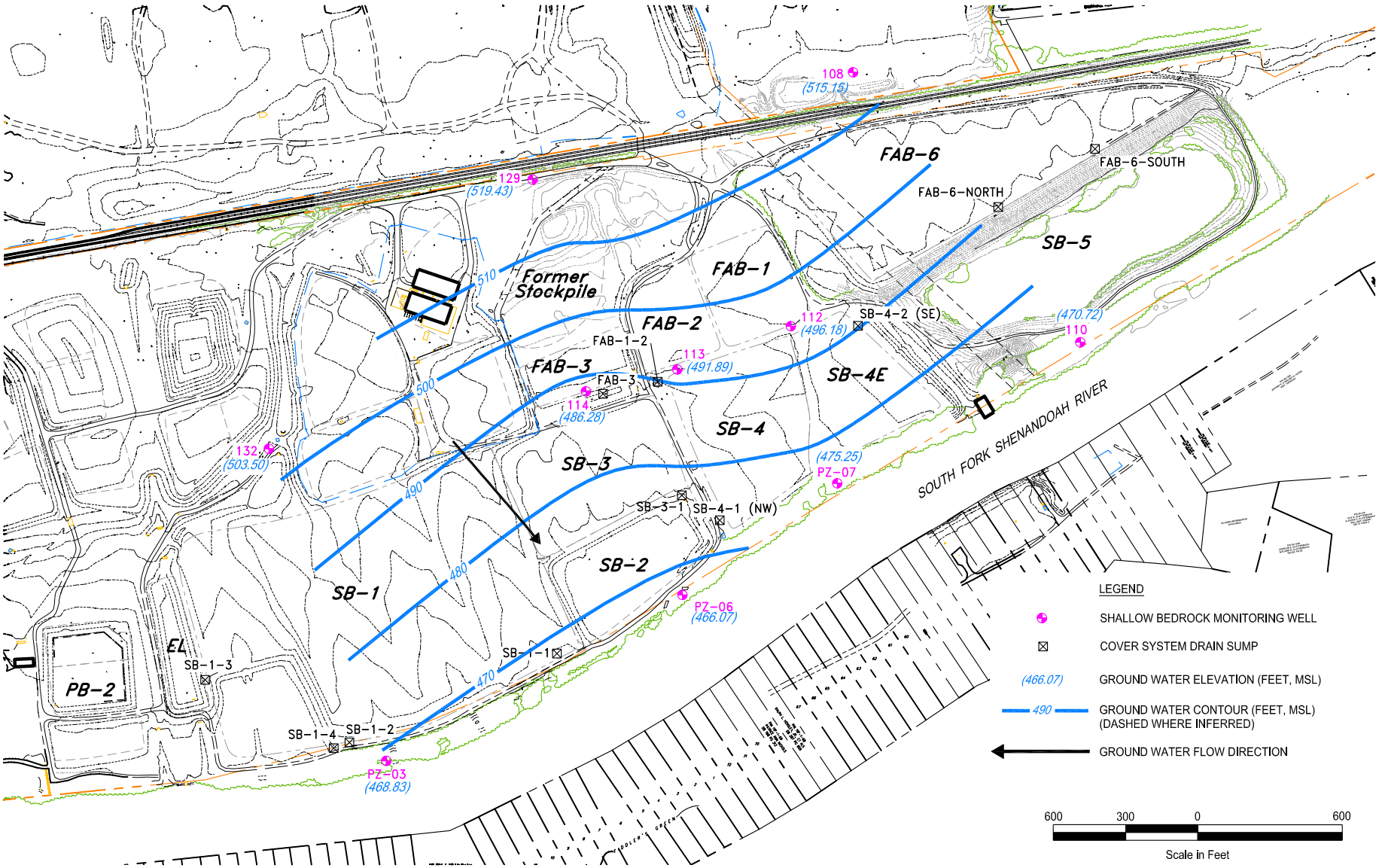

PARSONS
404 KENDRICK LANE, FRONT ROYAL, VA 22630

NTCRA BASINS SHALLOW BEDROCK GROUNDWATER COUNTOUR MAP (JULY 2017)

2017 ANNUAL SITE-WIDE GROUNDWATER, SURFACE WATER, AND SEDIMENT MONITORING
REPORT FOR OU-7, OU-10, AND NTCRA BASINS
AVTEX FIBERS SUPERFUND SITE
FRONT ROYAL, VIRGINIA

CREATED: M. ROBINSON	CLIENT PROJECT NO.:
DATE: 2018-04-23	PARSONS PROJECT NO.: 451099
REVISION:	FIGURE NO.: 19
FILE NAME: FIG 19 - Basins SBR Pot Map_2017-07-11.DWG	

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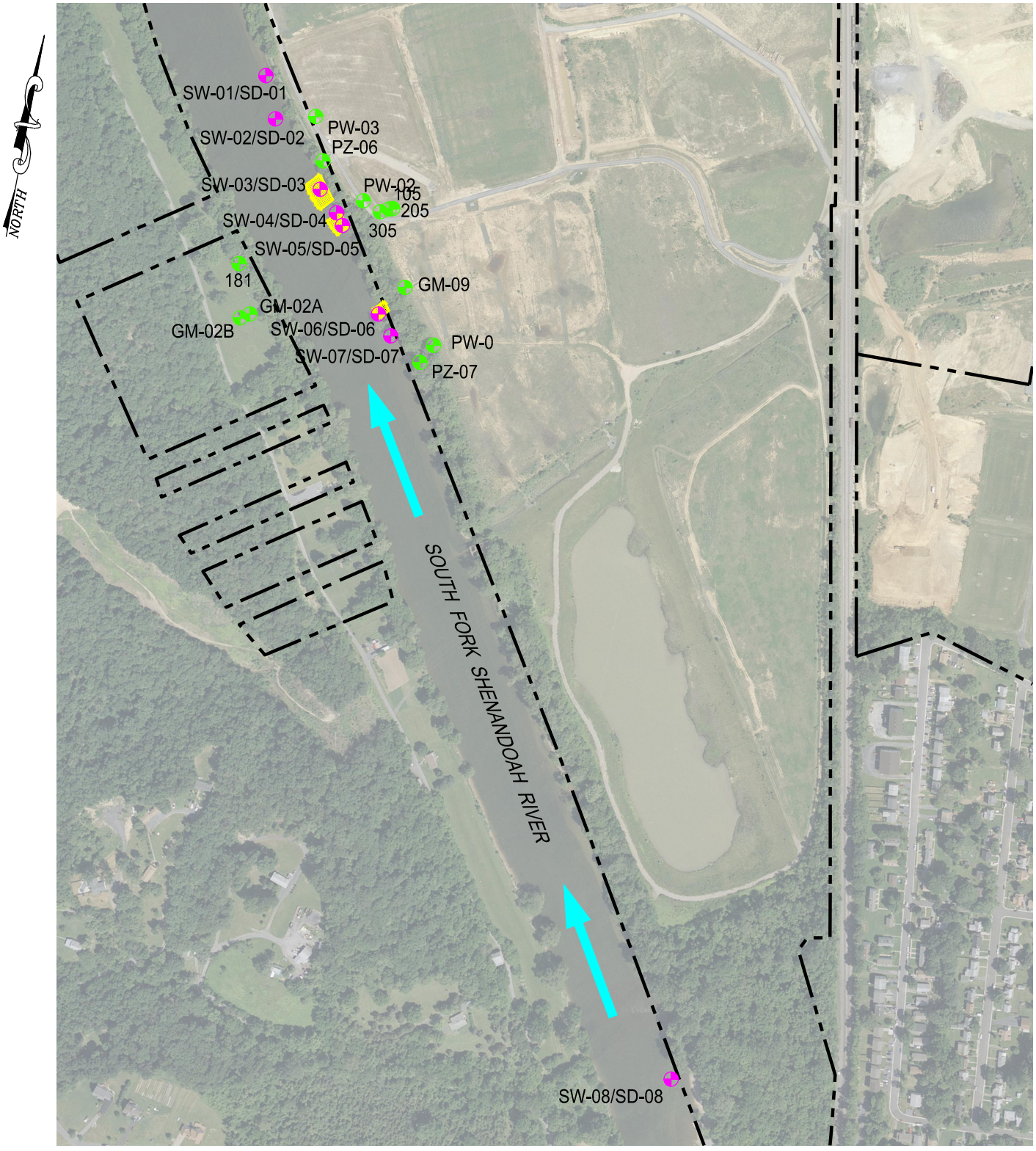

LEGEND

- AVTEX PROPERTY BOUNDARY
- 181 — EXISTING WELL
- SW/SD — SURFACE WATER AND SEDIMENT SAMPLING LOCATION
- APPROXIMATE AREA IN WHICH SEEPAGE ZONES OBSERVED
- SURFACE WATER FLOW DIRECTION

500 250 0 500

SCALE IN FEET

PARSONS
404 KENDRICK LANE, FRONT ROYAL, VA 22630

RIVER WATER AND SEDIMENT SAMPLE LOCATIONS

2017 ANNUAL SITE-WIDE GROUNDWATER, SURFACE WATER, AND SEDIMENT MONITORING REPORT FOR OU-7, OU-10, AND NTCRA BASINS
AVTEX FIBERS SUPERFUND SITE
FRONT ROYAL, VIRGINIA

CREATED: M. ROBINSON	CLIENT PROJECT NO.:
DATE: 2018-04-23	PARSONS PROJECT NO.: 451099
REVISION:	FIGURE NO.: 20
FILE NAME: FIG 20 – SW and Sed Loc.DWG	

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TABLES

PARSONS

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TABLE 1

Monitoring Well Construction Details for the OU-7 Monitoring Network
2017 Annual Site-Wide Groundwater, Surface Water, and Sediment Monitoring Report for OU-7, OU-10, and NTCRA Basins
Avtex Fibers Superfund Site
Front Royal, Virginia

Well ID	Well Type	Measuring Point Elevation (feet amsl)	Well Diameter (inches)	Constructed Depth (feet bre)	Monitoring Interval Length (feet)	Measured Depth to Bottom	Date Measured
005	OMW	492.24	2	34.4	10	34.10	6/24/2014
012*	OMW	508.59	2	37.6	10	37.75	6/24/2014
014R*	OMW	511.16	2	34.3	10	33.85	6/24/2014
024	OMW	479.05	2	11.3	5	11.31	6/24/2014
029	OMW	530.66	2	22.0	10	22.00	6/24/2014
091*	D BMW	611.46	6	275.0	--[3]	251.59	6/24/2014
103	S BMW	524.22	4	40.0	16	41.95	6/24/2014
105	S BMW	500.52	4	51.5	11	51.05	6/24/2014
110*	S BMW	479.88	4	40.3	21	40.00	6/24/2014
112*	S BMW	511.25	4	65.5	20	65.75	6/24/2014
114	S BMW	511.92	4	60.1	20	59.80	6/24/2014
115	S BMW	500.90	4	44.4	26	44.36	6/24/2014
116R[1]	S BMW	532.14	2	93.5	20	93.05	6/24/2014
128	S BMW	518.37	2	47.5	10	47.50	6/24/2014
129*	S BMW	530.69	2	46.2	10	46.25	6/24/2014
132	S BMW	506.30	2	30.0	10	33.40	7/12/2016
133	S BMW	528.16	4	42.9	20	43.00	6/24/2014
135*	S BMW	527.03	4	46.3	20	46.00	6/24/2014
136	I BMW	496.05	6	200.5	--[3]	199.91	6/24/2014
138	S BMW	503.81	2	84.0	30	84.00	6/24/2014
141*	I BMW	491.50	6	80.3	--[3]	80.16	6/24/2014
162	S BMW	489.80	6	60.5	--[3]	59.56	6/24/2014
181	I BMW	492.70	6	175.8	--[3]	175.00	7/7/2015
185	S BMW	492.69	6	72.0	--[3]	75.30	7/7/2015
203	I BMW	525.77	4	180.9	28	182.90	6/24/2014
205	I BMW	499.42	4	182.0	27	179.80	6/24/2014
206	I BMW	495.81	2	215.0	20	218.58	6/24/2014
210	I BMW	480.33	4	102.3	22	102.00	6/24/2014
215	I BMW	500.83	4	187.6	23	183.81	6/24/2014
216	I BMW	532.34	4	185.4	20	181.60	6/24/2014
232	I BMW	505.52	2	145.8	20	145.35	6/24/2014
238	I BMW	503.38	2	174.2	20	173.60	6/24/2014
301	D BMW	552.19	4	250.0	20	>250	6/24/2014
303*	D BMW	522.62	4	308.0	27	>300	6/24/2014
305	D BMW	502.00	4	304.8	20	300.10	6/24/2014
306	D BMW	495.62	2	287.0	30	289.69	6/24/2014
315*	D BMW	500.88	4	250.0	21	254.27	6/24/2014
316	D BMW	532.67	4	250.0	20	>250	6/24/2014
336	D BMW	492.17	4	280.0	40	287.39	6/24/2014
338	D BMW	503.27	2	293.0	30	>200	6/24/2014
501A	D BMW	488.13	2	350.0	20	350.81	6/24/2014
501B	D BMW	488.03	2.5	495.0	20	493.95	6/24/2014

TABLE 1

Monitoring Well Construction Details for the OU-7 Monitoring Network
2017 Annual Site-Wide Groundwater, Surface Water, and Sediment Monitoring Report for OU-7, OU-10, and NTCRA Basins
Avtex Fibers Superfund Site
Front Royal, Virginia

501C	D BMW	488.01	2.5	600.0	20	603.69	6/24/2014
601	D BMW	485.31	4	350.0	59	349.30	7/12/2016
602	D BMW	492.71	4	560.0	79	575.26	6/24/2014
603[2]	D BMW	494.57	8	600.0	FLUTe	NM	--
604[2]	D BMW	646.13	8	603.0	FLUTe	NM	--
605A	D BMW	616.74	2.5	545.0	40	543.62	6/24/2014
605B	D BMW	616.26	2.5	725.0	40	728.05	6/24/2014
606A	D BMW	492.58	2.5	405.0	40	402.11	6/24/2014
606B	D BMW	493.01	2.5	545.0	20	549.95	6/24/2014
133-Off*	I BMW	501.09	6	92.4	--[4]	92.28	6/24/2014
GM-01B*	I BMW	497.56	4	98.9	4	101.00	6/24/2014
GM-02A	S BMW	492.05	4	100.0	73	103.11	6/24/2014
GM-02B	I BMW	492.99	4	161.9	63	160.34	6/24/2014
GM-09	I BMW	507.70	4	147.0	99	113.20	6/24/2014
MW-03R[1]	S BMW	527.69	2	51.0	11	50.52	6/24/2014
MW-06*	S BMW	502.42	4	39.1	5	38.35	6/24/2014
MW-09	OMW	521.19	4	42.9	15	42.85	6/24/2014
MW-10	OMW	524.46	4	53.4	15	53.40	6/24/2014
PW-0	I BMW	508.25	6	158.0	125	119.00	6/24/2014
PW-01*	I BMW	508.08	6	162.0	99	137.90	3/21/2017
PW-02	I BMW	497.37	6	150.0	107	166.91	7/7/2015
PW-04*	I BMW	495.77	6	158.0	115	151.00	6/24/2014
PZ-03*	S BMW	474.64	4	19.2	6	19.18	6/24/2014
PZ-05*	S BMW	477.97	4	21.3	12	21.43	6/24/2014
PZ-06	S BMW	478.49	4	25.0	11	25.14	6/24/2014
PZ-09*	S BMW	478.72	4	27.7	5	27.67	6/24/2014
TW-01	D BMW	497.40	8	297.3	260	NM	--
TW-02	D BMW	526.11	8	300.0	240	NM	--
TW-03	D BMW	484.71	8	500.0	350	NM	--
WP-10	OMW	524.30	2	25.3	10	25.15	6/24/2014
WP-11	OMW	524.88	2	20.6	10	20.05	6/24/2014
WP-12R[1]*	OMW	531.49	2	41.0	10	45.65	6/24/2014

NOTES:

OMW - Overburden Monitoring Well; monitoring interval is a PVC machine-slotted well screen
S BMW - Shallow Bedrock Monitoring Well; monitoring interval is an open borehole
I BMW - Intermediate Bedrock Monitoring Well; monitoring interval is an open borehole
D BMW - Deep Bedrock Monitoring Well; monitoring interval is an open borehole
amsl - above mean sea level
bre - below reference elevation
NM - Not measured
-- - Information not available
* - denotes wells monitored for water level only (no sample collection)
[1] - Wells 116, MW-03, and WP-12 were abandoned and re-installed in 2012.
[2] - Well fitted with FLUTe sampler with multiple sample ports in 4 zones.
[3] - Monitoring interval is not available for former residential wells located in Rivermont or Fiddler's

TABLE 2

Monitoring Well Construction Details for the OU-10 Monitoring Network
2017 Annual Site-Wide Groundwater, Surface Water, and Sediment Monitoring Report for OU-7, OU-10, and NTCRA Basins
Avtex Fibers Superfund Site
Front Royal, Virginia

Well ID	Well Type	Measuring Point Elevation (feet amsl)	Well Diameter (inches)	Constructed Depth (feet bre)	Monitoring Interval Length (feet)	Measured Depth to Bottom	Date Meausred
GPW-02	OMW	535.48	1	23.0	5	26.13	7/7/2015
GPW-03R	OMW	541.04	2	28.0	5	30.77	7/7/2015
GPW-14	OMW	512.47	1	9.5	5	12.11	7/16/2014
GPW-15R	OMW	505.84	2	21.5	5	23.25	7/16/2014
GPW-16R*	OMW	535.41	2	26.0	5	27.56	7/12/2016
GPW-17*	OMW	529.59	1	20.0	5	22.15	7/12/2016
GPW-18*	OMW	526.57	1	22.0	5	24.25	7/12/2016
GPW-19	OMW	532.31	1	18.5	5	19.8	7/16/2014
GPW-20	OMW	530.88	1	19.0	5	20.00	7/16/2014
GPW-21*	OMW	528.78	1	16.0	5	17.91	7/16/2014
MW-11	OMW	525.83	4	30.0	10	32.31	7/16/2014
MW-12	OMW	506.53	4	13.0	5	17.35	7/16/2014
118	S BMW	532.12	4	48.0	21	50.9	7/12/2016
119	S BMW	511.69	4	35.0	20	39.3	7/12/2016
120R	S BMW	504.81	4	38.0	20	40.31	7/16/2014
128	S BMW	518.37	2	47.5	10	47.50	6/24/2014
130R	S BMW	527.94	2	46.0	10	48.4	7/12/2016
132	S BMW	506.30	2	30.0	10	33.4	7/12/2016
133	S BMW	528.16	4	42.9	20	43.00	6/24/2014
134*	S BMW	528.76	4	52.0	24	46.00	6/24/2014
135	S BMW	527.03	4	46.3	20	45.95	7/16/2014
MW-05	S BMW	493.18	4	30.0	8	35.28	7/7/2015
MW-07	S BMW	532.24	2	40.0	5	44.55	7/12/2016
MW-08	S BMW	529.14	2	40.0	5	44.34	7/16/2014

NOTES:
OMW - Overburden Monitoring Well; monitoring interval is a PVC machine-slotted well screen
S BMW - Shallow Bedrock Monitoring Well; monitoring interval is an open borehole
amsl - above mean sea level
bre - below reference elevation
NM - Not Measured
* - denotes wells monitored for water level only (no sample collection)

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TABLE 3

Monitoring Well Construction Details for the NTCRA Basins Monitoring Network
2017 Annual Site-Wide Groundwater, Surface Water, and Sediment Monitoring Report for OU-7, OU-10, and NTCRA Basins
Avtex Fibers Superfund Site,
Front Royal, Virginia

Well ID	Well Type	Measuring Point Elevation (feet amsl)	Well Diameter (inches)	Constructed Depth (feet bre)	Monitoring Interval Length (feet)	Measured Depth to Bottom	Date Meausred
008	OMW	530.03	2	16.5	5	NM	
012	OMW	508.59	2	37.6	10	37.70	7/16/2014
013	OMW	512.85	2	37.9	10	37.30	7/16/2014
014R	OMW	511.16	2	34.3	10	33.40	7/16/2014
022	OMW	478.24	2	9.9	5	9.95	7/16/2014
023	OMW	474.66	2	7.6	3	7.47	7/16/2014
025R	OMW	475.18	2	7.0	2	7.46	7/16/2014
029	OMW	530.66	2	22.0	10	22.00	7/16/2014
B-48A	OMW	515.54	1	38.7	8	38.42	7/16/2014
MW-12	OMW	506.53	4	13.0	5	17.35	7/16/2014
108	S BMW	526.85	4	45.0	20	NM	--
110	S BMW	479.88	4	40.3	21	40.00	7/16/2014
112	S BMW	511.25	4	65.5	20	85.75	7/16/2014
113	S BMW	510.67	4	64.8	20	NM	--
114	S BMW	511.92	4	60.1	20	59.74	7/16/2014
129	S BMW	530.69	2	46.2	10	46.25	7/16/2014
132	S BMW	506.30	2	30.0	10	33.4	7/12/2106
PZ-03	S BMW	474.64	4	19.2	6	19.30	7/16/2014
PZ-06	S BMW	478.49	4	25.0	11	25.25	7/16/2014
PZ-07	S BMW	479.45	4	25.4	10	25.15	7/16/2014
FAB 1-2	Sump	--	--	--	--	9.4	7/16/2014
FAB 3-1	Sump	--	--	--	--	7.00	7/16/2014
FAB 6-North	Sump	--	--	--	--	9.84	7/16/2014
FAB 6-South	Sump	--	--	--	--	9.88	7/16/2014
SB 1-1	Sump	--	--	--	--	11.37	7/16/2014
SB 1-2	Sump	--	--	--	--	5.80	7/16/2014
SB 1-3	Sump	--	--	--	--	10.90	7/16/2014
SB 1-4	Sump	--	--	--	--	13.55	7/16/2014
SB 3-1	Sump	--	--	--	--	8.90	7/16/2014
SB 4-1 (NW)	Sump	--	--	--	--	8.25	7/16/2014
SB 4-2 (SE)	Sump	--	--	--	--	12.37	7/16/2014

NOTES:
OMW - Overburden Monitoring Well; monitoring interval is a PVC machine-slotted well screen
S BMW - Shallow Bedrock Monitoring Well; monitoring interval is an open borehole
amsl - above mean sea level
bre - below reference elevation
NM - Not Measured
-- - Information not available

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TABLE 4

Monitoring Well Purging and Sampling Details for the OU-7 Monitoring Network

2017 Annual Site-Wide Groundwater, Surface Water, and Sediment Monitoring Report for OU-7, OU-10, and NTCRA Basins

Avtex Fibers Superfund Site

Front Royal, Virginia

Well ID	Constructed Depth (feet bre)	Well Diameter (inches)	Screen Interval Length (feet)	Date Sampled	Static DTW (prior to sampling) (feet bre)	Well Volume (gallons) [5]	Sustainable Flow Rate (ml/min)	DTW at Sustainable Flow Rate (feet)	Purge Equipment	Pump Placement (feet bre)	Total Time Purged (minutes)	Purge Method [6]
005	34.4	2	10	Not enough water to sample								
024	11.3	2	5	7/28/2017	7.80	0.6	NA (Purged Dry)	NA	Peristaltic Pump	11	4	Method 3
029[1]	22.0	2	10	7/25/2017	12.39	1.6	150	12.40	Peristaltic Pump	16	26	Standard
103	40.0	4	16	7/25/2017	0.94	25.7	200	0.94	Peristaltic Pump	32	50	Standard
105	51.5	4	11	7/29/2017	33.25	12.0	120	33.26	Double Valve Pump	46	35	Standard
114[1]	60.1	4	20	8/1/2017	25.58	22.7	100	26.12	Peristaltic Pump	50	36	Method 2A
115	44.4	4	26	7/18/2017	20.39	15.8	NA (Purged Dry)	NA	Sub. Electric Pump	44	20	Method 3
116 R	93.5	2	20	7/14/2017	67.70	4.2	100	71.47	Double Valve Pump	84	70	Method 2A
128[2]	47.5	2	10	7/25/2017	6.60	6.7	225	6.64	Peristaltic Pump	40	70	Standard
132[3]	30.0	2	10	7/27/2017	6.38	3.9	120	6.38	Peristaltic Pump	25	40	Standard
133[2]	42.9	4	20	7/26/2017	28.84	9.2	130	29.48	Double Valve Pump	35	50	Method 3 (MOD)
136	200.5	6	unknown	7/19/2017	22.70	167.2	125	23.75	Double Valve Pump	190	25	Method 2A
138	84.0	2	30	7/30/2017	22.78	10.0	150	22.81	Double Valve Pump	69	50	Standard
162	60.5	6	unknown	7/16/2017	20.15	30.9	200	20.2	Double Valve Pump	53	60	Standard
181	175.8	6	unknown	7/18/2017	23.46	223.6	200	24.14	Double Valve Pump	165	35	Method 2A
185	72.0	6	unknown	7/18/2017	21.22	74.5	105	21.5	Double Valve Pump	67	58	Standard
203	180.9	4	28	7/25/2017	2.20	117.4	280	2.20	Double Valve Pump	166	55	Standard
205	182.0	4	27	7/31/2017	61.94	78.9	100	63.68	Double Valve Pump	168	85	Method 2A
206	215.0	2	20	7/13/2017	27.55	30.6	100	28.10	Double Valve Pump (Dedicated)	208	50	Method 2A
210	102.3	4	22	7/27/2017	10.30	60.4	150	10.3	Peristaltic Pump	91	35	Standard
215	187.6	4	23	7/18/2017	48.54	91.4	NA (purge to screen)	NA	Sub. Electric Pump / Double Valve Pump	175	2 days	Method 2
216	185.4	4	20	7/15/2017	109.40	49.9	100	110.55	Double Valve Pump	175	30	Method 2A
232	145.8	2	20	7/27/2017	30.53	18.8	100	39.78	Double Valve Pump	135	100	Method 2A
238	174.2	2	20	7/30/2017	31.31	23.3	100	40.44	Double Valve Pump	164	80	Method 2A
301	250.0	4	20	7/25/2017	12.00	156.4	100	14.11	Double Valve Pump (Dedicated)	240	72	Method 2A
305	304.8	4	20	8/8/2017	76.95	149.7	NA (purge to screen)	NA	Sub. Electric Pump / Double Valve Pump	295	2 Days	Method 4
306	287.0	2	30	12/20/2017	172.00	18.7	NA (purge to screen)	NA	Double Valve Pump (Dedicated)	272	2 Days	Method 4
316	250.0	4	20	7/15/2017	154.75	62.6	100	154.97	Double Valve Pump (Dedicated)	240	40	Standard
336	280.0	4	40	7/18/2017	36.18	160.2	200	37.53	Double Valve Pump (Dedicated)	260	60	Method 2A
338	293.0	2	30	7/30/2017	43.91	40.6	100	62.41	Double Valve Pump (Dedicated)	278	150	Method 2A
501 A	350.0	2	20	7/17/2017	84.60	43.3	100	90.52	Double Valve Pump (Dedicated)	340	65	Method 2A
501 B	495.0	2.5	20	7/17/2017	96.05	101.7	100	96.9	Double Valve Pump (Dedicated)	485	40	Method 2A
501 C	600.0	2.5	20	7/17/2017	48.97	140.5	100	52.95	Double Valve Pump (Dedicated)	590	40	Method 2A
601	350.0	4	59	8/10/2017	16.28	219.3	100	19.90	Double Valve Pump (Dedicated)	320.5	100	Method 2A
602	560.0	4	79	7/16/2017	26.60	350.4	100	27.58	Double Valve Pump (Dedicated)	520.5	35	Method 2A
603	600.0	8	FLUTe™	7/18/2017	26.67	NA	NA	NA	NA	NA	NA	Grab
604	603.0	8	FLUTe™	7/17/2017	121.72	NA	NA	NA	NA	NA	NA	Grab
605 A	545.0	2.5	40	7/14/2017	186.90	91.3	100	188.1	Double Valve Pump (Dedicated)	525	2 Days	Method 2A
605 B	725.0	2.5	40	7/13/2017	697.00	7.1	100	699.15	Double Valve Pump (Dedicated)	707	158	Method 1
606 A	404.0	2.5	40	7/15/2017	21.74	97.5	100	22.13	Double Valve Pump (Dedicated)	384	25	Method 2A
606 B	544.0	2.5	20	7/17/2017	163.08	97.1	100	163.15	Double Valve Pump (Dedicated)	534	136	Standard
GM-02 A	100.0	4	73	7/19/2017	35.23	42.6	130	35.95	Double Valve Pump	65	30	Method 3 (MOD)

TABLE 4

Monitoring Well Purging and Sampling Details for the OU-7 Monitoring Network

2017 Annual Site-Wide Groundwater, Surface Water, and Sediment Monitoring Report for OU-7, OU-10, and NTCRA Basins

Avtex Fibers Superfund Site

Front Royal, Virginia

Well ID	Constructed Depth (feet bre)	Well Diameter (inches)	Screen Interval Length (feet)	Date Sampled	Static DTW (prior to sampling) (feet bre)	Well Volume (gallons) [5]	Sustainable Flow Rate (ml/min)	DTW at Sustainable Flow Rate (feet)	Purge Equipment	Pump Placement (feet bre)	Total Time Purged (minutes)	Purge Method [6]
GM-02 B	161.9	4	63	7/19/2017	38.82	80.9	130	39.41	Double Valve Pump	131	55	Method 2A
GM-09	147.0	4	99	7/30/2017	39.47	70.6	100	39.51	Double Valve Pump	99	41	Standard
MW-03 R	51.0	2	11	7/28/2017	41.72	1.5	100	41.93	Double Valve Pump	46	30	Standard
MW-09	42.9	4	15	7/31/2017	17.65	16.6	100	22.22	Peristaltic Pump	36	100	Method 2A
MW-10	53.4	4	15	7/31/2017	44.00	6.2	100	44.84	Double Valve Pump	50	135	Method 3 (MOD)
PW-0	158.0	6	125	7/30/2017	36.49	178.4	100	36.57	Double Valve Pump	100	41	Standard
PW-02	150.0	6	107	7/29/2017	77.92	105.8	130	78.11	Double Valve Pump	96	70	Method 3 (MOD)
PZ-06[1]	25.0	4	11	7/31/2017	12.27	8.4	100	13.92	Peristaltic Pump	20	55	Method 2A
TW-01[4]	297.3	8	260	8/1/2017	NA	NA	NA	NA	NA	NA	NA	Grab
TW-02[4]	300.0	8	240	8/1/2017	NA	NA	NA	NA	NA	NA	NA	Grab
TW-03[4]	500.0	8	350	8/1/2017	NA	NA	NA	NA	NA	NA	NA	Grab
WP-10	25.3	2	10	7/28/2017	15.57	1.6	110	15.74	Peristaltic Pump	20	36	Standard
WP-11	20.6	2	10	7/27/2017	12.62	1.3	NA (Purged Dry)	NA	Peristaltic Pump	20	70	Method 3

Notes:

NA - Unavailable or not applicable.

[1] - Well is sampled concurrently with the Basins Monitoring Program.

[2] - Well is sampled concurrently with the OU-10 Monitoring Program.

[3] - Well is sampled concurrently with the OU-10 and Basins Monitoring Programs.

[4] - Extraction pumps have been installed in these wells.

[5] - Well volume calculations based on: 2" well volume = feet x 0.163 2.5" well volume = feet x 0.255 4" well volume = feet x 0.657 6" well volume = feet x 1.468 8" well volume = feet x 2.61

[6] - Well sampled utilizing standard low-flow purging techniques or an alternative method, if applicable.

- Alternative Method 1 - Less than half the casing volume is above the well screen/open interval (at least one casing volume removed).
- Alternative Method 2 - More than half the casing volume is located above the well screen/open interval (at least one casing volume removed).
- Alternative Method 2a - Used when water level stabilizes prior to reaching the top of the well screen.
- Alternative Method 3 - Well screened across the water table. Water level did not stabilize so well purged dry.
- Alternative Method 3 (MOD) - Well screened across the water table but water level stabilized within the screened zone.
- Alternative Method 4 - Low recharge well not screened across the water table. Well purged to top of screen.

TABLE 5
Monitoring Well Purging and Sampling Details for the OU-10 Monitoring Network
2017 Annual Site-Wide Groundwater, Surface Water, and Sediment Monitoring Report for OU-7, OU-10, and NTCRA Basins
Avtex Fibers Superfund Site
Front Royal, Virginia

Well ID	Constructed Depth (feet bre)	Well Diameter (inches)	Screen Interval Length (feet)	Sample Date	Static DTW (feet)	Well Volume (gallons) [4]	Sustainable Flow Rate (ml/min)	DTW at Sustainable Flow Rate (feet bre)	Purge Equipment	Pump Placement (feet bre)	Total Time Purged (minutes)	Purge Method [5]
118	48.0	4	21	7/26/2017	17.10	20.3	150	17.3	Double Valve Pump	38	65	Standard
119	35.0	4	20	7/26/2017	7.17	18.3	120	10.1	Peristaltic Pump	29	70	Method 2A
120 R	38.0	4	20	7/26/2017	4.31	22.1	130	4.48	Peristaltic Pump	28	35	Standard
128[1]	47.5	2	10	7/25/2017	6.60	6.7	225	6.64	Peristaltic Pump	40	70	Standard
130 R	46.0	2	10	7/27/2017	21.26	4.0	250	21.33	Double Valve Pump	41	75	Standard
132[2]	30.0	2	10	7/27/2017	6.38	3.9	120	6.38	Peristaltic Pump	25	40	Standard
133[1]	42.9	4	20	7/26/2017	28.84	9.2	130	29.48	Double Valve Pump	35	50	Method 3 (MOD)
135	46.3	4	20	8/1/2017	23.58	14.9	100	24.04	Peristaltic Pump	36	33	Method 2A
GPW-02	23.0	1	5	7/25/2017	22.98	0.0	NA (Purged Dry)	NA	Peristaltic Pump	23	1	Method 3
GPW-03 R	28.0	2	5	7/24/2017	22.13	1.0	100	22.53	Peristaltic Pump	25.5	25	Method 2A
GPW-14	9.5	1	5	7/27/2017	8.52	0.0	NA (Purged Dry)	NA	Peristaltic Pump	9	2	Method 3
GPW-15 R	21.5	2	5	7/29/2017	13.07	1.4	NA (Purged to Screen)	NA	Peristaltic Pump	21	5	Method 2
GPW-19	18.5	1	5	DRY	Not Sampled							
GPW-20	19.0	1	5	DRY	Not Sampled							
MW-05	30.0	4	8	7/26/2017	10.98	12.5	120	12.6	Peristaltic Pump	26	55	Method 2A
MW-07	40.0	2	5	7/29/2017	27.62	2.0	120	27.64	Double Valve Pump	37.5	35	Standard
MW-08	40.0	2	5	7/29/2017	25.75	2.3	110	25.92	Double Valve Pump	37.5	70	Standard
MW-11	30.0	4	10	7/31/2017	27.16	1.9	100	27.41	Peristaltic Pump	29	100	Standard
MW-12[3]	13.0	4	5	7/29/2017	11.79	0.8	NA (Purged Dry)	NA	Peristaltic Pump	12.5	3	Method 3

Notes:
NA - Unavailable or not applicable.
[1] - Well is sampled concurrently with the OU-7 Monitoring Program.
[2] - Well is sampled concurrently with the OU-7 and Basins Monitoring Programs.
[3] - Well is sampled concurrently with the Basins Monitoring Program.
[4] - Well volume calculations based on: 1" well volume = feet x 0.041 2" well volume = feet x 0.163 4" well volume = feet x 0.657
[5] - Well sampled utilizing standard low-flow purging techniques or an alternative method, if applicable.
- Alternative Method 2 - More than half the casing volume is located above the well screen/open interval (at least one casing volume removed).
- Alternative Method 2a - Used when water level stabilizes prior to reaching the top of the well screen.
- Alternative Method 3 - Well screened across the water table. Water level did not stabilize so well purged dry.
- Alternative Method 3 (MOD) - Well screened across the water table but water level stabilized within the screened zone.
- Alternative Method 4 - Low recharge well not screened across the water table. Well purged dry.

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TABLE 6
Monitoring Well Purging and Sampling Details for the NTCRA Basins
2017 Annual Site-Wide Groundwater, Surface Water, and Sediment Monitoring Report for OU-7, OU-10, and NTCRA Basins
Avtex Fibers Superfund Site,
Front Royal, Virginia

Well ID	Constructed Depth (feet bre)	Well Diameter (inches)	Screen Interval Length (feet)	Date	Static DTW (feet)	Well Volume (gallons) [4]	Sustainable Flow Rate (ml/min)	DTW at Sustainable Flow Rate (feet bre)	Purge Equipment	Pump Placement (feet bre)	Total Time Purged (minutes)	Purge Method [5]
008	16.5	2	5	7/25/2017	13.45	0.5	NA (Purged Dry)	NA	Peristaltic Pump	16.5	5	Method 3
012	37.6	2	10	7/29/2017	16.55	3.4	100	17.41	Peristaltic Pump	33	61	Method 2A
013	37.9	2	10	7/29/2017	24.57	2.2	100	24.77	Peristaltic Pump	32	30	Standard
014 R	34.3	2	10	7/30/2017	14.65	3.2	100	15.91	Peristaltic Pump	29	30	Method 2A
022	9.9	2	5	7/28/2017	9.60	0.0	NA (Purged Dry)	NA	Peristaltic Pump	9.8	1	Method 3
023	7.6	2	3	7/28/2017	6.50	0.2	NA (Purged Dry)	NA	Peristaltic Pump	7.5	2	Method 3
025 R	7.0	2	2	7/28/2017	7.22	0.0	100	7.27	Peristaltic Pump	7	28	Standard
029[1]	22.0	2	10	7/25/2017	12.39	1.6	150	12.40	Peristaltic Pump	16	26	Standard
108	45.0	4	20	7/25/2017	13.09	21.0	100	13.39	Peristaltic Pump	35	175	Standard
110	40.3	4	21	7/27/2017	9.35	20.3	120	10.77	Peristaltic Pump	30	51	Method 2A
112	65.5	4	20	7/29/2017	15.45	32.9	100	15.50	Peristaltic Pump	56	51	Standard
113	64.8	4	20	7/25/2017	19.26	29.9	120	21.76	Peristaltic Pump	55	125	Method 2A
114[1]	60.1	4	20	8/1/2017	25.58	22.7	100	26.12	Peristaltic Pump	50	36	Method 2A
129	46.2	2	10	7/26/2017	11.57	5.6	120	19.91	Peristaltic Pump	42	150	Method 2A
132[3]	30.0	2	10	7/27/2017	6.38	3.9	120	6.38	Peristaltic Pump	25	40	Standard
B-48 A	38.7	1	8	7/26/2017	21.51	0.7	100	23.5	Peristaltic Pump	35	83	Method 2A
MW-12[2]	13.0	4	5	7/29/2017	11.79	0.8	NA (Purged Dry)	NA	Peristaltic Pump	12.5	3	Method 3
PZ-03	19.2	4	6	7/27/2017	6.11	8.6	100	6.37	Peristaltic Pump	16	45	Standard
PZ-06[1]	25.0	4	11	7/31/2017	12.27	8.4	100	13.92	Peristaltic Pump	20	55	Method 2A
PZ-07	25.4	4	10	7/28/2017	9.47	10.5	100	10.95	Peristaltic Pump	20	50	Method 2A

Notes:
NA - Unavailable or not applicable.
[1] - Well is sampled concurrently with the OU-7 Monitoring Program.
[2] - Well is sampled concurrently with the OU-10 Monitoring Program.
[3] - Well is sampled concurrently with the OU-7 and OU-10 Monitoring Programs.
[4] - Well volume calculations based on: 1" well volume = feet x 0.041 2" well volume = feet x 0.163 4" well volume = feet x 0.657
[5] - Well sampled utilizing standard low-flow purging techniques or an alternative method, if applicable.
- Alternative Method 2 - More than half the casing volume is located above the well screen/open interval (at least one casing volume removed).
- Alternative Method 2a - Used when water level stabilizes prior to reaching the top of the well screen.
- Alternative Method 3 - Well screened across the water table. Water level did not stabilize so well purged dry.
- Alternative Method 4 - Low recharge well not screened across the water table. Well purged dry.

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TABLE 7

OU-7 Groundwater Elevation Measurements
2017 Annual Site-Wide Groundwater, Surface Water, and Sediment Monitoring Report for OU-7, OU-10, and NTCRA Basins
Avtex Fibers Superfund Site
Front Royal, Virginia

Well ID	Well Diameter (inches)	Baseline Groundwater Elevation (March 18, 2015)	Measuring Point Elevation post July 2016 (feet amsl)	Measuring Point Elevation post June 2017 (feet amsl)	3/21/17-3/22/17			7/11/2017			9/21/2017			12/19/2017		
					Depth To Water (feet bre)	Groundwater Elevation (feet amsl)	Drawdown (feet)	Depth To Water (feet bre)	Groundwater Elevation (feet amsl)	Drawdown (feet)	Depth To Water (feet bre)	Groundwater Elevation (feet amsl)	Drawdown (feet)	Depth To Water (feet bre)	Groundwater Elevation (feet amsl)	Drawdown (feet)
Overburden Monitoring Wells																
005	2	463.81	492.24	492.24	33.92	458.32	5.49	33.50	458.74	5.07	33.61	458.63	5.18	33.83	458.41	5.40
012*	2	495.15	508.59	508.59	14.80	493.79	1.36	16.13	492.46	2.69	16.53	492.06	3.09	16.65	491.94	3.21
014R*	2	502.18	511.16	511.16	12.49	498.67	3.51	14.54	496.62	5.56	16.35	494.81	7.37	16.06	495.10	7.08
024	2	470.84	479.05	479.05	9.67	469.38	1.46	10.52	468.53	2.31	10.90	468.15	2.69	10.83	468.22	2.62
029	2	520.95	530.66	530.66	10.49	520.17	0.78	12.14	518.52	2.43	11.91	518.75	2.20	12.48	518.18	2.77
MW-09	4	507.09	521.19	521.19	15.63	505.56	1.53	17.75	503.44	3.65	16.75	504.44	2.65	16.73	504.46	2.63
MW-10	4	486.27	524.46	524.46	43.23	481.23	5.04	43.65	480.81	5.46	42.77	481.69	4.58	42.97	481.49	4.78
WP-10	2	513.15	524.30	524.30	12.76	511.54	1.61	15.64	508.66	4.49	15.37	508.93	4.22	15.40	508.90	4.25
WP-11	2	513.09	524.88	524.88	12.18	512.70	0.39	12.38	512.50	0.59	12.12	512.76	0.33	12.74	512.14	0.95
WP-12R*	2	505.82	531.49	531.49	29.11	502.38	3.44	30.34	501.15	4.67	30.75	500.74	5.08	31.45	500.04	5.78
Shallow Bedrock Monitoring Wells																
103	4	522.43	524.22	524.22	2.52	521.70	0.73	3.95	520.27	2.16	3.80	520.42	2.01	4.45	519.77	2.66
105	4	472.83	500.52	500.52	33.70	466.82	6.01	34.03	466.49	6.34	32.88	467.64	5.19	33.04	467.48	5.35
110*	4	473.01	479.88	479.88	8.69	471.19	1.82	9.16	470.72	2.29	9.63	470.25	2.76	9.51	470.37	2.64
112*	4	498.61	511.25	511.25	13.51	497.74	0.87	15.07	496.18	2.43	15.39	495.86	2.75	15.43	495.82	2.79
114	4	492.52	511.92	511.92	24.10	487.82	4.70	25.64	486.28	6.24	25.12	486.80	5.72	25.25	486.67	5.85
115	4	485.02	500.90	500.90	19.51	481.39	3.63	20.34	480.56	4.46	24.91	475.99	9.03	21.31	479.59	5.43
116R	2	479.09	532.14	532.14	67.38	464.76	14.33	67.75	464.39	14.70	62.81	469.33	9.76	62.12	470.02	9.07
128	2	514.58	518.37	518.37	4.98	513.39	1.19	6.00	512.37	2.21	5.46	512.91	1.67	6.02	512.35	2.23
129*	2	522.68	530.69	530.69	9.53	521.16	1.52	11.26	519.43	3.25	11.02	519.67	3.01	11.69	519.00	3.68
132	2	506.30	506.30	506.30	3.96	502.34	3.96	2.80	503.50	2.80	1.86	504.44	1.86	0.30	506.00	0.30
133	4	506.95	528.16	528.16	26.21	501.95	5.00	28.05	500.11	6.84	24.36	503.80	3.15	24.54	503.62	3.33
135*	4	506.32	527.03	527.03	22.42	504.61	1.71	23.55	503.48	2.84	23.00	504.03	2.29	23.47	503.56	2.76
138	2	489.27	503.81	503.81	21.48	482.33	6.94	22.66	481.15	8.12	21.22	482.59	6.68	21.58	482.23	7.04
162	6	471.61	489.80	489.80	20.00	469.80	1.81	20.12	469.68	1.93	20.50	469.30	2.31	20.52	469.28	2.33
185	6	473.36	492.69	492.69	20.78	471.91	1.45	21.04	471.65	1.71	21.54	471.15	2.21	21.70	470.99	2.37
GM-02A	4	471.57	492.05	492.05	35.08	456.97	14.60	35.32	456.73	14.84	32.11	459.94	11.63	32.37	459.68	11.89
MW-03R	2	496.68	527.69	527.69	40.26	487.43	9.25	42.32	485.37	11.31	32.93	494.76	1.92	33.30	494.39	2.29
MW-06*	4	473.68	502.42	502.42	33.88	468.54	5.14	33.48	468.94	4.74	33.65	468.77	4.91	33.86	468.56	5.12
PZ-03*	4	470.47	474.64	474.64	5.48	469.16	1.31	5.81	468.83	1.64	6.26	468.38	2.09	6.20	468.44	2.03
PZ-05*	4	471.09	477.97	477.97	8.69	469.28	1.81	8.88	469.09	2.00	9.17	468.80	2.29	9.20	468.77	2.32
PZ-06	4	471.13	478.49	478.49	12.50	465.99	5.14	12.42	466.07	5.06	12.06	466.43	4.70	12.17	466.32	4.81
PZ-09*	4	472.04	478.72	478.72	10.24	468.48	3.56	10.46	468.26	3.78	10.16	468.56	3.48	10.25	468.47	3.57
Intermediate Bedrock Monitoring Wells																
133-Off*	6	493.52	500.09	500.09	6.48	493.61	-0.09	7.87	492.22	1.30	8.11	491.98	1.54	8.64	491.45	2.07
136	6	481.58	496.05	496.05	18.20	477.85	3.73	23.41	472.64	8.94	22.85	473.20	8.38	23.06	472.99	8.59
141*	6	471.88	491.50	491.50	21.78	469.72	2.16	21.90	469.60	2.28	22.11	469.39	2.49	22.18	469.32	2.56
181	6	472.72	492.70	492.70	22.81	469.89	2.83	23.35	469.35	3.37	23.41	469.29	3.43	23.18	469.52	3.20
203	4	525.77	525.77	525.77	0.96	525.77	0.00	-2.69	528.46	-2.69	2.17	523.60	2.17	2.79	522.98	2.79
205	4	471.96	499.42	499.42	65.30	434.12	37.84	67.50	431.92	40.04	55.32	444.10	27.86	55.44	443.98	27.98
206 [1]	2	471.80	495.81	495.83	26.89	468.92	2.88	27.09	468.74	3.06	27.05	468.78	3.02	27.12	468.71	3.09
210	4	472.83	480.33	480.33	9.58	470.75	2.08	10.01	470.32	2.51	10.50	469.83	3.00	10.38	469.95	2.88
215	4	402.14	500.83	500.83	64.91	435.92	-33.78	48.60	452.23	-50.09	112.15	388.68	13.46	75.35	425.48	-23.34
216	4	460.53	532.34	532.34	105.10	427.24	33.29	127.70	404.64	55.89	72.08	460.26	0.27	73.38	458.96	1.57
232	2	486.57	505.52	505.52	32.15	473.37	13.20	32.24	473.28	13.29	26.56	478.96	7.61	27.27	478.25	8.32
238	2	481.90	503.38	503.38	31.17	472.21	9.69	32.62	470.76	11.14	28.53	474.85	7.05	29.07	474.31	7.59
GM-01B*	4	472.02	497.56	497.56	31.04	466.52	5.50	31.28	466.28	5.74	31.30	466.26	5.76	31.42	466.14	5.88
GM-02B	4	471.45	492.99	492.99	38.45	454.54	16.91	38.81	454.18	17.27	35.49	457.50	13.95	35.41	457.58	13.87

TABLE 7

OU-7 Groundwater Elevation Measurements
2017 Annual Site-Wide Groundwater, Surface Water, and Sediment Monitoring Report for OU-7, OU-10, and NTCRA Basins
Avtex Fibers Superfund Site
Front Royal, Virginia

Well ID	Well Diameter (inches)	Baseline Groundwater Elevation (March 18, 2015)	Measuring Point Elevation post July 2016 (feet amsl)	Measuring Point Elevation post June 2017 (feet amsl)	3/21/17-3/22/17			7/11/2017			9/21/2017			12/19/2017		
					Depth To Water (feet bre)	Groundwater Elevation (feet amsl)	Drawdown (feet)	Depth To Water (feet bre)	Groundwater Elevation (feet amsl)	Drawdown (feet)	Depth To Water (feet bre)	Groundwater Elevation (feet amsl)	Drawdown (feet)	Depth To Water (feet bre)	Groundwater Elevation (feet amsl)	Drawdown (feet)
GM-09R	4	472.34	507.70	507.70	40.33	467.37	4.97	40.61	467.09	5.25	39.48	468.22	4.12	40.08	467.62	4.72
PW-0	6	476.94	508.25	508.25	36.55	471.70	5.24	37.25	471.00	5.94	36.25	472.00	4.94	36.39	471.86	5.08
PW-01*	6	472.77	508.08	508.08	41.05	467.03	5.74	41.35	466.73	6.04	40.55	467.53	5.24	40.66	467.42	5.35
PW-02	6	470.32	497.37	497.37	81.20	416.17	54.15	82.92	414.45	55.87	69.68	427.69	42.63	73.40	423.97	46.35
PW-04*	6	474.53	495.77	495.77	21.43	474.34	0.19	21.95	473.82	0.71	22.25	473.52	1.01	22.40	473.37	1.16
Deep Bedrock Monitoring Wells																
091*	6	540.38	611.46	611.46	72.18	539.28	1.10	71.84	539.62	0.76	73.20	538.26	2.12	74.52	536.94	3.44
301 [1]	4	542.21	552.19	552.19	10.78	541.41	0.80	12.44	539.75	2.46	12.58	539.61	2.60	13.13	539.06	3.15
303*	4	519.13	522.62	522.62	0.80	521.82	-2.69	-0.75	523.37	-4.24	1.40	521.22	-2.09	1.97	520.65	-1.52
305	4	463.80	502.00	502.00	64.37	437.63	26.17	63.36	438.64	25.16	60.57	441.43	22.37	59.62	442.38	21.42
306 [1]	2	406.99	495.62	495.64	170.83	324.79	82.20	126.18	369.46	37.53	214.57	281.07	125.92	172.40	323.24	83.75
315*	4	319.85	500.88	500.88	175.80	325.08	-5.23	175.14	325.74	-5.89	174.75	326.13	-6.28	174.25	326.63	-6.78
316 [1]	4	421.13	532.67	532.67	86.69	445.98	-24.85	157.65	375.02	46.11	58.07	474.60	-53.47	69.38	463.29	-42.16
336 [1]	4	471.11	492.17	492.17	35.83	456.34	14.77	36.15	456.02	15.09	33.67	458.50	12.61	33.56	458.61	12.50
338 [1]	2	476.42	503.27	503.29	46.60	456.67	19.75	49.58	453.71	22.71	36.50	466.79	9.63	37.58	465.71	10.71
501A [2]	2	472.31	488.15	488.15	18.25	469.90	2.41	18.32	469.83	2.48	18.62	469.53	2.78	18.47	469.68	2.63
501B [2]	2.5	472.34	488.06	488.06	18.11	469.95	2.39	18.21	469.85	2.49	18.50	469.56	2.78	18.33	469.73	2.61
501C [2]	2.5	473.32	488.04	488.04	19.52	468.52	4.80	18.41	469.63	3.69	19.09	468.95	4.37	18.92	469.12	4.20
601 [2]	4	473.85	485.33	485.33	16.98	468.35	5.50	17.80	467.53	6.32	15.56	469.77	4.08	15.77	469.56	4.29
602 [2]	4	475.41	492.73	492.73	26.58	466.15	9.26	26.48	466.25	9.16	23.61	469.12	6.29	23.58	469.15	6.26
603 [3]	8	---	494.57	494.57	NM	---	---	NM	---	---	NM	---	---	NM	---	---
604 [3]	8	---	646.13	646.13	NM	---	---	NM	---	---	NM	---	---	NM	---	---
605A [4]	2.5	491.08	616.77	616.77	135.47	481.30	9.78	135.68	481.09	9.99	22.15	594.62	-103.54	135.41	481.36	9.72
605B [2]	2.5	-59.92	616.29	616.29	686.24	-69.95	10.03	684.50	-68.21	8.29	698.85	-82.56	22.64	698.24	-81.95	22.03
606A [2]	2.5	473.22	492.61	492.61	21.55	471.06	2.16	21.65	470.96	2.26	134.78	357.83	115.39	21.85	470.76	2.46
606B	2.5	473.73	493.01	493.01	22.15	470.86	2.87	22.08	470.93	2.80	22.56	470.45	3.28	22.43	470.58	3.15
TW-01 [5]	8	427.40	497.40	497.40	NM	NR	---	NM	416.10	11.30	NM	416.10	---	NM	415.10	---
TW-02 [5]	8	275.10	526.11	526.11	NM	283.40	---	NM	258.30	16.80	NM	Broken Trans.	---	NM	Broken Trans.	---
TW-03 [5]	8	459.40	484.71	484.71	NM	459.90	---	NM	467.10	-7.70	NM	467.10	---	NM	467.40	---

NOTES:
-- - Information not available
NM - Not measured
NR - Not Recorded (level indicator not functioning)
feet bre - feet below reference elevation
feet amsl - feet above mean sea level
* - Denotes wells that were monitored for water level only (no sample collection)
[1] - Dedicated pump installed in June 2017, refference point adjusted based on new well cap at wells: 206, 306, and 338.
[2] - Dedicated pump installed in July 2016
[3] - Well fitted with FLUTe liner, no water level measurement avaialable.

TABLE 8

Operational History for Extraction Wells
2017 Annual Site-Wide Groundwater, Surface Water, and Sediment Monitoring Report for OU-7, OU-10, and NTCRA Basins
Avtex Fibers Superfund Site
Front Royal, Virginia

Well	Parameter	Units	January	February	March	April	May	June	July	August	September	October	November	December	Annual
2017															
TW-01	Operating	Days	31	28	31	30	31	30	31	30	30	31	30	0	333
	Avg. Daily Flow	MGD	0.063	0.062	0.062	0.062	0.063	0.064	0.062	0.059	0.064	0.065	0.063	0.000	0.057
	Monthly Flow	MG	1.97	1.742	1.918	1.865	1.96	1.992	1.937	1.829	1.935	2.004	1.891	0.000	21.043
TW-02	Operating	Days	31	27	31	30	29	30	31	9	15	17	13	0	263
	Avg. Daily Flow	MGD	0.023	0.023	0.024	0.022	0.019	0.027	0.023	0.001	0.001	0.001	0.001	0.000	0.014
	Monthly Flow	MG	0.725	0.357	0.73	0.653	0.587	0.799	0.723	0.019	0.039	0.027	0.017	0.000	4.676
TW-03	Operating	Days	7	6	13	0	3	0	6	5	0	2	0	0	42
	Avg. Daily Flow	MGD	0.003	0.003	0.007	0.000	0.000	0.000	0.001	0.002	0.000	0.001	0.000	0.000	0.001
	Monthly Flow	MG	0.081	0.076	0.215	0.000	0.007	0.000	0.02	0.067	0.000	0.021	0.000	0.000	0.487
Total	Avg. Daily Flow	MGD	0.089	0.088	0.093	0.084	0.082	0.091	0.086	0.062	0.065	0.067	0.064	0	0.073
	Monthly Flow	MG	2.776	2.175	2.863	2.518	2.554	2.791	2.68	1.915	1.974	2.052	1.908	0	26.206
2016															
TW-01	Operating	Days	31	6	9	30	31	30	31	31	30	31	30	31	321
	Avg. Daily Flow	MGD	0.042	0.000	0.014	0.061	0.061	0.060	0.063	0.062	0.063	0.063	0.063	0.063	0.051
	Monthly Flow	MG	1.304	0.010	0.432	1.839	1.904	1.801	1.946	1.937	1.885	1.964	1.889	1.964	18.875
TW-02	Operating	Days	21	27	29	26	31	30	31	31	30	30	30	31	347
	Avg. Daily Flow	MGD	0.016	0.033	0.031	0.019	0.032	0.031	0.030	0.030	0.028	0.027	0.027	0.026	0.028
	Monthly Flow	MG	0.509	0.955	0.956	0.563	0.977	0.921	0.943	0.918	0.845	0.849	0.824	0.808	10.068
TW-03	Operating	Days	2	22	21	0	21	24	24	31	29	28	30	16	248
	Avg. Daily Flow	MGD	0.001	0.016	0.014	0.000	0.020	0.027	0.014	0.031	0.027	0.023	0.026	0.010	0.017
	Monthly Flow	MG	0.023	0.470	0.439	0.000	0.613	0.817	0.428	0.949	0.816	0.728	0.771	0.300	6.354
Total	Avg. Daily Flow	MGD	0.059	0.049	0.059	0.08	0.113	0.118	0.107	0.123	0.118	0.113	0.116	0.099	0.096
	Monthly Flow	MG	1.836	1.435	1.827	2.402	3.494	3.539	3.317	3.804	3.546	3.541	3.484	3.072	35.297
2015															
TW-01	Operating	Days	0	0	3	0	0	23	31	31	30	31	22	24	195
	Avg. Daily Flow	MGD	0	0	0.00048	0	0	0.0303	0.0488	0.0492	0.0515	0.0585	0.0423	0.041	0.0268
	Monthly Flow	MG	0	0	0.015	0	0	0.879	1.514	1.525	1.545	1.812	1.269	1.27	9.829
TW-02	Operating	Days	0	0	29	30	31	21	31	31	30	16	19	29	267
	Avg. Daily Flow	MGD	0	0	0.0197	0.0344	0.0457	0.0234	0.0398	0.0363	0.0345	0.0174	0.0197	0.0332	0.0253
	Monthly Flow	MG	0	0	0.611	1.033	1.417	0.691	1.234	1.126	1.037	0.538	0.59	1.028	9.305
TW-03	Operating	Days	0	0	0	0	0	0	5	24	28	16	7	10	90
	Avg. Daily Flow	MGD	0	0	0	0	0	0	0.002	0.014	0.034	0.018	0.008	0.009	0.0071
	Monthly Flow	MG	0	0	0	0	0	0	0.073	0.448	1.024	0.544	0.241	0.279	2.609
Total	Avg. Daily Flow	MGD	0	0	0.02018	0.0344	0.0457	0.0537	0.0906	0.0995	0.12	0.0939	0.07	0.0832	0.059
	Monthly Flow	MG	0	0	0.626	1.033	1.417	1.57	2.821	3.099	3.606	2.894	2.1	2.577	21.743

Note: In December 2017, a communications failure resulted in no flow being recorded, although the pumps were in operation
MGD = Million Gallons per Day
MG = Million Gallons

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TABLE 9

OU-7 Monitoring Network Sampling Results
2017 Annual Site-Wide Groundwater, Surface Water, and Sediment Monitoring Report for OU-7, OU-10, and NTCRA Basins
Avtex Fibers Superfund Site
Front Royal, Virginia

FMC-Front Royal Avtex Fibers 2017 Sampling Event Validated OU-7 Groundwater Data		Location ID: Sample Name: Well Type: Sample Date:	Groundwater Cleanup Standards[1]		024 2017AN-024 OMW 7/28/2017 & 8/9/2017	029 2017AN-029 OMW 7/25/2017	103 2017AN-103 S BMW 7/25/2017	105 2017AN-105 S BMW 7/29/2017 & 8/8/2017	114 2017AN-114 S BMW 8/1/2017	115 2017AN-115 S BMW 7/18/2017 & 3/8/2018	116R 2017AN-116R S BMW 7/14/2017	128 2017AN-128 S BMW 7/25/2017	132 2017AN-132 S BMW 7/27/2017 & 8/10/2017	132 (DUP) 2017AN-132D S BMW 7/27/2017 & 8/10/2017
CAS NO.	COMPOUND	UNITS:												
	VOLATILES													
67-64-1	Acetone	ug/L	22000	RBC	-- R	2.66 U	2.66 U	-- R	-- R	-- R	26.6 U	2.94 U	2.66 U	2.66 U
75-15-0	Carbon disulfide	ug/L	1000	RBC	0.22 U	0.22 U	0.22 U	0.22 U	**1.85**	0.22 U	**18.2**	0.22 U	0.22 U	0.22 U
	SEMIVOLATILES													
117-81-7	bis(2-Ethylhexyl)phthalate (DEHP)	ug/L	6	MCL	2.87 U	1.44 U	1.44 U	2.1 U	1.67 U	6.29 U	7.5 U	1.44 U	2.24 U	2.38 U
95-48-7	2-Methylphenol	ug/L	1800	RBC	1.54 U	1.54 U	1.54 U	1.48 U	1.78 U	1.45 U	8 U	1.54 U	1.48 U	1.51 U
	3&4-Methylphenol	ug/L	180	RBC	1.35 U	1.35 U	1.35 U	1.3 U	1.56 U	1.27 U	7 U	1.35 U	1.3 U	1.32 U
91-20-3	Naphthalene	ug/L	14	RBC	0.356 U	0.356 U	0.356 U	0.343 U	0.411 U	0.336 U	1.85 U	0.356 U	0.343 U	0.349 U
87-86-5	Pentachlorophenol	ug/L	1	MCL	3.17 U	3.17 U	3.17 U	3.06 U	3.67 UJ	3 U	16.5 U	3.17 U	3.06 U	3.11 U
108-95-2	Phenol	ug/L	11000	RBC	1.44 U	1.44 U	1.44 U	1.39 U	1.67 U	1.36 U	7.5 U	1.44 U	1.39 U	1.42 U
	METALS - DISSOLVED													
7429-90-5	Aluminum	ug/L	37000	RBC	8.4 U	8.4 U	8.4 U	8.4 U	8.4 U	**28.1**	84 U	8.4 U	8.4 U	8.4 U
7440-36-0	Antimony	ug/L	6	MCLG	0.8 U	0.8 U	0.8 U	0.8 U	0.8 UJ	0.8 U	**166**	0.8 U	0.8 U	0.8 U
7440-38-2	Arsenic	ug/L	10	MCL	**2.28**	0.4 U	**0.425 J**	**2.67**	**14.7 J**	0.4 U	**1330**	0.4 U	**3.53**	**2.81**
7440-43-9	Cadmium	ug/L	5	MCLG	0.1 U	0.1 U	0.1 U	0.1 U	0.1 UJ	0.1 U	1 U	0.1 U	0.1 U	0.1 U
7440-47-3	Chromium	ug/L	100	MCLG	0.5 U	0.5 U	0.5 U	**0.572 J**	0.5 UJ	0.5 U	**133**	0.5 U	0.5 U	0.5 U
7440-48-4	Cobalt	ug/L	11	RBC	**0.648 J**	**0.202 J**	**9.49**	**0.329 J**	**3.65 J**	**0.186 J**	**923**	**0.437 J**	**0.675 J**	**0.663 J**
7439-89-6	Iron	ug/L	26000	RBC	**81.2**	10 U	**4540**	**2570**	**14300**	**284**	**232 J**	**8020**	**7460**	**7220**
7439-92-1	Lead	ug/L	15	AL	**0.109 J**	0.1 U	0.1 U	0.1 U	0.1 UJ	0.1 U	1 U	0.1 U	**0.106 J**	0.1 U
7439-96-5	Manganese	ug/L	880	RBC	**199**	1.5 U	**6300**	**546**	**5270**	**7.52**	**30.2 J**	**1090**	**1800**	**1760**
7439-97-6	Mercury[2]	ug/L	2	MCLG	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 UJ	0.1 U	0.1 U	0.1 U	0.1 U
7440-02-0	Nickel	ug/L	730	RBC	**2.32**	**1.7 J**	**1.87 J**	**6.28**	**70.6 J**	**4.63**	**3380**	**2.52**	**0.568 J**	**0.989 J**
7440-62-2	Vanadium	ug/L	260	RBC	0.7 U	0.7 U	0.7 U	0.7 U	3.5 U	0.7 U	**119**	0.7 U	0.7 U	0.7 U
7440-66-6	Zinc	ug/L	11000	RBC	5.2 U	5.2 U	**148**	**8.63 J**	**5.7 J**	5.2 U	**853**	**74.1**	5.2 U	**17.9 J**
	OTHER													
FREE CN	Cyanide (free)	ug/L	200	MCLG	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U
	FIELD PARAMETERS													
	Temperature	°C	---	---	21.9 (22.24)	24.15	20.19	(19.49)	21.94	23.68 (6.76)	25.31	18.75	20.97	20.97
	Conductivity	uS/cm	---	---	2395.8 (2340)	1137.2	3064.6	(1970.3)	3794.4	290 (300)	26550	1557	2758.2	2758.2
	pH	s.u.	---	---	7.6 (7.3)	6.81	6.57	(7.25)	6.66	7.96 (8.18)	9.25	6.49	6.53	6.53
	ORP	mV	---	---	-185.2 (-1.4)	114.7	-66.6	(-236.7)	-84.5	27 (-187.5)	-492.7	-32.6	-42.4	-42.4
	Turbidity	NTU	---	---	25.2 (2.88)	1.97	0.82	(12.2)	18.8	0 (3.12)	16.09	67.7	29.2	29.2
	Dissolved Oxygen	mg/L	---	---	4.25 (2.91)	0.32	0.14	(0.06)	0.27	2.43 (8.85)	0	0.16	0.21	0.21
					(Resample)			(Resample)		(Resample)				

[1] - Groundwater cleanup standards as presented in Table 7 of the ROD.

[2] - Reported standard is for Mercury as Methyl.

Bold text indicates detected value.

MCL = Maximum Contaminant Level MCLG = MCL Goal

RBC = Risk Based Concentration AL = Action Level

U = Not Detected J = Estimated value UJ = Not detected; reporting limit is estimated

mg/L = miligrams per liter mV = millivolts

ug/L = micrograms per liter mS/cm = milisiemens per centimeter

s.u = std. units NTU = nephelometric turbidity unit

= Detected value exceeds groundwater cleanup standard.

TABLE 9

OU-7 Monitoring Network Sampling Results
2017 Annual Site-Wide Groundwater, Surface Water, and Sediment Monitoring Report for OU-7, OU-10, and NTCRA Basins
Avtex Fibers Superfund Site
Front Royal, Virginia

FMC-Front Royal Avtex Fibers 2017 Sampling Event Validated OU-7 Groundwater Data		Location ID: Sample Name: Well Type: Sample Date:	Groundwater Cleanup Standards[1]		133 2017AN-133 S BMW 7/26/2017	136 2017AN-136 I BMW 7/19/2017	138 2017AN-138 S BMW 7/30/2017 & 8/9/2017	138 (DUP) 2017AN-138D S BMW 7/30/2017	162 2017AN-162 S BMW 7/16/2017	181 2017AN-181 I BMW 7/18/2017	185 2017AN-185 S BMW 7/18/2017	203 2017AN-203 I BMW 7/25/2017	205 2017AN-205 I BMW 7/31/2017	206 2017AN-206 I BMW 7/13/2017 & 7/19/2017
CAS NO.	COMPOUND	UNITS:												
	VOLATILES													
67-64-1	Acetone	ug/L	22000	RBC	3.71 U	8.46 U	**5.36**	2.66 U	2.66 U	2.66 U	2.66 U	2.66 U	-- R	8.46 U
75-15-0	Carbon disulfide	ug/L	1000	RBC	**0.346 J**	0.22 U	**157**	**207**	0.22 U	0.22 U	0.22 U	0.22 U	**35.2**	**2390**
	SEMIVOLATILES													
117-81-7	bis(2-Ethylhexyl)phthalate (DEHP)	ug/L	6	MCL	1.44 U	1.44 U	6.82 U	6.82 U	1.9 U	1.44 U	1.44 U	1.44 U	7.35 U	4.07 U
95-48-7	2-Methylphenol	ug/L	1800	RBC	1.54 U	1.54 U	7.27 U	7.27 U	1.6 U	1.54 U	1.54 U	1.54 U	7.84 U	1.6 U
	3&4-Methylphenol	ug/L	180	RBC	1.35 U	1.35 U	6.36 U	6.36 U	1.4 U	1.35 U	1.35 U	1.35 U	6.86 U	1.4 U
91-20-3	Naphthalene	ug/L	14	RBC	0.356 U	0.356 U	1.68 U	1.68 U	0.37 U	0.356 U	0.356 U	0.356 U	1.81 U	0.37 U
87-86-5	Pentachlorophenol	ug/L	1	MCL	3.17 U	3.17 U	15 U	15 U	3.3 U	3.17 U	3.17 U	3.17 U	16.2 UJ	3.3 UJ
108-95-2	Phenol	ug/L	11000	RBC	1.44 U	1.44 U	6.82 U	6.82 U	1.5 U	1.44 U	1.44 U	1.44 U	7.35 U	1.5 U
	METALS - DISSOLVED													
7429-90-5	Aluminum	ug/L	37000	RBC	84 U	8.4 U	8.4 U	**33.3**	8.4 U	8.4 U	8.4 U	8.4 U	8.4 U	42 U
7440-36-0	Antimony	ug/L	6	MCLG	0.8 U	0.8 U	**1.53 J**	**1.6 J**	0.8 U	0.8 U	0.8 U	0.8 U	**1.53 J**	4 U
7440-38-2	Arsenic	ug/L	10	MCL	**1.87 J**	0.4 U	**36.8**	**36.8**	0.4 U	0.4 U	0.4 U	0.4 U	**19.7 J**	**21.6**
7440-43-9	Cadmium	ug/L	5	MCLG	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 UJ	0.5 U
7440-47-3	Chromium	ug/L	100	MCLG	0.5 U	0.5 U	**1.57 J**	**4.02**	0.908 U	0.5 U	0.5 U	0.5 U	**1.36 J**	2.5 U
7440-48-4	Cobalt	ug/L	11	RBC	**3.35**	0.1 U	**13.2**	**12.7**	**0.472 J**	0.1 U	0.1 U	0.1 U	**2.26 J**	**3.12 J**
7439-89-6	Iron	ug/L	26000	RBC	10 U	**664**	**51.2 J**	**87.2 J**	**634**	**339**	**39**	**3650**	10 U	50 U
7439-92-1	Lead	ug/L	15	AL	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	**0.687 J**	0.1 U	0.1 U	0.1 UJ	0.5 U
7439-96-5	Manganese	ug/L	880	RBC	**58.3**	**160**	**504**	**494**	**204**	**284**	**287**	**478**	**84.4**	7.5 U
7439-97-6	Mercury[2]	ug/L	2	MCLG	0.15 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
7440-02-0	Nickel	ug/L	730	RBC	**10.6**	0.5 U	**43.6**	**43.6**	**5.42**	0.5 U	**2.25**	0.5 U	**11.7 J**	**3.11 J**
7440-62-2	Vanadium	ug/L	260	RBC	0.7 U	0.7 U	0.7 U	0.7 U	0.7 U	0.7 U	0.7 U	0.7 U	0.7 U	3.5 U
7440-66-6	Zinc	ug/L	11000	RBC	5.2 U	**20.1 J**	5.2 U	5.2 U	**32.6**	5.2 U	**47.9**	5.2 U	5.2 UJ	26 U
	OTHER													
FREE CN	Cyanide (free)	ug/L	200	MCLG	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U
	FIELD PARAMETERS													
	Temperature	°C	---	---	20.91	18	(21.93)	(21.93)	18.39	20.72	16.92	19.47	20.2	19.99 (17.08)
	Conductivity	uS/cm	---	---	11067	570.02	(2755)	(2755)	617.29	576.04	467.48	1248.3	3943.6	2258 (2840.6)
	pH	s.u.	---	---	6.88	8.09	(7.06)	(7.06)	6.67	7.34	6.14	6.9	9.78	7.28 (7.81)
	ORP	mV	---	---	-90.1	-202.1	(-413.8)	(-413.8)	-89.6	-287.8	28.9	-120.5	-389.6	-450.2 (-450.4)
	Turbidity	NTU	---	---	6.29	0.9	(1.31)	(1.31)	17.06	1.63	9.48	4.09	11.3	0.47 (0.34)
	Dissolved Oxygen	mg/L	---	---	0.13	1.14	(0.07)	(0.07)	0.13	0.25	0.68	0.06	0.11	0.11 (0.2)
							(Resample)	(Resample)						(Resample)

[1] - Groundwater cleanup standards as presented in Table 7 of the ROD.

[2] - Reported standard is for Mercury as Methyl.

Bold text indicates detected value.

MCL = Maximum Contaminant Level MCLG = MCL Goal

RBC = Risk Based Concentration AL = Action Level

U = Not Detected J = Estimated value UJ = Not detected; reporting limit is estimated

mg/L = miligrams per liter mV = millivolts

ug/L = micrograms per liter mS/cm = milisiemens per centimeter

s.u = std. units NTU = nephelometric turbidity unit

= Detected value exceeds groundwater cleanup standard.

TABLE 9

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Avtex Fibers Superfund Site
Front Royal, Virginia

FMC-Front Royal Avtex Fibers 2017 Sampling Event Validated OU-7 Groundwater Data		Location ID: Sample Name: Well Type: Sample Date:	Groundwater Cleanup Standards[1]		210 2017AN-210 I BMW 7/27/2017 & 2/1/2018	215 2017AN-215 I BMW 7/18/2017 & 3/8/2018	216 2017AN-216 I BMW 7/15/2017	232 2017AN-232 I BMW 7/27/2017 & 8/10/2017	238 2017AN-238 I BMW 7/30/2017 & 8/9/2017	301 2017AN-301 D BMW 7/25/2017	305 2017AN-305 D BMW 8/8/2017	306 2017AN-306 D BMW 12/20/2017	316 2017AN-316 D BMW 7/15/2017	336 2017AN-336 D BMW 7/18/2017 & 1/30/2018
CAS NO.	COMPOUND	UNITS:												
	VOLATILES													
67-64-1	Acetone	ug/L	22000	RBC	2.66 U	**46.2 J**	26.6 U	**8.65**	2.66 U	2.66 U	**1590 J**	**6.79 J**	2.66 U	**3.78 J**
75-15-0	Carbon disulfide	ug/L	1000	RBC	0.22 U	**408**	**352**	**0.815**	**90.7**	0.22 U	**44300**	**10.5**	**451**	**363**
	SEMIVOLATILES													
117-81-7	bis(2-Ethylhexyl)phthalate (DEHP)	ug/L	6	MCL	1.5 U	6.16 U	8.14 U	2.1 U	6.47 U	1.44 U	15 U	1.47 U	7.5 U	6.82 U
95-48-7	2-Methylphenol	ug/L	1800	RBC	1.6 U	1.45 U	8 U	1.54 U	6.9 U	1.54 U	16 U	1.57 U	8 U	7.27 U
	3&4-Methylphenol	ug/L	180	RBC	1.4 U	**1.29 J**	7 U	1.35 U	6.03 U	1.35 U	14 U	1.37 U	7 U	6.36 U
91-20-3	Naphthalene	ug/L	14	RBC	0.37 U	**0.78 J**	1.85 U	0.356 U	1.59 U	0.356 U	3.7 U	0.363 U	1.85 U	1.68 U
87-86-5	Pentachlorophenol	ug/L	1	MCL	3.3 U	3 U	16.5 U	3.17 U	14.2 U	3.17 U	33 UJ	3.24 U	16.5 U	15 U
108-95-2	Phenol	ug/L	11000	RBC	1.5 U	**16.9**	7.5 U	1.44 U	6.47 U	1.44 U	**89.5 J**	1.47 U	7.5 U	6.82 U
	METALS - DISSOLVED													
7429-90-5	Aluminum	ug/L	37000	RBC	8.4 U	**120**	**13.5 J**	8.4 U	8.4 U	8.4 U	8.4 U	8.4 U	8.4 U	**10.4 J**
7440-36-0	Antimony	ug/L	6	MCLG	0.8 U	**1.08 J**	**16.6**	0.8 U	**15.2**	0.8 U	**616**	**0.822 J**	**4.24**	**1.03 J**
7440-38-2	Arsenic	ug/L	10	MCL	0.4 U	**1.12 J**	**215**	**3.35**	**96.6**	0.4 U	**3740**	**12.3**	**61.8**	**8.61**
7440-43-9	Cadmium	ug/L	5	MCLG	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
7440-47-3	Chromium	ug/L	100	MCLG	0.5 U	**6.67**	**10.4**	**8.58**	**2.19**	**6.17**	**16.9**	1.19 U	**6.55**	**16**
7440-48-4	Cobalt	ug/L	11	RBC	0.1 U	**0.644 J**	**104**	**0.703 J**	**4.49**	**0.285 J**	**178**	**0.562 J**	**22.7**	**0.237 J**
7439-89-6	Iron	ug/L	26000	RBC	**497**	**7750**	20.5 U	**4570**	**61**	**1140**	**78.2**	10 U	15.3 U	**87**
7439-92-1	Lead	ug/L	15	AL	0.1 U	**0.337 J**	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
7439-96-5	Manganese	ug/L	880	RBC	**134 J**	**66.4**	**106**	**108**	**9.9**	**24.5**	**41.5**	1.5 U	**51.7**	**199 J**
7439-97-6	Mercury[2]	ug/L	2	MCLG	0.1 U	0.1 UJ	0.1 U	0.1 U	0.1 U	0.1 U	1 U	**0.358**	0.1 U	0.1 UJ
7440-02-0	Nickel	ug/L	730	RBC	**8.83**	**5.09**	**355**	**2.01**	**3.35**	**13.3**	**75**	**6.65**	**73.1**	**1.44 J**
7440-62-2	Vanadium	ug/L	260	RBC	**0.862 J**	0.7 U	**9.36**	0.7 U	0.7 U	0.7 U	0.7 U	**1.02 J**	**2.17**	**0.841 J**
7440-66-6	Zinc	ug/L	11000	RBC	5.2 U	5.2 U	**10.9 J**	**12.9 J**	5.2 U	5.2 U	**36.9**	5.2 U	5.2 U	5.2 U
	OTHER													
FREE CN	Cyanide (free)	ug/L	200	MCLG	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U
	FIELD PARAMETERS													
	Temperature	°C	---	---	19.88 (13.74)	25.32 (5.87)	27.9	(22.4)	(27.25)	19.37	18.16	13	24.38	19.99 (12.63)
	Conductivity	uS/cm	---	---	2188 (1884)	6880 (520)	8132.8	(3897)	(2504)	576.07	15413	1342	3341	5465.6 (3999.7)
	pH	s.u.	---	---	7.77 (7.28)	11.15 (8.3)	9.06	(7.99)	(7.17)	7.83	9.06	9.79	8.24	6.77 (6.9)
	ORP	mV	---	---	-83.5 (-142.6)	-363.8 (-294.3)	-449.2	(-156.9)	(-430.5)	-181.6	-506.9	-102.5	-394.8	-436.3 (-324.6)
	Turbidity	NTU	---	---	2.11 (3.18)	0 (81.4)	25.07	(21.7)	(3.66)	0.25	23.1	1.46	2.17	0.61 (1.38)
	Dissolved Oxygen	mg/L	---	---	0.35 (0.12)	2.23 (3.14)	0.02	(0.28)	(0.1)	0.19	0.09	1.1	0.13	0.14 (0.11)
					(Resample)	(Resample)		(Resample)	(Resample)					(Resample)

[1] - Groundwater cleanup standards as presented in Table 7 of the ROD.

[2] - Reported standard is for Mercury as Methyl.

Bold text indicates detected value.

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Avtex Fibers Superfund Site
Front Royal, Virginia

FMC-Front Royal Avtex Fibers 2017 Sampling Event Validated OU-7 Groundwater Data		Location ID: Sample Name: Well Type: Sample Date:	Groundwater Cleanup Standards[1]		336 (DUP) 2017AN-336D D BMW 7/18/2017 & 1/30/2018	338 2017AN-338 D BMW 7/30/2017	501A 2017AN-501A D BMW 7/17/2017	501B 2017AN-501B D BMW 7/17/2017	501C 2017AN-501C D BMW 7/17/2017	601 2017AN-601 D BMW 7/28/2017 & 8/10/2017	602 2017AN-602 D BMW 7/16/2017	603-Z1 2017AN-603-Z1 D BMW 7/18/2017 & 2/1/2018	603-Z2 2017AN-603-Z2 D BMW 7/18/2017 & 2/1/2018	603-Z3 2017AN-603-Z3 D BMW 7/18/2017 & 2/1/2018
CAS NO.	COMPOUND	UNITS:												
	VOLATILES													
67-64-1	Acetone	ug/L	22000	RBC	-- R	5.72 U	2.66 U	2.66 U	2.66 U	**2.9 J**	2.66 U	-- R	-- R	-- R
75-15-0	Carbon disulfide	ug/L	1000	RBC	**335**	**11.9**	0.22 U	**0.434 J**	**0.951**	**1.27**	**0.331 J**	**0.648**	**0.622**	**0.659**
	SEMIVOLATILES													
117-81-7	bis(2-Ethylhexyl)phthalate (DEHP)	ug/L	6	MCL	6.82 U	1.44 U	6.82 U	2.67 U	2.84 U	2.61 U	7.12 U	4.68 U	4.87 U	3.15 U
95-48-7	2-Methylphenol	ug/L	1800	RBC	7.27 U	1.54 U	7.27 U	1.4 U	1.45 U	1.4 U	1.45 U	1.45 U	1.45 U	1.45 U
	3&4-Methylphenol	ug/L	180	RBC	6.36 U	1.35 U	6.36 U	1.23 U	1.27 U	1.23 U	1.27 U	1.27 U	1.27 U	1.27 U
91-20-3	Naphthalene	ug/L	14	RBC	1.68 U	0.356 U	1.68 U	0.325 U	0.336 U	0.325 U	0.336 U	0.336 U	0.336 U	0.336 U
87-86-5	Pentachlorophenol	ug/L	1	MCL	15 U	3.17 UJ	15 U	2.89 U	3 U	2.89 U	3 U	3 U	3 U	3 U
108-95-2	Phenol	ug/L	11000	RBC	6.82 U	1.44 U	6.82 U	1.32 U	1.36 U	1.32 U	1.36 U	1.36 U	1.36 U	1.36 U
	METALS - DISSOLVED													
7429-90-5	Aluminum	ug/L	37000	RBC	**10 J**	8.4 U	8.4 U	**14.8 J**	**27.2**	**83**	**57.9**	8.4 U	**8.83 J**	**9.56 J**
7440-36-0	Antimony	ug/L	6	MCLG	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U
7440-38-2	Arsenic	ug/L	10	MCL	**8.65**	**21.6**	0.4 U	0.4 U	**1.09 J**	0.4 U	**1.57 J**	**0.723 J**	**1.25 J**	**0.549 J**
7440-43-9	Cadmium	ug/L	5	MCLG	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
7440-47-3	Chromium	ug/L	100	MCLG	**10.3**	**1.85 J**	0.5 U	0.5 U	0.595 U	0.5 U	0.535 U	0.5 U	0.5 U	0.5 U
7440-48-4	Cobalt	ug/L	11	RBC	**0.214 J**	**3.92**	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	**0.216 J**	**0.225 J**	**0.232 J**
7439-89-6	Iron	ug/L	26000	RBC	10 U	**27.3**	10.3 U	10 U	21.8 U	**308**	10 U	10 U	10 U	10 U
7439-92-1	Lead	ug/L	15	AL	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
7439-96-5	Manganese	ug/L	880	RBC	**200 J**	**24.9**	**2.6 J**	**3.6 J**	**7.7**	**1.5 J**	**2.73 J**	**52.1 J**	**69.3 J**	**38.5 J**
7439-97-6	Mercury[2]	ug/L	2	MCLG	0.1 UJ	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 UJ	0.1 UJ	0.1 UJ
7440-02-0	Nickel	ug/L	730	RBC	**1.1 J**	**13.8**	**5.01**	**3.25**	**2.15**	**2.4**	0.5 U	0.5 U	**0.598 J**	**1.01 J**
7440-62-2	Vanadium	ug/L	260	RBC	**0.888 J**	0.7 U	0.7 U	0.7 U	0.7 U	0.7 U	0.7 U	0.7 U	0.7 U	0.7 U
7440-66-6	Zinc	ug/L	11000	RBC	5.2 U	5.2 U	5.2 U	5.2 U	5.2 U	5.2 U	5.2 U	5.2 U	5.2 U	5.2 U
	OTHER													
FREE CN	Cyanide (free)	ug/L	200	MCLG	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U
	FIELD PARAMETERS													
	Temperature	°C	---	---	19.99 (12.63)	16.88	20.19	19.34	20.33	(21.19)	21.8	17.68 (11.6)	16.93 (11.62)	16.46 (11.8)
	Conductivity	uS/cm	---	---	5465.6 (3999.7)	975.95	1781.8	1035.6	743.02	(782)	524.92	739.74 (820)	831.07 (800)	756.94 (740)
	pH	s.u.	---	---	6.77 (6.9)	7.76	7.8	8.61	9.07	(9.67)	9.75	7.45 (7.86)	7.41 (7.77)	7.44 (7.76)
	ORP	mV	---	---	-436.3 (-324.6)	-360.9	-413.6	-401.8	-417.4	(-227.9)	-305.4	-348.4 (-235.1)	-345.9 (-259.2)	-353.5 (-256.6)
	Turbidity	NTU	---	---	0.61 (1.38)	0.47	0	0	0	(0.24)	0	0.59 (1.49)	0.63 (0.64)	0.57 (0.26)
	Dissolved Oxygen	mg/L	---	---	0.14 (0.11)	0.1	0.19	0.18	0.15	(0.08)	0.2	1.46 (3.28)	2.07 (4.75)	1.86 (4.23)
					(Resample)					(Resample)		(Resample)	(Resample)	(Resample)

[1] - Groundwater cleanup standards as presented in Table 7 of the ROD.

[2] - Reported standard is for Mercury as Methyl.

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CAS NO.	COMPOUND	UNITS:											
	VOLATILES												
67-64-1	Acetone	ug/L	22000	RBC	-- R	-- R	-- R	-- R	-- R	2.66 U	2.66 U	-- R	-- R
75-15-0	Carbon disulfide	ug/L	1000	RBC	**0.626**	0.22 U	0.22 U	0.22 U	0.22 U	**8.9**	**0.776**	0.22 U	**0.261 J**
	SEMIVOLATILES												
117-81-7	bis(2-Ethylhexyl)phthalate (DEHP)	ug/L	6	MCL	6.39 U	4.58 U	4.01 U	2.5 U	4.37 U	3.16 U	5.43 U	5.07 U	3.17 U
95-48-7	2-Methylphenol	ug/L	1800	RBC	1.45 U	1.45 U	1.45 U	1.4 U	1.45 U	1.54 U	1.67 U	1.45 U	1.45 U
	3&4-Methylphenol	ug/L	180	RBC	1.27 U	1.27 U	1.27 U	1.23 U	1.27 U	1.35 U	1.46 U	1.27 U	1.27 U
91-20-3	Naphthalene	ug/L	14	RBC	0.336 U	0.336 U	0.336 U	0.325 U	0.336 U	0.356 U	**1 J**	0.336 U	0.336 U
87-86-5	Pentachlorophenol	ug/L	1	MCL	3 U	3 U	3 U	2.89 U	3 U	3.17 U	3.44 U	3 U	3 U
108-95-2	Phenol	ug/L	11000	RBC	1.36 U	1.36 U	1.36 U	1.32 U	1.36 U	1.44 U	1.56 U	1.36 U	1.36 U
	METALS - DISSOLVED												
7429-90-5	Aluminum	ug/L	37000	RBC	8.4 U	8.4 U	8.4 U	8.4 U	8.4 U	42 U	42 U	8.4 U	**33**
7440-36-0	Antimony	ug/L	6	MCLG	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	4 U	4 U	0.8 U	0.8 U
7440-38-2	Arsenic	ug/L	10	MCL	**3.34**	0.4 U	0.4 U	0.4 U	**0.41 J**	**9.56 J**	**7.99 J**	0.4 U	**0.928 J**
7440-43-9	Cadmium	ug/L	5	MCLG	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.5 U	0.5 U	0.1 U	0.1 U
7440-47-3	Chromium	ug/L	100	MCLG	0.5 U	0.535 U	0.703 U	1.32 U	0.5 U	2.5 U	2.5 U	0.826 U	0.621 U
7440-48-4	Cobalt	ug/L	11	RBC	**0.269 J**	0.1 U	0.1 U	0.1 U	0.1 U	0.5 U	0.5 U	0.1 U	0.1 U
7439-89-6	Iron	ug/L	26000	RBC	10 U	**352**	**279**	46 U	18.6 U	50 U	**105 J**	10 U	16 U
7439-92-1	Lead	ug/L	15	AL	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.5 U	0.5 U	0.1 U	0.1 U
7439-96-5	Manganese	ug/L	880	RBC	**41.8 J**	**250**	**236**	**197**	**26.6**	7.5 U	**10.1 J**	**8.3**	**14.1**
7439-97-6	Mercury[2]	ug/L	2	MCLG	0.1 UJ	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
7440-02-0	Nickel	ug/L	730	RBC	0.5 U	**0.635 J**	0.5 U	0.5 U	0.5 U	2.5 U	**6.66 J**	**2**	**1.25 J**
7440-62-2	Vanadium	ug/L	260	RBC	0.7 U	0.7 U	0.7 U	0.7 U	0.7 U	3.5 U	3.5 U	0.7 U	0.7 U
7440-66-6	Zinc	ug/L	11000	RBC	5.2 U	5.2 U	**7.34 J**	5.2 U	5.2 U	26 U	26 U	5.2 U	5.2 U
	OTHER												
FREE CN	Cyanide (free)	ug/L	200	MCLG	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U
	FIELD PARAMETERS												
	Temperature	^{o}C	---	---	16.43 (11.94)	18.7	17.3	17.96	18.07	17.93	19.67	17.67	18.13
	Conductivity	uS/cm	---	---	779.2 (700)	748.67	718.7	780.9	683.49	666.29	1991.4	1026.8	1039.1
	pH	s.u.	---	---	7.37 (7.75)	7.48	7.52	7.53	8.15	9.78	9.2	8.99	8.88
	ORP	mV	---	---	-366.9 (-291)	-121.6	-138.2	-154.2	-183.2	-125.5	-413.4	-282.8	-275
	Turbidity	NTU	---	---	1.22 (0.22)	2.64	8.07	3.04	0.7	0.92	67.9	0.94	0.32
	Dissolved Oxygen	mg/L	---	---	1.63 (4.49)	2.88	3.42	3.34	4.05	0.19	0.03	0.25	0.19
					(Resample)								

[1] - Groundwater cleanup standards as presented in Table 7 of the ROD.

[2] - Reported standard is for Mercury as Methyl.

Bold text indicates detected value.

MCL = Maximum Contaminant Level MCLG = MCL Goal

RBC = Risk Based Concentration AL = Action Level

U = Not Detected J = Estimated value UJ = Not detected; reporting limit is estimated

mg/L = miligrams per liter mV = millivolts

ug/L = micrograms per liter mS/cm = milisiemens per centimeter

s.u = std. units NTU = nephelometric turbidity unit

= Detected value exceeds groundwater cleanup standard.

TABLE 9

OU-7 Monitoring Network Sampling Results
2017 Annual Site-Wide Groundwater, Surface Water, and Sediment Monitoring Report for OU-7, OU-10, and NTCRA Basins
Avtex Fibers Superfund Site
Front Royal, Virginia

FMC-Front Royal Avtex Fibers 2017 Sampling Event Validated OU-7 Groundwater Data		Location ID: Sample Name: Well Type: Sample Date:	Groundwater Cleanup Standards[1]		GM-02A 2017AN-GM-02A S BMW 7/19/2017	GM-02B 2017AN-GM-02B I BMW 7/19/2017	GM-09R 2017AN-GM-09R I BMW 7/30/2017	MW-03R 2017AN-MW-03R S BMW 7/28/2017	MW-09 2017AN-MW-09 OMW 7/31/2017	MW-10 2017AN-MW-10 OMW 7/31/2017	PW-0 2017AN-PW-0 I BMW 7/30/2017 & 8/9/2017	PW-02 2017AN-PW-02 I BMW 7/29/2017
CAS NO.	COMPOUND	UNITS:										
	VOLATILES											
67-64-1	Acetone	ug/L	22000	RBC	2.66 U	8.46 U	5.72 U	5.72 U	**2190 J**	-- R	2.66 U	2.66 U
75-15-0	Carbon disulfide	ug/L	1000	RBC	**3.83**	**896**	**0.891**	**99.4**	**1410**	**9.53**	**0.63**	**8.79**
	SEMIVOLATILES											
117-81-7	bis(2-Ethylhexyl)phthalate (DEHP)	ug/L	6	MCL	1.5 U	15 U	1.89 U	2.78 U	8.93 U	1.5 U	1.41 U	**1.75 J**
95-48-7	2-Methylphenol	ug/L	1800	RBC	1.6 U	16 U	1.48 U	1.45 U	**267**	1.6 U	1.48 U	1.48 U
	3&4-Methylphenol	ug/L	180	RBC	1.4 U	14 U	1.3 U	1.27 U	**235**	1.4 U	1.3 U	1.3 U
91-20-3	Naphthalene	ug/L	14	RBC	0.37 U	3.7 U	0.343 U	0.336 U	2.2 U	0.37 U	0.343 U	0.343 U
87-86-5	Pentachlorophenol	ug/L	1	MCL	3.3 U	33 U	3.06 U	3 U	19.6 UJ	3.3 UJ	3.06 U	3.06 UJ
108-95-2	Phenol	ug/L	11000	RBC	1.5 U	15 U	1.39 U	1.36 U	**23200**	**6.45 J**	1.39 U	1.39 U
	METALS - DISSOLVED											
7429-90-5	Aluminum	ug/L	37000	RBC	8.4 U	8.4 U	8.4 U	**26.4**	**197**	8.4 U	8.4 U	8.4 U
7440-36-0	Antimony	ug/L	6	MCLG	0.8 U	**79.4**	0.8 U	**5.49**	**56.7**	0.8 U	0.8 U	0.8 U
7440-38-2	Arsenic	ug/L	10	MCL	**2.99**	**160**	0.4 U	**231**	**1500 J**	**36.1 J**	0.4 U	0.4 U
7440-43-9	Cadmium	ug/L	5	MCLG	0.1 U	0.1 U	0.1 U	**0.204 J**	0.8 UJ	0.1 UJ	0.1 U	0.1 U
7440-47-3	Chromium	ug/L	100	MCLG	0.5 U	0.5 U	0.5 U	**22.5**	**79.6**	**1.77 J**	0.5 U	**0.782 J**
7440-48-4	Cobalt	ug/L	11	RBC	**0.355 J**	**12.1**	**0.266 J**	**144**	**478 J**	**17 J**	0.1 U	**0.195 J**
7439-89-6	Iron	ug/L	26000	RBC	**26.1**	10 U	**2600**	**256**	80 UJ	**32600 J**	**9210**	**248**
7439-92-1	Lead	ug/L	15	AL	**0.166 J**	0.1 U	0.1 U	**0.189 J**	0.8 U	0.1 U	0.1 U	0.1 U
7439-96-5	Manganese	ug/L	880	RBC	**28.4**	1.5 U	**1110**	**7.85**	**110**	**3170**	**1550**	**22.2**
7439-97-6	Mercury[2]	ug/L	2	MCLG	0.1 U	0.1 U	0.1 U	0.1 U	0.2 U	0.1 U	0.1 U	0.1 U
7440-02-0	Nickel	ug/L	730	RBC	**0.887 J**	**16.9**	**5.15**	**472**	**1180 J**	**21.4 J**	**19.3**	0.5 U
7440-62-2	Vanadium	ug/L	260	RBC	0.7 U	**0.891 J**	0.7 U	**23.4**	**385 J**	0.7 UJ	0.7 U	0.7 U
7440-66-6	Zinc	ug/L	11000	RBC	**5.79 J**	5.2 U	**11.7 J**	**31.4**	**3680 J**	**144 J**	**23.9 J**	5.2 U
	OTHER											
FREE CN	Cyanide (free)	ug/L	200	MCLG	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U
	FIELD PARAMETERS											
	Temperature	°C	---	---	18.54	24.22	25.02	18.37	21.8	24.4	19.37 (16.72)	18.25
	Conductivity	uS/cm	---	---	626.23	8453.9	2987.7	13141	32895	10613	2329.7 (2200)	755.34
	pH	s.u.	---	---	8.06	7.76	7.47	8.82	10.49	6.35	7.4 (6.73)	8.74
	ORP	mV	---	---	-347.6	-525.9	-168.8	-414.1	-483.8	-85.6	-141.7 (-158.4)	-354.3
	Turbidity	NTU	---	---	0.96	20.92	8.26	20.4	5.53	151	10.5 (5.46)	3.93
	Dissolved Oxygen	mg/L	---	---	0.2	0.12	0.23	0	0	0.16	0.16 (0.15)	0.06
											(Resample)	

[1] - Groundwater cleanup standards as presented in Table 7 of the ROD.

[2] - Reported standard is for Mercury as Methyl.

Bold text indicates detected value.

MCL = Maximum Contaminant Level MCLG = MCL Goal

RBC = Risk Based Concentration AL = Action Level

U = Not Detected J = Estimated value UJ = Not detected; reporting limit is estimated

mg/L = miligrams per liter mV = millivolts

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s.u = std. units NTU = nephelometric turbidity unit

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TABLE 9

OU-7 Monitoring Network Sampling Results
2017 Annual Site-Wide Groundwater, Surface Water, and Sediment Monitoring Report for OU-7, OU-10, and NTCRA Basins
Avtex Fibers Superfund Site
Front Royal, Virginia

FMC-Front Royal Avtex Fibers 2017 Sampling Event Validated OU-7 Groundwater Data		Location ID: Sample Name: Well Type: Sample Date:	Groundwater Cleanup Standards[1]		PZ-06 2017AN-PZ-06 S BMW 7/31/2017	PZ-06 (DUP) 2017AN-PZ-06D S BMW 7/31/2017	TW-01 2017AN-TW-01 D BMW 8/9/2017	TW-02 2017AN-TW-02 D BMW 8/1/2017	TW-03 2017AN-TW-03 D BMW 8/1/2017	WP-10 2017AN-WP-10 OMW 7/28/2017	WP-11 2017AN-WP-11 OMW 7/27/2017
CAS NO.	COMPOUND	UNITS:									
	VOLATILES										
67-64-1	Acetone	ug/L	22000	RBC	**2.87 J**	-- R	-- R	-- R	-- R	5.72 U	12.1 U
75-15-0	Carbon disulfide	ug/L	1000	RBC	0.22 U	0.22 U	**29.9**	**743**	**0.687**	**25.7**	**0.754**
	SEMIVOLATILES										
117-81-7	bis(2-Ethylhexyl)phthalate (DEHP)	ug/L	6	MCL	1.63 U	1.5 U	1.72 U	7.5 U	1.44 U	1.43 U	2.75 U
95-48-7	2-Methylphenol	ug/L	1800	RBC	1.74 U	1.6 U	1.67 U	8 U	1.54 U	1.45 U	1.48 U
	3&4-Methylphenol	ug/L	180	RBC	1.52 U	1.4 U	1.46 U	7 U	1.35 U	1.27 U	1.3 U
91-20-3	Naphthalene	ug/L	14	RBC	0.402 U	0.37 U	0.385 U	1.85 U	0.356 U	**6.46**	0.343 U
87-86-5	Pentachlorophenol	ug/L	1	MCL	3.59 UJ	3.3 UJ	3.44 UJ	16.5 UJ	3.17 UJ	3 U	3.06 U
108-95-2	Phenol	ug/L	11000	RBC	1.63 U	1.5 U	1.56 U	7.5 U	1.44 U	1.36 U	1.39 U
	METALS - DISSOLVED										
7429-90-5	Aluminum	ug/L	37000	RBC	8.4 UJ	**61 J**	8.4 U	8.4 UJ	8.4 U	**53.7**	8.4 U
7440-36-0	Antimony	ug/L	6	MCLG	0.8 U	0.8 U	**1.35 J**	**3.16 J**	0.8 U	0.8 U	**2.77**
7440-38-2	Arsenic	ug/L	10	MCL	**3.79**	**4.18**	**11.3**	**32.2 J**	0.4 U	**180**	**10.1**
7440-43-9	Cadmium	ug/L	5	MCLG	0.1 U	0.1 U	0.1 U	0.1 UJ	0.1 U	**0.178 J**	0.1 U
7440-47-3	Chromium	ug/L	100	MCLG	0.5 U	**0.674 J**	**0.697 J**	**1.94 J**	0.5 UJ	**19.5**	0.5 U
7440-48-4	Cobalt	ug/L	11	RBC	**0.197 J**	**0.188 J**	**1.2 J**	**12 J**	0.1 U	**192**	**4.94**
7439-89-6	Iron	ug/L	26000	RBC	**364**	**339**	10 U	10 U	10 UJ	**421**	**1660**
7439-92-1	Lead	ug/L	15	AL	0.1 U	0.1 U	0.1 U	0.1 UJ	0.1 U	**0.132 J**	0.1 U
7439-96-5	Manganese	ug/L	880	RBC	**492 J**	**541 J**	**15.8**	**123**	**48.1**	**54.5**	**457**
7439-97-6	Mercury[2]	ug/L	2	MCLG	0.1 U	0.1 U	0.1 U	0.1 UJ	0.1 UJ	0.1 U	0.1 U
7440-02-0	Nickel	ug/L	730	RBC	**0.993 J**	**1.13 J**	**4.41**	**37.7 J**	**1.62 J**	**488**	**14.2**
7440-62-2	Vanadium	ug/L	260	RBC	0.7 U	0.7 U	0.7 U	0.7 U	0.7 U	**60.8**	0.7 U
7440-66-6	Zinc	ug/L	11000	RBC	**5.47 J**	5.2 U	5.2 U	5.2 U	5.2 U	**24.3 J**	5.2 U
	OTHER										
FREE CN	Cyanide (free)	ug/L	200	MCLG	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U
	FIELD PARAMETERS										
	Temperature	°C	---	---	19.98	19.98	17.82	24.52	26.77	22.99	29.46
	Conductivity	uS/cm	---	---	518.25	518.25	1218.3	3076.6	1065.5	14625	2210.9
	pH	s.u.	---	---	7.53	7.53	8.29	8.17	7.92	9.44	7.38
	ORP	mV	---	---	-58.2	-58.2	-304.5	-302.2	-232.8	203	4.4
	Turbidity	NTU	---	---	41	41	4.4	29.2	8.77	2.98	97.7
	Dissolved Oxygen	mg/L	---	---	2.83	2.83	4.87	3.96	5.5	0	4.95

[1] - Groundwater cleanup standards as presented in Table 7 of the ROD.

[2] - Reported standard is for Mercury as Methyl.

Bold text indicates detected value.

MCL = Maximum Contaminant Level MCLG = MCL Goal

RBC = Risk Based Concentration AL = Action Level

U = Not Detected J = Estimated value UJ = Not detected; reporting limit is estimated

mg/L = miligrams per liter mV = millivolts

ug/L = micrograms per liter mS/cm = milisiemens per centimeter

s.u = std. units NTU = nephelometric turbidity unit

= Detected value exceeds groundwater cleanup standard.

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TABLE 10

OU-7 VSWMR Monitoring Network Sampling Results
2017 Annual Site-Wide Groundwater, Surface Water, and Sediment Monitoring Report for OU-7, OU-10, and NTCRA Basins
Avtex Fibers Superfund Site
Front Royal, Virginia

FMC-Front Royal Avtex Fibers 2017 Sampling Event VSWMR Groundwater Wells		Purpose:	Groundwater Cleanup Standards[1]		Upgradient Overburden Wells				Upgradient Shallow Bedrock Monitoring Wells			
		Location ID:			029		WP-11		128		133	
		Sampled:			7/25/2017	Baseline	7/27/2017	Baseline	7/25/2017	Baseline	7/26/2017	Baseline
CAS NO.	COMPOUND	UNITS:										
	VOLATILES											
67-64-1	Acetone	ug/L	22,000	RBC	2.66 U	25 U	12.1 U	13.4	2.94 U	25 U	3.71 U	25 U
75-15-0	Carbon disulfide	ug/L	1,000	RBC	0.22 U	4 U	**0.754**	4 U	0.22 U	4 U	**0.346 J**	3.3
	SEMIVOLATILES											
117-81-7	bis(2-Ethylhexyl)phthalate (DEHP)	ug/L	6	MCL	1.44 U	6 U	2.75 U	6 U	1.44 U	6 U	1.44 U	6 U
95-48-7	2-Methylphenol	ug/L	1,800	RBC	1.54 U	10 U	1.48 U	10 U	1.54 U	10 U	1.54 U	10 U
	3&4-Methylphenol	ug/L	180	RBC	1.35 U	10 U	1.3 U	10 U	1.35 U	10 U	1.35 U	10 U
91-20-3	Naphthalene	ug/L	14	RBC	0.356 U	10 U	0.343 U	10 U	0.356 U	10 U	0.356 U	10 U
87-86-5	Pentachlorophenol	ug/L	1	MCL	3.17 U	25 U	3.06 U	25 U	3.17 U	25 U	3.17 U	25 U
108-95-2	Phenol	ug/L	11,000	RBC	1.44 U	10 U	1.39 U	2.8	1.44 U	10 U	1.44 U	10 U
	METALS - DISSOLVED											
7429-90-5	Aluminum	ug/L	37,000	RBC	8.4 U	25.2	8.4 U	93.8	8.4 U	6.7	84 U	25.2
7440-36-0	Antimony	ug/L	6	MCLG	0.8 U	3 U	**2.77**	3.3	0.8 U	2 U	0.8 U	2 U
7440-38-2	Arsenic	ug/L	10	MCL	0.4 U	5 U	**10.1**	3.3	0.4 U	0.76	**1.87 J**	15.6
7440-43-9	Cadmium	ug/L	5	MCLG	0.1 U	0.3 U	0.1 U	0.6 U	0.1 U	0.1 U	0.1 U	0.2 U
7440-47-3	Chromium	ug/L	100	MCLG	0.5 U	1.0	0.5 U	4.2	0.5 U	1.6	0.5 U	1.7
7440-48-4	Cobalt	ug/L	11	RBC	**0.202 J**	0.99	**4.94**	5.1	**0.437 J**	7.5	**3.35**	16.4
7439-89-6	Iron	ug/L	26,000	RBC	10 U	68.2	**1660**	11,300	**8020**	8,700	10 U	7,800
7439-92-1	Lead	ug/L	15	AL	0.1 U	3.0 U	0.1 U	3 U	0.1 U	2.3 U	0.1 U	2.7 U
7439-96-5	Manganese	ug/L	880	RBC	1.5 U	34.3	**457**	1,240	**1090**	1,170	**58.3**	1,180
7439-97-6	Mercury[2]	ug/L	2	MCLG	0.1 U	0.2 U	0.1 U	0.2 U	0.1 U	0.2 U	0.15 U	0.2 U
7440-02-0	Nickel	ug/L	730	RBC	**1.7 J**	2.9	**14.2**	11.5	**2.52**	2.6	**10.6**	8.0
7440-62-2	Vanadium	ug/L	260	RBC	0.7 U	3.7 U	0.7 U	1.4	0.7 U	2.3 U	0.7 U	2.7 U
7440-66-6	Zinc	ug/L	11,000	RBC	5.2 U	65.8	5.2 U	49	**74.1**	11.4	5.2 U	18.2
	OTHER											
57-12-5	Cyanide (free)	ug/L	200	MCLG	1.54 U	100 U	1.54 U	100 U	1.54 U	100 U	1.54 U	100 U
	FIELD PARAMETERS											
	Temperature	°C	---		24.15	---	29.46	---	18.75	---	20.91	---
	Conductivity	uS/cm	---		1137.2	---	2210.9	---	1557	---	11067	---
	pH	s.u.	---		6.81	---	7.38	---	6.49	---	6.88	---
	ORP	mV	---		114.7	---	4.4	---	-32.6	---	-90.1	---
	Turbidity	NTU	---		1.97	---	97.7	---	67.7	---	6.29	---
	Dissolved Oxygen	mg/L	---		0.32	---	4.95	---	0.16	---	0.13	---

[1] - Groundwater cleanup standards as presented in Table 7 of the ROD.

[2] - Reported standard is for Mercury as Methyl.

Bold text indicates detected value.

= Detected value exceeds groundwater cleanup standard.

MCL = Maximum Contaminant Level
MCLG = MCL Goal
RBC = Risk Based Concentration
AL = Action Level
J = Estimated value (+ high bias - low bias)
U = Not Detected
NTU = nephelometric turbidity unit
s.u = std. units
mS/cm = milisiemens per centimeter
ug/L = micrograms per liter
mg/L = miligrams per liter
mV = millivolts
R = Rejected

TABLE 10

OU-7 VSWMR Monitoring Network Sampling Results
2017 Annual Site-Wide Groundwater, Surface Water, and Sediment Monitoring Report for OU-7, OU-10, and NTCRA Basins
Avtex Fibers Superfund Site
Front Royal, Virginia

FMC-Front Royal Avtex Fibers 2017 Sampling Event VSWMR Groundwater Wells		Purpose:	Groundwater Cleanup Standards[1]		Downgradient Overburden Monitoring Wells						Downgradient Shallow Bedrock Monitoring Wells			
		Location ID:			024		MW-09		WP-10		105		116R	
		Sampled:			7/28/2017 & 8/9/2017	Baseline	7/31/2017	Baseline	7/28/2017	Baseline	7/29/2017 & 8/8/2017	Baseline	7/14/2017	Baseline
CAS NO.	COMPOUND	UNITS:												
	VOLATILES													
67-64-1	Acetone	ug/L	22,000	RBC	-- R	25 U	**2190 J**	2,970	5.72 U	25 U	-- R	25 U	26.6 U	17.1
75-15-0	Carbon disulfide	ug/L	1,000	RBC	0.22 U	4 U	**1410**	1,210	**25.7**	107	0.22 U	4 U	**18.2**	183
	SEMIVOLATILES													
117-81-7	bis(2-Ethylhexyl)phthalate (DEHP)	ug/L	6	MCL	2.87 U	6 U	8.93 U	1.1	1.43 U	6	2.1 U	2.1	7.5 U	6.5 U
95-48-7	2-Methylphenol	ug/L	1,800	RBC	1.54 U	10 U	**267**	95.4	1.45 U	2.2	1.48 U	10 U	8 U	2.8
	3&4-Methylphenol	ug/L	180	RBC	1.35 U	10 U	**235**	80.8	1.27 U	20 U	1.3 U	10 U	7 U	10.8 U
91-20-3	Naphthalene	ug/L	14	RBC	0.356 U	10 U	2.2 U	10.0	**6.46**	20.1	0.343 U	10 U	1.85 U	10.8 U
87-86-5	Pentachlorophenol	ug/L	1	MCL	3.17 U	25 U	19.6 UJ	1.9	3 U	50 U	3.06 U	25 U	16.5 U	27.1 U
108-95-2	Phenol	ug/L	11,000	RBC	1.44 U	10 U	**23200**	17,300	1.36 U	4.0	1.39 U	10 U	7.5 U	10.8 U
	METALS - DISSOLVED													
7429-90-5	Aluminum	ug/L	37,000	RBC	8.4 U	45.9	**197**	286	**53.7**	51.3	8.4 U	50.7	84 U	1,570
7440-36-0	Antimony	ug/L	6	MCLG	0.8 U	3 U	**56.7**	82.6	0.8 U	4 U	0.8 U	1 U	**166**	336
7440-38-2	Arsenic	ug/L	10	MCL	**2.28**	1.1	**1500 J**	2,180	**180**	227	**2.67**	4.5	**1330**	1,050
7440-43-9	Cadmium	ug/L	5	MCLG	0.1 U	0.6 U	0.8 UJ	13.3	**0.178 J**	1.0	0.1 U	0.1 U	1 U	5.0
7440-47-3	Chromium	ug/L	100	MCLG	0.5 U	0.81	**79.6**	119	**19.5**	12.5	**0.572 J**	2.1	**133**	104
7440-48-4	Cobalt	ug/L	11	RBC	**0.648 J**	3 U	**478 J**	637	**192**	167	**0.329 J**	2.3 U	**923**	651
7439-89-6	Iron	ug/L	26,000	RBC	**81.2**	43.6	80 UJ	400	**421**	978	**2570**	3,930	**232 J**	2810
7439-92-1	Lead	ug/L	15	AL	**0.109 J**	3 U	0.8 U	10.0 U	**0.132 J**	4 U	0.1 U	3 U	1 U	15 U
7439-96-5	Manganese	ug/L	880	RBC	**199**	327	**110**	133	**54.5**	120	**546**	1,610	**30.2 J**	41.3
7439-97-6	Mercury[2]	ug/L	2	MCLG	0.1 U	0.2 U	0.2 U	1.0 U	0.1 U	0.8 U	0.1 U	0.2 U	0.1 U	0.5
7440-02-0	Nickel	ug/L	730	RBC	**2.32**	3.0	**1180 J**	1,640	**488**	504	**6.28**	12.3	**3380**	2,350
7440-62-2	Vanadium	ug/L	260	RBC	0.7 U	3.5	**385 J**	476	**60.8**	39.3	0.7 U	0.74	**119**	189
7440-66-6	Zinc	ug/L	11,000	RBC	5.2 U	197	**3680 J**	8,100	**24.3 J**	17.4	**8.63 J**	4.4	**853**	1150
	OTHER													
57-12-5	Cyanide (free)	ug/L	200	MCLG	1.54 U	100 U	1.54 U	1,310	1.54 U	158	1.54 U	100 U	1.54 U	2,020
	FIELD PARAMETERS													
	Temperature	°C	---		21.9 (22.24)	---	21.8	---	22.99	---	19.49	---	25.31	---
	Conductivity	uS/cm	---		2395.8 (2340)	---	32895	---	14625	---	1970.3	---	26550	---
	pH	s.u.	---		7.6 (7.3)	---	10.49	---	9.44	---	7.25	---	9.25	---
	ORP	mV	---		-185.2 (-1.4)	---	-483.8	---	203	---	-236.7	---	-492.7	---
	Turbidity	NTU	---		25.2 (2.88)	---	5.53	---	2.98	---	12.2	---	16.09	---
	Dissolved Oxygen	mg/L	---		4.25 (2.91)	---	0	---	0	---	0.06	---	0	---
					(Resample)						(Resample)			

[1] - Groundwater cleanup standards as presented in Table 7 of the ROD.

[2] - Reported standard is for Mercury as Methyl.

Bold text indicates detected value.

= Detected value exceeds groundwater cleanup standard.

MCL = Maximum Contaminant Level
MCLG = MCL Goal
RBC = Risk Based Concentration
AL = Action Level
J = Estimated value (+ high bias - low bias)
U = Not Detected
NTU = nephelometric turbidity unit
s.u = std. units
mS/cm = milisiemens per centimeter
ug/L = micrograms per liter
mg/L = miligrams per liter
mV = millivolts
R = Rejected

TABLE 10

OU-7 VSWMR Monitoring Network Sampling Results
2017 Annual Site-Wide Groundwater, Surface Water, and Sediment Monitoring Report for OU-7, OU-10, and NTCRA Basins
Avtex Fibers Superfund Site
Front Royal, Virginia

FMC-Front Royal Avtex Fibers 2017 Sampling Event VSWMR Groundwater Wells		Purpose:	Groundwater Cleanup Standards[1]		**Downgradient Shallow Bedrock Monitoring Wells (Continued)**					
		Location ID:			138			PZ-06		
		Sampled:			7/30/2017 & 8/9/2017	7/30/2017 Duplicate	Baseline	7/31/2017	7/31/2017 Duplicate	Baseline
CAS NO.	COMPOUND	UNITS:								
	VOLATILES									
67-64-1	Acetone	ug/L	22,000	RBC	**5.36**	2.66 U	25.0 U	**2.87 J**	-- R	25.0 U
75-15-0	Carbon disulfide	ug/L	1,000	RBC	**157**	**207**	2,690	0.22 U	0.22 U	11.9
	SEMIVOLATILES									
117-81-7	bis(2-Ethylhexyl)phthalate (DEHP)	ug/L	6	MCL	6.82 U	6.82 U	12 U	1.63 U	1.5 U	6 U
95-48-7	2-Methylphenol	ug/L	1,800	RBC	7.27 U	7.27 U	20 U	1.74 U	1.6 U	10 U
	3&4-Methylphenol	ug/L	180	RBC	6.36 U	6.36 U	20 U	1.52 U	1.4 U	10 U
91-20-3	Naphthalene	ug/L	14	RBC	1.68 U	1.68 U	20 U	0.402 U	0.37 U	10 U
87-86-5	Pentachlorophenol	ug/L	1	MCL	15 U	15 U	50 U	3.59 UJ	3.3 UJ	25 U
108-95-2	Phenol	ug/L	11,000	RBC	6.82 U	6.82 U	2.4	1.63 U	1.5 U	10 U
	METALS - DISSOLVED									
7429-90-5	Aluminum	ug/L	37,000	RBC	8.4 U	**33.3**	10 U	8.4 UJ	**61 J**	27.9
7440-36-0	Antimony	ug/L	6	MCLG	**1.53 J**	**1.6 J**	8.98	0.8 U	0.8 U	4 U
7440-38-2	Arsenic	ug/L	10	MCL	**36.8**	**36.8**	139	**3.79**	**4.18**	34.8
7440-43-9	Cadmium	ug/L	5	MCLG	0.1 U	0.1 U	10 U	0.1 U	0.1 U	0.7 U
7440-47-3	Chromium	ug/L	100	MCLG	**1.57 J**	**4.02**	2.4	0.5 U	**0.674 J**	2.7
7440-48-4	Cobalt	ug/L	11	RBC	**13.2**	**12.7**	63.4	**0.197 J**	**0.188 J**	4.8
7439-89-6	Iron	ug/L	26,000	RBC	**51.2 J**	**87.2 J**	30 U	**364**	**339**	2,710
7439-92-1	Lead	ug/L	15	AL	0.1 U	0.1 U	3.0 U	0.1 U	0.1 U	3.7 U
7439-96-5	Manganese	ug/L	880	RBC	**504**	**494**	233	**492 J**	**541 J**	1,060
7439-97-6	Mercury[2]	ug/L	2	MCLG	0.1 U	0.1 U	0.2 U	0.1 U	0.1 U	0.2 U
7440-02-0	Nickel	ug/L	730	RBC	**43.6**	**43.6**	138	**0.993 J**	**1.13 J**	12.7
7440-62-2	Vanadium	ug/L	260	RBC	0.7 U	0.7 U	8.5	0.7 U	0.7 U	1.1
7440-66-6	Zinc	ug/L	11,000	RBC	5.2 U	5.2 U	2.0	**5.47 J**	5.2 U	6.7
	OTHER									
57-12-5	Cyanide (free)	ug/L	200	MCLG	1.54 U	1.54 U	169	1.54 U	1.54 U	100 U
	FIELD PARAMETERS									
	Temperature	^{o}C	---		(21.93)	(21.93)	---	19.98	19.98	---
	Conductivity	uS/cm	---		(2755)	(2755)	---	518.25	518.25	---
	pH	s.u.	---		(7.06)	(7.06)	---	7.53	7.53	---
	ORP	mV	---		(-413.8)	(-413.8)	---	-58.2	-58.2	---
	Turbidity	NTU	---		(1.31)	(1.31)	---	41	41	---
	Dissolved Oxygen	mg/L	---		(0.07)	(0.07)	---	2.83	2.83	---
					(Resample)	(Resample)				

[1] - Groundwater cleanup standards as presented in Table 7 of the ROD.

[2] - Reported standard is for Mercury as Methyl.

Bold text indicates detected value.

= Detected value exceeds groundwater cleanup standard.

MCL = Maximum Contaminant Level
MCLG = MCL Goal
RBC = Risk Based Concentration
AL = Action Level
J = Estimated value (+ high bias - low bias)
U = Not Detected
NTU = nephelometric turbidity unit
s.u = std. units
mS/cm = milisiemens per centimeter
ug/L = micrograms per liter
mg/L = miligrams per liter
mV = millivolts
R = Rejected

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TABLE 11

OU-10 Groundwater Elevation Measurements
2017 Annual Site-Wide Groundwater, Surface Water, and Sediment Monitoring Report for OU-7, OU-10, and NTCRA Basins
Avtex Fibers Superfund Site
Front Royal, Virginia

Well ID	Well Type	Reference Elevation (ft MSL) 2009	Reference Elevation (ft MSL) 2012	Total Depth (ft BTOC)
GPW-02	OMW	535.46	535.48	24.54
GPW-03R	OMW	541.04	541.04	30.22
GPW-14	OMW	512.47	512.47	12.09
GPW-15R	OMW	505.84	505.84	23.4
GPW-16R	OMW	535.41	535.41	27.79
GPW-17	OMW	529.59	529.59	22.32
GPW-18	OMW	526.57	526.57	22
GPW-19	OMW	532.31	532.31	19.98
GPW-20	OMW	530.76	530.88	21.25
GPW-21	OMW	528.78	528.78	16
MW-11	OMW	525.45	525.83	43.52
MW-12	OMW	506.53	506.53	30.8
MW-5	S BMW	492.17	493.18	35.22
MW-7	S BMW	531.80	532.24	43.5
MW-8	S BMW	528.77	529.14	43.5
118	S BMW	530.62	532.12	50.91
119	S BMW	511.69	511.69	39.09
120R	S BMW	504.51	504.81	40.45
128	S BMW	518.35	518.37	47.62
130R	S BMW	529.91	527.94	47.90
132[(a)]	S BMW	505.43	506.30	30
133	S BMW	528.14	528.12	43.15
134	S BMW	528.76	528.76	50.46
135	S BMW	526.94	527.03	47.11

Notes:
OMW - Overburden Monitoring Well; monitoring interval is a PVC machine-s
S BMW - Shallow Bedrock Monitoring Well; monitoring interval is an open bo
MSL - mean sea level
BTOC - below top of casing
NM - Water level was not measured at this location.
NP - Not present (well had not yet been installed at the time of sampling)
--- - Ground water elevation unknown
(a) Well 132 is artesian; negative water levels indicate that the water level was the measuring point.
Wells GPW-15, GPW-03 and 120 were replaced in February 2009. The majorit wells onsite were also re-surveyed at this time.
Well GPW-16 was replaced in December 2009. Well 130 was replaced in Janu of the other existing wells onsite were also re-surveyed at this time.

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TABLE 12

OU-10 Viscose Basin 1-8 Groundwater Monitoring Network Sampling Results
2017 Annual Site-Wide Groundwater, Surface Water, and Sediment Monitoring Report for OU-7, OU-10, and NTCRA Basins
Avtex Fibers Superfund Site
Front Royal, Virginia

FMC-Front Royal Avtex Fibers 2017 Sampling Event OU-10 VB 1-8 Groundwater Wells		Purpose:			**Upgradient Overburden Monitoring Wells**		**Upgradient Shallow Bedrock Monitoring Wells**				
		Location ID:	Regional	Regional	GPW-02	GPW-03R	MW-07	MW-08	MW-08 (DUP)	118	128
		Sample ID:	Screening	Screening	2017AN-GPW-02	2017AN-GPW-03R	2017AN-MW-07	2017AN-MW-08	2017AN-MW-08D	2017AN-118	2017AN-128
		Sampled:	Level[1]	Level[1]	7/25/2017	7/24/2017	7/29/2017	7/29/2017	7/29/2017	7/26/2017	7/25/2017
CAS NO.	COMPOUND	UNITS:	HQ=0.1	HQ=1.0							
	VOLATILES										
67-64-1	Acetone	ug/L	1400	14000	2.66 U	2.66 U	-- R	2.66 U	-- R	6.86 U	2.94 U
71-43-2	Benzene	ug/L	0.46	0.46	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
75-27-4	Bromodichloromethane	ug/L	0.13	0.13	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U
75-25-2	Bromoform	ug/L	3.3	3.3	0.29 U	0.29 U	0.29 U	0.29 U	0.29 U	0.29 U	0.29 U
74-83-9	Bromomethane (Methyl bromide)	ug/L	0.75	7.5	0.35 U	0.35 U	0.35 U	0.35 U	0.35 U	0.35 U	0.35 U
78-93-3	2-Butanone (Methyl ethyl ketone) (MEK)	ug/L	560	5600	2.64 U	2.64 U	2.64 U	2.64 U	2.64 U	2.64 U	2.64 U
75-15-0	Carbon disulfide	ug/L	81	810	0.22 U	0.22 U	0.22 U	0.22 U	0.22 U	0.22 U	0.22 U
56-23-5	Carbon tetrachloride	ug/L	0.46	0.46	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U
108-90-7	Chlorobenzene	ug/L	7.8	78	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U
75-00-3	Chloroethane	ug/L	2100	21000	0.36 U	0.36 U	0.36 U	0.36 U	0.36 U	0.36 U	0.36 U
67-66-3	Chloroform (Trichloromethane)	ug/L	0.22	0.22	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U
74-87-3	Chloromethane (Methyl chloride)	ug/L	19	190	0.36 U	0.36 U	0.36 U	0.36 U	0.36 U	0.36 U	0.36 U
124-48-1	Dibromochloromethane	ug/L	0.87	0.87	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
95-50-1	1,2-Dichlorobenzene	ug/L	30	300	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U
541-73-1	1,3-Dichlorobenzene	ug/L	NV	NV	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U
106-46-7	1,4-Dichlorobenzene	ug/L	0.48	0.48	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U
75-34-3	1,1-Dichloroethane	ug/L	2.8	2.8	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U
107-06-2	1,2-Dichloroethane	ug/L	0.17	0.17	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
75-35-4	1,1-Dichloroethene	ug/L	28	280	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
156-59-2	cis-1,2-Dichloroethene	ug/L	3.6	36	0.21 U	0.21 U	0.21 U	0.21 U	0.21 U	0.21 U	0.21 U
156-60-5	trans-1,2-Dichloroethene	ug/L	36	360	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U
78-87-5	1,2-Dichloropropane	ug/L	0.82	0.85	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
10061-01-5	cis-1,3-Dichloropropene	ug/L	0.47	0.47	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U
10061-02-6	trans-1,3-Dichloropropene	ug/L	0.47	0.47	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U
100-41-4	Ethylbenzene	ug/L	1.5	1.5	0.19 U	0.19 U	**0.206 J**	0.19 U	0.19 U	0.19 U	0.19 U
591-78-6	2-Hexanone	ug/L	3.8	38	1.28 U	1.28 U	1.28 U	1.28 U	1.28 U	1.28 U	1.28 U
108-10-1	4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	ug/L	630	6300	0.81 U	0.81 U	0.81 U	0.81 U	0.81 U	0.81 U	0.81 U
75-09-2	Methylene chloride	ug/L	11	11	1 U	1 U	1 U	1 U	1 U	1 U	1 U
100-42-5	Styrene	ug/L	120	1200	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U
79-34-5	1,1,2,2-Tetrachloroethane	ug/L	0.076	0.076	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U
127-18-4	Tetrachloroethene	ug/L	4.1	11	0.14 U	0.14 U	0.14 U	0.14 U	0.14 U	0.14 U	0.14 U
108-88-3	Toluene	ug/L	110	1100	0.17 U	0.17 U	**0.366 J**	0.17 U	**0.202 J**	0.17 U	**0.174 J**
120-82-1	1,2,4-Trichlorobenzene	ug/L	0.4	1.2	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
71-55-6	1,1,1-Trichloroethane	ug/L	800	8000	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U
79-00-5	1,1,2-Trichloroethane	ug/L	0.041	0.28	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U
79-01-6	Trichloroethene	ug/L	0.28	0.49	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
75-01-4	Vinyl chloride	ug/L	0.019	0.019	0.18 U	0.18 U	**2.08**	0.18 U	0.18 U	0.18 U	0.18 U
1330-20-7	Xylenes (total)	ug/L	19	190	0.58 U	0.58 U	**1.22 J**	**0.835 J**	**0.765 J**	0.58 U	0.58 U
	SEMIVOLATILES										
83-32-9	Acenaphthene	ug/L	53	530	0.308 U	0.308 U	0.281 U	0.286 U	0.296 U	0.308 U	0.308 U
208-96-8	Acenaphthylene	ug/L	NV	NV	0.337 U	0.337 U	0.307 U	0.313 U	0.324 U	0.337 U	0.337 U
120-12-7	Anthracene	ug/L	180	1800	0.365 U	0.365 U	0.333 U	0.339 U	0.352 U	0.365 U	0.365 U

TABLE 12

OU-10 Viscose Basin 1-8 Groundwater Monitoring Network Sampling Results
2017 Annual Site-Wide Groundwater, Surface Water, and Sediment Monitoring Report for OU-7, OU-10, and NTCRA Basins
Avtex Fibers Superfund Site
Front Royal, Virginia

FMC-Front Royal Avtex Fibers 2017 Sampling Event OU-10 VB 1-8 Groundwater Wells		Purpose:			Upgradient Overburden Monitoring Wells		Upgradient Shallow Bedrock Monitoring Wells				
		Location ID: Sample ID: Sampled:	Regional Screening Level[1]	Regional Screening Level[1]	GPW-02 2017AN-GPW-02 7/25/2017	GPW-03R 2017AN-GPW-03R 7/24/2017	MW-07 2017AN-MW-07 7/29/2017	MW-08 2017AN-MW-08 7/29/2017	MW-08 (DUP) 2017AN-MW-08D 7/29/2017	118 2017AN-118 7/26/2017	128 2017AN-128 7/25/2017
CAS NO.	COMPOUND	UNITS:	HQ=0.1	HQ=1.0							
	SEMIVOLATILES (CONTINUED)										
56-55-3	Benzo(a)anthracene	ug/L	0.03	0.03	0.308 U	0.308 U	0.281 U	0.286 U	0.296 U	0.308 U	0.308 U
50-32-8	Benzo(a)pyrene	ug/L	0.025	0.025	0.365 U	0.365 U	0.333 U	0.339 U	0.352 U	0.365 U	0.365 U
205-99-2	Benzo(b)fluoranthene	ug/L	0.25	0.25	0.346 U	0.346 U	0.316 U	0.321 U	0.333 U	0.346 U	0.346 U
191-24-2	Benzo(g,h,i)perylene	ug/L	NV	NV	0.596 U	0.596 U	0.544 U	0.554 U	0.574 U	0.596 U	0.596 U
207-08-9	Benzo(k)fluoranthene	ug/L	2.5	2.5	0.356 U	0.356 U	0.325 U	0.33 U	0.343 U	0.356 U	0.356 U
101-55-3	4-Bromophenyl phenyl ether	ug/L	NV	NV	1.54 U	1.54 U	1.4 U	1.43 U	1.48 U	1.54 U	1.54 U
85-68-7	Butyl benzylphthalate (BBP)	ug/L	16	16	0.962 U	0.962 U	0.877 U	0.893 U	0.926 U	0.962 U	0.962 U
86-74-8	Carbazole	ug/L	NV	NV	0.865 U	0.865 U	0.789 U	0.804 U	0.833 U	0.865 U	0.865 U
59-50-7	4-Chloro-3-methylphenol	ug/L	140	1400	1.35 U	1.35 U	1.23 U	1.25 U	1.3 U	1.35 U	1.35 U
106-47-8	4-Chloroaniline	ug/L	0.37	0.37	1.15 U	1.15 U	1.05 U	1.07 U	1.11 U	1.15 U	1.15 U
111-91-1	bis(2-Chloroethoxy)methane	ug/L	5.9	59	1.83 U	1.83 U	1.67 U	1.7 U	1.76 U	1.83 U	1.83 U
111-44-4	bis(2-Chloroethyl)ether	ug/L	0.014	0.014	1.25 U	1.25 U	1.14 U	1.16 U	1.2 U	1.25 U	1.25 U
91-58-7	2-Chloronaphthalene	ug/L	75	750	1.44 U	1.44 U	1.32 U	1.34 U	1.39 U	1.44 U	1.44 U
95-57-8	2-Chlorophenol	ug/L	9.1	91	1.63 U	1.63 U	1.49 U	1.52 U	1.57 U	1.63 U	1.63 U
7005-72-3	4-Chlorophenyl phenyl ether	ug/L	NV	NV	1.54 U	1.54 U	1.4 U	1.43 U	1.48 U	1.54 U	1.54 U
218-01-9	Chrysene	ug/L	25	25	0.317 U	0.317 U	0.289 U	0.295 U	0.306 U	0.317 U	0.317 U
53-70-3	Dibenz(a,h)anthracene	ug/L	0.025	0.025	0.433 U	0.433 U	0.395 U	0.402 U	0.417 U	0.433 U	0.433 U
132-64-9	Dibenzofuran	ug/L	0.79	7.9	1.25 U	1.25 U	1.14 U	1.16 U	1.2 U	1.25 U	1.25 U
95-50-1	1,2-Dichlorobenzene	ug/L	30	300	2.12 U	2.12 U	1.93 U	1.96 U	2.04 U	2.12 U	2.12 U
541-73-1	1,3-Dichlorobenzene	ug/L	NV	NV	1.92 U	1.92 U	1.75 U	1.79 U	1.85 U	1.92 U	1.92 U
106-46-7	1,4-Dichlorobenzene	ug/L	0.48	0.48	1.92 U	1.92 U	1.75 U	1.79 U	1.85 U	1.92 U	1.92 U
91-94-1	3,3'-Dichlorobenzidine	ug/L	0.13	0.13	1.44 U	1.44 U	1.32 U	1.34 U	1.39 U	1.44 U	1.44 U
120-83-2	2,4-Dichlorophenol	ug/L	4.6	46	2.12 U	2.12 U	1.93 U	1.96 U	2.04 U	2.12 U	2.12 U
84-66-2	Diethyl phthalate	ug/L	1500	15000	1.15 U	1.15 U	1.05 U	1.07 U	1.11 U	1.15 U	1.15 U
105-67-9	2,4-Dimethylphenol	ug/L	36	360	1.54 U	1.54 U	1.4 U	1.43 U	1.48 U	1.54 U	1.54 U
131-11-3	Dimethyl phthalate	ug/L	NV	NV	1.15 U	1.15 U	1.05 U	1.07 U	1.11 U	1.15 U	1.15 U
84-74-2	Di-n-butylphthalate (DBP)	ug/L	90	900	1.25 U	1.25 U	1.14 U	1.16 U	1.2 U	1.25 U	1.25 U
534-52-1	4,6-Dinitro-2-methylphenol	ug/L	0.15	1.5	2.79 U	2.79 U	2.54 U	2.59 U	2.69 U	2.79 U	2.79 U
51-28-5	2,4-Dinitrophenol	ug/L	3.9	39	6.92 U	6.92 U	6.32 U	6.43 U	6.67 U	6.92 U	6.92 U
121-14-2	2,4-Dinitrotoluene	ug/L	0.24	0.24	1.54 U	1.54 U	1.4 U	1.43 U	1.48 U	1.54 U	1.54 U
606-20-2	2,6-Dinitrotoluene	ug/L	0.049	0.049	1.44 U	1.44 U	1.32 U	1.34 U	1.39 U	1.44 U	1.44 U
117-84-0	Di-n-octyl phthalate (DnOP)	ug/L	20	200	0.865 U	0.865 U	0.789 U	0.804 U	0.833 U	0.865 U	0.865 U
117-81-7	bis(2-Ethylhexyl)phthalate (DEHP)	ug/L	5.6	5.6	1.44 U	1.44 U	6.26 U	1.76 U	1.78 U	1.44 U	1.44 U
206-44-0	Fluoranthene	ug/L	80	800	0.308 U	0.308 U	0.281 U	0.286 U	0.296 U	0.308 U	0.308 U
86-73-7	Fluorene	ug/L	29	290	0.308 U	0.308 U	0.281 U	0.286 U	0.296 U	0.308 U	0.308 U
118-74-1	Hexachlorobenzene	ug/L	0.0098	0.0098	1.44 U	1.44 U	1.32 U	1.34 U	1.39 U	1.44 U	1.44 U
87-68-3	Hexachlorobutadiene	ug/L	0.14	0.14	1.44 U	1.44 U	1.32 U	1.34 U	1.39 U	1.44 U	1.44 U
77-47-4	Hexachlorocyclopentadiene	ug/L	0.041	0.41	1.25 U	1.25 U	-- R	-- R	-- R	1.25 U	1.25 U
67-72-1	Hexachloroethane	ug/L	0.33	0.33	2.12 U	2.12 U	1.93 U	1.96 U	2.04 U	2.12 U	2.12 U
193-39-5	Indeno(1,2,3-cd)pyrene	ug/L	0.25	0.25	0.394 U	0.394 U	0.36 U	0.366 U	0.38 U	0.394 U	0.394 U
78-59-1	Isophorone	ug/L	78	78	2.12 U	2.12 U	1.93 U	1.96 U	2.04 U	2.12 U	2.12 U
91-57-6	2-Methylnaphthalene	ug/L	3.6	36	0.385 U	0.385 U	0.351 U	0.357 U	0.37 U	0.385 U	0.385 U

TABLE 12

OU-10 Viscose Basin 1-8 Groundwater Monitoring Network Sampling Results
2017 Annual Site-Wide Groundwater, Surface Water, and Sediment Monitoring Report for OU-7, OU-10, and NTCRA Basins
Avtex Fibers Superfund Site
Front Royal, Virginia

FMC-Front Royal Avtex Fibers 2017 Sampling Event OU-10 VB 1-8 Groundwater Wells		Purpose:			**Upgradient Overburden Monitoring Wells**		**Upgradient Shallow Bedrock Monitoring Wells**				
		Location ID: Sample ID: Sampled:	Regional Screening Level[1]	Regional Screening Level[1]	GPW-02 2017AN-GPW-02 7/25/2017	GPW-03R 2017AN-GPW-03R 7/24/2017	MW-07 2017AN-MW-07 7/29/2017	MW-08 2017AN-MW-08 7/29/2017	MW-08 (DUP) 2017AN-MW-08D 7/29/2017	118 2017AN-118 7/26/2017	128 2017AN-128 7/25/2017
CAS NO.	COMPOUND	UNITS:	HQ=0.1	HQ=1.0							
	SEMIVOLATILES (CONTINUED)										
95-48-7	2-Methylphenol	ug/L	93	930	1.54 U	1.54 U	1.4 U	1.43 U	1.48 U	1.54 U	1.54 U
	3&4-Methylphenol	ug/L	140	1400	1.35 U	1.35 U	1.23 U	1.25 U	1.3 U	1.35 U	1.35 U
91-20-3	Naphthalene	ug/L	0.17	0.17	0.356 U	0.356 U	0.325 U	0.33 U	0.343 U	0.356 U	0.356 U
88-74-4	2-Nitroaniline	ug/L	19	190	1.06 U	1.06 U	0.965 U	0.982 U	1.02 U	1.06 U	1.06 U
99-09-2	3-Nitroaniline	ug/L	NV	NV	1.54 U	1.54 U	1.4 U	1.43 U	1.48 U	1.54 U	1.54 U
100-01-6	4-Nitroaniline	ug/L	3.8	3.8	1.54 U	1.54 U	1.4 U	1.43 U	1.48 U	1.54 U	1.54 U
98-95-3	Nitrobenzene	ug/L	0.14	0.14	2.12 U	2.12 U	1.93 U	1.96 U	2.04 U	2.12 U	2.12 U
88-75-5	2-Nitrophenol	ug/L	NV	NV	2.31 U	2.31 U	2.11 U	2.14 U	2.22 U	2.31 U	2.31 U
100-02-7	4-Nitrophenol	ug/L	NV	NV	1.92 U	1.92 U	1.75 U	1.79 U	1.85 U	1.92 U	1.92 U
621-64-7	N-Nitrosodi-n-propylamine	ug/L	0.011	0.011	1.63 U	1.63 U	1.49 U	1.52 U	1.57 U	1.63 U	1.63 U
86-30-6	N-Nitrosodiphenylamine	ug/L	12	12	3.46 U	3.46 U	3.16 U	3.21 U	3.33 U	3.46 U	3.46 U
108-60-1	2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	ug/L	71	710	1.73 U	1.73 U	1.58 U	1.61 U	1.67 U	1.73 U	1.73 U
87-86-5	Pentachlorophenol	ug/L	0.041	0.041	3.17 U	3.17 U	2.89 U	2.95 U	3.06 U	3.17 U	3.17 U
85-01-8	Phenanthrene	ug/L	NV	NV	0.404 U	0.404 U	0.368 U	0.375 U	0.389 U	0.404 U	0.404 U
108-95-2	Phenol	ug/L	580	5800	1.44 U	1.44 U	1.32 U	1.34 U	1.39 U	1.44 U	1.44 U
129-00-0	Pyrene	ug/L	12	120	0.337 U	0.337 U	0.307 U	0.313 U	0.324 U	0.337 U	0.337 U
120-82-1	1,2,4-Trichlorobenzene	ug/L	0.4	1.2	2.02 U	2.02 U	1.84 U	1.88 U	1.94 U	2.02 U	2.02 U
95-95-4	2,4,5-Trichlorophenol	ug/L	120	1200	1.25 U	1.25 U	1.14 U	1.16 U	1.2 U	1.25 U	1.25 U
88-06-2	2,4,6-Trichlorophenol	ug/L	1.2	4.1	1.83 U	1.83 U	1.67 U	1.7 U	1.76 U	1.83 U	1.83 U
	METALS - DISSOLVED										
7440-36-0	Antimony	ug/L	0.78	7.8	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U
7440-38-2	Arsenic	ug/L	0.052	0.052	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
7440-41-7	Beryllium	ug/L	2.5	25	**0.117 J**	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	**0.13 J**
7440-43-9	Cadmium	ug/L	0.92	9.2	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
7440-47-3	Chromium	ug/L	2200	22000	**2.44**	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
7440-50-8	Copper	ug/L	80	800	**8.55**	**13.3**	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U
7439-92-1	Lead	ug/L	15	15	0.1 U	**1.46 J**	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
7439-97-6	Mercury[2]	ug/L	0.063	0.63	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
7440-02-0	Nickel	ug/L	39	390	**10.3**	**8.38**	0.5 U	0.5 U	0.5 U	**3.14**	**2.52**
7782-49-2	Selenium	ug/L	10	100	**0.375 J**	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
7440-28-0	Thallium	ug/L	0.02	0.20	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U
7440-62-2	Vanadium	ug/L	8.6	86	0.7 U	0.7 U	0.7 U	0.7 U	0.7 U	0.7 U	0.7 U
7440-66-6	Zinc	ug/L	600	6000	**234**	**136**	**47.5**	**30.4**	**38.3**	**41.6**	**74.1**
	FIELD PARAMETERS										
	Temperature	°C	---	---	21.4	21.84	17.92	18.4	18.4	16.12	18.75
	Conductivity	uS/cm	---	---	433.78	759.56	1534.9	1270.4	1270.4	1121.4	1557
	pH	s.u.	---	---	5.5	5.69	6.4	6.55	6.55	6.69	6.49
	ORP	mV	---	---	81.7	209.6	-59.8	-57.5	-57.5	-27.1	-32.6
	Turbidity	NTU	---	---	55.8	2.28	1.79	82.2	82.2	18.8	67.7
	Dissolved Oxygen	mg/L	---	---	1.99	1.96	0.29	0.45	0.45	0.13	0.16

TABLE 12

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Avtex Fibers Superfund Site
Front Royal, Virginia

FMC-Front Royal Avtex Fibers 2017 Sampling Event OU-10 VB 1-8 Groundwater Wells		Purpose:			**Upgradient Shallow Bedrock Monitoring Wells (Continued)**		**Downgradient Overburden Monitoring Wells**			
		Location ID: Sample ID: Sampled:	Regional Screening Level[1]	Regional Screening Level[1]	130R 2017AN-130R 7/27/2017 & 2/1/2018	133 2017AN-133 7/26/2017	GPW-14 2017AN-GPW-14 7/27/2017 & 1/31/2018	GPW-15R 2017AN-GPW-15R 7/29/2017	MW-11 2017AN-MW-11 7/31/2017	MW-12 2017AN-MW-12 7/29/2017
CAS NO.	COMPOUND	UNITS:	HQ=0.1	HQ=1.0						
	VOLATILES									
67-64-1	Acetone	ug/L	1400	14000	7.44 U	3.71 U	7.92 U	-- R	-- R	-- R
71-43-2	Benzene	ug/L	0.46	0.46	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	**0.923**
75-27-4	Bromodichloromethane	ug/L	0.13	0.13	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U
75-25-2	Bromoform	ug/L	3.3	3.3	0.29 U	0.29 U	0.29 U	0.29 U	0.29 U	0.29 U
74-83-9	Bromomethane (Methyl bromide)	ug/L	0.75	7.5	0.35 U	0.35 U	0.35 U	0.35 U	0.35 U	0.35 U
78-93-3	2-Butanone (Methyl ethyl ketone) (MEK)	ug/L	560	5600	2.64 U	2.64 U	2.64 U	2.64 U	2.64 U	2.64 U
75-15-0	Carbon disulfide	ug/L	81	810	0.22 U	**0.346 J**	0.22 U	0.22 U	0.22 U	**0.284 J**
56-23-5	Carbon tetrachloride	ug/L	0.46	0.46	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U
108-90-7	Chlorobenzene	ug/L	7.8	78	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U
75-00-3	Chloroethane	ug/L	2100	21000	0.36 U	0.36 U	0.36 U	0.36 U	0.36 U	0.36 U
67-66-3	Chloroform (Trichloromethane)	ug/L	0.22	0.22	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U
74-87-3	Chloromethane (Methyl chloride)	ug/L	19	190	0.36 U	0.36 U	0.36 U	0.36 U	0.36 U	0.36 U
124-48-1	Dibromochloromethane	ug/L	0.87	0.87	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
95-50-1	1,2-Dichlorobenzene	ug/L	30	300	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U
541-73-1	1,3-Dichlorobenzene	ug/L	NV	NV	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U
106-46-7	1,4-Dichlorobenzene	ug/L	0.48	0.48	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U
75-34-3	1,1-Dichloroethane	ug/L	2.8	2.8	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U
107-06-2	1,2-Dichloroethane	ug/L	0.17	0.17	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
75-35-4	1,1-Dichloroethene	ug/L	28	280	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
156-59-2	cis-1,2-Dichloroethene	ug/L	3.6	36	0.21 U	0.21 U	0.21 U	0.21 U	0.21 U	0.21 U
156-60-5	trans-1,2-Dichloroethene	ug/L	36	360	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U
78-87-5	1,2-Dichloropropane	ug/L	0.82	0.85	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
10061-01-5	cis-1,3-Dichloropropene	ug/L	0.47	0.47	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U
10061-02-6	trans-1,3-Dichloropropene	ug/L	0.47	0.47	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U
100-41-4	Ethylbenzene	ug/L	1.5	1.5	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	**0.229 J**
591-78-6	2-Hexanone	ug/L	3.8	38	1.28 U	1.28 U	1.28 U	1.28 U	1.28 U	1.28 U
108-10-1	4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	ug/L	630	6300	0.81 U	0.81 U	0.81 U	0.81 U	0.81 U	0.81 U
75-09-2	Methylene chloride	ug/L	11	11	1 U	1 U	1 U	1 U	1 U	1 U
100-42-5	Styrene	ug/L	120	1200	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U
79-34-5	1,1,2,2-Tetrachloroethane	ug/L	0.076	0.076	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U
127-18-4	Tetrachloroethene	ug/L	4.1	11	0.14 U	0.14 U	0.14 U	0.14 U	0.14 U	0.14 U
108-88-3	Toluene	ug/L	110	1100	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U
120-82-1	1,2,4-Trichlorobenzene	ug/L	0.4	1.2	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
71-55-6	1,1,1-Trichloroethane	ug/L	800	8000	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U
79-00-5	1,1,2-Trichloroethane	ug/L	0.041	0.28	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U
79-01-6	Trichloroethene	ug/L	0.28	0.49	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
75-01-4	Vinyl chloride	ug/L	0.019	0.019	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U
1330-20-7	Xylenes (total)	ug/L	19	190	0.58 U	0.58 U	0.58 U	0.58 U	0.58 U	**0.923 J**
	SEMIVOLATILES									
83-32-9	Acenaphthene	ug/L	53	530	0.308 U	0.308 U	0.308 U	0.296 U	0.333 U	0.32 U
208-96-8	Acenaphthylene	ug/L	NV	NV	0.337 U	0.337 U	0.337 U	0.324 U	0.365 U	0.35 U
120-12-7	Anthracene	ug/L	180	1800	0.365 U	0.365 U	0.365 U	0.352 U	0.396 U	0.38 U

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Avtex Fibers Superfund Site
Front Royal, Virginia

FMC-Front Royal Avtex Fibers 2017 Sampling Event OU-10 VB 1-8 Groundwater Wells		Purpose:			**Upgradient Shallow Bedrock Monitoring Wells (Continued)**		**Downgradient Overburden Monitoring Wells**			
		Location ID: Sample ID: Sampled:	Regional Screening Level[1]	Regional Screening Level[1]	130R 2017AN-130R 7/27/2017 & 2/1/2018	133 2017AN-133 7/26/2017	GPW-14 2017AN-GPW-14 7/27/2017 & 1/31/2018	GPW-15R 2017AN-GPW-15R 7/29/2017	MW-11 2017AN-MW-11 7/31/2017	MW-12 2017AN-MW-12 7/29/2017
CAS NO.	COMPOUND	UNITS:	HQ=0.1	HQ=1.0						
	SEMIVOLATILES (CONTINUED)									
56-55-3	Benzo(a)anthracene	ug/L	0.03	0.03	0.308 U	0.308 U	0.308 U	0.296 U	0.333 U	0.32 U
50-32-8	Benzo(a)pyrene	ug/L	0.025	0.025	0.365 U	0.365 U	0.365 U	0.352 U	0.396 U	0.38 U
205-99-2	Benzo(b)fluoranthene	ug/L	0.25	0.25	0.346 U	0.346 U	0.346 U	0.333 U	0.375 U	0.36 U
191-24-2	Benzo(g,h,i)perylene	ug/L	NV	NV	0.596 U	0.596 U	0.596 U	0.574 U	0.646 U	0.62 U
207-08-9	Benzo(k)fluoranthene	ug/L	2.5	2.5	0.356 U	0.356 U	0.356 U	0.343 U	0.385 U	0.37 U
101-55-3	4-Bromophenyl phenyl ether	ug/L	NV	NV	1.54 U	1.54 U	1.54 U	1.48 U	1.67 U	1.6 U
85-68-7	Butyl benzylphthalate (BBP)	ug/L	16	16	0.962 U	0.962 U	0.962 U	0.926 U	1.04 U	1 U
86-74-8	Carbazole	ug/L	NV	NV	0.865 U	0.865 U	0.865 U	0.833 U	0.938 U	0.9 U
59-50-7	4-Chloro-3-methylphenol	ug/L	140	1400	1.35 U	1.35 U	1.35 U	1.3 U	1.46 U	1.4 U
106-47-8	4-Chloroaniline	ug/L	0.37	0.37	1.15 U	1.15 U	1.15 U	1.11 U	1.25 U	1.2 U
111-91-1	bis(2-Chloroethoxy)methane	ug/L	5.9	59	1.83 U	1.83 U	1.83 U	1.76 U	1.98 U	1.9 U
111-44-4	bis(2-Chloroethyl)ether	ug/L	0.014	0.014	1.25 U	1.25 U	1.25 U	1.2 U	1.35 U	1.3 U
91-58-7	2-Chloronaphthalene	ug/L	75	750	1.44 U	1.44 U	1.44 U	1.39 U	1.56 U	1.5 U
95-57-8	2-Chlorophenol	ug/L	9.1	91	1.63 U	1.63 U	1.63 U	1.57 U	1.77 U	1.7 U
7005-72-3	4-Chlorophenyl phenyl ether	ug/L	NV	NV	1.54 U	1.54 U	1.54 U	1.48 U	1.67 U	1.6 U
218-01-9	Chrysene	ug/L	25	25	0.317 U	0.317 U	0.317 U	0.306 U	0.344 U	0.33 U
53-70-3	Dibenz(a,h)anthracene	ug/L	0.025	0.025	0.433 U	0.433 U	0.433 U	0.417 U	0.469 U	0.45 U
132-64-9	Dibenzofuran	ug/L	0.79	7.9	1.25 U	1.25 U	1.25 U	1.2 U	1.35 U	1.3 U
95-50-1	1,2-Dichlorobenzene	ug/L	30	300	2.12 U	2.12 U	2.12 U	2.04 U	2.29 U	2.2 U
541-73-1	1,3-Dichlorobenzene	ug/L	NV	NV	1.92 U	1.92 U	1.92 U	1.85 U	2.08 U	2 U
106-46-7	1,4-Dichlorobenzene	ug/L	0.48	0.48	1.92 U	1.92 U	1.92 U	1.85 U	2.08 U	2 U
91-94-1	3,3'-Dichlorobenzidine	ug/L	0.13	0.13	1.44 U	1.44 U	1.44 U	1.39 U	1.56 U	1.5 U
120-83-2	2,4-Dichlorophenol	ug/L	4.6	46	2.12 U	2.12 U	2.12 U	2.04 U	2.29 U	2.2 U
84-66-2	Diethyl phthalate	ug/L	1500	15000	1.15 U	1.15 U	1.15 U	1.11 U	1.25 U	1.2 U
105-67-9	2,4-Dimethylphenol	ug/L	36	360	1.54 U	1.54 U	1.54 U	1.48 U	1.67 U	1.6 U
131-11-3	Dimethyl phthalate	ug/L	NV	NV	1.15 U	1.15 U	1.15 U	1.11 U	1.25 U	1.2 U
84-74-2	Di-n-butylphthalate (DBP)	ug/L	90	900	1.25 U	1.25 U	1.25 U	1.2 U	1.35 U	1.3 U
534-52-1	4,6-Dinitro-2-methylphenol	ug/L	0.15	1.5	2.79 U	2.79 U	2.79 U	2.69 U	3.02 U	2.9 U
51-28-5	2,4-Dinitrophenol	ug/L	3.9	39	6.92 U	6.92 U	6.92 U	6.67 U	7.5 U	7.2 U
121-14-2	2,4-Dinitrotoluene	ug/L	0.24	0.24	1.54 U	1.54 U	1.54 U	1.48 U	1.67 U	1.6 U
606-20-2	2,6-Dinitrotoluene	ug/L	0.049	0.049	1.44 U	1.44 U	1.44 U	1.39 U	1.56 U	1.5 U
117-84-0	Di-n-octyl phthalate (DnOP)	ug/L	20	200	0.865 U	0.865 U	0.865 U	0.833 U	0.938 U	0.9 U
117-81-7	bis(2-Ethylhexyl)phthalate (DEHP)	ug/L	5.6	5.6	1.44 U	1.44 U	1.44 U	1.67 U	1.56 U	1.5 U
206-44-0	Fluoranthene	ug/L	80	800	0.308 U	0.308 U	0.308 U	0.296 U	0.333 U	0.32 U
86-73-7	Fluorene	ug/L	29	290	0.308 U	0.308 U	0.308 U	0.296 U	0.333 U	0.32 U
118-74-1	Hexachlorobenzene	ug/L	0.0098	0.0098	1.44 U	1.44 U	1.44 U	1.39 U	1.56 U	1.5 U
87-68-3	Hexachlorobutadiene	ug/L	0.14	0.14	1.44 U	1.44 U	1.44 U	1.39 U	1.56 U	1.5 U
77-47-4	Hexachlorocyclopentadiene	ug/L	0.041	0.41	1.25 U	1.25 U	1.25 U	-- R	1.35 UJ	1.3 UJ
67-72-1	Hexachloroethane	ug/L	0.33	0.33	2.12 U	2.12 U	2.12 U	2.04 U	2.29 U	2.2 U
193-39-5	Indeno(1,2,3-cd)pyrene	ug/L	0.25	0.25	0.394 U	0.394 U	0.394 U	0.38 U	0.427 U	0.41 U
78-59-1	Isophorone	ug/L	78	78	2.12 U	2.12 U	2.12 U	2.04 U	2.29 U	2.2 U
91-57-6	2-Methylnaphthalene	ug/L	3.6	36	0.385 U	0.385 U	0.385 U	0.37 U	0.417 U	0.4 U

TABLE 12

OU-10 Viscose Basin 1-8 Groundwater Monitoring Network Sampling Results
2017 Annual Site-Wide Groundwater, Surface Water, and Sediment Monitoring Report for OU-7, OU-10, and NTCRA Basins
Avtex Fibers Superfund Site
Front Royal, Virginia

FMC-Front Royal Avtex Fibers 2017 Sampling Event OU-10 VB 1-8 Groundwater Wells		Purpose:			**Upgradient Shallow Bedrock Monitoring Wells (Continued)**		**Downgradient Overburden Monitoring Wells**			
		Location ID: Sample ID: Sampled:	Regional Screening Level[1]	Regional Screening Level[1]	130R 2017AN-130R 7/27/2017 & 2/1/2018	133 2017AN-133 7/26/2017	GPW-14 2017AN-GPW-14 7/27/2017 & 1/31/2018	GPW-15R 2017AN-GPW-15R 7/29/2017	MW-11 2017AN-MW-11 7/31/2017	MW-12 2017AN-MW-12 7/29/2017
CAS NO.	COMPOUND	UNITS:	HQ=0.1	HQ=1.0						
	SEMIVOLATILES (CONTINUED)									
95-48-7	2-Methylphenol	ug/L	93	930	1.54 U	1.54 U	1.54 U	1.48 U	1.67 U	1.6 U
	3&4-Methylphenol	ug/L	140	1400	1.35 U	1.35 U	1.35 U	1.3 U	1.46 U	1.4 U
91-20-3	Naphthalene	ug/L	0.17	0.17	0.356 U	0.356 U	0.356 U	0.343 U	0.385 U	0.37 U
88-74-4	2-Nitroaniline	ug/L	19	190	1.06 U	1.06 U	1.06 U	1.02 U	1.15 U	1.1 U
99-09-2	3-Nitroaniline	ug/L	NV	NV	1.54 U	1.54 U	1.54 U	1.48 U	1.67 U	1.6 U
100-01-6	4-Nitroaniline	ug/L	3.8	3.8	1.54 U	1.54 U	1.54 U	1.48 U	1.67 U	1.6 U
98-95-3	Nitrobenzene	ug/L	0.14	0.14	2.12 U	2.12 U	2.12 U	2.04 U	2.29 U	2.2 U
88-75-5	2-Nitrophenol	ug/L	NV	NV	2.31 U	2.31 U	2.31 U	2.22 U	2.5 U	2.4 U
100-02-7	4-Nitrophenol	ug/L	NV	NV	1.92 U	1.92 U	1.92 U	1.85 U	2.08 U	2 UJ
621-64-7	N-Nitrosodi-n-propylamine	ug/L	0.011	0.011	1.63 U	1.63 U	1.63 U	1.57 U	1.77 U	1.7 U
86-30-6	N-Nitrosodiphenylamine	ug/L	12	12	3.46 U	3.46 U	3.46 U	3.33 U	3.75 U	3.6 U
108-60-1	2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	ug/L	71	710	1.73 U	1.73 U	1.73 U	1.67 U	1.88 UJ	1.8 U
87-86-5	Pentachlorophenol	ug/L	0.041	0.041	3.17 U	3.17 U	3.17 U	3.06 U	3.44 UJ	3.3 UJ
85-01-8	Phenanthrene	ug/L	NV	NV	0.404 U	0.404 U	0.404 U	0.389 U	0.438 U	0.42 U
108-95-2	Phenol	ug/L	580	5800	1.44 U	1.44 U	1.44 U	1.39 U	1.56 U	1.5 U
129-00-0	Pyrene	ug/L	12	120	0.337 U	0.337 U	0.337 U	0.324 U	0.365 U	0.35 U
120-82-1	1,2,4-Trichlorobenzene	ug/L	0.4	1.2	2.02 U	2.02 U	2.02 U	1.94 U	2.19 U	2.1 U
95-95-4	2,4,5-Trichlorophenol	ug/L	120	1200	1.25 U	1.25 U	1.25 U	1.2 U	1.35 U	1.3 U
88-06-2	2,4,6-Trichlorophenol	ug/L	1.2	4.1	1.83 U	1.83 U	1.83 U	1.76 U	1.98 U	1.9 U
	METALS - DISSOLVED									
7440-36-0	Antimony	ug/L	0.78	7.8	0.8 U	0.8 U	**1.09 J**	0.8 U	0.8 UJ	1.6 U
7440-38-2	Arsenic	ug/L	0.052	0.052	0.4 U	**1.87 J**	**2.08**	0.4 U	**5.84 J**	**44.6**
7440-41-7	Beryllium	ug/L	2.5	25	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.2 U
7440-43-9	Cadmium	ug/L	0.92	9.2	0.1 U	0.1 U	**0.176 J**	0.1 U	**0.136 J**	0.2 U
7440-47-3	Chromium	ug/L	2200	22000	0.5 U	0.5 U	**0.658 J**	0.5 U	0.5 UJ	1 U
7440-50-8	Copper	ug/L	80	800	**1.22 J**	12 U	**9.08**	**1.34 J**	1.2 U	2.4 U
7439-92-1	Lead	ug/L	15	15	0.1 U	0.1 U	0.1 U	**0.65 J**	0.1 U	0.2 U
7439-97-6	Mercury[2]	ug/L	0.063	0.63	0.1 U	0.15 U	0.1 U	0.1 U	0.1 U	0.1 U
7440-02-0	Nickel	ug/L	39	390	**0.701 J**	**10.6**	**53.2**	**1.01 J**	**39.6 J**	**9.79**
7782-49-2	Selenium	ug/L	10	100	0.3 U	**0.326 J**	**1.58 J**	0.3 U	0.3 U	**1.92 J**
7440-28-0	Thallium	ug/L	0.02	0.20	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	1.6 U
7440-62-2	Vanadium	ug/L	8.6	86	0.7 U	0.7 U	**2.04**	0.7 U	0.7 U	**5.72**
7440-66-6	Zinc	ug/L	600	6000	**13.3 J**	5.2 U	**9.4 J**	**51.9**	**10.2 J**	10.4 U
	FIELD PARAMETERS									
	Temperature	°C	---	---	16.8 (14.28)	20.91	21.66 (1.53)	17.82	26.89	18.75
	Conductivity	uS/cm	---	---	834.87 (407.19)	11067	18555 (11380)	793.25	5299.9	14293
	pH	s.u.	---	---	6.61 (6.83)	6.88	6.58 (6.99)	6.34	6.51	8.31
	ORP	mV	---	---	-6.2 (-65.4)	-90.1	79.2 (-16.4)	106.3	-7.4	46.3
	Turbidity	NTU	---	---	1.85 (9.58)	6.29	176 (13.8)	5.87	0	8.23
	Dissolved Oxygen	mg/L	---	---	0.15 (0.19)	0.13	6.24 (5.41)	1.63	0.23	5.01
					(Resample)		(Resample)			

TABLE 12

OU-10 Viscose Basin 1-8 Groundwater Monitoring Network Sampling Results
2017 Annual Site-Wide Groundwater, Surface Water, and Sediment Monitoring Report for OU-7, OU-10, and NTCRA Basins
Avtex Fibers Superfund Site
Front Royal, Virginia

FMC-Front Royal Avtex Fibers 2017 Sampling Event OU-10 VB 1-8 Groundwater Wells		Purpose:			Downgradient Shallow Bedrock Monitoring Wells					
		Location ID: Sample ID: Sampled:	Regional Screening Level[1]	Regional Screening Level[1]	MW-05 2017AN-MW-05 7/26/2017	119 2017AN-119 7/26/2017	120R 2017AN-120R 7/26/2017	132 2017AN-132 7/27/2017 & 8/10/2017	132 (DUP) 2017AN-132D 7/27/2017 & 8/10/2017	135 2017AN-135 8/1/2017
CAS NO.	COMPOUND	UNITS:	HQ=0.1	HQ=1.0						
	VOLATILES									
67-64-1	Acetone	ug/L	1400	14000	3.38 U	4.48 U	3.11 U	2.66 U	2.66 U	-- R
71-43-2	Benzene	ug/L	0.46	0.46	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
75-27-4	Bromodichloromethane	ug/L	0.13	0.13	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U
75-25-2	Bromoform	ug/L	3.3	3.3	0.29 U	0.29 U	0.29 U	0.29 U	0.29 U	0.29 U
74-83-9	Bromomethane (Methyl bromide)	ug/L	0.75	7.5	0.35 U	0.35 U	0.35 U	0.35 U	0.35 U	0.35 U
78-93-3	2-Butanone (Methyl ethyl ketone) (MEK)	ug/L	560	5600	2.64 U	2.64 U	2.64 U	2.64 U	2.64 U	2.64 U
75-15-0	Carbon disulfide	ug/L	81	810	0.22 U	0.22 U	0.22 U	0.22 U	0.22 U	**0.267 J**
56-23-5	Carbon tetrachloride	ug/L	0.46	0.46	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U
108-90-7	Chlorobenzene	ug/L	7.8	78	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U
75-00-3	Chloroethane	ug/L	2100	21000	0.36 U	0.36 U	0.36 U	0.36 U	0.36 U	0.36 U
67-66-3	Chloroform (Trichloromethane)	ug/L	0.22	0.22	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U
74-87-3	Chloromethane (Methyl chloride)	ug/L	19	190	0.36 U	0.36 U	0.36 U	0.36 U	0.36 U	0.36 U
124-48-1	Dibromochloromethane	ug/L	0.87	0.87	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
95-50-1	1,2-Dichlorobenzene	ug/L	30	300	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U
541-73-1	1,3-Dichlorobenzene	ug/L	NV	NV	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U
106-46-7	1,4-Dichlorobenzene	ug/L	0.48	0.48	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U
75-34-3	1,1-Dichloroethane	ug/L	2.8	2.8	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U
107-06-2	1,2-Dichloroethane	ug/L	0.17	0.17	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
75-35-4	1,1-Dichloroethene	ug/L	28	280	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
156-59-2	cis-1,2-Dichloroethene	ug/L	3.6	36	0.21 U	0.21 U	0.21 U	0.21 U	0.21 U	0.21 U
156-60-5	trans-1,2-Dichloroethene	ug/L	36	360	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U
78-87-5	1,2-Dichloropropane	ug/L	0.82	0.85	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
10061-01-5	cis-1,3-Dichloropropene	ug/L	0.47	0.47	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U
10061-02-6	trans-1,3-Dichloropropene	ug/L	0.47	0.47	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U
100-41-4	Ethylbenzene	ug/L	1.5	1.5	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U
591-78-6	2-Hexanone	ug/L	3.8	38	1.28 U	1.28 U	1.28 U	1.28 U	1.28 U	1.28 U
108-10-1	4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	ug/L	630	6300	0.81 U	0.81 U	0.81 U	0.81 U	0.81 U	0.81 U
75-09-2	Methylene chloride	ug/L	11	11	1 U	1 U	1 U	1 U	1 U	1 U
100-42-5	Styrene	ug/L	120	1200	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U
79-34-5	1,1,2,2-Tetrachloroethane	ug/L	0.076	0.076	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U
127-18-4	Tetrachloroethene	ug/L	4.1	11	0.14 U	0.14 U	0.14 U	0.14 U	0.14 U	0.14 U
108-88-3	Toluene	ug/L	110	1100	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U
120-82-1	1,2,4-Trichlorobenzene	ug/L	0.4	1.2	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
71-55-6	1,1,1-Trichloroethane	ug/L	800	8000	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U
79-00-5	1,1,2-Trichloroethane	ug/L	0.041	0.28	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U
79-01-6	Trichloroethene	ug/L	0.28	0.49	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
75-01-4	Vinyl chloride	ug/L	0.019	0.019	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U
1330-20-7	Xylenes (total)	ug/L	19	190	0.58 U	0.58 U	0.58 U	0.58 U	0.58 U	0.58 U
	SEMIVOLATILES									
83-32-9	Acenaphthene	ug/L	53	530	0.308 U	0.308 U	0.308 U	0.296 U	0.302 U	0.356 U
208-96-8	Acenaphthylene	ug/L	NV	NV	0.337 U	0.337 U	0.337 U	0.324 U	0.33 U	0.389 U
120-12-7	Anthracene	ug/L	180	1800	0.365 U	0.365 U	0.365 U	0.352 U	0.358 U	0.422 U

TABLE 12

OU-10 Viscose Basin 1-8 Groundwater Monitoring Network Sampling Results
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Avtex Fibers Superfund Site
Front Royal, Virginia

FMC-Front Royal Avtex Fibers 2017 Sampling Event OU-10 VB 1-8 Groundwater Wells		Purpose:			Downgradient Shallow Bedrock Monitoring Wells					
		Location ID:	Regional	Regional	MW-05	119	120R	132	132 (DUP)	135
		Sample ID:	Screening	Screening	2017AN-MW-05	2017AN-119	2017AN-120R	2017AN-132	2017AN-132D	2017AN-135
		Sampled:	Level[1]	Level[1]	7/26/2017	7/26/2017	7/26/2017	7/27/2017 & 8/10/2017	7/27/2017 & 8/10/2017	8/1/2017
CAS NO.	COMPOUND	UNITS:	HQ=0.1	HQ=1.0						
	SEMIVOLATILES (CONTINUED)									
56-55-3	Benzo(a)anthracene	ug/L	0.03	0.03	0.308 U	0.308 U	0.308 U	0.296 U	0.302 U	0.356 U
50-32-8	Benzo(a)pyrene	ug/L	0.025	0.025	0.365 U	0.365 U	0.365 U	0.352 U	0.358 U	0.422 U
205-99-2	Benzo(b)fluoranthene	ug/L	0.25	0.25	0.346 U	0.346 U	0.346 U	0.333 U	0.34 U	0.4 U
191-24-2	Benzo(g,h,i)perylene	ug/L	NV	NV	0.596 U	0.596 U	0.596 U	0.574 U	0.585 U	0.689 U
207-08-9	Benzo(k)fluoranthene	ug/L	2.5	2.5	0.356 U	0.356 U	0.356 U	0.343 U	0.349 U	0.411 U
101-55-3	4-Bromophenyl phenyl ether	ug/L	NV	NV	1.54 U	1.54 U	1.54 U	1.48 U	1.51 U	1.78 U
85-68-7	Butyl benzylphthalate (BBP)	ug/L	16	16	0.962 U	0.962 U	0.962 U	0.926 U	0.943 U	1.11 U
86-74-8	Carbazole	ug/L	NV	NV	0.865 U	0.865 U	0.865 U	0.833 U	0.849 U	1 U
59-50-7	4-Chloro-3-methylphenol	ug/L	140	1400	1.35 U	1.35 U	1.35 U	1.3 U	1.32 U	1.56 U
106-47-8	4-Chloroaniline	ug/L	0.37	0.37	1.15 U	1.15 U	1.15 U	1.11 U	1.13 U	1.33 U
111-91-1	bis(2-Chloroethoxy)methane	ug/L	5.9	59	1.83 U	1.83 U	1.83 U	1.76 U	1.79 U	2.11 U
111-44-4	bis(2-Chloroethyl)ether	ug/L	0.014	0.014	1.25 U	1.25 U	1.25 U	1.2 U	1.23 U	1.44 U
91-58-7	2-Chloronaphthalene	ug/L	75	750	1.44 U	1.44 U	1.44 U	1.39 U	1.42 U	1.67 U
95-57-8	2-Chlorophenol	ug/L	9.1	91	1.63 U	1.63 U	1.63 U	1.57 U	1.6 U	1.89 U
7005-72-3	4-Chlorophenyl phenyl ether	ug/L	NV	NV	1.54 U	1.54 U	1.54 U	1.48 U	1.51 U	1.78 U
218-01-9	Chrysene	ug/L	25	25	0.317 U	0.317 U	0.317 U	0.306 U	0.311 U	0.367 U
53-70-3	Dibenz(a,h)anthracene	ug/L	0.025	0.025	0.433 U	0.433 U	0.433 U	0.417 U	0.425 U	0.5 U
132-64-9	Dibenzofuran	ug/L	0.79	7.9	1.25 U	1.25 U	1.25 U	1.2 U	1.23 U	1.44 U
95-50-1	1,2-Dichlorobenzene	ug/L	30	300	2.12 U	2.12 U	2.12 U	2.04 U	2.08 U	2.44 U
541-73-1	1,3-Dichlorobenzene	ug/L	NV	NV	1.92 U	1.92 U	1.92 U	1.85 U	1.89 U	2.22 U
106-46-7	1,4-Dichlorobenzene	ug/L	0.48	0.48	1.92 U	1.92 U	1.92 U	1.85 U	1.89 U	2.22 U
91-94-1	3,3'-Dichlorobenzidine	ug/L	0.13	0.13	1.44 U	1.44 U	1.44 U	1.39 U	1.42 U	1.67 U
120-83-2	2,4-Dichlorophenol	ug/L	4.6	46	2.12 U	2.12 U	2.12 U	2.04 U	2.08 U	2.44 U
84-66-2	Diethyl phthalate	ug/L	1500	15000	1.15 U	1.15 U	1.15 U	1.11 U	1.13 U	1.33 U
105-67-9	2,4-Dimethylphenol	ug/L	36	360	1.54 U	1.54 U	1.54 U	1.48 U	1.51 U	1.78 U
131-11-3	Dimethyl phthalate	ug/L	NV	NV	1.15 U	1.15 U	1.15 U	1.11 U	1.13 U	1.33 U
84-74-2	Di-n-butylphthalate (DBP)	ug/L	90	900	1.25 U	1.25 U	1.25 U	1.2 U	1.23 U	1.44 U
534-52-1	4,6-Dinitro-2-methylphenol	ug/L	0.15	1.5	2.79 U	2.79 U	2.79 U	2.69 U	2.74 U	3.22 U
51-28-5	2,4-Dinitrophenol	ug/L	3.9	39	6.92 U	6.92 U	6.92 U	6.67 U	6.79 U	8 U
121-14-2	2,4-Dinitrotoluene	ug/L	0.24	0.24	1.54 U	1.54 U	1.54 U	1.48 U	1.51 U	1.78 U
606-20-2	2,6-Dinitrotoluene	ug/L	0.049	0.049	1.44 U	1.44 U	1.44 U	1.39 U	1.42 U	1.67 U
117-84-0	Di-n-octyl phthalate (DnOP)	ug/L	20	200	0.865 U	0.865 U	0.865 U	0.833 U	0.849 U	1 U
117-81-7	bis(2-Ethylhexyl)phthalate (DEHP)	ug/L	5.6	5.6	1.44 U	1.44 U	1.44 U	2.24 U	2.38 U	1.67 U
206-44-0	Fluoranthene	ug/L	80	800	0.308 U	0.308 U	0.308 U	0.296 U	0.302 U	0.356 U
86-73-7	Fluorene	ug/L	29	290	0.308 U	0.308 U	0.308 U	0.296 U	0.302 U	0.356 U
118-74-1	Hexachlorobenzene	ug/L	0.0098	0.0098	1.44 U	1.44 U	1.44 U	1.39 U	1.42 U	1.67 U
87-68-3	Hexachlorobutadiene	ug/L	0.14	0.14	1.44 U	1.44 U	1.44 U	1.39 U	1.42 U	1.67 U
77-47-4	Hexachlorocyclopentadiene	ug/L	0.041	0.41	1.25 U	1.25 U	1.25 U	-- R	-- R	1.44 UJ
67-72-1	Hexachloroethane	ug/L	0.33	0.33	2.12 U	2.12 U	2.12 U	2.04 U	2.08 U	2.44 U
193-39-5	Indeno(1,2,3-cd)pyrene	ug/L	0.25	0.25	0.394 U	0.394 U	0.394 U	0.38 U	0.387 U	0.456 U
78-59-1	Isophorone	ug/L	78	78	2.12 U	2.12 U	2.12 U	2.04 U	2.08 U	2.44 U
91-57-6	2-Methylnaphthalene	ug/L	3.6	36	0.385 U	0.385 U	0.385 U	0.37 U	0.377 U	0.444 U

TABLE 12

OU-10 Viscose Basin 1-8 Groundwater Monitoring Network Sampling Results
2017 Annual Site-Wide Groundwater, Surface Water, and Sediment Monitoring Report for OU-7, OU-10, and NTCRA Basins
Avtex Fibers Superfund Site
Front Royal, Virginia

FMC-Front Royal Avtex Fibers 2017 Sampling Event OU-10 VB 1-8 Groundwater Wells		Purpose:			Downgradient Shallow Bedrock Monitoring Wells					
		Location ID: Sample ID: Sampled:	Regional Screening Level[1]	Regional Screening Level[1]	MW-05 2017AN-MW-05 7/26/2017	119 2017AN-119 7/26/2017	120R 2017AN-120R 7/26/2017	132 2017AN-132 7/27/2017 & 8/10/2017	132 (DUP) 2017AN-132D 7/27/2017 & 8/10/2017	135 2017AN-135 8/1/2017
CAS NO.	COMPOUND	UNITS:	HQ=0.1	HQ=1.0						
	SEMIVOLATILES (CONTINUED)									
95-48-7	2-Methylphenol	ug/L	93	930	1.54 U	1.54 U	1.54 U	1.48 U	1.51 U	1.78 U
	3&4-Methylphenol	ug/L	140	1400	1.35 U	1.35 U	1.35 U	1.3 U	1.32 U	1.56 U
91-20-3	Naphthalene	ug/L	0.17	0.17	0.356 U	0.356 U	0.356 U	0.343 U	0.349 U	0.411 U
88-74-4	2-Nitroaniline	ug/L	19	190	1.06 U	1.06 U	1.06 U	1.02 U	1.04 U	1.22 U
99-09-2	3-Nitroaniline	ug/L	NV	NV	1.54 U	1.54 U	1.54 U	1.48 U	1.51 U	1.78 U
100-01-6	4-Nitroaniline	ug/L	3.8	3.8	1.54 U	1.54 U	1.54 U	1.48 U	1.51 U	1.78 U
98-95-3	Nitrobenzene	ug/L	0.14	0.14	2.12 U	2.12 U	2.12 U	2.04 U	2.08 U	2.44 U
88-75-5	2-Nitrophenol	ug/L	NV	NV	2.31 U	2.31 U	2.31 U	2.22 U	2.26 U	2.67 U
100-02-7	4-Nitrophenol	ug/L	NV	NV	1.92 U	1.92 U	1.92 U	1.85 U	1.89 U	2.22 U
621-64-7	N-Nitrosodi-n-propylamine	ug/L	0.011	0.011	1.63 U	1.63 U	1.63 U	1.57 U	1.6 U	1.89 U
86-30-6	N-Nitrosodiphenylamine	ug/L	12	12	3.46 U	3.46 U	3.46 U	3.33 U	3.4 U	4 U
108-60-1	2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	ug/L	71	710	1.73 U	1.73 U	1.73 U	1.67 U	1.7 U	2 UJ
87-86-5	Pentachlorophenol	ug/L	0.041	0.041	3.17 U	3.17 U	3.17 U	3.06 U	3.11 U	3.67 UJ
85-01-8	Phenanthrene	ug/L	NV	NV	0.404 U	0.404 U	0.404 U	0.389 U	0.396 U	0.467 U
108-95-2	Phenol	ug/L	580	5800	1.44 U	1.44 U	1.44 U	1.39 U	1.42 U	1.67 U
129-00-0	Pyrene	ug/L	12	120	0.337 U	0.337 U	0.337 U	0.324 U	0.33 U	0.389 U
120-82-1	1,2,4-Trichlorobenzene	ug/L	0.4	1.2	2.02 U	2.02 U	2.02 U	1.94 U	1.98 U	2.33 U
95-95-4	2,4,5-Trichlorophenol	ug/L	120	1200	1.25 U	1.25 U	1.25 U	1.2 U	1.23 U	1.44 U
88-06-2	2,4,6-Trichlorophenol	ug/L	1.2	4.1	1.83 U	1.83 U	1.83 U	1.76 U	1.79 U	2.11 U
	METALS - DISSOLVED									
7440-36-0	Antimony	ug/L	0.78	7.8	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 UJ
7440-38-2	Arsenic	ug/L	0.052	0.052	0.4 U	0.4 U	0.4 U	**3.53**	**2.81**	0.4 UJ
7440-41-7	Beryllium	ug/L	2.5	25	0.1 U	0.1 U	0.1 U	**0.348 J**	**0.356 J**	0.1 U
7440-43-9	Cadmium	ug/L	0.92	9.2	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 UJ
7440-47-3	Chromium	ug/L	2200	22000	**1.4 J**	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ
7440-50-8	Copper	ug/L	80	800	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U
7439-92-1	Lead	ug/L	15	15	0.1 U	0.1 U	0.1 U	**0.106 J**	0.1 U	0.1 UJ
7439-97-6	Mercury[2]	ug/L	0.063	0.63	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
7440-02-0	Nickel	ug/L	39	390	0.5 U	0.5 U	0.5 U	**0.568 J**	**0.989 J**	0.5 UJ
7782-49-2	Selenium	ug/L	10	100	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
7440-28-0	Thallium	ug/L	0.02	0.20	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 UJ
7440-62-2	Vanadium	ug/L	8.6	86	0.7 U	0.7 U	0.7 U	0.7 U	0.7 U	0.7 U
7440-66-6	Zinc	ug/L	600	6000	5.2 U	**63**	5.2 U	5.2 U	**17.9 J**	5.2 UJ
	FIELD PARAMETERS									
	Temperature	°C	---	---	20.45	20.47	22.1	20.97	20.97	18.35
	Conductivity	uS/cm	---	---	306.24	549.84	484.71	2758.2	2758.2	1674
	pH	s.u.	---	---	9.15	7.76	8.16	6.53	6.53	7
	ORP	mV	---	---	-183.8	-151.8	-174.8	-42.4	-42.4	-136
	Turbidity	NTU	---	---	5.02	25.1	35.9	29.2	29.2	0
	Dissolved Oxygen	mg/L	---	---	0.15	0.14	0.12	0.21	0.21	0.25

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TABLE 13

OU-10 New Landfill Groundwater Monitoring Network Sampling Results
2017 Annual Site-Wide Groundwater, Surface Water, and Sediment Monitoring Report for OU-7, OU-10, and NTCRA Basins
Avtex Fibers Superfund Site
Front Royal, Virginia

FMC-Front Royal Avtex Fibers 2017 Sampling Event OU-10 NLF Groundwater Wells		Purpose:			**Upgradient Overburden Monitoring Well**	**Upgradient Shallow Bedrock Monitoring Wells**		**Downgradient Shallow Bedrock Monitoring Wells**			
		Location ID: Sample ID: Sampled:	Regional Screening Level[1]	Regional Screening Level[1]	GPW-03R 2017AN-GPW-03R 7/24/2017	128 2017AN-128 7/25/2017	130R 2017AN-130R 7/27/2017 & 2/1/2018	MW-07 2017AN-MW-07 7/29/2017	MW-08 2017AN-MW-08 7/29/2017	MW-08 (DUP) 2017AN-MW-08D 7/29/2017 Duplicate	133 2017AN-133 7/26/2017
CAS NO.	COMPOUND	UNITS:	HQ=0.1	HQ=1.0							
	VOLATILES										
67-64-1	Acetone	ug/L	1400	14000	2.66 U	2.94 U	7.44 U	-- R	2.66 U	-- R	3.71 U
71-43-2	Benzene	ug/L	0.46	0.46	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
75-27-4	Bromodichloromethane	ug/L	0.13	0.13	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U
75-25-2	Bromoform	ug/L	3.3	3.3	0.29 U	0.29 U	0.29 U	0.29 U	0.29 U	0.29 U	0.29 U
74-83-9	Bromomethane (Methyl bromide)	ug/L	0.75	7.5	0.35 U	0.35 U	0.35 U	0.35 U	0.35 U	0.35 U	0.35 U
78-93-3	2-Butanone (Methyl ethyl ketone) (MEK)	ug/L	560	5600	2.64 U	2.64 U	2.64 U	2.64 U	2.64 U	2.64 U	2.64 U
75-15-0	Carbon disulfide	ug/L	81	810	0.22 U	0.22 U	0.22 U	0.22 U	0.22 U	0.22 U	**0.346 J**
56-23-5	Carbon tetrachloride	ug/L	0.46	0.46	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U
108-90-7	Chlorobenzene	ug/L	7.8	78	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U
75-00-3	Chloroethane	ug/L	2100	21000	0.36 U	0.36 U	0.36 U	0.36 U	0.36 U	0.36 U	0.36 U
67-66-3	Chloroform (Trichloromethane)	ug/L	0.22	0.22	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U
74-87-3	Chloromethane (Methyl chloride)	ug/L	19	190	0.36 U	0.36 U	0.36 U	0.36 U	0.36 U	0.36 U	0.36 U
124-48-1	Dibromochloromethane	ug/L	0.87	0.87	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
95-50-1	1,2-Dichlorobenzene	ug/L	30	300	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U
541-73-1	1,3-Dichlorobenzene	ug/L	NV	NV	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U
106-46-7	1,4-Dichlorobenzene	ug/L	0.48	0.48	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U
75-34-3	1,1-Dichloroethane	ug/L	2.8	2.8	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U
107-06-2	1,2-Dichloroethane	ug/L	0.17	0.17	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
75-35-4	1,1-Dichloroethene	ug/L	28	280	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
156-59-2	cis-1,2-Dichloroethene	ug/L	3.6	36	0.21 U	0.21 U	0.21 U	0.21 U	0.21 U	0.21 U	0.21 U
156-60-5	trans-1,2-Dichloroethene	ug/L	36	360	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U
78-87-5	1,2-Dichloropropane	ug/L	0.82	0.85	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
10061-01-5	cis-1,3-Dichloropropene	ug/L	0.47	0.47	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U
10061-02-6	trans-1,3-Dichloropropene	ug/L	0.47	0.47	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U
100-41-4	Ethylbenzene	ug/L	1.5	1.5	0.19 U	0.19 U	0.19 U	**0.206 J**	0.19 U	0.19 U	0.19 U
591-78-6	2-Hexanone	ug/L	3.8	38	1.28 U	1.28 U	1.28 U	1.28 U	1.28 U	1.28 U	1.28 U
108-10-1	4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	ug/L	630	6300	0.81 U	0.81 U	0.81 U	0.81 U	0.81 U	0.81 U	0.81 U
75-09-2	Methylene chloride	ug/L	11	11	1 U	1 U	1 U	1 U	1 U	1 U	1 U
100-42-5	Styrene	ug/L	120	1200	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U
79-34-5	1,1,2,2-Tetrachloroethane	ug/L	0.076	0.076	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U
127-18-4	Tetrachloroethene	ug/L	4.1	11	0.14 U	0.14 U	0.14 U	0.14 U	0.14 U	0.14 U	0.14 U
108-88-3	Toluene	ug/L	110	1100	0.17 U	**0.174 J**	0.17 U	**0.366 J**	0.17 U	**0.202 J**	0.17 U
120-82-1	1,2,4-Trichlorobenzene	ug/L	0.4	1.2	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
71-55-6	1,1,1-Trichloroethane	ug/L	800	8000	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U
79-00-5	1,1,2-Trichloroethane	ug/L	0.041	0.28	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U
79-01-6	Trichloroethene	ug/L	0.28	0.49	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
75-01-4	Vinyl chloride	ug/L	0.019	0.019	0.18 U	0.18 U	0.18 U	**2.08**	0.18 U	0.18 U	0.18 U
1330-20-7	Xylenes (total)	ug/L	19	190	0.58 U	0.58 U	0.58 U	**1.22 J**	**0.835 J**	**0.765 J**	0.58 U
	SEMIVOLATILES										
83-32-9	Acenaphthene	ug/L	53	530	0.308 U	0.308 U	0.308 U	0.281 U	0.286 U	0.296 U	0.308 U
208-96-8	Acenaphthylene	ug/L	NV	NV	0.337 U	0.337 U	0.337 U	0.307 U	0.313 U	0.324 U	0.337 U
120-12-7	Anthracene	ug/L	180	1800	0.365 U	0.365 U	0.365 U	0.333 U	0.339 U	0.352 U	0.365 U
56-55-3	Benzo(a)anthracene	ug/L	0.03	0.03	0.308 U	0.308 U	0.308 U	0.281 U	0.286 U	0.296 U	0.308 U
50-32-8	Benzo(a)pyrene	ug/L	0.025	0.025	0.365 U	0.365 U	0.365 U	0.333 U	0.339 U	0.352 U	0.365 U
205-99-2	Benzo(b)fluoranthene	ug/L	0.25	0.25	0.346 U	0.346 U	0.346 U	0.316 U	0.321 U	0.333 U	0.346 U
191-24-2	Benzo(g,h,i)perylene	ug/L	NV	NV	0.596 U	0.596 U	0.596 U	0.544 U	0.554 U	0.574 U	0.596 U

TABLE 13

OU-10 New Landfill Groundwater Monitoring Network Sampling Results
2017 Annual Site-Wide Groundwater, Surface Water, and Sediment Monitoring Report for OU-7, OU-10, and NTCRA Basins
Avtex Fibers Superfund Site
Front Royal, Virginia

FMC-Front Royal Avtex Fibers 2017 Sampling Event OU-10 NLF Groundwater Wells		Purpose:			**Upgradient Overburden Monitoring Well**	**Upgradient Shallow Bedrock Monitoring Wells**		**Downgradient Shallow Bedrock Monitoring Wells**			
		Location ID: Sample ID: Sampled:	Regional Screening Level[1]	Regional Screening Level[1]	GPW-03R 2017AN-GPW-03R 7/24/2017	128 2017AN-128 7/25/2017	130R 2017AN-130R 7/27/2017 & 2/1/2018	MW-07 2017AN-MW-07 7/29/2017	MW-08 2017AN-MW-08 7/29/2017	MW-08 (DUP) 2017AN-MW-08D 7/29/2017 Duplicate	133 2017AN-133 7/26/2017
CAS NO.	COMPOUND	UNITS:	HQ=0.1	HQ=1.0							
	SEMIVOLATILES (CONTINUED)										
207-08-9	Benzo(k)fluoranthene	ug/L	2.5	2.5	0.356 U	0.356 U	0.356 U	0.325 U	0.33 U	0.343 U	0.356 U
101-55-3	4-Bromophenyl phenyl ether	ug/L	NV	NV	1.54 U	1.54 U	1.54 U	1.4 U	1.43 U	1.48 U	1.54 U
85-68-7	Butyl benzylphthalate (BBP)	ug/L	16	16	0.962 U	0.962 U	0.962 U	0.877 U	0.893 U	0.926 U	0.962 U
86-74-8	Carbazole	ug/L	NV	NV	0.865 U	0.865 U	0.865 U	0.789 U	0.804 U	0.833 U	0.865 U
59-50-7	4-Chloro-3-methylphenol	ug/L	140	1400	1.35 U	1.35 U	1.35 U	1.23 U	1.25 U	1.3 U	1.35 U
106-47-8	4-Chloroaniline	ug/L	0.37	0.37	1.15 U	1.15 U	1.15 U	1.05 U	1.07 U	1.11 U	1.15 U
111-91-1	bis(2-Chloroethoxy)methane	ug/L	5.9	59	1.83 U	1.83 U	1.83 U	1.67 U	1.7 U	1.76 U	1.83 U
111-44-4	bis(2-Chloroethyl)ether	ug/L	0.014	0.014	1.25 U	1.25 U	1.25 U	1.14 U	1.16 U	1.2 U	1.25 U
91-58-7	2-Chloronaphthalene	ug/L	75	750	1.44 U	1.44 U	1.44 U	1.32 U	1.34 U	1.39 U	1.44 U
95-57-8	2-Chlorophenol	ug/L	9.1	91	1.63 U	1.63 U	1.63 U	1.49 U	1.52 U	1.57 U	1.63 U
7005-72-3	4-Chlorophenyl phenyl ether	ug/L	NV	NV	1.54 U	1.54 U	1.54 U	1.4 U	1.43 U	1.48 U	1.54 U
218-01-9	Chrysene	ug/L	25	25	0.317 U	0.317 U	0.317 U	0.289 U	0.295 U	0.306 U	0.317 U
53-70-3	Dibenz(a,h)anthracene	ug/L	0.025	0.025	0.433 U	0.433 U	0.433 U	0.395 U	0.402 U	0.417 U	0.433 U
132-64-9	Dibenzofuran	ug/L	0.79	7.9	1.25 U	1.25 U	1.25 U	1.14 U	1.16 U	1.2 U	1.25 U
95-50-1	1,2-Dichlorobenzene	ug/L	30	300	2.12 U	2.12 U	2.12 U	1.93 U	1.96 U	2.04 U	2.12 U
541-73-1	1,3-Dichlorobenzene	ug/L	NV	NV	1.92 U	1.92 U	1.92 U	1.75 U	1.79 U	1.85 U	1.92 U
106-46-7	1,4-Dichlorobenzene	ug/L	0.48	0.48	1.92 U	1.92 U	1.92 U	1.75 U	1.79 U	1.85 U	1.92 U
91-94-1	3,3'-Dichlorobenzidine	ug/L	0.13	0.13	1.44 U	1.44 U	1.44 U	1.32 U	1.34 U	1.39 U	1.44 U
120-83-2	2,4-Dichlorophenol	ug/L	4.6	46	2.12 U	2.12 U	2.12 U	1.93 U	1.96 U	2.04 U	2.12 U
84-66-2	Diethyl phthalate	ug/L	1500	15000	1.15 U	1.15 U	1.15 U	1.05 U	1.07 U	1.11 U	1.15 U
105-67-9	2,4-Dimethylphenol	ug/L	36	360	1.54 U	1.54 U	1.54 U	1.4 U	1.43 U	1.48 U	1.54 U
131-11-3	Dimethyl phthalate	ug/L	NV	NV	1.15 U	1.15 U	1.15 U	1.05 U	1.07 U	1.11 U	1.15 U
84-74-2	Di-n-butylphthalate (DBP)	ug/L	90	900	1.25 U	1.25 U	1.25 U	1.14 U	1.16 U	1.2 U	1.25 U
534-52-1	4,6-Dinitro-2-methylphenol	ug/L	0.15	1.5	2.79 U	2.79 U	2.79 U	2.54 U	2.59 U	2.69 U	2.79 U
51-28-5	2,4-Dinitrophenol	ug/L	3.9	39	6.92 U	6.92 U	6.92 U	6.32 U	6.43 U	6.67 U	6.92 U
121-14-2	2,4-Dinitrotoluene	ug/L	0.24	0.24	1.54 U	1.54 U	1.54 U	1.4 U	1.43 U	1.48 U	1.54 U
606-20-2	2,6-Dinitrotoluene	ug/L	0.049	0.049	1.44 U	1.44 U	1.44 U	1.32 U	1.34 U	1.39 U	1.44 U
117-84-0	Di-n-octyl phthalate (DnOP)	ug/L	20	200	0.865 U	0.865 U	0.865 U	0.789 U	0.804 U	0.833 U	0.865 U
117-81-7	bis(2-Ethylhexyl)phthalate (DEHP)	ug/L	5.6	5.6	1.44 U	1.44 U	1.44 U	6.26 U	1.76 U	1.78 U	1.44 U
206-44-0	Fluoranthene	ug/L	80	800	0.308 U	0.308 U	0.308 U	0.281 U	0.286 U	0.296 U	0.308 U
86-73-7	Fluorene	ug/L	29	290	0.308 U	0.308 U	0.308 U	0.281 U	0.286 U	0.296 U	0.308 U
118-74-1	Hexachlorobenzene	ug/L	0.0098	0.0098	1.44 U	1.44 U	1.44 U	1.32 U	1.34 U	1.39 U	1.44 U
87-68-3	Hexachlorobutadiene	ug/L	0.14	0.14	1.44 U	1.44 U	1.44 U	1.32 U	1.34 U	1.39 U	1.44 U
77-47-4	Hexachlorocyclopentadiene	ug/L	0.041	0.41	1.25 U	1.25 U	1.25 U	-- R	-- R	-- R	1.25 U
67-72-1	Hexachloroethane	ug/L	0.33	0.33	2.12 U	2.12 U	2.12 U	1.93 U	1.96 U	2.04 U	2.12 U
193-39-5	Indeno(1,2,3-cd)pyrene	ug/L	0.25	0.25	0.394 U	0.394 U	0.394 U	0.36 U	0.366 U	0.38 U	0.394 U
78-59-1	Isophorone	ug/L	78	78	2.12 U	2.12 U	2.12 U	1.93 U	1.96 U	2.04 U	2.12 U
91-57-6	2-Methylnaphthalene	ug/L	3.6	36	0.385 U	0.385 U	0.385 U	0.351 U	0.357 U	0.37 U	0.385 U
95-48-7	2-Methylphenol	ug/L	93	930	1.54 U	1.54 U	1.54 U	1.4 U	1.43 U	1.48 U	1.54 U
	3&4-Methylphenol	ug/L	140	1400	1.35 U	1.35 U	1.35 U	1.23 U	1.25 U	1.3 U	1.35 U
91-20-3	Naphthalene	ug/L	0.17	0.17	0.356 U	0.356 U	0.356 U	0.325 U	0.33 U	0.343 U	0.356 U
88-74-4	2-Nitroaniline	ug/L	19	190	1.06 U	1.06 U	1.06 U	0.965 U	0.982 U	1.02 U	1.06 U
99-09-2	3-Nitroaniline	ug/L	NV	NV	1.54 U	1.54 U	1.54 U	1.4 U	1.43 U	1.48 U	1.54 U
100-01-6	4-Nitroaniline	ug/L	3.8	3.8	1.54 U	1.54 U	1.54 U	1.4 U	1.43 U	1.48 U	1.54 U
98-95-3	Nitrobenzene	ug/L	0.14	0.14	2.12 U	2.12 U	2.12 U	1.93 U	1.96 U	2.04 U	2.12 U
88-75-5	2-Nitrophenol	ug/L	NV	NV	2.31 U	2.31 U	2.31 U	2.11 U	2.14 U	2.22 U	2.31 U

TABLE 13

OU-10 New Landfill Groundwater Monitoring Network Sampling Results
2017 Annual Site-Wide Groundwater, Surface Water, and Sediment Monitoring Report for OU-7, OU-10, and NTCRA Basins
Avtex Fibers Superfund Site
Front Royal, Virginia

FMC-Front Royal Avtex Fibers 2017 Sampling Event OU-10 NLF Groundwater Wells		Purpose:			**Upgradient Overburden Monitoring Well**	**Upgradient Shallow Bedrock Monitoring Wells**		**Downgradient Shallow Bedrock Monitoring Wells**			
		Location ID: Sample ID: Sampled:	Regional Screening Level[1]	Regional Screening Level[1]	GPW-03R 2017AN-GPW-03R 7/24/2017	128 2017AN-128 7/25/2017	130R 2017AN-130R 7/27/2017 & 2/1/2018	MW-07 2017AN-MW-07 7/29/2017	MW-08 2017AN-MW-08 7/29/2017	MW-08 (DUP) 2017AN-MW-08D 7/29/2017 Duplicate	133 2017AN-133 7/26/2017
CAS NO.	COMPOUND	UNITS:	HQ=0.1	HQ=1.0							
	SEMIVOLATILES (CONTINUED)										
100-02-7	4-Nitrophenol	ug/L	NV	NV	1.92 U	1.92 U	1.92 U	1.75 U	1.79 U	1.85 U	1.92 U
621-64-7	N-Nitrosodi-n-propylamine	ug/L	0.011	0.011	1.63 U	1.63 U	1.63 U	1.49 U	1.52 U	1.57 U	1.63 U
86-30-6	N-Nitrosodiphenylamine	ug/L	12	12	3.46 U	3.46 U	3.46 U	3.16 U	3.21 U	3.33 U	3.46 U
108-60-1	2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	ug/L	71	710	1.73 U	1.73 U	1.73 U	1.58 U	1.61 U	1.67 U	1.73 U
87-86-5	Pentachlorophenol	ug/L	0.041	0.041	3.17 U	3.17 U	3.17 U	2.89 U	2.95 U	3.06 U	3.17 U
85-01-8	Phenanthrene	ug/L	NV	NV	0.404 U	0.404 U	0.404 U	0.368 U	0.375 U	0.389 U	0.404 U
108-95-2	Phenol	ug/L	580	5800	1.44 U	1.44 U	1.44 U	1.32 U	1.34 U	1.39 U	1.44 U
129-00-0	Pyrene	ug/L	12	120	0.337 U	0.337 U	0.337 U	0.307 U	0.313 U	0.324 U	0.337 U
120-82-1	1,2,4-Trichlorobenzene	ug/L	0.4	1.2	2.02 U	2.02 U	2.02 U	1.84 U	1.88 U	1.94 U	2.02 U
95-95-4	2,4,5-Trichlorophenol	ug/L	120	1200	1.25 U	1.25 U	1.25 U	1.14 U	1.16 U	1.2 U	1.25 U
88-06-2	2,4,6-Trichlorophenol	ug/L	1.2	4.1	1.83 U	1.83 U	1.83 U	1.67 U	1.7 U	1.76 U	1.83 U
	METALS - DISSOLVED										
7440-36-0	Antimony	ug/L	0.78	7.8	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U
7440-38-2	Arsenic	ug/L	0.052	0.052	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	**1.87 J**
7440-41-7	Beryllium	ug/L	2.5	25	0.1 U	**0.13 J**	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
7440-43-9	Cadmium	ug/L	0.92	9.2	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
7440-47-3	Chromium	ug/L	2200	22000	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
7440-50-8	Copper	ug/L	80	800	**13.3**	1.2 U	**1.22 J**	1.2 U	1.2 U	1.2 U	12 U
7439-92-1	Lead	ug/L	15	15	**1.46 J**	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
7439-97-6	Mercury[2]	ug/L	0.063	0.63	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.15 U
7440-02-0	Nickel	ug/L	39	390	**8.38**	**2.52**	**0.701 J**	0.5 U	0.5 U	0.5 U	**10.6**
7782-49-2	Selenium	ug/L	10	100	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	**0.326 J**
7440-28-0	Thallium	ug/L	0.02	0.20	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U
7440-62-2	Vanadium	ug/L	8.6	86	0.7 U	0.7 U	0.7 U	0.7 U	0.7 U	0.7 U	0.7 U
7440-66-6	Zinc	ug/L	600	6000	**136**	**74.1**	**13.3 J**	**47.5**	**30.4**	**38.3**	5.2 U
	FIELD PARAMETERS										
	Temperature	°C	---	---	21.84	18.75	16.8 (14.28)	17.92	18.4	18.4	20.91
	Conductivity	uS/cm	---	---	759.56	1557	834.87 (407.19)	1534.9	1270.4	1270.4	11067
	pH	s.u.	---	---	5.69	6.49	6.61 (6.83)	6.4	6.55	6.55	6.88
	ORP	mV	---	---	209.6	-32.6	-6.2 (-65.4)	-59.8	-57.5	-57.5	-90.1
	Turbidity	NTU	---	---	2.28	67.7	1.85 (9.58)	1.79	82.2	82.2	6.29
	Dissolved Oxygen	mg/L	---	---	1.96	0.16	0.15 (0.19)	0.29	0.45	0.45	0.13
							(Resample)				

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TABLE 14

OU-10 Comparison of Results to Baseline Conditions
2017 Annual Site-Wide Groundwater, Surface Water, and Sediment Monitoring Report for OU-7, OU-10, and NTCRA Basins
Avtex Fibers Superfund Site
Front Royal, Virginia

		Overburden Monitoring Wells											
		Upgradient VB 1-8				Upgradient VB 1-8 and New Landfill				Downgradient VB 1-8			
		# Baseline Samples	Baseline Minimum	Baseline Maximum	July 2017 Result	# Baseline Samples	Baseline Minimum	Baseline Maximum	July 2017 Result	# Baseline Samples	Baseline Minimum	Baseline Maximum	July 2017/Jan 2018 Result
CAS NO.	COMPOUND	GPW-02				GPW-03R				GPW-14			
	VOLATILES (ug/L)												
67-64-1	Acetone	4	10.0 U	10.0 U	2.66 U	4	2.2 J	10.0 U	2.66 U	4	10.0 U	24.4	7.92 U
71-43-2	Benzene	4	1.00 U	1.00 U	0.2 U	4	1.00 U	1.00 U	0.2 U	4	1.00 U	1.00 U	0.2 U
75-27-4	Bromodichloromethane	4	1.00 U	1.00 U	0.17 U	4	1.00 U	1.00 U	0.17 U	4	1.00 U	1.00 U	0.17 U
75-25-2	Bromoform	4	1.00 U	1.00 U	0.29 U	4	1.00 U	1.00 U	0.29 U	4	1.00 U	1.00 U	0.29 U
74-83-9	Bromomethane (Methyl bromide)	4	1.00 U	1.00 U	0.35 U	4	1.00 U	2.00 U	0.35 U	4	1.00 U	1.00 U	0.35 U
78-93-3	2-Butanone (Methyl ethyl ketone) (MEK)	4	10.0 U	10.0 U	2.64 U	4	5.00 U	10.0 U	2.64 U	4	10.0 U	10.0 U	2.64 U
75-15-0	Carbon disulfide	4	1.00 U	1.00 U	0.22 U	4	1.00 U	2.00 U	0.22 U	4	1.00 U	1.00 U	0.22 U
56-23-5	Carbon tetrachloride	4	1.00 U	1.00 U	0.18 U	4	1.00 U	1.00 U	0.18 U	4	1.00 U	1.00 U	0.18 U
108-90-7	Chlorobenzene	4	1.00 U	1.00 U	0.18 U	4	1.00 U	1.00 U	0.18 U	4	1.00 U	1.00 U	0.18 U
75-00-3	Chloroethane	4	1.00 U	1.00 U	0.36 U	4	1.00 U	1.00 U	0.36 U	4	1.00 U	1.00 U	0.36 U
67-66-3	Chloroform (Trichloromethane)	4	1.00 U	1.00 U	0.23 U	4	1.00 U	1.00 U	0.23 U	4	1.00 U	1.00 U	0.23 U
74-87-3	Chloromethane (Methyl chloride)	4	1.00 U	1.00 U	0.36 U	4	1.00 U	1.00 U	0.36 U	4	1.00 U	1.00 U	0.36 U
124-48-1	Dibromochloromethane	4	1.00 U	1.00 U	0.25 U	4	1.00 U	1.00 U	0.25 U	4	1.00 U	1.00 U	0.25 U
95-50-1	1,2-Dichlorobenzene	4	1.00 U	1.00 U	0.19 U	4	1.00 U	1.00 U	0.19 U	4	1.00 U	1.00 U	0.19 U
541-73-1	1,3-Dichlorobenzene	4	1.00 U	1.00 U	0.18 U	4	1.00 U	1.00 U	0.18 U	4	1.00 U	1.00 U	0.18 U
106-46-7	1,4-Dichlorobenzene	4	1.00 U	1.00 U	0.17 U	4	1.00 U	1.00 U	0.17 U	4	1.00 U	1.00 U	0.17 U
75-34-3	1,1-Dichloroethane	4	1.00 U	1.00 U	0.24 U	4	1.00 U	1.00 U	0.24 U	4	1.00 U	1.00 U	0.24 U
107-06-2	1,2-Dichloroethane	4	1.00 U	1.00 U	0.2 U	4	1.00 U	1.00 U	0.2 U	4	1.00 U	1.00 U	0.2 U
75-35-4	1,1-Dichloroethene	4	1.00 U	1.00 U	0.25 U	4	1.00 U	1.00 U	0.25 U	4	1.00 U	1.00 U	0.25 U
156-59-2	cis-1,2-Dichloroethene	4	1.00 U	1.00 U	0.21 U	4	1.00 U	1.00 U	0.21 U	4	1.00 U	1.00 U	0.21 U
156-60-5	trans-1,2-Dichloroethene	4	1.00 U	1.00 U	0.23 U	4	1.00 U	1.00 U	0.23 U	4	1.00 U	1.00 U	0.23 U
78-87-5	1,2-Dichloropropane	4	1.00 U	1.00 U	0.25 U	4	1.00 U	1.00 U	0.25 U	4	1.00 U	1.00 U	0.25 U
10061-01-5	cis-1,3-Dichloropropene	4	1.00 U	1.00 U	0.17 U	4	1.00 U	1.00 U	0.17 U	4	1.00 U	1.00 U	0.17 U
10061-02-6	trans-1,3-Dichloropropene	4	1.00 U	1.00 U	0.17 U	4	1.00 U	1.00 U	0.17 U	4	1.00 U	1.00 U	0.17 U
100-41-4	Ethylbenzene	4	1.00 U	1.00 U	0.19 U	4	1.00 U	1.00 U	0.19 U	4	1.00 U	1.00 U	0.19 U
591-78-6	2-Hexanone	4	10.0 U	10.0 U	1.28 U	4	5.00 U	10.0 U	1.28 U	4	10.0 U	10.0 U	1.28 U
108-10-1	4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	4	10.0 U	10.0 U	0.81 U	4	5.00 U	10.0 U	0.81 U	4	10.0 U	10.0 U	0.81 U
75-09-2	Methylene chloride	4	1.00 U	1.00 U	1 U	4	1.00 U	2.00 U	1 U	4	1.00 U	1.00 U	1 U
100-42-5	Styrene	4	1.00 U	1.00 U	0.28 U	4	1.00 U	1.00 U	0.28 U	4	1.00 U	1.00 U	0.28 U
79-34-5	1,1,2,2-Tetrachloroethane	4	0.50 U	0.50 U	0.19 U	4	0.50 U	1.00 U	0.19 U	4	0.50 U	0.50 U	0.19 U
127-18-4	Tetrachloroethene	4	1.00 U	1.00 U	0.14 U	4	1.00 U	1.00 U	0.14 U	4	1.00 U	1.00 U	0.14 U
108-88-3	Toluene	4	1.00 U	1.00 U	0.17 U	4	1.00 U	1.00 U	0.17 U	4	1.00 U	1.00 U	0.17 U
120-82-1	1,2,4-Trichlorobenzene	4	1.00 U	1.00 U	0.2 U	4	1.00 U	1.00 U	0.2 U	4	1.00 U	1.00 U	0.2 U
71-55-6	1,1,1-Trichloroethane	4	1.00 U	1.00 U	0.19 U	4	1.00 U	1.00 U	0.19 U	4	1.00 U	1.00 U	0.19 U
79-00-5	1,1,2-Trichloroethane	4	1.00 U	1.00 U	0.19 U	4	1.00 U	1.00 U	0.19 U	4	1.00 U	1.00 U	0.19 U
79-01-6	Trichloroethene	4	1.00 U	1.00 U	0.2 U	4	1.00 U	1.00 U	0.2 U	4	1.00 U	1.00 U	0.2 U
75-01-4	Vinyl chloride	4	1.00 U	1.00 U	0.18 U	4	1.00 U	1.00 U	0.18 U	4	1.00 U	1.00 U	0.18 U
1330-20-7	Xylenes (total)	4	1.00 U	1.00 U	0.58 U	4	1.00 U	2.00 U	0.58 U	4	1.00 U	1.00 U	0.58 U

Notes:
Bold text indicates detected value
J - Estimated results
R - Rejected results
U - Not detected, value indicates reporting limit

TABLE 14

OU-10 Comparison of Results to Baseline Conditions
2017 Annual Site-Wide Groundwater, Surface Water, and Sediment Monitoring Report for OU-7, OU-10, and NTCRA Basins
Avtex Fibers Superfund Site
Front Royal, Virginia

		Overburden Monitoring Wells											
		Upgradient VB 1-8				Upgradient VB 1-8 and New Landfill				Downgradient VB 1-8			
		# Baseline Samples	Baseline Minimum	Baseline Maximum	July 2017 Result	# Baseline Samples	Baseline Minimum	Baseline Maximum	July 2017 Result	# Baseline Samples	Baseline Minimum	Baseline Maximum	July 2017/Jan 2018 Result
CAS NO.	COMPOUND	GPW-02				GPW-03R				GPW-14			
	SEMIVOLATILES (ug/L)												
83-32-9	Acenaphthene	4	5.00 U	5.29 U	0.308 U	4	5.00 U	10.0 U	0.308 U	4	5.00 U	10.0 U	0.308 U
208-96-8	Acenaphthylene	4	5.00 U	5.29 U	0.337 U	4	5.00 U	10.0 U	0.337 U	4	5.00 U	10.0 U	0.337 U
120-12-7	Anthracene	4	5.00 U	5.29 U	0.365 U	4	5.00 U	10.0 U	0.365 U	4	5.00 U	10.0 U	0.365 U
56-55-3	Benzo(a)anthracene	4	5.00 U	5.29 U	0.308 U	4	5.00 U	10.0 U	0.308 U	4	5.00 U	10.0 U	0.308 U
50-32-8	Benzo(a)pyrene	4	5.00 U	5.29 U	0.365 U	4	5.00 U	10.0 U	0.365 U	4	5.00 U	10.0 U	0.365 U
205-99-2	Benzo(b)fluoranthene	4	5.00 U	5.29 U	0.346 U	4	5.00 U	10.0 U	0.346 U	4	5.00 U	10.0 U	0.346 U
191-24-2	Benzo(g,h,i)perylene	4	5.00 U	5.29 U	0.596 U	4	5.00 U	10.0 U	0.596 U	4	5.00 U	10.0 U	0.596 U
207-08-9	Benzo(k)fluoranthene	4	5.00 U	5.29 U	0.356 U	4	5.00 U	10.0 U	0.356 U	4	5.00 U	10.0 U	0.356 U
101-55-3	4-Bromophenyl phenyl ether	4	5.00 U	5.29 U	1.54 U	4	5.00 U	10.0 U	1.54 U	4	5.00 U	10.0 U	1.54 U
85-68-7	Butyl benzylphthalate (BBP)	4	5.00 U	5.29 U	0.962 U	4	5.00 U	10.0 U	0.962 U	4	5.00 U	10.0 U	0.962 U
86-74-8	Carbazole	4	5.00 U	5.29 U	0.865 U	4	5.00 U	10.0 U	0.865 U	4	5.00 U	10.0 U	0.865 U
59-50-7	4-Chloro-3-methylphenol	4	5.00 U	5.29 U	1.35 U	4	5.00 U	10.0 U	1.35 U	4	5.00 U	10.0 U	1.35 U
106-47-8	4-Chloroaniline	4	5.00 U	5.29 U	1.15 U	4	5.00 U	10.0 U	1.15 U	4	5.00 U	10.0 U	1.15 U
111-91-1	bis(2-Chloroethoxy)methane	4	5.00 U	5.29 U	1.83 U	4	5.00 U	10.0 U	1.83 U	4	5.00 U	10.0 U	1.83 U
111-44-4	bis(2-Chloroethyl)ether	4	5.00 U	5.29 U	1.25 U	4	5.00 U	10.0 U	1.25 U	4	5.00 U	10.0 U	1.25 U
91-58-7	2-Chloronaphthalene	4	5.00 U	5.29 U	1.44 U	4	5.00 U	10.0 U	1.44 U	4	5.00 U	10.0 U	1.44 U
95-57-8	2-Chlorophenol	4	5.00 U	5.29 U	1.63 U	4	5.00 U	10.0 U	1.63 U	4	5.00 U	10.0 U	1.63 U
7005-72-3	4-Chlorophenyl phenyl ether	4	5.00 U	5.29 U	1.54 U	4	5.00 U	10.0 U	1.54 U	4	5.00 U	10.0 U	1.54 U
218-01-9	Chrysene	4	5.00 U	5.29 U	0.317 U	4	5.00 U	10.0 U	0.317 U	4	5.00 U	10.0 U	0.317 U
53-70-3	Dibenz(a,h)anthracene	4	5.00 U	5.29 U	0.433 U	4	5.00 U	10.0 U	0.433 U	4	5.00 U	10.0 U	0.433 U
132-64-9	Dibenzofuran	4	5.00 U	5.29 U	1.25 U	4	5.00 U	10.0 U	1.25 U	4	5.00 U	10.0 U	1.25 U
91-94-1	3,3'-Dichlorobenzidine	4	10.0 U	10.6 U	1.44 U	4	10.0 U	20.0 U	1.44 U	4	10.0 U	20.0 U	1.44 U
120-83-2	2,4-Dichlorophenol	4	5.00 U	5.29 U	2.12 U	4	5.00 U	10.0 U	2.12 U	4	5.00 U	10.0 U	2.12 U
84-66-2	Diethyl phthalate	4	5.00 U	5.29 U	1.15 U	4	5.00 U	10.0 U	1.15 U	4	5.00 U	10.0 U	1.15 U
105-67-9	2,4-Dimethylphenol	4	5.00 U	5.29 U	1.54 U	4	5.00 U	10.0 U	1.54 U	4	5.00 U	10.0 U	1.54 U
131-11-3	Dimethyl phthalate	4	5.00 U	5.29 U	1.15 U	4	5.00 U	10.0 U	1.15 U	4	5.00 U	10.0 U	1.15 U
84-74-2	Di-n-butylphthalate (DBP)	4	5.00 U	5.29 U	1.25 U	4	5.00 U	10.0 U	1.25 U	4	5.00 U	10.0 U	1.25 U
534-52-1	4,6-Dinitro-2-methylphenol	4	25.0 U	26.5 U	2.79 U	4	20.0 U	27.5 U	2.79 U	4	25.0 U	50.0 U	2.79 U
51-28-5	2,4-Dinitrophenol	4	25.0 U	26.5 U	6.92 U	4	25.0 U	50.0 U	6.92 U	4	25.0 U	50.0 U	6.92 U
121-14-2	2,4-Dinitrotoluene	4	5.00 U	5.29 U	1.54 U	4	5.00 U	10.0 U	1.54 U	4	5.00 U	10.0 U	1.54 U
606-20-2	2,6-Dinitrotoluene	4	5.00 U	5.29 U	1.44 U	4	5.00 U	10.0 U	1.44 U	4	5.00 U	10.0 U	1.44 U
117-84-0	Di-n-octyl phthalate (DnOP)	4	5.00 U	5.29 U	0.865 U	4	5.00 U	10.0 U	0.865 U	4	5.00 U	10.0 U	0.865 U
117-81-7	bis(2-Ethylhexyl)phthalate (DEHP)	4	5.00 U	11.5 B	1.44 U	4	5.00 U	6.00 U	1.44 U	4	5.00 U	10.0 U	1.44 U
206-44-0	Fluoranthene	4	5.00 U	5.29 U	0.308 U	4	5.00 U	10.0 U	0.308 U	4	5.00 U	10.0 U	0.308 U
86-73-7	Fluorene	4	5.00 U	5.29 U	0.308 U	4	5.00 U	10.0 U	0.308 U	4	5.00 U	10.0 U	0.308 U
118-74-1	Hexachlorobenzene	4	5.00 U	5.29 U	1.44 U	4	5.00 U	10.0 U	1.44 U	4	5.00 U	10.0 U	1.44 U
87-68-3	Hexachlorobutadiene	4	5.00 U	5.29 U	1.44 U	4	5.00 U	10.0 U	1.44 U	4	5.00 U	10.0 U	1.44 U
77-47-4	Hexachlorocyclopentadiene	4	5.00 U	5.29 U	1.25 U	4	5.00 U	10.0 U	1.25 U	4	5.00 U	10.0 U	1.25 U
67-72-1	Hexachloroethane	4	5.00 U	5.29 U	2.12 U	4	5.00 U	10.0 U	2.12 U	4	5.00 U	10.0 U	2.12 U
193-39-5	Indeno(1,2,3-cd)pyrene	4	5.00 U	5.29 U	0.394 U	4	5.00 U	10.0 U	0.394 U	4	5.00 U	10.0 U	0.394 U

Notes:
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TABLE 14

OU-10 Comparison of Results to Baseline Conditions
2017 Annual Site-Wide Groundwater, Surface Water, and Sediment Monitoring Report for OU-7, OU-10, and NTCRA Basins
Avtex Fibers Superfund Site
Front Royal, Virginia

		Overburden Monitoring Wells											
		Upgradient VB 1-8				**Upgradient VB 1-8 and New Landfill**				**Downgradient VB 1-8**			
		# Baseline Samples	**Baseline Minimum**	**Baseline Maximum**	**July 2017 Result**	**# Baseline Samples**	**Baseline Minimum**	**Baseline Maximum**	**July 2017 Result**	**# Baseline Samples**	**Baseline Minimum**	**Baseline Maximum**	**July 2017/Jan 2018 Result**
CAS NO.	COMPOUND	**GPW-02**				**GPW-03R**				**GPW-14**			
	SEMIVOLATILES (ug/L) - CONTINUED												
78-59-1	Isophorone	4	5.00 U	5.29 U	2.12 U	4	5.00 U	10.0 U	2.12 U	4	5.00 U	10.0 U	2.12 U
91-57-6	2-Methylnaphthalene	4	5.00 U	5.29 U	0.385 U	4	5.00 U	10.0 U	0.385 U	4	5.00 U	10.0 U	0.385 U
95-48-7	2-Methylphenol	4	5.00 U	5.29 U	1.54 U	4	5.00 U	10.0 U	1.54 U	4	5.00 U	10.0 U	1.54 U
	3&4-Methylphenol	-	-	-	1.35 U	-	-	-	1.35 U	-	-	-	1.35 U
106-44-5	4-Methylphenol (P-Cresol)	4	5.00 U	5.29 U	-	4	5.00 U	10.0 U	-	4	5.00 U	10.0 U	-
91-20-3	Naphthalene	4	5.00 U	5.29 U	0.356 U	4	5.00 U	10.0 U	0.356 U	4	5.00 U	10.0 U	0.356 U
88-74-4	2-Nitroaniline	4	25.0 U	26.5 U	1.06 U	4	25.0 U	50.0 U	1.06 U	4	25.0 U	50.0 U	1.06 U
99-09-2	3-Nitroaniline	4	25.0 U	26.5 U	1.54 U	4	25.0 U	50.0 U	1.54 U	4	25.0 U	50.0 U	1.54 U
100-01-6	4-Nitroaniline	4	25.0 U	26.5 U	1.54 U	4	20.0 U	27.5 U	1.54 U	4	25.0 U	50.0 U	1.54 U
98-95-3	Nitrobenzene	4	5.00 U	5.29 U	2.12 U	4	5.00 U	10.0 U	2.12 U	4	5.00 U	10.0 U	2.12 U
88-75-5	2-Nitrophenol	4	5.00 U	5.29 U	2.31 U	4	5.00 U	10.0 U	2.31 U	4	5.00 U	10.0 U	2.31 U
100-02-7	4-Nitrophenol	4	25.0 U	26.5 U	1.92 U	4	25.0 U	50.0 U	1.92 U	4	25.0 U	50.0 U	1.92 U
621-64-7	N-Nitrosodi-n-propylamine	4	5.00 U	5.29 U	1.63 U	4	5.00 U	10.0 U	1.63 U	4	5.00 U	10.0 U	1.63 U
86-30-6	N-Nitrosodiphenylamine	4	5.00 U	5.29 U	3.46 U	4	5.00 U	10.0 U	3.46 U	4	5.00 U	10.0 U	3.46 U
108-60-1	2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	4	5.00 U	5.29 U	1.73 U	4	5.00 U	10.0 U	1.73 U	4	5.00 U	10.0 U	1.73 U
87-86-5	Pentachlorophenol	4	10.0 U	10.6 U	3.17 U	4	10.0 U	25.0 U	3.17 U	4	10.0 U	20.0 U	3.17 U
85-01-8	Phenanthrene	4	5.00 U	5.29 U	0.404 U	4	5.00 U	10.0 U	0.404 U	4	5.00 U	5.26 U	0.404 U
108-95-2	Phenol	4	5.00 U	5.29 U	1.44 U	4	5.00 U	10.0 U	1.44 U	4	5.00 U	5.26 U	1.44 U
129-00-0	Pyrene	4	5.00 U	5.29 U	0.337 U	4	5.00 U	10.0 U	0.337 U	4	5.00 U	5.26 U	0.337 U
95-95-4	2,4,5-Trichlorophenol	4	5.00 U	5.29 U	1.25 U	4	5.00 U	10.0 U	1.25 U	4	5.00 U	5.26 U	1.25 U
88-06-2	2,4,6-Trichlorophenol	4	5.00 U	5.29 U	1.83 U	4	5.00 U	10.0 U	1.83 U	4	5.00 U	5.26 U	1.83 U
	METALS - DISSOLVED (ug/L)												
7440-36-0	Antimony	4	1 U	5 U	0.8 U	4	1 U	1 U	0.8 U	4	0.729	20 U	**1.09 J**
7440-38-2	Arsenic	4	1 U	5 U	0.4 U	4	1 U	1 U	0.4 U	4	12	94	**2.08**
7440-41-7	Beryllium	4	0.384	2	**0.117 J**	4	1 U	2 U	0.1 U	4	1.06	2 U	0.1 U
7440-43-9	Cadmium	4	0.277	5	0.1 U	4	1 U	5 U	0.1 U	4	5 U	5 U	**0.176 J**
7440-47-3	Chromium	4	3.04	5 U	**2.44**	4	0.42 J	5 U	0.5 U	4	5 U	7.48	**0.658 J**
7440-50-8	Copper	4	10 U	10 U	**8.55**	4	1.4 J	25.8	**13.3**	4	10 U	20 U	**9.08**
7439-92-1	Lead	4	1 U	5 U	0.1 U	4	1 U	1.6	**1.46 J**	4	0.436	20 U	0.1 U
7439-97-6	Mercury	4	0.2 U	0.2 U	0.1 U	4	0.2 U	0.2 U	0.1 U	4	0.2 U	0.2 U	0.1 U
7440-02-0	Nickel	4	12.6	20	**10.3**	4	11.1	45.5	**8.38**	4	61.8	131	**53.2**
7782-49-2	Selenium	4	1	5	**0.375 J**	4	1 U	2.2	0.3 U	4	25.8	44	**1.58 J**
7440-28-0	Thallium	4	0.2	1	0.8 U	4	0.2 U	1 U	0.8 U	4	0.063	4 U	0.8 U
7440-62-2	Vanadium	4	10	10	0.7 U	4	5 U	10 U	0.7 U	4	10 U	22.1	**2.04**
7440-66-6	Zinc	4	28	74.7	**234**	4	7.4 J	20 U	**136**	4	6.03	24.5	**9.4 J**

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2017 Annual Site-Wide Groundwater, Surface Water, and Sediment Monitoring Report for OU-7, OU-10, and NTCRA Basins
Avtex Fibers Superfund Site
Front Royal, Virginia

		Overburden Monitoring Wells (Continued)											
		Downgradient VB 1-8											
		# Baseline Samples	Baseline Minimum	Baseline Maximum	July 2017 Result	# Baseline Samples	Baseline Minimum	Baseline Maximum	July 2017 Result	# Baseline Samples	Baseline Minimum	Baseline Maximum	July 2017 Result
CAS NO.	COMPOUND	GPW-15R				MW-11				MW-12			
	VOLATILES (ug/L)												
67-64-1	Acetone	4	10.0 U	10.0 U	-- R	4	10.0 U	10.0 U	-- R	4	10.0 U	10.0 U	-- R
71-43-2	Benzene	4	1.00 U	1.00 U	0.2 U	4	0.135	1.00 U	0.2 U	4	1.42	2.33	**0.923**
75-27-4	Bromodichloromethane	4	1.00 U	1.00 U	0.17 U	4	1.00 U	1.00 U	0.17 U	4	1.00 U	1.00 U	0.17 U
75-25-2	Bromoform	4	1.00 U	1.00 U	0.29 U	4	1.00 U	1.00 U	0.29 U	4	1.00 U	1.00 U	0.29 U
74-83-9	Bromomethane (Methyl bromide)	4	1.00 U	1.00 U	0.35 U	4	1.00 U	1.00 U	0.35 U	4	1.00 U	1.00 U	0.35 U
78-93-3	2-Butanone (Methyl ethyl ketone) (MEK)	4	10.0 U	10.0 U	2.64 U	4	10.0 U	10.0 U	2.64 U	4	10.0 U	10.0 U	2.64 U
75-15-0	Carbon disulfide	4	1.00 U	1.00 U	0.22 U	4	1.00 U	1.00 U	0.22 U	4	1.15	3.92	**0.284 J**
56-23-5	Carbon tetrachloride	4	1.00 U	1.00 U	0.18 U	4	1.00 U	1.00 U	0.18 U	4	1.00 U	1.00 U	0.18 U
108-90-7	Chlorobenzene	4	1.00 U	1.00 U	0.18 U	4	1.00 U	1.00 U	0.18 U	4	1.00 U	1.00 U	0.18 U
75-00-3	Chloroethane	4	1.00 U	1.00 U	0.36 U	4	1.00 U	1.00 U	0.36 U	4	1.00 U	1.00 U	0.36 U
67-66-3	Chloroform (Trichloromethane)	4	1.00 U	1.00 U	0.23 U	4	1.00 U	1.00 U	0.23 U	4	1.00 U	1.00 U	0.23 U
74-87-3	Chloromethane (Methyl chloride)	4	1.00 U	1.00 U	0.36 U	4	1.00 U	1.00 U	0.36 U	4	1.00 U	1.00 U	0.36 U
124-48-1	Dibromochloromethane	4	1.00 U	1.00 U	0.25 U	4	1.00 U	1.00 U	0.25 U	4	1.00 U	1.00 U	0.25 U
95-50-1	1,2-Dichlorobenzene	4	1.00 U	1.00 U	0.19 U	4	1.00 U	1.00 U	0.19 U	4	1.00 U	1.00 U	0.19 U
541-73-1	1,3-Dichlorobenzene	4	1.00 U	1.00 U	0.18 U	4	1.00 U	1.00 U	0.18 U	4	1.00 U	1.00 U	0.18 U
106-46-7	1,4-Dichlorobenzene	4	1.00 U	1.00 U	0.17 U	4	1.00 U	1.00 U	0.17 U	4	1.00 U	1.00 U	0.17 U
75-34-3	1,1-Dichloroethane	4	1.00 U	1.00 U	0.24 U	4	1.00 U	1.00 U	0.24 U	4	1.00 U	1.00 U	0.24 U
107-06-2	1,2-Dichloroethane	4	1.00 U	1.00 U	0.2 U	4	1.00 U	1.00 U	0.2 U	4	1.00 U	1.00 U	0.2 U
75-35-4	1,1-Dichloroethene	4	1.00 U	1.00 U	0.25 U	4	1.00 U	1.00 U	0.25 U	4	1.00 U	1.00 U	0.25 U
156-59-2	cis-1,2-Dichloroethene	4	1.00 U	1.00 U	0.21 U	4	1.00 U	1.00 U	0.21 U	4	1.00 U	1.00 U	0.21 U
156-60-5	trans-1,2-Dichloroethene	4	1.00 U	1.00 U	0.23 U	4	1.00 U	1.00 U	0.23 U	4	1.00 U	1.00 U	0.23 U
78-87-5	1,2-Dichloropropane	4	1.00 U	1.00 U	0.25 U	4	1.00 U	1.00 U	0.25 U	4	1.00 U	1.00 U	0.25 U
10061-01-5	cis-1,3-Dichloropropene	4	1.00 U	1.00 U	0.17 U	4	1.00 U	1.00 U	0.17 U	4	1.00 U	1.00 U	0.17 U
10061-02-6	trans-1,3-Dichloropropene	4	1.00 U	1.00 U	0.17 U	4	1.00 U	1.00 U	0.17 U	4	1.00 U	1.00 U	0.17 U
100-41-4	Ethylbenzene	4	1.00 U	1.00 U	0.19 U	4	1.00 U	1.00 U	0.19 U	4	1.00 U	1.1	**0.229 J**
591-78-6	2-Hexanone	4	10.0 U	10.0 U	1.28 U	4	10.0 U	10.0 U	1.28 U	4	10.0 U	10.0 U	1.28 U
108-10-1	4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	4	10.0 U	10.0 U	0.81 U	4	10.0 U	10.0 U	0.81 U	4	10.0 U	10.0 U	0.81 U
75-09-2	Methylene chloride	4	1.00 U	1.00 U	1 U	4	1.00 U	1.00 U	1 U	4	1.00 U	1.00 U	1 U
100-42-5	Styrene	4	1.00 U	1.00 U	0.28 U	4	1.00 U	1.00 U	0.28 U	4	1.00 U	1.00 U	0.28 U
79-34-5	1,1,2,2-Tetrachloroethane	4	0.50 U	0.50 U	0.19 U	4	0.50 U	0.50 U	0.19 U	4	0.50 U	0.50 U	0.19 U
127-18-4	Tetrachloroethene	4	1.00 U	1.00 U	0.14 U	4	1.00 U	1.00 U	0.14 U	4	1.00 U	1.00 U	0.14 U
108-88-3	Toluene	4	1.00 U	1.00 U	0.17 U	4	1.00 U	1.00 U	0.17 U	4	1.00 U	0.292	0.17 U
120-82-1	1,2,4-Trichlorobenzene	4	1.00 U	1.00 U	0.2 U	4	1.00 U	1.00 U	0.2 U	4	1.00 U	1.00 U	0.2 U
71-55-6	1,1,1-Trichloroethane	4	1.00 U	1.00 U	0.19 U	4	1.00 U	1.00 U	0.19 U	4	1.00 U	1.00 U	0.19 U
79-00-5	1,1,2-Trichloroethane	4	1.00 U	1.00 U	0.19 U	4	1.00 U	1.00 U	0.19 U	4	1.00 U	1.00 U	0.19 U
79-01-6	Trichloroethene	4	1.00 U	1.00 U	0.2 U	4	1.00 U	1.00 U	0.2 U	4	1.00 U	1.00 U	0.2 U
75-01-4	Vinyl chloride	4	1.00 U	1.00 U	0.18 U	4	1.00 U	1.00 U	0.18 U	4	1.00 U	1.00 U	0.18 U
1330-20-7	Xylenes (total)	4	1.00 U	1.00 U	0.58 U	4	1.00 U	1.00 U	0.58 U	4	6.89	7.57	**0.923 J**

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		Overburden Monitoring Wells (Continued)											
		Downgradient VB 1-8											
		# Baseline Samples	Baseline Minimum	Baseline Maximum	July 2017 Result	# Baseline Samples	Baseline Minimum	Baseline Maximum	July 2017 Result	# Baseline Samples	Baseline Minimum	Baseline Maximum	July 2017 Result
CAS NO.	COMPOUND	GPW-15R				MW-11				MW-12			
	SEMIVOLATILES (ug/L)												
83-32-9	Acenaphthene	4	5.00 U	5.26 U	0.296 U	4	5.00 U	5.26 U	0.333 U	4	5.00 U	5.38 U	0.32 U
208-96-8	Acenaphthylene	4	5.00 U	5.26 U	0.324 U	4	5.00 U	5.26 U	0.365 U	4	5.00 U	5.38 U	0.35 U
120-12-7	Anthracene	4	5.00 U	5.26 U	0.352 U	4	5.00 U	5.26 U	0.396 U	4	5.00 U	5.38 U	0.38 U
56-55-3	Benzo(a)anthracene	4	5.00 U	5.26 U	0.296 U	4	5.00 U	5.26 U	0.333 U	4	5.00 U	5.38 U	0.32 U
50-32-8	Benzo(a)pyrene	4	5.00 U	5.26 U	0.352 U	4	5.00 U	5.26 U	0.396 U	4	5.00 U	5.38 U	0.38 U
205-99-2	Benzo(b)fluoranthene	4	5.00 U	5.26 U	0.333 U	4	5.00 U	5.26 U	0.375 U	4	5.00 U	5.38 U	0.36 U
191-24-2	Benzo(g,h,i)perylene	4	5.00 U	5.26 U	0.574 U	4	5.00 U	5.26 U	0.646 U	4	5.00 U	5.38 U	0.62 U
207-08-9	Benzo(k)fluoranthene	4	5.00 U	5.26 U	0.343 U	4	5.00 U	5.26 U	0.385 U	4	5.00 U	5.38 U	0.37 U
101-55-3	4-Bromophenyl phenyl ether	4	5.00 U	5.26 U	1.48 U	4	5.00 U	5.26 U	1.67 U	4	5.00 U	5.38 U	1.6 U
85-68-7	Butyl benzylphthalate (BBP)	4	5.00 U	5.26 U	0.926 U	4	5.00 U	5.26 U	1.04 U	4	5.00 U	5.38 U	1 U
86-74-8	Carbazole	4	5.00 U	5.26 U	0.833 U	4	5.00 U	5.26 U	0.938 U	4	5.00 U	5.38 U	0.9 U
59-50-7	4-Chloro-3-methylphenol	4	5.00 U	5.26 U	1.3 U	4	5.00 U	5.26 U	1.46 U	4	5.00 U	5.38 U	1.4 U
106-47-8	4-Chloroaniline	4	5.00 U	5.26 U	1.11 U	4	5.00 U	5.26 U	1.25 U	4	5.00 U	5.38 U	1.2 U
111-91-1	bis(2-Chloroethoxy)methane	4	5.00 U	5.26 U	1.76 U	4	5.00 U	5.26 U	1.98 U	4	5.00 U	5.38 U	1.9 U
111-44-4	bis(2-Chloroethyl)ether	4	5.00 U	5.26 U	1.2 U	4	5.00 U	5.26 U	1.35 U	4	5.00 U	5.38 U	1.3 U
91-58-7	2-Chloronaphthalene	4	5.00 U	5.26 U	1.39 U	4	5.00 U	5.26 U	1.56 U	4	5.00 U	5.38 U	1.5 U
95-57-8	2-Chlorophenol	4	5.00 U	5.26 U	1.57 U	4	5.00 U	5.26 U	1.77 U	4	5.00 U	5.38 U	1.7 U
7005-72-3	4-Chlorophenyl phenyl ether	4	5.00 U	5.26 U	1.48 U	4	5.00 U	5.26 U	1.67 U	4	5.00 U	5.38 U	1.6 U
218-01-9	Chrysene	4	5.00 U	5.26 U	0.306 U	4	5.00 U	5.26 U	0.344 U	4	5.00 U	5.38 U	0.33 U
53-70-3	Dibenz(a,h)anthracene	4	5.00 U	5.26 U	0.417 U	4	5.00 U	5.26 U	0.469 U	4	5.00 U	5.38 U	0.45 U
132-64-9	Dibenzofuran	4	5.00 U	5.26 U	1.2 U	4	5.00 U	5.26 U	1.35 U	4	5.00 U	5.38 U	1.3 U
91-94-1	3,3'-Dichlorobenzidine	4	10.0 U	10.5 U	1.39 U	4	10.0 U	10.5 U	1.56 U	4	10.0 U	10.8 U	1.5 U
120-83-2	2,4-Dichlorophenol	4	5.00 U	5.26 U	2.04 U	4	5.00 U	5.26 U	2.29 U	4	5.00 U	5.38 U	2.2 U
84-66-2	Diethyl phthalate	4	5.00 U	5.26 U	1.11 U	4	5.00 U	5.26 U	1.25 U	4	5.00 U	5.38 U	1.2 U
105-67-9	2,4-Dimethylphenol	4	5.00 U	5.26 U	1.48 U	4	5.00 U	5.26 U	1.67 U	4	5.00 U	5.38 U	1.6 U
131-11-3	Dimethyl phthalate	4	5.00 U	5.26 U	1.11 U	4	5.00 U	5.26 U	1.25 U	4	5.00 U	5.38 U	1.2 U
84-74-2	Di-n-butylphthalate (DBP)	4	5.00 U	5.26 U	1.2 U	4	5.00 U	5.26 U	1.35 U	4	5.00 U	5.38 U	1.3 U
534-52-1	4,6-Dinitro-2-methylphenol	4	25.0 U	26.3 U	2.69 U	4	25.0 U	26.3 U	3.02 U	4	25.0 U	26.9 U	2.9 U
51-28-5	2,4-Dinitrophenol	4	25.0 U	26.3 U	6.67 U	4	25.0 U	26.3 U	7.5 U	4	25.0 U	26.9 U	7.2 U
121-14-2	2,4-Dinitrotoluene	4	5.00 U	5.26 U	1.48 U	4	5.00 U	5.26 U	1.67 U	4	5.00 U	5.38 U	1.6 U
606-20-2	2,6-Dinitrotoluene	4	5.00 U	5.26 U	1.39 U	4	5.00 U	5.26 U	1.56 U	4	5.00 U	5.38 U	1.5 U
117-84-0	Di-n-octyl phthalate (DnOP)	4	5.00 U	5.26 U	0.833 U	4	5.00 U	5.26 U	0.938 U	4	5.00 U	5.38 U	0.9 U
117-81-7	bis(2-Ethylhexyl)phthalate (DEHP)	4	5.00 U	5.26 U	1.67 U	4	5.00 U	7.09	1.56 U	4	5.00 U	5.38 U	1.5 U
206-44-0	Fluoranthene	4	5.00 U	5.26 U	0.296 U	4	5.00 U	5.26 U	0.333 U	4	5.00 U	5.38 U	0.32 U
86-73-7	Fluorene	4	5.00 U	5.26 U	0.296 U	4	5.00 U	5.26 U	0.333 U	4	5.00 U	5.38 U	0.32 U
118-74-1	Hexachlorobenzene	4	5.00 U	5.26 U	1.39 U	4	5.00 U	5.26 U	1.56 U	4	5.00 U	5.38 U	1.5 U
87-68-3	Hexachlorobutadiene	4	5.00 U	5.26 U	1.39 U	4	5.00 U	5.26 U	1.56 U	4	5.00 U	5.38 U	1.5 U
77-47-4	Hexachlorocyclopentadiene	4	5.00 U	5.26 U	-- R	4	5.00 U	5.26 U	1.35 UJ	4	5.00 U	5.38 U	1.3 UJ
67-72-1	Hexachloroethane	4	5.00 U	5.26 U	2.04 U	4	5.00 U	5.26 U	2.29 U	4	5.00 U	5.38 U	2.2 U
193-39-5	Indeno(1,2,3-cd)pyrene	4	5.00 U	5.26 U	0.38 U	4	5.00 U	5.26 U	0.427 U	4	5.00 U	5.38 U	0.41 U

Notes:
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TABLE 14

OU-10 Comparison of Results to Baseline Conditions
2017 Annual Site-Wide Groundwater, Surface Water, and Sediment Monitoring Report for OU-7, OU-10, and NTCRA Basins
Avtex Fibers Superfund Site
Front Royal, Virginia

		Overburden Monitoring Wells (Continued)											
		Downgradient VB 1-8											
		# Baseline Samples	Baseline Minimum	Baseline Maximum	July 2017 Result	# Baseline Samples	Baseline Minimum	Baseline Maximum	July 2017 Result	# Baseline Samples	Baseline Minimum	Baseline Maximum	July 2017 Result
CAS NO.	COMPOUND	GPW-15R				MW-11				MW-12			
	SEMIVOLATILES (ug/L) - CONTINUED												
78-59-1	Isophorone	4	5.00 U	5.26 U	2.04 U	4	5.00 U	5.26 U	2.29 U	4	5.00 U	5.38 U	2.2 U
91-57-6	2-Methylnaphthalene	4	5.00 U	5.26 U	0.37 U	4	5.00 U	5.26 U	0.417 U	4	5.00 U	5.38 U	0.4 U
95-48-7	2-Methylphenol	4	5.00 U	5.26 U	1.48 U	4	5.00 U	5.26 U	1.67 U	4	5.00 U	5.38 U	1.6 U
	3&4-Methylphenol	-	-	-	1.3 U	-	-	-	1.46 U	-	-	-	1.4 U
106-44-5	4-Methylphenol (P-Cresol)	4	5.00 U	5.26 U	-	4	5.00 U	5.26 U	-	4	5.00 U	5.38 U	-
91-20-3	Naphthalene	4	5.00 U	5.26 U	0.343 U	4	5.00 U	5.26 U	0.385 U	4	5.00 U	5.38 U	0.37 U
88-74-4	2-Nitroaniline	4	25.0 U	26.3 U	1.02 U	4	25.0 U	26.3 U	1.15 U	4	25.0 U	26.9 U	1.1 U
99-09-2	3-Nitroaniline	4	25.0 U	26.3 U	1.48 U	4	25.0 U	26.3 U	1.67 U	4	25.0 U	26.9 U	1.6 U
100-01-6	4-Nitroaniline	4	25.0 U	26.3 U	1.48 U	4	25.0 U	26.3 U	1.67 U	4	25.0 U	26.9 U	1.6 U
98-95-3	Nitrobenzene	4	5.00 U	5.26 U	2.04 U	4	5.00 U	5.26 U	2.29 U	4	5.00 U	5.38 U	2.2 U
88-75-5	2-Nitrophenol	4	5.00 U	5.26 U	2.22 U	4	5.00 U	5.26 U	2.5 U	4	5.00 U	5.38 U	2.4 U
100-02-7	4-Nitrophenol	4	25.0 U	26.3 U	1.85 U	4	25.0 U	26.3 U	2.08 U	4	25.0 U	26.9 U	2 UJ
621-64-7	N-Nitrosodi-n-propylamine	4	5.00 U	5.26 U	1.57 U	4	5.00 U	5.26 U	1.77 U	4	5.00 U	5.38 U	1.7 U
86-30-6	N-Nitrosodiphenylamine	4	5.00 U	5.26 U	3.33 U	4	5.00 U	5.26 U	3.75 U	4	5.00 U	5.38 U	3.6 U
108-60-1	2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	4	5.00 U	5.26 U	1.67 U	4	5.00 U	5.26 U	1.88 UJ	4	5.00 U	5.38 U	1.8 U
87-86-5	Pentachlorophenol	4	10.0 U	10.5 U	3.06 U	4	10.0 U	10.5 U	3.44 UJ	4	10.0 U	10.8 U	3.3 UJ
85-01-8	Phenanthrene	4	5.00 U	5.26 U	0.389 U	4	5.00 U	5.26 U	0.438 U	4	5.00 U	5.38 U	0.42 U
108-95-2	Phenol	4	5.00 U	5.26 U	1.39 U	4	5.00 U	5.26 U	1.56 U	4	5.00 U	5.38 U	1.5 U
129-00-0	Pyrene	4	5.00 U	5.26 U	0.324 U	4	5.00 U	5.26 U	0.365 U	4	5.00 U	5.38 U	0.35 U
95-95-4	2,4,5-Trichlorophenol	4	5.00 U	5.26 U	1.2 U	4	5.00 U	5.26 U	1.35 U	4	5.00 U	5.38 U	1.3 U
88-06-2	2,4,6-Trichlorophenol	4	5.00 U	5.26 U	1.76 U	4	5.00 U	5.26 U	1.98 U	4	5.00 U	5.38 U	1.9 U
	METALS - DISSOLVED (ug/L)												
7440-36-0	Antimony	4	1 U	1 U	0.8 U	4	1 U	20 U	0.8 UJ	4	1 U	5 U	1.6 U
7440-38-2	Arsenic	4	1 U	1 U	0.4 U	4	3.55	92.8	**5.84 J**	4	53.8	146	**44.6**
7440-41-7	Beryllium	4	2 U	2 U	0.1 U	4	0.664	2 U	0.1 U	4	2 U	5 U	0.2 U
7440-43-9	Cadmium	4	5 U	5 U	0.1 U	4	0.494	5 U	**0.136 J**	4	0.492	5 U	0.2 U
7440-47-3	Chromium	4	5 U	5 U	0.5 U	4	3.13	5 U	0.5 UJ	4	2.9	5 U	1 U
7440-50-8	Copper	4	10 U	20.3	**1.34 J**	4	9.28	68.1	1.2 U	4	10 U	10 U	2.4 U
7439-92-1	Lead	4	1 U	1 U	**0.65 J**	4	1 U	20 U	0.1 U	4	1 U	5 U	0.2 U
7439-97-6	Mercury	4	0.2 U	0.2 U	0.1 U	4	0.2 U	0.2 U	0.1 U	4	0.2 U	0.2 U	0.1 U
7440-02-0	Nickel	4	4 U	4.96	**1.01 J**	4	66.8	121	**39.6 J**	4	24.7	41.4	**9.79**
7782-49-2	Selenium	4	1 U	1.28	0.3 U	4	13.7	20.9	0.3 U	4	5.2	12.6	**1.92 J**
7440-28-0	Thallium	4	0.2 U	0.2 U	0.8 U	4	0.2 U	1.85	0.8 U	4	0.068	0.2 U	1.6 U
7440-62-2	Vanadium	4	10 U	10 U	0.7 U	4	10 U	29	0.7 U	4	10 U	14.8	**5.72**
7440-66-6	Zinc	4	20 U	20 U	**51.9**	4	16.8	87.5	**10.2 J**	4	20 U	20 U	10.4 U

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TABLE 14

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2017 Annual Site-Wide Groundwater, Surface Water, and Sediment Monitoring Report for OU-7, OU-10, and NTCRA Basins
Avtex Fibers Superfund Site
Front Royal, Virginia

		Shallow Bedrock Monitoring Wells											
		Upgradient VB 1-8				Upgradient VB 1-8 and New Landfill							
		# Baseline Samples	Baseline Minimum	Baseline Maximum	July 2017 Result	# Baseline Samples	Baseline Minimum	Baseline Maximum	July 2017 Result	# Baseline Samples	Baseline Minimum	Baseline Maximum	July 2017/Feb 2018 Result
CAS NO.	COMPOUND	118				128				130R			
	VOLATILES (ug/L)												
67-64-1	Acetone	4	10.0 U	10.0 U	6.86 U	4	10.0 U	10.0 U	2.94 U	4	10.0 U	10.0 U	7.44 U
71-43-2	Benzene	4	1.00 U	1.00 U	0.2 U	4	1.00 U	1.00 U	0.2 U	4	1.00 U	1.00 U	0.2 U
75-27-4	Bromodichloromethane	4	1.00 U	1.00 U	0.17 U	4	1.00 U	1.00 U	0.17 U	4	1.00 U	1.00 U	0.17 U
75-25-2	Bromoform	4	1.00 U	1.00 U	0.29 U	4	1.00 U	1.00 U	0.29 U	4	1.00 U	1.00 U	0.29 U
74-83-9	Bromomethane (Methyl bromide)	4	1.00 U	1.00 U	0.35 U	4	1.00 U	1.00 U	0.35 U	4	1.00 U	1.00 U	0.35 U
78-93-3	2-Butanone (Methyl ethyl ketone) (MEK)	4	10.0 U	10.0 U	2.64 U	4	10.0 U	10.0 U	2.64 U	4	10.0 U	10.0 U	2.64 U
75-15-0	Carbon disulfide	4	1.00 U	1.00 U	0.22 U	4	1.00 U	1.00 U	0.22 U	4	1.00 U	1.00 U	0.22 U
56-23-5	Carbon tetrachloride	4	1.00 U	1.00 U	0.18 U	4	1.00 U	1.00 U	0.18 U	4	1.00 U	1.00 U	0.18 U
108-90-7	Chlorobenzene	4	1.00 U	1.00 U	0.18 U	4	1.00 U	1.00 U	0.18 U	4	1.00 U	1.00 U	0.18 U
75-00-3	Chloroethane	4	1.00 U	1.00 U	0.36 U	4	1.00 U	1.00 U	0.36 U	4	1.00 U	1.00 U	0.36 U
67-66-3	Chloroform (Trichloromethane)	4	1.00 U	1.00 U	0.23 U	4	1.00 U	1.00 U	0.23 U	4	1.00 U	1.00 U	0.23 U
74-87-3	Chloromethane (Methyl chloride)	4	1.00 U	1.00 U	0.36 U	4	1.00 U	1.00 U	0.36 U	4	1.00 U	1.00 U	0.36 U
124-48-1	Dibromochloromethane	4	1.00 U	1.00 U	0.25 U	4	1.00 U	1.00 U	0.25 U	4	1.00 U	1.00 U	0.25 U
95-50-1	1,2-Dichlorobenzene	4	1.00 U	1.00 U	0.19 U	4	1.00 U	1.00 U	0.19 U	4	1.00 U	1.00 U	0.19 U
541-73-1	1,3-Dichlorobenzene	4	1.00 U	1.00 U	0.18 U	4	1.00 U	1.00 U	0.18 U	4	1.00 U	1.00 U	0.18 U
106-46-7	1,4-Dichlorobenzene	4	1.00 U	1.00 U	0.17 U	4	1.00 U	1.00 U	0.17 U	4	1.00 U	1.00 U	0.17 U
75-34-3	1,1-Dichloroethane	4	1.00 U	1.00 U	0.24 U	4	1.00 U	1.00 U	0.24 U	4	1.00 U	1.00 U	0.24 U
107-06-2	1,2-Dichloroethane	4	1.00 U	1.00 U	0.2 U	4	1.00 U	1.00 U	0.2 U	4	1.00 U	1.00 U	0.2 U
75-35-4	1,1-Dichloroethene	4	1.00 U	1.00 U	0.25 U	4	1.00 U	1.00 U	0.25 U	4	1.00 U	1.00 U	0.25 U
156-59-2	cis-1,2-Dichloroethene	4	1.00 U	1.00 U	0.21 U	4	1.00 U	1.00 U	0.21 U	4	1.00 U	1.00 U	0.21 U
156-60-5	trans-1,2-Dichloroethene	4	1.00 U	1.00 U	0.23 U	4	1.00 U	1.00 U	0.23 U	4	1.00 U	1.00 U	0.23 U
78-87-5	1,2-Dichloropropane	4	1.00 U	1.00 U	0.25 U	4	1.00 U	1.00 U	0.25 U	4	1.00 U	1.00 U	0.25 U
10061-01-5	cis-1,3-Dichloropropene	4	1.00 U	1.00 U	0.17 U	4	1.00 U	1.00 U	0.17 U	4	1.00 U	1.00 U	0.17 U
10061-02-6	trans-1,3-Dichloropropene	4	1.00 U	1.00 U	0.17 U	4	1.00 U	1.00 U	0.17 U	4	1.00 U	1.00 U	0.17 U
100-41-4	Ethylbenzene	4	1.00 U	1.00 U	0.19 U	4	1.00 U	1.00 U	0.19 U	4	1.00 U	1.00 U	0.19 U
591-78-6	2-Hexanone	4	10.0 U	10.0 U	1.28 U	4	10.0 U	10.0 U	1.28 U	4	10.0 U	10.0 U	1.28 U
108-10-1	4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	4	1.00 U	1.00 U	0.81 U	4	10.0 U	10.0 U	0.81 U	4	10.0 U	10.0 U	0.81 U
75-09-2	Methylene chloride	4	1.00 U	1.00 U	1 U	4	1.00 U	1.00 U	1 U	4	1.00 U	1.00 U	1 U
100-42-5	Styrene	4	1.00 U	1.00 U	0.28 U	4	1.00 U	1.00 U	0.28 U	4	1.00 U	1.00 U	0.28 U
79-34-5	1,1,2,2-Tetrachloroethane	4	0.05 U	0.50 U	0.19 U	4	0.50 U	0.50 U	0.19 U	4	0.50 U	0.50 U	0.19 U
127-18-4	Tetrachloroethene	4	1.00 U	1.00 U	0.14 U	4	1.00 U	1.00 U	0.14 U	4	1.00 U	1.00 U	0.14 U
108-88-3	Toluene	4	1.00 U	1.00 U	0.17 U	4	1.00 U	1.00 U	**0.174 J**	4	1.00 U	1.00 U	0.17 U
120-82-1	1,2,4-Trichlorobenzene	4	1.00 U	1.00 U	0.2 U	4	1.00 U	1.00 U	0.2 U	4	1.00 U	1.00 U	0.2 U
71-55-6	1,1,1-Trichloroethane	4	1.00 U	1.00 U	0.19 U	4	1.00 U	1.00 U	0.19 U	4	1.00 U	1.00 U	0.19 U
79-00-5	1,1,2-Trichloroethane	4	1.00 U	1.00 U	0.19 U	4	1.00 U	1.00 U	0.19 U	4	1.00 U	1.00 U	0.19 U
79-01-6	Trichloroethene	4	1.00 U	1.00 U	0.2 U	4	1.00 U	1.00 U	0.2 U	4	1.00 U	1.00 U	0.2 U
75-01-4	Vinyl chloride	4	1.00 U	1.00 U	0.18 U	4	1.00 U	1.00 U	0.18 U	4	1.00 U	1.00 U	0.18 U
1330-20-7	Xylenes (total)	4	1.00 U	1.00 U	0.58 U	4	1.00 U	1.00 U	0.58 U	4	1.00 U	1.00 U	0.58 U

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Avtex Fibers Superfund Site
Front Royal, Virginia

		Shallow Bedrock Monitoring Wells											
		Upgradient VB 1-8				**Upgradient VB 1-8 and New Landfill**							
		# Baseline Samples	**Baseline Minimum**	**Baseline Maximum**	**July 2017 Result**	**# Baseline Samples**	**Baseline Minimum**	**Baseline Maximum**	**July 2017 Result**	**# Baseline Samples**	**Baseline Minimum**	**Baseline Maximum**	**July 2017/Feb 2018 Result**
CAS NO.	COMPOUND	**118**				**128**				**130R**			
	SEMIVOLATILES (ug/L)												
83-32-9	Acenaphthene	4	5.00 U	5.21 U	0.308 U	4	5.00 U	5.62 U	0.308 U	4	5.00 U	5.26 U	0.308 U
208-96-8	Acenaphthylene	4	5.00 U	5.21 U	0.337 U	4	5.00 U	5.62 U	0.337 U	4	5.00 U	5.26 U	0.337 U
120-12-7	Anthracene	4	5.00 U	5.21 U	0.365 U	4	5.00 U	5.62 U	0.365 U	4	5.00 U	5.26 U	0.365 U
56-55-3	Benzo(a)anthracene	4	5.00 U	5.21 U	0.308 U	4	5.00 U	5.62 U	0.308 U	4	5.00 U	5.26 U	0.308 U
50-32-8	Benzo(a)pyrene	4	5.00 U	5.21 U	0.365 U	4	5.00 U	5.62 U	0.365 U	4	5.00 U	5.26 U	0.365 U
205-99-2	Benzo(b)fluoranthene	4	5.00 U	5.21 U	0.346 U	4	5.00 U	5.62 U	0.346 U	4	5.00 U	5.26 U	0.346 U
191-24-2	Benzo(g,h,i)perylene	4	5.00 U	5.21 U	0.596 U	4	5.00 U	5.62 U	0.596 U	4	5.00 U	5.26 U	0.596 U
207-08-9	Benzo(k)fluoranthene	4	5.00 U	5.21 U	0.356 U	4	5.00 U	5.62 U	0.356 U	4	5.00 U	5.26 U	0.356 U
101-55-3	4-Bromophenyl phenyl ether	4	5.00 U	5.21 U	1.54 U	4	5.00 U	5.62 U	1.54 U	4	5.00 U	5.26 U	1.54 U
85-68-7	Butyl benzylphthalate (BBP)	4	5.00 U	5.21 U	0.962 U	4	5.00 U	5.62 U	0.962 U	4	5.00 U	5.26 U	0.962 U
86-74-8	Carbazole	4	5.00 U	5.21 U	0.865 U	4	5.00 U	5.62 U	0.865 U	4	5.00 U	5.26 U	0.865 U
59-50-7	4-Chloro-3-methylphenol	4	5.00 U	5.21 U	1.35 U	4	5.00 U	5.62 U	1.35 U	4	5.00 U	5.26 U	1.35 U
106-47-8	4-Chloroaniline	4	5.00 U	5.21 U	1.15 U	4	5.00 U	5.62 U	1.15 U	4	5.00 U	5.26 U	1.15 U
111-91-1	bis(2-Chloroethoxy)methane	4	5.00 U	5.21 U	1.83 U	4	5.00 U	5.62 U	1.83 U	4	5.00 U	5.26 U	1.83 U
111-44-4	bis(2-Chloroethyl)ether	4	5.00 U	5.21 U	1.25 U	4	5.00 U	5.62 U	1.25 U	4	5.00 U	5.26 U	1.25 U
91-58-7	2-Chloronaphthalene	4	5.00 U	5.21 U	1.44 U	4	5.00 U	5.62 U	1.44 U	4	5.00 U	5.26 U	1.44 U
95-57-8	2-Chlorophenol	4	5.00 U	5.21 U	1.63 U	4	5.00 U	5.62 U	1.63 U	4	5.00 U	5.26 U	1.63 U
7005-72-3	4-Chlorophenyl phenyl ether	4	5.00 U	5.21 U	1.54 U	4	5.00 U	5.62 U	1.54 U	4	5.00 U	5.26 U	1.54 U
218-01-9	Chrysene	4	5.00 U	5.21 U	0.317 U	4	5.00 U	5.62 U	0.317 U	4	5.00 U	5.26 U	0.317 U
53-70-3	Dibenz(a,h)anthracene	4	5.00 U	5.21 U	0.433 U	4	5.00 U	5.62 U	0.433 U	4	5.00 U	5.26 U	0.433 U
132-64-9	Dibenzofuran	4	5.00 U	5.21 U	1.25 U	4	5.00 U	5.62 U	1.25 U	4	5.00 U	5.26 U	1.25 U
91-94-1	3,3'-Dichlorobenzidine	4	10.0 U	10.5 U	1.44 U	4	10.0 U	11.2 U	1.44 U	4	10.0 U	10.5 U	1.44 U
120-83-2	2,4-Dichlorophenol	4	5.00 U	5.21 U	2.12 U	4	5.00 U	5.62 U	2.12 U	4	5.00 U	5.26 U	2.12 U
84-66-2	Diethyl phthalate	4	5.00 U	5.21 U	1.15 U	4	5.00 U	5.62 U	1.15 U	4	5.00 U	5.26 U	1.15 U
105-67-9	2,4-Dimethylphenol	4	5.00 U	5.21 U	1.54 U	4	5.00 U	5.62 U	1.54 U	4	5.00 U	5.26 U	1.54 U
131-11-3	Dimethyl phthalate	4	5.00 U	5.21 U	1.15 U	4	5.00 U	5.62 U	1.15 U	4	5.00 U	5.26 U	1.15 U
84-74-2	Di-n-butylphthalate (DBP)	4	5.00 U	5.21 U	1.25 U	4	5.00 U	5.62 U	1.25 U	4	5.00 U	5.26 U	1.25 U
534-52-1	4,6-Dinitro-2-methylphenol	4	5.00 U	5.21 U	2.79 U	4	25.0 U	28.1 U	2.79 U	4	25.0 U	26.3 U	2.79 U
51-28-5	2,4-Dinitrophenol	4	5.00 U	5.21 U	6.92 U	4	25.0 U	28.1 U	6.92 U	4	25.0 U	26.3 U	6.92 U
121-14-2	2,4-Dinitrotoluene	4	5.00 U	5.21 U	1.54 U	4	5.00 U	5.62 U	1.54 U	4	5.00 U	5.26 U	1.54 U
606-20-2	2,6-Dinitrotoluene	4	5.00 U	5.21 U	1.44 U	4	5.00 U	5.62 U	1.44 U	4	5.00 U	5.26 U	1.44 U
117-84-0	Di-n-octyl phthalate (DnOP)	4	5.00 U	5.21 U	0.865 U	4	5.00 U	5.62 U	0.865 U	4	5.00 U	5.26 U	0.865 U
117-81-7	bis(2-Ethylhexyl)phthalate (DEHP)	4	5.00 U	5.21 U	1.44 U	4	5.00 U	5.62 U	1.44 U	4	5.00 U	5.26 U	1.44 U
206-44-0	Fluoranthene	4	5.00 U	5.21 U	0.308 U	4	5.00 U	5.62 U	0.308 U	4	5.00 U	5.26 U	0.308 U
86-73-7	Fluorene	4	5.00 U	5.21 U	0.308 U	4	5.00 U	5.62 U	0.308 U	4	5.00 U	5.26 U	0.308 U
118-74-1	Hexachlorobenzene	4	5.00 U	5.21 U	1.44 U	4	5.00 U	5.62 U	1.44 U	4	5.00 U	5.26 U	1.44 U
87-68-3	Hexachlorobutadiene	4	5.00 U	5.21 U	1.44 U	4	5.00 U	5.62 U	1.44 U	4	5.00 U	5.26 U	1.44 U
77-47-4	Hexachlorocyclopentadiene	4	5.00 U	5.21 U	1.25 U	4	5.00 U	5.62 U	1.25 U	4	5.00 U	5.26 U	1.25 U
67-72-1	Hexachloroethane	4	5.00 U	5.21 U	2.12 U	4	5.00 U	5.62 U	2.12 U	4	5.00 U	5.26 U	2.12 U
193-39-5	Indeno(1,2,3-cd)pyrene	4	5.00 U	5.21 U	0.394 U	4	5.00 U	5.62 U	0.394 U	4	5.00 U	5.26 U	0.394 U

Notes:
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TABLE 14

OU-10 Comparison of Results to Baseline Conditions
2017 Annual Site-Wide Groundwater, Surface Water, and Sediment Monitoring Report for OU-7, OU-10, and NTCRA Basins
Avtex Fibers Superfund Site
Front Royal, Virginia

		Shallow Bedrock Monitoring Wells											
		Upgradient VB 1-8				**Upgradient VB 1-8 and New Landfill**							
		# Baseline Samples	**Baseline Minimum**	**Baseline Maximum**	**July 2017 Result**	**# Baseline Samples**	**Baseline Minimum**	**Baseline Maximum**	**July 2017 Result**	**# Baseline Samples**	**Baseline Minimum**	**Baseline Maximum**	**July 2017/Feb 2018 Result**
CAS NO.	COMPOUND	**118**				**128**				**130R**			
	SEMIVOLATILES (ug/L) - CONTINUED												
78-59-1	Isophorone	4	5.00 U	5.21 U	2.12 U	4	5.00 U	5.62 U	2.12 U	4	5.00 U	5.26 U	2.12 U
91-57-6	2-Methylnaphthalene	4	5.00 U	5.21 U	0.385 U	4	5.00 U	5.62 U	0.385 U	4	5.00 U	5.26 U	0.385 U
95-48-7	2-Methylphenol	4	5.00 U	5.21 U	1.54 U	4	5.00 U	5.62 U	1.54 U	4	5.00 U	5.26 U	1.54 U
	3&4-Methylphenol	-	-	-	1.35 U	-	-	-	1.35 U	-	-	-	1.35 U
106-44-5	4-Methylphenol (P-Cresol)	4	5.00 U	5.21 U	-	4	5.00 U	5.62 U	-	4	5.00 U	5.26 U	-
91-20-3	Naphthalene	4	5.00 U	5.21 U	0.356 U	4	5.00 U	5.62 U	0.356 U	4	5.00 U	5.26 U	0.356 U
88-74-4	2-Nitroaniline	4	5.00 U	5.21 U	1.06 U	4	25.0 U	28.1 U	1.06 U	4	25.0 U	26.3 U	1.06 U
99-09-2	3-Nitroaniline	4	5.00 U	5.21 U	1.54 U	4	25.0 U	28.1 U	1.54 U	4	25.0 U	26.3 U	1.54 U
100-01-6	4-Nitroaniline	4	5.00 U	5.21 U	1.54 U	4	25.0 U	28.1 U	1.54 U	4	25.0 U	26.3 U	1.54 U
98-95-3	Nitrobenzene	4	5.00 U	5.21 U	2.12 U	4	5.00 U	5.62 U	2.12 U	4	5.00 U	5.26 U	2.12 U
88-75-5	2-Nitrophenol	4	5.00 U	5.21 U	2.31 U	4	5.00 U	5.62 U	2.31 U	4	5.00 U	5.26 U	2.31 U
100-02-7	4-Nitrophenol	4	5.00 U	5.21 U	1.92 U	4	25.0 U	28.1 U	1.92 U	4	25.0 U	26.3 U	1.92 U
621-64-7	N-Nitrosodi-n-propylamine	4	5.00 U	5.21 U	1.63 U	4	5.00 U	5.62 U	1.63 U	4	5.00 U	5.26 U	1.63 U
86-30-6	N-Nitrosodiphenylamine	4	5.00 U	5.21 U	3.46 U	4	5.00 U	5.62 U	3.46 U	4	5.00 U	5.26 U	3.46 U
108-60-1	2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	4	5.00 U	5.21 U	1.73 U	4	5.00 U	5.62 U	1.73 U	4	5.00 U	5.26 U	1.73 U
87-86-5	Pentachlorophenol	4	10.0 U	10.4 U	3.17 U	4	10.0 U	11.2 U	3.17 U	4	10.0 U	10.5 U	3.17 U
85-01-8	Phenanthrene	4	5.00 U	5.21 U	0.404 U	4	5.00 U	5.62 U	0.404 U	4	5.00 U	5.26 U	0.404 U
108-95-2	Phenol	4	5.00 U	5.21 U	1.44 U	4	5.00 U	5.62 U	1.44 U	4	5.00 U	5.26 U	1.44 U
129-00-0	Pyrene	4	5.00 U	5.21 U	0.337 U	4	5.00 U	5.62 U	0.337 U	4	5.00 U	5.26 U	0.337 U
95-95-4	2,4,5-Trichlorophenol	4	5.00 U	5.21 U	1.25 U	4	5.00 U	5.62 U	1.25 U	4	5.00 U	5.26 U	1.25 U
88-06-2	2,4,6-Trichlorophenol	4	5.00 U	5.21 U	1.83 U	4	5.00 U	5.62 U	1.83 U	4	5.00 U	5.26 U	1.83 U
	METALS - DISSOLVED (ug/L)												
7440-36-0	Antimony	4	1 U	5 U	0.8 U	4	1 U	5 U	0.8 U	4	1 U	1 U	0.8 U
7440-38-2	Arsenic	4	0.631	5 U	0.4 U	4	1 U	0.688	0.4 U	4	1 U	8.71	0.4 U
7440-41-7	Beryllium	4	0.297	2 U	0.1 U	4	2 U	5 U	**0.13 J**	4	2 U	5 U	0.1 U
7440-43-9	Cadmium	4	5 U	5 U	0.1 U	4	5 U	5 U	0.1 U	4	5 U	5 U	0.1 U
7440-47-3	Chromium	4	5 U	5 U	0.5 U	4	5 U	4.6	0.5 U	4	5 U	5 U	0.5 U
7440-50-8	Copper	4	10 U	10 U	1.2 U	4	10 U	10 U	1.2 U	4	10 U	10 U	**1.22 J**
7439-92-1	Lead	4	1 U	5 U	0.1 U	4	1 U	5 U	0.1 U	4	1 U	3 U	0.1 U
7439-97-6	Mercury	4	0.2 U	0.2 U	0.1 U	4	0.2 U	0.2 U	0.1 U	4	0.2 U	0.2 U	0.1 U
7440-02-0	Nickel	4	4 U	20 U	**3.14**	4	3.6	20 U	**2.52**	4	4 U	13.3	**0.701 J**
7782-49-2	Selenium	4	1 U	5 U	0.3 U	4	1.14	5 U	0.3 U	4	1 U	1.5	0.3 U
7440-28-0	Thallium	4	0.2 U	1 U	0.8 U	4	0.2 U	1 U	0.8 U	4	0.2 U	0.2 U	0.8 U
7440-62-2	Vanadium	4	10 U	50 U	0.7 U	4	10 U	10 U	0.7 U	4	10 U	50 U	0.7 U
7440-66-6	Zinc	4	20 U	20 U	**41.6**	4	10 U	10 U	**74.1**	4	20 U	14.5	**13.3 J**

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TABLE 14

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2017 Annual Site-Wide Groundwater, Surface Water, and Sediment Monitoring Report for OU-7, OU-10, and NTCRA Basins
Avtex Fibers Superfund Site
Front Royal, Virginia

		Shallow Bedrock Monitoring Wells (Continued)												
		Upgradient VB 1-8 Downgradient New Landfill												
		# Baseline Samples	Baseline Minimum	Baseline Maximum	July 2017 Result	# Baseline Samples	Baseline Minimum	Baseline Maximum	July 2017 Result	# Baseline Samples	Baseline Minimum	Baseline Maximum	July 2017 Result	July 2017 Result (Duplicate)
CAS NO.	COMPOUND	MW-07				133				MW-08				
	VOLATILES (ug/L)													
67-64-1	Acetone	4	10.0 U	10.0 U	-- R	4	10.0 U	10.0 U	3.71 U	4	10.0 U	10.0 U	2.66 U	-- R
71-43-2	Benzene	4	1.0 U	1.0 U	0.2 U	4	1.00 U	1.00 U	0.2 U	4	1.00 U	1.00 U	0.2 U	0.2 U
75-27-4	Bromodichloromethane	4	1.0 U	1.0 U	0.17 U	4	1.00 U	1.00 U	0.17 U	4	1.00 U	1.00 U	0.17 U	0.17 U
75-25-2	Bromoform	4	1.0 U	1.0 U	0.29 U	4	1.00 U	1.00 U	0.29 U	4	1.00 U	1.00 U	0.29 U	0.29 U
74-83-9	Bromomethane (Methyl bromide)	4	1.0 U	1.0 U	0.35 U	4	1.00 U	1.00 U	0.35 U	4	1.00 U	1.00 U	0.35 U	0.35 U
78-93-3	2-Butanone (Methyl ethyl ketone) (MEK)	4	10.0 U	10.0 U	2.64 U	4	10.0 U	10.0 U	2.64 U	4	10.0 U	10.0 U	2.64 U	2.64 U
75-15-0	Carbon disulfide	4	1.0 U	1.0 U	0.22 U	4	1.00 U	1.00	**0.346 J**	4	1.00 U	1.00 U	0.22 U	0.22 U
56-23-5	Carbon tetrachloride	4	1.0 U	1.0 U	0.18 U	4	1.00 U	1.00 U	0.18 U	4	1.00 U	1.00 U	0.18 U	0.18 U
108-90-7	Chlorobenzene	4	1.0 U	1.0 U	0.18 U	4	1.00 U	1.00 U	0.18 U	4	1.00 U	1.00 U	0.18 U	0.18 U
75-00-3	Chloroethane	4	1.0 U	1.0 U	0.36 U	4	1.00 U	1.00 U	0.36 U	4	1.00 U	1.00 U	0.36 U	0.36 U
67-66-3	Chloroform (Trichloromethane)	4	1.0 U	1.0 U	0.23 U	4	1.00 U	1.00 U	0.23 U	4	1.00 U	1.00 U	0.23 U	0.23 U
74-87-3	Chloromethane (Methyl chloride)	4	1.0 U	1.0 U	0.36 U	4	1.00 U	1.00 U	0.36 U	4	1.00 U	1.00 U	0.36 U	0.36 U
124-48-1	Dibromochloromethane	4	1.0 U	1.0 U	0.25 U	4	1.00 U	1.00 U	0.25 U	4	1.00 U	1.00 U	0.25 U	0.25 U
95-50-1	1,2-Dichlorobenzene	4	1.0 U	1.0 U	0.19 U	4	1.00 U	1.00 U	0.19 U	4	1.00 U	1.00 U	0.19 U	0.19 U
541-73-1	1,3-Dichlorobenzene	4	1.0 U	1.0 U	0.18 U	4	1.00 U	1.00 U	0.18 U	4	1.00 U	1.00 U	0.18 U	0.18 U
106-46-7	1,4-Dichlorobenzene	4	1.0 U	1.0 U	0.17 U	4	1.00 U	1.00 U	0.17 U	4	1.00 U	1.00 U	0.17 U	0.17 U
75-34-3	1,1-Dichloroethane	4	1.0 U	1.0 U	0.24 U	4	1.00 U	1.00 U	0.24 U	4	1.00 U	1.00 U	0.24 U	0.24 U
107-06-2	1,2-Dichloroethane	4	1.0 U	1.0 U	0.2 U	4	1.00 U	1.00 U	0.2 U	4	1.00 U	1.00 U	0.2 U	0.2 U
75-35-4	1,1-Dichloroethene	4	1.0 U	1.0 U	0.25 U	4	1.00 U	1.00 U	0.25 U	4	1.00 U	1.00 U	0.25 U	0.25 U
156-59-2	cis-1,2-Dichloroethene	4	1.0 U	1.0 U	0.21 U	4	1.00 U	1.00 U	0.21 U	4	1.00 U	1.00 U	0.21 U	0.21 U
156-60-5	trans-1,2-Dichloroethene	4	1.0 U	1.0 U	0.23 U	4	1.00 U	1.00 U	0.23 U	4	1.00 U	1.00 U	0.23 U	0.23 U
78-87-5	1,2-Dichloropropane	4	1.0 U	1.0 U	0.25 U	4	1.00 U	1.00 U	0.25 U	4	1.00 U	1.00 U	0.25 U	0.25 U
10061-01-5	cis-1,3-Dichloropropene	4	1.0 U	1.0 U	0.17 U	4	1.00 U	1.00 U	0.17 U	4	1.00 U	1.00 U	0.17 U	0.17 U
10061-02-6	trans-1,3-Dichloropropene	4	1.0 U	1.0 U	0.17 U	4	1.00 U	1.00 U	0.17 U	4	1.00 U	1.00 U	0.17 U	0.17 U
100-41-4	Ethylbenzene	4	1.0 U	1.0 U	**0.206 J**	4	1.00 U	1.00 U	0.19 U	4	1.00 U	1.00 U	0.19 U	0.19 U
591-78-6	2-Hexanone	4	10.0 U	10.0 U	1.28 U	4	10.0 U	10.0 U	1.28 U	4	10.0 U	10.0 U	1.28 U	1.28 U
108-10-1	4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	4	10.0 U	10.0 U	0.81 U	4	10.0 U	10.0 U	0.81 U	4	10.0 U	10.0 U	0.81 U	0.81 U
75-09-2	Methylene chloride	4	1.0 U	1.0 U	1 U	4	1.00 U	1.00 U	1 U	4	1.00 U	1.00 U	1 U	1 U
100-42-5	Styrene	4	1.0 U	1.0 U	0.28 U	4	1.00 U	1.00 U	0.28 U	4	1.00 U	1.00 U	0.28 U	0.28 U
79-34-5	1,1,2,2-Tetrachloroethane	4	0.50 U	0.50 U	0.19 U	4	0.50 U	0.50 U	0.19 U	4	0.50 U	0.50 U	0.19 U	0.19 U
127-18-4	Tetrachloroethene	4	1.0 U	1.0 U	0.14 U	4	1.00 U	1.00 U	0.14 U	4	1.00 U	1.00 U	0.14 U	0.14 U
108-88-3	Toluene	4	1.0 U	1.0 U	**0.366 J**	4	1.00 U	1.00 U	0.17 U	4	1.00 U	1.00 U	0.17 U	**0.202 J**
120-82-1	1,2,4-Trichlorobenzene	4	1.0 U	1.0 U	0.2 U	4	1.00 U	1.00 U	0.2 U	4	1.00 U	1.00 U	0.2 U	0.2 U
71-55-6	1,1,1-Trichloroethane	4	1.0 U	1.0 U	0.19 U	4	1.00 U	1.00 U	0.19 U	4	1.00 U	1.00 U	0.19 U	0.19 U
79-00-5	1,1,2-Trichloroethane	4	1.0 U	1.0 U	0.19 U	4	1.00 U	1.00 U	0.19 U	4	1.00 U	1.00 U	0.19 U	0.19 U
79-01-6	Trichloroethene	4	1.0 U	1.0 U	0.2 U	4	1.00 U	1.00 U	0.2 U	4	1.00 U	1.00 U	0.2 U	0.2 U
75-01-4	Vinyl chloride	4	1.0 U	1.0 U	**2.08**	4	1.00 U	1.00 U	0.18 U	4	1.00 U	1.00 U	0.18 U	0.18 U
1330-20-7	Xylenes (total)	4	1.0 U	1.0 U	**1.22 J**	4	1.00 U	1.00 U	0.58 U	4	1.00 U	1.00 U	**0.835 J**	**0.765 J**

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		Shallow Bedrock Monitoring Wells (Continued)												
		Upgradient VB 1-8 Downgradient New Landfill												
		# Baseline Samples	Baseline Minimum	Baseline Maximum	July 2017 Result	# Baseline Samples	Baseline Minimum	Baseline Maximum	July 2017 Result	# Baseline Samples	Baseline Minimum	Baseline Maximum	July 2017 Result	July 2017 Result (Duplicate)
CAS NO.	COMPOUND	MW-07				133				MW-08				
	SEMIVOLATILES (ug/L)													
83-32-9	Acenaphthene	4	5.00 U	5.32 U	0.281 U	4	5.00 U	5.78 U	0.308 U	4	5.10 U	5.26 U	0.286 U	0.296 U
208-96-8	Acenaphthylene	4	5.00 U	5.32 U	0.307 U	4	5.00 U	5.78 U	0.337 U	4	5.10 U	5.26 U	0.313 U	0.324 U
120-12-7	Anthracene	4	5.00 U	5.32 U	0.333 U	4	5.00 U	5.78 U	0.365 U	4	5.10 U	5.26 U	0.339 U	0.352 U
56-55-3	Benzo(a)anthracene	4	5.00 U	5.32 U	0.281 U	4	5.00 U	5.78 U	0.308 U	4	5.10 U	5.26 U	0.286 U	0.296 U
50-32-8	Benzo(a)pyrene	4	5.00 U	5.32 U	0.333 U	4	5.00 U	5.78 U	0.365 U	4	5.10 U	5.26 U	0.339 U	0.352 U
205-99-2	Benzo(b)fluoranthene	4	5.00 U	5.32 U	0.316 U	4	5.00 U	5.78 U	0.346 U	4	5.10 U	5.26 U	0.321 U	0.333 U
191-24-2	Benzo(g,h,i)perylene	4	5.00 U	5.32 U	0.544 U	4	5.00 U	5.78 U	0.596 U	4	5.10 U	5.26 U	0.554 U	0.574 U
207-08-9	Benzo(k)fluoranthene	4	5.00 U	5.32 U	0.325 U	4	5.00 U	5.78 U	0.356 U	4	5.10 U	5.26 U	0.33 U	0.343 U
101-55-3	4-Bromophenyl phenyl ether	4	5.00 U	5.32 U	1.4 U	4	5.00 U	5.78 U	1.54 U	4	5.10 U	5.26 U	1.43 U	1.48 U
85-68-7	Butyl benzylphthalate (BBP)	4	5.00 U	5.32 U	0.877 U	4	5.00 U	5.78 U	0.962 U	4	5.10 U	5.26 U	0.893 U	0.926 U
86-74-8	Carbazole	4	5.00 U	5.32 U	0.789 U	4	5.00 U	5.78 U	0.865 U	4	5.10 U	5.26 U	0.804 U	0.833 U
59-50-7	4-Chloro-3-methylphenol	4	5.00 U	5.32 U	1.23 U	4	5.00 U	5.78 U	1.35 U	4	5.10 U	5.26 U	1.25 U	1.3 U
106-47-8	4-Chloroaniline	4	5.00 U	5.32 U	1.05 U	4	5.00 U	5.78 U	1.15 U	4	5.10 U	5.26 U	1.07 U	1.11 U
111-91-1	bis(2-Chloroethoxy)methane	4	5.00 U	5.32 U	1.67 U	4	5.00 U	5.78 U	1.83 U	4	5.10 U	5.26 U	1.7 U	1.76 U
111-44-4	bis(2-Chloroethyl)ether	4	5.00 U	5.32 U	1.14 U	4	5.00 U	5.78 U	1.25 U	4	5.10 U	5.26 U	1.16 U	1.2 U
91-58-7	2-Chloronaphthalene	4	5.00 U	5.32 U	1.32 U	4	5.00 U	5.78 U	1.44 U	4	5.10 U	5.26 U	1.34 U	1.39 U
95-57-8	2-Chlorophenol	4	5.00 U	5.32 U	1.49 U	4	5.00 U	5.78 U	1.63 U	4	5.10 U	5.26 U	1.52 U	1.57 U
7005-72-3	4-Chlorophenyl phenyl ether	4	5.00 U	5.32 U	1.4 U	4	5.00 U	5.78 U	1.54 U	4	5.10 U	5.26 U	1.43 U	1.48 U
218-01-9	Chrysene	4	5.00 U	5.32 U	0.289 U	4	5.00 U	5.78 U	0.317 U	4	5.10 U	5.26 U	0.295 U	0.306 U
53-70-3	Dibenz(a,h)anthracene	4	5.00 U	5.32 U	0.395 U	4	5.00 U	5.78 U	0.433 U	4	5.10 U	5.26 U	0.402 U	0.417 U
132-64-9	Dibenzofuran	4	5.00 U	5.32 U	1.14 U	4	5.00 U	5.78 U	1.25 U	4	5.10 U	5.26 U	1.16 U	1.2 U
91-94-1	3,3'-Dichlorobenzidine	4	10.0 U	10.6 U	1.32 U	4	10.0 U	11.6 U	1.44 U	4	10.2 U	10.5 U	1.34 U	1.39 U
120-83-2	2,4-Dichlorophenol	4	5.00 U	5.32 U	1.93 U	4	5.00 U	5.78 U	2.12 U	4	5.10 U	5.26 U	1.96 U	2.04 U
84-66-2	Diethyl phthalate	4	5.00 U	5.32 U	1.05 U	4	5.00 U	5.78 U	1.15 U	1	5.10 U	5.26 U	1.07 U	1.11 U
105-67-9	2,4-Dimethylphenol	4	5.00 U	5.32 U	1.4 U	4	5.00 U	5.78 U	1.54 U	1	5.10 U	5.26 U	1.43 U	1.48 U
131-11-3	Dimethyl phthalate	4	5.00 U	5.32 U	1.05 U	4	5.00 U	5.78 U	1.15 U	4	5.10 U	5.26 U	1.07 U	1.11 U
84-74-2	Di-n-butylphthalate (DBP)	4	5.00 U	5.32 U	1.14 U	4	5.00 U	5.78 U	1.25 U	4	5.10 U	5.26 U	1.16 U	1.2 U
534-52-1	4,6-Dinitro-2-methylphenol	4	25.0 U	26.6 U	2.54 U	4	25.0 U	28.9 U	2.79 U	4	25.5 U	26.3 U	2.59 U	2.69 U
51-28-5	2,4-Dinitrophenol	4	25.0 U	26.6 U	6.32 U	4	25.0 U	28.9 U	6.92 U	4	25.5 U	26.3 U	6.43 U	6.67 U
121-14-2	2,4-Dinitrotoluene	4	5.00 U	5.32 U	1.4 U	4	5.00 U	5.78 U	1.54 U	4	5.10 U	5.26 U	1.43 U	1.48 U
606-20-2	2,6-Dinitrotoluene	4	5.00 U	5.32 U	1.32 U	4	5.00 U	5.78 U	1.44 U	4	5.10 U	5.26 U	1.34 U	1.39 U
117-84-0	Di-n-octyl phthalate (DnOP)	4	5.00 U	5.32 U	0.789 U	4	5.00 U	5.78 U	0.865 U	4	5.10 U	5.26 U	0.804 U	0.833 U
117-81-7	bis(2-Ethylhexyl)phthalate (DEHP)	4	5.00 U	5.32 U	6.26 U	4	5.00 U	5.78 U	1.44 U	4	5.10 U	5.26 U	1.76 U	1.78 U
206-44-0	Fluoranthene	4	5.00 U	5.32 U	0.281 U	4	5.00 U	5.78 U	0.308 U	4	5.10 U	5.26 U	0.286 U	0.296 U
86-73-7	Fluorene	4	5.00 U	5.32 U	0.281 U	4	5.00 U	5.78 U	0.308 U	4	5.10 U	5.26 U	0.286 U	0.296 U
118-74-1	Hexachlorobenzene	4	5.00 U	5.32 U	1.32 U	4	5.00 U	5.78 U	1.44 U	4	5.10 U	5.26 U	1.34 U	1.39 U
87-68-3	Hexachlorobutadiene	4	5.00 U	5.32 U	1.32 U	4	5.00 U	5.78 U	1.44 U	4	5.10 U	5.26 U	1.34 U	1.39 U
77-47-4	Hexachlorocyclopentadiene	4	5.00 U	5.32 U	-- R	4	5.00 U	5.78 U	1.25 U	4	5.10 U	5.26 U	-- R	-- R
67-72-1	Hexachloroethane	4	5.00 U	5.32 U	1.93 U	4	5.00 U	5.78 U	2.12 U	4	5.10 U	5.26 U	1.96 U	2.04 U
193-39-5	Indeno(1,2,3-cd)pyrene	4	5.00 U	5.32 U	0.36 U	4	5.00 U	5.78 U	0.394 U	4	5.10 U	5.26 U	0.366 U	0.38 U

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TABLE 14

OU-10 Comparison of Results to Baseline Conditions
2017 Annual Site-Wide Groundwater, Surface Water, and Sediment Monitoring Report for OU-7, OU-10, and NTCRA Basins
Avtex Fibers Superfund Site
Front Royal, Virginia

		Shallow Bedrock Monitoring Wells (Continued)												
		Upgradient VB 1-8 Downgradient New Landfill												
		# Baseline Samples	Baseline Minimum	Baseline Maximum	July 2017 Result	# Baseline Samples	Baseline Minimum	Baseline Maximum	July 2017 Result	# Baseline Samples	Baseline Minimum	Baseline Maximum	July 2017 Result	July 2017 Result (Duplicate)
CAS NO.	COMPOUND	MW-07				133				MW-08				
	SEMIVOLATILES (ug/L) - CONTINUED													
78-59-1	Isophorone	4	5.00 U	5.32 U	1.93 U	4	5.00 U	5.78 U	2.12 U	4	5.10 U	5.26 U	1.96 U	2.04 U
91-57-6	2-Methylnaphthalene	4	5.00 U	5.32 U	0.351 U	4	5.00 U	5.78 U	0.385 U	4	5.10 U	5.26 U	0.357 U	0.37 U
95-48-7	2-Methylphenol	4	5.00 U	5.32 U	1.4 U	4	5.00 U	5.78 U	1.54 U	4	5.10 U	5.26 U	1.43 U	1.48 U
	3&4-Methylphenol	-	-	-	1.23 U	-	-	-	1.35 U	-	-	-	1.25 U	1.3 U
106-44-5	4-Methylphenol (P-Cresol)	4	5.00 U	5.32 U	-	4	5.00 U	5.78 U	-	4	5.10 U	5.26 U	-	-
91-20-3	Naphthalene	4	5.00 U	5.32 U	0.325 U	4	5.00 U	5.78 U	0.356 U	4	5.10 U	5.26 U	0.33 U	0.343 U
88-74-4	2-Nitroaniline	4	25.0 U	26.6 U	0.965 U	4	25.0 U	28.9 U	1.06 U	4	25.5 U	26.3 U	0.982 U	1.02 U
99-09-2	3-Nitroaniline	4	25.0 U	26.6 U	1.4 U	4	25.0 U	28.9 U	1.54 U	4	25.5 U	26.3 U	1.43 U	1.48 U
100-01-6	4-Nitroaniline	4	25.0 U	26.6 U	1.4 U	4	25.0 U	28.9 U	1.54 U	4	25.5 U	26.3 U	1.43 U	1.48 U
98-95-3	Nitrobenzene	4	5.00 U	5.32 U	1.93 U	4	5.00 U	5.78 U	2.12 U	4	5.10 U	5.26 U	1.96 U	2.04 U
88-75-5	2-Nitrophenol	4	5.00 U	5.32 U	2.11 U	4	5.00 U	5.78 U	2.31 U	4	5.10 U	5.26 U	2.14 U	2.22 U
100-02-7	4-Nitrophenol	4	25.0 U	26.6 U	1.75 U	4	25.0 U	28.9 U	1.92 U	4	25.5 U	26.3 U	1.79 U	1.85 U
621-64-7	N-Nitrosodi-n-propylamine	4	5.00 U	5.32 U	1.49 U	4	5.00 U	5.78 U	1.63 U	4	5.10 U	5.26 U	1.52 U	1.57 U
86-30-6	N-Nitrosodiphenylamine	4	5.00 U	5.32 U	3.16 U	4	5.00 U	5.78 U	3.46 U	4	5.10 U	5.26 U	3.21 U	3.33 U
108-60-1	2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	4	5.00 U	5.32 U	1.58 U	4	5.00 U	5.78 U	1.73 U	4	5.10 U	5.26 U	1.61 U	1.67 U
87-86-5	Pentachlorophenol	4	10.0 U	10.6 U	2.89 U	4	10.0 U	11.6 U	3.17 U	4	10.2 U	10.5 U	2.95 U	3.06 U
85-01-8	Phenanthrene	4	5.00 U	5.32 U	0.368 U	4	5.00 U	5.78 U	0.404 U	4	5.10 U	5.26 U	0.375 U	0.389 U
108-95-2	Phenol	4	5.00 U	5.32 U	1.32 U	4	5.00 U	5.78 U	1.44 U	4	5.10 U	5.26 U	1.34 U	1.39 U
129-00-0	Pyrene	4	5.00 U	5.32 U	0.307 U	4	5.00 U	5.78 U	0.337 U	4	5.10 U	5.26 U	0.313 U	0.324 U
95-95-4	2,4,5-Trichlorophenol	4	5.00 U	5.32 U	1.14 U	4	5.00 U	5.78 U	1.25 U	4	5.10 U	5.26 U	1.16 U	1.2 U
88-06-2	2,4,6-Trichlorophenol	4	5.00 U	5.32 U	1.67 U	4	5.00 U	5.78 U	1.83 U	4	5.10 U	5.26 U	1.7 U	1.76 U
	METALS - DISSOLVED (ug/L)													
7440-36-0	Antimony	4	1 U	1 U	0.8 U	4	0.335	1 U	0.8 U	4	1 U	5 U	0.8 U	0.8 U
7440-38-2	Arsenic	4	0.388	1 U	0.4 U	4	11.7	23.7	**1.87 J**	4	0.49	1 U	0.4 U	0.4 U
7440-41-7	Beryllium	4	2 U	5 U	0.1 U	4	0.517	2 U	0.1 U	4	0.371	2 U	0.1 U	0.1 U
7440-43-9	Cadmium	4	5 U	5 U	0.1 U	4	5 U	5 U	0.1 U	4	5 U	5 U	0.1 U	0.1 U
7440-47-3	Chromium	4	5 U	5 U	0.5 U	4	5 U	5 U	0.5 U	4	5 U	5 U	0.5 U	0.5 U
7440-50-8	Copper	4	10 U	10 U	1.2 U	4	10 U	10 U	12 U	4	10 U	10 U	1.2 U	1.2 U
7439-92-1	Lead	4	1 U	3 U	0.1 U	4	1 U	3 U	0.1 U	4	1 U	5 U	0.1 U	0.1 U
7439-97-6	Mercury	4	0.2 U	0.2 U	0.1 U	4	0.2 U	0.2 U	0.15 U	4	0.2 U	0.2 U	0.1 U	0.1 U
7440-02-0	Nickel	4	5.63	9.31	0.5 U	4	24.5	35.3	**10.6**	4	4.83	20 U	0.5 U	0.5 U
7782-49-2	Selenium	4	1 U	1.37	0.3 U	4	5.47	16	**0.326 J**	4	1 U	5	0.3 U	0.3 U
7440-28-0	Thallium	4	0.2 U	0.2 U	0.8 U	4	0.073	2 U	0.8 U	4	0.2 U	1 U	0.8 U	0.8 U
7440-62-2	Vanadium	4	10 U	10 U	0.7 U	4	10 U	50 U	0.7 U	4	10 U	10 U	0.7 U	0.7 U
7440-66-6	Zinc	4	5.65	20 U	**47.5**	4	10 U	21.4	5.2 U	4	20 U	20 U	**30.4**	**38.3**

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2017 Annual Site-Wide Groundwater, Surface Water, and Sediment Monitoring Report for OU-7, OU-10, and NTCRA Basins
Avtex Fibers Superfund Site
Front Royal, Virginia

		Shallow Bedrock Monitoring Wells (Continued)											
		Downgradient VB-1-8											
		# Baseline Samples	Baseline Minimum	Baseline Maximum	July 2017 Result	# Baseline Samples	Baseline Minimum	Baseline Maximum	July 2017 Result	# Baseline Samples	Baseline Minimum	Baseline Maximum	July 2017 Result
CAS NO.	COMPOUND	MW-05				119				120R			
	VOLATILES (ug/L)												
67-64-1	Acetone	4	10.0 U	10.0 U	3.38 U	4	10.0 U	10.0 U	4.48 U	4	10.0 U	10.0 U	3.11 U
71-43-2	Benzene	4	1.00 U	1.00 U	0.2 U	4	1.00 U	1.00 U	0.2 U	4	1.00 U	1.00 U	0.2 U
75-27-4	Bromodichloromethane	4	1.00 U	1.00 U	0.17 U	4	1.00 U	1.00 U	0.17 U	4	1.00 U	1.00 U	0.17 U
75-25-2	Bromoform	4	1.00 U	1.00 U	0.29 U	4	1.00 U	1.00 U	0.29 U	4	1.00 U	1.00 U	0.29 U
74-83-9	Bromomethane (Methyl bromide)	4	1.00 U	1.00 U	0.35 U	4	1.00 U	1.00 U	0.35 U	4	1.00 U	1.00 U	0.35 U
78-93-3	2-Butanone (Methyl ethyl ketone) (MEK)	4	10.0 U	10.0 U	2.64 U	4	10.0 U	10.0 U	2.64 U	4	10.0 U	10.0 U	2.64 U
75-15-0	Carbon disulfide	4	1.00 U	1.00 U	0.22 U	4	1.00 U	1.00 U	0.22 U	4	1.00 U	1.00 U	0.22 U
56-23-5	Carbon tetrachloride	4	1.00 U	1.00 U	0.18 U	4	1.00 U	1.00 U	0.18 U	4	1.00 U	1.00 U	0.18 U
108-90-7	Chlorobenzene	4	1.00 U	1.00 U	0.18 U	4	1.00 U	1.00 U	0.18 U	4	1.00 U	1.00 U	0.18 U
75-00-3	Chloroethane	4	1.00 U	1.00 U	0.36 U	4	1.00 U	1.00 U	0.36 U	4	1.00 U	1.00 U	0.36 U
67-66-3	Chloroform (Trichloromethane)	4	1.00 U	1.00 U	0.23 U	4	1.00 U	1.00 U	0.23 U	4	1.00 U	1.00 U	0.23 U
74-87-3	Chloromethane (Methyl chloride)	4	1.00 U	1.00 U	0.36 U	4	1.00 U	1.00 U	0.36 U	4	1.00 U	1.00 U	0.36 U
124-48-1	Dibromochloromethane	4	1.00 U	1.00 U	0.25 U	4	1.00 U	1.00 U	0.25 U	4	1.00 U	1.00 U	0.25 U
95-50-1	1,2-Dichlorobenzene	4	1.00 U	1.00 U	0.19 U	4	1.00 U	1.00 U	0.19 U	4	1.00 U	1.00 U	0.19 U
541-73-1	1,3-Dichlorobenzene	4	1.00 U	1.00 U	0.18 U	4	1.00 U	1.00 U	0.18 U	4	1.00 U	1.00 U	0.18 U
106-46-7	1,4-Dichlorobenzene	4	1.00 U	1.00 U	0.17 U	4	1.00 U	1.00 U	0.17 U	4	1.00 U	1.00 U	0.17 U
75-34-3	1,1-Dichloroethane	4	1.00 U	1.00 U	0.24 U	4	1.00 U	1.00 U	0.24 U	4	1.00 U	1.00 U	0.24 U
107-06-2	1,2-Dichloroethane	4	1.00 U	1.00 U	0.2 U	4	1.00 U	1.00 U	0.2 U	4	1.00 U	1.00 U	0.2 U
75-35-4	1,1-Dichloroethene	4	1.00 U	1.00 U	0.25 U	4	1.00 U	1.00 U	0.25 U	4	1.00 U	1.00 U	0.25 U
156-59-2	cis-1,2-Dichloroethene	4	1.00 U	1.00 U	0.21 U	4	1.00 U	1.00 U	0.21 U	4	1.00 U	1.00 U	0.21 U
156-60-5	trans-1,2-Dichloroethene	4	1.00 U	1.00 U	0.23 U	4	1.00 U	1.00 U	0.23 U	4	1.00 U	1.00 U	0.23 U
78-87-5	1,2-Dichloropropane	4	1.00 U	1.00 U	0.25 U	4	1.00 U	1.00 U	0.25 U	4	1.00 U	1.00 U	0.25 U
10061-01-5	cis-1,3-Dichloropropene	4	1.00 U	1.00 U	0.17 U	4	1.00 U	1.00 U	0.17 U	4	1.00 U	1.00 U	0.17 U
10061-02-6	trans-1,3-Dichloropropene	4	1.00 U	1.00 U	0.17 U	4	1.00 U	1.00 U	0.17 U	4	1.00 U	1.00 U	0.17 U
100-41-4	Ethylbenzene	4	1.00 U	1.00 U	0.19 U	4	1.00 U	1.00 U	0.19 U	4	1.00 U	1.00 U	0.19 U
591-78-6	2-Hexanone	4	10.0 U	10.0 U	1.28 U	4	10.0 U	10.0 U	1.28 U	4	10.0 U	10.0 U	1.28 U
108-10-1	4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	4	10.0 U	10.0 U	0.81 U	4	10.0 U	10.0 U	0.81 U	4	10.0 U	10.0 U	0.81 U
75-09-2	Methylene chloride	4	1.00 U	1.00 U	1 U	4	1.00 U	1.00 U	1 U	4	1.00 U	1.00 U	1 U
100-42-5	Styrene	4	1.00 U	1.00 U	0.28 U	4	1.00 U	1.00 U	0.28 U	4	1.00 U	1.00 U	0.28 U
79-34-5	1,1,2,2-Tetrachloroethane	4	1.00 U	1.00 U	0.19 U	4	0.5 U	0.5 U	0.19 U	4	0.50 U	0.50 U	0.19 U
127-18-4	Tetrachloroethene	4	1.00 U	1.00 U	0.14 U	4	1.00 U	1.00 U	0.14 U	4	1.00 U	1.00 U	0.14 U
108-88-3	Toluene	4	1.00 U	1.00 U	0.17 U	4	1.00 U	1.00 U	0.17 U	4	1.00 U	1.00 U	0.17 U
120-82-1	1,2,4-Trichlorobenzene	4	1.00 U	1.00 U	0.2 U	4	1.00 U	1.00 U	0.2 U	4	1.00 U	1.00 U	0.2 U
71-55-6	1,1,1-Trichloroethane	4	1.00 U	1.00 U	0.19 U	4	1.00 U	1.00 U	0.19 U	4	1.00 U	1.00 U	0.19 U
79-00-5	1,1,2-Trichloroethane	4	1.00 U	1.00 U	0.19 U	4	1.00 U	1.00 U	0.19 U	4	1.00 U	1.00 U	0.19 U
79-01-6	Trichloroethene	4	1.00 U	1.00 U	0.2 U	4	1.00 U	1.00 U	0.2 U	4	1.00 U	1.00 U	0.2 U
75-01-4	Vinyl chloride	4	1.00 U	1.00 U	0.18 U	4	1.00 U	1.00 U	0.18 U	4	1.00 U	1.00 U	0.18 U
1330-20-7	Xylenes (total)	4	1.00 U	1.00 U	0.58 U	4	1.00 U	1.00 U	0.58 U	4	1.00 U	1.00 U	0.58 U

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Front Royal, Virginia

		Shallow Bedrock Monitoring Wells (Continued)											
		Downgradient VB-1-8											
		# Baseline Samples	Baseline Minimum	Baseline Maximum	July 2017 Result	# Baseline Samples	Baseline Minimum	Baseline Maximum	July 2017 Result	# Baseline Samples	Baseline Minimum	Baseline Maximum	July 2017 Result
CAS NO.	COMPOUND	MW-05				119				120R			
	SEMIVOLATILES (ug/L)												
83-32-9	Acenaphthene	4	5.00 U	5.32 U	0.308 U	4	5.00 U	5.35 U	0.308 U	4	5.00 U	5.26 U	0.308 U
208-96-8	Acenaphthylene	4	5.00 U	5.32 U	0.337 U	4	5.00 U	5.35 U	0.337 U	4	5.00 U	5.26 U	0.337 U
120-12-7	Anthracene	4	5.00 U	5.32 U	0.365 U	4	5.00 U	5.35 U	0.365 U	4	5.00 U	5.26 U	0.365 U
56-55-3	Benzo(a)anthracene	4	5.00 U	5.32 U	0.308 U	4	5.00 U	5.35 U	0.308 U	4	5.00 U	5.26 U	0.308 U
50-32-8	Benzo(a)pyrene	4	5.00 U	5.32 U	0.365 U	4	5.00 U	5.35 U	0.365 U	4	5.00 U	5.26 U	0.365 U
205-99-2	Benzo(b)fluoranthene	4	5.00 U	5.32 U	0.346 U	4	5.00 U	5.35 U	0.346 U	4	5.00 U	5.26 U	0.346 U
191-24-2	Benzo(g,h,i)perylene	4	5.00 U	5.32 U	0.596 U	4	5.00 U	5.35 U	0.596 U	4	5.00 U	5.26 U	0.596 U
207-08-9	Benzo(k)fluoranthene	4	5.00 U	5.32 U	0.356 U	4	5.00 U	5.35 U	0.356 U	4	5.00 U	5.26 U	0.356 U
101-55-3	4-Bromophenyl phenyl ether	4	5.00 U	5.32 U	1.54 U	4	5.00 U	5.35 U	1.54 U	4	5.00 U	5.26 U	1.54 U
85-68-7	Butyl benzylphthalate (BBP)	4	5.00 U	5.32 U	0.962 U	4	5.00 U	5.35 U	0.962 U	4	5.00 U	5.26 U	0.962 U
86-74-8	Carbazole	4	5.00 U	5.32 U	0.865 U	4	5.00 U	5.35 U	0.865 U	4	5.00 U	5.26 U	0.865 U
59-50-7	4-Chloro-3-methylphenol	4	5.00 U	5.32 U	1.35 U	4	5.00 U	5.35 U	1.35 U	4	5.00 U	5.26 U	1.35 U
106-47-8	4-Chloroaniline	4	5.00 U	5.32 U	1.15 U	4	5.00 U	5.35 U	1.15 U	4	5.00 U	5.26 U	1.15 U
111-91-1	bis(2-Chloroethoxy)methane	4	5.00 U	5.32 U	1.83 U	4	5.00 U	5.35 U	1.83 U	4	5.00 U	5.26 U	1.83 U
111-44-4	bis(2-Chloroethyl)ether	4	5.00 U	5.32 U	1.25 U	4	5.00 U	5.35 U	1.25 U	4	5.00 U	5.26 U	1.25 U
91-58-7	2-Chloronaphthalene	4	5.00 U	5.32 U	1.44 U	4	5.00 U	5.35 U	1.44 U	4	5.00 U	5.26 U	1.44 U
95-57-8	2-Chlorophenol	4	5.00 U	5.32 U	1.63 U	4	5.00 U	5.35 U	1.63 U	4	5.00 U	5.26 U	1.63 U
7005-72-3	4-Chlorophenyl phenyl ether	4	5.00 U	5.32 U	1.54 U	4	5.00 U	5.35 U	1.54 U	4	5.00 U	5.26 U	1.54 U
218-01-9	Chrysene	4	5.00 U	5.32 U	0.317 U	4	5.00 U	5.35 U	0.317 U	4	5.00 U	5.26 U	0.317 U
53-70-3	Dibenz(a,h)anthracene	4	5.00 U	5.32 U	0.433 U	4	5.00 U	5.35 U	0.433 U	4	5.00 U	5.26 U	0.433 U
132-64-9	Dibenzofuran	4	5.00 U	5.32 U	1.25 U	4	5.00 U	5.35 U	1.25 U	4	5.00 U	5.26 U	1.25 U
91-94-1	3,3'-Dichlorobenzidine	4	10.0 U	10.6 U	1.44 U	4	10.0 U	10.7 U	1.44 U	4	10.0 U	10.4 U	1.44 U
120-83-2	2,4-Dichlorophenol	4	5.00 U	5.32 U	2.12 U	4	5.00 U	5.35 U	2.12 U	4	5.00 U	5.26 U	2.12 U
84-66-2	Diethyl phthalate	4	5.00 U	5.32 U	1.15 U	4	5.00 U	5.35 U	1.15 U	4	5.00 U	5.26 U	1.15 U
105-67-9	2,4-Dimethylphenol	4	5.00 U	5.32 U	1.54 U	4	5.00 U	5.35 U	1.54 U	4	5.00 U	5.26 U	1.54 U
131-11-3	Dimethyl phthalate	4	5.00 U	5.32 U	1.15 U	4	5.00 U	5.35 U	1.15 U	4	5.00 U	5.26 U	1.15 U
84-74-2	Di-n-butylphthalate (DBP)	4	5.00 U	5.32 U	1.25 U	4	5.00 U	5.35 U	1.25 U	4	5.00 U	5.26 U	1.25 U
534-52-1	4,6-Dinitro-2-methylphenol	4	25.0 U	26.6 U	2.79 U	4	25.0 U	26.7 U	2.79 U	4	25.0 U	26.3 U	2.79 U
51-28-5	2,4-Dinitrophenol	4	25.0 U	26.6 U	6.92 U	4	25.0 U	26.7 U	6.92 U	4	25.0 U	26.3 U	6.92 U
121-14-2	2,4-Dinitrotoluene	4	5.00 U	5.32 U	1.54 U	4	5.00 U	5.35 U	1.54 U	4	5.00 U	5.26 U	1.54 U
606-20-2	2,6-Dinitrotoluene	4	5.00 U	5.32 U	1.44 U	4	5.00 U	5.35 U	1.44 U	4	5.00 U	5.26 U	1.44 U
117-84-0	Di-n-octyl phthalate (DnOP)	4	5.00 U	5.32 U	0.865 U	4	5.00 U	5.35 U	0.865 U	4	5.00 U	5.26 U	0.865 U
117-81-7	bis(2-Ethylhexyl)phthalate (DEHP)	4	5.00 U	5.43	1.44 U	4	5.00 U	5.35 U	1.44 U	4	5.00 U	5.26 U	1.44 U
206-44-0	Fluoranthene	4	5.00 U	5.32 U	0.308 U	4	5.00 U	5.35 U	0.308 U	4	5.00 U	5.26 U	0.308 U
86-73-7	Fluorene	4	5.00 U	5.32 U	0.308 U	4	5.00 U	5.35 U	0.308 U	4	5.00 U	5.26 U	0.308 U
118-74-1	Hexachlorobenzene	4	5.00 U	5.32 U	1.44 U	4	5.00 U	5.35 U	1.44 U	4	5.00 U	5.26 U	1.44 U
87-68-3	Hexachlorobutadiene	4	5.00 U	5.32 U	1.44 U	4	5.00 U	5.35 U	1.44 U	4	5.00 U	5.26 U	1.44 U
77-47-4	Hexachlorocyclopentadiene	4	5.00 U	5.32 U	1.25 U	4	5.00 U	5.35 U	1.25 U	4	5.00 U	5.26 U	1.25 U
67-72-1	Hexachloroethane	4	5.00 U	5.32 U	2.12 U	4	5.00 U	5.35 U	2.12 U	4	5.00 U	5.26 U	2.12 U
193-39-5	Indeno(1,2,3-cd)pyrene	4	5.00 U	5.32 U	0.394 U	4	5.00 U	5.35 U	0.394 U	4	5.00 U	5.26 U	0.394 U

Notes:
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TABLE 14

OU-10 Comparison of Results to Baseline Conditions
2017 Annual Site-Wide Groundwater, Surface Water, and Sediment Monitoring Report for OU-7, OU-10, and NTCRA Basins
Avtex Fibers Superfund Site
Front Royal, Virginia

		Shallow Bedrock Monitoring Wells (Continued)											
		Downgradient VB-1-8											
		# Baseline Samples	Baseline Minimum	Baseline Maximum	July 2017 Result	# Baseline Samples	Baseline Minimum	Baseline Maximum	July 2017 Result	# Baseline Samples	Baseline Minimum	Baseline Maximum	July 2017 Result
CAS NO.	COMPOUND	MW-05				119				120R			
	SEMIVOLATILES (ug/L) - CONTINUED												
78-59-1	Isophorone	4	5.00 U	5.32 U	2.12 U	4	5.00 U	5.35 U	2.12 U	4	5.00 U	5.26 U	2.12 U
91-57-6	2-Methylnaphthalene	4	5.00 U	5.32 U	0.385 U	4	5.00 U	5.35 U	0.385 U	4	5.00 U	5.26 U	0.385 U
95-48-7	2-Methylphenol	4	5.00 U	5.32 U	1.54 U	4	5.00 U	5.35 U	1.54 U	4	5.00 U	5.26 U	1.54 U
	3&4-Methylphenol	-	-	-	1.35 U	-	-	-	1.35 U	-	-	-	1.35 U
106-44-5	4-Methylphenol (P-Cresol)	4	5.00 U	5.32 U	-	4	5.00 U	5.35 U	-	4	5.00 U	5.26 U	-
91-20-3	Naphthalene	4	5.00 U	5.32 U	0.356 U	4	5.00 U	5.35 U	0.356 U	4	5.00 U	5.26 U	0.356 U
88-74-4	2-Nitroaniline	4	25.0 U	26.6 U	1.06 U	4	25.0 U	26.7 U	1.06 U	4	25.0 U	26.3 U	1.06 U
99-09-2	3-Nitroaniline	4	25.0 U	26.6 U	1.54 U	4	25.0 U	26.7 U	1.54 U	4	25.0 U	26.3 U	1.54 U
100-01-6	4-Nitroaniline	4	25.0 U	26.6 U	1.54 U	4	25.0 U	26.7 U	1.54 U	4	25.0 U	26.3 U	1.54 U
98-95-3	Nitrobenzene	4	5.00 U	5.32 U	2.12 U	4	5.00 U	5.35 U	2.12 U	4	5.00 U	5.26 U	2.12 U
88-75-5	2-Nitrophenol	4	5.00 U	5.32 U	2.31 U	4	5.00 U	5.35 U	2.31 U	4	5.00 U	5.26 U	2.31 U
100-02-7	4-Nitrophenol	4	25.0 U	26.6 U	1.92 U	4	25.0 U	26.7 U	1.92 U	4	25.0 U	26.3 U	1.92 U
621-64-7	N-Nitrosodi-n-propylamine	4	5.00 U	5.32 U	1.63 U	4	5.00 U	5.35 U	1.63 U	4	5.00 U	5.26 U	1.63 U
86-30-6	N-Nitrosodiphenylamine	4	5.00 U	5.32 U	3.46 U	4	5.00 U	5.35 U	3.46 U	4	5.00 U	5.26 U	3.46 U
108-60-1	2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	4	5.00 U	5.32 U	1.73 U	4	5.00 U	5.35 U	1.73 U	4	5.00 U	5.26 U	1.73 U
87-86-5	Pentachlorophenol	4	10.0 U	10.6 U	3.17 U	4	10.0 U	10.7 U	3.17 U	4	10.0 U	10.5 U	3.17 U
85-01-8	Phenanthrene	4	5.00 U	5.32 U	0.404 U	4	5.00 U	5.35 U	0.404 U	4	5.00 U	5.26 U	0.404 U
108-95-2	Phenol	4	5.00 U	5.32 U	1.44 U	4	5.00 U	5.35 U	1.44 U	4	5.00 U	5.26 U	1.44 U
129-00-0	Pyrene	4	5.00 U	5.32 U	0.337 U	4	5.00 U	5.35 U	0.337 U	4	5.00 U	5.26 U	0.337 U
95-95-4	2,4,5-Trichlorophenol	4	5.00 U	5.32 U	1.25 U	4	5.00 U	5.35 U	1.25 U	4	5.00 U	5.26 U	1.25 U
88-06-2	2,4,6-Trichlorophenol	4	5.00 U	5.32 U	1.83 U	4	5.00 U	5.35 U	1.83 U	4	5.00 U	5.26 U	1.83 U
	METALS - DISSOLVED (ug/L)												
7440-36-0	Antimony	4	1 U	5 U	0.8 U	4	1 U	5 U	0.8 U	4	1 U	5 U	0.8 U
7440-38-2	Arsenic	4	0.767	5 U	0.4 U	4	3.24	5 U	0.4 U	4	1 U	5 U	0.4 U
7440-41-7	Beryllium	4	2 U	5 U	0.1 U	4	2 U	0.359	0.1 U	4	2 U	5 U	0.1 U
7440-43-9	Cadmium	4	5 U	5 U	0.1 U	4	5 U	5 U	0.1 U	4	5 U	5 U	0.1 U
7440-47-3	Chromium	4	5 U	5 U	**1.4 J**	4	5 U	5 U	0.5 U	4	5 U	5 U	0.5 U
7440-50-8	Copper	4	10 U	10 U	1.2 U	4	10 U	10 U	1.2 U	4	10 U	10 U	1.2 U
7439-92-1	Lead	4	1 U	5 U	0.1 U	4	1 U	5 U	0.1 U	4	0.429	5 U	0.1 U
7439-97-6	Mercury	4	0.2 U	0.2 U	0.1 U	4	0.2 U	0.2 U	0.1 U	4	0.2	0.2	0.1 U
7440-02-0	Nickel	4	4 U	4.58	0.5 U	4	20 U	6.26	0.5 U	4	3.29	20 U	0.5 U
7782-49-2	Selenium	4	5 U	1.21	0.3 U	4	1.89	5 U	0.3 U	4	1 U	5 U	0.3 U
7440-28-0	Thallium	4	0.2 U	1 U	0.8 U	4	0.2 U	1 U	0.8 U	4	1 U	0.2 U	0.8 U
7440-62-2	Vanadium	4	10 U	20 U	0.7 U	4	10 U	12.2	0.7 U	4	10 U	10 U	0.7 U
7440-66-6	Zinc	4	20 U	20 U	5.2 U	4	20 U	20 U	**63**	4	20 U	20 U	5.2 U

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Avtex Fibers Superfund Site
Front Royal, Virginia

		Shallow Bedrock Monitoring Wells (Continued)								
		Downgradient VB-1-8								
		# Baseline Samples	Baseline Minimum	Baseline Maximum	July/August 2017 Result	July/August 2017 Result (Duplicate)	# Baseline Samples	Baseline Minimum	Baseline Maximum	August 2017 Result
CAS NO.	COMPOUND	132					135			
	VOLATILES (ug/L)									
67-64-1	Acetone	4	10.0 U	10.0 U	2.66 U	2.66 U	4	10.0 U	10.0 U	-- R
71-43-2	Benzene	4	1.00 U	1.00 U	0.2 U	0.2 U	4	1.00 U	1.00 U	0.2 U
75-27-4	Bromodichloromethane	4	1.00 U	1.00 U	0.17 U	0.17 U	4	1.00 U	1.00 U	0.17 U
75-25-2	Bromoform	4	1.00 U	1.00 U	0.29 U	0.29 U	4	1.00 U	1.00 U	0.29 U
74-83-9	Bromomethane (Methyl bromide)	4	1.00 U	1.00 U	0.35 U	0.35 U	4	1.00 U	1.00 U	0.35 U
78-93-3	2-Butanone (Methyl ethyl ketone) (MEK)	4	10.0 U	10.0 U	2.64 U	2.64 U	4	10.0 U	10.0 U	2.64 U
75-15-0	Carbon disulfide	4	1.00 U	1.34	0.22 U	0.22 U	4	1.00 U	0.71	**0.267 J**
56-23-5	Carbon tetrachloride	4	1.00 U	1.00 U	0.18 U	0.18 U	4	1.00 U	1.00 U	0.18 U
108-90-7	Chlorobenzene	4	1.00 U	1.00 U	0.18 U	0.18 U	4	1.00 U	1.00 U	0.18 U
75-00-3	Chloroethane	4	1.00 U	1.00 U	0.36 U	0.36 U	4	1.00 U	1.00 U	0.36 U
67-66-3	Chloroform (Trichloromethane)	4	1.00 U	1.00 U	0.23 U	0.23 U	4	1.00 U	1.00 U	0.23 U
74-87-3	Chloromethane (Methyl chloride)	4	1.00 U	1.00 U	0.36 U	0.36 U	4	1.00 U	1.00 U	0.36 U
124-48-1	Dibromochloromethane	4	1.00 U	1.00 U	0.25 U	0.25 U	4	1.00 U	1.00 U	0.25 U
95-50-1	1,2-Dichlorobenzene	4	1.00 U	1.00 U	0.19 U	0.19 U	4	1.00 U	1.00 U	0.19 U
541-73-1	1,3-Dichlorobenzene	4	1.00 U	1.00 U	0.18 U	0.18 U	4	1.00 U	1.00 U	0.18 U
106-46-7	1,4-Dichlorobenzene	4	1.00 U	1.00 U	0.17 U	0.17 U	4	1.00 U	1.00 U	0.17 U
75-34-3	1,1-Dichloroethane	4	1.00 U	1.00 U	0.24 U	0.24 U	4	1.00 U	1.00 U	0.24 U
107-06-2	1,2-Dichloroethane	4	1.00 U	1.00 U	0.2 U	0.2 U	4	1.00 U	1.00 U	0.2 U
75-35-4	1,1-Dichloroethene	4	1.00 U	1.00 U	0.25 U	0.25 U	4	1.00 U	1.00 U	0.25 U
156-59-2	cis-1,2-Dichloroethene	4	1.00 U	1.00 U	0.21 U	0.21 U	4	1.00 U	1.00 U	0.21 U
156-60-5	trans-1,2-Dichloroethene	4	1.00 U	1.00 U	0.23 U	0.23 U	4	1.00 U	1.00 U	0.23 U
78-87-5	1,2-Dichloropropane	4	1.00 U	1.00 U	0.25 U	0.25 U	4	1.00 U	1.00 U	0.25 U
10061-01-5	cis-1,3-Dichloropropene	4	1.00 U	1.00 U	0.17 U	0.17 U	4	1.00 U	1.00 U	0.17 U
10061-02-6	trans-1,3-Dichloropropene	4	1.00 U	1.00 U	0.17 U	0.17 U	4	1.00 U	1.00 U	0.17 U
100-41-4	Ethylbenzene	4	1.00 U	1.00 U	0.19 U	0.19 U	4	1.00 U	1.00 U	0.19 U
591-78-6	2-Hexanone	4	10.0 U	10.0 U	1.28 U	1.28 U	4	10.0 U	10.0 U	1.28 U
108-10-1	4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	4	10.0 U	10.0 U	0.81 U	0.81 U	4	10.0 U	10.0 U	0.81 U
75-09-2	Methylene chloride	4	1.00 U	1.00 U	1 U	1 U	4	1.00 U	1.00 U	1 U
100-42-5	Styrene	4	1.00 U	1.00 U	0.28 U	0.28 U	4	1.00 U	1.00 U	0.28 U
79-34-5	1,1,2,2-Tetrachloroethane	4	0.50 U	0.50 U	0.19 U	0.19 U	4	0.50 U	0.50 U	0.19 U
127-18-4	Tetrachloroethene	4	1.00 U	1.00 U	0.14 U	0.14 U	4	1.00 U	1.00 U	0.14 U
108-88-3	Toluene	4	1.00 U	1.00 U	0.17 U	0.17 U	4	1.00 U	1.00 U	0.17 U
120-82-1	1,2,4-Trichlorobenzene	4	1.00 U	1.00 U	0.2 U	0.2 U	4	1.00 U	1.00 U	0.2 U
71-55-6	1,1,1-Trichloroethane	4	1.00 U	1.00 U	0.19 U	0.19 U	4	1.00 U	1.00 U	0.19 U
79-00-5	1,1,2-Trichloroethane	4	1.00 U	1.00 U	0.19 U	0.19 U	4	1.00 U	1.00 U	0.19 U
79-01-6	Trichloroethene	4	1.00 U	1.00 U	0.2 U	0.2 U	4	1.00 U	1.00 U	0.2 U
75-01-4	Vinyl chloride	4	1.00 U	1.00 U	0.18 U	0.18 U	4	1.00 U	1.00 U	0.18 U
1330-20-7	Xylenes (total)	4	1.00 U	1.00 U	0.58 U	0.58 U	4	1.00 U	1.00 U	0.58 U

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Front Royal, Virginia

		Shallow Bedrock Monitoring Wells (Continued)								
		Downgradient VB-1-8								
		# Baseline Samples	Baseline Minimum	Baseline Maximum	July/August 2017 Result	July/August 2017 Result (Duplicate)	# Baseline Samples	Baseline Minimum	Baseline Maximum	August 2017 Result
CAS NO.	COMPOUND	132					135			
	SEMIVOLATILES (ug/L)									
83-32-9	Acenaphthene	4	5.00 U	5.10 U	0.296 U	0.302 U	4	5.0 U	5.49 U	0.356 U
208-96-8	Acenaphthylene	4	5.00 U	5.10 U	0.324 U	0.33 U	4	5.0 U	5.49 U	0.389 U
120-12-7	Anthracene	4	5.00 U	5.10 U	0.352 U	0.358 U	4	5.0 U	5.49 U	0.422 U
56-55-3	Benzo(a)anthracene	4	5.00 U	5.10 U	0.296 U	0.302 U	4	5.0 U	5.49 U	0.356 U
50-32-8	Benzo(a)pyrene	4	5.00 U	5.10 U	0.352 U	0.358 U	4	5.0 U	5.49 U	0.422 U
205-99-2	Benzo(b)fluoranthene	4	5.00 U	5.10 U	0.333 U	0.34 U	4	5.0 U	5.49 U	0.4 U
191-24-2	Benzo(g,h,i)perylene	4	5.00 U	5.10 U	0.574 U	0.585 U	4	5.0 U	5.49 U	0.689 U
207-08-9	Benzo(k)fluoranthene	4	5.00 U	5.10 U	0.343 U	0.349 U	4	5.0 U	5.49 U	0.411 U
101-55-3	4-Bromophenyl phenyl ether	4	5.00 U	5.10 U	1.48 U	1.51 U	4	5.0 U	5.49 U	1.78 U
85-68-7	Butyl benzylphthalate (BBP)	4	5.00 U	5.10 U	0.926 U	0.943 U	4	5.0 U	5.49 U	1.11 U
86-74-8	Carbazole	4	5.00 U	5.10 U	0.833 U	0.849 U	4	5.0 U	5.49 U	1 U
59-50-7	4-Chloro-3-methylphenol	4	5.00 U	5.10 U	1.3 U	1.32 U	4	5.0 U	5.49 U	1.56 U
106-47-8	4-Chloroaniline	4	5.00 U	5.10 U	1.11 U	1.13 U	4	5.0 U	5.49 U	1.33 U
111-91-1	bis(2-Chloroethoxy)methane	4	5.00 U	5.10 U	1.76 U	1.79 U	4	5.0 U	5.49 U	2.11 U
111-44-4	bis(2-Chloroethyl)ether	4	5.00 U	5.10 U	1.2 U	1.23 U	4	5.0 U	5.49 U	1.44 U
91-58-7	2-Chloronaphthalene	4	5.00 U	5.10 U	1.39 U	1.42 U	4	5.0 U	5.49 U	1.67 U
95-57-8	2-Chlorophenol	4	5.00 U	5.10 U	1.57 U	1.6 U	4	5.0 U	5.49 U	1.89 U
7005-72-3	4-Chlorophenyl phenyl ether	4	5.00 U	5.10 U	1.48 U	1.51 U	4	5.0 U	5.49 U	1.78 U
218-01-9	Chrysene	4	5.00 U	5.10 U	0.306 U	0.311 U	4	5.0 U	5.49 U	0.367 U
53-70-3	Dibenz(a,h)anthracene	4	5.00 U	5.10 U	0.417 U	0.425 U	4	5.0 U	5.49 U	0.5 U
132-64-9	Dibenzofuran	4	5.00 U	5.10 U	1.2 U	1.23 U	4	5.0 U	5.49 U	1.44 U
91-94-1	3,3'-Dichlorobenzidine	4	10.0 U	10.2 U	1.39 U	1.42 U	4	10.0 U	11.0 U	1.67 U
120-83-2	2,4-Dichlorophenol	4	5.00 U	5.10 U	2.04 U	2.08 U	4	5.0 U	5.49 U	2.44 U
84-66-2	Diethyl phthalate	4	5.00 U	5.10 U	1.11 U	1.13 U	4	5.0 U	5.49 U	1.33 U
105-67-9	2,4-Dimethylphenol	4	5.00 U	5.10 U	1.48 U	1.51 U	4	5.0 U	5.49 U	1.78 U
131-11-3	Dimethyl phthalate	4	5.00 U	5.10 U	1.11 U	1.13 U	4	5.0 U	5.49 U	1.33 U
84-74-2	Di-n-butylphthalate (DBP)	4	5.00 U	5.10 U	1.2 U	1.23 U	4	5.0 U	5.49 U	1.44 U
534-52-1	4,6-Dinitro-2-methylphenol	4	25.0 U	25.5 U	2.69 U	2.74 U	4	25.0 U	27.5 U	3.22 U
51-28-5	2,4-Dinitrophenol	4	25.0 U	25.5 U	6.67 U	6.79 U	4	25.0 U	27.5 U	8 U
121-14-2	2,4-Dinitrotoluene	4	5.00 U	5.10 U	1.48 U	1.51 U	4	5.0 U	5.49 U	1.78 U
606-20-2	2,6-Dinitrotoluene	4	5.00 U	5.10 U	1.39 U	1.42 U	4	5.0 U	5.49 U	1.67 U
117-84-0	Di-n-octyl phthalate (DnOP)	4	5.00 U	5.10 U	0.833 U	0.849 U	4	5.0 U	5.49 U	1 U
117-81-7	bis(2-Ethylhexyl)phthalate (DEHP)	4	5.00 U	5.10 U	2.24 U	2.38 U	4	5.0 U	5.49 U	1.67 U
206-44-0	Fluoranthene	4	5.00 U	5.10 U	0.296 U	0.302 U	4	5.0 U	5.49 U	0.356 U
86-73-7	Fluorene	4	5.00 U	5.10 U	0.296 U	0.302 U	4	5.0 U	5.49 U	0.356 U
118-74-1	Hexachlorobenzene	4	5.00 U	5.10 U	1.39 U	1.42 U	4	5.0 U	5.49 U	1.67 U
87-68-3	Hexachlorobutadiene	4	5.00 U	5.10 U	1.39 U	1.42 U	4	5.0 U	5.49 U	1.67 U
77-47-4	Hexachlorocyclopentadiene	4	5.00 U	5.10 U	-- R	-- R	4	5.0 U	5.49 U	1.44 UJ
67-72-1	Hexachloroethane	4	5.00 U	5.10 U	2.04 U	2.08 U	4	5.0 U	5.49 U	2.44 U
193-39-5	Indeno(1,2,3-cd)pyrene	4	5.00 U	5.10 U	0.38 U	0.387 U	4	5.0 U	5.49 U	0.456 U

Notes:
Bold text indicates detected value
J - Estimated results
R - Rejected results
U - Not detected, value indicates reporting limit

TABLE 14

OU-10 Comparison of Results to Baseline Conditions
2017 Annual Site-Wide Groundwater, Surface Water, and Sediment Monitoring Report for OU-7, OU-10, and NTCRA Basins
Avtex Fibers Superfund Site
Front Royal, Virginia

		Shallow Bedrock Monitoring Wells (Continued)								
		Downgradient VB-1-8								
		# Baseline Samples	Baseline Minimum	Baseline Maximum	July/August 2017 Result	July/August 2017 Result (Duplicate)	# Baseline Samples	Baseline Minimum	Baseline Maximum	August 2017 Result
CAS NO.	COMPOUND	132					135			
	SEMIVOLATILES (ug/L) - CONTINUED									
78-59-1	Isophorone	4	5.00 U	5.10 U	2.04 U	2.08 U	4	5.0 U	5.49 U	2.44 U
91-57-6	2-Methylnaphthalene	4	5.00 U	5.10 U	0.37 U	0.377 U	4	5.0 U	5.49 U	0.444 U
95-48-7	2-Methylphenol	4	5.00 U	5.10 U	1.48 U	1.51 U	4	5.0 U	5.49 U	1.78 U
	3&4-Methylphenol	-	-	-	1.3 U	1.32 U	-	-	-	1.56 U
106-44-5	4-Methylphenol (P-Cresol)	4	5.00 U	5.10 U	-	-	4	5.0 U	5.49 U	-
91-20-3	Naphthalene	4	5.00 U	5.10 U	0.343 U	0.349 U	4	5.0 U	5.49 U	0.411 U
88-74-4	2-Nitroaniline	4	25.0 U	25.5 U	1.02 U	1.04 U	4	25.0 U	27.5 U	1.22 U
99-09-2	3-Nitroaniline	4	25.0 U	25.5 U	1.48 U	1.51 U	4	25.0 U	27.5 U	1.78 U
100-01-6	4-Nitroaniline	4	25.0 U	25.5 U	1.48 U	1.51 U	4	25.0 U	27.5 U	1.78 U
98-95-3	Nitrobenzene	4	5.00 U	5.10 U	2.04 U	2.08 U	4	5.0 U	5.49 U	2.44 U
88-75-5	2-Nitrophenol	4	5.00 U	5.10 U	2.22 U	2.26 U	4	5.0 U	5.49 U	2.67 U
100-02-7	4-Nitrophenol	4	25.0 U	25.5 U	1.85 U	1.89 U	4	25.0 U	27.5 U	2.22 U
621-64-7	N-Nitrosodi-n-propylamine	4	5.00 U	5.10 U	1.57 U	1.6 U	4	5.0 U	5.49 U	1.89 U
86-30-6	N-Nitrosodiphenylamine	4	5.00 U	5.10 U	3.33 U	3.4 U	4	5.0 U	5.49 U	4 U
108-60-1	2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	4	5.00 U	5.10 U	1.67 U	1.7 U	4	5.0 U	5.49 U	2 UJ
87-86-5	Pentachlorophenol	4	10.0 U	10.2 U	3.06 U	3.11 U	4	10.0 U	11.0 U	3.67 UJ
85-01-8	Phenanthrene	4	5.00 U	5.10 U	0.389 U	0.396 U	4	5.0 U	5.49 U	0.467 U
108-95-2	Phenol	4	5.00 U	5.10 U	1.39 U	1.42 U	4	5.0 U	5.49 U	1.67 U
129-00-0	Pyrene	4	5.00 U	5.10 U	0.324 U	0.33 U	4	5.0 U	5.49 U	0.389 U
95-95-4	2,4,5-Trichlorophenol	4	5.00 U	5.10 U	1.2 U	1.23 U	4	5.0 U	5.49 U	1.44 U
88-06-2	2,4,6-Trichlorophenol	4	5.00 U	5.10 U	1.76 U	1.79 U	4	5.0 U	5.49 U	2.11 U
	METALS - DISSOLVED (ug/L)									
7440-36-0	Antimony	4	1 U	1 U	0.8 U	0.8 U	4	1 U	1 U	0.8 UJ
7440-38-2	Arsenic	4	0.512	1 U	**3.53**	**2.81**	4	2.2	5.63	0.4 UJ
7440-41-7	Beryllium	4	0.727	2 U	**0.348 J**	**0.356 J**	4	0.292	2 U	0.1 U
7440-43-9	Cadmium	4	5 U	5 U	0.1 U	0.1 U	4	5 U	5 U	0.1 UJ
7440-47-3	Chromium	4	5 U	5 U	0.5 U	0.5 U	4	5 U	5 U	0.5 UJ
7440-50-8	Copper	4	10 U	10 U	1.2 U	1.2 U	4	10 U	10 U	1.2 U
7439-92-1	Lead	4	1 U	3 U	**0.106 J**	0.1 U	4	1 U	3 U	0.1 UJ
7439-97-6	Mercury	4	0.2 U	0.2 U	0.1 U	0.1 U	4	0.2 U	0.2 U	0.1 U
7440-02-0	Nickel	4	6.66	10.8	**0.568 J**	**0.989 J**	4	8.24	20 U	0.5 UJ
7782-49-2	Selenium	4	1.55	2.05	0.3 U	0.3 U	4	5 U	20.7	0.3 U
7440-28-0	Thallium	4	0.2 U	0.2 U	0.8 U	0.8 U	4	0.117	2 U	0.8 UJ
7440-62-2	Vanadium	4	10 U	10 U	0.7 U	0.7 U	4	10 U	19.5	0.7 U
7440-66-6	Zinc	4	20 U	20.3	5.2 U	**17.9 J**	4	20 U	23.1	5.2 UJ

Notes:
Bold text indicates detected value
J - Estimated results
R - Rejected results
U - Not detected, value indicates reporting limit

TABLE 14

Sulfate Basins and Fly Ash Management Units Groundwater Elevation Measurements
2017 Annual Site-Wide Groundwater, Surface Water, and Sediment Monitoring Report for OU-7, OU-10, and NTCRA Basins
Avtex Fibers Superfund Site
Front Royal, Virginia

Well ID	Well Type	Measuring Point Elevation (feet MSL)	Total Depth (feet TOC)
008	OMW	530.03	16.50
012	OMW	508.59	37.59
013	OMW	512.85	37.90
022	OMW	478.24	9.90
023	OMW	474.66	7.60
025R	OMW	475.18	7.00
029	OMW	530.66	22.00
014R	OMW	511.16	34.26
B-48A	OMW	515.54	38.70
MW-12	OMW	506.53	13.00
108	S BMW	526.85	45.00
110	S BMW	479.88	40.25
112	S BMW	511.25	65.54
113	S BMW	510.67	64.80
114	S BMW	511.92	60.13
129	S BMW	530.69	46.22
132	S BMW	506.3	30.00
PZ-03	S BMW	474.64	19.19
PZ-06	S BMW	478.49	25.03
PZ-07	S BMW	479.45	25.40

Notes:
OMW - Overburden Monitoring Well; monitoring interval is a PVC ma
S BMW - Shallow Bedrock Monitoring Well; monitoring interval is an c
MSL - Mean sea level.
TOC - Top of outer casing.
NA - Measurement was not collected; well is artesian.
Monitoring well construction details (i.e., measuring point elevations) f
in December 2012.

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TABLE 16

NTCRA Basins Groundwater Monitoring Results
2017 Annual Site-Wide Groundwater, Surface Water, and Sediment Monitoring Report for OU-7, OU-10, and NTCRA Basins
Avtex Fibers Superfund Site
Front Royal, Virginia

FMC-Front Royal Avtex Fibers 2017 Sampling Event Validated BSN Wells		Location ID: Sample Name: Well Type: Sampled:	Regional Screening Level[1]	Regional Screening Level[1]	008 2017AN-008 OMW 7/25/2017	012 2017AN-012 OMW 7/29/2017	013 2017AN-013 OMW 7/29/2017	014R 2017AN-014R OMW 7/30/2017	022 2017AN-022 OMW 7/28/2017	023 2017AN-023 OMW 7/28/2017
CAS NO.	COMPOUND	UNITS:	HQ=0.1	HQ=1.0						
	METALS - DISSOLVED									
7440-38-2	Arsenic	ug/L	0.052	0.052	0.4 U	**2.4**	**3.59**	**889**	0.4 U	**10.6**
7440-41-7	Beryllium	ug/L	2.5	25	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	5.2 U
7440-43-9	Cadmium	ug/L	0.92	9.2	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	5.2 U
7440-47-3	Chromium	ug/L	2200	22000	**0.602 J**	0.5 U	0.5 U	0.5 U	0.5 U	**2.72**
7440-50-8	Copper	ug/L	80	800	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	**1.65 J**
7439-92-1	Lead	ug/L	15	15	0.1 U	0.1 U	0.1 U	**0.103 J**	0.1 U	**1.58 J**
7439-97-6	Mercury[2]	ug/L	0.063	0.63	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
7440-02-0	Nickel	ug/L	39	390	**2.18**	**1.75 J**	**13.7**	**62.5**	**0.864 J**	**7.72**
7782-49-2	Selenium	ug/L	10	100	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
7440-66-6	Zinc	ug/L	600	6000	**12.7 J**	**6.06 J**	5.2 U	**5.55 J**	5.2 U	**42.3**
	OTHER									
7440-70-2	Calcium (dissolved)	ug/L	NV	NV	**214000**	**132000**	**236000**	**370000**	**37400**	**77900**
7439-95-4	Magnesium (dissolved)	ug/L	NV	NV	**22800**	**18400**	**33900**	**105000**	**5870**	**45600**
7440-23-5	Sodium (dissolved)	ug/L	NV	NV	**12300 J**	**29000**	**64200**	**626000**	**36800**	**126000**
16887-00-6	Chloride (As Cl)	mg/L	NV	NV	**15.8**	**46.0**	**26.0**	**111**	**16.3**	**10.0**
14808-79-8	Sulfate (As SO4)	mg/L	NV	NV	**311**	**354**	**699**	**2600**	**29.1**	**177**
	FIELD PARAMETERS									
	Temperature	°C	---	---	20.29	18.11	22.34	17.63	25.77	23.66
	Conductivity	uS/cm	---	---	1220.2	1087.5	1725.9	5050.6	524.73	1477.5
	pH	s.u.	---	---	7.1	7.34	6.98	7.12	6.99	7.44
	ORP	mV	---	---	215.4	-27	-93	-141.5	-20.1	-46
	Turbidity	NTU	---	---	11.2	1.58	11	28.8	50.8	78.7
	Dissolved Oxygen	mg/L	---	---	4.24	0.34	0.26	0.25	4.22	5.96

[1] - EPA Regional Screening Levels (RSLs) for tapwater (November 2017).

[2] - Reported standard is for elemental mercury.

Bold text indicates detected value

U - Not detected, value indicates reporting limit

J = Estimated value (+ high bias - low bias)

NV - No Value Available

= Detected value exceeds RSL (HQ=0.1).

= Detected value exceeds RSL (HQ=1.0).

TABLE 16

NTCRA Basins Groundwater Monitoring Results
2017 Annual Site-Wide Groundwater, Surface Water, and Sediment Monitoring Report for OU-7, OU-10, and NTCRA Basins
Avtex Fibers Superfund Site
Front Royal, Virginia

FMC-Front Royal Avtex Fibers 2017 Sampling Event Validated BSN Wells		Location ID: Sample Name: Well Type: Sampled:	Regional Screening Level[1]	Regional Screening Level[1]	025R 2017AN-025R OMW 7/28/2017	029 2017AN-029 OMW 7/25/2017	108 2017AN-108 S BMW 7/25/2017	110 2017AN-110 S BMW 7/27/2017 & 2/1/2018	112 2017AN-112 S BMW 7/29/2017	113 2017AN-113 S BMW 7/25/2017
CAS NO.	COMPOUND	UNITS:	HQ=0.1	HQ=1.0						
	METALS - DISSOLVED									
7440-38-2	Arsenic	ug/L	0.052	0.052	**2.4**	0.4 U	0.4 U	0.4 U	**4.07**	0.4 U
7440-41-7	Beryllium	ug/L	2.5	25	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
7440-43-9	Cadmium	ug/L	0.92	9.2	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
7440-47-3	Chromium	ug/L	2200	22000	**0.615 J**	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
7440-50-8	Copper	ug/L	80	800	1.2 U	1.2 U	1.2 U	**1.5 J**	1.2 U	1.2 U
7439-92-1	Lead	ug/L	15	15	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
7439-97-6	Mercury[2]	ug/L	0.063	0.63	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
7440-02-0	Nickel	ug/L	39	390	**1.13 J**	**1.7 J**	0.5 U	**21.8**	**22.8**	**0.534 J**
7782-49-2	Selenium	ug/L	10	100	0.3 U	**1.11 J**	0.3 U	0.3 U	0.3 U	0.3 U
7440-66-6	Zinc	ug/L	600	6000	5.2 U	5.2 U	5.2 U	**86.7**	**5.44 J**	**6.07 J**
	OTHER									
7440-70-2	Calcium (dissolved)	ug/L	NV	NV	**146000**	**155000**	**191000**	**199000**	**211000**	**99600**
7439-95-4	Magnesium (dissolved)	ug/L	NV	NV	**28500**	**19900**	**17100**	**35600**	250 U	**11900**
7440-23-5	Sodium (dissolved)	ug/L	NV	NV	**93400**	**51200 J**	**13700 J**	**256000**	**28900**	**5900 J**
16887-00-6	Chloride (As Cl)	mg/L	NV	NV	**23.9**	**45.3**	**14.9**	**23.2**	**44.8**	**1.83**
14808-79-8	Sulfate (As SO4)	mg/L	NV	NV	**205**	**337**	**238**	**763**	**319**	**39.9**
	FIELD PARAMETERS									
	Temperature	°C	---	---	22.25	24.15	21.73	17.85 (13.53)	19.33	22.72
	Conductivity	uS/cm	---	---	1513.9	1137.2	675.58	2273.2 (1979)	2043.9	623.61
	pH	s.u.	---	---	7.31	6.81	7.38	7.71 (7.18)	12.69	8.41
	ORP	mV	---	---	-268.2	114.7	-48.5	-35.5 (-100.5)	-218.3	-184
	Turbidity	NTU	---	---	4.07	1.97	48	19.6 (15.6)	3.69	12.5
	Dissolved Oxygen	mg/L	---	---	0.13	0.32	0.32	0.17 (0.28)	0.24	0.16
								(Resample)		

[1] - EPA Regional Screening Levels (RSLs) for tapwater (November 2017).

[2] - Reported standard is for elemental mercury.

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= Detected value exceeds RSL (HQ=0.1).

= Detected value exceeds RSL (HQ=1.0).

TABLE 16

NTCRA Basins Groundwater Monitoring Results
2017 Annual Site-Wide Groundwater, Surface Water, and Sediment Monitoring Report for OU-7, OU-10, and NTCRA Basins
Avtex Fibers Superfund Site
Front Royal, Virginia

FMC-Front Royal Avtex Fibers 2017 Sampling Event Validated BSN Wells		Location ID: Sample Name: Well Type: Sampled:	Regional Screening Level[1]	Regional Screening Level[1]	114 2017AN-114 S BMW 8/1/2017	129 2017AN-129 S BMW 7/26/2017	132 2017AN-132 S BMW 7/27/2017	132 (DUP) 2017AN-132D S BMW 7/27/2017	B-48A 2017AN-B-48A OMW 7/26/2017	MW-12 2017AN-MW-12 OMW 7/29/2017
CAS NO.	COMPOUND	UNITS:	HQ=0.1	HQ=1.0						
	METALS - DISSOLVED									
7440-38-2	Arsenic	ug/L	0.052	0.052	**14.7 J**	**0.705 J**	**3.53**	**2.81**	0.4 U	**44.6**
7440-41-7	Beryllium	ug/L	2.5	25	**0.59 J**	0.1 U	**0.348 J**	**0.356 J**	0.1 U	0.2 U
7440-43-9	Cadmium	ug/L	0.92	9.2	0.1 UJ	0.1 U	0.1 U	0.1 U	0.1 U	0.2 U
7440-47-3	Chromium	ug/L	2200	22000	0.5 UJ	0.5 U	0.5 U	0.5 U	0.5 U	1.0 U
7440-50-8	Copper	ug/L	80	800	6.0 U	1.2 U	1.2 U	1.2 U	1.2 U	2.4 U
7439-92-1	Lead	ug/L	15	15	0.1 UJ	0.1 U	**0.106 J**	0.1 U	0.1 U	0.2 U
7439-97-6	Mercury[2]	ug/L	0.063	0.63	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
7440-02-0	Nickel	ug/L	39	390	**70.6 J**	**1.21 J**	**0.568 J**	**0.989 J**	**69.4**	**9.79**
7782-49-2	Selenium	ug/L	10	100	**2.87 J**	0.3 U	0.3 U	0.3 U	0.3 U	**1.92 J**
7440-66-6	Zinc	ug/L	600	6000	**5.7 J**	**6.12 J**	5.2 U	**17.9 J**	5.2 U	10.4 U
	OTHER									
7440-70-2	Calcium (dissolved)	ug/L	NV	NV	**451000**	**262000**	**316000**	**353000**	**187000**	**16400**
7439-95-4	Magnesium (dissolved)	ug/L	NV	NV	**97000**	**30600**	**44700**	**50000**	**22000**	**27500**
7440-23-5	Sodium (dissolved)	ug/L	NV	NV	**301000**	**24900 J**	**228000**	**255000**	**189000 J**	**4540000**
16887-00-6	Chloride (As Cl)	mg/L	NV	NV	**83.4**	**72.5**	**81.8**	**83.3**	**24.9**	**442**
14808-79-8	Sulfate (As SO4)	mg/L	NV	NV	**1430**	**450**	**1080**	**1110**	**529**	**3930**
	FIELD PARAMETERS									
	Temperature	°C	---	---	21.94	21.43	20.97	20.97	24.38	18.75
	Conductivity	uS/cm	---	---	3794.4	1360	2758.2	2758.2	1930	14293
	pH	s.u.	---	---	6.66	7.38	6.53	6.53	7.27	8.31
	ORP	mV	---	---	-84.5	39.5	-42.4	-42.4	40.1	46.3
	Turbidity	NTU	---	---	18.8	1.2	29.2	29.2	6.44	8.23
	Dissolved Oxygen	mg/L	---	---	0.27	1.48	0.21	0.21	0.45	5.01

[1] - EPA Regional Screening Levels (RSLs) for tapwater (November 2017).

[2] - Reported standard is for elemental mercury.

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J = Estimated value (+ high bias - low bias)

NV - No Value Available

= Detected value exceeds RSL (HQ=0.1).

= Detected value exceeds RSL (HQ=1.0).

TABLE 16

NTCRA Basins Groundwater Monitoring Results
2017 Annual Site-Wide Groundwater, Surface Water, and Sediment Monitoring Report for OU-7, OU-10, and NTCRA Basins
Avtex Fibers Superfund Site
Front Royal, Virginia

FMC-Front Royal Avtex Fibers 2017 Sampling Event Validated BSN Wells		Location ID: Sample Name: Well Type: Sampled:	Regional Screening Level[1]	Regional Screening Level[1]	PZ-03 2017AN-PZ-03 S BMW 7/27/2017	PZ-06 2017AN-PZ-06 S BMW 7/31/2017	PZ-06 (DUP) 2017AN-PZ-06D S BMW 7/31/2017	PZ-07 2017AN-PZ-07 S BMW 7/28/2017
CAS NO.	COMPOUND	UNITS:	HQ=0.1	HQ=1.0				
	METALS - DISSOLVED							
7440-38-2	Arsenic	ug/L	0.052	0.052	**3.69**	**3.79**	**4.18**	**6.66**
7440-41-7	Beryllium	ug/L	2.5	25	**0.118 J**	0.1 U	0.1 U	0.1 U
7440-43-9	Cadmium	ug/L	0.92	9.2	0.1 U	0.1 U	0.1 U	0.1 U
7440-47-3	Chromium	ug/L	2200	22000	0.5 U	0.5 U	**0.674 J**	**1.5 J**
7440-50-8	Copper	ug/L	80	800	1.2 U	1.2 U	1.2 U	1.2 U
7439-92-1	Lead	ug/L	15	15	0.1 U	0.1 U	0.1 U	0.1 U
7439-97-6	Mercury[2]	ug/L	0.063	0.63	0.1 U	0.1 U	0.1 U	0.1 U
7440-02-0	Nickel	ug/L	39	390	**2.96**	**0.993 J**	**1.13 J**	**19.5**
7782-49-2	Selenium	ug/L	10	100	0.3 U	**0.427 J**	0.3 U	0.3 U
7440-66-6	Zinc	ug/L	600	6000	5.2 U	**5.47 J**	5.2 U	**12.9 J**
	OTHER							
7440-70-2	Calcium (dissolved)	ug/L	NV	NV	**419000**	**49200**	**46800**	**294000**
7439-95-4	Magnesium (dissolved)	ug/L	NV	NV	**107000**	**15600**	**14800**	**47400**
7440-23-5	Sodium (dissolved)	ug/L	NV	NV	**806000**	**35500 J**	**34400 J**	**204000**
16887-00-6	Chloride (As Cl)	mg/L	NV	NV	**145**	**14.9**	**14.4**	**59.6**
14808-79-8	Sulfate (As SO4)	mg/L	NV	NV	**2920**	**33.4**	**33.1**	**1040**
	FIELD PARAMETERS							
	Temperature	^{o}C	---	---	24.23	18.13	18.13	21.14
	Conductivity	uS/cm	---	---	5581.2	510.39	510.39	2810.7
	pH	s.u.	---	---	7.51	7.48	7.48	7.14
	ORP	mV	---	---	-13.2	66.4	66.4	-130
	Turbidity	NTU	---	---	15.4	10.8	10.8	2.7
	Dissolved Oxygen	mg/L	---	---	0.19	0.79	0.79	0.18

[1] - EPA Regional Screening Levels (RSLs) for tapwater (November 2017).

[2] - Reported standard is for elemental mercury.

Bold text indicates detected value

U - Not detected, value indicates reporting limit

J = Estimated value (+ high bias - low bias)

NV - No Value Available

= Detected value exceeds RSL (HQ=0.1).

= Detected value exceeds RSL (HQ=1.0).

TABLE 17

NTCRA Basins Sump Monitoring Results
2017 Annual Site-Wide Groundwater, Surface Water, and Sediment Monitoring Report for OU-7, OU-10, and NTCRA Basins
Avtex Fibers Superfund Site
Front Royal, Virginia

FMC-Front Royal Avtex Fibers 2017 Sampling Event Validated BSN Sumps Groundwater Data		Location ID: Sample Name: Well Type: Sample Date:	Screening Criteria[1]	FAB 1-2 2017AN-FAB1-2 Sump 8/1/2017	FAB 3-1 2017AN-FAB3-1 Sump 8/1/2017	FAB 6-North 2017AN-FAB6-North Sump 8/1/2017	FAB 6-South 2017AN-FAB6-South Sump 8/1/2017	SB 1-1 2017AN-SB1-1 Sump 8/1/2017
CAS NO.	COMPOUND	UNITS:						
	METALS - DISSOLVED							
7440-38-2	Arsenic	ug/L	10	**13.3**	**11.5 J**	**55.3 J**	**14.0 J**	**44.0 J**
7440-41-7	Beryllium	ug/L	NA	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
7440-43-9	Cadmium	ug/L	1.1	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ
7440-47-3	Chromium[2]	ug/L	11	0.5 UJ	**0.635 J**	0.5 UJ	0.5 UJ	0.5 UJ
7440-50-8	Copper	ug/L	9	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U
7439-92-1	Lead	ug/L	11	0.1 U	0.1 U	0.1 U	0.1 U	0.1 UJ
7439-97-6	Mercury	ug/L	0.77	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
7440-02-0	Nickel	ug/L	20	**18.2 J**	**31.2 J**	**28.7 J**	**27.1 J**	0.5 UJ
7782-49-2	Selenium	ug/L	5	0.3 U	**2.58**	0.3 U	0.3 U	0.3 U
7440-66-6	Zinc	ug/L	120	5.2 UJ	**65.7 J**	**12.2 J**	**6.3 J**	**7.83 J**
	OTHER							
7440-70-2	Calcium, Dissolved	ug/L	NA	**212000**	**222000**	**318000**	**315000**	**52800**
7439-95-4	Magnesium, Dissolved	ug/L	NA	**54600**	**83300**	**39300**	**39800**	**12400**
7440-23-5	Sodium, Dissolved	ug/L	NA	**59600**	**267000**	**55800**	**56400**	**32700**
16887-00-6	Chloride (As Cl)	mg/L	230	**18.2**	**36.6**	**17.8**	**17.3**	**4.22**
14808-79-8	Sulfate (As SO4)	mg/L	250	**659**	**934**	**399**	**416**	**30.9**
	FIELD PARAMETERS							
	Temperature	°C	---	39.36	27.43	28.73	31.71	26.67
	Conductivity	uS/cm	---	1590	2720	1990.9	1890	723.66
	pH	s.u.	---	7.92	7.86	7.82	7.76	7.61
	ORP	mV	---	-21.6	10.1	-136.1	-151.9	-121.8
	Turbidity	NTU	---	4.21	3.33	11.8	3.15	142
	Dissolved Oxygen	mg/L	---	6.85	1.72	0.48	1.56	3.66

[1] - Screening value used for comparison is the lowest value of the freshwater aquatic life criterion or human health criterion.
[2] - Screening value is for Chromium (VI).
Bold text indicates detected value
U - Not detected, value indicates reporting limit
J = Estimated value (+ high bias - low bias)
NV - No Value Available
= Detected value exceeds Screening Criteria.

TABLE 17

NTCRA Basins Sump Monitoring Results
2017 Annual Site-Wide Groundwater, Surface Water, and Sediment Monitoring Report for OU-7, OU-10, and NTCRA Basins
Avtex Fibers Superfund Site
Front Royal, Virginia

FMC-Front Royal Avtex Fibers 2017 Sampling Event Validated BSN Sumps Groundwater Data		Location ID: Sample Name: Well Type: Sample Date:	Screening Criteria[1]	SB 1-2 2017AN-SB1-2 Sump 8/1/2017	SB 1-3 2017AN-SB1-3 Sump 8/1/2017	SB 1-4 2017AN-SB1-4 Sump 8/1/2017	SB 3-1 2017AN-SB3-1 Sump 8/1/2017	SB 4-1 2017AN-SB4-1 Sump 8/1/2017	SB 4-2 2017AN-SB4-2 Sump 8/1/2017
CAS NO.	COMPOUND	UNITS:							
	METALS - DISSOLVED								
7440-38-2	Arsenic	ug/L	10	**6.02 J**	0.4 UJ	**8.88 J**	0.4 UJ	0.4 UJ	**43.7 J**
7440-41-7	Beryllium	ug/L	NA	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
7440-43-9	Cadmium	ug/L	1.1	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ
7440-47-3	Chromium[2]	ug/L	11	**0.651 J**	**1.19 J**	**3.24 J**	0.5 UJ	0.5 UJ	0.5 UJ
7440-50-8	Copper	ug/L	9	**2.62**	**3.21 J**	**6.43**	1.2 U	**11.5**	1.2 U
7439-92-1	Lead	ug/L	11	0.1 U	0.1 U	0.1 U	0.1 U	0.1 UJ	0.1 U
7439-97-6	Mercury	ug/L	0.77	0.1 U	0.1 U	0.1 U	0.1 UJ	0.1 UJ	0.1 UJ
7440-02-0	Nickel	ug/L	20	**0.912 J**	**8.16 J**	**21.3 J**	**4.54 J**	**6.78 J**	**4.71 J**
7782-49-2	Selenium	ug/L	5	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
7440-66-6	Zinc	ug/L	120	**5.95 J**	**9.48 J**	**11.4 J**	**9.7 J**	**18.8 J**	5.2 UJ
	OTHER								
7440-70-2	Calcium, Dissolved	ug/L	NA	**50600**	**36500**	**4820**	**70500**	**102000**	**206000**
7439-95-4	Magnesium, Dissolved	ug/L	NA	**3150**	**82700**	**606 J**	**57700**	**71500**	**68500**
7440-23-5	Sodium, Dissolved	ug/L	NA	**5830**	**1790000**	**427000**	**245000**	**157000**	**191000**
16887-00-6	Chloride (As Cl)	mg/L	230	**2.17**	**117**	**109**	**32.7**	**43.3**	**32.0**
14808-79-8	Sulfate (As SO4)	mg/L	250	**7.17**	**1090**	**388**	**90.2**	**121**	**626**
	FIELD PARAMETERS								
	Temperature	°C	---	22.89	25.49	21.33	31.1	27.45	26.52
	Conductivity	uS/cm	---	361.07	5090	2087.6	1790	1440.8	2190.8
	pH	s.u.	---	8.37	8.41	9.69	7.63	7.41	7.45
	ORP	mV	---	-43.4	-14.4	-53.7	-7.3	-35.2	-220.8
	Turbidity	NTU	---	>1000	0.01	1.21	0	13.3	23
	Dissolved Oxygen	mg/L	---	4.25	0.18	0.78	2.37	3.61	1.33

[1] - Screening value used for comparison is the lowest value of the freshwater aquatic life criterion or human health criterion.
[2] - Screening value is for Chromium (VI).
Bold text indicates detected value
U - Not detected, value indicates reporting limit
J = Estimated value (+ high bias - low bias)
NV - No Value Available
= Detected value exceeds Screening Criteria.

TABLE 18

Fly Ash Basins Comparisons of Results to Baseline Conditions
2017 Annual Site-Wide Groundwater, Surface Water, and Sediment Monitoring Report for OU-7, OU-10, and NTCRA Basins
Avtex Fibers Superfund Site
Front Royal, Virginia

		Upgradient Fly Ash Basin															
		Overburden Monitoring Wells								Shallow Bedrock Monitoring Wells							
		008				029				108				129			
COMPOUND	UNITS	# of Samples	Min	Max	7/25/2017	# of Samples	Min	Max	7/25/2017	# of Samples	Min	Max	7/25/2017	# of Samples	Min	Max	7/26/2017
METALS - DISSOLVED																	
Arsenic	ug/L	4	< 1	< 1	0.4 U	3	< 1	< 1	0.4 U	4	< 1	< 5	0.4 U	4	< 1	5.9	**0.705 J**
Beryllium	ug/L	4	< 0.6	< 0.6	0.1 U	3	< 0.6	< 0.6	0.1 U	4	< 0.6	< 3	0.1 U	4	< 0.6	< 3	0.1 U
Cadmium	ug/L	4	< 2	< 2	0.1 U	3	< 2	< 2	0.1 U	4	< 2	< 3	0.1 U	4	< 2	< 3	0.1 U
Chromium	ug/L	4	< 3	< 3	**0.6 J**	3	< 3	< 3	0.5 U	4	< 3	< 5	0.5 U	4	< 2	< 5	0.5 U
Copper	ug/L	4	< 25	< 25	1.2 U	3	< 25	< 25	1.2 U	4	< 25	< 25	1.2 U	4	< 25	< 25	1.2 U
Lead	ug/L	4	< 3	< 3	0.1 U	3	< 3	< 3	0.1 U	4	< 3	< 3	0.1 U	4	< 3	< 3	0.1 U
Mercury	ug/L	4	< 0.2	< 0.2	0.1 U	3	< 0.2	< 0.2	0.1 U	4	< 0.2	< 0.2	0.1 U	4	< 0.2	< 0.2	0.1 U
Nickel	ug/L	4	< 50	< 50	**2.18**	3	< 50	< 50	**1.7 J**	4	< 50	< 50	0.5 U	4	< 50	< 50	**1.21 J**
Selenium	ug/L	4	< 5	< 5	0.3 U	3	< 5	< 5	**1.11 J**	4	< 5	< 5	0.3 U	4	< 5	< 5	0.3 U
Zinc	ug/L	4	76	677	**12.7 J**	3	41	185	5.2 U	4	< 25	181	5.2 U	4	72	220	**6.12 J**
OTHER																	
Calcium, Dissolved	mg/L	4	192	197	**214**	3	97	127	**155**	4	178	189	**191**	4	181	218	**262**
Magnesium, Dissolved	mg/L	4	16	21	**22.8**	3	13	16	**19.9**	4	17	18	**17.1**	4	24	27	**30.6**
Sodium, Dissolved	mg/L	3	12	17	**12.3 J**	3	75	88	**51.2 J**	3	14	17	**13.7 J**	4	20	40	**24.9 J**
Chloride	mg/L	4	15	17	**15.8**	3	29	37	**45.3**	4	17	18	**14.9**	4	35	36	**72.5**
Sulfate	mg/L	4	260	297	**311**	3	365	411	**337**	4	281	293	**238**	4	381	465	**450**

Bold text indicates detected value
Shaded results exceed baseline
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TABLE 18

Fly Ash Basins Comparisons of Results to Baseline Conditions
2017 Annual Site-Wide Groundwater, Surface Water, and Sediment Monitoring Report for OU-7, OU-10, and NTCRA Basins
Avtex Fibers Superfund Site
Front Royal, Virginia

		Downgradient Fly Ash Basin															
		Overburden Monitoring Wells															
		012				013				014R				B-48A			
COMPOUND	UNITS	# of Samples	Min	Max	7/29/2017	# of Samples	Min	Max	7/29/2017	# of Samples	Min	Max	7/30/2017	# of Samples	Min	Max	7/26/2017
METALS - DISSOLVED																	
Arsenic	ug/L	4	< 1	< 5	**2.4**	4	< 1	< 5	**3.59**	3	46	66	**889**	4	< 1	< 5	0.4 U
Beryllium	ug/L	4	< 0.6	< 3	0.1 U	4	< 0.6	< 3	0.1 U	3	< 0.6	< 2	0.1 U	4	< 0.6	< 32	0.1 U
Cadmium	ug/L	4	< 2	< 3	0.1 U	4	< 2	< 3	0.1 U	3	< 1	< 3	0.1 U	4	< 2	< 3	0.1 U
Chromium	ug/L	4	< 3	< 5	0.5 U	4	< 3	< 5	0.5 U	3	< 3	< 5	0.5 U	4	< 3	< 5	0.5 U
Copper	ug/L	4	< 25	< 25	1.2 U	4	< 25	< 25	1.2 U	3	< 25	< 25	1.2 U	4	< 25	< 25	1.2 U
Lead	ug/L	4	< 3	< 3	0.1 U	4	< 3	< 3	0.1 U	3	< 3	< 3	**0.103 J**	4	< 3	4.5	0.1 U
Mercury	ug/L	4	< 0.2	< 0.2	0.1 U	4	< 0.2	< 0.2	0.1 U	3	< 0.2	< 0.2	0.1 U	4	< 0.2	< 0.0002	0.1 U
Nickel	ug/L	4	< 50	< 50	**1.75 J**	4	< 50	< 50	**13.7**	3	61	67	**62.5**	4	67	101	**69.4**
Selenium	ug/L	4	< 5	< 5	0.3 U	4	< 5	< 5	0.3 U	3	< 5	< 5	0.3 U	4	< 5	< 5	0.3 U
Zinc	ug/L	4	< 25	147	**6.06 J**	4	< 25	191	5.2 U	3	87	134	**5.55 J**	4	< 25	185	5.2 U
OTHER																	
Calcium, Dissolved	mg/L	4	149	180	**132**	4	159	210	**236**	3	388	403	**370**	4	110	196	**187**
Magnesium, Dissolved	mg/L	4	22	25	**18.4**	4	23	25	**33.9**	3	107	115	**105**	4	12	22	**22.0**
Sodium, Dissolved	mg/L	4	32	35	**29.0**	4	57	82	**64.2**	3	141	172	**626**	4	234	268	**189 J**
Chloride	mg/L	4	42	47	**46.0**	4	35	42	**26.0**	3	70	76	**111**	4	30	35	**24.9**
Sulfate	mg/L	4	330	353	**354**	4	233	474	**699**	3	1,290	1,370	**2600**	4	520	830	**529**

Bold text indicates detected value
Shaded results exceed baseline
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TABLE 18

Fly Ash Basins Comparisons of Results to Baseline Conditions
2017 Annual Site-Wide Groundwater, Surface Water, and Sediment Monitoring Report for OU-7, OU-10, and NTCRA Basins
Avtex Fibers Superfund Site
Front Royal, Virginia

		Downgradient Fly Ash Basin (Continued)															
		Shallow Bedrock Monitoring Wells															
		110				112				113				114			
COMPOUND	UNITS	# of Samples	Min	Max	7/27/2017 & 2/1/2018	# of Samples	Min	Max	7/29/2017	# of Samples	Min	Max	7/25/2017	# of Samples	Min	Max	8/1/2017
METALS - DISSOLVED																	
Arsenic	ug/L	4	< 1	< 5	0.4 U	4	< 1	42	**4.07**	4	< 1	< 5	0.4 U	4	< 1	5	**14.7 J**
Beryllium	ug/L	4	< 0.6	< 3	0.1 U	4	< 0.6	< 3	0.1 U	4	< 0.6	< 3	0.1 U	4	< 0.6	< 3	**0.59 J**
Cadmium	ug/L	4	< 2	< 3	0.1 U	4	< 2	< 3	0.1 U	4	< 2	< 3	0.1 U	4	< 2	< 3	0.1 UJ
Chromium	ug/L	4	< 3	< 5	0.5 U	4	< 3	< 5	0.5 U	4	< 3	< 5	0.5 U	4	< 3	< 5	0.5 UJ
Copper	ug/L	4	< 25	< 25	**1.5 J**	4	< 25	< 25	1.2 U	4	< 25	< 25	1.2 U	4	< 25	< 25	6.0 U
Lead	ug/L	4	< 3	< 15	0.1 U	4	< 3	< 3	0.1 U	4	< 3	< 3	0.1 U	4	< 3	< 3	0.1 UJ
Mercury	ug/L	4	< 0.2	< 0.2	0.1 U	4	< 0.2	< 0.2	0.1 U	4	< 0.2	< 0.2	0.1 U	4	< 0.2	< 0.2	0.1 U
Nickel	ug/L	4	< 50	< 50	**21.8**	4	< 50	< 50	**22.8**	4	< 50	< 50	**0.534 J**	4	< 50	< 50	**70.6 J**
Selenium	ug/L	4	< 5	< 5	0.3 U	4	< 5	< 5	0.3 U	4	< 5	< 5	0.3 U	4	< 5	< 5	**2.87 J**
Zinc	ug/L	4	< 25	151	**86.7**	3	< 25	175	**5.44 J**	4	< 25	119	**6.07 J**	4	< 25	82	**5.7 J**
OTHER																	
Calcium, Dissolved	mg/L	4	259	298	**199**	4	275	308	**211**	4	301	319	**100**	4	353	394	**451**
Magnesium, Dissolved	mg/L	4	47	65	**35.6**	4	35	39	0.250 U	4	35	36	**11.9**	4	60	77	**97.0**
Sodium, Dissolved	mg/L	4	239	324	**256**	4	46	47	**28.9**	4	28	30	**5.90 J**	4	133	150	**301**
Chloride	mg/L	4	23	24	**23.2**	4	51	59	**44.8**	4	29	35	**1.83**	4	59	66	**83.4**
Sulfate	mg/L	4	1,120	1,400	**763**	4	600	671	**319**	4	700	780	**39.9**	4	860	1,140	**1430**

Bold text indicates detected value
Shaded results exceed baseline
< - Not detected, value indicates reporting limit
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J - Estimated results (+ high bias - low bias)

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TABLE 19

Sulfate Basins Comparisons of Results to Baseline Conditions
2017 Annual Site-Wide Groundwater, Surface Water, and Sediment Monitoring Report for OU-7, OU-10, and NTCRA Basins
Avtex Fibers Superfund Site
Front Royal, Virginia

		Upgradent Sulfate Basins															
		Overburden Monitoring Wells															
		MW-12				012				013				014R			
COMPOUND	UNITS	# of Samples	Min	Max	7/29/2017	# of Samples	Min	Max	7/29/2017	# of Samples	Min	Max	7/29/2017	# of Samples	Min	Max	7/30/2017
METALS - DISSOLVED																	
Arsenic	ug/L	4	< 1	< 5	**44.6**	4	< 1	< 5	**2.4**	4	< 1	< 5	**3.59**	3	46	66	**889**
Beryllium	ug/L	4	< 0.6	< 3	0.2 U	4	< 0.6	< 3	0.1 U	4	< 0.6	< 3	0.1 U	3	< 0.6	< 2	0.1 U
Cadmium	ug/L	4	< 2	< 3	0.2 U	4	< 2	< 3	0.1 U	4	< 2	< 3	0.1 U	3	< 1	< 3	0.1 U
Chromium	ug/L	4	< 3	< 5	1.0 U	4	< 3	< 5	0.5 U	4	< 3	< 5	0.5 U	3	< 3	< 5	0.5 U
Copper	ug/L	4	< 25	< 25	2.4 U	4	< 25	< 25	1.2 U	4	< 25	< 25	1.2 U	3	< 25	< 25	1.2 U
Lead	ug/L	4	< 3	< 3	0.2 U	4	< 3	< 3	0.1 U	4	< 3	< 3	0.1 U	3	< 3	< 3	**0.103 J**
Mercury	ug/L	4	< 0.2	< 0.2	0.1 U	4	< 0.2	< 0.2	0.1 U	4	< 0.2	< 0.2	0.1 U	3	< 0.2	< 0.2	0.1 U
Nickel	ug/L	4	< 50	< 50	**9.79**	4	< 50	< 50	**1.75 J**	4	< 50	< 50	**13.7**	3	61	67	**62.5**
Selenium	ug/L	4	< 5	< 5	**1.92 J**	4	< 5	< 5	0.3 U	4	< 5	< 5	0.3 U	3	< 5	< 5	0.3 U
Zinc	ug/L	4	< 25	147	10.4 U	4	< 25	147	**6.06 J**	4	< 25	191	5.2 U	3	87	134	**5.55 J**
OTHER																	
Calcium, Dissolved	mg/L	4	149	180	**16.4**	4	149	180	**132**	4	159	210	**236**	3	388	403	**370**
Magnesium, Dissolved	mg/L	4	22	25	**27.5**	4	22	25	**18.4**	4	23	25	**33.9**	3	107	115	**105**
Sodium, Dissolved	mg/L	4	32	35	**4540**	4	32	35	**29.0**	4	57	82	**64.2**	3	141	172	**626**
Chloride	mg/L	4	42	47	**442**	4	42	47	**46.0**	4	35	42	**26.0**	3	70	76	**111**
Sulfate	mg/L	4	330	353	**3930**	4	330	353	**354**	4	233	474	**699**	3	1,290	1,370	**2600**

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Shaded results exceed baseline
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TABLE 19

Sulfate Basins Comparisons of Results to Baseline Conditions
2017 Annual Site-Wide Groundwater, Surface Water, and Sediment Monitoring Report for OU-7, OU-10, and NTCRA Basins
Avtex Fibers Superfund Site
Front Royal, Virginia

		Upgradent Sulfate Basins (Continued)																
		Shallow Bedrock Monitoring Wells																
		112				113				114				132				
COMPOUND	UNITS	# of Samples	Min	Max	7/29/2017	# of Samples	Min	Max	7/25/2017	# of Samples	Min	Max	8/1/2017	# of Samples	Min	Max	7/27/2017	Duplicate
METALS - DISSOLVED																		
Arsenic	ug/L	4	< 1	42	**4.07**	4	< 1	< 5	0.4 U	4	< 1	5	**14.7 J**	4	< 5	23	**3.53**	**2.81**
Beryllium	ug/L	4	< 0.6	< 3	0.1 U	4	< 0.6	< 3	0.1 U	4	< 0.6	< 3	**0.59 J**	4	< 0.6	< 3	**0.348 J**	**0.356 J**
Cadmium	ug/L	4	< 2	< 3	0.1 U	4	< 2	< 3	0.1 U	4	< 2	< 3	0.1 UJ	4	< 2	< 3	0.1 U	0.1 U
Chromium	ug/L	4	< 3	< 5	0.5 U	4	< 3	< 5	0.5 U	4	< 3	< 5	0.5 UJ	4	< 3	3	0.5 U	0.5 U
Copper	ug/L	4	< 25	< 25	1.2 U	4	< 25	< 25	1.2 U	4	< 25	< 25	6.0 U	4	< 25	< 25	1.2 U	1.2 U
Lead	ug/L	4	< 3	< 3	0.1 U	4	< 3	< 3	0.1 U	4	< 3	< 3	0.1 UJ	4	< 3	< 9	**0.106 J**	0.1 U
Mercury	ug/L	4	< 0.2	< 0.2	0.1 U	4	< 0.2	< 0.2	0.1 U	4	< 0.2	< 0.2	0.1 U	4	< 0.2	< 0.2	0.1 U	0.1 U
Nickel	ug/L	4	< 50	< 50	**22.8**	4	< 50	< 50	**0.534 J**	4	< 50	< 50	**70.6 J**	4	< 50	< 50	**0.568 J**	**0.989 J**
Selenium	ug/L	4	< 5	< 5	0.3 U	4	< 5	< 5	0.3 U	4	< 5	< 5	**2.87 J**	4	< 5	< 5	0.3 U	0.3 U
Zinc	ug/L	3	< 25	175	**5.44 J**	4	< 25	119	**6.07 J**	4	< 25	82	**5.7 J**	4	< 25	95	5.2 U	**17.9 J**
OTHER																		
Calcium, Dissolved	mg/L	4	275	308	**211**	4	301	319	**100**	4	353	394	**451**	4	126	182	**316**	**353**
Magnesium, Dissolved	mg/L	4	35	39	0.250 U	4	35	36	**11.9**	4	60	77	**97.0**	4	27	38	**44.7**	**50.0**
Sodium, Dissolved	mg/L	4	46	47	**28.9**	4	28	30	**5.90 J**	4	133	150	**301**	4	372	654	**228**	**255**
Chloride	mg/L	4	51	59	**44.8**	4	29	35	**1.83**	4	59	66	**83.4**	4	72	88	**81.8**	**83.3**
Sulfate	mg/L	4	600	671	**319**	4	700	780	**39.9**	4	860	1,140	**1430**	4	790	840	**1080**	**1110**

Bold text indicates detected value
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TABLE 19

Sulfate Basins Comparisons of Results to Baseline Conditions
2017 Annual Site-Wide Groundwater, Surface Water, and Sediment Monitoring Report for OU-7, OU-10, and NTCRA Basins
Avtex Fibers Superfund Site
Front Royal, Virginia

		Downgradient Sulfate Basins											
		Overburden Monitoring Wells											
		022				023				025R			
COMPOUND	UNITS	# of Samples	Min	Max	7/28/2017	# of Samples	Min	Max	7/28/2017	# of Samples	Min	Max	7/28/2017
METALS - DISSOLVED													
Arsenic	ug/L	4	< 1	< 5	0.4 U	4	< 4	< 5	**10.6**	4	< 1	< 5	**2.4**
Beryllium	ug/L	4	< 0.6	< 3	0.1 U	4	< 0.6	< 3	5.2 U	4	< 0.6	< 3	0.1 U
Cadmium	ug/L	4	< 2	< 3	0.1 U	4	< 2	< 3	5.2 U	4	< 2	< 3	0.1 U
Chromium	ug/L	4	< 3	< 5	0.5 U	4	< 3	< 5	**2.72**	4	< 3	< 5	**0.615 J**
Copper	ug/L	4	< 25	< 25	1.2 U	4	< 25	< 25	**1.65 J**	4	< 25	< 25	1.2 U
Lead	ug/L	4	< 3	< 9	0.1 U	4	< 3	< 6	**1.58 J**	4	< 3	< 9	0.1 U
Mercury	ug/L	4	< 0.2	< 0.2	0.1 U	4	< 0.2	< 0.2	0.1 U	4	< 0.2	< 0.2	0.1 U
Nickel	ug/L	4	< 50	< 50	**0.864 J**	4	< 50	< 50	**7.72**	4	< 50	< 50	**1.13 J**
Selenium	ug/L	4	< 5	17	0.3 U	4	< 5	5.4	0.3 U	4	< 5	< 5	0.3 U
Zinc	ug/L	4	90.7	193	5.2 U	4	< 25	71.3	**42.3**	4	< 25	136	5.2 U
OTHER													
Calcium, Dissolved	mg/L	4	357	444	**37.4**	4	27	50	**77.9**	4	84	125	**146**
Magnesium, Dissolved	mg/L	4	66	82	**5.87**	4	26	58	**45.6**	4	62	77	**28.5**
Sodium, Dissolved	mg/L	4	1,100	1,230	**36.8**	4	578	704	**126**	4	1,190	1,530	**93.4**
Chloride	mg/L	4	107	146	**16.3**	4	51	109	**10.0**	4	105	114	**23.9**
Sulfate	mg/L	4	2,390	3,000	**29.1**	4	423	1,260	**177**	4	307	552	**205**

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TABLE 19

Sulfate Basins Comparisons of Results to Baseline Conditions
2017 Annual Site-Wide Groundwater, Surface Water, and Sediment Monitoring Report for OU-7, OU-10, and NTCRA Basins
Avtex Fibers Superfund Site
Front Royal, Virginia

		Downgradient Sulfate Basins (Continued)												
		Shallow Bedrock Monitoring Wells												
		PZ-03				PZ-06					PZ-07			
COMPOUND	UNITS	# of Samples	Min	Max	7/27/2017	# of Samples	Min	Max	7/31/2017	Duplicate	# of Samples	Min	Max	7/28/2017
METALS - DISSOLVED														
Arsenic	ug/L	4	< 1	< 5	**3.69**	4	6.6	24	**3.79**	**4.18**	4	< 1	< 5	**6.66**
Beryllium	ug/L	4	< 0.6	< 3	**0.118 J**	4	< 0.6	< 3	0.1 U	0.1 U	4	< 0.6	< 3	0.1 U
Cadmium	ug/L	4	< 2	< 3	0.1 U	4	< 2	< 3	0.1 U	0.1 U	4	< 2	< 3	0.1 U
Chromium	ug/L	4	< 3	< 5	0.5 U	4	< 3	< 5	0.5 U	**0.674 J**	4	< 3	< 5	**1.5 J**
Copper	ug/L	4	< 25	< 25	1.2 U	4	< 25	< 25	1.2 U	1.2 U	4	< 25	< 25	1.2 U
Lead	ug/L	4	< 3	< 11	0.1 U	4	< 3	< 9	0.1 U	0.1 U	4	< 3	< 9	0.1 U
Mercury	ug/L	4	< 0.2	< 0.2	0.1 U	4	< 0.2	< 0.2	0.1 U	0.1 U	4	< 0.2	< 0.2	0.1 U
Nickel	ug/L	4	< 50	< 50	**2.96**	4	< 50	< 50	**0.993 J**	**1.13 J**	4	< 50	< 50	**19.5**
Selenium	ug/L	4	< 5	13.5	0.3 U	4	< 5	7.3	**0.427 J**	0.3 U	4	< 5	< 5	0.3 U
Zinc	ug/L	4	< 25	134	5.2 U	4	< 25	106	**5.47 J**	5.2 U	4	< 25	40.5	**12.9 J**
OTHER														
Calcium, Dissolved	mg/L	4	456	478	**419**	4	38	63	**49.2**	**46.8**	4	382	407	**294**
Magnesium, Dissolved	mg/L	4	122	132	**107**	4	49	96	**15.6**	**14.8**	4	65	75	**47.4**
Sodium, Dissolved	mg/L	4	1,030	1,110	**806**	4	697	884	**35.5 J**	**34.4 J**	4	321	368	**204**
Chloride	mg/L	4	75	80	**145**	4	91	131	**14.9**	**14.4**	4	62	70	**59.6**
Sulfate	mg/L	4	2,290	2,600	**2920**	4	391	1,270	**33.4**	**33.1**	4	1,310	1,600	**1040**

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TABLE 20

OU-7 River Sediment Sample Results
2017 Annual Site-Wide Groundwater, Surface Water, and Sediment Monitoring Report for OU-7, OU-10, and NTCRA Basins
Avtex Fibers Superfund Site
Front Royal, Virginia

FMC-Front Royal Avtex Fibers 2017 Sampling Event Validated OU-7 Sediment Data	Location ID: Sample Name: Sample Date:	Screening Criteria[1]	SED-01 2017AN-SED-01 7/13/2017	SED-02 2017AN-SED-02 7/13/2017	SED-03 2017AN-SED-03 7/13/2017	SED-04 2017AN-SED-04 7/13/2017	SED-05 2017AN-SED-05 7/13/2017	SED-06 2017AN-SED-06 7/13/2017	SED-06 (DUP) 2017AN-SED-06D 7/13/2017	SED-07 2017AN-SED-07 7/13/2017	SED-08 2017AN-SED-08 7/13/2017
COMPOUND	UNITS:										
VOLATILES											
Acetone	ug/kg	NV	**24.1 J**	**32.7 J**	11.1 U	**46.6 J**	**57.2 J**	**49.5 J**	**54.6 J**	**138**	**81.5 J**
Carbon disulfide	ug/kg	0.851	4.78 U	4.92 U	**6.19 J**	**34.3**	4.97 U	**6.67 J**	**7.23 J**	7.06 U	**6.83 J**
Chlorobenzene	ug/kg	8.42	0.889 U	0.915 U	0.884 U	0.955 U	0.924 U	0.925 U	1.03 U	1.31 U	1.11 U
SEMIVOLATILES											
bis(2-Ethylhexyl)phthalate (DEHP)	ug/kg	180	290 U	298 U	285 U	327 U	300 U	317 U	326 U	411 U	373 U
2-Methylphenol	ug/kg	NV	302 U	311 U	298 U	341 U	313 U	330 U	340 U	428 U	389 U
3&4-Methylphenol	ug/kg	670	284 U	292 U	280 U	321 U	294 U	310 U	320 U	403 U	366 U
Naphthalene	ug/kg	176	40.6 U	41.7 U	40.0 U	45.8 U	42.0 U	44.3 U	45.6 U	57.5 U	52.2 U
Pentachlorophenol	ug/kg	504	372 U	383 U	367 U	420 U	385 U	407 U	419 U	528 U	479 U
Phenol	ug/kg	420	284 U	292 U	280 U	321 U	294 U	310 U	320 U	403 U	366 U
METALS											
Aluminum	mg/kg	NV	**1900 J**	**1930 J**	**2440 J**	**4130 J**	**2950 J**	**3310 J**	**6390 J**	**1960 J**	**3540 J**
Antimony	mg/kg	2	1.4 U	1.39 U	1.35 U	1.59 U	1.46 U	1.51 U	1.6 U	2 U	1.78 U
Arsenic	mg/kg	9.8	**3.22 J**	**1.53 J**	**2.64 J**	**3.24 J**	**4.36**	**2.04 J**	**3.63 J**	2 U	**1.96 J**
Cadmium	mg/kg	0.99	1.4 U	1.39 U	1.35 U	1.59 U	1.46 U	1.51 U	1.6 U	2 U	1.78 U
Chromium	mg/kg	43.4	**9.66 J**	**8.34 J**	**11.2 J**	**12.8 J**	**11.1 J**	**13.2 J**	**13.1 J**	**8.43 J**	**12.4 J**
Cobalt	mg/kg	50	**3.82**	**4.08**	**7.19**	**7.11**	**7.49**	**5.4 J**	**12.6 J**	**6.69**	**6.08**
Iron	mg/kg	20000	**5190 J**	**6240 J**	**7910 J**	**10800 J**	**6990 J**	**11000 J**	**16300 J**	**3520 J**	**10300 J**
Lead	mg/kg	35.8	**16.1**	**6.64**	**12.1**	**12.9**	**12.6**	**8.11**	**14.7**	**9.45**	**10.2**
Manganese	mg/kg	460	**141 J**	**178 J**	**216 J**	**327 J**	**468 J**	**285 J**	**1140 J**	**210 J**	**340 J**
Mercury	mg/kg	0.18	**0.0953 J**	**0.132 J**	**0.118 J**	**0.343**	**0.441**	**0.108 J**	**0.0954 J**	**0.227**	**0.416**
Nickel	mg/kg	22.7	**4.25 J**	**5.27 J**	**5.01 J**	**7.94 J**	**6.41 J**	**6.81 J**	**11.1 J**	**5.04 J**	**7.44 J**
Vanadium	mg/kg	NV	**9.01 J**	**10.8 J**	**14.3 J**	**19.6 J**	**12.7 J**	**17.9 J**	**27.6 J**	**8.46 J**	**18.1 J**
Zinc	mg/kg	121	**22.6 J**	**23.6 J**	**31.6 J**	**64.3 J**	**79.7 J**	**26 J**	**37.1 J**	**25.7 J**	**40.5 J**
OTHER											
Cyanide (total)	mg/kg	NV	-- R	-- R	-- R	-- R	-- R	-- R	-- R	-- R	-- R
Cyanide (free)	mg/kg	0.1	0.43 U	0.451 U	0.431 U	0.5 U	0.433 U	0.421 U	0.477 U	0.618 U	0.532 U
Moisture, Percent	%	-	29.2	31.7	29.3	38.4	31.7	34.7	37.4	51.2	45.0
Total organic carbon (TOC)	mg/L	NV	**4340**	**9210**	**6830**	**9880**	**12800**	**16500**	**7740**	**16300**	**36500**
Total Solids	%	-	70.8	68.3	70.7	61.6	68.3	65.3	62.6	48.8	55.0
GRAIN SIZE											
Clay	%	-	1.8	26.4	3.3	6.4	6.1	10.3	14.2	4.6	14.1
Coarse sand	%	-	0.2	0.3	6.1	2.2	2.3	2.4	0.6	1.7	8.9
Fine sand	%	-	86.2	39.2	32.4	56	64.1	37.4	42.5	71.3	24.4
Gravel	%	-	0.1	0.9	33.5	0.5	5.3	14.6	1.7	3.5	15.8
Medium sand	%	-	6.5	5.2	21.9	13.8	14.3	11.8	11	4.5	5.7
Sand	%	-	92.9	44.7	60.4	72	80.7	51.6	54.1	77.5	39
Silt	%	-	5.2	28	2.8	21.1	7.9	23.5	30	14.4	31.1

U - Not detected at the associated reporting limit
UJ - Not detected, estimated reporting limit
NV - No value available.
J - Estimated Concentration
R - Rejected

[1]Screening criteria based on EPA Region III Freshwater Sediment Screening Benchmarks (EPA, 2006).
= Detected value exceeds screening criteria.

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TABLE 20

OU-7 River Sediment Sample Results
2017 Annual Site-Wide Groundwater, Surface Water, and Sediment Monitoring Report for OU-7, OU-10, and NTCRA Basins
Avtex Fibers Superfund Site
Front Royal, Virginia

FMC-Front Royal Avtex Fibers 2017 Sampling Event Validated OU-7 Sediment Data	Location ID: Sample Name: Sample Date:	Screening Criteria[1]	SED-01 2017AN-SED-01 7/13/2017	SED-02 2017AN-SED-02 7/13/2017	SED-03 2017AN-SED-03 7/13/2017	SED-04 2017AN-SED-04 7/13/2017	SED-05 2017AN-SED-05 7/13/2017	SED-06 2017AN-SED-06 7/13/2017	SED-06 (DUP) 2017AN-SED-06D 7/13/2017	SED-07 2017AN-SED-07 7/13/2017	SED-08 2017AN-SED-08 7/13/2017
COMPOUND	UNITS:										
Hydrometer 1 for particle size distribution	% passed	-	3.5	42.2	6.5	14.5	11.4	21.8	25.5	8.3	28
Hydrometer 2 for particle size distribution	% passed	-	3.5	38.8	6	12.1	10.3	20.5	23.5	6.8	24.6
Hydrometer 3 for particle size distribution	% passed	-	2.9	34.8	5.1	10.3	9.2	17.2	19.5	6.8	19.9
Hydrometer 4 for particle size distribution	% passed	-	2.3	32.4	4.6	8.5	8.1	14.6	17.5	6.1	17.6
Hydrometer 5 for particle size distribution	% passed	-	1.8	26.4	3.4	6.4	6.1	10.3	14.2	4.6	14.1
Hydrometer 6 for particle size distribution	% passed	-	1.3	17.5	2.4	4.1	3.8	7.7	8.8	2.4	8.3
Hydrometer 7 for particle size distribution	% passed	-	0.8	10.8	1.7	2.7	2.5	4.9	5.5	1.6	4.8
Sieve, #10	% passed	-	99.7	98.8	60.4	97.3	92.4	83	97.7	94.8	75.3
Sieve, #100	% passed	-	15.7	62.3	11.3	40.6	27.6	41.2	51	52.4	56.3
Sieve, #20	% passed	-	99.4	98.2	51.7	95.2	90	80.8	96.8	94.2	73.5
Sieve, #200	% passed	-	7	54.4	6.1	27.5	14	33.8	44.2	19	45.2
Sieve, #4	% passed	-	99.9	99.1	66.5	99.5	94.7	85.4	98.3	96.5	84.2
Sieve, #40	% passed	-	93.2	93.6	38.5	83.5	78.1	71.2	86.7	90.3	69.6
Sieve, #60	% passed	-	41.1	74.3	19.1	57.6	48.1	50.1	60.1	73.3	64.5
Sieve, #80	% passed	-	22.8	66.4	13.7	47.3	34.5	44.3	53.8	62	59.8
Sieve, 0.375 inch	% passed	-	100	99.4	76.8	100	97.2	88.5	100	100	100
Sieve, 0.75 inch	% passed	-	100	100	90.3	100	100	100	100	100	100
Sieve, 1 inch	% passed	-	100	100	100	100	100	100	100	100	100
Sieve, 1.5 inch	% passed	-	100	100	100	100	100	100	100	100	100
Sieve, 2 inch	% passed	-	100	100	100	100	100	100	100	100	100
Sieve, 3 inch	% passed	-	100	100	100	100	100	100	100	100	100

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= Detected value exceeds screening criteria.

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TABLE 21

OU-7 River Water Sample Results
2017 Annual Site-Wide Groundwater, Surface Water, and Sediment Monitoring Report for OU-7, OU-10, and NTCRA Basins
Avtex Fibers Superfund Site
Front Royal, Virginia

FMC-Front Royal Avtex Fibers 2017 Sampling Event Validated OU-7 Surface Water Data	Location ID: Sample Name: Sample Date:	Virginia Chronic Water Quality Criteria[1] Freshwater-Chronic	Virginia Chronic Water Quality Criteria[1] Human Health Drinking Water	Virginia Chronic Water Quality Criteria[1] Human Health All Other SW	EPA Region III BTAG Freshwater Benchmarks[2]	SW-01 2017AN-SW-01 7/13/2017	SW-02 2017AN-SW-02 7/13/2017	SW-03 2017AN-SW-03 7/13/2017	SW-04 2017AN-SW-04 7/13/2017	SW-05 2017AN-SW-05 7/13/2017	SW-06 2017AN-SW-06 7/13/2017	SW-06 (DUP) 2017AN-SW-06D 7/13/2017	SW-07 2017AN-SW-07 7/13/2017	SW-08 2017AN-SW-08 7/13/2017
COMPOUND	UNITS:													
VOLATILES														
Acetone	ug/L	NV	NV	NV	1500	-- R	-- R	-- R	-- R	-- R	-- R	-- R	-- R	-- R
Carbon disulfide	ug/L	NV	NV	NV	0.92	0.22 U	0.22 U	0.22 U	0.22 U	0.22 U	0.22 U	0.22 U	0.22 U	0.22 U
Chlorobenzene	ug/L	NV	130	1,600	1.3	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U
SEMIVOLATILES														
bis(2-Ethylhexyl)phthalate (DEHP)	ug/L	NV	12	22	16	2.54 U	4.75 U	4.71 U	3.1 U	0.319 U	3.17 U	2.66 U	2.35 U	2.32 U
2-Methylphenol	ug/L	NV	NV	NV	13	1.54 U	1.6 U	1.6 U	1.54 U	0.157 U	1.6 U	1.54 U	1.54 U	1.6 U
3&4-Methylphenol	ug/L	NV	NV	NV	543	1.35 U	1.4 U	1.4 U	1.35 U	0.137 U	1.4 U	1.35 U	1.35 U	1.4 U
Naphthalene	ug/L	NV	NV	NV	1.1	0.356 U	0.37 U	0.37 U	0.356 U	0.0363 U	0.37 U	0.356 U	0.356 U	0.37 U
Pentachlorophenol	ug/L	6.7	2.7	30	0.5	3.17 U	3.3 U	3.3 U	3.17 U	0.324 U	3.3 U	3.17 U	3.17 UJ	3.3 UJ
Phenol	ug/L	NV	10,000	860,000	4	1.44 U	1.5 U	1.5 U	1.44 U	0.147 U	1.5 U	1.44 U	1.44 U	1.5 U
METALS - TOTAL														
Aluminum	ug/L	NV	NV	NV	87	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U
Antimony	ug/L	NV	5.6	640	30	4 U	4 U	4 U	4 U	4 U	4 U	4 U	4 U	4 U
Arsenic	ug/L	150	10	NV	5	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Cadmium	ug/L	1.1	5	NV	0.25	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Chromium	ug/L	11	NV	NV	85	3 U	3 U	3 U	**6.2**	3 U	3 U	3 U	3 U	3 U
Cobalt	ug/L	NV	NV	NV	23	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Iron	ug/L	NV	300*	NV	300	50 U	50 U	50 U	**5490**	**1290**	50 U	**193**	50 U	50 U
Lead	ug/L	11	15	NV	2.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.541 U	0.5 U	0.5 U
Manganese	ug/L	NV	NV	NV	120	5 U	5 U	5 U	**26.1**	**6.3 J**	5 U	5 U	5 U	5 U
Mercury	ug/L	0.77	NV	NV	0.026	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Nickel	ug/L	20	610	4,600	52	3 U	3 U	3 U	**5.7 J**	3 U	3 U	3 U	3 U	3 U
Vanadium	ug/L	NV	NV	NV	20	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Zinc	ug/L	120	7,400	26,000	120	25 U	25 U	25 U	**533**	**174**	25 U	25 U	25 U	25 U
METALS - DISSOLVED														
Aluminum	ug/L	NV	NV	NV	87	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U
Antimony	ug/L	NV	5.6	640	30	4 U	4 U	4 U	4 U	4 U	4 U	4 U	4 U	4 U
Arsenic	ug/L	150	10	NV	5	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Cadmium	ug/L	1.1	5	NV	0.25	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Chromium	ug/L	11	NV	NV	85	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U
Cobalt	ug/L	NV	NV	NV	23	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	**1.72 J**	0.5 U	0.5 U
Iron	ug/L	NV	300*	NV	300	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U
Lead	ug/L	11	15	NV	2.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Manganese	ug/L	NV	NV	NV	120	5 U	5 U	5 U	5 U	5 U	**7.1 J**	5 U	5 U	5 U
Mercury	ug/L	0.77	NV	NV	0.026	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Nickel	ug/L	20	610	4,600	52	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U
Vanadium	ug/L	NV	NV	NV	20	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Zinc	ug/L	120	7,400	26,000	120	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U
OTHER														
Cyanide (total)	ug/L	5.2	140	16,000	5	7 UJ	7 UJ	7 U	7 U	7 U	7 U	7 U	7 U	7 U
Cyanide (free)	ug/L	5.2	140	16,000	5	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U
FIELD PARAMETERS														
Temperature	°C	20	NV	NV	NV	28.47	28.8	28.68	28.87	31.68	31.26	31.26	30.88	35.43
Conductivity	uS/cm	NV	NV	NV	NV	310	300	290	290	270	260	260	260	270
pH	s.u.	6.0-9.0	NV	NV	6.5-9	8.44	8.5	8.82	8.87	9.19	9.26	9.26	9.24	9.18
ORP	mV	NV	NV	NV	NV	195.9	182.6	157	156.9	161.4	177.5	177.5	141.4	168.4
Turbidity	NTU	NV	NV	NV	NV	0	0	0	0	0.36	0.1	0.1	0.05	1.19
Dissolved Oxygen	mg/L	6.0 (min); 7.0 (avg	NV	NV	NV	7.22	7.5	9.35	9.85	12.59	13.13	13.13	13.03	11.16

[1]Screening criteria, where available, are based on the Virginia Chronic Water Quality Criteria (9 VAC 25-260-140) (updated June 5, 2017).

[2]Screening criteria is the Region III BTAG Aquatic Freshwater Screening Benchmarks (July 2006).

[3]Screening criteria based on hardness of 100 mg/L as $CaCO_3$.

[4]Screening criteria for Chromium 6 based on hardness of 100 mg/L as $CaCO_3$.

* applies to drinking water characteristics (taste, odor, etc.)

NV - No Value Available

= Detected value exceeds Screening Criteria.

PARSONS

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APPENDIX A
SAMPLING LOGS

PARSONS

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Low-Flow Test Report:

Test Date / Time: 7/25/2017 8:05:25 AM
Project: FMC 008 (4)
Operator Name: KTeague

Location Name: 008 **Well Diameter: 2 in** **Casing Type: PvC** **Screen Length: 5 ft** **Top of Screen: 11.5 ft** **Total Depth: 16.5 ft** **Initial Depth to Water: 13.45 ft**	**Pump Type: Peristaltic** **Pump Intake From TOC: 14 ft** **Flow Cell Volume: 130 ml** **Final Flow Rate: 100 ml/min** **Final Draw Down: 0 ft**	**Instrument Used: AquaTROLL 600** **Serial Number: 447417**

Test Notes:

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 10 %	+/- 3 %	+/- 10 %	+/- 10 %	+/- 10	+/- 5	
7/25/2017 8:05 AM	00:00	7.10 pH	20.29 °C	1,220.2 µS/cm	4.24 mg/L	11.20 NTU	215.4 mV	13.45 ft	100.00 ml/min

Samples

Sample ID:	Description:
FMC-008	

Low-Flow Test Report:

Test Date / Time: 7/29/2017 10:28:06 AM
Project: FMC 012 (2)
Operator Name: KTeague

Location Name: 012 **Well Diameter: 2 in** **Casing Type: PVC** **Screen Length: 10 ft** **Top of Screen: 27.59 ft** **Total Depth: 37.59 ft** **Initial Depth to Water: 16.55 ft**	**Pump Intake From TOC: 30 ft** **Estimated Total Volume Pumped: 6110 ml** **Flow Cell Volume: 130 ml** **Final Flow Rate: 100 ml/min** **Final Draw Down: 0.86 ft**	**Instrument Used: AquaTROLL 600** **Serial Number: 447417**

Test Notes:
Used method 2a.

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 10 %	+/- 3 %	+/- 10 %	+/- 10 %	+/- 10	+/- 5	
7/29/2017 10:28 AM	00:00	7.02 pH	21.45 °C	1.12 µS/cm	8.64 mg/L		92.7 mV	16.55 ft	100.00 ml/min
7/29/2017 10:29 AM	01:08	10.36 pH	20.74 °C	730.62 µS/cm	7.49 mg/L		53.6 mV	16.95 ft	100.00 ml/min
7/29/2017 10:34 AM	06:08	11.08 pH	19.08 °C	583.87 µS/cm	6.44 mg/L		6.4 mV	17.03 ft	100.00 ml/min
7/29/2017 10:39 AM	11:08	11.10 pH	18.64 °C	406.24 µS/cm	6.23 mg/L	2.43 NTU	-6.3 mV	17.19 ft	100.00 ml/min
7/29/2017 10:44 AM	16:07	11.07 pH	18.36 °C	464.25 µS/cm	6.25 mg/L	1.18 NTU	-0.5 mV	17.25 ft	100.00 ml/min
7/29/2017 10:49 AM	21:06	10.99 pH	18.23 °C	449.36 µS/cm	6.20 mg/L	1.24 NTU	6.3 mV	17.30 ft	100.00 ml/min
7/29/2017 10:54 AM	26:06	11.25 pH	18.14 °C	647.13 µS/cm	6.21 mg/L	2.63 NTU	-13.6 mV	17.35 ft	100.00 ml/min
7/29/2017 10:59 AM	31:07	8.74 pH	18.07 °C	845.98 µS/cm	4.00 mg/L	3.20 NTU	3.3 mV	17.40 ft	100.00 ml/min
7/29/2017 11:04 AM	36:07	7.58 pH	18.01 °C	1,035.5 µS/cm	1.42 mg/L	3.33 NTU	-21.3 mV	17.41 ft	100.00 ml/min
7/29/2017 11:09 AM	41:07	7.46 pH	18.04 °C	981.09 µS/cm	0.77 mg/L	2.04 NTU	-25.5 mV	17.41 ft	100.00 ml/min
7/29/2017 11:14 AM	46:07	7.39 pH	18.03 °C	1,036.6 µS/cm	0.61 mg/L	3.71 NTU	-23.6 mV	17.41 ft	100.00 ml/min
7/29/2017 11:19 AM	51:06	7.35 pH	18.05 °C	1,075.9 µS/cm	0.49 mg/L		-25.5 mV	17.41 ft	100.00 ml/min
7/29/2017 11:24 AM	56:06	7.35 pH	18.01 °C	1,070.5 µS/cm	0.45 mg/L	1.97 NTU	-24.7 mV	17.41 ft	100.00 ml/min
7/29/2017 11:29 AM	01:01:06	7.34 pH	18.11 °C	1,087.5 µS/cm	0.34 mg/L	1.58 NTU	-27.0 mV	17.41 ft	100.00 ml/min

Samples

Sample ID:	Description:
2017AN-012	Sample time: 1135

Created using VuSitu from In-Situ, Inc.

Low-Flow Test Report:

Test Date / Time: 7/29/2017 2:53:27 PM
Project: FMC 013 (2)
Operator Name:

Location Name: 013 **Well Diameter: 2 in** **Casing Type: PVC** **Screen Length: 10 ft** **Top of Screen: 27.37 ft** **Total Depth: 37.37 ft** **Initial Depth to Water: 24.57 ft**	**Pump Type: Peristaltic** **Pump Intake From TOC: 32 ft** **Estimated Total Volume Pumped: 2999.999 ml** **Flow Cell Volume: 130 ml** **Final Flow Rate: 100 ml/min** **Final Draw Down: 0.2 ft**	**Instrument Used: AquaTROLL 600** **Serial Number: 447417**

Test Notes:
Standard method.

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 10 %	+/- 3 %	+/- 10 %	+/- 10 %	+/- 10	+/- 5	
7/29/2017 2:53 PM	00:00	7.23 pH	24.52 °C	1,658.5 µS/cm	3.17 mg/L		-245.6 mV	24.57 ft	100.00 ml/min
7/29/2017 2:58 PM	05:00	6.84 pH	22.68 °C	1,708.9 µS/cm	1.04 mg/L		-90.9 mV	24.74 ft	100.00 ml/min
7/29/2017 3:03 PM	10:00	6.91 pH	22.33 °C	1,722.8 µS/cm	0.44 mg/L		-89.4 mV	24.75 ft	100.00 ml/min
7/29/2017 3:08 PM	15:00	6.94 pH	22.32 °C	1,721.5 µS/cm	0.35 mg/L		-94.6 mV	24.76 ft	100.00 ml/min
7/29/2017 3:13 PM	20:00	6.97 pH	22.30 °C	1,728.8 µS/cm	0.28 mg/L	10.10 NTU	-94.4 mV	24.76 ft	100.00 ml/min
7/29/2017 3:18 PM	25:00	6.99 pH	22.32 °C	1,725.6 µS/cm	0.29 mg/L	10.50 NTU	-94.4 mV	24.77 ft	100.00 ml/min
7/29/2017 3:23 PM	29:59	6.98 pH	22.34 °C	1,725.9 µS/cm	0.26 mg/L	11.00 NTU	-93.0 mV	24.77 ft	100.00 ml/min

Samples

Sample ID:	Description:
2017AN-013	Sampled at 1525. Standard method.

Low-Flow Test Report:

Test Date / Time: 7/30/2017 9:09:30 AM
Project: FMC 014R (2)
Operator Name: KTeague

Location Name: 014R **Well Diameter: 2 in** **Screen Length: 10 ft** **Top of Screen: 24.26 ft** **Total Depth: 34.26 ft** **Initial Depth to Water: 14.65 ft**	**Pump Type: Peristaltic** **Pump Intake From TOC: 29 ft** **Estimated Total Volume Pumped: 3000 ml** **Flow Cell Volume: 130 ml** **Final Flow Rate: 100 ml/min** **Final Draw Down: 1.26 ft**	**Instrument Used: AquaTROLL 600** **Serial Number: 447417**

Test Notes:
Method 2A

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 10 %	+/- 3 %	+/- 10 %	+/- 10 %	+/- 10	+/- 5	
7/30/2017 9:09 AM	00:00	7.18 pH	17.65 °C	5,064.2 µS/cm	0.73 mg/L		-141.2 mV	14.65 ft	100.00 ml/min
7/30/2017 9:14 AM	05:00	7.08 pH	17.54 °C	5,091.5 µS/cm	0.42 mg/L		-141.1 mV	15.57 ft	100.00 ml/min
7/30/2017 9:19 AM	09:59	7.09 pH	17.55 °C	5,076.2 µS/cm	0.34 mg/L	24.90 NTU	-139.9 mV	15.76 ft	100.00 ml/min
7/30/2017 9:24 AM	15:00	7.10 pH	17.47 °C	5,079.8 µS/cm	0.29 mg/L	25.50 NTU	-140.8 mV	15.81 ft	100.00 ml/min
7/30/2017 9:29 AM	20:00	7.10 pH	17.60 °C	5,062.5 µS/cm	0.27 mg/L	28.50 NTU	-141.9 mV	15.86 ft	100.00 ml/min
7/30/2017 9:34 AM	24:59	7.11 pH	17.61 °C	5,054.6 µS/cm	0.25 mg/L	28.40 NTU	-141.4 mV	15.89 ft	100.00 ml/min
7/30/2017 9:39 AM	29:59	7.12 pH	17.63 °C	5,050.6 µS/cm	0.25 mg/L	28.80 NTU	-141.5 mV	15.91 ft	100.00 ml/min

Samples

Sample ID:	Description:
2017AN-014R	Sampled at 9:40

Low-Flow Test Report:

Test Date / Time: 7/28/2017 1:52:32 PM
Project: FMC 022 (2)
Operator Name:

Location Name: 022 **Well Diameter: 2 in** **Screen Length: 5 ft** **Top of Screen: 4.9 ft** **Total Depth: 9.9 ft** **Initial Depth to Water: 9.6 ft**	**Estimated Total Volume Pumped: 0 ml** **Flow Cell Volume: 130 ml** **Final Flow Rate: 100 ml/min** **Final Draw Down: 0 ft**	**Instrument Used: AquaTROLL 600** **Serial Number: 447417**

Test Notes:
Sampled via Method 3.

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 10 %	+/- 3 %	+/- 10 %	+/- 10 %	+/- 10	+/- 5	
7/28/2017 1:52 PM	00:00	6.99 pH	25.77 °C	524.73 µS/cm	4.22 mg/L	50.80 NTU	-20.1 mV	292.61 cm	100.00 ml/min

Samples

Sample ID:	Description:
2017AN-022	Sampled at 1355

Created using VuSitu from In-Situ, Inc.

Low-Flow Test Report:

Test Date / Time: 7/28/2017 10:52:09 AM
Project: FMC 023 (2)
Operator Name: KTeague

Location Name: 023 **Well Diameter: 2 in** **Casing Type: PVC** **Screen Length: 3 ft** **Top of Screen: 4.6 ft** **Total Depth: 7.6 ft** **Initial Depth to Water: 6.5 ft**	**Pump Type: Peristaltic** **Pump Intake From TOC: 7 ft** **Flow Cell Volume: 130 ml** **Final Flow Rate: 100 ml/min** **Final Draw Down: 0 ft**	**Instrument Used: AquaTROLL 600** **Serial Number: 447417**

Test Notes:
Well purged dry and allowed to recharge via Method 3.

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 10 %	+/- 3 %	+/- 10 %	+/- 10 %	+/- 10	+/- 5	
7/28/2017 10:52 AM	00:00	7.44 pH	23.66 °C	1,477.5 µS/cm	5.96 mg/L	78.70 NTU	-46.0 mV	6.50 ft	100.00 ml/min

Samples

Sample ID:	Description:
2017AN-023	Sampled at 1055

Created using VuSitu from In-Situ, Inc.

Low-Flow Test Report:

Test Date / Time: 7/28/2017 8:46:21 AM
Project: FMC 024 (2)
Operator Name:

Location Name: 024 **Well Diameter: 2 in** **Casing Type: Pvc** **Screen Length: 10 ft** **Top of Screen: 6.25 ft** **Total Depth: 11.25 ft** **Initial Depth to Water: 7.8 ft**	**Estimated Total Volume Pumped: 128.332 ml** **Flow Cell Volume: 130 ml** **Final Flow Rate: 100 ml/min** **Final Draw Down: 0 ft**	**Instrument Used: AquaTROLL 600** **Serial Number: 447417**

Test Notes:

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 10 %	+/- 3 %	+/- 10 %	+/- 10 %	+/- 10	+/- 5	
7/28/2017 8:46 AM	00:00	7.60 pH	21.90 °C	2,395.8 µS/cm	4.25 mg/L		-185.2 mV	7.80 ft	100.00 ml/min
7/28/2017 8:47 AM	01:16	7.58 pH	21.32 °C	2,447.2 µS/cm	3.05 mg/L	25.20 NTU	-185.5 mV	7.80 ft	100.00 ml/min

Samples

Sample ID:	Description:
2017AN-024	08:50

Created using VuSitu from In-Situ, Inc.

PARSONS

Field Monitoring Record
Low-Flow (minimal drawdown)
GROUNDWATER SAMPLING

Client: FMC Front Royal
Site name: Front Royal, VA
Samplers: M. Harder / C. Brown
Sample Event #: 2017 AN
Well Condition: Good
Purge Start: 0920
Pump Type: Peristaltic

Date: 8/9/17
Wind:
Weather:
Air Temperature:
Meters Calibrated: Y
Purge Stop: 1000
Sample Style: Grab

Well #: 024
Initial DTW: 10.22
Pump Depth: NA
Total Well Depth: 11.3
Screen Depth: 6.3
Sample Time: 1000
Alternate Method: 3

TIME	FLOW RATE (ml/min)	DEPTH TO WATER (TOC, FT/M)	pH	SPECIFIC CONDUCTANCE (uS/cm)	TEMP (C)	D.O. (MG/L)	ORP (MV)	TURBIDITY (NTU)	APPEARANCE (COLOR, CLARITY, SOLIDS)	COMMENTS
	Parameter Stability Values over 3 Consecutive Readings									
	100 to 500 ml/min	<0.33 Feet	+ 0.1 -	+ 3% -	+10% -	+10% -	+10 mV -	+10% -		
0920	—	10.22	Purged Dry							
1000			7.3	2.34	22.24	2.9	-1.7	2.88	clear	Sampled

Chain of custody # FR-1702

Low-Flow Test Report:

Test Date / Time: 7/28/2017 7:48:32 AM
Project: FMC 025R (2)
Operator Name: KTeague

Location Name: 025R **Well Diameter: 2 in** **Casing Type: PVC** **Screen Length: 2 ft** **Top of Screen: 4.99 ft** **Total Depth: 6.99 ft** **Initial Depth to Water: 7.22 ft**	**Pump Type: Peristaltic** **Pump Intake From TOC: 7 ft** **Flow Cell Volume: 130 ml** **Final Flow Rate: 100 ml/min** **Final Draw Down: 0.05 ft**	**Instrument Used: AquaTROLL 600** **Serial Number: 447417**

Test Notes:

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 10 %	+/- 3 %	+/- 10 %	+/- 10 %	+/- 10	+/- 5	
7/28/2017 7:48 AM	00:00	7.58 pH	21.17 °C	0.47 µS/cm	7.47 mg/L		73.7 mV	7.22 ft	100.00 ml/min
7/28/2017 7:53 AM	04:59	7.19 pH	21.72 °C	1,393.6 µS/cm	0.31 mg/L		-203.3 mV	7.27 ft	100.00 ml/min
7/28/2017 7:56 AM	07:48	7.24 pH	21.82 °C	1,413.5 µS/cm	0.22 mg/L	16.70 NTU	-222.2 mV	7.27 ft	100.00 ml/min
7/28/2017 8:01 AM	12:48	7.27 pH	21.95 °C	1,452.0 µS/cm	0.19 mg/L	8.23 NTU	-249.6 mV	7.27 ft	100.00 ml/min
7/28/2017 8:06 AM	17:48	7.27 pH	22.05 °C	1,475.3 µS/cm	0.15 mg/L	6.05 NTU	-260.3 mV	7.27 ft	100.00 ml/min
7/28/2017 8:11 AM	22:48	7.27 pH	22.13 °C	1,496.9 µS/cm	0.14 mg/L	3.77 NTU	-267.8 mV	7.27 ft	100.00 ml/min
7/28/2017 8:16 AM	27:48	7.31 pH	22.25 °C	1,513.9 µS/cm	0.13 mg/L	4.07 NTU	-268.2 mV	7.27 ft	100.00 ml/min

Samples

Sample ID:	Description:
2017AN-025R	Sampled at 0820

Low-Flow Test Report:

Test Date / Time: 7/25/2017 4:59:01 PM
Project: FMC 029 (2)
Operator Name: KTeague

Location Name: 029 **Well Diameter: 2 in** **Casing Type: PVC** **Screen Length: 10 ft** **Top of Screen: 11 ft** **Total Depth: 22 ft** **Initial Depth to Water: 12.39 ft**	**Pump Type: Peristaltic** **Flow Cell Volume: 130 ml** **Final Flow Rate: 150 ml/min** **Final Draw Down: 0.01 ft**	**Instrument Used: AquaTROLL 600** **Serial Number: 447417**

Test Notes:

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 10 %	+/- 3 %	+/- 10 %	+/- 10 %	+/- 10	+/- 5	
7/25/2017 4:59 PM	00:00	8.04 pH	30.38 °C	0.42 µS/cm	7.45 mg/L		14.8 mV	12.39 ft	150.00 ml/min
7/25/2017 4:59 PM	00:54	8.03 pH	30.34 °C	0.42 µS/cm	7.46 mg/L		15.8 mV	12.39 ft	150.00 ml/min
7/25/2017 5:04 PM	05:55	7.11 pH	25.76 °C	1,136.1 µS/cm	0.81 mg/L	10.20 NTU	85.9 mV	12.39 ft	150.00 ml/min
7/25/2017 5:09 PM	10:55	7.01 pH	24.18 °C	1,143.6 µS/cm	0.40 mg/L		103.3 mV	12.39 ft	150.00 ml/min
7/25/2017 5:14 PM	15:54	6.86 pH	23.68 °C	1,144.1 µS/cm	0.35 mg/L	5.05 NTU	114.8 mV	12.40 ft	150.00 ml/min
7/25/2017 5:19 PM	20:55	6.77 pH	24.01 °C	1,148.3 µS/cm	0.34 mg/L	5.14 NTU	118.1 mV	12.40 ft	150.00 ml/min
7/25/2017 5:24 PM	25:55	6.81 pH	24.15 °C	1,137.2 µS/cm	0.32 mg/L	1.97 NTU	114.7 mV	12.40 ft	150.00 ml/min

Samples

Sample ID:	Description:
FMC-029	

Low-Flow Test Report:

Test Date / Time: 7/25/2017 10:54:01 AM
Project: FMC 103 (2)
Operator Name:

Location Name: 103 **Well Diameter: 4 in** **Screen Length: 16 ft** **Top of Screen: 23.95 ft** **Total Depth: 39.95 ft** **Initial Depth to Water: 0.94 ft**	**Estimated Total Volume Pumped: 9999.999 ml** **Flow Cell Volume: 130 ml** **Final Flow Rate: 200 ml/min** **Final Draw Down: 0 ft**	**Instrument Used: AquaTROLL 600** **Serial Number: 468828**

Test Notes:
Standard method with peristaltic pump

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 10 %	+/- 3 %	+/- 10 %	+/- 10 %	+/- 10	+/- 0.33	
7/25/2017 10:54 AM	00:00	6.75 pH	23.11 °C	2,876.8 µS/cm	0.82 mg/L		-98.6 mV	0.94 ft	200.00 ml/min
7/25/2017 10:59 AM	04:59	6.71 pH	21.42 °C	3,006.7 µS/cm	0.21 mg/L	13.20 NTU	-82.2 mV	0.94 ft	200.00 ml/min
7/25/2017 11:04 AM	09:59	6.71 pH	21.13 °C	3,037.9 µS/cm	0.19 mg/L	8.51 NTU	-83.0 mV	0.94 ft	200.00 ml/min
7/25/2017 11:09 AM	14:59	6.70 pH	20.80 °C	3,049.5 µS/cm	0.16 mg/L	8.70 NTU	-78.5 mV	0.94 ft	200.00 ml/min
7/25/2017 11:14 AM	20:00	6.70 pH	20.55 °C	3,064.7 µS/cm	0.16 mg/L	8.11 NTU	-78.0 mV	0.94 ft	200.00 ml/min
7/25/2017 11:19 AM	25:00	6.70 pH	20.40 °C	3,060.9 µS/cm	0.15 mg/L	6.33 NTU	-76.2 mV	0.94 ft	200.00 ml/min
7/25/2017 11:24 AM	30:00	6.69 pH	20.34 °C	3,053.1 µS/cm	0.14 mg/L	2.14 NTU	-78.4 mV	0.94 ft	200.00 ml/min
7/25/2017 11:29 AM	35:00	6.67 pH	20.44 °C	3,068.4 µS/cm	0.14 mg/L	1.41 NTU	-76.5 mV	0.94 ft	200.00 ml/min
7/25/2017 11:34 AM	39:59	6.64 pH	20.46 °C	3,064.0 µS/cm	0.14 mg/L	0.82 NTU	-73.6 mV	0.94 ft	200.00 ml/min
7/25/2017 11:39 AM	45:00	6.61 pH	20.17 °C	3,046.8 µS/cm	0.14 mg/L	0.88 NTU	-70.4 mV	0.94 ft	200.00 ml/min
7/25/2017 11:44 AM	49:59	6.57 pH	20.19 °C	3,064.6 µS/cm	0.14 mg/L	0.82 NTU	-66.6 mV	0.94 ft	200.00 ml/min

Samples

Sample ID:	Description:
2017AN-103	Sample time 11:50

Created using VuSitu from In-Situ, Inc.

Low-Flow Test Report:

Test Date / Time: 7/29/2017 2:04:09 PM
Project: FMC 105 (2)
Operator Name:

Location Name: 105 **Well Diameter: 4 in** **Screen Length: 11 ft** **Top of Screen: 40.49 ft** **Total Depth: 51.49 ft** **Initial Depth to Water: 33.25 ft**	**Estimated Total Volume Pumped: 4198.001 ml** **Flow Cell Volume: 130 ml** **Final Flow Rate: 120 ml/min** **Final Draw Down: 0.01 ft**	**Instrument Used: AquaTROLL 600** **Serial Number: 468828**

Test Notes:
Standard method

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 10 %	+/- 3 %	+/- 10 %	+/- 10 %	+/- 10	+/- 0.33	
7/29/2017 2:04 PM	00:00	7.38 pH	19.26 °C	2,120.6 µS/cm	4.75 mg/L		-88.7 mV	33.25 ft	120.00 ml/min
7/29/2017 2:09 PM	05:00	7.44 pH	18.78 °C	2,395.6 µS/cm	0.58 mg/L	13.80 NTU	-139.8 mV	33.25 ft	120.00 ml/min
7/29/2017 2:14 PM	10:00	7.44 pH	19.23 °C	2,396.2 µS/cm	0.41 mg/L	13.40 NTU	-145.3 mV	33.25 ft	120.00 ml/min
7/29/2017 2:19 PM	15:00	7.45 pH	19.25 °C	2,391.8 µS/cm	0.26 mg/L	14.30 NTU	-149.7 mV	33.25 ft	120.00 ml/min
7/29/2017 2:24 PM	20:00	7.45 pH	19.07 °C	2,375.6 µS/cm	0.24 mg/L	14.90 NTU	-152.3 mV	33.25 ft	120.00 ml/min
7/29/2017 2:29 PM	24:59	7.45 pH	19.15 °C	2,373.5 µS/cm	0.22 mg/L	15.00 NTU	-154.0 mV	33.26 ft	120.00 ml/min
7/29/2017 2:34 PM	29:59	7.46 pH	19.14 °C	2,363.4 µS/cm	0.22 mg/L	15.00 NTU	-155.8 mV	33.26 ft	120.00 ml/min
7/29/2017 2:39 PM	34:59	7.46 pH	19.25 °C	2,362.3 µS/cm	0.21 mg/L	15.30 NTU	-157.0 mV	33.26 ft	120.00 ml/min

Samples

Sample ID:	Description:
2017AN-105	Sample time 14:45

Low-Flow Test Report:

Test Date / Time: 8/8/2017 3:31:23 PM
Project: FMC 105 (2)
Operator Name: Harder

Location Name: 105 **Well Diameter: 4 in** **Casing Type: Steel** **Screen Length: 11 ft** **Top of Screen: 40.49 ft** **Total Depth: 51.49 ft** **Initial Depth to Water: 33.19 ft**	**Pump Type: DV** **Tubing Type: Pvc** **Pump Intake From TOC: 46 ft** **Estimated Total Volume Pumped: 21480.002 ml** **Flow Cell Volume: 130 ml** **Final Flow Rate: 200 ml/min** **Final Draw Down: 0.09 ft**	**Instrument Used: AquaTROLL 600** **Serial Number: 468828**

Test Notes:

Weather Conditions:
Sunny 85

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 10 %	+/- 3 %	+/- 10 %	+/- 10 %	+/- 10	+/- 0.33	
8/8/2017 3:31 PM	00:00	7.43 pH	23.99 °C	1,850.2 µS/cm	0.58 mg/L		-286.2 mV	33.19 ft	200.00 ml/min
8/8/2017 3:36 PM	04:59	7.41 pH	21.62 °C	1,896.4 µS/cm	0.26 mg/L		-280.2 mV	33.28 ft	200.00 ml/min
8/8/2017 3:41 PM	09:59	7.42 pH	20.86 °C	1,936.4 µS/cm	0.17 mg/L		-243.0 mV	33.28 ft	200.00 ml/min
8/8/2017 3:46 PM	15:00	7.40 pH	20.73 °C	1,934.0 µS/cm	0.15 mg/L		-226.0 mV	33.28 ft	200.00 ml/min
8/8/2017 3:48 PM	17:27	7.38 pH	20.87 °C	1,939.3 µS/cm	0.14 mg/L		-237.2 mV	33.28 ft	200.00 ml/min
8/8/2017 3:53 PM	22:28	7.31 pH	20.40 °C	1,900.6 µS/cm	0.12 mg/L		-241.4 mV	33.28 ft	200.00 ml/min
8/8/2017 3:58 PM	27:28	7.24 pH	20.29 °C	1,953.8 µS/cm	0.12 mg/L		-206.3 mV	33.28 ft	200.00 ml/min
8/8/2017 4:03 PM	32:27	7.20 pH	20.35 °C	1,954.3 µS/cm	0.12 mg/L		-210.2 mV	33.28 ft	200.00 ml/min
8/8/2017 4:08 PM	37:27	7.17 pH	20.58 °C	1,952.8 µS/cm	0.11 mg/L		-225.6 mV	33.28 ft	200.00 ml/min
8/8/2017 4:13 PM	42:26	7.18 pH	20.15 °C	1,948.5 µS/cm	0.10 mg/L		-208.1 mV	33.28 ft	200.00 ml/min
8/8/2017 4:18 PM	47:26	7.19 pH	19.95 °C	1,959.2 µS/cm	0.11 mg/L		-203.3 mV	33.28 ft	200.00 ml/min
8/8/2017 4:23 PM	52:26	7.20 pH	20.34 °C	1,965.7 µS/cm	0.09 mg/L		-223.9 mV	33.28 ft	200.00 ml/min
8/8/2017 4:28 PM	57:26	7.23 pH	19.50 °C	1,952.3 µS/cm	0.08 mg/L		-225.3 mV	33.28 ft	200.00 ml/min

8/8/2017 4:33 PM	01:02:25	7.23 pH	19.25 °C	1,974.3 µS/cm	0.08 mg/L		-209.8 mV	33.28 ft	200.00 ml/min
8/8/2017 4:38 PM	01:07:25	7.23 pH	18.78 °C	1,964.5 µS/cm	0.09 mg/L		-221.2 mV	33.28 ft	200.00 ml/min
8/8/2017 4:43 PM	01:12:25	7.24 pH	18.55 °C	1,975.5 µS/cm	0.07 mg/L		-234.4 mV	33.28 ft	200.00 ml/min
8/8/2017 4:48 PM	01:17:24	7.25 pH	18.44 °C	1,974.1 µS/cm	0.07 mg/L		-219.7 mV	33.28 ft	200.00 ml/min
8/8/2017 4:53 PM	01:22:24	7.25 pH	18.47 °C	1,981.7 µS/cm	0.07 mg/L		-222.0 mV	33.28 ft	200.00 ml/min
8/8/2017 4:58 PM	01:27:24	7.27 pH	19.26 °C	1,981.5 µS/cm	0.07 mg/L		-236.6 mV	33.28 ft	200.00 ml/min
8/8/2017 5:03 PM	01:32:24	7.25 pH	19.42 °C	1,950.4 µS/cm	0.06 mg/L		-229.5 mV	33.28 ft	200.00 ml/min
8/8/2017 5:08 PM	01:37:24	7.25 pH	19.49 °C	1,976.3 µS/cm	0.06 mg/L		-225.1 mV	33.28 ft	200.00 ml/min
8/8/2017 5:13 PM	01:42:23	7.25 pH	19.49 °C	1,970.3 µS/cm	0.06 mg/L		-236.7 mV	33.28 ft	200.00 ml/min
8/8/2017 5:18 PM	01:47:24	7.22 pH	21.06 °C	2,044.5 µS/cm	0.14 mg/L		-237.7 mV	33.28 ft	200.00 ml/min

Samples

Sample ID:	Description:
105	

Low-Flow Test Report:

Test Date / Time: 7/25/2017 8:50:23 AM
Project: FMC 108 (2)
Operator Name: KTeague

Location Name: 108 **Well Diameter: 4 in** **Casing Type: PVC** **Screen Length: 20 ft** **Top of Screen: 25 ft** **Total Depth: 45 ft** **Initial Depth to Water: 13.09 ft**	**Pump Type: Peristaltic** **Pump Intake From TOC: 35 ft** **Estimated Total Volume Pumped: 3 gal** **Flow Cell Volume: 130 ml** **Final Flow Rate: 100 ml/min** **Final Draw Down: 0.3 ft**	**Instrument Used: AquaTROLL 600** **Serial Number: 447417**

Test Notes:

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 10 %	+/- 3 %	+/- 10 %	+/- 10 %	+/- 10	+/- 5	
7/25/2017 8:50 AM	00:00	7.26 pH	20.59 °C	1,076.8 µS/cm	1.12 mg/L	61.25 NTU	15.7 mV	13.23 ft	100.00 ml/min
7/25/2017 8:55 AM	04:59	7.27 pH	20.76 °C	553.17 µS/cm	2.54 mg/L	59.10 NTU	-0.3 mV	13.30 ft	100.00 ml/min
7/25/2017 9:00 AM	09:59	7.27 pH	20.94 °C	629.40 µS/cm	2.46 mg/L	56.20 NTU	4.3 mV	13.35 ft	100.00 ml/min
7/25/2017 9:05 AM	14:59	7.27 pH	21.12 °C	135.32 µS/cm	3.43 mg/L	57.00 NTU	-2.5 mV	13.37 ft	100.00 ml/min
7/25/2017 9:10 AM	19:58	7.27 pH	21.19 °C	84.53 µS/cm	3.84 mg/L	53.50 NTU	-6.4 mV	13.37 ft	100.00 ml/min
7/25/2017 9:15 AM	24:58	7.28 pH	21.25 °C	72.50 µS/cm	3.24 mg/L	103.00 NTU	-9.7 mV	13.37 ft	100.00 ml/min
7/25/2017 9:20 AM	29:58	7.27 pH	21.85 °C	72.07 µS/cm	2.67 mg/L	236.00 NTU	-2.8 mV	13.37 ft	100.00 ml/min
7/25/2017 9:25 AM	34:58	7.27 pH	22.10 °C	46.86 µS/cm	2.55 mg/L	107.00 NTU	-1.1 mV	13.37 ft	100.00 ml/min
7/25/2017 9:30 AM	39:58	7.31 pH	22.07 °C	980.08 µS/cm	2.50 mg/L		-19.9 mV	13.37 ft	100.00 ml/min
7/25/2017 9:35 AM	44:58	7.34 pH	22.29 °C	755.47 µS/cm	2.37 mg/L	66.00 NTU	-29.5 mV	13.37 ft	100.00 ml/min
7/25/2017 9:40 AM	49:57	7.36 pH	22.57 °C	515.38 µS/cm	2.32 mg/L		-32.8 mV	13.39 ft	100.00 ml/min
7/25/2017 9:45 AM	54:57	7.36 pH	22.69 °C	46.71 µS/cm	2.25 mg/L	46.40 NTU	-27.3 mV	13.39 ft	100.00 ml/min
7/25/2017 9:50 AM	59:57	7.35 pH	22.86 °C	42.42 µS/cm	2.13 mg/L	43.20 NTU	-30.7 mV	13.39 ft	100.00 ml/min
7/25/2017 9:55 AM	01:04:56	7.39 pH	22.66 °C	1,021.3 µS/cm	0.60 mg/L	34.80 NTU	-36.0 mV	13.39 ft	100.00 ml/min
7/25/2017 10:00 AM	01:09:56	7.40 pH	22.82 °C	865.30 µS/cm	0.41 mg/L		-37.1 mV	13.39 ft	100.00 ml/min
7/25/2017 10:05 AM	01:14:56	7.43 pH	22.62 °C	677.62 µS/cm	0.34 mg/L	34.80 NTU	-37.3 mV	13.39 ft	100.00 ml/min

7/25/2017 10:10 AM	01:19:56	7.44 pH	22.56 °C	557.88 µS/cm	0.30 mg/L	70.90 NTU	-34.6 mV	13.39 ft	100.00 ml/min
7/25/2017 10:15 AM	01:24:55	7.44 pH	22.59 °C	468.41 µS/cm	0.29 mg/L		-31.3 mV	13.39 ft	100.00 ml/min
7/25/2017 10:20 AM	01:29:55	7.44 pH	22.47 °C	30.45 µS/cm	0.29 mg/L	65.40 NTU	-34.7 mV	13.39 ft	100.00 ml/min
7/25/2017 10:25 AM	01:34:55	7.43 pH	22.56 °C	20.42 µS/cm	0.28 mg/L	68.10 NTU	-41.4 mV	13.39 ft	100.00 ml/min
7/25/2017 10:30 AM	01:39:55	7.42 pH	22.72 °C	5.81 µS/cm	0.26 mg/L	65.50 NTU	-34.6 mV	13.39 ft	100.00 ml/min
7/25/2017 10:35 AM	01:44:55	7.47 pH	22.52 °C	769.39 µS/cm	0.27 mg/L	69.80 NTU	-42.5 mV	13.39 ft	100.00 ml/min
7/25/2017 10:40 AM	01:49:55	7.47 pH	22.73 °C	589.18 µS/cm	0.26 mg/L	59.50 NTU	-44.4 mV	13.39 ft	100.00 ml/min
7/25/2017 10:45 AM	01:54:55	7.49 pH	22.67 °C	679.86 µS/cm	0.29 mg/L		-44.3 mV	13.39 ft	100.00 ml/min
7/25/2017 10:45 AM	01:55:14	7.49 pH	22.66 °C	627.79 µS/cm	0.29 mg/L		-44.2 mV	13.39 ft	100.00 ml/min
7/25/2017 10:50 AM	02:00:14	7.47 pH	22.77 °C	1,075.2 µS/cm	0.34 mg/L	64.40 NTU	-44.0 mV	13.39 ft	100.00 ml/min
7/25/2017 10:55 AM	02:05:13	7.48 pH	22.78 °C	745.77 µS/cm	0.28 mg/L	79.70 NTU	-45.0 mV	13.39 ft	100.00 ml/min
7/25/2017 11:00 AM	02:10:13	7.52 pH	22.14 °C	1,003.8 µS/cm	0.25 mg/L		-45.2 mV	13.39 ft	100.00 ml/min
7/25/2017 11:05 AM	02:15:13	7.49 pH	21.90 °C	892.37 µS/cm	0.46 mg/L	66.60 NTU	-44.5 mV	13.39 ft	100.00 ml/min
7/25/2017 11:10 AM	02:20:13	7.46 pH	21.94 °C	649.50 µS/cm	0.49 mg/L	76.20 NTU	-44.8 mV	13.39 ft	100.00 ml/min
7/25/2017 11:15 AM	02:25:13	7.44 pH	21.88 °C	651.27 µS/cm	0.37 mg/L	55.70 NTU	-43.5 mV	13.39 ft	100.00 ml/min
7/25/2017 11:20 AM	02:30:13	7.43 pH	21.57 °C	476.59 µS/cm	0.30 mg/L	57.30 NTU	-45.4 mV	13.39 ft	100.00 ml/min
7/25/2017 11:25 AM	02:35:13	7.40 pH	21.49 °C	401.26 µS/cm	0.28 mg/L	46.00 NTU	-50.2 mV	13.39 ft	100.00 ml/min
7/25/2017 11:30 AM	02:40:12	7.39 pH	21.60 °C	63.11 µS/cm	0.29 mg/L	49.80 NTU	-52.9 mV	13.39 ft	100.00 ml/min
7/25/2017 11:35 AM	02:45:12	7.36 pH	22.06 °C	56.31 µS/cm	0.27 mg/L	52.70 NTU	-50.2 mV	13.39 ft	100.00 ml/min
7/25/2017 11:40 AM	02:50:12	7.37 pH	21.85 °C	1,039.6 µS/cm	0.30 mg/L		-49.0 mV	13.39 ft	100.00 ml/min
7/25/2017 11:45 AM	02:55:12	7.38 pH	21.73 °C	675.58 µS/cm	0.32 mg/L		-48.5 mV	13.39 ft	100.00 ml/min

Samples

Sample ID:	Description:
FMC-108	

Low-Flow Test Report:

Test Date / Time: 7/27/2017 8:24:05 AM
Project: FMC 110 (2)
Operator Name: KTeague

Location Name: 110 **Well Diameter: 4 in** **Casing Type: Steel** **Screen Length: 21 ft** **Top of Screen: 19.25 ft** **Total Depth: 40.25 ft** **Initial Depth to Water: 9.35 ft**	**Pump Type: Peristaltic** **Pump Intake From TOC: 31 ft** **Estimated Total Volume Pumped: 7838 ml** **Flow Cell Volume: 130 ml** **Final Flow Rate: 120 ml/min** **Final Draw Down: 1.42 ft**	**Instrument Used: AquaTROLL 600** **Serial Number: 447417**

Test Notes:

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 10 %	+/- 3 %	+/- 10 %	+/- 10 %	+/- 10	+/- 5	
7/27/2017 8:24 AM	00:00	8.85 pH	21.45 °C	0.44 µS/cm	10.91 mg/L		120.5 mV	9.35 ft	200.00 ml/min
7/27/2017 8:29 AM	04:59	8.83 pH	21.66 °C	0.44 µS/cm	10.86 mg/L		118.8 mV	9.90 ft	200.00 ml/min
7/27/2017 8:30 AM	06:12	8.82 pH	21.71 °C	0.44 µS/cm	10.85 mg/L		118.5 mV	10.50 ft	200.00 ml/min
7/27/2017 8:35 AM	11:11	8.80 pH	21.89 °C	0.44 µS/cm	10.82 mg/L	36.40 NTU	117.0 mV	10.73 ft	200.00 ml/min
7/27/2017 8:40 AM	16:11	7.92 pH	19.17 °C	2,199.6 µS/cm	0.84 mg/L		-48.5 mV	10.73 ft	200.00 ml/min
7/27/2017 8:45 AM	21:11	7.85 pH	18.19 °C	2,243.9 µS/cm	0.29 mg/L		-35.4 mV	10.75 ft	120.00 ml/min
7/27/2017 8:50 AM	26:11	7.80 pH	17.96 °C	2,251.3 µS/cm	0.26 mg/L		-34.9 mV	10.75 ft	120.00 ml/min
7/27/2017 8:55 AM	31:11	7.75 pH	18.04 °C	2,265.0 µS/cm	0.21 mg/L	30.80 NTU	-34.9 mV	10.76 ft	120.00 ml/min
7/27/2017 9:00 AM	36:11	7.75 pH	17.83 °C	2,263.5 µS/cm	0.19 mg/L	21.30 NTU	-35.6 mV	10.76 ft	120.00 ml/min
7/27/2017 9:05 AM	41:11	7.73 pH	17.86 °C	2,273.5 µS/cm	0.18 mg/L	16.20 NTU	-34.6 mV	10.77 ft	120.00 ml/min
7/27/2017 9:10 AM	46:11	7.73 pH	17.84 °C	2,262.8 µS/cm	0.17 mg/L	18.50 NTU	-35.6 mV	10.77 ft	120.00 ml/min
7/27/2017 9:15 AM	51:10	7.71 pH	17.85 °C	2,273.2 µS/cm	0.17 mg/L	19.60 NTU	-35.5 mV	10.77 ft	120.00 ml/min

Samples

Sample ID:	Description:

FMC-110	

Created using VuSitu from In-Situ, Inc.

Low-Flow Test Report:

Test Date / Time: 2/1/2018 2:26:59 PM
Project:
Operator Name:

Location Name: 110R	**Flow Cell Volume: 130 ml** **Final Flow Rate: 100 ml/min**	**Instrument Used: Aqua TROLL 600** **Serial Number: 468828**

Test Notes:

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 0.5	+/- 3 %	+/- 0.3	+/- 10	+/- 10	+/- 0.33	
2/1/2018 2:26 PM	00:00	7.20 pH	13.80 °C	1,969.5 µS/cm	1.55 mg/L		-104.3 mV	9.28 ft	100.00 ml/min
2/1/2018 2:31 PM	05:00	7.18 pH	13.85 °C	1,990.0 µS/cm	0.43 mg/L	24.90 NTU	-103.8 mV	9.98 ft	100.00 ml/min
2/1/2018 2:36 PM	10:00	7.18 pH	13.83 °C	1,978.9 µS/cm	0.37 mg/L	29.30 NTU	-102.5 mV	10.12 ft	100.00 ml/min
2/1/2018 2:41 PM	15:00	7.18 pH	13.71 °C	1,981.7 µS/cm	0.33 mg/L	21.10 NTU	-101.5 mV	10.20 ft	100.00 ml/min
2/1/2018 2:46 PM	20:00	7.18 pH	13.64 °C	1,979.5 µS/cm	0.30 mg/L	16.70 NTU	-101.0 mV	10.32 ft	100.00 ml/min
2/1/2018 2:51 PM	25:00	7.18 pH	13.53 °C	1,979.0 µS/cm	0.28 mg/L	15.60 NTU	-100.5 mV	10.35 ft	100.00 ml/min

Samples

Sample ID:	Description:

Created using VuSitu from In-Situ, Inc.

Low-Flow Test Report:

Test Date / Time: 7/29/2017 1:32:14 PM
Project: FMC 112 (2)
Operator Name: KTeague

Location Name: 112 **Well Diameter: 4 in** **Casing Type: PVC** **Screen Length: 20 ft** **Top of Screen: 45.54 ft** **Total Depth: 65.54 ft** **Initial Depth to Water: 15.55 ft**	**Pump Type: Peristaltic** **Pump Intake From TOC: 55 ft** **Estimated Total Volume Pumped: 5120.001 ml** **Flow Cell Volume: 130 ml** **Final Flow Rate: 100 ml/min** **Final Draw Down: -0.05 ft**	**Instrument Used: AquaTROLL 600** **Serial Number: 447417**

Test Notes:
Standard method. DO was low so considered stable within 0.1

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 10 %	+/- 3 %	+/- 10 %	+/- 10 %	+/- 10	+/- 5	
7/29/2017 1:32 PM	00:00	11.98 pH	21.04 °C	1,622.6 µS/cm	4.96 mg/L		7.4 mV	15.45 ft	100.00 ml/min
7/29/2017 1:33 PM	01:13	12.39 pH	20.50 °C	1,822.7 µS/cm	2.87 mg/L		-87.2 mV	15.47 ft	100.00 ml/min
7/29/2017 1:38 PM	06:13	12.56 pH	18.77 °C	2,019.3 µS/cm	0.69 mg/L	4.70 NTU	-148.0 mV	15.47 ft	100.00 ml/min
7/29/2017 1:43 PM	11:13	12.57 pH	18.25 °C	2,034.8 µS/cm	0.48 mg/L		-167.8 mV	15.48 ft	100.00 ml/min
7/29/2017 1:48 PM	16:13	12.60 pH	18.27 °C	2,043.4 µS/cm	0.44 mg/L		-181.2 mV	15.48 ft	100.00 ml/min
7/29/2017 1:53 PM	21:13	12.62 pH	18.31 °C	2,046.6 µS/cm	0.39 mg/L	4.27 NTU	-189.9 mV	15.50 ft	100.00 ml/min
7/29/2017 1:58 PM	26:13	12.64 pH	18.32 °C	2,045.2 µS/cm	0.34 mg/L		-195.7 mV	15.50 ft	100.00 ml/min
7/29/2017 2:03 PM	31:13	12.66 pH	18.38 °C	2,047.0 µS/cm	0.30 mg/L	4.33 NTU	-201.2 mV	15.50 ft	100.00 ml/min
7/29/2017 2:08 PM	36:13	12.66 pH	18.71 °C	2,057.1 µS/cm	0.28 mg/L	4.69 NTU	-207.7 mV	15.50 ft	100.00 ml/min
7/29/2017 2:13 PM	41:12	12.67 pH	19.09 °C	2,056.3 µS/cm	0.27 mg/L	4.07 NTU	-212.6 mV	15.50 ft	100.00 ml/min
7/29/2017 2:18 PM	46:12	12.68 pH	19.20 °C	2,047.2 µS/cm	0.25 mg/L	3.84 NTU	-215.6 mV	15.50 ft	100.00 ml/min
7/29/2017 2:23 PM	51:12	12.69 pH	19.33 °C	2,043.9 µS/cm	0.24 mg/L	3.69 NTU	-218.3 mV	15.50 ft	100.00 ml/min

Samples

Sample ID:	Description:

2017AN-112	Sampled at 1425

Created using VuSitu from In-Situ, Inc.

Low-Flow Test Report:

Test Date / Time: 7/25/2017 2:03:07 PM
Project: FMC 113 (2)
Operator Name: KTeague

Location Name: 113 **Well Diameter: 4 in** **Casing Type: 4** **Screen Length: 20 ft** **Top of Screen: 44.8 ft** **Total Depth: 64.8 ft** **Initial Depth to Water: 19.26 ft**	**Pump Type: Peristaltic** **Pump Intake From TOC: 55 ft** **Estimated Total Volume Pumped: 2 gal** **Flow Cell Volume: 130 ml** **Final Flow Rate: 120 ml/min** **Final Draw Down: 2.5 ft**	**Instrument Used: AquaTROLL 600** **Serial Number: 447417**

Test Notes:

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 10 %	+/- 3 %	+/- 10 %	+/- 10 %	+/- 10	+/- 5	
7/25/2017 2:03 PM	00:00	8.30 pH	21.79 °C	595.63 µS/cm	0.41 mg/L		-177.7 mV	19.70 ft	120.00 ml/min
7/25/2017 2:08 PM	05:00	8.35 pH	22.23 °C	618.91 µS/cm	0.33 mg/L	87.70 NTU	-171.5 mV	19.85 ft	120.00 ml/min
7/25/2017 2:13 PM	10:00	8.31 pH	23.19 °C	511.20 µS/cm	0.29 mg/L	87.50 NTU	-170.1 mV	19.94 ft	120.00 ml/min
7/25/2017 2:18 PM	15:00	8.35 pH	23.65 °C	383.57 µS/cm	0.25 mg/L	93.90 NTU	-163.6 mV	20.04 ft	120.00 ml/min
7/25/2017 2:23 PM	19:59	8.42 pH	23.92 °C	333.65 µS/cm	0.34 mg/L	108.00 NTU	-165.6 mV	20.16 ft	120.00 ml/min
7/25/2017 2:28 PM	24:59	8.46 pH	23.95 °C	200.12 µS/cm	0.39 mg/L	117.00 NTU	-168.5 mV	20.28 ft	120.00 ml/min
7/25/2017 2:33 PM	30:00	8.46 pH	23.80 °C	483.50 µS/cm	0.32 mg/L	90.40 NTU	-167.6 mV	20.40 ft	120.00 ml/min
7/25/2017 2:38 PM	34:59	8.48 pH	24.06 °C	2.77 µS/cm	0.34 mg/L	78.50 NTU	-170.9 mV	20.52 ft	120.00 ml/min
7/25/2017 2:43 PM	40:00	8.50 pH	24.38 °C	2.93 µS/cm	0.49 mg/L	53.00 NTU	-169.6 mV	20.62 ft	120.00 ml/min
7/25/2017 2:48 PM	44:59	8.53 pH	24.52 °C	3.23 µS/cm	0.22 mg/L	54.60 NTU	-176.5 mV	20.71 ft	120.00 ml/min
7/25/2017 2:53 PM	49:59	8.56 pH	24.84 °C	3.15 µS/cm	0.44 mg/L	33.60 NTU	-171.4 mV	20.80 ft	120.00 ml/min
7/25/2017 2:58 PM	54:59	8.56 pH	24.30 °C	605.57 µS/cm	0.23 mg/L	36.00 NTU	-177.8 mV	20.89 ft	120.00 ml/min
7/25/2017 3:03 PM	59:59	8.58 pH	23.92 °C	620.85 µS/cm	0.24 mg/L	31.30 NTU	-175.5 mV	21.00 ft	120.00 ml/min
7/25/2017 3:08 PM	01:04:59	8.53 pH	24.43 °C	498.51 µS/cm	0.18 mg/L	19.10 NTU	-187.9 mV	21.12 ft	120.00 ml/min
7/25/2017 3:13 PM	01:10:00	8.53 pH	24.56 °C	274.99 µS/cm	0.21 mg/L	16.90 NTU	-188.2 mV	21.15 ft	120.00 ml/min
7/25/2017 3:18 PM	01:14:59	8.57 pH	24.68 °C	204.19 µS/cm	0.17 mg/L	17.00 NTU	-190.0 mV	21.21 ft	120.00 ml/min

7/25/2017 3:23 PM	01:19:59	8.60 pH	24.38 °C	215.38 µS/cm	0.19 mg/L	14.90 NTU	-188.0 mV	21.30 ft	120.00 ml/min
7/25/2017 3:28 PM	01:24:59	8.54 pH	24.88 °C	190.16 µS/cm	0.17 mg/L	20.10 NTU	-188.2 mV	21.36 ft	120.00 ml/min
7/25/2017 3:33 PM	01:30:00	8.62 pH	24.79 °C	3.21 µS/cm	0.23 mg/L	18.10 NTU	-187.1 mV	21.43 ft	120.00 ml/min
7/25/2017 3:38 PM	01:35:00	8.52 pH	24.53 °C	493.56 µS/cm	0.18 mg/L	15.20 NTU	-194.2 mV	21.48 ft	120.00 ml/min
7/25/2017 3:43 PM	01:39:59	8.53 pH	24.74 °C	225.94 µS/cm	0.15 mg/L		-190.4 mV	21.53 ft	120.00 ml/min
7/25/2017 3:48 PM	01:44:59	8.50 pH	24.24 °C	623.57 µS/cm	0.17 mg/L	16.90 NTU	-185.4 mV	21.60 ft	120.00 ml/min
7/25/2017 3:53 PM	01:49:59	8.44 pH	23.82 °C	578.12 µS/cm	0.14 mg/L	13.40 NTU	-170.0 mV	21.67 ft	120.00 ml/min
7/25/2017 3:58 PM	01:54:59	8.43 pH	23.11 °C	622.92 µS/cm	0.15 mg/L	12.30 NTU	-160.0 mV	21.71 ft	120.00 ml/min
7/25/2017 4:03 PM	01:59:59	8.42 pH	22.82 °C	625.44 µS/cm	0.17 mg/L	12.70 NTU	-180.0 mV	21.76 ft	120.00 ml/min
7/25/2017 4:08 PM	02:04:59	8.41 pH	22.72 °C	623.61 µS/cm	0.16 mg/L	12.50 NTU	-184.0 mV	21.76 ft	120.00 ml/min

Samples

Sample ID:	Description:
FMC-113	

Low-Flow Test Report:

Test Date / Time: 8/1/2017 9:25:29 AM
Project: FMC 114 (2)
Operator Name: KTeague

Location Name: 114 **Well Diameter: 4 in** **Casing Type: PVC** **Screen Length: 20 ft** **Top of Screen: 40.13 ft** **Total Depth: 60.13 ft** **Initial Depth to Water: 25.58 ft**	**Pump Type: Peristaltic** **Pump Intake From TOC: 50 ft** **Flow Cell Volume: 130 ml** **Final Flow Rate: 100 ml/min** **Final Draw Down: 0.54 ft**	**Instrument Used: AquaTROLL 600** **Serial Number: 447417**

Test Notes:
Method 2a

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 10 %	+/- 3 %	+/- 10 %	+/- 10 %	+/- 10	+/- 5	
8/1/2017 9:25 AM	00:00	6.74 pH	23.72 °C	3,092.8 µS/cm	5.48 mg/L		-59.9 mV	25.58 ft	100.00 ml/min
8/1/2017 9:26 AM	01:20	6.65 pH	22.89 °C	3,441.4 µS/cm	2.74 mg/L		-57.3 mV	25.78 ft	100.00 ml/min
8/1/2017 9:31 AM	06:20	6.63 pH	22.01 °C	3,834.6 µS/cm	0.55 mg/L		-55.1 mV	25.88 ft	100.00 ml/min
8/1/2017 9:36 AM	11:20	6.66 pH	21.65 °C	3,819.1 µS/cm	0.40 mg/L	9.88 NTU	-61.2 mV	25.97 ft	100.00 ml/min
8/1/2017 9:41 AM	16:20	6.66 pH	21.44 °C	3,828.8 µS/cm	0.34 mg/L		-64.1 mV	26.02 ft	100.00 ml/min
8/1/2017 9:46 AM	21:19	6.65 pH	21.64 °C	3,814.3 µS/cm	0.30 mg/L	14.50 NTU	-73.0 mV	26.04 ft	100.00 ml/min
8/1/2017 9:51 AM	26:19	6.66 pH	21.65 °C	3,811.9 µS/cm	0.29 mg/L	18.70 NTU	-77.7 mV	26.06 ft	100.00 ml/min
8/1/2017 9:56 AM	31:19	6.66 pH	21.83 °C	3,805.3 µS/cm	0.27 mg/L	18.80 NTU	-79.1 mV	26.09 ft	100.00 ml/min
8/1/2017 10:01 AM	36:19	6.66 pH	21.94 °C	3,794.4 µS/cm	0.27 mg/L	18.80 NTU	-84.5 mV	26.12 ft	100.00 ml/min

Samples

Sample ID:	Description:
2017AN-114	Sampled at 1005

PARSONS

Field Monitoring Record
Low-Flow (minimal drawdown)
GROUNDWATER SAMPLING

Client: FMC Front Royal
Site name: Front Royal, VA
Samplers: MH & CB
Sample Event #: 2017
Well Condition: Good
Purge Start: 7/12
Pump Type: Grundfos / Double Valve

Date: 7/18/17
Wind:
Weather:
Air Temperature:
Meters Calibrated: Y
Purge Stop:
Sample Style: Grab

Well #: 115
Initial DTW: 20.39
Pump Depth: 44
Total Well Depth: 44.4
Screen Depth: 18.4
Sample Time: 0850
Alternate Method: Method 3

TIME	FLOW RATE (ml/min)	DEPTH TO WATER (TOC, FT/M)	pH	SPECIFIC CONDUCTANCE (uS/cm)	TEMP (C)	D.O. (MG/L)	ORP (MV)	TURBIDITY (NTU)	APPEARANCE (COLOR, CLARITY, SOLIDS)	COMMENTS
Parameter Stability Values over 3 Consecutive Readings										
	100 to 500 ml/min	<0.33 Feet	+ 0.1 -	+ 3% -	+10% -	+10% -	+10 mV -	+10% -		
0850			7.96	0.29	28.68	2.43	27.0	0		
		* Began purge on 7/12/17, pumped dry (~15 gallons)								
		allow well to recover, sampled on 7/18/17 @ 0850								

Chain of custody #_____

Low-Flow Test Report:

Test Date / Time: 7/14/2017 5:07:13 PM
Project: FMC 116R (2)
Operator Name: Harder

Location Name: 116R **Well Diameter: 2 in** **Casing Type: Pvc** **Screen Length: 20 ft** **Top of Screen: 73.46 ft** **Total Depth: 93.46 ft** **Initial Depth to Water: 67.7 ft**	**Pump Type: Double valve** **Tubing Type: Pvc** **Pump Intake From TOC: 83.5 ft** **Estimated Total Volume Pumped: 7000 ml** **Flow Cell Volume: 130 ml** **Final Flow Rate: 100 ml/min** **Final Draw Down: -65.355 ft**	**Instrument Used: AquaTROLL 600** **Serial Number: 447365**

Test Notes:

Weather Conditions:
Overcast

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 10 %	+/- 3 %	+/- 10 %	+/- 10 %	+/- 10	+/- 5	
7/14/2017 5:07 PM	00:00	9.26 pH	24.64 °C	26,073 µS/cm	0.13 mg/L	32.75 NTU	-445.6 mV	68.90 cm	100.00 ml/min
7/14/2017 5:12 PM	04:59	9.25 pH	25.68 °C	26,385 µS/cm	0.07 mg/L	31.52 NTU	-445.8 mV		100.00 ml/min
7/14/2017 5:17 PM	10:00	9.25 pH	25.26 °C	26,229 µS/cm	0.02 mg/L	30.19 NTU	-466.0 mV	69.35 cm	100.00 ml/min
7/14/2017 5:22 PM	15:00	9.26 pH	24.89 °C	26,202 µS/cm	0.01 mg/L	37.23 NTU	-478.6 mV	69.59 cm	100.00 ml/min
7/14/2017 5:27 PM	20:00	9.26 pH	24.51 °C	26,256 µS/cm	0.03 mg/L	30.66 NTU	-451.2 mV	69.78 cm	100.00 ml/min
7/14/2017 5:32 PM	24:59	9.26 pH	24.47 °C	26,297 µS/cm	0.01 mg/L	25.14 NTU	-472.8 mV	70.16 cm	100.00 ml/min
7/14/2017 5:37 PM	29:59	9.26 pH	24.48 °C	26,235 µS/cm	0.01 mg/L	14.33 NTU	-431.8 mV	70.37 cm	100.00 ml/min
7/14/2017 5:42 PM	35:00	9.26 pH	24.55 °C	26,377 µS/cm	0.02 mg/L	21.62 NTU	-452.3 mV		100.00 ml/min
7/14/2017 5:47 PM	40:00	9.26 pH	24.64 °C	26,644 µS/cm	0.01 mg/L	23.76 NTU	-483.7 mV	70.60 cm	100.00 ml/min
7/14/2017 5:52 PM	45:00	9.26 pH	24.73 °C	26,444 µS/cm	0.01 mg/L	22.25 NTU	-490.8 mV		100.00 ml/min
7/14/2017 5:57 PM	50:00	9.26 pH	25.02 °C	26,511 µS/cm	0.03 mg/L	14.45 NTU	-482.1 mV	70.88 cm	100.00 ml/min
7/14/2017 6:02 PM	55:00	9.26 pH	24.95 °C	26,409 µS/cm	0.03 mg/L	17.85 NTU	-472.3 mV	71.04 cm	100.00 ml/min
7/14/2017 6:07 PM	01:00:00	9.26 pH	24.95 °C	26,430 µS/cm	0.01 mg/L	16.01 NTU	-494.5 mV	71.19 cm	100.00 ml/min

7/14/2017 6:12 PM	01:05:00	9.25 pH	25.28 °C	26,635 µS/cm	0.00 mg/L	19.66 NTU	-498.4 mV	71.37 cm	100.00 ml/min
7/14/2017 6:17 PM	01:10:00	9.25 pH	25.31 °C	26,550 µS/cm	0.00 mg/L	16.09 NTU	-492.7 mV	71.47 cm	100.00 ml/min

Samples

Sample ID:	Description:
116R	

Created using VuSitu from In-Situ, Inc.

Low-Flow Test Report:

Test Date / Time: 7/26/2017 7:56:53 AM
Project: FMC 118 (2)
Operator Name:

Location Name: 118 **Well Diameter: 4 in** **Screen Length: 21 ft** **Top of Screen: 27 ft** **Total Depth: 48 ft** **Initial Depth to Water: 17.1 ft**	**Estimated Total Volume Pumped: 9999.999 ml** **Flow Cell Volume: 130 ml** **Final Flow Rate: 150 ml/min** **Final Draw Down: 0.2 ft**	**Instrument Used: AquaTROLL 600** **Serial Number: 468828**

Test Notes:
RDO not at 10% but <0.15 mg/London
Standard method

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 10 %	+/- 3 %	+/- 10 %	+/- 10 %	+/- 10	+/- 0.33	
7/26/2017 7:56 AM	00:00	6.72 pH	16.14 °C	1,086.4 µS/cm	0.47 mg/L		-36.3 mV	17.10 ft	200.00 ml/min
7/26/2017 8:01 AM	04:59	6.71 pH	15.73 °C	1,113.3 µS/cm	0.21 mg/L	6.31 NTU	-33.7 mV	17.21 ft	150.00 ml/min
7/26/2017 8:06 AM	09:59	6.71 pH	15.65 °C	1,119.1 µS/cm	0.20 mg/L	6.21 NTU	-31.4 mV	17.27 ft	150.00 ml/min
7/26/2017 8:11 AM	14:59	6.71 pH	15.66 °C	1,122.6 µS/cm	0.16 mg/L	6.57 NTU	-31.0 mV	17.29 ft	150.00 ml/min
7/26/2017 8:16 AM	19:59	6.70 pH	15.54 °C	1,122.4 µS/cm	0.14 mg/L	10.50 NTU	-29.9 mV	17.29 ft	150.00 ml/min
7/26/2017 8:21 AM	24:59	6.70 pH	15.67 °C	1,123.8 µS/cm	0.14 mg/L	20.60 NTU	-29.5 mV	17.29 ft	150.00 ml/min
7/26/2017 8:26 AM	29:59	6.70 pH	15.63 °C	1,124.0 µS/cm	0.13 mg/L	28.40 NTU	-29.8 mV	17.29 ft	150.00 ml/min
7/26/2017 8:31 AM	35:00	6.70 pH	15.70 °C	1,125.1 µS/cm	0.14 mg/L	29.90 NTU	-28.8 mV	17.29 ft	150.00 ml/min
7/26/2017 8:36 AM	39:59	6.70 pH	15.79 °C	1,124.1 µS/cm	0.13 mg/L	26.70 NTU	-28.5 mV	17.30 ft	150.00 ml/min
7/26/2017 8:41 AM	44:59	6.69 pH	15.73 °C	1,121.9 µS/cm	0.12 mg/L	23.30 NTU	-27.6 mV	17.30 ft	150.00 ml/min
7/26/2017 8:46 AM	49:59	6.69 pH	15.88 °C	1,124.3 µS/cm	0.14 mg/L	20.90 NTU	-27.4 mV	17.30 ft	150.00 ml/min
7/26/2017 8:51 AM	54:59	6.69 pH	15.92 °C	1,122.7 µS/cm	0.12 mg/L	19.60 NTU	-27.3 mV	17.30 ft	150.00 ml/min
7/26/2017 8:56 AM	59:59	6.69 pH	15.86 °C	1,119.6 µS/cm	0.11 mg/L	18.60 NTU	-27.0 mV	17.30 ft	150.00 ml/min
7/26/2017 9:01 AM	01:04:59	6.69 pH	16.12 °C	1,121.4 µS/cm	0.13 mg/L	18.80 NTU	-27.1 mV	17.30 ft	150.00 ml/min

Samples

Sample ID:	Description:
2017AN-118	Sample time 09:05

Created using VuSitu from In-Situ, Inc.

Low-Flow Test Report:

Test Date / Time: 7/26/2017 10:10:13 AM
Project: FMC 119 (4)
Operator Name:

Location Name: 119 **Well Diameter: 4 in** **Screen Length: 20 ft** **Top of Screen: 15 ft** **Total Depth: 35 ft** **Initial Depth to Water: 7.17 ft**	**Estimated Total Volume Pumped: 8843.502 ml** **Flow Cell Volume: 130 ml** **Final Flow Rate: 120 ml/min** **Final Draw Down: 2.93 ft**	**Instrument Used: AquaTROLL 600** **Serial Number: 468828**

Test Notes:
RDO was stable for several readings but then dropped slightly. Readings <0.2 mg/ London Method 2A

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 10 %	+/- 3 %	+/- 10 %	+/- 10 %	+/- 10	+/- 0.33	
7/26/2017 10:10 AM	00:00	6.98 pH	20.71 °C	3,065.6 µS/cm	0.82 mg/L		-8.8 mV	7.87 ft	150.00 ml/min
7/26/2017 10:15 AM	04:59	7.60 pH	19.86 °C	691.83 µS/cm	0.38 mg/L	76.70 NTU	-82.6 mV	8.10 ft	150.00 ml/min
7/26/2017 10:20 AM	09:59	7.51 pH	20.37 °C	732.26 µS/cm	0.28 mg/L	110.00 NTU	-92.1 mV	8.36 ft	150.00 ml/min
7/26/2017 10:25 AM	14:59	7.56 pH	21.17 °C	714.45 µS/cm	0.25 mg/L	132.00 NTU	-101.2 mV	8.52 ft	120.00 ml/min
7/26/2017 10:30 AM	19:59	7.60 pH	20.98 °C	629.93 µS/cm	0.14 mg/L	137.00 NTU	-115.9 mV	8.76 ft	120.00 ml/min
7/26/2017 10:35 AM	24:58	7.61 pH	21.15 °C	625.58 µS/cm	0.14 mg/L	127.00 NTU	-120.0 mV	8.83 ft	120.00 ml/min
7/26/2017 10:40 AM	29:58	7.66 pH	20.98 °C	609.91 µS/cm	0.14 mg/L	111.00 NTU	-126.6 mV	9.07 ft	120.00 ml/min
7/26/2017 10:45 AM	34:58	7.67 pH	20.78 °C	607.03 µS/cm	0.15 mg/L	70.70 NTU	-130.5 mV	9.23 ft	120.00 ml/min
7/26/2017 10:50 AM	39:58	7.69 pH	20.99 °C	599.45 µS/cm	0.15 mg/L	55.70 NTU	-133.9 mV	9.42 ft	120.00 ml/min
7/26/2017 10:55 AM	44:58	7.69 pH	20.89 °C	589.19 µS/cm	0.15 mg/L	58.00 NTU	-138.4 mV	9.53 ft	120.00 ml/min
7/26/2017 11:00 AM	49:58	7.70 pH	20.83 °C	580.63 µS/cm	0.16 mg/L	51.70 NTU	-139.6 mV	9.60 ft	120.00 ml/min
7/26/2017 11:05 AM	54:58	7.73 pH	20.59 °C	565.75 µS/cm	0.16 mg/L	34.40 NTU	-143.8 mV	9.82 ft	120.00 ml/min
7/26/2017 11:10 AM	59:57	7.74 pH	21.13 °C	559.80 µS/cm	0.16 mg/L	27.30 NTU	-147.8 mV	9.99 ft	120.00 ml/min
7/26/2017 11:15 AM	01:04:57	7.75 pH	20.95 °C	552.56 µS/cm	0.15 mg/L	26.30 NTU	-147.1 mV	10.07 ft	120.00 ml/min
7/26/2017 11:20 AM	01:09:57	7.76 pH	20.47 °C	549.84 µS/cm	0.14 mg/L	25.10 NTU	-151.8 mV	10.10 ft	120.00 ml/min

Samples

Sample ID:	Description:
2017AN-119	Sample time 11:25

Low-Flow Test Report:

Test Date / Time: 7/26/2017 2:42:13 PM
Project: FMC 120R (2)
Operator Name:

Location Name: 120R **Well Diameter: 4 in** **Screen Length: 20 ft** **Top of Screen: 18 ft** **Total Depth: 38 ft** **Initial Depth to Water: 4.31 ft**	**Estimated Total Volume Pumped: 4547.834 ml** **Flow Cell Volume: 130 ml** **Final Flow Rate: 130 ml/min** **Final Draw Down: 0.17 ft**	**Instrument Used: AquaTROLL 600** **Serial Number: 468828**

Test Notes:
Standard method

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 10 %	+/- 3 %	+/- 10 %	+/- 10 %	+/- 10	+/- 0.33	
7/26/2017 2:42 PM	00:00	8.45 pH	25.27 °C	429.85 µS/cm	3.09 mg/L		-65.3 mV	4.31 ft	130.00 ml/min
7/26/2017 2:47 PM	05:00	8.26 pH	23.27 °C	467.61 µS/cm	0.37 mg/L	29.10 NTU	-151.4 mV	4.45 ft	130.00 ml/min
7/26/2017 2:52 PM	09:59	8.30 pH	22.38 °C	471.83 µS/cm	0.24 mg/L	31.00 NTU	-167.0 mV	4.45 ft	130.00 ml/min
7/26/2017 2:57 PM	14:59	8.29 pH	21.95 °C	471.83 µS/cm	0.18 mg/L	30.90 NTU	-174.6 mV	4.45 ft	130.00 ml/min
7/26/2017 3:02 PM	19:59	8.26 pH	21.66 °C	472.60 µS/cm	0.14 mg/L	31.80 NTU	-175.9 mV	4.45 ft	130.00 ml/min
7/26/2017 3:07 PM	25:00	8.23 pH	21.65 °C	476.52 µS/cm	0.13 mg/L	33.60 NTU	-176.6 mV	4.46 ft	130.00 ml/min
7/26/2017 3:12 PM	29:59	8.21 pH	21.59 °C	479.13 µS/cm	0.12 mg/L	33.10 NTU	-175.6 mV	4.46 ft	130.00 ml/min
7/26/2017 3:17 PM	34:59	8.16 pH	22.10 °C	484.71 µS/cm	0.12 mg/L	35.90 NTU	-174.8 mV	4.48 ft	130.00 ml/min

Samples

Sample ID:	Description:
2017AN-120R	Sample time 15:20

Low-Flow Test Report:

Test Date / Time: 7/25/2017 3:49:25 PM
Project: FMC 128 (3)
Operator Name:

Location Name: 128 **Well Diameter: 2 in** **Screen Length: 10 ft** **Top of Screen: 37.46 ft** **Total Depth: 47.36 ft** **Initial Depth to Water: 6.69 ft**	**Estimated Total Volume Pumped: 15746.252 ml** **Flow Cell Volume: 130 ml** **Final Flow Rate: 225 ml/min** **Final Draw Down: -0.05 ft**	**Instrument Used: AquaTROLL 600** **Serial Number: 468828**

Test Notes:
RDO not 10% but below 0.2mg/L
Standard method

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 10 %	+/- 3 %	+/- 10 %	+/- 10 %	+/- 10	+/- 0.33	
7/25/2017 3:49 PM	00:00	6.60 pH	18.85 °C	1,550.1 µS/cm	0.62 mg/L		-36.8 mV	6.60 ft	225.00 ml/min
7/25/2017 3:54 PM	04:59	6.60 pH	18.53 °C	1,565.5 µS/cm	0.18 mg/L	1,000.00 NTU	-39.4 mV	6.60 ft	225.00 ml/min
7/25/2017 3:59 PM	10:00	6.60 pH	18.80 °C	1,577.2 µS/cm	0.27 mg/L	941.00 NTU	-31.8 mV	6.63 ft	225.00 ml/min
7/25/2017 4:04 PM	15:00	6.60 pH	18.71 °C	1,550.7 µS/cm	0.28 mg/L	981.00 NTU	-37.6 mV	6.63 ft	225.00 ml/min
7/25/2017 4:09 PM	20:00	6.59 pH	18.59 °C	1,562.4 µS/cm	0.16 mg/L	425.00 NTU	-32.5 mV	6.63 ft	225.00 ml/min
7/25/2017 4:14 PM	25:00	6.60 pH	18.20 °C	1,558.0 µS/cm	0.15 mg/L	198.00 NTU	-32.0 mV	6.64 ft	225.00 ml/min
7/25/2017 4:19 PM	30:00	6.58 pH	18.32 °C	1,566.5 µS/cm	0.15 mg/L	133.00 NTU	-27.7 mV	6.64 ft	225.00 ml/min
7/25/2017 4:24 PM	35:00	6.57 pH	18.33 °C	1,563.3 µS/cm	0.14 mg/L	107.00 NTU	-29.2 mV	6.64 ft	225.00 ml/min
7/25/2017 4:29 PM	40:00	6.56 pH	18.39 °C	1,552.0 µS/cm	0.15 mg/L	115.00 NTU	-30.4 mV	6.64 ft	225.00 ml/min
7/25/2017 4:34 PM	45:00	6.55 pH	18.12 °C	1,555.9 µS/cm	0.14 mg/L	74.40 NTU	-31.6 mV	6.64 ft	225.00 ml/min
7/25/2017 4:39 PM	50:00	6.54 pH	18.26 °C	1,569.0 µS/cm	0.13 mg/L	70.30 NTU	-33.1 mV	6.64 ft	225.00 ml/min
7/25/2017 4:44 PM	54:59	6.53 pH	18.23 °C	1,562.6 µS/cm	0.15 mg/L	61.50 NTU	-32.6 mV	6.64 ft	225.00 ml/min
7/25/2017 4:49 PM	59:59	6.52 pH	18.01 °C	1,562.7 µS/cm	0.14 mg/L	72.00 NTU	-32.6 mV	6.64 ft	225.00 ml/min
7/25/2017 4:54 PM	01:04:59	6.50 pH	18.62 °C	1,565.0 µS/cm	0.14 mg/L	68.10 NTU	-33.2 mV	6.64 ft	225.00 ml/min
7/25/2017 4:59 PM	01:09:59	6.49 pH	18.75 °C	1,557.0 µS/cm	0.16 mg/L	67.70 NTU	-32.6 mV	6.64 ft	225.00 ml/min

Samples

Sample ID:	Description:
2017AN-128, 2017AN-128MS, 2017AN-128MSD	Sample time 17:05

Created using VuSitu from In-Situ, Inc.

Low-Flow Test Report:

Test Date / Time: 7/26/2017 8:38:58 AM
Project: FMC 129 (2)
Operator Name: KTeague

Location Name: 129 **Well Diameter: 2 in** **Screen Length: 10 ft** **Top of Screen: 36.22 ft** **Total Depth: 46.22 ft** **Initial Depth to Water: 11.57 ft**	**Pump Type: Peristaltic** **Pump Intake From TOC: 41 ft** **Estimated Total Volume Pumped: 26538.33 ml** **Flow Cell Volume: 130 ml** **Final Flow Rate: 120 ml/min** **Final Draw Down: 8.34 ft**	**Instrument Used: AquaTROLL 600** **Serial Number: 447417**

Test Notes:

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 10 %	+/- 3 %	+/- 10 %	+/- 10 %	+/- 10	+/- 5	
7/26/2017 8:38 AM	00:00	7.56 pH	19.91 °C	1,610.8 µS/cm	2.76 mg/L		-58.2 mV	11.57 ft	100.00 ml/min
7/26/2017 8:43 AM	04:59	7.31 pH	19.59 °C	1,629.1 µS/cm	1.04 mg/L		-49.9 mV	13.30 ft	100.00 ml/min
7/26/2017 8:48 AM	09:58	7.29 pH	19.62 °C	1,627.0 µS/cm	0.77 mg/L		-48.2 mV	13.47 ft	100.00 ml/min
7/26/2017 8:53 AM	14:58	7.28 pH	19.87 °C	1,631.7 µS/cm	0.46 mg/L		-47.9 mV	13.76 ft	100.00 ml/min
7/26/2017 8:58 AM	19:58	7.28 pH	19.94 °C	1,627.1 µS/cm	0.41 mg/L		-46.9 mV	14.10 ft	100.00 ml/min
7/26/2017 9:03 AM	24:58	7.30 pH	20.02 °C	1,607.1 µS/cm	0.44 mg/L		-47.0 mV	14.42 ft	100.00 ml/min
7/26/2017 9:08 AM	29:58	7.29 pH	20.29 °C	1,596.2 µS/cm	0.39 mg/L		-45.0 mV	14.62 ft	100.00 ml/min
7/26/2017 9:13 AM	34:58	7.29 pH	20.81 °C	1,571.6 µS/cm	0.39 mg/L		-43.0 mV	14.82 ft	100.00 ml/min
7/26/2017 9:18 AM	39:58	7.30 pH	20.91 °C	1,467.6 µS/cm	0.53 mg/L	4.39 NTU	-37.3 mV	15.04 ft	100.00 ml/min
7/26/2017 9:23 AM	44:58	7.29 pH	21.17 °C	1,347.5 µS/cm	0.91 mg/L	3.94 NTU	-30.6 mV	15.21 ft	100.00 ml/min
7/26/2017 9:28 AM	49:58	7.32 pH	21.12 °C	1,176.5 µS/cm	1.44 mg/L		-25.2 mV	15.36 ft	100.00 ml/min
7/26/2017 9:33 AM	54:58	7.37 pH	20.55 °C	958.05 µS/cm	2.49 mg/L		-14.1 mV	15.85 ft	250.00 ml/min
7/26/2017 9:38 AM	59:57	7.41 pH	19.88 °C	889.35 µS/cm	3.09 mg/L		-2.8 mV	16.21 ft	250.00 ml/min
7/26/2017 9:43 AM	01:04:56	7.41 pH	19.81 °C	999.55 µS/cm	3.04 mg/L		15.3 mV	16.85 ft	250.00 ml/min
7/26/2017 9:48 AM	01:09:56	7.44 pH	19.84 °C	1,009.2 µS/cm	3.01 mg/L		19.8 mV	17.33 ft	250.00 ml/min
7/26/2017 9:53 AM	01:14:56	7.47 pH	20.05 °C	1,064.9 µS/cm	2.94 mg/L	2.73 NTU	22.5 mV	17.78 ft	250.00 ml/min

7/26/2017 9:58 AM	01:19:56	7.49 pH	20.39 °C	983.74 µS/cm	3.02 mg/L		21.4 mV	18.17 ft	250.00 ml/min
7/26/2017 10:03 AM	01:24:56	7.53 pH	20.38 °C	961.68 µS/cm	3.07 mg/L		25.4 mV	18.50 ft	250.00 ml/min
7/26/2017 10:08 AM	01:29:56	7.58 pH	20.45 °C	975.47 µS/cm	3.21 mg/L		31.2 mV	18.82 ft	250.00 ml/min
7/26/2017 10:13 AM	01:34:55	7.62 pH	20.62 °C	1,001.5 µS/cm	3.17 mg/L		33.6 mV	19.10 ft	250.00 ml/min
7/26/2017 10:18 AM	01:39:55	7.63 pH	20.44 °C	998.97 µS/cm	3.15 mg/L		36.6 mV	19.37 ft	250.00 ml/min
7/26/2017 10:23 AM	01:44:55	7.61 pH	20.89 °C	1,023.1 µS/cm	3.05 mg/L		37.8 mV	19.52 ft	250.00 ml/min
7/26/2017 10:28 AM	01:49:55	7.63 pH	21.11 °C	1,044.8 µS/cm	2.96 mg/L		39.1 mV	19.73 ft	250.00 ml/min
7/26/2017 10:33 AM	01:54:55	7.62 pH	21.05 °C	952.37 µS/cm	2.88 mg/L		37.9 mV	19.88 ft	250.00 ml/min
7/26/2017 10:38 AM	01:59:55	7.60 pH	21.43 °C	867.43 µS/cm	2.76 mg/L		36.9 mV	20.02 ft	250.00 ml/min
7/26/2017 10:43 AM	02:04:55	7.59 pH	21.24 °C	1,322.5 µS/cm	1.78 mg/L		36.4 mV	20.14 ft	250.00 ml/min
7/26/2017 10:48 AM	02:09:55	7.54 pH	20.91 °C	1,306.1 µS/cm	1.72 mg/L	2.11 NTU	36.0 mV	20.23 ft	110.00 ml/min
7/26/2017 10:53 AM	02:14:55	7.40 pH	21.83 °C	1,340.6 µS/cm	1.63 mg/L	1.73 NTU	37.2 mV	20.10 ft	110.00 ml/min
7/26/2017 10:58 AM	02:19:56	7.35 pH	22.36 °C	1,346.4 µS/cm	1.48 mg/L	1.21 NTU	37.5 mV	19.90 ft	120.00 ml/min
7/26/2017 11:03 AM	02:24:55	7.38 pH	21.68 °C	1,335.8 µS/cm	1.48 mg/L	1.37 NTU	38.7 mV	19.91 ft	120.00 ml/min
7/26/2017 11:08 AM	02:29:55	7.38 pH	21.43 °C	1,360.4 µS/cm	1.48 mg/L	1.20 NTU	39.5 mV	19.91 ft	120.00 ml/min

Samples

Sample ID:	Description:
FMC-129	

PARSONS

Field Monitoring Record
Low-Flow (minimal drawdown)
GROUNDWATER SAMPLING

Client: FMC Front Royal
Site name: Front Royal, VA
Samplers: CH + WP
Sample Event #: 2017 AN
Well Condition: _____
Purge Start: _____
Pump Type: Double Valve

Date: 7/27/17
Wind: _____
Weather: _____
Air Temperature: _____
Meters Calibrated: _____
Purge Stop: 1020
Sample Style: Grab

Well #: 130 R
Initial DTW: 21.26
Pump Depth: _____
Total Well Depth: _____
Screen Depth: _____
Sample Time: _____
Alternate Method: _____

TIME	FLOW RATE (ml/min)	DEPTH TO WATER (TOC, FT/M)	pH	SPECIFIC CONDUCTANCE (uS/cm)	TEMP (C)	D.O. (MG/L)	ORP (MV)	TURBIDITY (NTU)	APPEARANCE (COLOR, CLARITY, SOLIDS)	COMMENTS
	Parameter Stability Values over 3 Consecutive Readings									
	100 to 500 ml/min	**<0.33 Feet**	**+ 0.1 -**	**+ 3% -**	**+10% -**	**+10% -**	**+10 mV -**	**+10% -**		
1020	250	21.33	6.61	834.87	16.80	0.15	-6.2	1.85	Clear	

Chain of custody # _____

Low-Flow Test Report:

Test Date / Time: 2/1/2018 3:23:15 PM
Project:
Operator Name:

Location Name: 130R-R	**Flow Cell Volume: 130 ml** **Final Flow Rate: 300 ml/min**	**Instrument Used: Aqua TROLL 600** **Serial Number: 468828**

Test Notes:

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 0.5	+/- 3 %	+/- 0.3	+/- 10	+/- 10	+/- 5	
2/1/2018 3:23 PM	00:00	7.97 pH	14.85 °C	0.32 µS/cm	10.00 mg/L	46.50 NTU	-53.7 mV	18.92 cm	300.00 ml/min
2/1/2018 3:28 PM	05:00	6.82 pH	14.58 °C	714.43 µS/cm	0.32 mg/L	15.60 NTU	-63.9 mV	18.99 cm	300.00 ml/min
2/1/2018 3:33 PM	10:00	6.81 pH	14.63 °C	527.60 µS/cm	0.34 mg/L		-64.7 mV	19.00 cm	300.00 ml/min
2/1/2018 3:38 PM	15:00	6.82 pH	14.62 °C	347.02 µS/cm	0.22 mg/L	41.30 NTU	-67.2 mV	19.00 cm	300.00 ml/min
2/1/2018 3:43 PM	20:00	6.82 pH	14.57 °C	393.48 µS/cm	0.24 mg/L	17.70 NTU	-61.5 mV	19.00 cm	300.00 ml/min
2/1/2018 3:48 PM	25:00	6.82 pH	14.52 °C	451.98 µS/cm	0.16 mg/L	18.00 NTU	-60.7 mV	19.00 cm	300.00 ml/min
2/1/2018 3:53 PM	30:00	6.82 pH	14.50 °C	456.15 µS/cm	0.19 mg/L	14.30 NTU	-65.4 mV	19.00 cm	300.00 ml/min
2/1/2018 3:58 PM	35:00	6.82 pH	14.47 °C	86.01 µS/cm	0.17 mg/L	9.85 NTU	-65.2 mV	19.00 cm	300.00 ml/min
2/1/2018 4:03 PM	40:00	6.82 pH	14.45 °C	33.67 µS/cm	0.16 mg/L	9.56 NTU	-66.3 mV	19.00 cm	300.00 ml/min
2/1/2018 4:08 PM	45:00	6.81 pH	14.41 °C	402.20 µS/cm	0.23 mg/L	9.41 NTU	-66.1 mV	19.00 cm	300.00 ml/min
2/1/2018 4:13 PM	50:00	6.82 pH	14.36 °C	412.61 µS/cm	0.20 mg/L	9.63 NTU	-65.8 mV	19.00 cm	300.00 ml/min
2/1/2018 4:18 PM	55:00	6.83 pH	14.28 °C	407.19 µS/cm	0.19 mg/L	9.58 NTU	-65.4 mV	19.00 cm	300.00 ml/min

Samples

Sample ID:	Description:

Low-Flow Test Report:

Test Date / Time: 7/27/2017 10:59:52 AM
Project: FMC 132 (2)
Operator Name:

Location Name: 132 **Well Diameter: 2 in** **Screen Length: 10 ft** **Top of Screen: 20 ft** **Total Depth: 30 ft** **Initial Depth to Water: 6.38 ft**	**Estimated Total Volume Pumped: 4796.001 ml** **Flow Cell Volume: 130 ml** **Final Flow Rate: 120 ml/min** **Final Draw Down: 0 ft**	**Instrument Used: AquaTROLL 600** **Serial Number: 468828**

Test Notes:
Standard method

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 10 %	+/- 3 %	+/- 10 %	+/- 10 %	+/- 10	+/- 0.33	
7/27/2017 10:59 AM	00:00	6.53 pH	21.55 °C	2,763.4 µS/cm	1.67 mg/L		-12.9 mV	6.38 ft	120.00 ml/min
7/27/2017 11:04 AM	04:59	6.54 pH	20.65 °C	2,740.5 µS/cm	0.49 mg/L	18.50 NTU	-24.3 mV	6.38 ft	120.00 ml/min
7/27/2017 11:09 AM	09:59	6.54 pH	20.26 °C	2,757.1 µS/cm	0.34 mg/L	19.20 NTU	-29.6 mV	6.38 ft	120.00 ml/min
7/27/2017 11:14 AM	14:59	6.53 pH	20.72 °C	2,765.8 µS/cm	0.32 mg/L	19.10 NTU	-32.7 mV	6.38 ft	120.00 ml/min
7/27/2017 11:19 AM	19:59	6.53 pH	20.90 °C	2,775.7 µS/cm	0.28 mg/L	24.50 NTU	-35.3 mV	6.38 ft	120.00 ml/min
7/27/2017 11:24 AM	24:58	6.53 pH	21.01 °C	2,769.5 µS/cm	0.26 mg/L	25.10 NTU	-37.6 mV	6.38 ft	120.00 ml/min
7/27/2017 11:29 AM	29:58	6.53 pH	21.35 °C	2,755.5 µS/cm	0.23 mg/L	28.90 NTU	-39.6 mV	6.38 ft	120.00 ml/min
7/27/2017 11:34 AM	34:58	6.53 pH	21.28 °C	2,799.3 µS/cm	0.23 mg/L	27.90 NTU	-41.2 mV	6.38 ft	120.00 ml/min
7/27/2017 11:39 AM	39:58	6.53 pH	20.97 °C	2,758.2 µS/cm	0.21 mg/L	29.20 NTU	-42.4 mV	6.38 ft	120.00 ml/min

Samples

Sample ID:	Description:
2017AN-132, 132DUP, 132MS/MSD	Sample time 11:45

Low-Flow Test Report:

Test Date / Time: 8/10/2017 8:14:08 AM
Project: FMC 132 (3)
Operator Name: Harder, Brown

Location Name: 132 **Well Diameter: 2 in** **Casing Type: Steel** **Screen Length: 10 ft** **Top of Screen: 20 ft** **Total Depth: 30 ft** **Initial Depth to Water: 3.66 ft**	**Pump Type: Peristaltic pump** **Tubing Type: Pvc** **Pump Intake From TOC: 25 ft** **Estimated Total Volume Pumped: 5000 ml** **Flow Cell Volume: 130 ml** **Final Flow Rate: 100 ml/min** **Final Draw Down: 0 ft**	**Instrument Used: AquaTROLL 600** **Serial Number: 468828**

Test Notes:

Weather Conditions:
Sunny 70

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 10 %	+/- 3 %	+/- 10 %	+/- 10 %	+/- 10	+/- 5	
8/10/2017 8:14 AM	00:00	6.66 pH	18.56 °C	2,354.6 µS/cm	1.61 mg/L	14.50 NTU	-99.8 mV	111.56 cm	100.00 ml/min
8/10/2017 8:19 AM	05:00	6.66 pH	18.06 °C	2,401.5 µS/cm	0.21 mg/L	17.80 NTU	-105.3 mV	111.56 cm	100.00 ml/min
8/10/2017 8:24 AM	10:00	6.65 pH	17.55 °C	2,388.8 µS/cm	0.17 mg/L	8.60 NTU	-107.2 mV	111.56 cm	100.00 ml/min
8/10/2017 8:29 AM	15:00	6.64 pH	17.26 °C	2,392.9 µS/cm	0.13 mg/L	8.75 NTU	-111.3 mV	111.56 cm	100.00 ml/min
8/10/2017 8:34 AM	20:00	6.65 pH	17.31 °C	2,579.3 µS/cm	0.12 mg/L	5.74 NTU	-114.3 mV	111.56 cm	100.00 ml/min
8/10/2017 8:39 AM	25:00	6.65 pH	17.25 °C	2,425.2 µS/cm	0.11 mg/L	4.92 NTU	-118.3 mV	111.56 cm	100.00 ml/min
8/10/2017 8:44 AM	30:00	6.65 pH	17.16 °C	2,402.2 µS/cm	0.10 mg/L	4.04 NTU	-121.0 mV	111.56 cm	100.00 ml/min
8/10/2017 8:49 AM	35:00	6.65 pH	17.19 °C	2,412.9 µS/cm	0.09 mg/L	4.19 NTU	-123.9 mV	111.56 cm	100.00 ml/min
8/10/2017 8:54 AM	40:00	6.66 pH	17.23 °C	2,403.2 µS/cm	0.09 mg/L	3.08 NTU	-127.5 mV	111.56 cm	100.00 ml/min
8/10/2017 8:59 AM	45:00	6.66 pH	17.24 °C	2,417.6 µS/cm	0.08 mg/L	3.90 NTU	-129.6 mV	111.56 cm	100.00 ml/min
8/10/2017 9:04 AM	50:00	6.66 pH	17.28 °C	2,392.0 µS/cm	0.08 mg/L		-132.0 mV	111.56 cm	100.00 ml/min

Samples

Sample ID:	Description:
132	Resample

Low-Flow Test Report:

Test Date / Time: 7/26/2017 4:09:09 PM
Project: FMC 133 (2)
Operator Name:

Location Name: 133 **Well Diameter: 4 in** **Screen Length: 20 ft** **Top of Screen: 22.95 ft** **Total Depth: 42.95 ft** **Initial Depth to Water: 28.84 ft**	**Estimated Total Volume Pumped: 6695.668 ml** **Flow Cell Volume: 130 ml** **Final Flow Rate: 130 ml/min** **Final Draw Down: 0.64 ft**	**Instrument Used: AquaTROLL 600** **Serial Number: 468828**

Test Notes:
Method 2A
RDO not quite 10% stability but <0.15 mg/L

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 10 %	+/- 3 %	+/- 10 %	+/- 10 %	+/- 10	+/- 0.33	
7/26/2017 4:09 PM	00:00	6.95 pH	21.95 °C	10,742 µS/cm	0.60 mg/L		-102.7 mV	28.84 ft	150.00 ml/min
7/26/2017 4:14 PM	05:00	6.96 pH	21.91 °C	11,144 µS/cm	0.24 mg/L	11.70 NTU	-103.0 mV	29.21 ft	150.00 ml/min
7/26/2017 4:19 PM	09:59	6.96 pH	21.22 °C	11,080 µS/cm	0.20 mg/L	4.83 NTU	-100.4 mV	29.28 ft	130.00 ml/min
7/26/2017 4:24 PM	14:59	6.96 pH	21.25 °C	11,146 µS/cm	0.18 mg/L	7.01 NTU	-99.8 mV	29.34 ft	130.00 ml/min
7/26/2017 4:29 PM	19:59	6.96 pH	20.35 °C	11,051 µS/cm	0.16 mg/L	7.28 NTU	-97.7 mV	29.39 ft	130.00 ml/min
7/26/2017 4:34 PM	24:59	6.94 pH	20.87 °C	11,191 µS/cm	0.16 mg/L	6.91 NTU	-97.0 mV	29.41 ft	130.00 ml/min
7/26/2017 4:39 PM	29:59	6.93 pH	20.98 °C	11,130 µS/cm	0.14 mg/L	6.85 NTU	-95.4 mV	29.43 ft	130.00 ml/min
7/26/2017 4:44 PM	34:58	6.91 pH	21.39 °C	11,167 µS/cm	0.16 mg/L	7.24 NTU	-93.8 mV	29.46 ft	130.00 ml/min
7/26/2017 4:49 PM	39:58	6.90 pH	21.26 °C	11,144 µS/cm	0.13 mg/L	6.77 NTU	-92.2 mV	29.48 ft	130.00 ml/min
7/26/2017 4:54 PM	44:58	6.89 pH	21.59 °C	11,158 µS/cm	0.14 mg/L	6.74 NTU	-91.3 mV	29.48 ft	130.00 ml/min
7/26/2017 4:59 PM	49:58	6.88 pH	20.91 °C	11,067 µS/cm	0.13 mg/L	6.29 NTU	-90.1 mV	29.48 ft	130.00 ml/min

Samples

Sample ID:	Description:
2017AN-133	Sample time 17:05

Created using VuSitu from In-Situ, Inc.

Low-Flow Test Report:

Test Date / Time: 8/1/2017 7:47:35 AM
Project: FMC 135 (2)
Operator Name: KTeague

Location Name: 135 **Well Diameter: 4 in** **Casing Type: Steel** **Screen Length: 20 ft** **Top of Screen: 26.25 ft** **Total Depth: 46.25 ft** **Initial Depth to Water: 23.58 ft**	**Pump Type: Peristaltic** **Pump Intake From TOC: 36 ft** **Estimated Total Volume Pumped: 3299.999 ml** **Flow Cell Volume: 130 ml** **Final Flow Rate: 100 ml/min** **Final Draw Down: 0.46 ft**	**Instrument Used: AquaTROLL 600** **Serial Number: 447417**

Test Notes:
Method 2a

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 10 %	+/- 3 %	+/- 10 %	+/- 10 %	+/- 10	+/- 5	
8/1/2017 7:47 AM	00:00	7.20 pH	19.25 °C	1,836.1 µS/cm	2.29 mg/L		-112.3 mV	23.58 ft	100.00 ml/min
8/1/2017 7:50 AM	02:59	7.04 pH	18.33 °C	1,877.9 µS/cm	0.71 mg/L		-112.5 mV	23.58 ft	100.00 ml/min
8/1/2017 7:55 AM	08:00	7.02 pH	18.03 °C	1,842.6 µS/cm	0.36 mg/L		-108.6 mV	23.79 ft	100.00 ml/min
8/1/2017 8:00 AM	12:59	7.01 pH	18.01 °C	1,817.7 µS/cm	0.31 mg/L	0.00 NTU	-118.3 mV	23.87 ft	100.00 ml/min
8/1/2017 8:05 AM	17:59	7.00 pH	18.03 °C	1,774.9 µS/cm	0.29 mg/L	0.00 NTU	-127.6 mV	23.94 ft	100.00 ml/min
8/1/2017 8:10 AM	22:59	7.01 pH	17.95 °C	1,707.1 µS/cm	0.27 mg/L	0.00 NTU	-130.1 mV	24.01 ft	100.00 ml/min
8/1/2017 8:15 AM	27:59	7.00 pH	18.20 °C	1,682.4 µS/cm	0.26 mg/L	0.00 NTU	-133.1 mV	24.02 ft	100.00 ml/min
8/1/2017 8:20 AM	32:59	7.00 pH	18.35 °C	1,674.0 µS/cm	0.25 mg/L	0.00 NTU	-136.0 mV	24.04 ft	100.00 ml/min

Samples

Sample ID:	Description:
2017AN-135	Sample collected at 0825

Low-Flow Test Report:

Test Date / Time: 7/19/2017 7:57:35 AM
Project: FMC 136 (3)
Operator Name:

Location Name: 136 **Well Diameter: 6 in** **Total Depth: 200.51 ft** **Initial Depth to Water: 22.7 ft**	**Estimated Total Volume Pumped: 3125 ml** **Flow Cell Volume: 130 ml** **Final Flow Rate: 125 ml/min** **Final Draw Down: 1.05 ft**	**Instrument Used: AquaTROLL 600** **Serial Number: 468828**

Test Notes:
Turbidity below 0.1 NTU

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 10 %	+/- 3 %	+/- 10 %	+/- 10 %	+/- 10	+/- 0.33	
7/19/2017 7:57 AM	00:00	8.06 pH	17.68 °C	565.18 µS/cm	1.42 mg/L		-184.9 mV	22.70 ft	125.00 ml/min
7/19/2017 8:02 AM	04:59	8.09 pH	17.61 °C	566.92 µS/cm	1.24 mg/L	1.84 NTU	-194.4 mV	23.24 ft	125.00 ml/min
7/19/2017 8:07 AM	09:59	8.09 pH	17.74 °C	568.88 µS/cm	1.20 mg/L	1.33 NTU	-197.2 mV	23.41 ft	125.00 ml/min
7/19/2017 8:12 AM	14:59	8.06 pH	17.94 °C	569.45 µS/cm	1.17 mg/L	0.80 NTU	-199.7 mV	23.54 ft	125.00 ml/min
7/19/2017 8:17 AM	19:59	8.07 pH	18.00 °C	568.84 µS/cm	1.17 mg/L	0.84 NTU	-201.4 mV	23.68 ft	125.00 ml/min
7/19/2017 8:22 AM	24:59	8.09 pH	18.00 °C	570.02 µS/cm	1.14 mg/L	0.90 NTU	-202.1 mV	23.75 ft	125.00 ml/min

Samples

Sample ID:	Description:
2017AN-136	Sample time 08:25

Created using VuSitu from In-Situ, Inc.

Low-Flow Test Report:

Test Date / Time: 7/30/2017 8:40:47 AM
Project: FMC 138 (3)
Operator Name:

Location Name: 138 **Well Diameter: 2 in** **Screen Length: 30 ft** **Top of Screen: 53.96 ft** **Total Depth: 83.96 ft** **Initial Depth to Water: 22.78 ft**	**Estimated Total Volume Pumped: 7500 ml** **Flow Cell Volume: 130 ml** **Final Flow Rate: 150 ml/min** **Final Draw Down: 0.03 ft**	**Instrument Used: AquaTROLL 600** **Serial Number: 468828**

Test Notes:
Standard method
Turbidity not quite 10 % but <1.0 NTU

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 10 %	+/- 3 %	+/- 10 %	+/- 10 %	+/- 10	+/- 0.33	
7/30/2017 8:40 AM	00:00	7.10 pH	16.34 °C	3,014.1 µS/cm	0.49 mg/L		-349.3 mV	22.78 ft	150.00 ml/min
7/30/2017 8:45 AM	05:00	7.09 pH	16.30 °C	3,011.9 µS/cm	0.47 mg/L	0.65 NTU	-352.5 mV	22.80 ft	150.00 ml/min
7/30/2017 8:50 AM	09:59	7.72 pH	16.61 °C	1,529.6 µS/cm	7.18 mg/L	6.76 NTU	-330.4 mV	22.83 ft	150.00 ml/min
7/30/2017 8:55 AM	15:00	7.10 pH	16.09 °C	2,998.4 µS/cm	0.42 mg/L	1.10 NTU	-353.9 mV	22.83 ft	150.00 ml/min
7/30/2017 9:00 AM	20:00	7.09 pH	16.02 °C	3,002.7 µS/cm	0.33 mg/L	0.43 NTU	-357.0 mV	22.81 ft	150.00 ml/min
7/30/2017 9:05 AM	25:00	7.09 pH	15.94 °C	2,994.6 µS/cm	0.31 mg/L	0.68 NTU	-357.6 mV	22.80 ft	150.00 ml/min
7/30/2017 9:10 AM	30:00	7.11 pH	15.93 °C	3,007.2 µS/cm	0.28 mg/L	0.69 NTU	-360.3 mV	22.80 ft	150.00 ml/min
7/30/2017 9:15 AM	35:00	7.11 pH	15.99 °C	2,999.6 µS/cm	0.27 mg/L	0.40 NTU	-360.7 mV	22.80 ft	150.00 ml/min
7/30/2017 9:20 AM	39:59	7.10 pH	16.01 °C	2,996.9 µS/cm	0.25 mg/L	0.41 NTU	-361.8 mV	22.80 ft	150.00 ml/min
7/30/2017 9:25 AM	44:59	7.11 pH	16.02 °C	2,988.3 µS/cm	0.24 mg/L	0.49 NTU	-362.4 mV	22.80 ft	150.00 ml/min
7/30/2017 9:30 AM	50:00	7.11 pH	16.11 °C	2,994.3 µS/cm	0.23 mg/L	0.66 NTU	-362.7 mV	22.81 ft	150.00 ml/min

Samples

Sample ID:	Description:
2017AN-138, D, MS, MSD	Sample time 09:35

Created using VuSitu from In-Situ, Inc.

Low-Flow Test Report:

Test Date / Time: 8/9/2017 3:43:17 PM
Project: FMC 138 (2)
Operator Name: Harder, Brown

Location Name: 138 **Well Diameter: 2 in** **Casing Type: Pvc** **Screen Length: 30 ft** **Top of Screen: 53.96 ft** **Total Depth: 83.96 ft** **Initial Depth to Water: 21.95 ft**	**Pump Type: DV** **Tubing Type: Pvc** **Pump Intake From TOC: 70 ft** **Estimated Total Volume Pumped: 7666.665 ml** **Flow Cell Volume: 130 ml** **Final Flow Rate: 200 ml/min** **Final Draw Down: 0.05 ft**	**Instrument Used: AquaTROLL 600** **Serial Number: 468828**

Test Notes:

Weather Conditions:
Sunny 85

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 10 %	+/- 3 %	+/- 10 %	+/- 10 %	+/- 10	+/- 0.33	
8/9/2017 3:43 PM	00:00	7.02 pH	22.93 °C	2,732.8 µS/cm	0.22 mg/L		-401.0 mV	21.95 ft	200.00 ml/min
8/9/2017 3:44 PM	01:11	7.03 pH	22.93 °C	2,617.2 µS/cm	0.23 mg/L		-403.3 mV		200.00 ml/min
8/9/2017 3:56 PM	13:20	7.09 pH	22.36 °C	2,737.5 µS/cm	0.11 mg/L	4.46 NTU	-411.6 mV	22.00 ft	200.00 ml/min
8/9/2017 4:01 PM	18:20	7.10 pH	22.14 °C	2,732.9 µS/cm	0.09 mg/L	2.74 NTU	-413.6 mV	22.00 ft	200.00 ml/min
8/9/2017 4:06 PM	23:19	7.09 pH	22.33 °C	2,715.3 µS/cm	0.09 mg/L	0.89 NTU	-414.0 mV	22.00 ft	200.00 ml/min
8/9/2017 4:11 PM	28:19	7.09 pH	22.14 °C	2,748.9 µS/cm	0.08 mg/L	1.90 NTU	-414.3 mV	22.00 ft	200.00 ml/min
8/9/2017 4:16 PM	33:19	7.07 pH	22.29 °C	2,741.7 µS/cm	0.08 mg/L	1.31 NTU	-414.2 mV	22.00 ft	200.00 ml/min
8/9/2017 4:21 PM	38:19	7.06 pH	21.93 °C	2,754.9 µS/cm	0.07 mg/L		-413.8 mV	22.00 ft	200.00 ml/min

Samples

Sample ID:	Description:
138	Resample

Created using VuSitu from In-Situ, Inc.

Low-Flow Test Report:

Test Date / Time: 7/16/2017 3:34:01 PM
Project: FMC 162 (2)
Operator Name: Harder

Location Name: 162 **Well Diameter: 6 in** **Casing Type: Steel** **Total Depth: 60.26 ft** **Initial Depth to Water: 20.15 ft**	**Pump Type: Double valve** **Tubing Type: Pvc** **Pump Intake From TOC: 53 ft** **Estimated Total Volume Pumped: 12000 ml** **Flow Cell Volume: 130 ml** **Final Flow Rate: 200 ml/min** **Final Draw Down: 0.05 ft**	**Instrument Used: AquaTROLL 600** **Serial Number: 447365**

Test Notes:

Weather Conditions:
Sunny 85

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 10 %	+/- 3 %	+/- 10 %	+/- 10 %	+/- 10	+/- 0.33	
7/16/2017 3:34 PM	00:00	7.05 pH	21.14 °C	599.02 µS/cm	0.23 mg/L	52.14 NTU	-118.7 mV	20.15 ft	200.00 ml/min
7/16/2017 3:39 PM	05:00	6.99 pH	20.30 °C	615.28 µS/cm	0.19 mg/L	77.54 NTU	-118.0 mV	20.20 ft	200.00 ml/min
7/16/2017 3:44 PM	10:00	6.81 pH	20.41 °C	619.76 µS/cm	0.16 mg/L	162.83 NTU	-112.3 mV	20.20 ft	200.00 ml/min
7/16/2017 3:49 PM	15:00	6.71 pH	19.75 °C	613.36 µS/cm	0.15 mg/L	91.59 NTU	-104.5 mV	20.20 ft	200.00 ml/min
7/16/2017 3:54 PM	20:00	6.66 pH	19.55 °C	618.40 µS/cm	0.15 mg/L	39.78 NTU	-97.3 mV	20.20 ft	200.00 ml/min
7/16/2017 3:59 PM	25:00	6.62 pH	19.44 °C	619.78 µS/cm	0.18 mg/L	37.05 NTU	-80.9 mV	20.20 ft	200.00 ml/min
7/16/2017 4:04 PM	30:00	6.60 pH	19.48 °C	619.59 µS/cm	0.15 mg/L	21.04 NTU	-82.0 mV	20.20 ft	200.00 ml/min
7/16/2017 4:09 PM	35:00	6.60 pH	19.35 °C	620.25 µS/cm	0.14 mg/L	20.25 NTU	-85.4 mV	20.20 ft	200.00 ml/min
7/16/2017 4:14 PM	40:00	6.60 pH	18.34 °C	617.42 µS/cm	0.17 mg/L	18.21 NTU	-74.0 mV	20.20 ft	200.00 ml/min
7/16/2017 4:19 PM	45:00	6.61 pH	18.26 °C	619.01 µS/cm	0.15 mg/L	13.33 NTU	-78.1 mV	20.20 ft	200.00 ml/min
7/16/2017 4:24 PM	50:00	6.65 pH	18.08 °C	619.88 µS/cm	0.13 mg/L	15.10 NTU	-82.2 mV	20.20 ft	200.00 ml/min
7/16/2017 4:29 PM	55:00	6.69 pH	18.53 °C	619.97 µS/cm	0.13 mg/L	14.32 NTU	-87.1 mV	20.20 ft	200.00 ml/min
7/16/2017 4:34 PM	01:00:00	6.67 pH	18.39 °C	617.29 µS/cm	0.13 mg/L	17.06 NTU	-89.6 mV	20.20 ft	200.00 ml/min

Samples

Sample ID:	Description:
162	

Low-Flow Test Report:

Test Date / Time: 7/18/2017 4:47:46 PM
Project: FMC 181 (2)
Operator Name: Harder, Brown

Location Name: 181 **Well Diameter: 6 in** **Casing Type: Steel** **Total Depth: 175.84 ft** **Initial Depth to Water: 23.46 ft**	**Pump Type: Double Valve** **Tubing Type: Pvc** **Pump Intake From TOC: 160 ft** **Estimated Total Volume Pumped: 7000.001 ml** **Flow Cell Volume: 130 ml** **Final Flow Rate: 200 ml/min** **Final Draw Down: 0.68 ft**	**Instrument Used: AquaTROLL 600** **Serial Number: 447365**

Test Notes:

Weather Conditions:
Overcast 80

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 10 %	+/- 3 %	+/- 10 %	+/- 10 %	+/- 10	+/- 0.33	
7/18/2017 4:47 PM	00:00	7.69 pH	20.02 °C	570.34 µS/cm	0.51 mg/L	0.67 NTU	-281.2 mV	23.46 ft	200.00 ml/min
7/18/2017 4:52 PM	05:00	7.46 pH	20.24 °C	576.97 µS/cm	0.38 mg/L	0.00 NTU	-274.2 mV	23.57 ft	200.00 ml/min
7/18/2017 4:57 PM	09:59	7.18 pH	20.24 °C	581.49 µS/cm	0.33 mg/L	0.00 NTU	-268.3 mV	23.68 ft	200.00 ml/min
7/18/2017 5:02 PM	15:00	7.14 pH	20.28 °C	577.85 µS/cm	0.31 mg/L	0.00 NTU	-270.9 mV	23.78 ft	200.00 ml/min
7/18/2017 5:07 PM	20:00	7.25 pH	20.38 °C	577.34 µS/cm	0.28 mg/L	0.00 NTU	-276.2 mV	23.86 ft	200.00 ml/min
7/18/2017 5:12 PM	25:00	7.40 pH	20.36 °C	579.04 µS/cm	0.26 mg/L	0.00 NTU	-285.2 mV	23.93 ft	200.00 ml/min
7/18/2017 5:17 PM	29:59	7.36 pH	20.38 °C	579.51 µS/cm	0.25 mg/L	0.00 NTU	-285.9 mV	24.05 ft	200.00 ml/min
7/18/2017 5:22 PM	35:00	7.34 pH	20.72 °C	576.04 µS/cm	0.25 mg/L	0.00 NTU	-287.8 mV	24.14 ft	200.00 ml/min

Samples

Sample ID:	Description:

Low-Flow Test Report:

Test Date / Time: 7/18/2017 1:46:17 PM
Project: FMC 185 (2)
Operator Name:

Location Name: 185 **Well Diameter: 6 in** **Total Depth: 71.79 ft** **Initial Depth to Water: 21.22 ft**	**Estimated Total Volume Pumped: 6091.749 ml** **Flow Cell Volume: 130 ml** **Final Flow Rate: 105 ml/min** **Final Draw Down: 0.28 ft**	**Instrument Used: AquaTROLL 600** **Serial Number: 468828**

Test Notes:
Turbidity not 10% but 3 readings below 10 NTU.

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 10 %	+/- 3 %	+/- 10 %	+/- 10 %	+/- 10	+/- 0.33	
7/18/2017 1:46 PM	00:00	6.68 pH	22.25 °C	329.50 µS/cm	0.92 mg/L		-69.1 mV	21.22 ft	105.00 ml/min
7/18/2017 1:51 PM	04:59	6.68 pH	19.98 °C	329.24 µS/cm	0.89 mg/L	10.00 NTU	-43.5 mV	21.30 ft	105.00 ml/min
7/18/2017 1:56 PM	09:59	6.66 pH	18.19 °C	472.35 µS/cm	0.85 mg/L	18.70 NTU	-28.9 mV	21.38 ft	105.00 ml/min
7/18/2017 1:59 PM	13:02	6.66 pH	17.75 °C	478.61 µS/cm	0.69 mg/L	15.50 NTU	-23.8 mV	21.42 ft	105.00 ml/min
7/18/2017 2:04 PM	18:02	6.62 pH	17.67 °C	474.15 µS/cm	0.72 mg/L	17.70 NTU	-17.4 mV	21.42 ft	105.00 ml/min
7/18/2017 2:09 PM	23:01	6.54 pH	17.49 °C	467.26 µS/cm	0.73 mg/L	28.00 NTU	-6.4 mV	21.44 ft	105.00 ml/min
7/18/2017 2:14 PM	28:01	6.39 pH	17.25 °C	463.59 µS/cm	0.74 mg/L	21.50 NTU	1.5 mV	21.47 ft	105.00 ml/min
7/18/2017 2:19 PM	33:01	6.23 pH	17.03 °C	463.19 µS/cm	0.72 mg/L	16.80 NTU	13.2 mV	21.48 ft	105.00 ml/min
7/18/2017 2:24 PM	38:02	6.11 pH	16.92 °C	467.17 µS/cm	0.72 mg/L	15.50 NTU	22.1 mV	21.48 ft	105.00 ml/min
7/18/2017 2:29 PM	43:01	6.06 pH	16.98 °C	466.77 µS/cm	0.70 mg/L	12.00 NTU	27.2 mV	21.48 ft	105.00 ml/min
7/18/2017 2:34 PM	48:01	6.08 pH	16.85 °C	467.82 µS/cm	0.71 mg/L	9.42 NTU	28.2 mV	21.50 ft	105.00 ml/min
7/18/2017 2:39 PM	53:00	6.12 pH	16.99 °C	468.65 µS/cm	0.70 mg/L	8.33 NTU	28.1 mV	21.50 ft	105.00 ml/min
7/18/2017 2:44 PM	58:00	6.14 pH	16.92 °C	467.48 µS/cm	0.68 mg/L	9.48 NTU	28.9 mV	21.50 ft	105.00 ml/min

Samples

Sample ID:	Description:
2017AN-185	Sample time 14:45

Created using VuSitu from In-Situ, Inc.

Low-Flow Test Report:

Test Date / Time: 7/25/2017 1:33:28 PM
Project: FMC 203 (3)
Operator Name:

Location Name: 203 **Well Diameter: 4 in** **Screen Length: 28 ft** **Top of Screen: 154.94 ft** **Total Depth: 182.94 ft** **Initial Depth to Water: 2.2 ft**	**Estimated Total Volume Pumped: 15386 ml** **Flow Cell Volume: 130 ml** **Final Flow Rate: 280 ml/min** **Final Draw Down: 0 ft**	**Instrument Used: AquaTROLL 600** **Serial Number: 468828**

Test Notes:
Standard method
Double valve pump

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 10 %	+/- 3 %	+/- 10 %	+/- 10 %	+/- 10	+/- 0.33	
7/25/2017 1:33 PM	00:00	7.46 pH	20.76 °C	1,261.2 µS/cm	0.23 mg/L		-166.4 mV	2.20 ft	280.00 ml/min
7/25/2017 1:38 PM	04:59	7.41 pH	20.62 °C	1,273.2 µS/cm	0.19 mg/L	12.80 NTU	-160.0 mV	2.20 ft	280.00 ml/min
7/25/2017 1:43 PM	09:59	7.37 pH	20.26 °C	1,267.4 µS/cm	0.15 mg/L	10.00 NTU	-153.6 mV	2.20 ft	280.00 ml/min
7/25/2017 1:48 PM	14:59	7.30 pH	20.22 °C	1,258.2 µS/cm	0.12 mg/L	8.23 NTU	-144.8 mV	2.20 ft	280.00 ml/min
7/25/2017 1:53 PM	19:59	7.24 pH	20.05 °C	1,258.7 µS/cm	0.11 mg/L	9.25 NTU	-138.8 mV	2.20 ft	280.00 ml/min
7/25/2017 1:58 PM	24:58	7.16 pH	19.85 °C	1,248.4 µS/cm	0.09 mg/L	8.19 NTU	-136.4 mV	2.20 ft	280.00 ml/min
7/25/2017 2:03 PM	29:58	7.04 pH	19.91 °C	1,251.8 µS/cm	0.09 mg/L	7.12 NTU	-126.7 mV	2.20 ft	280.00 ml/min
7/25/2017 2:08 PM	34:57	6.97 pH	19.79 °C	1,248.8 µS/cm	0.08 mg/L	6.88 NTU	-123.7 mV	2.20 ft	280.00 ml/min
7/25/2017 2:13 PM	39:57	6.91 pH	19.88 °C	1,249.8 µS/cm	0.07 mg/L	5.24 NTU	-118.2 mV	2.20 ft	280.00 ml/min
7/25/2017 2:18 PM	44:57	6.88 pH	19.77 °C	1,243.5 µS/cm	0.06 mg/L	4.49 NTU	-114.8 mV	2.20 ft	280.00 ml/min
7/25/2017 2:23 PM	49:57	6.87 pH	19.73 °C	1,244.4 µS/cm	0.06 mg/L	4.36 NTU	-113.9 mV	2.20 ft	280.00 ml/min
7/25/2017 2:28 PM	54:56	6.90 pH	19.47 °C	1,248.3 µS/cm	0.06 mg/L	4.09 NTU	-120.5 mV	2.20 ft	280.00 ml/min

Samples

Sample ID:	Description:

2017AN-203	Sample time14:30

Created using VuSitu from In-Situ, Inc.

Low-Flow Test Report:

Test Date / Time: 7/31/2017 1:17:24 PM
Project: FMC 205 (2)
Operator Name:

Location Name: 205 **Well Diameter: 4 in** **Screen Length: 27 ft** **Top of Screen: 154.19 ft** **Total Depth: 181.19 ft** **Initial Depth to Water: 61.94 ft**	**Estimated Total Volume Pumped: 9547.501 ml** **Flow Cell Volume: 130 ml** **Final Flow Rate: 100 ml/min** **Final Draw Down: 1.74 ft**	**Instrument Used: AquaTROLL 600** **Serial Number: 468828**

Test Notes:
Method 2A. Water level slowly dropping.
Last 4 readings within 0.33'.

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 10 %	+/- 3 %	+/- 10 %	+/- 10 %	+/- 10	+/- 0.33	
7/31/2017 1:17 PM	00:00	9.81 pH	21.63 °C	3,767.1 µS/cm	0.45 mg/L		-369.0 mV	61.94 ft	150.00 ml/min
7/31/2017 1:22 PM	04:59	9.79 pH	23.49 °C	3,927.2 µS/cm	0.24 mg/L	23.30 NTU	-374.3 mV	61.96 ft	150.00 ml/min
7/31/2017 1:27 PM	09:58	9.82 pH	21.81 °C	3,815.8 µS/cm	0.43 mg/L	16.60 NTU	-369.8 mV	61.99 ft	150.00 ml/min
7/31/2017 1:32 PM	14:59	9.86 pH	21.06 °C	3,876.4 µS/cm	0.37 mg/L	13.40 NTU	-372.6 mV	62.06 ft	110.00 ml/min
7/31/2017 1:37 PM	19:59	9.88 pH	20.35 °C	3,868.1 µS/cm	0.28 mg/L	12.80 NTU	-378.1 mV	62.10 ft	110.00 ml/min
7/31/2017 1:42 PM	24:59	9.86 pH	19.50 °C	3,893.0 µS/cm	0.24 mg/L	13.80 NTU	-379.9 mV	62.27 ft	110.00 ml/min
7/31/2017 1:47 PM	29:59	9.78 pH	19.47 °C	3,901.5 µS/cm	0.21 mg/L	12.90 NTU	-377.7 mV	62.43 ft	110.00 ml/min
7/31/2017 1:52 PM	34:59	9.73 pH	19.34 °C	3,913.8 µS/cm	0.21 mg/L	12.10 NTU	-376.1 mV	62.58 ft	110.00 ml/min
7/31/2017 1:57 PM	39:59	9.72 pH	19.45 °C	3,912.1 µS/cm	0.19 mg/L	11.50 NTU	-376.7 mV	62.72 ft	110.00 ml/min
7/31/2017 2:02 PM	44:59	9.74 pH	19.51 °C	3,932.7 µS/cm	0.19 mg/L	13.20 NTU	-379.1 mV	62.83 ft	100.00 ml/min
7/31/2017 2:07 PM	49:59	9.77 pH	19.43 °C	3,950.8 µS/cm	0.18 mg/L	10.90 NTU	-381.8 mV	62.96 ft	100.00 ml/min
7/31/2017 2:12 PM	54:59	9.78 pH	19.59 °C	3,936.6 µS/cm	0.17 mg/L	11.40 NTU	-382.3 mV	63.11 ft	100.00 ml/min
7/31/2017 2:17 PM	59:59	9.78 pH	19.67 °C	3,963.3 µS/cm	0.16 mg/L	12.40 NTU	-384.3 mV	63.21 ft	100.00 ml/min
7/31/2017 2:22 PM	01:04:58	9.79 pH	19.87 °C	3,950.1 µS/cm	0.15 mg/L	10.70 NTU	-385.6 mV	63.29 ft	100.00 ml/min
7/31/2017 2:27 PM	01:09:59	9.79 pH	19.99 °C	3,941.6 µS/cm	0.13 mg/L	10.10 NTU	-386.9 mV	63.40 ft	100.00 ml/min
7/31/2017 2:32 PM	01:14:59	9.79 pH	20.09 °C	3,951.2 µS/cm	0.12 mg/L	11.70 NTU	-388.4 mV	63.55 ft	100.00 ml/min

7/31/2017 2:37 PM	01:19:59	9.78 pH	20.06 °C	3,930.0 µS/cm	0.11 mg/L	10.80 NTU	-388.9 mV	63.61 ft	100.00 ml/min
7/31/2017 2:42 PM	01:24:59	9.78 pH	20.20 °C	3,943.6 µS/cm	0.11 mg/L	11.30 NTU	-389.6 mV	63.68 ft	100.00 ml/min

Samples

Sample ID:	Description:
2017AN-205	Sample time 14:45

Created using VuSitu from In-Situ, Inc.

Low-Flow Test Report:

Test Date / Time: 7/13/2017 2:40:52 PM
Project: FMC 206 (2)
Operator Name:

Location Name: 206 **Well Diameter: 2 in** **Screen Length: 20 ft** **Top of Screen: 205 ft** **Total Depth: 215 ft** **Initial Depth to Water: 27.55 ft**	**Pump Type: Dedicated Double Valve** **Tubing Type: Poly** **Tubing Inner Diameter: 0.25 in** **Tubing Length: 205 ft** **Pump Intake From TOC: 208 ft** **Estimated Total Volume Pumped: 4996.667 ml** **Flow Cell Volume: 130 ml** **Final Flow Rate: 100 ml/min** **Final Draw Down: 0.55 ft**	**Instrument Used: AquaTROLL 600** **Serial Number: 468828**

Test Notes:
RDO not 10% but below 0.15

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 10 %	+/- 3 %	+/- 10 %	+/- 10 %	+/- 10	+/- 0.33	
7/13/2017 2:40 PM	00:00	7.29 pH	23.94 °C	2,465.3 µS/cm	1.01 mg/L		-418.2 mV	27.55 ft	100.00 ml/min
7/13/2017 2:45 PM	04:59	7.38 pH	20.55 °C	2,492.8 µS/cm	0.27 mg/L	3.33 NTU	-440.4 mV	27.95 ft	100.00 ml/min
7/13/2017 2:50 PM	09:59	7.37 pH	19.71 °C	2,478.1 µS/cm	0.25 mg/L	0.65 NTU	-444.7 mV	28.05 ft	100.00 ml/min
7/13/2017 2:55 PM	14:59	7.28 pH	19.31 °C	2,417.7 µS/cm	0.21 mg/L	0.72 NTU	-440.5 mV	28.10 ft	100.00 ml/min
7/13/2017 3:00 PM	19:58	7.19 pH	19.67 °C	2,440.1 µS/cm	0.18 mg/L	0.86 NTU	-437.8 mV	28.10 ft	100.00 ml/min
7/13/2017 3:05 PM	24:58	7.19 pH	19.84 °C	2,486.2 µS/cm	0.17 mg/L	0.43 NTU	-438.4 mV	28.10 ft	100.00 ml/min
7/13/2017 3:10 PM	29:58	7.25 pH	19.83 °C	2,420.5 µS/cm	0.15 mg/L	0.54 NTU	-442.3 mV	28.10 ft	100.00 ml/min
7/13/2017 3:15 PM	34:58	7.27 pH	19.86 °C	2,245.5 µS/cm	0.14 mg/L	0.42 NTU	-444.5 mV	28.10 ft	100.00 ml/min
7/13/2017 3:20 PM	39:57	7.27 pH	19.90 °C	2,321.8 µS/cm	0.14 mg/L	0.50 NTU	-446.0 mV	28.10 ft	100.00 ml/min
7/13/2017 3:25 PM	44:58	7.28 pH	19.88 °C	2,290.4 µS/cm	0.12 mg/L	0.32 NTU	-448.5 mV	28.10 ft	100.00 ml/min
7/13/2017 3:30 PM	49:57	7.28 pH	19.99 °C	2,258.0 µS/cm	0.11 mg/L	0.47 NTU	-450.2 mV	28.10 ft	100.00 ml/min

Samples

Sample ID:	Description:

2017AN-206	Sample time 15:35

Created using VuSitu from In-Situ, Inc.

Low-Flow Test Report:

Test Date / Time: 7/19/2017 9:05:55 AM
Project: FMC 206 (3)
Operator Name:

Location Name: 206 **Well Diameter: 2 in** **Screen Length: 20 ft** **Top of Screen: 205 ft** **Total Depth: 215 ft** **Initial Depth to Water: 27.23 ft**	**Pump Type: Dedicated Double Valve** **Tubing Type: Poly** **Tubing Inner Diameter: 0.25 in** **Tubing Length: 205 ft** **Pump Intake From TOC: 208 ft** **Estimated Total Volume Pumped: 4953.001 ml** **Flow Cell Volume: 130 ml** **Final Flow Rate: 120 ml/min** **Final Draw Down: 1.27 ft**	**Instrument Used: AquaTROLL 600** **Serial Number: 468828**

Test Notes:
Resample for vocs.

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 10 %	+/- 3 %	+/- 10 %	+/- 10 %	+/- 10	+/- 0.33	
7/19/2017 9:05 AM	00:00	7.69 pH	24.11 °C	0.31 µS/cm	8.07 mg/L		-40.9 mV	27.23 ft	150.00 ml/min
7/19/2017 9:07 AM	01:55	8.09 pH	19.43 °C	2,746.8 µS/cm	0.91 mg/L		-426.7 mV	27.23 ft	150.00 ml/min
7/19/2017 9:08 AM	02:22	8.10 pH	18.81 °C	2,791.7 µS/cm	0.64 mg/L		-421.1 mV	27.23 ft	150.00 ml/min
7/19/2017 9:13 AM	07:22	7.70 pH	17.02 °C	2,914.4 µS/cm	0.33 mg/L	0.42 NTU	-433.4 mV	28.40 ft	150.00 ml/min
7/19/2017 9:18 AM	12:22	7.69 pH	16.85 °C	2,934.2 µS/cm	0.31 mg/L	0.54 NTU	-437.4 mV	28.65 ft	140.00 ml/min
7/19/2017 9:23 AM	17:22	7.78 pH	16.83 °C	2,891.1 µS/cm	0.26 mg/L	0.26 NTU	-444.4 mV	28.63 ft	120.00 ml/min
7/19/2017 9:28 AM	22:22	7.80 pH	17.11 °C	2,815.4 µS/cm	0.25 mg/L	0.45 NTU	-446.1 mV	28.56 ft	120.00 ml/min
7/19/2017 9:33 AM	27:22	7.81 pH	17.04 °C	2,834.5 µS/cm	0.22 mg/L	0.39 NTU	-445.7 mV	28.52 ft	120.00 ml/min
7/19/2017 9:38 AM	32:21	7.80 pH	17.22 °C	2,853.2 µS/cm	0.22 mg/L	0.31 NTU	-450.1 mV	28.50 ft	120.00 ml/min
7/19/2017 9:43 AM	37:21	7.81 pH	17.08 °C	2,840.6 µS/cm	0.20 mg/L	0.34 NTU	-450.4 mV	28.50 ft	120.00 ml/min

Samples

Sample ID:	Description:
2017AN-206	Sample time 09:45 vows only - resample

Created using VuSitu from In-Situ, Inc.

Low-Flow Test Report:

Test Date / Time: 7/27/2017 9:51:55 AM
Project: FMC 210 (2)
Operator Name: KTeague

Location Name: 210 **Well Diameter: 4 in** **Casing Type: Steel** **Screen Length: 22 ft** **Top of Screen: 79.85 ft** **Total Depth: 101.85 ft** **Initial Depth to Water: 10.3 ft**	**Pump Type: Peristaltic** **Pump Intake From TOC: 91 ft** **Estimated Total Volume Pumped: 1.5 gal** **Flow Cell Volume: 130 ml** **Final Flow Rate: 120 ml/min** **Final Draw Down: 0 ft**	**Instrument Used: AquaTROLL 600** **Serial Number: 447417**

Test Notes:

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 10 %	+/- 3 %	+/- 10 %	+/- 10 %	+/- 10	+/- 5	
7/27/2017 9:51 AM	00:00	8.15 pH	19.57 °C	1,693.1 µS/cm	2.03 mg/L		-59.3 mV	10.30 ft	150.00 ml/min
7/27/2017 9:56 AM	04:59	7.77 pH	19.78 °C	2,208.5 µS/cm	0.70 mg/L		-48.6 mV	10.30 ft	150.00 ml/min
7/27/2017 10:01 AM	09:59	7.77 pH	19.52 °C	2,210.6 µS/cm	0.57 mg/L		-56.1 mV	10.30 ft	150.00 ml/min
7/27/2017 10:06 AM	14:59	7.76 pH	19.71 °C	2,214.0 µS/cm	0.47 mg/L	7.31 NTU	-64.2 mV	10.30 ft	150.00 ml/min
7/27/2017 10:11 AM	19:58	7.77 pH	19.70 °C	2,200.9 µS/cm	0.42 mg/L	2.88 NTU	-71.1 mV	10.30 ft	150.00 ml/min
7/27/2017 10:16 AM	24:58	7.78 pH	19.57 °C	2,208.2 µS/cm	0.39 mg/L	2.68 NTU	-74.8 mV	10.30 ft	150.00 ml/min
7/27/2017 10:21 AM	29:58	7.80 pH	19.54 °C	2,187.3 µS/cm	0.37 mg/L	2.67 NTU	-78.8 mV	10.30 ft	150.00 ml/min
7/27/2017 10:26 AM	34:58	7.77 pH	19.88 °C	2,188.0 µS/cm	0.35 mg/L	2.11 NTU	-83.5 mV	10.30 ft	150.00 ml/min

Samples

Sample ID:	Description:
FMC-210	DO readings were within 0.1 mg/L of each other and we're low enough to consider stable for sampling.

Low-Flow Test Report:

Test Date / Time: 2/1/2018 1:25:55 PM
Project:
Operator Name:

Location Name: 210R	**Flow Cell Volume: 130 ml** **Final Flow Rate: 200 ml/min**	**Instrument Used: Aqua TROLL 600** **Serial Number: 468828**

Test Notes:

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 0.5	+/- 3 %	+/- 0.3	+/- 10	+/- 10	+/- 0.33	
2/1/2018 1:25 PM	00:00	9.80 pH	13.50 °C	1,130.6 µS/cm	0.33 mg/L		-212.7 mV	10.18 ft	200.00 ml/min
2/1/2018 1:30 PM	05:00	9.75 pH	13.55 °C	1,139.7 µS/cm	0.26 mg/L		-232.9 mV	10.18 ft	200.00 ml/min
2/1/2018 1:35 PM	10:00	9.45 pH	13.52 °C	1,193.8 µS/cm	0.22 mg/L		-240.1 mV	10.18 ft	200.00 ml/min
2/1/2018 1:40 PM	15:00	8.18 pH	13.53 °C	1,565.7 µS/cm	0.17 mg/L	8.79 NTU	-222.6 mV	10.18 ft	200.00 ml/min
2/1/2018 1:45 PM	20:00	7.65 pH	13.52 °C	1,833.2 µS/cm	0.16 mg/L	4.27 NTU	-173.2 mV	10.19 ft	200.00 ml/min
2/1/2018 1:50 PM	25:00	7.57 pH	13.66 °C	1,841.3 µS/cm	0.14 mg/L	4.01 NTU	-154.8 mV	10.19 ft	200.00 ml/min
2/1/2018 1:55 PM	30:00	7.54 pH	13.74 °C	1,848.9 µS/cm	0.14 mg/L	3.44 NTU	-150.4 mV	10.20 ft	200.00 ml/min
2/1/2018 2:00 PM	35:00	7.47 pH	13.79 °C	1,858.6 µS/cm	0.14 mg/L	3.36 NTU	-144.7 mV	10.20 ft	200.00 ml/min
2/1/2018 2:05 PM	40:00	7.38 pH	13.79 °C	1,874.4 µS/cm	0.13 mg/L	3.14 NTU	-137.1 mV	10.20 ft	200.00 ml/min
2/1/2018 2:10 PM	45:00	7.33 pH	13.76 °C	1,878.0 µS/cm	0.12 mg/L	3.19 NTU	-134.9 mV	10.20 ft	200.00 ml/min
2/1/2018 2:15 PM	50:00	7.28 pH	13.74 °C	1,884.0 µS/cm	0.12 mg/L	3.18 NTU	-142.6 mV	10.20 ft	200.00 ml/min

Samples

Sample ID:	Description:

PARSONS

Field Monitoring Record
Low-Flow (minimal drawdown)
GROUNDWATER SAMPLING

Client: FMC Front Royal
Site name: Front Royal, VA
Samplers: MH + CB
Sample Event #: 2017
Well Condition: Good
Purge Start: 7/12/17
Pump Type: Grundfos | Double Valve

Date: 7/18/17
Wind:
Weather:
Air Temperature:
Meters Calibrated: Y
Purge Stop:
Sample Style: Grab

Well #: 215
Initial DTW: 48.54
Pump Depth: 176
Total Well Depth: 187.6
Screen Depth: ~~184~~ 164.6
Sample Time: 1000
Alternate Method: Method 2

TIME	FLOW RATE (ml/min)	DEPTH TO WATER (TOC, FT/M)	pH	SPECIFIC CONDUCTANCE (uS/cm)	TEMP (C)	D.O. (MG/L)	ORP (MV)	TURBIDITY (NTU)	APPEARANCE (COLOR, CLARITY, SOLIDS)	COMMENTS
	Parameter Stability Values over 3 Consecutive Readings									
	100 to 500 ml/min	<0.33 Feet	+0.1 -	+3% -	+10% -	+10% -	+10 mV -	+10% -		
1000		158.20	11.15	6.88	25.32	2.23	-363.8	0		
	★	Begin purge on 7/12/17, removed ~90 gallons,								
		allow well to recover, sample on 7/18/17 @ 1000								

Chain of custody #_____

PARSONS

Field Monitoring Record
Low-Flow (minimal drawdown)
GROUNDWATER SAMPLING

Client: FMC Front Royal
Site name: Front Royal, VA
Samplers: Lifsmi / Hardo
Sample Event #: 2017AN
Well Condition: Good
Purge Start: 1/30/18 @ 1030
Pump Type: Grundfos / Double Valve

Date: 1/30/18 + 3/8/18
Wind:
Weather:
Air Temperature:
Meters Calibrated: Y
Purge Stop: 1/30/18 @ 1200
Sample Style: Grab

Well #: 215 (Resample)
Initial DTW: 63.85
Pump Depth: 174
Total Well Depth: 187.6
Screen Depth: 164.6
Sample Time: 3/8/18 @ 0910
Alternate Method:

TIME	FLOW RATE (ml/min)	DEPTH TO WATER (TOC, FT/M)	pH	SPECIFIC CONDUCTANCE (uS/cm)	TEMP (C)	D.O. (MG/L)	ORP (MV)	TURBIDITY (NTU)	APPEARANCE (COLOR, CLARITY, SOLIDS)	COMMENTS
	Parameter Stability Values over 3 Consecutive Readings									
	100 to 500 ml/min	<0.33 Feet	+ 0.1 -	+ 3% -	+10% -	+10% -	+10 mV -	+10% -		
1/30 1030	—	63.85								
1200		132	Grundfos	Field	/	Purge	Star			
3/8 0910		111.12	8.30	520	5.87	3.14	-294.3	81.4		

Chain of custody # _____

Low-Flow Test Report:

Test Date / Time: 7/15/2017 10:45:17 AM
Project: FMC 216 (2)
Operator Name: Harder, Brown

Location Name: 216 **Well Diameter: 4 in** **Casing Type: PVC** **Screen Length: 20 ft** **Top of Screen: 165.38 ft** **Total Depth: 185.38 ft** **Initial Depth to Water: 109.4 ft**	**Pump Type: Double Valve** **Tubing Type: Pvc** **Pump Intake From TOC: 175 ft** **Estimated Total Volume Pumped: 2998.333 ml** **Flow Cell Volume: 130 ml** **Final Flow Rate: 100 ml/min** **Final Draw Down: 1.15 ft**	**Instrument Used: AquaTROLL 600** **Serial Number: 447365**

Test Notes:

Weather Conditions:
Sunny 80

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 10 %	+/- 3 %	+/- 10 %	+/- 10 %	+/- 10	+/- 0.33	
7/15/2017 10:45 AM	00:00	9.12 pH	27.81 °C	7,766.5 µS/cm	0.21 mg/L	39.96 NTU	-396.2 mV	109.40 ft	100.00 ml/min
7/15/2017 10:50 AM	05:00	9.08 pH	26.98 °C	8,023.3 µS/cm	0.05 mg/L	30.55 NTU	-433.8 mV	109.93 ft	100.00 ml/min
7/15/2017 10:55 AM	09:59	9.09 pH	26.72 °C	8,016.8 µS/cm	0.04 mg/L	25.60 NTU	-437.4 mV	110.00 ft	100.00 ml/min
7/15/2017 11:00 AM	14:58	9.07 pH	28.01 °C	8,154.9 µS/cm	0.03 mg/L	21.02 NTU	-441.7 mV	110.20 ft	100.00 ml/min
7/15/2017 11:05 AM	19:58	9.06 pH	28.26 °C	8,152.5 µS/cm	0.03 mg/L	25.07 NTU	-443.2 mV	110.35 ft	100.00 ml/min
7/15/2017 11:10 AM	24:59	9.06 pH	27.59 °C	8,102.2 µS/cm	0.02 mg/L	24.04 NTU	-443.6 mV	110.55 ft	100.00 ml/min
7/15/2017 11:15 AM	29:58	9.06 pH	27.90 °C	8,132.8 µS/cm	0.02 mg/L	25.07 NTU	-449.2 mV	110.55 ft	100.00 ml/min

Samples

Sample ID:	Description:
216	

Low-Flow Test Report:

Test Date / Time: 7/27/2017 1:46:39 PM
Project: FMC 232 (3)
Operator Name:

Location Name: 232 **Well Diameter: 2 in** **Screen Length: 20 ft** **Top of Screen: 125.82 ft** **Total Depth: 145.82 ft** **Initial Depth to Water: 30.53 ft**	**Estimated Total Volume Pumped: 11196.668 ml** **Flow Cell Volume: 130 ml** **Final Flow Rate: 100 ml/min** **Final Draw Down: 9.25 ft**	**Instrument Used: AquaTROLL 600** **Serial Number: 468828**

Test Notes:
Water level dropping then stabilized.
Method 2A

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 10 %	+/- 3 %	+/- 10 %	+/- 10 %	+/- 10	+/- 0.33	
7/27/2017 1:46 PM	00:00	6.96 pH	23.76 °C	4,998.0 µS/cm	1.48 mg/L		-51.6 mV	30.53 ft	180.00 ml/min
7/27/2017 1:51 PM	05:00	6.95 pH	21.80 °C	5,272.9 µS/cm	0.51 mg/L	94.10 NTU	-68.6 mV	33.52 ft	180.00 ml/min
7/27/2017 1:56 PM	10:00	6.95 pH	22.70 °C	5,352.5 µS/cm	0.51 mg/L	80.90 NTU	-70.9 mV	34.31 ft	180.00 ml/min
7/27/2017 2:01 PM	15:00	6.95 pH	22.83 °C	5,369.1 µS/cm	0.50 mg/L	76.70 NTU	-71.0 mV	34.74 ft	100.00 ml/min
7/27/2017 2:06 PM	20:00	6.94 pH	22.71 °C	5,405.4 µS/cm	0.52 mg/L	74.60 NTU	-69.6 mV	35.48 ft	100.00 ml/min
7/27/2017 2:11 PM	25:00	6.93 pH	21.65 °C	5,359.1 µS/cm	0.46 mg/L	71.30 NTU	-67.4 mV	36.00 ft	100.00 ml/min
7/27/2017 2:16 PM	30:00	6.91 pH	21.60 °C	5,333.5 µS/cm	0.38 mg/L	67.70 NTU	-66.2 mV	36.47 ft	100.00 ml/min
7/27/2017 2:21 PM	35:00	6.87 pH	21.61 °C	5,362.9 µS/cm	0.36 mg/L	63.10 NTU	-64.8 mV	36.98 ft	100.00 ml/min
7/27/2017 2:26 PM	40:00	6.82 pH	22.01 °C	5,335.3 µS/cm	0.34 mg/L	60.50 NTU	-63.1 mV	37.43 ft	100.00 ml/min
7/27/2017 2:31 PM	45:00	6.79 pH	22.11 °C	5,348.9 µS/cm	0.35 mg/L	63.00 NTU	-61.5 mV	37.88 ft	100.00 ml/min
7/27/2017 2:36 PM	49:59	6.79 pH	22.16 °C	5,313.5 µS/cm	0.35 mg/L	56.80 NTU	-60.7 mV	38.26 ft	100.00 ml/min
7/27/2017 2:41 PM	54:59	6.79 pH	22.11 °C	5,269.5 µS/cm	0.32 mg/L	57.60 NTU	-60.6 mV	38.63 ft	100.00 ml/min
7/27/2017 2:46 PM	59:59	6.80 pH	22.80 °C	5,298.2 µS/cm	0.33 mg/L	52.20 NTU	-62.0 mV	38.93 ft	100.00 ml/min
7/27/2017 2:51 PM	01:04:59	6.80 pH	23.42 °C	5,240.0 µS/cm	0.32 mg/L	49.00 NTU	-63.2 mV	39.30 ft	100.00 ml/min
7/27/2017 2:56 PM	01:09:59	6.81 pH	23.45 °C	5,207.7 µS/cm	0.31 mg/L	43.00 NTU	-63.4 mV	39.48 ft	100.00 ml/min
7/27/2017 3:01 PM	01:14:59	6.81 pH	24.35 °C	5,210.8 µS/cm	0.30 mg/L	35.70 NTU	-65.4 mV	39.50 ft	100.00 ml/min

7/27/2017 3:06 PM	01:19:59	6.82 pH	23.97 °C	5,021.0 µS/cm	0.26 mg/L	29.20 NTU	-65.7 mV	39.53 ft	100.00 ml/min
7/27/2017 3:11 PM	01:24:59	6.84 pH	23.74 °C	5,050.2 µS/cm	0.25 mg/L	23.90 NTU	-66.7 mV	39.60 ft	100.00 ml/min
7/27/2017 3:16 PM	01:29:59	6.87 pH	24.06 °C	4,866.5 µS/cm	0.24 mg/L	20.80 NTU	-69.5 mV	39.65 ft	100.00 ml/min
7/27/2017 3:21 PM	01:34:58	6.90 pH	24.90 °C	4,758.9 µS/cm	0.24 mg/L	19.90 NTU	-73.0 mV	39.73 ft	100.00 ml/min
7/27/2017 3:26 PM	01:39:58	6.93 pH	25.54 °C	4,773.0 µS/cm	0.25 mg/L	19.10 NTU	-76.0 mV	39.78 ft	100.00 ml/min

Samples

Sample ID:	Description:
2017AN-232	Sample time 15:30

Created using VuSitu from In-Situ, Inc.

Low-Flow Test Report:

Test Date / Time: 8/10/2017 8:46:15 AM
Project: FMC 232 (2)
Operator Name: Harder, Brown

Location Name: 232 **Well Diameter: 2 in** **Casing Type: Pvc** **Screen Length: 20 ft** **Top of Screen: 125.82 ft** **Total Depth: 145.82 ft** **Initial Depth to Water: 29.22 ft**	**Pump Type: DV** **Tubing Type: Pvc** **Pump Intake From TOC: 135 ft** **Estimated Total Volume Pumped: 9995.001 ml** **Flow Cell Volume: 130 ml** **Final Flow Rate: 100 ml/min** **Final Draw Down: 10.38 ft**	**Instrument Used: AquaTROLL 600** **Serial Number: 447417**

Test Notes:

Weather Conditions:
Sunny 80

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 10 %	+/- 3 %	+/- 10 %	+/- 10 %	+/- 10	+/- 0.33	
8/10/2017 8:46 AM	00:00	7.85 pH	16.60 °C	3,882.0 µS/cm	0.38 mg/L		-131.4 mV	29.22 ft	250.00 ml/min
8/10/2017 8:51 AM	04:59	7.94 pH	16.51 °C	3,778.9 µS/cm	0.32 mg/L		-144.2 mV		250.00 ml/min
8/10/2017 8:56 AM	10:00	7.96 pH	16.90 °C	3,762.0 µS/cm	0.30 mg/L	61.50 NTU	-147.4 mV		100.00 ml/min
8/10/2017 9:01 AM	14:59	7.95 pH	17.63 °C	3,764.5 µS/cm	0.38 mg/L		-149.0 mV	34.17 ft	100.00 ml/min
8/10/2017 9:06 AM	19:59	7.94 pH	18.01 °C	3,722.2 µS/cm	0.39 mg/L	66.00 NTU	-146.2 mV		100.00 ml/min
8/10/2017 9:11 AM	24:59	7.95 pH	18.37 °C	3,664.9 µS/cm	0.37 mg/L		-144.6 mV	35.50 ft	100.00 ml/min
8/10/2017 9:16 AM	29:59	7.96 pH	18.56 °C	3,640.9 µS/cm	0.36 mg/L		-144.6 mV	36.15 ft	100.00 ml/min
8/10/2017 9:21 AM	34:59	7.97 pH	18.80 °C	3,594.0 µS/cm	0.35 mg/L	50.50 NTU	-145.1 mV	36.95 ft	100.00 ml/min
8/10/2017 9:26 AM	39:58	7.99 pH	19.08 °C	3,634.3 µS/cm	0.33 mg/L		-145.8 mV	37.30 ft	100.00 ml/min
8/10/2017 9:31 AM	44:59	8.02 pH	19.30 °C	3,630.9 µS/cm	0.32 mg/L	43.30 NTU	-146.3 mV	37.58 ft	100.00 ml/min
8/10/2017 9:36 AM	49:59	8.03 pH	19.75 °C	3,760.7 µS/cm	0.39 mg/L	35.10 NTU	-148.3 mV	37.81 ft	100.00 ml/min
8/10/2017 9:41 AM	54:59	8.00 pH	20.32 °C	3,723.2 µS/cm	0.35 mg/L	31.20 NTU	-149.7 mV	38.20 ft	100.00 ml/min
8/10/2017 9:46 AM	59:58	7.97 pH	20.85 °C	3,946.4 µS/cm	0.37 mg/L	28.10 NTU	-151.0 mV	38.50 ft	100.00 ml/min

8/10/2017 9:51 AM	01:04:58	7.99 pH	21.13 °C	3,947.5 µS/cm	0.33 mg/L	25.80 NTU	-153.6 mV	38.75 ft	100.00 ml/min
8/10/2017 9:56 AM	01:09:58	8.00 pH	21.22 °C	3,932.4 µS/cm	0.31 mg/L	23.00 NTU	-154.3 mV	39.00 ft	100.00 ml/min
8/10/2017 10:01 AM	01:14:58	8.01 pH	21.59 °C	3,921.9 µS/cm	0.29 mg/L	22.30 NTU	-155.7 mV	39.28 ft	100.00 ml/min
8/10/2017 10:06 AM	01:19:57	8.01 pH	22.00 °C	3,930.4 µS/cm	0.30 mg/L	22.30 NTU	-156.2 mV	39.45 ft	100.00 ml/min
8/10/2017 10:11 AM	01:24:57	7.99 pH	22.40 °C	3,897.4 µS/cm	0.28 mg/L	21.70 NTU	-156.9 mV	39.60 ft	100.00 ml/min

Samples

Sample ID:	Description:
232	Resample

Created using VuSitu from In-Situ, Inc.

Low-Flow Test Report:

Test Date / Time: 7/30/2017 3:17:06 PM
Project: FMC 238 (3)
Operator Name:

Location Name: 238 **Well Diameter: 2 in** **Screen Length: 20 ft** **Top of Screen: 154.75 ft** **Total Depth: 174.15 ft** **Initial Depth to Water: 31.31 ft**	**Estimated Total Volume Pumped: 16540.666 ml** **Flow Cell Volume: 130 ml** **Final Flow Rate: 100 ml/min** **Final Draw Down: 9.13 ft**	**Instrument Used: AquaTROLL 600** **Serial Number: 468828**

Test Notes:
Method 2A
Turbidity not 10% but <1.0 NTU
Water level dropped but then stabilized

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 10 %	+/- 3 %	+/- 10 %	+/- 10 %	+/- 10	+/- 0.33	
7/30/2017 3:17 PM	00:00	7.33 pH	21.16 °C	2,811.8 µS/cm	0.72 mg/L		-369.3 mV	31.31 ft	130.00 ml/min
7/30/2017 3:22 PM	04:59	7.40 pH	20.19 °C	2,845.5 µS/cm	0.51 mg/L	9.27 NTU	-378.8 mV	31.42 ft	130.00 ml/min
7/30/2017 3:27 PM	09:58	7.45 pH	20.02 °C	2,865.2 µS/cm	0.46 mg/L	6.72 NTU	-383.9 mV	31.50 ft	130.00 ml/min
7/30/2017 3:32 PM	14:58	7.42 pH	20.02 °C	2,873.9 µS/cm	0.43 mg/L	3.79 NTU	-384.5 mV	31.72 ft	110.00 ml/min
7/30/2017 3:37 PM	19:58	7.35 pH	19.95 °C	2,877.9 µS/cm	0.42 mg/L	2.42 NTU	-381.6 mV	32.20 ft	110.00 ml/min
7/30/2017 3:42 PM	24:58	7.29 pH	17.66 °C	2,841.0 µS/cm	0.35 mg/L	1.57 NTU	-378.3 mV	33.50 ft	300.00 ml/min
7/30/2017 3:47 PM	29:57	7.26 pH	17.11 °C	2,866.3 µS/cm	0.24 mg/L	1.48 NTU	-386.1 mV	34.55 ft	300.00 ml/min
7/30/2017 3:52 PM	34:57	7.26 pH	16.99 °C	2,880.6 µS/cm	0.23 mg/L	1.38 NTU	-387.8 mV	35.88 ft	300.00 ml/min
7/30/2017 3:57 PM	39:57	7.30 pH	16.90 °C	2,868.7 µS/cm	0.22 mg/L	1.06 NTU	-390.0 mV	36.85 ft	300.00 ml/min
7/30/2017 4:02 PM	44:57	7.31 pH	16.72 °C	2,863.5 µS/cm	0.21 mg/L	0.77 NTU	-392.2 mV	37.89 ft	300.00 ml/min
7/30/2017 4:07 PM	49:57	7.32 pH	16.69 °C	2,856.6 µS/cm	0.21 mg/L	1.26 NTU	-393.5 mV	38.91 ft	300.00 ml/min
7/30/2017 4:12 PM	54:57	7.32 pH	16.74 °C	2,826.5 µS/cm	0.20 mg/L	0.93 NTU	-393.9 mV	39.63 ft	300.00 ml/min
7/30/2017 4:17 PM	59:57	7.32 pH	16.77 °C	2,827.8 µS/cm	0.21 mg/L	0.69 NTU	-394.5 mV	40.31 ft	300.00 ml/min
7/30/2017 4:22 PM	01:04:57	7.31 pH	17.66 °C	2,855.3 µS/cm	0.22 mg/L	0.60 NTU	-394.9 mV	40.50 ft	100.00 ml/min
7/30/2017 4:27 PM	01:09:57	7.30 pH	18.32 °C	2,828.5 µS/cm	0.26 mg/L	0.51 NTU	-390.5 mV	40.41 ft	100.00 ml/min

7/30/2017 4:32 PM	01:14:57	7.29 pH	18.05 °C	2,794.6 µS/cm	0.26 mg/L	0.54 NTU	-388.9 mV	40.42 ft	100.00 ml/min
7/30/2017 4:37 PM	01:19:57	7.29 pH	18.00 °C	2,784.0 µS/cm	0.25 mg/L	0.45 NTU	-389.6 mV	40.44 ft	100.00 ml/min

Samples

Sample ID:	Description:
2017AN-238	Sample time 16:40

Created using VuSitu from In-Situ, Inc.

Low-Flow Test Report:

Test Date / Time: 8/9/2017 2:06:53 PM
Project: FMC 238 (2)
Operator Name: Harder, Brown

Location Name: 238 **Well Diameter: 2 in** **Casing Type: Pvc** **Screen Length: 20 ft** **Top of Screen: 154.75 ft** **Total Depth: 174.15 ft** **Initial Depth to Water: 29.78 ft**	**Pump Type: DV** **Tubing Type: Pvc** **Pump Intake From TOC: 164 ft** **Estimated Total Volume Pumped: 6365 ml** **Flow Cell Volume: 130 ml** **Final Flow Rate: 100 ml/min** **Final Draw Down: 4.44 ft**	**Instrument Used: AquaTROLL 600** **Serial Number: 468828**

Test Notes:

Weather Conditions:
Sunny 85

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 10 %	+/- 3 %	+/- 10 %	+/- 10 %	+/- 10	+/- 0.33	
8/9/2017 2:06 PM	00:00	7.21 pH	25.73 °C	2,512.5 µS/cm	0.15 mg/L		-395.8 mV	29.78 ft	100.00 ml/min
8/9/2017 2:11 PM	05:00	7.19 pH	26.00 °C	2,535.7 µS/cm	0.10 mg/L		-406.1 mV		100.00 ml/min
8/9/2017 2:16 PM	09:54	7.17 pH	24.91 °C	2,475.7 µS/cm	0.10 mg/L		-413.1 mV	32.27 ft	125.00 ml/min
8/9/2017 2:21 PM	14:54	7.15 pH	24.91 °C	2,449.1 µS/cm	0.09 mg/L		-417.3 mV	32.65 ft	125.00 ml/min
8/9/2017 2:26 PM	19:54	7.19 pH	25.41 °C	2,352.2 µS/cm	0.09 mg/L	6.62 NTU	-423.7 mV	32.92 ft	125.00 ml/min
8/9/2017 2:31 PM	24:54	7.15 pH	25.37 °C	2,748.2 µS/cm	0.08 mg/L	6.82 NTU	-423.3 mV	33.16 ft	100.00 ml/min
8/9/2017 2:36 PM	29:55	7.15 pH	25.93 °C	2,707.0 µS/cm	0.08 mg/L	3.66 NTU	-426.1 mV	33.30 ft	100.00 ml/min
8/9/2017 2:41 PM	34:55	7.18 pH	25.78 °C	2,556.2 µS/cm	0.09 mg/L		-428.5 mV	33.45 ft	100.00 ml/min
8/9/2017 2:46 PM	39:55	7.15 pH	25.09 °C	2,599.9 µS/cm	0.08 mg/L	1.84 NTU	-427.1 mV	33.71 ft	100.00 ml/min
8/9/2017 2:51 PM	44:55	7.10 pH	25.90 °C	2,642.0 µS/cm	0.09 mg/L	1.48 NTU	-425.0 mV	33.85 ft	100.00 ml/min
8/9/2017 2:56 PM	49:54	7.18 pH	25.64 °C	2,499.3 µS/cm	0.09 mg/L	1.23 NTU	-430.5 mV	33.98 ft	100.00 ml/min
8/9/2017 3:01 PM	54:54	7.19 pH	25.93 °C	2,434.7 µS/cm	0.08 mg/L	1.44 NTU	-431.5 mV	34.15 ft	100.00 ml/min
8/9/2017 3:06 PM	59:53	7.17 pH	27.25 °C	2,504.6 µS/cm	0.10 mg/L		-430.5 mV	34.22 ft	100.00 ml/min

Samples

Sample ID:	Description:
238	Resample

Created using VuSitu from In-Situ, Inc.

Low-Flow Test Report:

Test Date / Time: 7/25/2017 8:41:00 AM
Project: FMC 301 (2)
Operator Name:

Location Name: 301 **Well Diameter: 4 in** **Screen Length: 20 ft** **Top of Screen: 230 ft** **Total Depth: 250 ft** **Initial Depth to Water: 12 ft**	**Pump Type: Dedicated Double Valve** **Tubing Type: Poly** **Tubing Inner Diameter: 0.25 in** **Tubing Length: 238 ft** **Pump Intake From TOC: 240 ft** **Estimated Total Volume Pumped: 8578.331 ml** **Flow Cell Volume: 130 ml** **Final Flow Rate: 100 ml/min** **Final Draw Down: 2.11 ft**	**Instrument Used: AquaTROLL 600** **Serial Number: 468828**

Test Notes:
Turbidity not 10% but below 1 NTU
Method 2A

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 10 %	+/- 3 %	+/- 10 %	+/- 10 %	+/- 10	+/- 0.33	
7/25/2017 8:41 AM	00:00	8.71 pH	16.46 °C	402.60 µS/cm	0.30 mg/L		-74.0 mV	12.00 ft	250.00 ml/min
7/25/2017 8:46 AM	04:59	7.70 pH	16.10 °C	584.58 µS/cm	0.14 mg/L	0.58 NTU	-169.1 mV	12.90 ft	180.00 ml/min
7/25/2017 8:51 AM	09:59	7.66 pH	16.33 °C	595.71 µS/cm	0.18 mg/L	0.81 NTU	-167.9 mV	13.08 ft	120.00 ml/min
7/25/2017 8:52 AM	11:15	7.66 pH	16.43 °C	593.72 µS/cm	0.17 mg/L		-168.1 mV	13.00 ft	120.00 ml/min
7/25/2017 8:57 AM	16:15	7.66 pH	16.51 °C	589.33 µS/cm	0.14 mg/L	0.64 NTU	-173.1 mV	13.30 ft	120.00 ml/min
7/25/2017 9:02 AM	21:14	7.65 pH	16.86 °C	589.01 µS/cm	0.17 mg/L	0.53 NTU	-169.5 mV	13.48 ft	100.00 ml/min
7/25/2017 9:07 AM	26:14	7.67 pH	16.96 °C	587.83 µS/cm	0.18 mg/L	0.42 NTU	-174.1 mV	13.59 ft	100.00 ml/min
7/25/2017 9:12 AM	31:14	7.69 pH	17.09 °C	588.15 µS/cm	0.17 mg/L	0.43 NTU	-174.6 mV	13.68 ft	100.00 ml/min
7/25/2017 9:17 AM	36:14	7.67 pH	18.48 °C	0.32 µS/cm	9.41 mg/L	0.83 NTU	-63.2 mV	13.72 ft	100.00 ml/min
7/25/2017 9:22 AM	41:14	7.60 pH	18.70 °C	592.18 µS/cm	0.97 mg/L	0.99 NTU	-140.0 mV	13.79 ft	100.00 ml/min
7/25/2017 9:27 AM	46:14	7.63 pH	18.79 °C	587.88 µS/cm	0.39 mg/L	0.89 NTU	-159.4 mV	13.81 ft	100.00 ml/min
7/25/2017 9:32 AM	51:14	7.66 pH	18.79 °C	587.63 µS/cm	0.25 mg/L	0.51 NTU	-167.1 mV	13.90 ft	100.00 ml/min
7/25/2017 9:37 AM	56:14	7.70 pH	18.86 °C	580.42 µS/cm	0.18 mg/L	0.68 NTU	-169.7 mV	13.99 ft	100.00 ml/min
7/25/2017 9:42 AM	01:01:14	7.74 pH	19.09 °C	584.06 µS/cm	0.19 mg/L	0.46 NTU	-176.3 mV	14.02 ft	100.00 ml/min

7/25/2017 9:43 AM	01:02:01	7.75 pH	18.98 °C	580.79 µS/cm	0.17 mg/L		-177.0 mV	14.02 ft	100.00 ml/min
7/25/2017 9:48 AM	01:07:01	7.79 pH	19.05 °C	580.26 µS/cm	0.19 mg/L	0.35 NTU	-181.7 mV	14.09 ft	100.00 ml/min
7/25/2017 9:53 AM	01:12:01	7.83 pH	19.37 °C	576.07 µS/cm	0.19 mg/L	0.25 NTU	-181.6 mV	14.11 ft	100.00 ml/min

Samples

Sample ID:	Description:
2017AN-301	Sample time 09:55

Created using VuSitu from In-Situ, Inc.

Low-Flow Test Report:

Test Date / Time: 7/12/2017 3:56:24 PM
Project: FMC 605A (2)
Operator Name:

Location Name: 605A **Well Diameter: 2.5 in** **Screen Length: 40 ft** **Top of Screen: 505 ft** **Total Depth: 545 ft** **Initial Depth to Water: 186.9 ft**	**Pump Type: Dedicated Double Valve** **Tubing Type: Poly** **Tubing Inner Diameter: 0.25 in** **Tubing Length: 523 ft** **Pump Intake From TOC: 525 ft** **Estimated Total Volume Pumped: 234816.672 ml** **Flow Cell Volume: 130 ml** **Final Flow Rate: 100 ml/min** **Final Draw Down: 1.2 ft**	**Instrument Used: AquaTROLL 600** **Serial Number: 468828**

Test Notes:

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 10 %	+/- 3 %	+/- 10 %	+/- 10 %	+/- 10	+/- 0.33	
7/12/2017 3:56 PM	00:00	7.36 pH	32.34 °C	1.90 µS/cm	6.74 mg/L		101.5 mV	186.90 ft	100.00 ml/min
7/12/2017 4:01 PM	05:27	9.77 pH	20.67 °C	638.85 µS/cm	0.52 mg/L	0.77 NTU	-25.2 mV	186.95 ft	100.00 ml/min
7/12/2017 4:06 PM	10:28	9.80 pH	19.35 °C	666.77 µS/cm	0.38 mg/L	0.25 NTU	-47.0 mV	187.02 ft	100.00 ml/min
7/12/2017 4:11 PM	15:28	9.82 pH	18.48 °C	648.30 µS/cm	0.30 mg/L	0.87 NTU	-58.7 mV	187.15 ft	100.00 ml/min
7/12/2017 4:16 PM	20:28	9.81 pH	19.48 °C	669.39 µS/cm	0.69 mg/L	1.08 NTU	-70.5 mV	187.20 ft	100.00 ml/min
7/12/2017 4:21 PM	25:28	9.82 pH	18.58 °C	674.46 µS/cm	0.24 mg/L	1.54 NTU	-84.0 mV	187.29 ft	100.00 ml/min
7/12/2017 4:26 PM	30:27	9.83 pH	18.24 °C	657.66 µS/cm	0.27 mg/L	0.87 NTU	-88.8 mV	187.43 ft	100.00 ml/min
7/12/2017 4:31 PM	35:27	9.81 pH	19.02 °C	659.09 µS/cm	0.33 mg/L	0.94 NTU	-97.9 mV	187.49 ft	100.00 ml/min
7/12/2017 4:36 PM	40:27	9.82 pH	18.91 °C	673.41 µS/cm	0.25 mg/L	0.91 NTU	-104.6 mV	187.55 ft	100.00 ml/min
7/12/2017 4:41 PM	45:27	9.82 pH	18.95 °C	673.48 µS/cm	0.71 mg/L	0.93 NTU	-98.1 mV	187.49 ft	100.00 ml/min
7/12/2017 4:46 PM	50:27	9.81 pH	18.44 °C	654.77 µS/cm	0.23 mg/L	0.92 NTU	-110.3 mV	187.64 ft	100.00 ml/min
7/12/2017 4:51 PM	55:27	9.80 pH	18.52 °C	680.65 µS/cm	0.21 mg/L	0.99 NTU	-116.3 mV	187.74 ft	100.00 ml/min
7/12/2017 4:56 PM	01:00:28	9.83 pH	17.97 °C	662.51 µS/cm	0.56 mg/L	0.88 NTU	-119.2 mV	187.90 ft	100.00 ml/min
7/12/2017 5:01 PM	01:05:28	9.82 pH	17.76 °C	649.56 µS/cm	0.19 mg/L	0.73 NTU	-123.9 mV	188.00 ft	100.00 ml/min

7/12/2017 5:06 PM	01:10:28	9.78 pH	17.93 °C	666.29 µS/cm	0.19 mg/L	0.92 NTU	-128.5 mV	188.10 ft	100.00 ml/min
7/14/2017 7:04 AM	15:08:09	7.38 pH	20.91 °C	0.00 µS/cm	8.14 mg/L		-14.9 mV	188.10 ft	100.00 ml/min

Samples

Sample ID:	Description:
2017AN-605A	Sample time 17:15

Created using VuSitu from In-Situ, Inc.

PARSONS

Field Monitoring Record
Low-Flow (minimal drawdown)
GROUNDWATER SAMPLING

Client: FMC Front Royal
Site name: Front Royal, VA
Samplers: C. HUGY / C. BROWN / C. JAYNES
Sample Event #: 2017 AN
Well Condition: GOOD
Purge Start: 15:55
Pump Type: DOUBLE VALVE

Date: 7/13/17
Wind: 5-10mph
Weather: MOSTLY CLOUDY
Air Temperature: 92°F
Meters Calibrated: YES
Purge Stop: 7/13 16:17
Sample Style: GRAB

Well #: 306
Initial DTW: 125.50
Pump Depth: 272
Total Well Depth: 287
Screen Depth: 30
Sample Time:
Alternate Method:

TIME	FLOW RATE (ml/min)	DEPTH TO WATER (TOC, FT/M)	pH	SPECIFIC CONDUCTANCE (uS/cm)	TEMP (C)	D.O. (MG/L)	ORP (MV)	TURBIDITY (NTU)	APPEARANCE (COLOR, CLARITY, SOLIDS)	COMMENTS
			Parameter Stability Values over 3 Consecutive Readings							
	100 to 500 ml/min	<0.33 Feet	+ 0.1 -	+ 3% -	+10% -	+10% -	+10 mV -	+10% -		
7/13/17 16:17	PURGED	3.0 gal. END OF DAY	STOP, PURGE AGAIN TOMORROW							
7/14/17 13:38	PURGED	9.5 gal. (12.5 TOTAL)	PURGED TO TOP OF SCREEN							

Chain of custody #_____

PARSONS

Field Monitoring Record
Low-Flow (minimal drawdown)
GROUNDWATER SAMPLING

Client: FMC Front Royal
Site name: Front Royal, VA
Samplers: Rosinski - Harder
Sample Event #: 2017AN
Well Condition: Good
Purge Start: 0830
Pump Type: Double Valve

Date: 12/20/17
Wind: WNW 6 mph
Weather: Cloudy
Air Temperature: 47°F
Meters Calibrated: Y
Purge Stop:
Sample Style:

Well #: 306
Initial DTW: 172.00
Pump Depth:
Total Well Depth: 495.62
Screen Depth: 465.62
Sample Time:
Alternate Method:

TIME	FLOW RATE (ml/min)	DEPTH TO WATER (TOC, FT/M)	pH	SPECIFIC CONDUCTANCE (uS/cm)	TEMP (C)	D.O. (MG/L)	ORP (MV)	TURBIDITY (NTU)	APPEARANCE (COLOR, CLARITY, SOLIDS)	COMMENTS
	Parameter Stability Values over 3 Consecutive Readings									
	100 to 500 ml/min	<0.33 Feet	+ 0.1 -	+ 3% -	+10% -	+10% -	+10 mV -	+10% -		
0830	365	172.00								
0850	500	180.30								
0900	500	185.50								
0910	500	195.00								
0925	500	203.60	9.79	1,342	13°C	~~1.80~~ 1.10	-102.5	1.46	clear	

Chain of custody # _____

Low-Flow Test Report:

Test Date / Time: 7/15/2017 8:44:24 AM
Project: FMC 316 (2)
Operator Name: Harder, Brown

Location Name: 316 **Well Diameter: 4 in** **Casing Type: Pvc** **Screen Length: 20 ft** **Top of Screen: 230 ft** **Total Depth: 250 ft** **Initial Depth to Water: 154.75 ft**	**Pump Type: Dedicated Double Valve** **Tubing Type: Poly** **Tubing Inner Diameter: 0.25 in** **Tubing Length: 238 ft** **Pump Intake From TOC: 240 ft** **Estimated Total Volume Pumped: 3998.334 ml** **Flow Cell Volume: 130 ml** **Final Flow Rate: 100 ml/min** **Final Draw Down: 0.22 ft**	**Instrument Used: AquaTROLL 600** **Serial Number: 447365**

Test Notes:

Weather Conditions:
Sunny 80

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 10 %	+/- 3 %	+/- 10 %	+/- 10 %	+/- 10	+/- 0.33	
7/15/2017 8:44 AM	00:00	8.43 pH	23.25 °C	3,299.4 µS/cm	0.33 mg/L	5.50 NTU	-353.3 mV	154.75 ft	100.00 ml/min
7/15/2017 8:49 AM	05:00	8.40 pH	23.34 °C	3,311.2 µS/cm	0.22 mg/L	3.56 NTU	-380.1 mV	154.95 ft	100.00 ml/min
7/15/2017 8:54 AM	10:00	8.37 pH	23.64 °C	3,305.3 µS/cm	0.20 mg/L	3.21 NTU	-385.0 mV	154.96 ft	100.00 ml/min
7/15/2017 8:59 AM	14:59	8.35 pH	23.83 °C	3,336.0 µS/cm	0.17 mg/L	3.08 NTU	-384.1 mV	154.96 ft	100.00 ml/min
7/15/2017 9:04 AM	19:59	8.32 pH	23.78 °C	3,349.0 µS/cm	0.16 mg/L	1.62 NTU	-387.3 mV	154.96 ft	100.00 ml/min
7/15/2017 9:09 AM	24:59	8.29 pH	23.72 °C	3,323.0 µS/cm	0.15 mg/L	0.00 NTU	-392.4 mV	154.96 ft	100.00 ml/min
7/15/2017 9:14 AM	29:59	8.27 pH	24.13 °C	3,379.7 µS/cm	0.13 mg/L	4.14 NTU	-389.4 mV	154.96 ft	100.00 ml/min
7/15/2017 9:19 AM	34:59	8.26 pH	24.55 °C	3,361.2 µS/cm	0.13 mg/L	11.67 NTU	-391.9 mV	154.97 ft	100.00 ml/min
7/15/2017 9:24 AM	39:59	8.24 pH	24.38 °C	3,341.0 µS/cm	0.13 mg/L	2.17 NTU	-394.8 mV	154.97 ft	100.00 ml/min

Samples

Sample ID:	Description:

316	

Created using VuSitu from In-Situ, Inc.

Low-Flow Test Report:

Test Date / Time: 7/18/2017 11:13:45 AM
Project: FMC 336 (2)
Operator Name: Harder, Brown

Location Name: 336 **Well Diameter: 4 in** **Casing Type: Pvc** **Screen Length: 40 ft** **Top of Screen: 240 ft** **Total Depth: 280 ft** **Initial Depth to Water: 36.18 ft**	**Pump Type: Dedicated Double Valve** **Tubing Type: Poly** **Tubing Inner Diameter: 0.25 in** **Tubing Length: 258 ft** **Pump Intake From TOC: 260 ft** **Estimated Total Volume Pumped: 11996.667 ml** **Flow Cell Volume: 130 ml** **Final Flow Rate: 200 ml/min** **Final Draw Down: 1.35 ft**	**Instrument Used: AquaTROLL 600** **Serial Number: 447365**

Test Notes:

Weather Conditions:
Sunny 90

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 10 %	+/- 3 %	+/- 10 %	+/- 10 %	+/- 10	+/- 0.33	
7/18/2017 11:13 AM	00:00	6.91 pH	20.78 °C	5,436.6 µS/cm	0.29 mg/L	0.00 NTU	-422.9 mV	36.18 ft	200.00 ml/min
7/18/2017 11:18 AM	05:00	6.90 pH	20.68 °C	5,703.9 µS/cm	0.22 mg/L	0.00 NTU	-432.5 mV	37.29 ft	200.00 ml/min
7/18/2017 11:23 AM	09:59	6.88 pH	20.55 °C	5,503.5 µS/cm	0.21 mg/L	0.00 NTU	-434.4 mV	37.36 ft	200.00 ml/min
7/18/2017 11:28 AM	14:59	6.86 pH	20.61 °C	5,455.6 µS/cm	0.20 mg/L	0.00 NTU	-434.3 mV	37.41 ft	200.00 ml/min
7/18/2017 11:33 AM	19:59	6.84 pH	20.11 °C	5,457.7 µS/cm	0.22 mg/L	0.00 NTU	-424.0 mV	37.46 ft	200.00 ml/min
7/18/2017 11:38 AM	24:59	6.82 pH	20.33 °C	5,482.2 µS/cm	0.16 mg/L	0.00 NTU	-435.0 mV	37.50 ft	200.00 ml/min
7/18/2017 11:43 AM	29:59	6.80 pH	20.29 °C	5,786.9 µS/cm	0.16 mg/L	0.00 NTU	-435.4 mV	37.52 ft	200.00 ml/min
7/18/2017 11:48 AM	34:59	6.79 pH	20.38 °C	5,482.0 µS/cm	0.17 mg/L	0.54 NTU	-436.0 mV	37.53 ft	200.00 ml/min
7/18/2017 11:53 AM	39:59	6.78 pH	20.39 °C	5,464.7 µS/cm	0.16 mg/L	0.00 NTU	-416.6 mV	37.53 ft	200.00 ml/min
7/18/2017 11:58 AM	44:59	6.78 pH	20.53 °C	5,453.4 µS/cm	0.15 mg/L	0.00 NTU	-435.0 mV	37.53 ft	200.00 ml/min
7/18/2017 12:03 PM	49:59	6.77 pH	20.61 °C	5,505.3 µS/cm	0.15 mg/L	0.00 NTU	-437.6 mV	37.53 ft	200.00 ml/min
7/18/2017 12:08 PM	54:58	6.77 pH	20.14 °C	5,485.2 µS/cm	0.15 mg/L	0.00 NTU	-434.6 mV	37.53 ft	200.00 ml/min

7/18/2017 12:13 PM	59:59	6.77 pH	19.99 °C	5,465.6 µS/cm	0.14 mg/L	0.00 NTU	-436.3 mV	37.53 ft	200.00 ml/min

Samples

Sample ID:	Description:
336	

Created using VuSitu from In-Situ, Inc.

Low-Flow Test Report:

Test Date / Time: 1/30/2018 1:43:05 PM
Project:
Operator Name:

Location Name: Default Location **Initial Depth to Water: 33.73 ft**	**Estimated Total Volume Pumped: 5993.333 ml** **Flow Cell Volume: 130 ml** **Final Flow Rate: 200 ml/min** **Final Draw Down: 0.72 ft**	**Instrument Used: Aqua TROLL 600** **Serial Number: 468828**

Test Notes:

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 10 %	+/- 3 %	+/- 10 %	+/- 10 %	+/- 10	+/- 5	
1/30/2018 1:43 PM	00:00	6.97 pH	13.21 °C	4,806.5 µS/cm	0.68 mg/L		-203.1 mV	33.73 ft	200.00 ml/min
1/30/2018 1:45 PM	02:14	6.97 pH	13.27 °C	4,834.5 µS/cm	0.22 mg/L	19.40 NTU	-224.9 mV	33.73 ft	200.00 ml/min
1/30/2018 1:50 PM	07:14	6.93 pH	13.13 °C	4,422.7 µS/cm	0.15 mg/L		-281.1 mV	33.73 ft	200.00 ml/min
1/30/2018 1:52 PM	09:15	6.93 pH	12.98 °C	4,401.3 µS/cm	0.14 mg/L		-295.1 mV	33.73 ft	200.00 ml/min
1/30/2018 1:53 PM	09:58	6.93 pH	12.97 °C	4,392.3 µS/cm	0.14 mg/L	2.44 NTU	-298.3 mV	34.30 ft	200.00 ml/min
1/30/2018 1:58 PM	14:58	6.92 pH	12.93 °C	4,333.9 µS/cm	0.13 mg/L	1.64 NTU	-312.6 mV	34.35 ft	200.00 ml/min
1/30/2018 2:03 PM	19:58	6.92 pH	12.84 °C	4,054.5 µS/cm	0.12 mg/L	0.52 NTU	-318.3 mV	34.38 ft	200.00 ml/min
1/30/2018 2:08 PM	24:58	6.91 pH	12.64 °C	4,077.4 µS/cm	0.11 mg/L	0.64 NTU	-321.5 mV	34.43 ft	200.00 ml/min
1/30/2018 2:13 PM	29:58	6.90 pH	12.63 °C	3,999.7 µS/cm	0.11 mg/L	1.38 NTU	-324.6 mV	34.45 ft	200.00 ml/min

Samples

Sample ID:	Description:

Low-Flow Test Report:

Test Date / Time: 7/30/2017 10:51:23 AM
Project: FMC 338 (2)
Operator Name:

Location Name: 338 **Well Diameter: 2 in** **Screen Length: 30 ft** **Top of Screen: 263 ft** **Total Depth: 293 ft** **Initial Depth to Water: 43.91 ft**	**Pump Type: Dedicated Double Valve** **Tubing Type: Poly** **Tubing Inner Diameter: 0.25 in** **Tubing Length: 276 ft** **Pump Intake From TOC: 278 ft** **Estimated Total Volume Pumped: 17698.332 ml** **Flow Cell Volume: 130 ml** **Final Flow Rate: 100 ml/min** **Final Draw Down: 18.5 ft**	**Instrument Used: AquaTROLL 600** **Serial Number: 468828**

Test Notes:
RDO not quite stable at 10% but <0.2 mg/L
Water level dropping
, last 4 readings within 0.33'.
Turbidity not stable at 10% but < 1 NTU

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 10 %	+/- 3 %	+/- 10 %	+/- 10 %	+/- 10	+/- 0.33	
7/30/2017 10:51 AM	00:00	7.88 pH	25.97 °C	1,256.4 µS/cm	3.19 mg/L		-315.8 mV	43.91 ft	150.00 ml/min
7/30/2017 10:56 AM	04:59	7.82 pH	19.40 °C	986.58 µS/cm	0.40 mg/L	1.13 NTU	-332.2 mV	44.99 ft	120.00 ml/min
7/30/2017 11:01 AM	09:59	7.87 pH	18.22 °C	993.35 µS/cm	0.30 mg/L	0.89 NTU	-343.4 mV	45.80 ft	120.00 ml/min
7/30/2017 11:06 AM	14:59	7.73 pH	17.74 °C	991.48 µS/cm	0.23 mg/L	0.90 NTU	-343.4 mV	46.82 ft	100.00 ml/min
7/30/2017 11:11 AM	19:59	7.74 pH	17.37 °C	997.41 µS/cm	0.19 mg/L	1.00 NTU	-350.3 mV	47.56 ft	100.00 ml/min
7/30/2017 11:16 AM	24:59	7.73 pH	17.24 °C	1,003.9 µS/cm	0.16 mg/L	0.65 NTU	-354.4 mV	48.46 ft	100.00 ml/min
7/30/2017 11:21 AM	29:59	7.77 pH	17.44 °C	1,004.1 µS/cm	0.14 mg/L	0.59 NTU	-358.7 mV	49.28 ft	100.00 ml/min
7/30/2017 11:26 AM	34:59	7.75 pH	17.63 °C	1,006.6 µS/cm	0.14 mg/L	0.48 NTU	-356.4 mV	50.00 ft	100.00 ml/min
7/30/2017 11:31 AM	39:59	7.77 pH	17.57 °C	1,004.4 µS/cm	0.12 mg/L	0.45 NTU	-358.8 mV	50.74 ft	100.00 ml/min
7/30/2017 11:36 AM	44:59	7.78 pH	17.71 °C	1,006.9 µS/cm	0.12 mg/L	0.59 NTU	-361.3 mV	51.36 ft	100.00 ml/min
7/30/2017 11:41 AM	49:59	7.75 pH	17.77 °C	1,007.8 µS/cm	0.12 mg/L	0.49 NTU	-360.4 mV	51.90 ft	100.00 ml/min
7/30/2017 11:46 AM	55:00	7.78 pH	17.86 °C	1,004.5 µS/cm	0.11 mg/L	0.41 NTU	-362.4 mV	52.33 ft	100.00 ml/min

7/30/2017 11:51 AM	59:59	7.78 pH	17.83 °C	1,003.8 µS/cm	0.11 mg/L	0.05 NTU	-363.3 mV	53.09 ft	100.00 ml/min
7/30/2017 11:56 AM	01:04:59	7.77 pH	17.96 °C	1,004.8 µS/cm	0.11 mg/L	0.42 NTU	-363.2 mV	53.72 ft	100.00 ml/min
7/30/2017 12:01 PM	01:09:59	7.76 pH	18.14 °C	997.59 µS/cm	0.11 mg/L	0.45 NTU	-362.2 mV	54.25 ft	100.00 ml/min
7/30/2017 12:06 PM	01:14:59	7.75 pH	18.20 °C	996.59 µS/cm	0.10 mg/L	0.51 NTU	-362.8 mV	54.79 ft	100.00 ml/min
7/30/2017 12:11 PM	01:19:59	7.74 pH	18.57 °C	996.86 µS/cm	0.11 mg/L	0.45 NTU	-362.8 mV	55.22 ft	100.00 ml/min
7/30/2017 12:16 PM	01:24:59	7.74 pH	18.48 °C	991.92 µS/cm	0.11 mg/L	0.35 NTU	-361.7 mV	55.64 ft	100.00 ml/min
7/30/2017 12:21 PM	01:30:00	7.77 pH	18.84 °C	994.47 µS/cm	0.26 mg/L	0.40 NTU	-356.9 mV	56.02 ft	100.00 ml/min
7/30/2017 12:26 PM	01:34:59	7.77 pH	18.76 °C	989.98 µS/cm	0.36 mg/L	0.40 NTU	-349.8 mV	56.43 ft	100.00 ml/min
7/30/2017 12:31 PM	01:39:59	7.66 pH	19.07 °C	987.87 µS/cm	0.45 mg/L	0.39 NTU	-339.2 mV	56.90 ft	100.00 ml/min
7/30/2017 12:36 PM	01:44:59	7.79 pH	18.15 °C	979.12 µS/cm	0.62 mg/L	0.37 NTU	-341.5 mV	57.42 ft	100.00 ml/min
7/30/2017 12:41 PM	01:49:58	7.76 pH	17.89 °C	979.76 µS/cm	0.69 mg/L	0.43 NTU	-336.4 mV	58.05 ft	100.00 ml/min
7/30/2017 12:46 PM	01:54:58	7.73 pH	16.71 °C	976.71 µS/cm	0.21 mg/L	0.45 NTU	-348.1 mV	59.05 ft	250.00 ml/min
7/30/2017 12:51 PM	01:59:58	7.78 pH	16.67 °C	983.28 µS/cm	0.26 mg/L	0.43 NTU	-350.7 mV	60.35 ft	250.00 ml/min
7/30/2017 12:56 PM	02:04:58	7.76 pH	16.42 °C	986.79 µS/cm	0.17 mg/L	0.41 NTU	-353.8 mV	61.72 ft	250.00 ml/min
7/30/2017 1:01 PM	02:09:58	7.79 pH	16.82 °C	986.54 µS/cm	0.14 mg/L	0.54 NTU	-358.4 mV	61.99 ft	100.00 ml/min
7/30/2017 1:06 PM	02:14:58	7.79 pH	16.70 °C	981.97 µS/cm	0.21 mg/L	0.50 NTU	-354.7 mV	62.13 ft	100.00 ml/min
7/30/2017 1:11 PM	02:19:58	7.80 pH	16.63 °C	978.26 µS/cm	0.11 mg/L	0.45 NTU	-361.2 mV	62.25 ft	100.00 ml/min
7/30/2017 1:16 PM	02:24:58	7.79 pH	16.78 °C	975.01 µS/cm	0.14 mg/L	0.35 NTU	-358.9 mV	62.35 ft	100.00 ml/min
7/30/2017 1:21 PM	02:29:58	7.76 pH	16.88 °C	975.95 µS/cm	0.10 mg/L	0.47 NTU	-360.9 mV	62.41 ft	100.00 ml/min

Samples

Sample ID:	Description:
2017AN-338	Sample time 13:25

Low-Flow Test Report:

Test Date / Time: 7/17/2017 10:19:03 AM
Project: FMC 501A (2)
Operator Name: Harder, Brown

Location Name: 501A **Well Diameter: 2 in** **Casing Type: Pvc** **Screen Length: 20 ft** **Top of Screen: 330 ft** **Total Depth: 350 ft** **Initial Depth to Water: 84.6 ft**	**Pump Type: Dedicated Double Valve** **Tubing Type: Poly** **Tubing Inner Diameter: 0.25 in** **Tubing Length: 338 ft** **Pump Intake From TOC: 340 ft** **Estimated Total Volume Pumped: 6498.333 ml** **Flow Cell Volume: 130 ml** **Final Flow Rate: 100 ml/min** **Final Draw Down: 5.92 ft**	**Instrument Used: AquaTROLL 600** **Serial Number: 447365**

Test Notes:

Weather Conditions:
Clear 80

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 10 %	+/- 3 %	+/- 10 %	+/- 10 %	+/- 10	+/- 0.33	
7/17/2017 10:19 AM	00:00	9.03 pH	21.06 °C	1,759.5 µS/cm	0.56 mg/L	23.53 NTU	-322.5 mV	84.60 ft	100.00 ml/min
7/17/2017 10:24 AM	05:00	8.23 pH	20.23 °C	1,817.1 µS/cm	0.35 mg/L	6.87 NTU	-351.4 mV		100.00 ml/min
7/17/2017 10:29 AM	10:00	7.96 pH	20.13 °C	1,811.3 µS/cm	0.31 mg/L	0.00 NTU	-365.0 mV	89.00 ft	100.00 ml/min
7/17/2017 10:34 AM	15:00	7.93 pH	20.12 °C	1,787.9 µS/cm	0.29 mg/L	1.64 NTU	-375.8 mV	89.30 ft	100.00 ml/min
7/17/2017 10:39 AM	19:59	7.92 pH	20.12 °C	1,823.6 µS/cm	0.24 mg/L	0.00 NTU	-385.2 mV	89.60 ft	100.00 ml/min
7/17/2017 10:44 AM	24:59	7.85 pH	20.16 °C	1,814.5 µS/cm	0.25 mg/L	0.00 NTU	-389.0 mV	89.80 ft	100.00 ml/min
7/17/2017 10:49 AM	29:59	7.83 pH	20.35 °C	1,786.2 µS/cm	0.25 mg/L	0.00 NTU	-398.0 mV	89.90 ft	100.00 ml/min
7/17/2017 10:54 AM	34:58	7.82 pH	20.31 °C	1,809.7 µS/cm	0.23 mg/L	0.00 NTU	-398.3 mV	90.03 ft	100.00 ml/min
7/17/2017 10:59 AM	39:58	7.80 pH	20.08 °C	1,805.2 µS/cm	0.22 mg/L	0.00 NTU	-411.0 mV	90.20 ft	100.00 ml/min
7/17/2017 11:04 AM	44:58	7.78 pH	19.97 °C	1,776.2 µS/cm	0.21 mg/L	0.00 NTU	-412.2 mV	90.25 ft	100.00 ml/min
7/17/2017 11:09 AM	49:58	7.78 pH	20.17 °C	1,833.1 µS/cm	0.21 mg/L	0.00 NTU	-411.2 mV	90.45 ft	100.00 ml/min
7/17/2017 11:14 AM	54:58	7.78 pH	20.20 °C	1,795.5 µS/cm	0.20 mg/L	0.00 NTU	-414.0 mV	90.50 ft	100.00 ml/min

7/17/2017 11:19 AM	59:58	7.78 pH	20.45 °C	1,754.6 µS/cm	0.20 mg/L	0.00 NTU	-417.8 mV	90.52 ft	100.00 ml/min
7/17/2017 11:24 AM	01:04:58	7.80 pH	20.19 °C	1,781.8 µS/cm	0.19 mg/L	0.00 NTU	-413.6 mV		100.00 ml/min

Samples

Sample ID:	Description:
501A	

Created using VuSitu from In-Situ, Inc.

Low-Flow Test Report:

Test Date / Time: 7/17/2017 1:46:15 PM
Project: FMC 501B (2)
Operator Name: Harder

Location Name: 501B **Well Diameter: 2.5 in** **Casing Type: Pvc** **Screen Length: 20 ft** **Top of Screen: 475 ft** **Total Depth: 495 ft** **Initial Depth to Water: 96.05 ft**	**Pump Type: Dedicated Double Valve** **Tubing Type: Poly** **Tubing Inner Diameter: 0.25 in** **Tubing Length: 483 ft** **Pump Intake From TOC: 485 ft** **Estimated Total Volume Pumped: 4000.001 ml** **Flow Cell Volume: 130 ml** **Final Flow Rate: 100 ml/min** **Final Draw Down: 0.85 ft**	**Instrument Used: AquaTROLL 600** **Serial Number: 447365**

Test Notes:

Weather Conditions:
Overcast, 85

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 10 %	+/- 3 %	+/- 10 %	+/- 10 %	+/- 10	+/- 0.33	
7/17/2017 1:46 PM	00:00	9.12 pH	20.73 °C	988.76 µS/cm	0.29 mg/L	0.34 NTU	-373.1 mV	96.05 ft	100.00 ml/min
7/17/2017 1:51 PM	05:00	8.98 pH	19.84 °C	1,011.3 µS/cm	0.24 mg/L	0.00 NTU	-404.4 mV		100.00 ml/min
7/17/2017 1:56 PM	10:00	8.96 pH	19.80 °C	1,016.3 µS/cm	0.22 mg/L	0.00 NTU	-408.2 mV	96.50 ft	100.00 ml/min
7/17/2017 2:01 PM	15:00	8.95 pH	19.74 °C	1,022.7 µS/cm	0.21 mg/L	7.58 NTU	-412.9 mV	96.65 ft	100.00 ml/min
7/17/2017 2:06 PM	19:59	8.84 pH	19.41 °C	1,021.0 µS/cm	0.20 mg/L	0.00 NTU	-408.9 mV	96.75 ft	100.00 ml/min
7/17/2017 2:11 PM	24:59	8.71 pH	19.16 °C	1,028.8 µS/cm	0.20 mg/L	0.00 NTU	-407.7 mV	96.82 ft	100.00 ml/min
7/17/2017 2:16 PM	30:00	8.59 pH	18.71 °C	1,006.9 µS/cm	0.19 mg/L	0.00 NTU	-397.4 mV	96.90 ft	100.00 ml/min
7/17/2017 2:21 PM	35:00	8.58 pH	18.64 °C	1,010.1 µS/cm	0.19 mg/L	0.00 NTU	-400.6 mV	96.90 ft	100.00 ml/min
7/17/2017 2:26 PM	40:00	8.61 pH	19.34 °C	1,035.6 µS/cm	0.18 mg/L	0.00 NTU	-401.8 mV	96.90 ft	100.00 ml/min

Samples

Sample ID:	Description:

501B	

Created using VuSitu from In-Situ, Inc.

Low-Flow Test Report:

Test Date / Time: 7/17/2017 3:13:32 PM
Project: FMC 501C (2)
Operator Name: Harder

Location Name: 501C **Well Diameter: 2.5 in** **Casing Type: Pvc** **Screen Length: 20 ft** **Top of Screen: 580 ft** **Total Depth: 600 ft** **Initial Depth to Water: 48.97 ft**	**Pump Type: Dedicated Double Valve** **Tubing Type: Poly** **Tubing Inner Diameter: 0.25 in** **Tubing Length: 588 ft** **Pump Intake From TOC: 590 ft** **Estimated Total Volume Pumped: 3996.666 ml** **Flow Cell Volume: 130 ml** **Final Flow Rate: 100 ml/min** **Final Draw Down: 3.98 ft**	**Instrument Used: AquaTROLL 600** **Serial Number: 447365**

Test Notes:

Weather Conditions:
Sunny 85

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 10 %	+/- 3 %	+/- 10 %	+/- 10 %	+/- 10	+/- 0.33	
7/17/2017 3:13 PM	00:00	8.98 pH	22.02 °C	751.56 µS/cm	0.25 mg/L	0.00 NTU	-381.7 mV	48.97 ft	100.00 ml/min
7/17/2017 3:18 PM	04:59	9.05 pH	21.32 °C	753.27 µS/cm	0.24 mg/L	0.00 NTU	-383.9 mV	51.15 ft	100.00 ml/min
7/17/2017 3:23 PM	09:59	9.08 pH	21.00 °C	757.65 µS/cm	0.21 mg/L	3.59 NTU	-389.7 mV	51.60 ft	100.00 ml/min
7/17/2017 3:28 PM	14:59	9.07 pH	20.30 °C	753.18 µS/cm	0.19 mg/L	0.00 NTU	-398.8 mV	51.95 ft	100.00 ml/min
7/17/2017 3:33 PM	19:58	9.03 pH	20.10 °C	744.00 µS/cm	0.19 mg/L	1.30 NTU	-401.1 mV	52.25 ft	100.00 ml/min
7/17/2017 3:38 PM	24:58	9.03 pH	20.23 °C	746.85 µS/cm	0.17 mg/L	2.08 NTU	-404.6 mV	52.50 ft	100.00 ml/min
7/17/2017 3:43 PM	29:57	9.02 pH	20.14 °C	748.06 µS/cm	0.15 mg/L	0.00 NTU	-409.7 mV	52.70 ft	100.00 ml/min
7/17/2017 3:48 PM	34:57	9.02 pH	19.96 °C	739.16 µS/cm	0.15 mg/L	0.00 NTU	-409.8 mV	52.90 ft	100.00 ml/min
7/17/2017 3:53 PM	39:57	9.07 pH	20.33 °C	743.02 µS/cm	0.15 mg/L	0.00 NTU	-417.4 mV	52.95 ft	100.00 ml/min

Samples

Sample ID:	Description:

501C	

Created using VuSitu from In-Situ, Inc.

Low-Flow Test Report:

Test Date / Time: 7/28/2017 8:24:09 AM
Project: FMC 601 (2)
Operator Name:

Location Name: 601 **Well Diameter: 4 in** **Screen Length: 59 ft** **Top of Screen: 290.95 ft** **Total Depth: 349.95 ft** **Initial Depth to Water: 17.48 ft**	**Pump Type: Dedicated Double Valve** **Tubing Type: Poly** **Tubing Inner Diameter: 0.25 in** **Tubing Length: 318.5 ft** **Pump Intake From TOC: 320.5 ft** **Estimated Total Volume Pumped: 10147.834 ml** **Flow Cell Volume: 130 ml** **Final Flow Rate: 100 ml/min** **Final Draw Down: 4.29 ft**	**Instrument Used: AquaTROLL 600** **Serial Number: 468828**

Test Notes:
Water level dropped. Turbidity not quite 10% but <0.5 NTU
Method 2A

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 10 %	+/- 3 %	+/- 10 %	+/- 10 %	+/- 10	+/- 0.33	
7/28/2017 8:24 AM	00:00	10.25 pH	16.78 °C	1,423.1 µS/cm	0.23 mg/L		-246.9 mV	17.48 ft	140.00 ml/min
7/28/2017 8:29 AM	05:00	10.25 pH	16.73 °C	1,436.8 µS/cm	0.11 mg/L	0.44 NTU	-257.1 mV	19.23 ft	140.00 ml/min
7/28/2017 8:34 AM	10:00	10.19 pH	16.72 °C	1,434.6 µS/cm	0.10 mg/L	0.31 NTU	-261.3 mV	19.50 ft	130.00 ml/min
7/28/2017 8:39 AM	14:59	10.02 pH	16.74 °C	1,388.3 µS/cm	0.08 mg/L	0.22 NTU	-258.6 mV	19.75 ft	130.00 ml/min
7/28/2017 8:44 AM	19:59	9.87 pH	16.80 °C	1,353.0 µS/cm	0.09 mg/L	0.20 NTU	-255.7 mV	19.92 ft	130.00 ml/min
7/28/2017 8:49 AM	24:59	9.80 pH	16.78 °C	1,343.6 µS/cm	0.08 mg/L	0.22 NTU	-256.8 mV	20.14 ft	130.00 ml/min
7/28/2017 8:54 AM	29:59	9.76 pH	16.78 °C	1,332.8 µS/cm	0.08 mg/L	0.25 NTU	-257.1 mV	20.31 ft	120.00 ml/min
7/28/2017 8:59 AM	34:59	9.75 pH	16.75 °C	1,340.9 µS/cm	0.08 mg/L	0.22 NTU	-258.5 mV	20.48 ft	120.00 ml/min
7/28/2017 9:04 AM	39:59	9.72 pH	16.91 °C	1,329.4 µS/cm	0.08 mg/L	0.19 NTU	-258.8 mV	20.68 ft	120.00 ml/min
7/28/2017 9:09 AM	44:59	9.68 pH	16.89 °C	1,317.5 µS/cm	0.08 mg/L	0.14 NTU	-258.8 mV	20.81 ft	120.00 ml/min
7/28/2017 9:14 AM	49:59	9.63 pH	16.92 °C	1,307.2 µS/cm	0.08 mg/L	0.14 NTU	-258.5 mV	20.93 ft	110.00 ml/min
7/28/2017 9:19 AM	54:59	9.61 pH	16.87 °C	1,299.1 µS/cm	0.08 mg/L	0.17 NTU	-257.8 mV	21.07 ft	110.00 ml/min
7/28/2017 9:24 AM	59:59	9.60 pH	16.92 °C	1,304.1 µS/cm	0.08 mg/L	0.25 NTU	-257.6 mV	21.21 ft	110.00 ml/min
7/28/2017 9:29 AM	01:04:59	9.60 pH	16.94 °C	1,299.0 µS/cm	0.07 mg/L	0.25 NTU	-258.2 mV	21.33 ft	110.00 ml/min

7/28/2017 9:34 AM	01:09:59	9.61 pH	17.13 °C	1,302.3 µS/cm	0.08 mg/L	0.19 NTU	-260.0 mV	21.44 ft	110.00 ml/min
7/28/2017 9:39 AM	01:14:59	9.63 pH	17.02 °C	1,310.2 µS/cm	0.07 mg/L	0.19 NTU	-261.4 mV	21.56 ft	100.00 ml/min
7/28/2017 9:44 AM	01:19:58	9.62 pH	17.12 °C	1,299.7 µS/cm	0.07 mg/L	0.25 NTU	-261.5 mV	21.68 ft	100.00 ml/min
7/28/2017 9:49 AM	01:24:59	9.63 pH	17.05 °C	1,303.9 µS/cm	0.07 mg/L	0.30 NTU	-261.7 mV	21.77 ft	100.00 ml/min

Samples

Sample ID:	Description:
2017AN-601	Sample time 09:50

Created using VuSitu from In-Situ, Inc.

Low-Flow Test Report:

Test Date / Time: 8/10/2017 1:43:24 PM
Project: FMC 601 (3)
Operator Name: Harder, Brown

Location Name: 601 **Well Diameter: 4 in** **Casing Type: Pvc** **Screen Length: 59 ft** **Top of Screen: 290.95 ft** **Total Depth: 349.95 ft** **Initial Depth to Water: 16.28 ft**	**Pump Type: Dedicated Double Valve** **Tubing Type: Poly** **Tubing Inner Diameter: 0.25 in** **Tubing Length: 318.5 ft** **Pump Intake From TOC: 320.5 ft** **Estimated Total Volume Pumped: 10998.334 ml** **Flow Cell Volume: 130 ml** **Final Flow Rate: 100 ml/min** **Final Draw Down: 3.62 ft**	**Instrument Used: AquaTROLL 600** **Serial Number: 447417**

Test Notes:

Weather Conditions:
Sunny 85

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 10 %	+/- 3 %	+/- 10 %	+/- 10 %	+/- 10	+/- 0.33	
8/10/2017 1:43 PM	00:00	9.69 pH	23.41 °C	1,264.8 µS/cm	0.58 mg/L	5.70 NTU	-192.4 mV	16.28 ft	200.00 ml/min
8/10/2017 1:48 PM	05:00	9.75 pH	20.77 °C	1,214.5 µS/cm	0.12 mg/L	1.08 NTU	-216.6 mV	17.08 ft	200.00 ml/min
8/10/2017 1:53 PM	10:00	9.72 pH	20.23 °C	1,239.5 µS/cm	0.09 mg/L	0.95 NTU	-227.8 mV	17.48 ft	100.00 ml/min
8/10/2017 1:58 PM	15:00	9.68 pH	21.81 °C	1,248.4 µS/cm	0.12 mg/L	0.40 NTU	-236.6 mV	17.70 ft	100.00 ml/min
8/10/2017 2:03 PM	20:00	9.69 pH	22.06 °C	1,187.3 µS/cm	0.12 mg/L	0.32 NTU	-235.1 mV	17.88 ft	100.00 ml/min
8/10/2017 2:08 PM	25:00	9.73 pH	21.84 °C	1,099.7 µS/cm	0.11 mg/L	0.26 NTU	-222.2 mV	18.05 ft	100.00 ml/min
8/10/2017 2:13 PM	30:00	9.76 pH	21.71 °C	1,055.1 µS/cm	0.10 mg/L	0.61 NTU	-217.2 mV	18.20 ft	100.00 ml/min
8/10/2017 2:18 PM	35:00	9.70 pH	21.92 °C	895.55 µS/cm	0.10 mg/L	0.28 NTU	-213.6 mV	18.35 ft	100.00 ml/min
8/10/2017 2:23 PM	40:00	9.69 pH	22.32 °C	893.10 µS/cm	0.10 mg/L	0.23 NTU	-216.4 mV	18.50 ft	100.00 ml/min
8/10/2017 2:28 PM	45:00	9.66 pH	21.93 °C	672.18 µS/cm	0.10 mg/L	0.28 NTU	-215.2 mV	18.65 ft	100.00 ml/min
8/10/2017 2:33 PM	50:00	9.65 pH	22.36 °C	686.56 µS/cm	0.10 mg/L	0.29 NTU	-219.2 mV	18.80 ft	100.00 ml/min
8/10/2017 2:38 PM	54:59	9.65 pH	22.21 °C	582.34 µS/cm	0.09 mg/L	0.34 NTU	-220.7 mV	18.92 ft	100.00 ml/min

8/10/2017 2:43 PM	01:00:00	9.80 pH	21.69 °C	1,197.1 µS/cm	0.14 mg/L		-246.3 mV	19.05 ft	100.00 ml/min
8/10/2017 2:48 PM	01:04:59	9.71 pH	21.88 °C	1,185.6 µS/cm	0.13 mg/L	0.19 NTU	-246.8 mV	19.18 ft	100.00 ml/min
8/10/2017 2:53 PM	01:10:00	9.75 pH	21.79 °C	1,086.9 µS/cm	0.12 mg/L	0.24 NTU	-234.3 mV	19.28 ft	100.00 ml/min
8/10/2017 2:58 PM	01:14:59	9.72 pH	21.42 °C	1,126.1 µS/cm	0.12 mg/L		-230.0 mV	19.40 ft	100.00 ml/min
8/10/2017 3:03 PM	01:20:00	9.66 pH	21.34 °C	1,019.2 µS/cm	0.11 mg/L	0.24 NTU	-226.9 mV	19.50 ft	100.00 ml/min
8/10/2017 3:08 PM	01:25:00	9.61 pH	21.36 °C	997.77 µS/cm	0.11 mg/L		-226.4 mV	19.58 ft	100.00 ml/min
8/10/2017 3:13 PM	01:29:59	9.66 pH	21.27 °C	916.12 µS/cm	0.10 mg/L		-227.3 mV	19.70 ft	100.00 ml/min
8/10/2017 3:18 PM	01:34:59	9.68 pH	21.18 °C	874.41 µS/cm	0.08 mg/L		-227.8 mV	19.80 ft	100.00 ml/min
8/10/2017 3:23 PM	01:39:58	9.67 pH	21.19 °C	782.24 µS/cm	0.08 mg/L		-227.9 mV	19.90 ft	100.00 ml/min

Samples

Sample ID:	Description:

Low-Flow Test Report:

Test Date / Time: 7/16/2017 1:42:12 PM
Project: FMC 602 (2)
Operator Name: Harder

Location Name: 602 **Well Diameter: 4 in** **Casing Type: Pvc** **Screen Length: 79 ft** **Top of Screen: 481 ft** **Total Depth: 560 ft** **Initial Depth to Water: 26.6 ft**	**Pump Type: Dedicated Double Valve** **Tubing Type: Poly** **Tubing Inner Diameter: 0.25 in** **Tubing Length: 518.5 ft** **Pump Intake From TOC: 520.5 ft** **Estimated Total Volume Pumped: 3498.333 ml** **Flow Cell Volume: 130 ml** **Final Flow Rate: 100 ml/min** **Final Draw Down: 0.98 ft**	**Instrument Used: AquaTROLL 600** **Serial Number: 447365**

Test Notes:

Weather Conditions:
Sunny 85

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 10 %	+/- 3 %	+/- 10 %	+/- 10 %	+/- 10	+/- 0.33	
7/16/2017 1:42 PM	00:00	9.80 pH	22.69 °C	530.32 µS/cm	0.98 mg/L	0.00 NTU	-241.3 mV	26.60 ft	100.00 ml/min
7/16/2017 1:47 PM	04:59	9.74 pH	21.79 °C	515.07 µS/cm	0.41 mg/L	0.00 NTU	-280.3 mV	27.35 ft	100.00 ml/min
7/16/2017 1:52 PM	09:59	9.75 pH	22.15 °C	524.14 µS/cm	0.31 mg/L	0.22 NTU	-302.3 mV	27.40 ft	100.00 ml/min
7/16/2017 1:57 PM	15:00	9.72 pH	22.73 °C	527.48 µS/cm	0.26 mg/L	0.08 NTU	-319.2 mV	27.43 ft	100.00 ml/min
7/16/2017 2:02 PM	19:59	9.74 pH	22.44 °C	524.59 µS/cm	0.22 mg/L	0.00 NTU	-315.3 mV	27.48 ft	100.00 ml/min
7/16/2017 2:07 PM	24:59	9.75 pH	21.78 °C	515.37 µS/cm	0.19 mg/L	0.00 NTU	-307.8 mV	27.50 ft	100.00 ml/min
7/16/2017 2:12 PM	29:59	9.75 pH	22.14 °C	525.22 µS/cm	0.21 mg/L	0.00 NTU	-305.7 mV	27.55 ft	100.00 ml/min
7/16/2017 2:17 PM	34:59	9.75 pH	21.80 °C	524.92 µS/cm	0.20 mg/L	0.00 NTU	-305.4 mV	27.58 ft	100.00 ml/min

Samples

Sample ID:	Description:
602	

Created using VuSitu from In-Situ, Inc.

PARSONS

Field Monitoring Record
Low-Flow (minimal drawdown)
GROUNDWATER SAMPLING

Client: FMC Front Royal
Site name: Front Royal, VA
Samplers: C. HUEY / C. JAYNES
Sample Event #: 2017 AN
Well Condition: GOOD
Purge Start: 0814
Pump Type: FLUTE

Date: 7/18/17
Wind: SW 5-10 mph
Weather: SUNNY
Air Temperature: HIGH 70's
Meters Calibrated: 7/18
Purge Stop: 1030
Sample Style: FLUTE

Well #: 603 Zi
Initial DTW: 26.67
Pump Depth: —
Total Well Depth: —
Screen Depth: —
Sample Time: 11:05
Alternate Method: FLUTE

TIME	FLOW RATE (ml/min)	DEPTH TO WATER (TOC, FT/M)	pH	SPECIFIC CONDUCTANCE (uS/cm)	TEMP (C)	D.O. (MG/L)	ORP (MV)	TURBIDITY (NTU)	APPEARANCE (COLOR, CLARITY, SOLIDS)	COMMENTS
				Parameter Stability Values over 3 Consecutive Readings						
	100 to 500 ml/min	<0.33 Feet	+0.1 -	+3% -	+10% -	+10% -	+10 mV -	+10% -		
0814 - 0825	—	VOLUME 6.2L							CLEAR	CYCLE 1
0908 - 0915	—	VOL. 6.55L							CLEAR	CYCLE 2
0947 - 0955	—	5.25L							CLEAR	CYCLE 3
1023 - 1030	—	5.2L	7.73	662.22	22.80	3.09	-279.3	1.42	CLEAR	CYCLE 4
1105	SAMPLE COLLECTED		7.45	739.74	17.68	1.46	-348.4	0.59	CLEAR	SAMPLE CYCLE

Chain of custody # _____

PARSONS

Field Monitoring Record
Low-Flow (minimal drawdown)
GROUNDWATER SAMPLING

Client: FMC Front Royal
Site name: Front Royal, VA
Samplers: C. Huey / C. JAYNES
Sample Event #: 2017 AN
Well Condition: GOOD
Purge Start: ~~0~~ 0831
Pump Type: FLUTE

Date: 7-18-17
Wind: 5-10 mph SW
Weather: SUNNY TO MOSTLY CLOUDY
Air Temperature: MID 70's TO HIGH 80's
Meters Calibrated: 7-18-17
Purge Stop: 1040
Sample Style: FLUTE

Well #: 603 Z2
Initial DTW: 26.75
Pump Depth: —
Total Well Depth: —
Screen Depth: —
Sample Time: 11:15
Alternate Method: FLUTE

TIME	FLOW RATE (ml/min)	DEPTH TO WATER (TOC, FT/M)	pH	SPECIFIC CONDUCTANCE (uS/cm)	TEMP (C)	D.O. (MG/L)	ORP (MV)	TURBIDITY (NTU)	APPEARANCE (COLOR, CLARITY, SOLIDS)	COMMENTS
Parameter Stability Values over 3 Consecutive Readings										
	100 to 500 ml/min	**<0.33 Feet**	**+ 0.1** -	**+ 3%** -	**+10%** -	**+10%** -	**+10 mV** -	**+10%** -		
0814 – 0825	—	6.72							CLEAR	CYCLE 1
0917 – 0924	—	6.52							CLEAR	CYCLE 2
0957 – 1005	—	5.65L							CLEAR	CYCLE 3
1033 – 1040	—	5.0L	7.44	762.53	20.71	3.03	-288.4	0.65	CLEAR	CYCLE 4
1115	SAMPLE	—	7.41	831.07	16.93	2.07	-345.9	0.63	CLEAR	SAMPLE CYCLE

Chain of custody # _____

PARSONS

Field Monitoring Record
Low-Flow (minimal drawdown)
GROUNDWATER SAMPLING

Client: FMC Front Royal
Site name: Front Royal, VA
Samplers: C. HUEY / C. JAYNES
Sample Event #: 2017 AN
Well Condition: GOOD
Purge Start: 0843
Pump Type: FLUTE

Date: 7-18-17
Wind: SW 5-10 mph
Weather: SUNNY TO MOSTLY CLOUDY
Air Temperature: MID 70's TO HIGH 80's
Meters Calibrated: 7-18-17
Purge Stop: 1054
Sample Style: FLUTE

Well #: 603 Z3
Initial DTW: 26.67
Pump Depth: –
Total Well Depth: –
Screen Depth: –
Sample Time: 11:25
Alternate Method: FLUTE

TIME	FLOW RATE (ml/min)	DEPTH TO WATER (TOC, FT/M)	pH	SPECIFIC CONDUCTANCE (uS/cm)	TEMP (C)	D.O. (MG/L)	ORP (MV)	TURBIDITY (NTU)	APPEARANCE (COLOR, CLARITY, SOLIDS)	COMMENTS
Parameter Stability Values over 3 Consecutive Readings										
	100 to 500 ml/min	**<0.33 Feet**	**+ 0.1** -	**+ 3%** -	**+10%** -	**+10%** -	**+10 mV** -	**+10%** -		
0843 – 0853	—	6.5L	—	—	—	—	—	—	CLEAR	CYCLE 1
0927 – 0934	—	5.2L	—	—	—	—	—	—	CLEAR	CYCLE 2
1006 – 1013	—	5.3L	—	—	—	—	—	—	CLEAR	CYCLE 3
1046 – 1054	—	4.2L	7.75	746.88	17.96	3.07	-319.5	1.42	CLEAR	CYCLE 4
1125	SAMPLE	—	7.44	756.94	16.46	1.86	-353.5	0.57	CLEAR	SAMPLE CYCLE

Chain of custody # _____

PARSONS

Field Monitoring Record
Low-Flow (minimal drawdown)
GROUNDWATER SAMPLING

Client: FMC Front Royal
Site name: Front Royal, VA
Samplers: C. HUEY / C. JAYNES
Sample Event #: 2017 AN
Well Condition: GOOD
Purge Start: 0854
Pump Type: FLUTE

Date: 7-18-17
Wind: 5-10 mph SW
Weather: SUNNY TO MOSTLY CLOUDY
Air Temperature: MID 70's TO HIGH 80's
Meters Calibrated: 7-18-17
Purge Stop: 1103
Sample Style: FLUTE

Well #: 603 Z4
Initial DTW: 26.76
Pump Depth: —
Total Well Depth: —
Screen Depth: —
Sample Time: 11:35
Alternate Method: FLUTE

TIME	FLOW RATE (ml/min)	DEPTH TO WATER (TOC, FT/M)	pH	SPECIFIC CONDUCTANCE (uS/cm)	TEMP (C)	D.O. (MG/L)	ORP (MV)	TURBIDITY (NTU)	APPEARANCE (COLOR, CLARITY, SOLIDS)	COMMENTS
Parameter Stability Values over 3 Consecutive Readings										
	100 to 500 ml/min	**<0.33 Feet**	**+ 0.1** -	**+ 3%** -	**+10%** -	**+10%** -	**+10 mV** -	**+10%** -		
0854 – 0904	—	VOLUME 8.0L							CLEAR	CYCLE 1
0936 – 0944	—	VOL 4.7L							CLEAR	CYCLE 2
1015 – 1021	—	4.55L							CLEAR	CYCLE 3
1055 – 1103	—	4.42	7.47	832.82	18.28	2.46	-328.9	0.95	CLEAR	CYCLE 4
1135	SAMPLE	—	7.37	779.20	16.43	1.63	-366.9	1.22	CLEAR	SAMPLE CYCLE

Chain of custody # _____

PARSONS

Field Monitoring Record
Low-Flow (minimal drawdown)
GROUNDWATER SAMPLING

Client: FMC Front Royal
Site name: Front Royal, VA
Samplers: C. HUEY, C. JAYNES
Sample Event #: 2017 AN
Well Condition: GOOD
Purge Start: 0815S
Pump Type: FLUTE

Date: 7/17/17
Wind: 4mph SE
Weather: MOSTLY SUNNY TO CLOUDY
Air Temperature: 70° TO 89°F
Meters Calibrated: 7/12/17
Purge Stop:
Sample Style: FLUTE

Well #: 604 Z1
Initial DTW: Z1 - 121.72
Pump Depth: —
Total Well Depth: —
Screen Depth: —
Sample Time:
Alternate Method: FLUTE

TIME	FLOW RATE (ml/min)	DEPTH TO WATER (TOC, FT/M)	pH	SPECIFIC CONDUCTANCE (uS/cm)	TEMP (C)	D.O. (MG/L)	ORP (MV)	TURBIDITY (NTU)	APPEARANCE (COLOR, CLARITY, SOLIDS)	COMMENTS
Parameter Stability Values over 3 Consecutive Readings										
0843	**100 to 500 ml/min**	**<0.33 Feet**	**+ 0.1** -	**+ 3%** -	**+10%** -	**+10%** -	**+10 mV** -	**+10%** -		
CH ~~0855~~ - 0857 ~~0902~~	—	VOLUME 5.2L ~~6.0L 5.7~~								CYCLE 1
0940 - 0949	—	VOLUME 6.2L								CYCLE 2
1026 - 1036	—	VOLUME 6.0L								CYCLE 3
1443 - 1454	—	5.9L	7.54	643.02	21.35	2.43	-71.0	1.93	CLEAR	CYCLE 4
1530	SAMPLE	—	7.48	748.67	18.70	2.88	-121.6	2.64	CLEAR	SAMPLE

Chain of custody # _____

PARSONS

Field Monitoring Record
Low-Flow (minimal drawdown)
GROUNDWATER SAMPLING

Client: FMC Front Royal
Site name: Front Royal, VA
Samplers: C. Hugy / C. Jaynes
Sample Event #: 2017 AN
Well Condition: Good
Purge Start: 08:55
Pump Type: Flute

Date: 7/17/17
Wind: 4 mph SE
Weather: Mostly sunny to cloudy, rain
Air Temperature: 70-89°F
Meters Calibrated: 7/16/17
Purge Stop:
Sample Style: Flute

Well #: 604 R2
Initial DTW: Blockage @ 11.0'
Pump Depth: —
Total Well Depth: —
Screen Depth: —
Sample Time:
Alternate Method: Flute

TIME	FLOW RATE (ml/min)	DEPTH TO WATER (TOC, FT/M)	pH	SPECIFIC CONDUCTANCE (uS/cm)	TEMP (C)	D.O. (MG/L)	ORP (MV)	TURBIDITY (NTU)	APPEARANCE (COLOR, CLARITY, SOLIDS)	COMMENTS
Parameter Stability Values over 3 Consecutive Readings										
	100 to 500 ml/min	**<0.33 Feet**	**+ 0.1** -	**+ 3%** -	**+10%** -	**+10%** -	**+10 mV** -	**+10%** -		
0855-0904	—	Volume 6.0L	—	—	—	—	—	—	—	CYCLE 1
0953-0959	—	Volume 3.25L	—	—	—	—	—	—	—	CYCLE 2
1039-1047	—	Volume 4.8L	—	—	—	—	—	—	—	CYCLE 3
1455-1505	—	5.4L	7.61	683.93	19.53	2.70	-139.9	1.24	CLEAR	CYCLE 4
1540	SAMPLE	—	7.52	718.70	17.30	3.42	-138.2	8.07	CLEAR	SAMPLE

Chain of custody # _____

PARSONS

Field Monitoring Record
Low-Flow (minimal drawdown)
GROUNDWATER SAMPLING

Client: FMC Front Royal
Site name: Front Royal, VA
Samplers: C. Hugi / C. Jaynes
Sample Event #: 2017 AN
Well Condition: Good
Purge Start: 09:07
Pump Type: Flute

Date: 7/17/17
Wind: 4 mph SE
Weather: mostly sunny to cloudy, rain
Air Temperature: 70-89°F
Meters Calibrated: 7/16/17
Purge Stop:
Sample Style:

Well #: 604 Z3
Initial DTW: 172.51
Pump Depth: —
Total Well Depth: —
Screen Depth: —
Sample Time:
Alternate Method: Flute

TIME	FLOW RATE (ml/min)	DEPTH TO WATER (TOC, FT/M)	pH	SPECIFIC CONDUCTANCE (uS/cm)	TEMP (C)	D.O. (MG/L)	ORP (MV)	TURBIDITY (NTU)	APPEARANCE (COLOR, CLARITY, SOLIDS)	COMMENTS
Parameter Stability Values over 3 Consecutive Readings										
	100 to 500 ml/min	**<0.33 Feet**	**+ 0.1** -	**+ 3%** -	**+10%** -	**+10%** -	**+10 mV** -	**+10%** -		
0957 - 0957	—	Volume 5.8L								CYCLE 1
1001 - 1007	—	Volume 3.2L								CYCLE 2
1048 - 1056	—	Volume 4.65L								CYCLE 3
1506 - 1515	—	3.45L	7.77	693.24	20.51	2.80	-148.8	1.16	CLEAR	CYCLE 4
1550	SAMPLE	—	7.53	780.90	17.96	3.34	-154.2	3.04	CLEAR	SAMPLE

Chain of custody # _____

PARSONS

Field Monitoring Record
Low-Flow (minimal drawdown)
GROUNDWATER SAMPLING

Client: FMC Front Royal
Site name: Front Royal, VA
Samplers: C. HUEY / C. JAYNES
Sample Event #: 2017 AN
Well Condition: GOOD
Purge Start: 09:19
Pump Type:

Date: 7/17/17
Wind: 4 mph SE
Weather: MOSTLY SUNNY TO CLOUDY, RAIN
Air Temperature: 70-89°F
Meters Calibrated: 7/16/17
Purge Stop:
Sample Style: FLUTE

Well #: 604 Z4
Initial DTW: 174.43
Pump Depth: —
Total Well Depth: —
Screen Depth: —
Sample Time:
Alternate Method: FLUTE

TIME	FLOW RATE (ml/min)	DEPTH TO WATER (TOC, FT/M)	pH	SPECIFIC CONDUCTANCE (uS/cm)	TEMP (C)	D.O. (MG/L)	ORP (MV)	TURBIDITY (NTU)	APPEARANCE (COLOR, CLARITY, SOLIDS)	COMMENTS
Parameter Stability Values over 3 Consecutive Readings										
	100 to 500 ml/min	**<0.33 Feet**	**+ 0.1** -	**+ 3%** -	**+10%** -	**+10%** -	**+10 mV** -	**+10%** -		
0919-0929	—	VOLUME 5.6L								CYCLE 1
1009-1016	—	4.25L								CYCLE 2
1058-1105	—	4.8L								CYCLE 3
1516-1521	—	4.6L	8.25	655.25	18.84	2.16	-192.1	0.75	CLEAR	CYCLE 4
1600	SAMPLE	—	8.15	683.49	18.07	4.05	-183.2	0.70	CLEAR	SAMPLE

Chain of custody # _____

Low-Flow Test Report:

Test Date / Time: 7/12/2017 3:56:24 PM
Project: FMC 605A (2)
Operator Name:

Location Name: 605A **Well Diameter: 2.5 in** **Screen Length: 40 ft** **Top of Screen: 505 ft** **Total Depth: 545 ft** **Initial Depth to Water: 186.9 ft**	**Pump Type: Dedicated Double Valve** **Tubing Type: Poly** **Tubing Inner Diameter: 0.25 in** **Tubing Length: 523 ft** **Pump Intake From TOC: 525 ft** **Estimated Total Volume Pumped: 234816.672 ml** **Flow Cell Volume: 130 ml** **Final Flow Rate: 100 ml/min** **Final Draw Down: 1.2 ft**	**Instrument Used: AquaTROLL 600** **Serial Number: 468828**

Test Notes:

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 10 %	+/- 3 %	+/- 10 %	+/- 10 %	+/- 10	+/- 0.33	
7/12/2017 3:56 PM	00:00	7.36 pH	32.34 °C	1.90 µS/cm	6.74 mg/L		101.5 mV	186.90 ft	100.00 ml/min
7/12/2017 4:01 PM	05:27	9.77 pH	20.67 °C	638.85 µS/cm	0.52 mg/L	0.77 NTU	-25.2 mV	186.95 ft	100.00 ml/min
7/12/2017 4:06 PM	10:28	9.80 pH	19.35 °C	666.77 µS/cm	0.38 mg/L	0.25 NTU	-47.0 mV	187.02 ft	100.00 ml/min
7/12/2017 4:11 PM	15:28	9.82 pH	18.48 °C	648.30 µS/cm	0.30 mg/L	0.87 NTU	-58.7 mV	187.15 ft	100.00 ml/min
7/12/2017 4:16 PM	20:28	9.81 pH	19.48 °C	669.39 µS/cm	0.69 mg/L	1.08 NTU	-70.5 mV	187.20 ft	100.00 ml/min
7/12/2017 4:21 PM	25:28	9.82 pH	18.58 °C	674.46 µS/cm	0.24 mg/L	1.54 NTU	-84.0 mV	187.29 ft	100.00 ml/min
7/12/2017 4:26 PM	30:27	9.83 pH	18.24 °C	657.66 µS/cm	0.27 mg/L	0.87 NTU	-88.8 mV	187.43 ft	100.00 ml/min
7/12/2017 4:31 PM	35:27	9.81 pH	19.02 °C	659.09 µS/cm	0.33 mg/L	0.94 NTU	-97.9 mV	187.49 ft	100.00 ml/min
7/12/2017 4:36 PM	40:27	9.82 pH	18.91 °C	673.41 µS/cm	0.25 mg/L	0.91 NTU	-104.6 mV	187.55 ft	100.00 ml/min
7/12/2017 4:41 PM	45:27	9.82 pH	18.95 °C	673.48 µS/cm	0.71 mg/L	0.93 NTU	-98.1 mV	187.49 ft	100.00 ml/min
7/12/2017 4:46 PM	50:27	9.81 pH	18.44 °C	654.77 µS/cm	0.23 mg/L	0.92 NTU	-110.3 mV	187.64 ft	100.00 ml/min
7/12/2017 4:51 PM	55:27	9.80 pH	18.52 °C	680.65 µS/cm	0.21 mg/L	0.99 NTU	-116.3 mV	187.74 ft	100.00 ml/min
7/12/2017 4:56 PM	01:00:28	9.83 pH	17.97 °C	662.51 µS/cm	0.56 mg/L	0.88 NTU	-119.2 mV	187.90 ft	100.00 ml/min
7/12/2017 5:01 PM	01:05:28	9.82 pH	17.76 °C	649.56 µS/cm	0.19 mg/L	0.73 NTU	-123.9 mV	188.00 ft	100.00 ml/min

7/12/2017 5:06 PM	01:10:28	9.78 pH	17.93 °C	666.29 µS/cm	0.19 mg/L	0.92 NTU	-128.5 mV	188.10 ft	100.00 ml/min
7/14/2017 7:04 AM	15:08:09	7.38 pH	20.91 °C	0.00 µS/cm	8.14 mg/L		-14.9 mV	188.10 ft	100.00 ml/min

Samples

Sample ID:	Description:
2017AN-605A	Sample time 17:15

Created using VuSitu from In-Situ, Inc.

Low-Flow Test Report:

Test Date / Time: 7/13/2017 8:53:46 AM
Project: FMC 605B (2)
Operator Name:

Location Name: 605B **Well Diameter: 2.5 in** **Screen Length: 40 ft** **Top of Screen: 685 ft** **Total Depth: 725 ft** **Initial Depth to Water: 167 ft**	**Pump Type: Dedicated Double Valve** **Tubing Type: Poly** **Tubing Inner Diameter: 0.25 in** **Tubing Length: 703 ft** **Pump Intake From TOC: 705 ft** **Estimated Total Volume Pumped: 16357.499 ml** **Flow Cell Volume: 130 ml** **Final Flow Rate: 100 ml/min** **Final Draw Down: 532.15 ft**	**Instrument Used: AquaTROLL 600** **Serial Number: 468828**

Test Notes:

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 10 %	+/- 3 %	+/- 10 %	+/- 10 %	+/- 10	+/- 5	
7/13/2017 8:53 AM	00:00	9.21 pH	20.24 °C	1,861.4 µS/cm	1.70 mg/L		119.2 mV	697.00 ft	150.00 ml/min
7/13/2017 8:54 AM	00:45	9.23 pH	19.36 °C	1,912.6 µS/cm	0.95 mg/L		111.7 mV	697.00 ft	150.00 ml/min
7/13/2017 8:59 AM	05:45	9.25 pH	18.26 °C	1,947.1 µS/cm	0.48 mg/L	31.70 NTU	10.9 mV	697.30 ft	150.00 ml/min
7/13/2017 9:04 AM	10:45	9.23 pH	19.23 °C	1,986.3 µS/cm	0.31 mg/L		-54.4 mV	697.35 ft	150.00 ml/min
7/13/2017 9:05 AM	11:54	9.22 pH	19.56 °C	1,984.8 µS/cm	0.34 mg/L		-62.2 mV	697.35 ft	100.00 ml/min
7/13/2017 9:10 AM	16:54	9.23 pH	18.15 °C	1,929.0 µS/cm	0.17 mg/L	31.10 NTU	-97.3 mV	697.50 ft	100.00 ml/min
7/13/2017 9:15 AM	21:54	9.23 pH	18.35 °C	1,959.5 µS/cm	0.12 mg/L	60.70 NTU	-124.8 mV	697.57 ft	100.00 ml/min
7/13/2017 9:20 AM	26:54	9.22 pH	18.58 °C	1,966.0 µS/cm	0.15 mg/L	102.00 NTU	-146.5 mV	697.67 ft	100.00 ml/min
7/13/2017 9:25 AM	31:54	9.22 pH	18.24 °C	1,950.7 µS/cm	0.10 mg/L	97.60 NTU	-164.8 mV	697.77 ft	100.00 ml/min
7/13/2017 9:30 AM	36:54	9.21 pH	18.51 °C	1,959.6 µS/cm	0.11 mg/L	98.40 NTU	-178.2 mV	697.76 ft	100.00 ml/min
7/13/2017 9:35 AM	41:54	9.22 pH	18.20 °C	1,923.2 µS/cm	0.09 mg/L	97.60 NTU	-188.6 mV	697.84 ft	100.00 ml/min
7/13/2017 9:40 AM	46:54	9.21 pH	18.55 °C	1,947.3 µS/cm	0.09 mg/L	100.00 NTU	-197.4 mV	697.84 ft	100.00 ml/min
7/13/2017 9:45 AM	51:53	9.20 pH	18.94 °C	1,946.5 µS/cm	0.10 mg/L	87.00 NTU	-204.6 mV	698.00 ft	100.00 ml/min
7/13/2017 9:50 AM	56:53	9.16 pH	18.74 °C	1,931.6 µS/cm	0.08 mg/L	79.20 NTU	-211.2 mV	698.10 ft	100.00 ml/min

7/13/2017 9:55 AM	01:01:52	9.15 pH	19.08 °C	1,921.2 µS/cm	0.09 mg/L	68.50 NTU	-217.9 mV	698.10 ft	100.00 ml/min
7/13/2017 10:00 AM	01:06:52	9.16 pH	18.86 °C	1,892.1 µS/cm	0.07 mg/L	64.10 NTU	-225.5 mV	698.18 ft	100.00 ml/min
7/13/2017 10:05 AM	01:11:51	9.16 pH	19.45 °C	1,920.3 µS/cm	0.07 mg/L	59.70 NTU	-237.1 mV	698.30 ft	100.00 ml/min
7/13/2017 10:10 AM	01:16:52	9.15 pH	20.81 °C	1,932.2 µS/cm	0.08 mg/L		-248.4 mV	698.30 ft	100.00 ml/min
7/13/2017 10:15 AM	01:21:51	9.14 pH	21.93 °C	1,916.1 µS/cm	0.09 mg/L	65.80 NTU	-253.1 mV	698.30 ft	100.00 ml/min
7/13/2017 10:20 AM	01:26:51	9.18 pH	20.64 °C	1,898.3 µS/cm	0.07 mg/L	74.20 NTU	-275.5 mV	698.38 ft	100.00 ml/min
7/13/2017 10:25 AM	01:31:51	9.21 pH	19.31 °C	1,871.1 µS/cm	0.05 mg/L	65.40 NTU	-305.4 mV	698.42 ft	100.00 ml/min
7/13/2017 10:30 AM	01:36:51	9.21 pH	19.48 °C	1,891.3 µS/cm	0.06 mg/L	62.80 NTU	-336.3 mV	698.46 ft	100.00 ml/min
7/13/2017 10:35 AM	01:41:51	9.22 pH	19.19 °C	1,859.6 µS/cm	0.05 mg/L	59.90 NTU	-364.2 mV	698.55 ft	100.00 ml/min
7/13/2017 10:40 AM	01:46:51	9.21 pH	19.68 °C	1,874.3 µS/cm	0.05 mg/L	62.50 NTU	-384.2 mV	698.62 ft	100.00 ml/min
7/13/2017 10:51 AM	01:57:37	9.20 pH	19.41 °C	1,928.6 µS/cm	0.04 mg/L	63.70 NTU	-403.6 mV	698.70 ft	100.00 ml/min
7/13/2017 10:56 AM	02:02:37	9.20 pH	20.05 °C	1,961.7 µS/cm	0.04 mg/L	67.20 NTU	-414.0 mV	698.78 ft	100.00 ml/min
7/13/2017 11:01 AM	02:07:37	9.19 pH	20.63 °C	1,972.8 µS/cm	0.05 mg/L	67.90 NTU	-414.4 mV	698.87 ft	100.00 ml/min
7/13/2017 11:06 AM	02:12:37	9.17 pH	22.43 °C	2,013.9 µS/cm	0.05 mg/L		-400.0 mV	698.90 ft	100.00 ml/min
7/13/2017 11:11 AM	02:17:37	9.12 pH	25.26 °C	2,005.1 µS/cm	0.05 mg/L	69.50 NTU	-385.6 mV	698.90 ft	100.00 ml/min
7/13/2017 11:16 AM	02:22:36	9.17 pH	22.61 °C	1,968.6 µS/cm	0.04 mg/L	70.30 NTU	-403.4 mV	699.00 ft	100.00 ml/min
7/13/2017 11:21 AM	02:27:36	9.18 pH	21.00 °C	1,990.9 µS/cm	0.03 mg/L	72.10 NTU	-407.7 mV	699.05 ft	100.00 ml/min
7/13/2017 11:26 AM	02:32:36	9.20 pH	20.49 °C	2,062.3 µS/cm	0.03 mg/L	69.70 NTU	-412.6 mV	699.10 ft	100.00 ml/min
7/13/2017 11:31 AM	02:37:36	9.20 pH	19.67 °C	1,991.4 µS/cm	0.03 mg/L	67.90 NTU	-413.4 mV	699.15 ft	100.00 ml/min

Samples

Sample ID:	Description:
2017AN-605B	Sampled 11:35. Anomaly with conductivity next to last reading.

Low-Flow Test Report:

Test Date / Time: 7/15/2017 8:28:44 AM
Project: FMC 606A (3)
Operator Name:

Location Name: 606A **Well Diameter: 2.5 in** **Screen Length: 40 ft** **Top of Screen: 464 ft** **Total Depth: 404 ft** **Initial Depth to Water: 21.74 ft**	**Pump Type: Dedicated Double Valve** **Tubing Type: Poly** **Tubing Inner Diameter: 0.25 in** **Tubing Length: 382 ft** **Pump Intake From TOC: 384 ft** **Estimated Total Volume Pumped: 2499.999 ml** **Flow Cell Volume: 130 ml** **Final Flow Rate: 100 ml/min** **Final Draw Down: 0.39 ft**	**Instrument Used: AquaTROLL 600** **Serial Number: 468828**

Test Notes:
Turbidity was <1

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 10 %	+/- 3 %	+/- 10 %	+/- 10 %	+/- 10	+/- 0.33	
7/15/2017 8:28 AM	00:00	8.89 pH	22.31 °C	984.26 µS/cm	2.56 mg/L		-200.9 mV	21.74 ft	100.00 ml/min
7/15/2017 8:33 AM	04:59	8.96 pH	19.09 °C	1,040.7 µS/cm	0.28 mg/L	2.09 NTU	-261.8 mV	22.03 ft	100.00 ml/min
7/15/2017 8:38 AM	09:59	8.98 pH	18.41 °C	1,042.9 µS/cm	0.23 mg/L	0.54 NTU	-276.0 mV	22.09 ft	100.00 ml/min
7/15/2017 8:43 AM	14:59	8.99 pH	18.01 °C	1,035.2 µS/cm	0.25 mg/L	0.55 NTU	-274.6 mV	22.09 ft	100.00 ml/min
7/15/2017 8:48 AM	19:59	8.99 pH	17.80 °C	1,037.4 µS/cm	0.26 mg/L	0.91 NTU	-277.3 mV	22.13 ft	100.00 ml/min
7/15/2017 8:53 AM	24:59	8.99 pH	17.67 °C	1,026.8 µS/cm	0.25 mg/L	0.94 NTU	-282.8 mV	22.13 ft	100.00 ml/min

Samples

Sample ID:	Description:
2017AN-606A	0855 sample Time

Created using VuSitu from In-Situ, Inc.

Low-Flow Test Report:

Test Date / Time: 7/17/2017 4:52:16 PM
Project: FMC 606B (2)
Operator Name:

Location Name: 606B **Well Diameter: 2.5 in** **Screen Length: 20 ft** **Top of Screen: 524 ft** **Total Depth: 544 ft** **Initial Depth to Water: 163.6 ft**	**Pump Type: Dedicated Double Valve** **Tubing Type: Poly** **Tubing Inner Diameter: 0.25 in** **Tubing Length: 532 ft** **Pump Intake From TOC: 534 ft** **Estimated Total Volume Pumped: 13596.667 ml** **Flow Cell Volume: 130 ml** **Final Flow Rate: 100 ml/min** **Final Draw Down: -0.45 ft**	**Instrument Used: AquaTROLL 600** **Serial Number: 468828**

Test Notes:
Dissolved oxygen <0.2. Conductivity oscillating.

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 10 %	+/- 3 %	+/- 10 %	+/- 10 %	+/- 10	+/- 0.33	
7/17/2017 4:52 PM	00:00	9.28 pH	23.33 °C	1,067.1 µS/cm	2.39 mg/L		-155.3 mV	163.60 ft	100.00 ml/min
7/17/2017 4:55 PM	03:04	9.33 pH	21.07 °C	1,004.4 µS/cm	0.83 mg/L	0.41 NTU	-187.2 mV	163.60 ft	100.00 ml/min
7/17/2017 5:00 PM	08:04	9.36 pH	19.93 °C	927.61 µS/cm	0.58 mg/L	0.35 NTU	-195.0 mV	163.60 ft	100.00 ml/min
7/17/2017 5:05 PM	13:03	9.36 pH	19.56 °C	1,023.9 µS/cm	0.46 mg/L	0.40 NTU	-197.7 mV	163.63 ft	100.00 ml/min
7/17/2017 5:10 PM	18:03	9.29 pH	19.60 °C	701.66 µS/cm	0.45 mg/L	0.44 NTU	-164.3 mV	163.65 ft	100.00 ml/min
7/17/2017 5:15 PM	23:02	9.25 pH	19.74 °C	610.14 µS/cm	0.40 mg/L	0.22 NTU	-175.7 mV	163.65 ft	100.00 ml/min
7/17/2017 5:20 PM	28:02	9.25 pH	20.09 °C	450.66 µS/cm	0.34 mg/L	0.33 NTU	-185.8 mV	163.65 ft	100.00 ml/min
7/17/2017 5:32 PM	40:39	9.26 pH	24.20 °C	1,131.0 µS/cm	0.58 mg/L		-225.7 mV	163.08 ft	100.00 ml/min
7/17/2017 5:37 PM	45:39	9.31 pH	20.08 °C	785.39 µS/cm	0.40 mg/L	0.19 NTU	-217.9 mV	163.09 ft	100.00 ml/min
7/17/2017 5:42 PM	50:38	9.31 pH	19.34 °C	580.57 µS/cm	0.36 mg/L	0.28 NTU	-217.5 mV	163.13 ft	100.00 ml/min
7/17/2017 5:47 PM	55:39	9.27 pH	19.13 °C	428.03 µS/cm	0.33 mg/L	0.20 NTU	-217.9 mV	163.13 ft	100.00 ml/min
7/17/2017 5:52 PM	01:00:38	9.23 pH	18.65 °C	937.20 µS/cm	0.25 mg/L	0.19 NTU	-239.5 mV	163.14 ft	100.00 ml/min
7/17/2017 5:57 PM	01:05:38	9.15 pH	18.66 °C	834.86 µS/cm	0.23 mg/L	0.20 NTU	-217.0 mV	163.15 ft	100.00 ml/min
7/17/2017 6:02 PM	01:10:38	9.06 pH	18.76 °C	560.79 µS/cm	0.24 mg/L	0.21 NTU	-217.1 mV	163.15 ft	100.00 ml/min

7/17/2017 6:08 PM	01:16:00	9.02 pH	18.80 °C	1,015.1 µS/cm	0.22 mg/L	0.33 NTU	-241.2 mV	163.15 ft	100.00 ml/min
7/17/2017 6:13 PM	01:20:59	8.99 pH	18.49 °C	1,055.2 µS/cm	0.19 mg/L	0.33 NTU	-238.9 mV	163.15 ft	100.00 ml/min
7/17/2017 6:18 PM	01:25:59	8.94 pH	18.61 °C	1,045.6 µS/cm	0.20 mg/L	0.37 NTU	-244.7 mV	163.15 ft	100.00 ml/min
7/17/2017 6:23 PM	01:30:59	8.91 pH	18.55 °C	967.53 µS/cm	0.18 mg/L	0.23 NTU	-245.7 mV	163.15 ft	100.00 ml/min
7/17/2017 6:28 PM	01:35:59	8.90 pH	18.33 °C	874.94 µS/cm	0.18 mg/L	0.46 NTU	-252.1 mV	163.15 ft	100.00 ml/min
7/17/2017 6:33 PM	01:40:58	8.90 pH	18.33 °C	1,035.1 µS/cm	0.19 mg/L	0.34 NTU	-256.2 mV	163.15 ft	100.00 ml/min
7/17/2017 6:38 PM	01:45:58	8.89 pH	18.31 °C	1,042.5 µS/cm	0.19 mg/L	0.24 NTU	-254.9 mV	163.15 ft	100.00 ml/min
7/17/2017 6:43 PM	01:50:58	8.88 pH	18.16 °C	891.89 µS/cm	0.19 mg/L	0.31 NTU	-260.6 mV	163.15 ft	100.00 ml/min
7/17/2017 6:48 PM	01:55:58	8.88 pH	18.24 °C	981.17 µS/cm	0.19 mg/L	0.32 NTU	-265.0 mV	163.15 ft	100.00 ml/min
7/17/2017 6:53 PM	02:00:58	8.88 pH	17.99 °C	995.11 µS/cm	0.19 mg/L	0.27 NTU	-267.7 mV	163.15 ft	100.00 ml/min
7/17/2017 6:58 PM	02:05:58	8.88 pH	18.08 °C	896.02 µS/cm	0.18 mg/L	0.24 NTU	-269.7 mV	163.15 ft	100.00 ml/min
7/17/2017 7:03 PM	02:10:58	8.88 pH	18.08 °C	1,047.9 µS/cm	0.20 mg/L	0.25 NTU	-272.4 mV	163.15 ft	100.00 ml/min
7/17/2017 7:08 PM	02:15:58	8.88 pH	18.13 °C	1,039.1 µS/cm	0.19 mg/L	0.32 NTU	-275.0 mV	163.15 ft	100.00 ml/min

Samples

Sample ID:	Description:
2017AN-606B	Sample time 19:10

Low-Flow Test Report:

Test Date / Time: 7/26/2017 2:08:42 PM
Project: FMC B-48A (2)
Operator Name: KTeague

Location Name: B-48A **Well Diameter: 1 in** **Casing Type: PVC** **Screen Length: 8 ft** **Top of Screen: 30.74 ft** **Total Depth: 38.74 ft** **Initial Depth to Water: 21.61 ft**	**Pump Type: Peristaltic** **Pump Intake From TOC: 34 ft** **Estimated Total Volume Pumped: 8306.666 ml** **Flow Cell Volume: 130 ml** **Final Flow Rate: 100 ml/min** **Final Draw Down: 1.89 ft**	**Instrument Used: AquaTROLL 600** **Serial Number: 447417**

Test Notes:

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 10 %	+/- 3 %	+/- 10 %	+/- 10 %	+/- 10	+/- 5	
7/26/2017 2:08 PM	00:00	7.48 pH	29.64 °C	1.12 µS/cm	7.52 mg/L		97.2 mV	21.61 ft	100.00 ml/min
7/26/2017 2:13 PM	05:00	7.55 pH	27.11 °C	1,988.5 µS/cm	4.01 mg/L		78.3 mV	22.47 ft	100.00 ml/min
7/26/2017 2:18 PM	10:00	7.65 pH	27.04 °C	1.29 µS/cm	8.30 mg/L		32.1 mV	22.47 ft	100.00 ml/min
7/26/2017 2:23 PM	15:00	7.68 pH	28.39 °C	1.22 µS/cm	8.13 mg/L		56.1 mV	23.04 ft	100.00 ml/min
7/26/2017 2:28 PM	20:00	7.51 pH	26.03 °C	1,937.8 µS/cm	1.33 mg/L		20.8 mV	23.17 ft	100.00 ml/min
7/26/2017 2:33 PM	24:59	7.47 pH	24.50 °C	1,954.5 µS/cm	0.62 mg/L		31.2 mV	23.25 ft	100.00 ml/min
7/26/2017 2:38 PM	30:00	7.36 pH	24.89 °C	1,970.0 µS/cm	0.48 mg/L		36.4 mV	23.31 ft	100.00 ml/min
7/26/2017 2:43 PM	34:59	7.37 pH	24.59 °C	1,964.7 µS/cm	0.36 mg/L		38.9 mV	23.41 ft	100.00 ml/min
7/26/2017 2:48 PM	39:59	7.36 pH	25.15 °C	1,957.5 µS/cm	0.41 mg/L	14.50 NTU	38.4 mV	23.42 ft	100.00 ml/min
7/26/2017 2:53 PM	45:00	7.40 pH	24.35 °C	1,944.5 µS/cm	0.36 mg/L	11.50 NTU	39.9 mV	23.44 ft	100.00 ml/min
7/26/2017 2:58 PM	49:59	7.38 pH	24.42 °C	1,935.1 µS/cm	0.39 mg/L	10.10 NTU	40.1 mV	23.50 ft	100.00 ml/min
7/26/2017 3:03 PM	55:00	7.39 pH	23.94 °C	1,929.1 µS/cm	0.34 mg/L	8.81 NTU	41.8 mV	23.50 ft	100.00 ml/min
7/26/2017 3:08 PM	01:00:00	7.37 pH	23.64 °C	1,917.2 µS/cm	0.38 mg/L	10.10 NTU	42.7 mV	23.50 ft	100.00 ml/min
7/26/2017 3:13 PM	01:04:59	7.39 pH	23.70 °C	1,915.8 µS/cm	0.43 mg/L	7.58 NTU	42.3 mV	23.50 ft	100.00 ml/min
7/26/2017 3:18 PM	01:09:59	7.35 pH	23.80 °C	1,918.2 µS/cm	0.43 mg/L	6.70 NTU	41.2 mV	23.50 ft	100.00 ml/min
7/26/2017 3:23 PM	01:14:59	7.32 pH	23.72 °C	1,915.9 µS/cm	0.46 mg/L		41.6 mV	23.50 ft	100.00 ml/min

7/26/2017 3:31 PM	01:23:03	7.27 pH	24.38 °C	1,930.0 µS/cm	0.45 mg/L		40.1 mV	23.50 ft	100.00 ml/min

Samples

Sample ID:	Description:
B-48	

Created using VuSitu from In-Situ, Inc.

PARSONS

Field Monitoring Record
Low-Flow (minimal drawdown)
GROUNDWATER SAMPLING

Client: FMC Front Royal
Site name: Front Royal, VA
Samplers: K. Teague, C. Brown
Sample Event #: 2017 Annual Sampling
Well Condition: ___
Purge Start: ___
Pump Type: Peristaltic

Date: 8/1/17
Wind: ___
Weather: ___
Air Temperature: ___
Meters Calibrated: ___
Purge Stop: ___
Sample Style: ___

~~Well #:~~ Sump FAB-1-2
Initial DTW: ~~4.95~~ 4.0 KT
Pump Depth: ___
Total Well Depth: ___
Screen Depth: ___
Sample Time: 1525
Alternate Method: ___

TIME	FLOW RATE (ml/min)	DEPTH TO WATER (TOC, FT/M)	pH	SPECIFIC CONDUCTANCE (uS/cm)	TEMP (C)	D.O. (MG/L)	ORP (MV)	TURBIDITY (NTU)	APPEARANCE (COLOR, CLARITY, SOLIDS)	COMMENTS
	Parameter Stability Values over 3 Consecutive Readings									
	100 to 500 ml/min	<0.33 Feet	+ 0.1 -	+ 3% -	+10% -	+10% -	+10 mV -	+10% -		
1525	200	4.0	7.92	1.59	39.36	6.85	-21.6	4.21	clear	

Chain of custody # ___

PARSONS

Field Monitoring Record
Low-Flow (minimal drawdown)
GROUNDWATER SAMPLING

Client: FMC Front Royal
Site name: Front Royal, VA
Samplers: K. Teague, C. Brown
Sample Event #: 2017 Annual
Well Condition: ___
Purge Start: ___
Pump Type: ___

Date: 8/1/17
Wind: ___
Weather: ___
Air Temperature: ___
Meters Calibrated: ___
Purge Stop: ___
Sample Style: ___

Sump
~~Well #:~~ FAB-3-1
Initial DTW: 4.95
Pump Depth: ___
Total Well Depth: ___
Screen Depth: ___
Sample Time: 1532
Alternate Method: ___

TIME	FLOW RATE (ml/min)	DEPTH TO WATER (TOC, FT/M)	pH	SPECIFIC CONDUCTANCE (uS/cm)	TEMP (C)	D.O. (MG/L)	ORP (MV)	TURBIDITY (NTU)	APPEARANCE (COLOR, CLARITY, SOLIDS)	COMMENTS
	Parameter Stability Values over 3 Consecutive Readings									
	100 to 500 ml/min	<0.33 Feet	+ 0.1 -	+ 3% -	+10% -	+10% -	+10 mV -	+10% -		
1540	200	4.95	7.86	2.72	27.93	1.72	10.1	3.33	clear	

Chain of custody # ___

PARSONS

Field Monitoring Record
Low-Flow (minimal drawdown)
GROUNDWATER SAMPLING

Client: FMC Front Royal
Site name: Front Royal, VA
Samplers: K. Teague, C. Brown
Sample Event #: 2017 annual
Well Condition: ___
Purge Start: ___
Pump Type: Peristaltic

Date: 8/1/17
Wind: ___
Weather: ___
Air Temperature: ___
Meters Calibrated: ___
Purge Stop: ___
Sample Style: ___

Well #: Sump FAB-6 North
Initial DTW: 8.00
Pump Depth: ___
Total Well Depth: ___
Screen Depth: ___
Sample Time: 1410
Alternate Method: ___

TIME	FLOW RATE (ml/min)	DEPTH TO WATER (TOC, FT/M)	pH	SPECIFIC CONDUCTANCE (uS/cm)	TEMP (C)	D.O. (MG/L)	ORP (MV)	TURBIDITY (NTU)	APPEARANCE (COLOR, CLARITY, SOLIDS)	COMMENTS
Parameter Stability Values over 3 Consecutive Readings										
	100 to 500 ml/min	**<0.33 Feet**	**+ 0.1 -**	**+ 3% -**	**+10% -**	**+10% -**	**+10 mV -**	**+10% -**		
1410	200	8.05	7.82	1,990.9	28.73	0.48	-130.1	11.80	clear	

Chain of custody # ___

PARSONS

Field Monitoring Record
Low-Flow (minimal drawdown)
GROUNDWATER SAMPLING

Client: FMC Front Royal
Site name: Front Royal, VA
Samplers: K Teague, C. Brown
Sample Event #: 2017 Annual
Well Condition: ___
Purge Start: ___
Pump Type: peristaltic

Date: 8/1/17
Wind: ___
Weather: ___
Air Temperature: ___
Meters Calibrated: ___
Purge Stop: ___
Sample Style: ___

Well #: ~~Well #:~~ Sump FAB-6-South
Initial DTW: 8.05
Pump Depth: ___
Total Well Depth: ___
Screen Depth: ___
Sample Time: 1430
Alternate Method: ___

TIME	FLOW RATE (ml/min)	DEPTH TO WATER (TOC, FT/M)	pH	SPECIFIC CONDUCTANCE (uS/cm)	TEMP (C)	D.O. (MG/L)	ORP (MV)	TURBIDITY (NTU)	APPEARANCE (COLOR, CLARITY, SOLIDS)	COMMENTS
	Parameter Stability Values over 3 Consecutive Readings									
	100 to 500 ml/min	**<0.33 Feet**	**+ 0.1** -	**+ 3%** -	**+10%** -	**+10%** -	**+10 mV** -	**+10%** -		
1430	200	8.05	7.76	1.89	31.71	1.56	-151.9	3.15	clear	

Chain of custody # ___

Low-Flow Test Report:

Test Date / Time: 7/19/2017 8:32:32 AM
Project: FMC GM-02A (2)
Operator Name: Harder, Brown

Location Name: GM-02A **Well Diameter: 4 in** **Casing Type: Steel** **Screen Length: 73 ft** **Top of Screen: 29.43 ft** **Total Depth: 102.43 ft** **Initial Depth to Water: 35.23 ft**	**Pump Type: Double Valve** **Tubing Type: Pvc** **Pump Intake From TOC: 65 ft** **Estimated Total Volume Pumped: 4125 ml** **Flow Cell Volume: 130 ml** **Final Flow Rate: 130 ml/min** **Final Draw Down: 0.72 ft**	**Instrument Used: AquaTROLL 600** **Serial Number: 447365**

Test Notes:

Weather Conditions:
Sunny 70

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 10 %	+/- 3 %	+/- 10 %	+/- 10 %	+/- 10	+/- 0.33	
7/19/2017 8:32 AM	00:00	8.04 pH	19.30 °C	617.43 µS/cm	0.63 mg/L	1.00 NTU	-344.3 mV	35.23 ft	175.00 ml/min
7/19/2017 8:37 AM	05:00	8.04 pH	18.84 °C	625.15 µS/cm	0.33 mg/L	1.59 NTU	-369.0 mV	35.71 ft	130.00 ml/min
7/19/2017 8:42 AM	10:00	8.05 pH	18.67 °C	623.98 µS/cm	0.31 mg/L	0.03 NTU	-334.7 mV	35.85 ft	130.00 ml/min
7/19/2017 8:47 AM	15:00	8.05 pH	18.73 °C	627.75 µS/cm	0.25 mg/L	0.54 NTU	-335.8 mV	35.90 ft	130.00 ml/min
7/19/2017 8:52 AM	20:00	8.06 pH	18.56 °C	626.64 µS/cm	0.22 mg/L	1.01 NTU	-337.9 mV	35.93 ft	130.00 ml/min
7/19/2017 8:57 AM	25:00	8.06 pH	18.52 °C	627.29 µS/cm	0.22 mg/L	0.60 NTU	-343.9 mV	35.94 ft	130.00 ml/min
7/19/2017 9:02 AM	29:59	8.06 pH	18.54 °C	626.23 µS/cm	0.20 mg/L	0.96 NTU	-347.6 mV	35.95 ft	130.00 ml/min

Samples

Sample ID:	Description:
GM-02A	

Low-Flow Test Report:

Test Date / Time: 7/19/2017 9:48:24 AM
Project: FMC GM-02B (2)
Operator Name: Harder, Brown

Location Name: GM-02B **Well Diameter: 4 in** **Casing Type: Steel** **Screen Length: 63 ft** **Top of Screen: 101.72 ft** **Total Depth: 164.72 ft** **Initial Depth to Water: 38.82 ft**	**Pump Type: Double Valve** **Tubing Type: Pvc** **Pump Intake From TOC: 132 ft** **Estimated Total Volume Pumped: 7395.665 ml** **Flow Cell Volume: 130 ml** **Final Flow Rate: 130 ml/min** **Final Draw Down: 0.59 ft**	**Instrument Used: AquaTROLL 600** **Serial Number: 447365**

Test Notes:

Weather Conditions:
Sunny 80

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 10 %	+/- 3 %	+/- 10 %	+/- 10 %	+/- 10	+/- 0.33	
7/19/2017 9:48 AM	00:00	7.79 pH	21.34 °C	3,998.7 µS/cm	0.43 mg/L	43.38 NTU	-501.8 mV	38.82 ft	180.00 ml/min
7/19/2017 9:53 AM	04:59	7.77 pH	21.65 °C	8,499.7 µS/cm	0.21 mg/L	8.73 NTU	-520.0 mV	39.08 ft	130.00 ml/min
7/19/2017 9:58 AM	09:59	7.77 pH	22.01 °C	8,486.7 µS/cm	0.17 mg/L	23.87 NTU	-495.9 mV	39.17 ft	130.00 ml/min
7/19/2017 10:03 AM	14:59	7.77 pH	22.02 °C	8,575.4 µS/cm	0.18 mg/L	18.78 NTU	-523.3 mV	39.26 ft	130.00 ml/min
7/19/2017 10:08 AM	19:58	7.77 pH	22.40 °C	8,551.9 µS/cm	0.16 mg/L	2.16 NTU	-523.9 mV	39.31 ft	130.00 ml/min
7/19/2017 10:13 AM	24:58	7.76 pH	22.40 °C	8,486.2 µS/cm	0.14 mg/L	18.82 NTU	-530.8 mV	39.35 ft	130.00 ml/min
7/19/2017 10:18 AM	29:59	7.76 pH	23.23 °C	8,489.3 µS/cm	0.12 mg/L	27.15 NTU	-533.6 mV	39.37 ft	130.00 ml/min
7/19/2017 10:23 AM	34:58	7.77 pH	23.07 °C	8,509.3 µS/cm	0.13 mg/L	4.45 NTU	-530.3 mV	39.40 ft	130.00 ml/min
7/19/2017 10:28 AM	39:58	7.76 pH	23.75 °C	8,562.1 µS/cm	0.14 mg/L	20.81 NTU	-533.6 mV	39.41 ft	130.00 ml/min
7/19/2017 10:33 AM	44:58	7.75 pH	23.93 °C	8,594.7 µS/cm	0.11 mg/L	19.61 NTU	-534.6 mV	39.41 ft	130.00 ml/min
7/19/2017 10:38 AM	49:58	7.76 pH	24.39 °C	8,463.9 µS/cm	0.11 mg/L	12.30 NTU	-535.8 mV	39.41 ft	130.00 ml/min
7/19/2017 10:43 AM	54:57	7.76 pH	24.22 °C	8,453.9 µS/cm	0.12 mg/L	20.92 NTU	-525.9 mV	39.41 ft	130.00 ml/min

Samples

Sample ID:	Description:
GM-02B	

Low-Flow Test Report:

Test Date / Time: 7/30/2017 11:27:05 AM
Project: FMC GM-09 (2)
Operator Name: KTeague

Location Name: GM-09 **Well Diameter: 4 in** **Screen Length: 99 ft** **Top of Screen: 50.96 ft** **Total Depth: 149.96 ft** **Initial Depth to Water: 39.47 ft**	**Pump Type: Double valve** **Pump Intake From TOC: 99 ft** **Estimated Total Volume Pumped: 4146.667 ml** **Flow Cell Volume: 130 ml** **Final Flow Rate: 100 ml/min** **Final Draw Down: 0.04 ft**	**Instrument Used: AquaTROLL 600** **Serial Number: 447417**

Test Notes:
Standard method

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 10 %	+/- 3 %	+/- 10 %	+/- 10 %	+/- 10	+/- 5	
7/30/2017 11:27 AM	00:00	7.41 pH	24.99 °C	2,968.3 µS/cm	1.89 mg/L		-129.2 mV	39.47 ft	100.00 ml/min
7/30/2017 11:28 AM	01:29	7.39 pH	24.88 °C	2,954.8 µS/cm	0.95 mg/L		-142.1 mV	39.51 ft	100.00 ml/min
7/30/2017 11:33 AM	06:29	7.42 pH	24.57 °C	2,988.8 µS/cm	0.51 mg/L	11.30 NTU	-152.7 mV	39.51 ft	100.00 ml/min
7/30/2017 11:38 AM	11:29	7.41 pH	24.79 °C	3,000.3 µS/cm	0.41 mg/L	14.50 NTU	-157.1 mV	39.51 ft	100.00 ml/min
7/30/2017 11:43 AM	16:29	7.41 pH	25.04 °C	3,004.1 µS/cm	0.35 mg/L	13.00 NTU	-160.7 mV	39.51 ft	100.00 ml/min
7/30/2017 11:48 AM	21:28	7.43 pH	24.94 °C	2,996.7 µS/cm	0.31 mg/L	16.70 NTU	-163.0 mV	39.51 ft	100.00 ml/min
7/30/2017 11:53 AM	26:28	7.44 pH	25.06 °C	2,999.4 µS/cm	0.28 mg/L	14.00 NTU	-165.4 mV	39.51 ft	100.00 ml/min
7/30/2017 11:58 AM	31:28	7.46 pH	24.93 °C	2,989.5 µS/cm	0.25 mg/L	8.40 NTU	-166.3 mV	39.51 ft	100.00 ml/min
7/30/2017 12:03 PM	36:28	7.45 pH	25.04 °C	2,998.6 µS/cm	0.24 mg/L	7.47 NTU	-167.3 mV	39.51 ft	100.00 ml/min
7/30/2017 12:08 PM	41:27	7.47 pH	25.02 °C	2,987.7 µS/cm	0.23 mg/L	8.26 NTU	-168.8 mV	39.51 ft	100.00 ml/min

Samples

Sample ID:	Description:
2017AN-GM-09	Sampled at 1210

Low-Flow Test Report:

Test Date / Time: 7/25/2017 3:04:14 PM
Project: FMC GPW-02 (3)
Operator Name:

Location Name: GPW-02 **Well Diameter: 1 in** **Screen Length: 5 ft** **Top of Screen: 18 ft** **Total Depth: 23 ft** **Initial Depth to Water: 22.98 ft**	**Estimated Total Volume Pumped: 0 ml** **Flow Cell Volume: 130 ml** **Final Flow Rate: 100 ml/min** **Final Draw Down: 0 ft**	**Instrument Used: AquaTROLL 600** **Serial Number: 468828**

Test Notes:
1 reading taken
Method 4

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 10 %	+/- 3 %	+/- 10 %	+/- 10 %	+/- 10	+/- 5	
7/25/2017 3:04 PM	00:00	5.50 pH	21.40 °C	433.78 µS/cm	1.99 mg/L		81.7 mV	22.98 ft	100.00 ml/min

Samples

Sample ID:	Description:
2017AN-GPW02	Sample time 15:05

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Low-Flow Test Report:

Test Date / Time: 7/24/2017 4:14:16 PM
Project: FMC GPW-03R (2)
Operator Name:

Location Name: GPW-03R **Well Diameter: 2 in** **Screen Length: 5 ft** **Top of Screen: 23 ft** **Total Depth: 28 ft** **Initial Depth to Water: 22.13 ft**	**Estimated Total Volume Pumped: 2622.918 ml** **Flow Cell Volume: 130 ml** **Final Flow Rate: 100 ml/min** **Final Draw Down: 0.4 ft**	**Instrument Used: AquaTROLL 600** **Serial Number: 468828**

Test Notes:
Turbidity just outside 10% but below 5 NTU
Method 2A

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 10 %	+/- 3 %	+/- 10 %	+/- 10 %	+/- 10	+/- 0.33	
7/24/2017 4:14 PM	00:00	5.77 pH	24.90 °C	723.09 µS/cm	2.34 mg/L		195.7 mV	22.13 ft	125.00 ml/min
7/24/2017 4:19 PM	04:59	5.77 pH	23.32 °C	741.00 µS/cm	2.03 mg/L	7.70 NTU	207.6 mV	22.53 ft	100.00 ml/min
7/24/2017 4:24 PM	09:59	5.77 pH	22.67 °C	754.16 µS/cm	2.04 mg/L	5.35 NTU	211.3 mV	22.53 ft	100.00 ml/min
7/24/2017 4:29 PM	14:59	5.76 pH	22.34 °C	757.39 µS/cm	2.01 mg/L	2.58 NTU	209.4 mV	22.53 ft	100.00 ml/min
7/24/2017 4:34 PM	19:59	5.74 pH	22.15 °C	756.54 µS/cm	2.00 mg/L	2.31 NTU	207.8 mV	22.53 ft	100.00 ml/min
7/24/2017 4:39 PM	24:59	5.69 pH	21.84 °C	759.56 µS/cm	1.96 mg/L	2.28 NTU	209.6 mV	22.53 ft	100.00 ml/min

Samples

Sample ID:	Description:
2017AN-GPW03R	Sample time 16:45

Low-Flow Test Report:

Test Date / Time: 7/27/2017 8:18:08 AM
Project: FMC GPW-14 (2)
Operator Name:

Location Name: GPW-14 **Well Diameter: 1 in** **Screen Length: 5 ft** **Top of Screen: 4.5 ft** **Total Depth: 9.5 ft** **Initial Depth to Water: 8.52 ft**	**Estimated Total Volume Pumped: 0 ml** **Flow Cell Volume: 130 ml** **Final Flow Rate: 100 ml/min** **Final Draw Down: 0 ft**	**Instrument Used: AquaTROLL 600** **Serial Number: 468828**

Test Notes:
One reading collected. Well pumped dry on 7/26/17
Method 3

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 10 %	+/- 3 %	+/- 10 %	+/- 10 %	+/- 10	+/- 0.33	
7/27/2017 8:18 AM	00:00	6.58 pH	21.66 °C	18,555 µS/cm	6.24 mg/L	176.00 NTU	79.2 mV	8.52 ft	100.00 ml/min

Samples

Sample ID:	Description:
2017AN-GPW-14	Sample time 08:20

Created using VuSitu from In-Situ, Inc.

PARSONS

Field Monitoring Record
Low-Flow (minimal drawdown)
GROUNDWATER SAMPLING

Client: FMC Front Royal
Site name: Front Royal, VA
Samplers: Lipomi / Hunter
Sample Event #: 2017NN
Well Condition: Good
Purge Start: 1600
Pump Type: Peristaltic

Date: 1/30/18
Wind:
Weather:
Air Temperature:
Meters Calibrated: Y
Purge Stop: 1620
Sample Style: Grab

Well #: GPW-14 (Resample)
Initial DTW: 9.35
Pump Depth: N/A
Total Well Depth: 12.05
Screen Depth:
Sample Time: 1/31/18 - 0800
Alternate Method: 3

	TIME	FLOW RATE (ml/min)	DEPTH TO WATER (TOC, FT/M)	pH	SPECIFIC CONDUCTANCE (uS/cm)	TEMP (C)	D.O. (MG/L)	ORP (MV)	TURBIDITY (NTU)	APPEARANCE (COLOR, CLARITY, SOLIDS)	COMMENTS
		Parameter Stability Values over 3 Consecutive Readings									
		100 to 500 ml/min	<0.33 Feet	+0.1 -	+3% -	+10% -	+10% -	+10 mV -	+10% -		
1/30	1600	—	9.35		Purged Dry						
1/31	0800	—	9.60	6.99	11.38 ms/cm	1.53	5.41	-16.4	13.8	Clear	

Chain of custody # _____

Low-Flow Test Report:

Test Date / Time: 7/29/2017 7:45:51 AM
Project: FMC GPW-15 (2)
Operator Name:

Location Name: GPW-15 **Well Diameter: 2 in** **Screen Length: 5 ft** **Top of Screen: 16.5 ft** **Total Depth: 21.5 ft** **Initial Depth to Water: 13.07 ft**	**Estimated Total Volume Pumped: 0 ml** **Flow Cell Volume: 130 ml** **Final Flow Rate: 100 ml/min** **Final Draw Down: 0 ft**	**Instrument Used: AquaTROLL 600** **Serial Number: 468828**

Test Notes:
One reading collected. One casing volume removed 1.5 gal. Removed. Casing volume was 1.3 gal. Method 3

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 10 %	+/- 3 %	+/- 10 %	+/- 10 %	+/- 10	+/- 0.33	
7/29/2017 7:45 AM	00:00	6.34 pH	17.82 °C	793.25 µS/cm	1.63 mg/L	5.87 NTU	106.3 mV	13.07 ft	100.00 ml/min

Samples

Sample ID:	Description:
2017AN-GPW-15R	Sample time 07:45

Created using VuSitu from In-Situ, Inc.

Low-Flow Test Report:

Test Date / Time: 7/28/2017 1:31:43 PM
Project: FMC MW-03R (3)
Operator Name:

Location Name: MW-03R **Well Diameter: 2 in** **Screen Length: 11 ft** **Top of Screen: 40 ft** **Total Depth: 51 ft** **Initial Depth to Water: 41.72 ft**	**Estimated Total Volume Pumped: 3250 ml** **Flow Cell Volume: 130 ml** **Final Flow Rate: 100 ml/min** **Final Draw Down: 0.21 ft**	**Instrument Used: AquaTROLL 600** **Serial Number: 468828**

Test Notes:
Standard method. Water light amber color with strong odors.

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 10 %	+/- 3 %	+/- 10 %	+/- 10 %	+/- 10	+/- 0.33	
7/28/2017 1:31 PM	00:00	8.82 pH	17.42 °C	12,746 µS/cm	0.25 mg/L		-384.4 mV	41.72 ft	150.00 ml/min
7/28/2017 1:36 PM	04:59	8.84 pH	19.28 °C	13,385 µS/cm	0.02 mg/L	63.00 NTU	-400.0 mV	41.79 ft	100.00 ml/min
7/28/2017 1:41 PM	09:59	8.79 pH	18.82 °C	13,534 µS/cm	0.00 mg/L	42.50 NTU	-407.2 mV	41.85 ft	100.00 ml/min
7/28/2017 1:46 PM	14:59	8.84 pH	18.77 °C	13,353 µS/cm		25.10 NTU	-414.3 mV	41.85 ft	100.00 ml/min
7/28/2017 1:51 PM	19:59	8.85 pH	18.55 °C	13,279 µS/cm		22.30 NTU	-416.5 mV	41.88 ft	100.00 ml/min
7/28/2017 1:56 PM	24:59	8.83 pH	18.40 °C	13,193 µS/cm		21.20 NTU	-416.2 mV	41.90 ft	100.00 ml/min
7/28/2017 2:01 PM	29:59	8.82 pH	18.37 °C	13,141 µS/cm		20.40 NTU	-414.1 mV	41.93 ft	100.00 ml/min

Samples

Sample ID:	Description:
2017AN-MW-03R	Sample time 14:05

Low-Flow Test Report:

Test Date / Time: 7/26/2017 1:15:33 PM
Project: FMC MW-05 (2)
Operator Name:

Location Name: MW-05 **Well Diameter: 4 in** **Screen Length: 8 ft** **Top of Screen: 22 ft** **Total Depth: 30 ft** **Initial Depth to Water: 10.98 ft**	**Estimated Total Volume Pumped: 6798.001 ml** **Flow Cell Volume: 130 ml** **Final Flow Rate: 120 ml/min** **Final Draw Down: 1.62 ft**	**Instrument Used: AquaTROLL 600** **Serial Number: 468828**

Test Notes:
Method 2A

Water was clear with black particles

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 10 %	+/- 3 %	+/- 10 %	+/- 10 %	+/- 10	+/- 0.33	
7/26/2017 1:15 PM	00:00	7.59 pH	31.15 °C	502.19 µS/cm	3.58 mg/L		-68.2 mV	10.98 ft	140.00 ml/min
7/26/2017 1:20 PM	05:00	9.33 pH	21.68 °C	294.63 µS/cm	0.50 mg/L	9.04 NTU	-158.4 mV	11.44 ft	140.00 ml/min
7/26/2017 1:25 PM	10:00	9.37 pH	21.46 °C	300.36 µS/cm	0.38 mg/L	21.40 NTU	-169.8 mV	11.61 ft	120.00 ml/min
7/26/2017 1:30 PM	15:00	9.32 pH	22.11 °C	303.46 µS/cm	0.29 mg/L	7.26 NTU	-170.4 mV	11.68 ft	120.00 ml/min
7/26/2017 1:35 PM	20:00	9.36 pH	21.28 °C	297.67 µS/cm	0.23 mg/L	5.95 NTU	-175.2 mV	11.75 ft	120.00 ml/min
7/26/2017 1:40 PM	25:00	9.33 pH	20.67 °C	296.54 µS/cm	0.19 mg/L	6.42 NTU	-180.1 mV	11.89 ft	120.00 ml/min
7/26/2017 1:45 PM	29:59	9.32 pH	21.21 °C	298.29 µS/cm	0.19 mg/L	4.59 NTU	-183.3 mV	12.12 ft	120.00 ml/min
7/26/2017 1:50 PM	34:59	9.29 pH	21.72 °C	299.34 µS/cm	0.19 mg/L	4.78 NTU	-182.5 mV	12.28 ft	120.00 ml/min
7/26/2017 1:55 PM	39:59	9.28 pH	20.98 °C	297.07 µS/cm	0.18 mg/L	4.77 NTU	-180.2 mV	12.36 ft	120.00 ml/min
7/26/2017 2:00 PM	44:59	9.25 pH	20.76 °C	299.32 µS/cm	0.16 mg/L	4.88 NTU	-184.1 mV	12.45 ft	120.00 ml/min
7/26/2017 2:05 PM	49:59	9.22 pH	20.29 °C	300.82 µS/cm	0.16 mg/L	4.89 NTU	-184.0 mV	12.53 ft	120.00 ml/min
7/26/2017 2:10 PM	54:59	9.15 pH	20.45 °C	306.24 µS/cm	0.15 mg/L	5.02 NTU	-183.8 mV	12.60 ft	120.00 ml/min

Samples

Sample ID:	Description:

2017AN-MW-05	Sample time 14:15

Created using VuSitu from In-Situ, Inc.

Low-Flow Test Report:

Test Date / Time: 7/29/2017 12:38:31 PM
Project: FMC MW-07 (3)
Operator Name:

Location Name: MW-07 **Well Diameter: 2 in** **Screen Length: 5 ft** **Top of Screen: 35 ft** **Total Depth: 40 ft** **Initial Depth to Water: 27.62 ft**	**Estimated Total Volume Pumped: 4197.999 ml** **Flow Cell Volume: 130 ml** **Final Flow Rate: 120 ml/min** **Final Draw Down: 0.02 ft**	**Instrument Used: AquaTROLL 600** **Serial Number: 468828**

Test Notes:
Standard method

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 10 %	+/- 3 %	+/- 10 %	+/- 10 %	+/- 10	+/- 0.33	
7/29/2017 12:38 PM	00:00	6.27 pH	17.40 °C	1,544.2 µS/cm	0.61 mg/L		-48.6 mV	27.62 ft	120.00 ml/min
7/29/2017 12:43 PM	04:59	6.42 pH	17.48 °C	1,551.5 µS/cm	0.39 mg/L	4.57 NTU	-61.9 mV	27.63 ft	120.00 ml/min
7/29/2017 12:48 PM	09:59	6.42 pH	17.65 °C	1,543.1 µS/cm	0.33 mg/L	2.60 NTU	-61.3 mV	27.63 ft	120.00 ml/min
7/29/2017 12:53 PM	14:59	6.41 pH	17.71 °C	1,539.5 µS/cm	0.27 mg/L	2.61 NTU	-60.9 mV	27.63 ft	120.00 ml/min
7/29/2017 12:58 PM	19:59	6.42 pH	17.64 °C	1,535.2 µS/cm	0.28 mg/L	2.00 NTU	-62.1 mV	27.63 ft	120.00 ml/min
7/29/2017 1:03 PM	24:58	6.43 pH	17.62 °C	1,535.4 µS/cm	0.29 mg/L	1.76 NTU	-62.7 mV	27.64 ft	120.00 ml/min
7/29/2017 1:08 PM	29:58	6.41 pH	17.65 °C	1,533.5 µS/cm	0.28 mg/L	1.74 NTU	-60.1 mV	27.64 ft	120.00 ml/min
7/29/2017 1:13 PM	34:58	6.40 pH	17.92 °C	1,534.9 µS/cm	0.29 mg/L	1.79 NTU	-59.8 mV	27.64 ft	120.00 ml/min

Samples

Sample ID:	Description:
2017AN-MW-07	Sample time 13:15

Low-Flow Test Report:

Test Date / Time: 7/29/2017 9:03:01 AM
Project: FMC MW-08 (3)
Operator Name:

Location Name: MW-08 **Well Diameter: 2 in** **Screen Length: 5 ft** **Top of Screen: 35 ft** **Total Depth: 40 ft** **Initial Depth to Water: 25.75 ft**	**Estimated Total Volume Pumped: 8144.835 ml** **Flow Cell Volume: 130 ml** **Final Flow Rate: 110 ml/min** **Final Draw Down: 0.17 ft**	**Instrument Used: AquaTROLL 600** **Serial Number: 468828**

Test Notes:
Standard method. Water was turbid.

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 10 %	+/- 3 %	+/- 10 %	+/- 10 %	+/- 10	+/- 0.33	
7/29/2017 9:03 AM	00:00	6.68 pH	17.22 °C	1,289.6 µS/cm	0.35 mg/L		-85.6 mV	25.75 ft	200.00 ml/min
7/29/2017 9:08 AM	04:59	6.64 pH	17.57 °C	1,281.2 µS/cm	0.36 mg/L	263.00 NTU	-75.0 mV	26.03 ft	110.00 ml/min
7/29/2017 9:13 AM	09:59	6.63 pH	17.66 °C	1,276.0 µS/cm	0.38 mg/L	205.00 NTU	-71.9 mV	25.90 ft	110.00 ml/min
7/29/2017 9:18 AM	14:58	6.62 pH	17.63 °C	1,271.8 µS/cm	0.38 mg/L	156.00 NTU	-68.6 mV	25.90 ft	110.00 ml/min
7/29/2017 9:23 AM	19:59	6.62 pH	17.59 °C	1,270.2 µS/cm	0.43 mg/L	200.00 NTU	-66.3 mV	25.91 ft	110.00 ml/min
7/29/2017 9:28 AM	24:58	6.61 pH	17.47 °C	1,266.4 µS/cm	0.49 mg/L	137.00 NTU	-62.8 mV	25.91 ft	110.00 ml/min
7/29/2017 9:33 AM	29:59	6.60 pH	17.48 °C	1,272.5 µS/cm	0.55 mg/L	120.00 NTU	-60.0 mV	25.91 ft	110.00 ml/min
7/29/2017 9:38 AM	34:59	6.59 pH	17.50 °C	1,267.6 µS/cm	0.53 mg/L	155.00 NTU	-58.5 mV	25.92 ft	110.00 ml/min
7/29/2017 9:43 AM	39:58	6.58 pH	17.46 °C	1,267.1 µS/cm	0.52 mg/L	142.00 NTU	-57.3 mV	25.92 ft	110.00 ml/min
7/29/2017 9:47 AM	44:58	6.56 pH	17.63 °C	1,283.5 µS/cm	0.53 mg/L	97.40 NTU	-56.1 mV	25.92 ft	110.00 ml/min
7/29/2017 9:52 AM	49:58	6.56 pH	17.82 °C	1,268.8 µS/cm	0.47 mg/L	274.00 NTU	-56.4 mV	25.92 ft	110.00 ml/min
7/29/2017 9:57 AM	54:58	6.55 pH	17.96 °C	1,270.7 µS/cm	0.47 mg/L	100.00 NTU	-56.5 mV	25.92 ft	110.00 ml/min
7/29/2017 10:02 AM	59:58	6.55 pH	18.17 °C	1,272.3 µS/cm	0.48 mg/L	80.50 NTU	-56.6 mV	25.92 ft	110.00 ml/min
7/29/2017 10:07 AM	01:04:58	6.55 pH	18.32 °C	1,270.5 µS/cm	0.45 mg/L	83.40 NTU	-57.3 mV	25.92 ft	110.00 ml/min
7/29/2017 10:12 AM	01:09:58	6.55 pH	18.40 °C	1,270.4 µS/cm	0.45 mg/L	82.20 NTU	-57.5 mV	25.92 ft	110.00 ml/min

Samples

Sample ID:	Description:
2017AN-MW-08	Sample time 10:20

Created using VuSitu from In-Situ, Inc.

Low-Flow Test Report:

Test Date / Time: 7/31/2017 9:37:12 AM
Project: FMC MW-09 (2)
Operator Name: KTeague

Location Name: MW-09 **Well Diameter: 4 in** **Casing Type: PVC** **Screen Length: 15 ft** **Top of Screen: 27.87 ft** **Total Depth: 42.87 ft** **Initial Depth to Water: 17.65 ft**	**Pump Type: Peristaltic** **Pump Intake From TOC: 36 ft** **Estimated Total Volume Pumped: 14494.176 ml** **Flow Cell Volume: 130 ml** **Final Flow Rate: 100 ml/min** **Final Draw Down: 4.57 ft**	**Instrument Used: AquaTROLL 600** **Serial Number: 447417**

Test Notes:
Method 2a

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 10 %	+/- 3 %	+/- 10 %	+/- 10 %	+/- 10	+/- 5	
7/31/2017 9:37 AM	00:00	10.22 pH	22.35 °C	25,278 µS/cm	6.11 mg/L		-251.4 mV	17.65 ft	100.00 ml/min
7/31/2017 9:42 AM	04:59	10.41 pH	20.55 °C	32,198 µS/cm			-364.0 mV	17.90 ft	100.00 ml/min
7/31/2017 9:47 AM	10:00	10.48 pH	20.40 °C	32,543 µS/cm			-390.0 mV	18.08 ft	100.00 ml/min
7/31/2017 9:52 AM	14:59	10.42 pH	20.49 °C	32,657 µS/cm		8.43 NTU	-404.3 mV	18.24 ft	100.00 ml/min
7/31/2017 9:57 AM	20:00	10.42 pH	20.54 °C	32,784 µS/cm		4.07 NTU	-414.0 mV	18.43 ft	100.00 ml/min
7/31/2017 10:02 AM	24:59	10.43 pH	20.61 °C	32,894 µS/cm		6.17 NTU	-424.2 mV	18.55 ft	100.00 ml/min
7/31/2017 10:07 AM	29:59	10.46 pH	20.59 °C	32,941 µS/cm		6.49 NTU	-434.5 mV	18.72 ft	100.00 ml/min
7/31/2017 10:12 AM	34:59	10.47 pH	20.91 °C	33,034 µS/cm		3.25 NTU	-443.3 mV	18.92 ft	100.00 ml/min
7/31/2017 10:17 AM	40:00	10.48 pH	21.06 °C	33,095 µS/cm		3.61 NTU	-450.2 mV	19.04 ft	100.00 ml/min
7/31/2017 10:22 AM	44:59	10.48 pH	21.12 °C	33,128 µS/cm		5.45 NTU	-456.3 mV	19.20 ft	100.00 ml/min
7/31/2017 10:27 AM	49:59	10.49 pH	21.30 °C	32,998 µS/cm		5.72 NTU	-460.2 mV	19.36 ft	100.00 ml/min
7/31/2017 10:32 AM	54:58	10.49 pH	21.03 °C	33,050 µS/cm		5.26 NTU	-463.5 mV	19.52 ft	100.00 ml/min
7/31/2017 10:37 AM	59:58	10.48 pH	21.08 °C	33,177 µS/cm		5.44 NTU	-466.6 mV	19.68 ft	250.00 ml/min
7/31/2017 10:42 AM	01:04:58	10.65 pH	18.46 °C	32,385 µS/cm			-470.8 mV	20.08 ft	250.00 ml/min
7/31/2017 10:47 AM	01:09:58	10.64 pH	18.20 °C	32,558 µS/cm			-473.6 mV	20.40 ft	250.00 ml/min
7/31/2017 10:52 AM	01:14:58	10.63 pH	18.23 °C	32,783 µS/cm			-476.1 mV	20.85 ft	250.00 ml/min

7/31/2017 10:57 AM	01:19:58	10.63 pH	18.34 °C	32,754 µS/cm			-478.1 mV	21.28 ft	250.00 ml/min
7/31/2017 11:02 AM	01:24:58	10.63 pH	18.43 °C	32,610 µS/cm		9.19 NTU	-480.1 mV	21.63 ft	250.00 ml/min
7/31/2017 11:07 AM	01:29:57	10.52 pH	20.21 °C	33,541 µS/cm		5.40 NTU	-482.8 mV	21.97 ft	100.00 ml/min
7/31/2017 11:12 AM	01:34:57	10.48 pH	21.57 °C	33,254 µS/cm		4.72 NTU	-483.8 mV	22.10 ft	100.00 ml/min
7/31/2017 11:17 AM	01:39:57	10.49 pH	21.80 °C	32,895 µS/cm		5.53 NTU	-483.8 mV	22.22 ft	100.00 ml/min

Samples

Sample ID:	Description:
2017AN-MW-09	1120 sample time

Created using VuSitu from In-Situ, Inc.

Low-Flow Test Report:

Test Date / Time: 7/31/2017 8:11:29 AM
Project: FMC MW-10 (2)
Operator Name:

Location Name: MW-10 **Well Diameter: 4 in** **Screen Length: 15 ft** **Top of Screen: 38.43 ft** **Total Depth: 53.43 ft** **Initial Depth to Water: 44 ft**	**Estimated Total Volume Pumped: 13493.332 ml** **Flow Cell Volume: 130 ml** **Final Flow Rate: 100 ml/min** **Final Draw Down: 0.84 ft**	**Instrument Used: AquaTROLL 600** **Serial Number: 468828**

Test Notes:
Method 2A

RDO not quite 10% but 3 readings <0.25 mg/L. Last hour of readings only one reading was > 0.5.

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 10 %	+/- 3 %	+/- 10 %	+/- 10 %	+/- 10	+/- 0.33	
7/31/2017 8:11 AM	00:00	6.44 pH	19.37 °C	10,942 µS/cm	2.14 mg/L		-91.6 mV	44.00 ft	100.00 ml/min
7/31/2017 8:16 AM	04:59	6.46 pH	20.08 °C	10,910 µS/cm	3.00 mg/L	256.00 NTU	-84.5 mV	44.16 ft	100.00 ml/min
7/31/2017 8:21 AM	09:59	6.45 pH	20.37 °C	10,867 µS/cm	2.83 mg/L	198.00 NTU	-74.4 mV	44.19 ft	100.00 ml/min
7/31/2017 8:26 AM	14:58	6.45 pH	21.17 °C	10,902 µS/cm	2.90 mg/L	158.00 NTU	-73.7 mV	44.22 ft	100.00 ml/min
7/31/2017 8:31 AM	19:58	6.48 pH	22.02 °C	10,834 µS/cm	3.67 mg/L	165.00 NTU	-70.0 mV	44.24 ft	100.00 ml/min
7/31/2017 8:36 AM	24:59	6.43 pH	21.37 °C	10,700 µS/cm	3.06 mg/L	148.00 NTU	-64.7 mV	44.27 ft	100.00 ml/min
7/31/2017 8:41 AM	29:58	6.42 pH	21.20 °C	10,702 µS/cm	2.20 mg/L	158.00 NTU	-67.0 mV	44.33 ft	100.00 ml/min
7/31/2017 8:46 AM	34:58	6.41 pH	21.59 °C	10,709 µS/cm	2.21 mg/L	174.00 NTU	-66.2 mV	44.38 ft	100.00 ml/min
7/31/2017 8:51 AM	39:58	6.43 pH	22.15 °C	10,710 µS/cm	2.72 mg/L	185.00 NTU	-65.3 mV	44.39 ft	100.00 ml/min
7/31/2017 8:56 AM	44:58	6.47 pH	23.28 °C	10,761 µS/cm	3.18 mg/L	159.00 NTU	-64.5 mV	44.40 ft	100.00 ml/min
7/31/2017 9:01 AM	49:57	6.53 pH	24.77 °C	10,913 µS/cm	3.52 mg/L	189.00 NTU	-72.5 mV	44.44 ft	100.00 ml/min
7/31/2017 9:06 AM	54:58	6.40 pH	23.57 °C	10,686 µS/cm	1.56 mg/L	198.00 NTU	-70.2 mV	44.48 ft	100.00 ml/min
7/31/2017 9:11 AM	59:57	6.41 pH	20.44 °C	10,474 µS/cm	0.38 mg/L	187.00 NTU	-79.6 mV	44.50 ft	100.00 ml/min
7/31/2017 9:16 AM	01:04:56	6.42 pH	19.84 °C	10,667 µS/cm	0.24 mg/L	192.00 NTU	-85.9 mV	44.55 ft	100.00 ml/min
7/31/2017 9:21 AM	01:09:57	6.42 pH	19.70 °C	10,732 µS/cm	0.20 mg/L	195.00 NTU	-88.4 mV	44.57 ft	100.00 ml/min
7/31/2017 9:26 AM	01:14:56	6.42 pH	19.68 °C	10,765 µS/cm	0.17 mg/L	199.00 NTU	-90.7 mV	44.59 ft	100.00 ml/min

7/31/2017 9:31 AM	01:19:56	6.41 pH	19.91 °C	10,774 µS/cm	0.17 mg/L	194.00 NTU	-90.9 mV	44.60 ft	100.00 ml/min
7/31/2017 9:36 AM	01:24:57	6.41 pH	20.13 °C	10,782 µS/cm	0.23 mg/L	189.00 NTU	-90.3 mV	44.64 ft	100.00 ml/min
7/31/2017 9:41 AM	01:29:57	6.40 pH	20.16 °C	10,684 µS/cm	0.18 mg/L	184.00 NTU	-89.2 mV	44.64 ft	100.00 ml/min
7/31/2017 9:46 AM	01:34:56	6.38 pH	20.75 °C	10,714 µS/cm	0.26 mg/L	182.00 NTU	-85.2 mV	44.69 ft	100.00 ml/min
7/31/2017 9:51 AM	01:39:56	6.37 pH	21.36 °C	10,713 µS/cm	0.26 mg/L	179.00 NTU	-84.9 mV	44.71 ft	100.00 ml/min
7/31/2017 9:56 AM	01:44:56	6.38 pH	22.02 °C	10,696 µS/cm	0.35 mg/L	171.00 NTU	-81.2 mV	44.73 ft	100.00 ml/min
7/31/2017 10:01 AM	01:49:56	6.37 pH	22.73 °C	10,691 µS/cm	0.38 mg/L	163.00 NTU	-78.4 mV	44.73 ft	100.00 ml/min
7/31/2017 10:06 AM	01:54:55	6.37 pH	23.22 °C	10,609 µS/cm	0.31 mg/L	155.00 NTU	-79.1 mV	44.75 ft	100.00 ml/min
7/31/2017 10:11 AM	01:59:55	6.36 pH	23.70 °C	10,603 µS/cm	0.57 mg/L	146.00 NTU	-76.6 mV	44.78 ft	100.00 ml/min
7/31/2017 10:16 AM	02:04:55	6.36 pH	24.21 °C	10,693 µS/cm	0.24 mg/L	137.00 NTU	-83.4 mV	44.80 ft	100.00 ml/min
7/31/2017 10:21 AM	02:09:55	6.35 pH	24.19 °C	10,584 µS/cm	0.16 mg/L	148.00 NTU	-85.4 mV	44.81 ft	100.00 ml/min
7/31/2017 10:26 AM	02:14:55	6.35 pH	24.40 °C	10,613 µS/cm	0.16 mg/L	151.00 NTU	-85.6 mV	44.84 ft	100.00 ml/min

Samples

Sample ID:	Description:
2017AN-MW-10	Sample time 10:30

Created using VuSitu from In-Situ, Inc.

Low-Flow Test Report:

Test Date / Time: 7/31/2017 1:44:36 PM
Project: FMC MW-11 (2)
Operator Name: KTeague

Location Name: MW-11 **Well Diameter: 4 in** **Screen Length: 10 ft** **Top of Screen: 20 ft** **Total Depth: 30 ft** **Initial Depth to Water: 27.16 ft**	**Pump Type: Peristaltic** **Pump Intake From TOC: 29 ft** **Estimated Total Volume Pumped: 9996.666 ml** **Flow Cell Volume: 130 ml** **Final Flow Rate: 100 ml/min** **Final Draw Down: 0.25 ft**	**Instrument Used: AquaTROLL 600** **Serial Number: 447417**

Test Notes:
Standard method. Conductivity was ranging between about 6,000 and 8,000 but all other parameters were stable. Previous event had the same issue.

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 10 %	+/- 3 %	+/- 10 %	+/- 10 %	+/- 10	+/- 5	
7/31/2017 1:44 PM	00:00	7.02 pH	26.77 °C	8,041.8 µS/cm	2.20 mg/L		-84.6 mV	27.16 ft	100.00 ml/min
7/31/2017 1:49 PM	05:00	6.79 pH	25.49 °C	7,424.3 µS/cm	0.39 mg/L		-44.8 mV	27.28 ft	100.00 ml/min
7/31/2017 1:54 PM	10:00	6.66 pH	25.53 °C	8,322.5 µS/cm	0.42 mg/L		-35.8 mV	27.29 ft	100.00 ml/min
7/31/2017 1:59 PM	14:59	6.64 pH	25.25 °C	8,054.5 µS/cm	0.42 mg/L		-26.8 mV	27.31 ft	100.00 ml/min
7/31/2017 2:04 PM	20:00	6.58 pH	25.43 °C	4,643.0 µS/cm	0.37 mg/L		-24.8 mV	27.33 ft	100.00 ml/min
7/31/2017 2:09 PM	24:59	6.57 pH	25.46 °C	8,025.6 µS/cm	0.33 mg/L		-16.9 mV	27.33 ft	100.00 ml/min
7/31/2017 2:14 PM	29:58	6.55 pH	25.39 °C	4,009.3 µS/cm	0.24 mg/L		-19.0 mV	27.37 ft	100.00 ml/min
7/31/2017 2:19 PM	34:58	6.52 pH	25.79 °C	4,559.5 µS/cm	0.24 mg/L		-21.5 mV	27.39 ft	100.00 ml/min
7/31/2017 2:24 PM	39:58	6.50 pH	26.06 °C	7,179.4 µS/cm	0.34 mg/L		-18.9 mV	27.41 ft	100.00 ml/min
7/31/2017 2:29 PM	44:58	6.52 pH	25.96 °C	8,228.0 µS/cm	0.30 mg/L	12.90 NTU	-12.9 mV	27.41 ft	100.00 ml/min
7/31/2017 2:34 PM	49:58	6.51 pH	26.33 °C	8,250.8 µS/cm	0.25 mg/L	9.57 NTU	-8.5 mV	27.41 ft	100.00 ml/min
7/31/2017 2:39 PM	54:59	6.50 pH	26.40 °C	6,977.7 µS/cm	0.30 mg/L	3.88 NTU	-1.1 mV	27.41 ft	100.00 ml/min
7/31/2017 2:44 PM	59:58	6.55 pH	26.51 °C	8,341.2 µS/cm	0.25 mg/L	0.04 NTU	-8.8 mV	27.41 ft	100.00 ml/min
7/31/2017 2:49 PM	01:04:58	6.51 pH	26.69 °C	6,852.8 µS/cm	0.24 mg/L	0.00 NTU	-6.3 mV	27.41 ft	100.00 ml/min
7/31/2017 2:54 PM	01:09:58	6.49 pH	26.91 °C	6,066.5 µS/cm	0.26 mg/L	0.00 NTU	-3.3 mV	27.41 ft	100.00 ml/min

7/31/2017 2:59 PM	01:14:58	6.54 pH	26.52 °C	8,248.1 µS/cm	0.23 mg/L	0.00 NTU	-4.9 mV	27.41 ft	100.00 ml/min
7/31/2017 3:04 PM	01:19:58	6.53 pH	26.72 °C	6,759.1 µS/cm	0.22 mg/L	0.00 NTU	-9.1 mV	27.41 ft	100.00 ml/min
7/31/2017 3:09 PM	01:24:58	6.52 pH	26.79 °C	6,573.2 µS/cm	0.23 mg/L	0.00 NTU	-5.6 mV	27.41 ft	100.00 ml/min
7/31/2017 3:14 PM	01:29:57	6.53 pH	26.73 °C	7,345.7 µS/cm	0.25 mg/L	0.00 NTU	-2.2 mV	27.41 ft	100.00 ml/min
7/31/2017 3:19 PM	01:34:58	6.50 pH	26.83 °C	8,183.9 µS/cm	0.24 mg/L	0.00 NTU	-4.4 mV	27.41 ft	100.00 ml/min
7/31/2017 3:24 PM	01:39:57	6.51 pH	26.89 °C	5,299.9 µS/cm	0.23 mg/L	0.00 NTU	-7.4 mV	27.41 ft	100.00 ml/min

Samples

Sample ID:	Description:
2017AN-MW-11	Sample time 1530

Created using VuSitu from In-Situ, Inc.

PARSONS

Field Monitoring Record
Low-Flow (minimal drawdown)
GROUNDWATER SAMPLING

Client: FMC Front Royal
Site name: Front Royal, VA
Samplers: CH + WP
Sample Event #: 2017 AN
Well Condition: _____
Purge Start: _____
Pump Type: Peristaltic

Date: 7/29/17
Wind: _____
Weather: _____
Air Temperature: _____
Meters Calibrated: _____
Purge Stop: 0815
Sample Style: Grab

Well #: MW-12
Initial DTW: 11.79
Pump Depth: _____
Total Well Depth: _____
Screen Depth: _____
Sample Time: _____
Alternate Method: _____

TIME	FLOW RATE (ml/min)	DEPTH TO WATER (TOC, FT/M)	pH	SPECIFIC CONDUCTANCE (uS/cm)	TEMP (C)	D.O. (MG/L)	ORP (MV)	TURBIDITY (NTU)	APPEARANCE (COLOR, CLARITY, SOLIDS)	COMMENTS
	Parameter Stability Values over 3 Consecutive Readings									
	100 to 500 ml/min	<0.33 Feet	+ 0.1 -	+ 3% -	+10% -	+10% -	+10 mV -	+10% -		
0815	500	11.95	6.31	14,293	18.75	5.01	46.3	8.23	Clear	

Chain of custody # _____

Low-Flow Test Report:

Test Date / Time: 7/30/2017 3:26:32 PM
Project: FMC PW-0 (2)
Operator Name: KTeague

Location Name: PW-0 **Well Diameter: 6 in** **Screen Length: 125 ft** **Top of Screen: 35.33 ft** **Total Depth: 160.33 ft** **Initial Depth to Water: 36.49 ft**	**Pump Type: Double valve** **Pump Intake From TOC: 96 ft** **Flow Cell Volume: 130 ml** **Final Flow Rate: 100 ml/min** **Final Draw Down: 0.08 ft**	**Instrument Used: AquaTROLL 600** **Serial Number: 447417**

Test Notes:
Standard method

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 10 %	+/- 3 %	+/- 10 %	+/- 10 %	+/- 10	+/- 5	
7/30/2017 3:26 PM	00:00	7.99 pH	20.59 °C	2,167.1 µS/cm	0.47 mg/L		-123.9 mV	36.49 ft	120.00 ml/min
7/30/2017 3:27 PM	00:49	8.00 pH	20.25 °C	2,187.9 µS/cm	0.36 mg/L		-123.8 mV	36.52 ft	120.00 ml/min
7/30/2017 3:32 PM	05:49	7.82 pH	19.20 °C	2,235.3 µS/cm	0.25 mg/L		-129.5 mV	36.57 ft	120.00 ml/min
7/30/2017 3:37 PM	10:48	7.52 pH	19.91 °C	2,286.3 µS/cm	0.27 mg/L	9.32 NTU	-132.3 mV	36.57 ft	100.00 ml/min
7/30/2017 3:42 PM	15:48	7.49 pH	19.61 °C	2,304.9 µS/cm	0.23 mg/L	17.90 NTU	-133.9 mV	36.57 ft	100.00 ml/min
7/30/2017 3:47 PM	20:48	7.41 pH	19.86 °C	2,313.1 µS/cm	0.21 mg/L	9.30 NTU	-136.1 mV	36.57 ft	100.00 ml/min
7/30/2017 3:52 PM	25:48	7.42 pH	19.98 °C	2,325.2 µS/cm	0.20 mg/L	10.80 NTU	-138.2 mV	36.57 ft	100.00 ml/min
7/30/2017 3:57 PM	30:47	7.46 pH	19.50 °C	2,319.3 µS/cm	0.18 mg/L	10.10 NTU	-139.6 mV	36.57 ft	100.00 ml/min
7/30/2017 4:02 PM	35:47	7.45 pH	19.40 °C	2,319.5 µS/cm	0.18 mg/L	9.54 NTU	-140.6 mV	36.57 ft	100.00 ml/min
7/30/2017 4:07 PM	40:48	7.40 pH	19.37 °C	2,329.7 µS/cm	0.16 mg/L	10.50 NTU	-141.7 mV	36.57 ft	100.00 ml/min

Samples

Sample ID:	Description:
PW-0	Sample time 1610

Low-Flow Test Report:

Test Date / Time: 8/9/2017 11:00:55 AM
Project: FMC PW-0 (2) (2)
Operator Name: KTeague

Location Name: PW-0 **Well Diameter: 6 in** **Casing Type: Steel** **Screen Length: 125 ft** **Top of Screen: 35.33 ft** **Total Depth: 160.33 ft** **Initial Depth to Water: 36.1 ft**	**Pump Type: Double valve** **Pump Intake From TOC: 100 ft** **Estimated Total Volume Pumped: 7000 ml** **Flow Cell Volume: 130 ml** **Final Flow Rate: 200 ml/min** **Final Draw Down: 0.29 ft**	**Instrument Used: AquaTROLL 600** **Serial Number: 468828**

Test Notes:

Weather Conditions:
Sunny 80

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 10 %	+/- 3 %	+/- 10 %	+/- 10 %	+/- 10	+/- 0.33	
8/9/2017 11:00 AM	00:00	6.70 pH	18.42 °C	2,132.4 µS/cm	0.28 mg/L		-123.3 mV	36.10 ft	200.00 ml/min
8/9/2017 11:05 AM	05:00	6.70 pH	17.55 °C	2,160.4 µS/cm	0.22 mg/L		-133.0 mV	36.28 ft	200.00 ml/min
8/9/2017 11:10 AM	09:59	6.72 pH	17.29 °C	2,189.0 µS/cm	0.20 mg/L		-139.5 mV	36.31 ft	200.00 ml/min
8/9/2017 11:15 AM	14:59	6.72 pH	17.04 °C	2,192.8 µS/cm	0.18 mg/L		-142.5 mV	36.35 ft	200.00 ml/min
8/9/2017 11:20 AM	20:00	6.73 pH	16.93 °C	2,190.5 µS/cm	0.17 mg/L		-146.1 mV	36.37 ft	200.00 ml/min
8/9/2017 11:25 AM	25:00	6.72 pH	16.99 °C	2,199.3 µS/cm	0.16 mg/L		-149.4 mV	36.39 ft	200.00 ml/min
8/9/2017 11:30 AM	30:00	6.72 pH	16.68 °C	2,190.5 µS/cm	0.15 mg/L		-153.9 mV	36.39 ft	200.00 ml/min
8/9/2017 11:35 AM	34:59	6.73 pH	16.72 °C	2,199.9 µS/cm	0.15 mg/L		-158.4 mV	36.39 ft	200.00 ml/min

Samples

Sample ID:	Description:
PW-0	

Low-Flow Test Report:

Test Date / Time: 7/29/2017 3:18:58 PM
Project: FMC PW-02 (2)
Operator Name:

Location Name: PW-02 **Well Diameter: 6 in** **Screen Length: 107 ft** **Top of Screen: 43 ft** **Total Depth: 150 ft** **Initial Depth to Water: 77.92 ft**	**Estimated Total Volume Pumped: 9691.332 ml** **Flow Cell Volume: 130 ml** **Final Flow Rate: 130 ml/min** **Final Draw Down: 0.19 ft**	**Instrument Used: AquaTROLL 600** **Serial Number: 468828**

Test Notes:
RDO readings not quite 10% but <0.1mg/L.
Turbidity readings not quite 10% but <5 NTU
Standard method

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 10 %	+/- 3 %	+/- 10 %	+/- 10 %	+/- 10	+/- 0.33	
7/29/2017 3:18 PM	00:00	8.74 pH	19.74 °C	744.29 µS/cm	0.80 mg/L		-271.1 mV	77.92 ft	250.00 ml/min
7/29/2017 3:23 PM	04:59	8.73 pH	18.74 °C	749.78 µS/cm	0.20 mg/L	2.38 NTU	-315.4 mV	77.98 ft	130.00 ml/min
7/29/2017 3:28 PM	09:59	8.74 pH	18.49 °C	749.51 µS/cm	0.19 mg/L	4.86 NTU	-322.6 mV	78.05 ft	130.00 ml/min
7/29/2017 3:33 PM	14:58	8.73 pH	18.42 °C	750.02 µS/cm	0.16 mg/L	3.25 NTU	-326.3 mV	78.09 ft	130.00 ml/min
7/29/2017 3:38 PM	19:58	8.73 pH	18.36 °C	751.31 µS/cm	0.14 mg/L	2.63 NTU	-331.7 mV	78.10 ft	130.00 ml/min
7/29/2017 3:43 PM	24:57	8.72 pH	18.24 °C	757.29 µS/cm	0.14 mg/L	2.08 NTU	-332.3 mV	78.10 ft	130.00 ml/min
7/29/2017 3:48 PM	29:57	8.76 pH	18.20 °C	758.13 µS/cm	0.13 mg/L	2.22 NTU	-337.9 mV	78.11 ft	130.00 ml/min
7/29/2017 3:53 PM	34:57	8.74 pH	18.03 °C	760.16 µS/cm	0.14 mg/L	2.84 NTU	-338.2 mV	78.11 ft	130.00 ml/min
7/29/2017 3:58 PM	39:56	8.76 pH	18.24 °C	759.57 µS/cm	0.12 mg/L	2.41 NTU	-342.5 mV	78.11 ft	130.00 ml/min
7/29/2017 4:03 PM	44:56	8.74 pH	18.17 °C	751.11 µS/cm	0.10 mg/L	3.00 NTU	-343.7 mV	78.11 ft	130.00 ml/min
7/29/2017 4:08 PM	49:56	8.74 pH	18.21 °C	755.92 µS/cm	0.08 mg/L	3.20 NTU	-346.0 mV	78.11 ft	130.00 ml/min
7/29/2017 4:13 PM	54:56	8.75 pH	18.02 °C	756.47 µS/cm	0.09 mg/L	2.86 NTU	-348.3 mV	78.11 ft	130.00 ml/min
7/29/2017 4:18 PM	59:56	8.74 pH	18.19 °C	759.68 µS/cm	0.08 mg/L	3.11 NTU	-350.1 mV	78.11 ft	130.00 ml/min
7/29/2017 4:23 PM	01:04:55	8.74 pH	18.17 °C	759.72 µS/cm	0.07 mg/L	3.57 NTU	-352.4 mV	78.11 ft	130.00 ml/min
7/29/2017 4:28 PM	01:09:55	8.74 pH	18.25 °C	755.34 µS/cm	0.06 mg/L	3.93 NTU	-354.3 mV	78.11 ft	130.00 ml/min

Samples

Sample ID:	Description:
2017AN-PW-02	Sample time 16:35

Low-Flow Test Report:

Test Date / Time: 7/27/2017 3:30:38 PM
Project: FMC PZ-03 (2)
Operator Name:

Location Name: PZ-03 **Well Diameter: 4 in** **Casing Type: Steel** **Screen Length: 6 ft** **Top of Screen: 13.19 ft** **Total Depth: 19.19 ft** **Initial Depth to Water: 6.11 ft**	**Pump Intake From TOC: 16 ft** **Estimated Total Volume Pumped: 4499.999 ml** **Flow Cell Volume: 130 ml** **Final Flow Rate: 100 ml/min** **Final Draw Down: 0.26 ft**	**Instrument Used: AquaTROLL 600** **Serial Number: 447417**

Test Notes:

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 10 %	+/- 3 %	+/- 10 %	+/- 10 %	+/- 10	+/- 5	
7/27/2017 3:30 PM	00:00	7.38 pH	32.29 °C	6,433.8 µS/cm	6.76 mg/L		-21.0 mV	6.11 ft	100.00 ml/min
7/27/2017 3:35 PM	04:59	7.76 pH	25.27 °C	6,690.2 µS/cm	0.51 mg/L	19.10 NTU	-11.3 mV	6.33 ft	100.00 ml/min
7/27/2017 3:40 PM	09:59	7.71 pH	24.36 °C	6,149.8 µS/cm	0.27 mg/L		-5.9 mV	6.34 ft	100.00 ml/min
7/27/2017 3:45 PM	15:00	7.69 pH	23.82 °C	6,180.7 µS/cm	0.23 mg/L	20.00 NTU	-5.1 mV	6.35 ft	100.00 ml/min
7/27/2017 3:50 PM	19:59	7.67 pH	23.29 °C	6,128.8 µS/cm	0.22 mg/L	21.00 NTU	-5.1 mV	6.37 ft	100.00 ml/min
7/27/2017 3:55 PM	24:59	7.64 pH	23.08 °C	5,909.6 µS/cm	0.20 mg/L	20.03 NTU	-6.8 mV	6.37 ft	100.00 ml/min
7/27/2017 4:00 PM	29:59	7.60 pH	23.11 °C	5,904.7 µS/cm	0.19 mg/L	15.20 NTU	-8.4 mV	6.37 ft	100.00 ml/min
7/27/2017 4:05 PM	34:59	7.59 pH	23.18 °C	5,684.4 µS/cm	0.18 mg/L	15.10 NTU	-9.4 mV	6.37 ft	100.00 ml/min
7/27/2017 4:10 PM	39:59	7.57 pH	23.21 °C	5,685.5 µS/cm	0.18 mg/L	14.00 NTU	-10.8 mV	6.37 ft	100.00 ml/min
7/27/2017 4:15 PM	44:59	7.51 pH	24.23 °C	5,581.2 µS/cm	0.19 mg/L	15.40 NTU	-13.2 mV	6.37 ft	100.00 ml/min

Samples

Sample ID:	Description:
PZ-03	

Low-Flow Test Report:

Test Date / Time: 7/29/2017 8:17:10 AM
Project: FMC PZ-06 (2)
Operator Name: KTeague

Location Name: PZ-06 **Well Diameter: 4 in** **Screen Length: 11 ft** **Top of Screen: 14.03 ft** **Total Depth: 25.03 ft** **Initial Depth to Water: 12.27 ft**	**Estimated Total Volume Pumped: 5496.666 ml** **Flow Cell Volume: 130 ml** **Final Flow Rate: 100 ml/min** **Final Draw Down: 1.65 ft**	**Instrument Used: AquaTROLL 600** **Serial Number: 447417**

Test Notes:

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 10 %	+/- 3 %	+/- 10 %	+/- 10 %	+/- 10	+/- 5	
7/29/2017 8:17 AM	00:00	7.48 pH	18.98 °C	582.30 µS/cm	0.71 mg/L	12.20 NTU	91.4 mV	12.27 ft	100.00 ml/min
7/29/2017 8:22 AM	04:59	7.38 pH	18.72 °C	583.14 µS/cm	0.38 mg/L		95.3 mV	12.66 ft	100.00 ml/min
7/29/2017 8:27 AM	09:58	7.36 pH	18.58 °C	584.47 µS/cm	0.32 mg/L		96.0 mV	12.80 ft	100.00 ml/min
7/29/2017 8:32 AM	14:58	7.37 pH	18.48 °C	584.66 µS/cm	0.28 mg/L		95.3 mV	12.94 ft	100.00 ml/min
7/29/2017 8:37 AM	19:58	7.38 pH	18.39 °C	585.57 µS/cm	0.27 mg/L		94.1 mV	13.08 ft	100.00 ml/min
7/29/2017 8:42 AM	24:58	7.41 pH	18.40 °C	585.96 µS/cm	0.27 mg/L	10.30 NTU	91.3 mV	13.20 ft	100.00 ml/min
7/29/2017 8:47 AM	29:57	7.42 pH	18.31 °C	585.44 µS/cm	0.27 mg/L	10.80 NTU	88.4 mV	13.33 ft	100.00 ml/min
7/29/2017 8:52 AM	34:58	7.44 pH	18.31 °C	517.64 µS/cm	0.31 mg/L		85.0 mV	13.46 ft	100.00 ml/min
7/29/2017 8:57 AM	39:57	7.45 pH	18.28 °C	517.25 µS/cm	0.37 mg/L		81.6 mV	13.59 ft	100.00 ml/min
7/29/2017 9:02 AM	44:57	7.46 pH	18.26 °C	514.36 µS/cm	0.53 mg/L		77.7 mV	13.70 ft	100.00 ml/min
7/29/2017 9:07 AM	49:57	7.47 pH	18.23 °C	511.38 µS/cm	0.69 mg/L		71.8 mV	13.81 ft	100.00 ml/min
7/29/2017 9:12 AM	54:57	7.48 pH	18.13 °C	510.39 µS/cm	0.79 mg/L		66.4 mV	13.92 ft	100.00 ml/min

Samples

Sample ID:	Description:

Created using VuSitu from In-Situ, Inc.

Low-Flow Test Report:

Test Date / Time: 7/31/2017 7:51:06 AM
Project: FMC PZ-06 (3)
Operator Name: KTeague

Location Name: PZ-06 **Well Diameter: 4 in** **Screen Length: 11 ft** **Top of Screen: 14.03 ft** **Total Depth: 25.03 ft** **Initial Depth to Water: 11.45 ft**	**Pump Type: Peristaltic** **Pump Intake From TOC: 20 ft** **Estimated Total Volume Pumped: 300 ml** **Flow Cell Volume: 130 ml** **Final Flow Rate: 100 ml/min** **Final Draw Down: 0 ft**	**Instrument Used: AquaTROLL 600** **Serial Number: 447417**

Test Notes:
Method 1

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 10 %	+/- 3 %	+/- 10 %	+/- 10 %	+/- 10	+/- 5	
7/31/2017 7:51 AM	00:00	7.69 pH	20.36 °C	504.49 µS/cm	5.50 mg/L		-11.8 mV	11.45 ft	100.00 ml/min
7/31/2017 7:54 AM	03:00	7.53 pH	19.98 °C	518.25 µS/cm	2.83 mg/L	41.00 NTU	-58.2 mV	11.45 ft	100.00 ml/min

Samples

Sample ID:	Description:
2017AN-PZ-06	Samp.e time 0800

Created using VuSitu from In-Situ, Inc.

Low-Flow Test Report:

Test Date / Time: 7/28/2017 2:25:31 PM
Project: FMC PZ-07 (2)
Operator Name: KTeague

Location Name: PZ-07 **Well Diameter: 4 in** **Casing Type: Steel** **Screen Length: 10 ft** **Top of Screen: 15.4 ft** **Total Depth: 25.4 ft** **Initial Depth to Water: 9.47 ft**	**Pump Intake From TOC: 20 ft** **Estimated Total Volume Pumped: 4996.666 ml** **Flow Cell Volume: 130 ml** **Final Flow Rate: 100 ml/min** **Final Draw Down: 1.48 ft**	**Instrument Used: AquaTROLL 600** **Serial Number: 447417**

Test Notes:
Method 2a

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 10 %	+/- 3 %	+/- 10 %	+/- 10 %	+/- 10	+/- 5	
7/28/2017 2:25 PM	00:00	7.25 pH	24.59 °C	2,734.5 µS/cm	3.40 mg/L		-49.8 mV	9.47 ft	100.00 ml/min
7/28/2017 2:30 PM	04:59	7.29 pH	21.58 °C	2,802.1 µS/cm	0.50 mg/L		-77.3 mV	9.70 ft	100.00 ml/min
7/28/2017 2:35 PM	09:59	7.23 pH	21.03 °C	2,811.0 µS/cm	0.34 mg/L		-84.2 mV	9.90 ft	100.00 ml/min
7/28/2017 2:40 PM	14:59	7.17 pH	21.02 °C	2,823.7 µS/cm	0.29 mg/L		-86.1 mV	10.11 ft	100.00 ml/min
7/28/2017 2:45 PM	20:00	7.16 pH	21.11 °C	2,823.1 µS/cm	0.25 mg/L		-91.9 mV	10.24 ft	100.00 ml/min
7/28/2017 2:50 PM	25:00	7.15 pH	21.22 °C	2,827.7 µS/cm	0.23 mg/L		-99.6 mV	10.37 ft	100.00 ml/min
7/28/2017 2:55 PM	29:59	7.17 pH	20.92 °C	2,819.3 µS/cm	0.20 mg/L		-109.8 mV	10.50 ft	100.00 ml/min
7/28/2017 3:00 PM	34:59	7.16 pH	20.89 °C	2,809.1 µS/cm	0.18 mg/L		-111.8 mV	10.64 ft	100.00 ml/min
7/28/2017 3:05 PM	39:58	7.15 pH	20.97 °C	2,816.7 µS/cm	0.18 mg/L	11.80 NTU	-117.1 mV	10.75 ft	100.00 ml/min
7/28/2017 3:10 PM	44:58	7.15 pH	21.01 °C	2,810.2 µS/cm	0.18 mg/L	5.80 NTU	-121.5 mV	10.85 ft	100.00 ml/min
7/28/2017 3:15 PM	49:57	7.14 pH	21.14 °C	2,810.7 µS/cm	0.18 mg/L	2.70 NTU	-130.0 mV	10.95 ft	100.00 ml/min

Samples

Sample ID:	Description:
2017AN-PZ-07	Sampled at 1517

Created using VuSitu from In-Situ, Inc.

PARSONS

Field Monitoring Record
Low-Flow (minimal drawdown)
GROUNDWATER SAMPLING

Client: FMC Front Royal
Site name: Front Royal, VA
Samplers: Huey / Parker
Sample Event #: 2017AN
Well Condition: Good
Purge Start: 0920
Pump Type: Peristaltic

Date: 8/1/17
Wind:
Weather:
Air Temperature:
Meters Calibrated: Y
Purge Stop: 0920
Sample Style: Grab

Well #: SB-1-1
Initial DTW: 7.98
Pump Depth:
Total Well Depth:
Screen Depth:
Sample Time: 0920
Alternate Method:

TIME	FLOW RATE (ml/min)	DEPTH TO WATER (TOC, FT/M)	pH	SPECIFIC CONDUCTANCE (uS/cm)	TEMP (C)	D.O. (MG/L)	ORP (MV)	TURBIDITY (NTU)	APPEARANCE (COLOR, CLARITY, SOLIDS)	COMMENTS
	Parameter Stability Values over 3 Consecutive Readings									
	100 to 500 ml/min	<0.33 Feet	+ 0.1 -	+ 3% -	+10% -	+10% -	+10 mV -	+10% -		
0920	—	7.98	7.61	723.66	26.67	3.66	-121.8	142		

Chain of custody # _____

PARSONS

Field Monitoring Record
Low-Flow (minimal drawdown)
GROUNDWATER SAMPLING

Client: FMC Front Royal
Site name: Front Royal, VA
Samplers: Huey / Parker
Sample Event #: 2017 AN
Well Condition: Good
Purge Start: 0830
Pump Type: Peristaltic

Date: 8/1/17
Wind:
Weather:
Air Temperature:
Meters Calibrated:
Purge Stop: 0835
Sample Style: Grab

Well #: SB-1-2
Initial DTW: 4.03
Pump Depth:
Total Well Depth:
Screen Depth:
Sample Time: 0835
Alternate Method:

TIME	FLOW RATE (ml/min)	DEPTH TO WATER (TOC, FT/M)	pH	SPECIFIC CONDUCTANCE (uS/cm)	TEMP (C)	D.O. (MG/L)	ORP (MV)	TURBIDITY (NTU)	APPEARANCE (COLOR, CLARITY, SOLIDS)	COMMENTS
Parameter Stability Values over 3 Consecutive Readings										
	100 to 500 ml/min	<0.33 Feet	+ 0.1 -	+ 3% -	+10% -	+10% -	+10 mV -	+10% -		
0835	—	4.03	8.37	361.07 ~~0.361~~	22.89	4.25	-43.4	>1,000		

Chain of custody #

PARSONS

Field Monitoring Record
Low-Flow (minimal drawdown)
GROUNDWATER SAMPLING

Client: FMC Front Royal
Site name: Front Royal, VA
Samplers: K. Teague, C. Brown
Sample Event #: 2017 Annual
Well Condition: ___
Purge Start: ___
Pump Type: Peristaltic

Date: 8/2/17
Wind: ___
Weather: ___
Air Temperature: ___
Meters Calibrated: ___
Purge Stop: ___
Sample Style: ___

Sump
~~Well #:~~ SB-1-3
Initial DTW: 8.20
Pump Depth: ___
Total Well Depth: ___
Screen Depth: ___
Sample Time: 1500
Alternate Method: ___

TIME	FLOW RATE (ml/min)	DEPTH TO WATER (TOC, FT/M)	pH	SPECIFIC CONDUCTANCE (uS/cm)	TEMP (C)	D.O. (MG/L)	ORP (MV)	TURBIDITY (NTU)	APPEARANCE (COLOR, CLARITY, SOLIDS)	COMMENTS
Parameter Stability Values over 3 Consecutive Readings										
	100 to 500 ml/min	**<0.33 Feet**	**+ 0.1** -	**+ 3%** -	**+10%** -	**+10%** -	**+10 mV** -	**+10%** -		
1500	200	8.20	8.41	5.09	25.49	0.18	-14.4	0.01	clear	

Chain of custody # ___

PARSONS

Field Monitoring Record
Low-Flow (minimal drawdown)
GROUNDWATER SAMPLING

Client: FMC Front Royal
Site name: Front Royal, VA
Samplers: Huey / Parker
Sample Event #: 2017 AN
Well Condition: Good
Purge Start: 0800
Pump Type: Peristaltic

Date: 8/1/17
Wind:
Weather:
Air Temperature:
Meters Calibrated: Y
Purge Stop: 0810
Sample Style: Grab

Well #: SB-1-4
Initial DTW: 5.78
Pump Depth:
Total Well Depth:
Screen Depth:
Sample Time: 0810
Alternate Method:

TIME	FLOW RATE (ml/min)	DEPTH TO WATER (TOC, FT/M)	pH	SPECIFIC CONDUCTANCE (uS/cm)	TEMP (C)	D.O. (MG/L)	ORP (MV)	TURBIDITY (NTU)	APPEARANCE (COLOR, CLARITY, SOLIDS)	COMMENTS
	Parameter Stability Values over 3 Consecutive Readings									
	100 to 500 ml/min	<0.33 Feet	+ 0.1 -	+ 3% -	+10% -	+10% -	+10 mV -	+10% -		
0810	—	5.78	9.69	2,087.6 ~~2.09~~	21.33	0.78	-53.7	1.21		

Chain of custody # _____

PARSONS

Field Monitoring Record
Low-Flow (minimal drawdown)
GROUNDWATER SAMPLING

Client: FMC Front Royal
Site name: Front Royal, VA
Samplers: K Teague
Sample Event #: 2017 Annual Sampling
Well Condition: ___
Purge Start: ___
Pump Type: ___

Date: 8/1/17
Wind: ___
Weather: ___
Air Temperature: ___
Meters Calibrated: ___
Purge Stop: ___
Sample Style: ___

Sump
~~Well #~~: SB-3-1
Initial DTW: 1.41
Pump Depth: ___
Total Well Depth: ___
Screen Depth: ___
Sample Time: 1555
Alternate Method: ___

TIME	FLOW RATE (ml/min)	DEPTH TO WATER (TOC, FT/M)	pH	SPECIFIC CONDUCTANCE (uS/cm)	TEMP (C)	D.O. (MG/L)	ORP (MV)	TURBIDITY (NTU)	APPEARANCE (COLOR, CLARITY, SOLIDS)	COMMENTS
Parameter Stability Values over 3 Consecutive Readings										
	100 to 500 ml/min	**<0.33 Feet**	**+ 0.1** -	**+ 3%** -	**+10%** -	**+10%** -	**+10 mV** -	**+10%** -		
1555	200	1.41	7.03	1.79	31.10	2.37	-7.3	0.00	Clear	

Chain of custody # ___

PARSONS

Field Monitoring Record
Low-Flow (minimal drawdown)
GROUNDWATER SAMPLING

Client: FMC Front Royal
Site name: Front Royal, VA
Samplers: Huey/Parker
Sample Event #: 2017AN
Well Condition: Good
Purge Start: 0940
Pump Type: Peristaltic

Date: 8/1/17
Wind:
Weather:
Air Temperature:
Meters Calibrated:
Purge Stop: 0940
Sample Style: Grab

Well #: SB-4-1
Initial DTW: 4.84
Pump Depth:
Total Well Depth:
Screen Depth:
Sample Time: 0940
Alternate Method:

TIME	FLOW RATE (ml/min)	DEPTH TO WATER (TOC, FT/M)	pH	SPECIFIC CONDUCTANCE (uS/cm)	TEMP (C)	D.O. (MG/L)	ORP (MV)	TURBIDITY (NTU)	APPEARANCE (COLOR, CLARITY, SOLIDS)	COMMENTS
Parameter Stability Values over 3 Consecutive Readings										
	100 to 500 ml/min	<0.33 Feet	+ 0.1 -	+ 3% -	+10% -	+10% -	+10 mV -	+10% -		
0940	—	4.84	7.41	1,440.8	27.45	3.61	-35.2	13.3		

Chain of custody #

PARSONS

Field Monitoring Record
Low-Flow (minimal drawdown)
GROUNDWATER SAMPLING

Client: FMC Front Royal
Site name: Front Royal, VA
Samplers: Hoey / Parker
Sample Event #: 2017 AN
Well Condition: Good
Purge Start: 1000
Pump Type: Peristaltic

Date: 8/1/17
Wind:
Weather:
Air Temperature:
Meters Calibrated: Y
Purge Stop: 1000
Sample Style: Grab

Well #: SB-4-2
Initial DTW: 8.75
Pump Depth:
Total Well Depth:
Screen Depth:
Sample Time: 1000
Alternate Method:

TIME	FLOW RATE (ml/min)	DEPTH TO WATER (TOC, FT/M)	pH	SPECIFIC CONDUCTANCE (uS/cm)	TEMP (C)	D.O. (MG/L)	ORP (MV)	TURBIDITY (NTU)	APPEARANCE (COLOR, CLARITY, SOLIDS)	COMMENTS
	Parameter Stability Values over 3 Consecutive Readings									
	100 to 500 ml/min	<0.33 Feet	+ 0.1 -	+ 3% -	+10% -	+10% -	+10 mV -	+10% -		
1000	—	8.75	7.45	2,110.8	26.52	1.33	-230.8	23.0		

Chain of custody # _____

PARSONS

Field Monitoring Record
Low-Flow (minimal drawdown)
GROUNDWATER SAMPLING

Client: FMC Front Royal
Site name: Front Royal, VA
Samplers: MH & CJ
Sample Event #: _____
Well Condition: NA
Purge Start: NA
Pump Type: NA

Date: 7/13/17
Wind: _____
Weather: _____
Air Temperature: _____
Meters Calibrated: Y
Purge Stop: NA
Sample Style: Grab

Well #: Surface Water
Initial DTW: NA
Pump Depth: NA
Total Well Depth: NA
Screen Depth: NA
Sample Time: —
Alternate Method: —

~~TIME~~ Sample ID	FLOW RATE (ml/min)	DEPTH TO WATER (TOC, FT/M)	pH	SPECIFIC CONDUCTANCE (uS/cm)	TEMP (C)	D.O. (MG/L)	ORP (MV)	TURBIDITY (NTU)	APPEARANCE (COLOR, CLARITY, SOLIDS)	~~COMMENTS~~ Sample Time
	Parameter Stability Values over 3 Consecutive Readings									
	100 to 500 ml/min	**<0.33 Feet**	**+ 0.1** -	**+ 3%** -	**+10%** -	**+10%** -	**+10 mV** -	**+10%** -		
SW-01			8.44	0.31	28.47	7.22	195.9	0.0		0850
SW-02			8.50	0.30	28.80	7.50	182.6	0.0		0915
SW-03			8.82	0.29	28.68	9.35	157.0	0.0		1030
SW-04			8.87	0.29	28.87	9.85	156.9	0.0		1055
SW-05			9.19	0.27	31.68	12.59	161.4	0.36		1350
SW-06			9.26	0.26	31.26	13.13	177.5	0.10		1500
SW-07			9.24	0.26	30.88	13.03	141.4	0.05		1420
SW-08			9.18	0.27	35.43	11.16	168.4	1.19		1730

Chain of custody # _____

PARSONS

Field Monitoring Record
Low-Flow (minimal drawdown)
GROUNDWATER SAMPLING

Client: FMC Front Royal
Site name: Front Royal, VA
Samplers: C. HUEY, L. PARKER
Sample Event #: 2017 AN
Well Condition: (PUMPING WELL)
Purge Start: 1045
Pump Type: SAMPLE FROM PROCESS AREA

Date: 8-1-17
Wind: 0-5 mph
Weather: MOSTLY SUNNY
Air Temperature: 80°
Meters Calibrated: YES 7/31/17
Purge Stop:
Sample Style: GRAB

Well #: TW-01
Initial DTW:
Pump Depth:
Total Well Depth:
Screen Depth:
Sample Time: 1045
Alternate Method:

TIME	FLOW RATE (ml/min)	DEPTH TO WATER (TOC, FT/M)	pH	SPECIFIC CONDUCTANCE (uS/cm)	TEMP (C)	D.O. (MG/L)	ORP (MV)	TURBIDITY (NTU)	APPEARANCE (COLOR, CLARITY, SOLIDS)	COMMENTS
	Parameter Stability Values over 3 Consecutive Readings									
	100 to 500 ml/min	<0.33 Feet	+ 0.1 -	+ 3% -	+10% -	+10% -	+10 mV -	+10% -		
1045	CH ~~150~~	—	8.25	1136.6	27.55	4.61	-61.7	1.71	CLEAR W/ ODORS	

Chain of custody # _____

PARSONS

Field Monitoring Record
Low-Flow (minimal drawdown)
GROUNDWATER SAMPLING

Client: FMC Front Royal
Site name: Front Royal, VA
Samplers: C. HUGY / L. PARKER
Sample Event #: 2017AN
Well Condition: _____
Purge Start: 1345 (PUMPING WELL)
Pump Type: SAMPLE FROM PROCESS AREA

Date: 8-1-17
Wind: 0-5 mph
Weather: MOSTLY SUNNY
Air Temperature: 80°F
Meters Calibrated: 7/31/17
Purge Stop: _____
Sample Style: GRAB

Well #: TW-02
Initial DTW: _____
Pump Depth: _____
Total Well Depth: _____
Screen Depth: _____
Sample Time: 1345
Alternate Method: _____

TIME	FLOW RATE (ml/min)	DEPTH TO WATER (TOC, FT/M)	pH	SPECIFIC CONDUCTANCE (uS/cm)	TEMP (C)	D.O. (MG/L)	ORP (MV)	TURBIDITY (NTU)	APPEARANCE (COLOR, CLARITY, SOLIDS)	COMMENTS
Parameter Stability Values over 3 Consecutive Readings										
	100 to 500 ml/min	**<0.33 Feet**	**+ 0.1** -	**+ 3%** -	**+10%** -	**+10%** -	**+10 mV** -	**+10%** -		
1345	—	—	8.17	3076.6	24.52	3.96	-302.2	29.2	SLIGHTLY TURBID WITH STRONG ODORS	

Chain of custody # _____

PARSONS

Field Monitoring Record
Low-Flow (minimal drawdown)
GROUNDWATER SAMPLING

Client: FMC Front Royal
Site name: Front Royal, VA
Samplers: C. HUGY / L. PARKER
Sample Event #: 2017 AN
Well Condition:
Purge Start: 1450 (PUMPING WELL)
Pump Type: SAMPLE FROM PROCESS AREA

Date: 8-1-17
Wind: 0-5 mph
Weather: MOSTLY SUNNY
Air Temperature: 80°
Meters Calibrated: 7-31-17
Purge Stop:
Sample Style: GRAB

Well #: TW-03
Initial DTW:
Pump Depth:
Total Well Depth:
Screen Depth:
Sample Time: 1450
Alternate Method:

TIME	FLOW RATE (ml/min)	DEPTH TO WATER (TOC, FT/M)	pH	SPECIFIC CONDUCTANCE (uS/cm)	TEMP (C)	D.O. (MG/L)	ORP (MV)	TURBIDITY (NTU)	APPEARANCE (COLOR, CLARITY, SOLIDS)	COMMENTS
Parameter Stability Values over 3 Consecutive Readings										
	100 to 500 ml/min	**<0.33 Feet**	**+ 0.1** -	**+ 3%** -	**+10%** -	**+10%** -	**+10 mV** -	**+10%** -		
1450	—	—	7.92	1065.5	26.77	5.50	-232.8	8.77	CLEAR WITH PARTICLES	

Chain of custody #

PARSONS

Field Monitoring Record
Low-Flow (minimal drawdown)
GROUNDWATER SAMPLING

Client: FMC Front Royal
Site name: Front Royal, VA
Samplers: CH + WP
Sample Event #: 2017 AN
Well Condition: _____
Purge Start: _____
Pump Type: Peristaltic

Date: 7/25/17
Wind: _____
Weather: _____
Air Temperature: _____
Meters Calibrated: _____
Purge Stop: 1115
Sample Style: Grab

Well #: WP-10
Initial DTW: 15.57
Pump Depth: _____
Total Well Depth: _____
Screen Depth: _____
Sample Time: _____
Alternate Method: _____

TIME	FLOW RATE (ml/min)	DEPTH TO WATER (TOC, FT/M)	pH	SPECIFIC CONDUCTANCE (uS/cm)	TEMP (C)	D.O. (MG/L)	ORP (MV)	TURBIDITY (NTU)	APPEARANCE (COLOR, CLARITY, SOLIDS)	COMMENTS
	Parameter Stability Values over 3 Consecutive Readings									
	100 to 500 ml/min	**<0.33 Feet**	**+ 0.1** -	**+ 3%** -	**+10%** -	**+10%** -	**+10 mV** -	**+10%** -		
1115	110	15.74	9.44	14,625	22.99	Ø	203	2.98	Clear	

Chain of custody # _____

Low-Flow Test Report:

Test Date / Time: 7/27/2017 11:23:31 AM
Project: FMC WP-11 (2)
Operator Name:

Location Name: WP-11 **Well Diameter: 2 in** **Screen Length: 10 ft** **Top of Screen: 15.57 ft** **Total Depth: 20.57 ft** **Initial Depth to Water: 12.62 ft**	**Estimated Total Volume Pumped: 28991.672 ml** **Flow Cell Volume: 130 ml** **Final Flow Rate: 500 ml/min** **Final Draw Down: -11.964 ft**	**Instrument Used: AquaTROLL 600** **Serial Number: 447417**

Test Notes:
Water level dropping required switching to method 3. Evacuated all water and waiting to recharge.

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 10 %	+/- 3 %	+/- 10 %	+/- 10 %	+/- 10	+/- 5	
7/27/2017 11:23 AM	00:00	7.87 pH	25.26 °C	2,259.7 µS/cm	3.26 mg/L	2.82 NTU	-27.7 mV	12.62 cm	100.00 ml/min
7/27/2017 11:28 AM	04:59	7.88 pH	26.21 °C	2,262.7 µS/cm	3.29 mg/L		-23.1 mV	12.71 cm	100.00 ml/min
7/27/2017 11:33 AM	09:59	7.88 pH	26.78 °C	2,263.0 µS/cm	3.27 mg/L	5.61 NTU	-16.5 mV	12.95 cm	100.00 ml/min
7/27/2017 11:38 AM	14:59	7.88 pH	27.24 °C	2,264.2 µS/cm	3.26 mg/L	3.12 NTU	-11.0 mV	13.12 cm	500.00 ml/min
7/27/2017 11:43 AM	19:59	7.88 pH	27.59 °C	2,265.8 µS/cm	3.24 mg/L	2.28 NTU	-6.9 mV	13.55 cm	500.00 ml/min
7/27/2017 11:48 AM	24:59	7.87 pH	27.86 °C	2,267.1 µS/cm	3.23 mg/L		-2.7 mV	13.67 cm	500.00 ml/min
7/27/2017 11:53 AM	29:59	8.31 pH	21.21 °C	2,143.4 µS/cm	0.21 mg/L		-63.9 mV		500.00 ml/min
7/27/2017 11:58 AM	34:59	8.08 pH	18.71 °C	2,176.0 µS/cm	0.04 mg/L		-54.9 mV		500.00 ml/min
7/27/2017 12:03 PM	39:59	7.63 pH	20.68 °C	2,181.1 µS/cm	0.47 mg/L		-54.8 mV		500.00 ml/min
7/27/2017 12:08 PM	44:59	7.96 pH	17.96 °C	2,312.4 µS/cm	0.08 mg/L		-56.6 mV		500.00 ml/min
7/27/2017 12:13 PM	49:59	7.97 pH	17.74 °C	2,380.3 µS/cm	0.07 mg/L		-81.0 mV		500.00 ml/min
7/27/2017 12:18 PM	54:59	7.87 pH	17.50 °C	2,216.0 µS/cm	0.07 mg/L		-76.8 mV		500.00 ml/min
7/27/2017 12:23 PM	59:59	7.86 pH	17.23 °C	2,411.6 µS/cm	0.07 mg/L		-72.2 mV	18.20 cm	500.00 ml/min
7/27/2017 12:28 PM	01:04:58	7.86 pH	16.75 °C	2,383.4 µS/cm	0.06 mg/L		-71.2 mV	19.10 cm	500.00 ml/min
7/27/2017 12:33 PM	01:09:58	7.81 pH	16.82 °C	2,387.7 µS/cm	0.06 mg/L		-71.0 mV	20.00 cm	500.00 ml/min

Samples

Sample ID:	Description:

Low-Flow Test Report:

Test Date / Time: 7/27/2017 2:36:26 PM
Project: FMC WP-11 (3)
Operator Name:

Location Name: WP-11 **Well Diameter: 2 in** **Casing Type: PVC** **Screen Length: 10 ft** **Top of Screen: 15.57 ft** **Total Depth: 20.57 ft** **Initial Depth to Water: 18.85 ft**	**Estimated Total Volume Pumped: 998.334 ml** **Flow Cell Volume: 130 ml** **Final Flow Rate: 100 ml/min** **Final Draw Down: 0 ft**	**Instrument Used: AquaTROLL 600** **Serial Number: 447417**

Test Notes:
Method 3 used. Well has been purged dry and is being sampled after some recharge.

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 10 %	+/- 3 %	+/- 10 %	+/- 10 %	+/- 10	+/- 5	
7/27/2017 2:36 PM	00:00	7.38 pH	29.46 °C	2,210.9 µS/cm	4.95 mg/L	97.70 NTU	4.4 mV	18.85 ft	100.00 ml/min
7/27/2017 2:41 PM	04:59	8.08 pH	26.82 °C	0.84 µS/cm	9.47 mg/L		-21.6 mV	18.85 ft	100.00 ml/min
7/27/2017 2:46 PM	09:59	8.01 pH	28.34 °C	0.75 µS/cm	9.22 mg/L		12.3 mV	18.85 ft	100.00 ml/min

Samples

Sample ID:	Description:
WP-11	
WP-11	First reading is the accurate sample reading. Forgot to hit finish in time before next readings were collected. The last two readings were collected after tubing had been disconnected from flow cell.

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APPENDIX B
DATA VALIDATION REPORTS

PARSONS

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Memorandum

November 2, 2017

To:	Michael Robinson	Ref. No.:	11119510-001
From:	Deb Andrasko/eew/8	Tel:	716 297 6150

Subject: **Analytical Results and Full Validation**
Annual Sediment and Surface Water Sampling
Avtex Fibers Superfund Site
Front Royal, Virginia
July 2017

1. Introduction

This document details a validation of analytical results for sediment samples collected during July 2017 in support of the Annual Sediment and Surface Water Sampling at the Avtex Fibers Superfund site. Samples were submitted to TestAmerica Laboratory, located in Nashville, Tennessee. A sample collection and analysis summary is presented in Table 1. The validated analytical results are summarized in Tables 2A and 2B. A summary of the analytical methodology is presented in Table 3.

Full Contract Laboratory Program (CLP) equivalent raw data deliverables were provided by the laboratory. Evaluation of the data was based on information obtained from the finished data sheets, raw data, chain of custody forms, calibration data, blank data, duplicate data, recovery data from surrogate spikes/laboratory control samples (LCS)/matrix spike (MS) samples, and field quality assurance/quality control (QA/QC) samples. The assessment of analytical and in-house data included checks for: data consistency (by observing comparability of duplicate analyses), adherence to accuracy and precision criteria, and transmittal errors.

The QA/QC criteria by which these data have been assessed are outlined in the analytical methods referenced in Table 3 and applicable guidance from the documents entitled:

i) "USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review", USEPA 540-R-10-011, January 2010

ii) "USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review", USEPA 540-R-08-01, June 2008

These items will subsequently be referred to as the "Guidelines" in this Memorandum.

2. Sample Holding Time and Preservation

The sample holding time criteria for the analyses are summarized in Table 3. Sample chain of custody documents and analytical reports were used to determine sample holding times. All samples were analyzed within the required holding times.

All samples were properly preserved, delivered on ice, and stored by the laboratory at the required temperature (0-6°C).

3. Gas Chromatography/Mass Spectrometer (GC/MS) – Tuning and Mass Calibration (Instrument Performance Check) and Inductively Coupled Plasma/Mass Spectrometer (ICP/MS)

3.1 Organic Analyses

Prior to volatile organic compound (VOC) analysis and semi-volatile organic compound (SVOC) analysis, GC/MS instrumentation is tuned to ensure optimization over the mass range of interest. To evaluate instrument tuning, the method requires the analysis of the specific tuning compounds bromofluorobenzene (BFB) and decafluorotriphenylphosphine (DFTPP), respectively. The resulting spectra must meet the criteria cited in the methods before analysis is initiated. Analysis of the tuning compound must then be repeated every 12 hours throughout sample analysis to ensure the continued optimization of the instrument.

Tuning compounds were analyzed at the required frequency throughout the VOC and SVOC analysis periods. All tuning criteria were met indicating that proper optimization of the instrumentation was achieved.

3.2 Inorganic Analyses

To ensure adequate mass resolution, identification, and to some degree, sensitivity, the performance of each ICP/MS instrument used for metals analyses is checked prior to calibration and initiating an analysis sequence through the analysis of a tuning solution.

Instrument performance check data were reviewed. The tuning solution was analyzed at the required frequency throughout the analyses. The results of all instrument performance checks were within the method acceptance criteria, indicating that proper optimization of the instrumentation was achieved.

4. Initial Calibration - Organic Analyses

4.1 GC/MS

To quantify VOCs and SVOCs of interest in samples, calibration of the GC/MS over a specific concentration range must be performed. Initially, a five-point calibration curve containing all compounds of interest is analyzed to characterize instrument response for each analyte over a specific concentration range. Linearity of the calibration curve and instrument sensitivity are evaluated against the following criteria:

i) All relative response factors (RRFs) must be greater than or equal to 0.05 (0.01 for poor responders)

ii) The percent relative standard deviation (RSD) values must not exceed 20.0 percent (40 percent for poor responders) or a minimum correlation coefficient (R) of 0.995 and minimum coefficient of determination (R^2) of 0.99 if linear and quadratic equation calibration curves, respectively, are used.

The initial calibration data for VOCs and SVOCs were reviewed. All compounds met the above criteria for sensitivity and linearity.

5. Initial Calibration – Inorganic Analyses

Initial calibration of the instruments ensures that they are capable of producing satisfactory quantitative data at the beginning of a series of analyses. For ICP/MS analysis, a calibration blank and at least one standard must be analyzed at each wavelength to establish the analytical curve. For mercury atomic absorption (AA) analyses, a calibration blank and a minimum of five standards must be analyzed to establish the analytical curve, and resulting correlation coefficients (R) must be 0.995 or greater.

After the analyses of the calibration curves, an initial calibration verification (ICV) standard must be analyzed to verify the analytical accuracy of the calibration curves. All analyte recoveries from the analyses of the ICVs must be within the following control limits:

Analytical Method	Parameter	Control Limits
ICP/AA	Metals	90 - 110%
Cold Vapor AA	Mercury	80 - 120%
Instrumental Wet Chemistry	TOC, Cyanide	85 - 115%

Upon review of the data, it was determined that the calibration curves and ICVs were analyzed at the proper frequencies and that all of the above-specified criteria were met. The laboratory effectively demonstrated that the instrumentation used for metals and general chemistry analyses were properly calibrated prior to sample analysis.

6. Continuing Calibration - Organic Analyses

6.1 GC/MS

To ensure that instrument calibration for VOC and SVOC analyses is acceptable throughout the sample analysis period, continuing calibration standards must be analyzed and compared to the initial calibration curve every 12 hours.

The following criteria were employed to evaluate continuing calibration data:

i) All RRF values must be greater than or equal to 0.05 (0.01 for poor responders)

ii) Percent difference (%D) values must not exceed 25 percent (40 percent for poor responders)

Calibration standards were analyzed at the required frequency, and most results met the above criteria for instrument sensitivity and stability. Acetone was reported with a low RRF value and pentachlorophenol was reported with a high %D in some of the continuing calibrations. The associated acetone results were rejected

based on the poor sensitivity exhibited and the associated pentachlorophenol results were qualified as estimated (see Table 4).

7. Continuing Calibration - Inorganic Analyses

To ensure that instrument calibration is acceptable throughout the sample analysis period, continuing calibration verification (CCV) standards are analyzed on a regular basis. Each CCV is deemed acceptable if all analyte recoveries are within the control limits specified above for the ICVs. If some of the CCV analyte recoveries are outside the control limits, samples analyzed before and after the CCV, up until the previous and proceeding CCV analyses, are affected.

For this study, CCVs were analyzed at the proper frequency. All analyte recoveries reported for the CCVs were within the specified limits.

8. Contract Required Detection Limit (CRDL) Standard Analyses

To verify the linearity of the ICP/MS calibration near the detection limit, a standard is analyzed which contains the ICP/MS analytes at specified concentrations. This standard must be analyzed at the beginning and end of each sample analysis run or a minimum of twice per 8-hour period.

CRDL recoveries were evaluated using the criteria specified in the October 2004 "Guidelines". The CRDL recoveries were acceptable.

9. Laboratory Blank Analyses

Method blanks are prepared from a purified matrix and analyzed with investigative samples to determine the existence and magnitude of sample contamination introduced during the analytical procedures. Additionally, initial and continuing calibration blanks (ICBs/CCBs) are routinely analyzed after each ICV/CCV for the inorganic parameters.

For this study, laboratory method blanks were analyzed at a minimum frequency of 1 per 20 investigative samples and/or 1 per analytical batch.

9.1 Organic Analyses

Most method blank results were non-detect, indicating that laboratory contamination was not a factor for this investigation. A low concentration of bis(2-ethylhexyl)phthalate was reported in one of the blanks. All associated similar results were qualified as non-detect based on the potential laboratory contamination (see Table 5).

9.2 Inorganic Analyses

Upon review of the ICBs, CCBs, and method blanks, it was noted that a low arsenic concentration was observed above the method detection limit (MDL) in one of the method blanks. The associated investigative

samples were either non-detect or had concentrations significantly greater than the blank concentration. These sample results were not impacted by the contamination detected and no qualification of the data was required.

10. Surrogate Spike Recoveries

In accordance with the methods employed, all samples, blanks, and QC samples analyzed for organics are spiked with surrogate compounds prior to sample extraction and/or analysis. Surrogate recoveries provide a means to evaluate the effects of laboratory performance on individual sample matrices.

All samples submitted for VOC and SVOC determinations were spiked with the appropriate number of surrogate compounds prior to sample extraction and/or analysis.

Each individual surrogate compound is expected to meet the laboratory control limits with the exception of SVOC analyses. According to the "Guidelines" for SVOC analyses, up to one outlying surrogate in the base/neutral or acid fractions is acceptable as long as the recovery is at least 10 percent.

Surrogate recoveries were assessed against laboratory control limits. All surrogate recoveries met criteria.

11. Internal Standards (IS) Analyses

IS data were evaluated for all VOC, SVOC and ICP/MS metals sample analyses.

11.1 Organics Analyses

To ensure that changes in the GC/MS sensitivity and response do not affect sample analysis results, IS compounds are added to each sample prior to analysis. All results are then calculated as a ratio of the IS responses.

The sample IS results were evaluated against the following criteria:

i) The retention time of the IS must not vary more than ±30 seconds from the associated calibration standard.

ii) IS area counts must not vary by more than a factor of two (-50 percent to +100 percent) from the associated calibration standard.

All organic IS recoveries and retention times met the above criteria with the exception of one volatile IS. The IS was not associated with any reportable results and qualification was not required.

11.2 Inorganic Analyses

IS elements were added to all samples prior to metals analysis by ICP/MS. Overall instrument stability and performance for metals analyses were monitored using the IS intensity data. IS recoveries were assessed using control limits of 60-130 percent.

All inorganic IS recoveries associated with reported results were acceptable, demonstrating adequate analytical performance.

12. Laboratory Control Sample Analyses

LCS and/or laboratory control sample duplicates (LCSD) are prepared and analyzed as samples to assess the analytical efficiencies of the methods employed, independent of sample matrix effects. The relative percent difference (RPD) of the LCS/LCSD recoveries is used to evaluate analytical precision.

For this study, LCS/LCSD were analyzed at a minimum frequency of 1 per 20 investigative samples and/or 1 per analytical batch.

12.1 Organic Analyses

The LCS and LCS/LCSD contained all compounds of interest. All LCS recoveries and RPDs were within the laboratory control limits, demonstrating acceptable analytical accuracy and precision.

12.2 Inorganic Analyses

The LCS and LCS/LCSD contained all analytes of interest. LCS recoveries were assessed per the "Guidelines". All LCS recoveries and RPDs were within the control limits, demonstrating acceptable analytical accuracy and precision.

13. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analyses

To evaluate the effects of sample matrices on the preparation process, measurement procedures, and accuracy of a particular analysis, samples are spiked with known concentrations of the analytes of concern and analyzed as MS/MSD samples. The RPD between the MS and MSD is used to assess analytical precision. If the original sample concentration is significantly greater than the spike concentration, the recovery is not assessed.

MS/MSD analyses were performed as specified in Table 1. The laboratory performed additional site-specific MS/MSD analyses internally.

13.1 Organic Analyses

The MS/MSD samples were spiked with all compounds of interest. All percent recoveries and RPD values were within the laboratory control limits, demonstrating acceptable analytical accuracy and precision.

13.2 Inorganic Analyses

The MS/MSD samples were spiked with the analytes of interest, and the results were evaluated using the "Guidelines". All percent recoveries and RPD values were within the control limits, demonstrating acceptable analytical accuracy and precision with the following exceptions:

i) A low total cyanide recovery and high RPD were recorded. Associated sample results were qualified as estimated to reflect the implied low bias and variability.

ii) Cyanide (total) was not recovered in the sediment MS/MSD. All associated results were non-detect and were rejected due to the poor analytical efficiency demonstrated.

iii) Some metals were not recovered in the sediment MS/MSD. All associated results had positive hits and were qualified as estimated due to the poor analytical efficiency.

A summary of qualified results is presented in Table 6.

14. ICP/MS Serial Dilution

The serial dilution determines whether significant physical or chemical interferences exist due to sample matrix. A minimum of 1 per 20 investigative samples or at least 1 per analytical batch must be analyzed at a five-fold dilution. For samples with sufficient analyte concentrations (>50 times the method detection limit), the serial dilution results must agree within 10 percent of the original results.

A serial dilution was performed on each MS/MSD sample. All results met the criteria above with the exception of aluminum, manganese and iron. All positive results greater than 50 times the IDL were qualified as estimated. A summary of qualified results is presented in Table 7.

15. ICP Interference Check Sample Analysis (ICS)

To verify that the laboratory has established proper inter-element and background correction factors, ICSs are analyzed. These samples contain high concentrations of aluminum, calcium, magnesium, and iron and are analyzed at the beginning and end of each sample analysis period. The ICSs are evaluated against recovery control limits of 80 to 120 percent.

ICS analysis results were evaluated for all samples using the criteria in the "Guidelines". All ICS recoveries and results were acceptable.

16. Field QA/QC Samples

The field QA/QC consisted of two trip blanks, one rinse blank sample, and two field duplicate sample sets.

16.1 Trip Blank Sample Analysis

To evaluate contamination from sample collection, transportation, storage, and analytical activities, trip blanks were submitted to the laboratory for VOC analysis. All results were non-detect for the compounds of interest.

16.2 Rinse Blank Sample Analysis

To assess field decontamination procedures, ambient conditions at the site, and cleanliness of sample containers, a rinse blank was submitted for analysis, as identified in Table 1. All results were non-detect for the analytes of interest with the exception of low concentrations of lead and bis(2-eyhylhexyl)phthalate. Associated sample results with concentrations similar to that found in the blank were qualified as non-detect. A summary of qualified results is presented in Table 8.

16.3 Field Duplicate Sample Analysis

To assess the analytical and sampling protocol precision, two field duplicate samples were collected and submitted "blind" to the laboratory, as specified in Table 1. The RPDs associated with these duplicate samples must be less than 50 and 100 percent for water and soil samples, respectively. If the reported concentration in either the investigative sample or its duplicate is less than five times the reporting limit (RL), the evaluation criteria is one or two times the RL value for water and soil samples, respectively.

All field duplicate results were in agreement, demonstrating acceptable sampling and analytical precision, with the exception of two metals. The associated results were qualified as estimated based on the implied variability (see Table 9).

17. Analyte Reporting

The laboratory reported detected results down to the laboratory's MDL for each analyte. Positive analyte detections less than the PQL but greater than the MDL were qualified as estimated (J) in Tables 2 and 2B unless qualified otherwise in this memorandum. Non-detect results were presented as non-detect at the MDL in Tables 2A and 2B.

All sediment results were reported on a dry weight basis.

18. Target Compound Identification

To minimize erroneous compound identification during organic analyses, qualitative criteria including compound retention time and mass spectra were evaluated according to the identification criteria established by the methods. The samples identified in Table 1 were reviewed. The organic compounds reported adhered to the specified identification criteria.

19. Conclusion

Based on the assessment detailed in the foregoing, the data summarized in Table 2 are acceptable with the specific exceptions and qualifications noted herein.

Table 1

Sample Collection and Analysis Summary
Annual Sediment and Surface Water Sampling
Avtex Fibers Superfund Site
Front Royal, Virginia
July 2017

					Parameters						
Sample Identification	**Location**	**Matrix**	**Collection Date (mm/dd/yyyy)**	**Collection Time (hr:min)**	**TOC**	**Metals**	**Mercury**	**Select VOCs**	**Select SVOCs**	**Cyanide (free and total)**	**Comments**
RB-071417-01	-	Water	07/14/2017	08:00		X	X	X	X	X	Rinse Blank
2017AN-SED-01	SED-01	Sediment	07/13/2017	09:00	X	X	X	X	X	X	MS/MSD-P
2017AN-SED-02	SED-02	Sediment	07/13/2017	09:30	X	X	X	X	X	X	
2017AN-SED-03	SED-03	Sediment	07/13/2017	10:50	X	X	X	X	X	X	
2017AN-SED-04	SED-04	Sediment	07/13/2017	11:05	X	X	X	X	X	X	
2017AN-SED-05	SED-05	Sediment	07/13/2017	14:00	X	X	X	X	X	X	
2017AN-SED-06	SED-06	Sediment	07/13/2017	15:30	X	X	X	X	X	X	MS/MSD
2017AN-SED-06D	SED-06	Sediment	07/13/2017	15:30	X	X	X	X	X	X	FD (2017AN-SED-06)
2017AN-SED-07	SED-07	Sediment	07/13/2017	14:30	X	X	X	X	X	X	
2017AN-SED-08	SED-08	Sediment	07/13/2017	17:45	X	X	X	X	X	X	
2017AN-SW-01	SW-01	Water	07/13/2017	08:50		X	X	X	X	X	MS/MSD-P
2017AN-SW-02	SW-02	Water	07/13/2017	09:15		X	X	X	X	X	
2017AN-SW-03	SW-03	Water	07/13/2017	10:30		X	X	X	X	X	
2017AN-SW-04	SW-04	Water	07/13/2017	10:55		X	X	X	X	X	
2017AN-SW-05	SW-05	Water	07/13/2017	13:50		X	X	X	X	X	
2017AN-SW-06	SW-06	Water	07/13/2017	15:00		X	X	X	X	X	MS/MSD
2017AN-SW-06D	SW-06	Water	07/13/2017	15:00		X	X	X	X	X	FD (2017AN-SW-06)
2017AN-SW-07	SW-07	Water	07/13/2017	14:20		X	X	X	X	X	
2017AN-SW-08	SW-08	Water	07/13/2017	17:30		X	X	X	X	X	
TB-071317-01	-	Water	07/13/2017	08:00				X			Trip Blank
TB-071317-02	-	Water	07/13/2017	08:15				X			Trip Blank

Notes:

-	- Not applicable
MS/MSD	- Matrix Spike/Matrix Spike Duplicate
MS/MSD-P	- Matrix Spike/Matrix Spike Duplicate (partial parameters)
VOCs	- Volatile Organic Compounds
SVOCs	- Semi-volatile Organic Compounds
TOC	- Total Organic Carbon
FD	- Field Duplicate sample of sample in parenthesis

Table 2A

Analytical Results Summary - Surface Water
Annual Sediment and Surface Water Sampling
Avtex Fibers Superfund Site
Front Royal, Virginia
July 2017

Location ID:		SW-01	SW-02	SW-03	SW-04	SW-05
Sample Name:		2017AN-SW-01	2017AN-SW-02	2017AN-SW-03	2017AN-SW-04	2017AN-SW-05
Sample Date:		07/13/2017	07/13/2017	07/13/2017	07/13/2017	07/13/2017
Parameters	**Unit**					
Volatile Organic Compounds						
Acetone	mg/L	R	R	R	R	R
Carbon disulfide	mg/L	0.000220 U	0.000220 U	0.000220 U	0.000220 U	0.000220 U
Chlorobenzene	mg/L	0.000180 U	0.000180 U	0.000180 U	0.000180 U	0.000180 U
Semi-volatile Organic Compounds						
2-Methylphenol	µg/L	1.54 U	1.60 U	1.60 U	1.54 U	1.57 U
3&4-Methylphenol	µg/L	1.35 U	1.40 U	1.40 U	1.35 U	1.37 U
bis(2-Ethylhexyl)phthalate (DEHP)	µg/L	2.54 U	4.75 U	4.71 U	3.10 U	3.19 U
Naphthalene	µg/L	0.356 U	0.370 U	0.370 U	0.356 U	0.363 U
Pentachlorophenol	µg/L	3.17 U	3.30 U	3.30 U	3.17 U	3.24 U
Phenol	µg/L	1.44 U	1.50 U	1.50 U	1.44 U	1.47 U
Metals						
Aluminum	mg/L	0.0500 U	0.0500 U	0.0500 U	0.0500 U	0.0500 U
Aluminum (dissolved)	mg/L	0.0500 U	0.0500 U	0.0500 U	0.0500 U	0.0500 U
Antimony	mg/L	0.00400 U	0.00400 U	0.00400 U	0.00400 U	0.00400 U
Antimony (dissolved)	mg/L	0.00400 U	0.00400 U	0.00400 U	0.00400 U	0.00400 U
Arsenic	mg/L	0.00200 U	0.00200 U	0.00200 U	0.00200 U	0.00200 U
Arsenic (dissolved)	mg/L	0.00200 U	0.00200 U	0.00200 U	0.00200 U	0.00200 U
Cadmium	mg/L	0.000500 U	0.000500 U	0.000500 U	0.000500 U	0.000500 U
Cadmium (dissolved)	mg/L	0.000500 U	0.000500 U	0.000500 U	0.000500 U	0.000500 U
Chromium	mg/L	0.00300 U	0.00300 U	0.00300 U	0.00620	0.00300 U
Chromium (dissolved)	mg/L	0.00300 U	0.00300 U	0.00300 U	0.00300 U	0.00300 U
Cobalt	mg/L	0.000500 U	0.000500 U	0.000500 U	0.000500 U	0.000500 U
Cobalt (dissolved)	mg/L	0.000500 U	0.000500 U	0.000500 U	0.000500 U	0.000500 U
Iron	mg/L	0.0500 U	0.0500 U	0.0500 U	5.49	1.29

Table 2A

Analytical Results Summary - Surface Water
Annual Sediment and Surface Water Sampling
Avtex Fibers Superfund Site
Front Royal, Virginia
July 2017

Location ID:		SW-01	SW-02	SW-03	SW-04	SW-05
Sample Name:		2017AN-SW-01	2017AN-SW-02	2017AN-SW-03	2017AN-SW-04	2017AN-SW-05
Sample Date:		07/13/2017	07/13/2017	07/13/2017	07/13/2017	07/13/2017
Parameters	**Unit**					
Metals (Continued)						
Iron (dissolved)	mg/L	0.0500 U	0.0500 U	0.0500 U	0.0500 U	0.0500 U
Lead	mg/L	0.000500 U	0.000500 U	0.000500 U	0.000500 U	0.000500 U
Lead (dissolved)	mg/L	0.000500 U	0.000500 U	0.000500 U	0.000500 U	0.000500 U
Manganese	mg/L	0.00500 U	0.00500 U	0.00500 U	0.0261	0.00630 J
Manganese (dissolved)	mg/L	0.00500 U	0.00500 U	0.00500 U	0.00500 U	0.00500 U
Mercury	mg/L	0.000100 U	0.000100 U	0.000100 U	0.000100 U	0.000100 U
Mercury (dissolved)	mg/L	0.000100 U	0.000100 U	0.000100 U	0.000100 U	0.000100 U
Nickel	mg/L	0.00300 U	0.00300 U	0.00300 U	0.00570 J	0.00300 U
Nickel (dissolved)	mg/L	0.00300 U	0.00300 U	0.00300 U	0.00300 U	0.00300 U
Vanadium	mg/L	0.0100 U	0.0100 U	0.0100 U	0.0100 U	0.0100 U
Vanadium (dissolved)	mg/L	0.0100 U	0.0100 U	0.0100 U	0.0100 U	0.0100 U
Zinc	mg/L	0.0250 U	0.0250 U	0.0250 U	0.533	0.174
Zinc (dissolved)	mg/L	0.0250 U	0.0250 U	0.0250 U	0.0250 U	0.0250 U
General Chemistry						
Cyanide (total)	mg/L	0.00700 UJ	0.00700 UJ	0.00700 U	0.00700 U	0.00700 U
Cyanide (free)	µg/L	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U

Notes:

J - Estimated concentration
U - Not detected at the associated reporting limit
UJ - Not detected; associated reporting limit is estimated
R - Rejected

Table 2A

Analytical Results Summary - Surface Water
Annual Sediment and Surface Water Sampling
Avtex Fibers Superfund Site
Front Royal, Virginia
July 2017

Location ID:		SW-06	SW-06	SW-07	SW-08
Sample Name:		2017AN-SW-06	2017AN-SW-06D	2017AN-SW-07	2017AN-SW-08
Sample Date:		07/13/2017	07/13/2017 Duplicate	07/13/2017	07/13/2017
Parameters	**Unit**				
Volatile Organic Compounds					
Acetone	mg/L	R	R	R	R
Carbon disulfide	mg/L	0.000220 U	0.000220 U	0.000220 U	0.000220 U
Chlorobenzene	mg/L	0.000180 U	0.000180 U	0.000180 U	0.000180 U
Semi-volatile Organic Compounds					
2-Methylphenol	µg/L	1.60 U	1.54 U	1.54 U	1.60 U
3&4-Methylphenol	µg/L	1.40 U	1.35 U	1.35 U	1.40 U
bis(2-Ethylhexyl)phthalate (DEHP)	µg/L	3.17 U	2.66 U	2.35 U	2.32 U
Naphthalene	µg/L	0.370 U	0.356 U	0.356 U	0.370 U
Pentachlorophenol	µg/L	3.30 U	3.17 U	3.17 UJ	3.30 UJ
Phenol	µg/L	1.50 U	1.44 U	1.44 U	1.50 U
Metals					
Aluminum	mg/L	0.0500 U	0.0500 U	0.0500 U	0.0500 U
Aluminum (dissolved)	mg/L	0.0500 U	0.0500 U	0.0500 U	0.0500 U
Antimony	mg/L	0.00400 U	0.00400 U	0.00400 U	0.00400 U
Antimony (dissolved)	mg/L	0.00400 U	0.00400 U	0.00400 U	0.00400 U
Arsenic	mg/L	0.00200 U	0.00200 U	0.00200 U	0.00200 U
Arsenic (dissolved)	mg/L	0.00200 U	0.00200 U	0.00200 U	0.00200 U
Cadmium	mg/L	0.000500 U	0.000500 U	0.000500 U	0.000500 U
Cadmium (dissolved)	mg/L	0.000500 U	0.000500 U	0.000500 U	0.000500 U
Chromium	mg/L	0.00300 U	0.00300 U	0.00300 U	0.00300 U
Chromium (dissolved)	mg/L	0.00300 U	0.00300 U	0.00300 U	0.00300 U
Cobalt	mg/L	0.000500 U	0.000500 U	0.000500 U	0.000500 U
Cobalt (dissolved)	mg/L	0.000500 U	0.00172 J	0.000500 U	0.000500 U
Iron	mg/L	0.0500 U	0.193	0.0500 U	0.0500 U

Table 2A

Analytical Results Summary - Surface Water
Annual Sediment and Surface Water Sampling
Avtex Fibers Superfund Site
Front Royal, Virginia
July 2017

Location ID:		SW-06	SW-06	SW-07	SW-08
Sample Name:		2017AN-SW-06	2017AN-SW-06D	2017AN-SW-07	2017AN-SW-08
Sample Date:		07/13/2017	07/13/2017 Duplicate	07/13/2017	07/13/2017
Parameters	**Unit**				
Metals (Continued)					
Iron (dissolved)	mg/L	0.0500 U	0.0500 U	0.0500 U	0.0500 U
Lead	mg/L	0.000500 U	0.000541 U	0.000500 U	0.000500 U
Lead (dissolved)	mg/L	0.000500 U	0.000500 U	0.000500 U	0.000500 U
Manganese	mg/L	0.00500 U	0.00500 U	0.00500 U	0.00500 U
Manganese (dissolved)	mg/L	0.00710 J	0.00500 U	0.00500 U	0.00500 U
Mercury	mg/L	0.000100 U	0.000100 U	0.000100 U	0.000100 U
Mercury (dissolved)	mg/L	0.000100 U	0.000100 U	0.000100 U	0.000100 U
Nickel	mg/L	0.00300 U	0.00300 U	0.00300 U	0.00300 U
Nickel (dissolved)	mg/L	0.00300 U	0.00300 U	0.00300 U	0.00300 U
Vanadium	mg/L	0.0100 U	0.0100 U	0.0100 U	0.0100 U
Vanadium (dissolved)	mg/L	0.0100 U	0.0100 U	0.0100 U	0.0100 U
Zinc	mg/L	0.0250 U	0.0250 U	0.0250 U	0.0250 U
Zinc (dissolved)	mg/L	0.0250 U	0.0250 U	0.0250 U	0.0250 U
General Chemistry					
Cyanide (total)	mg/L	0.00700 U	0.00700 U	0.00700 U	0.00700 U
Cyanide (free)	µg/L	1.54 U	1.54 U	1.54 U	1.54 U

Notes:

J - Estimated concentration
U - Not detected at the associated reporting limit
UJ - Not detected; associated reporting limit is estimated
R - Rejected

Table 2B

Analytical Results Summary - Sediments
Annual Sediment and Surface Water Sampling
Avtex Fibers Superfund Site
Front Royal, Virginia
July 2017

Location ID:		SED-01	SED-02	SED-03	SED-04	SED-05
Sample Name:		2017AN-SED-01	2017AN-SED-02	2017AN-SED-03	2017AN-SED-04	2017AN-SED-05
Sample Date:		07/13/2017	07/13/2017	07/13/2017	07/13/2017	07/13/2017
Parameters	**Unit**					
Volatile Organic Compounds						
Acetone	mg/kg	0.0241 J	0.0327 J	0.0111 U	0.0466 J	0.0572 J
Carbon disulfide	mg/kg	0.00478 U	0.00492 U	0.00619 J	0.0343	0.00497 U
Chlorobenzene	mg/kg	0.000889 U	0.000915 U	0.000884 U	0.000955 U	0.000924 U
Semi-volatile Organic Compounds						
2-Methylphenol	mg/kg	0.302 U	0.311 U	0.298 U	0.341 U	0.313 U
3&4-Methylphenol	mg/kg	0.284 U	0.292 U	0.280 U	0.321 U	0.294 U
bis(2-Ethylhexyl)phthalate (DEHP)	mg/kg	0.290 U	0.298 U	0.285 U	0.327 U	0.300 U
Naphthalene	mg/kg	0.0406 U	0.0417 U	0.0400 U	0.0458 U	0.0420 U
Pentachlorophenol	mg/kg	0.372 U	0.383 U	0.367 U	0.420 U	0.385 U
Phenol	mg/kg	0.284 U	0.292 U	0.280 U	0.321 U	0.294 U
Metals						
Aluminum	mg/kg	1900 J	1930 J	2440 J	4130 J	2950 J
Antimony	mg/kg	1.40 U	1.39 U	1.35 U	1.59 U	1.46 U
Arsenic	mg/kg	3.22 J	1.53 J	2.64 J	3.24 J	4.36
Cadmium	mg/kg	1.40 U	1.39 U	1.35 U	1.59 U	1.46 U
Chromium	mg/kg	9.66 J	8.34 J	11.2 J	12.8 J	11.1 J
Cobalt	mg/kg	3.82	4.08	7.19	7.11	7.49
Iron	mg/kg	5190 J	6240 J	7910 J	10800 J	6990 J
Lead	mg/kg	16.1	6.64	12.1	12.9	12.6
Manganese	mg/kg	141 J	178 J	216 J	327 J	468 J
Mercury	mg/kg	0.0953 J	0.132 J	0.118 J	0.343	0.441
Nickel	mg/kg	4.25 J	5.27 J	5.01 J	7.94 J	6.41 J
Vanadium	mg/kg	9.01 J	10.8 J	14.3 J	19.6 J	12.7 J
Zinc	mg/kg	22.6 J	23.6 J	31.6 J	64.3 J	79.7 J

Table 2B

Analytical Results Summary - Sediments
Annual Sediment and Surface Water Sampling
Avtex Fibers Superfund Site
Front Royal, Virginia
July 2017

Location ID:		SED-01	SED-02	SED-03	SED-04	SED-05
Sample Name:		2017AN-SED-01	2017AN-SED-02	2017AN-SED-03	2017AN-SED-04	2017AN-SED-05
Sample Date:		07/13/2017	07/13/2017	07/13/2017	07/13/2017	07/13/2017
Parameters	**Unit**					
General Chemistry						
Cyanide (free)	mg/kg	0.430 U	0.451 U	0.431 U	0.500 U	0.433 U
Cyanide (total)	mg/kg	R	R	R	R	R
Total organic carbon (TOC)	mg/kg	4340	9210	6830	9880	12800

Notes:

J - Estimated concentration
U - Not detected at the associated reporting limit
UJ - Not detected; associated reporting limit is estimated
R - Rejected

Table 2B

Analytical Results Summary - Sediments
Annual Sediment and Surface Water Sampling
Avtex Fibers Superfund Site
Front Royal, Virginia
July 2017

Location ID:		SED-06	SED-06	SED-07	SED-08
Sample Name:		2017AN-SED-06	2017AN-SED-06D	2017AN-SED-07	2017AN-SED-08
Sample Date:		07/13/2017	07/13/2017 Duplicate	07/13/2017	07/13/2017
Parameters	**Unit**				
Volatile Organic Compounds					
Acetone	mg/kg	0.0495 J	0.0546 J	0.138	0.0815 J
Carbon disulfide	mg/kg	0.00667 J	0.00723 J	0.00706 U	0.00683 J
Chlorobenzene	mg/kg	0.000925 U	0.00103 U	0.00131 U	0.00111 U
Semi-volatile Organic Compounds					
2-Methylphenol	mg/kg	0.330 U	0.340 U	0.428 U	0.389 U
3&4-Methylphenol	mg/kg	0.310 U	0.320 U	0.403 U	0.366 U
bis(2-Ethylhexyl)phthalate (DEHP)	mg/kg	0.317 U	0.326 U	0.411 U	0.373 U
Naphthalene	mg/kg	0.0443 U	0.0456 U	0.0575 U	0.0522 U
Pentachlorophenol	mg/kg	0.407 U	0.419 U	0.528 U	0.479 U
Phenol	mg/kg	0.310 U	0.320 U	0.403 U	0.366 U
Metals					
Aluminum	mg/kg	3310 J	6390 J	1960 J	3540 J
Antimony	mg/kg	1.51 U	1.60 U	2.00 U	1.78 U
Arsenic	mg/kg	2.04 J	3.63 J	2.00 U	1.96 J
Cadmium	mg/kg	1.51 U	1.60 U	2.00 U	1.78 U
Chromium	mg/kg	13.2 J	13.1 J	8.43 J	12.4 J
Cobalt	mg/kg	5.40 J	12.6 J	6.69	6.08
Iron	mg/kg	11000 J	16300 J	3520 J	10300 J
Lead	mg/kg	8.11	14.7	9.45	10.2
Manganese	mg/kg	285 J	1140 J	210 J	340 J
Mercury	mg/kg	0.108 J	0.0954 J	0.227	0.416
Nickel	mg/kg	6.81 J	11.1 J	5.04 J	7.44 J
Vanadium	mg/kg	17.9 J	27.6 J	8.46 J	18.1 J
Zinc	mg/kg	26.0 J	37.1 J	25.7 J	40.5 J

Table 2B

Analytical Results Summary - Sediments
Annual Sediment and Surface Water Sampling
Avtex Fibers Superfund Site
Front Royal, Virginia
July 2017

Location ID:		SED-06	SED-06	SED-07	SED-08
Sample Name:		2017AN-SED-06	2017AN-SED-06D	2017AN-SED-07	2017AN-SED-08
Sample Date:		07/13/2017	07/13/2017 Duplicate	07/13/2017	07/13/2017
Parameters	**Unit**				
General Chemistry					
Cyanide (free)	mg/kg	0.421 U	0.477 U	0.618 U	0.532 U
Cyanide (total)	mg/kg	R	R	R	R
Total organic carbon (TOC)	mg/kg	16500	7740	16300	36500

Notes:

J - Estimated concentration
U - Not detected at the associated reporting limit
UJ - Not detected; associated reporting limit is estimated
R - Rejected

Table 3

Analytical Methods
Annual Sediment and Surface Water Sampling
Avtex Fibers Superfund Site
Front Royal, Virginia
July 2017

Parameter	Method	Matrix	Holding Time	
			Collection to Extraction (Days)	Collection or Extraction to Analysis (Days)
Select Volatile Organic Compounds (VOCs)	SW-846 8260B	Water, Sediments	-	14
Select Semi-volatile Organic Compounds (SVOCs)	SW-846 8260B	Water	7	40
Select Semi-volatile Organic Compounds (SVOCs)	SW-846 8270D	Sediments	14	40
Metals	SW-846 6010C/6020A	Water, Sediments	-	180
Mercury	SW-846 7470A/7471B	Water, Sediments	-	28
TOC	SM 5310C	Water, Sediments	-	28
Cyanide (total)	SW-846 9012B	Water, Sediments	-	14
Cyanide (free)	SW-846 9016	Water, Sediments	-	14

Notes:

Method References:

SW-846 - "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", SW-846, Third Edition, 1986, with subsequent revisions

SM - "Standard Methods for the Examination of Water and Wastewater". 18th Edition, 1992

Table 4

Qualified Sample Results Due to Outlying Continuing Calibration Results
Annual Sediment and Surface Water Sampling
Avtex Fibers Superfund Site
Front Royal, Virginia
July 2017

Parameter	Analyte	Calibration Date (mm/dd/yyyy)	RRF	%D	Associated Sample ID	Qualified Result	Units
VOCs	Acetone	07/18/2017	0.0091	12.5	2017AN-SW-01	R	mg/L
					2017AN-SW-02	R	mg/L
					2017AN-SW-03	R	mg/L
					2017AN-SW-04	R	mg/L
					2017AN-SW-05	R	mg/L
					2017AN-SW-06	R	mg/L
					2017AN-SW-06D	R	mg/L
					2017AN-SW-07	R	mg/L
					2017AN-SW-08	R	mg/L
SVOCs	Pentachlorophenol	07/20/2017	0.1146	28.8	2017AN-SW-07	3.17 UJ	µg/L
					2017AN-SW-08	3.30 UJ	µg/L

Notes:

%D - Percent difference
RRF - Relative Response Factor
UJ - Not detected; associated reporting limit is estimated
R - Rejected
VOCs - Volatile Organic Compounds
SVOCs - Semi-volatile Organic Compounds

Table 5

Qualified Sample Results Due to Analyte Concentrations in the Method Blanks
Annual Sediment and Surface Water Sampling
Avtex Fibers Superfund Site
Front Royal, Virginia
July 2017

Parameter	Analyte	Analysis Date (mm/dd/yyyy)	Blank Result *	Sample ID	Original Result	Qualified Result	Units
SVOCs	bis(2-Ethylhexyl)phthalate (DEHP)	07/19/2017	3.450 J	2017AN-SW-01	2.54 J	2.54 U	µg/L
				2017AN-SW-02	4.75 J	4.75 U	µg/L
				2017AN-SW-03	4.71 J	4.71 U	µg/L
				2017AN-SW-04	3.10 J	3.10 U	µg/L
				2017AN-SW-05	3.19 J	3.19 U	µg/L
				2017AN-SW-06	3.17 J	3.17 U	µg/L
				2017AN-SW-06D	2.66 J	2.66 U	µg/L
				2017AN-SW-07	2.35 J	2.35 U	µg/L
				2017AN-SW-08	2.32 J	2.32 U	µg/L

Notes:

* - Blank result adjusted for sample factors where applicable
U - Not detected at the associated reporting limit
J - Estimated concentration
SVOCs - Semi-volatile Organic Compounds

Table 6

Qualified Sample Results Due to Outlying MS/MSD Results
Annual Sediment and Surface Water Sampling
Avtex Fibers Superfund Site
Front Royal, Virginia
July 2017

Parameter	Sample ID	Analyte	MS % Recovery	MSD % Recovery	RPD (percent)	Control Limits % Recovery	Control Limits RPD	Associated Sample IDs	Qualified Result	Units
Metals	2017AN-SED-06	Chromium	0	0	NA	75-125	35	2017AN-SED-06	13.2 J	mg/kg
								2017AN-SED-01	9.66 J	mg/kg
								2017AN-SED-02	8.34 J	mg/kg
								2017AN-SED-03	11.2 J	mg/kg
								2017AN-SED-04	12.8 J	mg/kg
								2017AN-SED-05	11.1 J	mg/kg
								2017AN-SED-06D	13.1 J	mg/kg
								2017AN-SED-07	8.43 J	mg/kg
								2017AN-SED-08	12.4 J	mg/kg
Metals	2017AN-SED-06	Nickel	0	0	NA	75-125	35	2017AN-SED-06	6.81 J	mg/kg
								2017AN-SED-01	4.25 J	mg/kg
								2017AN-SED-02	5.27 J	mg/kg
								2017AN-SED-03	5.01 J	mg/kg
								2017AN-SED-04	7.94 J	mg/kg
								2017AN-SED-05	6.41 J	mg/kg
								2017AN-SED-06D	11.1 J	mg/kg
								2017AN-SED-07	5.04 J	mg/kg
								2017AN-SED-08	7.44 J	mg/kg

Table 6

Qualified Sample Results Due to Outlying MS/MSD Results
Annual Sediment and Surface Water Sampling
Avtex Fibers Superfund Site
Front Royal, Virginia
July 2017

Parameter	Sample ID	Analyte	MS % Recovery	MSD % Recovery	RPD (percent)	Control Limits % Recovery	Control Limits RPD	Associated Sample IDs	Qualified Result	Units
Metals	2017AN-SED-06	Vanadium	0	0	NA	75-125	35	2017AN-SED-06	17.9 J	mg/kg
								2017AN-SED-01	9.01 J	mg/kg
								2017AN-SED-02	10.8 J	mg/kg
								2017AN-SED-03	14.3 J	mg/kg
								2017AN-SED-04	19.6 J	mg/kg
								2017AN-SED-05	12.7 J	mg/kg
								2017AN-SED-06D	27.6 J	mg/kg
								2017AN-SED-07	8.46 J	mg/kg
								2017AN-SED-08	18.1 J	mg/kg
Metals	2017AN-SED-06	Zinc	0	0	NA	75-125	35	2017AN-SED-06	26.0 J	mg/kg
								2017AN-SED-01	22.6 J	mg/kg
								2017AN-SED-02	23.6 J	mg/kg
								2017AN-SED-03	31.6 J	mg/kg
								2017AN-SED-04	64.3 J	mg/kg
								2017AN-SED-05	79.7 J	mg/kg
								2017AN-SED-06D	37.1 J	mg/kg
								2017AN-SED-07	25.7 J	mg/kg
								2017AN-SED-08	40.5 J	mg/kg

Table 6

Qualified Sample Results Due to Outlying MS/MSD Results
Annual Sediment and Surface Water Sampling
Avtex Fibers Superfund Site
Front Royal, Virginia
July 2017

Parameter	Sample ID	Analyte	MS % Recovery	MSD % Recovery	RPD (percent)	Control Limits % Recovery	Control Limits RPD	Associated Sample IDs	Qualified Result		Units
General Chemistry	2017AN-SED-06	Cyanide (total)	0	0	NA	75-125	35	2017AN-SED-01	R		mg/kg
								2017AN-SED-02	R		mg/kg
								2017AN-SED-03	R		mg/kg
								2017AN-SED-04	R		mg/kg
								2017AN-SED-05	R		mg/kg
								2017AN-SED-06	R		mg/kg
								2017AN-SED-06D	R		mg/kg
								2017AN-SED-07	R		mg/kg
								2017AN-SED-08	R		mg/kg
General Chemistry	2017AN-SW-01	Cyanide (total)	37	75	69	75-125	35	2017AN-SW-01	0.00700	UJ	mg/l
								2017AN-SW-02	0.00700	UJ	mg/l

Notes:

MS - Matrix Spike
MSD - Matrix Spike Duplicate
RPD - Relative Percent Difference
J - Estimated concentration
UJ - Not detected; associated reporting limit is estimated
R - Rejected

Table 7

Qualified Sample Data Due to Outlying ICP Serial Dilution Results
Annual Sediment and Surface Water Sampling
Avtex Fibers Superfund Site
Front Royal, Virginia
July 2017

Parameter	Serial Dilution Sample ID	Analyte	%D	Associated Sample ID	Qualified Result	Units
Metals	2017AN-SED-01	Aluminum	28	2017AN-SED-01	1900 J	mg/kg
				2017AN-SED-02	1930 J	mg/kg
				2017AN-SED-03	2440 J	mg/kg
				2017AN-SED-04	4130 J	mg/kg
				2017AN-SED-05	2950 J	mg/kg
				2017AN-SED-06	3310 J	mg/kg
				2017AN-SED-06D	6390 J	mg/kg
				2017AN-SED-07	1960 J	mg/kg
				2017AN-SED-08	3540 J	mg/kg
	2017AN-SED-01	Iron	113	2017AN-SED-01	5190 J	mg/kg
				2017AN-SED-02	6240 J	mg/kg
				2017AN-SED-03	7910 J	mg/kg
				2017AN-SED-04	10800 J	mg/kg
				2017AN-SED-05	6990 J	mg/kg
				2017AN-SED-06	11000 J	mg/kg
				2017AN-SED-06D	16300 J	mg/kg
				2017AN-SED-07	3520 J	mg/kg
				2017AN-SED-08	10300 J	mg/kg
	2017AN-SED-01	Manganese	21	2017AN-SED-01	141 J	mg/kg
				2017AN-SED-02	178 J	mg/kg
				2017AN-SED-03	216 J	mg/kg
				2017AN-SED-04	327 J	mg/kg
				2017AN-SED-05	468 J	mg/kg
				2017AN-SED-06	285 J	mg/kg
				2017AN-SED-06D	1140 J	mg/kg
				2017AN-SED-07	210 J	mg/kg
				2017AN-SED-08	340 J	mg/kg

Notes:

%D - Percent Difference
ICP - Inductively Coupled Plasma
J - Estimated concentration

Table 8

Qualified Sample Data Due to Analyte Concentrations in the Rinse Blanks
Annual Sediment and Surface Water Sampling
Avtex Fibers Superfund Site
Front Royal, Virginia
July 2017

Parameter	Rinse Blank ID	Blank Date (dd/mm/yyyy)	Analyte	Blank Result	Associated Sample ID	Original Result	Qualified Result	Units
Metals	RB-071417-01	7/14/2017	Lead	0.000901 J	2017AN-SW-06D	0.000541 J	0.000541 U	mg/l

Notes:

U - Not detected at the associated reporting limit
J - Estimated concentration

Table 9

Qualified Sample Data Due to Variability in Field Duplicate Results
Annual Sediment and Surface Water Sampling
Avtex Fibers Superfund Site
Front Royal, Virginia
July 2017

Parameter	Analyte	RPD/Diff		Sample ID	Qualified Result	Field Duplicate Sample ID	Qualified Result	Units
Metals	Cobalt	-	>2X RL	2017AN-SED-06	5.40 J	2017AN-SED-06D	12.6 J	mg/kg
	Manganese	120	-	2017AN-SED-06	285 J	2017AN-SED-06D	1140 J	mg/kg

Notes:

Diff - Difference (i.e., >1X RL for waters or >2XRL for soils)
RL - Reporting limit
RPD - Relative Percent Difference
J - Estimated concentration
- - Not applicable

Memorandum

March 13, 2018

To:	Michael Robinson	Ref. No.:	11119510-001
From:	Deb Andrasko/mkd/10	Tel:	716-297-6150

Subject: **Analytical Results and Full Validation**
Annual Groundwater Sampling
Avtex Fibers Superfund Site
Front Royal, Virginia
July- August 2017

1. Introduction

This document details a validation of analytical results for groundwater samples collected in support of the Annual Groundwater Sampling at the Avtex Fibers Superfund site during July and August 2017. Samples were submitted to TestAmerica Laboratory, located in Nashville, Tennessee. A sample collection and analysis summary is presented in Table 1. The validated analytical results are summarized in Table 2. A summary of the analytical methodology is presented in Table 3.

Full Contract Laboratory Program (CLP) equivalent raw data deliverables were provided by the laboratory. Evaluation of the data was based on information obtained from the finished data sheets, raw data, chain of custody forms, calibration data, blank data, duplicate data, recovery data from surrogate spikes/laboratory control samples (LCS)/matrix spike (MS) samples, and field QC samples. The assessment of analytical and in-house data included checks for: data consistency (by observing comparability of duplicate analyses), adherence to accuracy and precision criteria, and transmittal errors.

The QA/QC criteria by which these data have been assessed are outlined in the analytical methods referenced in Table 3 and applicable guidance from the documents entitled:

i) "USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review", USEPA 540-R-10-011, January 2010

ii) "USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review", USEPA 540-R-08-01, June 2008

Items i) and ii) will subsequently be referred to as the "Guidelines" in this Memorandum.

2. Sample Holding Time and Preservation

The sample holding time criteria for the analyses are summarized in Table 3. Sample chain of custody documents and analytical reports were used to determine sample holding times. All samples were prepared and analyzed within the required holding times.

All samples were properly preserved, delivered on ice, and stored by the laboratory at the required temperature (0-6°C).

3. Gas Chromatography/Mass Spectrometer (GC/MS) – Tuning and Mass Calibration (Instrument Performance Check) and Inductively Coupled Plasma/Mass Spectrometer (ICP/MS)

3.1 Organic Analyses

Prior to volatile organic compound (VOC) and semi-volatile organic compound (SVOC) analysis, GC/MS instrumentation is tuned to ensure optimization over the mass range of interest. To evaluate instrument tuning, methods require the analysis of specific tuning compounds bromofluorobenzene (BFB) and decafluorotriphenylphosphine (DFTPP), respectively. The resulting spectra must meet the criteria cited in the methods before analysis is initiated. Analysis of the tuning compound must then be repeated every 12 hours throughout sample analysis to ensure the continued optimization of the instrument.

Tuning compounds were analyzed at the required frequency throughout VOC and SVOC analysis periods. All tuning criteria were met indicating that proper optimization of the instrumentation was achieved.

3.2 Inorganic Analyses

To ensure adequate mass resolution, identification, and to some degree, sensitivity, the performance of each ICP/MS instrument used for metals analyses is checked prior to calibration and initiating an analysis sequence through the analysis of a tuning solution.

Instrument performance check data were reviewed. The tuning solution was analyzed at the required frequency throughout the analyses. The results of most instrument performance checks were within the method acceptance criteria, indicating that proper optimization of the instrumentation was achieved. Due to a power failure, the laboratory was unable to retrieve and provide the ICP/MS tune for samples analyzed on August 5, 2017. Based on the acceptable calibration curves, continuing calibration checks, and laboratory check sample (LCS) recoveries, the data were judged usable for reporting but were qualified as estimated (see Table 4).

4. Initial Calibration - Organic Analyses

4.1 GC/MS

To quantify VOCs and SVOCs of interest in samples, calibration of the GC/MS over a specific concentration range must be performed. Initially, a minimum of a five-point calibration curve containing all compounds of

interest is analyzed to characterize instrument response for each analyte over a specific concentration range. Linearity of the calibration curve and instrument sensitivity are evaluated against the following criteria:

i) All relative response factors (RRFs) must be greater than or equal to 0.05 (0.01 for poor responders)

ii) The percent relative standard deviation (RSD) values must not exceed 20.0 percent (40 percent for poor responders) or a minimum correlation coefficient (R) of 0.99 and minimum coefficient of determination (R^2) of 0.99 if linear and quadratic equation calibration curves, respectively, are used.

The initial calibration data for VOCs and SVOCs were reviewed. All compounds met the above criteria for sensitivity and linearity with the exception of low RRFs for acetone. All associated hits were qualified as estimated; non-detect results were rejected based on the poor sensitivity demonstrated (see Table 5).

5. Initial Calibration – Inorganic Analyses

Initial calibration of the instruments ensures that they are capable of producing satisfactory quantitative data at the beginning of a series of analyses. For ICP and ICP/MS analysis, a calibration blank and at least one standard must be analyzed at each wavelength to establish the analytical curve. For mercury atomic absorption (AA) analyses, a calibration blank and a minimum of five standards must be analyzed to establish the analytical curve, and resulting correlation coefficients (R) must be 0.995 or greater. For instrumental general chemistry analyses, a calibration blank and a minimum of five standards must be analyzed to establish the analytical curve, and resulting correlation coefficients (R) must be 0.995 or greater.

After the analyses of the calibration curves, an initial calibration verification (ICV) standard must be analyzed to verify the analytical accuracy of the calibration curves. All analyte recoveries from the analyses of the ICVs must be within the following control limits:

Analytical Method	Parameter	Control Limits
ICP/MS, ICP/AA	Metals	90 - 110%
Cold Vapor AA	Mercury	80 - 120%
Instrumental Wet Chemistry	Chloride, Sulfate, Free Cyanide	85 - 115%

Upon review of the data, it was determined that the calibration curves and ICVs were analyzed at the proper frequencies and that all of the above-specified criteria were met. The laboratory effectively demonstrated that the instrumentation used for metals and general chemistry analyses were properly calibrated prior to sample analysis.

6. Continuing Calibration - Organic Analyses

6.1 GC/MS

To ensure that instrument calibration for VOC and SVOC analyses is acceptable throughout the sample analysis period, continuing calibration standards must be analyzed and compared to the initial calibration curve every 12 hours.

The following criteria were employed to evaluate continuing calibration data:

i) All RRF values must be greater than or equal to 0.05 (0.01 for poor responders)

ii) Percent difference (%D) values must not exceed 25 percent (40 percent for poor responders)

Calibration standards were analyzed at the required frequency, and the results met the above criteria for instrument sensitivity and stability with the exception of a few volatile and semi-volatile compounds. For the VOCs with low RRFs, all associated sample hits were qualified as estimated; non-detect results were rejected based on the poor sensitivity demonstrated. For the SVOCs with high %D, all associated sample results were qualified as estimated. The qualified results are presented in Table 6.

7. Continuing Calibration - Inorganic Analyses

To ensure that instrument calibration is acceptable throughout the sample analysis period, continuing calibration verification (CCV) standards are analyzed on a regular basis. Each CCV is deemed acceptable if all analyte recoveries are within the control limits specified above for the ICVs. If some of the CCV analyte recoveries are outside the control limits, samples analyzed before and after the CCV, up until the previous and proceeding CCV analyses, are affected.

For this study, CCVs were analyzed at the proper frequency. All analyte recoveries reported for the CCVs were within the specified limits.

8. Contract Required Detection Limit (CRDL) Standard Analyses

To verify the linearity of the ICP or ICP/MS calibration near the detection limit, a standard is analyzed which contains the ICP or ICP/MS analytes at specified concentrations. This standard must be analyzed at the beginning and end of each sample analysis run or a minimum of twice per 8-hour period.

CRDL recoveries were evaluated using the criteria specified in the October 2004 "Guidelines". The CRDL recoveries were acceptable.

9. Laboratory Blank Analyses

Method blanks are prepared from a purified matrix and analyzed with investigative samples to determine the existence and magnitude of sample contamination introduced during the analytical procedures. Additionally,

initial and continuing calibration blanks (ICBs/CCBs) are routinely analyzed after each ICV/CCV for the inorganic parameters.

For this study, laboratory method blanks were analyzed at a minimum frequency of 1 per 20 investigative samples and/or 1 per analytical batch.

9.1 Organic Analyses

All method blank results were non-detect, indicating that laboratory contamination was not a factor for this investigation, with the exception of low concentrations of bis(2-ethylhexyl)phthalate in some blanks. All associated samples with similar results were qualified as non-detect (see Table 7).

9.2 Inorganic Analyses

Upon review of the ICBs, CCBs, and method blanks, it was noted that metal concentrations were observed above the method detection limit (MDL) in some of the method blanks and CCBs. Most investigative samples associated with the low level detections reported either non-detect concentrations or concentrations significantly greater than the associated laboratory blank concentrations for the analytes of interest. These sample results were not impacted by the contamination detected. Associated positive sample results with similar concentrations to the levels reported in the method blanks were qualified as non-detect (see Table 7). An associated positive sample result with a similar concentration to the level reported in a CCB was qualified as non-detect (see Table 8).

10. Surrogate Spike Recoveries

In accordance with the methods employed, all samples, blanks, and QC samples analyzed for organics are spiked with surrogate compounds prior to sample extraction and/or analysis. Surrogate recoveries provide a means to evaluate the effects of laboratory performance on individual sample matrices.

All samples submitted for VOC and SVOC determinations were spiked with the appropriate number of surrogate compounds prior to sample extraction and/or analysis.

Each individual surrogate compound is expected to meet the laboratory control limits with the exception of SVOC analyses. According to the "Guidelines" for SVOC analyses, up to one outlying surrogate in the base/neutral or acid fractions is acceptable as long as the recovery is at least 10 percent.

Surrogate recoveries were assessed against laboratory control limits. All surrogate recoveries met criteria.

11. Internal Standards (IS) Analyses

IS data were evaluated for all VOC, SVOC, and ICP/MS metals sample analyses.

11.1 Organics Analyses

To ensure that changes in the GC/MS sensitivity and response do not affect sample analysis results, IS compounds are added to each sample prior to analysis. All results are then calculated as a ratio of the IS responses.

The sample IS results were evaluated against the following criteria:

i) The retention time of the IS must not vary more than ±30 seconds from the associated calibration standard.

ii) IS area counts must not vary by more than a factor of two (-50 percent to +100 percent) from the associated calibration standard.

All organic IS recoveries and retention times met the above criteria.

11.2 Inorganic Analyses

IS elements were added to all samples prior to metals analysis by ICP/MS. Overall instrument stability and performance for metals analyses were monitored using the IS intensity data. IS recoveries were assessed using control limits of 60-125 percent.

All inorganic IS recoveries were acceptable, demonstrating adequate analytical performance.

12. Laboratory Control Sample Analyses

LCS and/or laboratory control sample duplicates (LCSD) are prepared and analyzed as samples to assess the analytical efficiencies of the methods employed, independent of sample matrix effects. The relative percent difference (RPD) of the LCS/LCSD recoveries is used to evaluate analytical precision.

For this study, LCS or LCS/LCSD were analyzed at a minimum frequency of 1 per 20 investigative samples and/or 1 per analytical batch.

12.1 Organic Analyses

The LCS/LCSD contained all compounds of interest. All LCS recoveries and RPDs were within the laboratory control limits, with the exception of low and severely low (<10 percent) hexachlorocyclopentadiene recoveries. The sample result associated with the low LCS/LCSD recoveries was qualified as estimated. The sample results associated with the severely low recovery were non-detect and were rejected based on the extremely poor analytical efficiency demonstrated. Qualified results are presented in Table 9.

12.2 Inorganic Analyses

The LCS or LCS/LCSD contained all analytes of interest. LCS recoveries and RPD were assessed per the "Guidelines". All LCS recoveries and RPD were within the control limits, demonstrating acceptable analytical accuracy, with the exception of a high beryllium recovery for one LCS. The associated sample results were non-detect and would not be impacted by the implied high bias.

13. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analyses

To evaluate the effects of sample matrices on the preparation process, measurement procedures, and accuracy of a particular analysis, samples are spiked with known concentrations of the analytes of concern and analyzed as MS/MSD samples. The RPD between the MS and MSD is used to assess analytical precision. If the original sample concentration is significantly greater than the spike concentration, the recovery is not assessed.

MS/MSD analyses were performed as specified in Table 1. The laboratory performed additional site-specific MS/MSD analyses internally.

13.1 Organic Analyses

The MS/MSD samples were spiked with all compounds of interest. Most percent recoveries and RPD values were within the laboratory control limits, demonstrating acceptable analytical accuracy and precision. High recoveries or RPD were reported for some SVOCs. All associated sample results were non-detect and would not be impacted by the implied high bias and /or variability. Severely low hexachlorocyclopentadiene recoveries were reported for some of the semi-volatile MS/MSD. The associated sample results were previously qualified as rejected based on the extremely poor analytical efficiency demonstrated by the LCS as noted above.

13.2 Inorganic Analyses

The MS/MSD samples were spiked with the analytes of interest, and the results were evaluated using the "Guidelines". All percent recoveries and RPD values were within the control limits, demonstrating acceptable analytical accuracy and precision, with the following exceptions (see Table 10):

i) Some dissolved metals recoveries could not be assessed as the sample concentrations were significantly greater than the spike concentrations.

ii) High recoveries and/or RPDs were reported for some dissolved metals MS/MSD. All associated positive results were qualified as estimated; non-detect results would not be impacted by the indicated high bias and/or variability demonstrated

iii) Low recoveries were reported for some dissolved metals MS/MSDs. All associated samples were qualified as estimated based on the implied low bias

14. ICP and ICP/MS Serial Dilution

The serial dilution determines whether significant physical or chemical interferences exist due to sample matrix. A minimum of 1 per 20 investigative samples or at least 1 per analytical batch must be analyzed at a five-fold dilution. For samples with sufficient analyte concentrations (>50 times the method detection limit), the serial dilution results must agree within 10 percent of the original results.

A serial dilution was performed on each MS/MSD sample. All results met the criteria above with the exception of a few dissolved metals for two samples. The associated sample results were qualified as estimated (see Table 11).

15. ICP Interference Check Sample Analysis (ICS)

To verify that the laboratory has established proper inter-element and background correction factors, ICSs are analyzed. These samples contain high concentrations of aluminum, calcium, magnesium, and iron and are analyzed at the beginning and end of each sample analysis period. The ICSs are evaluated against recovery control limits of 80 to 120 percent.

ICS analysis results were evaluated for all samples using the criteria in the "Guidelines". All ICS recoveries and results were acceptable.

16. Field QA/QC Samples

The field QA/QC consisted of 10 trip blank samples, 4 rinse blank samples, and 6 field duplicate sample sets.

16.1 Trip Blank Sample Analysis

To evaluate contamination from sample collection, transportation, storage, and analytical activities, trip blanks were submitted to the laboratory for VOC analysis. All results were non-detect for the compounds of interest with the exception of some low concentrations of acetone, toluene and methylene chloride. All associated results with similar concentrations were qualified as non-detect (see Table 12).

16.2 Rinse Blank Sample Analysis

To assess field decontamination procedures, ambient conditions at the site, and cleanliness of sample containers, rinse blanks were submitted for analysis, as identified in Table 1. All results were non-detect for the analytes of interest with the exception of low concentrations of bis(2-ethylhexyl)phthalate and various dissolved metals. Associated samples with bis(2-ethylhexyl)phthalate concentrations similar to that of the rinse blank were previously qualified as non-detect for method blank contamination. All associated dissolved metals samples with results similar to that of the blanks were qualified as non-detect (see Table 13).

16.3 Field Duplicate Sample Analysis

To assess the analytical and sampling protocol precision, field duplicate sample sets were collected and submitted "blind" to the laboratory, as specified in Table 1. The RPDs associated with these duplicate samples must be less than 50 percent for water samples. If the reported concentration in either the investigative sample or its duplicate is less than five times the reporting limit (RL), the evaluation criteria is one times the RL value for water samples.

All field duplicate results were within acceptable agreement, with the exception of two dissolved metals. The associated results were qualified as estimated based on the variability demonstrated (see Table 14).

17. Analyte Reporting

The laboratory reported detected results down to the sample-specific MDL for each analyte. Positive analyte detections less than the RL but greater than the sample-specific MDL were reported as estimated (J) in Table 2 unless qualified otherwise in this memorandum. Non-detect results were presented as non-detect at the sample-specific MDL in Table 2.

18. Target Compound Identification

To minimize erroneous compound identification during organic analyses, qualitative criteria including compound retention time and mass spectra were evaluated according to the identification criteria established by the methods. The samples identified in Table 1 were reviewed. The organic compounds reported adhered to the specified identification criteria.

19. Conclusion

Based on the assessment detailed in the foregoing, the data summarized in Table 2 are acceptable with the specific qualifications and exceptions noted herein.

Table 1

Sample Collection and Analysis Summary
Annual Groundwater Sampling
Avtex Fibers Superfund Site
Front Royal, Virginia
July - August 2017

Sample Delivery Group	Sample Identification	Location	Matrix	Collection Date (mm/dd/yyyy)	Collection Time (hr:min)	Parameters							Comments
						Cyanide (free)	SVOCs	VOCs	Mercury, dissolved	Metals by ICP/MS, dissolved	Metals by ICP, dissolved	Chloride, Sulfate	
4901328071	2017AN-206	206	Water	07/13/2017	15:35	X	X		X	X			P-MS/MSD
4901328071	2017AN-605A	605A	Water	07/12/2017	17:15	X	X	X	X	X			
4901328071	2017AN-605B	605B	Water	07/13/2017	11:35	X	X	X	X	X			P-MS/MSD
4901328071	TB-071217	-	Water	07/12/2017	08:00			X					Trip Blank
4901329691	2017AN-116R	116R	Water	07/14/2017	18:15	X	X	X	X	X			
4901329691	2017AN-162	162	Water	07/16/2017	16:30	X	X	X	X	X			
4901329691	2017AN-216	216	Water	07/15/2017	11:15	X	X	X	X	X			
4901329691	2017AN-316	316	Water	07/15/2017	09:20	X	X	X	X	X			P-MS/MSD
4901329691	2017AN-501A	501A	Water	07/17/2017	11:25	X	X	X	X	X			
4901329691	2017AN-501B	501B	Water	07/17/2017	14:30	X	X	X	X	X			
4901329691	2017AN-501C	501C	Water	07/17/2017	16:00	X	X	X	X	X			
4901329691	2017AN-602	602	Water	07/16/2017	14:20	X	X	X	X	X			
4901329691	2017AN-604-Z2	604	Water	07/17/2017	15:40	X	X	X	X	X			
4901329691	2017AN-604-Z3	604	Water	07/17/2017	15:50	X	X	X	X	X			
4901329691	2017AN-604-Z4	604	Water	07/17/2017	16:00	X	X	X	X	X			
4901329691	2017AN-604-Z1	604	Water	07/17/2017	15:30	X	X	X	X	X			
4901329691	2017AN-606A	606A	Water	07/15/2017	08:55	X	X	X	X	X			
4901329691	2017AN-606B	606B	Water	07/17/2017	19:10	X	X	X	X	X			

Table 1

Sample Collection and Analysis Summary
Annual Groundwater Sampling
Avtex Fibers Superfund Site
Front Royal, Virginia
July - August 2017

						Parameters							
Sample Delivery Group	Sample Identification	Location	Matrix	Collection Date (mm/dd/yyyy)	Collection Time (hr:min)	Cyanide (free)	SVOCs	VOCs	Mercury, dissolved	Metals by ICP/MS, dissolved	Metals by ICP, dissolved	Chloride, Sulfate	Comments
4901329691	RB-071817	-	Water	07/18/2017	10:00	X	X	X	X	X	X	X	Rinse Blank
4901329691	TB-071817	-	Water	07/14/2017	08:00			X					Trip Blank
4901330041	2017AN-115	115	Water	07/18/2017	08:50	X	X	X	X	X			
4901330041	2017AN-215	215	Water	07/18/2017	10:00	X	X	X	X	X			P-MS/MSD
4901330041	2017AN-336	336	Water	07/18/2017	12:30	X	X	X	X	X			MS/MSD
4901330041	2017AN-336D	336	Water	07/18/2017	12:30	X	X	X	X	X			FD (2017AN-336)
4901330041	2017AN-603-Z1	603	Water	07/18/2017	11:05	X	X	X	X	X			
4901330041	2017AN-603-Z2	603	Water	07/18/2017	11:15	X	X	X	X	X			
4901330041	2017AN-603-Z3	603	Water	07/18/2017	11:25	X	X	X	X	X			
4901330041	2017AN-603-Z4	603	Water	07/18/2017	11:35	X	X	X	X	X			P-MS/MSD
4901330041	TB-071817	-	Water	07/14/2017	08:00			X					Trip Blank
4901331061	2017AN-136	136	Water	07/19/2017	08:25	X	X	X	X	X			
4901331061	2017AN-181	181	Water	07/18/2017	17:30	X	X	X	X	X			P-MS/MSD
4901331061	2017AN-185	185	Water	07/18/2017	14:45	X	X	X	X	X			
4901331061	2017AN-206-Resample	206	Water	07/19/2017	09:45			X					
4901331061	2017AN-GM-02A	GM-02A	Water	07/19/2017	09:05	X	X	X	X	X			
4901331061	2017AN-GM-02B	GM-02B	Water	07/19/2017	10:50	X	X	X	X	X			
4901331061	TB-071817-2	-	Water	07/18/2017	16:00			X					Trip Blank

Table 1

Sample Collection and Analysis Summary
Annual Groundwater Sampling
Avtex Fibers Superfund Site
Front Royal, Virginia
July - August 2017

						Parameters							
Sample Delivery Group	Sample Identification	Location	Matrix	Collection Date (mm/dd/yyyy)	Collection Time (hr:min)	Cyanide (free)	SVOCs	VOCs	Mercury, dissolved	Metals by ICP/MS, dissolved	Metals by ICP, dissolved	Chloride, Sulfate	Comments
4901336261	2017AN-008	008	Water	07/25/2017	08:05				X	X	X	X	P-MS/MSD
4901336261	2017AN-029	029	Water	07/25/2017	17:25	X	X	X	X	X	X	X	
4901336261	2017AN-103	103	Water	07/25/2017	11:50	X	X	X	X	X			
4901336261	2017AN-108	108	Water	07/25/2017	11:45				X	X	X	X	
4901336261	2017AN-113	113	Water	07/25/2017	16:10				X	X	X	X	
4901336261	2017AN-118	118	Water	07/26/2017	09:05		X	X	X	X			
4901336261	2017AN-119	119	Water	07/26/2017	11:25		X	X	X	X			
4901336261	2017AN-120R	120R	Water	07/26/2017	15:20		X	X	X	X			
4901336261	2017AN-128	128	Water	07/25/2017	17:05	X	X	X	X	X			MS/MSD
4901336261	2017AN-129	129	Water	07/26/2017	11:15				X	X	X	X	
4901336261	2017AN-133	133	Water	07/26/2017	17:05	X	X	X	X	X			P-MS/MSD
4901336261	2017AN-203	203	Water	07/25/2017	14:30	X	X	X	X	X			
4901336261	2017AN-301	301	Water	07/25/2017	09:55	X	X	X	X	X			
4901336261	2017AN-B-48A	B-48A	Water	07/26/2017	15:30				X	X	X	X	
4901336261	2017AN-GPW-02	GPW-02	Water	07/25/2017	15:05		X	X	X	X			
4901336261	2017AN-GPW-03R	GPW-03R	Water	07/24/2017	16:45		X	X	X	X			
4901336261	2017AN-MW-05	MW-05	Water	07/26/2017	14:15		X	X	X	X			
4901336261	TB-072517	-	Water	07/25/2017	08:00			X					Trip Blank

Table 1

Sample Collection and Analysis Summary
Annual Groundwater Sampling
Avtex Fibers Superfund Site
Front Royal, Virginia
July - August 2017

						Parameters							
Sample Delivery Group	Sample Identification	Location	Matrix	Collection Date (mm/dd/yyyy)	Collection Time (hr:min)	Cyanide (free)	SVOCs	VOCs	Mercury, dissolved	Metals by ICP/MS, dissolved	Metals by ICP, dissolved	Chloride, Sulfate	Comments
4901336421	2017AN-110	110	Water	07/27/2017	09:18				X	X	X	X	P-MS/MSD
4901336421	2017AN-130R	130R	Water	07/27/2017	10:20		X	X	X	X			
4901336421	2017AN-210	210	Water	07/27/2017	10:30	X	X	X	X	X			
4901336421	2017AN-GPW-14	GPW-14	Water	07/27/2017	08:20		X	X	X	X			P-MS/MSD
4901336421	TB-072717	-	Water	07/27/2017	08:00			X					Trip Blank
4901338271	2017AN-012	012	Water	07/29/2017	11:35				X	X	X	X	
4901338271	2017AN-013	013	Water	07/29/2017	15:25				X	X	X	X	
4901338271	2017AN-014R	014R	Water	07/30/2017	09:40				X	X	X	X	
4901338271	2017AN-022	022	Water	07/28/2017	13:55				X	X	X	X	
4901338271	2017AN-023	023	Water	07/28/2017	10:55				X	X	X	X	
4901338271	2017AN-024	024	Water	07/28/2017	08:50	X	X		X	X			
4901338271	2017AN-025R	025R	Water	07/28/2017	08:20				X	X	X	X	
4901338271	2017AN-105	105	Water	07/29/2017	14:45	X	X		X	X			
4901338271	2017AN-112	112	Water	07/29/2017	14:25				X	X	X	X	
4901338271	2017AN-132	132	Water	07/27/2017	11:45	X	X		X	X	X	X	P-MS/MSD
4901338271	2017AN-132D	132	Water	07/27/2017	11:45	X	X		X	X	X	X	FD (2017AN-132)
4901338271	2017AN-138	138	Water	07/30/2017	09:35	X	X		X	X			P-MS/MSD
4901338271	2017AN-138D	138	Water	07/30/2017	09:35	X	X	X	X	X			FD (2017AN-138)

Table 1

Sample Collection and Analysis Summary
Annual Groundwater Sampling
Avtex Fibers Superfund Site
Front Royal, Virginia
July - August 2017

						Parameters							
Sample Delivery Group	Sample Identification	Location	Matrix	Collection Date (mm/dd/yyyy)	Collection Time (hr:min)	Cyanide (free)	SVOCs	VOCs	Mercury, dissolved	Metals by ICP/MS, dissolved	Metals by ICP, dissolved	Chloride, Sulfate	Comments
4901338271	2017AN-232	232	Water	07/27/2017	15:30	X	X		X	X			
4901338271	2017AN-238	238	Water	07/30/2017	13:25	X	X		X	X			
4901338271	2017AN-338	338	Water	07/30/2017	13:25	X	X	X	X	X			
4901338271	2017AN-601	601	Water	07/28/2017	09:50	X	X		X	X			
4901338271	2017AN-GM-09R	GM-09R	Water	07/30/2017	12:10	X	X	X	X	X			
4901338271	2017AN-GPW-15R	GPW-15R	Water	07/29/2017	07:45		X	X	X	X			
4901338271	2017AN-MW-03R	MW-03R	Water	07/28/2017	14:05	X	X	X	X	X			
4901338271	2017AN-MW-07	MW-07	Water	07/29/2017	13:15		X	X	X	X			
4901338271	2017AN-MW-08	MW-08	Water	07/29/2017	10:20		X	X	X	X			MS/MSD
4901338271	2017AN-MW-08D	MW-08	Water	07/29/2017	10:20		X	X	X	X			FD (2017AN-MW-08)
4901338271	2017AN-MW-12	MW-12	Water	07/29/2017	08:15		X	X	X	X	X	X	
4901338271	2017AN-PW-0	PW-0	Water	07/30/2017	16:10	X	X		X	X			
4901338271	2017AN-PW-02	PW-02	Water	07/29/2017	16:35	X	X	X	X	X			
4901338271	2017AN-PZ-03	PZ-03	Water	07/27/2017	16:15				X	X	X	X	
4901338271	2017AN-PZ-07	PZ-07	Water	07/28/2017	15:17				X	X	X	X	
4901338271	TB-072817	-	Water	07/28/2017	08:00			X					Trip Blank
4901338271	2017AN-WP-10	WP-10	Water	07/28/2017	11:15	X	X	X	X	X			
4901338271	2017AN-WP-11	WP-11	Water	07/27/2017	14:40	X	X	X	X	X			

Table 1

Sample Collection and Analysis Summary
Annual Groundwater Sampling
Avtex Fibers Superfund Site
Front Royal, Virginia
July - August 2017

						Parameters							
Sample Delivery Group	Sample Identification	Location	Matrix	Collection Date (mm/dd/yyyy)	Collection Time (hr:min)	Cyanide (free)	SVOCs	VOCs	Mercury, dissolved	Metals by ICP/MS, dissolved	Metals by ICP, dissolved	Chloride, Sulfate	Comments
4901338571	2017AN-PZ-06	PZ-06	Water	07/31/2017	08:00	X	X	X	X	X	X	X	MS/MSD
4901338571	2017AN-PZ-06D	PZ-06	Water	07/31/2017	08:00	X	X	X	X	X	X	X	FD (2017AN-PZ-06)
4901338571	TB-073117	-	Water	07/31/2017	08:00			X					Trip Blank
4901339321	2017AN-114	114	Water	08/01/2017	10:05	X	X	X	X	X	X	X	P-MS/MSD
4901339321	2017AN-135	135	Water	08/01/2017	08:25		X	X	X	X			
4901339321	2017AN-205	205	Water	07/31/2017	14:45	X	X	X	X	X			
4901339321	2017AN-FAB1-2	FAB 1-2	Water	08/01/2017	15:25				X	X	X	X	P-MS/MSD
4901339321	2017AN-FAB3-1	FAB 3-1	Water	08/01/2017	15:40				X	X	X	X	
4901339321	2017AN-FAB6-North	FAB 6-North	Water	08/01/2017	14:10				X	X	X	X	
4901339321	2017AN-FAB6-South	FAB 6-South	Water	08/01/2017	14:30				X	X	X	X	
4901339321	2017AN-MW-09	MW-09	Water	07/31/2017	11:20	X	X	X	X	X			P-MS/MSD
4901339321	2017AN-MW-10	MW-10	Water	07/31/2017	10:30	X	X	X	X	X			
4901339321	2017AN-MW-11	MW-11	Water	07/31/2017	15:30		X	X	X	X			
4901339321	RB-073117	-	Water	07/31/2017	15:00	X	X	X	X	X	X	X	Rinse Blank
4901339321	RB-080117	-	Water	08/01/2017	12:00	X	X	X	X	X	X	X	Rinse Blank
4901339321	2017AN-SB1-1	SB 1-1	Water	08/01/2017	09:20				X	X	X	X	P-MS/MSD
4901339321	2017AN-SB1-2	SB 1-2	Water	08/01/2017	08:35				X	X	X	X	
4901339321	2017AN-SB1-3	SB 1-3	Water	08/01/2017	15:00				X	X	X	X	P-MS/MSD

Table 1

Sample Collection and Analysis Summary
Annual Groundwater Sampling
Avtex Fibers Superfund Site
Front Royal, Virginia
July - August 2017

						Parameters							
Sample Delivery Group	Sample Identification	Location	Matrix	Collection Date (mm/dd/yyyy)	Collection Time (hr:min)	Cyanide (free)	SVOCs	VOCs	Mercury, dissolved	Metals by ICP/MS, dissolved	Metals by ICP, dissolved	Chloride, Sulfate	Comments
4901339321	2017AN-SB1-4	SB 1-4	Water	08/01/2017	08:10				X	X	X	X	
4901339321	2017AN-SB3-1	SB 3-1	Water	08/01/2017	15:55				X	X	X	X	
4901339321	2017AN-SB4-1	SB 4-1	Water	08/01/2017	09:40				X	X	X	X	
4901339321	2017AN-SB4-2	SB 4-2	Water	08/01/2017	10:00				X	X	X	X	
4901339321	TB-080117	-	Water	08/01/2017	08:00			X					Trip Blank
4901339321	2017AN-TW-02	TW-02	Water	08/01/2017	13:45	X	X	X	X	X			
4901339321	2017AN-TW-03	TW-03	Water	08/01/2017	14:50	X	X	X	X	X			P-MS/MSD
4901344761	2017AN-024-Resample	024	Water	08/09/2017	10:00			X					
4901344761	2017AN-105-Resample	105	Water	08/08/2017	17:15			X					
4901344761	2017AN-305	305	Water	08/08/2017	12:50	X	X	X	X	X			P-MS/MSD
4901344761	RB-0800817	-	Water	08/08/2017	17:00	X	X	X	X	X	X	X	Rinse Blank
4901344761	TB-080917-2	-	Water	08/01/2017	08:00			X					Trip Blank
4901344761	2017AN-TW-01	TW-01	Water	08/09/2017	08:00	X	X	X	X	X			
4901345701	2017AN-132-Resample	132	Water	08/10/2017	09:10			X					
4901345701	2017AN-132D-Resample	132	Water	08/10/2017	09:10			X					FD (2017AN-132-Resample)
4901345701	2017AN-138-Resample	138	Water	08/09/2017	16:30			X					
4901345701	2017AN-232-Resample	232	Water	08/10/2017	10:15			X					
4901345701	2017AN-238-Resample	238	Water	08/09/2017	15:10			X					

Table 1

Sample Collection and Analysis Summary
Annual Groundwater Sampling
Avtex Fibers Superfund Site
Front Royal, Virginia
July - August 2017

Sample Delivery Group	Sample Identification	Location	Matrix	Collection Date (mm/dd/yyyy)	Collection Time (hr:min)	Parameters: Cyanide (free)	SVOCs	VOCs	Mercury, dissolved	Metals by ICP/MS, dissolved	Metals by ICP, dissolved	Chloride, Sulfate	Comments
4901345701	2017AN-601-Resample	GM-02A	Water	08/10/2017	15:30			X					
4901345701	2017AN-PW-0-Resample	PW-0	Water	08/09/2017	11:40			X					MS/MSD
4901345701	TB-081017-2	-	Water	08/01/2017	08:00			X					Trip Blank

Notes:

"--"	- Not applicable
FD	- Field Duplicate
MS/MSD	- Matrix Spike/Matrix Spike Duplicate
P-MS/MSD	- Matrix Spike/Matrix Spike Duplicate - partial parameters
SVOCs	- Semi-volatile Organic Compounds
VOCs	- Volatile Organic Compounds
ICP	- Inductively Coupled Plasma
ICP/MS	- Inductively Coupled Plasma/Matrix Spike

Table 2

Analytical Results Summary
Annual Groundwater Sampling
Avtex Fibers Superfund Site
Front Royal, Virginia
July - August 2017

Sample Location:		008	012	013	014R	022	023	024	024
Sample ID:		2017AN-008	2017AN-012	2017AN-013	2017AN-014R	2017AN-022	2017AN-023	2017AN-024	2017AN-024-Resample
Sample Date:		7/25/2017	7/29/2017	7/29/2017	7/30/2017	7/28/2017	7/28/2017	7/28/2017	8/9/2017
Parameters	**Units**								
Metals									
Aluminum (dissolved)	mg/L	--	--	--	--	--	--	0.00840 U	--
Antimony (dissolved)	mg/L	--	--	--	--	--	--	0.000800 U	--
Arsenic (dissolved)	mg/L	0.000400 U	0.00240	0.00359	0.889	0.00180 U	0.0106	0.00228	--
Beryllium (dissolved)	mg/L	0.000100 U	0.000100 U	0.000100 U	0.000100 U	0.000100 U	0.000100 U	--	--
Cadmium (dissolved)	mg/L	0.000100 U	0.000100 U	0.000100 U	0.000100 U	0.000100 U	0.000100 U	0.000100 U	--
Calcium (dissolved)	mg/L	214	132	236	370	37.4	77.9	--	--
Chromium (dissolved)	mg/L	0.000602 J	0.000500 U	0.000500 U	0.000500 U	0.000500 U	0.00272	0.000500 U	--
Cobalt (dissolved)	mg/L	--	--	--	--	--	--	0.000648 J	--
Copper (dissolved)	mg/L	0.00120 U	0.00120 U	0.00120 U	0.00120 U	0.00120 U	0.00165 J	--	--
Iron (dissolved)	mg/L	--	--	--	--	--	--	0.0812	--
Lead (dissolved)	mg/L	0.000100 U	0.000100 U	0.000100 U	0.000103 J	0.000100 U	0.00158 J	0.000109 J	--
Magnesium (dissolved)	mg/L	22.8	18.4	33.9	105	5.87	45.6	--	--
Manganese (dissolved)	mg/L	--	--	--	--	--	--	0.199	--
Mercury (dissolved)	mg/L	0.000100 U	0.000100 U	0.000100 U	0.000100 U	0.000100 U	0.000100 U	0.000100 U	--
Nickel (dissolved)	mg/L	0.00218	0.00175 J	0.0137	0.0625	0.000864 J	0.00772	0.00232	--
Selenium (dissolved)	mg/L	0.000300 U	0.000433 U	0.000448 U	0.000697 U	0.00154 U	0.000910 U	--	--
Sodium (dissolved)	mg/L	12.3 J	29.0	64.2	626	36.8	126	--	--
Thallium (dissolved)	mg/L	--	--	--	--	--	--	--	--
Vanadium (dissolved)	mg/L	--	--	--	--	--	--	0.00657 U	--
Zinc (dissolved)	mg/L	0.0127 J	0.00606 J	0.00520 U	0.00555 J	0.00520 U	0.0423	0.00520 U	--
Semi-volatile Organic Compounds									
1,2,4-Trichlorobenzene	mg/L	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/L	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/L	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/L	--	--	--	--	--	--	--	--
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	mg/L	--	--	--	--	--	--	--	--
2,4,5-Trichlorophenol	mg/L	--	--	--	--	--	--	--	--
2,4,6-Trichlorophenol	mg/L	--	--	--	--	--	--	--	--
2,4-Dichlorophenol	mg/L	--	--	--	--	--	--	--	--
2,4-Dimethylphenol	mg/L	--	--	--	--	--	--	--	--
2,4-Dinitrophenol	mg/L	--	--	--	--	--	--	--	--
2,4-Dinitrotoluene	mg/L	--	--	--	--	--	--	--	--
2,6-Dinitrotoluene	mg/L	--	--	--	--	--	--	--	--
2-Chloronaphthalene	mg/L	--	--	--	--	--	--	--	--
2-Chlorophenol	mg/L	--	--	--	--	--	--	--	--
2-Methylnaphthalene	mg/L	--	--	--	--	--	--	--	--
2-Methylphenol	mg/L	--	--	--	--	--	--	0.00154 U	--

Table 2

Analytical Results Summary
Annual Groundwater Sampling
Avtex Fibers Superfund Site
Front Royal, Virginia
July - August 2017

Sample Location:		008	012	013	014R	022	023	024	024
Sample ID:		2017AN-008	2017AN-012	2017AN-013	2017AN-014R	2017AN-022	2017AN-023	2017AN-024	2017AN-024-Resample
Sample Date:		7/25/2017	7/29/2017	7/29/2017	7/30/2017	7/28/2017	7/28/2017	7/28/2017	8/9/2017
Parameters	**Units**								
Semi-volatile Organic Compounds (Continued)									
2-Nitroaniline	mg/L	--	--	--	--	--	--	--	--
2-Nitrophenol	mg/L	--	--	--	--	--	--	--	--
3&4-Methylphenol	mg/L	--	--	--	--	--	--	0.00135 U	--
3,3'-Dichlorobenzidine	mg/L	--	--	--	--	--	--	--	--
3-Nitroaniline	mg/L	--	--	--	--	--	--	--	--
4,6-Dinitro-2-methylphenol	mg/L	--	--	--	--	--	--	--	--
4-Bromophenyl phenyl ether	mg/L	--	--	--	--	--	--	--	--
4-Chloro-3-methylphenol	mg/L	--	--	--	--	--	--	--	--
4-Chloroaniline	mg/L	--	--	--	--	--	--	--	--
4-Chlorophenyl phenyl ether	mg/L	--	--	--	--	--	--	--	--
4-Nitroaniline	mg/L	--	--	--	--	--	--	--	--
4-Nitrophenol	mg/L	--	--	--	--	--	--	--	--
Acenaphthene	mg/L	--	--	--	--	--	--	--	--
Acenaphthylene	mg/L	--	--	--	--	--	--	--	--
Anthracene	mg/L	--	--	--	--	--	--	--	--
Benzo(a)anthracene	mg/L	--	--	--	--	--	--	--	--
Benzo(a)pyrene	mg/L	--	--	--	--	--	--	--	--
Benzo(b)fluoranthene	mg/L	--	--	--	--	--	--	--	--
Benzo(g,h,i)perylene	mg/L	--	--	--	--	--	--	--	--
Benzo(k)fluoranthene	mg/L	--	--	--	--	--	--	--	--
bis(2-Chloroethoxy)methane	mg/L	--	--	--	--	--	--	--	--
bis(2-Chloroethyl)ether	mg/L	--	--	--	--	--	--	--	--
bis(2-Ethylhexyl)phthalate (DEHP)	mg/L	--	--	--	--	--	--	0.00287 U	--
Butyl benzylphthalate (BBP)	mg/L	--	--	--	--	--	--	--	--
Carbazole	mg/L	--	--	--	--	--	--	--	--
Chrysene	mg/L	--	--	--	--	--	--	--	--
Dibenz(a,h)anthracene	mg/L	--	--	--	--	--	--	--	--
Dibenzofuran	mg/L	--	--	--	--	--	--	--	--
Diethyl phthalate	mg/L	--	--	--	--	--	--	--	--
Dimethyl phthalate	mg/L	--	--	--	--	--	--	--	--
Di-n-butylphthalate (DBP)	mg/L	--	--	--	--	--	--	--	--
Di-n-octyl phthalate (DnOP)	mg/L	--	--	--	--	--	--	--	--
Fluoranthene	mg/L	--	--	--	--	--	--	--	--
Fluorene	mg/L	--	--	--	--	--	--	--	--
Hexachlorobenzene	mg/L	--	--	--	--	--	--	--	--
Hexachlorobutadiene	mg/L	--	--	--	--	--	--	--	--
Hexachlorocyclopentadiene	mg/L	--	--	--	--	--	--	--	--
Hexachloroethane	mg/L	--	--	--	--	--	--	--	--

Table 2

Analytical Results Summary
Annual Groundwater Sampling
Avtex Fibers Superfund Site
Front Royal, Virginia
July - August 2017

Sample Location:		008	012	013	014R	022	023	024	024
Sample ID:		2017AN-008	2017AN-012	2017AN-013	2017AN-014R	2017AN-022	2017AN-023	2017AN-024	2017AN-024-Resample
Sample Date:		7/25/2017	7/29/2017	7/29/2017	7/30/2017	7/28/2017	7/28/2017	7/28/2017	8/9/2017
Parameters	**Units**								
Semi-volatile Organic Compounds (Continued)									
Indeno(1,2,3-cd)pyrene	mg/L	--	--	--	--	--	--	--	--
Isophorone	mg/L	--	--	--	--	--	--	--	--
Naphthalene	mg/L	--	--	--	--	--	--	0.000356 U	--
Nitrobenzene	mg/L	--	--	--	--	--	--	--	--
N-Nitrosodi-n-propylamine	mg/L	--	--	--	--	--	--	--	--
N-Nitrosodiphenylamine	mg/L	--	--	--	--	--	--	--	--
Pentachlorophenol	mg/L	--	--	--	--	--	--	0.00317 U	--
Phenanthrene	mg/L	--	--	--	--	--	--	--	--
Phenol	mg/L	--	--	--	--	--	--	0.00144 U	--
Pyrene	mg/L	--	--	--	--	--	--	--	--
Volatile Organic Compounds									
1,1,1-Trichloroethane	mg/L	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/L	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/L	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/L	--	--	--	--	--	--	--	--
1,1-Dichloroethene	mg/L	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/L	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/L	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/L	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/L	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/L	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/L	--	--	--	--	--	--	--	--
2-Butanone (Methyl ethyl ketone) (MEK)	mg/L	--	--	--	--	--	--	--	--
2-Hexanone	mg/L	--	--	--	--	--	--	--	--
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	mg/L	--	--	--	--	--	--	--	--
Acetone	mg/L	--	--	--	--	--	--	--	R
Benzene	mg/L	--	--	--	--	--	--	--	--
Bromodichloromethane	mg/L	--	--	--	--	--	--	--	--
Bromoform	mg/L	--	--	--	--	--	--	--	--
Bromomethane (Methyl bromide)	mg/L	--	--	--	--	--	--	--	--
Carbon disulfide	mg/L	--	--	--	--	--	--	--	0.000220 U
Carbon tetrachloride	mg/L	--	--	--	--	--	--	--	--
Chlorobenzene	mg/L	--	--	--	--	--	--	--	--
Chloroethane	mg/L	--	--	--	--	--	--	--	--
Chloroform (Trichloromethane)	mg/L	--	--	--	--	--	--	--	--
Chloromethane (Methyl chloride)	mg/L	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/L	--	--	--	--	--	--	--	--

Table 2

Analytical Results Summary
Annual Groundwater Sampling
Avtex Fibers Superfund Site
Front Royal, Virginia
July - August 2017

Sample Location:		008	012	013	014R	022	023	024	024
Sample ID:		2017AN-008	2017AN-012	2017AN-013	2017AN-014R	2017AN-022	2017AN-023	2017AN-024	2017AN-024-Resample
Sample Date:		7/25/2017	7/29/2017	7/29/2017	7/30/2017	7/28/2017	7/28/2017	7/28/2017	8/9/2017
Parameters	**Units**								
Volatile Organic Compounds (Continued)									
cis-1,3-Dichloropropene	mg/L	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/L	--	--	--	--	--	--	--	--
Ethylbenzene	mg/L	--	--	--	--	--	--	--	--
Methylene chloride	mg/L	--	--	--	--	--	--	--	--
Styrene	mg/L	--	--	--	--	--	--	--	--
Tetrachloroethene	mg/L	--	--	--	--	--	--	--	--
Toluene	mg/L	--	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/L	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/L	--	--	--	--	--	--	--	--
Trichloroethene	mg/L	--	--	--	--	--	--	--	--
Vinyl chloride	mg/L	--	--	--	--	--	--	--	--
Xylenes (total)	mg/L	--	--	--	--	--	--	--	--
General Chemistry									
Chloride	mg/L	15.8	46.0	26.0	111	16.3	10.0	--	--
Cyanide (free)	mg/L	--	--	--	--	--	--	0.00154 U	--
Sulfate	mg/L	--	354	699	2600	29.1	177	--	--

Notes:.

"--" - Not analyzed
U - Not detected at the associated reporting limit
J - Estimated concentration
UJ - Not detected; associated reporting limit is estimated
R - Rejected

Table 2

Analytical Results Summary
Annual Groundwater Sampling
Avtex Fibers Superfund Site
Front Royal, Virginia
July - August 2017

Sample Location:		025R	029	103	105	105	108	110	112
Sample ID:		2017AN-025R	2017AN-029	2017AN-103	2017AN-105	2017AN-105-Resample	2017AN-108	2017AN-110	2017AN-112
Sample Date:		7/28/2017	7/25/2017	7/25/2017	7/29/2017	8/8/2017	7/25/2017	7/27/2017	7/29/2017
Parameters	**Units**								
Metals									
Aluminum (dissolved)	mg/L	--	0.00840 U	0.00840 U	0.00840 U	--	--	--	--
Antimony (dissolved)	mg/L	--	0.000800 U	0.000800 U	0.000800 U	--	--	--	--
Arsenic (dissolved)	mg/L	0.00240	0.000400 U	0.000425 J	0.00267	--	0.000400 U	--	0.00407
Beryllium (dissolved)	mg/L	0.000100 U	0.000100 U	--	--	--	0.000100 U	--	0.000100 U
Cadmium (dissolved)	mg/L	0.000100 U	0.000100 U	0.000100 U	0.000100 U	--	0.000100 U	--	0.000100 U
Calcium (dissolved)	mg/L	146	155	--	--	--	191	199	211
Chromium (dissolved)	mg/L	0.000615 J	0.000500 U	0.000500 U	0.000572 J	--	0.000500 U	--	0.000500 U
Cobalt (dissolved)	mg/L	--	0.000202 J	0.00949	0.000329 J	--	--	--	--
Copper (dissolved)	mg/L	0.00120 U	0.00120 U	--	--	--	0.00120 U	--	0.00120 U
Iron (dissolved)	mg/L	--	0.0100 U	4.54	2.57	--	--	--	--
Lead (dissolved)	mg/L	0.000100 U	0.000100 U	0.000100 U	0.000100 U	--	0.000100 U	--	0.000100 U
Magnesium (dissolved)	mg/L	28.5	19.9	--	--	--	17.1	35.6	0.250 U
Manganese (dissolved)	mg/L	--	0.00150 U	6.30	0.546	--	--	--	--
Mercury (dissolved)	mg/L	0.000100 U	0.000100 U	0.000100 U	0.000100 U	--	0.000100 U	0.000100 U	0.000100 U
Nickel (dissolved)	mg/L	0.00113 J	0.00170 J	0.00187 J	0.00628	--	0.000500 U	--	0.0228
Selenium (dissolved)	mg/L	0.000594 U	0.00111 J	--	--	--	0.000300 U	--	0.000582 U
Sodium (dissolved)	mg/L	93.4	51.2 J	--	--	--	13.7 J	256	28.9
Thallium (dissolved)	mg/L	--	--	--	--	--	--	--	--
Vanadium (dissolved)	mg/L	--	0.000700 U	0.000700 U	0.00321 U	--	--	--	--
Zinc (dissolved)	mg/L	0.00520 U	0.00520 U	0.148	0.00863 J	--	0.00520 U	--	0.00544 J
Semi-volatile Organic Compounds									
1,2,4-Trichlorobenzene	mg/L	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/L	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/L	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/L	--	--	--	--	--	--	--	--
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	mg/L	--	--	--	--	--	--	--	--
2,4,5-Trichlorophenol	mg/L	--	--	--	--	--	--	--	--
2,4,6-Trichlorophenol	mg/L	--	--	--	--	--	--	--	--
2,4-Dichlorophenol	mg/L	--	--	--	--	--	--	--	--
2,4-Dimethylphenol	mg/L	--	--	--	--	--	--	--	--
2,4-Dinitrophenol	mg/L	--	--	--	--	--	--	--	--
2,4-Dinitrotoluene	mg/L	--	--	--	--	--	--	--	--
2,6-Dinitrotoluene	mg/L	--	--	--	--	--	--	--	--
2-Chloronaphthalene	mg/L	--	--	--	--	--	--	--	--
2-Chlorophenol	mg/L	--	--	--	--	--	--	--	--
2-Methylnaphthalene	mg/L	--	--	--	--	--	--	--	--
2-Methylphenol	mg/L	--	0.00154 U	0.00154 U	0.00148 U	--	--	--	--

Table 2

Analytical Results Summary
Annual Groundwater Sampling
Avtex Fibers Superfund Site
Front Royal, Virginia
July - August 2017

Sample Location:		025R	029	103	105	105	108	110	112
Sample ID:		2017AN-025R	2017AN-029	2017AN-103	2017AN-105	2017AN-105-Resample	2017AN-108	2017AN-110	2017AN-112
Sample Date:		7/28/2017	7/25/2017	7/25/2017	7/29/2017	8/8/2017	7/25/2017	7/27/2017	7/29/2017
Parameters	**Units**								
Semi-volatile Organic Compounds (Continued)									
2-Nitroaniline	mg/L	--	--	--	--	--	--	--	--
2-Nitrophenol	mg/L	--	--	--	--	--	--	--	--
3&4-Methylphenol	mg/L	--	0.00135 U	0.00135 U	0.0013 U	--	--	--	--
3,3'-Dichlorobenzidine	mg/L	--	--	--	--	--	--	--	--
3-Nitroaniline	mg/L	--	--	--	--	--	--	--	--
4,6-Dinitro-2-methylphenol	mg/L	--	--	--	--	--	--	--	--
4-Bromophenyl phenyl ether	mg/L	--	--	--	--	--	--	--	--
4-Chloro-3-methylphenol	mg/L	--	--	--	--	--	--	--	--
4-Chloroaniline	mg/L	--	--	--	--	--	--	--	--
4-Chlorophenyl phenyl ether	mg/L	--	--	--	--	--	--	--	--
4-Nitroaniline	mg/L	--	--	--	--	--	--	--	--
4-Nitrophenol	mg/L	--	--	--	--	--	--	--	--
Acenaphthene	mg/L	--	--	--	--	--	--	--	--
Acenaphthylene	mg/L	--	--	--	--	--	--	--	--
Anthracene	mg/L	--	--	--	--	--	--	--	--
Benzo(a)anthracene	mg/L	--	--	--	--	--	--	--	--
Benzo(a)pyrene	mg/L	--	--	--	--	--	--	--	--
Benzo(b)fluoranthene	mg/L	--	--	--	--	--	--	--	--
Benzo(g,h,i)perylene	mg/L	--	--	--	--	--	--	--	--
Benzo(k)fluoranthene	mg/L	--	--	--	--	--	--	--	--
bis(2-Chloroethoxy)methane	mg/L	--	--	--	--	--	--	--	--
bis(2-Chloroethyl)ether	mg/L	--	--	--	--	--	--	--	--
bis(2-Ethylhexyl)phthalate (DEHP)	mg/L	--	0.00144 U	0.00144 U	0.0021 U	--	--	--	--
Butyl benzylphthalate (BBP)	mg/L	--	--	--	--	--	--	--	--
Carbazole	mg/L	--	--	--	--	--	--	--	--
Chrysene	mg/L	--	--	--	--	--	--	--	--
Dibenz(a,h)anthracene	mg/L	--	--	--	--	--	--	--	--
Dibenzofuran	mg/L	--	--	--	--	--	--	--	--
Diethyl phthalate	mg/L	--	--	--	--	--	--	--	--
Dimethyl phthalate	mg/L	--	--	--	--	--	--	--	--
Di-n-butylphthalate (DBP)	mg/L	--	--	--	--	--	--	--	--
Di-n-octyl phthalate (DnOP)	mg/L	--	--	--	--	--	--	--	--
Fluoranthene	mg/L	--	--	--	--	--	--	--	--
Fluorene	mg/L	--	--	--	--	--	--	--	--
Hexachlorobenzene	mg/L	--	--	--	--	--	--	--	--
Hexachlorobutadiene	mg/L	--	--	--	--	--	--	--	--
Hexachlorocyclopentadiene	mg/L	--	--	--	--	--	--	--	--
Hexachloroethane	mg/L	--	--	--	--	--	--	--	--

Table 2

Analytical Results Summary
Annual Groundwater Sampling
Avtex Fibers Superfund Site
Front Royal, Virginia
July - August 2017

Sample Location:		025R	029	103	105	105	108	110	112
Sample ID:		2017AN-025R	2017AN-029	2017AN-103	2017AN-105	2017AN-105-Resample	2017AN-108	2017AN-110	2017AN-112
Sample Date:		7/28/2017	7/25/2017	7/25/2017	7/29/2017	8/8/2017	7/25/2017	7/27/2017	7/29/2017
Parameters	**Units**								
Semi-volatile Organic Compounds (Continued)									
Indeno(1,2,3-cd)pyrene	mg/L	--	--	--	--	--	--	--	--
Isophorone	mg/L	--	--	--	--	--	--	--	--
Naphthalene	mg/L	--	0.000356 U	0.000356 U	0.000343 U	--	--	--	--
Nitrobenzene	mg/L	--	--	--	--	--	--	--	--
N-Nitrosodi-n-propylamine	mg/L	--	--	--	--	--	--	--	--
N-Nitrosodiphenylamine	mg/L	--	--	--	--	--	--	--	--
Pentachlorophenol	mg/L	--	0.00317 U	0.00317 U	0.00306 U	--	--	--	--
Phenanthrene	mg/L	--	--	--	--	--	--	--	--
Phenol	mg/L	--	0.00144 U	0.00144 U	0.00139 U	--	--	--	--
Pyrene	mg/L	--	--	--	--	--	--	--	--
Volatile Organic Compounds									
1,1,1-Trichloroethane	mg/L	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/L	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/L	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/L	--	--	--	--	--	--	--	--
1,1-Dichloroethene	mg/L	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/L	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/L	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/L	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/L	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/L	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/L	--	--	--	--	--	--	--	--
2-Butanone (Methyl ethyl ketone) (MEK)	mg/L	--	--	--	--	--	--	--	--
2-Hexanone	mg/L	--	--	--	--	--	--	--	--
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	mg/L	--	--	--	--	--	--	--	--
Acetone	mg/L	--	0.00266 U	0.00266 U	--	R	--	--	--
Benzene	mg/L	--	--	--	--	--	--	--	--
Bromodichloromethane	mg/L	--	--	--	--	--	--	--	--
Bromoform	mg/L	--	--	--	--	--	--	--	--
Bromomethane (Methyl bromide)	mg/L	--	--	--	--	--	--	--	--
Carbon disulfide	mg/L	--	0.000220 U	0.000220 U	--	0.000220 U	--	--	--
Carbon tetrachloride	mg/L	--	--	--	--	--	--	--	--
Chlorobenzene	mg/L	--	--	--	--	--	--	--	--
Chloroethane	mg/L	--	--	--	--	--	--	--	--
Chloroform (Trichloromethane)	mg/L	--	--	--	--	--	--	--	--
Chloromethane (Methyl chloride)	mg/L	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/L	--	--	--	--	--	--	--	--

Table 2

Analytical Results Summary
Annual Groundwater Sampling
Avtex Fibers Superfund Site
Front Royal, Virginia
July - August 2017

Sample Location:		025R	029	103	105	105	108	110	112
Sample ID:		2017AN-025R	2017AN-029	2017AN-103	2017AN-105	2017AN-105-Resample	2017AN-108	2017AN-110	2017AN-112
Sample Date:		7/28/2017	7/25/2017	7/25/2017	7/29/2017	8/8/2017	7/25/2017	7/27/2017	7/29/2017
Parameters	**Units**								
Volatile Organic Compounds (Continued)									
cis-1,3-Dichloropropene	mg/L	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/L	--	--	--	--	--	--	--	--
Ethylbenzene	mg/L	--	--	--	--	--	--	--	--
Methylene chloride	mg/L	--	--	--	--	--	--	--	--
Styrene	mg/L	--	--	--	--	--	--	--	--
Tetrachloroethene	mg/L	--	--	--	--	--	--	--	--
Toluene	mg/L	--	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/L	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/L	--	--	--	--	--	--	--	--
Trichloroethene	mg/L	--	--	--	--	--	--	--	--
Vinyl chloride	mg/L	--	--	--	--	--	--	--	--
Xylenes (total)	mg/L	--	--	--	--	--	--	--	--
General Chemistry									
Chloride	mg/L	23.9	45.3	--	--	--	14.9	23.2	44.8
Cyanide (free)	mg/L	--	0.00154 U	0.00154 U	0.00154 U	--	--	--	--
Sulfate	mg/L	205	337	--	--	--	238	763	319

Notes:.

"--" - Not analyzed
U - Not detected at the associated reporting limit
J - Estimated concentration
UJ - Not detected; associated reporting limit is estimated
R - Rejected

Table 2

Analytical Results Summary
Annual Groundwater Sampling
Avtex Fibers Superfund Site
Front Royal, Virginia
July - August 2017

Sample Location:		113	114	115	116R	118	119	120R	128
Sample ID:		2017AN-113	2017AN-114	2017AN-115	2017AN-116R	2017AN-118	2017AN-119	2017AN-120R	2017AN-128
Sample Date:		7/25/2017	8/1/2017	7/18/2017	7/14/2017	7/26/2017	7/26/2017	7/26/2017	7/25/2017
Parameters	**Units**								
Metals									
Aluminum (dissolved)	mg/L	--	0.00840 U	--	0.0840 U	--	--	--	0.00840 U
Antimony (dissolved)	mg/L	--	0.000800 UJ	--	0.166	0.000800 U	0.000800 U	0.000800 U	0.000800 U
Arsenic (dissolved)	mg/L	0.000400 U	0.0147 J	--	1.33	0.000400 U	0.000400 U	0.000400 U	0.000400 U
Beryllium (dissolved)	mg/L	0.000100 U	0.000590 J	--	--	0.000100 U	0.000100 U	0.000100 U	0.000130 J
Cadmium (dissolved)	mg/L	0.000100 U	0.000100 UJ	--	0.00100 U	0.000100 U	0.000100 U	0.000100 U	0.000100 U
Calcium (dissolved)	mg/L	99.6	451	--	--	--	--	--	--
Chromium (dissolved)	mg/L	0.000500 U	0.000500 UJ	--	0.133	0.000500 U	0.000500 U	0.000500 U	0.000500 U
Cobalt (dissolved)	mg/L	--	0.00365 J	--	0.923	--	--	--	0.000437 J
Copper (dissolved)	mg/L	0.00120 U	0.00600 U	--	--	0.00120 U	0.00120 U	0.00120 U	0.00120 U
Iron (dissolved)	mg/L	--	14.3	--	0.232 J	--	--	--	8.02
Lead (dissolved)	mg/L	0.000100 U	0.000750 UJ	--	0.00100 U	0.000100 U	0.000100 U	0.000100 U	0.000100 U
Magnesium (dissolved)	mg/L	11.9	97.0	--	--	--	--	--	--
Manganese (dissolved)	mg/L	--	5.27	--	0.0302 J	--	--	--	1.09
Mercury (dissolved)	mg/L	0.000100 U	0.000100 U	0.000100 UJ	0.000100 U	0.000100 U	0.000100 U	0.000100 U	0.000100 U
Nickel (dissolved)	mg/L	0.000534 J	0.0706 J	--	3.38	0.00314	0.000500 U	0.000500 U	0.00252
Selenium (dissolved)	mg/L	0.000300 U	0.00287 J	--	--	0.000300 U	0.000300 U	0.000300 U	0.000300 U
Sodium (dissolved)	mg/L	5.90 J	301	--	--	--	--	--	--
Thallium (dissolved)	mg/L	--	--	--	--	0.000800 U	0.000800 U	0.000800 U	0.000800 U
Vanadium (dissolved)	mg/L	--	0.00350 U	--	0.119	0.000700 U	0.000700 U	0.000700 U	0.000700 U
Zinc (dissolved)	mg/L	0.00607 J	0.00570 J	--	0.853	0.0416	0.0630	0.00520 U	0.0741
Semi-volatile Organic Compounds									
1,2,4-Trichlorobenzene	mg/L	--	--	--	--	0.00202 U	0.00202 U	0.00202 U	--
1,2-Dichlorobenzene	mg/L	--	--	--	--	0.00212 U	0.00212 U	0.00212 U	--
1,3-Dichlorobenzene	mg/L	--	--	--	--	0.00192 U	0.00192 U	0.00192 U	--
1,4-Dichlorobenzene	mg/L	--	--	--	--	0.00192 U	0.00192 U	0.00192 U	--
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	mg/L	--	--	--	--	0.00173 U	0.00173 U	0.00173 U	--
2,4,5-Trichlorophenol	mg/L	--	--	--	--	0.00125 U	0.00125 U	0.00125 U	0.00125 U
2,4,6-Trichlorophenol	mg/L	--	--	--	--	0.00183 U	0.00183 U	0.00183 U	--
2,4-Dichlorophenol	mg/L	--	--	--	--	0.00212 U	0.00212 U	0.00212 U	0.00212 U
2,4-Dimethylphenol	mg/L	--	--	--	--	0.00154 U	0.00154 U	0.00154 U	--
2,4-Dinitrophenol	mg/L	--	--	--	--	0.00692 U	0.00692 U	0.00692 U	0.00692 U
2,4-Dinitrotoluene	mg/L	--	--	--	--	0.00154 U	0.00154 U	0.00154 U	--
2,6-Dinitrotoluene	mg/L	--	--	--	--	0.00144 U	0.00144 U	0.00144 U	0.00144 U
2-Chloronaphthalene	mg/L	--	--	--	--	0.00144 U	0.00144 U	0.00144 U	--
2-Chlorophenol	mg/L	--	--	--	--	0.00163 U	0.00163 U	0.00163 U	--
2-Methylnaphthalene	mg/L	--	--	--	--	0.000385 U	0.000385 U	0.000385 U	--
2-Methylphenol	mg/L	--	0.00178 U	0.00145 U	0.008 U	0.00154 U	0.00154 U	0.00154 U	--

Table 2

Analytical Results Summary
Annual Groundwater Sampling
Avtex Fibers Superfund Site
Front Royal, Virginia
July - August 2017

Sample Location:		113	114	115	116R	118	119	120R	128
Sample ID:		2017AN-113	2017AN-114	2017AN-115	2017AN-116R	2017AN-118	2017AN-119	2017AN-120R	2017AN-128
Sample Date:		7/25/2017	8/1/2017	7/18/2017	7/14/2017	7/26/2017	7/26/2017	7/26/2017	7/25/2017
Parameters	**Units**								
Semi-volatile Organic Compounds (Continued)									
2-Nitroaniline	mg/L	--	--	--	--	0.00106 U	0.00106 U	0.00106 U	0.00106 U
2-Nitrophenol	mg/L	--	--	--	--	0.00231 U	0.00231 U	0.00231 U	--
3&4-Methylphenol	mg/L	--	0.00156 U	0.00127 U	0.007 U	0.00135 U	0.00135 U	0.00135 U	--
3,3'-Dichlorobenzidine	mg/L	--	--	--	--	0.00144 U	0.00144 U	0.00144 U	--
3-Nitroaniline	mg/L	--	--	--	--	0.00154 U	0.00154 U	0.00154 U	0.00154 U
4,6-Dinitro-2-methylphenol	mg/L	--	--	--	--	0.00279 U	0.00279 U	0.00279 U	--
4-Bromophenyl phenyl ether	mg/L	--	--	--	--	0.00154 U	0.00154 U	0.00154 U	--
4-Chloro-3-methylphenol	mg/L	--	--	--	--	0.00135 U	0.00135 U	0.00135 U	--
4-Chloroaniline	mg/L	--	--	--	--	0.00115 U	0.00115 U	0.00115 U	--
4-Chlorophenyl phenyl ether	mg/L	--	--	--	--	0.00154 U	0.00154 U	0.00154 U	0.00154 U
4-Nitroaniline	mg/L	--	--	--	--	0.00154 U	0.00154 U	0.00154 U	0.00154 U
4-Nitrophenol	mg/L	--	--	--	--	0.00192 U	0.00192 U	0.00192 U	--
Acenaphthene	mg/L	--	--	--	--	0.000308 U	0.000308 U	0.000308 U	--
Acenaphthylene	mg/L	--	--	--	--	0.000337 U	0.000337 U	0.000337 U	--
Anthracene	mg/L	--	--	--	--	0.000365 U	0.000365 U	0.000365 U	--
Benzo(a)anthracene	mg/L	--	--	--	--	0.000308 U	0.000308 U	0.000308 U	--
Benzo(a)pyrene	mg/L	--	--	--	--	0.000365 U	0.000365 U	0.000365 U	--
Benzo(b)fluoranthene	mg/L	--	--	--	--	0.000346 U	0.000346 U	0.000346 U	0.000346 U
Benzo(g,h,i)perylene	mg/L	--	--	--	--	0.000596 U	0.000596 U	0.000596 U	--
Benzo(k)fluoranthene	mg/L	--	--	--	--	0.000356 U	0.000356 U	0.000356 U	--
bis(2-Chloroethoxy)methane	mg/L	--	--	--	--	0.00183 U	0.00183 U	0.00183 U	--
bis(2-Chloroethyl)ether	mg/L	--	--	--	--	0.00125 U	0.00125 U	0.00125 U	0.00125 U
bis(2-Ethylhexyl)phthalate (DEHP)	mg/L	--	0.00167 U	0.00629 U	0.0075 U	0.00144 U	0.00144 U	0.00144 U	--
Butyl benzylphthalate (BBP)	mg/L	--	--	--	--	0.000962 U	0.000962 U	0.000962 U	--
Carbazole	mg/L	--	--	--	--	0.000865 U	0.000865 U	0.000865 U	--
Chrysene	mg/L	--	--	--	--	0.000317 U	0.000317 U	0.000317 U	--
Dibenz(a,h)anthracene	mg/L	--	--	--	--	0.000433 U	0.000433 U	0.000433 U	--
Dibenzofuran	mg/L	--	--	--	--	0.00125 U	0.00125 U	0.00125 U	--
Diethyl phthalate	mg/L	--	--	--	--	0.00115 U	0.00115 U	0.00115 U	--
Dimethyl phthalate	mg/L	--	--	--	--	0.00115 U	0.00115 U	0.00115 U	0.00115 U
Di-n-butylphthalate (DBP)	mg/L	--	--	--	--	0.00125 U	0.00125 U	0.00125 U	--
Di-n-octyl phthalate (DnOP)	mg/L	--	--	--	--	0.000865 U	0.000865 U	0.000865 U	--
Fluoranthene	mg/L	--	--	--	--	0.000308 U	0.000308 U	0.000308 U	--
Fluorene	mg/L	--	--	--	--	0.000308 U	0.000308 U	0.000308 U	--
Hexachlorobenzene	mg/L	--	--	--	--	0.00144 U	0.00144 U	0.00144 U	--
Hexachlorobutadiene	mg/L	--	--	--	--	0.00144 U	0.00144 U	0.00144 U	--
Hexachlorocyclopentadiene	mg/L	--	--	--	--	0.00125 U	0.00125 U	0.00125 U	--
Hexachloroethane	mg/L	--	--	--	--	0.00212 U	0.00212 U	0.00212 U	0.00212 U

Table 2

Analytical Results Summary
Annual Groundwater Sampling
Avtex Fibers Superfund Site
Front Royal, Virginia
July - August 2017

Sample Location:		113	114	115	116R	118	119	120R	128
Sample ID:		2017AN-113	2017AN-114	2017AN-115	2017AN-116R	2017AN-118	2017AN-119	2017AN-120R	2017AN-128
Sample Date:		7/25/2017	8/1/2017	7/18/2017	7/14/2017	7/26/2017	7/26/2017	7/26/2017	7/25/2017
Parameters	**Units**								
Semi-volatile Organic Compounds (Continued)									
Indeno(1,2,3-cd)pyrene	mg/L	--	--	--	--	0.000394 U	0.000394 U	0.000394 U	--
Isophorone	mg/L	--	--	--	--	0.00212 U	0.00212 U	0.00212 U	--
Naphthalene	mg/L	--	0.000411 U	0.000336 U	0.00185 U	0.000356 U	0.000356 U	0.000356 U	--
Nitrobenzene	mg/L	--	--	--	--	0.00212 U	0.00212 U	0.00212 U	0.00212 U
N-Nitrosodi-n-propylamine	mg/L	--	--	--	--	0.00163 U	0.00163 U	0.00163 U	--
N-Nitrosodiphenylamine	mg/L	--	--	--	--	0.00346 U	0.00346 U	0.00346 U	0.00346 U
Pentachlorophenol	mg/L	--	0.00367 UJ	0.003 U	0.0165 U	0.00317 U	0.00317 U	0.00317 U	--
Phenanthrene	mg/L	--	--	--	--	0.000404 U	0.000404 U	0.000404 U	0.000404 U
Phenol	mg/L	--	0.00167 U	0.00136 U	0.0075 U	0.00144 U	0.00144 U	0.00144 U	--
Pyrene	mg/L	--	--	--	--	0.000337 U	0.000337 U	0.000337 U	--
Volatile Organic Compounds									
1,1,1-Trichloroethane	mg/L	--	--	--	--	0.000190 U	0.000190 U	0.000190 U	--
1,1,2,2-Tetrachloroethane	mg/L	--	--	--	--	0.000190 U	0.000190 U	0.000190 U	--
1,1,2-Trichloroethane	mg/L	--	--	--	--	0.000190 U	0.000190 U	0.000190 U	--
1,1-Dichloroethane	mg/L	--	--	--	--	0.000240 U	0.000240 U	0.000240 U	0.000240 U
1,1-Dichloroethene	mg/L	--	--	--	--	0.000250 U	0.000250 U	0.000250 U	0.000250 U
1,2,4-Trichlorobenzene	mg/L	--	--	--	--	0.000200 U	0.000200 U	0.000200 U	0.000200 U
1,2-Dichlorobenzene	mg/L	--	--	--	--	0.000190 U	0.000190 U	0.000190 U	--
1,2-Dichloroethane	mg/L	--	--	--	--	0.000200 U	0.000200 U	0.000200 U	--
1,2-Dichloropropane	mg/L	--	--	--	--	0.000250 U	0.000250 U	0.000250 U	0.000250 U
1,3-Dichlorobenzene	mg/L	--	--	--	--	0.000180 U	0.000180 U	0.000180 U	0.000180 U
1,4-Dichlorobenzene	mg/L	--	--	--	--	0.000170 U	0.000170 U	0.000170 U	0.000170 U
2-Butanone (Methyl ethyl ketone) (MEK)	mg/L	--	--	--	--	0.00264 U	0.00264 U	0.00264 U	0.00264 U
2-Hexanone	mg/L	--	--	--	--	0.00128 U	0.00128 U	0.00128 U	--
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	mg/L	--	--	--	--	0.000810 U	0.000810 U	0.000810 U	0.000810 U
Acetone	mg/L	--	R	R	0.0266 U	0.00686 U	0.00448 U	0.00311 U	0.00294 U
Benzene	mg/L	--	--	--	--	0.000200 U	0.000200 U	0.000200 U	--
Bromodichloromethane	mg/L	--	--	--	--	0.000170 U	0.000170 U	0.000170 U	0.000170 U
Bromoform	mg/L	--	--	--	--	0.000290 U	0.000290 U	0.000290 U	0.000290 U
Bromomethane (Methyl bromide)	mg/L	--	--	--	--	0.000350 U	0.000350 U	0.000350 U	0.000350 U
Carbon disulfide	mg/L	--	0.00185	0.000220 U	0.0182	0.000220 U	0.000220 U	0.000220 U	0.000220 U
Carbon tetrachloride	mg/L	--	--	--	--	0.000180 U	0.000180 U	0.000180 U	0.000180 U
Chlorobenzene	mg/L	--	--	--	--	0.000180 U	0.000180 U	0.000180 U	0.000180 U
Chloroethane	mg/L	--	--	--	--	0.000360 U	0.000360 U	0.000360 U	--
Chloroform (Trichloromethane)	mg/L	--	--	--	--	0.000230 U	0.000230 U	0.000230 U	--
Chloromethane (Methyl chloride)	mg/L	--	--	--	--	0.000360 U	0.000360 U	0.000360 U	--
cis-1,2-Dichloroethene	mg/L	--	--	--	--	0.000210 U	0.000210 U	0.000210 U	--

Table 2

Analytical Results Summary
Annual Groundwater Sampling
Avtex Fibers Superfund Site
Front Royal, Virginia
July - August 2017

Sample Location:		113	114	115	116R	118	119	120R	128
Sample ID:		2017AN-113	2017AN-114	2017AN-115	2017AN-116R	2017AN-118	2017AN-119	2017AN-120R	2017AN-128
Sample Date:		7/25/2017	8/1/2017	7/18/2017	7/14/2017	7/26/2017	7/26/2017	7/26/2017	7/25/2017
Parameters	**Units**								
Volatile Organic Compounds (Continued)									
cis-1,3-Dichloropropene	mg/L	--	--	--	--	0.000170 U	0.000170 U	0.000170 U	0.000170 U
Dibromochloromethane	mg/L	--	--	--	--	0.000250 U	0.000250 U	0.000250 U	--
Ethylbenzene	mg/L	--	--	--	--	0.000190 U	0.000190 U	0.000190 U	--
Methylene chloride	mg/L	--	--	--	--	0.00100 U	0.00100 U	0.00100 U	--
Styrene	mg/L	--	--	--	--	0.000280 U	0.000280 U	0.000280 U	0.000280 U
Tetrachloroethene	mg/L	--	--	--	--	0.000140 U	0.000140 U	0.000140 U	--
Toluene	mg/L	--	--	--	--	0.000170 U	0.000170 U	0.000170 U	0.000174 J
trans-1,2-Dichloroethene	mg/L	--	--	--	--	0.000230 U	0.000230 U	0.000230 U	--
trans-1,3-Dichloropropene	mg/L	--	--	--	--	0.000170 U	0.000170 U	0.000170 U	--
Trichloroethene	mg/L	--	--	--	--	0.000200 U	0.000200 U	0.000200 U	--
Vinyl chloride	mg/L	--	--	--	--	0.000180 U	0.000180 U	0.000180 U	0.000180 U
Xylenes (total)	mg/L	--	--	--	--	0.000580 U	0.000580 U	0.000580 U	--
General Chemistry									
Chloride	mg/L	1.83	83.4	--	--	--	--	--	--
Cyanide (free)	mg/L	--	0.00154 U	0.00154 U	0.00154 U	--	--	--	--
Sulfate	mg/L	39.9	1430	--	--	--	--	--	--

Notes:.

"--" - Not analyzed
U - Not detected at the associated reporting limit
J - Estimated concentration
UJ - Not detected; associated reporting limit is estimated
R - Rejected

Table 2

Analytical Results Summary
Annual Groundwater Sampling
Avtex Fibers Superfund Site
Front Royal, Virginia
July - August 2017

Sample Location:		129	130R	132	132	132	132	133
Sample ID:		2017AN-129	2017AN-130R	2017AN-132	2017AN-132D	2017AN-132-Resample	2017AN-132D-Resample	2017AN-133
Sample Date:		7/26/2017	7/27/2017	7/27/2017	7/27/2017	8/10/2017	8/10/2017	7/26/2017
					Duplicate		Duplicate	
Parameters	**Units**							
Metals								
Aluminum (dissolved)	mg/L	--	--	0.00840 U	0.00840 U	--	--	0.0840 U
Antimony (dissolved)	mg/L	--	--	0.000800 U	0.000800 U	--	--	0.000800 U
Arsenic (dissolved)	mg/L	0.000705 J	--	0.00353	0.00281	--	--	0.00187 J
Beryllium (dissolved)	mg/L	0.000100 U	--	0.000348 J	0.000356 J	--	--	0.000100 U
Cadmium (dissolved)	mg/L	0.000100 U	--	0.000100 U	0.000100 U	--	--	0.000100 U
Calcium (dissolved)	mg/L	262	--	316	353	--	--	--
Chromium (dissolved)	mg/L	0.000500 U	--	0.000500 U	0.000500 U	--	--	0.000500 U
Cobalt (dissolved)	mg/L	--	--	0.000675 J	0.000663 J	--	--	0.00335
Copper (dissolved)	mg/L	0.00120 U	--	0.00120 U	0.00120 U	--	--	0.0120 U
Iron (dissolved)	mg/L	--	--	7.46	7.22	--	--	0.0100 U
Lead (dissolved)	mg/L	0.000100 U	--	0.000106 J	0.000100 U	--	--	0.000100 U
Magnesium (dissolved)	mg/L	30.6	--	44.7	50.0	--	--	--
Manganese (dissolved)	mg/L	--	--	1.80	1.76	--	--	0.0583
Mercury (dissolved)	mg/L	0.000100 U	0.000100 U	0.000100 U	0.000100 U	--	--	0.000150 U
Nickel (dissolved)	mg/L	0.00121 J	--	0.000568 J	0.000989 J	--	--	0.0106
Selenium (dissolved)	mg/L	0.000300 U	--	0.000433 U	0.000688 U	--	--	0.000326 J
Sodium (dissolved)	mg/L	24.9 J	--	228	255	--	--	--
Thallium (dissolved)	mg/L	--	--	0.000800 U	0.000800 U	--	--	0.000800 U
Vanadium (dissolved)	mg/L	--	--	0.00234 U	0.00282 U	--	--	0.000700 U
Zinc (dissolved)	mg/L	0.00612 J	--	0.00520 U	0.0179 J	--	--	0.00520 U
Semi-volatile Organic Compounds								
1,2,4-Trichlorobenzene	mg/L	--	0.00202 U	0.00194 U	0.00198 U	--	--	0.00202 U
1,2-Dichlorobenzene	mg/L	--	0.00212 U	0.00204 U	0.00208 U	--	--	0.00212 U
1,3-Dichlorobenzene	mg/L	--	0.00192 U	0.00185 U	0.00189 U	--	--	0.00192 U
1,4-Dichlorobenzene	mg/L	--	0.00192 U	0.00185 U	0.00189 U	--	--	0.00192 U
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	mg/L	--	0.00173 U	0.00167 U	0.00170 U	--	--	0.00173 U
2,4,5-Trichlorophenol	mg/L	--	0.00125 U	0.00120 U	0.00123 U	--	--	0.00125 U
2,4,6-Trichlorophenol	mg/L	--	0.00183 U	0.00176 U	0.00179 U	--	--	0.00183 U
2,4-Dichlorophenol	mg/L	--	0.00212 U	0.00204 U	0.00208 U	--	--	0.00212 U
2,4-Dimethylphenol	mg/L	--	0.00154 U	0.00148 U	0.00151 U	--	--	0.00154 U
2,4-Dinitrophenol	mg/L	--	0.00692 U	0.00667 U	0.00679 U	--	--	0.00692 U
2,4-Dinitrotoluene	mg/L	--	0.00154 U	0.00148 U	0.00151 U	--	--	0.00154 U
2,6-Dinitrotoluene	mg/L	--	0.00144 U	0.00139 U	0.00142 U	--	--	0.00144 U
2-Chloronaphthalene	mg/L	--	0.00144 U	0.00139 U	0.00142 U	--	--	0.00144 U
2-Chlorophenol	mg/L	--	0.00163 U	0.00157 U	0.00160 U	--	--	0.00163 U
2-Methylnaphthalene	mg/L	--	0.000385 U	0.000370 U	0.000377 U	--	--	0.000385 U
2-Methylphenol	mg/L	--	0.00154 U	0.00148 U	0.00151 U	--	--	0.00154 U

Table 2

Analytical Results Summary
Annual Groundwater Sampling
Avtex Fibers Superfund Site
Front Royal, Virginia
July - August 2017

Sample Location:		129	130R	132	132	132	132	133
Sample ID:		2017AN-129	2017AN-130R	2017AN-132	2017AN-132D	2017AN-132-Resample	2017AN-132D-Resample	2017AN-133
Sample Date:		7/26/2017	7/27/2017	7/27/2017	7/27/2017	8/10/2017	8/10/2017	7/26/2017
					Duplicate		Duplicate	
Parameters	**Units**							
Semi-volatile Organic Compounds (Continued)								
2-Nitroaniline	mg/L	--	0.00106 U	0.00102 U	0.00104 U	--	--	0.00106 U
2-Nitrophenol	mg/L	--	0.00231 U	0.00222 U	0.00226 U	--	--	0.00231 U
3&4-Methylphenol	mg/L	--	0.00135 U	0.00130 U	0.00132 U	--	--	0.00135 U
3,3'-Dichlorobenzidine	mg/L	--	0.00144 U	0.00139 U	0.00142 U	--	--	0.00144 U
3-Nitroaniline	mg/L	--	0.00154 U	0.00148 U	0.00151 U	--	--	0.00154 U
4,6-Dinitro-2-methylphenol	mg/L	--	0.00279 U	0.00269 U	0.00274 U	--	--	0.00279 U
4-Bromophenyl phenyl ether	mg/L	--	0.00154 U	0.00148 U	0.00151 U	--	--	0.00154 U
4-Chloro-3-methylphenol	mg/L	--	0.00135 U	0.00130 U	0.00132 U	--	--	0.00135 U
4-Chloroaniline	mg/L	--	0.00115 U	0.00111 U	0.00113 U	--	--	0.00115 U
4-Chlorophenyl phenyl ether	mg/L	--	0.00154 U	0.00148 U	0.00151 U	--	--	0.00154 U
4-Nitroaniline	mg/L	--	0.00154 U	0.00148 U	0.00151 U	--	--	0.00154 U
4-Nitrophenol	mg/L	--	0.00192 U	0.00185 U	0.00189 U	--	--	0.00192 U
Acenaphthene	mg/L	--	0.000308 U	0.000296 U	0.000302 U	--	--	0.000308 U
Acenaphthylene	mg/L	--	0.000337 U	0.000324 U	0.000330 U	--	--	0.000337 U
Anthracene	mg/L	--	0.000365 U	0.000352 U	0.000358 U	--	--	0.000365 U
Benzo(a)anthracene	mg/L	--	0.000308 U	0.000296 U	0.000302 U	--	--	0.000308 U
Benzo(a)pyrene	mg/L	--	0.000365 U	0.000352 U	0.000358 U	--	--	0.000365 U
Benzo(b)fluoranthene	mg/L	--	0.000346 U	0.000333 U	0.000340 U	--	--	0.000346 U
Benzo(g,h,i)perylene	mg/L	--	0.000596 U	0.000574 U	0.000585 U	--	--	0.000596 U
Benzo(k)fluoranthene	mg/L	--	0.000356 U	0.000343 U	0.000349 U	--	--	0.000356 U
bis(2-Chloroethoxy)methane	mg/L	--	0.00183 U	0.00176 U	0.00179 U	--	--	0.00183 U
bis(2-Chloroethyl)ether	mg/L	--	0.00125 U	0.00120 U	0.00123 U	--	--	0.00125 U
bis(2-Ethylhexyl)phthalate (DEHP)	mg/L	--	0.00144 U	0.00224 U	0.00238 U	--	--	0.00144 U
Butyl benzylphthalate (BBP)	mg/L	--	0.000962 U	0.000926 U	0.000943 U	--	--	0.000962 U
Carbazole	mg/L	--	0.000865 U	0.000833 U	0.000849 U	--	--	0.000865 U
Chrysene	mg/L	--	0.000317 U	0.000306 U	0.000311 U	--	--	0.000317 U
Dibenz(a,h)anthracene	mg/L	--	0.000433 U	0.000417 U	0.000425 U	--	--	0.000433 U
Dibenzofuran	mg/L	--	0.00125 U	0.00120 U	0.00123 U	--	--	0.00125 U
Diethyl phthalate	mg/L	--	0.00115 U	0.00111 U	0.00113 U	--	--	0.00115 U
Dimethyl phthalate	mg/L	--	0.00115 U	0.00111 U	0.00113 U	--	--	0.00115 U
Di-n-butylphthalate (DBP)	mg/L	--	0.00125 U	0.00120 U	0.00123 U	--	--	0.00125 U
Di-n-octyl phthalate (DnOP)	mg/L	--	0.000865 U	0.000833 U	0.000849 U	--	--	0.000865 U
Fluoranthene	mg/L	--	0.000308 U	0.000296 U	0.000302 U	--	--	0.000308 U
Fluorene	mg/L	--	0.000308 U	0.000296 U	0.000302 U	--	--	0.000308 U
Hexachlorobenzene	mg/L	--	0.00144 U	0.00139 U	0.00142 U	--	--	0.00144 U
Hexachlorobutadiene	mg/L	--	0.00144 U	0.00139 U	0.00142 U	--	--	0.00144 U
Hexachlorocyclopentadiene	mg/L	--	0.00125 U	R	R	--	--	0.00125 U
Hexachloroethane	mg/L	--	0.00212 U	0.00204 U	0.00208 U	--	--	0.00212 U

Table 2

Analytical Results Summary
Annual Groundwater Sampling
Avtex Fibers Superfund Site
Front Royal, Virginia
July - August 2017

Sample Location:		129	130R	132	132	132	132	133
Sample ID:		2017AN-129	2017AN-130R	2017AN-132	2017AN-132D	2017AN-132-Resample	2017AN-132D-Resample	2017AN-133
Sample Date:		7/26/2017	7/27/2017	7/27/2017	7/27/2017 Duplicate	8/10/2017	8/10/2017 Duplicate	7/26/2017
Parameters	**Units**							
Semi-volatile Organic Compounds (Continued)								
Indeno(1,2,3-cd)pyrene	mg/L	--	0.000394 U	0.000380 U	0.000387 U	--	--	0.000394 U
Isophorone	mg/L	--	0.00212 U	0.00204 U	0.00208 U	--	--	0.00212 U
Naphthalene	mg/L	--	0.000356 U	0.000343 U	0.000349 U	--	--	0.000356 U
Nitrobenzene	mg/L	--	0.00212 U	0.00204 U	0.00208 U	--	--	0.00212 U
N-Nitrosodi-n-propylamine	mg/L	--	0.00163 U	0.00157 U	0.00160 U	--	--	0.00163 U
N-Nitrosodiphenylamine	mg/L	--	0.00346 U	0.00333 U	0.00340 U	--	--	0.00346 U
Pentachlorophenol	mg/L	--	0.00317 U	0.00306 U	0.00311 U	--	--	0.00317 U
Phenanthrene	mg/L	--	0.000404 U	0.000389 U	0.000396 U	--	--	0.000404 U
Phenol	mg/L	--	0.00144 U	0.00139 U	0.00142 U	--	--	0.00144 U
Pyrene	mg/L	--	0.000337 U	0.000324 U	0.000330 U	--	--	0.000337 U
Volatile Organic Compounds								
1,1,1-Trichloroethane	mg/L	--	0.000190 U	--	--	0.000190 U	0.000190 U	0.000190 U
1,1,2,2-Tetrachloroethane	mg/L	--	0.000190 U	--	--	0.000190 U	0.000190 U	0.000190 U
1,1,2-Trichloroethane	mg/L	--	0.000190 U	--	--	0.000190 U	0.000190 U	0.000190 U
1,1-Dichloroethane	mg/L	--	0.000240 U	--	--	0.000240 U	0.000240 U	0.000240 U
1,1-Dichloroethene	mg/L	--	0.000250 U	--	--	0.000250 U	0.000250 U	0.000250 U
1,2,4-Trichlorobenzene	mg/L	--	0.000200 U	--	--	0.000200 U	0.000200 U	0.000200 U
1,2-Dichlorobenzene	mg/L	--	0.000190 U	--	--	0.000190 U	0.000190 U	0.000190 U
1,2-Dichloroethane	mg/L	--	0.000200 U	--	--	0.000200 U	0.000200 U	0.000200 U
1,2-Dichloropropane	mg/L	--	0.000250 U	--	--	0.000250 U	0.000250 U	0.000250 U
1,3-Dichlorobenzene	mg/L	--	0.000180 U	--	--	0.000180 U	0.000180 U	0.000180 U
1,4-Dichlorobenzene	mg/L	--	0.000170 U	--	--	0.000170 U	0.000170 U	0.000170 U
2-Butanone (Methyl ethyl ketone) (MEK)	mg/L	--	0.00264 U	--	--	0.00264 U	0.00264 U	0.00264 U
2-Hexanone	mg/L	--	0.00128 U	--	--	0.00128 U	0.00128 U	0.00128 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	mg/L	--	0.000810 U	--	--	0.000810 U	0.000810 U	0.000810 U
Acetone	mg/L	--	0.00744 U	--	--	0.00266 U	0.00266 U	0.00371 U
Benzene	mg/L	--	0.000200 U	--	--	0.000200 U	0.000200 U	0.000200 U
Bromodichloromethane	mg/L	--	0.000170 U	--	--	0.000170 U	0.000170 U	0.000170 U
Bromoform	mg/L	--	0.000290 U	--	--	0.000290 U	0.000290 U	0.000290 U
Bromomethane (Methyl bromide)	mg/L	--	0.000350 U	--	--	0.000350 U	0.000350 U	0.000350 U
Carbon disulfide	mg/L	--	0.000220 U	--	--	0.000220 U	0.000220 U	0.000346 J
Carbon tetrachloride	mg/L	--	0.000180 U	--	--	0.000180 U	0.000180 U	0.000180 U
Chlorobenzene	mg/L	--	0.000180 U	--	--	0.000180 U	0.000180 U	0.000180 U
Chloroethane	mg/L	--	0.000360 U	--	--	0.000360 U	0.000360 U	0.000360 U
Chloroform (Trichloromethane)	mg/L	--	0.000230 U	--	--	0.000230 U	0.000230 U	0.000230 U
Chloromethane (Methyl chloride)	mg/L	--	0.000360 U	--	--	0.000360 U	0.000360 U	0.000360 U
cis-1,2-Dichloroethene	mg/L	--	0.000210 U	--	--	0.000210 U	0.000210 U	0.000210 U

Table 2

Analytical Results Summary
Annual Groundwater Sampling
Avtex Fibers Superfund Site
Front Royal, Virginia
July - August 2017

Sample Location:		129	130R	132	132	132	132	133
Sample ID:		2017AN-129	2017AN-130R	2017AN-132	2017AN-132D	2017AN-132-Resample	2017AN-132D-Resample	2017AN-133
Sample Date:		7/26/2017	7/27/2017	7/27/2017	7/27/2017	8/10/2017	8/10/2017	7/26/2017
					Duplicate		Duplicate	
Parameters	**Units**							
Volatile Organic Compounds (Continued)								
cis-1,3-Dichloropropene	mg/L	--	0.000170 U	--	--	0.000170 U	0.000170 U	0.000170 U
Dibromochloromethane	mg/L	--	0.000250 U	--	--	0.000250 U	0.000250 U	0.000250 U
Ethylbenzene	mg/L	--	0.000190 U	--	--	0.000190 U	0.000190 U	0.000190 U
Methylene chloride	mg/L	--	0.00100 U	--	--	0.00100 U	0.00100 U	0.00100 U
Styrene	mg/L	--	0.000280 U	--	--	0.000280 U	0.000280 U	0.000280 U
Tetrachloroethene	mg/L	--	0.000140 U	--	--	0.000140 U	0.000140 U	0.000140 U
Toluene	mg/L	--	0.000170 U	--	--	0.000170 U	0.000170 U	0.000170 U
trans-1,2-Dichloroethene	mg/L	--	0.000230 U	--	--	0.000230 U	0.000230 U	0.000230 U
trans-1,3-Dichloropropene	mg/L	--	0.000170 U	--	--	0.000170 U	0.000170 U	0.000170 U
Trichloroethene	mg/L	--	0.000200 U	--	--	0.000200 U	0.000200 U	0.000200 U
Vinyl chloride	mg/L	--	0.000180 U	--	--	0.000180 U	0.000180 U	0.000180 U
Xylenes (total)	mg/L	--	0.000580 U	--	--	0.000580 U	0.000580 U	0.000580 U
General Chemistry								
Chloride	mg/L	72.5	--	81.8	83.3	--	--	--
Cyanide (free)	mg/L	--	--	0.00154 U	0.00154 U	--	--	0.00154 U
Sulfate	mg/L	450	--	1080	1110	--	--	--

Notes:.

"--" - Not analyzed
U - Not detected at the associated reporting limit
J - Estimated concentration
UJ - Not detected; associated reporting limit is estimated
R - Rejected

Table 2

Analytical Results Summary
Annual Groundwater Sampling
Avtex Fibers Superfund Site
Front Royal, Virginia
July - August 2017

Sample Location:		135	136	138	138	138	162	181	185
Sample ID:		2017AN-135	2017AN-136	2017AN-138	2017AN-138D	2017AN-138-Resample	2017AN-162	2017AN-181	2017AN-185
Sample Date:		8/1/2017	7/19/2017	7/30/2017	7/30/2017 Duplicate	8/9/2017	7/16/2017	7/18/2017	7/18/2017
Parameters	**Units**								
Metals									
Aluminum (dissolved)	mg/L	--	0.00840 U	0.00840 U	0.0333	--	0.00840 U	0.00840 U	0.00840 U
Antimony (dissolved)	mg/L	0.000800 UJ	0.000800 U	0.00153 J	0.00160 J	--	0.000800 U	0.000800 U	0.000800 U
Arsenic (dissolved)	mg/L	0.00284 UJ	0.000400 U	0.0368	0.0368	--	0.000400 U	0.000400 U	0.000400 U
Beryllium (dissolved)	mg/L	0.000100 U	--	--	--	--	--	--	--
Cadmium (dissolved)	mg/L	0.000100 UJ	0.000100 U	0.000100 U	0.000100 U	--	0.000100 U	0.000100 U	0.000100 U
Calcium (dissolved)	mg/L	--	--	--	--	--	--	--	--
Chromium (dissolved)	mg/L	0.000500 UJ	0.000500 U	0.00157 J	0.00402	--	0.000908 U	0.000500 U	0.000500 U
Cobalt (dissolved)	mg/L	--	0.000100 U	0.0132	0.0127	--	0.000472 J	0.000100 U	0.000100 U
Copper (dissolved)	mg/L	0.00120 U	--	--	--	--	--	--	--
Iron (dissolved)	mg/L	--	0.664	0.0512 J	0.0872 J	--	0.634	0.339	0.0390
Lead (dissolved)	mg/L	0.0006435 UJ	0.000100 U	0.000100 U	0.000100 U	--	0.000100 U	0.000687 J	0.000100 U
Magnesium (dissolved)	mg/L	--	--	--	--	--	--	--	--
Manganese (dissolved)	mg/L	--	0.160	0.504	0.494	--	0.204	0.284	0.287
Mercury (dissolved)	mg/L	0.000100 U	0.000100 U	0.000100 U	0.000100 U	--	0.000100 U	0.000100 U	0.000100 U
Nickel (dissolved)	mg/L	0.000500 UJ	0.000500 U	0.0436	0.0436	--	0.00542	0.000500 U	0.00225
Selenium (dissolved)	mg/L	0.000735 U	--	--	--	--	--	--	--
Sodium (dissolved)	mg/L	--	--	--	--	--	--	--	--
Thallium (dissolved)	mg/L	0.000800 UJ	--	--	--	--	--	--	--
Vanadium (dissolved)	mg/L	0.000700 U	0.000700 U	0.00486 U	0.00470 U	--	0.000700 U	0.000700 U	0.000700 U
Zinc (dissolved)	mg/L	0.00520 UJ	0.0201 J	0.00520 U	0.00520 U	--	0.0326	0.00520 U	0.0479
Semi-volatile Organic Compounds									
1,2,4-Trichlorobenzene	mg/L	0.00233 U	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/L	0.00244 U	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/L	0.00222 U	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/L	0.00222 U	--	--	--	--	--	--	--
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	mg/L	0.00200 UJ	--	--	--	--	--	--	--
2,4,5-Trichlorophenol	mg/L	0.00144 U	--	--	--	--	--	--	--
2,4,6-Trichlorophenol	mg/L	0.00211 U	--	--	--	--	--	--	--
2,4-Dichlorophenol	mg/L	0.00244 U	--	--	--	--	--	--	--
2,4-Dimethylphenol	mg/L	0.00178 U	--	--	--	--	--	--	--
2,4-Dinitrophenol	mg/L	0.00800 U	--	--	--	--	--	--	--
2,4-Dinitrotoluene	mg/L	0.00178 U	--	--	--	--	--	--	--
2,6-Dinitrotoluene	mg/L	0.00167 U	--	--	--	--	--	--	--
2-Chloronaphthalene	mg/L	0.00167 U	--	--	--	--	--	--	--
2-Chlorophenol	mg/L	0.00189 U	--	--	--	--	--	--	--
2-Methylnaphthalene	mg/L	0.000444 U	--	--	--	--	--	--	--
2-Methylphenol	mg/L	0.00178 U	0.00154 U	0.00727 U	0.00727 U	--	0.0016 U	0.00154 U	0.00154 U

Table 2

Analytical Results Summary
Annual Groundwater Sampling
Avtex Fibers Superfund Site
Front Royal, Virginia
July - August 2017

Sample Location:		135	136	138	138	138	162	181	185
Sample ID:		2017AN-135	2017AN-136	2017AN-138	2017AN-138D	2017AN-138-Resample	2017AN-162	2017AN-181	2017AN-185
Sample Date:		8/1/2017	7/19/2017	7/30/2017	7/30/2017 Duplicate	8/9/2017	7/16/2017	7/18/2017	7/18/2017
Parameters	**Units**								
Semi-volatile Organic Compounds (Continued)									
2-Nitroaniline	mg/L	0.00122 U	--	--	--	--	--	--	--
2-Nitrophenol	mg/L	0.00267 U	--	--	--	--	--	--	--
3&4-Methylphenol	mg/L	0.00156 U	0.00135 U	0.00636 U	0.00636 U	--	0.0014 U	0.00135 U	0.00135 U
3,3'-Dichlorobenzidine	mg/L	0.00167 U	--	--	--	--	--	--	--
3-Nitroaniline	mg/L	0.00178 U	--	--	--	--	--	--	--
4,6-Dinitro-2-methylphenol	mg/L	0.00322 U	--	--	--	--	--	--	--
4-Bromophenyl phenyl ether	mg/L	0.00178 U	--	--	--	--	--	--	--
4-Chloro-3-methylphenol	mg/L	0.00156 U	--	--	--	--	--	--	--
4-Chloroaniline	mg/L	0.00133 U	--	--	--	--	--	--	--
4-Chlorophenyl phenyl ether	mg/L	0.00178 U	--	--	--	--	--	--	--
4-Nitroaniline	mg/L	0.00178 U	--	--	--	--	--	--	--
4-Nitrophenol	mg/L	0.00222 U	--	--	--	--	--	--	--
Acenaphthene	mg/L	0.000356 U	--	--	--	--	--	--	--
Acenaphthylene	mg/L	0.000389 U	--	--	--	--	--	--	--
Anthracene	mg/L	0.000422 U	--	--	--	--	--	--	--
Benzo(a)anthracene	mg/L	0.000356 U	--	--	--	--	--	--	--
Benzo(a)pyrene	mg/L	0.000422 U	--	--	--	--	--	--	--
Benzo(b)fluoranthene	mg/L	0.000400 U	--	--	--	--	--	--	--
Benzo(g,h,i)perylene	mg/L	0.000689 U	--	--	--	--	--	--	--
Benzo(k)fluoranthene	mg/L	0.000411 U	--	--	--	--	--	--	--
bis(2-Chloroethoxy)methane	mg/L	0.00211 U	--	--	--	--	--	--	--
bis(2-Chloroethyl)ether	mg/L	0.00144 U	--	--	--	--	--	--	--
bis(2-Ethylhexyl)phthalate (DEHP)	mg/L	0.00167 U	0.00144 U	0.00682 U	0.00682 U	--	0.0019 U	0.00144 U	0.00144 U
Butyl benzylphthalate (BBP)	mg/L	0.00111 U	--	--	--	--	--	--	--
Carbazole	mg/L	0.00100 U	--	--	--	--	--	--	--
Chrysene	mg/L	0.000367 U	--	--	--	--	--	--	--
Dibenz(a,h)anthracene	mg/L	0.000500 U	--	--	--	--	--	--	--
Dibenzofuran	mg/L	0.00144 U	--	--	--	--	--	--	--
Diethyl phthalate	mg/L	0.00133 U	--	--	--	--	--	--	--
Dimethyl phthalate	mg/L	0.00133 U	--	--	--	--	--	--	--
Di-n-butylphthalate (DBP)	mg/L	0.00144 U	--	--	--	--	--	--	--
Di-n-octyl phthalate (DnOP)	mg/L	0.00100 U	--	--	--	--	--	--	--
Fluoranthene	mg/L	0.000356 U	--	--	--	--	--	--	--
Fluorene	mg/L	0.000356 U	--	--	--	--	--	--	--
Hexachlorobenzene	mg/L	0.00167 U	--	--	--	--	--	--	--
Hexachlorobutadiene	mg/L	0.00167 U	--	--	--	--	--	--	--
Hexachlorocyclopentadiene	mg/L	0.00144 UJ	--	--	--	--	--	--	--
Hexachloroethane	mg/L	0.00244 U	--	--	--	--	--	--	--

Table 2

Analytical Results Summary
Annual Groundwater Sampling
Avtex Fibers Superfund Site
Front Royal, Virginia
July - August 2017

Sample Location:		135	136	138	138	138	162	181	185
Sample ID:		2017AN-135	2017AN-136	2017AN-138	2017AN-138D	2017AN-138-Resample	2017AN-162	2017AN-181	2017AN-185
Sample Date:		8/1/2017	7/19/2017	7/30/2017	7/30/2017 Duplicate	8/9/2017	7/16/2017	7/18/2017	7/18/2017
Parameters	**Units**								
Semi-volatile Organic Compounds (Continued)									
Indeno(1,2,3-cd)pyrene	mg/L	0.000456 U	--	--	--	--	--	--	--
Isophorone	mg/L	0.00244 U	--	--	--	--	--	--	--
Naphthalene	mg/L	0.000411 U	0.000356 U	0.00168 U	0.00168 U	--	0.00037 U	0.000356 U	0.000356 U
Nitrobenzene	mg/L	0.00244 U	--	--	--	--	--	--	--
N-Nitrosodi-n-propylamine	mg/L	0.00189 U	--	--	--	--	--	--	--
N-Nitrosodiphenylamine	mg/L	0.00400 U	--	--	--	--	--	--	--
Pentachlorophenol	mg/L	0.00367 UJ	0.00317 U	0.015 U	0.015 U	--	0.0033 U	0.00317 U	0.00317 U
Phenanthrene	mg/L	0.000467 U	--	--	--	--	--	--	--
Phenol	mg/L	0.00167 U	0.00144 U	0.00682 U	0.00682 U	--	0.0015 U	0.00144 U	0.00144 U
Pyrene	mg/L	0.000389 U	--	--	--	--	--	--	--
Volatile Organic Compounds									
1,1,1-Trichloroethane	mg/L	0.000190 U	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/L	0.000190 U	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/L	0.000190 U	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/L	0.000240 U	--	--	--	--	--	--	--
1,1-Dichloroethene	mg/L	0.000250 U	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/L	0.000200 U	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/L	0.000190 U	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/L	0.000200 U	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/L	0.000250 U	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/L	0.000180 U	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/L	0.000170 U	--	--	--	--	--	--	--
2-Butanone (Methyl ethyl ketone) (MEK)	mg/L	0.00264 U	--	--	--	--	--	--	--
2-Hexanone	mg/L	0.00128 U	--	--	--	--	--	--	--
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	mg/L	0.000810 U	--	--	--	--	--	--	--
Acetone	mg/L	R	0.00846 U	--	0.00266 U	0.00536	0.00266 U	0.00266 U	0.00266 U
Benzene	mg/L	0.000200 U	--	--	--	--	--	--	--
Bromodichloromethane	mg/L	0.000170 U	--	--	--	--	--	--	--
Bromoform	mg/L	0.000290 U	--	--	--	--	--	--	--
Bromomethane (Methyl bromide)	mg/L	0.000350 U	--	--	--	--	--	--	--
Carbon disulfide	mg/L	0.000267 J	0.000220 U	--	0.207	0.157	0.000220 U	0.000220 U	0.000220 U
Carbon tetrachloride	mg/L	0.000180 U	--	--	--	--	--	--	--
Chlorobenzene	mg/L	0.000180 U	--	--	--	--	--	--	--
Chloroethane	mg/L	0.000360 U	--	--	--	--	--	--	--
Chloroform (Trichloromethane)	mg/L	0.000230 U	--	--	--	--	--	--	--
Chloromethane (Methyl chloride)	mg/L	0.000360 U	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/L	0.000210 U	--	--	--	--	--	--	--

Table 2

Analytical Results Summary
Annual Groundwater Sampling
Avtex Fibers Superfund Site
Front Royal, Virginia
July - August 2017

Sample Location:		135	136	138	138	138	162	181	185
Sample ID:		2017AN-135	2017AN-136	2017AN-138	2017AN-138D	2017AN-138-Resample	2017AN-162	2017AN-181	2017AN-185
Sample Date:		8/1/2017	7/19/2017	7/30/2017	7/30/2017	8/9/2017	7/16/2017	7/18/2017	7/18/2017
					Duplicate				
Parameters	**Units**								
Volatile Organic Compounds (Continued)									
cis-1,3-Dichloropropene	mg/L	0.000170 U	--	--	--	--	--	--	--
Dibromochloromethane	mg/L	0.000250 U	--	--	--	--	--	--	--
Ethylbenzene	mg/L	0.000190 U	--	--	--	--	--	--	--
Methylene chloride	mg/L	0.00100 U	--	--	--	--	--	--	--
Styrene	mg/L	0.000280 U	--	--	--	--	--	--	--
Tetrachloroethene	mg/L	0.000140 U	--	--	--	--	--	--	--
Toluene	mg/L	0.000170 U	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/L	0.000230 U	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/L	0.000170 U	--	--	--	--	--	--	--
Trichloroethene	mg/L	0.000200 U	--	--	--	--	--	--	--
Vinyl chloride	mg/L	0.000180 U	--	--	--	--	--	--	--
Xylenes (total)	mg/L	0.000580 U	--	--	--	--	--	--	--
General Chemistry									
Chloride	mg/L	--	--	--	--	--	--	--	--
Cyanide (free)	mg/L	--	0.00154 U	0.00154 U	0.00154 U	--	0.00154 U	0.00154 U	0.00154 U
Sulfate	mg/L	--	--	--	--	--	--	--	--

Notes:.

"--" - Not analyzed
U - Not detected at the associated reporting limit
J - Estimated concentration
UJ - Not detected; associated reporting limit is estimated
R - Rejected

Table 2

Analytical Results Summary
Annual Groundwater Sampling
Avtex Fibers Superfund Site
Front Royal, Virginia
July - August 2017

Sample Location:		203	205	206	206	210	215	216	232
Sample ID:		2017AN-203	2017AN-205	2017AN-206	2017AN-206-Resample	2017AN-210	2017AN-215	2017AN-216	2017AN-232
Sample Date:		7/25/2017	7/31/2017	7/13/2017	7/19/2017	7/27/2017	7/18/2017	7/15/2017	7/27/2017
Parameters	**Units**								
Metals									
Aluminum (dissolved)	mg/L	0.00840 U	0.07666 U	0.0420 U	--	--	--	0.0135 J	0.00840 U
Antimony (dissolved)	mg/L	0.000800 U	0.00153 J	0.00400 U	--	--	--	0.0166	0.000800 U
Arsenic (dissolved)	mg/L	0.000400 U	0.0197 J	0.0216	--	--	--	0.215	0.00335
Beryllium (dissolved)	mg/L	--	--	--	--	--	--	--	--
Cadmium (dissolved)	mg/L	0.000100 U	0.000100 UJ	0.000500 U	--	--	--	0.000100 U	0.000100 U
Calcium (dissolved)	mg/L	--	--	--	--	--	--	--	--
Chromium (dissolved)	mg/L	0.000500 U	0.00136 J	0.00250 U	--	--	--	0.0104	0.00858
Cobalt (dissolved)	mg/L	0.000100 U	0.00226 J	0.00312 J	--	--	--	0.104	0.000703 J
Copper (dissolved)	mg/L	--	--	--	--	--	--	--	--
Iron (dissolved)	mg/L	3.65	0.0253 U	0.0500 U	--	--	--	0.0205 U	4.57
Lead (dissolved)	mg/L	0.000100 U	0.0006435 UJ	0.000500 U	--	--	--	0.000100 U	0.000100 U
Magnesium (dissolved)	mg/L	--	--	--	--	--	--	--	--
Manganese (dissolved)	mg/L	0.478	0.0844	0.00750 U	--	--	--	0.106	0.108
Mercury (dissolved)	mg/L	0.000100 U	0.000100 U	0.000100 U	--	0.000100 U	0.000100 UJ	0.000100 U	0.000100 U
Nickel (dissolved)	mg/L	0.000500 U	0.0117 J	0.00311 J	--	--	--	0.355	0.00201
Selenium (dissolved)	mg/L	--	--	--	--	--	--	--	--
Sodium (dissolved)	mg/L	--	--	--	--	--	--	--	--
Thallium (dissolved)	mg/L	--	--	--	--	--	--	--	--
Vanadium (dissolved)	mg/L	0.000700 U	0.00191 U	0.00350 U	--	--	--	0.00936	0.00290 U
Zinc (dissolved)	mg/L	0.00520 U	0.00520 UJ	0.0260 U	--	--	--	0.0109 J	0.0129 J
Semi-volatile Organic Compounds									
1,2,4-Trichlorobenzene	mg/L	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/L	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/L	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/L	--	--	--	--	--	--	--	--
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	mg/L	--	--	--	--	--	--	--	--
2,4,5-Trichlorophenol	mg/L	--	--	--	--	--	--	--	--
2,4,6-Trichlorophenol	mg/L	--	--	--	--	--	--	--	--
2,4-Dichlorophenol	mg/L	--	--	--	--	--	--	--	--
2,4-Dimethylphenol	mg/L	--	--	--	--	--	--	--	--
2,4-Dinitrophenol	mg/L	--	--	--	--	--	--	--	--
2,4-Dinitrotoluene	mg/L	--	--	--	--	--	--	--	--
2,6-Dinitrotoluene	mg/L	--	--	--	--	--	--	--	--
2-Chloronaphthalene	mg/L	--	--	--	--	--	--	--	--
2-Chlorophenol	mg/L	--	--	--	--	--	--	--	--
2-Methylnaphthalene	mg/L	--	--	--	--	--	--	--	--
2-Methylphenol	mg/L	0.00154 U	0.00784 U	0.0016 U	--	0.0016 U	0.00145 U	0.008 U	0.00154 U

Table 2

Analytical Results Summary
Annual Groundwater Sampling
Avtex Fibers Superfund Site
Front Royal, Virginia
July - August 2017

Sample Location:		203	205	206	206	210	215	216	232
Sample ID:		2017AN-203	2017AN-205	2017AN-206	2017AN-206-Resample	2017AN-210	2017AN-215	2017AN-216	2017AN-232
Sample Date:		7/25/2017	7/31/2017	7/13/2017	7/19/2017	7/27/2017	7/18/2017	7/15/2017	7/27/2017
Parameters	**Units**								
Semi-volatile Organic Compounds (Continued)									
2-Nitroaniline	mg/L	--	--	--	--	--	--	--	--
2-Nitrophenol	mg/L	--	--	--	--	--	--	--	--
3&4-Methylphenol	mg/L	0.00135 U	0.00686 U	0.0014 U	--	0.0014 U	0.00129 J	0.007 U	0.00135 U
3,3'-Dichlorobenzidine	mg/L	--	--	--	--	--	--	--	--
3-Nitroaniline	mg/L	--	--	--	--	--	--	--	--
4,6-Dinitro-2-methylphenol	mg/L	--	--	--	--	--	--	--	--
4-Bromophenyl phenyl ether	mg/L	--	--	--	--	--	--	--	--
4-Chloro-3-methylphenol	mg/L	--	--	--	--	--	--	--	--
4-Chloroaniline	mg/L	--	--	--	--	--	--	--	--
4-Chlorophenyl phenyl ether	mg/L	--	--	--	--	--	--	--	--
4-Nitroaniline	mg/L	--	--	--	--	--	--	--	--
4-Nitrophenol	mg/L	--	--	--	--	--	--	--	--
Acenaphthene	mg/L	--	--	--	--	--	--	--	--
Acenaphthylene	mg/L	--	--	--	--	--	--	--	--
Anthracene	mg/L	--	--	--	--	--	--	--	--
Benzo(a)anthracene	mg/L	--	--	--	--	--	--	--	--
Benzo(a)pyrene	mg/L	--	--	--	--	--	--	--	--
Benzo(b)fluoranthene	mg/L	--	--	--	--	--	--	--	--
Benzo(g,h,i)perylene	mg/L	--	--	--	--	--	--	--	--
Benzo(k)fluoranthene	mg/L	--	--	--	--	--	--	--	--
bis(2-Chloroethoxy)methane	mg/L	--	--	--	--	--	--	--	--
bis(2-Chloroethyl)ether	mg/L	--	--	--	--	--	--	--	--
bis(2-Ethylhexyl)phthalate (DEHP)	mg/L	0.00144 U	0.00735 U	0.00407 U	--	0.0015 U	0.00616 U	0.00814 U	0.0021 U
Butyl benzylphthalate (BBP)	mg/L	--	--	--	--	--	--	--	--
Carbazole	mg/L	--	--	--	--	--	--	--	--
Chrysene	mg/L	--	--	--	--	--	--	--	--
Dibenz(a,h)anthracene	mg/L	--	--	--	--	--	--	--	--
Dibenzofuran	mg/L	--	--	--	--	--	--	--	--
Diethyl phthalate	mg/L	--	--	--	--	--	--	--	--
Dimethyl phthalate	mg/L	--	--	--	--	--	--	--	--
Di-n-butylphthalate (DBP)	mg/L	--	--	--	--	--	--	--	--
Di-n-octyl phthalate (DnOP)	mg/L	--	--	--	--	--	--	--	--
Fluoranthene	mg/L	--	--	--	--	--	--	--	--
Fluorene	mg/L	--	--	--	--	--	--	--	--
Hexachlorobenzene	mg/L	--	--	--	--	--	--	--	--
Hexachlorobutadiene	mg/L	--	--	--	--	--	--	--	--
Hexachlorocyclopentadiene	mg/L	--	--	--	--	--	--	--	--
Hexachloroethane	mg/L	--	--	--	--	--	--	--	--

Table 2

Analytical Results Summary
Annual Groundwater Sampling
Avtex Fibers Superfund Site
Front Royal, Virginia
July - August 2017

Sample Location:		203	205	206	206	210	215	216	232
Sample ID:		2017AN-203	2017AN-205	2017AN-206	2017AN-206-Resample	2017AN-210	2017AN-215	2017AN-216	2017AN-232
Sample Date:		7/25/2017	7/31/2017	7/13/2017	7/19/2017	7/27/2017	7/18/2017	7/15/2017	7/27/2017
Parameters	**Units**								
Semi-volatile Organic Compounds (Continued)									
Indeno(1,2,3-cd)pyrene	mg/L	--	--	--	--	--	--	--	--
Isophorone	mg/L	--	--	--	--	--	--	--	--
Naphthalene	mg/L	0.000356 U	0.00181 U	0.00037 U	--	0.00037 U	0.00078 J	0.00185 U	0.000356 U
Nitrobenzene	mg/L	--	--	--	--	--	--	--	--
N-Nitrosodi-n-propylamine	mg/L	--	--	--	--	--	--	--	--
N-Nitrosodiphenylamine	mg/L	--	--	--	--	--	--	--	--
Pentachlorophenol	mg/L	0.00317 U	0.0162 UJ	0.0033 UJ	--	0.0033 U	0.003 U	0.0165 U	0.00317 U
Phenanthrene	mg/L	--	--	--	--	--	--	--	--
Phenol	mg/L	0.00144 U	0.00735 U	0.0015 U	--	0.0015 U	0.0169	0.0075 U	0.00144 U
Pyrene	mg/L	--	--	--	--	--	--	--	--
Volatile Organic Compounds									
1,1,1-Trichloroethane	mg/L	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/L	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/L	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/L	--	--	--	--	--	--	--	--
1,1-Dichloroethene	mg/L	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/L	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/L	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/L	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/L	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/L	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/L	--	--	--	--	--	--	--	--
2-Butanone (Methyl ethyl ketone) (MEK)	mg/L	--	--	--	--	--	--	--	--
2-Hexanone	mg/L	--	--	--	--	--	--	--	--
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	mg/L	--	--	--	--	--	--	--	--
Acetone	mg/L	0.00266 U	R	--	0.00846 U	0.00266 U	0.0462 J	0.0266 U	--
Benzene	mg/L	--	--	--	--	--	--	--	--
Bromodichloromethane	mg/L	--	--	--	--	--	--	--	--
Bromoform	mg/L	--	--	--	--	--	--	--	--
Bromomethane (Methyl bromide)	mg/L	--	--	--	--	--	--	--	--
Carbon disulfide	mg/L	0.000220 U	0.0352	--	2.39	0.000220 U	0.408	0.352	--
Carbon tetrachloride	mg/L	--	--	--	--	--	--	--	--
Chlorobenzene	mg/L	--	--	--	--	--	--	--	--
Chloroethane	mg/L	--	--	--	--	--	--	--	--
Chloroform (Trichloromethane)	mg/L	--	--	--	--	--	--	--	--
Chloromethane (Methyl chloride)	mg/L	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/L	--	--	--	--	--	--	--	--

Table 2

Analytical Results Summary
Annual Groundwater Sampling
Avtex Fibers Superfund Site
Front Royal, Virginia
July - August 2017

Sample Location:		203	205	206	206	210	215	216	232
Sample ID:		2017AN-203	2017AN-205	2017AN-206	2017AN-206-Resample	2017AN-210	2017AN-215	2017AN-216	2017AN-232
Sample Date:		7/25/2017	7/31/2017	7/13/2017	7/19/2017	7/27/2017	7/18/2017	7/15/2017	7/27/2017
Parameters	**Units**								
Volatile Organic Compounds (Continued)									
cis-1,3-Dichloropropene	mg/L	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/L	--	--	--	--	--	--	--	--
Ethylbenzene	mg/L	--	--	--	--	--	--	--	--
Methylene chloride	mg/L	--	--	--	--	--	--	--	--
Styrene	mg/L	--	--	--	--	--	--	--	--
Tetrachloroethene	mg/L	--	--	--	--	--	--	--	--
Toluene	mg/L	--	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/L	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/L	--	--	--	--	--	--	--	--
Trichloroethene	mg/L	--	--	--	--	--	--	--	--
Vinyl chloride	mg/L	--	--	--	--	--	--	--	--
Xylenes (total)	mg/L	--	--	--	--	--	--	--	--
General Chemistry									
Chloride	mg/L	--	--	--	--	--	--	--	--
Cyanide (free)	mg/L	0.00154 U	0.00154 U	0.00154 U	--	0.00154 U	0.00154 U	0.00154 U	0.00154 U
Sulfate	mg/L	--	--	--	--	--	--	--	--

Notes:.

"--" - Not analyzed
U - Not detected at the associated reporting limit
J - Estimated concentration
UJ - Not detected; associated reporting limit is estimated
R - Rejected

Table 2

Analytical Results Summary
Annual Groundwater Sampling
Avtex Fibers Superfund Site
Front Royal, Virginia
July - August 2017

Sample Location:		232	238	238	301	305	316	336
Sample ID:		2017AN-232-Resample	2017AN-238	2017AN-238-Resample	2017AN-301	2017AN-305	2017AN-316	2017AN-336
Sample Date:		8/10/2017	7/30/2017	8/9/2017	7/25/2017	8/8/2017	7/15/2017	7/18/2017
Parameters	**Units**							
Metals								
Aluminum (dissolved)	mg/L	--	0.00840 U	--	0.00840 U	0.00840 U	0.00840 U	--
Antimony (dissolved)	mg/L	--	0.0152	--	0.000800 U	0.616	0.00424	--
Arsenic (dissolved)	mg/L	--	0.0966	--	0.000400 U	3.74	0.0618	--
Beryllium (dissolved)	mg/L	--	--	--	--	--	--	--
Cadmium (dissolved)	mg/L	--	0.000100 U	--	0.000100 U	0.000100 U	0.000100 U	--
Calcium (dissolved)	mg/L	--	--	--	--	--	--	--
Chromium (dissolved)	mg/L	--	0.00219	--	0.00617	0.0169	0.00655	--
Cobalt (dissolved)	mg/L	--	0.00449	--	0.000285 J	0.178	0.0227	--
Copper (dissolved)	mg/L	--	--	--	--	--	--	--
Iron (dissolved)	mg/L	--	0.0610	--	1.14	0.0782	0.0153 U	--
Lead (dissolved)	mg/L	--	0.000100 U	--	0.000100 U	0.000100 U	0.000100 U	--
Magnesium (dissolved)	mg/L	--	--	--	--	--	--	--
Manganese (dissolved)	mg/L	--	0.00990	--	0.0245	0.0415	0.0517	--
Mercury (dissolved)	mg/L	--	0.000100 U	--	0.000100 U	0.00100 U	0.000100 U	0.000100 UJ
Nickel (dissolved)	mg/L	--	0.00335	--	0.0133	0.0750	0.0731	--
Selenium (dissolved)	mg/L	--	--	--	--	--	--	--
Sodium (dissolved)	mg/L	--	--	--	--	--	--	--
Thallium (dissolved)	mg/L	--	--	--	--	--	--	--
Vanadium (dissolved)	mg/L	--	0.00673 U	--	0.000700 U	0.00393 U	0.00217	--
Zinc (dissolved)	mg/L	--	0.00520 U	--	0.00520 U	0.0369	0.00520 U	--
Semi-volatile Organic Compounds								
1,2,4-Trichlorobenzene	mg/L	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/L	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/L	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/L	--	--	--	--	--	--	--
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	mg/L	--	--	--	--	--	--	--
2,4,5-Trichlorophenol	mg/L	--	--	--	--	--	--	--
2,4,6-Trichlorophenol	mg/L	--	--	--	--	--	--	--
2,4-Dichlorophenol	mg/L	--	--	--	--	--	--	--
2,4-Dimethylphenol	mg/L	--	--	--	--	--	--	--
2,4-Dinitrophenol	mg/L	--	--	--	--	--	--	--
2,4-Dinitrotoluene	mg/L	--	--	--	--	--	--	--
2,6-Dinitrotoluene	mg/L	--	--	--	--	--	--	--
2-Chloronaphthalene	mg/L	--	--	--	--	--	--	--
2-Chlorophenol	mg/L	--	--	--	--	--	--	--
2-Methylnaphthalene	mg/L	--	--	--	--	--	--	--
2-Methylphenol	mg/L	--	0.0069 U	--	0.00154 U	0.016 U	0.008 U	0.00727 U

Table 2

Analytical Results Summary
Annual Groundwater Sampling
Avtex Fibers Superfund Site
Front Royal, Virginia
July - August 2017

Sample Location:		232	238	238	301	305	316	336
Sample ID:		2017AN-232-Resample	2017AN-238	2017AN-238-Resample	2017AN-301	2017AN-305	2017AN-316	2017AN-336
Sample Date:		8/10/2017	7/30/2017	8/9/2017	7/25/2017	8/8/2017	7/15/2017	7/18/2017
Parameters	**Units**							
Semi-volatile Organic Compounds (Continued)								
2-Nitroaniline	mg/L	--	--	--	--	--	--	--
2-Nitrophenol	mg/L	--	--	--	--	--	--	--
3&4-Methylphenol	mg/L	--	0.00603 U	--	0.00135 U	0.014 U	0.007 U	0.00636 U
3,3'-Dichlorobenzidine	mg/L	--	--	--	--	--	--	--
3-Nitroaniline	mg/L	--	--	--	--	--	--	--
4,6-Dinitro-2-methylphenol	mg/L	--	--	--	--	--	--	--
4-Bromophenyl phenyl ether	mg/L	--	--	--	--	--	--	--
4-Chloro-3-methylphenol	mg/L	--	--	--	--	--	--	--
4-Chloroaniline	mg/L	--	--	--	--	--	--	--
4-Chlorophenyl phenyl ether	mg/L	--	--	--	--	--	--	--
4-Nitroaniline	mg/L	--	--	--	--	--	--	--
4-Nitrophenol	mg/L	--	--	--	--	--	--	--
Acenaphthene	mg/L	--	--	--	--	--	--	--
Acenaphthylene	mg/L	--	--	--	--	--	--	--
Anthracene	mg/L	--	--	--	--	--	--	--
Benzo(a)anthracene	mg/L	--	--	--	--	--	--	--
Benzo(a)pyrene	mg/L	--	--	--	--	--	--	--
Benzo(b)fluoranthene	mg/L	--	--	--	--	--	--	--
Benzo(g,h,i)perylene	mg/L	--	--	--	--	--	--	--
Benzo(k)fluoranthene	mg/L	--	--	--	--	--	--	--
bis(2-Chloroethoxy)methane	mg/L	--	--	--	--	--	--	--
bis(2-Chloroethyl)ether	mg/L	--	--	--	--	--	--	--
bis(2-Ethylhexyl)phthalate (DEHP)	mg/L	--	0.00647 U	--	0.00144 U	0.015 U	0.0075 U	0.00682 U
Butyl benzylphthalate (BBP)	mg/L	--	--	--	--	--	--	--
Carbazole	mg/L	--	--	--	--	--	--	--
Chrysene	mg/L	--	--	--	--	--	--	--
Dibenz(a,h)anthracene	mg/L	--	--	--	--	--	--	--
Dibenzofuran	mg/L	--	--	--	--	--	--	--
Diethyl phthalate	mg/L	--	--	--	--	--	--	--
Dimethyl phthalate	mg/L	--	--	--	--	--	--	--
Di-n-butylphthalate (DBP)	mg/L	--	--	--	--	--	--	--
Di-n-octyl phthalate (DnOP)	mg/L	--	--	--	--	--	--	--
Fluoranthene	mg/L	--	--	--	--	--	--	--
Fluorene	mg/L	--	--	--	--	--	--	--
Hexachlorobenzene	mg/L	--	--	--	--	--	--	--
Hexachlorobutadiene	mg/L	--	--	--	--	--	--	--
Hexachlorocyclopentadiene	mg/L	--	--	--	--	--	--	--
Hexachloroethane	mg/L	--	--	--	--	--	--	--

Table 2

Analytical Results Summary
Annual Groundwater Sampling
Avtex Fibers Superfund Site
Front Royal, Virginia
July - August 2017

Sample Location:		232	238	238	301	305	316	336
Sample ID:		2017AN-232-Resample	2017AN-238	2017AN-238-Resample	2017AN-301	2017AN-305	2017AN-316	2017AN-336
Sample Date:		8/10/2017	7/30/2017	8/9/2017	7/25/2017	8/8/2017	7/15/2017	7/18/2017
Parameters	**Units**							
Semi-volatile Organic Compounds (Continued)								
Indeno(1,2,3-cd)pyrene	mg/L	--	--	--	--	--	--	--
Isophorone	mg/L	--	--	--	--	--	--	--
Naphthalene	mg/L	--	0.00159 U	--	0.000356 U	0.0037 U	0.00185 U	0.00168 U
Nitrobenzene	mg/L	--	--	--	--	--	--	--
N-Nitrosodi-n-propylamine	mg/L	--	--	--	--	--	--	--
N-Nitrosodiphenylamine	mg/L	--	--	--	--	--	--	--
Pentachlorophenol	mg/L	--	0.0142 U	--	0.00317 U	0.033 UJ	0.0165 U	0.015 U
Phenanthrene	mg/L	--	--	--	--	--	--	--
Phenol	mg/L	--	0.00647 U	--	0.00144 U	0.0895 J	0.0075 U	0.00682 U
Pyrene	mg/L	--	--	--	--	--	--	--
Volatile Organic Compounds								
1,1,1-Trichloroethane	mg/L	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/L	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/L	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/L	--	--	--	--	--	--	--
1,1-Dichloroethene	mg/L	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/L	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/L	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/L	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/L	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/L	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/L	--	--	--	--	--	--	--
2-Butanone (Methyl ethyl ketone) (MEK)	mg/L	--	--	--	--	--	--	--
2-Hexanone	mg/L	--	--	--	--	--	--	--
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	mg/L	--	--	--	--	--	--	--
Acetone	mg/L	0.00865	--	0.00266 U	0.00266 U	1.59 J	0.00266 U	0.00378 J
Benzene	mg/L	--	--	--	--	--	--	--
Bromodichloromethane	mg/L	--	--	--	--	--	--	--
Bromoform	mg/L	--	--	--	--	--	--	--
Bromomethane (Methyl bromide)	mg/L	--	--	--	--	--	--	--
Carbon disulfide	mg/L	0.000815	--	0.0907	0.000220 U	44.3	0.451	0.363
Carbon tetrachloride	mg/L	--	--	--	--	--	--	--
Chlorobenzene	mg/L	--	--	--	--	--	--	--
Chloroethane	mg/L	--	--	--	--	--	--	--
Chloroform (Trichloromethane)	mg/L	--	--	--	--	--	--	--
Chloromethane (Methyl chloride)	mg/L	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/L	--	--	--	--	--	--	--

Table 2

Analytical Results Summary
Annual Groundwater Sampling
Avtex Fibers Superfund Site
Front Royal, Virginia
July - August 2017

Sample Location:		232	238	238	301	305	316	336
Sample ID:		2017AN-232-Resample	2017AN-238	2017AN-238-Resample	2017AN-301	2017AN-305	2017AN-316	2017AN-336
Sample Date:		8/10/2017	7/30/2017	8/9/2017	7/25/2017	8/8/2017	7/15/2017	7/18/2017
Parameters	**Units**							
Volatile Organic Compounds (Continued)								
cis-1,3-Dichloropropene	mg/L	--	--	--	--	--	--	--
Dibromochloromethane	mg/L	--	--	--	--	--	--	--
Ethylbenzene	mg/L	--	--	--	--	--	--	--
Methylene chloride	mg/L	--	--	--	--	--	--	--
Styrene	mg/L	--	--	--	--	--	--	--
Tetrachloroethene	mg/L	--	--	--	--	--	--	--
Toluene	mg/L	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/L	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/L	--	--	--	--	--	--	--
Trichloroethene	mg/L	--	--	--	--	--	--	--
Vinyl chloride	mg/L	--	--	--	--	--	--	--
Xylenes (total)	mg/L	--	--	--	--	--	--	--
General Chemistry								
Chloride	mg/L	--	--	--	--	--	--	--
Cyanide (free)	mg/L	--	0.00154 U	--	0.00154 U	0.00154 U	0.00154 U	0.00154 U
Sulfate	mg/L	--	--	--	--	--	--	--

Notes:.

"--" - Not analyzed
U - Not detected at the associated reporting limit
J - Estimated concentration
UJ - Not detected; associated reporting limit is estimated
R - Rejected

Table 2

Analytical Results Summary
Annual Groundwater Sampling
Avtex Fibers Superfund Site
Front Royal, Virginia
July - August 2017

Sample Location:		336	338	501A	501B	501C	601	602	601
Sample ID:		2017AN-336D	2017AN-338	2017AN-501A	2017AN-501B	2017AN-501C	2017AN-601	2017AN-602	2017AN-601-Resample
Sample Date:		7/18/2017	7/30/2017	7/17/2017	7/17/2017	7/17/2017	7/28/2017	7/16/2017	8/10/2017
		Duplicate							
Parameters	**Units**								
Metals									
Aluminum (dissolved)	mg/L	--	0.00840 U	0.00840 U	0.0148 J	0.0272	0.0830	0.0579	--
Antimony (dissolved)	mg/L	--	0.000800 U	0.000800 U	0.000800 U	0.000800 U	0.000800 U	0.000800 U	--
Arsenic (dissolved)	mg/L	--	0.0216	0.000400 U	0.000400 U	0.00109 J	0.000924 U	0.00157 J	--
Beryllium (dissolved)	mg/L	--	--	--	--	--	--	--	--
Cadmium (dissolved)	mg/L	--	0.000100 U	0.000100 U	0.000100 U	0.000100 U	0.000100 U	0.000100 U	--
Calcium (dissolved)	mg/L	--	--	--	--	--	--	--	--
Chromium (dissolved)	mg/L	--	0.00185 J	0.000500 U	0.000500 U	0.000595 U	0.000500 U	0.000535 U	--
Cobalt (dissolved)	mg/L	--	0.00392	0.000100 U	0.000100 U	0.000100 U	0.000100 U	0.000100 U	--
Copper (dissolved)	mg/L	--	--	--	--	--	--	--	--
Iron (dissolved)	mg/L	--	0.0273	0.0103 U	0.0100 U	0.0218 U	0.308	0.0100 U	--
Lead (dissolved)	mg/L	--	0.000100 U	0.000100 U	0.000100 U	0.000100 U	0.000100 U	0.000100 U	--
Magnesium (dissolved)	mg/L	--	--	--	--	--	--	--	--
Manganese (dissolved)	mg/L	--	0.0249	0.00260 J	0.00360 J	0.00770	0.00150 J	0.00273 J	--
Mercury (dissolved)	mg/L	0.000100 UJ	0.000100 U	0.000100 U	0.000100 U	0.000100 U	0.000100 U	0.000100 U	--
Nickel (dissolved)	mg/L	--	0.0138	0.00501	0.00325	0.00215	0.00240	0.000500 U	--
Selenium (dissolved)	mg/L	--	--	--	--	--	--	--	--
Sodium (dissolved)	mg/L	--	--	--	--	--	--	--	--
Thallium (dissolved)	mg/L	--	--	--	--	--	--	--	--
Vanadium (dissolved)	mg/L	--	0.00483 U	0.000700 U	0.000700 U	0.000700 U	0.00294 U	0.000700 U	--
Zinc (dissolved)	mg/L	--	0.00520 U	0.00520 U	0.00520 U	0.00520 U	0.00520 U	0.00520 U	--
Semi-volatile Organic Compounds									
1,2,4-Trichlorobenzene	mg/L	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/L	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/L	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/L	--	--	--	--	--	--	--	--
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	mg/L	--	--	--	--	--	--	--	--
2,4,5-Trichlorophenol	mg/L	--	--	--	--	--	--	--	--
2,4,6-Trichlorophenol	mg/L	--	--	--	--	--	--	--	--
2,4-Dichlorophenol	mg/L	--	--	--	--	--	--	--	--
2,4-Dimethylphenol	mg/L	--	--	--	--	--	--	--	--
2,4-Dinitrophenol	mg/L	--	--	--	--	--	--	--	--
2,4-Dinitrotoluene	mg/L	--	--	--	--	--	--	--	--
2,6-Dinitrotoluene	mg/L	--	--	--	--	--	--	--	--
2-Chloronaphthalene	mg/L	--	--	--	--	--	--	--	--
2-Chlorophenol	mg/L	--	--	--	--	--	--	--	--
2-Methylnaphthalene	mg/L	--	--	--	--	--	--	--	--
2-Methylphenol	mg/L	0.00727 U	0.00154 U	0.00727 U	0.0014 U	0.00145 U	0.0014 U	0.00145 U	--

Table 2

Analytical Results Summary
Annual Groundwater Sampling
Avtex Fibers Superfund Site
Front Royal, Virginia
July - August 2017

Sample Location:		336	338	501A	501B	501C	601	602	601
Sample ID:		2017AN-336D	2017AN-338	2017AN-501A	2017AN-501B	2017AN-501C	2017AN-601	2017AN-602	2017AN-601-Resample
Sample Date:		7/18/2017	7/30/2017	7/17/2017	7/17/2017	7/17/2017	7/28/2017	7/16/2017	8/10/2017
		Duplicate							
Parameters	**Units**								
Semi-volatile Organic Compounds (Continued)									
2-Nitroaniline	mg/L	--	--	--	--	--	--	--	--
2-Nitrophenol	mg/L	--	--	--	--	--	--	--	--
3&4-Methylphenol	mg/L	0.00636 U	0.00135 U	0.00636 U	0.00123 U	0.00127 U	0.00123 U	0.00127 U	--
3,3'-Dichlorobenzidine	mg/L	--	--	--	--	--	--	--	--
3-Nitroaniline	mg/L	--	--	--	--	--	--	--	--
4,6-Dinitro-2-methylphenol	mg/L	--	--	--	--	--	--	--	--
4-Bromophenyl phenyl ether	mg/L	--	--	--	--	--	--	--	--
4-Chloro-3-methylphenol	mg/L	--	--	--	--	--	--	--	--
4-Chloroaniline	mg/L	--	--	--	--	--	--	--	--
4-Chlorophenyl phenyl ether	mg/L	--	--	--	--	--	--	--	--
4-Nitroaniline	mg/L	--	--	--	--	--	--	--	--
4-Nitrophenol	mg/L	--	--	--	--	--	--	--	--
Acenaphthene	mg/L	--	--	--	--	--	--	--	--
Acenaphthylene	mg/L	--	--	--	--	--	--	--	--
Anthracene	mg/L	--	--	--	--	--	--	--	--
Benzo(a)anthracene	mg/L	--	--	--	--	--	--	--	--
Benzo(a)pyrene	mg/L	--	--	--	--	--	--	--	--
Benzo(b)fluoranthene	mg/L	--	--	--	--	--	--	--	--
Benzo(g,h,i)perylene	mg/L	--	--	--	--	--	--	--	--
Benzo(k)fluoranthene	mg/L	--	--	--	--	--	--	--	--
bis(2-Chloroethoxy)methane	mg/L	--	--	--	--	--	--	--	--
bis(2-Chloroethyl)ether	mg/L	--	--	--	--	--	--	--	--
bis(2-Ethylhexyl)phthalate (DEHP)	mg/L	0.00682 U	0.00144 U	0.00682 U	0.00267 U	0.00284 U	0.00261 U	0.00712 U	--
Butyl benzylphthalate (BBP)	mg/L	--	--	--	--	--	--	--	--
Carbazole	mg/L	--	--	--	--	--	--	--	--
Chrysene	mg/L	--	--	--	--	--	--	--	--
Dibenz(a,h)anthracene	mg/L	--	--	--	--	--	--	--	--
Dibenzofuran	mg/L	--	--	--	--	--	--	--	--
Diethyl phthalate	mg/L	--	--	--	--	--	--	--	--
Dimethyl phthalate	mg/L	--	--	--	--	--	--	--	--
Di-n-butylphthalate (DBP)	mg/L	--	--	--	--	--	--	--	--
Di-n-octyl phthalate (DnOP)	mg/L	--	--	--	--	--	--	--	--
Fluoranthene	mg/L	--	--	--	--	--	--	--	--
Fluorene	mg/L	--	--	--	--	--	--	--	--
Hexachlorobenzene	mg/L	--	--	--	--	--	--	--	--
Hexachlorobutadiene	mg/L	--	--	--	--	--	--	--	--
Hexachlorocyclopentadiene	mg/L	--	--	--	--	--	--	--	--
Hexachloroethane	mg/L	--	--	--	--	--	--	--	--

Table 2

Analytical Results Summary
Annual Groundwater Sampling
Avtex Fibers Superfund Site
Front Royal, Virginia
July - August 2017

Sample Location:		336	338	501A	501B	501C	601	602	601
Sample ID:		2017AN-336D	2017AN-338	2017AN-501A	2017AN-501B	2017AN-501C	2017AN-601	2017AN-602	2017AN-601-Resample
Sample Date:		7/18/2017	7/30/2017	7/17/2017	7/17/2017	7/17/2017	7/28/2017	7/16/2017	8/10/2017
		Duplicate							
Parameters	**Units**								
Semi-volatile Organic Compounds (Continued)									
Indeno(1,2,3-cd)pyrene	mg/L	--	--	--	--	--	--	--	--
Isophorone	mg/L	--	--	--	--	--	--	--	--
Naphthalene	mg/L	0.00168 U	0.000356 U	0.00168 U	0.000325 U	0.000336 U	0.000325 U	0.000336 U	--
Nitrobenzene	mg/L	--	--	--	--	--	--	--	--
N-Nitrosodi-n-propylamine	mg/L	--	--	--	--	--	--	--	--
N-Nitrosodiphenylamine	mg/L	--	--	--	--	--	--	--	--
Pentachlorophenol	mg/L	0.015 U	0.00317 UJ	0.015 U	0.00289 U	0.003 U	0.00289 U	0.003 U	--
Phenanthrene	mg/L	--	--	--	--	--	--	--	--
Phenol	mg/L	0.00682 U	0.00144 U	0.00682 U	0.00132 U	0.00136 U	0.00132 U	0.00136 U	--
Pyrene	mg/L	--	--	--	--	--	--	--	--
Volatile Organic Compounds									
1,1,1-Trichloroethane	mg/L	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/L	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/L	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/L	--	--	--	--	--	--	--	--
1,1-Dichloroethene	mg/L	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/L	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/L	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/L	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/L	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/L	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/L	--	--	--	--	--	--	--	--
2-Butanone (Methyl ethyl ketone) (MEK)	mg/L	--	--	--	--	--	--	--	--
2-Hexanone	mg/L	--	--	--	--	--	--	--	--
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	mg/L	--	--	--	--	--	--	--	--
Acetone	mg/L	R	0.00572 U	0.00266 U	0.00266 U	0.00266 U	--	0.00266 U	0.00290 J
Benzene	mg/L	--	--	--	--	--	--	--	--
Bromodichloromethane	mg/L	--	--	--	--	--	--	--	--
Bromoform	mg/L	--	--	--	--	--	--	--	--
Bromomethane (Methyl bromide)	mg/L	--	--	--	--	--	--	--	--
Carbon disulfide	mg/L	0.335	0.0119	0.000220 U	0.000434 J	0.000951	--	0.000331 J	0.00127
Carbon tetrachloride	mg/L	--	--	--	--	--	--	--	--
Chlorobenzene	mg/L	--	--	--	--	--	--	--	--
Chloroethane	mg/L	--	--	--	--	--	--	--	--
Chloroform (Trichloromethane)	mg/L	--	--	--	--	--	--	--	--
Chloromethane (Methyl chloride)	mg/L	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/L	--	--	--	--	--	--	--	--

Table 2

Analytical Results Summary
Annual Groundwater Sampling
Avtex Fibers Superfund Site
Front Royal, Virginia
July - August 2017

Sample Location:		336	338	501A	501B	501C	601	602	601
Sample ID:		2017AN-336D	2017AN-338	2017AN-501A	2017AN-501B	2017AN-501C	2017AN-601	2017AN-602	2017AN-601-Resample
Sample Date:		7/18/2017	7/30/2017	7/17/2017	7/17/2017	7/17/2017	7/28/2017	7/16/2017	8/10/2017
		Duplicate							
Parameters	**Units**								
Volatile Organic Compounds (Continued)									
cis-1,3-Dichloropropene	mg/L	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/L	--	--	--	--	--	--	--	--
Ethylbenzene	mg/L	--	--	--	--	--	--	--	--
Methylene chloride	mg/L	--	--	--	--	--	--	--	--
Styrene	mg/L	--	--	--	--	--	--	--	--
Tetrachloroethene	mg/L	--	--	--	--	--	--	--	--
Toluene	mg/L	--	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/L	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/L	--	--	--	--	--	--	--	--
Trichloroethene	mg/L	--	--	--	--	--	--	--	--
Vinyl chloride	mg/L	--	--	--	--	--	--	--	--
Xylenes (total)	mg/L	--	--	--	--	--	--	--	--
General Chemistry									
Chloride	mg/L	--	--	--	--	--	--	--	--
Cyanide (free)	mg/L	0.00154 U	0.00154 U	0.00154 U	0.00154 U	0.00154 U	0.00154 U	0.00154 U	--
Sulfate	mg/L	--	--	--	--	--	--	--	--

Notes:.

"--" - Not analyzed
U - Not detected at the associated reporting limit
J - Estimated concentration
UJ - Not detected; associated reporting limit is estimated
R - Rejected

Table 2

Analytical Results Summary
Annual Groundwater Sampling
Avtex Fibers Superfund Site
Front Royal, Virginia
July - August 2017

Sample Location:		603	603	603	603	604	604	604	604
Sample ID:		2017AN-603-Z1	2017AN-603-Z2	2017AN-603-Z3	2017AN-603-Z4	2017AN-604-Z1	2017AN-604-Z2	2017AN-604-Z3	2017AN-604-Z4
Sample Date:		7/18/2017	7/18/2017	7/18/2017	7/18/2017	7/17/2017	7/17/2017	7/17/2017	7/17/2017
Parameters	**Units**								
Metals									
Aluminum (dissolved)	mg/L	--	--	--	--	0.00840 U	0.00840 U	0.00840 U	0.00840 U
Antimony (dissolved)	mg/L	--	--	--	--	0.000800 U	0.000800 U	0.000800 U	0.000800 U
Arsenic (dissolved)	mg/L	--	--	--	--	0.000400 U	0.000400 U	0.000400 U	0.000410 J
Beryllium (dissolved)	mg/L	--	--	--	--	--	--	--	--
Cadmium (dissolved)	mg/L	--	--	--	--	0.000100 U	0.000100 U	0.000100 U	0.000100 U
Calcium (dissolved)	mg/L	--	--	--	--	--	--	--	--
Chromium (dissolved)	mg/L	--	--	--	--	0.000535 U	0.000703 U	0.00132 U	0.000500 U
Cobalt (dissolved)	mg/L	--	--	--	--	0.000100 U	0.000100 U	0.000100 U	0.000100 U
Copper (dissolved)	mg/L	--	--	--	--	--	--	--	--
Iron (dissolved)	mg/L	--	--	--	--	0.352	0.279	0.0460 U	0.0186 U
Lead (dissolved)	mg/L	--	--	--	--	0.000100 U	0.000100 U	0.000100 U	0.000100 U
Magnesium (dissolved)	mg/L	--	--	--	--	--	--	--	--
Manganese (dissolved)	mg/L	--	--	--	--	0.250	0.236	0.197	0.0266
Mercury (dissolved)	mg/L	0.000100 UJ	0.000100 UJ	0.000100 UJ	0.000100 UJ	0.000100 U	0.000100 U	0.000100 U	0.000100 U
Nickel (dissolved)	mg/L	--	--	--	--	0.000635 J	0.000500 U	0.000500 U	0.000500 U
Selenium (dissolved)	mg/L	--	--	--	--	--	--	--	--
Sodium (dissolved)	mg/L	--	--	--	--	--	--	--	--
Thallium (dissolved)	mg/L	--	--	--	--	--	--	--	--
Vanadium (dissolved)	mg/L	--	--	--	--	0.000700 U	0.000700 U	0.000700 U	0.000700 U
Zinc (dissolved)	mg/L	--	--	--	--	0.00520 U	0.00734 J	0.00520 U	0.00520 U
Semi-volatile Organic Compounds									
1,2,4-Trichlorobenzene	mg/L	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/L	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/L	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/L	--	--	--	--	--	--	--	--
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	mg/L	--	--	--	--	--	--	--	--
2,4,5-Trichlorophenol	mg/L	--	--	--	--	--	--	--	--
2,4,6-Trichlorophenol	mg/L	--	--	--	--	--	--	--	--
2,4-Dichlorophenol	mg/L	--	--	--	--	--	--	--	--
2,4-Dimethylphenol	mg/L	--	--	--	--	--	--	--	--
2,4-Dinitrophenol	mg/L	--	--	--	--	--	--	--	--
2,4-Dinitrotoluene	mg/L	--	--	--	--	--	--	--	--
2,6-Dinitrotoluene	mg/L	--	--	--	--	--	--	--	--
2-Chloronaphthalene	mg/L	--	--	--	--	--	--	--	--
2-Chlorophenol	mg/L	--	--	--	--	--	--	--	--
2-Methylnaphthalene	mg/L	--	--	--	--	--	--	--	--
2-Methylphenol	mg/L	0.00145 U	0.00145 U	0.00145 U	0.00145 U	0.00145 U	0.00145 U	0.0014 U	0.00145 U

Table 2

Analytical Results Summary
Annual Groundwater Sampling
Avtex Fibers Superfund Site
Front Royal, Virginia
July - August 2017

Sample Location:		603	603	603	603	604	604	604	604
Sample ID:		2017AN-603-Z1	2017AN-603-Z2	2017AN-603-Z3	2017AN-603-Z4	2017AN-604-Z1	2017AN-604-Z2	2017AN-604-Z3	2017AN-604-Z4
Sample Date:		7/18/2017	7/18/2017	7/18/2017	7/18/2017	7/17/2017	7/17/2017	7/17/2017	7/17/2017
Parameters	**Units**								
Semi-volatile Organic Compounds (Continued)									
2-Nitroaniline	mg/L	--	--	--	--	--	--	--	--
2-Nitrophenol	mg/L	--	--	--	--	--	--	--	--
3&4-Methylphenol	mg/L	0.00127 U	0.00127 U	0.00127 U	0.00127 U	0.00127 U	0.00127 U	0.00123 U	0.00127 U
3,3'-Dichlorobenzidine	mg/L	--	--	--	--	--	--	--	--
3-Nitroaniline	mg/L	--	--	--	--	--	--	--	--
4,6-Dinitro-2-methylphenol	mg/L	--	--	--	--	--	--	--	--
4-Bromophenyl phenyl ether	mg/L	--	--	--	--	--	--	--	--
4-Chloro-3-methylphenol	mg/L	--	--	--	--	--	--	--	--
4-Chloroaniline	mg/L	--	--	--	--	--	--	--	--
4-Chlorophenyl phenyl ether	mg/L	--	--	--	--	--	--	--	--
4-Nitroaniline	mg/L	--	--	--	--	--	--	--	--
4-Nitrophenol	mg/L	--	--	--	--	--	--	--	--
Acenaphthene	mg/L	--	--	--	--	--	--	--	--
Acenaphthylene	mg/L	--	--	--	--	--	--	--	--
Anthracene	mg/L	--	--	--	--	--	--	--	--
Benzo(a)anthracene	mg/L	--	--	--	--	--	--	--	--
Benzo(a)pyrene	mg/L	--	--	--	--	--	--	--	--
Benzo(b)fluoranthene	mg/L	--	--	--	--	--	--	--	--
Benzo(g,h,i)perylene	mg/L	--	--	--	--	--	--	--	--
Benzo(k)fluoranthene	mg/L	--	--	--	--	--	--	--	--
bis(2-Chloroethoxy)methane	mg/L	--	--	--	--	--	--	--	--
bis(2-Chloroethyl)ether	mg/L	--	--	--	--	--	--	--	--
bis(2-Ethylhexyl)phthalate (DEHP)	mg/L	0.00468 U	0.00487 U	0.00315 U	0.00639 U	0.00458 U	0.00401 U	0.0025 U	0.00437 U
Butyl benzylphthalate (BBP)	mg/L	--	--	--	--	--	--	--	--
Carbazole	mg/L	--	--	--	--	--	--	--	--
Chrysene	mg/L	--	--	--	--	--	--	--	--
Dibenz(a,h)anthracene	mg/L	--	--	--	--	--	--	--	--
Dibenzofuran	mg/L	--	--	--	--	--	--	--	--
Diethyl phthalate	mg/L	--	--	--	--	--	--	--	--
Dimethyl phthalate	mg/L	--	--	--	--	--	--	--	--
Di-n-butylphthalate (DBP)	mg/L	--	--	--	--	--	--	--	--
Di-n-octyl phthalate (DnOP)	mg/L	--	--	--	--	--	--	--	--
Fluoranthene	mg/L	--	--	--	--	--	--	--	--
Fluorene	mg/L	--	--	--	--	--	--	--	--
Hexachlorobenzene	mg/L	--	--	--	--	--	--	--	--
Hexachlorobutadiene	mg/L	--	--	--	--	--	--	--	--
Hexachlorocyclopentadiene	mg/L	--	--	--	--	--	--	--	--
Hexachloroethane	mg/L	--	--	--	--	--	--	--	--

Table 2

Analytical Results Summary
Annual Groundwater Sampling
Avtex Fibers Superfund Site
Front Royal, Virginia
July - August 2017

Sample Location:		603	603	603	603	604	604	604	604
Sample ID:		2017AN-603-Z1	2017AN-603-Z2	2017AN-603-Z3	2017AN-603-Z4	2017AN-604-Z1	2017AN-604-Z2	2017AN-604-Z3	2017AN-604-Z4
Sample Date:		7/18/2017	7/18/2017	7/18/2017	7/18/2017	7/17/2017	7/17/2017	7/17/2017	7/17/2017
Parameters	**Units**								
Semi-volatile Organic Compounds (Continued)									
Indeno(1,2,3-cd)pyrene	mg/L	--	--	--	--	--	--	--	--
Isophorone	mg/L	--	--	--	--	--	--	--	--
Naphthalene	mg/L	0.000336 U	0.000336 U	0.000336 U	0.000336 U	0.000336 U	0.000336 U	0.000325 U	0.000336 U
Nitrobenzene	mg/L	--	--	--	--	--	--	--	--
N-Nitrosodi-n-propylamine	mg/L	--	--	--	--	--	--	--	--
N-Nitrosodiphenylamine	mg/L	--	--	--	--	--	--	--	--
Pentachlorophenol	mg/L	0.003 U	0.003 U	0.003 U	0.003 U	0.003 U	0.003 U	0.00289 U	0.003 U
Phenanthrene	mg/L	--	--	--	--	--	--	--	--
Phenol	mg/L	0.00136 U	0.00136 U	0.00136 U	0.00136 U	0.00136 U	0.00136 U	0.00132 U	0.00136 U
Pyrene	mg/L	--	--	--	--	--	--	--	--
Volatile Organic Compounds									
1,1,1-Trichloroethane	mg/L	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/L	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/L	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/L	--	--	--	--	--	--	--	--
1,1-Dichloroethene	mg/L	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/L	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/L	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/L	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/L	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/L	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/L	--	--	--	--	--	--	--	--
2-Butanone (Methyl ethyl ketone) (MEK)	mg/L	--	--	--	--	--	--	--	--
2-Hexanone	mg/L	--	--	--	--	--	--	--	--
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	mg/L	--	--	--	--	--	--	--	--
Acetone	mg/L	R	R	R	R	R	R	R	R
Benzene	mg/L	--	--	--	--	--	--	--	--
Bromodichloromethane	mg/L	--	--	--	--	--	--	--	--
Bromoform	mg/L	--	--	--	--	--	--	--	--
Bromomethane (Methyl bromide)	mg/L	--	--	--	--	--	--	--	--
Carbon disulfide	mg/L	0.000648	0.000622	0.000659	0.000626	0.000220 U	0.000220 U	0.000220 U	0.000220 U
Carbon tetrachloride	mg/L	--	--	--	--	--	--	--	--
Chlorobenzene	mg/L	--	--	--	--	--	--	--	--
Chloroethane	mg/L	--	--	--	--	--	--	--	--
Chloroform (Trichloromethane)	mg/L	--	--	--	--	--	--	--	--
Chloromethane (Methyl chloride)	mg/L	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/L	--	--	--	--	--	--	--	--

Table 2

Analytical Results Summary
Annual Groundwater Sampling
Avtex Fibers Superfund Site
Front Royal, Virginia
July - August 2017

Sample Location:		603	603	603	603	604	604	604	604
Sample ID:		2017AN-603-Z1	2017AN-603-Z2	2017AN-603-Z3	2017AN-603-Z4	2017AN-604-Z1	2017AN-604-Z2	2017AN-604-Z3	2017AN-604-Z4
Sample Date:		7/18/2017	7/18/2017	7/18/2017	7/18/2017	7/17/2017	7/17/2017	7/17/2017	7/17/2017
Parameters	**Units**								
Volatile Organic Compounds (Continued)									
cis-1,3-Dichloropropene	mg/L	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/L	--	--	--	--	--	--	--	--
Ethylbenzene	mg/L	--	--	--	--	--	--	--	--
Methylene chloride	mg/L	--	--	--	--	--	--	--	--
Styrene	mg/L	--	--	--	--	--	--	--	--
Tetrachloroethene	mg/L	--	--	--	--	--	--	--	--
Toluene	mg/L	--	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/L	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/L	--	--	--	--	--	--	--	--
Trichloroethene	mg/L	--	--	--	--	--	--	--	--
Vinyl chloride	mg/L	--	--	--	--	--	--	--	--
Xylenes (total)	mg/L	--	--	--	--	--	--	--	--
General Chemistry									
Chloride	mg/L	--	--	--	--	--	--	--	--
Cyanide (free)	mg/L	0.00154 U	0.00154 U	0.00154 U	0.00154 U	0.00154 U	0.00154 U	0.00154 U	0.00154 U
Sulfate	mg/L	--	--	--	--	--	--	--	--

Notes:.

"--" - Not analyzed
U - Not detected at the associated reporting limit
J - Estimated concentration
UJ - Not detected; associated reporting limit is estimated
R - Rejected

Table 2

Analytical Results Summary
Annual Groundwater Sampling
Avtex Fibers Superfund Site
Front Royal, Virginia
July - August 2017

Sample Location:		605A	605B	606A	606B	B-48A	FAB 1-2	FAB 3-1	FAB 6-North
Sample ID:		2017AN-605A	2017AN-605B	2017AN-606A	2017AN-606B	2017AN-B-48A	2017AN-FAB1-2	2017AN-FAB3-1	2017AN-FAB6-North
Sample Date:		7/12/2017	7/13/2017	7/15/2017	7/17/2017	7/26/2017	8/1/2017	8/1/2017	8/1/2017
Parameters	**Units**								
Metals									
Aluminum (dissolved)	mg/L	0.0420 U	0.0420 U	0.00840 U	0.0330	--	--	--	--
Antimony (dissolved)	mg/L	0.00400 U	0.00400 U	0.000800 U	0.000800 U	--	--	--	--
Arsenic (dissolved)	mg/L	0.00956 J	0.00799 J	0.000400 U	0.000928 J	0.000400 U	0.0133	0.0115 J	0.0553 J
Beryllium (dissolved)	mg/L	--	--	--	--	0.000100 U	0.000100 U	0.000100 U	0.000100 U
Cadmium (dissolved)	mg/L	0.000500 U	0.000500 U	0.000100 U	0.000100 U	0.000100 U	0.000100 UJ	0.000100 UJ	0.000100 UJ
Calcium (dissolved)	mg/L	--	--	--	--	187	212	222	318
Chromium (dissolved)	mg/L	0.00250 U	0.00250 U	0.000826 U	0.000621 U	0.000500 U	0.000500 UJ	0.000635 J	0.000500 UJ
Cobalt (dissolved)	mg/L	0.000500 U	0.000500 U	0.000100 U	0.000100 U	--	--	--	--
Copper (dissolved)	mg/L	--	--	--	--	0.00120 U	0.00120 U	0.00120 U	0.00120 U
Iron (dissolved)	mg/L	0.0500 U	0.105 J	0.0100 U	0.0160 U	--	--	--	--
Lead (dissolved)	mg/L	0.000500 U	0.000500 U	0.000100 U	0.000100 U	0.000100 U	0.000100 U	0.000100 U	0.000100 U
Magnesium (dissolved)	mg/L	--	--	--	--	22.0	54.6	83.3	39.3
Manganese (dissolved)	mg/L	0.00750 U	0.0101 J	0.00830	0.0141	--	--	--	--
Mercury (dissolved)	mg/L	0.000100 U	0.000100 U	0.000100 U	0.000100 U	0.000100 U	0.000100 U	0.000100 U	0.000100 U
Nickel (dissolved)	mg/L	0.00250 U	0.00666 J	0.00200	0.00125 J	0.0694	0.0182 J	0.0312 J	0.0287 J
Selenium (dissolved)	mg/L	--	--	--	--	0.000300 U	0.000834 U	0.00258	0.000723 U
Sodium (dissolved)	mg/L	--	--	--	--	189 J	59.6	267	55.8
Thallium (dissolved)	mg/L	--	--	--	--	--	--	--	--
Vanadium (dissolved)	mg/L	0.00350 U	0.00350 U	0.000700 U	0.000700 U	--	--	--	--
Zinc (dissolved)	mg/L	0.0260 U	0.0260 U	0.00520 U	0.00520 U	0.00520 U	0.00520 UJ	0.0657 J	0.0122 J
Semi-volatile Organic Compounds									
1,2,4-Trichlorobenzene	mg/L	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/L	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/L	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/L	--	--	--	--	--	--	--	--
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	mg/L	--	--	--	--	--	--	--	--
2,4,5-Trichlorophenol	mg/L	--	--	--	--	--	--	--	--
2,4,6-Trichlorophenol	mg/L	--	--	--	--	--	--	--	--
2,4-Dichlorophenol	mg/L	--	--	--	--	--	--	--	--
2,4-Dimethylphenol	mg/L	--	--	--	--	--	--	--	--
2,4-Dinitrophenol	mg/L	--	--	--	--	--	--	--	--
2,4-Dinitrotoluene	mg/L	--	--	--	--	--	--	--	--
2,6-Dinitrotoluene	mg/L	--	--	--	--	--	--	--	--
2-Chloronaphthalene	mg/L	--	--	--	--	--	--	--	--
2-Chlorophenol	mg/L	--	--	--	--	--	--	--	--
2-Methylnaphthalene	mg/L	--	--	--	--	--	--	--	--
2-Methylphenol	mg/L	0.00154 U	0.00167 U	0.00145 U	0.00145 U	--	--	--	--

Table 2

Analytical Results Summary
Annual Groundwater Sampling
Avtex Fibers Superfund Site
Front Royal, Virginia
July - August 2017

Sample Location:		605A	605B	606A	606B	B-48A	FAB 1-2	FAB 3-1	FAB 6-North
Sample ID:		2017AN-605A	2017AN-605B	2017AN-606A	2017AN-606B	2017AN-B-48A	2017AN-FAB1-2	2017AN-FAB3-1	2017AN-FAB6-North
Sample Date:		7/12/2017	7/13/2017	7/15/2017	7/17/2017	7/26/2017	8/1/2017	8/1/2017	8/1/2017
Parameters	**Units**								
Semi-volatile Organic Compounds (Continued)									
2-Nitroaniline	mg/L	--	--	--	--	--	--	--	--
2-Nitrophenol	mg/L	--	--	--	--	--	--	--	--
3&4-Methylphenol	mg/L	0.00135 U	0.00146 U	0.00127 U	0.00127 U	--	--	--	--
3,3'-Dichlorobenzidine	mg/L	--	--	--	--	--	--	--	--
3-Nitroaniline	mg/L	--	--	--	--	--	--	--	--
4,6-Dinitro-2-methylphenol	mg/L	--	--	--	--	--	--	--	--
4-Bromophenyl phenyl ether	mg/L	--	--	--	--	--	--	--	--
4-Chloro-3-methylphenol	mg/L	--	--	--	--	--	--	--	--
4-Chloroaniline	mg/L	--	--	--	--	--	--	--	--
4-Chlorophenyl phenyl ether	mg/L	--	--	--	--	--	--	--	--
4-Nitroaniline	mg/L	--	--	--	--	--	--	--	--
4-Nitrophenol	mg/L	--	--	--	--	--	--	--	--
Acenaphthene	mg/L	--	--	--	--	--	--	--	--
Acenaphthylene	mg/L	--	--	--	--	--	--	--	--
Anthracene	mg/L	--	--	--	--	--	--	--	--
Benzo(a)anthracene	mg/L	--	--	--	--	--	--	--	--
Benzo(a)pyrene	mg/L	--	--	--	--	--	--	--	--
Benzo(b)fluoranthene	mg/L	--	--	--	--	--	--	--	--
Benzo(g,h,i)perylene	mg/L	--	--	--	--	--	--	--	--
Benzo(k)fluoranthene	mg/L	--	--	--	--	--	--	--	--
bis(2-Chloroethoxy)methane	mg/L	--	--	--	--	--	--	--	--
bis(2-Chloroethyl)ether	mg/L	--	--	--	--	--	--	--	--
bis(2-Ethylhexyl)phthalate (DEHP)	mg/L	0.00316 U	0.00543 U	0.00507 U	0.00317 U	--	--	--	--
Butyl benzylphthalate (BBP)	mg/L	--	--	--	--	--	--	--	--
Carbazole	mg/L	--	--	--	--	--	--	--	--
Chrysene	mg/L	--	--	--	--	--	--	--	--
Dibenz(a,h)anthracene	mg/L	--	--	--	--	--	--	--	--
Dibenzofuran	mg/L	--	--	--	--	--	--	--	--
Diethyl phthalate	mg/L	--	--	--	--	--	--	--	--
Dimethyl phthalate	mg/L	--	--	--	--	--	--	--	--
Di-n-butylphthalate (DBP)	mg/L	--	--	--	--	--	--	--	--
Di-n-octyl phthalate (DnOP)	mg/L	--	--	--	--	--	--	--	--
Fluoranthene	mg/L	--	--	--	--	--	--	--	--
Fluorene	mg/L	--	--	--	--	--	--	--	--
Hexachlorobenzene	mg/L	--	--	--	--	--	--	--	--
Hexachlorobutadiene	mg/L	--	--	--	--	--	--	--	--
Hexachlorocyclopentadiene	mg/L	--	--	--	--	--	--	--	--
Hexachloroethane	mg/L	--	--	--	--	--	--	--	--

Table 2

Analytical Results Summary
Annual Groundwater Sampling
Avtex Fibers Superfund Site
Front Royal, Virginia
July - August 2017

Sample Location:		605A	605B	606A	606B	B-48A	FAB 1-2	FAB 3-1	FAB 6-North
Sample ID:		2017AN-605A	2017AN-605B	2017AN-606A	2017AN-606B	2017AN-B-48A	2017AN-FAB1-2	2017AN-FAB3-1	2017AN-FAB6-North
Sample Date:		7/12/2017	7/13/2017	7/15/2017	7/17/2017	7/26/2017	8/1/2017	8/1/2017	8/1/2017
Parameters	**Units**								
Semi-volatile Organic Compounds (Continued)									
Indeno(1,2,3-cd)pyrene	mg/L	--	--	--	--	--	--	--	--
Isophorone	mg/L	--	--	--	--	--	--	--	--
Naphthalene	mg/L	0.000356 U	0.001 J	0.000336 U	0.000336 U	--	--	--	--
Nitrobenzene	mg/L	--	--	--	--	--	--	--	--
N-Nitrosodi-n-propylamine	mg/L	--	--	--	--	--	--	--	--
N-Nitrosodiphenylamine	mg/L	--	--	--	--	--	--	--	--
Pentachlorophenol	mg/L	0.00317 U	0.00344 U	0.003 U	0.003 U	--	--	--	--
Phenanthrene	mg/L	--	--	--	--	--	--	--	--
Phenol	mg/L	0.00144 U	0.00156 U	0.00136 U	0.00136 U	--	--	--	--
Pyrene	mg/L	--	--	--	--	--	--	--	--
Volatile Organic Compounds									
1,1,1-Trichloroethane	mg/L	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/L	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/L	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/L	--	--	--	--	--	--	--	--
1,1-Dichloroethene	mg/L	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/L	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/L	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/L	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/L	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/L	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/L	--	--	--	--	--	--	--	--
2-Butanone (Methyl ethyl ketone) (MEK)	mg/L	--	--	--	--	--	--	--	--
2-Hexanone	mg/L	--	--	--	--	--	--	--	--
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	mg/L	--	--	--	--	--	--	--	--
Acetone	mg/L	0.00266 U	0.00266 U	R	R	--	--	--	--
Benzene	mg/L	--	--	--	--	--	--	--	--
Bromodichloromethane	mg/L	--	--	--	--	--	--	--	--
Bromoform	mg/L	--	--	--	--	--	--	--	--
Bromomethane (Methyl bromide)	mg/L	--	--	--	--	--	--	--	--
Carbon disulfide	mg/L	0.00890	0.000776	0.000220 U	0.000261 J	--	--	--	--
Carbon tetrachloride	mg/L	--	--	--	--	--	--	--	--
Chlorobenzene	mg/L	--	--	--	--	--	--	--	--
Chloroethane	mg/L	--	--	--	--	--	--	--	--
Chloroform (Trichloromethane)	mg/L	--	--	--	--	--	--	--	--
Chloromethane (Methyl chloride)	mg/L	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/L	--	--	--	--	--	--	--	--

Table 2

Analytical Results Summary
Annual Groundwater Sampling
Avtex Fibers Superfund Site
Front Royal, Virginia
July - August 2017

Sample Location:		605A	605B	606A	606B	B-48A	FAB 1-2	FAB 3-1	FAB 6-North
Sample ID:		2017AN-605A	2017AN-605B	2017AN-606A	2017AN-606B	2017AN-B-48A	2017AN-FAB1-2	2017AN-FAB3-1	2017AN-FAB6-North
Sample Date:		7/12/2017	7/13/2017	7/15/2017	7/17/2017	7/26/2017	8/1/2017	8/1/2017	8/1/2017
Parameters	**Units**								
Volatile Organic Compounds (Continued)									
cis-1,3-Dichloropropene	mg/L	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/L	--	--	--	--	--	--	--	--
Ethylbenzene	mg/L	--	--	--	--	--	--	--	--
Methylene chloride	mg/L	--	--	--	--	--	--	--	--
Styrene	mg/L	--	--	--	--	--	--	--	--
Tetrachloroethene	mg/L	--	--	--	--	--	--	--	--
Toluene	mg/L	--	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/L	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/L	--	--	--	--	--	--	--	--
Trichloroethene	mg/L	--	--	--	--	--	--	--	--
Vinyl chloride	mg/L	--	--	--	--	--	--	--	--
Xylenes (total)	mg/L	--	--	--	--	--	--	--	--
General Chemistry									
Chloride	mg/L	--	--	--	--	24.9	18.2	36.6	17.8
Cyanide (free)	mg/L	0.00154 U	0.00154 U	0.00154 U	0.00154 U	--	--	--	--
Sulfate	mg/L	--	--	--	--	529	659	934	399

Notes:.

"--" - Not analyzed
U - Not detected at the associated reporting limit
J - Estimated concentration
UJ - Not detected; associated reporting limit is estimated
R - Rejected

Table 2

Analytical Results Summary
Annual Groundwater Sampling
Avtex Fibers Superfund Site
Front Royal, Virginia
July - August 2017

Sample Location:		FAB 6-South	GM-02A	GM-02B	GM-09R	GPW-02	GPW-03R	GPW-14	GPW-15R
Sample ID:		2017AN-FAB6-South	2017AN-GM-02A	2017AN-GM-02B	2017AN-GM-09R	2017AN-GPW-02	2017AN-GPW-03R	2017AN-GPW-14	2017AN-GPW-15R
Sample Date:		8/1/2017	7/19/2017	7/19/2017	7/30/2017	7/25/2017	7/24/2017	7/27/2017	7/29/2017
Parameters	**Units**								
Metals									
Aluminum (dissolved)	mg/L	--	0.00840 U	0.00840 U	0.00840 U	--	--	--	--
Antimony (dissolved)	mg/L	--	0.000800 U	0.0794	0.000800 U	0.000800 U	0.000800 U	--	0.000800 U
Arsenic (dissolved)	mg/L	0.0140 J	0.00299	0.160	0.00118 U	0.000400 U	0.000400 U	--	0.000910 U
Beryllium (dissolved)	mg/L	0.000100 U	--	--	--	0.000117 J	0.000100 U	--	0.000100 U
Cadmium (dissolved)	mg/L	0.000100 UJ	0.000100 U	0.000100 U	0.000100 U	0.000100 U	0.000100 U	--	0.000100 U
Calcium (dissolved)	mg/L	315	--	--	--	--	--	--	--
Chromium (dissolved)	mg/L	0.000500 UJ	0.000500 U	0.000500 U	0.000500 U	0.00244	0.000500 U	--	0.000500 U
Cobalt (dissolved)	mg/L	--	0.000355 J	0.0121	0.000266 J	--	--	--	--
Copper (dissolved)	mg/L	0.00120 U	--	--	--	0.00855	0.0133	--	0.00134 J
Iron (dissolved)	mg/L	--	0.0261	0.0100 U	2.60	--	--	--	--
Lead (dissolved)	mg/L	0.000100 U	0.000166 J	0.000100 U	0.000100 U	0.000100 U	0.00146 J	--	0.000650 J
Magnesium (dissolved)	mg/L	39.8	--	--	--	--	--	--	--
Manganese (dissolved)	mg/L	--	0.0284	0.00150 U	1.11	--	--	--	--
Mercury (dissolved)	mg/L	0.000100 U	0.000100 U	0.000100 U	0.000100 U	0.000100 U	0.000100 U	0.000100 U	0.000100 U
Nickel (dissolved)	mg/L	0.0271 J	0.000887 J	0.0169	0.00515	0.0103	0.00838	--	0.00101 J
Selenium (dissolved)	mg/L	0.000992 U	--	--	--	0.000375 J	0.000300 U	--	0.000715 U
Sodium (dissolved)	mg/L	56.4	--	--	--	--	--	--	--
Thallium (dissolved)	mg/L	--	--	--	--	0.000800 U	0.000800 U	--	0.000800 U
Vanadium (dissolved)	mg/L	--	0.000700 U	0.000891 J	0.00281 U	0.000700 U	0.000700 U	--	0.00279 U
Zinc (dissolved)	mg/L	0.00630 J	0.00579 J	0.00520 U	0.0117 J	0.234	0.136	--	0.0519
Semi-volatile Organic Compounds									
1,2,4-Trichlorobenzene	mg/L	--	--	--	--	0.00202 U	0.00202 U	0.00202 U	0.00194 U
1,2-Dichlorobenzene	mg/L	--	--	--	--	0.00212 U	0.00212 U	0.00212 U	0.00204 U
1,3-Dichlorobenzene	mg/L	--	--	--	--	0.00192 U	0.00192 U	0.00192 U	0.00185 U
1,4-Dichlorobenzene	mg/L	--	--	--	--	0.00192 U	0.00192 U	0.00192 U	0.00185 U
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	mg/L	--	--	--	--	0.00173 U	0.00173 U	0.00173 U	0.00167 U
2,4,5-Trichlorophenol	mg/L	--	--	--	--	0.00125 U	0.00125 U	0.00125 U	0.00120 U
2,4,6-Trichlorophenol	mg/L	--	--	--	--	0.00183 U	0.00183 U	0.00183 U	0.00176 U
2,4-Dichlorophenol	mg/L	--	--	--	--	0.00212 U	0.00212 U	0.00212 U	0.00204 U
2,4-Dimethylphenol	mg/L	--	--	--	--	0.00154 U	0.00154 U	0.00154 U	0.00148 U
2,4-Dinitrophenol	mg/L	--	--	--	--	0.00692 U	0.00692 U	0.00692 U	0.00667 U
2,4-Dinitrotoluene	mg/L	--	--	--	--	0.00154 U	0.00154 U	0.00154 U	0.00148 U
2,6-Dinitrotoluene	mg/L	--	--	--	--	0.00144 U	0.00144 U	0.00144 U	0.00139 U
2-Chloronaphthalene	mg/L	--	--	--	--	0.00144 U	0.00144 U	0.00144 U	0.00139 U
2-Chlorophenol	mg/L	--	--	--	--	0.00163 U	0.00163 U	0.00163 U	0.00157 U
2-Methylnaphthalene	mg/L	--	--	--	--	0.000385 U	0.000385 U	0.000385 U	0.000370 U
2-Methylphenol	mg/L	--	0.0016 U	0.016 U	0.00148 U	0.00154 U	0.00154 U	0.00154 U	0.00148 U

Table 2

Analytical Results Summary
Annual Groundwater Sampling
Avtex Fibers Superfund Site
Front Royal, Virginia
July - August 2017

Sample Location:		FAB 6-South	GM-02A	GM-02B	GM-09R	GPW-02	GPW-03R	GPW-14	GPW-15R
Sample ID:		2017AN-FAB6-South	2017AN-GM-02A	2017AN-GM-02B	2017AN-GM-09R	2017AN-GPW-02	2017AN-GPW-03R	2017AN-GPW-14	2017AN-GPW-15R
Sample Date:		8/1/2017	7/19/2017	7/19/2017	7/30/2017	7/25/2017	7/24/2017	7/27/2017	7/29/2017
Parameters	**Units**								
Semi-volatile Organic Compounds (Continued)									
2-Nitroaniline	mg/L	--	--	--	--	0.00106 U	0.00106 U	0.00106 U	0.00102 U
2-Nitrophenol	mg/L	--	--	--	--	0.00231 U	0.00231 U	0.00231 U	0.00222 U
3&4-Methylphenol	mg/L	--	0.0014 U	0.014 U	0.0013 U	0.00135 U	0.00135 U	0.00135 U	0.00130 U
3,3'-Dichlorobenzidine	mg/L	--	--	--	--	0.00144 U	0.00144 U	0.00144 U	0.00139 U
3-Nitroaniline	mg/L	--	--	--	--	0.00154 U	0.00154 U	0.00154 U	0.00148 U
4,6-Dinitro-2-methylphenol	mg/L	--	--	--	--	0.00279 U	0.00279 U	0.00279 U	0.00269 U
4-Bromophenyl phenyl ether	mg/L	--	--	--	--	0.00154 U	0.00154 U	0.00154 U	0.00148 U
4-Chloro-3-methylphenol	mg/L	--	--	--	--	0.00135 U	0.00135 U	0.00135 U	0.00130 U
4-Chloroaniline	mg/L	--	--	--	--	0.00115 U	0.00115 U	0.00115 U	0.00111 U
4-Chlorophenyl phenyl ether	mg/L	--	--	--	--	0.00154 U	0.00154 U	0.00154 U	0.00148 U
4-Nitroaniline	mg/L	--	--	--	--	0.00154 U	0.00154 U	0.00154 U	0.00148 U
4-Nitrophenol	mg/L	--	--	--	--	0.00192 U	0.00192 U	0.00192 U	0.00185 U
Acenaphthene	mg/L	--	--	--	--	0.000308 U	0.000308 U	0.000308 U	0.000296 U
Acenaphthylene	mg/L	--	--	--	--	0.000337 U	0.000337 U	0.000337 U	0.000324 U
Anthracene	mg/L	--	--	--	--	0.000365 U	0.000365 U	0.000365 U	0.000352 U
Benzo(a)anthracene	mg/L	--	--	--	--	0.000308 U	0.000308 U	0.000308 U	0.000296 U
Benzo(a)pyrene	mg/L	--	--	--	--	0.000365 U	0.000365 U	0.000365 U	0.000352 U
Benzo(b)fluoranthene	mg/L	--	--	--	--	0.000346 U	0.000346 U	0.000346 U	0.000333 U
Benzo(g,h,i)perylene	mg/L	--	--	--	--	0.000596 U	0.000596 U	0.000596 U	0.000574 U
Benzo(k)fluoranthene	mg/L	--	--	--	--	0.000356 U	0.000356 U	0.000356 U	0.000343 U
bis(2-Chloroethoxy)methane	mg/L	--	--	--	--	0.00183 U	0.00183 U	0.00183 U	0.00176 U
bis(2-Chloroethyl)ether	mg/L	--	--	--	--	0.00125 U	0.00125 U	0.00125 U	0.00120 U
bis(2-Ethylhexyl)phthalate (DEHP)	mg/L	--	0.0015 U	0.015 U	0.00189 U	0.00144 U	0.00144 U	0.00144 U	0.00167 U
Butyl benzylphthalate (BBP)	mg/L	--	--	--	--	0.000962 U	0.000962 U	0.000962 U	0.000926 U
Carbazole	mg/L	--	--	--	--	0.000865 U	0.000865 U	0.000865 U	0.000833 U
Chrysene	mg/L	--	--	--	--	0.000317 U	0.000317 U	0.000317 U	0.000306 U
Dibenz(a,h)anthracene	mg/L	--	--	--	--	0.000433 U	0.000433 U	0.000433 U	0.000417 U
Dibenzofuran	mg/L	--	--	--	--	0.00125 U	0.00125 U	0.00125 U	0.00120 U
Diethyl phthalate	mg/L	--	--	--	--	0.00115 U	0.00115 U	0.00115 U	0.00111 U
Dimethyl phthalate	mg/L	--	--	--	--	0.00115 U	0.00115 U	0.00115 U	0.00111 U
Di-n-butylphthalate (DBP)	mg/L	--	--	--	--	0.00125 U	0.00125 U	0.00125 U	0.00120 U
Di-n-octyl phthalate (DnOP)	mg/L	--	--	--	--	0.000865 U	0.000865 U	0.000865 U	0.000833 U
Fluoranthene	mg/L	--	--	--	--	0.000308 U	0.000308 U	0.000308 U	0.000296 U
Fluorene	mg/L	--	--	--	--	0.000308 U	0.000308 U	0.000308 U	0.000296 U
Hexachlorobenzene	mg/L	--	--	--	--	0.00144 U	0.00144 U	0.00144 U	0.00139 U
Hexachlorobutadiene	mg/L	--	--	--	--	0.00144 U	0.00144 U	0.00144 U	0.00139 U
Hexachlorocyclopentadiene	mg/L	--	--	--	--	0.00125 U	0.00125 U	0.00125 U	R
Hexachloroethane	mg/L	--	--	--	--	0.00212 U	0.00212 U	0.00212 U	0.00204 U

Table 2

Analytical Results Summary
Annual Groundwater Sampling
Avtex Fibers Superfund Site
Front Royal, Virginia
July - August 2017

Sample Location:		FAB 6-South	GM-02A	GM-02B	GM-09R	GPW-02	GPW-03R	GPW-14	GPW-15R
Sample ID:		2017AN-FAB6-South	2017AN-GM-02A	2017AN-GM-02B	2017AN-GM-09R	2017AN-GPW-02	2017AN-GPW-03R	2017AN-GPW-14	2017AN-GPW-15R
Sample Date:		8/1/2017	7/19/2017	7/19/2017	7/30/2017	7/25/2017	7/24/2017	7/27/2017	7/29/2017
Parameters	**Units**								
Semi-volatile Organic Compounds (Continued)									
Indeno(1,2,3-cd)pyrene	mg/L	--	--	--	--	0.000394 U	0.000394 U	0.000394 U	0.000380 U
Isophorone	mg/L	--	--	--	--	0.00212 U	0.00212 U	0.00212 U	0.00204 U
Naphthalene	mg/L	--	0.00037 U	0.0037 U	0.000343 U	0.000356 U	0.000356 U	0.000356 U	0.000343 U
Nitrobenzene	mg/L	--	--	--	--	0.00212 U	0.00212 U	0.00212 U	0.00204 U
N-Nitrosodi-n-propylamine	mg/L	--	--	--	--	0.00163 U	0.00163 U	0.00163 U	0.00157 U
N-Nitrosodiphenylamine	mg/L	--	--	--	--	0.00346 U	0.00346 U	0.00346 U	0.00333 U
Pentachlorophenol	mg/L	--	0.0033 U	0.033 U	0.00306 U	0.00317 U	0.00317 U	0.00317 U	0.00306 U
Phenanthrene	mg/L	--	--	--	--	0.000404 U	0.000404 U	0.000404 U	0.000389 U
Phenol	mg/L	--	0.0015 U	0.015 U	0.00139 U	0.00144 U	0.00144 U	0.00144 U	0.00139 U
Pyrene	mg/L	--	--	--	--	0.000337 U	0.000337 U	0.000337 U	0.000324 U
Volatile Organic Compounds									
1,1,1-Trichloroethane	mg/L	--	--	--	--	0.000190 U	0.000190 U	0.000190 U	0.000190 U
1,1,2,2-Tetrachloroethane	mg/L	--	--	--	--	0.000190 U	0.000190 U	0.000190 U	0.000190 U
1,1,2-Trichloroethane	mg/L	--	--	--	--	0.000190 U	0.000190 U	0.000190 U	0.000190 U
1,1-Dichloroethane	mg/L	--	--	--	--	0.000240 U	0.000240 U	0.000240 U	0.000240 U
1,1-Dichloroethene	mg/L	--	--	--	--	0.000250 U	0.000250 U	0.000250 U	0.000250 U
1,2,4-Trichlorobenzene	mg/L	--	--	--	--	0.000200 U	0.000200 U	0.000200 U	0.000200 U
1,2-Dichlorobenzene	mg/L	--	--	--	--	0.000190 U	0.000190 U	0.000190 U	0.000190 U
1,2-Dichloroethane	mg/L	--	--	--	--	0.000200 U	0.000200 U	0.000200 U	0.000200 U
1,2-Dichloropropane	mg/L	--	--	--	--	0.000250 U	0.000250 U	0.000250 U	0.000250 U
1,3-Dichlorobenzene	mg/L	--	--	--	--	0.000180 U	0.000180 U	0.000180 U	0.000180 U
1,4-Dichlorobenzene	mg/L	--	--	--	--	0.000170 U	0.000170 U	0.000170 U	0.000170 U
2-Butanone (Methyl ethyl ketone) (MEK)	mg/L	--	--	--	--	0.00264 U	0.00264 U	0.00264 U	0.00264 U
2-Hexanone	mg/L	--	--	--	--	0.00128 U	0.00128 U	0.00128 U	0.00128 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	mg/L	--	--	--	--	0.000810 U	0.000810 U	0.000810 U	0.000810 U
Acetone	mg/L	--	0.00266 U	0.00846 U	0.00572 U	0.00266 U	0.00266 U	0.00792 U	R
Benzene	mg/L	--	--	--	--	0.000200 U	0.000200 U	0.000200 U	0.000200 U
Bromodichloromethane	mg/L	--	--	--	--	0.000170 U	0.000170 U	0.000170 U	0.000170 U
Bromoform	mg/L	--	--	--	--	0.000290 U	0.000290 U	0.000290 U	0.000290 U
Bromomethane (Methyl bromide)	mg/L	--	--	--	--	0.000350 U	0.000350 U	0.000350 U	0.000350 U
Carbon disulfide	mg/L	--	0.00383	0.896	0.000891	0.000220 U	0.000220 U	0.000220 U	0.000220 U
Carbon tetrachloride	mg/L	--	--	--	--	0.000180 U	0.000180 U	0.000180 U	0.000180 U
Chlorobenzene	mg/L	--	--	--	--	0.000180 U	0.000180 U	0.000180 U	0.000180 U
Chloroethane	mg/L	--	--	--	--	0.000360 U	0.000360 U	0.000360 U	0.000360 U
Chloroform (Trichloromethane)	mg/L	--	--	--	--	0.000230 U	0.000230 U	0.000230 U	0.000230 U
Chloromethane (Methyl chloride)	mg/L	--	--	--	--	0.000360 U	0.000360 U	0.000360 U	0.000360 U
cis-1,2-Dichloroethene	mg/L	--	--	--	--	0.000210 U	0.000210 U	0.000210 U	0.000210 U

Table 2

Analytical Results Summary
Annual Groundwater Sampling
Avtex Fibers Superfund Site
Front Royal, Virginia
July - August 2017

Sample Location:		FAB 6-South	GM-02A	GM-02B	GM-09R	GPW-02	GPW-03R	GPW-14	GPW-15R
Sample ID:		2017AN-FAB6-South	2017AN-GM-02A	2017AN-GM-02B	2017AN-GM-09R	2017AN-GPW-02	2017AN-GPW-03R	2017AN-GPW-14	2017AN-GPW-15R
Sample Date:		8/1/2017	7/19/2017	7/19/2017	7/30/2017	7/25/2017	7/24/2017	7/27/2017	7/29/2017
Parameters	**Units**								
Volatile Organic Compounds (Continued)									
cis-1,3-Dichloropropene	mg/L	--	--	--	--	0.000170 U	0.000170 U	0.000170 U	0.000170 U
Dibromochloromethane	mg/L	--	--	--	--	0.000250 U	0.000250 U	0.000250 U	0.000250 U
Ethylbenzene	mg/L	--	--	--	--	0.000190 U	0.000190 U	0.000190 U	0.000190 U
Methylene chloride	mg/L	--	--	--	--	0.00100 U	0.00100 U	0.00100 U	0.00100 U
Styrene	mg/L	--	--	--	--	0.000280 U	0.000280 U	0.000280 U	0.000280 U
Tetrachloroethene	mg/L	--	--	--	--	0.000140 U	0.000140 U	0.000140 U	0.000140 U
Toluene	mg/L	--	--	--	--	0.000170 U	0.000170 U	0.000170 U	0.000170 U
trans-1,2-Dichloroethene	mg/L	--	--	--	--	0.000230 U	0.000230 U	0.000230 U	0.000230 U
trans-1,3-Dichloropropene	mg/L	--	--	--	--	0.000170 U	0.000170 U	0.000170 U	0.000170 U
Trichloroethene	mg/L	--	--	--	--	0.000200 U	0.000200 U	0.000200 U	0.000200 U
Vinyl chloride	mg/L	--	--	--	--	0.000180 U	0.000180 U	0.000180 U	0.000180 U
Xylenes (total)	mg/L	--	--	--	--	0.000580 U	0.000580 U	0.000580 U	0.000580 U
General Chemistry									
Chloride	mg/L	17.3	--	--	--	--	--	--	--
Cyanide (free)	mg/L	--	0.00154 U	0.00154 U	0.00154 U	--	--	--	--
Sulfate	mg/L	416	--	--	--	--	--	--	--

Notes:.

"--" - Not analyzed
U - Not detected at the associated reporting limit
J - Estimated concentration
UJ - Not detected; associated reporting limit is estimated
R - Rejected

Table 2

Analytical Results Summary
Annual Groundwater Sampling
Avtex Fibers Superfund Site
Front Royal, Virginia
July - August 2017

Sample Location:		MW-03R	MW-05	MW-07	MW-08	MW-08	MW-09	MW-10	MW-11
Sample ID:		2017AN-MW-03R	2017AN-MW-05	2017AN-MW-07	2017AN-MW-08	2017AN-MW-08D	2017AN-MW-09	2017AN-MW-10	2017AN-MW-11
Sample Date:		7/28/2017	7/26/2017	7/29/2017	7/29/2017	7/29/2017 Duplicate	7/31/2017	7/31/2017	7/31/2017
Parameters	**Units**								
Metals									
Aluminum (dissolved)	mg/L	0.0264	--	--	--	--	0.197	0.00840 U	--
Antimony (dissolved)	mg/L	0.00549	0.000800 U	0.000800 U	0.000800 U	0.000800 U	0.0567	0.000800 U	0.000800 UJ
Arsenic (dissolved)	mg/L	0.231	0.000400 U	0.00286 U	0.00156 U	0.00176 U	1.50 J	0.0361 J	0.00584 J
Beryllium (dissolved)	mg/L	--	0.000100 U	0.000100 U	0.000100 U	0.000100 U	--	--	0.000100 U
Cadmium (dissolved)	mg/L	0.000204 J	0.000100 U	0.000100 U	0.000100 U	0.000100 U	0.000800 UJ	0.000100 UJ	0.000136 J
Calcium (dissolved)	mg/L	--	--	--	--	--	--	--	--
Chromium (dissolved)	mg/L	0.0225	0.00140 J	0.000500 U	0.000500 U	0.000500 U	0.0796	0.00177 J	0.000500 UJ
Cobalt (dissolved)	mg/L	0.144	--	--	--	--	0.478 J	0.0170 J	--
Copper (dissolved)	mg/L	--	0.00120 U	0.00120 U	0.00120 U	0.00120 U	--	--	0.00120 U
Iron (dissolved)	mg/L	0.256	--	--	--	--	0.201 UJ	32.6 J	--
Lead (dissolved)	mg/L	0.000189 J	0.000100 U	0.000100 U	0.000100 U	0.000100 U	0.000800 U	0.000100 U	0.000100 U
Magnesium (dissolved)	mg/L	--	--	--	--	--	--	--	--
Manganese (dissolved)	mg/L	0.00785	--	--	--	--	0.110	3.17	--
Mercury (dissolved)	mg/L	0.000100 U	0.000100 U	0.000100 U	0.000100 U	0.000100 U	0.000200 U	0.000100 U	0.000100 U
Nickel (dissolved)	mg/L	0.472	0.000500 U	0.00124 U	0.000500 U	0.000689 U	1.18 J	0.0214 J	0.0396 J
Selenium (dissolved)	mg/L	--	0.000300 U	0.01479 U	0.01479 U	0.01479 U	--	--	0.00111 U
Sodium (dissolved)	mg/L	--	--	--	--	--	--	--	--
Thallium (dissolved)	mg/L	--	0.000800 U	0.000800 U	0.000800 U	0.000800 U	--	--	0.000800 U
Vanadium (dissolved)	mg/L	0.0234	0.000700 U	0.00187 U	0.001894 U	0.001894 U	0.385 J	0.00316 UJ	00183 U
Zinc (dissolved)	mg/L	0.0314	0.00520 U	0.0475	0.0304	0.0383	3.68 J	0.144 J	0.0102 J
Semi-volatile Organic Compounds									
1,2,4-Trichlorobenzene	mg/L	--	0.00202 U	0.00184 U	0.00188 U	0.00194 U	--	--	0.00219 U
1,2-Dichlorobenzene	mg/L	--	0.00212 U	0.00193 U	0.00196 U	0.00204 U	--	--	0.00229 U
1,3-Dichlorobenzene	mg/L	--	0.00192 U	0.00175 U	0.00179 U	0.00185 U	--	--	0.00208 U
1,4-Dichlorobenzene	mg/L	--	0.00192 U	0.00175 U	0.00179 U	0.00185 U	--	--	0.00208 U
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	mg/L	--	0.00173 U	0.00158 U	0.00161 U	0.00167 U	--	--	0.00188 UJ
2,4,5-Trichlorophenol	mg/L	--	0.00125 U	0.00114 U	0.00116 U	0.00120 U	--	--	0.00135 U
2,4,6-Trichlorophenol	mg/L	--	0.00183 U	0.00167 U	0.00170 U	0.00176 U	--	--	0.00198 U
2,4-Dichlorophenol	mg/L	--	0.00212 U	0.00193 U	0.00196 U	0.00204 U	--	--	0.00229 U
2,4-Dimethylphenol	mg/L	--	0.00154 U	0.00140 U	0.00143 U	0.00148 U	--	--	0.00167 U
2,4-Dinitrophenol	mg/L	--	0.00692 U	0.00632 U	0.00643 U	0.00667 U	--	--	0.00750 U
2,4-Dinitrotoluene	mg/L	--	0.00154 U	0.00140 U	0.00143 U	0.00148 U	--	--	0.00167 U
2,6-Dinitrotoluene	mg/L	--	0.00144 U	0.00132 U	0.00134 U	0.00139 U	--	--	0.00156 U
2-Chloronaphthalene	mg/L	--	0.00144 U	0.00132 U	0.00134 U	0.00139 U	--	--	0.00156 U
2-Chlorophenol	mg/L	--	0.00163 U	0.00149 U	0.00152 U	0.00157 U	--	--	0.00177 U
2-Methylnaphthalene	mg/L	--	0.000385 U	0.000351 U	0.000357 U	0.000370 U	--	--	0.000417 U
2-Methylphenol	mg/L	0.00145 U	0.00154 U	0.00140 U	0.00143 U	0.00148 U	0.267	0.0016 U	0.00167 U

Table 2

Analytical Results Summary
Annual Groundwater Sampling
Avtex Fibers Superfund Site
Front Royal, Virginia
July - August 2017

Sample Location:		MW-03R	MW-05	MW-07	MW-08	MW-08	MW-09	MW-10	MW-11
Sample ID:		2017AN-MW-03R	2017AN-MW-05	2017AN-MW-07	2017AN-MW-08	2017AN-MW-08D	2017AN-MW-09	2017AN-MW-10	2017AN-MW-11
Sample Date:		7/28/2017	7/26/2017	7/29/2017	7/29/2017	7/29/2017 Duplicate	7/31/2017	7/31/2017	7/31/2017
Parameters	**Units**								
Semi-volatile Organic Compounds (Continued)									
2-Nitroaniline	mg/L	--	0.00106 U	0.000965 U	0.000982 U	0.00102 U	--	--	0.00115 U
2-Nitrophenol	mg/L	--	0.00231 U	0.00211 U	0.00214 U	0.00222 U	--	--	0.00250 U
3&4-Methylphenol	mg/L	0.00127 U	0.00135 U	0.00123 U	0.00125 U	0.00130 U	0.235	0.0014 U	0.00146 U
3,3'-Dichlorobenzidine	mg/L	--	0.00144 U	0.00132 U	0.00134 U	0.00139 U	--	--	0.00156 U
3-Nitroaniline	mg/L	--	0.00154 U	0.00140 U	0.00143 U	0.00148 U	--	--	0.00167 U
4,6-Dinitro-2-methylphenol	mg/L	--	0.00279 U	0.00254 U	0.00259 U	0.00269 U	--	--	0.00302 U
4-Bromophenyl phenyl ether	mg/L	--	0.00154 U	0.00140 U	0.00143 U	0.00148 U	--	--	0.00167 U
4-Chloro-3-methylphenol	mg/L	--	0.00135 U	0.00123 U	0.00125 U	0.00130 U	--	--	0.00146 U
4-Chloroaniline	mg/L	--	0.00115 U	0.00105 U	0.00107 U	0.00111 U	--	--	0.00125 U
4-Chlorophenyl phenyl ether	mg/L	--	0.00154 U	0.00140 U	0.00143 U	0.00148 U	--	--	0.00167 U
4-Nitroaniline	mg/L	--	0.00154 U	0.00140 U	0.00143 U	0.00148 U	--	--	0.00167 U
4-Nitrophenol	mg/L	--	0.00192 U	0.00175 U	0.00179 U	0.00185 U	--	--	0.00208 U
Acenaphthene	mg/L	--	0.000308 U	0.000281 U	0.000286 U	0.000296 U	--	--	0.000333 U
Acenaphthylene	mg/L	--	0.000337 U	0.000307 U	0.000313 U	0.000324 U	--	--	0.000365 U
Anthracene	mg/L	--	0.000365 U	0.000333 U	0.000339 U	0.000352 U	--	--	0.000396 U
Benzo(a)anthracene	mg/L	--	0.000308 U	0.000281 U	0.000286 U	0.000296 U	--	--	0.000333 U
Benzo(a)pyrene	mg/L	--	0.000365 U	0.000333 U	0.000339 U	0.000352 U	--	--	0.000396 U
Benzo(b)fluoranthene	mg/L	--	0.000346 U	0.000316 U	0.000321 U	0.000333 U	--	--	0.000375 U
Benzo(g,h,i)perylene	mg/L	--	0.000596 U	0.000544 U	0.000554 U	0.000574 U	--	--	0.000646 U
Benzo(k)fluoranthene	mg/L	--	0.000356 U	0.000325 U	0.000330 U	0.000343 U	--	--	0.000385 U
bis(2-Chloroethoxy)methane	mg/L	--	0.00183 U	0.00167 U	0.00170 U	0.00176 U	--	--	0.00198 U
bis(2-Chloroethyl)ether	mg/L	--	0.00125 U	0.00114 U	0.00116 U	0.00120 U	--	--	0.00135 U
bis(2-Ethylhexyl)phthalate (DEHP)	mg/L	0.00278 U	0.00144 U	0.00626 U	0.00176 U	0.00178 U	0.00893 U	0.0015 U	0.00156 U
Butyl benzylphthalate (BBP)	mg/L	--	0.000962 U	0.000877 U	0.000893 U	0.000926 U	--	--	0.00104 U
Carbazole	mg/L	--	0.000865 U	0.000789 U	0.000804 U	0.000833 U	--	--	0.000938 U
Chrysene	mg/L	--	0.000317 U	0.000289 U	0.000295 U	0.000306 U	--	--	0.000344 U
Dibenz(a,h)anthracene	mg/L	--	0.000433 U	0.000395 U	0.000402 U	0.000417 U	--	--	0.000469 U
Dibenzofuran	mg/L	--	0.00125 U	0.00114 U	0.00116 U	0.00120 U	--	--	0.00135 U
Diethyl phthalate	mg/L	--	0.00115 U	0.00105 U	0.00107 U	0.00111 U	--	--	0.00125 U
Dimethyl phthalate	mg/L	--	0.00115 U	0.00105 U	0.00107 U	0.00111 U	--	--	0.00125 U
Di-n-butylphthalate (DBP)	mg/L	--	0.00125 U	0.00114 U	0.00116 U	0.00120 U	--	--	0.00135 U
Di-n-octyl phthalate (DnOP)	mg/L	--	0.000865 U	0.000789 U	0.000804 U	0.000833 U	--	--	0.000938 U
Fluoranthene	mg/L	--	0.000308 U	0.000281 U	0.000286 U	0.000296 U	--	--	0.000333 U
Fluorene	mg/L	--	0.000308 U	0.000281 U	0.000286 U	0.000296 U	--	--	0.000333 U
Hexachlorobenzene	mg/L	--	0.00144 U	0.00132 U	0.00134 U	0.00139 U	--	--	0.00156 U
Hexachlorobutadiene	mg/L	--	0.00144 U	0.00132 U	0.00134 U	0.00139 U	--	--	0.00156 U
Hexachlorocyclopentadiene	mg/L	--	0.00125 U	R	R	R	--	--	0.00135 UJ
Hexachloroethane	mg/L	--	0.00212 U	0.00193 U	0.00196 U	0.00204 U	--	--	0.00229 U

Table 2

Analytical Results Summary
Annual Groundwater Sampling
Avtex Fibers Superfund Site
Front Royal, Virginia
July - August 2017

Sample Location:		MW-03R	MW-05	MW-07	MW-08	MW-08	MW-09	MW-10	MW-11
Sample ID:		2017AN-MW-03R	2017AN-MW-05	2017AN-MW-07	2017AN-MW-08	2017AN-MW-08D	2017AN-MW-09	2017AN-MW-10	2017AN-MW-11
Sample Date:		7/28/2017	7/26/2017	7/29/2017	7/29/2017	7/29/2017 Duplicate	7/31/2017	7/31/2017	7/31/2017
Parameters	**Units**								
Semi-volatile Organic Compounds (Continued)									
Indeno(1,2,3-cd)pyrene	mg/L	--	0.000394 U	0.000360 U	0.000366 U	0.000380 U	--	--	0.000427 U
Isophorone	mg/L	--	0.00212 U	0.00193 U	0.00196 U	0.00204 U	--	--	0.00229 U
Naphthalene	mg/L	0.000336 U	0.000356 U	0.000325 U	0.000330 U	0.000343 U	0.0022 U	0.00037 U	0.000385 U
Nitrobenzene	mg/L	--	0.00212 U	0.00193 U	0.00196 U	0.00204 U	--	--	0.00229 U
N-Nitrosodi-n-propylamine	mg/L	--	0.00163 U	0.00149 U	0.00152 U	0.00157 U	--	--	0.00177 U
N-Nitrosodiphenylamine	mg/L	--	0.00346 U	0.00316 U	0.00321 U	0.00333 U	--	--	0.00375 U
Pentachlorophenol	mg/L	0.003 U	0.00317 U	0.00289 U	0.00295 U	0.00306 U	0.0196 UJ	0.0033 UJ	0.00344 UJ
Phenanthrene	mg/L	--	0.000404 U	0.000368 U	0.000375 U	0.000389 U	--	--	0.000438 U
Phenol	mg/L	0.00136 U	0.00144 U	0.00132 U	0.00134 U	0.00139 U	23.2	0.00645 J	0.00156 U
Pyrene	mg/L	--	0.000337 U	0.000307 U	0.000313 U	0.000324 U	--	--	0.000365 U
Volatile Organic Compounds									
1,1,1-Trichloroethane	mg/L	--	0.000190 U	0.000190 U	0.000190 U	0.000190 U	--	--	0.000190 U
1,1,2,2-Tetrachloroethane	mg/L	--	0.000190 U	0.000190 U	0.000190 U	0.000190 U	--	--	0.000190 U
1,1,2-Trichloroethane	mg/L	--	0.000190 U	0.000190 U	0.000190 U	0.000190 U	--	--	0.000190 U
1,1-Dichloroethane	mg/L	--	0.000240 U	0.000240 U	0.000240 U	0.000240 U	--	--	0.000240 U
1,1-Dichloroethene	mg/L	--	0.000250 U	0.000250 U	0.000250 U	0.000250 U	--	--	0.000250 U
1,2,4-Trichlorobenzene	mg/L	--	0.000200 U	0.000200 U	0.000200 U	0.000200 U	--	--	0.000200 U
1,2-Dichlorobenzene	mg/L	--	0.000190 U	0.000190 U	0.000190 U	0.000190 U	--	--	0.000190 U
1,2-Dichloroethane	mg/L	--	0.000200 U	0.000200 U	0.000200 U	0.000200 U	--	--	0.000200 U
1,2-Dichloropropane	mg/L	--	0.000250 U	0.000250 U	0.000250 U	0.000250 U	--	--	0.000250 U
1,3-Dichlorobenzene	mg/L	--	0.000180 U	0.000180 U	0.000180 U	0.000180 U	--	--	0.000180 U
1,4-Dichlorobenzene	mg/L	--	0.000170 U	0.000170 U	0.000170 U	0.000170 U	--	--	0.000170 U
2-Butanone (Methyl ethyl ketone) (MEK)	mg/L	--	0.00264 U	0.00264 U	0.00264 U	0.00264 U	--	--	0.00264 U
2-Hexanone	mg/L	--	0.00128 U	0.00128 U	0.00128 U	0.00128 U	--	--	0.00128 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	mg/L	--	0.000810 U	0.000810 U	0.000810 U	0.000810 U	--	--	0.000810 U
Acetone	mg/L	0.00572 U	0.00338 U	R	0.00266 U	R	2.19 J	R	R
Benzene	mg/L	--	0.000200 U	0.000200 U	0.000200 U	0.000200 U	--	--	0.000200 U
Bromodichloromethane	mg/L	--	0.000170 U	0.000170 U	0.000170 U	0.000170 U	--	--	0.000170 U
Bromoform	mg/L	--	0.000290 U	0.000290 U	0.000290 U	0.000290 U	--	--	0.000290 U
Bromomethane (Methyl bromide)	mg/L	--	0.000350 U	0.000350 U	0.000350 U	0.000350 U	--	--	0.000350 U
Carbon disulfide	mg/L	0.0994	0.000220 U	0.000220 U	0.000220 U	0.000220 U	1.41	0.00953	0.000220 U
Carbon tetrachloride	mg/L	--	0.000180 U	0.000180 U	0.000180 U	0.000180 U	--	--	0.000180 U
Chlorobenzene	mg/L	--	0.000180 U	0.000180 U	0.000180 U	0.000180 U	--	--	0.000180 U
Chloroethane	mg/L	--	0.000360 U	0.000360 U	0.000360 U	0.000360 U	--	--	0.000360 U
Chloroform (Trichloromethane)	mg/L	--	0.000230 U	0.000230 U	0.000230 U	0.000230 U	--	--	0.000230 U
Chloromethane (Methyl chloride)	mg/L	--	0.000360 U	0.000360 U	0.000360 U	0.000360 U	--	--	0.000360 U
cis-1,2-Dichloroethene	mg/L	--	0.000210 U	0.000210 U	0.000210 U	0.000210 U	--	--	0.000210 U

Table 2

Analytical Results Summary
Annual Groundwater Sampling
Avtex Fibers Superfund Site
Front Royal, Virginia
July - August 2017

Sample Location:		MW-03R	MW-05	MW-07	MW-08	MW-08	MW-09	MW-10	MW-11
Sample ID:		2017AN-MW-03R	2017AN-MW-05	2017AN-MW-07	2017AN-MW-08	2017AN-MW-08D	2017AN-MW-09	2017AN-MW-10	2017AN-MW-11
Sample Date:		7/28/2017	7/26/2017	7/29/2017	7/29/2017	7/29/2017 Duplicate	7/31/2017	7/31/2017	7/31/2017
Parameters	**Units**								
Volatile Organic Compounds (Continued)									
cis-1,3-Dichloropropene	mg/L	--	0.000170 U	0.000170 U	0.000170 U	0.000170 U	--	--	0.000170 U
Dibromochloromethane	mg/L	--	0.000250 U	0.000250 U	0.000250 U	0.000250 U	--	--	0.000250 U
Ethylbenzene	mg/L	--	0.000190 U	0.000206 J	0.000190 U	0.000190 U	--	--	0.000190 U
Methylene chloride	mg/L	--	0.00100 U	0.00100 U	0.00100 U	0.00100 U	--	--	0.00100 U
Styrene	mg/L	--	0.000280 U	0.000280 U	0.000280 U	0.000280 U	--	--	0.000280 U
Tetrachloroethene	mg/L	--	0.000140 U	0.000140 U	0.000140 U	0.000140 U	--	--	0.000140 U
Toluene	mg/L	--	0.000170 U	0.000366 J	0.000170 U	0.000202 J	--	--	0.000170 U
trans-1,2-Dichloroethene	mg/L	--	0.000230 U	0.000230 U	0.000230 U	0.000230 U	--	--	0.000230 U
trans-1,3-Dichloropropene	mg/L	--	0.000170 U	0.000170 U	0.000170 U	0.000170 U	--	--	0.000170 U
Trichloroethene	mg/L	--	0.000200 U	0.000200 U	0.000200 U	0.000200 U	--	--	0.000200 U
Vinyl chloride	mg/L	--	0.000180 U	0.00208	0.000180 U	0.000180 U	--	--	0.000180 U
Xylenes (total)	mg/L	--	0.000580 U	0.00122 J	0.000835 J	0.000765 J	--	--	0.000580 U
General Chemistry									
Chloride	mg/L	--	--	--	--	--	--	--	--
Cyanide (free)	mg/L	0.00154 U	--	--	--	--	0.00154 U	0.00154 U	--
Sulfate	mg/L	--	--	--	--	--	--	--	--

Notes:.

"--" - Not analyzed
U - Not detected at the associated reporting limit
J - Estimated concentration
UJ - Not detected; associated reporting limit is estimated
R - Rejected

Table 2

Analytical Results Summary
Annual Groundwater Sampling
Avtex Fibers Superfund Site
Front Royal, Virginia
July - August 2017

Sample Location:		MW-12	PW-0	PW-0	PW-02	PZ-03	PZ-06	PZ-06
Sample ID:		2017AN-MW-12	2017AN-PW-0	2017AN-PW-0-Resample	2017AN-PW-02	2017AN-PZ-03	2017AN-PZ-06	2017AN-PZ-06D
Sample Date:		7/29/2017	7/30/2017	8/9/2017	7/29/2017	7/27/2017	7/31/2017	7/31/2017 Duplicate
Parameters	**Units**							
Metals								
Aluminum (dissolved)	mg/L	--	0.00840 U	--	0.00840 U	--	0.00840 UJ	0.0610 J
Antimony (dissolved)	mg/L	0.00160 U	0.000800 U	--	0.000800 U	--	0.000800 U	0.000800 U
Arsenic (dissolved)	mg/L	0.0446	0.00291 U	--	0.00234 U	0.00369	0.00379	0.00418
Beryllium (dissolved)	mg/L	0.000200 U	--	--	--	0.000118 J	0.000100 U	0.000100 U
Cadmium (dissolved)	mg/L	0.000200 U	0.000100 U	--	0.000100 U	0.000100 U	0.000100 U	0.000100 U
Calcium (dissolved)	mg/L	16.4	--	--	--	419	49.2	46.8
Chromium (dissolved)	mg/L	0.00100 U	0.000500 U	--	0.000782 J	0.000500 U	0.000500 U	0.000674 J
Cobalt (dissolved)	mg/L	--	0.000100 U	--	0.000195 J	--	0.000197 J	0.000188 J
Copper (dissolved)	mg/L	0.00240 U	--	--	--	0.00120 U	0.00120 U	0.00120 U
Iron (dissolved)	mg/L	--	9.21	--	0.248	--	0.364	0.339
Lead (dissolved)	mg/L	0.000200 U	0.000100 U	--	0.000100 U	0.000100 U	0.000646 U	0.000100 U
Magnesium (dissolved)	mg/L	27.5	--	--	--	107	15.6	14.8
Manganese (dissolved)	mg/L	--	1.55	--	0.0222	--	0.492 J	0.541 J
Mercury (dissolved)	mg/L	0.000100 U	0.000100 U	--	0.000100 U	0.000100 U	0.000100 U	0.000100 U
Nickel (dissolved)	mg/L	0.00979	0.0193	--	0.00118 U	0.00296	0.000993 J	0.00113 J
Selenium (dissolved)	mg/L	0.00192 J	--	--	--	0.01479 U	0.000427 J	0.00201 U
Sodium (dissolved)	mg/L	4540	--	--	--	806	35.5 J	34.4 J
Thallium (dissolved)	mg/L	0.00160 U	--	--	--	--	--	--
Vanadium (dissolved)	mg/L	0.00572	0.00199 U	--	0.00218 U	--	0.00212 U	0.00234 U
Zinc (dissolved)	mg/L	0.0104 U	0.0239 J	--	0.00520 U	0.00520 U	0.00547 J	0.00520 U
Semi-volatile Organic Compounds								
1,2,4-Trichlorobenzene	mg/L	0.00210 U	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/L	0.00220 U	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/L	0.00200 U	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/L	0.00200 U	--	--	--	--	--	--
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	mg/L	0.00180 U	--	--	--	--	--	--
2,4,5-Trichlorophenol	mg/L	0.00130 U	--	--	--	--	--	--
2,4,6-Trichlorophenol	mg/L	0.00190 U	--	--	--	--	--	--
2,4-Dichlorophenol	mg/L	0.00220 U	--	--	--	--	--	--
2,4-Dimethylphenol	mg/L	0.00160 U	--	--	--	--	--	--
2,4-Dinitrophenol	mg/L	0.00720 U	--	--	--	--	--	--
2,4-Dinitrotoluene	mg/L	0.00160 U	--	--	--	--	--	--
2,6-Dinitrotoluene	mg/L	0.00150 U	--	--	--	--	--	--
2-Chloronaphthalene	mg/L	0.00150 U	--	--	--	--	--	--
2-Chlorophenol	mg/L	0.00170 U	--	--	--	--	--	--
2-Methylnaphthalene	mg/L	0.000400 U	--	--	--	--	--	--
2-Methylphenol	mg/L	0.00160 U	0.00148 U	--	0.00148 U	--	0.00174 U	0.0016 U

Table 2

Analytical Results Summary
Annual Groundwater Sampling
Avtex Fibers Superfund Site
Front Royal, Virginia
July - August 2017

Sample Location:		MW-12	PW-0	PW-0	PW-02	PZ-03	PZ-06	PZ-06
Sample ID:		2017AN-MW-12	2017AN-PW-0	2017AN-PW-0-Resample	2017AN-PW-02	2017AN-PZ-03	2017AN-PZ-06	2017AN-PZ-06D
Sample Date:		7/29/2017	7/30/2017	8/9/2017	7/29/2017	7/27/2017	7/31/2017	7/31/2017 Duplicate
Parameters	**Units**							
Semi-volatile Organic Compounds (Continued)								
2-Nitroaniline	mg/L	0.00110 U	--	--	--	--	--	--
2-Nitrophenol	mg/L	0.00240 U	--	--	--	--	--	--
3&4-Methylphenol	mg/L	0.00140 U	0.0013 U	--	0.0013 U	--	0.00152 U	0.0014 U
3,3'-Dichlorobenzidine	mg/L	0.00150 U	--	--	--	--	--	--
3-Nitroaniline	mg/L	0.00160 U	--	--	--	--	--	--
4,6-Dinitro-2-methylphenol	mg/L	0.00290 U	--	--	--	--	--	--
4-Bromophenyl phenyl ether	mg/L	0.00160 U	--	--	--	--	--	--
4-Chloro-3-methylphenol	mg/L	0.00140 U	--	--	--	--	--	--
4-Chloroaniline	mg/L	0.00120 U	--	--	--	--	--	--
4-Chlorophenyl phenyl ether	mg/L	0.00160 U	--	--	--	--	--	--
4-Nitroaniline	mg/L	0.00160 U	--	--	--	--	--	--
4-Nitrophenol	mg/L	0.00200 UJ	--	--	--	--	--	--
Acenaphthene	mg/L	0.000320 U	--	--	--	--	--	--
Acenaphthylene	mg/L	0.000350 U	--	--	--	--	--	--
Anthracene	mg/L	0.000380 U	--	--	--	--	--	--
Benzo(a)anthracene	mg/L	0.000320 U	--	--	--	--	--	--
Benzo(a)pyrene	mg/L	0.000380 U	--	--	--	--	--	--
Benzo(b)fluoranthene	mg/L	0.000360 U	--	--	--	--	--	--
Benzo(g,h,i)perylene	mg/L	0.000620 U	--	--	--	--	--	--
Benzo(k)fluoranthene	mg/L	0.000370 U	--	--	--	--	--	--
bis(2-Chloroethoxy)methane	mg/L	0.00190 U	--	--	--	--	--	--
bis(2-Chloroethyl)ether	mg/L	0.00130 U	--	--	--	--	--	--
bis(2-Ethylhexyl)phthalate (DEHP)	mg/L	0.00150 U	0.00141 U	--	0.00175 J	--	0.00163 U	0.0015 U
Butyl benzylphthalate (BBP)	mg/L	0.00100 U	--	--	--	--	--	--
Carbazole	mg/L	0.000900 U	--	--	--	--	--	--
Chrysene	mg/L	0.000330 U	--	--	--	--	--	--
Dibenz(a,h)anthracene	mg/L	0.000450 U	--	--	--	--	--	--
Dibenzofuran	mg/L	0.00130 U	--	--	--	--	--	--
Diethyl phthalate	mg/L	0.00120 U	--	--	--	--	--	--
Dimethyl phthalate	mg/L	0.00120 U	--	--	--	--	--	--
Di-n-butylphthalate (DBP)	mg/L	0.00130 U	--	--	--	--	--	--
Di-n-octyl phthalate (DnOP)	mg/L	0.000900 U	--	--	--	--	--	--
Fluoranthene	mg/L	0.000320 U	--	--	--	--	--	--
Fluorene	mg/L	0.000320 U	--	--	--	--	--	--
Hexachlorobenzene	mg/L	0.00150 U	--	--	--	--	--	--
Hexachlorobutadiene	mg/L	0.00150 U	--	--	--	--	--	--
Hexachlorocyclopentadiene	mg/L	0.00130 UJ	--	--	--	--	--	--
Hexachloroethane	mg/L	0.00220 U	--	--	--	--	--	--

Table 2

Analytical Results Summary
Annual Groundwater Sampling
Avtex Fibers Superfund Site
Front Royal, Virginia
July - August 2017

Sample Location:		MW-12	PW-0	PW-0	PW-02	PZ-03	PZ-06	PZ-06
Sample ID:		2017AN-MW-12	2017AN-PW-0	2017AN-PW-0-Resample	2017AN-PW-02	2017AN-PZ-03	2017AN-PZ-06	2017AN-PZ-06D
Sample Date:		7/29/2017	7/30/2017	8/9/2017	7/29/2017	7/27/2017	7/31/2017	7/31/2017 Duplicate
Parameters	**Units**							
Semi-volatile Organic Compounds (Continued)								
Indeno(1,2,3-cd)pyrene	mg/L	0.000410 U	--	--	--	--	--	--
Isophorone	mg/L	0.00220 U	--	--	--	--	--	--
Naphthalene	mg/L	0.000370 U	0.000343 U	--	0.000343 U	--	0.000402 U	0.00037 U
Nitrobenzene	mg/L	0.00220 U	--	--	--	--	--	--
N-Nitrosodi-n-propylamine	mg/L	0.00170 U	--	--	--	--	--	--
N-Nitrosodiphenylamine	mg/L	0.00360 U	--	--	--	--	--	--
Pentachlorophenol	mg/L	0.00330 UJ	0.00306 U	--	0.00306 UJ	--	0.00359 UJ	0.0033 UJ
Phenanthrene	mg/L	0.000420 U	--	--	--	--	--	--
Phenol	mg/L	0.00150 U	0.00139 U	--	0.00139 U	--	0.00163 U	0.0015 U
Pyrene	mg/L	0.000350 U	--	--	--	--	--	--
Volatile Organic Compounds								
1,1,1-Trichloroethane	mg/L	0.000190 U	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/L	0.000190 U	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/L	0.000190 U	--	--	--	--	--	--
1,1-Dichloroethane	mg/L	0.000240 U	--	--	--	--	--	--
1,1-Dichloroethene	mg/L	0.000250 U	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/L	0.000200 U	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/L	0.000190 U	--	--	--	--	--	--
1,2-Dichloroethane	mg/L	0.000200 U	--	--	--	--	--	--
1,2-Dichloropropane	mg/L	0.000250 U	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/L	0.000180 U	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/L	0.000170 U	--	--	--	--	--	--
2-Butanone (Methyl ethyl ketone) (MEK)	mg/L	0.00264 U	--	--	--	--	--	--
2-Hexanone	mg/L	0.00128 U	--	--	--	--	--	--
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	mg/L	0.000810 U	--	--	--	--	--	--
Acetone	mg/L	R	--	0.00266 U	0.00266 U	--	0.00287 J	R
Benzene	mg/L	0.000923	--	--	--	--	--	--
Bromodichloromethane	mg/L	0.000170 U	--	--	--	--	--	--
Bromoform	mg/L	0.000290 U	--	--	--	--	--	--
Bromomethane (Methyl bromide)	mg/L	0.000350 U	--	--	--	--	--	--
Carbon disulfide	mg/L	0.000284 J	--	0.000630	0.00879	--	0.000220 U	0.000220 U
Carbon tetrachloride	mg/L	0.000180 U	--	--	--	--	--	--
Chlorobenzene	mg/L	0.000180 U	--	--	--	--	--	--
Chloroethane	mg/L	0.000360 U	--	--	--	--	--	--
Chloroform (Trichloromethane)	mg/L	0.000230 U	--	--	--	--	--	--
Chloromethane (Methyl chloride)	mg/L	0.000360 U	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/L	0.000210 U	--	--	--	--	--	--

Table 2

Analytical Results Summary
Annual Groundwater Sampling
Avtex Fibers Superfund Site
Front Royal, Virginia
July - August 2017

Sample Location:		MW-12	PW-0	PW-0	PW-02	PZ-03	PZ-06	PZ-06
Sample ID:		2017AN-MW-12	2017AN-PW-0	2017AN-PW-0-Resample	2017AN-PW-02	2017AN-PZ-03	2017AN-PZ-06	2017AN-PZ-06D
Sample Date:		7/29/2017	7/30/2017	8/9/2017	7/29/2017	7/27/2017	7/31/2017	7/31/2017 Duplicate
Parameters	**Units**							
Volatile Organic Compounds (Continued)								
cis-1,3-Dichloropropene	mg/L	0.000170 U	--	--	--	--	--	--
Dibromochloromethane	mg/L	0.000250 U	--	--	--	--	--	--
Ethylbenzene	mg/L	0.000229 J	--	--	--	--	--	--
Methylene chloride	mg/L	0.00100 U	--	--	--	--	--	--
Styrene	mg/L	0.000280 U	--	--	--	--	--	--
Tetrachloroethene	mg/L	0.000140 U	--	--	--	--	--	--
Toluene	mg/L	0.000170 U	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/L	0.000230 U	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/L	0.000170 U	--	--	--	--	--	--
Trichloroethene	mg/L	0.000200 U	--	--	--	--	--	--
Vinyl chloride	mg/L	0.000180 U	--	--	--	--	--	--
Xylenes (total)	mg/L	0.000923 J	--	--	--	--	--	--
General Chemistry								
Chloride	mg/L	442	--	--	--	145	14.9	14.4
Cyanide (free)	mg/L	--	0.00154 U	--	0.00154 U	--	0.00154 U	0.00154 U
Sulfate	mg/L	3930	--	--	--	2920	33.4	33.1

Notes:.

"--" - Not analyzed
U - Not detected at the associated reporting limit
J - Estimated concentration
UJ - Not detected; associated reporting limit is estimated
R - Rejected

Table 2

Analytical Results Summary
Annual Groundwater Sampling
Avtex Fibers Superfund Site
Front Royal, Virginia
July - August 2017

Sample Location:		PZ-07	SB 1-1	SB 1-2	SB 1-3	SB 1-4	SB 3-1	SB 4-1
Sample ID:		2017AN-PZ-07	2017AN-SB1-1	2017AN-SB1-2	2017AN-SB1-3	2017AN-SB1-4	2017AN-SB3-1	2017AN-SB4-1
Sample Date:		7/28/2017	8/1/2017	8/1/2017	8/1/2017	8/1/2017	8/1/2017	8/1/2017
Parameters	**Units**							
Metals								
Aluminum (dissolved)	mg/L	--	--	--	--	--	--	--
Antimony (dissolved)	mg/L	--	--	--	--	--	--	--
Arsenic (dissolved)	mg/L	0.00666	0.0440 J	0.00602 J	0.00247 UJ	0.00888 J	0.00266 UJ	0.00310 UJ
Beryllium (dissolved)	mg/L	0.000100 U	0.000100 U	0.000100 U	0.000100 U	0.000100 U	0.000100 U	0.000100 U
Cadmium (dissolved)	mg/L	0.000100 U	0.000100 UJ	0.000100 UJ	0.000100 UJ	0.000100 UJ	0.000100 UJ	0.000100 UJ
Calcium (dissolved)	mg/L	294	52.8	50.6	36.5	4.82	70.5	102
Chromium (dissolved)	mg/L	0.00150 J	0.000500 UJ	0.000651 J	0.00119 J	0.00324 J	0.000500 UJ	0.000500 UJ
Cobalt (dissolved)	mg/L	--	--	--	--	--	--	--
Copper (dissolved)	mg/L	0.00120 U	0.00120 U	0.00262	0.00321 J	0.00643	0.00120 U	0.0115
Iron (dissolved)	mg/L	--	--	--	--	--	--	--
Lead (dissolved)	mg/L	0.000100 U	0.0006435 UJ	0.000100 U	0.000100 U	0.00231 U	0.000100 U	0.0006435 UJ
Magnesium (dissolved)	mg/L	47.4	12.4	3.15	82.7	0.606 J	57.7	71.5
Manganese (dissolved)	mg/L	--	--	--	--	--	--	--
Mercury (dissolved)	mg/L	0.000100 U	0.000100 U	0.000100 U	0.000100 U	0.000100 U	0.000100 UJ	0.000100 UJ
Nickel (dissolved)	mg/L	0.0195	0.000500 UJ	0.000912 J	0.00816 J	0.0213 J	0.00454 J	0.00678 J
Selenium (dissolved)	mg/L	0.01479 U	0.000713 U	0.000709 U	0.000722 U	0.00153 U	0.000838 U	0.000904 U
Sodium (dissolved)	mg/L	204	32.7	5.83	1790	427	245	157
Thallium (dissolved)	mg/L	--	--	--	--	--	--	--
Vanadium (dissolved)	mg/L	--	--	--	--	--	--	--
Zinc (dissolved)	mg/L	0.0129 J	0.00783 J	0.00595 J	0.00948 J	0.0114 J	0.00970 J	0.0188 J
Semi-volatile Organic Compounds								
1,2,4-Trichlorobenzene	mg/L	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/L	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/L	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/L	--	--	--	--	--	--	--
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	mg/L	--	--	--	--	--	--	--
2,4,5-Trichlorophenol	mg/L	--	--	--	--	--	--	--
2,4,6-Trichlorophenol	mg/L	--	--	--	--	--	--	--
2,4-Dichlorophenol	mg/L	--	--	--	--	--	--	--
2,4-Dimethylphenol	mg/L	--	--	--	--	--	--	--
2,4-Dinitrophenol	mg/L	--	--	--	--	--	--	--
2,4-Dinitrotoluene	mg/L	--	--	--	--	--	--	--
2,6-Dinitrotoluene	mg/L	--	--	--	--	--	--	--
2-Chloronaphthalene	mg/L	--	--	--	--	--	--	--
2-Chlorophenol	mg/L	--	--	--	--	--	--	--
2-Methylnaphthalene	mg/L	--	--	--	--	--	--	--
2-Methylphenol	mg/L	--	--	--	--	--	--	--

Table 2

Analytical Results Summary
Annual Groundwater Sampling
Avtex Fibers Superfund Site
Front Royal, Virginia
July - August 2017

Sample Location:		PZ-07	SB 1-1	SB 1-2	SB 1-3	SB 1-4	SB 3-1	SB 4-1
Sample ID:		2017AN-PZ-07	2017AN-SB1-1	2017AN-SB1-2	2017AN-SB1-3	2017AN-SB1-4	2017AN-SB3-1	2017AN-SB4-1
Sample Date:		7/28/2017	8/1/2017	8/1/2017	8/1/2017	8/1/2017	8/1/2017	8/1/2017
Parameters	**Units**							
Semi-volatile Organic Compounds (Continued)								
2-Nitroaniline	mg/L	--	--	--	--	--	--	--
2-Nitrophenol	mg/L	--	--	--	--	--	--	--
3&4-Methylphenol	mg/L	--	--	--	--	--	--	--
3,3'-Dichlorobenzidine	mg/L	--	--	--	--	--	--	--
3-Nitroaniline	mg/L	--	--	--	--	--	--	--
4,6-Dinitro-2-methylphenol	mg/L	--	--	--	--	--	--	--
4-Bromophenyl phenyl ether	mg/L	--	--	--	--	--	--	--
4-Chloro-3-methylphenol	mg/L	--	--	--	--	--	--	--
4-Chloroaniline	mg/L	--	--	--	--	--	--	--
4-Chlorophenyl phenyl ether	mg/L	--	--	--	--	--	--	--
4-Nitroaniline	mg/L	--	--	--	--	--	--	--
4-Nitrophenol	mg/L	--	--	--	--	--	--	--
Acenaphthene	mg/L	--	--	--	--	--	--	--
Acenaphthylene	mg/L	--	--	--	--	--	--	--
Anthracene	mg/L	--	--	--	--	--	--	--
Benzo(a)anthracene	mg/L	--	--	--	--	--	--	--
Benzo(a)pyrene	mg/L	--	--	--	--	--	--	--
Benzo(b)fluoranthene	mg/L	--	--	--	--	--	--	--
Benzo(g,h,i)perylene	mg/L	--	--	--	--	--	--	--
Benzo(k)fluoranthene	mg/L	--	--	--	--	--	--	--
bis(2-Chloroethoxy)methane	mg/L	--	--	--	--	--	--	--
bis(2-Chloroethyl)ether	mg/L	--	--	--	--	--	--	--
bis(2-Ethylhexyl)phthalate (DEHP)	mg/L	--	--	--	--	--	--	--
Butyl benzylphthalate (BBP)	mg/L	--	--	--	--	--	--	--
Carbazole	mg/L	--	--	--	--	--	--	--
Chrysene	mg/L	--	--	--	--	--	--	--
Dibenz(a,h)anthracene	mg/L	--	--	--	--	--	--	--
Dibenzofuran	mg/L	--	--	--	--	--	--	--
Diethyl phthalate	mg/L	--	--	--	--	--	--	--
Dimethyl phthalate	mg/L	--	--	--	--	--	--	--
Di-n-butylphthalate (DBP)	mg/L	--	--	--	--	--	--	--
Di-n-octyl phthalate (DnOP)	mg/L	--	--	--	--	--	--	--
Fluoranthene	mg/L	--	--	--	--	--	--	--
Fluorene	mg/L	--	--	--	--	--	--	--
Hexachlorobenzene	mg/L	--	--	--	--	--	--	--
Hexachlorobutadiene	mg/L	--	--	--	--	--	--	--
Hexachlorocyclopentadiene	mg/L	--	--	--	--	--	--	--
Hexachloroethane	mg/L	--	--	--	--	--	--	--

Table 2

Analytical Results Summary
Annual Groundwater Sampling
Avtex Fibers Superfund Site
Front Royal, Virginia
July - August 2017

Sample Location:		PZ-07	SB 1-1	SB 1-2	SB 1-3	SB 1-4	SB 3-1	SB 4-1
Sample ID:		2017AN-PZ-07	2017AN-SB1-1	2017AN-SB1-2	2017AN-SB1-3	2017AN-SB1-4	2017AN-SB3-1	2017AN-SB4-1
Sample Date:		7/28/2017	8/1/2017	8/1/2017	8/1/2017	8/1/2017	8/1/2017	8/1/2017
Parameters	**Units**							
Semi-volatile Organic Compounds (Continued)								
Indeno(1,2,3-cd)pyrene	mg/L	--	--	--	--	--	--	--
Isophorone	mg/L	--	--	--	--	--	--	--
Naphthalene	mg/L	--	--	--	--	--	--	--
Nitrobenzene	mg/L	--	--	--	--	--	--	--
N-Nitrosodi-n-propylamine	mg/L	--	--	--	--	--	--	--
N-Nitrosodiphenylamine	mg/L	--	--	--	--	--	--	--
Pentachlorophenol	mg/L	--	--	--	--	--	--	--
Phenanthrene	mg/L	--	--	--	--	--	--	--
Phenol	mg/L	--	--	--	--	--	--	--
Pyrene	mg/L	--	--	--	--	--	--	--
Volatile Organic Compounds								
1,1,1-Trichloroethane	mg/L	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/L	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/L	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/L	--	--	--	--	--	--	--
1,1-Dichloroethene	mg/L	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/L	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/L	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/L	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/L	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/L	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/L	--	--	--	--	--	--	--
2-Butanone (Methyl ethyl ketone) (MEK)	mg/L	--	--	--	--	--	--	--
2-Hexanone	mg/L	--	--	--	--	--	--	--
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	mg/L	--	--	--	--	--	--	--
Acetone	mg/L	--	--	--	--	--	--	--
Benzene	mg/L	--	--	--	--	--	--	--
Bromodichloromethane	mg/L	--	--	--	--	--	--	--
Bromoform	mg/L	--	--	--	--	--	--	--
Bromomethane (Methyl bromide)	mg/L	--	--	--	--	--	--	--
Carbon disulfide	mg/L	--	--	--	--	--	--	--
Carbon tetrachloride	mg/L	--	--	--	--	--	--	--
Chlorobenzene	mg/L	--	--	--	--	--	--	--
Chloroethane	mg/L	--	--	--	--	--	--	--
Chloroform (Trichloromethane)	mg/L	--	--	--	--	--	--	--
Chloromethane (Methyl chloride)	mg/L	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/L	--	--	--	--	--	--	--

Table 2

Analytical Results Summary
Annual Groundwater Sampling
Avtex Fibers Superfund Site
Front Royal, Virginia
July - August 2017

Sample Location:		PZ-07	SB 1-1	SB 1-2	SB 1-3	SB 1-4	SB 3-1	SB 4-1
Sample ID:		2017AN-PZ-07	2017AN-SB1-1	2017AN-SB1-2	2017AN-SB1-3	2017AN-SB1-4	2017AN-SB3-1	2017AN-SB4-1
Sample Date:		7/28/2017	8/1/2017	8/1/2017	8/1/2017	8/1/2017	8/1/2017	8/1/2017
Parameters	**Units**							
Volatile Organic Compounds (Continued)								
cis-1,3-Dichloropropene	mg/L	--	--	--	--	--	--	--
Dibromochloromethane	mg/L	--	--	--	--	--	--	--
Ethylbenzene	mg/L	--	--	--	--	--	--	--
Methylene chloride	mg/L	--	--	--	--	--	--	--
Styrene	mg/L	--	--	--	--	--	--	--
Tetrachloroethene	mg/L	--	--	--	--	--	--	--
Toluene	mg/L	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/L	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/L	--	--	--	--	--	--	--
Trichloroethene	mg/L	--	--	--	--	--	--	--
Vinyl chloride	mg/L	--	--	--	--	--	--	--
Xylenes (total)	mg/L	--	--	--	--	--	--	--
General Chemistry								
Chloride	mg/L	59.6	4.22	2.17	117	109	32.7	43.3
Cyanide (free)	mg/L	--	--	--	--	--	--	--
Sulfate	mg/L	1040	30.9	7.17	1090	388	90.2	121

Notes:.

"--" - Not analyzed
U - Not detected at the associated reporting limit
J - Estimated concentration
UJ - Not detected; associated reporting limit is estimated
R - Rejected

Table 2

Analytical Results Summary
Annual Groundwater Sampling
Avtex Fibers Superfund Site
Front Royal, Virginia
July - August 2017

Sample Location:		SB 4-2	TW-01	TW-02	TW-03	WP-10	WP-11
Sample ID:		2017AN-SB4-2	2017AN-TW-01	2017AN-TW-02	2017AN-TW-03	2017AN-WP-10	2017AN-WP-11
Sample Date:		8/1/2017	8/9/2017	8/1/2017	8/1/2017	7/28/2017	7/27/2017
Parameters	**Units**						
Metals							
Aluminum (dissolved)	mg/L	--	0.00840 U	0.00840 UJ	0.00840 U	0.0537	0.00840 U
Antimony (dissolved)	mg/L	--	0.00135 J	0.00316 J	0.000800 U	0.000800 U	0.00277
Arsenic (dissolved)	mg/L	0.0437 J	0.0113	0.0322 J	0.00118 U	0.180	0.0101
Beryllium (dissolved)	mg/L	0.000100 U	--	--	--	--	--
Cadmium (dissolved)	mg/L	0.000100 UJ	0.000100 U	0.000100 UJ	0.000100 U	0.000178 J	0.000100 U
Calcium (dissolved)	mg/L	206	--	--	--	--	--
Chromium (dissolved)	mg/L	0.000500 UJ	0.000697 J	0.00194 J	0.000500 UJ	0.0195	0.000500 U
Cobalt (dissolved)	mg/L	--	0.00120 J	0.0120 J	0.000100 U	0.192	0.00494
Copper (dissolved)	mg/L	0.00120 U	--	--	--	--	--
Iron (dissolved)	mg/L	--	0.0100 U	0.0100 U	0.0519 UJ	0.421	1.66
Lead (dissolved)	mg/L	0.000100 U	0.000100 U	0.000100 UJ	0.000100 U	0.000132 J	0.000100 U
Magnesium (dissolved)	mg/L	68.5	--	--	--	--	--
Manganese (dissolved)	mg/L	--	0.0158	0.123	0.0481	0.0545	0.457
Mercury (dissolved)	mg/L	0.000100 UJ	0.000100 U	0.000100 UJ	0.000100 UJ	0.000100 U	0.000100 U
Nickel (dissolved)	mg/L	0.00471 J	0.00441	0.0377 J	0.00162 J	0.488	0.0142
Selenium (dissolved)	mg/L	0.000728 U	--	--	--	--	--
Sodium (dissolved)	mg/L	191	--	--	--	--	--
Thallium (dissolved)	mg/L	--	--	--	--	--	--
Vanadium (dissolved)	mg/L	--	0.00255 U	0.00303 U	0.00179 U	0.0608	0.00360 U
Zinc (dissolved)	mg/L	0.00520 UJ	0.00520 U	0.00520 U	0.00520 U	0.0243 J	0.00520 U
Semi-volatile Organic Compounds							
1,2,4-Trichlorobenzene	mg/L	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/L	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/L	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/L	--	--	--	--	--	--
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	mg/L	--	--	--	--	--	--
2,4,5-Trichlorophenol	mg/L	--	--	--	--	--	--
2,4,6-Trichlorophenol	mg/L	--	--	--	--	--	--
2,4-Dichlorophenol	mg/L	--	--	--	--	--	--
2,4-Dimethylphenol	mg/L	--	--	--	--	--	--
2,4-Dinitrophenol	mg/L	--	--	--	--	--	--
2,4-Dinitrotoluene	mg/L	--	--	--	--	--	--
2,6-Dinitrotoluene	mg/L	--	--	--	--	--	--
2-Chloronaphthalene	mg/L	--	--	--	--	--	--
2-Chlorophenol	mg/L	--	--	--	--	--	--
2-Methylnaphthalene	mg/L	--	--	--	--	--	--
2-Methylphenol	mg/L	--	0.00167 U	0.008 U	0.00154 U	0.00145 U	0.00148 U

Table 2

Analytical Results Summary
Annual Groundwater Sampling
Avtex Fibers Superfund Site
Front Royal, Virginia
July - August 2017

Sample Location:		SB 4-2	TW-01	TW-02	TW-03	WP-10	WP-11
Sample ID:		2017AN-SB4-2	2017AN-TW-01	2017AN-TW-02	2017AN-TW-03	2017AN-WP-10	2017AN-WP-11
Sample Date:		8/1/2017	8/9/2017	8/1/2017	8/1/2017	7/28/2017	7/27/2017
Parameters	**Units**						
Semi-volatile Organic Compounds (Continued)							
2-Nitroaniline	mg/L	--	--	--	--	--	--
2-Nitrophenol	mg/L	--	--	--	--	--	--
3&4-Methylphenol	mg/L	--	0.00146 U	0.007 U	0.00135 U	0.00127 U	0.0013 U
3,3'-Dichlorobenzidine	mg/L	--	--	--	--	--	--
3-Nitroaniline	mg/L	--	--	--	--	--	--
4,6-Dinitro-2-methylphenol	mg/L	--	--	--	--	--	--
4-Bromophenyl phenyl ether	mg/L	--	--	--	--	--	--
4-Chloro-3-methylphenol	mg/L	--	--	--	--	--	--
4-Chloroaniline	mg/L	--	--	--	--	--	--
4-Chlorophenyl phenyl ether	mg/L	--	--	--	--	--	--
4-Nitroaniline	mg/L	--	--	--	--	--	--
4-Nitrophenol	mg/L	--	--	--	--	--	--
Acenaphthene	mg/L	--	--	--	--	--	--
Acenaphthylene	mg/L	--	--	--	--	--	--
Anthracene	mg/L	--	--	--	--	--	--
Benzo(a)anthracene	mg/L	--	--	--	--	--	--
Benzo(a)pyrene	mg/L	--	--	--	--	--	--
Benzo(b)fluoranthene	mg/L	--	--	--	--	--	--
Benzo(g,h,i)perylene	mg/L	--	--	--	--	--	--
Benzo(k)fluoranthene	mg/L	--	--	--	--	--	--
bis(2-Chloroethoxy)methane	mg/L	--	--	--	--	--	--
bis(2-Chloroethyl)ether	mg/L	--	--	--	--	--	--
bis(2-Ethylhexyl)phthalate (DEHP)	mg/L	--	0.00172 U	0.0075 U	0.00144 U	0.00143 U	0.00275 U
Butyl benzylphthalate (BBP)	mg/L	--	--	--	--	--	--
Carbazole	mg/L	--	--	--	--	--	--
Chrysene	mg/L	--	--	--	--	--	--
Dibenz(a,h)anthracene	mg/L	--	--	--	--	--	--
Dibenzofuran	mg/L	--	--	--	--	--	--
Diethyl phthalate	mg/L	--	--	--	--	--	--
Dimethyl phthalate	mg/L	--	--	--	--	--	--
Di-n-butylphthalate (DBP)	mg/L	--	--	--	--	--	--
Di-n-octyl phthalate (DnOP)	mg/L	--	--	--	--	--	--
Fluoranthene	mg/L	--	--	--	--	--	--
Fluorene	mg/L	--	--	--	--	--	--
Hexachlorobenzene	mg/L	--	--	--	--	--	--
Hexachlorobutadiene	mg/L	--	--	--	--	--	--
Hexachlorocyclopentadiene	mg/L	--	--	--	--	--	--
Hexachloroethane	mg/L	--	--	--	--	--	--

Table 2

Analytical Results Summary
Annual Groundwater Sampling
Avtex Fibers Superfund Site
Front Royal, Virginia
July - August 2017

Sample Location:		SB 4-2	TW-01	TW-02	TW-03	WP-10	WP-11
Sample ID:		2017AN-SB4-2	2017AN-TW-01	2017AN-TW-02	2017AN-TW-03	2017AN-WP-10	2017AN-WP-11
Sample Date:		8/1/2017	8/9/2017	8/1/2017	8/1/2017	7/28/2017	7/27/2017
Parameters	**Units**						
Semi-volatile Organic Compounds (Continued)							
Indeno(1,2,3-cd)pyrene	mg/L	--	--	--	--	--	--
Isophorone	mg/L	--	--	--	--	--	--
Naphthalene	mg/L	--	0.000385 U	0.00185 U	0.000356 U	0.00646	0.000343 U
Nitrobenzene	mg/L	--	--	--	--	--	--
N-Nitrosodi-n-propylamine	mg/L	--	--	--	--	--	--
N-Nitrosodiphenylamine	mg/L	--	--	--	--	--	--
Pentachlorophenol	mg/L	--	0.00344 UJ	0.0165 UJ	0.00317 UJ	0.003 U	0.00306 U
Phenanthrene	mg/L	--	--	--	--	--	--
Phenol	mg/L	--	0.00156 U	0.0075 U	0.00144 U	0.00136 U	0.00139 U
Pyrene	mg/L	--	--	--	--	--	--
Volatile Organic Compounds							
1,1,1-Trichloroethane	mg/L	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/L	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/L	--	--	--	--	--	--
1,1-Dichloroethane	mg/L	--	--	--	--	--	--
1,1-Dichloroethene	mg/L	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/L	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/L	--	--	--	--	--	--
1,2-Dichloroethane	mg/L	--	--	--	--	--	--
1,2-Dichloropropane	mg/L	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/L	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/L	--	--	--	--	--	--
2-Butanone (Methyl ethyl ketone) (MEK)	mg/L	--	--	--	--	--	--
2-Hexanone	mg/L	--	--	--	--	--	--
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	mg/L	--	--	--	--	--	--
Acetone	mg/L	--	R	R	R	0.00572 U	0.0121 U
Benzene	mg/L	--	--	--	--	--	--
Bromodichloromethane	mg/L	--	--	--	--	--	--
Bromoform	mg/L	--	--	--	--	--	--
Bromomethane (Methyl bromide)	mg/L	--	--	--	--	--	--
Carbon disulfide	mg/L	--	0.0299	0.743	0.000687	0.0257	0.000754
Carbon tetrachloride	mg/L	--	--	--	--	--	--
Chlorobenzene	mg/L	--	--	--	--	--	--
Chloroethane	mg/L	--	--	--	--	--	--
Chloroform (Trichloromethane)	mg/L	--	--	--	--	--	--
Chloromethane (Methyl chloride)	mg/L	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/L	--	--	--	--	--	--

Table 2

Analytical Results Summary
Annual Groundwater Sampling
Avtex Fibers Superfund Site
Front Royal, Virginia
July - August 2017

Sample Location:		SB 4-2	TW-01	TW-02	TW-03	WP-10	WP-11
Sample ID:		2017AN-SB4-2	2017AN-TW-01	2017AN-TW-02	2017AN-TW-03	2017AN-WP-10	2017AN-WP-11
Sample Date:		8/1/2017	8/9/2017	8/1/2017	8/1/2017	7/28/2017	7/27/2017
Parameters	**Units**						
Volatile Organic Compounds (Continued)							
cis-1,3-Dichloropropene	mg/L	--	--	--	--	--	--
Dibromochloromethane	mg/L	--	--	--	--	--	--
Ethylbenzene	mg/L	--	--	--	--	--	--
Methylene chloride	mg/L	--	--	--	--	--	--
Styrene	mg/L	--	--	--	--	--	--
Tetrachloroethene	mg/L	--	--	--	--	--	--
Toluene	mg/L	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/L	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/L	--	--	--	--	--	--
Trichloroethene	mg/L	--	--	--	--	--	--
Vinyl chloride	mg/L	--	--	--	--	--	--
Xylenes (total)	mg/L	--	--	--	--	--	--
General Chemistry							
Chloride	mg/L	32.0	--	--	--	--	--
Cyanide (free)	mg/L	--	0.00154 U	0.00154 U	0.00154 U	0.00154 U	0.00154 U
Sulfate	mg/L	626	--	--	--	--	--

Notes:.

"--" - Not analyzed
U - Not detected at the associated reporting limit
J - Estimated concentration
UJ - Not detected; associated reporting limit is estimated
R - Rejected

Table 3

Analytical Methods
Annual Groundwater Sampling
Avtex Fibers Superfund Site
Front Royal, Virginia
July - August 2017

Parameter	Method	Matrix	Holding Time	
			Collection to Extraction (Days)	Collection or Extraction to Analysis (Days)
SSPL Volatile Organic Compounds (VOCs)	SW-846 8260B	Water	-	14
SSPL Semi-Volatile Organic Compounds (SVOCs)	SW-846 8270C	Water	7	40
Metals (ICP/MS & ICP)	SW-846 6020/6010B	Water	-	180
Mercury	SW-846 7470A	Water	-	28
Cyanide, free	SW-846 9016	Water	-	14
Anions (chloride, sulfate)	MCAWW 300.0	Water	-	28

Notes:

ICP - Inductively Coupled Plasma
ICP/MS - Inductively Coupled Plasma/Mass Spectrophotometry

Method References:

SW-846 - "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", SW-846, Third Edition, 1986, with subsequent revisions
MCAWW - “Methods for Chemical Analysis of Water and Waste,” EPA-600/4-79-020, revised March 1983, with subsequent revisions
SSPL - Site-Specific Parameter List

Table 4

Results Qualified Due to ICP/MS Tune
Annual Groundwater Sampling
Avtex Fibers Superfund Site
Front Royal, Virginia
July - August 2017

Parameter	Sample ID	Analyte	Qualified Result	Units
Metals	2017AN-114	Antimony (dissolved)	0.000800 UJ	mg/L
	2017AN-114	Arsenic (dissolved)	0.0147 J	mg/L
	2017AN-114	Cadmium (dissolved)	0.000100 UJ	mg/L
	2017AN-114	Chromium (dissolved)	0.000500 UJ	mg/L
	2017AN-114	Cobalt (dissolved)	0.00365 J	mg/L
	2017AN-114	Lead (dissolved)	0.000750 UJ	mg/L
	2017AN-114	Nickel (dissolved)	0.0706 J	mg/L
	2017AN-114	Zinc (dissolved)	0.00570 J	mg/L
Metals	2017AN-MW-11	Antimony (dissolved)	0.000800 UJ	mg/L
	2017AN-MW-11	Arsenic (dissolved)	0.00584 J	mg/L
	2017AN-MW-11	Cadmium (dissolved)	0.000136 J	mg/L
	2017AN-MW-11	Chromium (dissolved)	0.000500 UJ	mg/L
	2017AN-MW-11	Nickel (dissolved)	0.0396 J	mg/L
	2017AN-MW-11	Zinc (dissolved)	0.0102 J	mg/L
Metals	2017AN-SB1-1	Arsenic (dissolved)	0.0440 J	mg/L
	2017AN-SB1-1	Cadmium (dissolved)	0.000100 UJ	mg/L
	2017AN-SB1-1	Chromium (dissolved)	0.000500 UJ	mg/L
	2017AN-SB1-1	Lead (dissolved)	0.0006435 UJ	mg/L
	2017AN-SB1-1	Nickel (dissolved)	0.000500 UJ	mg/L
	2017AN-SB1-1	Zinc (dissolved)	0.00783 J	mg/L
Metals	2017AN-SB1-2	Arsenic (dissolved)	0.00602 J	mg/L
	2017AN-SB1-2	Cadmium (dissolved)	0.000100 UJ	mg/L
	2017AN-SB1-2	Chromium (dissolved)	0.000651 J	mg/L
	2017AN-SB1-2	Nickel (dissolved)	0.000912 J	mg/L
	2017AN-SB1-2	Zinc (dissolved)	0.00595 J	mg/L
Metals	2017AN-SB1-4	Arsenic (dissolved)	0.00888 J	mg/L
	2017AN-SB1-4	Cadmium (dissolved)	0.000100 UJ	mg/L
	2017AN-SB1-4	Chromium (dissolved)	0.00324 J	mg/L
	2017AN-SB1-4	Nickel (dissolved)	0.0213 J	mg/L
	2017AN-SB1-4	Zinc (dissolved)	0.0114 J	mg/L
Metals	2017AN-SB3-1	Arsenic (dissolved)	0.00266 UJ	mg/L
	2017AN-SB3-1	Cadmium (dissolved)	0.000100 UJ	mg/L
	2017AN-SB3-1	Chromium (dissolved)	0.000500 UJ	mg/L

Table 4

Results Qualified Due to ICP/MS Tune
Annual Groundwater Sampling
Avtex Fibers Superfund Site
Front Royal, Virginia
July - August 2017

Parameter	Sample ID	Analyte	Qualified Result	Units
Metals	2017AN-SB3-1	Nickel (dissolved)	0.00454 J	mg/L
	2017AN-SB3-1	Zinc (dissolved)	0.00970 J	mg/L
Metals	2017AN-SB4-1	Arsenic (dissolved)	0.00310 UJ	mg/L
	2017AN-SB4-1	Cadmium (dissolved)	0.000100 UJ	mg/L
	2017AN-SB4-1	Chromium (dissolved)	0.000500 UJ	mg/L
	2017AN-SB4-1	Lead (dissolved)	0.0006435 UJ	mg/L
	2017AN-SB4-1	Nickel (dissolved)	0.00678 J	mg/L
	2017AN-SB4-1	Zinc (dissolved)	0.0188 J	mg/L
Metals	2017AN-SB4-2	Arsenic (dissolved)	0.0437 J	mg/L
	2017AN-SB4-2	Cadmium (dissolved)	0.000100 UJ	mg/L
	2017AN-SB4-2	Chromium (dissolved)	0.000500 UJ	mg/L
	2017AN-SB4-2	Nickel (dissolved)	0.00471 J	mg/L
	2017AN-SB4-2	Zinc (dissolved)	0.00520 UJ	mg/L
Metals	2017AN-TW-02	Aluminum (dissolved)	0.00840 UJ	mg/L
	2017AN-TW-02	Antimony (dissolved)	0.00316 J	mg/L
	2017AN-TW-02	Arsenic (dissolved)	0.0322 J	mg/L
	2017AN-TW-02	Cadmium (dissolved)	0.000100 UJ	mg/L
	2017AN-TW-02	Chromium (dissolved)	0.00194 J	mg/L
	2017AN-TW-02	Cobalt (dissolved)	0.0120 J	mg/L
	2017AN-TW-02	Lead (dissolved)	0.000100 UJ	mg/L
	2017AN-TW-02	Nickel (dissolved)	0.0377 J	mg/L
Metals	2017AN-135	Antimony (dissolved)	0.000800 UJ	mg/L
	2017AN-135	Arsenic (dissolved)	0.00284 UJ	mg/L
	2017AN-135	Cadmium (dissolved)	0.000100 UJ	mg/L
	2017AN-135	Chromium (dissolved)	0.000500 UJ	mg/L
	2017AN-135	Lead (dissolved)	0.0006435 UJ	mg/L
	2017AN-135	Nickel (dissolved)	0.000500 UJ	mg/L
	2017AN-135	Thallium (dissolved)	0.000800 UJ	mg/L
	2017AN-135	Zinc (dissolved)	0.00520 UJ	mg/L
Metals	2017AN-205	Antimony (dissolved)	0.00153 J	mg/L
	2017AN-205	Arsenic (dissolved)	0.0197 J	mg/L
	2017AN-205	Cadmium (dissolved)	0.000100 UJ	mg/L
	2017AN-205	Chromium (dissolved)	0.00136 J	mg/L

Table 4

Results Qualified Due to ICP/MS Tune
Annual Groundwater Sampling
Avtex Fibers Superfund Site
Front Royal, Virginia
July - August 2017

Parameter	Sample ID	Analyte	Qualified Result	Units
Metals	2017AN-205	Cobalt (dissolved)	0.00226 J	mg/L
	2017AN-205	Lead (dissolved)	0.0006435 UJ	mg/L
	2017AN-205	Nickel (dissolved)	0.0117 J	mg/L
	2017AN-205	Zinc (dissolved)	0.00520 UJ	mg/L
Metals	2017AN-FAB1-2	Cadmium (dissolved)	0.000100 UJ	mg/L
	2017AN-FAB1-2	Chromium (dissolved)	0.000500 UJ	mg/L
	2017AN-FAB1-2	Nickel (dissolved)	0.0182 J	mg/L
	2017AN-FAB1-2	Zinc (dissolved)	0.00520 UJ	mg/L
Metals	2017AN-FAB3-1	Arsenic (dissolved)	0.0115 J	mg/L
	2017AN-FAB3-1	Cadmium (dissolved)	0.000100 UJ	mg/L
	2017AN-FAB3-1	Chromium (dissolved)	0.000635 J	mg/L
	2017AN-FAB3-1	Nickel (dissolved)	0.0312 J	mg/L
	2017AN-FAB3-1	Zinc (dissolved)	0.0657 J	mg/L
Metals	2017AN-FAB6-North	Arsenic (dissolved)	0.0553 J	mg/L
	2017AN-FAB6-North	Cadmium (dissolved)	0.000100 UJ	mg/L
	2017AN-FAB6-North	Chromium (dissolved)	0.000500 UJ	mg/L
	2017AN-FAB6-North	Nickel (dissolved)	0.0287 J	mg/L
	2017AN-FAB6-North	Zinc (dissolved)	0.0122 J	mg/L
Metals	2017AN-FAB6-South	Arsenic (dissolved)	0.0140 J	mg/L
	2017AN-FAB6-South	Cadmium (dissolved)	0.000100 UJ	mg/L
	2017AN-FAB6-South	Chromium (dissolved)	0.000500 UJ	mg/L
	2017AN-FAB6-South	Nickel (dissolved)	0.0271 J	mg/L
	2017AN-FAB6-South	Zinc (dissolved)	0.00630 J	mg/L

Notes:

J - Estimated concentration
UJ - Not detected; associated reporting limit is estimated

Table 5

Qualified Sample Results Due to Outlying Initial Calibration Results
Annual Groundwater Sampling
Avtex Fibers Superfund Site
Front Royal, Virginia
July - August 2017

Parameter	Analyte	Calibration Date (mm/dd/yyyy)	RRF	Criteria	Associated Sample ID	Qualified Result	Units
VOCs	Acetone	07/12/2017	0,0099	0.01	2017AN-GPW-15R	R	mg/L
					2017AN-MW-07	R	mg/L
					2017AN-MW-08D	R	mg/L
					2017AN-MW-12	R	mg/L
					2017AN-114	R	mg/L
					2017AN-MW-11	R	mg/L
					2017AN-TW-02	R	mg/L
					2017AN-TW-03	R	mg/L
					2017AN-135	R	mg/L
					2017AN-205	R	mg/L
					2017AN-MW-09	2.19 J	mg/L
					2017AN-MW-10	R	mg/L
	Acetone	07/19/2017	0.0078	0.01	2017AN-PZ-06	0.00287 J	mg/L
					2017AN-PZ-06D	R	mg/L

Notes:

RRF - Relative Response Factor
%RSD - Percent Relative Standard Deviation
J - Estimated concentration
R - Rejected

Table 6

Qualified Sample Results Due to Outlying Continuing Calibration Results
Annual Groundwater Sampling
Avtex Fibers Superfund Site
Front Royal, Virginia
July - August 2017

Parameter	Analyte	Calibration Date (mm/dd/yyyy)	RRF	%D	Associated Sample ID	Qualified Result		Units
VOCs	Acetone	07/21/2017	0.0082	8.8	2017AN-604-Z2		R	mg/L
					2017AN-604-Z3		R	mg/L
					2017AN-604-Z4		R	mg/L
					2017AN-606A		R	mg/L
					2017AN-606B		R	mg/L
					2017AN-604-Z1		R	mg/L
					2017AN-115		R	mg/L
					2017AN-215	0.0462	J	mg/L
					2017AN-336	0.00378	J	mg/L
					2017AN-336D		R	mg/L
					2017AN-603-Z1		R	mg/L
					2017AN-603-Z2		R	mg/L
					2017AN-603-Z3		R	mg/L
					2017AN-603-Z4		R	mg/L
	Acetone	08/11/2017	0.0099	5.3	2017AN-024-Resample		R	mg/L
					2017AN-105-Resample		R	mg/L
					2017AN-305	1.59	J	mg/L
					2017AN-TW-01		R	mg/L
SVOCs	Pentachlorophenol	07/20/2017	0.1146	28.8	2017AN-206	0.0033	UJ	mg/L
	Pentachlorophenol	08/02/2107	0.123	36.6	2017AN-PW-02	0.00306	UJ	mg/l
	Pentachlorophenol	08/08/2017	0.1172	31.2	2017AN-338	0.00317	UJ	mg/l
					2017AN-MW-12	0.00330	UJ	mg/L
	4-Nitrophenol	08/08/2017	0.4377	25.5	2017AN-MW-12	0.00200	UJ	mg/L
	Pentachlorophenol	08/04/2017	0.1107	25.1	2017AN-PZ-06	0.00359	UJ	mg/l
					2017AN-PZ-06D	0.00330	UJ	mg/l
					2017AN-114	0.00367	UJ	mg/l
					2017AN-MW-11	0.00344	UJ	mg/L
					2017AN-TW-02	0.0165	UJ	mg/L

Table 6

Qualified Sample Results Due to Outlying Continuing Calibration Results
Annual Groundwater Sampling
Avtex Fibers Superfund Site
Front Royal, Virginia
July - August 2017

Parameter	Analyte	Calibration Date (mm/dd/yyyy)	RRF	%D	Associated Sample ID	Qualified Result	Units
SVOCs	Pentachlorophenol	08/04/2017	0.1107	25.1	2017AN-TW-03	0.00317 UJ	mg/l
					2017AN-135	0.00367 UJ	mg/L
					2017AN-205	0.0162 UJ	mg/l
					2017AN-MW-09	0.0196 UJ	mg/l
					2017AN-MW-10	0.00330 UJ	mg/l
	2,2'-Oxybis(1-chloropropane)	08/04/2017	5.005	50.0	2017AN-MW-11	0.00188 UJ	mg/L
					2017AN-135	0.00200 UJ	mg/L
	Hexachlorocyclopentadiene	08/04/2017	0.2051	25.4	2017AN-MW-11	0.00135 UJ	mg/L
					2017AN-135	0.00144 UJ	mg/L
	Pentachlorophenol	08/11/2017	0.1177	31.7	2017AN-305	0.033 UJ	mg/l
					2017AN-TW-01	0.00344 UJ	mg/l

Notes:

%D - Percent difference
RRF - Relative Response Factor
J - Estimated concentration
UJ - Not detected; associated reporting limit is estimated
R - Rejected
SVOCs - Semi-volatile Organic Compounds
VOCs - Volatile Organic Compounds

Table 7

Qualified Sample Results Due to Analyte Concentrations in the Method Blanks
Annual Groundwater Sampling
Avtex Fibers Superfund Site
Front Royal, Virginia
July - August 2017

Parameter	Analyte	Analysis Date (mm/dd/yyyy)	Blank Result *	Sample ID	Original Result	Qualified Result	Units
SVOCs	bis(2-Ethylhexyl)phthalate (DEHP)	07/19/2017	0.00345	2017AN-206	0.00407 J	0.00407 U	mg/L
				2017AN-605A	0.00316 J	0.00316 U	mg/L
				2017AN-605B	0.00543 J	0.00543 U	mg/L
	bis(2-Ethylhexyl)phthalate (DEHP)	07/20/2017	0.00235	2017AN-162	0.0019 J	0.0019 U	mg/L
				2017AN-216	0.00814 J	0.00814 U	mg/L
	bis(2-Ethylhexyl)phthalate (DEHP)	07/20/2017	0.00768	2017AN-604-Z1	0.00458 J	0.00458 U	mg/L
				2017AN-604-Z2	0.00401 J	0.00401 U	mg/L
				2017AN-604-Z3	0.0025 J	0.0025 U	mg/L
				2017AN-604-Z4	0.00437 J	0.00437 U	mg/L
				2017AN-606A	0.00507 J	0.00507 U	mg/L
				2017AN-606B	0.00317 J	0.00317 U	mg/L
				2017AN-501B	0.00267 J	0.00267 U	mg/L
				2017AN-501C	0.00284 J	0.00284 U	mg/L
				2017AN-602	0.00712 J	0.00712 U	mg/L
				2017AN-115	0.00629 J	0.00629 U	mg/L
				2017AN-215	0.00616 J	0.00616 U	mg/L
				2017AN-603-Z1	0.00468 J	0.00468 U	mg/L
				2017AN-603-Z2	0.00487 J	0.00487 U	mg/L
				2017AN-603-Z3	0.00315 J	0.00315 U	mg/L
				2017AN-603-Z4	0.00639 J	0.00639 U	mg/L
	bis(2-Ethylhexyl)phthalate (DEHP)	08/02/2017	0.004316	2017AN-132	0.00224 J	0.00224 U	mg/L
				2017AN-132D	0.00238 J	0.00238 U	mg/L
				2017AN-232	0.0021 J	0.0021 U	mg/L
				2017AN-601	0.00261 J	0.00261 U	mg/L
				2017AN-GM-09R	0.00189 J	0.00189 U	mg/L

Table 7

Qualified Sample Results Due to Analyte Concentrations in the Method Blanks
Annual Groundwater Sampling
Avtex Fibers Superfund Site
Front Royal, Virginia
July - August 2017

Parameter	Analyte	Analysis Date (mm/dd/yyyy)	Blank Result *	Sample ID	Original Result	Qualified Result	Units
SVOCs	bis(2-Ethylhexyl)phthalate (DEHP)	08/02/2017	0.004316	2017AN-GPW-15R	0.00167 J	0.00167 U	mg/L
				2017AN-MW-03R	0.00278 J	0.00278 U	mg/L
				2017AN-MW-07	0.00626 J	0.00626 U	mg/L
				2017AN-MW-08	0.00176 J	0.00176 U	mg/L
				2017AN-MW-08D	0.00178 J	0.00178 U	mg/L
				2017AN-PW-0	0.00141 J	0.00141 U	mg/L
				2017AN-WP-10	0.00143 J	0.00143 U	mg/L
				2017AN-WP-11	0.00275 J	0.00275 U	mg/L
				2017AN-024	0.00287 J	0.00287 U	mg/L
				2017AN-105	0.0021 J	0.0021 U	mg/L
	bis(2-Ethylhexyl)phthalate (DEHP)	08/11/2017	0.01989	2017AN-TW-01	0.00172 J	0.00172 U	mg/L
Metals	Aluminum (dissolved)	08/10/2017	0.07666	2017AN-205	0.0113 J	0.07666 U	mg/L
Metals	Arsenic (dissolved)	08/01/2017	0.000577	2017AN-603-Z1	0.00273	0.00273 U	mg/L
Metals	Arsenic (dissolved)	08/04/2017	0.00071	2017AN-110	0.00316 J	0.00316 U	mg/L
				2017AN-130R	0.00228 J	0.00228 U	mg/L
Metals	Arsenic (dissolved)	08/08/2017	0.0005885	2017AN-601	0.000924 J	0.000924 U	mg/L
				2017AN-GM-09R	0.00118 J	0.00118 U	mg/L
				2017AN-GPW-15R	0.000910 J	0.000910 U	mg/L
				2017AN-MW-07	0.00286	0.00286 U	mg/L
				2017AN-MW-08	0.00156 J	0.00156 U	mg/L
				2017AN-MW-08D	0.00176 J	0.00176 U	mg/L

Table 7

Qualified Sample Results Due to Analyte Concentrations in the Method Blanks
Annual Groundwater Sampling
Avtex Fibers Superfund Site
Front Royal, Virginia
July - August 2017

Parameter	Analyte	Analysis Date (mm/dd/yyyy)	Blank Result *	Sample ID	Original Result	Qualified Result	Units
Metals	Arsenic (dissolved)	08/08/2017	0.0005885	2017AN-PW-0	0.00291	0.00291 U	mg/L
				2017AN-PW-02	0.00234	0.00234 U	mg/L
				2017AN-022	0.00180 J	0.00180 U	mg/L
Metals	Arsenic (dissolved)	08/05/2017	0.0007026	2017AN-SB3-1	0.00266 J	0.00266 U	mg/L
				2017AN-SB4-1	0.00310 J	0.00310 U	mg/L
				2017AN-TW-03	0.00118 J	0.00118 U	mg/L
				2017AN-135	0.00284 J	0.00284 U	mg/L
Metals	Chromium (dissolved)	11/27/2017	0.000535	2017AN-604-Z2	0.000703 J	0.000703 U	mg/L
				2017AN-604-Z3	0.00132 J	0.00132 U	mg/L
				2017AN-606A	0.000826 J	0.000826 U	mg/L
				2017AN-606B	0.000621 J	0.000621 U	mg/L
				2017AN-162	0.000908 J	0.000908 U	mg/L
				2017AN-501C	0.000595 J	0.000595 U	mg/L
				2017AN-602	0.000502 J	0.000535 U	mg/L
				2017AN-604-Z1	0.000528 J	0.000535 U	mg/L
Metals	Lead (dissolved)	08/08/2017	0.000646	2017AN-PZ-06	0.000127 J	0.000646 U	mg/L
Metals	Lead (dissolved)	08/05/2017	0.0006435	2017AN-114	0.000750 J	0.000750 U	mg/L
				2017AN-SB1-1	0.000497 J	0.0006435 U	mg/L
				2017AN-SB1-4	0.00231	0.00231 U	mg/L
				2017AN-SB4-1	0.000171 J	0.0006435 U	mg/L
				2017AN-135	0.000270 J	0.0006435 U	mg/L
				2017AN-205	0.000228 J	0.0006435 U	mg/L

Table 7

Qualified Sample Results Due to Analyte Concentrations in the Method Blanks
Annual Groundwater Sampling
Avtex Fibers Superfund Site
Front Royal, Virginia
July - August 2017

Parameter	Analyte	Analysis Date (mm/dd/yyyy)	Blank Result *	Sample ID	Original Result	Qualified Result	Units
Metals	Nickel (dissolved)	08/11/2017	0.0005471	2017AN-MW-07	0.00124 J	0.00124 U	mg/L
				2017AN-MW-08D	0.000689 J	0.000689 U	mg/L
				2017AN-PW-02	0.00118 J	0.00118 U	mg/L
Metals	Selenium (dissolved)	08/04/2017	0.00052	2017AN-110	0.000747 J	0.000747 U	mg/L
				2017AN-130R	0.000734 J	0.000734 U	mg/L
Metals	Selenium (dissolved)	08/08/2017	0.01479	2017AN-012	0.000354 J	0.000433 U	mg/L
				2017AN-132	0.000384 J	0.000433 U	mg/L
				2017AN-132D	0.000688 J	0.000688 U	mg/L
				2017AN-GPW-15R	0.000715 J	0.000715 U	mg/L
				2017AN-013	0.000448 J	0.000448 U	mg/L
				2017AN-MW-07	0.000421 J	0.01479 U	mg/L
				2017AN-MW-08	0.000386 J	0.01479 U	mg/L
				2017AN-MW-08D	0.000460 J	0.01479 U	mg/L
				2017AN-PZ-03	0.000692 J	0.01479 U	mg/L
				2017AN-PZ-07	0.000487 J	0.01479 U	mg/L
				2017AN-014R	0.000697 J	0.000697 U	mg/L
				2017AN-022	0.00154 J	0.00154 U	mg/L
				2017AN-023	0.000910 J	0.000910 U	mg/L
				2017AN-025R	0.000594 J	0.000594 U	mg/L
				2017AN-112	0.000582 J	0.000582 U	mg/L
Metals	Selenium (dissolved)	08/10/2017	0.0004709	2017AN-MW-11	0.00111 J	0.00111 U	mg/L
				2017AN-SB1-1	0.000713 J	0.000713 U	mg/L

Table 7

Qualified Sample Results Due to Analyte Concentrations in the Method Blanks
Annual Groundwater Sampling
Avtex Fibers Superfund Site
Front Royal, Virginia
July - August 2017

Parameter	Analyte	Analysis Date (mm/dd/yyyy)	Blank Result *	Sample ID	Original Result	Qualified Result	Units
Metals	Selenium (dissolved)	08/10/2017	0.0004709	2017AN-SB1-2	0.000709 J	0.000709 U	mg/L
				2017AN-SB1-3	0.000722 J	0.000722 U	mg/L
				2017AN-SB1-4	0.00153 J	0.00153 U	mg/L
				2017AN-SB3-1	0.000838 J	0.000838 U	mg/L
				2017AN-SB4-1	0.000904 J	0.000904 U	mg/L
				2017AN-SB4-2	0.000728 J	0.000728 U	mg/L
				2017AN-135	0.000735 J	0.000735 U	mg/L
				2017AN-FAB1-2	0.000834 J	0.000834 U	mg/L
				2017AN-FAB6-North	0.000723 J	0.000723 U	mg/L
				2017AN-FAB6-South	0.000992 J	0.000992 U	mg/L
Metals	Vanadium (dissolved)	08/11/2017	0.001894	2017AN-132	0.00234	0.00234 U	mg/L
				2017AN-132D	0.00282	0.00282 U	mg/L
				2017AN-138	0.00486	0.00486 U	mg/L
				2017AN-138D	0.00470	0.00470 U	mg/L
				2017AN-232	0.00290	0.00290 U	mg/L
				2017AN-238	0.00673	0.00673 U	mg/L
				2017AN-338	0.00483	0.00483 U	mg/L
				2017AN-601	0.00294	0.00294 U	mg/L
				2017AN-GM-09R	0.00281	0.00281 U	mg/L
				2017AN-GPW-15R	0.00279	0.00279 U	mg/L
				2017AN-MW-07	0.00187 J	0.00187 U	mg/L
				2017AN-MW-08	0.00170 J	0.001894 U	mg/L
				2017AN-MW-08D	0.00168 J	0.001894 U	mg/L
				2017AN-PW-0	0.00199 J	0.00199 U	mg/L

Table 7

Qualified Sample Results Due to Analyte Concentrations in the Method Blanks
Annual Groundwater Sampling
Avtex Fibers Superfund Site
Front Royal, Virginia
July - August 2017

Parameter	Analyte	Analysis Date (mm/dd/yyyy)	Blank Result *	Sample ID	Original Result	Qualified Result	Units
Metals	Vanadium (dissolved)	08/11/2017	0.001894	2017AN-PW-02	0.00218	0.00218 U	mg/L
				2017AN-WP-11	0.00360	0.00360 U	mg/L
				2017AN-024	0.00657	0.00657 U	mg/L
				2017AN-105	0.00321	0.00321 U	mg/L
Metals	Vanadium (dissolved)	08/08/2017	0.001894	2017AN-PZ-06	0.00212	0.00212 U	mg/L
				2017AN-PZ-06D	0.00234	0.00234 U	mg/L
Metals	Vanadium (dissolved)	08/16/2017	0.000738	2017AN-TW-03	0.00179 J	0.00179 U	mg/L
				2017AN-MW-10	0.00316	0.00316 UJ	mg/L
Metals	Vanadium (dissolved)	08/16/2017	0.001786	2017AN-305	0.00393	0.00393 U	mg/L
				2017AN-TW-01	0.00255	0.00255 U	mg/L

Notes:

* - Blank result adjusted for sample factors where applicable
U - Not detected at the associated reporting limit
J - Estimated concentration
UJ - Not detected; associated reporting limit is estimated
SVOCs - Semi-volatile Organic Compounds

Table 8

Qualified Sample Results Due to Analyte Concentrations in the Instrument Blanks
Annual Groundwater Sampling
Avtex Fibers Superfund Site
Front Royal, Virginia
July - August 2017

Parameter	Analyte	Blank ID	Analysis Date (mm/dd/yyyy)	Blank Result	Sample ID	Original Result	Qualified Result	Units
Metals	Selenium (dissolved)	CCB	08/11/2017	0.001899	2017AN-PZ-06D	0.00201	0.00201 U	mg/L

Notes:

CCB - Continuing Calibration Blank
U - Not detected at the associated reporting limit
J - Estimated concentration

Table 9

Qualified Sample Results Due to Outlying LCS/LCSD Results
Annual Groundwater Sampling
Avtex Fibers Superfund Site
Front Royal, Virginia
July - August 2017

Parameter	Analyte	LCS Date (mm/dd/yyyy)	LCS % Recovery	LCSD % Recovery	RPD (percent)	Control Limits % Recovery	Control Limits RPD	Associated Sample ID	Qualified Result	Units
SVOCs	Hexachlorocyclopentadiene	08/05/2017	21	15	29	17-128	50	2017AN-MW-12	0.00130 UJ	mg/L
	Hexachlorocyclopentadiene	08/02/2107	6	-	-	17-128	-	2017AN-132	R	mg/L
								2017AN-132D	R	mg/L
								2017AN-GPW-15R	R	mg/L
								2017AN-MW-07	R	mg/L
								2017AN-MW-08	R	mg/L
								2017AN-MW-08D	R	mg/L

Notes:

"-" - Not applicable
LCS - Laboratory Control Sample
LCSD - Laboratory Control Sample Duplicate
RPD - Relative Percent Difference
UJ - Not detected; associated reporting limit is estimated
R - Rejected

Table 10

Qualified Sample Results Due to Outlying MS/MSD Results
Annual Groundwater Sampling
Avtex Fibers Superfund Site
Front Royal, Virginia
July - August 2017

Parameter	Sample ID	Analyte	MS % Recovery	MSD % Recovery	RPD (percent)	Control Limits % Recovery	Control Limits RPD	Associated Sample IDs	Qualified Result	Units
Metals	2017AN-008	Sodium (dissolved)	138	159	8	75-125	20	2017AN-008	12.3 J	mg/l
								2017AN-129	24.9 J	mg/l
								2017AN-B-48A	189 J	mg/l
								2017AN-029	51.2 J	mg/l
								2017AN-108	13.7 J	mg/l
								2017AN-113	5.90 J	mg/l
Metals	2017AN-PZ-06	Sodium (dissolved)	73	144	15	75-125	20	2017AN-PZ-06	35.5 J	mg/l
								2017AN-PZ-06D	34.4 J	mg/l
Metals	2017AN-SB3-1	Mercury (dissolved)	59	61	3	75-125	20	2017AN-SB3-1	0.000100 UJ	mg/l
								2017AN-SB4-1	0.000100 UJ	mg/l
								2017AN-SB4-2	0.000100 UJ	mg/l
								2017AN-TW-02	0.000100 UJ	mg/l
								2017AN-TW-03	0.000100 UJ	mg/l
Metals	2017AN-336	Mercury (dissolved)	70	73	4	75-125	20	2017AN-115	0.000100 UJ	mg/l
								2017AN-215	0.000100 UJ	mg/l
								2017AN-336	0.000100 UJ	mg/l
								2017AN-336D	0.000100 UJ	mg/l
								2017AN-603-Z1	0.000100 UJ	mg/l
								2017AN-603-Z2	0.000100 UJ	mg/l
								2017AN-603-Z3	0.000100 UJ	mg/l
								2017AN-603-Z4	0.000100 UJ	mg/l
	2017AN-210	Manganese (dissolved)	30	29	1	75 - 125	20	2017AN-210	0.115 J	mg/L
	2017AN-TW-03	Chromium (dissolved)	132	102	25	75 - 125	20	2017AN-TW-03	0.000500 UJ	mg/L

Table 10

Qualified Sample Results Due to Outlying MS/MSD Results
Annual Groundwater Sampling
Avtex Fibers Superfund Site
Front Royal, Virginia
July - August 2017

Parameter	Sample ID	Analyte	MS % Recovery	MSD % Recovery	RPD (percent)	Control Limits % Recovery	Control Limits RPD	Associated Sample IDs	Qualified Result		Units
Metals	2017AN-TW-03	Iron (dissolved)	151	99	40	75 - 125	20	2017AN-TW-03	0.0519	UJ	mg/L
	2017AN-MW-09	Cadmium (dissolved)	55	55	0	75 - 125	20	2017AN-MW-09	0.000800	UJ	mg/L
								2017AN-MW-10	0.000100	UJ	mg/L
								2017AN-SB1-3	0.000100	UJ	mg/L
	2017AN-MW-09	Cobalt (dissolved)	69	69	0	75 - 125	20	2017AN-MW-09	0.478	J	mg/L
								2017AN-MW-10	0.0170	J	mg/L
	2017AN-SB1-3	Copper (dissolved)	61	61	0	75 - 125	20	2017AN-SB1-3	0.00321	J	mg/L
	2017AN-MW-09	Iron (dissolved)	74	73	0	75 - 125	20	2017AN-MW-09	0.201	UJ	mg/L
								2017AN-MW-10	32.6	J	mg/L
	2017AN-MW-09	Nickel (dissolved)	73	72	0	75 - 125	20	2017AN-MW-09	1.18	J	mg/L
								2017AN-MW-10	0.0214	J	mg/L
								2017AN-SB1-3	0.00816	J	mg/L

Notes:

MS - Matrix Spike
MSD - Matrix Spike Duplicate
RPD - Relative Percent Difference
J - Estimated concentration
UJ - Not detected; associated reporting limit is estimated

Table 11

Qualified Sample Data Due to Outlying ICP Serial Dilution Results
Annual Groundwater Sampling
Avtex Fibers Superfund Site
Front Royal, Virginia
July - August 2017

Parameter	Serial Dilution Sample ID	Analyte	%D	Associated Sample ID	Qualified Result	Units
Metals	2017AN-MW-09	Arsenic (dissolved)	38	2017AN-SB1-3	0.00247 UJ	mg/L
				2017AN-MW-09	1.50 J	mg/L
				2017AN-MW-10	0.0361 J	mg/L
Metals	2017AN-MW-09	Cobalt (dissolved)	33	2017AN-MW-09	0.478 J	mg/L
				2017AN-MW-10	0.0170 J	mg/L
Metals	2017AN-PZ-06	Manganese (dissolved)	17.5	2017AN-PZ-06	0.492 J	mg/L
				2017AN-PZ-06D	0.541 J	mg/L
Metals	2017AN-MW-09	Nickel (dissolved)	40	2017AN-SB1-3	0.00816 J	mg/L
				2017AN-MW-09	1.18 J	mg/L
				2017AN-MW-10	0.0214 J	mg/L
Metals	2017AN-MW-09	Vanadium (dissolved)	11	2017AN-MW-09	0.385 J	mg/L
				2017AN-MW-10	0.00316 UJ	mg/L
Metals	2017AN-MW-09	Zinc (dissolved)	42	2017AN-SB1-3	0.00948 J	mg/L
				2017AN-MW-09	3.68 J	mg/L
				2017AN-MW-10	0.144 J	mg/L

Notes:

%D - Percent Difference
ICP - Inductively Coupled Plasma
J - Estimated concentration
UJ - Not detected; associated reporting limit is estimated

Table 12

Qualified Sample Data Due to Analyte Concentrations in the Trip Blanks
Annual Groundwater Sampling
Avtex Fibers Superfund Site
Front Royal, Virginia
July - August 2017

Parameter	Blank Date (mm/dd/yyyy)	Analyte	Blank Result	Associated Sample ID	Original Result	Qualified Result	Units
VOCs	07/14/2017	Acetone	0.00579	2017AN-604-Z3	0.00266 J	0.00579 U	mg/L
				2017AN-606B	0.00392 J	0.00579 U	mg/L
	07/18/2017	Acetone	0.00846	2017AN-136	0.00366 J	0.00846 U	mg/L
				2017AN-206-Resample	0.00324 J	0.00846 U	mg/L
				2017AN-GM-02B	0.00472 J	0.00846 U	mg/L
	07/25/2017	Acetone	0.00307	2017AN-133	0.00371 J	0.00371 U	mg/L
				2017AN-MW-05	0.00338 J	0.00338 U	mg/L
				2017AN-118	0.00686	0.00686 U	mg/L
				2017AN-119	0.00448 J	0.00448 U	mg/L
				2017AN-120R	0.00311 J	0.00311 U	mg/L
				2017AN-128	0.00294 J	0.00294 U	mg/L
	07/27/2017	Acetone	0.00470	2017AN-130R	0.00744	0.00744 U	mg/L
				2017AN-GPW-14	0.00792	0.00792 U	mg/L
	07/28/2017	Acetone	0.00572	2017AN-338	0.00284 J	0.00572 U	mg/L
				2017AN-GM-09R	0.00380 J	0.00572 U	mg/L
				2017AN-MW-03R	0.00308 J	0.00572 U	mg/L
				2017AN-WP-10	0.00543 J	0.00572 U	mg/L
				2017AN-WP-11	0.0121	0.0121 U	mg/L

Notes:

U - Not detected at the associated reporting limit
J - Estimated concentration
VOCs - Volatile Organic Compounds

Table 13

Qualified Sample Data Due to Analyte Concentrations in the Rinse Blanks
Annual Groundwater Sampling
Avtex Fibers Superfund Site
Front Royal, Virginia
July - August 2017

Parameter	Rinse Blank ID	Blank Date (dd/mm/yyyy)	Analyte	Blank Result	Associated Sample ID	Original Result	Qualified Result	Units
Metals	RB-071817	07/18/2017	Iron (dissolved)	0.0148	2017AN-604-Z3	0.0460	0.0460 U	mg/L
					2017AN-604-Z4	0.0186 J	0.0186 U	mg/L
					2017AN-606B	0.0160 J	0.0160 U	mg/L
					2017AN-216	0.0205 J	0.0205 U	mg/L
					2017AN-316	0.0153 J	0.0153 U	mg/L
					2017AN-501A	0.0103 J	0.0103 U	mg/L
					2017AN-501C	0.0218 J	0.0218 U	mg/L
Metals	RB-080117	08/01/2017	Arsenic (dissolved)	0.000494	2017AN-SB1-3	0.00240	0.00247 UJ	mg/L
Metals	RB-080117	08/01/2017	Vanadium (dissolved)	0.0019	2017AN-MW-11	0.00121 J	00183 U	mg/L
					2017AN-TW-02	0.00303	0.00303 U	mg/L
					2017AN-205	0.00191 J	0.00191 U	mg/L
Metals	RB-080117	08/01/2017	Iron (dissolved)	0.154	2017AN-TW-03	0.0494	0.0519 UJ	mg/L
					2017AN-205	0.0253	0.0253 U	mg/L
					2017AN-MW-09	0.201	0.201 UJ	mg/L

Notes:

U - Not detected at the associated reporting limit
J - Estimated concentration
UJ - Not detected; associated reporting limit is estimated

Table 14

Qualified Sample Data Due to Variability in Field Duplicate Results
Annual Groundwater Sampling
Avtex Fibers Superfund Site
Front Royal, Virginia
July - August 2017

Parameter	Analyte	RPD	Diff	Sample ID	Qualified Result	Field Duplicate Sample ID	Qualified Result	Units
Metals	Iron (dissolved)	52	0.036	2017AN-138	0.0512 J	2017AN-138D	0.0872 J	mg/L
	Aluminum (dissolved)	152	0.0526	2017AN-PZ-06	0.00840 UJ	2017AN-PZ-06D	0.0610 J	mg/L

Notes:

Diff - Difference (i.e., >1X RL for waters or >2XRL for soils)
RPD - Relative Percent Difference
J - Estimated concentration
UJ - Not detected; associated reporting limit is estimated

Memorandum

March 15, 2018

To:	Michael Robinson	Ref. No.:	11119510-001
From:	Deb Andrasko/mkd/11-NF	Tel:	716-297-6150

Subject: **Analytical Results and Full Validation**
Annual Groundwater Sampling
Avtex Fibers Superfund Site
Front Royal, Virginia
December 2017

1. Introduction

This document details a validation of analytical results for a groundwater sample collected in support of the Annual Groundwater Sampling at the Avtex Fibers Superfund site in December 2017. The sample was submitted to TestAmerica Laboratory, located in Nashville, Tennessee. A sample collection and analysis summary is presented in Table 1. The validated analytical results are summarized in Table 2. A summary of the analytical methodology is presented in Table 3.

Full Contract Laboratory Program (CLP) equivalent raw data deliverables were provided by the laboratory. Evaluation of the data was based on information obtained from the finished data sheets, raw data, chain of custody forms, calibration data, blank data, and recovery data from surrogate spikes and laboratory control samples (LCS). The assessment of analytical and in-house data included checks for: data consistency (by observing comparability of duplicate analyses), adherence to accuracy and precision criteria, and transmittal errors.

The QA/QC criteria by which these data have been assessed are outlined in the analytical methods referenced in Table 3 and applicable guidance from the documents entitled:

i) "USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review", USEPA 540-R-10-011, January 2010

ii) "USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review", USEPA 540-R-08-01, June 2008

Items i) and ii) will subsequently be referred to as the "Guidelines" in this Memorandum.

2. Sample Holding Time and Preservation

The sample holding time criteria for the analyses are summarized in Table 3. Sample chain of custody documents and analytical reports were used to determine sample holding times. All samples were prepared and analyzed within the required holding times.

All samples were properly preserved, delivered on ice, and stored by the laboratory at the required temperature (0-6°C).

3. Gas Chromatography/Mass Spectrometer (GC/MS) – Tuning and Mass Calibration (Instrument Performance Check) and Inductively Coupled Plasma/Mass Spectrometer (ICP/MS)

3.1 Organic Analyses

Prior to volatile organic compound (VOC) and semi-volatile organic compound (SVOC) analysis, GC/MS instrumentation is tuned to ensure optimization over the mass range of interest. To evaluate instrument tuning, methods require the analysis of specific tuning compounds bromofluorobenzene (BFB) and decafluorotriphenylphosphine (DFTPP), respectively. The resulting spectra must meet the criteria cited in the methods before analysis is initiated. Analysis of the tuning compound must then be repeated every 12 hours throughout sample analysis to ensure the continued optimization of the instrument.

Tuning compounds were analyzed at the required frequency throughout VOC and SVOC analysis periods. All tuning criteria were met indicating that proper optimization of the instrumentation was achieved.

3.2 Inorganic Analyses

To ensure adequate mass resolution, identification, and to some degree, sensitivity, the performance of each ICP/MS instrument used for metals analyses is checked prior to calibration and initiating an analysis sequence through the analysis of a tuning solution.

Instrument performance check data were reviewed. The tuning solution was analyzed at the required frequency throughout the analyses. The results of the instrument performance checks were within the method acceptance criteria, indicating that proper optimization of the instrumentation was achieved.

4. Initial Calibration - Organic Analyses

4.1 GC/MS

To quantify VOCs and SVOCs of interest in samples, calibration of the GC/MS over a specific concentration range must be performed. Initially, a minimum of a five-point calibration curve containing all compounds of interest is analyzed to characterize instrument response for each analyte over a specific concentration range.

Linearity of the calibration curve and instrument sensitivity are evaluated against the following criteria:

i) All relative response factors (RRFs) must be greater than or equal to 0.05 (0.01 for poor responders)

ii) The percent relative standard deviation (RSD) values must not exceed 20.0 percent (40 percent for poor responders) or a minimum correlation coefficient (R) of 0.99 and minimum coefficient of determination (R^2) of 0.99 if linear and quadratic equation calibration curves, respectively, are used.

The initial calibration data for VOCs and SVOCs were reviewed. All compounds met the above criteria for sensitivity and linearity.

5. Initial Calibration – Inorganic Analyses

Initial calibration of the instruments ensures that they are capable of producing satisfactory quantitative data at the beginning of a series of analyses. For ICP/MS analysis, a calibration blank and at least one standard must be analyzed at each wavelength to establish the analytical curve. For mercury atomic absorption (AA) analyses, a calibration blank and a minimum of five standards must be analyzed to establish the analytical curve, and resulting correlation coefficients (R) must be 0.995 or greater. For instrumental general chemistry analyses, a calibration blank and a minimum of five standards must be analyzed to establish the analytical curve, and resulting correlation coefficients (R) must be 0.995 or greater.

After the analyses of the calibration curves, an initial calibration verification (ICV) standard must be analyzed to verify the analytical accuracy of the calibration curves. All analyte recoveries from the analyses of the ICVs must be within the following control limits:

Analytical Method	Parameter	Control Limits
ICP/MS,	Metals	90 - 110%
Cold Vapor AA	Mercury	80 - 120%
Instrumental Wet Chemistry	Free Cyanide	85 - 115%

Upon review of the data, it was determined that the calibration curves and ICVs were analyzed at the proper frequencies and that all of the above-specified criteria were met. The laboratory effectively demonstrated that the instrumentation used for metals and general chemistry analyses were properly calibrated prior to sample analysis.

6. Continuing Calibration - Organic Analyses

6.1 GC/MS

To ensure that instrument calibration for VOC and SVOC analyses is acceptable throughout the sample analysis period, continuing calibration standards must be analyzed and compared to the initial calibration curve every 12 hours.

The following criteria were employed to evaluate continuing calibration data:

i) All RRF values must be greater than or equal to 0.05 (0.01 for poor responders)

ii) Percent difference (%D) values must not exceed 25 percent (40 percent for poor responders)

Calibration standards were analyzed at the required frequency, and the results met the above criteria for instrument sensitivity and stability.

7. Continuing Calibration - Inorganic Analyses

To ensure that instrument calibration is acceptable throughout the sample analysis period, continuing calibration verification (CCV) standards are analyzed on a regular basis. Each CCV is deemed acceptable if all analyte recoveries are within the control limits specified above for the ICVs. If some of the CCV analyte recoveries are outside the control limits, samples analyzed before and after the CCV, up until the previous and proceeding CCV analyses, are affected.

For this study, CCVs were analyzed at the proper frequency. All analyte recoveries reported for the CCVs were within the specified limits.

8. Contract Required Detection Limit (CRDL) Standard Analyses

To verify the linearity of the ICP/MS calibration near the detection limit, a standard is analyzed which contains the ICP/MS analytes at specified concentrations. This standard must be analyzed at the beginning and end of each sample analysis run or a minimum of twice per 8-hour period.

CRDL recoveries were evaluated using the criteria specified in the October 2004 "Guidelines". The CRDL recoveries were acceptable.

9. Laboratory Blank Analyses

Method blanks are prepared from a purified matrix and analyzed with investigative samples to determine the existence and magnitude of sample contamination introduced during the analytical procedures. Additionally, initial and continuing calibration blanks (ICBs/CCBs) are routinely analyzed after each ICV/CCV for the inorganic parameters.

For this study, laboratory method blanks were analyzed at a minimum frequency of 1 per 20 investigative samples and/or 1 per analytical batch.

9.1 Organic Analyses

All method blank results were non-detect, indicating that laboratory contamination was not a factor for this investigation.

9.2 Inorganic Analyses

Upon review of the ICBs, CCBs, and method blanks, chromium and aluminum concentrations were observed above the method detection limit (MDL) in the method blank and one of the CCBs, respectively. The associated sample result for chromium had a similar concentration to the level reported in the method blank and was qualified as non-detect (see Table 4).

10. Surrogate Spike Recoveries

In accordance with the methods employed, all samples, blanks, and QC samples analyzed for organics are spiked with surrogate compounds prior to sample extraction and/or analysis. Surrogate recoveries provide a means to evaluate the effects of laboratory performance on individual sample matrices.

All samples submitted for VOC and SVOC determinations were spiked with the appropriate number of surrogate compounds prior to sample extraction and/or analysis.

Each individual surrogate compound is expected to meet the laboratory control limits with the exception of SVOC analyses. According to the "Guidelines" for SVOC analyses, up to one outlying surrogate in the base/neutral or acid fractions is acceptable as long as the recovery is at least 10 percent.

Surrogate recoveries were assessed against laboratory control limits. All surrogate recoveries met criteria.

11. Internal Standards (IS) Analyses

IS data were evaluated for all VOC, SVOC, and ICP/MS metals sample analyses.

11.1 Organics Analyses

To ensure that changes in the GC/MS sensitivity and response do not affect sample analysis results, IS compounds are added to each sample prior to analysis. All results are then calculated as a ratio of the IS responses.

The sample IS results were evaluated against the following criteria:

i) The retention time of the IS must not vary more than ±30 seconds from the associated calibration standard.

ii) IS area counts must not vary by more than a factor of two (-50 percent to +100 percent) from the associated calibration standard.

All organic IS recoveries and retention times met the above criteria.

11.2 Inorganic Analyses

IS elements were added to all samples prior to metals analysis by ICP/MS. Overall instrument stability and performance for metals analyses were monitored using the IS intensity data. IS recoveries were assessed using control limits of 60-125 percent.

All inorganic IS recoveries were acceptable, demonstrating adequate analytical performance.

12. Laboratory Control Sample Analyses

LCS and/or laboratory control sample duplicates (LCSD) are prepared and analyzed as samples to assess the analytical efficiencies of the methods employed, independent of sample matrix effects. The relative percent difference (RPD) of the LCS/LCSD recoveries is used to evaluate analytical precision.

For this study, LCS or LCS/LCSD were analyzed at a minimum frequency of 1 per 20 investigative samples and/or 1 per analytical batch.

12.1 Organic Analyses

The LCS or LCS/LCSD contained all compounds of interest. All LCS recoveries and RPDs were within the laboratory control limits, indicating good analytical accuracy and precision, where applicable.

12.2 Inorganic Analyses

The LCS or LCS/LCSD contained all analytes of interest. LCS recoveries and RPD were assessed per the "Guidelines". All LCS recoveries and RPD were within the control limits, demonstrating acceptable analytical accuracy and precision, where applicable.

13. ICP Interference Check Sample Analysis (ICS)

To verify that the laboratory has established proper inter-element and background correction factors, ICSs are analyzed. These samples contain high concentrations of aluminum, calcium, magnesium, and iron and are analyzed at the beginning and end of each sample analysis period. The ICSs are evaluated against recovery control limits of 80 to 120 percent.

ICS analysis results were evaluated for all samples using the criteria in the "Guidelines". All ICS recoveries and results were acceptable.

14. Field QA/QC Samples

No field QA/QC samples were submitted for analysis with this sample.

15. Analyte Reporting

The laboratory reported detected results down to the sample-specific MDL for each analyte. Positive analyte detections less than the RL but greater than the sample-specific MDL were reported as estimated (J) in Table 2 unless qualified otherwise in this memorandum. Non-detect results were presented as non-detect at the sample-specific MDL in Table 2.

16. Target Compound Identification

To minimize erroneous compound identification during organic analyses, qualitative criteria including compound retention time and mass spectra were evaluated according to the identification criteria established by the methods. The samples identified in Table 1 were reviewed. The organic compounds reported adhered to the specified identification criteria.

17. Conclusion

Based on the assessment detailed in the foregoing, the data summarized in Table 2 are acceptable with the specific qualification noted herein.

Table 1

Analytical Methods
Annual Groundwater Sampling
Avtex Fibers Superfund Site
Front Royal, Virginia
December 2017

Sample Identification	Location	Matrix	Collection Date (mm/dd/yyyy)	Collection Time (hr:min)	Parameters				
					Cyanide (free)	SVOCs	VOCs	Mercury, dissolved	Metals by ICP/MS, dissolved
2017AN-306	306	Water	12/20/2017	09:30	X	X	X	X	X

Notes:

SVOCs - Semi-volatile Organic Compounds
VOCs - Volatile Organic Compounds
ICP/MS - Inductively Coupled Plasma/Mass Spectrophotometry

Table 2

Analytical Result Summary
Annual Groundwater Sampling
Avtex Fibers Superfund Site
Front Royal, Virginia
December 2017

Location ID:	**306**
Sample Name:	**2017AN-306**
Sample Date:	**12/20/2017**

Parameters	**Unit**	
Volatile Organic Compounds		
Acetone	mg/L	0.00679 J
Carbon disulfide	mg/L	0.0105
Semivolatile Organic Compounds		
2-Methylphenol	µg/L	1.57 U
3&4-Methylphenol	µg/L	1.37 U
bis(2-Ethylhexyl)phthalate (DEHP)	µg/L	1.47 U
Naphthalene	µg/L	0.363 U
Pentachlorophenol	µg/L	3.24 U
Phenol	µg/L	1.47 U
Metals		
Aluminum (dissolved)	mg/L	0.00840 U
Antimony (dissolved)	mg/L	0.000822 J
Arsenic (dissolved)	mg/L	0.0123
Cadmium (dissolved)	mg/L	0.000100 U
Chromium (dissolved)	mg/L	0.00119 U
Cobalt (dissolved)	mg/L	0.000562 J
Iron (dissolved)	mg/L	0.0100 U
Lead (dissolved)	mg/L	0.000100 U
Manganese (dissolved)	mg/L	0.00150 U
Mercury (dissolved)	mg/L	0.000358
Nickel (dissolved)	mg/L	0.00665
Vanadium (dissolved)	mg/L	0.00102 J
Zinc (dissolved)	mg/L	0.00520 U
General Chemistry		
Cyanide (free)	µg/L	1.54 U

Notes:

U - Not detected at the associated reporting limit
J - Estimated concentration

Table 3

Analytical Methods
Annual Groundwater Sampling
Avtex Fibers Superfund Site
Front Royal, Virginia
December 2017

Parameter	Method	Matrix	Holding Time	
			Collection to Extraction (Days)	Collection or Extraction to Analysis (Days)
SSPL Volatile Organic Compounds (VOCs)	SW-846 8260B	Water	-	14
SSPL Semi-Volatile Organic Compounds (SVOCs)	SW-846 8270C	Water	7	40
Metals (ICP/MS)	SW-846 6020	Water	-	180
Mercury	SW-846 7470A	Water	-	28
Cyanide, free	SW-846 9016	Water	-	14

Notes:

- - Not applicable
ICP/MS - Inductively Coupled Plasma/Mass Spectrophotometry

Method References:

SW-846 - "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", SW-846, Third Edition, 1986, with subsequent revisions

Table 4

Qualified Sample Results Due to Analyte Concentrations in the Method Blanks
Annual Groundwater Sampling
Avtex Fibers Superfund Site
Front Royal, Virginia
December 2017

Parameter	Analyte	Analysis Date (mm/dd/yyyy)	Blank Result	Sample ID	Original Result	Qualified Result	Units
Metals	Chromium (dissolved)	12/29/2017	0.000725	2017AN-306	0.00119 J	0.00119 U	mg/L

Notes:

U - Not detected at the associated reporting limit
J - Estimated concentration

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Memorandum

Revised: May 31, 2018
April 12, 2018

To:	Michael Robinson	Ref. No.:	11119510-001
From:	Sheri Finn/mkd/12	Tel:	716-297-6150

Subject: **Analytical Results and Full Validation**
Annual Groundwater Sampling
Avtex Fibers Superfund Site
Front Royal, Virginia
January, February and March

1. Introduction

This document details a validation of analytical results for groundwater samples collected in support of the Annual Groundwater Sampling at the Avtex Fibers Superfund site in January, February and March 2018. The samples were submitted to TestAmerica Laboratory, located in Nashville, Tennessee. A sample collection and analysis summary is presented in Table 1. The validated analytical results are summarized in Table 2. A summary of the analytical methodology is presented in Table 3.

Full Contract Laboratory Program (CLP) equivalent raw data deliverables were provided by the laboratory. Evaluation of the data was based on information obtained from the finished data sheets, raw data, chain of custody forms, calibration data, blank data, and recovery data from laboratory control samples (LCS) and matrix spike/ matrix spike duplicates (MS/MSD). The assessment of analytical and in-house data included checks for: data consistency (by observing comparability of duplicate analyses), adherence to accuracy and precision criteria, and transmittal errors.

The QA/QC criteria by which these data have been assessed are outlined in the analytical method referenced in Table 3 and applicable guidance from the document entitled:

i) "USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review", USEPA 540-R-10-011, January 2010

Item i) will subsequently be referred to as the "Guidelines" in this Memorandum.

2. Sample Holding Time and Preservation

The sample holding time criterion for the analysis is summarized in Table 3. The sample chain of custody documents and analytical reports were used to determine the sample holding times. All samples were prepared and analyzed within the required holding time.

All samples were properly preserved, delivered on ice, and stored by the laboratory at the required temperature (0-6°C).

3. Inductively Coupled Plasma/Mass Spectrometer (ICP/MS)

To ensure adequate mass resolution, identification, and to some degree, sensitivity, the performance of each ICP/MS instrument used for metals analyses is checked prior to calibration and initiating an analysis sequence through the analysis of a tuning solution.

Instrument performance check data were reviewed. The tuning solution was analyzed at the required frequency throughout the analyses. The results of the instrument performance checks were within the method acceptance criteria, indicating that proper optimization of the instrumentation was achieved.

4. Initial Calibration

Initial calibration of the instruments ensures that they are capable of producing satisfactory quantitative data at the beginning of a series of analyses. For ICP/MS analysis, a calibration blank and at least one standard must be analyzed at each wavelength to establish the analytical curve.

After the analyses of the calibration curves, an initial calibration verification (ICV) standard must be analyzed to verify the analytical accuracy of the calibration curves. All analyte recoveries from the analyses of the ICVs must be within the following control limits:

Analytical Method	Parameter	Control Limits
ICP/MS	Metals	90 - 110%

Upon review of the data, it was determined that the calibration curves and ICVs were analyzed at the proper frequencies and that all of the above-specified criteria were met. The laboratory effectively demonstrated that the instrumentation used for metals and general chemistry analyses were properly calibrated prior to sample analysis.

5. Continuing Calibration - Inorganic Analyses

To ensure that instrument calibration is acceptable throughout the sample analysis period, continuing calibration verification (CCV) standards are analyzed on a regular basis. Each CCV is deemed acceptable if all analyte recoveries are within the control limits specified above for the ICVs. If some of the CCV analyte recoveries are outside the control limits, samples analyzed before and after the CCV, up until the previous and proceeding CCV analyses, are affected.

For this study, CCVs were analyzed at the proper frequency. All analyte recoveries reported for the CCVs were within the specified limits with the exception of a few high beryllium and selenium recoveries. The associated sample results were non-detect and would not be impacted by the implied high bias.

6. Contract Required Detection Limit (CRDL) Standard Analyses

To verify the linearity of the ICP/MS calibration near the detection limit, a standard is analyzed which contains the ICP/MS analytes at specified concentrations. This standard must be analyzed at the beginning and end of each sample analysis run or a minimum of twice per 8-hour period.

CRDL recoveries were evaluated using the criteria specified in the October 2004 "Guidelines". The CRDL recoveries were acceptable.

7. Laboratory Blank Analyses

Method blanks are prepared from a purified matrix and analyzed with investigative samples to determine the existence and magnitude of sample contamination introduced during the analytical procedures. Additionally, initial and continuing calibration blanks (ICBs/CCBs) are analyzed after each ICV/CCV.

For this study, laboratory method blanks were analyzed at a minimum frequency of 1 per 20 investigative samples and/or 1 per analytical batch.

Upon review of the ICBs, CCBs, and method blanks, chromium, copper, iron, lead and zinc concentrations were observed above the method detection limit (MDL) in the method blank. The associated sample results with concentrations similar to the level reported in the method blanks were qualified as non-detect (see Table 4).

8. Internal Standards (IS) Analyses

IS data were evaluated for ICP/MS metals sample analyses.

IS elements were added to all samples prior to metals analysis by ICP/MS. Overall instrument stability and performance for metals analyses were monitored using the IS intensity data. IS recoveries were assessed using control limits of 60-125 percent.

All inorganic IS recoveries were acceptable, demonstrating adequate analytical performance.

9. Laboratory Control Sample Analyses

LCS are prepared and analyzed as samples to assess the analytical efficiencies of the method employed, independent of sample matrix effects.

For this study, LCS were analyzed at a minimum frequency of 1 per 20 investigative samples and/or 1 per analytical batch.

The LCS contained all analytes of interest. LCS recoveries were assessed per the "Guidelines". All LCS recoveries were within the control limits, demonstrating acceptable analytical accuracy.

10. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analyses

To evaluate the effects of sample matrices on the preparation process, measurement procedures, and accuracy of a particular analysis, samples are spiked with a known concentration of the analyte of concern and analyzed as MS/MSD samples. The RPD between the MS and MSD is used to assess analytical precision. If the original sample concentration is significantly greater than the spike concentration, the recovery is not assessed.

Site-specific MS/MSD analyses were performed.

The MS/MSD samples were spiked with the analytes of interest, and the results were evaluated using the "Guidelines". The MS/MSD recoveries and RPD values were within the control limits, demonstrating acceptable analytical accuracy and precision.

11. ICP/MS Serial Dilution

The serial dilution determines whether significant physical or chemical interferences exist due to sample matrix. A minimum of 1 per 20 investigative samples or at least 1 per analytical batch must be analyzed at a five-fold dilution. For samples with sufficient analyte concentrations (>50 times the method detection limit), the serial dilution results must agree within 10 percent of the original results.

A serial dilution was performed on the MS/MSD samples. All results met the criteria above with the exception of manganese. Associated sample results were qualified as estimated (see Table 5).

12. ICP Interference Check Sample Analysis (ICS)

To verify that the laboratory has established proper inter-element and background correction factors, ICSs are analyzed. These samples contain high concentrations of aluminum, calcium, magnesium, and iron and are analyzed at the beginning and end of each sample analysis period. The ICSs are evaluated against recovery control limits of 80 to 120 percent.

ICS analysis results were evaluated for all samples using the criteria in the "Guidelines". All ICS recoveries and results were acceptable.

13. Field QA/QC Samples

The field QA/QC consisted of one field duplicate sample set.

To assess the analytical and sampling protocol precision, a field duplicate sample was collected and submitted "blind" to the laboratory, as specified in Table 1. The RPDs associated with the duplicate sample must be less than 50 percent for water samples. If the reported concentration in either the investigative sample or its duplicate is less than five times the reporting limit (RL), the evaluation criterion is one times the RL value for water samples.

All field duplicate results were within acceptable agreement, demonstrating acceptable sampling and analytical precision.

14. Analyte Reporting

The laboratory reported detected results down to the sample-specific MDL for each analyte. Positive analyte detections less than the RL but greater than the sample-specific MDL were reported as estimated (J) in Table 2 unless qualified otherwise in this memorandum. Non-detect results were presented as non-detect at the sample-specific MDL in Table 2.

15. Conclusion

Based on the assessment detailed in the foregoing, the data summarized in Table 2 are acceptable with the specific qualifications noted herein.

Table 1

Analytical Methods
Annual Groundwater Sampling
Avtex Fibers Superfund Site
Front Royal, Virginia
January, February and March 2018

					Parameter	
Sample Identification	**Location**	**Matrix**	**Collection Date (mm/dd/yyyy)**	**Collection Time (hr:min)**	**Metals, dissolved**	**Comments**
2017AN-110-R	110	Water	02/01/2018	14:53	X	
2017AN-115-R	115	Water	03/08/2018	10:00	X	
2017AN-130R-R	130R	Water	02/01/2018	16:18	X	
2017AN-210-R	210	Water	02/01/2018	14:16	X	
2017AN-215-R	215	Water	03/08/2018	09:10	X	
2017AN-336-R	336	Water	01/30/2018	14:12	X	
2017AN-336D-R	336	Water	01/30/2018	14:12	X	Field Duplicate of 2017AN-336-R
2017AN-603-Z1-R	603	Water	02/01/2018	10:45	X	
2017AN-603-Z2-R	603	Water	02/01/2018	10:50	X	
2017AN-603-Z3-R	603	Water	02/01/2018	10:55	X	
2017AN-603-Z4-R	603	Water	02/01/2018	11:00	X	
2017AN-GPW-14-R	GPW-14	Water	01/31/2018	08:00	X	

Notes:

ICP/MS - Inductively Coupled Plasma/Mass Spectrophotometry

Table 2

Analytical Results Summary
Annual Groundwater Sampling
Avtex Fibers Superfund Site
Front Royal, Virginia
January, February and March

Location ID:		110	115	130R	210	215	336	336	603	603	603	603	GPW-14
Sample Name:		2017AN-110-R	2017AN-115-R	2017AN-130R-R	2017AN-210-R	2017AN-215-R	2017AN-336-R	2017AN-336D-R	2017AN-603-Z1-R	2017AN-603-Z2-R	2017AN-603-Z3-R	2017AN-603-Z4-R	2017AN-GPW-14-R
Sample Date:		02/01/2018	03/08/2018	02/01/2018	02/01/2018	03/08/2018	01/30/2018	01/30/2018 Duplicate	02/01/2018	02/01/2018	02/01/2018	02/01/2018	01/31/2018
Parameters	**Unit**												
Metals													
Aluminum (dissolved)	mg/L	--	0.0281	--	0.00840 U	0.120	0.0104 J	0.0100 J	0.00840 U	0.00883 J	0.00956 J	0.00840 U	--
Antimony (dissolved)	mg/L	--	0.000800 U	0.000800 U	0.000800 U	0.00108 J	0.00103 J	0.000800 U	0.000800 U	0.000800 U	0.000800 U	0.000800 U	0.00109 J
Arsenic (dissolved)	mg/L	0.000400 U	0.000400 U	0.000400 U	0.000400 U	0.00112 J	0.00861	0.00865	0.000723 J	0.00125 J	0.000549 J	0.00334	0.00208
Beryllium (dissolved)	mg/L	0.000100 U	--	0.000100 U	--	--	--	--	--	--	--	--	0.000100 U
Cadmium (dissolved)	mg/L	0.000100 U	0.000100 U	0.000100 U	0.000100 U	0.000100 U	0.000100 U	0.000100 U	0.000100 U	0.000100 U	0.000100 U	0.000100 U	0.000176 J
Chromium (dissolved)	mg/L	0.000500 U	0.000500 U	0.000500 U	0.00145 U	0.00667	0.0160	0.0103	0.000500 U	0.000500 U	0.00179 U	0.00103 U	0.000658 J
Cobalt (dissolved)	mg/L	--	0.000186 J	--	0.000100 U	0.000644 J	0.000237 J	0.000214 J	0.000216 J	0.000225 J	0.000232 J	0.000269 J	--
Copper (dissolved)	mg/L	0.00150 J	--	0.00122 J	--	--	--	--	--	--	--	--	0.00908
Iron (dissolved)	mg/L	--	0.284	--	0.497	7.75	0.0870	0.0552 U	0.0100 U	0.0100 U	0.0174 U	0.0153 U	--
Lead (dissolved)	mg/L	0.000195 U	0.000100 U	0.000174 U	0.000100 U	0.000337 J	0.000167 U	0.000100 U	0.000100 U	0.000100 U	0.000100 U	0.000100 U	0.000708 U
Manganese (dissolved)	mg/L	--	0.00752	--	0.134 J	0.0664	0.199 J	0.200 J	0.0521 J	0.0693 J	0.0385 J	0.0418 J	--
Nickel (dissolved)	mg/L	0.0218	0.00463	0.000701 J	0.00883	0.00509	0.00144 J	0.00110 J	0.000500 U	0.000598 J	0.00101 J	0.000500 U	0.0532
Selenium (dissolved)	mg/L	0.000300 U	--	0.000300 U	--	--	--	--	--	--	--	--	0.00158 J
Thallium (dissolved)	mg/L	--	--	0.000800 U	--	--	--	--	--	--	--	--	0.000800 U
Vanadium (dissolved)	mg/L	--	0.000700 U	0.000700 U	0.000862 J	0.000700 U	0.000841 J	0.000888 J	0.000700 U	0.000700 U	0.000700 U	0.000700 U	0.00204
Zinc (dissolved)	mg/L	0.0867	0.0296 U	0.0133 J	0.00520 U	0.00520 U	0.00520 U	0.00520 U	0.00520 U	0.00520 U	0.00520 U	0.00520 U	0.00940 J

Notes:
-- - Not analyzed
J - Estimated concentration
U - Not detected at the associated reporting limit

Table 3

Analytical Methods
Annual Groundwater Sampling
Avtex Fibers Superfund Site
Front Royal, Virginia
January, February and March 2018

Parameter	Method	Matrix	Holding Time	
			Collection to Extraction (Days)	Collection or Extraction to Analysis (Days)
Metals (ICP/MS)	SW-846 6020A	Water	-	180

Notes:

- - Not applicable
ICP/MS - Inductively Coupled Plasma/Mass Spectrophotometry

Method References:

SW-846 - "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", SW-846, Third Edition, 1986, with subsequent revisions

Table 4

Qualified Sample Results Due to Analyte Concentrations in the Method Blanks
Annual Groundwater Sampling
Avtex Fibers Superfund Site
Front Royal, Virginia
January, February and March 2018

Parameter	Analyte	Analysis Date (mm/dd/yyyy)	Blank Result	Sample ID	Original Result	Qualified Result	Units
Metals	Lead (dissolved)	02/06/2018	0.0002750 J	2017AN-110-R	0.000195 J	0.000195 U	mg/L
	Lead (dissolved)			2017AN-130R-R	0.000174 J	0.000174 U	mg/L
	Lead (dissolved)			2017AN-336-R	0.000167 J	0.000167 U	mg/L
	Lead (dissolved)	02/08/2018	0.0002520 J	2017AN-GPW-14-R	0.000708 J	0.000708 U	mg/L
	Chromium (dissolved)	02/06/2018	0.0009620 J	2017AN-210-R	0.00145 J	0.00145 U	mg/L
	Chromium (dissolved)			2017AN-603-Z3-R	0.00179 J	0.00179 U	mg/L
	Chromium (dissolved)			2017AN-603-Z4-R	0.00103 J	0.00103 U	mg/L
	Iron (dissolved)	02/06/2018	0.01570 J	2017AN-336D-R	0.0552	0.0552 U	mg/L
	Iron (dissolved)			2017AN-603-Z3-R	0.0174 J	0.0174 U	mg/L
	Iron (dissolved)			2017AN-603-Z4-R	0.0153 J	0.0153 U	mg/L
	Zinc (dissolved)	03/14/2018	0.02252 J	2017AN-115-R	0.0296	0.0296 U	mg/L

Notes:

U - Not detected at the associated reporting limit
J - Estimated concentration

Table 5

Qualified Sample Data Due to Outlying ICP Serial Dilution Results
Annual Groundwater Sampling
Avtex Fibers Superfund Site
Front Royal, Virginia
January, February and March 2018

Parameter	Serial Dilution Sample ID	Analyte	%D	Associated Sample ID	Qualified Result	Units
Metals	2017AN-336-R	Manganese (dissolved)	11	2017AN-210-R	0.134 J	mg/L
				2017AN-336D-R	0.200 J	mg/L
				2017AN-336-R	0.199 J	mg/L
				2017AN-603-Z1-R	0.0521 J	mg/L
				2017AN-603-Z2-R	0.0693 J	mg/L
				2017AN-603-Z3-R	0.0385 J	mg/L
				2017AN-603-Z4-R	0.0418 J	mg/L

Notes:

%D - Percent Difference
ICP - Inductively Coupled Plasma
J - Estimated concentration

APPENDIX C
LABORATORY REPORTS

PARSONS

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APPENDIX D
HISTORICAL GROUNDWATER RESULTS

PARSONS

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Table D-1

OU-7 Historical Groundwater Sampling Results Summary
Avtex Fibers Superfund Site
Front Royal, Virginia

Parameter	Groundwater Cleanup Standards[1] (µg/L)		Well ID	005	005	005	005	005	005	024	024	024	024
			Well Type	OMW	OMW	OMW	OMW	OMW	OMW	OMW	OMW	OMW	OMW
			Date	2/8/1994	4/4/1994	8/1/2000	7/11/2012	7/12/2013	7/16/2014	2/7/1994	4/7/1994	7/26/2000	9/13/2000
OU-7 COPC Volatile Organics (µg/L)													
Acetone	22,000	RBC		<10	<10	---	<25.0	<25.0	<25	<10	<10	---	---
Carbon disulfide	1,000	RBC		<10	**4 J**	---	<2.0	<2.0	**4.2 J**	<10	<10	---	---
OU-7 COPC Semivolatile Organics (µg/L)													
Bis(2-ethylhexyl)phthalate	6	MCL		**5 J**	<11	---	**1.6 J**	**0.98 J**	<6	<10	<11	---	---
Naphthalene	14	RBC		<11	<11	---	<10.0	<10.0	<10	<10	<11	---	---
Pentachlorophenol	1	MCL		<26	**26**	---	<1.1	<25.0	<25	<25	<26	---	---
o-Cresol/2-Methylphenol	1,800	RBC		<11	<11	---	<10.0	<10.0	<10	<10	<11	---	---
3&4-Methylphenol/4-methylphenol	180	RBC		<11	<11	---	<10.0	<10.0	<10	<10	<11	---	---
Phenol	11,000	RBC		<11	<11	---	<10.0	<10.0	**1.6 J**	<10	<11	---	---
OU-7 COPC Inorganics, Dissolved (µg/L)													
Aluminum	37,000	RBC		**621**	**67.4 B**	**19.6 JB**	<100 L	<100	**20.1**	**396**	**150 B**	**199 J**	**25,500**
Antimony	6	MCLG		<14 L	<26.4	<0.76	<1.0	<5.0	<1	<14 L	<26.4	**2 J**	<0.76 K
Arsenic	10	MCL		**4.2 K**	**1.7 L**	**2.3 J**	**4.9**	**4.4 K**	**3.2**	**6.3 K**	**2.6 L**	**15.6 K**	**6.5 JL**
Cadmium	5	MCLG		<1.1	<2.1	<0.9	**0.060 J**	<1.0 L	<0.1	<1.1	<2.1	<0.9	**2.1**
Chromium	100	MCLG		<2.9	<2.8	<1.6	**1.4 J**	**1.1 J**	<1	**9.5 B**	<2.8	**14.2**	**66.5**
Cobalt	11	RBC		<2.1	**2.5 B**	<7.1	**0.50 J**	<5.0	<1	**3.5 B**	**4.8 B**	<7.1	**40 J**
Iron	26,000	RBC		**706**	**129**	**4,190**	**3,320**	**3,260**	**3350**	**321**	**142**	**1,350 JK**	**62,800 J**
Lead	15	AL		**2 B**	<0.7	<9.8	<1.0	<5.0	<1	**26.1 B**	<0.7	<9.8	**70.3**
Manganese	880	RBC		**1,700 J**	**1,550**	**2,140**	**1,960**	**3,120**	**3600**	**124 J**	**50.4**	**474**	**1,930**
Mercury (total)[2]	2	MCLG		<0.1	<0.1	<0.48	<0.20	<0.20	<0.2	<0.1	<0.1	<0.48 L	<0.24
Nickel	730	RBC		**9 B**	<6.8	<8.4	<5.0	**3.3 J**	**2.8**	**22.6 B**	<6.8	**32.4 J**	**68.4**
Vanadium	260	RBC		<2.3	<3	<2.6	<5.0	**2.7 L**	<1	**52.8 B**	**15.1 B**	**99.1**	**206**
Zinc	11,000	RBC		**117 B**	**164**	<8.6	**2.7 K**	**1.6 J**	<5	**941 L**	**17.2**	**24.1 J**	**248**
Cyanide (free)[3]	200	MCLG		<10	<10	<4	<100	<100	<100	**33.2**	<10	<4	---
Field Parameters													
Temperature (°C)		---		9.00	14.00	16.8	15.19	13.89	16.55	7.00	10.00	24.6	18.2
Conductivity (mS/cm)		---		2	2.45	3.03	1.568	1.908	2.23	2.6	1.6	5.85	5.28
pH (s.u.)		---		6.9	7.8	7.39	7.15	7.21	7.30	8.7	8.5	6.62	8.36
ORP (mV)		---		---	---	14	-108.5	-110.0	-85.10	---	---	311	22 J
Turbidity (NTU)		---		---	---	1.7	4.3	22.8	98.60	---	---	249	177
Dissolved Oxygen (mg/L)		---		---	---	0.14	0.39	0.56	1.93	---	---	0.75	4.6

NOTES: See page 64 of 64.

Table D-1

OU-7 Historical Groundwater Sampling Results Summary
Avtex Fibers Superfund Site
Front Royal, Virginia

Parameter	Groundwater Cleanup Standards[1] (µg/L)		Well ID	024	024	024	024	024	024	024	024
			Well Type	OMW	OMW	OMW	OMW	OMW	OMW	OMW	OMW
			Date	7/5/2012 & 7/9/2012	7/23/2013	12/11/2013	7/29/2014	12/10/2014	7/8/2015	7/16/2016	7/28/2017 & 8/9/2017
OU-7 COPC Volatile Organics (µg/L)											
Acetone	22,000	RBC		**12.3 B**	<25.0	<25.0	<25	<25	<20	<2.66	R
Carbon disulfide	1,000	RBC		**8.9 B**	<2.0	<2.0	<10	<2	<5	<0.22	<0.22
OU-7 COPC Semivolatile Organics (µg/L)											
Bis(2-ethylhexyl)phthalate	6	MCL		<6.0	<6.0	<6.0	<6	<6	<5	<5.77	<2.87
Naphthalene	14	RBC		<10.0	<10.0	<10.0	<10	<10	<0.5	<0.356	<0.356
Pentachlorophenol	1	MCL		<25.0	<25.0 L	<25.0	<25	<25	<5	<1.63	<3.17
o-Cresol/2-Methylphenol	1,800	RBC		<10.0	<10.0 L	<10.0	<10	<10	<1	<2.21	<1.54
3&4-Methylphenol/4-methylphenol	180	RBC		<10.0	<10.0 L	<10.0	<10	<10	<1	<2.12	<1.35
Phenol	11,000	RBC		<10.0	<10.0 L	<10.0	<10	<10	<1	<1.44	<1.44
OU-7 COPC Inorganics, Dissolved (µg/L)											
Aluminum	37,000	RBC		**35.7 J**	**45.9 J**	<100.0 L	<10	**37.9**	<200	<9.6	<8.4
Antimony	6	MCLG		<1.2	<5.0 L	<5.0	<1	<1	<2	**0.509 J**	<0.8
Arsenic	10	MCL		**5.9**	<10.0	<10.0	**1.1**	**1 J**	**1.2 J**	<5	**2.28**
Cadmium	5	MCLG		<0.10	<1.0	<1.0 L	<0.1	<0.1	<1	<4	<0.1
Chromium	100	MCLG		**1.3 B**	**0.58 L**	**0.51 L**	<1	**0.81 J**	<4	<5	<0.5
Cobalt	11	RBC		**1.3**	<5.0 L	<5.0	<1	<1	**0.45 J**	<5	**0.648 J**
Iron	26,000	RBC		**144 L**	<50.0	<50.0	**43.6**	**10.6**	**26.5 J**	<200	**81.2**
Lead	15	AL		<1.0	<5.0 L	<5.0 L	<1	<1	<2	<0.2	**0.109 J**
Manganese	880	RBC		**156**	**15.7**	**35.8**	**327**	**99.6**	**75.9**	**220**	**199**
Mercury (total)[2]	2	MCLG		<0.20	<0.20	<0.20	<0.2	<0.2	<0.2	<0.1	<0.1
Nickel	730	RBC		**6.1 L**	**2.5 J**	**2.2 J**	**3**	**1.5**	**2.8 J**	<5	**2.32**
Vanadium	260	RBC		**24.5 L**	**2.6 J**	**3.5 B**	**2.9**	**1.1**	**1.8**	<7	<0.7
Zinc	11,000	RBC		**2.4 B**	**3.5 J**	**1.2 L**	**197**	**17.1**	<30	<100	<5.2
Cyanide (free)[3]	200	MCLG		<100	<100	<100.0	<100	<100	<6	**0.866 J**	<1.54
Field Parameters											
Temperature (°C)	---			---	16.31	12.88	NM	12.04	22.17	20.88	21.9 (22.24)
Conductivity (mS/cm)	---			---	1.649	1.613	NM	1.858	2.1	2.392	2.3958 (2.340)
pH (s.u.)	---			---	6.870	7.18	dry before	7.38	7.27	7.46	7.6 (7.3)
ORP (mV)	---			---	45.2	-198.8	stabiliazation	107.1	44.38	21.4	-185.2 (-1.4)
Turbidity (NTU)	---			---	999.9	6.5	NM	12.3	243	6.13	25.2 (2.88)
Dissolved Oxygen (mg/L)	---			---	2.94	7.62	NM	2.65	1.72	3.32	4.25 (2.91)

NOTES: See page 64 of 64.

Table D-1

OU-7 Historical Groundwater Sampling Results Summary
Avtex Fibers Superfund Site
Front Royal, Virginia

Parameter	Groundwater Cleanup Standards[1] (µg/L)		Well ID	029	029	029	029	029	029	029	029	029	029	029
			Well Type	OMW	OMW	OMW	OMW	OMW	OMW	OMW	OMW	OMW	OMW	OMW
			Date	11/13/2001	6/4/2002	11/11/2002	6/4/2003	6/2/2005	6/5/2007	6/4/2008	6/9/2009	6/14/2010	6/1/2011	6/25/2012
OU-7 COPC Volatile Organics (µg/L)														
Acetone	22,000	RBC		---	---	---	---	---	---	---	---	---	---	<25.0
Carbon disulfide	1,000	RBC		---	---	---	---	---	---	---	---	---	---	<2.0
OU-7 COPC Semivolatile Organics (µg/L)														
Bis(2-ethylhexyl)phthalate	6	MCL		---	---	---	---	---	---	---	---	---	---	<6.0
Naphthalene	14	RBC		---	---	---	---	---	---	---	---	---	---	<10.0
Pentachlorophenol	1	MCL		---	---	---	---	---	---	---	---	---	---	<1.0
o-Cresol/2-Methylphenol	1,800	RBC		---	---	---	---	---	---	---	---	---	---	<10.0
3&4-Methylphenol/4-methylphenol	180	RBC		---	---	---	---	---	---	---	---	---	---	<10.0
Phenol	11,000	RBC		---	---	---	---	---	---	---	---	---	---	<10.0
OU-7 COPC Inorganics, Dissolved (µg/L)														
Aluminum	37,000	RBC		---	---	---	---	---	---	---	---	---	---	<100
Antimony	6	MCLG		---	---	---	---	---	---	---	---	---	---	<1.0
Arsenic	10	MCL		<1.4 J	<5 L	<5 L	<5	<5	<1	<1	<1	<1	<5	<1.0
Cadmium	5	MCLG		<1.5	<3	<3	<5	<5	<0.5	<0.5	<0.5	<0.5	<3	<0.10
Chromium	100	MCLG		<3	<5 L	<5	<5	<15	**3.15**	**2.27**	**2.53**	**2.01**	<10	**0.60 J, L**
Cobalt	11	RBC		---	---	---	---	---	---	---	---	---	---	<1.0
Iron	26,000	RBC		---	---	---	---	---	---	---	---	---	---	<50.0
Lead	15	AL		<3 J	<3 L	<3	<3	<3	<1	<1	<1	<1	<5	<1.0
Manganese	880	RBC		---	---	---	---	<0.2	---	---	---	---	---	**3.5 J**
Mercury (total)[2]	2	MCLG		<0.2 L	<0.2 L	<0.2 L	<0.2	<10	<0.2	<0.2	<0.2	<0.2	<0.254	<0.20
Nickel	730	RBC		<50	<50	<50	<50	---	**5.67**	**4.27**	**6.71**	**6.49**	<20	**2.2**
Vanadium	260	RBC		---	---	---	---	---	---	---	---	---	---	<5.0
Zinc	11,000	RBC		**185**	**121**	**40.5**	<25	<20	<20	<20	<20	<20	<20	**3.8 J, K**
Cyanide (free)[3]	200	MCLG		---	---	---	---	---	---	---	---	---	---	<100
Field Parameters														
Temperature (°C)		---		15.09	14.9	16.4	13.26	13.76	15.29	15.18	14.87	15.40	14.80	16.00
Conductivity (mS/cm)		---		1.27	1.1	1.01	0.95	0.746	0.966	0.909	1.031	1.075	0.936	0.959
pH (s.u.)		---		6.11	6.03	6.09	5.83	6.00	5.97	5.93	5.90	6.130	5.600	6.04
ORP (mV)		---		-73	-7	117	146	224.3	196.1	153.1	297.4	146.6	-146.1	182.2
Turbidity (NTU)		---		0.9	2.6	530	53.7	7	0.0	64.6	18.1	44.3	34.1	6.4
Dissolved Oxygen (mg/L)		---		1.23	2.99	0.25	0.0	0.65	1.71	0.69	0.59	1.00	1.08	0.33

NOTES: See page 64 of 64.

Table D-1

OU-7 Historical Groundwater Sampling Results Summary
Avtex Fibers Superfund Site
Front Royal, Virginia

Parameter	Groundwater Cleanup Standards[1] (µg/L)		Well ID	029	029	029	029	029	029	029	103	103	103
			Well Type	OMW	OMW	OMW	OMW	OMW	OMW	OMW	S BMW	S BMW	S BMW
			Date	6/6/2013	12/11/2013	7/29/2014	12/11/2014	7/26/2015	8/1/2016	7/25/2017	1/31/1994	4/8/1994	7/31/2000
OU-7 COPC Volatile Organics (µg/L)													
Acetone	22,000	RBC		<25.0	<25.0	<25	<25	<20	<2.66	<2.66	**7 B**	<10	<6
Carbon disulfide	1,000	RBC		<2.0	<2.0	<10	<2	<5	<0.22	<0.22	<10	<10	<1
OU-7 COPC Semivolatile Organics (µg/L)													
Bis(2-ethylhexyl)phthalate	6	MCL		<6.0	<6.0	<6 J	<6	<5	<5.77	<1.44	**6 B**	<10	<2
Naphthalene	14	RBC		<10.0	<10.0	<10	<10	<0.5	<0.356	<0.356	<10	<10	<0.89
Pentachlorophenol	1	MCL		<25.0	<25.0	<25	<25 J	<5	<1.63	<3.17	<25	<25	<3
o-Cresol/2-Methylphenol	1,800	RBC		<10.0	<10.0	<10	<10	<1	<2.21	<1.54	<10	<10	<0.89
3&4-Methylphenol/4-methylphenol	180	RBC		<10.0	<10.0	<10	<10	<1	<2.12	<1.35	<10	<10	<3
Phenol	11,000	RBC		<10.0	<10.0	<10	<10	<1	<1.44	<1.44	<10	<10	<0.89
OU-7 COPC Inorganics, Dissolved (µg/L)													
Aluminum	37,000	RBC		<100	**25.2 L**	**11**	<50	<200	<9.6	<8.4	**40.7 B**	<19.9	**92.8 JB**
Antimony	6	MCLG		<5.0	<5.0	<1	<5	<2	<0.832	<0.8	<19.3	<20.6	<0.76
Arsenic	10	MCL		<1.0	<10.0	<1	<5	<4	<0.5	<0.4	**1.5 B**	**10.9 B**	<1.2 L
Cadmium	5	MCLG		<1.0	<1.0 L	<0.1	<0.5	<1	<0.4	<0.1	<1.8	<3	<0.9
Chromium	100	MCLG		<5.0	**1.0 L**	<1	<5	<4	<0.5	<0.5	<2.8	<6.1	<1.6
Cobalt	11	RBC		**0.99 J**	<5.0	<1	<5	**0.3 J**	<0.5	**0.202 J**	<4.6	<4.6	<7.1
Iron	26,000	RBC		<50.0	<50.0	**68.2**	<50	**29.2 J**	<89.3	<10	**8,210**	**5210 K**	**4,720**
Lead	15	AL		<1.0	<5.0 L	<1	<5	<2	<0.2	<0.1	<1.2 L	<0.29 L	<9.8
Manganese	880	RBC		**2.9 J**	**4.5 J**	**34.3**	<5	**8.5**	**22.3**	<1.5	**387**	**843**	**1,150**
Mercury (total)[2]	2	MCLG		<0.20	<0.20	<0.2	<0.2	<0.2	<0.1	<0.1	<0.066	**0.85 B**	<0.048 L
Nickel	730	RBC		**<5.0**	**2.9 J**	**1.8**	<5	**2.9 J**	<1.82	**1.7 J**	<5.3	<5.8	<8.4
Vanadium	260	RBC		<5.0 L	**0.70 B**	<1	<5	<1	<0.957	<0.7	<4.4	<5	<2.6
Zinc	11,000	RBC		**1.5 B**	**1.0 L**	<10	**65.8**	<30	<11.2	<5.2	**111 J**	**29.3 B**	<8.6
Cyanide (free)[3]	200	MCLG		<100	<100.0	<100	<100	<6	<0.608	<1.54	<2.5	<2.5 L	<4
Field Parameters													
Temperature (°C)		---		13.91	15.21	20.50	13.51	18.75	20.14	24.15	8.00	14.00	14.2
Conductivity (mS/cm)		---		1.006	1.174	1.09	1.156	1.1	1.1388	1.1372	0.95	1.2	1.81
pH (s.u.)		---		6.06	6.15	6.21	6.21	6.19	6.06	6.81	7.7	6.7	6.63
ORP (mV)		---		148.8	-115.4	76.31	64.4	290.09	19.2	114.7	---	---	-215
Turbidity (NTU)		---		5.3	16.8	15.00	1.4	4.52	40.57	1.97	---	---	0.84
Dissolved Oxygen (mg/L)		---		0.86	0.93	1.09	0.51	0.84	0.47	0.32	---	---	0.96

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Table D-1

OU-7 Historical Groundwater Sampling Results Summary
Avtex Fibers Superfund Site
Front Royal, Virginia

Parameter	Groundwater Cleanup Standards[1] (µg/L)		Well ID	103	103	103	103	103	103	105	105	105	105	105
			Well Type	S BMW	S BMW	S BMW	S BMW	S BMW	S BMW	S BMW	S BMW	S BMW	S BMW	S BMW
			Date	6/29/2012	7/9/2013	6/29/2014	7/26/2015	8/2/2016	7/25/2017	2/9/1994	4/6/1994	8/3/2000	7/12/2012	7/11/2013
OU-7 COPC Volatile Organics (µg/L)														
Acetone	22,000	RBC		<25.0	<25.0	<25	<20	<2.66	<2.66	**2 B**	<10	<6	<25.0	<25.0
Carbon disulfide	1,000	RBC		<2.0	**3.3 L**	<10	<5	<0.22	<0.22	**5 J**	**7 J**	**2 J**	<2.0 L	<2.0
OU-7 COPC Semivolatile Organics (µg/L)														
Bis(2-ethylhexyl)phthalate	6	MCL		<6.0	<6.0	<6	<5	<5.77	<1.44	<10	**3 B**	<2	**4.0 J**	**2.1 J**
Naphthalene	14	RBC		<10.0	<10.0	<10	<0.5	<0.356	<0.356	<10	<10	<1	<10.0	<10.0
Pentachlorophenol	1	MCL		<1.1	<25.0	<25	<5	<1.63	<3.17	<25	<25	<3	<1.0	<25.0
o-Cresol/2-Methylphenol	1,800	RBC		<10.0	<10.0	<10	<1	<2.21	<1.54	<10	<10	<1	<10.0	<10.0
3&4-Methylphenol/4-methylphenol	180	RBC		<10.0	<10.0	<10	<1	<2.12	<1.35	<10	<10	<3	<10.0	<10.0
Phenol	11,000	RBC		<10.0	<10.0	<10	<1	<1.44	<1.44	<10	**9 J**	<1	<10.0	<10.0
OU-7 COPC Inorganics, Dissolved (µg/L)														
Aluminum	37,000	RBC		**26.4 J**	<100	<10	<200	<9.6	<8.4	<19.9	**10,800**	<19	<100 L	**50.7 J**
Antimony	6	MCLG		<1.0	<5.0	<1	<2	<0.91	<0.8	<19.3	<19.3	<0.76 L	<1.0	<5.0
Arsenic	10	MCL		<1.0	<10.0	<1	<4	<0.5	**0.425 J**	**1.6 B**	**10.9 B**	<1.2	**2.7**	**4.5 K**
Cadmium	5	MCLG		<0.10	<1.0	<0.1	<1	<0.4	<0.1	<1.8	<1.8	<0.9	<0.10	<1.0 L
Chromium	100	MCLG		**1.4 J, L**	**0.81 J**	<1	<4	<0.5	<0.5	<6.1	**22.5 B**	<1.6	**3.2 J**	**1.1 J**
Cobalt	11	RBC		<1.0	**18.1**	**1.3**	**3.7**	**7.05**	**9.49**	**8.8 B**	**12.3**	<7.1	<1.0	<5.0
Iron	26,000	RBC		**2,390**	**7,390**	**9380**	**4640**	**3720**	**4540**	**80.8 B**	**40,600**	**888**	**2,060**	**2,880**
Lead	15	AL		<1.0	<5.0	<1	<2	<0.2	<0.1	<2.8 L	**4.3 L**	<9.8	<1.0	<5.0
Manganese	880	RBC		**4,370**	**4,560**	**6310**	**6280**	**6810**	**6300**	**683 J**	**661**	**270**	**957**	**1,320**
Mercury (total)[2]	2	MCLG		<0.20	<0.20	<0.2	<0.2	<0.1	<0.1	**0.051 B**	**0.067 B**	<0.048 L	<0.20	<0.20
Nickel	730	RBC		<5.0	<5.0	<1	**0.99 J**	**1.06 J**	**1.87 J**	**19.6 B**	**34.9 B**	<8.4	**5.6**	**8.5**
Vanadium	260	RBC		<5.0	<5.0	<1	<1	<0.888	<0.7	<4.4	**15.8**	<2.6	<5.0	**0.74 L**
Zinc	11,000	RBC		**8.7 J, K**	**11.0 B**	**18.2**	**53.5**	**98.9**	**148**	<2.4	<2.4	<8.6	**5.3 K**	**2.6 J**
Cyanide (free)[3]	200	MCLG		<100	<100	<100	<6	<0.608	<1.54	<2.5	<2.5	<4	<100	<100
Field Parameters														
Temperature (°C)		---		15.90	16.15	23.35	21.40	21.56	20.19	11.00	15.00	15.6	16.78	17.37
Conductivity (mS/cm)		---		2.987	3.101	3.03	3.0	3.2514	3.0646	3.2	3.4	3.39	2.558	2.728
pH (s.u.)		---		6.58	6.76	6.76	6.80	6.75	6.57	7.6	8.2	7.72	7.54	7.45
ORP (mV)		---		-162.9	-69.8	-60.7	10.03	-143.4	-66.6	---	---	13	-182.6	-155.7
Turbidity (NTU)		---		13.3	13.6	8.29	30.10	6.17	0.82	---	---	1.9	5.3	11.4
Dissolved Oxygen (mg/L)		---		0.22	0.41	2.51	0.05	0.13	0.14	---	---	0.27	0.30	0.51

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Table D-1

OU-7 Historical Groundwater Sampling Results Summary
Avtex Fibers Superfund Site
Front Royal, Virginia

Parameter	Groundwater Cleanup Standards[1] (µg/L)		Well ID	105	105	105	105	105	105	114	114	114	114
			Well Type	S BMW	S BMW	S BMW	S BMW	S BMW	S BMW	S BMW	S BMW	S BMW	S BMW
			Date	12/13/2013	7/14/2014	12/11/2014	7/28/2015	8/9/2016	7/29/2017 & 8/8/2017	1/31/1994	4/12/1994	8/1/2000	5/17/2001
OU-7 COPC Volatile Organics (µg/L)													
Acetone	22,000	RBC		<25.0	<25	<25	<20	<2.66	R	**4 B**	**3 B**	<6	---
Carbon disulfide	1,000	RBC		<2.0	<10	<2	**4 J**	**0.283 J**	<0.22	<10	<10	<1	---
OU-7 COPC Semivolatile Organics (µg/L)													
Bis(2-ethylhexyl)phthalate	6	MCL		<6.0	<6	<6	<5	<1.29	<2.10	<10	**6 J**	<2	---
Naphthalene	14	RBC		<10.0	<10	<10	<0.5	<0.319	<0.343	<10	<10	<0.9	---
Pentachlorophenol	1	MCL		<25.0	<25	<25	<5	<2.84	<3.06	<25	<25	<3	---
o-Cresol/2-Methylphenol	1,800	RBC		<10.0	<10	<10	<1	<1.38	<1.48	<10	<10	<0.9	---
3&4-Methylphenol/4-methylphenol	180	RBC		<10.0	<10	<10	<1	<1.21	<1.30	**1 J**	<10	<3	---
Phenol	11,000	RBC		<10.0	<10	<10	<1	<1.29	<1.39	<10	<10	<0.9	---
OU-7 COPC Inorganics, Dissolved (µg/L)													
Aluminum	37,000	RBC		<100.0	<10	<50	<200	<9.6	<8.4	**26.5 B**	<22.2	<19	---
Antimony	6	MCLG		<5.0	<1	<1	<2	<0.5	<0.8	<19.3	<11.4	<0.76	---
Arsenic	10	MCL		<10.0	**3.7**	**1.8**	**4.3**	<2.27	**2.67**	**1.4 B**	<1.5 L	<1.2	<1.4 LJ
Cadmium	5	MCLG		<1.0	<0.1	<0.1	<1	<0.4	<0.1	<1.8	<1.7	<0.9	<1.5 J
Chromium	100	MCLG		**2.1 L**	<1	**0.61 J**	<4	<0.5	**0.572 J**	<2.8	<5.1	<1.6	<3 J
Cobalt	11	RBC		**2.4 B**	<1	<1	**0.53 J**	<0.5	**0.329 J**	<4.6	<4.5	<7.1	---
Iron	26,000	RBC		**3,000**	**3930**	**3480**	**3420**	**3100 J**	**2570**	**10,000**	**53,400 L**	**16,400 J**	---
Lead	15	AL		<5.0 L	<1	<1	<2	<0.2	<0.1	<1.2 L	<0.29 L	<9.8 L	<3 J
Manganese	880	RBC		**1,320**	**1610**	**1260**	**1140**	**798**	**546**	**2,440**	**3,120**	**3,310**	---
Mercury (total)[2]	2	MCLG		<0.20	<0.2	<0.2	<0.2	<0.1	<0.1	**0.07**	**0.15 B**	<0.048 L	<0.2
Nickel	730	RBC		**6.2 L**	**12.3**	**12.2**	**13.2**	**8.82**	**6.28**	**17 B**	**8.3**	**26.3 J**	<50
Vanadium	260	RBC		<5.0	<5	<1	<1	<0.785	<0.7	<4.4	<3 L	<2.6	---
Zinc	11,000	RBC		**2.9 B**	<5	**4.4 J**	<30	<10	**8.63 J**	**31.9 J**	**18.9 B**	<8.6	**82.4 J**
Cyanide (free)[3]	200	MCLG		<100.0	<100	<100	<6	<0.608	<1.54	<2.5	<2.5	<4	---
Field Parameters													
Temperature (°C)		---		13.21	27.17	12.69	24.94	23.68	(19.49)	12.00	14.00	15.3	14.42
Conductivity (mS/cm)		---		2.901	3.18	3.065	3.4	0.5	(1.9703)	1.7	1.6	2.35	2.33
pH (s.u.)		---		7.54	7.66	7.52	7.38	7.41	(7.25)	6.7	7.4	6.37	6.04
ORP (mV)		---		-176.3	-134.66	-169.2	-155.19	-49.67	(-236.7)	---	---	99	-47
Turbidity (NTU)		---		10.6	19.60	11.2	18.10	13.78	(12.2)	---	---	3.6	---
Dissolved Oxygen (mg/L)		---		0.21	0.26	0.31	0.23	7.88	(0.06)	---	---	0.9	0.7

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Table D-1

OU-7 Historical Groundwater Sampling Results Summary
Avtex Fibers Superfund Site
Front Royal, Virginia

Parameter	Groundwater Cleanup Standards[1] (µg/L)		Well ID	114	114	114	114	114	114	114	114	114	114	114
			Well Type	S BMW	S BMW	S BMW	S BMW	S BMW	S BMW	S BMW	S BMW	S BMW	S BMW	S BMW
			Date	11/7/2001	6/6/2002	11/19/2002	6/3/2003	6/7/2005	6/6/2007	6/5/2008	6/2/2009	6/8/2010	5/24/2011	6/19/2012
OU-7 COPC Volatile Organics (µg/L)														
Acetone	22,000	RBC		---	---	---	---	---	---	---	---	---	---	<25.0
Carbon disulfide	1,000	RBC		---	---	---	---	---	---	---	---	---	---	<2.0
OU-7 COPC Semivolatile Organics (µg/L)														
Bis(2-ethylhexyl)phthalate	6	MCL		---	---	---	---	---	---	---	---	---	---	<6.0
Naphthalene	14	RBC		---	---	---	---	---	---	---	---	---	---	<10.0
Pentachlorophenol	1	MCL		---	---	---	---	---	---	---	---	---	---	<1.0
o-Cresol/2-Methylphenol	1,800	RBC		---	---	---	---	---	---	---	---	---	---	<10.0
3&4-Methylphenol/4-methylphenol	180	RBC		---	---	---	---	---	---	---	---	---	---	<10.0
Phenol	11,000	RBC		---	---	---	---	---	---	---	---	---	---	<10.0
OU-7 COPC Inorganics, Dissolved (µg/L)														
Aluminum	37,000	RBC		---	---	---	---	---	---	---	---	---	---	<100 L
Antimony	6	MCLG		---	---	---	---	---	---	---	---	---	---	**11.0**
Arsenic	10	MCL		<1.4 J	<5 L	**5 K**	<5	**2.9 J**	**3.54**	**3.34**	**3.47**	**3.79**	<5	**16.0**
Cadmium	5	MCLG		<1.5	<3	<3	<5	<5 L	<0.5	<0.5	<0.5	<0.5	<3	**1.1**
Chromium	100	MCLG		<3	<5 L	<5	<5	<15 J	<2	**3.16**	**3.98**	**4.13**	<10	**13.0**
Cobalt	11	RBC		---	---	---	---	---	---	---	---	---	---	**17.8**
Iron	26,000	RBC		---	---	---	---	---	---	---	---	---	---	**12,300**
Lead	15	AL		<3	<3 L	<3 L	<3	<4.4 J	<1	<1	<1	<1	<5	**12.0**
Manganese	880	RBC		---	---	---	---	---	---	---	---	---	---	**4,240**
Mercury (total)[2]	2	MCLG		<0.2	<0.2 L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.20
Nickel	730	RBC		<50	<50	<50 L	<50	**36.6**	**49.7**	**50**	**62.8**	**56.5**	**63.5**	**78.8**
Vanadium	260	RBC		---	---	---	---	---	---	---	---	---	---	<5.0
Zinc	11,000	RBC		**82.2**	<25	<25	<25	**6 J**	<20	<20	<20	<20	<125	**4.8 J, K**
Cyanide (free)[3]	200	MCLG		---	---	---	---	---	---	---	---	---	---	<100
Field Parameters														
Temperature (°C)		---		14.05	14.2	14.2	14.4	14.56	14.70	14.81	14.85	14.71	14.68	15.91
Conductivity (mS/cm)		---		2.65	2.69	2.8	2.77	2.56	2.737	2.753	3.011	2.883	2.765	2.442
pH (s.u.)		---		6.4	6.44	6.8	6.11	6.15	6.75	6.27	4.37	6.29	6.16	6.16
ORP (mV)		---		-288	-112	-71	-67	-23.7	-27.2	-66.7	64.7	-43.8	-326.7	-23.3
Turbidity (NTU)		---		1.4	6.1	19.1	2.0	5	14.8	2.8	5.6	0.0	2.7	6.1
Dissolved Oxygen (mg/L)		---		0.94	2.21	4.8	0.0	0.77	2.05	0.06	0.29	-0.02	0.0	2.44

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Table D-1

OU-7 Historical Groundwater Sampling Results Summary
Avtex Fibers Superfund Site
Front Royal, Virginia

Parameter	Groundwater Cleanup Standards[1] (µg/L)		Well ID	114	114	114	114	114	115	115	115	115	115 (Duplicate)
			Well Type	S BMW	S BMW	S BMW	S BMW	S BMW	S BMW	S BMW	S BMW	S BMW	S BMW
			Date	6/10/2013	7/28/2014	8/5/2015	8/10/2016	8/1/2017	1/26/1994	4/7/1994	7/31/2000	7/12/2012	7/12/2012
OU-7 COPC Volatile Organics (µg/L)													
Acetone	22,000	RBC		<25.0	<25	<20	<2.66	R	**9 B**	**21 J**	<6	<25.0	**3.0 J**
Carbon disulfide	1,000	RBC		<2.0	<10	<5	<0.22	**1.85**	**3 J**	**2 J**	**2 J**	<2.0 J	<2.0 J
OU-7 COPC Semivolatile Organics (µg/L)													
Bis(2-ethylhexyl)phthalate	6	MCL		<6.0	<6	<5	<1.34	<1.67	**4 B**	**8 J**	<2	<6.0	<6.0
Naphthalene	14	RBC		<10.0	<10	<0.5	<0.33	<0.411	<10	<10	<1	<10.0	<10.0
Pentachlorophenol	1	MCL		<25.0	<25	<5	<2.95	<3.67 J	<25	<25	<3	<1.0	<1.1
o-Cresol/2-Methylphenol	1,800	RBC		<10.0	<10	<1	<1.43	<1.78	<10	<10	<1	<10.0 R	<10.0 R
3&4-Methylphenol/4-methylphenol	180	RBC		<10.0	<10	<1	<1.25	<1.56	<10	<10	<3	<10.0 R	<10.0 R
Phenol	11,000	RBC		<10.0	<10	<1	<1.34	<1.67	<10	<10	<1	<10.0 R	<10.0 R
OU-7 COPC Inorganics, Dissolved (µg/L)													
Aluminum	37,000	RBC		<100	<10	<200	<48	<8.4	<19.9	<19.9	**93.4 JB**	<100 L	<100 L
Antimony	6	MCLG		<5.0	<1	<2	<2.5	<0.8 J	<19.3	<20.6	<0.76	<1.0	<1.0
Arsenic	10	MCL		**2.4**	**2.9**	**2.8 J**	**10.1**	**14.7 J**	**1.5 B**	<1.5	<1.2	<1.0	<1.0
Cadmium	5	MCLG		<1.0	<0.1	<1	<2	<0.1 J	<1.8	<3	<0.9	<0.10	<0.10
Chromium	100	MCLG		<5.0	<1	<4	<2.5	<0.5 J	<6.1	<6.1	**1.8 JB**	**0.69 J**	**0.80 J**
Cobalt	11	RBC		**5.0 J**	**4.4**	**4.8**	**4.69 J**	**3.65 J**	<4.6	<4.6	<7.1	<1.0	<1.0
Iron	26,000	RBC		**12,700**	**14000**	**13100**	**15000 J**	**14300**	**11.4 B**	<7.9	**10,700**	<50.0	<50.0
Lead	15	AL		<1.0	<1	<2	<0.2	<0.1 J	<0.23 L	<0.29 L	<9.8	<1.0	<1.0
Manganese	880	RBC		**4,280**	**5170**	**4790**	**4330**	**5270**	**91.9 J**	**181**	**229**	**11.5**	**11.5**
Mercury (total)[2]	2	MCLG		<0.20	<0.2	<0.2 J-	<0.1	<0.1	<0.066	**4**	<0.048	<0.20	<0.20
Nickel	730	RBC		**62.2**	**68.2**	**82.6**	**74.7**	**70.6 J**	<5.3	**7.2**	**9.9 J**	<5.0	<5.0
Vanadium	260	RBC		<5.0 L	<1	<1	<3.5	<3.5	<4.4	<5	<2.6	<5.0	<5.0
Zinc	11,000	RBC		**4.9 B**	**5.6**	<30	**99.9 J**	**5.7 J**	<2.4	**14.1 B**	<8.6	**5.4 K**	**5.6 K**
Cyanide (free)[3]	200	MCLG		<100	<100	**4 J**	<0.608	<1.54	<2.5	<2.5 L	<4	<100	<100
Field Parameters													
Temperature (°C)		---		16.59	24.49	21.77	26.02	21.94	9.00	11.00	14.8	12.71	---
Conductivity (mS/cm)		---		3.259	0.02	3.3	2.9557	3.7944	1.0	0.335	0.464	0.424	---
pH (s.u.)		---		6.11	6.37	6.49	6.43	6.66	7.8	7.5	7.78	7.86	---
ORP (mV)		---		-17.2	0.93	7.10	-175	-84.5	---	---	32	105.7	---
Turbidity (NTU)		---		4.0	7.41	8.96	14.14	18.8	---	---	68	15.1	---
Dissolved Oxygen (mg/L)		---		0.27	4.75	0.33	0.15	0.27	---	---	1.0	8.38	---

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Table D-1

OU-7 Historical Groundwater Sampling Results Summary
Avtex Fibers Superfund Site
Front Royal, Virginia

Parameter	Groundwater Cleanup Standards[1] (µg/L)		Well ID	115	115	115	115	115	116R	116R	116R	116R	116R (Duplicate)
			Well Type	S BMW	S BMW	S BMW	S BMW	S BMW	S BMW	S BMW	S BMW	S BMW	S BMW
			Date	9/3/2013	6/29/2014	7/12/2015	7/17/2016	7/18/2017 & 3/8/2018	2/10/1994	4/13/1994	8/8/2000	9/6/2012	9/6/2012
OU-7 COPC Volatile Organics (µg/L)													
Acetone	22,000	RBC		<25.0	<25	<20	<2.66	R	<12,000	<50,000	**5300 J**	**876**	**814**
Carbon disulfide	1,000	RBC		<2.0	<10	<5	<0.22	<0.22	**1,400,000**	**1,700,000 J**	**2,700**	**2,470**	**3,280**
OU-7 COPC Semivolatile Organics (µg/L)													
Bis(2-ethylhexyl)phthalate	6	MCL		<6.0	**77.7 J**	<5	<5.56	<6.29	<100	**19 B**	**3 J**	<30	<6.0
Naphthalene	14	RBC		<10.0	<10 J	<0.5	<0.343	<0.336	<100	<100	<0.89	<50	<10.0
Pentachlorophenol	1	MCL		<25.0	<25	<5	<1.57	<3.00	<250	**20 J**	<3	<125	<25.0
o-Cresol/2-Methylphenol	1,800	RBC		<10.0	<10	<1	<2.13	<1.45	**98 J**	**220 J**	**140**	<50	**1.8 J**
3&4-Methylphenol/4-methylphenol	180	RBC		<10.0	<10	<1	<2.04	<1.27	**70 J**	**160 J**	**110**	<50	<10.0
Phenol	11,000	RBC		<10.0	<10	<1	<1.39	<1.36	**6,300**	**21,000 J**	**18,000**	**14.3 J**	**22.9**
OU-7 COPC Inorganics, Dissolved (µg/L)													
Aluminum	37,000	RBC		<100	<10	<200	<9.6	**28.1**	**79.7 B**	**33.2**	**161 JB**	**330 J**	**379 J**
Antimony	6	MCLG		<5.0	<1	<2	<0.5	<0.8	**911**	**758**	**531 J**	**429**	**351**
Arsenic	10	MCL		<10.0	<1	<4	<0.5	<0.4	**1,230**	**439 J**	**278 J**	**944**	**847**
Cadmium	5	MCLG		<1.0	<0.1	<1	<0.4	<0.1	<1.2	<1.7	<0.9	<2.0	**1.0 J**
Chromium	100	MCLG		<5.0	<1	<4	**0.928 J**	<0.5	**340**	**337**	**68.6 J**	**116**	**108**
Cobalt	11	RBC		<5.0 L	<1	<1	<0.5	**0.186 J**	844	**798**	**252 J**	**618**	**566**
Iron	26,000	RBC		<50.0 L	<10	**24.4 J**	**23.3 J**	**284**	**201 K**	**304 L**	**817**	<500	<500
Lead	15	AL		<5.0 L	<1	<2	<0.2	<0.1	**1.4 L**	<2.9 L	<9.8	<20	<20
Manganese	880	RBC		**4.9 J**	**4.4**	**2.7**	**21.9**	**7.52**	<1.6	**2.6 B**	**7.3 J**	**16.2 J**	**16.5 J**
Mercury (total)[2]	2	MCLG		<0.20 L	<0.2	<0.2 J-	<0.1	<0.1 J	**176**	**134**	**28.3 L**	**2.5 L**	**2.0 L**
Nickel	730	RBC		<5.0	<1	**1.2 J**	**6.08**	**4.63**	**1,870**	**1,830**	**521 J**	**1,900**	**1,850**
Vanadium	260	RBC		**0.70 B**	<1	<1	<0.731	<0.7	**380**	**365 L**	**78 J**	**153 B**	**150 B**
Zinc	11,000	RBC		**7.5 B**	<5	<30	**28.9**	<5.2	**8,800 J**	**9,280 J**	**2,140 J**	**1,830 B**	**1,750 B**
Cyanide (free)[3]	200	MCLG		<100	<100	<6 J	**0.866 J**	<1.54	<50	<125	**585**	**3,050**	**3,450**
Field Parameters													
Temperature (°C)		---		11.81	19.96	28.86	22.92	23.68 (6.76)	9.00	14.00	23.7	17.13	---
Conductivity (mS/cm)		---		0.448	0.43	0.4	0.45639	0.290 (0.300)	30	32.5	23	25.64	---
pH (s.u.)		---		7.83	7.93	8.50	6.91	7.96 (8.18)	12.3	11.0	10.32	9.10	---
ORP (mV)		---		198.2	-25.2	98.84	68.2	27 (-187.5)	---	---	-403	-487.2	---
Turbidity (NTU)		---		48.3	7.79	26.50	45.68	0 (3.12)	---	---	9.2	150.2	---
Dissolved Oxygen (mg/L)		---		3.78	0.80	7.18	4.49	2.43 (8.85)	---	---	0.0	3.15	---

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Table D-1

OU-7 Historical Groundwater Sampling Results Summary
Avtex Fibers Superfund Site
Front Royal, Virginia

Parameter	Groundwater Cleanup Standards[1] (µg/L)		Well ID	116R	116R	116R	116R	116R	116R	116R	128	128	128
			Well Type	S BMW	S BMW	S BMW	S BMW	S BMW	S BMW	S BMW	S BMW	S BMW	S BMW
			Date	7/19/2013	12/11/2013	7/10/2014	12/9/2014	7/12/2015	7/19/2016	7/14/2017	8/2/2000	3/10/2008	9/18/2008
OU-7 COPC Volatile Organics (µg/L)													
Acetone	22,000	RBC		**13.3 B**	<25.0	**17.1 J**	<250	<400	<13.3	<26.6	<6	<10 R	<10 R
Carbon disulfide	1,000	RBC		**172**	**27.7**	**183**	**118**	**57 J**	**11.6**	**18.2**	<1	<1	<1 L
OU-7 COPC Semivolatile Organics (µg/L)													
Bis(2-ethylhexyl)phthalate	6	MCL		<6.0	<6.0	<7.5 J	<300	<5	<5.77	<7.50	<2	<5.62	<5.1
Naphthalene	14	RBC		<10.0	<10.0	<12.5 J	<500	<0.5	<0.356	<1.85	<0.9	<5.62	<5.1
Pentachlorophenol	1	MCL		<25.0	<25.0	<31.2 J	<1250	<5	<1.63	<16.5	<3	<11.2	<10.2
o-Cresol/2-Methylphenol	1,800	RBC		**2.8 J**	<10.0	<12.5 J	<500	**2**	<2.21	<8.00	<0.9	<5.62	<5.1
3&4-Methylphenol/4-methylphenol	180	RBC		<10.0	<10.0	<12.5 J	<500	<1	<2.12	<7.00	<3	<5.62	<5.1
Phenol	11,000	RBC		<10.0	<10.0	<12.5 J	<500	<1	<1.44	<7.50	<0.9	<5.62	<5.1
OU-7 COPC Inorganics, Dissolved (µg/L)													
Aluminum	37,000	RBC		**169 L**	**33.1 L**	<500	**1570**	<200	<96	<84	<19	---	---
Antimony	6	MCLG		**336**	**86.5**	**285**	**326**	**33.2**	**205 J**	**166**	<0.76	<1	<1
Arsenic	10	MCL		**952**	**248**	**976**	**1050**	**417**	**1090**	**1330**	**2 JB**	**0.688 J**	<1
Cadmium	5	MCLG		**4.7 L**	**2.9**	<5	**0.42 J**	<5	<4	<1	<0.9	<5	<5
Chromium	100	MCLG		**104**	**100**	**103**	**92.8**	**77.4**	**118**	**133**	<1.6	**4.6 J**	<5
Cobalt	11	RBC		**586**	**483**	**618**	**651**	**514**	**779**	**923**	<7.1	---	---
Iron	26,000	RBC		374	**350**	**315**	**2810**	**90.8 J**	<200	**232 J**	**4,840**	---	---
Lead	15	AL		<25.0 L	<5.0 L	<25	<5	<10	<2	<1	<9.8 L	<3	<1
Manganese	880	RBC		**11.8 J**	**6**	**9.1 J**	**41.3**	**6.9**	<20	**30.2 J**	**594**	---	---
Mercury (total)[2]	2	MCLG		<1.6	**0.18 J**	**0.31**	**0.5 J**	**0.13 J-**	<1	<0.1	**0.05 JLB**	<0.2	<0.2
Nickel	730	RBC		**2,130**	**2,130**	**2350**	**2320**	**1820**	**3040**	**3380**	<8.4	**3.6 J**	<4
Vanadium	260	RBC		**189**	**187**	**145**	**124**	**71.8**	**124**	**119**	<2.6	<10	<10
Zinc	11,000	RBC		**1,150**	**793**	**934**	**835**	**211**	**1160**	**853**	<8.6	<20	<20
Cyanide (free)[3]	200	MCLG		**264**	**2,020**	**1780**	**1630**	<150 J	<0.608 J	<1.54	<4	---	---
Field Parameters													
Temperature (°C)		---		16.00	14.81	21.04	12.02	18.56	21.1	25.31	14.8	13.94	14.71
Conductivity (mS/cm)		---		23.40	26.120	27.31	24.563	2.6	19.8831	26.55	1.24	1.204	1.168
pH (s.u.)		---		8.79	8.98	9.19	9.44	9.28	9.33	9.25	6.8	6.63	6.48
ORP (mV)		---		-483.3	-501.4	-416.37	-506	-477.5	-488.5	-492.7	121	-55.2	-47.0
Turbidity (NTU)		---		470.2	551.3	NR	630.3	301	186.35	16.09	1.1	6.5	7.6
Dissolved Oxygen (mg/L)		---		0.11	4.10	0.05	0.03	0.00	-0.01	0	0.29	0.43	0.30

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Table D-1

OU-7 Historical Groundwater Sampling Results Summary
Avtex Fibers Superfund Site
Front Royal, Virginia

Parameter	Groundwater Cleanup Standards[1] (µg/L)		Well ID	128	128	128	128	128	128	128	128	128	128
			Well Type	S BMW	S BMW	S BMW	S BMW	S BMW	S BMW	S BMW	S BMW	S BMW	S BMW
			Date	3/18/2009	10/8/2009	5/19/2010	6/16/2011	6/7/2012	6/25/2013	12/10/2013	7/8/2014	12/10/2014	7/14/2015
OU-7 COPC Volatile Organics (µg/L)													
Acetone	22,000	RBC		<10 R	<10 R	<10 J	<10 R	<25.0	<25.0	<25.0	<25	<25	<5.0
Carbon disulfide	1,000	RBC		<1	<1	<1	<1	<2.0	<2.0	<2.0	<10	<2	<1.0
OU-7 COPC Semivolatile Organics (µg/L)													
Bis(2-ethylhexyl)phthalate	6	MCL		<5.1	<5	**11**	<5.43	<6.0	<6.0	<6.0	<6	<6	<5
Naphthalene	14	RBC		<5.1	<5	<5.38	<5.43	<10.0	<10.0	<10.0	<10	<10	<0.5
Pentachlorophenol	1	MCL		<10.2	<10	<10.8	<10.9	<25.0	<25.0	<25.0	<25	<25	<5 R
o-Cresol/2-Methylphenol	1,800	RBC		<5.1	<5	<5.38	<5.43	<10.0	<10.0	<10.0	<10	<10	<1 R
3&4-Methylphenol/4-methylphenol	180	RBC		<5.1	<5	<5.38	<5.43	<10.0	<10.0	<10.0	<10	<10	<1
Phenol	11,000	RBC		<5.1	<5	<5.38	<5.43	<10.0	<10.0	<10.0	<10	<10	<1 R
OU-7 COPC Inorganics, Dissolved (µg/L)													
Aluminum	37,000	RBC		---	---	---	---	<100	<100	<100 L	<10	**6.7 J**	<200
Antimony	6	MCLG		<1	<5	<1	<5	<1.0	<1.0	<5.0	<1	<1	<2
Arsenic	10	MCL		<1	<5	<1	<5	<1.0	<1.0	<10.0	<1	**0.76 J**	<4
Cadmium	5	MCLG		<5	<5	<5	<5	<1.0	<1.0	<1.0	<0.1	<0.1	<1
Chromium	100	MCLG		<5	<5	<5	<5	**1.8 J**	<5.0	**1.6 K**	<1	<1	<4
Cobalt	11	RBC		---	---	---	---	<1.0	**7.5**	<5.0 L	<1	<1	**0.34 J**
Iron	26,000	RBC		---	---	---	---	**3,240**	**4,400**	**3,750**	**7360**	**8700**	**7320**
Lead	15	AL		<1	<5	<1	<5	<1.0	<1.0	<5.0 L	<1	<1	<2
Manganese	880	RBC		---	---	---	---	**402**	**764**	**758**	**972**	**1170**	**994**
Mercury (total)[2]	2	MCLG		<0.2	<0.2	<0.2	<0.2	<0.20	<0.20	**0.14 J**	<0.2	<0.2	<0.2
Nickel	730	RBC		<4	<20	<4	<20	<1.0	<1.0	**2.5 J**	<1	**2.6**	**1.1 J**
Vanadium	260	RBC		<10	<10	<10	<10	<5.0	<5.0	**1.5 B**	<1	<1	<1
Zinc	11,000	RBC		<20	<20	<20	<20	**3.3 K**	**3.5 B**	**1.8 L**	<5	**11.4**	<30
Cyanide (free)[3]	200	MCLG		---	---	---	---	<100	<100	<100.0	<100	<100	<6 J
Field Parameters													
Temperature (°C)		---		14.09	13.65	13.40	14.09	14.83	17.33	11.78	22.51	12.11	18.84
Conductivity (mS/cm)		---		1.149	1.147	1.181	1.162	1.048	1.349	1.426	1.43	1.501	1.3
pH (s.u.)		---		6.58	6.49	6.80	6.68	6.73	6.54	6.99	6.78	6.79	6.74
ORP (mV)		---		-30.0	-51.9	-72.3	-64.3	-68.1	-45.8	-252.1	-28.79	-35.5	-51.3
Turbidity (NTU)		---		8.1	0.0	7.7	7.6	145.4	15.2	41.1	17.90	310.6	19.8
Dissolved Oxygen (mg/L)		---		0.06	0.07	0.18	0.07	0.49	0.44	0.28	0.30	0	0.12

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Table D-1

OU-7 Historical Groundwater Sampling Results Summary
Avtex Fibers Superfund Site
Front Royal, Virginia

Parameter	Groundwater Cleanup Standards[1] (µg/L)		Well ID	128	128	132	132	132	132	132	132	132	132
			Well Type	S BMW	S BMW	S BMW	S BMW	S BMW	S BMW	S BMW	S BMW	S BMW	S BMW
			Date	7/29/2016	7/25/2017	9/13/2000	5/22/2001	11/12/2001	6/4/2002	11/12/2002	6/3/2003	6/6/2005	6/5/2007
OU-7 COPC Volatile Organics (µg/L)													
Acetone	22,000	RBC		<2.66	<2.94	<30	---	---	---	---	---	---	---
Carbon disulfide	1,000	RBC		<0.22	<0.22	**2,600**	---	---	---	---	---	---	---
OU-7 COPC Semivolatile Organics (µg/L)													
Bis(2-ethylhexyl)phthalate	6	MCL		<5.77	<1.44	<2	---	---	---	---	---	---	---
Naphthalene	14	RBC		<0.356	<0.356	<1	---	---	---	---	---	---	---
Pentachlorophenol	1	MCL		<1.63	<3.17	<3	---	---	---	---	---	---	---
o-Cresol/2-Methylphenol	1,800	RBC		<2.21	<1.54	<1	---	---	---	---	---	---	---
3&4-Methylphenol/4-methylphenol	180	RBC		<2.12	<1.35	<3	---	---	---	---	---	---	---
Phenol	11,000	RBC		<1.44	<1.44	**2 J**	---	---	---	---	---	---	---
OU-7 COPC Inorganics, Dissolved (µg/L)													
Aluminum	37,000	RBC		<10.3	<8.4	**81 JB**	---	---	---	---	---	---	---
Antimony	6	MCLG		<0.512	<0.8	**9.2 KL**	---	---	---	---	---	---	---
Arsenic	10	MCL		**1.57 J**	<0.4	**91.2 KL**	**14.7 K**	**23.3 K**	**9.9 L**	<5 L	<5	<5	<1
Cadmium	5	MCLG		<0.4	<0.1	<0.9	<1.5 J	<1.5	<3	<3	<5	<5 L	<0.5
Chromium	100	MCLG		<0.5	<0.5	**1.9 J**	**3.2 J**	<3	<5 L	<5	<5	<15 J	<2
Cobalt	11	RBC		<0.5	**0.437 J**	**40 J**	---	---	---	---	---	---	---
Iron	26,000	RBC		**8270**	**8020**	**30.5 J**	---	---	---	---	---	---	---
Lead	15	AL		<0.2	<0.1	<9.8	<0.9 J	<6 J	<3 L	<3	<3	<3	<1
Manganese	880	RBC		**1210**	**1090**	**117**	---	---	---	---	---	---	---
Mercury (total)[2]	2	MCLG		<0.1	<0.1	<0.48	<0.2	<0.2 L	<0.2 L	<0.2 L	<2	<0.2	<2
Nickel	730	RBC		<0.951	**2.52**	**52.2**	<50	<50	<50	<50	<50	<10 J	**9.86**
Vanadium	260	RBC		<1.92	<0.7	**10.2 J**	---	---	---	---	---	---	---
Zinc	11,000	RBC		<10	**74.1**	**9.8 JB**	**45.7**	**95.2**	**26.4**	<25	<25	<20 J	<20
Cyanide (free)[3]	200	MCLG		<0.608	<1.54	<4	---	---	---	---	---	---	---
Field Parameters													
Temperature (°C)		---		18.81	18.75	16.2	13.16	14.97	13.4	15.49	12.89	13.85	13.84
Conductivity (mS/cm)		---		1.4319	1.557	4.33	3.41	3.2	3.02	2.6	2.7	2.61	25.69
pH (s.u.)		---		6.75	6.49	7.85	6.78	7.13	7.5	7.67	6.5	6.31	6.39
ORP (mV)		---		-16.1	-32.6	-400 J	-328	-372	-368	-326	-184	-46.3	-51.8
Turbidity (NTU)		---		7.13	67.7	52 J	450	80.1	3.6	0.0	4.7	0	0.5
Dissolved Oxygen (mg/L)		---		0.08	0.16	0.2	3.6	0.61	1.66	3.38	0.0	2.85	1.86

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Table D-1

OU-7 Historical Groundwater Sampling Results Summary
Avtex Fibers Superfund Site
Front Royal, Virginia

Parameter	Groundwater Cleanup Standards[1] (µg/L)		Well ID	132	132	132	132	132	132	132	132	132	132
			Well Type	S BMW	S BMW	S BMW	S BMW	S BMW	S BMW	S BMW	S BMW	S BMW	S BMW
			Date	3/7/2008	6/4/2008	9/23/2008	3/26/2009	6/5/2009	10/13/2009	5/27/2010	6/7/2010	6/15/2011	6/5/2012 & 6/29/2012[5]
OU-7 COPC Volatile Organics (µg/L)													
Acetone	22,000	RBC		<10 R	---	<10 R	<10	---	<10	<10	---	<10 R	<25.0
Carbon disulfide	1,000	RBC		**1.34**	---	<1	<1	---	<1	<1	---	<1	<2.0
OU-7 COPC Semivolatile Organics (µg/L)													
Bis(2-ethylhexyl)phthalate	6	MCL		<5	---	<5.1	<5.1	---	<5	<5.1	---	**9.31**	<6.0
Naphthalene	14	RBC		<5	---	<5.1	<5.1	---	<5	<5.1	---	<5	<10.0
Pentachlorophenol	1	MCL		<10	---	<10.2	<10.2	---	<10	<10.2	---	<10	<25.0
o-Cresol/2-Methylphenol	1,800	RBC		<5	---	<5.1	<5.1	---	<5	<5.1	---	<5	<10.0
3&4-Methylphenol/4-methylphenol	180	RBC		<5	---	<5.1	<5.1	---	<5	<5.1	---	<5	<10.0
Phenol	11,000	RBC		<5	---	<5.1	<5.1	---	<5	<5.1	---	<5	<10.0
OU-7 COPC Inorganics, Dissolved (µg/L)													
Aluminum	37,000	RBC		---	---	---	---	---	---	---	---	---	<100
Antimony	6	MCLG		<1	---	<1	<1	---	<1	<1	---	<5	<1.0
Arsenic	10	MCL		**0.512 J**	<1	<1	<1	<1	<1	<1	<1	<5	<1.0
Cadmium	5	MCLG		<5	<0.5	<5	<5	<0.5	<5	<5	<0.5	<5	<1.0
Chromium	100	MCLG		<5	2.39	<5	<5	<2	<5	<5	**6.33**	<5	<5.0
Cobalt	11	RBC		---	---	---	---	---	---	---	---	---	<1.0
Iron	26,000	RBC		---	---	---	---	---	---	---	---	---	**6,210**
Lead	15	AL		<3	<1	<1	<1	<1	<1	<1	<1 B	<5	<1.0
Manganese	880	RBC		---	---	---	---	---	---	---	---	---	**1,590**
Mercury (total)[2]	2	MCLG		<0.2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.20
Nickel	730	RBC		**9.81 J**	**6.04**	**10.8**	**6.66**	**7.6**	**6.68**	**8.3**	**7.87**	<20	**0.98 J, B**
Vanadium	260	RBC		<10	<20	<10	<10	---	<10	<10	---	<10	<5.0
Zinc	11,000	RBC		**5.59 J**	---	**20.3**	<20	<20	<20	<20	<20	<20	**2.9 J, B**
Cyanide (free)[3]	200	MCLG		---	---	---	---	---	---	---	---	---	<100
Field Parameters													
Temperature (°C)		---		13.49	13.59	15.33	12.53	12.79	13.79	14.20	13.96	14.76	15.91
Conductivity (mS/cm)		---		2.505	2.457	2.510	2.453	2.450	2.183	2.178	2.429	2.212	1.764
pH (s.u.)		---		6.58	6.46	6.22	6.51	6.33	6.41	4.49	6.54	5.90	6.64
ORP (mV)		---		-54.4	-80.7	-49.2	-78.0	-46.9	-101.1	6.1	-82.3	-256.6	-158.1
Turbidity (NTU)		---		1.5	0	3.2	0.1	6.3	0.0	0.0	2.7	0	-1.8
Dissolved Oxygen (mg/L)		---		4.04	2.50	2.99	0.24	0.32	0.04	0.44	0.01	0	0.66

NOTES: See page 64 of 64.

Table D-1

OU-7 Historical Groundwater Sampling Results Summary
Avtex Fibers Superfund Site
Front Royal, Virginia

Parameter	Groundwater Cleanup Standards[1] (µg/L)		Well ID	132	132	132 (Duplicate)	132	132 (Duplicate)	132	132 (Duplicate)	132	132 (Duplicate)
			Well Type	S BMW	S BMW	S BMW	S BMW	S BMW	S BMW	S BMW	S BMW	S BMW
			Date	6/7/2013	8/5/2014	8/5/2014	7/24/2015	7/24/2015	7/29/2016	7/29/2016	7/27/2017 & 8/10/2017	7/27/2017 & 8/10/2017
OU-7 COPC Volatile Organics (µg/L)												
Acetone	22,000	RBC		<25.0	<25	<25	<5.0	<5.0	<2.66	<2.66	<2.66	<2.66
Carbon disulfide	1,000	RBC		<2.0	NR	NR	<1.0	<1.0	<0.22	<0.22	<0.22	<0.22
OU-7 COPC Semivolatile Organics (µg/L)												
Bis(2-ethylhexyl)phthalate	6	MCL		<6.0	<6	<6	<5	<5	<5.77	<5.56	<2.24	<2.38
Naphthalene	14	RBC		<10.0	<10	<10	<0.5	<0.5	<0.356	<0.343	<0.343	<0.349
Pentachlorophenol	1	MCL		<25.0	<25	<25	<5	<5	<1.63	<1.57	<3.06	<3.11
o-Cresol/2-Methylphenol	1,800	RBC		<10.0	<10	<10	<1	<1	<2.21	<2.13	<1.48	<1.51
3&4-Methylphenol/4-methylphenol	180	RBC		<10.0	<10	<10	<1	<1	<2.12	<2.04	<1.3	<1.32
Phenol	11,000	RBC		<10.0	<10	<10	<1	<1	<1.44	<1.39	<1.39	<1.42
OU-7 COPC Inorganics, Dissolved (µg/L)												
Aluminum	37,000	RBC		<100 L	**11.2**	<10	<200	<200	<9.6	<31.6	<8.4	<8.4
Antimony	6	MCLG		<1.0	<1	<1	<2	<2	<0.745	<0.5	<0.8	<0.8
Arsenic	10	MCL		<1.0	<1	<1	<4	<4	**1.95 J**	**1.86 J**	**3.53**	**2.81**
Cadmium	5	MCLG		<1.0	<0.1	<0.1	<1	<1	<0.4	<0.4	<0.1	<0.1
Chromium	100	MCLG		**1.0 J**	<1	<1	<4	<4	<0.533	<0.5	<0.5	<0.5
Cobalt	11	RBC		**11.8**	<1	<1	**0.14 J**	<1	<0.5	<0.5	**0.675 J**	**0.663 J**
Iron	26,000	RBC		**6,370**	**7270**	**7300**	**8060 J**	**8250 J**	**7490**	**7330**	**7460**	**7220**
Lead	15	AL		<1.0	<1	<1	<2	<2	<0.203	<0.333	**0.106 J**	<0.1
Manganese	880	RBC		**1,600**	**1820**	**1840**	**2030**	**2080**	**1920**	**1980**	**1800**	**1760**
Mercury (total)[2]	2	MCLG		<0.20	<0.2	<0.2	<0.2	<0.2	<0.1	<0.1	<0.1	<0.1
Nickel	730	RBC		<1.0	**1.4**	**1.3**	<4	<4	<1.71	<3.27	**0.568 J**	**0.989 J**
Vanadium	260	RBC		<5.0	<1	<1	**0.3 J**	<1	<1.08	<0.974	<0.7	<0.7
Zinc	11,000	RBC		**13.8 B**	**22.8**	**20.2**	<30	<30	<10	<13.1	<5.2	**17.9 J**
Cyanide (free)[3]	200	MCLG		<100	<100	<100	<6	**2.4 J**	<0.608	**0.703 J**	<1.54	<1.54
Field Parameters												
Temperature (°C)		---		14.44	18.09	18.09	22.00	22.00	18.43	18.43	20.97	20.97
Conductivity (mS/cm)		---		1.817	1.78	1.78	2.3	2.3	2.4529	2.4529	2.7582	2.7582
pH (s.u.)		---		6.55	6.66	6.66	6.66	6.66	6.89	6.89	6.53	6.53
ORP (mV)		---		-111.8	-55.49	-55.49	-42.23	-42.23	-151.9	-151.9	-42.4	-42.4
Turbidity (NTU)		---		0.0	0.42	0.42	2.06	2.06	2.57	2.57	29.2	29.2
Dissolved Oxygen (mg/L)		---		0.16	0.03	0.03	0.06	0.06	0.05	0.05	0.21	0.21

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Table D-1

OU-7 Historical Groundwater Sampling Results Summary
Avtex Fibers Superfund Site
Front Royal, Virginia

Parameter	Groundwater Cleanup Standards[1] (µg/L)		Well ID	133	133	133	133	133	133	133	133	133	133
			Well Type	S BMW	S BMW	S BMW	S BMW	S BMW	S BMW	S BMW	S BMW	S BMW	S BMW
			Date	1/19/1994	4/4/1994	3/7/2008	9/22/2008	3/23/2009	10/13/2009	5/24/2010	6/16/2011	6/7/2012	6/25/2013
OU-7 COPC Volatile Organics (µg/L)													
Acetone	22,000	RBC		<10	<10	<10 R	<10 R	<10	<10	<10 R	<10	<25.0	<25.0
Carbon disulfide	1,000	RBC		**2 J**	<10	**1**	<1 J	<1	<1	<1	<1	**3.6**	**1.9 J**
OU-7 COPC Semivolatile Organics (µg/L)													
Bis(2-ethylhexyl)phthalate	6	MCL		**3 B**	**4B**	<5.21	<5.1	<5.78	<5	<5	<5	<6.0	<6.0
Naphthalene	14	RBC		<10	<10	<5.21	<5.1	<5.78	<5	<5	<5	<10.0	<10.0
Pentachlorophenol	1	MCL		<25	<25	<10.4	<10.2	<11.6	<10	<10	<10	<25.0	<25.0
o-Cresol/2-Methylphenol	1,800	RBC		<10.0	<10.0	<5.21	<5.1	<5.78	<5	<5	<5	<10.0	<10.0
3&4-Methylphenol/4-methylphenol	180	RBC		<10.0	<10.0	<5.21	<5.1	<5.78	<5	<5	<5	<10.0	<10.0
Phenol	11,000	RBC		<10.0	<10.0	<5.21	<5.1	<5.78	<5	<5	<5	<10.0	<10.0
OU-7 COPC Inorganics, Dissolved (µg/L)													
Aluminum	37,000	RBC		**31.7 B**	<19.9	---	---	---	---	---	---	<100	<100
Antimony	6	MCLG		<19.3	<19.3	<1	<1	<1	<1	<1	<5	<1.0	<1.0
Arsenic	10	MCL		**2 B**	**2 B**	**17.3**	**21.1**	**23.7**	**11.7**	**11.9**	**11.3**	**9.8**	**7.6**
Cadmium	5	MCLG		<1.8	<1.8	<5	<5	<5	<5	<5	<5	<1.0	<1.0
Chromium	100	MCLG		<6.1	<6.1	<5	<5	<5	<5	<5	<5	**1.9 J**	**0.56 J**
Cobalt	11	RBC		<4.6	<4.6	---	---	---	---	---	---	**3.9**	**16.4**
Iron	26,000	RBC		**202 J**	**1,000**	---	---	---	---	---	---	**8,460**	**7,800**
Lead	15	AL		**0.99 B**	<0.23 L	<3	<1	<1	<1	<1	<5	<1.0	<1.0
Manganese	880	RBC		**434 J**	**436**	---	---	---	---	---	---	**1,730**	**1,180**
Mercury (total)[2]	2	MCLG		<0.066	**0.14 B**	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.20	<0.20
Nickel	730	RBC		**7.6**	<5.3	**35.3**	**27.9**	**24.5**	**26.8**	**22.6**	**23.9**	**7.7**	**5.9**
Vanadium	260	RBC		<4.4	<4.4	<10	<50	<10	<10	<10	<10	<5.0	<5.0
Zinc	11,000	RBC		**10.9 B**	<2.4	<20	**21.4**	<20	<20	<20	<20	**1.1 K**	**2.1 B**
Cyanide (free)[3]	200	MCLG		<2.5	<2.5	---	---	---	---	---	---	<100	<100
Field Parameters													
Temperature (°C)	---			---	---	15.73	16.96	15.80	15.50	19.65	15.53	17.61	17.89
Conductivity (mS/cm)	---			---	---	9.508	9.371	7.871	9.217	9.088	8.443	7.251	6.125
pH (s.u.)	---			---	---	6.63	6.35	6.58	6.43	6.12	6.67	6.78	6.40
ORP (mV)	---			---	---	-96.5	-97.1	-84.9	-105.5	-44.0	-96.7	-105.9	-114.4
Turbidity (NTU)	---			---	---	0	0	0	0.0	3.3	1.8	0.0	0.0
Dissolved Oxygen (mg/L)	---			---	---	0.29	0.24	0.04	0.06	1.35	0.04	0.48	0.27

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Table D-1

OU-7 Historical Groundwater Sampling Results Summary
Avtex Fibers Superfund Site
Front Royal, Virginia

Parameter	Groundwater Cleanup Standards[1] (µg/L)		Well ID	133	133	133	133	133	133	136	136	136	136
			Well Type	S BMW	S BMW	S BMW	S BMW	S BMW	S BMW	I BMW	I BMW	I BMW	I BMW
			Date	12/12/2013	8/5/2014	12/10/2014	7/15/2015	7/20/2016	7/26/2017	1/26/1994	4/6/1994	4/6/1994 (Dup)	7/26/2000
OU-7 COPC Volatile Organics (µg/L)													
Acetone	22,000	RBC		<25.0	<25	<25	<5.0	<2.66	<3.71	**7 B**	<10	**5 J**	<6
Carbon disulfide	1,000	RBC		**2.3**	<2	**3.3**	**8.6**	**5.45**	**0.346 J**	**2 J**	<10	**4 J**	**2 J**
OU-7 COPC Semivolatile Organics (µg/L)													
Bis(2-ethylhexyl)phthalate	6	MCL		<6.0	<6	<6	<5	<5.56	<1.44	**6 J**	**2 B**	**2 B**	<2
Naphthalene	14	RBC		<10.0	<10	<10	<0.5	<0.343	<0.356	<10	<10	<10	<1
Pentachlorophenol	1	MCL		<25.0	<25	<25	<5	<1.57	<3.17	<25	<25	<25	<3
o-Cresol/2-Methylphenol	1,800	RBC		<10.0	<10	<10	<1	<2.13	<1.54	<10	<10	<10	<1
3&4-Methylphenol/4-methylphenol	180	RBC		<10.0	<10	<10	<1	<2.04	<1.35	<10	<10	<10	<3
Phenol	11,000	RBC		<10.0	<10	<10	<1	<1.39	<1.44	<10	<10	<10	<1
OU-7 COPC Inorganics, Dissolved (µg/L)													
Aluminum	37,000	RBC		**25.2 L**	<10	**5.4 J**	<200	**201**	<84	<19.9	<19.9	<19.9	**484**
Antimony	6	MCLG		<5.0	<1	<2	<2	<0.5	<0.8	<19.3	<19.3	<19.3	**4.9 J**
Arsenic	10	MCL		**15.6**	**11.3**	**11.2**	**30.7**	**27.8**	**1.87 J**	<1.1	**3.4 B**	<1.5 L	**5.3 JKB**
Cadmium	5	MCLG		<1.0 L	<0.1	<0.2	<1	<0.4	<0.1	<1.8	<1.8	<1.8	<0.9
Chromium	100	MCLG		**1.7 L**	<1	**1.1 J**	**1.1 J**	**1.09 J**	<0.5	<6.1	<6.1	<6.1	**9.1**
Cobalt	11	RBC		<5.0	**5**	**5.6**	**14.8**	**11.5**	**3.35**	<4.6	<4.6	<4.6	<7.1
Iron	26,000	RBC		**5,360**	**4020**	**4120**	**6400**	**4850**	<10	**139**	**260**	**237**	**7,920 JK**
Lead	15	AL		<5.0 L	<1	<2	<2	<0.2	<0.1	<0.23 L	<0.23 L	<2.3 L	<9.8
Manganese	880	RBC		**1,040**	**847 J**	**903**	**782**	**923**	**58.3**	**32.1 B**	**24**	**24**	**166**
Mercury (total)[2]	2	MCLG		<0.20	NA	<0.2	<0.2	<1	<0.15	<0.066	**0.052 B**	**0.085 B**	<0.048 L
Nickel	730	RBC		**7.8**	**7.2**	**8**	**18.4**	**16.7**	**10.6**	**26.9 B**	<5.3	<5.3	**13 J**
Vanadium	260	RBC		**1.4 B**	<1	<2	**0.63 J**	**1.03 J**	<0.7	<4.4	<4.4	<4.4	<2.6
Zinc	11,000	RBC		**1.4 L**	**18.2**	**14.7**	<30	<10	<5.2	**15.9 B**	**7 B**	<2.4	**34.6**
Cyanide (free)[3]	200	MCLG		<100.0	<100	<100	<6 J	<0.608 J	<1.54	<2.5	<2.5	<2.5	<4
Field Parameters													
Temperature (°C)		---		15.14	22.96	12.47	20.29	19.43	20.91	8.2	8.00	8.00	14.2
Conductivity (mS/cm)		---		5.644	5.18	5.077	7.0	6.7444	11.067	0.175	0.17	0.17	0.39
pH (s.u.)		---		6.97	7.03	7.26	7.25	7.06	6.88	8.2	7.4	7.4	7.92
ORP (mV)		---		-113.2	-101.82	-115.3	-84.12	-111.5	-90.1	---	---	---	-51
Turbidity (NTU)		---		3.7	0.0	12.7	8.31	1.23	6.29	---	---	---	47
Dissolved Oxygen (mg/L)		---		0.57	0.10	0.33	0.11	0.02	0.13	---	---	---	76

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Table D-1

OU-7 Historical Groundwater Sampling Results Summary
Avtex Fibers Superfund Site
Front Royal, Virginia

Parameter	Groundwater Cleanup Standards[1] (µg/L)		Well ID	136	136	136	136	136	136	138	138	138	138
			Well Type	I BMW	I BMW	I BMW	I BMW	I BMW	I BMW	S BMW	S BMW	S BMW	S BMW
			Date	7/11/2012	7/23/2013	7/1/2014	7/13/2015	7/15/2016	7/19/2017	7/12/2012	7/17/2013	12/12/2013	7/13/2014
OU-7 COPC Volatile Organics (µg/L)													
Acetone	22,000	RBC		<25.0	<25.0	<25	<20	<2.66	<8.46	<250	<25.0	<25.0	<25
Carbon disulfide	1,000	RBC		<2.0 J	**46.2 B**	<10	<5	<0.22	<0.22	**3,830 J**	**2,690**	**1,890**	**1310**
OU-7 COPC Semivolatile Organics (µg/L)													
Bis(2-ethylhexyl)phthalate	6	MCL		<6.0	<6.0	<6	<5	<5.88	<1.44	<6.0	<30.0	<6.0	<6
Naphthalene	14	RBC		<10.0	<10.0	<10	<0.5	<0.363	<0.356	<10.0	<50.0	<10.0	<10
Pentachlorophenol	1	MCL		<1.1	<25.0	<25	<5	<1.67	<3.17	<1.0	<125	<25.0	<25
o-Cresol/2-Methylphenol	1,800	RBC		<10.0 R	<10.0	<10	<1	<2.25	<1.54	<10.0	<50.0	<10.0	<10
3&4-Methylphenol/4-methylphenol	180	RBC		<10.0 R	<10.0	<10	<1	<2.16	<1.35	<10.0	<50.0	<10.0	<10
Phenol	11,000	RBC		<10.0 R	**21.3 J**	<10	<1	<1.47	<1.44	<10.0	<50.0	**2.4 J**	<10
OU-7 COPC Inorganics, Dissolved (µg/L)													
Aluminum	37,000	RBC		<100 L	<100	**26.3**	<200	<9.6	<8.4	<100 L	<100 L	<100.0	<10
Antimony	6	MCLG		<1.0	<5.0 L	<1	**0.65 J**	<0.5	<0.8	**23.1**	**8.98 K**	**7.1 K**	**5.3**
Arsenic	10	MCL		<1.0	<10.0	<1	<4	**0.506 J**	<0.4	**205**	**131**	**139**	**96.2**
Cadmium	5	MCLG		<0.10	<1.0	<0.1	<1	<0.4	<0.1	**0.084 J**	<1.0	<1.0	<0.1
Chromium	100	MCLG		**0.75 J**	<5.0 L	<1	<4	**0.543 J**	<0.5	**3.7 J**	**2.4 J**	**1.2 L**	<1.3
Cobalt	11	RBC		<1.0	<5.0 L	<1	<1	<0.5	<0.1	**96.8**	**63.4**	**41.3 J**	**31.6**
Iron	26,000	RBC		**311**	**674**	**595**	**692**	**74.9**	**664**	<50.0	<50.0	<50.0	<10
Lead	15	AL		<1.0	<5.0 L	<1	<2	<0.2	<0.1	<1.0	<5.0 L	<5.0 L	<1
Manganese	880	RBC		**69**	**177**	**131**	**209**	**67.5**	**160**	**135**	**180**	**170**	**204**
Mercury (total)[2]	2	MCLG		<0.20	<0.20	<0.2	<0.2	<0.1	<0.1	<0.20	<0.20	<0.20	<0.2
Nickel	730	RBC		<5.0	<5.0	<1	**0.95 J**	**6.95**	<0.5	**129**	**138**	**108**	**87.5**
Vanadium	260	RBC		<5.0	**0.44 J**	<1	<1	<0.759	<0.7	**4.1 J**	**4.9 J**	**4.5 J**	**8.5**
Zinc	11,000	RBC		**5.4 K**	**3.2 B**	**13.5**	<30	**52.8**	**20.1 J**	**7.8 K**	**2.0 J**	**1.2 B**	<5
Cyanide (free)[3]	200	MCLG		<100	<100	<100	<6 J	<0.608	<1.54	**226**	**160**	**138 K**	**169**
Field Parameters													
Temperature (°C)		---		15.90	16.56	16.41	16.94	21.77	18	18.70	17.42	14.17	25.47
Conductivity (mS/cm)		---		0.499	0.521	0.49	0.5	0.4493	0.57002	6.190	4.354	4.057	4.14
pH (s.u.)		---		7.45	7.93	7.60	7.84	7.75	8.09	7.60	7.37	7.45	7.50
ORP (mV)		---		-108.9	-142.0	-109.7	-167.7	-17.4	-202.1	-400.5	-382.4	-388.6	-336.35
Turbidity (NTU)		---		13.6	0.0	1.75	15.2	1081.84	0.9	0.0	1.1	1.8	0.62
Dissolved Oxygen (mg/L)		---		0.32	0.42	0.52	0.21	0.41	1.14	0.30	0.15	0.18	0.09

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Table D-1

OU-7 Historical Groundwater Sampling Results Summary
Avtex Fibers Superfund Site
Front Royal, Virginia

Parameter	Groundwater Cleanup Standards[1] (µg/L)		Well ID	138	138	138	138 (Duplicate)	138	138 (Duplicate)	162	162	162	162
			Well Type	S BMW	S BMW	S BMW		S BMW	S BMW	S BMW	S BMW	S BMW	S BMW
			Date	12/11/2014	7/28/2015	7/31/2016	7/31/2016	7/30/2017 & 8/9/2017	7/30/2017	5/29/1987	8/15/1987	1/24/1994	4/4/1994
OU-7 COPC Volatile Organics (µg/L)													
Acetone	22,000	RBC		<250	<20	<2.66	<2.66	**5.36**	<2.66	<5	---	<10	<10
Carbon disulfide	1,000	RBC		**1180**	**410**	**197 J**	**197**	**157**	**207**	---	---	<10	<10
OU-7 COPC Semivolatile Organics (µg/L)													
Bis(2-ethylhexyl)phthalate	6	MCL		<6	<5	<5.77	<5.77	<6.82	<6.82	---	---	**4 J**	**29 B**
Naphthalene	14	RBC		<10	<0.5	<0.356	<0.356	<1.68	<1.68	---	---	<10.0	<10.0
Pentachlorophenol	1	MCL		<25	<5	<1.63	<1.63	<15.0	<15.0	---	---	<25.0	<25.0
o-Cresol/2-Methylphenol	1,800	RBC		<10	<1	<2.21	<2.21	<7.27	<7.27	---	---	<10.0	<10.0
3&4-Methylphenol/4-methylphenol	180	RBC		<10	<1	<2.12	<2.12	<6.36	<6.36	---	---	<10.0	<10.0
Phenol	11,000	RBC		<10	<1	<1.44	<1.44	<6.82	<6.82	---	---	<10.0	<10.0
OU-7 COPC Inorganics, Dissolved (µg/L)													
Aluminum	37,000	RBC		<10	<200	<16.2	<10.4	<8.4	**33.3**	---	---	<19.9	<19.9
Antimony	6	MCLG		**5.8**	**3.2**	<3.22	<2.7	**1.53 J**	**1.6 J**	---	---	<19.3	<19.3
Arsenic	10	MCL		**94.2**	**56.3**	**38.6**	**45.3**	**36.8**	**36.8**	---	<20	**2.4 B**	**1.7 B**
Cadmium	5	MCLG		<0.1	<1	<0.4	<0.4	<0.1	<0.1	---	<10	<1.8	<1.8
Chromium	100	MCLG		**1.6**	**0.75 J**	<1.45	<1.32	**1.57 J**	**4.02**	---	---	<6.1	<6.1
Cobalt	11	RBC		**28.3**	**22.2**	**21.9**	**22.8**	**13.2**	**12.7**	---	---	<4.6	<4.6
Iron	26,000	RBC		<10	<200	<20	<20	**51.2 J**	**87.2 J**	---	**600**	**379**	**76.4 B**
Lead	15	AL		<1	<2	<0.2	<0.2	<0.1	<0.1	---	<6	<0.23 L	<0.23 L
Manganese	880	RBC		**233**	**364**	**607 J**	**612**	**504**	**494**	---	**130**	**825**	**214**
Mercury (total)[2]	2	MCLG		<0.2	<0.2	<0.1	<0.1	<0.1	<0.1	---	---	<0.066	**0.024 B**
Nickel	730	RBC		**80.3**	**59.1**	**52.6**	**54.8**	**43.6**	**43.6**	---	---	<5.3	<5.3
Vanadium	260	RBC		**4**	**3.1**	<5.59	<5.41	<0.7	<0.7	---	---	<4.4	<4.4
Zinc	11,000	RBC		<5	<30	<10	<10	<5.2	<5.2	---	<40	**64.7 B**	<2.4
Cyanide (free)[3]	200	MCLG		**120**	<1200	<0.608	**0.703 J**	<1.54	<1.54	---	---	<2.5	<2.5
Field Parameters													
Temperature (°C)		---		13.96	17.45	18.95	18.95	(21.93)	(21.93)	---	---	---	---
Conductivity (mS/cm)		---		3.706	3.4	3.3257	3.3257	(2.755)	(2.755)	---	---	---	---
pH (s.u.)		---		7.45	7.15	7.31	7.31	(7.06)	(7.06)	---	---	---	---
ORP (mV)		---		-369.8	-319.43	-370.1	-370.1	(-413.8)	(-413.8)	---	---	---	---
Turbidity (NTU)		---		0.2	0.74	1.53	1.53	(1.31)	(1.31)	---	---	---	---
Dissolved Oxygen (mg/L)		---		0.21	0.15	0.09	0.09	(0.07)	(0.07)	---	---	---	---

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Table D-1

OU-7 Historical Groundwater Sampling Results Summary
Avtex Fibers Superfund Site
Front Royal, Virginia

Parameter	Groundwater Cleanup Standards[1] (µg/L)		Well ID	162	162	162	162	162	162	181	181	181	181
			Well Type	S BMW	S BMW	S BMW	S BMW	S BMW	S BMW	I BMW	I BMW	I BMW	I BMW
			Date	7/26/2000	7/23/2013	6/26/2014	7/13/2015	7/28/2016	7/16/2017	5/29/1987	8/15/1987	1/24/1994	4/6/1994
OU-7 COPC Volatile Organics (µg/L)													
Acetone	22,000	RBC		<6	<25.0	<25	<20	<2.66	<2.66	---	---	<10	<10
Carbon disulfide	1,000	RBC		<1	<2.0	<10	<5	<0.22	<0.22	**1 J**	---	**5 J**	**6 J**
OU-7 COPC Semivolatile Organics (µg/L)													
Bis(2-ethylhexyl)phthalate	6	MCL		<2	<6.0	<6	<5	<5.77	<1.90	---	---	**1 B**	**1 B**
Naphthalene	14	RBC		<0.9	<10.0	<10	<0.5	<0.356	<0.370	---	---	<10	<10
Pentachlorophenol	1	MCL		<3	<25.0 L	<25	<5	<1.63 J	<3.30	---	---	<25	<25
o-Cresol/2-Methylphenol	1,800	RBC		<0.9	<10.0 L	<10	<1	<2.21	<1.60	---	---	<10	<10
3&4-Methylphenol/4-methylphenol	180	RBC		<3	<10.0 L	<10	<1	<2.12	<1.40	---	---	<10	<10
Phenol	11,000	RBC		<0.9	<10.0 L	<10	<1	<1.44	<1.50	<20	---	<10	<10
OU-7 COPC Inorganics, Dissolved (µg/L)													
Aluminum	37,000	RBC		<19	<100	<10	<200	<9.6	<8.4	---	---	**39.3 B**	<19.9
Antimony	6	MCLG		**5**	<5.0 L	<1	<2	<1.09	<0.8	---	---	<19.3	<19.3
Arsenic	10	MCL		**3.4 J, K, B**	<10.0	<1	<4	**0.955 J**	<0.4	<3	<4	**3.7 B**	**6.4 B**
Cadmium	5	MCLG		<0.9	<1.0	<0.1	<1	<0.4	<0.1	<1	<10	<1.8	<1.8
Chromium	100	MCLG		<1.6	**0.44 L**	<1	<4	<0.5	<0.908	---	---	<6.1	<6.1
Cobalt	11	RBC		<7.1	<5.0 L	<1	**0.73 J**	<0.5	**0.472 J**	---	---	<4.6	<4.6
Iron	26,000	RBC		**1020 J, K**	**429**	**463**	**569**	**526**	**634**	**370**	**36**	**277 J**	**325**
Lead	15	AL		<9.8	<5.0 L	<1	<2	<0.2	<0.1	<10	<6	**1.1 B**	<0.23 L
Manganese	880	RBC		**186**	**168**	**204**	**231**	**179**	**204**	**530**	**170**	**470 J**	**646**
Mercury (total)[2]	2	MCLG		<0.048 L	<1.6	<0.2	<0.2	<0.1	<0.1	---	---	<0.066	**0.074 B**
Nickel	730	RBC		<8.4	**2.6 J**	**1.5**	**2.1 J**	**3.04**	**5.42**	---	---	<5.3	<5.3
Vanadium	260	RBC		<2.6	**0.24 J**	<1	<1	<1.43	<0.7	---	---	<4.4	<4.4
Zinc	11,000	RBC		<8.6	**3.8 J**	<5	<30	**16.2 J**	**32.6**	**30**	**190**	**152 B**	<2.4
Cyanide (free)[3]	200	MCLG		<4	<100	<100	<6 J	<0.608	<1.54	---	---	<2.5	<2.5
Field Parameters													
Temperature (°C)		---		---	15.82	15.85	21.42	21.35	18.39	---	---	9.00	14.00
Conductivity (mS/cm)		---		---	0.640	0.62	0.6	0.59822	0.61729	0.423	0.72	0.4	0.3
pH (s.u.)		---		---	7.23	7.28	7.30	7.49	6.67	7.08	8.37	8.25	7.3
ORP (mV)		---		---	-22.7	-112.7	-64.2	-31.8	-89.6	---	---	---	---
Turbidity (NTU)		---		---	13.2	16.1	119.2	84.4	17.06	---	---	---	---
Dissolved Oxygen (mg/L)		---		---	0.50	1.08	1.06	0.17	0.13	---	---	---	---

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Table D-1

OU-7 Historical Groundwater Sampling Results Summary
Avtex Fibers Superfund Site
Front Royal, Virginia

Parameter	Groundwater Cleanup Standards[1] (µg/L)		Well ID	181	181	181 (Duplicate)	181	181 (Duplicate)	181	181	181	181	181
			Well Type	I BMW	I BMW	I BMW	I BMW	I BMW	I BMW	I BMW	I BMW	I BMW	I BMW
			Date	7/27/2000	4/1/2008	4/1/2008	7/3/2012	7/3/2012	7/23/2013	6/30/2014	7/13/2015	7/28/2016	7/18/2017
OU-7 COPC Volatile Organics (µg/L)													
Acetone	22,000	RBC		**30**	**2.56 L**	**2.62 L**	<1,250	<25.0	<25.0	<25	<20	<2.66	<2.66
Carbon disulfide	1,000	RBC		**1,300**	**0.685 J**	< 1	**67.7 B**	**8.9 B**	**5.7**	**2.7 J**	<5	**0.252 J**	<0.22
OU-7 COPC Semivolatile Organics (µg/L)													
Bis(2-ethylhexyl)phthalate	6	MCL		<2	<5	<5	<6.0	<6.0	<6.0	<6	<5	<5.77	<1.44
Naphthalene	14	RBC		<0.89	<5	<5	<10.0	<10.0	<10.0	<10	<0.5	<0.356	<0.356
Pentachlorophenol	1	MCL		<3	<10	<10	<1.0	<25.0	<25.0 L	<25	<5	<1.63 J	<3.17
o-Cresol/2-Methylphenol	1,800	RBC		<0.89	<5	<5	<10.0	<10.0	<10.0 L	<10	<1	<2.21	<1.54
3&4-Methylphenol/4-methylphenol	180	RBC		<3	<5	<5	<10.0	<10.0	<10.0 L	<10	<1	<2.12	<1.35
Phenol	11,000	RBC		<0.89	<5	<5	<10.0	<10.0	<10.0 L	<10	<1	<1.44	<1.44
OU-7 COPC Inorganics, Dissolved (µg/L)													
Aluminum	37,000	RBC		**39.2 JB**	---	---	<100	<100	<100	<10	<200	<9.6	<8.4
Antimony	6	MCLG		**18.4 K**	**1.13 J**	**1.04 J**	**1.3**	**0.99 J**	<5.0 L	<1	<2	<0.5	<0.8
Arsenic	10	MCL		**52.5 L**	**2 J**	**2.24 J**	**12.1**	**11.4**	**8.6 K**	**5.4**	**0.98 J**	**1.4 J**	<0.4
Cadmium	5	MCLG		<0.9	<5	< 5	<0.10	<0.10	<1.0	<0.1	<1	<0.4	<0.1
Chromium	100	MCLG		<1.6	<5	< 5	**0.79 B**	**0.51 B**	**1.1 L**	<1	<4	<0.5	<0.5
Cobalt	11	RBC		<7.1	---	---	<1.0 L	<1.0	<5.0 L	<1	<1	<0.5	<0.1
Iron	26,000	RBC		**94.3 JB**	---	---	<50.0	<50.0 L	<50.0	<10	**239**	**275**	**339**
Lead	15	AL		<9.8	<3 J	< 3 J	<1.0	<1.0	<5.0 L	<1	<2	<0.2	**0.687 J**
Manganese	880	RBC		**65.3**	---	---	**112**	**111**	**82.0**	**92.9**	**363**	**199**	**284**
Mercury (total)[2]	2	MCLG		<0.048	---	< 0.20	<0.20	<0.20	<1.6	<0.2	<0.2	<0.1	<0.1
Nickel	730	RBC		<8.4	**1.93 J**	**2.15 J**	<5.0 R	<5.0 R	<5.0	<1	<4	**0.605 J**	<0.5
Vanadium	260	RBC		<2.6	<10	< 10	<5.0 L	<5.0 L	**0.82 J**	<1	**0.27 J**	<1.69	<0.7
Zinc	11,000	RBC		<8.6	<10	< 20	**1.5 B**	**0.83 B**	**2.4 J**	<5	<30	<10	<5.2
Cyanide (free)[3]	200	MCLG		<4	---	---	<100	<100	<100	<100	<6 J	**0.703 J**	<1.54
Field Parameters													
Temperature (°C)		---		14.00	14.22	---	16.92	---	15.58	23.96	19.27	18.19	20.72
Conductivity (mS/cm)		---		1.73	0.587	---	0.819	---	0.660	0.76	0.8	0.55809	0.57604
pH (s.u.)		---		7.54	7.32	---	7.79	---	7.82	7.77	7.83	7.97	7.34
ORP (mV)		---		-202	-325.3	---	-345.2	---	-264.0	-297.3	-226.2	-265	-287.8
Turbidity (NTU)		---		2.1	0.0	---	0.0	---	0.0	2.83	24.5	21.98	1.63
Dissolved Oxygen (mg/L)		---		1.1	0.18	---	0.27	---	0.09	1.01	0.28	0.03	0.25

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Table D-1

OU-7 Historical Groundwater Sampling Results Summary
Avtex Fibers Superfund Site
Front Royal, Virginia

Parameter	Groundwater Cleanup Standards[1] (µg/L)		Well ID	185	185	185	185	185	185	185	185	203	203
			Well Type	S BMW	S BMW	S BMW	S BMW	S BMW	S BMW	S BMW	S BMW	I BMW	I BMW
			Date	5/29/1987	8/15/1987	7/25/2000	7/23/2013	6/28/2014	7/13/2015	7/28/2016	7/18/2017	2/2/1994	4/12/1994
OU-7 COPC Volatile Organics (µg/L)													
Acetone	22,000	RBC		---	---	<6	<25.0	<25	<20	<2.66	<2.66	**2 B**	<10
Carbon disulfide	1,000	RBC		<5	---	<1	**3.6**	<10	<5	<0.22	<0.22	**11 J**	**190**
OU-7 COPC Semivolatile Organics (µg/L)													
Bis(2-ethylhexyl)phthalate	6	MCL		---	---	<2	<6.0	<6	<5	<5.77	<1.44	**12 B**	**4 J**
Naphthalene	14	RBC		---	---	<1	<10.0	<10	<0.5	<0.356	<0.356	<10	<10
Pentachlorophenol	1	MCL		---	---	<3	<25.0	<25	<5	<1.63 J	<3.17	<25	<25
o-Cresol/2-Methylphenol	1,800	RBC		---	---	<1	<10.0	<10	<1	<2.21	<1.54	<10	<10
3&4-Methylphenol/4-methylphenol	180	RBC		---	---	<3	<10.0	<10	<1	<2.12	<1.35	<10	<10
Phenol	11,000	RBC		---	---	<1	<10.0	<10	<1	<1.44	<1.44	**28**	<10
OU-7 COPC Inorganics, Dissolved (µg/L)													
Aluminum	37,000	RBC		---	---	<19	<100	<10	<200	<9.6	<8.4	**115 B**	**26.2 B**
Antimony	6	MCLG		---	---	**0.99 J**	<5.0 L	<1	<2	<0.5	<0.8	<19.3	<20.6
Arsenic	10	MCL		<3	<4	**2.3 J, K, B**	<10.0	<1	<4	**0.695 J**	<0.4	**2 B**	<1.5
Cadmium	5	MCLG		<1	<10	<0.9	<1.0	<0.1	<1	<0.4	<0.1	<1.8	<3
Chromium	100	MCLG		---	---	<1.6	<5.0 L	<1	<4	<0.5	<0.5	**11.9 B**	<5.8
Cobalt	11	RBC		---	---	<7.1	<5.0 L	<1	**0.12 J**	<0.5	<0.1	<4.6	<4
Iron	26,000	RBC		**1200**	310	**791 J, K**	**59.1 K**	**150**	**1530**	**247**	**39**	**16,900**	**2,160 J**
Lead	15	AL		<13	<6	<9.8	<5.0 L	<1	<2	<0.2	<0.1	**3.5 L**	<0.29 L
Manganese	880	RBC		**180**	**130**	**101**	**32.6**	**30.5**	**183**	**17.7**	**287**	**679**	**375**
Mercury (total)[2]	2	MCLG		---	---	<0.048 L	<0.20	<0.2	<0.2	<0.1	<0.1	<0.066	<0.008 L
Nickel	730	RBC		---	---	<8.4	<5.0	<1	**1.4 J**	**2.13**	**2.25**	**16.3 B**	<5.8
Vanadium	260	RBC		---	---	<2.6	**0.94 J**	<1	<1	<1.51	<0.7	<4.4	<5
Zinc	11,000	RBC		<20	<40	<8.6	**2.1 J**	<5	<30	**75.5**	**47.9**	**442 J**	**24.7 B**
Cyanide (free)[3]	200	MCLG		---	---	<4	<100	<100	<6 J	<0.608	<1.54	<2.5	<2.5
Field Parameters													
Temperature (°C)		---		---	---	---	16.02	19.73	16.69	21.62	16.92	2.00	15
Conductivity (mS/cm)		---		---	---	---	0.468	0.43	0.4	0.39894	0.46748	0.8	1
pH (s.u.)		---		---	---	---	6.95	6.58	6.84	6.94	6.14	8.0	7.4
ORP (mV)		---		---	---	---	63.8	27.1	-62.1	80.3	28.9	---	---
Turbidity (NTU)		---		---	---	---	38.9	161.0	141.7	24.8	9.48	---	---
Dissolved Oxygen (mg/L)		---		---	---	---	0.81	4.46	0.52	1	0.68	---	---

NOTES: See page 64 of 64.

Table D-1

OU-7 Historical Groundwater Sampling Results Summary
Avtex Fibers Superfund Site
Front Royal, Virginia

Parameter	Groundwater Cleanup Standards[1] (µg/L)		Well ID	203	203	203	203	203	203	203	205	205	205
			Well Type	I BMW	I BMW	I BMW	I BMW	I BMW	I BMW	I BMW	I BMW	I BMW	I BMW
			Date	8/1/2000	6/29/2012	7/9/2013	6/29/2014	7/26/2015	8/2/2016	7/25/2017	2/10/1994	4/14/1994	8/3/2000
OU-7 COPC Volatile Organics (µg/L)													
Acetone	22,000	RBC		<6	<25.0	<25.0	<25	<20	<2.66	<2.66	<1,000	<25,000	**1,200 J**
Carbon disulfide	1,000	RBC		<1	<2.0	**1.6 J**	<10	<5	<0.22	<0.22	**420,000**	**290,000**	**25,000**
OU-7 COPC Semivolatile Organics (µg/L)													
Bis(2-ethylhexyl)phthalate	6	MCL		<2	<6.0	<6.7	<6	<5	<5.77	<1.44	**280 B**	**30 B**	<2
Naphthalene	14	RBC		<0.89	<10.0	<11.1	<10	<0.5	<0.356	<0.356	<100	<50	<1
Pentachlorophenol	1	MCL		<3	<1.1	<27.8	<25	<5	<1.63	<3.17	<250	<120	<3
o-Cresol/2-Methylphenol	1,800	RBC		<0.89	<10.0	<11.1	<10	<1	<2.21	<1.54	**23 J**	**14 J**	**2 J**
3&4-Methylphenol/4-methylphenol	180	RBC		<3	<10.0	<11.1	<10	<1	<2.12	<1.35	**36 J**	**18 J**	<3
Phenol	11,000	RBC		<0.89	<10.0	<11.1	<10	<1	<1.44	<1.44	**9,500**	**6,600**	**470**
OU-7 COPC Inorganics, Dissolved (µg/L)													
Aluminum	37,000	RBC		**44.9 JB**	<100	<100	<10	<200	<9.6	<8.4	<22.1	**33.2**	<19
Antimony	6	MCLG		<0.76	<1.0	<5.0	<1	<2	<0.792	<0.8	**511**	**399**	**332 KL**
Arsenic	10	MCL		<1.2 L	<1.0	<10.0	<1	<4	<0.5	<0.4	**691**	**723 J**	**610**
Cadmium	5	MCLG		<0.9	<0.10	<1.0	<0.1	<1	<0.4	<0.1	**1.4 B**	**2.5**	<0.9
Chromium	100	MCLG		<1.6	**1.2 J, L**	**1.2 J**	<1	<4	<0.5	<0.5	**67**	**67.5**	**36.3**
Cobalt	11	RBC		<7.1	<1.0	**2.3 L**	<1	<1	<0.5	<0.1	**452**	**377**	**410**
Iron	26,000	RBC		**4,750**	**6,910**	**1,010**	**100**	**4560**	**3910**	**3650**	**685 K**	**578 L**	**2,890**
Lead	15	AL		<9.8	<1.0	<5.0	<1	<2	<0.2	<0.1	<1.2 L	<1.4 L	<9.8
Manganese	880	RBC		**319**	**664**	**2,090**	**200**	**497**	**569**	**478**	**28.9**	**27.1**	**29.2**
Mercury (total)[2]	2	MCLG		<0.048 L	<0.20	<0.20	<0.2	<0.2	<0.1	<0.1	**1.3**	**2.1 L**	<48 L
Nickel	730	RBC		<8.4	<5.0	<5.0	<1	<4	<0.5	<0.5	**673**	**701**	**700**
Vanadium	260	RBC		<2.6	<5.0	<5.0	<1	<1	<0.875	<0.7	**81.3**	**80.2**	**34.3**
Zinc	11,000	RBC		<8.6	**3.7 J, K**	**13.4**	<5	<30	<10	<5.2	**557 J**	**753 J**	**715**
Cyanide (free)[3]	200	MCLG		<4	<100	<100	<100	**2.5 J**	<0.608	<1.54	**262**	**38.2**	**349**
Field Parameters													
Temperature (°C)		---		16.1	18.72	16.04	25.30	22.55	19.46	19.47	9.00	16.00	15.9
Conductivity (mS/cm)		---		1.3	1.428	2.225	0.89	1.2	1.2611	1.2483	18	23	24.1
pH (s.u.)		---		7.02	7.18	6.87	7.99	7.44	7.42	6.9	9.8	9.0	8.5
ORP (mV)		---		79	194.8	-35.0	-173.2	-119.98	-142.7	-120.5	---	---	-344
Turbidity (NTU)		---		6.0	2.8	0.7	4.33	4.15	1.98	4.09	---	---	3.2
Dissolved Oxygen (mg/L)		---		0.33	0.45	0.69	0.73	0.16	0.11	0.06	---	---	0.17

NOTES: See page 64 of 64.

Table D-1

OU-7 Historical Groundwater Sampling Results Summary
Avtex Fibers Superfund Site
Front Royal, Virginia

Parameter	Groundwater Cleanup Standards[1] (µg/L)		Well ID	205	205	205	205	205	205	205	205	206	206 (Duplicate)
			Well Type	I BMW	I BMW	I BMW	I BMW	I BMW	I BMW	I BMW	I BMW	I BMW	I BMW
			Date	11/1/2001	4/4/2008	7/11/2012	7/18/2013	7/23/2014	8/5/2015	8/10/2016	7/31/2017	10/27/2011	10/27/2011
OU-7 COPC Volatile Organics (µg/L)													
Acetone	22,000	RBC		**170**	<1,000 R	**439 J**	**362**	<25	<200	<26.6	R	**17.2**	<100
Carbon disulfide	1,000	RBC		**9,000**	**9,590 J**	**9,450**	**203**	**90.5**	**1300**	**136**	**35.2**	**7250 K**	**14200 K**
OU-7 COPC Semivolatile Organics (µg/L)													
Bis(2-ethylhexyl)phthalate	6	MCL		---	<5.1	**1.4 J**	<30.0 L	<60	<5	<1.5	<7.35	**5.01 B**	**6.16 B**
Naphthalene	14	RBC		---	<5.1	<10.0	<50.0 L	<100	<0.5	<0.37	<1.81	<5	<5.1
Pentachlorophenol	1	MCL		---	<10.1	<1.1	<125	<250	<5	<3.3	<16.2 J	<10	<10.1
o-Cresol/2-Methylphenol	1,800	RBC		---	<5.1	<10.0	<50.0	<100	**2**	<1.6	<7.84	<5	<5.1
3&4-Methylphenol/4-methylphenol	180	RBC		---	<5.1	<10.0	<50.0	<100	**2**	<1.4	<6.86	<5	<5.1
Phenol	11,000	RBC		---	**95.9**	**132**	<50.0	<100	**64**	<1.5	<7.35	<5	<5.1
OU-7 COPC Inorganics, Dissolved (µg/L)													
Aluminum	37,000	RBC		<31.9	---	<500 L	<100	<10	**29.3 J**	<96	<8.4	<100	<100
Antimony	6	MCLG		**295**	**536 J**	**497**	**222**	**384**	**225**	**7.78 J**	**1.53 J**	**17.0**	**32.8**
Arsenic	10	MCL		**837**	**872 J**	**884**	**550**	**653**	**509**	**87.7**	**19.7 J**	**69.3 J**	**158 J**
Cadmium	5	MCLG		<0.64	**9.62 J**	<1.0	**3.4**	<0.1	<1	<4	<0.1 J	<5 J	<2.5 J
Chromium	100	MCLG		**54.9**	**23.7 J**	**26.4**	**72.6**	**61**	**42.9**	<5	**1.36 J**	<20	<20
Cobalt	11	RBC		**313**	---	**242**	**150**	**161**	**96.9**	**7.96 J**	**2.26 J**	**42.9**	**53.3**
Iron	26,000	RBC		**284**	---	<250	**288**	**1290**	**1920**	<200	<10	**202**	**259**
Lead	15	AL		**3.7**	**5.75 J**	<10.0	<5.0 L	<1 J	<2	<2	<0.1 J	<25	<5
Manganese	880	RBC		**38.3**	---	**92.5**	**127**	**190**	**197**	**219**	**84.4**	**29.9**	**29.9**
Mercury (total)[2]	2	MCLG		**0.608**	<0.2 J	<3.2	<0.20	<0.2 J	<0.2 J-	<0.1	<0.1	**0.137 J**	**0.257**
Nickel	730	RBC		**743**	**479 J**	**217**	**286**	**252**	**182**	**32.5**	**11.7 J**	**52.2**	**53.3**
Vanadium	260	RBC		**37.1**	**11.7 J**	**1.8 J**	**8.7**	**9**	**7.5**	<7	<0.7	**26.2**	**25**
Zinc	11,000	RBC		**867**	**171**	**106**	**83.6**	**51**	**66.7**	<100	<5.2 J	<20	<20
Cyanide (free)[3]	200	MCLG		---	---	**3,020**	**2,860**	**1370**	<300 J	**0.973 J**	<1.54	---	---
Field Parameters													
Temperature (°C)		---		20.35	16.02	18.92	18.38	35.63	19.68	26.7	20.2	14.72	---
Conductivity (mS/cm)		---		39.4	16.82	18.880	14.790	14.96	10.8	3.988	3.9436	5,045	---
pH (s.u.)		---		9.22	8.54	8.68	9.37	9.61	9.50	9.72	9.78	7.32	---
ORP (mV)		---		-538	-446.2	-499.9	-451.3	-402.33	-443.4	-407.4	-389.6	-403.4	---
Turbidity (NTU)		---		335	438.1	14.4	3.7	31.30	18.50	13	11.3	100.7	---
Dissolved Oxygen (mg/L)		---		0.69	0.0	0.23	0.30	-0.09	0.00	-0.01	0.11	4.01	---

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Table D-1

OU-7 Historical Groundwater Sampling Results Summary
Avtex Fibers Superfund Site
Front Royal, Virginia

Parameter	Groundwater Cleanup Standards[1] (µg/L)		Well ID	206	206	206	206	206	206	210	210	210	210
			Well Type	I BMW	I BMW	I BMW	I BMW	I BMW	I BMW	I BMW	I BMW	I BMW	I BMW
			Date	6/26/2012	7/15/2013	6/30/2014	7/14/2015	7/19/2016	7/13/2017 & 7/19/2017	2/8/1994	4/11/1994	8/2/2000	7/3/2012
OU-7 COPC Volatile Organics (µg/L)													
Acetone	22,000	RBC		**6.3 J, B**	<25.0	<250	<20	<2.66	<8.46	**8 J**	<10	<6	**4.8 B**
Carbon disulfide	1,000	RBC		**11,600**	**12,000 L**	**8100**	**7500**	**3530**	**2390**	**1 J**	<10	**1 J**	<2.0
OU-7 COPC Semivolatile Organics (µg/L)													
Bis(2-ethylhexyl)phthalate	6	MCL		<6.0	<6.0	<6	<5	<5.77	<4.07	**25 B**	**9 B**	<2	<6.0
Naphthalene	14	RBC		<10.0	<10.0	<10	<0.5	<0.356	<0.370	<10	<10	<0.89	<10.0
Pentachlorophenol	1	MCL		<15.2	<25.0	<25	<5	<1.63	<3.30 J	<25	<25	<3	<0.94
o-Cresol/2-Methylphenol	1,800	RBC		<10.0	<10.0	<10	<1	<2.21	<1.60	<10	<10	<0.89	<10.0
3&4-Methylphenol/4-methylphenol	180	RBC		<10.0	<10.0	<10	<1	<2.12	<1.40	**3 J**	**2 J**	<3	<10.0
Phenol	11,000	RBC		<10.0	<10.0	<10	<1	<1.44	<1.50	**4 J**	**2 J**	<0.89	<10.0
OU-7 COPC Inorganics, Dissolved (µg/L)													
Aluminum	37,000	RBC		**34.0 J**	<100	<10	**49.3 J**	<9.6	<42	**33.6 B**	<17	<19	**35.3 J**
Antimony	6	MCLG		**39.7**	**14.1**	**29.5**	**23.1**	<4.87	<4	<11.8	<20.6	<0.76	<1.0
Arsenic	10	MCL		**130**	**103**	**153**	**121**	**31.0**	**21.6**	<1.1	<1.5 L	<1.2	<1.0
Cadmium	5	MCLG		**0.055 J**	<1.0 L	<0.1	<1	<0.4	<0.5	<1.2	<3	<0.9	<0.10
Chromium	100	MCLG		**5.0 L**	**2.5 J**	**3**	**2.8 J**	**1.73 J**	<2.5	<2.8	<5.8	<1.6	**1.1 B**
Cobalt	11	RBC		**45.3**	**27.5**	**32.5**	**32.4**	**4.66**	**3.12 J**	<2.2	<4	<7.1	<1.0
Iron	26,000	RBC		**16.9 J**	<50.0	**11.1**	<200	<20	<50	**163 K**	**7.4 B**	**5,510 J**	**421 L**
Lead	15	AL		<1.0	<5.0	<1	<2	<0.2	<0.5	**0.84 L**	<0.29 L	<9.8 L	<1.0
Manganese	880	RBC		**16.8**	**10.7**	**9.3**	**9.3**	**8.10**	<7.5	**64.7**	**3.8 B**	**242**	**122**
Mercury (total)[2]	2	MCLG		<0.20	<0.20	<0.2	<0.2	<0.1	<0.1	<0.066	<0.008 L	<0.048 L	<0.20
Nickel	730	RBC		**38.2**	**59.0**	**61.7**	**33.7**	**7.62**	**3.11 J**	<3.9	**7.2 B**	**10.2 J**	**2.9 L**
Vanadium	260	RBC		**10.3**	**6.7 L**	**6.6**	**10.4**	**2.92**	<3.5	<1.9	<5	<2.6	**0.47 L**
Zinc	11,000	RBC		**11.3 K**	**5.2 J**	<5	<30	<10	<26	**71.5 B**	**6.6 B**	<8.6	**2.1 B**
Cyanide (free)[3]	200	MCLG		**146 L**	**311**	**304**	**53 J**	**0.705 J**	<1.54	<2.5	<2.5	<4	<100 R
Field Parameters													
Temperature (°C)		---		16.12	16.61	20.02	24.28	17.7	19.99 (17.08)	10.00	11.00	14.2	15.18
Conductivity (mS/cm)		---		5.780	5.885	5.41	4.1	1.937	2.258 (2.8406)	1.5	1.8	2.66	2.281
pH (s.u.)		---		7.27	7.31	7.45	7.49	7.75	7.28 (7.81)	9.7	9.4	7.05	7.02
ORP (mV)		---		-407.7	-401.5	-381.78	-367.8	-410.6	-450.2 (-450.4)	---	---	-100	-124.6
Turbidity (NTU)		---		3.8	0.0	8.71	5.17	4.07	0.47 (0.34)	---	---	5.4	6.8
Dissolved Oxygen (mg/L)		---		0.39	0.35	0.14	0.14	0.02	0.11 (0.2)	---	---	0.61	1.17

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Table D-1

OU-7 Historical Groundwater Sampling Results Summary
Avtex Fibers Superfund Site
Front Royal, Virginia

Parameter	Groundwater Cleanup Standards[1] (µg/L)		Well ID	210	210	210	210	210	215	215 (Duplicate)	215	215	215
			Well Type	I BMW	I BMW	I BMW	I BMW	I BMW	I BMW	I BMW	I BMW	I BMW	I BMW
			Date	7/11/2013	7/13/2014	7/23/2015	8/2/2016	7/27/2017 & 2/1/2018	1/28/1994	1/28/1994	4/7/1994	9/13/2000	4/2/2008
OU-7 COPC Volatile Organics (µg/L)													
Acetone	22,000	RBC		<25.0	<25	<20	<2.66	<2.66	**250 B**	<100	**53**	**13 J**	**33.9 J**
Carbon disulfide	1,000	RBC		<2.0	**2 J**	<5	<0.22	<0.22	**8,600 J**	**8500 J**	**1,400**	**85**	**603**
OU-7 COPC Semivolatile Organics (µg/L)													
Bis(2-ethylhexyl)phthalate	6	MCL		**1.9 K**	<6	<5	<5.77	<1.50	**16**	**15**	**4 J**	**3 J**	<5.15
Naphthalene	14	RBC		<10.0	<10	<0.5	<0.356	<0.370	<10	<10	<10	<0.89	<5.15
Pentachlorophenol	1	MCL		<25.0	<25	<5	<1.63	<3.30	<25	<25	<25	<3	<10.3
o-Cresol/2-Methylphenol	1,800	RBC		<10.0	<10	<1	<2.21	<1.60	<10	<10	<10	<0.89	<5.15
3&4-Methylphenol/4-methylphenol	180	RBC		<10.0	<10	<1	<2.12	<1.40	**9 J**	**8 J**	**5 J**	<3	**2.9 J**
Phenol	11,000	RBC		<10.0	<10	<1	<1.44	<1.50	**200**	**180**	**56**	**3 J**	**27.1**
OU-7 COPC Inorganics, Dissolved (µg/L)													
Aluminum	37,000	RBC		**47.7 J**	**12.3**	<200	<9.6	<8.4	**125**	**43.1 B**	<19.9	**102 JB**	---
Antimony	6	MCLG		<5.0	<1	<2	<0.887	<0.8	<19.3	<19.3	<20.6	<0.76	**1.64**
Arsenic	10	MCL		<10.0	<1	<4	<0.5	<0.4	**5.8 B**	**6.2 B**	**7.6**	**3.3 JL**	**2.11 J**
Cadmium	5	MCLG		<1.0 L	<0.1	<1	<0.4	<0.1	<1.8	<1.8	<3	<0.9	<5
Chromium	100	MCLG		**0.65 J**	<1	<4	<0.5	<0.5	<6.1	<6.1	<6.1	**4.6**	<5
Cobalt	11	RBC		<5.0	<1	<1	<0.5	<0.1	**7.9**	<4.6	**6.6**	<7.1	---
Iron	26,000	RBC		**635**	**807**	<200	**247**	**497**	**145 J**	**8.5 B**	<7.9	**466 J**	---
Lead	15	AL		<5.0	<1	<2	<0.2	<0.1	**0.27 B**	<0.23 L	<0.29 L	<9.8	<3
Manganese	880	RBC		**126**	**137**	**29.1**	**110**	**134 J**	**7.4 J**	<2.4	<2.4	**8.2 J**	---
Mercury (total)[2]	2	MCLG		<0.20	<0.2	<0.2	<0.1	<0.1	**0.08**	**0.09**	**0.082 B**	<0.48	<0.2
Nickel	730	RBC		**8.0**	**3.5**	**8**	**4.59**	**8.83**	**6.1**	<5.3	<5.8	<8.4	**19.1**
Vanadium	260	RBC		**1.2 L**	<5	<1	<1.32	**0.862 J**	<4.4	<4.4	<5	<2.6	**6.06 J**
Zinc	11,000	RBC		<10.0	<5	<30	<10	<5.2	**12.1 B**	<2.4	**20 B**	<8.6	<20
Cyanide (free)[3]	200	MCLG		<100	<100	<6	**0.754 J**	<1.54	<2.5	<2.5	<7.7 L	<4	---
Field Parameters													
Temperature (°C)		---		14.60	18.29	17.61	19.27	19.88 (13.74)	27.00	27.00	12.00	16.7	14.15
Conductivity (mS/cm)		---		2.120	2.21	1.2	1.9406	2.188 (1.884)	3.1	3.1	2.2	1.37	3.901
pH (s.u.)		---		7.01	7.24	9.32	7.2	7.77 (7.28)	11.3	11.3	11.4	11.61	12.33
ORP (mV)		---		-62.8	55.14	-97.56	-233.5	-83.5 (-142.6)	---	---	---	-414 J	-343.4
Turbidity (NTU)		---		5.7	3.48	9.21	6.71	2.11 (3.18)	---	---	---	3.5	22.7
Dissolved Oxygen (mg/L)		---		0.62	0.13	0.18	0.1	0.35 (0.12)	---	---	---	0.2	0.62

NOTES: See page 64 of 64.

Table D-1

OU-7 Historical Groundwater Sampling Results Summary
Avtex Fibers Superfund Site
Front Royal, Virginia

Parameter	Groundwater Cleanup Standards[1] (µg/L)		Well ID	215	215	215	215	215	215	216	216	216	216
			Well Type	I BMW	I BMW	I BMW	I BMW	I BMW	I BMW	I BMW	I BMW	I BMW	I BMW
			Date	7/12/2012	11/18/2013	7/25/2014	7/22/2015	12/7/2016	7/18/2017 & 3/8/2018	2/16/1994	4/13/1994	8/7/2000	10/31/2001
OU-7 COPC Volatile Organics (µg/L)													
Acetone	22,000	RBC		**39.9**	<250	<500	**140**	**46.3**	**46.2 J**	<1,000	<1,000	**880 JB**	<120
Carbon disulfide	1,000	RBC		**648 J**	**1,400**	**1230**	**930**	**764**	**408**	**140,000**	**150,000 J**	**71,000**	**20,000**
OU-7 COPC Semivolatile Organics (µg/L)													
Bis(2-ethylhexyl)phthalate	6	MCL		<6.0	<6.0	<6	<5	<1440	<6.16	**35 B**	<100	<2	---
Naphthalene	14	RBC		<10.0	<10.0	<10	<0.5	<356	**0.780 J**	<50	<100	<0.89	---
Pentachlorophenol	1	MCL		<1.1	<25.0	<25	<5	<3170	<3.00	<120	<250	<3	---
o-Cresol/2-Methylphenol	1,800	RBC		<10.0	<10.0 J	<10	<1	<1540	<1.45	<50	<100	<0.89	---
3&4-Methylphenol/4-methylphenol	180	RBC		<10.0	**2.5 J**	**4 J**	**5**	<1350	**1.29 J**	**9 J**	<100	<3	---
Phenol	11,000	RBC		**19.9**	**28**	**41.9**	**48**	**9.70**	**16.9**	**810**	**900**	**150**	---
OU-7 COPC Inorganics, Dissolved (µg/L)													
Aluminum	37,000	RBC		**34.5 L**	**42.1 J**	**10.3**	<200	<8.4	**120**	**72.2 B**	**276**	**61.6 JB**	<31.9
Antimony	6	MCLG		**0.58 J**	<5.0	<1	<2	<0.8	**1.08 J**	**869**	**633**	**211 L**	<2.4
Arsenic	10	MCL		**0.69 J**	<10.0	<1	**1.1 J**	**1.12 J**	**1.12 J**	**638**	**1,070**	**362 K**	**382**
Cadmium	5	MCLG		<0.10	<1.0	<0.1	<1	<0.1	<0.1	<1.2	<1.7	<0.9	<0.64
Chromium	100	MCLG		<5.0	<5.0	<1	<4	<0.5	**6.67**	**23.9**	**15.2**	**3.8**	**3.8**
Cobalt	11	RBC		<1.0	<5.0	<1	**0.22 J**	<0.1	**0.644 J**	**261**	**148**	**80.1**	**87.8**
Iron	26,000	RBC		<50.0	<50.0	**22**	**25.7 J**	<10	**7750**	**18,300 K**	**18,500 L**	<6.7	<37.6
Lead	15	AL		<1.0	<5.0	<1	<2	<0.1	**0.337 J**	<1.2 L	**2.4 B**	<9.8 L	<1.8
Manganese	880	RBC		**0.32 J**	<5.0	<1	**1 J**	<1.5	**66.4**	**127**	**117**	**34.6**	**35.7**
Mercury (total)[2]	2	MCLG		<0.20	<0.20 L	<0.2	<0.2	<0.1	<0.1 J	<0.66	**20.6**	<4.8 L	**0.156**
Nickel	730	RBC		<5.0	<5.0	**1.2**	**1.3 J**	<0.5	**5.09**	**222**	**230**	**41.3 J**	**84.7**
Vanadium	260	RBC		<5.0	<5.0	<1	<1	<0.7	<0.7	**12.9**	**12.5 L**	<2.6	**1.8**
Zinc	11,000	RBC		**5.4 K**	**3.0 B**	<5	<30	<5.2	<5.2	**165 B**	**219 B**	**30**	**18.9**
Cyanide (free)[3]	200	MCLG		<100	<100	<100	**29**	<1540	<1.54	<2.5	**30.7 B**	**60**	---
Field Parameters													
Temperature (°C)		---		18.32	12.87	16.39	15.54	22.92	25.32 (5.87)	13.00	17.00	19.8	17.31
Conductivity (mS/cm)		---		2.352	2.723	2.39	1.8	0.45639	6.88 (0.520)	6	8.5	9.64	16.2
pH (s.u.)		---		11.90	12.27	12.31	11.78	6.91	11.15 (8.3)	8.5	9	7.66	9.22
ORP (mV)		---		-309.8	-262.0	-6.44	-158.4	68.2	-363.8 (-294.3)	---	---	-239	-511
Turbidity (NTU)		---		6.0	4.1	NR	10.4	45.68	0 (81.4)	---	---	20	232
Dissolved Oxygen (mg/L)		---		0.28	0.52	1.15	0.21	4.49	2.23 (3.14)	---	---	0.57	0.54

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Table D-1

OU-7 Historical Groundwater Sampling Results Summary
Avtex Fibers Superfund Site
Front Royal, Virginia

Parameter	Groundwater Cleanup Standards[1] (µg/L)		Well ID	216	216	216	216	216	216	232	232	232	232
			Well Type	I BMW	I BMW	I BMW	I BMW	I BMW	I BMW	I BMW	I BMW	I BMW	I BMW
			Date	7/12/2012	7/18/2013	7/11/2014	7/27/2015	7/19/2016	7/15/2017	7/17/2000	8/2/2000	7/2/2012	7/15/2013
OU-7 COPC Volatile Organics (µg/L)													
Acetone	22,000	RBC		<250	<25.0	**18.8 J**	<20	<13.3	<26.6	120	<6	**7.6 J, B**	<25.0
Carbon disulfide	1,000	RBC		**2,960 J**	**5,320**	**3950**	**1000**	**364**	**352**	**6,600**	**2 J**	<2.0	<2.0
OU-7 COPC Semivolatile Organics (µg/L)													
Bis(2-ethylhexyl)phthalate	6	MCL		<6.0	**1.3 J**	<7.5	<5	<5.88	<8.14	<2 L	**3 J**	<6.0	<6.0
Naphthalene	14	RBC		<10.0	<10.0	<12.5	<0.5	<0.363	<1.85	<1 L	<0.9	<10.0	<10.0
Pentachlorophenol	1	MCL		<1.1	<25.0	<31.2	<5	<1.67	<16.5	<3	<3	<1.0	<25.0
o-Cresol/2-Methylphenol	1,800	RBC		<10.0	<10.0	<12.5	<1	<2.25	<8.00	<1	<0.9	<10.0	<10.0
3&4-Methylphenol/4-methylphenol	180	RBC		<10.0	<10.0	<12.5	<1	<2.16	<7.00	<3	<3	<10.0	<10.0
Phenol	11,000	RBC		<10.0	<10.0	<12.5	<1	<1.47	<7.50	**9 J**	<0.9	<10.0	<10.0
OU-7 COPC Inorganics, Dissolved (µg/L)													
Aluminum	37,000	RBC		<100 L	**42.1 J**	<100	**31.4 J**	**183**	**13.5 J**	**159 J, B**	<19	**29.8 J**	**40.7 J**
Antimony	6	MCLG		**254**	**31.1**	**57.6**	**39.1**	<7.42	**16.6**	**162 K**	<0.76	<1.0	**3.7 B**
Arsenic	10	MCL		**445**	**134**	**153**	**199**	**197**	**215**	**1320**	<1.2	**2.4**	**6.5 K**
Cadmium	5	MCLG		**0.11**	**0.85 L**	<1	<1	<2	<0.1	<0.9	<0.9	<0.10	<1.0 L
Chromium	100	MCLG		**58.1**	**27.3**	**14.4**	**7.2**	**6.9 J**	**10.4**	<1.6	<1.6	**3.1 J, L**	**0.54 J**
Cobalt	11	RBC		**158**	**76.5**	**60.9**	**72.4**	**98.4**	**104**	**109**	<7.1	**0.87 J**	<5.0
Iron	26,000	RBC		**577**	**117**	**408**	**87.8 J**	<100	<20.5	**205**	**2,760 J**	**21,400**	**23,400**
Lead	15	AL		<1.0	<5.0 L	<5	<2	<1	<0.1	<9.8	<9.8 L	<1.0	<5.0
Manganese	880	RBC		**114**	**136**	**97.4**	**74.6**	**129**	**106**	**252**	**727**	**372**	**303**
Mercury (total)[2]	2	MCLG		<0.20	<0.20	<0.2	<0.2	<1	<0.1	<0.48	<0.048 L	<0.20	<0.20
Nickel	730	RBC		**300**	**238**	**169**	**188**	**331**	**355**	**30.9 J**	**11.9 J**	<5.0	<5.0
Vanadium	260	RBC		**13.7**	**6.9**	**4 J**	**2.8**	**7.11 J**	**9.36**	**11.9 J**	<2.6	<5.0	**0.71 J**
Zinc	11,000	RBC		**347**	**107 L**	**59.4**	**44.1**	**61.1 J**	**10.9 J**	**32.3**	<8.6	**2.5 J, K**	<10.0
Cyanide (free)[3]	200	MCLG		**1,490**	**730 L**	**596**	**28**	<0.608 J	<1.54	**48**	<20	<100	<100
Field Parameters													
Temperature (°C)		---		21.19	20.57	24.19	25.91	27.57	27.9	---	21.7	19.14	18.41
Conductivity (mS/cm)		---		12.420	9.146	7.60	7.3	7.6896	8.1328	---	5.61	5.20	4.502
pH (s.u.)		---		9.81	9.46	9.88	9.95	9.72	9.06	---	6.63	7.00	7.28
ORP (mV)		---		-468.7	-432.1	-369.20	-259.5	-372	-449.2	---	131	-150.5	-187.6
Turbidity (NTU)		---		9.9	19.7	161.00	18.50	21.6	25.07	---	444	0.0	3.8
Dissolved Oxygen (mg/L)		---		0.19	0.10	0.00	0.02	0.31	0.02	---	1.8	0.30	0.38

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Table D-1

OU-7 Historical Groundwater Sampling Results Summary
Avtex Fibers Superfund Site
Front Royal, Virginia

Parameter	Groundwater Cleanup Standards[1] (µg/L)		Well ID	232	232	232	232	238	238	238	238	238	238
			Well Type	I BMW	I BMW	I BMW	I BMW	I BMW	I BMW	I BMW	I BMW	I BMW	I BMW
			Date	7/22/2014	7/25/2015	7/29/2016	7/27/2017 & 8/10/2017	7/12/2012	7/17/2013	7/15/2014	8/4/2015	7/31/2016	7/30/2017 & 8/9/2017
OU-7 COPC Volatile Organics (µg/L)													
Acetone	22,000	RBC		<25	<20	<2.66	**8.65**	**5.5 J**	**63** B	<125	**16 J**	<2.66	<2.66
Carbon disulfide	1,000	RBC		<10	**5**	**0.503**	**0.815**	**145 J**	**577**	**503**	**290**	**173**	**90.7**
OU-7 COPC Semivolatile Organics (µg/L)													
Bis(2-ethylhexyl)phthalate	6	MCL		<6	<5	<6	<2.10	<6.0	<6.0	<6	<5	<5.88	<6.47
Naphthalene	14	RBC		<10	<0.5	<0.37	<0.356	<10.0	<10.0	<10	<0.5	<0.363	<1.59
Pentachlorophenol	1	MCL		<25	<5	<1.7	<3.17	<1.1	<25.0	<25	<5	<1.67	<14.2
o-Cresol/2-Methylphenol	1,800	RBC		<10	<1	<2.3	<1.54	<10.0	<10.0	<10	<1	<2.25	<6.90
3&4-Methylphenol/4-methylphenol	180	RBC		<10	<1	<2.2	<1.35	<10.0	<10.0	<10	<1	<2.16	<6.03
Phenol	11,000	RBC		<10	<1	<1.5	<1.44	<10.0	<10.0	<10	<1	<1.47	<6.47
OU-7 COPC Inorganics, Dissolved (µg/L)													
Aluminum	37,000	RBC		**112**	<200	<9.6	<8.4	<100 L	**74.6 L**	**16.3**	<200	<10.5	<8.4
Antimony	6	MCLG		<5	<2	<0.5	<0.8	**55.2**	**31.6**	**22.8**	**28.6**	**34.8**	**15.2**
Arsenic	10	MCL		<5	**1.2 J**	**1.91 J**	**3.35**	**278**	**179**	**128**	**154**	**150**	**96.6**
Cadmium	5	MCLG		<0.5	<1	<0.4	<0.1	<0.10	<1.0	<0.1	<1	<0.4	<0.1
Chromium	100	MCLG		<5	<4	<0.5	**8.58**	**4.2 J**	**1.3 J**	<1	**0.96 J**	<1.11	**2.19**
Cobalt	11	RBC		<5	**0.68 J**	**0.714 J**	**0.703 J**	**62.8**	**12.5**	**8.3**	**9.4**	**8.03**	**4.49**
Iron	26,000	RBC		**15500**	**255**	**4770**	**4570**	**91.0**	<50.0	**21**	**50.4 J**	<20	**61**
Lead	15	AL		<1	<2	<0.202	<0.1	<1.0	<5.0 L	<1	<2	<0.2	<0.1
Manganese	880	RBC		**127**	**67.7**	**114**	**108**	**36.4**	**26.8**	**24.3**	**26.4**	**17.2**	**9.9**
Mercury (total)[2]	2	MCLG		<0.2 J	<0.2	<0.1	<0.1	<0.20	<0.20	<0.2	<0.2 J-	<0.1	<0.1
Nickel	730	RBC		<5	**1.5 J**	<1.44	**2.01**	**119**	**25.0**	**16.4**	**18.7**	<7.61	**3.35**
Vanadium	260	RBC		<5	<1	<2.26	<0.7	**19.2**	**4.4 J**	**3.2**	**6.2**	<8.43	<0.7
Zinc	11,000	RBC		<25	**8.3 J**	<16.9	**12.9 J**	**16.8 K**	**2.5 J**	<5	<30	<10	<5.2
Cyanide (free)[3]	200	MCLG		<100	**2.3 J**	<0.608	<1.54	**190**	**84.3 J**	**135**	<300 J	<0.608	<1.54
Field Parameters													
Temperature (°C)		---		30.29	18.73	25.06	(22.4)	23.09	18.34	25.52	21.40	22.71	(27.25)
Conductivity (mS/cm)		---		3.88	4.2	3.8502	(3.897)	6.086	3.066	3.08	3.0	3.0626	(2.504)
pH (s.u.)		---		7.41	7.51	8	(7.99)	7.71	7.24	7.35	7.33	7.51	(7.17)
ORP (mV)		---		-172.69	100.02	-203.5	(-156.9)	-413.2	-388.7	-358.71	-385.05	-394.9	(-430.5)
Turbidity (NTU)		---		21.40	58.60	4.97	(21.7)	0.0	2.2	1.79	1.50	2.26	(3.66)
Dissolved Oxygen (mg/L)		---		5.23	0.19	0.05	(0.28)	0.27	0.17	0.19	0.07	0.13	(0.1)

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Table D-1

OU-7 Historical Groundwater Sampling Results Summary
Avtex Fibers Superfund Site
Front Royal, Virginia

Parameter	Groundwater Cleanup Standards[1] (µg/L)		Well ID	301	301	301	301	301	301	301	301	301	305
			Well Type	D BMW	D BMW	D BMW	D BMW	D BMW	D BMW	D BMW	D BMW	D BMW	D BMW
			Date	1/25/1994	4/5/1994	8/1/2000	6/25/2012	7/10/2013	7/23/2014	7/22/2015	7/29/2016	7/25/2017	2/17/1994
OU-7 COPC Volatile Organics (µg/L)													
Acetone	22,000	RBC		**10 B**	<10	<6	**3.5 J, B**	<25.0	<25	<20	<2.66	<2.66	<5,000
Carbon disulfide	1,000	RBC		<10	**2 J**	<1	<2.0	<2.0	<10	<5	**0.4 J**	<0.22	**240,000 J**
OU-7 COPC Semivolatile Organics (µg/L)													
Bis(2-ethylhexyl)phthalate	6	MCL		**8 B**	**6 J**	<2	<6.0	<6.0	<6 J	<5	<5.88	<1.44	<100
Naphthalene	14	RBC		<10	<10	<1	<10.0	<10.0	<10 J	**0.6**	<0.363	<0.356	<100
Pentachlorophenol	1	MCL		<25	<25	<3	<1.1	<25.0	<25 J	<5	<1.67	<3.17	<250
o-Cresol/2-Methylphenol	1,800	RBC		<10	<10	<1	<10.0	<10.0	<10 J	<1	<2.25	<1.54	<100
3&4-Methylphenol/4-methylphenol	180	RBC		<10	<10	<3	<10.0	<10.0	<10 J	<1	<2.16	<1.35	<100
Phenol	11,000	RBC		<10	<10	<1	<10.0	<10.0	<10 J	<1	<1.47	<1.44	**590**
OU-7 COPC Inorganics, Dissolved (µg/L)													
Aluminum	37,000	RBC		**124**	<19.9	**58.4 JB**	<100	<100 L	<10	<200	<10.6	<8.4	**46 B**
Antimony	6	MCLG		<19.3	<19.3	<0.67	<1.0	<5.0	<1	<2	<0.5	<0.8	**526**
Arsenic	10	MCL		<1.1	<1.5 L	<1.2 L	<1.0	<10.0	<1	<4	**0.588 J**	<0.4	**1,840**
Cadmium	5	MCLG		<1.8	<1.8	<0.9	<0.10	<1.0	<0.1	<1	<0.4	<0.1	<1.2
Chromium	100	MCLG		**12.4**	<6.1	<1.6	**0.89 J, L**	**0.50 J**	<1	<4	<0.5	**6.17**	**26.8**
Cobalt	11	RBC		<4.6	<4.6	<7.1	<1.0	**1.6 L**	<1	<1	<0.5	**0.285 J**	**285**
Iron	26,000	RBC		**172 B**	**9.3 B**	**1,240**	**1,830**	**619**	**1210**	**561**	**204**	**1140**	**607 K**
Lead	15	AL		**0.28 B**	<0.23 L	<9.8	<1.0	<5.0	<1	<2	<0.206	<0.1	<0.23 L
Manganese	880	RBC		**47.8**	**49.4**	**22.6**	**53.7**	**25.1**	**25.9**	**13.6**	**23.9**	**24.5**	**68.9**
Mercury (total)[2]	2	MCLG		**0.07 B**	**0.077 B**	<0.48	<0.20	<0.20	<0.2	<0.2	<0.1	<0.1	<0.66
Nickel	730	RBC		<5.3	<5.3	<8.4	<5.0	<5.0	<1	<4	<0.5	**13.3**	**403**
Vanadium	260	RBC		<4.4	<4.4	<2.6	<5.0	<5.0	<1	<1	<2	<0.7	**22.2**
Zinc	11,000	RBC		**6 B**	**8.2 B**	<8.6	**3.4 J, K**	**2.0 B**	<5	<30	<10	<5.2	**464 J**
Cyanide (free)[3]	200	MCLG		<2.5	<2.5	<4	<100	<100	<100	<6	<0.608	<1.54	**4,840**
Field Parameters													
Temperature (°C)		---		13.00	17.00	16.2	21.05	18.05	24.96	18.34	21.34	19.37	13.00
Conductivity (mS/cm)		---		0.33	0.36	0.553	0.567	0.594	0.45	0.5	0.462	0.57607	14
pH (s.u.)		---		7.8	8.6	7.75	7.80	8.05	8.26	7.71	8.83	7.83	8.9
ORP (mV)		---		---	---	10	-245.5	-226.5	-163.09	-123.95	-208.3	-181.6	---
Turbidity (NTU)		---		---	---	11.0	0.0	8.3	14.10	1.69	5.94	0.25	---
Dissolved Oxygen (mg/L)		---		---	---	1.1	0.22	0.23	0.27	0.13	4.17	0.19	---

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Table D-1

OU-7 Historical Groundwater Sampling Results Summary
Avtex Fibers Superfund Site
Front Royal, Virginia

Parameter	Groundwater Cleanup Standards[1] (µg/L)		Well ID	305	305	305	305	305	305	305	305	305	306
			Well Type	D BMW	D BMW	D BMW	D BMW	D BMW	D BMW	D BMW	D BMW	D BMW	D BMW
			Date	4/6/1994	8/3/2000	4/7/2008	7/2/2012	7/24/2013	7/25/2014	7/28/2015	7/20/2016	8/8/2017	5/10/2011
OU-7 COPC Volatile Organics (µg/L)													
Acetone	22,000	RBC		<1,000	**1,300 J**	<10 R	**1,340**	<5000	<10000	**700**	**1030**	**1590 J**	<10 J
Carbon disulfide	1,000	RBC		**390,000**	**5,400**	**7.8 J**	**39,600**	**39,900**	**41100**	**28000**	**34700**	**44300**	<1
OU-7 COPC Semivolatile Organics (µg/L)													
Bis(2-ethylhexyl)phthalate	6	MCL		<50	<2 L	<5.1	<12.0	<60.0	<60	<5	<5.77	<15.0	**3.35 J**
Naphthalene	14	RBC		<50	<1 L	<5.1	<20.0	<100	<100	**12**	**3.97**	<3.70	<5.1
Pentachlorophenol	1	MCL		<120	<3	<10.2	<1.0	<250	<250	<5	<1.63	<33.0 J	<10.2
o-Cresol/2-Methylphenol	1,800	RBC		<50	**2 J**	<5.1	<20.0	<100	<100	**6**	<2.21	<16.0	<5.1
3&4-Methylphenol/4-methylphenol	180	RBC		<50	**7 J**	<5.1	<20.0	<100	<100	**4**	<2.12	<14.0	<5.1
Phenol	11,000	RBC		**1,200**	**920**	<5.1	**44.2**	**44.1 B**	**19.9 J**	**240**	**79.3**	**89.5 J**	<5.1
OU-7 COPC Inorganics, Dissolved (µg/L)													
Aluminum	37,000	RBC		**21.1 B**	<19	---	<500	<100	<500	<200	**77.1 J**	<8.4	<100
Antimony	6	MCLG		**445**	**312 L**	**500 J**	**550**	**319**	**1100**	**685**	**807 J**	**616**	<5
Arsenic	10	MCL		**1,260**	**972**	**1,580 J**	**2,300**	**1,560**	**1720**	**3010**	**3510**	**3740**	<5
Cadmium	5	MCLG		<1.8	<0.9	**19.2 J**	<1.0	**11.5**	<5	<1	<2	<0.1	<0.5
Chromium	100	MCLG		**24 B**	**24.5**	**25.5 J**	**12.3 J, L**	**6.6 L**	<50	**12.6**	**5.58 J**	**16.9**	<20
Cobalt	11	RBC		**292**	**467**	---	**222**	**122**	**146**	**171**	**165**	**178**	<5
Iron	26,000	RBC		**983**	**598**	---	474	**419**	<500	**380**	**478**	**78.2**	**564**
Lead	15	AL		<0.23 L	<9.8	**5.59 J**	<10.0	<5.0 L	<50	**0.27 J**	<1	<0.1	<5
Manganese	880	RBC		**58.8**	**116**	---	**72.0**	**72.8**	<50	**54.2**	**56.8**	**41.5**	**144**
Mercury (total)[2]	2	MCLG		**2.6**	<48 L	<0.2 J	<0.80	<0.20	<2	<1	<1	<1	<0.2
Nickel	730	RBC		**458**	**626**	**304 J**	**116**	**112**	**256**	**102**	**69.4**	**75**	<39.9
Vanadium	260	RBC		**23.9**	**16.7 J**	<0.1 J	<25.0	**2.8 J**	<50	**3.2**	<3.5	<0.7	<1
Zinc	11,000	RBC		**460**	**446**	**149 J**	**104**	**83.2**	<250	**59.5**	**71.7 J**	**36.9**	**353**
Cyanide (free)[3]	200	MCLG		**1,129**	**69.3**	---	**3,290**	**6,700**	**4480**	<1200	<0.608 J	<1.54	---
Field Parameters													
Temperature (°C)		---		16.00	17.4	15.58	24.50	20.96	18.49	20.03	21.76	18.16	---
Conductivity (mS/cm)		---		17	21.4	15.89	14.99	11.98	14.47	17.0	16.208	15.413	---
pH (s.u.)		---		9.6	9.28	10.02	9.40	9.59	10.03	9.42	8.76	9.06	---
ORP (mV)		---		---	30	-523.3	-538.4	-523.7	-346.94	-484.4	-461.2	-506.9	---
Turbidity (NTU)		---		---	19.6	52.4	41.8	102.7	NR	53.2	325	23.1	---
Dissolved Oxygen (mg/L)		---		---	0.13	0.0	0.17	0.11	0.00	0.10	0.01	0.09	---

NOTES: See page 64 of 64.

Table D-1

OU-7 Historical Groundwater Sampling Results Summary
Avtex Fibers Superfund Site
Front Royal, Virginia

Parameter	Groundwater Cleanup Standards[1] (µg/L)		Well ID	306	306	306	306	306	306	306	316	316	316
			Well Type	D BMW	D BMW	D BMW	D BMW	D BMW	D BMW	D BMW	D BMW	D BMW	D BMW
			Date	10/27/2011	9/7/2012	11/18/2013	7/25/2014	11/10/2015	12/6/2016	12/20/2017	2/10/1994	4/13/1994	8/7/2000
OU-7 COPC Volatile Organics (µg/L)													
Acetone	22,000	RBC		**93.9 J**	**48.8 B**	<50.0	<62.5	<20	<2.66	**6.79 J**	<1,000	<10,000	**680 J, B**
Carbon disulfide	1,000	RBC		**8570 K**	**1,640**	**368**	**196**	**25**	**19.9**	**10.5**	**360,000**	**140,000**	**30,000**
OU-7 COPC Semivolatile Organics (µg/L)													
Bis(2-ethylhexyl)phthalate	6	MCL		**17.6 B**	<6.0	<6.0	<6	<5	<1440	<1.47	**87 B**	**26 B**	<2
Naphthalene	14	RBC		<5.1	<10.0	<10.0	<10	**0.8**	**0.482 J**	<0.363	<100	<50	<1
Pentachlorophenol	1	MCL		<10.2	<25.0	<25.0	<25	<5	<3170	<3.24	<250	<120	<3
o-Cresol/2-Methylphenol	1,800	RBC		<5.1	<10.0	<10.0	<10	<1	<1540	<1.57	<100	**7 J**	**3 J**
3&4-Methylphenol/4-methylphenol	180	RBC		<5.1	<10.0	<10.0	<10	<1	<1350	<1.37	**51 J**	<50	**7 J**
Phenol	11,000	RBC		**7.56**	**4.8 J**	<10.0	<10	<1	<1440	<1.47	**5,600**	**3,800**	**530**
OU-7 COPC Inorganics, Dissolved (µg/L)													
Aluminum	37,000	RBC		<100	**34.9 J**	**63.5 J**	**29.7**	<200	**17.4 J**	<8.4	**26.4 B**	**49.9**	**82.3 J, B**
Antimony	6	MCLG		**20.9**	<10.0	<5.0	**1.6**	**1.3 J**	**1.13 J**	**0.822 J**	**283 B**	**163**	**172 J**
Arsenic	10	MCL		**137 J**	**87.1**	**103**	**72.2**	**22.7**	**11.3**	**12.3**	**839**	**720 J**	**533 J**
Cadmium	5	MCLG		<5 J	<1.0	<1.0	<0.1	<1	<0.1	<0.1	<1.2	<1.7	**0.98 J**
Chromium	100	MCLG		<20	**2.3 J**	<5.0	**2.3**	**1.2 J**	**0.748 J**	<1.19	**55.4**	**30**	**9.9 J**
Cobalt	11	RBC		**17.3**	**22.1**	**13.2**	**6.4**	**1.2**	**0.694 J**	**0.562 J**	**401**	**220**	**137 J**
Iron	26,000	RBC		<100	<50	<50.0	**44.7**	<200	<10	<10	**1,290 K**	**1,240 L**	**1,230**
Lead	15	AL		<5	<10.0	<5.0	<1	<2	<0.1	<0.1	<0.23 L	<2.9 L	<9.8
Manganese	880	RBC		<10	**1.7 J**	**1.9 J**	**3.6**	**1.5 J**	<1.5	<1.5	**99.4**	**94**	**17.8**
Mercury (total)[2]	2	MCLG		**0.184 J**	<0.20 L	<0.20 L	<0.2	<0.2	<0.1	**0.358**	**1**	**1.1 L**	<4.8 L
Nickel	730	RBC		**25.1 J**	**21.1**	**14**	**12.8**	**4.5**	**1.47 J**	**6.65**	**634**	**444**	**116 J**
Vanadium	260	RBC		**15.5**	**5.4 B**	**0.88 J**	**2.3**	**1.7**	**2.32**	**1.02 J**	**75.1**	**40.5**	**3.2 J**
Zinc	11,000	RBC		<20	**13.2 B, L**	**6.9 B**	**5.8**	<30	<5.2	<5.2	**483 J**	**327 B**	**36.4 J, B**
Cyanide (free)[3]	200	MCLG		---	**75.0 J**	<100	<100	**8.4**	<1540	<1.54	**70.9**	**5.1 B**	**159**
Field Parameters													
Temperature (°C)		---		15.15	17.80	14.78	NR	12.98	13.24	13	12.00	17.00	15.3
Conductivity (mS/cm)		---		4,113	4.444	4.172	NR	1.7	0.2026	1.342	17	13	10.9
pH (s.u.)		---		10.05	9.67	9.90	NR	9.31	9.75	9.79	10.1	9.1	8.44
ORP (mV)		---		-434	-381.6	-328.8	NR	-202.7	-300.4	-102.5	---	---	-229
Turbidity (NTU)		---		47.2	0.00	28.50	NR	0.2	6.55	1.46	---	---	3.1
Dissolved Oxygen (mg/L)		---		1.85	0.00	2.40	NR	0.93	1.56	1.1	---	---	0.75

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Table D-1

OU-7 Historical Groundwater Sampling Results Summary
Avtex Fibers Superfund Site
Front Royal, Virginia

Parameter	Groundwater Cleanup Standards[1] (µg/L)		Well ID	316	316	316	316	316	316	336	336	336	336
			Well Type	D BMW	D BMW	D BMW	D BMW	D BMW	D BMW	D BMW	D BMW	D BMW	D BMW
			Date	7/4/2012	7/16/2013	7/22/2014	7/28/2015	7/19/2016	7/15/2017	4/7/2008	6/26/2012	7/15/2013	6/27/2014
OU-7 COPC Volatile Organics (µg/L)													
Acetone	22,000	RBC		**313**	<25.0	<2500	<20	<2.66	<2.66	**1,090 L**	**1,500 A**	<2500	**1730**
Carbon disulfide	1,000	RBC		**91,200**	**4,540**	**7180**	**520**	**241**	**451**	**3,770 J**	**11,500**	**9,690**	**10200**
OU-7 COPC Semivolatile Organics (µg/L)													
Bis(2-ethylhexyl)phthalate	6	MCL		<10.0	<6.0	<60 J	<5	<5.88	<7.50	<5.1	<6.0	**2.1 J**	<60
Naphthalene	14	RBC		<16.7	<10.0	<100 J	<0.5	<0.363	<1.85	<5.1	<10.0	<10.0 L	<100
Pentachlorophenol	1	MCL		<1.1	<25.0	<250 J	<5	<1.67	<16.5	<10.2	<1.1	<25.0	<250
o-Cresol/2-Methylphenol	1,800	RBC		<16.7	<10.0	<100 J	<1	<2.25	<8.00	<5.1	<10.0	**2.0 J**	<100
3&4-Methylphenol/4-methylphenol	180	RBC		<16.7	<10.0	<100 J	<1	<2.16	<7.00	**6.69**	<10.0	**4.4 J**	<100
Phenol	11,000	RBC		<16.7	<10.0 J	<100 J	<1	<1.47	<7.50	**422**	**314**	**932**	**514**
OU-7 COPC Inorganics, Dissolved (µg/L)													
Aluminum	37,000	RBC		<100	**4,470**	<50	<200	<9.6	<8.4	---	<500	<100	<50
Antimony	6	MCLG		**221**	<5.0	**48.3**	**6.1**	<1.56	**4.24**	**445 J**	**314**	**63.9**	**312**
Arsenic	10	MCL		**634**	**34.1**	**269**	**70.5**	**28.7**	**61.8**	**1,040 J**	**988**	**584**	**952**
Cadmium	5	MCLG		<1.0	<1.0 L	<0.5	<1	<0.4	<0.1	**12.2 J**	<0.10	**1.2 L**	<0.5
Chromium	100	MCLG		**53.6**	**69.9**	**10**	<4	<0.5	**6.55**	**30.9 J**	**14.0 J, L**	**12.7**	**11.3**
Cobalt	11	RBC		**352**	**2.4 J**	**79.7**	**17.4**	**4.21**	**22.7**	---	**114**	**40.2**	**48.5**
Iron	26,000	RBC		**127 L**	**22,300**	**113**	**23.3 J**	**110**	<15.3	---	<250	**30.9 K**	<50
Lead	15	AL		<10.0	**21.4**	<5	<2	<0.2	<0.1	**6.47 J**	<1.0	<5.0	<5
Manganese	880	RBC		**13.5**	**516**	**126**	**43.8**	**13.2**	**51.7**	---	**6.0 J**	**5.7**	**5.3**
Mercury (total)[2]	2	MCLG		**0.53**	**0.15 J**	<0.2	<0.2	<0.1	<0.1	<0.2 J	<0.20	<2.0	<2
Nickel	730	RBC		**634 L**	**30.1**	**230**	**54.1**	**18.0**	**73.1**	**134 J**	**43.8**	**47.8**	**57.2**
Vanadium	260	RBC		**60.2 L**	**20.3**	**10.3**	**0.86 J**	**0.89 J**	**2.17**	**27.3 J**	**4.3 J**	**5.5 L**	**6**
Zinc	11,000	RBC		**703**	**35.0**	**135**	<30	<10	<5.2	**92.8 J**	**87 K**	**33.2**	**28.4**
Cyanide (free)[3]	200	MCLG		**4,660 L**	**623**	**618**	<600	<0.608 J	<1.54	---	**4,560**	**1,330**	**2020**
Field Parameters													
Temperature (°C)		---		22.79	19.87	32.05	21.64	33.08	24.38	11.75	15.22	15.59	16.30
Conductivity (mS/cm)		---		28.95	6.68	7.44	4.5	3.3095	3.341	13.64	12.59	11.650	10.88
pH (s.u.)		---		9.42	9.45	9.27	8.93	9.31	8.24	8.14	8.19	8.14	8.40
ORP (mV)		---		-526.9	-357.3	-322.80	-416.14	-324.3	-394.8	-453.8	-461.9	-452.6	-459.7
Turbidity (NTU)		---		6.6	17.5	15.80	15.40	60.4	2.17	4.8	0.0	0.6	1.53
Dissolved Oxygen (mg/L)		---		0.18	0.11	0.21	0.03	0.04	0.13	0.10	0.32	0.30	5.81

NOTES: See page 64 of 64.

Table D-1

OU-7 Historical Groundwater Sampling Results Summary
Avtex Fibers Superfund Site
Front Royal, Virginia

Parameter	Groundwater Cleanup Standards[1] (µg/L)		Well ID	336	336	336 (Duplicate)	336	336 (Duplicate)	338	338	338	338
			Well Type	D BMW	D BMW	D BMW	D BMW	D BMW	D BMW	D BMW	D BMW	D BMW
			Date	7/21/2015	7/15/2016	7/15/2016	7/18/2017 & 1/30/2018	7/18/2017 & 1/30/2018	7/4/2012	7/16/2013	7/23/2014	8/4/2015
OU-7 COPC Volatile Organics (µg/L)												
Acetone	22,000	RBC		**940**	**121**	**125**	**3.78 J**	R	**41.7**	<25.0	<50	<20
Carbon disulfide	1,000	RBC		**14000**	<0.22	<0.22	**363**	**335**	**1,950**	**512**	**169**	**33**
OU-7 COPC Semivolatile Organics (µg/L)												
Bis(2-ethylhexyl)phthalate	6	MCL		<5	<5.66	<5.88	<6.82	<6.82	<6.0	<6.0	<6	<5
Naphthalene	14	RBC		<0.5	<0.349	<0.363	<1.68	<1.68	<10.0	<10.0	<10	<0.5
Pentachlorophenol	1	MCL		<5	<1.6	<1.67	<15.0	<15.0	<1.0	<25.0	<25 J	<5
o-Cresol/2-Methylphenol	1,800	RBC		**4**	<2.17	<2.25	<7.27	<7.27	<10.0	<10.0	<10	<1
3&4-Methylphenol/4-methylphenol	180	RBC		**6**	<2.08	<2.16	<6.36	<6.36	<10.0	<10.0	<10	<1
Phenol	11,000	RBC		**1100**	**84.2**	**110**	<6.82	<6.82	<10.0	<10.0	<10	<1
OU-7 COPC Inorganics, Dissolved (µg/L)												
Aluminum	37,000	RBC		**27.1 J**	**119 J**	<9.6 J	**10.4 J**	**10**	<100	<100	<10	<200
Antimony	6	MCLG		**320**	**12.7**	**10.0**	**1.03 J**	<0.8	**28.7**	**12.4 B**	**6.3**	**3.1**
Arsenic	10	MCL		**980**	**55.3**	**55.9**	**8.61**	**8.65**	**182**	**115**	**57.6**	**41**
Cadmium	5	MCLG		<1	<2	<4	<0.1	<0.1	<0.10	<1.0 L	<0.1	<1
Chromium	100	MCLG		**8.6**	<2.5	<5	**16**	**10.3**	**4.4 J**	**1.7 J**	**1**	<4
Cobalt	11	RBC		**90**	**4.45 J**	<5	**0.237 J**	**0.214 J**	**83.6**	**40.3**	**16.9**	**10**
Iron	26,000	RBC		**43.7 J**	**139**	<200	**87**	<10	**188 L**	**26.5 J**	<10	<200
Lead	15	AL		**18.3**	<1	<0.2	<0.1	<0.1	<1.0	<5.0 L	<1	<2
Manganese	880	RBC		**4.6**	<11.5	<20	**199 J**	**200 J**	**30.8**	**16.5**	**10.7**	**12**
Mercury (total)[2]	2	MCLG		<0.2	<0.1	<0.1	<0.1 J	<0.1 J	<0.20	<0.20	<0.2	<0.2 J-
Nickel	730	RBC		**46.8**	<2.5	<5	**1.44 J**	**1.1 J**	**129 L**	**95.9**	**41.4**	**27.2**
Vanadium	260	RBC		**6.4**	<3.5	<7	**0.841 J**	**0.888 J**	**21 L**	**15.2**	**6.9**	**4.3**
Zinc	11,000	RBC		**24.7 J**	<50	<100	<5.2	<5.2	**4.7 B**	**0.42 J**	<5	<30
Cyanide (free)[3]	200	MCLG		**90 J**	**1.12 J**	**3.39 J**	<1.54	<1.54	**126 L**	**134**	<100	<300 J
Field Parameters												
Temperature (°C)		---		19.50	20.16	20.16	19.99 (12.63)	19.99 (12.63)	26.49	17.77	35.39	22.78
Conductivity (mS/cm)		---		9.3	6.20406	6.20406	5.4656 (3.9997)	5.4656 (3.9997)	9.026	3.344	2.19	1.3
pH (s.u.)		---		8.37	7.8	7.8	6.77 (6.9)	6.77 (6.9)	7.70	7.96	7.74	7.78
ORP (mV)		---		-376.96	-397.5	-397.5	-436.3 (-324.6)	-436.3 (-324.6)	-440.0	-345.1	-385.81	-363.06
Turbidity (NTU)		---		1.60	349.43	349.43	0.61 (1.38)	0.61 (1.38)	0.0	3.3	0.58	0.80
Dissolved Oxygen (mg/L)		---		0.06	0.08	0.08	0.14 (0.11)	0.14 (0.11)	0.26	0.16	-0.05	0.00

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Table D-1

OU-7 Historical Groundwater Sampling Results Summary
Avtex Fibers Superfund Site
Front Royal, Virginia

Parameter	Groundwater Cleanup Standards[1] (µg/L)		Well ID	338	338	501A	501A	501A	501A (Duplicate)	501A	501A	501A	501B
			Well Type	D BMW	D BMW	D BMW	D BMW	D BMW	D BMW	D BMW	D BMW	D BMW	D BMW
			Date	8/1/2016	7/30/2017	7/9/2012	7/11/2013	6/26/2014	6/26/2014	7/14/2015	7/17/2016	7/17/2017	7/10/2012
OU-7 COPC Volatile Organics (µg/L)													
Acetone	22,000	RBC		<2.66	<5.72	**10.0 B**	<25.0	<625	<625	<20	<2.66	<2.66	<25.0
Carbon disulfide	1,000	RBC		**15.6**	**11.9**	**4.0**	**140**	<250	<250	<5	**14.5**	<0.22	<2.0
OU-7 COPC Semivolatile Organics (µg/L)													
Bis(2-ethylhexyl)phthalate	6	MCL		<5.77	<1.44	<6.6	<6.0	<6	**1.4 J**	<5	<5.88	<6.82	<6.0
Naphthalene	14	RBC		<0.356	<0.356	<11.0	<10.0	<10	<10	<0.5	<0.363	<1.68	<10.0
Pentachlorophenol	1	MCL		<1.63	<3.17 J	<1.1	<25.0	<25	<25	<5	<1.67	<15.0	<1.1
o-Cresol/2-Methylphenol	1,800	RBC		<2.21	<1.54	<11.0	<10.0	<10	<10	<1	<2.25	<7.27	<10.0
3&4-Methylphenol/4-methylphenol	180	RBC		<2.12	<1.35	<11.0	<10.0	<10	<10	<1	<2.16	<6.36	<10.0
Phenol	11,000	RBC		<1.44	<1.44	<11.0	<10.0	<10	<10	<1	<1.47	<6.82	<10.0
OU-7 COPC Inorganics, Dissolved (µg/L)													
Aluminum	37,000	RBC		<10.6	<8.4	**33.7 J**	**30.3 L**	**17.2**	**18.2**	<200	**10.1 J**	<8.4	<100 L
Antimony	6	MCLG		<2.14	<0.8	**0.51 J**	<5.0	<1	<1	<2	<0.5	<0.8	**21.7**
Arsenic	10	MCL		**29.9**	**21.6**	**11.8**	**4.1 K**	<1	<1	**1.7 J**	<5	<0.4	**73.6**
Cadmium	5	MCLG		<0.4	<0.1	<0.10	<1.0	<0.1	<0.1	<1	<4	<0.1	**0.057 J**
Chromium	100	MCLG		<0.818	**1.85 J**	**0.75 K**	<5.0	<1	<1	<4	<5	<0.5	**2.8 J**
Cobalt	11	RBC		**6.55**	**3.92**	<1.0	<5.0	<1	<1	**0.15 J**	<5	<0.1	**35.9**
Iron	26,000	RBC		<20	**27.3**	**15.2 J**	<50.0	<40	<40	<200	<200	<10.3	<50.0
Lead	15	AL		<0.2	<0.1	<1.0	<5.0	<1	<1	<2	<0.2	<0.1	<1.0
Manganese	880	RBC		**12.0**	**24.9**	**3.7 J**	**2.8 J**	**2.6**	**2.5**	**3.1**	<20	**2.6 J**	**11.3**
Mercury (total)[2]	2	MCLG		<0.1	<0.1	<0.20	<0.20	<0.2	<0.2	<0.2	<0.1	<0.1	<0.20
Nickel	730	RBC		**15.4**	**13.8**	<5.0	<5.0	**2.1**	**2**	**2.1 J**	**6.76 J**	**5.01**	**49.6**
Vanadium	260	RBC		<3.56	<0.7	**0.21 J**	<5.0	<1	<1	<1	<7	<0.7	**1.8 J**
Zinc	11,000	RBC		<10	<5.2	**6.4 K**	**4.7 B**	<5	<5	<30	<100	<5.2	**2.8 K**
Cyanide (free)[3]	200	MCLG		**0.754 J**	<1.54	---	<100	<100	<100	<6 J	**0.866 J**	<1.54	**117**
Field Parameters													
Temperature (°C)		---		21.37	16.88	16.65	16.29	25.94	25.94	19.94	17.52	20.19	16.16
Conductivity (mS/cm)		---		1.2531	0.97595	0.729	0.723	0.90	0.90	0.8	2.0651	1.7818	0.828
pH (s.u.)		---		7.92	7.76	9.23	8.76	9.18	9.18	9.13	7.8	7.8	9.06
ORP (mV)		---		-344.5	-360.9	-282.8	-295.8	-371.1	-371.1	-321.75	-356.3	-413.6	-215.7
Turbidity (NTU)		---		0.74	0.47	27.9	30.3	2.42	2.42	4.15	1.78	0	68.8
Dissolved Oxygen (mg/L)		---		0.16	0.1	0.38	0.55	0.14	0.14	0.17	0.1	0.19	0.52

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Table D-1

OU-7 Historical Groundwater Sampling Results Summary
Avtex Fibers Superfund Site
Front Royal, Virginia

Parameter	Groundwater Cleanup Standards[1] (µg/L)		Well ID	501B	501B	501B	501B	501B	501C	501C	501C	501C (Duplicate)	501C
			Well Type	D BMW	D BMW	D BMW	D BMW	D BMW	D BMW	D BMW	D BMW	D BMW	D BMW
			Date	7/9/2013	7/12/2014	7/14/2015	7/18/2016	7/17/2017	7/10/2012	9/9/2013	7/13/2014	7/13/2014	7/21/2015
OU-7 COPC Volatile Organics (µg/L)													
Acetone	22,000	RBC		<25.0	<25	<20	<2.66	<2.66	<25.0	<25.0	<25	<25	<20
Carbon disulfide	1,000	RBC		**3.1**	<10	<5	<5.04	**0.434 J**	<2.0	<2.0	**3.4 J**	**3.6 J**	<5
OU-7 COPC Semivolatile Organics (µg/L)													
Bis(2-ethylhexyl)phthalate	6	MCL		<6.0	<6 J	<5	<6	<2.67	**2.8 J**	**1.5 J**	<6	<6	<5
Naphthalene	14	RBC		<10.0	<10 J	<0.5	<0.37	<0.325	<10.0	<10.0	<10	<10	<0.5
Pentachlorophenol	1	MCL		<25.0	<25	<5	<1.7	<2.89	<1.1	<25.0	<25	<25	<5
o-Cresol/2-Methylphenol	1,800	RBC		<10.0	<10	<1	<2.3	<1.40	<10.0	<10.0	<10	<10	<1
3&4-Methylphenol/4-methylphenol	180	RBC		<10.0	<10	<1	<2.2	<1.23	<10.0	<10.0	<10	<10	<1
Phenol	11,000	RBC		<10.0	<10	<1	<1.5	<1.32	<10.0	<10.0	<10	<10	<1
OU-7 COPC Inorganics, Dissolved (µg/L)													
Aluminum	37,000	RBC		<100	**13.7**	**32.6 J**	<9.6	**14.8 J**	<100 L	**36.0 J**	**32.6**	**31**	<200
Antimony	6	MCLG		<5.0	<1	<2	<0.5	<0.8	**1.4**	**3.8 K**	<1	<1	<2
Arsenic	10	MCL		**6.1 K**	**1.4**	**1.9 J**	<5	<0.4	**8.3 J**	**4.8 K**	**3.3**	**3.1**	**4.2**
Cadmium	5	MCLG		<1.0	<0.1	<1	<4	<0.1	<1.0	<1.0 L	<0.1	<0.1	<1
Chromium	100	MCLG		<5.0	<1	<4	<5	<0.5	**0.58 J**	<5.0 L	<1	<1	<4
Cobalt	11	RBC		<5.0 L	<1	<1	<5	<0.1	<10.0	<5.0	<1	<1	<1
Iron	26,000	RBC		<50.0	<10	<200	<200	<10	<50.0	**21.6 J**	**21.4**	**19.1**	<200
Lead	15	AL		<5.0	<1	<2	<0.2	<0.1	<1.0	<5.0 L	<1	<1	<2
Manganese	880	RBC		**1.9 J**	<4.9	**3.4**	<20	**3.6 J**	**10.8**	**7.2**	**5.9**	**5.8**	**3.8**
Mercury (total)[2]	2	MCLG		<0.20	<0.2	<0.2	<0.1	<0.1	<0.20	<0.20 L	<0.2	<0.2	<0.2
Nickel	730	RBC		<5.0	<1	<4	**7.12 J**	**3.25**	<5.0	<5.0	<1	<1	**1.1 J**
Vanadium	260	RBC		<5.0	<5	<1	<7	<0.7	<5.0	<5.0	<5	<5	**0.34 J**
Zinc	11,000	RBC		**1.9 B**	<5	<30	<100	<5.2	**3.8 K**	**1.8 B**	**85.5**	**78.4**	<30
Cyanide (free)[3]	200	MCLG		<100	<100	<6 J	<0.608	<1.54	<100	<100	<100	<100	<6
Field Parameters													
Temperature (°C)		---		15.25	15.86	20.35	19.157	19.34	16.11	15.02	22.88	22.88	21.64
Conductivity (mS/cm)		---		0.571	0.78	0.5	0.999316	1.0356	0.839	0.922	0.89	0.89	0.8
pH (s.u.)		---		8.82	9.14	9.08	9.107	8.61	8.34	8.61	8.72	8.72	8.95
ORP (mV)		---		-185.0	-157.71	-283.14	-367.2	-401.8	-246.9	-284.5	-193.86	-193.86	-108.16
Turbidity (NTU)		---		13.7	2.81	5.95	0.68	0	64.2	48.3	2.92	2.92	10.10
Dissolved Oxygen (mg/L)		---		0.45	0.00	0.22	0.11	0.18	0.30	0.27	-0.03	-0.03	0.12

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Table D-1

OU-7 Historical Groundwater Sampling Results Summary
Avtex Fibers Superfund Site
Front Royal, Virginia

Parameter	Groundwater Cleanup Standards[1] (µg/L)		Well ID	501C	501C	601	601	601 (Duplicate)	601	601	601	601	602
			Well Type	D BMW	D BMW	D BMW	D BMW	D BMW	D BMW	D BMW	D BMW	D BMW	D BMW
			Date	7/26/2016	7/17/2017	6/28/2012	7/10/2013	7/10/2013	7/16/2014	8/6/2015	7/18/2016	7/28/2017 & 8/10/2017	6/26/2012
OU-7 COPC Volatile Organics (µg/L)													
Acetone	22,000	RBC		<2.66	<2.66	<25.0	<25.0	<25.0	<25	<20	<2.66	**2.9 J**	**5.9 J**
Carbon disulfide	1,000	RBC		**0.437 J**	**0.951**	**2.9**	**1.6 J**	**1.4 J**	**4.2 J**	**1 J**	<3.55	**1.27**	**2.4**
OU-7 COPC Semivolatile Organics (µg/L)													
Bis(2-ethylhexyl)phthalate	6	MCL		<5.77	<2.84	<6.0	<6.0	<6.0	<6	<5	<5.56	<2.61	<6.0
Naphthalene	14	RBC		<0.356	<0.336	<10.0	<10.0	<10.0	<10	<0.5	<0.343	<0.325	<10.0
Pentachlorophenol	1	MCL		<1.63 J	<3.00	<1.1	<25.0	<25.0	<25	<5	<1.57	<2.89	<1.2
o-Cresol/2-Methylphenol	1,800	RBC		<2.21	<1.45	<10.0	<10.0	<10.0	<10	<1	<2.13	<1.40	<10.0
3&4-Methylphenol/4-methylphenol	180	RBC		<2.12	<1.27	<10.0	<10.0	<10.0	<10	<1	<2.04	<1.23	<10.0
Phenol	11,000	RBC		<1.44	<1.36	<10.0	<10.0	<10.0	<10	<1	<1.39	<1.32	<10.0
OU-7 COPC Inorganics, Dissolved (µg/L)													
Aluminum	37,000	RBC		**22.4**	**27.2**	**237**	**379**	**380**	**199**	**342**	**422**	**83**	**163**
Antimony	6	MCLG		<0.5	<0.8	<1.0	<5.0	<5.0	<1	<2	<0.5	<0.8	**1.4**
Arsenic	10	MCL		**1.62 J**	**1.09 J**	**3.2**	**3.0 B**	**5.1 B**	**2.7**	**2.9 J**	**1.34 J**	<0.4	**5.0**
Cadmium	5	MCLG		<0.4	<0.1	<0.10	<1.0	<1.0	<0.1	<1	<0.4	<0.1	<0.10
Chromium	100	MCLG		<0.5	<0.595	**1.5 J, L**	<5.0	<5.0	<1	<4	<0.5	<0.5	**1.3 J, L**
Cobalt	11	RBC		<0.5	<0.1	<1.0	<5.0 L	<5.0 L	<1	<1	<0.5	<0.1	<1.0
Iron	26,000	RBC		<20	<21.8	**20.9 J**	**27.9 B**	**29.6 B**	**14.7**	**26.8 J**	<20	**308**	**19.1 J**
Lead	15	AL		<0.2	<0.1	<1.0	<5.0	<5.0	<1	**0.17 J**	<0.2	<0.1	<1.0
Manganese	880	RBC		**3.12 J**	**7.7**	**0.81 J**	**0.91 J**	**0.95 J**	**1**	**0.96 J**	<2	**1.5 J**	**0.69 J**
Mercury (total)[2]	2	MCLG		<0.1	<0.1	<0.20	<0.20	<0.20	<0.2	<0.2 J-	<0.1	<0.1	<0.20
Nickel	730	RBC		**1.76 J**	**2.15**	<5.0	<5.0	<5.0	**1.3**	**1.3 J**	<2.28	**2.4**	<5.0
Vanadium	260	RBC		<1.66	<0.7	**0.29 J**	<5.0	**0.42 B**	<1	**0.69 J**	<1.22	<0.7	**5.9**
Zinc	11,000	RBC		<10	<5.2	**9.2 J, K**	**2.1 B**	**3.2 B**	<5	<30	<10	<5.2	**25.1**
Cyanide (free)[3]	200	MCLG		**0.703 J**	<1.54	<100	<100	<100	<100	**4.3 J**	<0.608	<1.54	<100
Field Parameters													
Temperature (°C)		---		24.4	20.33	15.58	19.01	19.01	23.11	20.58	31.28	(21.19)	15.11
Conductivity (mS/cm)		---		0.73555	0.74302	0.528	0.611	0.611	0.59	0.6	0.00031	(0.782)	0.540
pH (s.u.)		---		9.41	9.07	9.71	10.12	10.12	9.87	9.88	8.76	(9.67)	9.42
ORP (mV)		---		-326.2	-417.4	-232.3	-231.6	-231.6	-50.57	541.06	-49.9	(-227.9)	-114.3
Turbidity (NTU)		---		24.05	0	0.0	3.3	3.3	3.91	9.10	8.14	(0.24)	6.9
Dissolved Oxygen (mg/L)		---		0.05	0.15	0.35	0.56	0.56	0.13	0.16	6.51	(0.08)	5.39

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Table D-1

OU-7 Historical Groundwater Sampling Results Summary
Avtex Fibers Superfund Site
Front Royal, Virginia

Parameter	Groundwater Cleanup Standards[1] (µg/L)		Well ID	602	602	602	602	602	603-2 Packer (603-1 FLUTe)	603-1 (FLUTe)	603-1 (FLUTe)	603-1 (FLUTe)	603-1 (FLUTe)
			Well Type	D BMW	D BMW	D BMW	D BMW	D BMW	D BMW	D BMW	D BMW	D BMW	D BMW
			Date	7/9/2013	6/27/2014	7/22/2015	7/27/2016	7/16/2017	3/5/2003	3/27/2008	7/11/2012	7/10/2013	7/11/2014
OU-7 COPC Volatile Organics (µg/L)													
Acetone	22,000	RBC		<25.0	<25	<20	<2.66	<2.66	**130**	**3.22 B**	<25.0	**10.5 B**	<250
Carbon disulfide	1,000	RBC		**1.2 J**	<10	<5	<0.22	**0.331 J**	**9,200**	**9.37**	**1.4 J**	**1,180 J**	**1860**
OU-7 COPC Semivolatile Organics (µg/L)													
Bis(2-ethylhexyl)phthalate	6	MCL		<6.0	<6	<5	<5.77	<7.12	---	<5.0	<6.0	<6.0	<6
Naphthalene	14	RBC		<10.0	<10	<0.5	<0.356	<0.336	---	<5.0	<10.0	<10.0	<10
Pentachlorophenol	1	MCL		<25.0	<25	<5	<1.63 J	<3.00	---	<10.0	<1.1	<25.0	<25
o-Cresol/2-Methylphenol	1,800	RBC		<10.0	<10	<1	<2.21	<1.45	---	<5.0	<10.0	<10.0	<10
3&4-Methylphenol/4-methylphenol	180	RBC		<10.0	<10	<1	<2.12	<1.27	---	<5.0	<10.0	<10.0	<10
Phenol	11,000	RBC		<10.0	<10	<1	<1.44	<1.36	---	<5.0	<10.0	<10.0	<10
OU-7 COPC Inorganics, Dissolved (µg/L)													
Aluminum	37,000	RBC		**124**	**210**	**109 J**	**79.5**	**57.9**	<200	---	<100 L	<100 L	<100
Antimony	6	MCLG		<5.0	<1	<2	<0.5	<0.8	**27 L**	**0.421 J**	<5.0	**16.8**	**14.8 J**
Arsenic	10	MCL		**4.6 K**	**4.7**	**3.9 J**	**2.67**	**1.57 J**	**86 K**	**4.17 J**	**4.0 J**	**67.8 K**	**58.6 J**
Cadmium	5	MCLG		<1.0	<0.1	<1	<0.4	<0.1	<3.0	<5.0	<0.50	<1.0	<1
Chromium	100	MCLG		<5.0	<1	<4	<0.5	<0.535	<5.0	<5.0	**0.54 J**	**1.8 J**	<5
Cobalt	11	RBC		<5.0 L	<1	<1	<0.5	<0.1	**56 L**	---	<5.0	**27.5**	**17**
Iron	26,000	RBC		**23.2 B**	**12.9**	<200	<20	<10	**700**	---	<50.0	<50.0	<50
Lead	15	AL		<5.0	<1	<2	<0.2	<0.1	<3.0	<3.0	<5.0	<5.0	<5 J
Manganese	880	RBC		**2.9 J**	**1.1**	**2**	<2	**2.73 J**	**32**	---	**23.1**	**11.3**	**16.4**
Mercury (total)[2]	2	MCLG		<0.20	<0.2	<0.2	<0.1	<0.1	<4.0	<0.20	<0.20	<0.20	<0.2
Nickel	730	RBC		<5.0	<1	<4	**0.722 J**	<0.5	**55 K**	**0.344 J**	<5.0	**49.0**	**45**
Vanadium	260	RBC		**3.0 B**	**1.4**	**0.54 J**	<2.08	<0.7	<20	<10.0	<5.0	**0.58 B**	**2.9 J**
Zinc	11,000	RBC		**6.0 B**	<5	**15.4 J**	<10	<5.2	**390**	<2.0	**7.0 K**	**3.1 B**	<10
Cyanide (free)[3]	200	MCLG		<100	<100	<6	**0.703 J**	<1.54	---	---	<100	**130**	**107**
Field Parameters													
Temperature (°C)		---		16.20	17.88	16.96	26.65	21.8	10.2	12.64	20.34	18.88	18.02
Conductivity (mS/cm)		---		0.522	0.50	0.6	0.540	0.52492	4.35	0.856	2.323	3.109	2.93
pH (s.u.)		---		9.33	9.54	9.50	9.94	9.75	8.37	8.01	7.45	7.45	7.57
ORP (mV)		---		103.9	-98.5	192.86	-194.7	-305.4	-461	-353.9	-356.4	-369.8	-203.8
Turbidity (NTU)		---		8.8	5.13	2.03	5.41	0	54	0.8	0.0	4.2	0.94
Dissolved Oxygen (mg/L)		---		1.02	1.21	0.42	0.64	0.2	1.91	0.07	0.56	0.71	1.48

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Table D-1

OU-7 Historical Groundwater Sampling Results Summary
Avtex Fibers Superfund Site
Front Royal, Virginia

Parameter	Groundwater Cleanup Standards[1] (µg/L)		Well ID	603-1 (FLUTe)	603-1 (FLUTe)	603-1 (FLUTe)	603-4 Packer (603-2 FLUTe)	603-2 (FLUTe)	603-2 (FLUTe)	603-2 (FLUTe)	603-2 (FLUTe)	603-2 (FLUTe)
			Well Type	D BMW	D BMW	D BMW	D BMW	D BMW	D BMW	D BMW	D BMW	D BMW
			Date	7/10/2015	7/14/2016	7/18/2017 & 2/1/2018	3/7/2003	3/27/2008	7/11/2012	7/10/2013	7/11/2014	7/10/2015
OU-7 COPC Volatile Organics (µg/L)												
Acetone	22,000	RBC		<20	<2.66	R	**580**	<10.0	**5.4 B**	<25.0	<25	<20
Carbon disulfide	1,000	RBC		**98**	**2.47**	**0.648**	**32,000**	**11.9**	**2.1**	**36.0**	**342**	**61**
OU-7 COPC Semivolatile Organics (µg/L)												
Bis(2-ethylhexyl)phthalate	6	MCL		<5	<5.77	<4.68	---	<5.0	**1.4 J**	<6.0	<6	<5
Naphthalene	14	RBC		<0.5	<0.356	<0.336	---	<5.0	<10.0	<10.0	<10	<0.5
Pentachlorophenol	1	MCL		<5	<1.63	<3.00	---	<10.0	<25.0	<25.0	<25	<5
o-Cresol/2-Methylphenol	1,800	RBC		<1	<2.21	<1.45	---	<5.0	<10.0	<10.0	<10	<1
3&4-Methylphenol/4-methylphenol	180	RBC		<1	<2.12	<1.27	---	<5.0	<10.0	<10.0	<10	<1
Phenol	11,000	RBC		<1	<1.44	<1.36	---	<5.0	<10.0	<10.0	<10	<1
OU-7 COPC Inorganics, Dissolved (µg/L)												
Aluminum	37,000	RBC		<200	<9.6	<8.4	<200	---	**107 L**	<100 L	<100	<200
Antimony	6	MCLG		**4.1**	<0.5	<0.8	**200 L**	**0.499 J**	**4.7 J**	**3.2 K**	**3.4 J**	**4.1**
Arsenic	10	MCL		**27.4**	**3.19**	**0.723 J**	**570 K**	**5.95 J**	**15.0**	**10.6 K**	**9.5 J**	**35.9**
Cadmium	5	MCLG		<1	<0.4	<0.1	<3.0	<5.0	<0.50	<1.0	<1	<1
Chromium	100	MCLG		<4	<0.5	<0.5	**14**	<5.0	**1.1 J**	**1.6 J**	**0.93 J**	<4
Cobalt	11	RBC		**6.9**	**0.836 J**	**0.216 J**	**220**	---	**5**	**4.6 L**	**1.8 J**	**7.1**
Iron	26,000	RBC		<200	<20	<10	**2,000**	---	<50.0	<50.0	<50	<200
Lead	15	AL		<2	<0.2	<0.1	**3.7 K**	<3.0	<5.0	<5.0	<5 J	<2
Manganese	880	RBC		**29.4**	**38.3**	**52.1 J**	**43**	**---**	**33.5**	**31.9**	**41.5**	**51**
Mercury (total)[2]	2	MCLG		<0.2 J-	<0.1	<0.1 J	<20	<0.20	<0.20	<0.20	<0.2	<0.2 J-
Nickel	730	RBC		**10.5**	<0.5	<0.5	**100**	**0.316**	**5.6**	**7.5**	**8.6**	**11.2**
Vanadium	260	RBC		**0.97 J**	<1.11	<0.7	<20	<10.0	<5.0	<5.0	**0.85 J**	**1.1**
Zinc	11,000	RBC		<30	<10	<5.2	**470**	<2.0	**3.9 K**	**1.9 B**	**0.62 J**	<30
Cyanide (free)[3]	200	MCLG		<150 J	<0.608	<1.54	---	---	<100	<100	<100	<150 J
Field Parameters												
Temperature (°C)		---		14.89	21.79	17.68 (11.6)	10.5	12.60	21.28	16.87	17.29	15.12
Conductivity (mS/cm)		---		1.6	0.85203	0.73974 (0.820)	8.76	0.902	0.989	1.163	1.27	1.7
pH (s.u.)		---		7.46	7.73	7.45 (7.86)	8.51	8.12	7.82	7.22	7.71	7.36
ORP (mV)		---		-373.6	-268.4	-348.4 (-235.1)	-426	-383.4	-354.7	-348.7	-174.5	-376.4
Turbidity (NTU)		---		0.63	0.74	0.59 (1.49)	454	0.0	1.3	4.4	0.52	0.47
Dissolved Oxygen (mg/L)		---		0.00	1.98	1.46 (3.28)	2.51	0.00	1.71	1.01	2.08	0.00

NOTES: See page 64 of 64.

Table D-1

OU-7 Historical Groundwater Sampling Results Summary
Avtex Fibers Superfund Site
Front Royal, Virginia

Parameter	Groundwater Cleanup Standards[1] (µg/L)		Well ID	603-2 (FLUTe)	603-2 (FLUTe)	603-6 Packer (603-3 FLUTe)	603-3 (FLUTe)	603-3 (FLUTe)	603-3 (FLUTe)	603-3 (FLUTe)	603-3 (FLUTe)	603-3 (FLUTe)
			Well Type	D BMW	D BMW	D BMW	D BMW	D BMW	D BMW	D BMW	D BMW	D BMW
			Date	7/14/2016	7/18/2017 & 2/1/2018	3/11/2003	3/27/2008	7/11/2012	7/10/2013	7/11/2014	7/10/2015	7/14/2016
OU-7 COPC Volatile Organics (µg/L)												
Acetone	22,000	RBC		<2.66	R	<20	**2.82 B**	**5.0 B**	<25.0	<25	<20	<2.66
Carbon disulfide	1,000	RBC		**1.97**	**0.622**	**210**	**2.8**	**1.4 J**	**3.0**	**10.7**	**140**	**2.46**
OU-7 COPC Semivolatile Organics (µg/L)												
Bis(2-ethylhexyl)phthalate	6	MCL		<5.77	<4.87	---	<5.0	<6.0	<6.0	<6	<5	<5.77
Naphthalene	14	RBC		<0.356	<0.336	---	<5.0	<10.0	<10.0	<10	<0.5	<0.356
Pentachlorophenol	1	MCL		<1.63	<3.00	---	<10	<1.1	<25.0	<25	<5	<1.63
o-Cresol/2-Methylphenol	1,800	RBC		<2.21	<1.45	---	<5.0	<10.0	<10.0	<10	<1	<2.21
3&4-Methylphenol/4-methylphenol	180	RBC		<2.12	<1.27	---	<5.0	<10.0	<10.0	<10	<1	<2.12
Phenol	11,000	RBC		<1.44	<1.36	---	<5.0	<10.0	<10.0	<10	<1	<1.44
OU-7 COPC Inorganics, Dissolved (µg/L)												
Aluminum	37,000	RBC		<9.6	**8.83 J**	**4,000**	---	<100 L	<100 L	<100	<200	**13.1 J**
Antimony	6	MCLG		<0.5	<0.8	**8.1 L**	<1.0	<5.0	<5.0	<5 R	**4.8**	<0.5
Arsenic	10	MCL		**3.62**	**1.25 J**	**17**	**3.77 J**	**4.6 J**	<10.0	**4 J**	**35.8**	**3.53**
Cadmium	5	MCLG		<0.4	<0.1	<3.0	<5.0	<0.50	<1.0	<1	<1	<0.4
Chromium	100	MCLG		<0.5	<0.5	**8.5**	<5.0	**0.91 J**	**0.66 J**	<5	<4	<0.5
Cobalt	11	RBC		**0.575 J**	**0.225 J**	<50 L	---	<5.0	<5.0 L	<5	**9.2**	**1.06 J**
Iron	26,000	RBC		<20	<10	**11,300**	---	<50.0	<50.0	<50	<200	<20
Lead	15	AL		<0.2	<0.1	**11 K, L**	<3.0	<5.0	<5.0	<5 J	<2	<0.2
Manganese	880	RBC		**53.4**	**69.3 J**	**73**	---	**11.8**	**12.3**	**16.5**	**25**	**27.1**
Mercury (total)[2]	2	MCLG		<0.1	<0.1 J	<0.20 L	<0.2	<0.20	<0.20	<0.2	<0.2 J-	<0.1
Nickel	730	RBC		**0.598 J**	**0.598 J**	<50 L	**1.97**	<5.0	<5.0	**4 J**	**18.9**	**0.94 J**
Vanadium	260	RBC		<1.1	<0.7	<20 L	<10.0	<5.0	<5.0	<5	**1.2**	<0.998
Zinc	11,000	RBC		<10	<5.2	**4,500**	<20.0	**2.2 K**	**2.9 B**	<10	<30	<10
Cyanide (free)[3]	200	MCLG		<0.608	<1.54	---	---	<100	**76.3 J**	<100	<150 J	<0.608
Field Parameters												
Temperature (°C)		---		20.53	16.93 (11.62)	11.3	12.49	19.39	17.56	17.89	14.81	19.91
Conductivity (mS/cm)		---		0.10055	0.83107 (0.800)	0.518	0.729	0.615	0.697	0.87	1.7	0.75836
pH (s.u.)		---		7.83	7.41 (7.77)	9.57	8.25	8.22	7.06	7.95	7.47	7.89
ORP (mV)		---		-293.4	-345.9 (-259.2)	-358	-372.6	-339.0	-332.4	-167.6	-372.1	-296.1
Turbidity (NTU)		---		1.18	0.63 (0.64)	79.9	15.6	0.0	3.6	0.89	0.47	0.53
Dissolved Oxygen (mg/L)		---		1.46	2.07 (4.75)	2.53	0.11	1.27	0.58	1.68	0.00	1.58

NOTES: See page 64 of 64.

Table D-1

OU-7 Historical Groundwater Sampling Results Summary
Avtex Fibers Superfund Site
Front Royal, Virginia

Parameter	Groundwater Cleanup Standards[1] (µg/L)		Well ID / Well Type / Date	603-3 (FLUTe) D BMW 7/18/2017 & 2/1/2018	603-8 Packer (603-4 FLUTe) D BMW 3/11/2003	603-4 (FLUTe) D BMW 3/27/2008	603-4 (FLUTe) D BMW 7/11/2012	603-4 (FLUTe) D BMW 7/10/2013	603-4 (FLUTe) D BMW 7/11/2014	603-4 (FLUTe) D BMW 7/10/2015	603-4 (FLUTe) D BMW 7/14/2016	603-4 (FLUTe) D BMW 7/18/2017 & 2/1/2018
OU-7 COPC Volatile Organics (µg/L)												
Acetone	22,000	RBC		R	<20	<10.0	**7.9 B**	<25.0	<25	<20	<2.66	R
Carbon disulfide	1,000	RBC		**0.659**	**70**	**1.75**	**3.2**	<2.0	**4.2 J**	**12**	**4.11**	**0.626**
OU-7 COPC Semivolatile Organics (µg/L)												
Bis(2-ethylhexyl)phthalate	6	MCL		<3.15	---	<5.0	<6.0	<6.0	<6	<5	<5.77	<6.39
Naphthalene	14	RBC		<0.336	---	<5.0	<10.0	<10.0	<10	<0.5	<0.356	<0.336
Pentachlorophenol	1	MCL		<3.00	---	<10.0	<25.0	<25.0	<25	<5	<1.63	<3.00
o-Cresol/2-Methylphenol	1,800	RBC		<1.45	---	<5.0	<10.0	<10.0	<10	<1	<2.21	<1.45
3&4-Methylphenol/4-methylphenol	180	RBC		<1.27	---	<5.0	<10.0	<10.0	<10	<1	<2.12	<1.27
Phenol	11,000	RBC		<1.36	---	<5.0	**49.5**	<10.0	<10	<1	<1.44	<1.36
OU-7 COPC Inorganics, Dissolved (µg/L)												
Aluminum	37,000	RBC		**9.56 J**	**3,800**	---	<100 L	<100 L	<100	<200	<9.6	<8.4
Antimony	6	MCLG		<0.8	<5.0 L	<1.0	<5.0	<5.0	<5 R	<2	<1.17	<0.8
Arsenic	10	MCL		**0.549 J**	**7.4**	**5.22 J**	**5.8**	<10.0	<10 R	**11**	**10.3**	**3.34**
Cadmium	5	MCLG		<0.1	<3.0	<5.0	<0.50	<1.0	<1	<1	<0.4	<0.1
Chromium	100	MCLG		<0.5	**8.5**	<5.0	**0.97 J**	**0.73 J**	**1.1 J**	<4	<0.5	<0.5
Cobalt	11	RBC		**0.232 J**	<50 L	---	<5.0	<5.0 L	<5	**1**	**2.21**	**0.269 J**
Iron	26,000	RBC		<10	**11,700**	---	<50.0	<50.0	<50	<200	<20	<10
Lead	15	AL		<0.1	**17 K, L**	<3.0	<5.0	<5.0	<5 J	<2	<0.2	<0.1
Manganese	880	RBC		**38.5 J**	**73**	---	**12.7**	**13.3**	**19**	**22.3**	**25.8**	**41.8 J**
Mercury (total)[2]	2	MCLG		<0.1 J	<1 L	<0.2	<0.20	<0.20	<0.2	<0.2 J-	<0.1	<0.1 J
Nickel	730	RBC		**1.01 J**	<50 L	<10.0	<5.0	<5.0	**1.8 J**	**3.6 J**	**2.01**	<0.5
Vanadium	260	RBC		<0.7	<20 L	<10.0	<5.0	<5.0	<5	<1	<0.905	<0.7
Zinc	11,000	RBC		<5.2	**950**	<20.0	**3.2 K**	**11.3 B**	**2.9 J**	<30	<10	<5.2
Cyanide (free)[3]	200	MCLG		<1.54	---	---	<100	<100	<100	<150 J	<0.608	<1.54
Field Parameters												
Temperature (°C)		---		16.46 (11.8)	12.6	12.69	18.46	18.52	15.33	15.07	19.21	16.43 (11.94)
Conductivity (mS/cm)		---		0.75694 (0.740)	0.713	0.499	0.468	0.549	0.66	0.8	0.4357	0.7792 (0.700)
pH (s.u.)		---		7.44 (7.76)	9.06	8.27	8.20	6.98	8.03	7.65	7.79	7.37 (7.75)
ORP (mV)		---		-353.5 (-256.6)	-370	-357.3	-323.8	-326.2	-145.7	-386.6	-310.2	-366.9 (-291)
Turbidity (NTU)		---		0.57 (0.26)	80.8	0.1	0.0	27.2	1.55	0.37	0.29	1.22 (0.22)
Dissolved Oxygen (mg/L)		---		1.86 (4.23)	1.49	0.17	1.02	0.45	0.02	0.00	1.52	1.63 (4.49)

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Table D-1

OU-7 Historical Groundwater Sampling Results Summary
Avtex Fibers Superfund Site
Front Royal, Virginia

Parameter	Groundwater Cleanup Standards[1] (µg/L)		Well ID	604-1 Packer (604-1 FLUTe)	604-1 Packer Duplicate (604-1 FLUTe)	604-1 (FLUTe)	604-1 (FLUTe)	604-1 (FLUTe)	604-1 (FLUTe)	604-1 (FLUTe)	604-1 (FLUTe)
			Well Type	D BMW	D BMW	D BMW	D BMW	D BMW	D BMW	D BMW	D BMW
			Date	3/13/2003	3/13/2003	3/26/2008	7/12/2012	7/11/2013	7/10/2014	7/9/2015	7/13/2016
OU-7 COPC Volatile Organics (µg/L)											
Acetone	22,000	RBC		<20	<20	**3.28 B**	<25.0	<25.0	<25	<20	<2.66
Carbon disulfide	1,000	RBC		**16**	**5**	<1	<2.0	<2.0	<10	<5	**0.461 J**
OU-7 COPC Semivolatile Organics (µg/L)											
Bis(2-ethylhexyl)phthalate	6	MCL		---	---	<5	<6.0	<6.0	<6	<5	<5.77
Naphthalene	14	RBC		---	---	<5	<10.0	<10.0	<10	<0.5	<0.356
Pentachlorophenol	1	MCL		---	---	<10	<25.0	<25.0	<25	<5	<1.63
o-Cresol/2-Methylphenol	1,800	RBC		---	---	<5	<10.0	<10.0	<10	<1	<2.21
3&4-Methylphenol/4-methylphenol	180	RBC		---	---	<5	<10.0 R	<10.0	<10	<1	<2.12
Phenol	11,000	RBC		---	---	<5	<10.0	<10.0	<10	<1	<1.44
OU-7 COPC Inorganics, Dissolved (µg/L)											
Aluminum	37,000	RBC		<200 L	<200 L	---	<100 L	<100 L	**49.1 J**	<200	<9.6
Antimony	6	MCLG		<5 L	<5 L	<1	<1.0	<5.0	**2.6 J**	<2	<0.5
Arsenic	10	MCL		<5	<5 L	**0.512 J**	<1.0	<10.0	<10	<4	**0.598 J**
Cadmium	5	MCLG		<3	<3	<5	<0.10	<1.0	<1	<1	<0.4
Chromium	100	MCLG		<5	<5	<5	**1.0 J**	<5.0	**0.59 J**	<4	<0.5
Cobalt	11	RBC		<50	<50	---	<1.0	**0.96 L**	<5	<1	<0.5
Iron	26,000	RBC		**1,100**	**1,100**	---	**181**	**370**	**102**	**362**	**363**
Lead	15	AL		<3 L	<3 L	<3	<1.0	<5.0	<5	<2	<0.2
Manganese	880	RBC		**270**	**260**	---	**225**	**213**	**223**	**236**	**216**
Mercury (total)[2]	2	MCLG		<0.2	<0.2	<0.2	<0.20	<0.20	<0.2	<0.2	<0.1
Nickel	730	RBC		<50 L	<50 L	**4.22 J**	<5.0	<5.0	<5	<4	<0.5
Vanadium	260	RBC		<20	<20	<100	<5.0	<5.0	<5	<1	<0.7
Zinc	11,000	RBC		**400**	**400**	<20	**5.8 K**	**1.4 B**	**2.4 J**	<30	<10
Cyanide (free)[3]	200	MCLG		---	---	---	<100	<100	<100	<6	<0.608
Field Parameters											
Temperature (°C)		---		13.50	---	16.35	19.07	16.31	17.36	18.93	20.83
Conductivity (mS/cm)		---		0.863	---	0.718	0.766	0.728	0.69	0.7	0.74571
pH (s.u.)		---		7.80	---	7.07	6.89	6.79	7.01	7.50	7.2
ORP (mV)		---		-173.0	---	-96.3	-31.70	-51.80	153.3	-39.0	-83.6
Turbidity (NTU)		---		8.4	---	1.2	1.6	0.0	0.14	0.81	8.23
Dissolved Oxygen (mg/L)		---		2.09	---	2.00	2.27	2.39	1.72	0.03	2.43

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Table D-1

OU-7 Historical Groundwater Sampling Results Summary
Avtex Fibers Superfund Site
Front Royal, Virginia

Parameter	Groundwater Cleanup Standards[1] (µg/L)		Well ID	604-1 (FLUTe)	604-4 Packer (604-2 FLUTe)	604-2 (FLUTe)	604-2 (FLUTe)	604-2 (FLUTe)	604-2 (FLUTe)	604-2 (FLUTe)	604-2 (FLUTe)
			Well Type	D BMW	D BMW	D BMW	D BMW	D BMW	D BMW	D BMW	D BMW
			Date	7/17/2017	3/17/2003	3/26/2008	7/11/2012 & 7/12/2012[7]	7/11/2013	7/10/2014	7/9/2015	7/13/2016
OU-7 COPC Volatile Organics (µg/L)											
Acetone	22,000	RBC		R	<20	**2.91 B**	<25.0	<25.0	<25	<20	<2.66
Carbon disulfide	1,000	RBC		<0.22	**36**	**1.06**	<2.0	<2.0	<10	<5	<0.22
OU-7 COPC Semivolatile Organics (µg/L)											
Bis(2-ethylhexyl)phthalate	6	MCL		<4.58	---	<5	<6.0	<6.0	<6	<5	<6
Naphthalene	14	RBC		<0.336	---	<5	<10.0	<10.0	<10	<0.5	<0.37
Pentachlorophenol	1	MCL		<3.00	---	<10	<1.1	<25.0	<25	<5	<1.7
o-Cresol/2-Methylphenol	1,800	RBC		<1.45	---	<5	<10.0	<10.0	<10	<1	<2.3
3&4-Methylphenol/4-methylphenol	180	RBC		<1.27	---	<5	<10.0	<10.0	<10	<1	<2.2
Phenol	11,000	RBC		<1.36	---	<5	<10.0	<10.0	<10	<1	<1.5
OU-7 COPC Inorganics, Dissolved (µg/L)											
Aluminum	37,000	RBC		<8.4	<200	---	<100 L	<100 L	**41.5 J**	<200	<9.6
Antimony	6	MCLG		<0.8	<5	<1	<1.0	<5.0	<5	<2	<0.5
Arsenic	10	MCL		<0.4	<5	**1.55 J**	<1.0	<10.0	<10	<4	**0.821 J**
Cadmium	5	MCLG		<0.1	<3	<5	<0.10	<1.0	<1	<1	<0.4
Chromium	100	MCLG		<0.535	<5	<5	**1.2 J**	**1.2 J**	<5	<4	<0.5
Cobalt	11	RBC		<0.1	<50	---	<1.0	**0.67 L**	<5	<1	<0.5
Iron	26,000	RBC		**352**	**1,400 L, J**	---	**395**	**369**	**144**	**313**	**273**
Lead	15	AL		<0.1	<3	<3	<1.0	<5.0	<5	<2	<0.2
Manganese	880	RBC		**250**	**240**	---	**214**	**217**	**221**	**227**	**208**
Mercury (total)[2]	2	MCLG		<0.1	<0.2	<0.2	<0.20	<0.20	<0.2	<0.2	<0.1
Nickel	730	RBC		**0.635 J**	<50	**4.93 J**	<5.0	<5.0	<5	<4	<0.5
Vanadium	260	RBC		<0.7	<20	<100	<5.0	<5.0	<5	<1	<0.7
Zinc	11,000	RBC		<5.2	**990 L, J**	<20	**8.2 K**	**1.4 B**	**2.6 J**	<30	<10
Cyanide (free)[3]	200	MCLG		<1.54	---	---	<100	<100	<100	<6	<0.608
Field Parameters											
Temperature (°C)		---		18.7	15	14.85	16.94	16.41	15.59	19.41	19.16
Conductivity (mS/cm)		---		0.74867	0.829	0.706	0.698	0.719	0.72	0.7	0.68798
pH (s.u.)		---		7.48	7.86	7.08	6.98	7.08	7.19	7.85	7.59
ORP (mV)		---		-121.6	-179	-76.5	-20.2	-96.0	129.00	-114.4	-66.8
Turbidity (NTU)		---		2.64	9.6	585	2.4	0.0	0.47	0.92	7.56
Dissolved Oxygen (mg/L)		---		2.88	2.27	0.86	2.62	1.80	0.79	0.00	2.12

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Table D-1

OU-7 Historical Groundwater Sampling Results Summary
Avtex Fibers Superfund Site
Front Royal, Virginia

Parameter	Groundwater Cleanup Standards[1] (µg/L)		Well ID	604-2 (FLUTe)	604-5 Packer (604-3 FLUTe)	604-5 Packer Duplicate (604-3 FLUTe)	604-3 (FLUTe)	604-3 (FLUTe)	604-3 (FLUTe)	604-3 (FLUTe)	604-3 (FLUTe)	604-3 (FLUTe)
			Well Type	D BMW	D BMW	D BMW	D BMW	D BMW	D BMW	D BMW	D BMW	D BMW
			Date	7/17/2017	3/18/2003	3/18/2003	3/26/2008	7/12/2012	7/11/2013	7/10/2014	7/9/2015	7/13/2016
OU-7 COPC Volatile Organics (µg/L)												
Acetone	22,000	RBC		R	<20	---	**3.19 B**	<25.0	<25.0	<25	<20	<2.66
Carbon disulfide	1,000	RBC		<0.22	**30**	---	**1.03**	<2.0 J	<2.0	**4.2 J**	<5	<0.22
OU-7 COPC Semivolatile Organics (µg/L)												
Bis(2-ethylhexyl)phthalate	6	MCL		<4.01	---	---	<5	<6.0	<6.0	<6	<5	<5.77
Naphthalene	14	RBC		<0.336	---	---	<5	<10.0	<10.0	<10	<0.5	<0.356
Pentachlorophenol	1	MCL		<3.00	---	---	<10	<1.1	<25.0	<25	<5	<1.63
o-Cresol/2-Methylphenol	1,800	RBC		<1.45	---	---	<5	<10.0	<10.0	<10	<1	<2.21
3&4-Methylphenol/4-methylphenol	180	RBC		<1.27	---	---	<5	<10.0	<10.0	<10	<1	<2.12
Phenol	11,000	RBC		<1.36	---	---	<5	<10.0	<10.0	<10	<1	<1.44
OU-7 COPC Inorganics, Dissolved (µg/L)												
Aluminum	37,000	RBC		<8.4	<200 L	<200	---	<100 L	<100 L	**30.7 J**	<200	<9.6
Antimony	6	MCLG		<0.8	**5.1 L**	<5	<1	<1.0	<5.0	**3.2 J**	<2	<0.5
Arsenic	10	MCL		<0.4	**13**	**11**	**1.68 J**	**1.0 J**	<10.0	<10	**0.58 J**	**0.982 J**
Cadmium	5	MCLG		<0.1	<3	<3	<5	<0.10	<1.0	<1	<1	<0.4
Chromium	100	MCLG		<0.703	<5	<5	<5	**1.1 J**	<5.0	<5	<4	<0.5
Cobalt	11	RBC		<0.1	<50	<50	---	<1.0	**0.84 L**	<5	<1	<0.5
Iron	26,000	RBC		**279**	**1,600 L, J**	**1,300**	---	**155**	**145**	<50	**282**	**77.1**
Lead	15	AL		<0.1	<3	<3	<3	**1**	<5.0	<5	<2	<0.2
Manganese	880	RBC		**236**	**140**	**130**	---	**198**	**197**	**193**	**230**	**184**
Mercury (total)[2]	2	MCLG		<0.1	<0.2	<0.2	<0.2	<0.20	<0.20	<0.2	<0.2	<0.1
Nickel	730	RBC		<0.5	<50	<50	**3.72 J**	<5.0	<5.0	**3.3 J**	<4	<0.5
Vanadium	260	RBC		<0.7	<20	<20	<100	<5.0	<5.0	<5	<1	<0.7
Zinc	11,000	RBC		**7.34 J**	**1,100 L, J**	**900**	<20	**6.2 K**	**1.6 B**	**3.8 J**	<30	<10
Cyanide (free)[3]	200	MCLG		<1.54	---	---	---	<100	<100	<100	<6	<0.608
Field Parameters												
Temperature (°C)		---		17.3	12.4	---	14.29	21.44	16.50	14.94	17.03	20.14
Conductivity (mS/cm)		---		0.7187	0.886	---	0.694	0.688	0.726	0.72	0.7	0.75396
pH (s.u.)		---		7.52	8.02	---	6.96	7.18	7.27	7.28	7.86	7.65
ORP (mV)		---		-138.2	-135	---	-86.9	-62.8	-76.2	129.10	-73.10	-89.6
Turbidity (NTU)		---		8.07	30.3	---	0.8	9.3	0.0	0.22	1.28	50.12
Dissolved Oxygen (mg/L)		---		3.42	3.74	---	0.5	3.66	1.86	0.38	0.00	1.34

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OU-7 Historical Groundwater Sampling Results Summary
Avtex Fibers Superfund Site
Front Royal, Virginia

Parameter	Groundwater Cleanup Standards[1] (µg/L)		Well ID	604-3 (FLUTe)	604-7 Packer (604-4 FLUTe)	604-4 (FLUTe)	604-4 (FLUTe)	604-4 (FLUTe)	604-4 (FLUTe)	604-4 (FLUTe)	604-4 (FLUTe)	604-4 (FLUTe)	605A
			Well Type	D BMW	D BMW	D BMW	D BMW	D BMW	D BMW	D BMW	D BMW	D BMW	D BMW
			Date	7/17/2017	3/18/2003	3/26/2008	7/12/2012	7/11/2013	7/10/2014	7/9/2015	7/13/2016	7/17/2017	9/10/2013
OU-7 COPC Volatile Organics (µg/L)													
Acetone	22,000	RBC		R	<20	**4.54 B**	<25.0	<25.0	<25	**15 J**	<2.66	R	**16.4 J**
Carbon disulfide	1,000	RBC		<0.22	**10**	<1	<2.0 J	<2.0	**2.7 J**	<5	<0.22	<0.22	<2.0
OU-7 COPC Semivolatile Organics (µg/L)													
Bis(2-ethylhexyl)phthalate	6	MCL		<2.50	---	<5	<6.0	<6.0	**1.5 J**	<5	<5.77	<4.37	<6.0
Naphthalene	14	RBC		<0.325	---	<5	<10.0	<10.0	<10	<0.5	<0.356	<0.336	<10.0
Pentachlorophenol	1	MCL		<2.89	---	<10	<1.1	<25.0	<25	<5	<1.63	<3.00	<25.0
o-Cresol/2-Methylphenol	1,800	RBC		<1.40	---	<5	<10.0	<10.0	<10	<1	<2.21	<1.45	<10.0
3&4-Methylphenol/4-methylphenol	180	RBC		<1.23	---	<5	<10.0	<10.0	<10	<1	<2.12	<1.27	<10.0
Phenol	11,000	RBC		<1.32	---	<5	<10.0	<10.0	<10	<1	<1.44	<1.36	<10.0
OU-7 COPC Inorganics, Dissolved (µg/L)													
Aluminum	37,000	RBC		<8.4	**470**	---	<100 L	<100 L	<100	<200	<9.6	<8.4	**300**
Antimony	6	MCLG		<0.8	<5	**0.298 J**	**0.68 J**	<5.0	<5	<2	<0.5	<0.8	**41.4**
Arsenic	10	MCL		<0.4	**10**	**3.19 J**	**2.7**	<10.0	<10	**1.6 J**	**1.33 J**	**0.41 J**	**14.4 K**
Cadmium	5	MCLG		<0.1	<3	<5	**0.11**	<1.0	<1	<1	<0.4	<0.1	<1.0
Chromium	100	MCLG		<1.32	<5	<5	**0.60 J**	<5.0	<5	<4	<0.5	<0.5	**9.2 L**
Cobalt	11	RBC		<0.1	<50	---	<1.0	<5.0	<5	<1	<0.5	<0.1	<5.0
Iron	26,000	RBC		<46	**1,200 L, J**	---	**40.3 J**	**32.3 B**	<50	**29.8 J**	**28.0**	<18.6	<50.0
Lead	15	AL		<0.1	**3.4**	<3	<1.0	<5.0	<5	<2	<0.2	<0.1	<5.0
Manganese	880	RBC		**197**	**120**	---	**27.4**	**27.0**	**16.2**	**31.8**	**31.1**	**26.6**	<5.0
Mercury (total)[2]	2	MCLG		<0.1	<0.2	<0.2	<0.20	<0.20	<0.2	<0.2	<0.1	<0.1	<0.20
Nickel	730	RBC		<0.5	<50	**1.27 J**	<5.0	<5.0	<5	<4	<0.5	<0.5	<5.0
Vanadium	260	RBC		<0.7	<20	<10	<5.0	<5.0	<5	<1	<0.7	<0.7	**11.2**
Zinc	11,000	RBC		<5.2	**620 L, J**	<20	**6.5 K**	**2.0 B**	**2.3 J**	<30	<10	<5.2	**1.9 B**
Cyanide (free)[3]	200	MCLG		<1.54	---	---	<100	<100	<100	<6	<0.608	<1.54	<100
Field Parameters													
Temperature (°C)		---		17.96	13.5	14.61	24.93	16.23	14.87	18.65	20.41	18.07	16.40
Conductivity (mS/cm)		---		0.7809	0.849	0.738	0.947	0.874	0.70	0.8	0.82471	0.68349	2.439
pH (s.u.)		---		7.53	8.07	7.55	7.69	7.48	7.88	8.28	7.98	8.15	11.98
ORP (mV)		---		-154.2	-162	-120.6	-155.2	-158.3	75.80	-53.4	-153.5	-183.2	-114.2
Turbidity (NTU)		---		3.04	32.5	1.7	7.0	0.0	2.25	1.06	6.08	0.7	7.1
Dissolved Oxygen (mg/L)		---		3.34	3.01	0.46	2.36	1.70		0.06	2.19	4.05	0.33

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OU-7 Historical Groundwater Sampling Results Summary
Avtex Fibers Superfund Site
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Parameter	Groundwater Cleanup Standards[1]		Well ID	605A	605A (Duplicate)	605A	605A	605A	605A	605B	605B	605B	605B
			Well Type	D BMW	D BMW	D BMW	D BMW	D BMW	D BMW	D BMW	D BMW	D BMW	D BMW
	(µg/L)		Date	11/19/2013	11/19/2013	7/15/2014	7/11/2015	7/27/2016	7/12/2017	11/19/2013	7/2/2014	7/15/2015	7/29/2016
OU-7 COPC Volatile Organics (µg/L)													
Acetone	22,000	RBC		<25.0	<25.0	<25	<20	<2.66	<2.66	**25.9**	**29.6**	**9 J**	<2.66
Carbon disulfide	1,000	RBC		**12.2**	**12**	**18.8**	**13**	**9.60**	**8.9**	**12.7**	**16.6**	**2 J**	**1.78**
OU-7 COPC Semivolatile Organics (µg/L)													
Bis(2-ethylhexyl)phthalate	6	MCL		**1.7 B**	**1.9 B**	<6	<5	<5.77	<3.16	**5.8 B**	<6	<5	<5.66
Naphthalene	14	RBC		<10.0	<10.0	<10	<0.5	<0.356	<0.356	<10.0	<10	**3**	**1.51 J**
Pentachlorophenol	1	MCL		<25.0	<25.0	<25	<5	<1.63 J	<3.17	<25.0	<25	<5	<1.6
o-Cresol/2-Methylphenol	1,800	RBC		<10.0	<10.0	<10	<1	<2.21	<1.54	<10.0	<10	<1	<2.17
3&4-Methylphenol/4-methylphenol	180	RBC		<10.0	<10.0	<10	<1	<2.12	<1.35	<10.0	<10	<1	<2.08
Phenol	11,000	RBC		<10.0	<10.0	<10	<1	<1.44	<1.44	<10.0	<10	<1	<1.42
OU-7 COPC Inorganics, Dissolved (µg/L)													
Aluminum	37,000	RBC		**410**	**411**	**137**	**56.7 J**	**38.3**	<42	**27.4 J**	**18.1**	**60.6 J**	<64.8
Antimony	6	MCLG		**22.3**	**21.9**	**6.5**	**3.8**	<2.13	<4	**3.3 K**	<1	<2	<0.5
Arsenic	10	MCL		**7.4 K**	**9.1 K**	**8.5**	**10.7**	**11.3**	**9.56 J**	<10.0	**5.8**	**8.1**	**8.05**
Cadmium	5	MCLG		<1.0 L	<1.0 L	<0.1	<1	<0.4	<0.5	<1.0 L	<0.1	<1	<0.4
Chromium	100	MCLG		<5.0	<5.0	<1	<4	**1.18 J**	<2.5	<5.0	<1	<4	<0.886
Cobalt	11	RBC		<5.0	<5.0	<1	<1	<0.5	<0.5	**0.81 J**	<1	<1	<0.5
Iron	26,000	RBC		<50.0	<50.0	<10	<200	<20	<50	<50.0	**18.8**	<200	<20
Lead	15	AL		<5.0 L	<5.0 L	<1	**0.17 J**	<0.2	<0.5	<5.0	<1	<2	<0.2
Manganese	880	RBC		<5.0	<5.0	<1	<2	**3.44 J**	<7.5	**1.2 B**	**14.6**	**6.3**	**6.54**
Mercury (total)[2]	2	MCLG		<0.20	<0.20	<0.2	<0.2 J-	<0.1	<0.1	<0.20	<0.2	<0.2	<0.1
Nickel	730	RBC		<5.0 L	<5.0 L	<1	**1.2 J**	**3.19**	<2.5	**2.1 B**	<1	**2.8 J**	<2.42
Vanadium	260	RBC		**5.3 L**	**5.4 L**	**2.1**	**1.5**	<3.33	<3.5	<5.0	<1	**2.9**	<5.04
Zinc	11,000	RBC		**0.92 L**	**1.1 L**	<5	<30	<10	<26	**26.8 B**	<5	<30	<10
Cyanide (free)[3]	200	MCLG		<100	<100	<100	<6 J	<0.608	<1.54	<100	<100	<6 J	<0.608
Field Parameters													
Temperature (°C)		---		13.31	13.31	19.94	17.55	19.2	17.93	NM	26.6	15.04	15.91
Conductivity (mS/cm)		---		1.385	1.385	0.87	0.6	0.68587	0.66629	NM	1.44	1.6	1.7184
pH (s.u.)		---		11.66	11.66	10.44	9.71	10.22	9.78	NM	10.11	9.29	9.68
ORP (mV)		---		-28.9	-28.9	-58.96	-115.66	-293.2	-125.5	NM	-119.26	-107.74	-292.8
Turbidity (NTU)		---		9.8	9.8	6.23	1.55	1.35	0.92	NM	79.60	20.20	8.27
Dissolved Oxygen (mg/L)		---		0.41	0.41	0.20	0.00	0.19	0.19	NM	0.07	0.00	0.04

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OU-7 Historical Groundwater Sampling Results Summary
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Parameter	Groundwater Cleanup Standards[1] (µg/L)		Well ID	605B	606A	606A	606A	606A	606A	606A	606B	606B	606B (Duplicate)
			Well Type	D BMW	D BMW	D BMW	D BMW	D BMW	D BMW	D BMW	D BMW	D BMW	D BMW
			Date	7/13/2017	9/10/2013	10/9/2013	7/13/2014	7/9/2015	7/19/2016	7/15/2017	9/9/2013	10/10/2013	10/10/2013
OU-7 COPC Volatile Organics (µg/L)													
Acetone	22,000	RBC		<2.66	<25.0	<25.0	<25	<20	<2.66	R	<25.0	<25.0	<25.0
Carbon disulfide	1,000	RBC		**0.776**	<2.0	<2.0	<10	<5	**1.64**	<0.22	<2.0	<2.0	<2.0
OU-7 COPC Semivolatile Organics (µg/L)													
Bis(2-ethylhexyl)phthalate	6	MCL		<5.43	<6.0	<6.0	<6	<5	<5.88	<5.07	<6.0	<6.0	<6.0
Naphthalene	14	RBC		**1.00 J**	<10.0	<10.0	<10	<0.5	<0.363	<0.336	<10.0	<10.0	<10.0
Pentachlorophenol	1	MCL		<3.44	<25.0	<25.0	<25	<5	<1.67	<3.00	<25.0	<25.0	<25.0
o-Cresol/2-Methylphenol	1,800	RBC		<1.67	<10.0	<10.0	<10	<1	<2.25	<1.45	<10.0	<10.0	<10.0
3&4-Methylphenol/4-methylphenol	180	RBC		<1.46	<10.0	<10.0	<10	<1	<2.16	<1.27	<10.0	<10.0	<10.0
Phenol	11,000	RBC		<1.56	<10.0	<10.0 J	<10	<1	<1.47	<1.36	<10.0	<10.0	<10.0
OU-7 COPC Inorganics, Dissolved (µg/L)													
Aluminum	37,000	RBC		<42	<100 L	**38 L**	**20.3**	<200	<9.6	<8.4	**50.0 J**	**47 J**	**42 J**
Antimony	6	MCLG		<4	<5.0	<5.0 L	<1	<2	<0.5	<0.8	**4.3 J**	<5.0	<5.0
Arsenic	10	MCL		**7.99 J**	**8.8 K**	<10.0	**1.4**	**0.79 J**	<0.5	<0.4	<10.0	<10.0	<10.0
Cadmium	5	MCLG		<0.5	<1.0	<1.0	<0.1	<1	<0.4	<0.1	<1.0 L	<1.0	<1.0
Chromium	100	MCLG		<2.5	<5.0 L	<5.0	<1	<4	**0.684 J**	<0.826	<5.0 L	<5.0	<5.0
Cobalt	11	RBC		<0.5	<5.0	**0.61 J**	<1	<1	<0.5	<0.1	<5.0	<5.0	<5.0
Iron	26,000	RBC		**105 J**	<50.0	<50.0	**10.3**	<200	<20	<10	<50.0	**17.4 J**	<50.0
Lead	15	AL		<0.5	<5.0	<5.0 L	<1	<2	<0.2	<0.1	<5.0 L	<5.0 L	<5.0 L
Manganese	880	RBC		**10.1 J**	**15.4**	**12.7**	**4.5**	**4.3**	<5.43	**8.3**	**20.1**	**8.4**	**8.1**
Mercury (total)[2]	2	MCLG		<0.1	<0.20	<0.20 J	<0.2	<0.2	<0.1	<0.1	<0.20 L	<0.20	<0.20
Nickel	730	RBC		**6.66 J**	<5.0	<5.0	**1.2**	**1.1 J**	**1.42 J**	**2**	<5.0	<5.0	<5.0
Vanadium	260	RBC		<3.5	**0.99 K**	<5.0	<5	<1	**1.78 J**	<0.7	**1.9 J**	<5.0 L	<5.0 L
Zinc	11,000	RBC		<26	**1.5 B**	**9.1 B**	<5	<30	<10	<5.2	**1.3 B**	**0.89 L**	**3.0 L**
Cyanide (free)[3]	200	MCLG		<1.54	<100	<100	<100	<6	<0.608 J	<1.54	<100	<100	<100
Field Parameters													
Temperature (°C)		---		19.67	15.18	14.14	32.52	23.59	16.74	17.67	17.09	13.12	13.12
Conductivity (mS/cm)		---		1.9914	0.945	1.04	0.95	0.7	0.96396	1.0268	1.150	0.945	0.945
pH (s.u.)		---		9.2	8.45	8.71	8.91	9.01	8.99	8.99	8.84	9.12	9.12
ORP (mV)		---		-413.4	-205.3	-341.4	-216.05	-392.1	-344	-282.8	-113.3	-332.6	-332.6
Turbidity (NTU)		---		67.9	26.1	36.1	8.71	-0.7	0.36	0.94	88.8	2.0	2.0
Dissolved Oxygen (mg/L)		---		0.03	0.32	0.23	0.18	0.11	0.01	0.25	0.54	0.20	0.20

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Table D-1

OU-7 Historical Groundwater Sampling Results Summary
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Parameter	Groundwater Cleanup Standards[1] (µg/L)		Well ID	606B	606B	606B	606B	GM-02A	GM-02A	GM-02A	GM-02A	GM-02A	GM-02A
			Well Type	D BMW	D BMW	D BMW	D BMW	S BMW	S BMW	S BMW	S BMW	S BMW	S BMW
			Date	6/29/2014	7/14/2015	7/27/2016	7/17/2017	5/29/1987	8/15/1987	1/27/1994	4/5/1994	7/26/2000	7/5/2012
OU-7 COPC Volatile Organics (µg/L)													
Acetone	22,000	RBC		<125	<20	<2.66	R	---	---	**550 B**	**780**	**34**	**6.8 J**
Carbon disulfide	1,000	RBC		<50	**1 J**	**1.00**	**0.261 J**	**30 J**	**410,000 J**	**160,000 J**	**64,000**	**2,000**	**514**
OU-7 COPC Semivolatile Organics (µg/L)													
Bis(2-ethylhexyl)phthalate	6	MCL		<6	<5	<5.77	<3.17	---	---	<100	<100	<2	<6.0
Naphthalene	14	RBC		<10	<0.5	<0.356	<0.336	---	---	<100	<100	<1	<10.0
Pentachlorophenol	1	MCL		<25	<5	<1.63 J	<3.00	---	---	<250	<250	<3	<1.1
o-Cresol/2-Methylphenol	1,800	RBC		<10	<1	<2.21	<1.45	---	---	**15 J**	<100	**3 J**	<10.0
3&4-Methylphenol/4-methylphenol	180	RBC		<10	<1	<2.12	<1.27	---	---	**25 J**	**11 J**	**4 J**	<10.0
Phenol	11,000	RBC		<10	<1	<1.44	<1.36	**150**	---	**4,700**	**1,800**	**26**	**3.9 J**
OU-7 COPC Inorganics, Dissolved (µg/L)													
Aluminum	37,000	RBC		**16.7**	**28.5 J**	**22.8**	**33**	---	---	**24.8 B**	<19.9	**85 JB**	<100
Antimony	6	MCLG		<1	<2	<0.5	<0.8	---	---	**238 J**	**242**	**392**	**207**
Arsenic	10	MCL		**5.6**	**1.7 J**	**3.75**	**0.928 J**	<25	**280**	**366**	**358**	**500**	**375**
Cadmium	5	MCLG		<0.1	<1	<0.4	<0.1	<1	<40	<1.8	<1.8	<0.9	<0.10
Chromium	100	MCLG		<1	<4	<0.5	<0.621	---	---	**39.9**	**29.5 B**	**19.1**	**4.0 J**
Cobalt	11	RBC		<1	<1	<0.5	<0.1	---	---	**226 J**	**213**	**262**	**111**
Iron	26,000	RBC		**20.6**	<200	**23.2 J**	<16	**370**	**580**	**352**	**1,210**	**867 JK**	**179 L**
Lead	15	AL		<1	<2	<0.2	<0.1	<10	<12	**0.28 L**	<2.3 L	<9.8	<1.0
Manganese	880	RBC		**14.6**	**6.9**	**16.2**	**14.1**	**16**	<40	**33.3 B**	**6.8 B**	**11.9**	**8.4**
Mercury (total)[2]	2	MCLG		<0.2	<0.2	<0.1	<0.1	---	---	<6.6	**1.2**	<48 L	<0.20
Nickel	730	RBC		<1	<4	**1.29 J**	**1.25 J**	---	---	**385**	**300**	**499**	**182 L**
Vanadium	260	RBC		<1	**0.37 J**	<2.33	<0.7	---	---	**57.1**	**40.3**	**26.1**	**3.2 L**
Zinc	11,000	RBC		<5	<30	<10	<5.2	**60**	**220**	**182 B**	**115**	**331**	**24 B**
Cyanide (free)[3]	200	MCLG		<100	<6 J	<0.608	<1.54	---	---	**5,096**	<25 L	**99.9 J**	**286 L**
Field Parameters													
Temperature (°C)		---		27.41	18.75	31.38	18.13	---	---	10.00	14.00	13.9	20.23
Conductivity (mS/cm)		---		1.62	1.0	0.0003	1.0391	1.88	20.3	14	12	19.4	11.14
pH (s.u.)		---		8.61	8.86	9.26	8.88	8.72	9.58	8.8	9.4	8.75	7.93
ORP (mV)		---		-67.4	-57.41	-162.4	-275	---	---	---	---	-315	-454.4
Turbidity (NTU)		---		5.03	1.05	1.51	0.32	---	---	---	---	3.2	0.0
Dissolved Oxygen (mg/L)		---		0.04	0.07	7.04	0.19	---	---	---	---	0.09	0.35

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Table D-1

OU-7 Historical Groundwater Sampling Results Summary
Avtex Fibers Superfund Site
Front Royal, Virginia

Parameter	Groundwater Cleanup Standards[1] (µg/L)		Well ID	GM-02A	GM-02A	GM-02A	GM-02A	GM-02A	GM-02B	GM-02B	GM-02B	GM-02B	GM-02B
			Well Type	S BMW	S BMW	S BMW	S BMW	S BMW	I BMW	I BMW	I BMW	I BMW	I BMW
			Date	7/19/2013	6/27/2014	7/9/2015	7/16/2016	7/19/2017	5/29/1987	8/15/1987	2/1/1994	4/5/1994	7/26/2000
OU-7 COPC Volatile Organics (µg/L)													
Acetone	22,000	RBC		<25.0	<250	<20	<2.66	<2.66	**1,900 B**	---	**110 B**	**290 J**	**190**
Carbon disulfide	1,000	RBC		**114**	**460**	**86**	**8.89**	**3.83**	**310,000**	**470,000 J**	**20,000 J**	**200,000**	**26,000**
OU-7 COPC Semivolatile Organics (µg/L)													
Bis(2-ethylhexyl)phthalate	6	MCL		<6.0	<60	<5	<5.77	<1.50	<10	---	**26 B**	<100	<2
Naphthalene	14	RBC		<10.0	<100	**0.5 J**	<0.356	<0.370	<10	---	**1 J**	<100	<1
Pentachlorophenol	1	MCL		<25.0	<250	<5	<1.63	<3.30	---	---	<25 J	<250	<3
o-Cresol/2-Methylphenol	1,800	RBC		<10.0	<100	<1	<2.21	<1.60	<250	---	**3 J**	<100	**3 J**
3&4-Methylphenol/4-methylphenol	180	RBC		<10.0	<100	<1	<2.12	<1.40	<250	---	**1,600**	**12 J**	**3 J**
Phenol	11,000	RBC		<10.0	<100	<1	<1.44	<1.50	**4,100**	---	**230 J***	**4,400**	**180**
OU-7 COPC Inorganics, Dissolved (µg/L)													
Aluminum	37,000	RBC		**46.0 L**	<10	<200	<9.6	<8.4	---	---	<19.9	**21 B**	<19
Antimony	6	MCLG		**26.9**	**65.1**	<2	<0.5	<0.8	---	---	**28.8**	**375**	**111 K**
Arsenic	10	MCL		**114**	**194**	**19.6**	**7.26 J**	**2.99**	**110**	**320**	**67.8**	**460**	**344**
Cadmium	5	MCLG		**0.85 L**	<0.1	<1	<4	<0.1	<1	<40	<1.8	<1.8	<0.9
Chromium	100	MCLG		**3.4 B**	**3.4**	<4	<5	<0.5	---	---	**7.2 B**	**46.9**	**16**
Cobalt	11	RBC		**48.8**	**62**	**2.2**	<5	**0.355 J**	---	---	**25.7**	**301**	**269**
Iron	26,000	RBC		**33.1 J**	**31**	**25.7 J**	<200	**26.1**	**490**	**1,000**	**995**	**782**	**208 J, K**
Lead	15	AL		<5.0 L	<1 J	<2	<0.2	**0.166 J**	<75	<12	<1.2 L	<2.3 L	<9.8
Manganese	880	RBC		**6.8**	**7.1**	**4.3**	<20	**28.4**	**30**	<40	**48**	**19.6 B**	<2.5
Mercury (total)[2]	2	MCLG		<0.20	<0.2	<0.2	<0.1	<0.1	---	---	**0.15**	**2.1**	<48 L
Nickel	730	RBC		**158**	**146**	**6.9**	**5.66 J**	**0.887 J**	---	---	**67.9**	**447**	**391**
Vanadium	260	RBC		**2.6 L**	**3.1**	**1.2**	<7	<0.7	---	---	**7.3**	**56.4**	**15 J**
Zinc	11,000	RBC		**14.7 L**	**7**	<30	<100	**5.79 J**	**40**	<80	**100 J**	**251**	**277**
Cyanide (free)[3]	200	MCLG		**500**	**559 J**	<150	<0.608	<1.54	---	---	<2.5	<17.5 L	**94.1 J**
Field Parameters													
Temperature (°C)		---		15.29	25.21	21.07	18.82	18.54	---	---	12.00	14.00	13.8
Conductivity (mS/cm)		---		9.595	8.51	0.9	0.70437	0.62623	11.85	13.1	3.5	20	19.1
pH (s.u.)		---		8.15	8.29	9.01	8.82	8.06	8.54	9.18	9.9	9.3	8.78
ORP (mV)		---		-418.5	-425.4	-422.8	-319.7	-347.6	---	---	---	---	-254
Turbidity (NTU)		---		29.3	28.0	13.6	781.94	0.96	---	---	---	---	1.4
Dissolved Oxygen (mg/L)		---		0.19	0.07	0.08	0.1	0.2	---	---	---	---	0.81

NOTES: See page 64 of 64.

Table D-1

OU-7 Historical Groundwater Sampling Results Summary
Avtex Fibers Superfund Site
Front Royal, Virginia

Parameter	Groundwater Cleanup Standards[1] (µg/L)		Well ID	GM-02B	GM-02B	GM-02B	GM-02B	GM-02B (Duplicate)	GM-02B	GM-02B	GM-02B	GM-02B	GM-09
			Well Type	I BMW	I BMW	I BMW	I BMW	I BMW	I BMW	I BMW	I BMW	I BMW	I BMW
			Date	10/30/2001	4/3/2008	7/5/2012	9/6/2013	9/6/2013	6/27/2014	7/9/2015	7/17/2016	7/19/2017	5/29/1987
OU-7 COPC Volatile Organics (µg/L)													
Acetone	22,000	RBC		**230**	<500 R	**114**	<25.0	<25.0	<250	<200	**154**	<8.46	---
Carbon disulfide	1,000	RBC		**27,000**	**6,630 J**	**9,480**	**99.1 J**	**177 J**	**282**	**47 J**	<0.22	**896**	**890**
OU-7 COPC Semivolatile Organics (µg/L)													
Bis(2-ethylhexyl)phthalate	6	MCL		---	<5	<6.0	<6.0	<6.0	<60	<5	<6	<15.0	---
Naphthalene	14	RBC		---	<5	<10.0	<10.0	<10.0	<100	**0.4 J**	**0.889 J**	<3.70	---
Pentachlorophenol	1	MCL		---	<10	---	<25.0	<25.0	<250	<5	<1.7	<33.0	---
o-Cresol/2-Methylphenol	1,800	RBC		---	<5	<10.0	<10.0	<10.0	<100	**0.9 J**	<2.3	<16.0	---
3&4-Methylphenol/4-methylphenol	180	RBC		---	<5	**5.5 J**	<10.0	<10.0	<100	**0.7 J**	**2.79 J**	<14.0	---
Phenol	11,000	RBC		---	**26.1**	**13.5**	<10.0	<10.0	<100	<1	**69.5**	<15.0	---
OU-7 COPC Inorganics, Dissolved (µg/L)													
Aluminum	37,000	RBC		<31.9	---	<100	<100	<100	<50	**80.8 J**	**277**	<8.4	---
Antimony	6	MCLG		<2.4	**256 J**	**171**	**140**	**139**	**145**	**137**	**26.2**	**79.4**	---
Arsenic	10	MCL		**453**	**423 J**	**353**	**169 J**	**328 J**	**293**	**296**	**135**	**160**	**10**
Cadmium	5	MCLG		<0.64	**4.98 J**	<0.10	**2.4**	**2.5**	<0.5	<1	<4	<0.1	<1
Chromium	100	MCLG		**10.9**	**5.49 J**	**4.1 J**	**2.3 L**	**3.2 L**	<5	**3.6 J**	<5	<0.5	---
Cobalt	11	RBC		**197**	---	**86.1**	**80.3**	**74.8**	**96.5**	**89**	**12 J**	**12.1**	---
Iron	26,000	RBC		**61.8**	---	**435 L**	**272**	**237**	**564**	**218**	<200	<10	**2,300**
Lead	15	AL		<1.8	**4.15 J**	<1.0	<5.0 L	<5.0 L	<5	<2	<2	<0.1	<25
Manganese	880	RBC		**2.1**	---	**23.2**	**17.1**	**17.0**	**29.2**	**15.1**	**25.8 J**	<1.5	**7,400**
Mercury (total)[2]	2	MCLG		**0.337**	<0.2 J	<0.20	<0.20	<0.20	<0.2	<0.2	<0.1	<0.1	---
Nickel	730	RBC		**286**	**230 J**	**65.7 L**	**176**	**168**	**200**	**204**	**20.0**	**16.9**	---
Vanadium	260	RBC		**9**	**10.4 J**	**2.2 L**	**2.0 J**	**1.4 J**	<5	**2.9**	<7	**0.891 J**	---
Zinc	11,000	RBC		**139**	**50.4 J**	**23.3 B**	**23.3**	**20.9**	<25	<30	<100	<5.2	**30**
Cyanide (free)[3]	200	MCLG		---	---	**327 L**	**882**	**882**	**918**	<300	<0.608	<1.54	---
Field Parameters													
Temperature (°C)		---		13.59	13.40	14.82	13.42	13.42	18.26	22.83	19.18	24.22	---
Conductivity (mS/cm)		---		17.6	10.87	11.18	11.26	11.26	10.39	9.8	5.2188	8.4539	5.13
pH (s.u.)		---		9.01	8.26	8.30	8.36	8.36	8.54	8.44	8.24	7.76	7.32
ORP (mV)		---		-551	-452.1	-475.8	-452.1	-452.1	-441.8	-514.8	-421.2	-525.9	---
Turbidity (NTU)		---		107.3	641.3	0.0	3.0	3.0	7.51	1.6	1.2	20.92	---
Dissolved Oxygen (mg/L)		---		0.5	0.84	0.28	0.10	0.10	0.56	0.16	0.09	0.12	---

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Table D-1

OU-7 Historical Groundwater Sampling Results Summary
Avtex Fibers Superfund Site
Front Royal, Virginia

Parameter	Groundwater Cleanup Standards[1] (µg/L)		Well ID	GM-09	GM-09	GM-09	GM-09	GM-09	GM-09	GM-09R	GM-09R	GM-09R	GM-09R
			Well Type	I BMW	I BMW	I BMW	I BMW	I BMW	I BMW	I BMW	I BMW	I BMW	I BMW
			Date	8/15/1987	2/4/1994	4/11/1994	8/1/2000	7/10/2012	7/19/2013	7/8/2014	7/24/2015	8/9/2016	7/30/2017
OU-7 COPC Volatile Organics (µg/L)													
Acetone	22,000	RBC		**1,000 B**	**5 B**	<10	<6	**4.1 B**	<25.0	<250	<20	<2.66	<5.72
Carbon disulfide	1,000	RBC		**2,600**	**98 J**	**20**	**2,900 J**	**600**	**913**	**870**	**3 J**	**13.9**	**0.891**
OU-7 COPC Semivolatile Organics (µg/L)													
Bis(2-ethylhexyl)phthalate	6	MCL		**6 J**	**46 B**	**12 B**	<2	<6.0	<6.0	<6	<5	<1.44	<1.89
Naphthalene	14	RBC		<10	<10	<10	<1	<10.0	<10.0	<10	<0.5	<0.356	<0.343
Pentachlorophenol	1	MCL		<50 B	<25	<25	<3	<1.1	<25.0 L	<25	<5	<3.17	<3.06
o-Cresol/2-Methylphenol	1,800	RBC		<10	<10	<10	<1	<10.0	<10.0 L	<10	<1	<1.54	<1.48
3&4-Methylphenol/4-methylphenol	180	RBC		<10	<10	<10	<3	<10.0	<10.0 L	<10	<1	<1.35	<1.30
Phenol	11,000	RBC		**22,000**	**8 J**	<10	<1	<10.0	<10.0 L	<10	<1	<1.44	<1.39
OU-7 COPC Inorganics, Dissolved (µg/L)													
Aluminum	37,000	RBC		---	<19.9	<17	<19	<100 L	**94.3 L**	<100	<200	<96	<8.4
Antimony	6	MCLG		---	<19.3	<20.6	**1.5 JK**	**2.9**	<5.0	**8.9**	<2	<5	<0.8
Arsenic	10	MCL		<3	<1.1	<1.5	**11.8**	**20.0**	**21.7 B**	<10	**0.76 J**	<8.17	<0.4
Cadmium	5	MCLG		**12**	<1.8	<3	<0.9	<0.10	<1.0 L	<1	<1	<4	<0.1
Chromium	100	MCLG		---	<6.1	**10.8 B**	<1.6	**1.7 J**	**1.3 B**	**3.7 J**	<4	<5	<0.5
Cobalt	11	RBC		---	<4.6	<4	**13.2 J**	**7.9**	**3.8 J**	**4.2 J**	**0.62 J**	<5	**0.266 J**
Iron	26,000	RBC		**310**	**56.2 B**	**395 J**	**3,250**	<50.0	**23.4 J**	**215**	**242**	**8640 J**	**2600**
Lead	15	AL		<100	**1.2 B**	<0.29 L	<9.8 L	<1.0	<5.0 L	<5	<2	<2	<0.1
Manganese	880	RBC		**5,700**	**151 J**	**97.7**	**2,080**	**475**	**507**	**491**	**2300**	**3900**	**1110**
Mercury (total)[2]	2	MCLG		---	**0.045 B**	<0.008 L	<0.48 L	<0.20	<0.20	<0.2	<0.2	<0.1	<0.1
Nickel	730	RBC		---	<5.3	<5.8	**39.1 J**	**18.8**	**22.5**	**17.8**	**16.4**	**16.7 J**	**5.15**
Vanadium	260	RBC		---	**4.8 B**	<5	**4 J**	**0.59 B**	**1.8 L**	**0.82 J**	**1.6**	<7	<0.7
Zinc	11,000	RBC		**20**	**48.8 B**	**16.3 B**	<8.6	**3.0 K**	**3.7 L**	<10	<30	<100	**11.7 J**
Cyanide (free)[3]	200	MCLG		---	<50	<2.5	<4	<100	<100	<100	**4.1 J**	<0.608	<1.54
Field Parameters													
Temperature (°C)		---		---	12.00	14.00	15.6	16.22	19.33	22.99	26.92	18.28	25.02
Conductivity (mS/cm)		---		6.17	1.08	1	4.25	2.858	2.814	2.79	4.3	4.6612	2.9877
pH (s.u.)		---		7.48	8.95	9.6	6.96	6.87	6.81	6.94	6.80	7.03	7.47
ORP (mV)		---		---	---	---	270	-354.5	-311.9	-278.80	-301.22	-160.9	-168.8
Turbidity (NTU)		---		---	---	---	7.0	0.8	410.6	158.0	28.10	7.74	8.26
Dissolved Oxygen (mg/L)		---		---	---	---	0.43	0.26	0.42	0.12	0.05	0.11	0.23

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Table D-1

OU-7 Historical Groundwater Sampling Results Summary
Avtex Fibers Superfund Site
Front Royal, Virginia

Parameter	Groundwater Cleanup Standards[1] (µg/L)		Well ID	MW-3R	MW-3R	MW-3R	MW-3R	MW-3R (Duplicate)	MW-3R	MW-3R	MW-03R	MW-03R	MW-03R
			Well Type	S BMW	S BMW	S BMW	S BMW	S BMW	S BMW	S BMW	S BMW	S BMW	S BMW
			Date	5/29/1987	8/15/1987	2/7/1994	4/14/1994	4/14/1994	8/7/2000	7/9/2012	7/18/2013	7/8/2014	7/12/2015
OU-7 COPC Volatile Organics (µg/L)													
Acetone	22,000	RBC		**6700 B**	---	**1,800 B**	<50,000	<50,000	**1,500 JB**	**175 J**	<25.0	<250	<200
Carbon disulfide	1,000	RBC		**2,000,000**	**1,500,000**	**1,200,000 J**	**1,100,000 J**	**570,000 J**	**540000**	**3,450**	**6,930**	**4290**	**2600**
OU-7 COPC Semivolatile Organics (µg/L)													
Bis(2-ethylhexyl)phthalate	6	MCL		<100	---	<100	<50	<50	<2 L	<10.0	<6.0	<6	<5
Naphthalene	14	RBC		<100	---	<100	<50	<50	**65 L**	<16.7	<10.0	<10	<0.5
Pentachlorophenol	1	MCL		---	---	<250	<120	<120	**6 J**	<1.1	<25.0 J	<25	<5
o-Cresol/2-Methylphenol	1,800	RBC		<50,000	---	**41 J**	**52**	**60**	**80**	<16.7	<10.0 J	<10	<1
3&4-Methylphenol/4-methylphenol	180	RBC		<50,000	---	**98 J**	**120**	**150**	**150**	<16.7	<10.0 J	<10	<1
Phenol	11,000	RBC		**82,000 J**	---	**8,800**	**9,500**	**1100 J**	**13,000**	**13.3 J**	**19.3 J**	<10	<1
OU-7 COPC Inorganics, Dissolved (µg/L)													
Aluminum	37,000	RBC		---	---	**43.6**	<22.2	<22.2	**65.3 JB**	<300	**89.3 L**	**12.2**	**35.1 J**
Antimony	6	MCLG		---	---	**229**	**311**	**289**	**308 L**	**7.3**	**6.8**	**6.6**	**14.4**
Arsenic	10	MCL		**480**	**87**	**358**	**485 L**	**477 L**	**241 K**	**94.3**	**78.6**	**78.1**	**207**
Cadmium	5	MCLG		<2	<5	<1.8	<1.7	<1.7	<0.9	**0.36**	<1.0 L	**0.11**	<1
Chromium	100	MCLG		---	---	**88.5**	**129**	**122**	**105**	**10.5 K**	**4.0 B**	**2.9**	**12**
Cobalt	11	RBC		---	---	**273 J**	**311**	**287**	**244**	**39.8**	**27.6**	**26.8**	**139**
Iron	26,000	RBC		**370**	**480**	**367 K**	**337 B**	**324 B**	**399**	<150	**15.3 J**	**14.4**	**39.2 J**
Lead	15	AL		<50	**62**	<2.8 L	<5.8 L	<5.8 L	<9.8 L	<1.0	<5.0 L	<1	<2
Manganese	880	RBC		**140**	**140**	**93.5 J**	**7 B**	**7 B**	**592**	**4,150**	**3,080**	**3480**	**526**
Mercury (total)[2]	2	MCLG		---	---	**8.3**	**33.5**	**35.1**	**62 JL**	<0.20	<0.20	<0.2	<0.2 J-
Nickel	730	RBC		---	---	**685**	**1,030**	**1,080**	**866**	**98.1**	**83.9**	**64.7**	**491**
Vanadium	260	RBC		---	---	**113**	**168**	**163**	**111**	**26.0**	**9.1 L**	**9.2**	**18.3**
Zinc	11,000	RBC		**4,300**	**4,000**	**54.2 B**	**7,240**	**7,170**	**4,590**	**23.1 K**	**5.8 L**	<5	<30
Cyanide (free)[3]	200	MCLG		---	---	**24.1 J**	<12.5	<12.5	**550**	**188**	**138**	**110 J**	**53 J**
Field Parameters													
Temperature (°C)		---		---	---	---	---	---	23.6	17.98	19.00	23.34	20.65
Conductivity (mS/cm)		---		---	---	---	---	---	31.4	9.839	8.577	8.36	9.8
pH (s.u.)		---		---	---	---	---	---	10.24	6.50	6.78	6.85	7.54
ORP (mV)		---		---	---	---	---	---	-343	-357.7	-345.1	-371.05	-382.83
Turbidity (NTU)		---		---	---	---	---	---	---	14.6	30.9	19.20	59.70
Dissolved Oxygen (mg/L)		---		---	---	---	---	---	0	0.25	0.52	0.13	0.00

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Table D-1

OU-7 Historical Groundwater Sampling Results Summary
Avtex Fibers Superfund Site
Front Royal, Virginia

Parameter	Groundwater Cleanup Standards[1]		Well ID	MW-03R (Duplicate)	MW-03R	MW-03R	MW-09	MW-09	MW-09	MW-09	MW-09	MW-09	MW-09
			Well Type	S BMW	S BMW	S BMW	OMW	OMW	OMW	OMW	OMW	OMW	OMW
	(µg/L)		Date	7/12/2015	8/11/2016	7/28/2017	8/15/1987	2/9/1994	4/14/1994	8/2/2000	7/9/2012	7/24/2013	12/13/2013
OU-7 COPC Volatile Organics (µg/L)													
Acetone	22,000	RBC		<200	<26.6	<5.72	---	**3,400 B**	<50,000	**1,900 J**	**4,250**	**2,970**	**2710**
Carbon disulfide	1,000	RBC		**2600**	**367**	**99.4**	**2,800,000**	**1,700,000**	**660,000**	**260,000 J**	**5,450**	**1,110**	**987**
OU-7 COPC Semivolatile Organics (µg/L)													
Bis(2-ethylhexyl)phthalate	6	MCL		<5	<1.39	<2.78	---	<10 L	<50	<20	**2.2 J**	<300	<6.0
Naphthalene	14	RBC		<0.5	<0.343	<0.336	---	<10 L	<50	<10	**2.8 J**	<500	<10.0
Pentachlorophenol	1	MCL		<5	<3.06	<3.00	---	<25 L	**8 J**	<31 L	**1.5**	<1250	<25.0
o-Cresol/2-Methylphenol	1,800	RBC		<1	<1.48	<1.45	---	**240 L**	**380**	**470**	**130**	<500	<10.0
3&4-Methylphenol/4-methylphenol	180	RBC		<1	<1.3	<1.27	---	**100 L**	**210**	**280**	**117**	<500	<10.0
Phenol	11,000	RBC		<1	<1.39	<1.36	---	**1,300 L**	**2,600**	**34,000**	**13,100**	**4,900**	**3,930**
OU-7 COPC Inorganics, Dissolved (µg/L)													
Aluminum	37,000	RBC		**35.1 J**	<96	**26.4**	---	**125 B**	**288**	**99.3 J**	**345**	**286 K**	**283 B**
Antimony	6	MCLG		**10.4**	**6.91 J**	**5.49**	---	**154 B**	**66.8 B**	**37.3 K**	**127**	**48.4 L**	**17**
Arsenic	10	MCL		**165**	**288**	**231**	<4	**1,480**	**1,150 L**	**1,040**	**2,080**	**1,460**	**1,300**
Cadmium	5	MCLG		<1	<4	**0.204 J**	<10	<1.2	**2 B**	<0.9	**5.8**	**13.3**	<1.0
Chromium	100	MCLG		**9.7**	**19.1 J**	**22.5**	---	**199**	**202**	**183**	**101**	**96.8**	**70.8**
Cobalt	11	RBC		**114**	**177**	**144**	---	**917**	**735**	**910**	**596**	**456**	306
Iron	26,000	RBC		**28.8 J**	<200	**256**	**500**	**477 K**	**328 B**	**298 J**	**405**	**318**	**135 B**
Lead	15	AL		<2	<2	**0.189 J**	**200**	<2.3 L	<2.9 L	<9.8 L	<10.0	<25.0 L	<5.0 L
Manganese	880	RBC		**492**	<20	**7.85**	<20	**38.1**	**24.7 K**	**67.1**	**115**	**109**	**112**
Mercury (total)[2]	2	MCLG		<0.2 J-	<0.1	<0.1	---	**19**	**21.6**	<4.8 L	**0.26 J**	<0.20	<1.6
Nickel	730	RBC		**417**	**710**	**472**	---	**904**	**650**	**1,030**	**756**	**1,260**	**411**
Vanadium	260	RBC		**15.9**	<24.6	**23.4**	---	**830**	**877**	**684**	**549**	**449**	**430**
Zinc	11,000	RBC		<30	<100	**31.4**	**9,000**	**8,430 J**	**9,590**	**4,770**	**7,620**	**4,820**	**8100**
Cyanide (free)[3]	200	MCLG		<150 J	**0.973 J**	<1.54	---	<50	**17.7**	<20	**1,960**	**1,310**	**1050 K**
Field Parameters													
Temperature (°C)		---		20.65	26.02	18.37	---	13.00	18.00	14.9	14.96	15.19	14.56
Conductivity (mS/cm)		---		9.8	11.9661	13.141	50.1	31	39	22.8	36.400	28.71	30.230
pH (s.u.)		---		7.54	8.58	8.82	10.6	10.5	10.2	9.51	9.78	9.84	9.740
ORP (mV)		---		-382.83	-508.5	-414.1	---	---	---	-250	-529.8	-265.4	-488.1
Turbidity (NTU)		---		59.70	5.9	20.4	---	---	---	3.5	15.3	0.0	5.9
Dissolved Oxygen (mg/L)		---		0.00	0.04	0	---	---	---	0.0	0.11	0.80	0.05

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OU-7 Historical Groundwater Sampling Results Summary
Avtex Fibers Superfund Site
Front Royal, Virginia

Parameter	Groundwater Cleanup Standards[1] (µg/L)		Well ID	MW-09	MW-09	MW-09 (Duplicate)	MW-09	MW-09	MW-09	MW-10	MW-10	MW-10	MW-10
			Well Type	OMW	OMW	OMW	OMW	OMW	OMW	OMW	OMW	OMW	OMW
			Date	7/15/2014	12/10/2014	12/10/2014	8/4/2015	8/10/2016	7/31/2017	8/15/1987	2/8/1994	4/12/1994	8/6/2000
OU-7 COPC Volatile Organics (µg/L)													
Acetone	22,000	RBC		**2750**	**2030**	**2070**	**2800**	**879**	**2190 J**	---	**3 J**	<10	<6
Carbon disulfide	1,000	RBC		**1210**	**702**	**814**	**750**	**556**	**1410**	<5	**10 J**	<10	**6 B**
OU-7 COPC Semivolatile Organics (µg/L)													
Bis(2-ethylhexyl)phthalate	6	MCL		<120	**1.1 J**	**1.1 J**	<50	**5.59 J**	<8.93	---	**2 B**	**2 J**	<2
Naphthalene	14	RBC		<200	**10 J**	<10 J	<5	<0.356	<2.20	---	<10	<10	<0.9
Pentachlorophenol	1	MCL		<500	**1.9 J**	**1.8 J**	<50	<3.17	<19.6 J	---	<25	<25	<3
o-Cresol/2-Methylphenol	1,800	RBC		**95.4 J**	**44.1 J**	**36.2 J**	**260**	**32.6**	**267**	---	<10	<10	<0.9
3&4-Methylphenol/4-methylphenol	180	RBC		**80.8 J**	**39.1 J**	**30.6 J**	**190**	**16.7**	**235**	---	<10	<10	<3
Phenol	11,000	RBC		**17300**	**4830 J**	**4290 J**	**25000**	**2170**	**23200**	---	<10	<10	<0.9
OU-7 COPC Inorganics, Dissolved (µg/L)													
Aluminum	37,000	RBC		**185**	**244 J**	**167 J**	**175 J+**	<480	**197**	---	**47.4 B**	**268 B**	**96.2 JB**
Antimony	6	MCLG		**81.9**	**80.6**	**82.6**	**74.3**	**56.7 J**	**56.7**	---	<11.8	<206	**1.5 JLB**
Arsenic	10	MCL		**1850**	**2130**	**2180**	**2480**	**1990**	**1500 J**	<2	**21.5**	**11.1**	**5.7 JK**
Cadmium	5	MCLG		<10	**2.2 J**	**2.6**	**0.36 J**	<20	<0.8 J	<5	**3.5 B**	<30	<0.9
Chromium	100	MCLG		**103**	**112**	**119**	**144**	**71 J**	**79.6**	---	<2.8	<5.8	<1.6
Cobalt	11	RBC		**544**	**601**	**637**	**758**	**527**	**478 J**	---	**17.3**	**48.9**	**8 J**
Iron	26,000	RBC		**400**	**359**	**325**	**591**	<1000	<80 J	**2,900**	**17,100 K**	**13,600 J**	**42,300**
Lead	15	AL		<10	<5	<5	**0.27 J**	<10	<0.8	<30	**5.8**	**0.71 L**	<9.8 L
Manganese	880	RBC		**123**	**126**	**133**	**97.8**	**174 J**	**110**	**15,000**	**12,100**	**12,900**	**8,590**
Mercury (total)[2]	2	MCLG		<1	<1	<1	<1 J-	<0.5	<0.2	---	<0.066	<0.008 L	<0.048 L
Nickel	730	RBC		**1380**	**1560**	**1640**	**2140**	**1300**	**1180 J**	---	**15.2**	<58	**11.4 J**
Vanadium	260	RBC		**452**	**451**	**476**	**619**	**374**	**385 J**	---	<1.9	<50	<2.6
Zinc	11,000	RBC		**4220**	**5430**	**5620**	**6960**	**2820**	**3680 J**	**600**	**12.1 B**	**188**	<8.6
Cyanide (free)[3]	200	MCLG		**1240**	**51.4 J**	<100	<300 J	<0.608	<1.54	---	**10**	**5 J**	<4
Field Parameters													
Temperature (°C)		---		15.45	14.04	14.04	25.16	23.56	21.8	---	13.00	17.00	15.6
Conductivity (mS/cm)		---		3.11	26.17	26.17	34.7	22.8339	32.895	8.72	5.5	7	10.6
pH (s.u.)		---		9.83	9.89	9.89	9.44	9.38	10.49	6.63	7.2	6.4	6.6
ORP (mV)		---		-402.6	-504	-504	-391.8	-471.6	-483.8	---	---	---	-2
Turbidity (NTU)		---		NR	29.0	29.0	3.62	14.04	5.53	---	---	---	34
Dissolved Oxygen (mg/L)		---		0.81	0.01	0.01	0.00	-0.03	0	---	---	---	2.5

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Table D-1

OU-7 Historical Groundwater Sampling Results Summary
Avtex Fibers Superfund Site
Front Royal, Virginia

Parameter	Groundwater Cleanup Standards[1] (µg/L)		Well ID	MW-10	MW-10	MW-10	MW-10	MW-10	MW-10	PW-0	PW-0	PW-0	PW-0
			Well Type	OMW	OMW	OMW	OMW	OMW	OMW	I BMW	I BMW	I BMW	I BMW
			Date	7/4/2012	7/16/2013	7/13/2014	7/29/2015	8/10/2016	7/31/2017	5/29/1987	8/15/1987	8/1/2000	7/10/2012
OU-7 COPC Volatile Organics (µg/L)													
Acetone	22,000	RBC		**5.6 B**	<25.0	<25	<20	<2.66	R	---	---	<6	<25.0
Carbon disulfide	1,000	RBC		**21.7 B**	**20.3**	**47.8**	**18**	**14.5**	**9.53**	**58**	<500	**75**	**13.7**
OU-7 COPC Semivolatile Organics (µg/L)													
Bis(2-ethylhexyl)phthalate	6	MCL		<6.0	<6.0	<6	<5 J	<1.44	<1.50	---	---	<2	<6.0
Naphthalene	14	RBC		<10.0	<10.0	<10	<0.5 J	<0.356	<0.370	---	---	<1	<10.0
Pentachlorophenol	1	MCL		<1.0	<25.0	<25	<5	<3.17	<3.30 J	---	---	<3	<1.1
o-Cresol/2-Methylphenol	1,800	RBC		<10.0	<10.0	<10	<1	<1.54	<1.60	---	---	<1	<10.0
3&4-Methylphenol/4-methylphenol	180	RBC		<10.0	<10.0	<10	<1	<1.35	<1.40	---	---	<3	<10.0
Phenol	11,000	RBC		<10.0	<10.0	<10	<1	<1.44	**6.45 J**	<20	---	<1	<10.0
OU-7 COPC Inorganics, Dissolved (µg/L)													
Aluminum	37,000	RBC		**86.0 J**	**122**	<10	**310**	<96	<8.4	---	---	<19	<100 L
Antimony	6	MCLG		<1.0	**2.8 K**	<1	<2	<5	<0.8	---	---	<0.76	<1.0
Arsenic	10	MCL		**17.4**	**34.2**	**18.1**	**18**	**46.6**	**36.1 J**	<3	**5.3**	**3.2 JLB**	**7.1**
Cadmium	5	MCLG		<0.10	<1.0 L	<0.1	<1	<4	<0.1 J	<1	<5	<0.9	<0.10
Chromium	100	MCLG		**1.5 B**	**1.5 J**	<1	**6.3**	<5	**1.77 J**	---	---	<1.6	**2.3 J**
Cobalt	11	RBC		**13.8**	**13.5**	**19.2**	**71.5**	**31.8**	**17 J**	---	---	<7.1	**2.3**
Iron	26,000	RBC		**17,100 L**	**14,200**	**994**	**367000**	**54100 J**	**32600 J**	**1,100**	**490**	**915**	**74.7**
Lead	15	AL		<1.0	<5.0 L	<1 J	<2	<2	<0.1	<25	**35**	<9.8	<1.0
Manganese	880	RBC		**2,590**	**2,880**	**2060**	**22100**	**4020**	**3170**	**890**	**1,100**	**1,280**	**887**
Mercury (total)[2]	2	MCLG		<0.20	<0.20	<0.2	<0.2	<0.1	<0.1	---	---	<0.048 L	<0.20
Nickel	730	RBC		**25.8 L**	**32.3**	**37.5**	**30.1**	**40.4**	**21.4 J**	---	---	**69.6**	**19.1**
Vanadium	260	RBC		**1.5 L**	**3.3 J**	<5	**8.1**	<7	<0.7 J	---	---	**3.4 J**	<5.0
Zinc	11,000	RBC		**0.59 B**	<10.0	<5	**12.1 J**	<100	**144 J**	<20	<20	<8.6	**2.4 K**
Cyanide (free)[3]	200	MCLG		<100 R	<100	<100	**3.7 J**	<0.608	<1.54	---	---	<4	<100
Field Parameters													
Temperature (°C)		---		24.88	16.74	24.33	23.00	19.95	24.4	---	---	14.7	15.43
Conductivity (mS/cm)		---		20.870	10.53	1.12	9.6	10.2235	10.613	---	---	2.97	2.265
pH (s.u.)		---		6.61	6.73	6.83	6.16	6.61	6.35	---	---	6.46	6.69
ORP (mV)		---		-88.6	-137.2	-41.56	-31.54	-155.9	-85.6	---	---	-140	-335.5
Turbidity (NTU)		---		37.2	18.4	6.49	10.90	5.8	151	---	---	4	38.0
Dissolved Oxygen (mg/L)		---		0.58	0.35	0.07	0.11	0.06	0.16	---	---	0.27	0.19

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Table D-1

OU-7 Historical Groundwater Sampling Results Summary
Avtex Fibers Superfund Site
Front Royal, Virginia

Parameter	Groundwater Cleanup Standards[1] (µg/L)		Well ID	PW-0	PW-0	PW-0	PW-0 (Duplicate)	PW-0	PW-0	PW-02	PW-02	PW-02	PW-02 (Duplicate)
			Well Type	I BMW	I BMW	I BMW	I BMW	I BMW	I BMW	I BMW	I BMW	I BMW	I BMW
			Date	7/22/2013	7/8/2014	7/24/2015	7/24/2015	8/9/2016	7/30/2017 & 8/9/2017	5/29/1987	8/15/1987	2/8/1994	2/8/1994
OU-7 COPC Volatile Organics (µg/L)													
Acetone	22,000	RBC		<25.0	<25	<20	<20	<2.66	<2.66	---	---	<10,000	<2,500
Carbon disulfide	1,000	RBC		**3 K**	**3.3 J**	<5	<5	<0.22	**0.63**	**1,200,000**	**250,000 J**	**330,000**	**340,000**
OU-7 COPC Semivolatile Organics (µg/L)													
Bis(2-ethylhexyl)phthalate	6	MCL		<6.0	<6	<5	<5	<1.5	<1.41	---	---	**12 J**	**12 J**
Naphthalene	14	RBC		<10.0	<10	<0.5	<0.5	<0.37	<0.343	---	---	<100	<100
Pentachlorophenol	1	MCL		<25.0	<25	<5 J	<5 J	<3.3	<3.06	---	---	<250	<250
o-Cresol/2-Methylphenol	1,800	RBC		<10.0 L	<10	<1	<1	<1.6	<1.48	---	---	**24 J**	**31 J**
3&4-Methylphenol/4-methylphenol	180	RBC		**6.2 L**	<10	<1	<1	<1.4	<1.30	---	---	**39 J**	**49 J**
Phenol	11,000	RBC		<10.0 L	<10	<1	<1	<1.5	<1.39	**5,800**	---	**7,200**	**8,500**
OU-7 COPC Inorganics, Dissolved (µg/L)													
Aluminum	37,000	RBC		**77.5 J**	<100	<200	<200	<9.6	<8.4	---	---	**25**	**35.9**
Antimony	6	MCLG		<5.0 L	**8.1**	<2	**0.53 J**	<0.561	<0.8	---	---	**281**	**247**
Arsenic	10	MCL		**3.3 L**	<10	**0.74 J**	<4	<1.16	<0.4	**320**	**70**	**371**	**400**
Cadmium	5	MCLG		<1.0 L	<1	<1	<1	<0.4	<0.1	<1,000	<10	<1.8	<1.8
Chromium	100	MCLG		**1.3 J**	**3.4 J**	<4	<4	<0.5	<0.5	---	---	**56.1**	**52.3**
Cobalt	11	RBC		<5.0 L	<5	<1	**0.15 J**	<0.5	<0.1	---	---	**321 J**	**240 J**
Iron	26,000	RBC		**420 L**	**234**	**559**	**530**	**4450 J**	**9210**	**4,000**	**540**	**220 K**	**257 K**
Lead	15	AL		<5.0 L	<5	<2	<2	<0.2	<0.1	<2,500	<30	**5.4 B**	<0.57 L
Manganese	880	RBC		**1,050**	**1070**	**1530**	**1440**	**2250**	**1550**	**140**	**880**	**24.2 J**	**25.1 J**
Mercury (total)[2]	2	MCLG		<0.20 L	<0.2	<0.2	<0.2	<0.1	<0.1	---	---	**1.8**	**1.8**
Nickel	730	RBC		**21.1 L**	**19.6**	**23.8**	**22.8**	**23.3**	**19.3**	---	---	**439**	**431**
Vanadium	260	RBC		**1.1 L**	**0.2 J**	**0.68 J**	**0.76 J**	<1.09	<0.7	---	---	**68.2**	**70**
Zinc	11,000	RBC		**0.93 L**	**1.7 J**	<30	<30	**22.5 J**	**23.9 J**	**210**	<40	**86.4 B**	**107 B**
Cyanide (free)[3]	200	MCLG		<100	<100	<6	<6	**1.52 J**	<1.54	---	---	**122 J**	**122 J**
Field Parameters													
Temperature (°C)		---		17.37	31.40	6.53	6.53	16.85	19.37 (16.72)	---	---	12.00	12.00
Conductivity (mS/cm)		---		2.193	2.31	2.4	2.4	2.31	2.3297 (2.200)	14.99	7.17	11	11
pH (s.u.)		---		6.62	6.62	-217.40	-217.40	6.78	7.4 (6.73)	9.73	8.83	9.4	9.4
ORP (mV)		---		-256.8	-280.36	0.29	0.29	-135.9	-141.7 (-158.4)	---	---	---	---
Turbidity (NTU)		---		20.3	4.51	21.14	21.14	7.17	10.5 (5.46)	---	---	---	---
Dissolved Oxygen (mg/L)		---		3.60	0.11	4.72	4.72	0.21	0.16 (0.15)	---	---	---	---

NOTES: See page 64 of 64.

Table D-1

OU-7 Historical Groundwater Sampling Results Summary
Avtex Fibers Superfund Site
Front Royal, Virginia

Parameter	Groundwater Cleanup Standards[1] (µg/L)		Well ID	PW-02	PW-02	PW-02	PW-02	PW-02 (Duplicate)	PW-02	PW-02	PW-02	PW-02	PZ-06
			Well Type	I BMW	I BMW	I BMW	I BMW	I BMW	I BMW	I BMW	I BMW	I BMW	S BMW
			Date	4/7/1994	8/4/2000	7/10/2012	7/22/2013	7/22/2013	8/6/2014	8/5/2015	8/10/2016	7/29/2017	8/15/1987
OU-7 COPC Volatile Organics (µg/L)													
Acetone	22,000	RBC		<10,000	**77 J**	**12.1 B**	<25.0	<25.0	<25	<20	<2.66	<2.66	---
Carbon disulfide	1,000	RBC		**230,000**	**2,900**	**9.3**	**50.4**	**68.7**	**1,920**	**180**	**9.25**	**8.79**	<5
OU-7 COPC Semivolatile Organics (µg/L)													
Bis(2-ethylhexyl)phthalate	6	MCL		<50	<2	<66.7	<60.0	<60.0	<6	<5	<1.34	**1.75 J**	<10
Naphthalene	14	RBC		<50	<1	<111	<100	<100	<10	<0.5	<0.33	<0.343	<10
Pentachlorophenol	1	MCL		<120	<3	<278	<250	<250	<25	<5	<2.95	<3.06 J	<50
o-Cresol/2-Methylphenol	1,800	RBC		**22 J**	**3 J**	<111	<100	<100	<10	<1	<1.43	<1.48	<10
3&4-Methylphenol/4-methylphenol	180	RBC		**34 J**	**4 J**	<111	<100	<100	<10	<1	<1.25	<1.30	<10
Phenol	11,000	RBC		**7,600**	**13**	<111	<100	<100	<10	**1**	<1.34	<1.39	<10
OU-7 COPC Inorganics, Dissolved (µg/L)													
Aluminum	37,000	RBC		<19.9	<19	<100	<100	<100	<100	**30 J+**	**21.5**	<8.4	---
Antimony	6	MCLG		**260**	**238 KL**	**351**	**38.4 L**	**41.9 L**	**44.8**	**2.5**	<0.5	<0.8	---
Arsenic	10	MCL		**350**	**488**	**487**	**114 L**	**113 L**	**121**	**35.8**	**5.49**	<0.4	<4
Cadmium	5	MCLG		<3	<0.9	<0.10	**0.87 L**	**1 L**	**1.6**	<1	<0.4	<0.1	**32**
Chromium	100	MCLG		**54.1**	**30.8**	**9.8**	**3.0 L**	**2.9 L**	**3.8 J**	**1.3 J**	<0.5	**0.782 J**	---
Cobalt	11	RBC		**244**	**286**	**206**	**70.9 L**	**68.8 L**	**48.9**	**5.1**	**0.58 J**	**0.195 J**	---
Iron	26,000	RBC		**188 K**	**628**	**174 L**	**78.7 L**	**65.5 L**	**36.4 J**	**97.7 J**	**25 J**	**248**	**220**
Lead	15	AL		<2.9 L	<9.8	<1.0	<5.0 L	<5.0 L	<5	<2	<0.2	<0.1	<30
Manganese	880	RBC		**13 B**	**10.6**	**28.5**	**13.5**	**13.7**	**13.6**	**12.3**	**25.8**	**22.2**	**1,600**
Mercury (total)[2]	2	MCLG		**2.4**	<48 L	<1.6 L	<0.20 L	<0.20 L	**0.49 J**	<0.2 J-	<0.1	<0.1	---
Nickel	730	RBC		**443**	**622**	**460 L**	**214 L**	**215 L**	**168**	**11.6**	**1.77 J**	<0.5	---
Vanadium	260	RBC		**64.5**	**25.7**	**1.5 J**	**0.76 L**	**0.97 L**	**2.9 J**	**2.8**	<1.38	<0.7	---
Zinc	11,000	RBC		**550**	**778**	**103**	**24.8 L**	**22.3 L**	**56**	<30	<10	<5.2	<40
Cyanide (free)[3]	200	MCLG		**6.5 L**	**733**	**1,590**	**604**	**621**	**443**	<300 J	<0.608	<1.54	---
Field Parameters													
Temperature (°C)	---			16.00	18.2	17.82	15.93	15.93	18.44	19.50	22.1449	18.25	---
Conductivity (mS/cm)	---			12.5	17.8	16.96	9.56	9.56	8.88	1.9	0.8627744	0.75534	5.38
pH (s.u.)	---			9.7	9.05	8.37	8.48	8.48	8.70	8.78	8.872096	8.74	7.66
ORP (mV)	---			---	-149	-489.0	-447.4	-447.4	-441.57	-326.55	-396.4204	-354.3	---
Turbidity (NTU)	---			---	3.6	10.0	24.3	24.3	5.39	2.63	6.65	3.93	---
Dissolved Oxygen (mg/L)	---			---	0.52	0.32	0.17	0.17	0.02	-0.01	0.1458557	0.06	---

NOTES: See page 64 of 64.

Table D-1

OU-7 Historical Groundwater Sampling Results Summary
Avtex Fibers Superfund Site
Front Royal, Virginia

Parameter	Groundwater Cleanup Standards[1] (µg/L)		Well ID	PZ-06	PZ-06	PZ-06	PZ-06	PZ-06	PZ-06	PZ-06	PZ-06	PZ-06	PZ-06
			Well Type	S BMW	S BMW	S BMW	S BMW	S BMW	S BMW	S BMW	S BMW	S BMW	S BMW
			Date	8/2/2000	5/24/2001	11/19/2001	6/11/2002	11/20/2002	6/11/2003	6/9/2005	6/7/2007	6/12/2008	6/10/2009
OU-7 COPC Volatile Organics (µg/L)													
Acetone	22,000	RBC		<6	---	---	---	---	---	---	---	---	---
Carbon disulfide	1,000	RBC		**10**	---	---	---	---	---	---	---	---	---
OU-7 COPC Semivolatile Organics (µg/L)													
Bis(2-ethylhexyl)phthalate	6	MCL		<2	---	---	---	---	---	---	---	---	---
Naphthalene	14	RBC		<1	---	---	---	---	---	---	---	---	---
Pentachlorophenol	1	MCL		<3	---	---	---	---	---	---	---	---	---
o-Cresol/2-Methylphenol	1,800	RBC		<1	---	---	---	---	---	---	---	---	---
3&4-Methylphenol/4-methylphenol	180	RBC		<3	---	---	---	---	---	---	---	---	---
Phenol	11,000	RBC		<1	---	---	---	---	---	---	---	---	---
OU-7 COPC Inorganics, Dissolved (µg/L)													
Aluminum	37,000	RBC		<19	---	---	---	---	---	---	---	---	---
Antimony	6	MCLG		<0.76	---	---	---	---	---	---	---	---	---
Arsenic	10	MCL		**7.7 JB**	**6.6**	**24.3**	**20.7**	**24.2 K**	<5	**5.1 K**	**7.54**	**22.6**	**8.12**
Cadmium	5	MCLG		<0.9	<1.5 J	<1.5	<3	<3	<5	<5 L	<1	<0.5	<0.5
Chromium	100	MCLG		<1.6	<3 J	<3	<5 L	<5	<5	<15 J	<4	**4.02**	**2.94**
Cobalt	11	RBC		<7.1	---	---	---	---	---	---	---	---	---
Iron	26,000	RBC		**1,030 J**	---	---	---	---	---	---	---	---	---
Lead	15	AL		<9.8 L	<9 J	<6 L	<3	<3 L	<15 L	<3	<2	<1	<1
Manganese	880	RBC		**484**	---	---	---	---	---	---	---	---	---
Mercury (total)[2]	2	MCLG		<0.048 L	<0.2 L	<0.2	<0.2 L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Nickel	730	RBC		**9.4 J**	<50	<50	<50 L	<50 L	<50	<10 J	<8	**9.48**	**8.19**
Vanadium	260	RBC		<2.6	---	---	---	---	---	---	---	---	---
Zinc	11,000	RBC		<8.6	**106**	**58.3**	<25	<25	<25	<20 J	<20	<20	<20
Cyanide (free)[3]	200	MCLG		<4	---	---	---	---	---	---	---	---	---
Field Parameters													
Temperature (°C)		---		22.3	13.81	16.11	13.6	15.5	13.54	13.41	13.77	13.91	13.56
Conductivity (mS/cm)		---		3.17	3.2	3.58	4.3	4.75	3.71	2.87	3.119	3.328	2.855
pH (s.u.)		---		7.7	7.61	7.84	8.22	7.49	7.74	7.57	8.92	7.36	7.39
ORP (mV)		---		-3	-205	-179	-249	-229	-238	-137.1	-147.5	-252.7	-125.1
Turbidity (NTU)		---		0.82	67.8	1.9	1.0	0.0	0.0	2	0.0	0.0	0.0
Dissolved Oxygen (mg/L)		---		1.5	3.38	1.23	1.27	0.0	0.0	0.38	1.61	0.07	0.31

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Table D-1

OU-7 Historical Groundwater Sampling Results Summary
Avtex Fibers Superfund Site
Front Royal, Virginia

Parameter	Groundwater Cleanup Standards[1] (µg/L)		Well ID	PZ-06	PZ-06	PZ-06	PZ-06	PZ-06	PZ-06 (Duplicate)	PZ-06	PZ-06	PZ-06	PZ-06
			Well Type	S BMW	S BMW	S BMW	S BMW	S BMW	S BMW	S BMW	S BMW	S BMW	S BMW
			Date	6/15/2010	6/1/2011	6/22/2012	6/4/2013	12/10/2013	12/10/2013	8/6/2014	12/10/2014	8/4/2015	8/2/2016
OU-7 COPC Volatile Organics (µg/L)													
Acetone	22,000	RBC		---	---	**5.3 B**	<25.0	<25.0	<25.0	<25	<25	<20	<2.66
Carbon disulfide	1,000	RBC		---	---	**42.2 J**	**1.4 J**	**2.8**	**2.5**	<2	**11.9**	<5	<0.22
OU-7 COPC Semivolatile Organics (µg/L)													
Bis(2-ethylhexyl)phthalate	6	MCL		---	---	<6.0	<6.0	<6.0	<6.0	<6	<6	<6	<5.77
Naphthalene	14	RBC		---	---	<10.0	<10.0	<10.0	<10.0	<10	<10	<0.6	<0.356
Pentachlorophenol	1	MCL		---	---	<1.1	<25.0	<25.0 L	<25.0 L	<25	<25	<6	<1.63
o-Cresol/2-Methylphenol	1,800	RBC		---	---	<10.0	<10.0	<10.0 L	<10.0 L	<10	<10	<1	<2.21
3&4-Methylphenol/4-methylphenol	180	RBC		---	---	<10.0	<10.0	<10.0 L	<10.0 L	<10	<10	<1	<2.12
Phenol	11,000	RBC		---	---	<10.0	<10.0	<10.0 L	<10.0 L	<10	<10	<1	<1.44
OU-7 COPC Inorganics, Dissolved (µg/L)													
Aluminum	37,000	RBC		---	---	<100 L	<100	<100.0 L	<100.0 L	**27.9**	<20	**27.5 J+**	<9.6
Antimony	6	MCLG		---	---	**1.0**	<5.0	<5.0	<5.0	<1	<1	<2	<1.17
Arsenic	10	MCL		**8.59**	**141**	**39.6**	**26.2**	**34.8**	**33.6**	**23.8**	**31.3**	**8.2**	**6.71**
Cadmium	5	MCLG		<0.5	<6	<0.10	<1.0	<1.0	<1.0	<0.1	<0.1	<1	<0.4
Chromium	100	MCLG		**2.7**	<20	<1.0	**2.7 J**	**1.1 L**	**1.5 L**	**0.91 J**	<2	<4	<0.5
Cobalt	11	RBC		---	---	**5.3**	**4.8 J**	<5.0	<5.0	**2**	**2.6**	**0.45 J**	**0.541 J**
Iron	26,000	RBC		---	---	**914**	**730**	**1,080**	**1,090**	**1630**	**2710**	**140 J**	**696**
Lead	15	AL		<1	<10	<1.0	<1.0	<5.0 L	<5.0 L	<1	<1	<2	<0.2
Manganese	880	RBC		---	---	**1,010**	**799**	**858**	**858**	**931**	**1060**	**106**	**492**
Mercury (total)[2]	2	MCLG		<0.2	<0.2	<0.20	<0.20 L	<0.20	<0.20	<0.2	<0.2	<0.2 J-	<0.1
Nickel	730	RBC		**6.71**	**67.9**	**17.1**	**10.1**	**12.5**	**12.7**	**9.1**	**12**	**7.4**	**1.28 J**
Vanadium	260	RBC		---	---	<5.0	<5.0	**1.4 B**	**1.9 B**	**1.1**	<2	**0.33 J**	<1.11
Zinc	11,000	RBC		<20	<20	**2.0 K**	<10.0	**0.60 L**	**0.57 L**	**4.8 J**	**6.7 J**	<30	<10
Cyanide (free)[3]	200	MCLG		---	---	<100	<100	<100.0	<100.0	<100	<100	<6 J	<0.608
Field Parameters													
Temperature (°C)		---		13.79	13.80	15.02	13.57	13.97	13.97	24.44	11.37	20.95	23.04
Conductivity (mS/cm)		---		2.707	3.998	3.625	4.056	3.847	3.847	2.84	3.704	2.4	0.72258
pH (s.u.)		---		7.57	7.46	7.62	7.75	7.75	7.75	7.54	7.72	7.51	7.61
ORP (mV)		---		-319.2	-394.2	-165.2	-144.6	-132.8	-132.8	-165.27	-151.1	15.57	-106.4
Turbidity (NTU)		---		0.0	0.0	0.6	2.2	2.8	2.8	26.20	13.9	6.48	5.03
Dissolved Oxygen (mg/L)		---		0.01	0.00	0.00	0.13	0.45	0.45	0.07	0	0.39	0.63

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Table D-1

OU-7 Historical Groundwater Sampling Results Summary
Avtex Fibers Superfund Site
Front Royal, Virginia

Parameter	Groundwater Cleanup Standards[1] (µg/L)		Well ID	PZ-06 (Duplicate)	PZ-06	PZ-06 (Duplicate)	TW-01	TW-01	TW-01	TW-01	TW-01	TW-01	TW-01
			Well Type	S BMW	S BMW	S BMW	D BMW	D BMW	D BMW	D BMW	D BMW	D BMW	D BMW
			Date	8/2/2016	7/31/2017	7/31/2017	7/8/2003	7/12/2003	7/15/2003	4/2/2008	7/3/2012	7/11/2013	8/9/2016
OU-7 COPC Volatile Organics (µg/L)													
Acetone	22,000	RBC		<2.66	**2.87 J**	R	<20	<100	**36**	<25 L	6.4 J	**1,660**	<2.66
Carbon disulfide	1,000	RBC		<0.22	<0.22	<0.22	**1,800**	**5,000**	**6,800**	**265 L**	**68.9 B**	**90.7**	**169**
OU-7 COPC Semivolatile Organics (µg/L)													
Bis(2-ethylhexyl)phthalate	6	MCL		<5.77	<1.63	<1.50	---	---	---	<5.21	**3.3 J**	<6.0 L	<1.34
Naphthalene	14	RBC		<0.356	<0.402	<0.370	---	---	---	**27.3**	<10.0	<10.0 L	<0.33
Pentachlorophenol	1	MCL		<1.63	<3.59 J	<3.30 J	---	---	---	<10.4	**0.22 J**	<25.0	<2.95
o-Cresol/2-Methylphenol	1,800	RBC		<2.21	<1.74	<1.60	---	---	---	<5.21	<10.0	**24.8**	<1.43
3&4-Methylphenol/4-methylphenol	180	RBC		<2.12	<1.52	<1.40	---	---	---	<5.21	<10.0	**23.5**	<1.25
Phenol	11,000	RBC		<1.44	<1.63	<1.50	---	---	---	**2.73 J**	<10.0	**46.1**	<1.34
OU-7 COPC Inorganics, Dissolved (µg/L)													
Aluminum	37,000	RBC		<9.6	<8.4 J	**61 J**	<200	<200	<200	---	<100	<1,000 L	<9.6
Antimony	6	MCLG		<0.845	<0.8	<0.8	**325**	**117**	**99**	**355 J**	**329**	**219**	**2.69**
Arsenic	10	MCL		**6.45**	**3.79**	**4.18**	**422**	**200**	**172**	**534 J**	**548**	**715**	**19.4**
Cadmium	5	MCLG		<0.4	<0.1	<0.1	<5	<5	<5	8.1 J	<1.0	<10.0	<0.4
Chromium	100	MCLG		<0.5	<0.5	**0.674 J**	**41.1**	**12.1**	**9.5**	**17.4 J**	**11.6**	**140**	**0.575 J**
Cobalt	11	RBC		<0.5	**0.197 J**	**0.188 J**	**298**	**113**	**90.9**	---	**235**	**485**	**2.63**
Iron	26,000	RBC		**667**	**364**	**339**	**982**	<200	<200	---	**91.3 L**	**233 J**	<20
Lead	15	AL		<0.2	<0.1	<0.1	**5.1**	<3	<3	**5.46 J**	<10.0	<50.0	<0.2
Manganese	880	RBC		**467**	**492 J**	**541 J**	**25.8**	**17.4**	**20.8**	---	**6.8**	**8.1 J**	**18.1**
Mercury (total)[2]	2	MCLG		<0.1	<0.1	<0.1	<20	<0.2	<10	**0.134 J**	<0.20	**2.1**	<0.1
Nickel	730	RBC		**2.41**	**0.993 J**	**1.13 J**	**564**	**204**	**157**	**504 J**	**448 L**	**1,580**	**7.65**
Vanadium	260	RBC		<1.01	<0.7	<0.7	**33.5**	<20	<20	**23.7 J**	**9.9 L**	**123**	<2.06
Zinc	11,000	RBC		<10	**5.47 J**	<5.2	**1,060**	**219**	**160**	**425 J**	**341**	**3,960**	<10
Cyanide (free)[3]	200	MCLG		**0.754 J**	<1.54	<1.54	---	---	---	---	**11,100 L**	**1,210**	**4.58 J**
Field Parameters													
Temperature (°C)		---		23.04	19.98	19.98	16.8	15.3	15.0	15.00	17.09	15.31	---
Conductivity (mS/cm)		---		0.72258	0.51825	0.51825	1.70	0.92	0.75	15.74	21.550	12.51	---
pH (s.u.)		---		7.61	7.53	7.53	9.87	9.32	9.23	8.69	8.94	8.51	8.47
ORP (mV)		---		-106.4	-58.2	-58.2	-508	-509	-486	-425.5	-466.6	-466.2	---
Turbidity (NTU)		---		5.03	41	41	563	288	182	194.1	64.7	8.2	---
Dissolved Oxygen (mg/L)		---		0.63	2.83	2.83	1.55	0.00	0.22	0.0	0.22	0.22	---

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Table D-1

OU-7 Historical Groundwater Sampling Results Summary
Avtex Fibers Superfund Site
Front Royal, Virginia

Parameter	Groundwater Cleanup Standards[1] (µg/L)		Well ID	TW-01	TW-02	TW-02 (1-Hour)	TW-02 (10-Hour)	TW-02	TW-02	TW-02 (1-Hour)	TW-02 (10-Hour)	TW-02
			Well Type	D BMW	D BMW	D BMW	D BMW	D BMW	D BMW	D BMW	D BMW	D BMW
			Date	8/9/2017	6/22/2010	6/29/2010	6/29/2010	7/1/2010	7/3/2010	10/11/2010	10/11/2010	10/13/2010
OU-7 COPC Volatile Organics (µg/L)												
Acetone	22,000	RBC		R	**248**	**379**	**299**	**261 J**	<1000	**313**	<100	**731**
Carbon disulfide	1,000	RBC		**29.9**	**25,800**	**13,900**	**17,000**	**19,700**	**17,200**	**10,000**	**1,750**	**12,900**
OU-7 COPC Semivolatile Organics (µg/L)												
Bis(2-ethylhexyl)phthalate	6	MCL		<1.72	<26	**40.1**	**5.78 J**	<28.7	<25.9	**90.9**	**27.9 J**	**95**
Naphthalene	14	RBC		<0.385	<26	<10.9	<11.1	<28.7	<25.9	<56.2	<53.8	<5.49
Pentachlorophenol	1	MCL		<3.44 J	<26	<10.9	<11.1	<28.7	<25.9	<56.2	<53.8	<5.49
o-Cresol/2-Methylphenol	1,800	RBC		<1.67	<26	<10.9	<11.1	<28.7	<25.9	<56.2	<53.8	**8.22**
3&4-Methylphenol/4-methylphenol	180	RBC		<1.46	<26	<10.9	<11.1	<28.7	<25.9	<56.2	<53.8	**8.51**
Phenol	11,000	RBC		<1.56	**233**	**205**	**263**	**280**	**151**	**83.3**	**497**	**568**
OU-7 COPC Inorganics, Dissolved (µg/L)												
Aluminum	37,000	RBC		<8.4	**257**	<100	<100	**90.4 J**	**231**	**171**	<100	<100
Antimony	6	MCLG		**1.35 J**	**158**	**146**	**159**	**153**	**165**	**61.7**	**185**	**144**
Arsenic	10	MCL		**11.3**	**398**	**404**	**391**	**383**	**286**	**150**	**470**	**342**
Cadmium	5	MCLG		<0.1	<10	<10	<10	<10	<10	<10	<10	<10
Chromium	100	MCLG		**0.697 J**	**11.3 J**	**15.3 J**	**15.6 J**	**14.7 J**	**10.7 J**	**12.5 J**	**49.4**	**33**
Cobalt	11	RBC		**1.2 J**	**101**	**114**	**132**	**139**	**93.5**	**61.8**	**262**	**190**
Iron	26,000	RBC		<10	**141**	**148**	**82.3 J**	**71.7 J**	**97 J**	**216**	**168**	**122**
Lead	15	AL		<0.1	<5	<5	<5	<5	<5	<5	<5	<5
Manganese	880	RBC		**15.8**	**8.63 J**	**9.24 J**	**8.4 J**	**6.91 J**	<10	**12.5**	**12.6**	**10**
Mercury (total)[2]	2	MCLG		<0.1	**0.579**	**0.222**	**0.162 J**	<0.2	**0.162 J**	**0.398**	**0.804**	**0.576**
Nickel	730	RBC		**4.41**	**194**	**235**	**274**	**300**	**210**	**155**	**680**	**490**
Vanadium	260	RBC		<0.7	**12.2**	**17.7**	**20.4**	**14.2**	**7.95 J**	**14.9**	**56.6**	**39.6**
Zinc	11,000	RBC		<5.2	**293**	**346**	**421**	**445**	**283**	**464**	**1,420**	**934**
Cyanide (free)[3]	200	MCLG		<1.54	**6,760**	<50	<50	<100	<100	<50	**47.5 J**	**40.1 J**
Field Parameters												
Temperature (°C)		---		17.82	15.19	14.93	14.93	14.77	15.56	16.76	---	16.17
Conductivity (mS/cm)		---		1.2183	6.913	11.95	11.95	12.38	12.16	6.65	---	12.65
pH (s.u.)		---		8.29	7.91	9.37	9.37	9.31	9.18	9.35	---	9.45
ORP (mV)		---		-304.5	-317.4	-454.1	-454.1	-431.8	-404.6	-431.8	---	-530.0
Turbidity (NTU)		---		4.4	341.9	260.4	260.4	28.2	142.1	100.0	---	1145.3
Dissolved Oxygen (mg/L)		---		4.87	15.69	0.00	0.00	0.00	0.00	0.48	---	-1.76

NOTES: See page 64 of 64.

Table D-1

OU-7 Historical Groundwater Sampling Results Summary
Avtex Fibers Superfund Site
Front Royal, Virginia

Parameter	Groundwater Cleanup Standards[1] (µg/L)		Well ID	TW-02	TW-02	TW-02	TW-02	TW-02	TW-03	TW-03 (Duplicate)	TW-03	TW-03	TW-03
			Well Type	D BMW	D BMW	D BMW	D BMW	D BMW	D BMW	D BMW	D BMW	D BMW	D BMW
			Date	10/15/2010	7/3/2012	7/11/2013	8/9/2016	8/1/2017	8/27/2013	8/27/2013	8/28/2013	8/29/2013	8/9/2016
OU-7 COPC Volatile Organics (µg/L)													
Acetone	22,000	RBC		**641**	**3,210**	<25.0	<2.66	R	<25.0	<25.0	<25.0	<25.0	<2.66
Carbon disulfide	1,000	RBC		**2,440**	**24.7 K**	**98.3**	**168**	**743**	<2.0	<2.0	<2.0	<2.0	**1.02**
OU-7 COPC Semivolatile Organics (µg/L)													
Bis(2-ethylhexyl)phthalate	6	MCL		**22.4 J**	<12.0 J	<6.0	<1.34	<7.50	<6.0	<6.0	<6.0	<6.0	<1.39
Naphthalene	14	RBC		<10.8	<20.0 J	**1.0 J**	<0.33	<1.85	<10.0	<10.0	<10.0	<10.0	<0.343
Pentachlorophenol	1	MCL		<10.8	**1.4 J**	<25.0	<2.95	<16.5 J	<25.0	<25.0	<25.0	<25.0	<3.06
o-Cresol/2-Methylphenol	1,800	RBC		**9.18 J**	**15.7 J**	<10.0	<1.43	<8.00	<10.0	<10.0	<10.0	<10.0	<1.48
3&4-Methylphenol/4-methylphenol	180	RBC		**9.59 J**	**12.6 J**	<10.0	<1.25	<7.00	<10.0	<10.0	<10.0	<10.0	<1.3
Phenol	11,000	RBC		**627**	**22.2 J**	<10.0	<1.34	<7.50	<10.0	<10.0	<10.0	<10.0	<1.39
OU-7 COPC Inorganics, Dissolved (µg/L)													
Aluminum	37,000	RBC		**496**	<300	**27.5 L**	<9.6	<8.4 J	<100	**25.8 J**	<100	<100	<9.6
Antimony	6	MCLG		**149**	**381**	**249**	**2.66**	**3.16 J**	<5.0	<5.0	<5.0	<5.0	<0.5
Arsenic	10	MCL		**407**	**963**	**876**	**20.7**	**32.2 J**	<10.0	<10.0	<10.0	<10.0	**0.603 J**
Cadmium	5	MCLG		<10	<1.0	<1.0	<0.4	<0.1 J	<1.0 L	<1.0 L	<1.0	<1.0	<0.4
Chromium	100	MCLG		**34.2**	**155**	**6.5**	**0.584 J**	**1.94 J**	<5.0 L	<5.0	<5.0	<5.0	<0.5
Cobalt	11	RBC		**192**	**667**	**103**	**2.84**	**12 J**	<5.0	<5.0	<5.0	<5.0	<0.5
Iron	26,000	RBC		**225**	**250 L**	**127 B**	<20	<10	**14.8 J**	<50.0	**32.1 J**	**14.5 J**	<20
Lead	15	AL		<5	<10.0	<5.0	<0.2	<0.1 J	<5.0 L	<5.0	<5.0	<5.0	<0.2
Manganese	880	RBC		**20**	**5.9 J**	**12.9**	**26.6**	**123**	**9.5 J**	**9.6 J**	**27.6**	**34.6**	**39.1**
Mercury (total)[2]	2	MCLG		**0.771**	**2.1**	<0.20	<0.1	<0.1 J	<0.20	<0.20	<0.20	<0.20	<0.1
Nickel	730	RBC		**474**	**1,750 L**	**172**	**8.75**	**37.7 J**	<5.0	<5.0	<5.0	**1.7 J**	**1.92 J**
Vanadium	260	RBC		**39.6**	**171**	**0.35 B**	<1.99	<0.7	<5.0 L	<5.0 L	<5.0	**0.95 J**	<1.09
Zinc	11,000	RBC		**924**	**4,550 L**	**64.8**	<10	<5.2	**4.9 L**	**4.9 L**	**29.3**	**4.9 J**	<10
Cyanide (free)[3]	200	MCLG		<50	**7,890 L**	**1,230**	**10.2 J**	<1.54	<100	<100	<100	<100	<0.608 J
Field Parameters													
Temperature (°C)		---		16.02	20.24	18.40	---	24.52	15.16	15.16	---	---	---
Conductivity (mS/cm)		---		12.17	35.77	27.60	---	3.0766	0.637	0.637	---	---	---
pH (s.u.)		---		9.33	9.64	9.91	---	8.17	9.17	9.17	---	---	6.98
ORP (mV)		---		-532.1	-561.4	-532.0	---	-302.2	-391	-391	---	---	---
Turbidity (NTU)		---		1206.8	2.2	8.5	---	29.2	34.38	34.38	---	---	---
Dissolved Oxygen (mg/L)		---		21.48	0.20	0.10	---	3.96	0.63	0.63	---	---	---

NOTES: See page 64 of 64.

Table D-1

OU-7 Historical Groundwater Sampling Results Summary
Avtex Fibers Superfund Site
Front Royal, Virginia

Parameter	Groundwater Cleanup Standards[1] (µg/L)		Well ID	TW-03	WP-10	WP-10	WP-10 (Duplicate)	WP-10	WP-10	WP-10	WP-10	WP-10	WP-10
			Well Type	D BMW	OMW	OMW	OMW	OMW	OMW	OMW	OMW	OMW	OMW
			Date	8/1/2017	7/9/2012	7/16/2013	7/16/2013	12/12/2013	7/12/2014	12/11/2014	7/29/2015	8/11/2016	7/28/2017
OU-7 COPC Volatile Organics (µg/L)													
Acetone	22,000	RBC		R	**5.5 B**	<25.0	<25..0	<25.0	<25	<25	<20	<26.6	<5.72
Carbon disulfide	1,000	RBC		**0.687**	**37.0**	**2.7 J**	**68.8 J**	**10.1**	**107**	**61.3**	**36**	**33.1**	**25.7**
OU-7 COPC Semivolatile Organics (µg/L)													
Bis(2-ethylhexyl)phthalate	6	MCL		<1.44	<7.5	<30.0	<30.0 L	**1.2 J**	<6	<6 J	<5	<1.34	<1.43
Naphthalene	14	RBC		<0.356	**19.7**	**8.8 J**	**11.1 L**	**16.2**	**20.1**	**5.7 J**	**14**	**10.2**	**6.46**
Pentachlorophenol	1	MCL		<3.17 J	<1.1	<125	<125	<25.0	<25	<25 J	<5	<2.95	<3.00
o-Cresol/2-Methylphenol	1,800	RBC		<1.54	**3.4 J**	<50.0	<50.0	**1.7 J**	**2.2 J**	<10 J	**1**	<1.43	<1.45
3&4-Methylphenol/4-methylphenol	180	RBC		<1.35	<12.5	<50.0	<50.0	<10.0	<10	<10 J	<1	<1.25	<1.27
Phenol	11,000	RBC		<1.44	**2.5 J**	<50.0	<50.0	**4.0 J**	<10	<10 J	<1	<1.34	<1.36
OU-7 COPC Inorganics, Dissolved (µg/L)													
Aluminum	37,000	RBC		<8.4	<300	<100 L	**31.8 L**	**34.7 J**	**33.6**	**51.3**	**53 J**	<96	**53.7**
Antimony	6	MCLG		<0.8	<1.0	<5.0	<5.0	<5.0	<1	<5	**0.49 J**	<5	<0.8
Arsenic	10	MCL		<0.4	**162**	**223**	**227**	**204**	**143**	**195**	**182**	**261**	**180**
Cadmium	5	MCLG		<0.1	**0.74**	**1.0**	**0.80 J**	**0.52 J**	**0.44**	**0.43 J**	<1	<4	**0.178 J**
Chromium	100	MCLG		<0.5 J	**9.5 K**	**9.4**	**8.0**	**8.3 B**	**8.2**	**12.5**	**11.8**	**10.4 J**	**19.5**
Cobalt	11	RBC		<0.1	**115**	**126**	**123**	**125**	**139**	**167**	**174**	**265**	**192**
Iron	26,000	RBC		<10 J	**528**	**978**	**880**	**127 B**	**128**	**198**	**201**	<200	**421**
Lead	15	AL		<0.1	<1.0	<5.0 L	<5.0 L	<5.0	<1 J	<5	<2	<2	**0.132 J**
Manganese	880	RBC		**48.1**	**98.7**	**120**	**114**	**25.3**	**22.6**	**27.4**	**32**	**97.4**	**54.5**
Mercury (total)[2]	2	MCLG		<0.1 J	<0.20	<0.20	<0.20	<1.6 R	<0.2	<1	<1	<0.1	<0.1
Nickel	730	RBC		**1.62 J**	**489**	**447**	**396**	**420**	**358**	**504**	**546**	**847**	**488**
Vanadium	260	RBC		<0.7	**21.6**	**26.5**	**27.3**	**27.7**	**30.4**	**39.3**	**37.1**	**43.7**	**60.8**
Zinc	11,000	RBC		<5.2	**25.8 K**	**8.9 J**	**5.8 J**	**9.4 B**	**5.9**	**17.4 J**	**13.3 J**	<100	**24.3 J**
Cyanide (free)[3]	200	MCLG		<1.54	**126**	<100	**123**	**131**	**107**	**158**	**18**	<0.608	<1.54
Field Parameters													
Temperature (°C)		---		26.77	17.02	20.26	20.26	12.36	23.25	9.96	25.06	25.54	22.99
Conductivity (mS/cm)		---		1.0655	11.04	10.92	10.920	11.770	1.21	11.495	13.4	13.4927	14.625
pH (s.u.)		---		7.92	9.36	9.43	9.43	9.53	9.53	9.59	9.32	9.26	9.44
ORP (mV)		---		-232.8	-355.5	-361.8	-361.8	-308.1	75.24	-244.6	105.42	-415	203
Turbidity (NTU)		---		8.77	39.1	19.4	19.4	83.0	8.27	6.5	3.52	7.74	2.98
Dissolved Oxygen (mg/L)		---		5.5	0.14	0.33	0.33	0.03	-0.01	0	0.01	-0.01	0

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Table D-1

OU-7 Historical Groundwater Sampling Results Summary
Avtex Fibers Superfund Site
Front Royal, Virginia

Parameter	Groundwater Cleanup Standards[1] (µg/L)		Well ID	WP-11	WP-11 (Duplicate)	WP-11	WP-11	WP-11	WP-11	WP-11	WP-11	WP-11
			Well Type	OMW	OMW	OMW	OMW	OMW	OMW	OMW	OMW	OMW
			Date	7/4/2012	7/4/2012	7/16/2013	12/12/2013	7/9/2014	12/10/2014	8/4/2015	8/1/2016	7/27/2017
OU-7 COPC Volatile Organics (µg/L)												
Acetone	22,000	RBC		**5.0 B**	**4.4 B**	<25.0	<25.0	**13.4 J**	<25	**67**	<2.66	<12.1
Carbon disulfide	1,000	RBC		<2.0	<2.0	<2.0	<2.0	<10	<2	<5	<0.22	**0.754**
OU-7 COPC Semivolatile Organics (µg/L)												
Bis(2-ethylhexyl)phthalate	6	MCL		<6.0	<16.7	<6.0	<6.0	<6	<6	<5	<5.77	<2.75
Naphthalene	14	RBC		<10.0	<16.7	<10.0	<10.0	<10	<10	<0.5	<0.356	<0.343
Pentachlorophenol	1	MCL		<1.1	<1.0	<25.0	<25.0	<25	<25	<5	<1.63	<3.06
o-Cresol/2-Methylphenol	1,800	RBC		<10.0	<16.7	<10.0	<10.0	<10	<10	<1	<2.21	<1.48
3&4-Methylphenol/4-methylphenol	180	RBC		<10.0	<10.0	<10.0	<10.0	<10	<10	<1	<2.12	<1.30
Phenol	11,000	RBC		<10.0	<16.7	<10.0	<10.0	<10	**2.8 J**	<1	<1.44	<1.39
OU-7 COPC Inorganics, Dissolved (µg/L)												
Aluminum	37,000	RBC		<100	<100	**93.8 J**	<100.0 L	<10	<10	<200	<9.6	<8.4
Antimony	6	MCLG		<1.0	<1.0	**3.3 K**	<5.0	<1	<1	<2	<0.932	**2.77**
Arsenic	10	MCL		**3.5**	**3.1**	<10.0	<10.0	**3.3**	**2**	**2.3 J**	**1.67 J**	**10.1**
Cadmium	5	MCLG		<0.10	<0.10	<1.0 L	<1.0 L	<0.1	<0.1	<1	<0.4	<0.1
Chromium	100	MCLG		**1.1 B**	**1.4 B**	**1.0 J**	**4.2 L**	<1	**0.56 J**	<4	<0.5	<0.5
Cobalt	11	RBC		**0.55 J**	<1.0	**2.9 J**	<5.0	**5.1**	**1**	**2.4**	**1.35 J**	**4.94**
Iron	26,000	RBC		**15,500 L**	**15,400 L**	**3,180**	**11,300**	**4830**	**9780**	**13100**	**5970**	**1660**
Lead	15	AL		<1.0	<1.0	<5.0 L	<5.0 L	<1	<1	<2	<0.2	<0.1
Manganese	880	RBC		**543**	**540**	**760**	**844**	**1240**	**1100**	**1580**	**970**	**457**
Mercury (total)[2]	2	MCLG		<0.20	<0.20	<0.20	<0.20	<0.2	<0.2	<0.2 J-	<0.1	<0.1
Nickel	730	RBC		<5.0 R	**2.2 J, R**	**11.5**	**3.3 J**	**5.7**	**2.2**	**2.1 J**	<1.67	**14.2**
Vanadium	260	RBC		**0.52 L**	**0.39 L**	**1.4 J**	**2.2 B**	<1	**0.53 J**	**0.45 J**	<1.24	<0.7
Zinc	11,000	RBC		**0.59 B**	**1.6 B**	**28.0**	**1.1 L**	**9**	**49**	<30	<10	<5.2
Cyanide (free)[3]	200	MCLG		<100 R	<100 R	<100	<100.0	<100	<100	<6 J	**1.52 J**	<1.54
Field Parameters												
Temperature (°C)	---			16.19	---	14.95	14.32	18.10	14.57	20.83	22.87	29.46
Conductivity (mS/cm)	---			3.979	---	2.255	2.167	2.17	1.901	2.4	2.4699	2.2109
pH (s.u.)	---			6.81	---	6.84	6.87	6.88	6.84	6.79	6.84	7.38
ORP (mV)	---			-121.5	---	-109.3	-113.9	-48.28	-136.8	-39.13	-75.4	4.4
Turbidity (NTU)	---			5.0	---	14.3	6.0	4.82	45.2	10.60	3.44	97.7
Dissolved Oxygen (mg/L)	---			0.81	---	0.45	0.27	0.62	0.11	0.16	0.11	4.95

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Table D-1

OU-7 Historical Groundwater Sampling Results Summary
Avtex Fibers Superfund Site
Front Royal, Virginia

NOTES:

OU-7 - Operable Unit 7
COPC - Contaminant of Potential Concern
MCLG - Maximum Contaminant Level Goal, MCL - Maximum Contaminant Level, SMCL -
--- - Not Available, or cleanup standard not available; toxicity information is not available for essential nutrients calcium, magnesium, potassium, and sodium.
J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit (+ high bias - low bias)
B - Analyte was detected in associated method blank
K - Reported value may be biased high
L - Reported value may be biased low
R - Reported value is an unusable result.
µg/L - micrograms per liter
mg/L - milligrams per liter
°C - degrees Celcius
mS/cm - millisiemens per centimeter
s.u. - standard units
mV - millivolts
NTU - Nephelometric Turbidity Units
[2] - Reported standard is for Mercury as Methyl.
OMW - Overburden Monitoring Well
S BMW - Shallow Bedrock Monitoring Well
I BMW - Intermediate Bedrock Monitoring Well
D BMW - Deep Bedrock Monitoring Well
[1] - Ground water cleanup standard for COPC constituents as presented in Table 7 of the ROD. Cleanup standards for additional constituents not listed in Table 7 of the ROD were determined as the lower of the MCL/ non-zero MCLG and if no applicable MCL/MCLG then the RBC is listed. The EPA RBC tap water standards presented at cancer/hazard target benchmarks of 1x10-4 for carcinogens and 1 for noncarcinogens.
[3] - Reported standard is for Free Cyanide.
[4] - Sample collected for SVOC analysis on 7/9/2012; the sample collected for analysis of all other parameters collected on 7/5/2012.
[5] - Sample collected for cyanide analysis on 6/29/2012; the sample collected for analysis of all other parameters collected on 6/5/2012.
[6] - Cyanide sample presumed lost in transit to the laboratory.
[7] - Sample collected for voc analysis on 7/11/2012; the sample collected for analysis of all other parameters collected on 7/12/2012.
[8] - Sample not analyzed for pentachlorophenol; sample bottle broke during transit to laboratory.
<0.001 - Indicates constituent was not present above the Reporting Limit.
Bold - Indicates detected result.
Shaded cell indicates that the detected result exceeds the Groundwater Cleanup Standard

OU-10 VB 1 - 8
Historical Groundwater Sampling Results Summary
Avtex Fibers Superfund Site
Front Royal, Virginia

Parameter	Upgradient Overburden Wells										
	GPW-02										
	3/13/08	9/22/08	10/8/09	5/26/10	6/17/11	6/5/12	6/25/13	7/24/14	7/23/15	7/31/16	7/25/17
Volatile Organic Compounds (µg/L)											
Acetone	<10.0 R	<10.0	<10.0 R	<10.0	<10.0 R	<25.0	<25.0	<25.0	**6.1**	<2.66	<2.66
Benzene	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0	<0.5	<0.2	<0.2
Bromodichloromethane	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0	<0.5	<0.17	<0.17
Bromoform	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0	<0.5	<0.29	<0.29
Bromomethane	<1.00	<1.00 J	<1.00	<1.00	<1.00	<2.00	<2.00	<10.0	<0.5	<0.35	<0.35
2-Butanone	<10.0 R	<10.0	<10.0	<10.0	<10.0	<5.00	<5.00	<10.0	**24**	<2.64	<2.64
Carbon Disulfide	<1.00	<1.00	<1.00	<1.00	<1.00	<2.00	<2.00	<10.0	<1.0	<0.22	<0.22
Carbon Tetrachloride	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0	<0.5	<0.18	<0.18
Chlorobenzene	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0	<0.5	<0.18	<0.18
Chlorodibromomethane	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0	<0.5	<0.25	<0.25
Chloroethane	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<10.0	<0.5	<0.36	<0.36
Chloroform	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0	<0.5	<0.23	<0.23
Chloromethane	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00 J	<1.00	<5.0	<0.5 J	<0.36	<0.36
1,2-Dichlorobenzene	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0	<0.5	<0.19	<0.19
1,3-Dichlorobenzene	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0	<0.5	<0.18	<0.18
1,4-Dichlorobenzene	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0	<0.5	<0.17	<0.17
1,1-Dichloroethane	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0	<0.5	<0.24	<0.24
1,2-Dichloroethane	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0	<0.5	<0.2	<0.2
1,1-Dichloroethene	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0	<0.5	<0.25	<0.25
cis-1,2-Dichloroethene	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0	<0.5	<0.21	<0.21
trans-1,2-Dichloroethene	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0	<0.5	<0.23	<0.23
1,2-Dichloropropane	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0	<0.5	<0.25	<0.25
cis-1,3-Dichloropropene	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0	<0.5	<0.17	<0.17
trans-1,3-Dichloropropene	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0	<0.5	<0.17	<0.17
Ethylbenzene	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0	<0.5	<0.19	<0.19
2-Hexanone	<10.0	<10.0	<10.0	<10.0	<10.0	<5.00	<5.00	<10.0	**2.8 J**	<1.28	<1.28
4-Methyl-2-Pentanone	<10.0 R	<10.0	<10.0	<10.0	<10.0	<5.00	<5.00	<10.0	<5.0 J	<0.81	<0.81
Methylene Chloride	<1.00	<1.00	<1.00	<1.00	<1.00	<2.00	<2.00	<5.0	<0.5	<1	<1
Styrene	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0	<0.5	<0.28	<0.28
1,1,2,2-Tetrachloroethane	<0.50	<0.50	<0.50	<0.50	<0.50	<1.00	<1.00	<5.0	<0.5	<0.19	<0.19
Tetrachloroethene	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0	<0.5	<0.14	<0.14
Toluene	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0	<0.5	<0.17	<0.17
1,2,4-Trichlorobenzene	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0	<0.5	<0.2	<0.2
1,1,1-Trichloroethane	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0	<0.5	<0.19	<0.19
1,1,2-Trichloroethane	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0	<0.5	<0.19	<0.19
Trichloroethene	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0	<0.5	<0.2	<0.2
Vinyl Chloride	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0	<0.5	<0.18	<0.18
Xylenes (total)	<1.00	<1.00	<1.00	<1.00	<1.00	<2.00	<2.00	<10.0	**0.1 J**	<0.58	<0.58
Semivolatile Organic Compounds (µg/L)											
Acenaphthene	<5.00	<5.29	<5.21	<5.26 L	<5.10	<10.0	<10.0	<10.0	<0.5	<0.308	<0.308
Acenaphthylene	<5.00	<5.29	<5.21	<5.26 L	<5.10	<10.0	<10.0	<10.0	<0.5	<0.337	<0.337
Anthracene	<5.00	<5.29	<5.21	<5.26 L	<5.10	<10.0	<10.0	<10.0	<0.5	<0.365	<0.365
Benzo(a)anthracene	<5.00	<5.29	<5.21	<5.26 L	<5.10	<10.0	<10.0	<10.0	<0.5	<0.308	<0.308
Benzo (b) Fluoranthene	<5.00	<5.29	<5.21	<5.26 L	<5.10	<10.0	<10.0	<10.0	<0.5	<0.346	<0.346
Benzo (k) Fluoranthene	<5.00	<5.29	<5.21	<5.26 L	<5.10	<10.0	<10.0	<10.0	<0.5	<0.356	<0.356
Benzo (a) Pyrene	<5.00	<5.29	<5.21	<5.26 L	<5.10	<10.0	<10.0	<10.0	<0.5	<0.365	<0.365
Benzo (g,h,i) Perylene	<5.00	<5.29	<5.21	<5.26 L	<5.10	<10.0	<10.0	<10.0	<0.5	<0.596	<0.596
bis (2-Chloroethoxy) Methane	<5.00	<5.29	<5.21	<5.26 L	<5.10	<10.0	<10.0	<10.0	<1	<2.98	<1.83
bis (2-Chloroethyl) ether	<5.00	<5.29	<5.21	<5.26 L	<5.10	<10.0	<10.0	<10.0	<1	<2.69	<1.25
bis (2-Ethylhexyl) phthalate	<5.00	<5.29	**11.5 B**	<5.26 L	<5.10	<6.00	<6.00	<6.0	<5	<5.77	<1.44
4-Bromophenyl-phenylether	<5.00	<5.29	<5.21	<5.26 L	<5.10	<10.0	<10.0	<10.0	<1	<2.6	<1.54
Butlybenzylphthalate	<5.00	<5.29	<5.21	<5.26 L	<5.10	<10.0	<10.0	<10.0	<5	<2.4	<0.962
Carbazole	<5.00	<5.29	<5.21	<5.26 L	<5.10	<10.0	<10.0	<10.0	<1	<2.69	<0.865
4-Chloroaniline	<5.00	<5.29	<5.21	<5.26 L	<5.10	<20.0	<20.0	<20.0	<4	<4.04	<1.15
4-Chloro-3-methylphenol	<5.00	<5.29	<5.21	<5.26	<5.10	<20.0	<20.0	<20.0	<1	<4.33	<1.35
2-Chloronaphthalene	<5.00	<5.29	<5.21	<5.26 L	<5.10	<10.0	<10.0	<10.0	<1	<2.69	<1.44
2-Chlorophenol	<5.00	<5.29	<5.21	<5.26	<5.10	<10.0	<10.0	<10.0	<1	<4.62	<1.63
4-Chlorophenyl-phenyl Ether	<5.00	<5.29	<5.21	<5.26 L	<5.10	<10.0	<10.0	<10.0	<1	<2.69	<1.54
Chrysene	<5.00	<5.29	<5.21	<5.26 L	<5.10	<10.0	<10.0	<10.0	<0.5	<0.317	<0.317
Dibenzo (a,h) Anthracene	<5.00	<5.29	<5.21	<5.26 L	<5.10	<10.0	<10.0	<10.0	<0.5	<0.433	<0.433
Dibenzofuran	<5.00	<5.29	<5.21	<5.26 L	<5.10	<10.0	<10.0	<10.0	<1	<2.79	<1.25
3,3'-Dichlorobenzidine	<10.0	<10.6	<10.4	<10.5 L	<10.2	<20.0	<20.0	<20.0	<5	<3.17	<1.44
2,4-Dichlorophenol	<5.00	<5.29	<5.21	<5.26	<5.10	<10.0	<10.0	<10.0	<1	<5.38	<2.12
Diethylphthalate	<5.00	<5.29	<5.21	<5.26 L	<5.10	<10.0	<10.0	<10.0	<5	<2.88	<1.15

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Historical Groundwater Sampling Results Summary
Avtex Fibers Superfund Site
Front Royal, Virginia

Parameter	Upgradient Overburden Wells										
	GPW-02										
	3/13/08	9/22/08	10/8/09	5/26/10	6/17/11	6/5/12	6/25/13	7/24/14	7/23/15	7/31/16	7/25/17
SVOCs (cont.)											
2,4-Dimethylphenol	<5.00	<5.29	<5.21	<5.26	<5.10	<10.0	<10.0	<10.0	<1	<4.04	<1.54
Dimethylphthalate	<5.00	<5.29	<5.21	<5.26 L	<5.10	<10.0	<10.0	<10.0	<5	<2.98	<1.15
Di-N-Butylphthalate	<5.00	<5.29	<5.21	<5.26 L	<5.10	<10.0	<10.0	<10.0	<5	<2.4	<1.25
Di-n-octylphthalate	<5.00	<5.29	<5.21	<5.26 L	<5.10	<10.0	<10.0	<10.0	<5	<2.4	<0.865
4,6-Dinitro-2-methylphenol	<25.0	<26.5	<26.0	<26.3	<25.5	<20.0	<20.0	<20.0	<15	<8.94	<2.79
2,4-Dinitrophenol	<25.0	<26.5	<26.0	<26.3 J	<25.5	<50.0	<50.0	<50.0	<30	<5.67	<6.92
2,4-Dinitrotoluene	<5.00	<5.29	<5.21	<5.26 L	<5.10	<10.0	<10.0	<10.0	<5	<3.08	<1.54
2,6-Dinitrotoluene	<5.00	<5.29	<5.21	<5.26 L	<5.10	<10.0	<10.0	<10.0	<1	<2.21	<1.44
Fluoranthene	<5.00	<5.29	<5.21	<5.26 L	<5.10	<10.0	<10.0	<10.0	<0.5	<0.308	<0.308
Fluorene	<5.00	<5.29	<5.21	<5.26 L	<5.10	<10.0	<10.0	<10.0	<0.5	<0.308	<0.308
Hexachlorobenzene	<5.00	<5.29	<5.21	<5.26 L	<5.10	<10.0	<10.0	<10.0	<0.5	<2.69	<1.44
Hexachlorobutadiene	<5.00	<5.29	<5.21	<5.26 L	<5.10	<10.0	<10.0	<10.0	<1	<1.92	<1.44
Hexachlorocyclopentadiene	<5.00	<5.29	<5.21	<5.26 L	<5.10	<10.0	<10.0	<10.0	<15	<1.73	<1.25
Hexachloroethane	<5.00	<5.29	<5.21	<5.26 L	<5.10	<10.0	<10.0	<10.0	<5	<1.83	<2.12
Indeno (1,2,3-cd) Pyrene	<5.00	<5.29	<5.21	<5.26 L	<5.10	<10.0	<10.0	<10.0	<0.5	<0.394	<0.394
Isophorone	<5.00	<5.29	<5.21	<5.26 L	<5.10	<10.0	<10.0	<10.0	<1	<2.98	<2.12
2-Methylnaphthalene	<5.00	<5.29	<5.21	<5.26 L	<5.10	<10.0	<10.0	<10.0	<0.5	<0.385	<0.385
2-Methylphenol	<5.00	<5.29	<5.21	<5.26	<5.10	<10.0	<10.0	<10.0	<1	<2.21	<1.54
3&4-Methylphenol/4-methylphenol	<5.00	<5.29	<5.21	<5.26	<5.10	<10.0	<10.0	<10.0	<1	<2.12	<1.35
Naphthalene	<5.00	<5.29	<5.21	<5.26 L	<5.10	<10.0	<10.0	<10.0	**0.1 J**	<0.356	<0.356
2-Nitroaniline	<25.0	<26.5	<26.0	<26.3 L	<25.5	<50.0	<50.0	<50.0	<1	<3.56	<1.06
3-Nitroaniline	<25.0	<26.5	<26.0	<26.3 L	<25.5	<50.0	<50.0	<50.0	<1	<2.6	<1.54
4-Nitroaniline	<25.0	<26.5	<26.0	<26.3 L	<25.5	<20.0	<20.0	<20.0	<1	<2.98	<1.54
4-Nitrophenol	<25.0	<26.5	<26.0	<26.3	<25.5	<50.0	<50.0	<50.0	<30	<5.19	<1.92
2-Nitrophenol	<5.00	<5.29	<5.21	<5.26	<5.10	<10.0	<10.0	<10.0	<1	<5.1	<2.31
Nitrobenzene	<5.00	<5.29	<5.21	<5.26 L	<5.10	<10.0	<10.0	<10.0	<1	<2.6	<2.12
N-Nitroso-di-n-propylamine	<5.00	<5.29	<5.21	<5.26 L	<5.10	<10.0	<10.0	<10.0	<1	<3.27	<1.63
N-Nitrosodiphenylamine	<5.00	<5.29	<5.21	<5.26 L	<5.10	<10.0	<10.0	<10.0	<1	<3.46	<3.46
2,2'-Oxybis (1-chloropropane)	<5.00	<5.29	<5.21	<5.26 L	<5.10	<10.0	<10.0	<10.0	<1	<2.69	<1.73
Pentachlorophenol	<10.0	<10.6	<10.4	<10.5	<10.2	<25.0	<25.0	<25.0	<5	<1.63	<3.17
Phenanthrene	<5.00	<5.29	<5.21	<5.26 L	<5.10	<10.0	<10.0	<10.0	<0.5	<0.404	<0.404
Phenol	<5.00	<5.29	<5.21	<5.26	<5.10	<10.0	<10.0	<10.0	<1	<1.44	<1.44
Pyrene	<5.00	<5.29	<5.21	<5.26 L	<5.10	<10.0	<10.0	<10.0	<0.5	<0.337	<0.337
2,4,5-Trichlorophenol	<5.00	<5.29	<5.21	<5.26	<5.10	<10.0	<10.0	<10.0	<1	<6.83	<1.25
2,4,6-Trichlorophenol	<5.00	<5.29	<5.21	<5.26	<5.10	<10.0	<10.0	<10.0	<1	<6.54	<1.83
Filtered Inorganics (mg/L)											
Arsenic	**0.000941 B**	<0.001	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0040	<0.0005	<0.000400
Antimony	<0.001	<0.001	<0.005	<0.001	**0.00117**	<0.001	<0.001	<0.001	<0.0020 J	<0.0005	<0.000800
Beryllium	**0.000384 J**	<0.002	<0.002	<0.002	<0.002	<0.001	**0.00042 K**	<0.0001	**0.00019 J**	<0.001	**0.000117 J**
Cadmium	**0.000277 J**	<0.005	<0.0050	<0.005	<0.005	<0.001	<0.001	<0.0001	<0.0010	<0.0004	<0.000100
Chromium	**0.00304 J**	<0.005	<0.005	<0.005	<0.005	**0.002 J**	**0.0026 J**	<0.001	**0.0017 J**	<0.00205	**0.00244**
Copper	<0.01	<0.010	<0.010	<0.01	<0.01	**0.0016 J**	**0.0012 L**	**0.0023**	**0.0032 J**	<0.00688	**0.00855**
Lead	<0.003	<0.001	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0020	<0.0002	<0.000100
Mercury	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.00020	<0.0001	<0.000100
Nickel	**0.0144**	**0.0126**	<0.020	**0.0128**	**0.0117**	**0.0139**	**0.0131**	**0.0102**	**0.0190**	**0.014**	**0.0103**
Selenium	**0.00378 B**	<0.001	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0040	**0.000609 J**	**0.000375 J**
Thallium	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.001	<0.001	<0.001	<0.0010	<0.0005	<0.000800
Vanadium	<0.01	<0.01	<0.010	<0.01	<0.01	<0.005	**0.00066 K**	<0.001	<0.0010	<0.00181	<0.000700
Zinc	**0.0287**	**0.0747**	**0.0740**	**0.0280**	**0.0332**	**0.0172**	**0.0306**	**0.0236**	**0.0258 J**	<0.0525	**0.234**
Field Parameters											
pH	5.05	5.15	5.43	5.40	5.29	4.95	5.02	5.23	5.50	5.78	5.5
Specific Conductance (mS/cm)	0.504	0.453	0.438	0.452	0.417	0.437	0.430	0.39	0.4	0.39199	0.43378
Turbidity (ntu)	8.1	17.3	6.4	6.91	8	18.4	62.7	7.50	12.80	148.47	55.8
Dissolved Oxygen (mg/L)	7.03	8.72	6.36	13.9	6.41	5.48	4.65	1.31	2.61	4.19	1.99
Redox Potential (mV)	266.6	251.7	159.4	117.8	105.5	14.6	159.7	205.97	165.40	140.2	81.7
Temperature (^{o}C)	15.59	14.48	14.15	14.66	14.18	14.22	15.06	19.58	25.43	19.12	21.4

Notes:
B - Analyte detected in associated method blank.
J - Estimated result
K - Analytical result may be biased high.
L - Analytical result may be biased low.
< - Not detected, value indicates detection limit.
R - Result flagged as unusable due to low response, per EPA guidance, but validator notes that response is stable and calibration curve is within specified limits, and thus should be considered useable.
[1] - Blind duplicate sample

OU-10 VB 1 - 8
Historical Groundwater Sampling Results Summary
Avtex Fibers Superfund Site
Front Royal, Virginia

Parameter	Upgradient Overburden Wells (cont.)								
	GPW-03								
	3/19/2009	5/27/10	6/20/11	6/1/12	6/24/13	7/23/14	7/21/15	7/29/16	7/24/17
Volatile Organic Compounds (µg/L)									
Acetone	<10.0	<10.0	<10.0 R	**2.2 J**	<25.0	<25.0	<5.0	<2.66	<2.66
Benzene	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0	<0.5	<0.2	<0.2
Bromodichloromethane	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0	<0.5	<0.17	<0.17
Bromoform	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0	<0.5	<0.29	<0.29
Bromomethane	<1.00	<1.00	<1.00	<2.00	<2.00	<10.0	<0.5	<0.35	<0.35
2-Butanone	<10.0	<10.0	<10.0	<5.00	<5.00	<10.0	<5.0	<2.64	<2.64
Carbon Disulfide	<1.00	<1.00	<1.00	<2.00	<2.00	<10.0	<1.0	<0.22	<0.22
Carbon Tetrachloride	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0	<0.5	<0.18	<0.18
Chlorobenzene	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0	<0.5	<0.18	<0.18
Chlorodibromomethane	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0	<0.5	<0.25	<0.25
Chloroethane	<1.00	<1.00	<1.00	<1.00	<1.00	<10.0	<0.5	<0.36	<0.36
Chloroform	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0	<0.5	<0.23	<0.23
Chloromethane	<1.00	<1.00	<1.00	<1.00 J	<1.00	<5.0	<0.5	<0.36	<0.36
1,2-Dichlorobenzene	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0	<0.5	<0.19	<0.19
1,3-Dichlorobenzene	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0	<0.5	<0.18	<0.18
1,4-Dichlorobenzene	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0	<0.5	<0.17	<0.17
1,1-Dichloroethane	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0	<0.5	<0.24	<0.24
1,2-Dichloroethane	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0	<0.5	<0.2	<0.2
1,1-Dichloroethene	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0	<0.5	<0.25	<0.25
cis-1,2-Dichloroethene	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0	<0.5	<0.21	<0.21
trans-1,2-Dichloroethene	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0	<0.5	<0.23	<0.23
1,2-Dichloropropane	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0	<0.5	<0.25	<0.25
cis-1,3-Dichloropropene	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0	<0.5	<0.17	<0.17
trans-1,3-Dichloropropene	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0	<0.5	<0.17	<0.17
Ethylbenzene	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0	<0.5	<0.19	<0.19
2-Hexanone	<10.0	<10.0	<10.0	<5.00	<5.00	<10.0	<5.0	<1.28	<1.28
4-Methyl-2-Pentanone	<10.0	<10.0	<10.0	<5.00	<5.00	<10.0	<5.0	<0.81	<0.81
Methylene Chloride	<1.00	<1.00	<1.00	<2.00	<2.00	<5.0	<0.5	<1	<1
Styrene	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0	<0.5	<0.28	<0.28
1,1,2,2-Tetrachloroethane	<0.50	<0.50	<0.50	<1.00	<1.00	<5.0	<0.5	<0.19	<0.19
Tetrachloroethene	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0	<0.5	<0.14	<0.14
Toluene	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0	<0.5	<0.17	<0.17
1,2,4-Trichlorobenzene	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0	<0.5	<0.2	<0.2
1,1,1-Trichloroethane	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0	<0.5	<0.19	<0.19
1,1,2-Trichloroethane	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0	<0.5	<0.19	<0.19
Trichloroethene	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0	<0.5	<0.2	<0.2
Vinyl Chloride	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0	<0.5	<0.18	<0.18
Xylenes (total)	<1.00	<1.00	<1.00	<2.00	<2.00	<10.0	<0.5	<0.58	<0.58
Semivolatile Organic Compounds (µg/L)									
Acenaphthene	<5.26	<5.00	<5.49	<10.0	<10.0	<10.0	<0.5	<0.308	<0.308
Acenaphthylene	<5.26	<5.00	<5.49	<10.0	<10.0	<10.0	<0.5	<0.337	<0.337
Anthracene	<5.26	<5.00	<5.49	<10.0	<10.0	<10.0	<0.5	<0.365	<0.365
Benzo(a)anthracene	<5.26	<5.00	<5.49	<10.0	<10.0	<10.0	<0.5	<0.308	<0.308
Benzo (b) Fluoranthene	<5.26	<5.00	<5.49	<10.0	<10.0	<10.0	<0.5	<0.346	<0.346
Benzo (k) Fluoranthene	<5.26	<5.00	<5.49	<10.0	<10.0	<10.0	<0.5	<0.356	<0.356
Benzo (a) Pyrene	<5.26	<5.00	<5.49	<10.0	<10.0	<10.0	<0.5	<0.365	<0.365
Benzo (g,h,i) Perylene	<5.26	<5.00	<5.49	<10.0	<10.0	<10.0	<0.5	<0.596	<0.596
bis (2-Chloroethoxy) Methane	<5.26	<5.00	<5.49	<10.0	<10.0	<10.0	<1	<2.98	<1.83
bis (2-Chloroethyl) ether	<5.26	<5.00	<5.49	<10.0	<10.0	<10.0	<1	<2.69	<1.25
bis (2-Ethylhexyl) phthalate	<5.26	<5.00	<5.49	<6.00	<6.00	<6.0	<5	<5.77	<1.44
4-Bromophenyl-phenylether	<5.26	<5.00	<5.49	<10.0	<10.0	<10.0	<1	<2.6	<1.54
Butlybenzylphthalate	<5.26	<5.00	<5.49	<10.0	<10.0	<10.0	<5	<2.4	<0.962
Carbazole	<5.26	<5.00	<5.49	<10.0	<10.0	<10.0	<1	<2.69	<0.865
4-Chloroaniline	<5.26	<5.00 J	<5.49	<20.0	<20.0	<20.0	<4	<4.04	<1.15
4-Chloro-3-methylphenol	<5.26	<5.00	<5.49	<20.0	<20.0	<20.0	<1	<4.33	<1.35
2-Chloronaphthalene	<5.26	<5.00	<5.49	<10.0	<10.0	<10.0	<1	<2.69	<1.44
2-Chlorophenol	<5.26	<5.00	<5.49	<10.0	<10.0	<10.0	<1	<4.62	<1.63
4-Chlorophenyl-phenyl Ether	<5.26	<5.00	<5.49	<10.0	<10.0	<10.0	<1	<2.69	<1.54
Chrysene	<5.26	<5.00	<5.49	<10.0	<10.0	<10.0	<0.5	<0.317	<0.317
Dibenzo (a,h) Anthracene	<5.26	<5.00	<5.49	<10.0	<10.0	<10.0	<0.5	<0.433	<0.433
Dibenzofuran	<5.26	<5.00	<5.49	<10.0	<10.0	<10.0	<1	<2.79	<1.25
3,3'-Dichlorobenzidine	<10.5	<10.0	<11.0	<20.0	<20.0	<20.0	<5	<3.17	<1.44
2,4-Dichlorophenol	<5.26	<5.00	<5.49	<10.0	<10.0	<10.0	<1	<5.38	<2.12
Diethylphthalate	<5.26	<5.00	<5.49	<10.0	<10.0	<10.0	**2 J**	<2.88	<1.15

OU-10 VB 1 - 8
Historical Groundwater Sampling Results Summary
Avtex Fibers Superfund Site
Front Royal, Virginia

Parameter	Upgradient Overburden Wells (cont.)								
	GPW-03								
	3/19/2009	5/27/10	6/20/11	6/1/12	6/24/13	7/23/14	7/21/15	7/29/16	7/24/17
SVOCs (cont.)									
2,4-Dimethylphenol	<5.26	<5.00	<5.49	<10.0	<10.0	<10.0	<1	<4.04	<1.54
Dimethylphthalate	<5.26	<5.00	<5.49	<10.0	<10.0	<10.0	<5	<2.98	<1.15
Di-N-Butylphthalate	<5.26	<5.00	<5.49	<10.0	<10.0	<10.0	<5	<2.4	<1.25
Di-n-octylphthalate	<5.26	<5.00	<5.49	<10.0	<10.0	<10.0	<5	<2.4	<0.865
4,6-Dinitro-2-methylphenol	<26.3	<25.0 J	<27.5	<20.0	<20.0	<20.0	<16	<8.94	<2.79
2,4-Dinitrophenol	<26.3	<25.0 J	<27.5	<50.0	<50.0	<50.0	<32	<5.67	<6.92
2,4-Dinitrotoluene	<5.26	<5.00 J	<5.49	<10.0	<10.0	<10.0	<5	<3.08	<1.54
2,6-Dinitrotoluene	<5.26	<5.00 J	<5.49	<10.0	<10.0	<10.0	<1	<2.21	<1.44
Fluoranthene	<5.26	<5.00	<5.49	<10.0	<10.0	<10.0	<0.5	<0.308	<0.308
Fluorene	<5.26	<5.00	<5.49	<10.0	<10.0	<10.0	<0.5	<0.308	<0.308
Hexachlorobenzene	<5.26	<5.00	<5.49	<10.0	<10.0	<10.0	<0.5	<2.69	<1.44
Hexachlorobutadiene	<5.26	<5.00	<5.49	<10.0	<10.0	<10.0	<1	<1.92	<1.44
Hexachlorocyclopentadiene	<5.26	<5.00	<5.49	<10.0	<10.0	<10.0	<16	<1.73	<1.25
Hexachloroethane	<5.26	<5.00	<5.49	<10.0	<10.0	<10.0	<5	<1.83	<2.12
Indeno (1,2,3-cd) Pyrene	<5.26	<5.00	<5.49	<10.0	<10.0	<10.0	<0.5	<0.394	<0.394
Isophorone	<5.26	<5.00	<5.49	<10.0	<10.0	<10.0	<1	<2.98	<2.12
2-Methylnaphthalene	<5.26	<5.00	<5.49	<10.0	<10.0	<10.0	<0.5	<0.385	<0.385
2-Methylphenol	<5.26	<5.00	<5.49	<10.0	<10.0	<10.0	<1	<2.21	<1.54
3&4-Methylphenol/4-methylphenol	<5.26	<5.00	<5.49	<10.0	<10.0	<10.0	<1	<2.12	<1.35
Naphthalene	<5.26	<5.00	<5.49	<10.0	<10.0	<10.0	<0.5	<0.356	<0.356
2-Nitroaniline	<26.3	<25.0 J	<27.5	<50.0	<50.0	<50.0	<1	<3.56	<1.06
3-Nitroaniline	<26.3	<25.0 J	<27.5	<50.0	<50.0	<50.0	<1	<2.6	<1.54
4-Nitroaniline	<26.3	<25.0	<27.5	<20.0	<20.0	<20.0	<1	<2.98	<1.54
4-Nitrophenol	<26.3	<25.0 J	<27.5	<50.0	<50.0	<50.0	<32	<5.19	<1.92
2-Nitrophenol	<5.26	<5.00 J	<5.49	<10.0	<10.0	<10.0	<1	<5.1	<2.31
Nitrobenzene	<5.26	<5.00 J	<5.49	<10.0	<10.0	<10.0	<1	<2.6	<2.12
N-Nitroso-di-n-propylamine	<5.26	<5.00	<5.49	<10.0	<10.0	<10.0	<1	<3.27	<1.63
N-Nitrosodiphenylamine	<5.26	<5.00	<5.49	<10.0	<10.0	<10.0	<1	<3.46	<3.46
2,2'-Oxybis (1-chloropropane)	<5.26	<5.00 J	<5.49 J	<10.0	<10.0	<10.0	<1	<2.69	<1.73
Pentachlorophenol	<10.5	<10.0	<11.0	<25.0	<25.0	<25.0	<5	<1.63	<3.17
Phenanthrene	<5.26	<5.00	<5.49	<10.0	<10.0	<10.0	<0.5	<0.404	<0.404
Phenol	<5.26	<5.00	<5.49	<10.0	<10.0	<10.0 J	<1	<1.44	<1.44
Pyrene	<5.26	<5.00	<5.49	<10.0	<10.0	<10.0	<0.5	<0.337	<0.337
2,4,5-Trichlorophenol	<5.26	<5.00	<5.49	<10.0	<10.0	<10.0	<1	<6.83	<1.25
2,4,6-Trichlorophenol	<5.26	<5.00	<5.49	<10.0	<10.0	<10.0	<1	<6.54	<1.83
Filtered Inorganics (mg/L)									
Arsenic	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0040	**0.000658 J**	<0.000400
Antimony	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0020	<0.0005	<0.000800
Beryllium	<0.002	<0.002	<0.002	<0.001	<0.001	<0.0001	**0.000077 J**	<0.001	<0.000100
Cadmium	<0.005	<0.005	<0.005	<0.001	<0.001	**0.00012**	<0.0010	<0.0004	<0.000100
Chromium	<0.005	<0.005	<0.005	**0.00042 J**	**0.00064 J**	<0.001	<0.0040	<0.0005	<0.000500
Copper	**0.0258**	<0.01	<0.01	**0.0014 J**	**0.0012 L**	<0.001	**0.00087 J**	<0.00384	**0.0133**
Lead	**0.00155**	<0.001	<0.001	<0.001	<0.001	<0.001	**0.00016 J**	<0.0002	**0.00146 J**
Mercury	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.00020	<0.0001	<0.000100
Nickel	**0.0111**	**0.0455**	**0.0376**	**0.0286**	**0.0256**	**0.0239**	**0.0236**	**0.0113**	**0.00838**
Selenium	**0.00161**	**0.00218**	**0.00201**	<0.001	<0.001	<0.001	<0.0040	<0.0006	<0.000300
Thallium	<0.0002	<0.0002	<0.0002	<0.001	<0.001	<0.001	<0.0010	<0.0005	<0.000800
Vanadium	<0.01	<0.01	<0.01	<0.005	**0.00055 K**	<0.001	<0.0010	<0.00194	<0.000700
Zinc	<0.02	<0.02	<0.02	**0.0074 J**	**0.0128 B**	**0.0091**	**0.0105 J**	<0.0249	**0.136**
Field Parameters									
pH	5.88	4.89	5.73	5.60	5.15	5.67	5.66	5.79	5.69
Specific Conductance (mS/cm)	0.530	1.099	.974	0.989	0.866	0.72	0.7	0.65641	0.75956
Turbidity (ntu)	2.6	3.2	3.7	26.1	14.3	3.61	5.23	0.82	2.28
Dissolved Oxygen (mg/L)	2.92	2.65	7.43	2.00	1.62	1.31	1.06	0.86	1.96
Redox Potential (mV)	157.1	228.7	217.9	131.8	276.8	394.50	113.79	203	209.6
Temperature (^{o}C)	14.34	16.26	17.54	15.41	18.60	25.57	26.43	19.47	21.84

Notes:
B - Analyte detected in associated method blank.
J - Estimated result
K - Analytical result may be biased high.
L - Analytical result may be biased low.
< - Not detected, value indicates detection limit.
R - Result flagged as unusable due to low response
EPA guidance, but validator notes that response
stable and calibration curve is within specified li
and thus should be considered useable.
[1] - Blind duplicate sample

OU-10 VB 1 - 8
Historical Groundwater Sampling Results Summary
Avtex Fibers Superfund Site
Front Royal, Virginia

Parameter	Upgradient Shallow Bedrock Wells										
	MW-7										
	3/5/08	9/17/08	3/18/09	10/13/09	5/25/10	6/22/11	5/31/12	6/24/13	7/26/14	7/23/15	7/30/16
Volatile Organic Compounds (µg/L)											
Acetone	<10.0 R	<10.0 R	<10.0 R	<10.0	<10.0 R	<10.0 R	<25.0	<25.0	<25.0	<5.0	**452**
Benzene	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5	<0.2
Bromodichloromethane	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5	<0.17
Bromoform	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5	<0.29
Bromomethane	<1.00	<1.00 J	<1.00	<1.00	<1.00	<1.00	<2.00	<2.00	<2.0	<0.5	<0.35
2-Butanone	<10.0 J	<10.0 R	<10.0	<10.0	<10.0	<10.0	<5.00	<5.00	<5.0	<5.0	<2.64
Carbon Disulfide	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<2.00	<2.00	<2.0	<1.0	<0.22
Carbon Tetrachloride	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5	<0.18
Chlorobenzene	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5	<0.18
Chlorodibromomethane	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5	<0.25
Chloroethane	<1.00	<1.00 J	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5	<0.36
Chloroform	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5	<0.23
Chloromethane	<1.00	<1.00 J	<1.00	<1.00	<1.00	<1.00	<1.00 J	<1.00	<1.0	<0.5 J	<0.36
1,2-Dichlorobenzene	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5	<0.19
1,3-Dichlorobenzene	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5	<0.18
1,4-Dichlorobenzene	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5	<0.17
1,1-Dichloroethane	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5	<0.24
1,2-Dichloroethane	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5	<0.2
1,1-Dichloroethene	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5	<0.25
cis-1,2-Dichloroethene	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5	<0.21
trans-1,2-Dichloroethene	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5	<0.23
1,2-Dichloropropane	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5	<0.25
cis-1,3-Dichloropropene	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5	<0.17
trans-1,3-Dichloropropene	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5	<0.17
Ethylbenzene	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5	<0.19
2-Hexanone	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<5.00	<5.00	<5.0	<5.0	<1.28
4-Methyl-2-Pentanone	<10.0 R	<10.0 R	<10.0 R	<10.0	<10.0 R	<10.0	<5.00	<5.00	<5.0	<5.0 J	<0.81
Methylene Chloride	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<2.00	<2.00	<2.0	<0.5	<1
Styrene	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5	<0.28
1,1,2,2-Tetrachloroethane	<0.50	<0.50	<0.50	<0.50	<0.500	<0.500	<1.00	<1.00	<1.0	<0.5	<0.19
Tetrachloroethene	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5	<0.14
Toluene	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5	<0.17
1,2,4-Trichlorobenzene	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5	<0.2
1,1,1-Trichloroethane	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5	<0.19
1,1,2-Trichloroethane	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5	<0.19
Trichloroethene	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5	<0.2
Vinyl Chloride	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	**2.4**	**3.2**	**1.3**	**2.95**
Xylenes (total)	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<2.00	<2.00	<2.0	<0.5	<0.58
Semivolatile Organic Compounds (µg/L)											
Acenaphthene	<5.00	<5.32	<5.10	<5.00	<5.10	<5.10	<10.0	<10.0	<10.0	<0.5	<0.32
Acenaphthylene	<5.00	<5.32	<5.10	<5.00	<5.10	<5.10	<10.0	<10.0	<10.0	<0.5	<0.35
Anthracene	<5.00	<5.32	<5.10	<5.00	<5.10	<5.10	<10.0	<10.0	<10.0	<0.5	<0.38
Benzo(a)anthracene	<5.00	<5.32	<5.10	<5.00	<5.10	<5.10	<10.0	<10.0	<10.0	<0.5	<0.32
Benzo (b) Fluoranthene	<5.00	<5.32	<5.10	<5.00	<5.10	<5.10	<10.0	<10.0	<10.0	<0.5	<0.36
Benzo (k) Fluoranthene	<5.00	<5.32	<5.10	<5.00	<5.10	<5.10	<10.0	<10.0	<10.0	<0.5	<0.37
Benzo (a) Pyrene	<5.00	<5.32	<5.10	<5.00	<5.10	<5.10	<10.0	<10.0	<10.0	<0.5	<0.38
Benzo (g,h,i) Perylene	<5.00	<5.32	<5.10	<5.00	<5.10	<5.10	<10.0	<10.0	<10.0	<0.5	<0.62
bis (2-Chloroethoxy) Methane	<5.00	<5.32	<5.10	<5.00	<5.10	<5.10	<10.0	<10.0	<10.0	<1	<3.1
bis (2-Chloroethyl) ether	<5.00	<5.32	<5.10	<5.00	<5.10	<5.10	<10.0	<10.0	<10.0	<1	<2.8
bis (2-Ethylhexyl) phthalate	<5.00	<5.32	<5.10	<5.00	<5.10	**7.16**	<6.00	<6.00	<6.0	<5	<6
4-Bromophenyl-phenylether	<5.00	<5.32	<5.10	<5.00	<5.10	<5.10	<10.0	<10.0	<10.0	<1	<2.7
Butlybenzylphthalate	<5.00	<5.32	<5.10	<5.00	<5.10	<5.10	<10.0	<10.0	<10.0	<5	<2.5
Carbazole	<5.00	<5.32	<5.10	<5.00	<5.10	<5.10	<10.0	<10.0	NA	<1	<2.8
4-Chloroaniline	<5.00	<5.32	<5.10	<5.00	<5.10	<5.10	<20.0	<20.0	<20.0	<4	<4.2
4-Chloro-3-methylphenol	<5.00	<5.32	<5.10	<5.00	<5.10	<5.10	<20.0	<20.0	<20.0	<1	<4.5
2-Chloronaphthalene	<5.00	<5.32	<5.10	<5.00	<5.10	<5.10	<10.0	<10.0	<10.0	<1	<2.8
2-Chlorophenol	<5.00	<5.32	<5.10	<5.00	<5.10	<5.10	<10.0	<10.0	<10.0	<1	<4.8
4-Chlorophenyl-phenyl Ether	<5.00	<5.32	<5.10	<5.00	<5.10	<5.10	<10.0	<10.0	<10.0	<1	<2.8
Chrysene	<5.00	<5.32	<5.10	<5.00	<5.10	<5.10	<10.0	<10.0	<10.0	<0.5	<0.33
Dibenzo (a,h) Anthracene	<5.00	<5.32	<5.10	<5.00	<5.10	<5.10	<10.0	<10.0	<10.0	<0.5	<0.45
Dibenzofuran	<5.00	<5.32	<5.10	<5.00	<5.10	<5.10	<10.0	<10.0	<10.0	<1	<2.9
3,3'-Dichlorobenzidine	<10.0	<10.6	<10.2	<10.0	<10.2	<10.2	<20.0	<20.0	<20.0	<5	<3.3
2,4-Dichlorophenol	<5.00	<5.32	<5.10	<5.00	<5.10	<5.10	<10.0	<10.0	<10.0	<1	<5.6
Diethylphthalate	<5.00	<5.32	<5.10	<5.00	<5.10	<5.10	<10.0	<10.0	<10.0	<5	<3

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Historical Groundwater Sampling Results Summary
Avtex Fibers Superfund Site
Front Royal, Virginia

Parameter	Upgradient Shallow Bedrock Wells										
	MW-7										
	3/5/08	9/17/08	3/18/09	10/13/09	5/25/10	6/22/11	5/31/12	6/24/13	7/26/14	7/23/15	7/30/16
SVOCs (cont.)											
2,4-Dimethylphenol	<5.00	<5.32	<5.10	<5.00	<5.10	<5.10	<10.0	<10.0	<10.0	<1	<4.2
Dimethylphthalate	<5.00	<5.32	<5.10	<5.00	<5.10	<5.10	<10.0	<10.0	<10.0	<5	<3.1
Di-N-Butylphthalate	<5.00	<5.32	<5.10	<5.00	<5.10	<5.10	<10.0	<10.0	<10.0	<5	<2.5
Di-n-octylphthalate	<5.00	<5.32	<5.10	<5.00	<5.10	<5.10	<10.0	<10.0	<10.0	<5	<2.5
4,6-Dinitro-2-methylphenol	<25.0	<26.6	<25.5	<25.0	<25.5	<25.5	<20.0	<20.0	<20.0	<15	<9.3
2,4-Dinitrophenol	<25.0	<26.6	<25.5	<25.0	<25.5	<25.5	<50.0	<50.0	<50.0	<30	<5.9
2,4-Dinitrotoluene	<5.00	<5.32	<5.10	<5.00	<5.10	<5.10	<10.0	<10.0	<10.0	<5	<3.2
2,6-Dinitrotoluene	<5.00	<5.32	<5.10	<5.00	<5.10	<5.10	<10.0	<10.0	<10.0	<1	<2.3
Fluoranthene	<5.00	<5.32	<5.10	<5.00	<5.10	<5.10	<10.0	<10.0	<10.0	<0.5	<0.32
Fluorene	<5.00	<5.32	<5.10	<5.00	<5.10	<5.10	<10.0	<10.0	<10.0	<0.5	<0.32
Hexachlorobenzene	<5.00	<5.32	<5.10	<5.00	<5.10	<5.10	<10.0	<10.0	<10.0	<0.5	<2.8
Hexachlorobutadiene	<5.00	<5.32	<5.10	<5.00	<5.10	<5.10	<10.0	<10.0	<10.0	<1	<2
Hexachlorocyclopentadiene	<5.00	<5.32	<5.10	<5.00	<5.10	<5.10	<10.0	<10.0	<10.0	<15	<1.8
Hexachloroethane	<5.00	<5.32	<5.10	<5.00	<5.10	<5.10	<10.0	<10.0	<10.0	<5	<1.9
Indeno (1,2,3-cd) Pyrene	<5.00	<5.32	<5.10	<5.00	<5.10	<5.10	<10.0	<10.0	<10.0	<0.5	<0.41
Isophorone	<5.00	<5.32	<5.10	<5.00	<5.10	<5.10	<10.0	<10.0	<10.0	<1	<3.1
2-Methylnaphthalene	<5.00	<5.32	<5.10	<5.00	<5.10	<5.10	<10.0	<10.0	<10.0	<0.5	<0.4
2-Methylphenol	<5.00	<5.32	<5.10	<5.00	<5.10	<5.10	<10.0	<10.0	<10.0	<1	<2.3
3&4-Methylphenol/4-methylphenol	<5.00	<5.32	<5.10	<5.00	<5.10	<5.10	<10.0	<10.0	<10.0	<1	<2.2
Naphthalene	<5.00	<5.32	<5.10	<5.00	<5.10	<5.10	<10.0	<10.0	<10.0	<0.5	<0.37
2-Nitroaniline	<25.0	<26.6	<25.5	<25.0	<25.5	<25.5	<50.0	<50.0	<50.0	<1	<3.7
3-Nitroaniline	<25.0	<26.6	<25.5	<25.0	<25.5	<25.5	<50.0	<50.0	<50.0	<1	<2.7
4-Nitroaniline	<25.0	<26.6	<25.5	<25.0	<25.5	<25.5	<20.0	<20.0	<20.0	<1	<3.1
4-Nitrophenol	<25.0	<26.6	<25.5	<25.0	<25.5	<25.5	<50.0	<50.0	<50.0	<30	<5.4
2-Nitrophenol	<5.00	<5.32	<5.10	<5.00	<5.10	<5.10	<10.0	<10.0	<10.0	<1	<5.3
Nitrobenzene	<5.00	<5.32	<5.10	<5.00	<5.10	<5.10	<10.0	<10.0	<10.0	<1	<2.7
N-Nitroso-di-n-propylamine	<5.00	<5.32	<5.10	<5.00	<5.10	<5.10	<10.0	<10.0	<10.0	<1	<3.4
N-Nitrosodiphenylamine	<5.00	<5.32	<5.10	<5.00	<5.10	<5.10	<10.0	<10.0	<10.0	<1	<3.6
2,2'-Oxybis (1-chloropropane)	<5.00	<5.32	<5.10	<5.00	<5.10	<5.10	<10.0	<10.0	NA	<1	<2.8
Pentachlorophenol	<10.0	<10.6	<10.2	<10.0	<10.2	<10.2	<25.0	<25.0	<25.0	<5	<1.7
Phenanthrene	<5.00	<5.32	<5.10	<5.00	<5.10	<5.10	<10.0	<10.0	<10.0	<0.5	<0.42
Phenol	<5.00	<5.32	<5.10	<5.00	<5.10	<5.10	<10.0 J	<10.0	<10.0	<1	<1.5
Pyrene	<5.00	<5.32	<5.10	<5.00	<5.10	<5.10	<10.0	<10.0	<10.0	<0.5	<0.35
2,4,5-Trichlorophenol	<5.00	<5.32	<5.10	<5.00	<5.10	<5.10	<10.0	<10.0	<10.0	<1	<7.1
2,4,6-Trichlorophenol	<5.00	<5.32	<5.10	<5.00	<5.10	<5.10	<10.0	<10.0	<10.0	<1	<6.8
Filtered Inorganics (mg/L)											
Arsenic	**0.000388 J**	<0.001	<0.001	<0.001	<0.001	<0.001	**0.0022**	**0.00095 J**	<0.001	**0.00063 J**	**0.00254**
Antimony	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	**0.00086 J**	<0.001	<0.001	<0.0020 J	<0.0005
Beryllium	<0.005	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.001	<0.0002 J	<0.0010	<0.001
Cadmium	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.001	<0.0001	<0.0010	<0.0004
Chromium	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	**0.0078 J**	<0.005	<0.001	<0.0040	<0.000552
Copper	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	**0.012 J**	**0.0011 L**	<0.001	<0.0040	<0.001
Lead	<0.003	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	**0.0012 J**	<0.0002
Mercury	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.00020	<0.0001
Nickel	**0.00931 J**	**0.0071**	**0.00563**	**0.0071**	**0.00575**	**0.00502**	**0.05**	**0.00078 J**	**0.0018**	**0.0011 J**	<0.00364
Selenium	**0.00107 J**	**0.00137**	<0.001	**0.00112**	**0.00108**	<0.001	**0.0022**	<0.001	<0.001	<0.0040	<0.0006
Thallium	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.001	<0.001	<0.0010	<0.0005
Vanadium	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.025	<0.005	<0.001	<0.0010	<0.00167
Zinc	**0.00565 J**	<0.02	<0.02	<0.02	<0.02	<0.02	**0.0895**	**0.0039 K**	<0.005	<0.0300	**0.132**
Field Parameters											
pH	6.52	6.57	6.50	6.45	6.26	6.49	6.15	6.09	6.45	6.51	6.48
Specific Conductance (mS/cm)	1.816	1.837	1.758	1.743	1.636	1.555	1.528	1.430	1.43	1.4	1.6244
Turbidity (ntu)	0.2	0.4	3.4	0.0	0.4	0	8.3	0.0	1.69	2.67	2.64
Dissolved Oxygen (mg/L)	0.29	0.27	0.90	0.17	0.47	0.09	0.36	2.09	0.16	0.05	0.14
Redox Potential (mV)	-48.5	-29.9	-16.2	-62.7	-18.3	-38.2	77.9	-71.1	-29.97	-8.84	-83
Temperature (^{o}C)	15.94	16.20	15.90	14.66	15.61	15.75	18.15	18.77	30.26	20.71	22.08

Notes:
B - Analyte detected in associated method blank.
J - Estimated result
K - Analytical result may be biased high.
L - Analytical result may be biased low.
< - Not detected, value indicates detection limit.
R - Result flagged as unusable due to low response
EPA guidance, but validator notes that response
stable and calibration curve is within specified li
and thus should be considered useable.
[1] - Blind duplicate sample

OU-10 VB 1 - 8
Historical Groundwater Sampling Results Summary
Avtex Fibers Superfund Site
Front Royal, Virginia

Parameter	Upgradient Shallow Bedrock Wells (cont.)										
	MW-7 (cont.)	MW-8									
	7/29/17	3/3/08	9/17/08	3/17/09	10/9/09	5/21/10	6/22/11	6/1/12	6/21/13	7/26/14	7/25/15
Volatile Organic Compounds (µg/L)											
Acetone	R	<10.0 R	<10.0 R	<10 R	<10.0	<10.0 J	<10.0 R	<25.0	<25.0	<25.0	<5
Benzene	<0.2	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5
Bromodichloromethane	<0.17	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5
Bromoform	<0.29	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5
Bromomethane	<0.35	<1.00	<1.00 J	<1.00	<1.00	<1.00	<1.00	<2.00	<2.00	<2.0	<0.5
2-Butanone	<2.64	<10.0 R	<10.0 R	<10.0	<10.0	<10.0 J	<10.0	<5.00	<5.00	<5.0	<5
Carbon Disulfide	<0.22	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<2.00	<2.00	<2.0	<1
Carbon Tetrachloride	<0.18	<1.00 J	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5
Chlorobenzene	<0.18	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5
Chlorodibromomethane	<0.25	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5
Chloroethane	<0.36	<1.00 J	<1.00 J	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5
Chloroform	<0.23	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5
Chloromethane	<0.36	<1.00 J	<1.00 J	<1.00	<1.00	<1.00	<1.00	<1.00 J	<1.00	<1.0	<0.5
1,2-Dichlorobenzene	<0.19	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5
1,3-Dichlorobenzene	<0.18	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5
1,4-Dichlorobenzene	<0.17	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5
1,1-Dichloroethane	<0.24	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5
1,2-Dichloroethane	<0.2	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5
1,1-Dichloroethene	<0.25	<1.00 J	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5
cis-1,2-Dichloroethene	<0.21	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5
trans-1,2-Dichloroethene	<0.23	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5
1,2-Dichloropropane	<0.25	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5
cis-1,3-Dichloropropene	<0.17	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5
trans-1,3-Dichloropropene	<0.17	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5
Ethylbenzene	**0.206 J**	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5
2-Hexanone	<1.28	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<5.00	<5.00	<5.0	<5
4-Methyl-2-Pentanone	<0.81	<10.0 R	<10.0 R	<10.0 R	<10.0	<10.0 J	<10.0	<5.00	<5.00	<5.0	<5
Methylene Chloride	<1	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<2.00	<2.00	<2.0	<0.5
Styrene	<0.28	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5
1,1,2,2-Tetrachloroethane	<0.19	<0.50	<0.50	<0.50	<0.500	<0.50	<0.500	<1.00	<1.00	<1.0	<0.5
Tetrachloroethene	<0.14	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5
Toluene	**0.366 J**	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5
1,2,4-Trichlorobenzene	<0.2	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5
1,1,1-Trichloroethane	<0.19	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5
1,1,2-Trichloroethane	<0.19	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5
Trichloroethene	<0.2	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5
Vinyl Chloride	**2.08**	<1.00 J	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5
Xylenes (total)	**1.22 J**	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<2.00	<2.00	<2.0	<0.5
Semivolatile Organic Compounds (µg/L)											
Acenaphthene	<0.281	<5.10	<5.10	<5.26	<5.10	<5.00	<5.00	<10.0	<10.0	<10.0	<0.5
Acenaphthylene	<0.307	<5.10	<5.10	<5.26	<5.10	<5.00	<5.00	<10.0	<10.0	<10.0	<0.5
Anthracene	<0.333	<5.10	<5.10	<5.26	<5.10	<5.00	<5.00	<10.0	<10.0	<10.0	<0.5
Benzo(a)anthracene	<0.281	<5.10	<5.10	<5.26	<5.10	<5.00	<5.00	<10.0	<10.0	<10.0	<0.5
Benzo (b) Fluoranthene	<0.316	<5.10	<5.10	<5.26	<5.10	<5.00	<5.00	<10.0	<10.0	<10.0	<0.5
Benzo (k) Fluoranthene	<0.325	<5.10	<5.10	<5.26	<5.10	<5.00	<5.00	<10.0	<10.0	<10.0	<0.5
Benzo (a) Pyrene	<0.333	<5.10	<5.10	<5.26	<5.10	<5.00	<5.00	<10.0	<10.0	<10.0	<0.5
Benzo (g,h,i) Perylene	<0.544	<5.10	<5.10	<5.26	<5.10	<5.00	<5.00	<10.0	<10.0	<10.0	<0.5
bis (2-Chloroethoxy) Methane	<1.67	<5.10	<5.10	<5.26	<5.10	<5.00	<5.00	<10.0	<10.0	<10.0	<1
bis (2-Chloroethyl) ether	<1.14	<5.10	<5.10	<5.26	<5.10	<5.00	<5.00	<10.0	<10.0	<10.0	<1
bis (2-Ethylhexyl) phthalate	<6.26	<5.10	<5.10	<5.26	<5.10	<5.00	**6.70**	<6.00	<6.00	<6.0	<5
4-Bromophenyl-phenylether	<1.4	<5.10	<5.10	<5.26	<5.10	<5.00	<5.00	<10.0	<10.0	<10.0	<1
Butlybenzylphthalate	<0.877	<5.10	<5.10	<5.26	<5.10	<5.00	<5.00	<10.0	<10.0	<10.0	<5
Carbazole	<0.789	<5.10	<5.10	<5.26	<5.10	<5.00	<5.00	<10.0	<10.0	NA	<1
4-Chloroaniline	<1.05	<5.10	<5.10	<5.26	<5.10	<5.00	<5.00	<20.0	<20.0	<20.0	<4
4-Chloro-3-methylphenol	<1.23	<5.10	<5.10	<5.26	<5.10	<5.00 J	<5.00	<20.0	<20.0	<20.0	<1
2-Chloronaphthalene	<1.32	<5.10	<5.10	<5.26	<5.10	<5.00	<5.00	<10.0	<10.0	<10.0	<1
2-Chlorophenol	<1.49	<5.10	<5.10	<5.26	<5.10	<5.00 J	<5.00	<10.0	<10.0	<10.0	<1
4-Chlorophenyl-phenyl Ether	<1.4	<5.10	<5.10	<5.26	<5.10	<5.00	<5.00	<10.0	<10.0	<10.0	<1
Chrysene	<0.289	<5.10	<5.10	<5.26	<5.10	<5.00	<5.00	<10.0	<10.0	<10.0	<0.5
Dibenzo (a,h) Anthracene	<0.395	<5.10	<5.10	<5.26	<5.10	<5.00	<5.00	<10.0	<10.0	<10.0	<0.5
Dibenzofuran	<1.14	<5.10	<5.10	<5.26	<5.10	<5.00	<5.00	<10.0	<10.0	<10.0	<1
3,3'-Dichlorobenzidine	<1.32	<10.2	<10.2	<10.5	<10.2	<10.0	<10.0	<20.0	<20.0	<20.0	<5
2,4-Dichlorophenol	<1.93	<5.10	<5.10	<5.26	<5.10	<5.00 J	<5.00	<10.0	<10.0	<10.0	<1
Diethylphthalate	<1.05	<5.10	<5.10	<5.26	<5.10	<5.00	<5.00	<10.0	<10.0	<10.0	<5

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Historical Groundwater Sampling Results Summary
Avtex Fibers Superfund Site
Front Royal, Virginia

Parameter	Upgradient Shallow Bedrock Wells (cont.)										
	MW-7 (cont.)	MW-8									
	7/29/17	3/3/08	9/17/08	3/17/09	10/9/09	5/21/10	6/22/11	6/1/12	6/21/13	7/26/14	7/25/15
SVOCs (cont.)											
2,4-Dimethylphenol	<1.4	<5.10	<5.10	<5.26	<5.10	<5.00 J	<5.00	<10.0	<10.0	<10.0	<1
Dimethylphthalate	<1.05	<5.10	<5.10	<5.26	<5.10	<5.00	<5.00	<10.0	<10.0	<10.0	<5
Di-N-Butylphthalate	<1.14	<5.10	<5.10	<5.26	<5.10	<5.00	<5.00	<10.0	<10.0	<10.0	<5
Di-n-octylphthalate	<0.789	<5.10	<5.10	<5.26	<5.10	<5.00	<5.00	<10.0	<10.0	<10.0	<5
4,6-Dinitro-2-methylphenol	<2.54	<25.5	<25.5	<26.3	<25.5	<25.0	<25.0	<20.0	<20.0	<20.0	<15
2,4-Dinitrophenol	<6.32	<25.5	<25.5	<26.3	<25.5	<25.0	<25.0	<50.0	<50.0	<50.0	<30
2,4-Dinitrotoluene	<1.4	<5.10	<5.10	<5.26	<5.10	<5.00	<5.00	<10.0	<10.0	<10.0	<5
2,6-Dinitrotoluene	<1.32	<5.10	<5.10	<5.26	<5.10	<5.00	<5.00	<10.0	<10.0	<10.0	<1
Fluoranthene	<0.281	<5.10	<5.10	<5.26	<5.10	<5.00	<5.00	<10.0	<10.0	<10.0	<0.5
Fluorene	<0.281	<5.10	<5.10	<5.26	<5.10	<5.00	<5.00	<10.0	<10.0	<10.0	<0.5
Hexachlorobenzene	<1.32	<5.10	<5.10	<5.26	<5.10	<5.00	<5.00	<10.0	<10.0	<10.0	<0.5
Hexachlorobutadiene	<1.32	<5.10	<5.10	<5.26	<5.10	<5.00	<5.00	<10.0	<10.0	<10.0	<1
Hexachlorocyclopentadiene	R	<5.10	<5.10	<5.26	<5.10	<5.00 J	<5.00	<10.0	<10.0	<10.0	<15
Hexachloroethane	<1.93	<5.10	<5.10	<5.26	<5.10	<5.00	<5.00	<10.0	<10.0	<10.0	<5
Indeno (1,2,3-cd) Pyrene	<0.36	<5.10	<5.10	<5.26	<5.10	<5.00	<5.00	<10.0	<10.0	<10.0	<0.5
Isophorone	<1.93	<5.10	<5.10	<5.26	<5.10	<5.00	<5.00	<10.0	<10.0	<10.0	<1
2-Methylnaphthalene	<0.351	<5.10	<5.10	<5.26	<5.10	<5.00	<5.00	<10.0	<10.0	<10.0	<0.5
2-Methylphenol	<1.4	<5.10	<5.10	<5.26	<5.10	<5.00 J	<5.00	<10.0	<10.0	<10.0	<1
3&4-Methylphenol/4-methylphenol	<1.23	<5.10	<5.10	<5.26	<5.10	<5.00 J	<5.00	<10.0	<10.0	<10.0	<1
Naphthalene	<0.325	<5.10	<5.10	<5.26	<5.10	<5.00	<5.00	<10.0	<10.0	<10.0	<0.5
2-Nitroaniline	<0.965	<25.5	<25.5	<26.3	<25.5	<25.0	<25.0	<50.0	<50.0	<50.0	<1
3-Nitroaniline	<1.4	<25.5	<25.5	<26.3	<25.5	<25.0	<25.0	<50.0	<50.0	<50.0	<1
4-Nitroaniline	<1.4	<25.5	<25.5	<26.3	<25.5	<25.0	<25.0	<20.0	<20.0	<20.0	<1
4-Nitrophenol	<1.75	<25.5	<25.5	<26.3	<25.5	<25.0	<25.0	<50.0	<50.0	<50.0	<30
2-Nitrophenol	<2.11	<5.10	<5.10	<5.26	<5.10	<5.00 J	<5.00	<10.0	<10.0	<10.0	<1
Nitrobenzene	<1.93	<5.10	<5.10	<5.26	<5.10	<5.00	<5.00	<10.0	<10.0	<10.0	<1
N-Nitroso-di-n-propylamine	<1.49	<5.10	<5.10	<5.26	<5.10	<5.00	<5.00	<10.0	<10.0	<10.0	<1
N-Nitrosodiphenylamine	<3.16	<5.10	<5.10	<5.26	<5.10	<5.00	<5.00	<10.0	<10.0	<10.0	<1
2,2'-Oxybis (1-chloropropane)	<1.58	<5.10	<5.10	<5.26	<5.10	<5.00	<5.00	<10.0	<10.0	NA	<1
Pentachlorophenol	<2.89	<10.2	<10.2	<10.5	<10.2	<10.0	<10.0	<25.0	<25.0	<25.0	<5
Phenanthrene	<0.368	<5.10	<5.10	<5.26	<5.10	<5.00	<5.00	<10.0	<10.0	<10.0	<0.5
Phenol	<1.32	<5.10	<5.10	<5.26	<5.10	<5.00	<5.00	<10.0	<10.0	<10.0	<1
Pyrene	<0.307	<5.10	<5.10	<5.26	<5.10	<5.00	<5.00	<10.0	<10.0	<10.0	<0.5
2,4,5-Trichlorophenol	<1.14	<5.10	<5.10	<5.26	<5.10	<5.00 J	<5.00	<10.0	<10.0	<10.0	<1
2,4,6-Trichlorophenol	<1.67	<5.10	<5.10	<5.26	<5.10	<5.00 J	<5.00	<10.0	<10.0	<10.0	<1
Filtered Inorganics (mg/L)											
Arsenic	<0.000400	**0.000490 J**	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0040
Antimony	<0.000800	<0.001	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0020
Beryllium	<0.000100	**0.000371 J**	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	**0.00026 K**	<0.0002 J	<0.0010
Cadmium	<0.000100	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.001	<0.001	<0.0001	<0.0010
Chromium	<0.000500	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.001	<0.0040
Copper	<0.00120	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	**0.0009 J**	**0.00092 L**	<0.001	<0.0040
Lead	<0.000100	<0.003	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0020
Mercury	<0.000100	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.00020
Nickel	<0.000500	**0.0107**	**0.00627**	**0.00483**	<0.02	<0.004	<0.004	**0.00065 J**	<0.001	<0.001	**0.0015 J**
Selenium	<0.000300	**0.00160 J**	<0.001	**0.00102**	<0.005	**0.001**	<0.001	<0.001	<0.001	<0.001	<0.0040
Thallium	<0.000800	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.001	<0.001	<0.001	<0.0010
Vanadium	<0.000700	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.005	<0.005	<0.001	<0.0010
Zinc	**0.0475**	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.01	**0.0016 B**	<0.005	<0.0300
Field Parameters											
pH	6.4	6.49	6.55	6.63	6.19	6.57	6.66	6.69	6.36	6.81	6.65
Specific Conductance (mS/cm)	1.5349	1.531	1.577	1.550	1.330	1.211	1.123	1.196	1.234	1.21	1.3
Turbidity (ntu)	1.79	5.2	0.0	4.1	0.0	9.4	9.3	84.5	10.3	6.65	148.00
Dissolved Oxygen (mg/L)	0.29	0.34	0.37	0.15	0.13	0.88	0.34	0.62	0.37	0.14	0.10
Redox Potential (mV)	-59.8	-35.7	-44.1	-40.1	39.6	-20.5	-60.0	5.0	-60.1	-52.68	-32.45
Temperature (^{o}C)	17.92	16.08	16.30	15.96	17.01	15.49	16.08	17.38	17.54	21.08	25.24

Notes:
B - Analyte detected in associated method blank.
J - Estimated result
K - Analytical result may be biased high.
L - Analytical result may be biased low.
< - Not detected, value indicates detection limit.
R - Result flagged as unusable due to low response
EPA guidance, but validator notes that response
stable and calibration curve is within specified li
and thus should be considered useable.
[1] - Blind duplicate sample

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Historical Groundwater Sampling Results Summary
Avtex Fibers Superfund Site
Front Royal, Virginia

Parameter	Upgradient Shallow Bedrock Wells (cont.)										
	MW-8 (cont.)				118						
	7/30/16	7/30/16[1]	7/29/17	7/29/17[1]	3/4/08	9/18/08	3/20/09	10/9/09	5/19/10	6/22/11	5/30/12
Volatile Organic Compounds (µg/L)											
Acetone	<2.66	<2.66	<2.66	R	<10.0 R	<10.0	<10.0	<10.0	<10.0 J	<10.0 R	<25.0
Benzene	<0.2	<0.2	<0.2	<0.2	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
Bromodichloromethane	<0.17	<0.17	<0.17	<0.17	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
Bromoform	<0.29	<0.29	<0.29	<0.29	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
Bromomethane	<0.35	<0.35	<0.35	<0.35	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<2.00
2-Butanone	<2.64	<2.64	<2.64	<2.64	<10.0 R	<10.0	<10.0	<10.0	<10.0 J	<10.0	<5.00
Carbon Disulfide	<0.22	<0.22	<0.22	<0.22	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<2.00
Carbon Tetrachloride	<0.18	<0.18	<0.18	<0.18	<1.00 J	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
Chlorobenzene	<0.18	<0.18	<0.18	<0.18	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
Chlorodibromomethane	<0.25	<0.25	<0.25	<0.25	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
Chloroethane	<0.36	<0.36	<0.36	<0.36	<1.00 J	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
Chloroform	<0.23	<0.23	<0.23	<0.23	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
Chloromethane	<0.36	<0.36	<0.36	<0.36	<1.00 J	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
1,2-Dichlorobenzene	<0.19	<0.19	<0.19	<0.19	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
1,3-Dichlorobenzene	<0.18	<0.18	<0.18	<0.18	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
1,4-Dichlorobenzene	<0.17	<0.17	<0.17	<0.17	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
1,1-Dichloroethane	<0.24	<0.24	<0.24	<0.24	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
1,2-Dichloroethane	<0.2	<0.2	<0.2	<0.2	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
1,1-Dichloroethene	<0.25	<0.25	<0.25	<0.25	<1.00 J	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
cis-1,2-Dichloroethene	<0.21	<0.21	<0.21	<0.21	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
trans-1,2-Dichloroethene	<0.23	<0.23	<0.23	<0.23	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
1,2-Dichloropropane	<0.25	<0.25	<0.25	<0.25	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
cis-1,3-Dichloropropene	<0.17	<0.17	<0.17	<0.17	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
trans-1,3-Dichloropropene	<0.17	<0.17	<0.17	<0.17	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
Ethylbenzene	<0.19	<0.19	<0.19	<0.19	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
2-Hexanone	<1.28	<1.28	<1.28	<1.28	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<5.00
4-Methyl-2-Pentanone	<0.81	<0.81	<0.81	<0.81	<10.00 R	<10.0	<10.0	<10.0	<10.0	<10.0	<5.00
Methylene Chloride	<1	<1	<1	<1	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<2.00
Styrene	<0.28	<0.28	<0.28	<0.28	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
1,1,2,2-Tetrachloroethane	<0.19	<0.19	<0.19	<0.19	<0.50	<0.50	<0.50	<0.50	<0.50	<0.500	<1.00
Tetrachloroethene	<0.14	<0.14	<0.14	<0.14	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
Toluene	<0.17	<0.17	<0.17	**0.202 J**	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
1,2,4-Trichlorobenzene	<0.2	<0.2	<0.2	<0.2	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
1,1,1-Trichloroethane	<0.19	<0.19	<0.19	<0.19	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
1,1,2-Trichloroethane	<0.19	<0.19	<0.19	<0.19	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
Trichloroethene	<0.2	<0.2	<0.2	<0.2	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
Vinyl Chloride	<0.18	<0.18	<0.18	<0.18	<1.00 J	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
Xylenes (total)	<0.58	<0.58	**0.835 J**	**0.765 J**	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<2.00
Semivolatile Organic Compounds (µg/L)											
Acenaphthene	<0.32	<0.308	<0.286	<0.296	<5.21	<5.21	<5.00	<5.00	<5.32	<5.10	<10.0
Acenaphthylene	<0.35	<0.337	<0.313	<0.324	<5.21	<5.21	<5.00	<5.00	<5.32	<5.10	<10.0
Anthracene	<0.38	<0.365	<0.339	<0.352	<5.21	<5.21	<5.00	<5.00	<5.32	<5.10	<10.0
Benzo(a)anthracene	<0.32	<0.308	<0.286	<0.296	<5.21	<5.21	<5.00	<5.00	<5.32	<5.10	<10.0
Benzo (b) Fluoranthene	<0.36	<0.346	<0.321	<0.333	<5.21	<5.21	<5.00	<5.00	<5.32	<5.10	<10.0
Benzo (k) Fluoranthene	<0.37	<0.356	<0.33	<0.343	<5.21	<5.21	<5.00	<5.00	<5.32	<5.10	<10.0
Benzo (a) Pyrene	<0.38	<0.365	<0.339	<0.352	<5.21	<5.21	<5.00	<5.00	<5.32	<5.10	<10.0
Benzo (g,h,i) Perylene	<0.62	<0.596	<0.554	<0.574	<5.21	<5.21	<5.00	<5.00	<5.32	<5.10	<10.0
bis (2-Chloroethoxy) Methane	<3.1	<2.98	<1.7	<1.76	<5.21	<5.21	<5.00	<5.00	<5.32	<5.10	<10.0
bis (2-Chloroethyl) ether	<2.8	<2.69	<1.16	<1.2	<5.21	<5.21	<5.00	<5.00	<5.32	<5.10	<10.0
bis (2-Ethylhexyl) phthalate	<6	<5.77	<1.76	<1.78	<5.21	<5.21	<5.00	<5.00	<5.32	<5.10	<6.00
4-Bromophenyl-phenylether	<2.7	<2.6	<1.43	<1.48	<5.21	<5.21	<5.00	<5.00	<5.32	<5.10	<10.0
Butlybenzylphthalate	<2.5	<2.4	<0.893	<0.926	<5.21	<5.21	<5.00	<5.00	<5.32	<5.10	<10.0
Carbazole	<2.8	<2.69	<0.804	<0.833	<5.21	<5.21	<5.00	<5.00	<5.32	<5.10	<10.0
4-Chloroaniline	<4.2	<4.04	<1.07	<1.11	<5.21	<5.21	<5.00	<5.00	<5.32 J	<5.10	<20.0
4-Chloro-3-methylphenol	<4.5	<4.33	<1.25	<1.3	<5.21	<5.21	<5.00	<5.00	<5.32	<5.10	<20.0
2-Chloronaphthalene	<2.8	<2.69	<1.34	<1.39	<5.21	<5.21	<5.00	<5.00	<5.32	<5.10	<10.0
2-Chlorophenol	<4.8	<4.62	<1.52	<1.57	<5.21	<5.21	<5.00	<5.00	<5.32	<5.10	<10.0
4-Chlorophenyl-phenyl Ether	<2.8	<2.69	<1.43	<1.48	<5.21	<5.21	<5.00	<5.00	<5.32	<5.10	<10.0
Chrysene	<0.33	<0.317	<0.295	<0.306	<5.21	<5.21	<5.00	<5.00	<5.32	<5.10	<10.0
Dibenzo (a,h) Anthracene	<0.45	<0.433	<0.402	<0.417	<5.21	<5.21	<5.00	<5.00	<5.32	<5.10	<10.0
Dibenzofuran	<2.9	<2.79	<1.16	<1.2	<5.21	<5.21	<5.00	<5.00	<5.32	<5.10	<10.0
3,3'-Dichlorobenzidine	<3.3	<3.17	<1.34	<1.39	<10.4	<10.4	<10.0	<10.0	<10.6	<10.2	<20.0
2,4-Dichlorophenol	<5.6	<5.38	<1.96	<2.04	<5.21	<5.21	<5.00	<5.00	<5.32	<5.10	<10.0
Diethylphthalate	<3	<2.88	<1.07	<1.11	<5.21	<5.21	<5.00	<5.00	<5.32	<5.10	<10.0

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Historical Groundwater Sampling Results Summary
Avtex Fibers Superfund Site
Front Royal, Virginia

Parameter	Upgradient Shallow Bedrock Wells (cont.)										
	MW-8 (cont.)				118						
	7/30/16	7/30/16[1]	7/29/17	7/29/17[1]	3/4/08	9/18/08	3/20/09	10/9/09	5/19/10	6/22/11	5/30/12
SVOCs (cont.)											
2,4-Dimethylphenol	<4.2	<4.04	<1.43	<1.48	<5.21	<5.21	<5.00	<5.00	<5.32	<5.10	<10.0
Dimethylphthalate	<3.1	<2.98	<1.07	<1.11	<5.21	<5.21	<5.00	<5.00	<5.32	<5.10	<10.0
Di-N-Butylphthalate	<2.5	<2.4	<1.16	<1.2	<5.21	<5.21	<5.00	<5.00	<5.32	<5.10	<10.0
Di-n-octylphthalate	<2.5	<2.4	<0.804	<0.833	<5.21	<5.21	<5.00	<5.00	<5.32	<5.10	<10.0
4,6-Dinitro-2-methylphenol	<9.3	<8.94	<2.59	<2.69	<26.0	<26.0	<25.0	<25.0	<26.6	<25.5	<20.0
2,4-Dinitrophenol	<5.9	<5.67	<6.43	<6.67	<26.0	<26.0	<25.0	<25.0	<26.6	<25.5	<50.0
2,4-Dinitrotoluene	<3.2	<3.08	<1.43	<1.48	<5.21	<5.21	<5.00	<5.00	<5.32	<5.10	<10.0
2,6-Dinitrotoluene	<2.3	<2.21	<1.34	<1.39	<5.21	<5.21	<5.00	<5.00	<5.32	<5.10	<10.0
Fluoranthene	<0.32	<0.308	<0.286	<0.296	<5.21	<5.21	<5.00	<5.00	<5.32	<5.10	<10.0
Fluorene	<0.32	<0.308	<0.286	<0.296	<5.21	<5.21	<5.00	<5.00	<5.32	<5.10	<10.0
Hexachlorobenzene	<2.8	<2.69	<1.34	<1.39	<5.21	<5.21	<5.00	<5.00	<5.32	<5.10	<10.0
Hexachlorobutadiene	<2	<1.92	<1.34	<1.39	<5.21	<5.21	<5.00	<5.00	<5.32	<5.10	<10.0
Hexachlorocyclopentadiene	<1.8	<1.73	R	R	<5.21	<5.21	<5.00	<5.00	<5.32	<5.10	<10.0
Hexachloroethane	<1.9	<1.83	<1.96	<2.04	<5.21	<5.21	<5.00	<5.00	<5.32	<5.10	<10.0
Indeno (1,2,3-cd) Pyrene	<0.41	<0.394	<0.366	<0.38	<5.21	<5.21	<5.00	<5.00	<5.32	<5.10	<10.0
Isophorone	<3.1	<2.98	<1.96	<2.04	<5.21	<5.21	<5.00	<5.00	<5.32	<5.10	<10.0
2-Methylnaphthalene	<0.4	<0.385	<0.357	<0.37	<5.21	<5.21	<5.00	<5.00	<5.32	<5.10	<10.0
2-Methylphenol	<2.3	<2.21	<1.43	<1.48	<5.21	<5.21	<5.00	<5.00	<5.32	<5.10	<10.0
3&4-Methylphenol/4-methylphenol	<2.2	<2.12	<1.25	<1.3	<5.21	<5.21	<5.00	<5.00	<5.32	<5.10	<10.0
Naphthalene	<0.37	<0.356	<0.33	<0.343	<5.21	<5.21	<5.00	<5.00	<5.32	<5.10	<10.0
2-Nitroaniline	<3.7	<3.56	<0.982	<1.02	<26.0	<26.0	<25.0	<25.0	<26.6	<25.5	<50.0
3-Nitroaniline	<2.7	<2.6	<1.43	<1.48	<26.0	<26.0	<25.0	<25.0	<26.6	<25.5	<50.0
4-Nitroaniline	<3.1	<2.98	<1.43	<1.48	<26.0	<26.0	<25.0	<25.0	<26.6	<25.5	<20.0
4-Nitrophenol	<5.4	<5.19	<1.79	<1.85	<26.0	<26.0	<25.0	<25.0	<26.6	<25.5	<50.0
2-Nitrophenol	<5.3	<5.1	<2.14	<2.22	<5.21	<5.21	<5.00	<5.00	<5.32	<5.10	<10.0
Nitrobenzene	<2.7	<2.6	<1.96	<2.04	<5.21	<5.21	<5.00	<5.00	<5.32	<5.10	<10.0
N-Nitroso-di-n-propylamine	<3.4	<3.27	<1.52	<1.57	<5.21	<5.21	<5.00	<5.00	<5.32	<5.10	<10.0
N-Nitrosodiphenylamine	<3.6	<3.46	<3.21	<3.33	<5.21	<5.21	<5.00	<5.00	<5.32	<5.10	<10.0
2,2'-Oxybis (1-chloropropane)	<2.8	<2.69	<1.61	<1.67	<5.21	<5.21	<5.00	<5.00	<5.32	<5.10	<10.0
Pentachlorophenol	<1.7	<1.63	<2.95	<3.06	<10.4	<10.4	<10.0	<10.0	<10.6	<10.2	<25.0
Phenanthrene	<0.42	<0.404	<0.375	<0.389	<5.21	<5.21	<5.00	<5.00	<5.32	<5.10	<10.0
Phenol	<1.5	<1.44	<1.34	<1.39	<5.21	<5.21	<5.00	<5.00	<5.32	<5.10	<10.0
Pyrene	<0.35	<0.337	<0.313	<0.324	<5.21	<5.21	<5.00	<5.00	<5.32	<5.10	<10.0
2,4,5-Trichlorophenol	<7.1	<6.83	<1.16	<1.2	<5.21	<5.21	<5.00	<5.00	<5.32	<5.10	<10.0
2,4,6-Trichlorophenol	<6.8	<6.54	<1.7	<1.76	<5.21	<5.21	<5.00	<5.00	<5.32	<5.10	<10.0
Filtered Inorganics (mg/L)											
Arsenic	**0.00118 J**	**0.00119 J**	<0.000400	<0.000400	**0.000631 J**	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001
Antimony	<0.00134	<0.0005	<0.000800	<0.000800	<0.001	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001
Beryllium	<0.001	<0.001	<0.000100	<0.000100	**0.000297 J**	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001 L
Cadmium	<0.0004	<0.0004	<0.000100	<0.000100	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.001
Chromium	<0.0005	<0.0005	<0.000500	<0.000500	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Copper	<0.001	<0.001	<0.00120	<0.00120	<0.01	<0.01	<0.01	<0.01	**0.0124**	<0.01	**0.001 J**
Lead	<0.0002	<0.0002	<0.000100	<0.000100	<0.003	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001
Mercury	<0.0001	<0.0001	<0.000100	<0.000100	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Nickel	<0.000553	<0.0005	<0.000500	<0.000500	**0.00589 J**	**0.00414**	<0.004	<0.02	<0.004	<0.004	**0.0026**
Selenium	<0.0006	<0.0006	<0.000300	<0.000300	**0.00150 J**	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001
Thallium	<0.000819	<0.0005	<0.000800	<0.000800	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.001
Vanadium	<0.00174	<0.00146	<0.000700	<0.000700	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.005
Zinc	<0.0614	**0.0637**	**0.0304**	**0.0383**	<0.02	<0.02	<0.02	<0.02	**0.0267**	<0.02	**0.0016 J**
Field Parameters											
pH	6.76	6.76	6.55	6.55	6.60	6.54	6.54	6.46	6.67	6.55	6.72
Specific Conductance (mS/cm)	1.3648	1.3648	1.2704	1.2704	0.892	0.863	0.844	0.889	0.901	0.878	1.313
Turbidity (ntu)	45.51	45.51	82.2	82.2	2.7	1.9	3.9	3.3	17.3	9.3	9.8
Dissolved Oxygen (mg/L)	0.26	0.26	0.45	0.45	0.26	0.28	0.03	0.03	0.13	0.05	1.13
Redox Potential (mV)	-29.8	-29.8	-57.5	-57.5	-28.9	-10.2	-17.8	-46.8	-53.4	-28.4	-29.7
Temperature (^{o}C)	23.09	23.09	18.4	18.4	13.64	13.95	13.63	12.78	14.85	13.90	16.80

Notes:
B - Analyte detected in associated method blank.
J - Estimated result
K - Analytical result may be biased high.
L - Analytical result may be biased low.
< - Not detected, value indicates detection limit.
R - Result flagged as unusable due to low response
EPA guidance, but validator notes that response
stable and calibration curve is within specified li
and thus should be considered useable.
[1] - Blind duplicate sample

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Historical Groundwater Sampling Results Summary
Avtex Fibers Superfund Site
Front Royal, Virginia

Parameter	Upgradient Shallow Bedrock Wells (cont.)										
	118 (cont.)					128					
	6/20/13	7/24/14	7/23/15	7/19/16	7/26/17	3/10/08	9/18/08	3/18/09	10/8/09	5/19/10	6/16/11
Volatile Organic Compounds (µg/L)											
Acetone	<25.0	<25.0	<5.0	<2.66	<6.86	<10.0 R	<10.0 R	<10.0 R	<10.0 R	<10.0 J	<10.0 R
Benzene	<1.00	<5.0	<0.5	<0.2	<0.2	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
Bromodichloromethane	<1.00	<5.0	<0.5	<0.17	<0.17	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
Bromoform	<1.00	<5.0	<0.5	<0.29	<0.29	<1.00	<1.00 J	<1.00	<1.00	<1.00	<1.00
Bromomethane	<2.00	<10.0	<0.5	<0.35	<0.35	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
2-Butanone	<5.00	<10.0	<5.0	<2.64	<2.64	<10.0 J	<10.0 R	<10.0	<10.0	<10.0 J	<10.0 R
Carbon Disulfide	<2.00	<10.0	<1.0	<0.22	<0.22	<1.00	<1.00 L	<1.00	<1.00	<1.00	<1.00
Carbon Tetrachloride	<1.00	<5.0	<0.5	<0.18	<0.18	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
Chlorobenzene	<1.00	<5.0	<0.5	<0.18	<0.18	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
Chlorodibromomethane	<1.00	<5.0	<0.5	<0.25	<0.25	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
Chloroethane	<1.00	<10.0	<0.5	<0.36	<0.36	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
Chloroform	<1.00	<5.0	<0.5	<0.23	<0.23	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
Chloromethane	<1.00	<5.0	<0.5 J	<0.36	<0.36	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
1,2-Dichlorobenzene	<1.00	<5.0	<0.5	<0.19	<0.19	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
1,3-Dichlorobenzene	<1.00	<5.0	<0.5	<0.18	<0.18	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
1,4-Dichlorobenzene	<1.00	<5.0	<0.5	<0.17	<0.17	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
1,1-Dichloroethane	<1.00	<5.0	<0.5	<0.24	<0.24	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
1,2-Dichloroethane	<1.00	<5.0	<0.5	<0.2	<0.2	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
1,1-Dichloroethene	<1.00	<5.0	<0.5	<0.25	<0.25	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
cis-1,2-Dichloroethene	<1.00	<5.0	<0.5	<0.21	<0.21	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
trans-1,2-Dichloroethene	<1.00	<5.0	<0.5	<0.23	<0.23	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
1,2-Dichloropropane	<1.00	<5.0	<0.5	<0.25	<0.25	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
cis-1,3-Dichloropropene	<1.00	<5.0	<0.5	<0.17	<0.17	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
trans-1,3-Dichloropropene	<1.00	<5.0	<0.5	<0.17	<0.17	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
Ethylbenzene	<1.00	<5.0	<0.5	<0.19	<0.19	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
2-Hexanone	<5.00	<10.0	<5.0	<1.28	<1.28	<10.0	<10.0 R	<10.0	<10.0	<10.0	<10.0
4-Methyl-2-Pentanone	<5.00	<10.0	<5.0 J	<0.81	<0.81	<10.0 R	<10.0 R	<10.0 R	<10.0	<10.0	<10.0
Methylene Chloride	<2.00	<5.0	<0.5	<1	<1	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
Styrene	<1.00	<5.0	<0.5	<0.28	<0.28	<1.00	<1.00 L	<1.00	<1.00	<1.00	<1.00
1,1,2,2-Tetrachloroethane	<1.00	<5.0	<0.5	<0.19	<0.19	<0.50	<0.50	<0.50	<0.50	<0.50	<0.500
Tetrachloroethene	<1.00	<5.0	<0.5	<0.14	<0.14	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
Toluene	<1.00	<5.0	<0.5	<0.17	<0.17	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
1,2,4-Trichlorobenzene	<1.00	<5.0	<0.5	<0.2	<0.2	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
1,1,1-Trichloroethane	<1.00	<5.0	<0.5	<0.19	<0.19	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
1,1,2-Trichloroethane	<1.00	<5.0	<0.5	<0.19	<0.19	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
Trichloroethene	<1.00	<5.0	<0.5	<0.2	<0.2	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
Vinyl Chloride	<1.00	<5.0	<0.5	<0.18	<0.18	<1.00	<1.00 L	<1.00	<1.00	<1.00	<1.00
Xylenes (total)	<2.00	<10.0	<0.5	<0.58	<0.58	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
Semivolatile Organic Compounds (µg/L)											
Acenaphthene	<10.0	<10.0	<0.5	<0.314	<0.308	<5.62	<5.10	<5.10	<5.00	<5.38	<5.43
Acenaphthylene	<10.0	<10.0	<0.5	<0.343	<0.337	<5.62	<5.10	<5.10	<5.00	<5.38	<5.43
Anthracene	<10.0	<10.0	<0.5	<0.373	<0.365	<5.62	<5.10	<5.10	<5.00	<5.38	<5.43
Benzo(a)anthracene	<10.0	<10.0	<0.5	<0.314	<0.308	<5.62	<5.10	<5.10	<5.00	<5.38	<5.43
Benzo (b) Fluoranthene	<10.0	<10.0	<0.5	<0.353	<0.346	<5.62	<5.10	<5.10	<5.00	<5.38	<5.43
Benzo (k) Fluoranthene	<10.0	<10.0	<0.5	<0.363	<0.356	<5.62	<5.10	<5.10	<5.00	<5.38	<5.43
Benzo (a) Pyrene	<10.0	<10.0	<0.5	<0.373	<0.365	<5.62	<5.10	<5.10	<5.00	<5.38	<5.43
Benzo (g,h,i) Perylene	<10.0	<10.0	<0.5	<0.608	<0.596	<5.62	<5.10	<5.10	<5.00	<5.38	<5.43
bis (2-Chloroethoxy) Methane	<10.0	<10.0	<1	<3.04	<1.83	<5.62	<5.10	<5.10	<5.00	<5.38	<5.43
bis (2-Chloroethyl) ether	<10.0	<10.0	<1	<2.75	<1.25	<5.62	<5.10	<5.10	<5.00	<5.38	<5.43
bis (2-Ethylhexyl) phthalate	<6.00	<6.0	<5	<5.88	<1.44	<5.62	<5.10	<5.10	<5.00	**11.0**	<5.43
4-Bromophenyl-phenylether	<10.0	<10.0	<1	<2.65	<1.54	<5.62	<5.10	<5.10	<5.00	<5.38	<5.43
Butlybenzylphthalate	<10.0	<10.0	<5	<2.45	<0.962	<5.62	<5.10	<5.10	<5.00	<5.38	<5.43
Carbazole	<10.0	<10.0	<1	<2.75	<0.865	<5.62	<5.10	<5.10	<5.00	<5.38	<5.43
4-Chloroaniline	<20.0	<20.0	<4	<4.12	<1.15	<5.62	<5.10	<5.10	<5.00	<5.38 J	<5.43
4-Chloro-3-methylphenol	<20.0	<20.0	<1	<4.41	<1.35	<5.62	<5.10	<5.10	<5.00	<5.38	<5.43
2-Chloronaphthalene	<10.0	<10.0	<1	<2.75	<1.44	<5.62	<5.10	<5.10	<5.00	<5.38	<5.43
2-Chlorophenol	<10.0	<10.0	<1	<4.71	<1.63	<5.62	<5.10	<5.10	<5.00	<5.38	<5.43
4-Chlorophenyl-phenyl Ether	<10.0	<10.0	<1	<2.75	<1.54	<5.62	<5.10	<5.10	<5.00	<5.38	<5.43
Chrysene	<10.0	<10.0	<0.5	<0.324	<0.317	<5.62	<5.10	<5.10	<5.00	<5.38	<5.43
Dibenzo (a,h) Anthracene	<10.0	<10.0	<0.5	<0.441	<0.433	<5.62	<5.10	<5.10	<5.00	<5.38	<5.43
Dibenzofuran	<10.0	<10.0	<1	<2.84	<1.25	<5.62	<5.10	<5.10	<5.00	<5.38	<5.43
3,3'-Dichlorobenzidine	<20.0	<20.0	<5	<3.24	<1.44	<11.2	<10.2	<10.2	<10.0	<10.8	<10.9
2,4-Dichlorophenol	<10.0	<10.0	<1	<5.49	<2.12	<5.62	<5.10	<5.10	<5.00	<5.38	<5.43
Diethylphthalate	<10.0	<10.0	<5	<2.94	<1.15	<5.62	<5.10	<5.10	<5.00	<5.38	<5.43

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Historical Groundwater Sampling Results Summary
Avtex Fibers Superfund Site
Front Royal, Virginia

Parameter	Upgradient Shallow Bedrock Wells (cont.)										
	118 (cont.)					128					
	6/20/13	7/24/14	7/23/15	7/19/16	7/26/17	3/10/08	9/18/08	3/18/09	10/8/09	5/19/10	6/16/11
SVOCs (cont.)											
2,4-Dimethylphenol	<10.0	<10.0	<1	<4.12	<1.54	<5.62	<5.10	<5.10	<5.00	<5.38	<5.43
Dimethylphthalate	<10.0	<10.0	<5	<3.04	<1.15	<5.62	<5.10	<5.10	<5.00	<5.38	<5.43
Di-N-Butylphthalate	<10.0	<10.0	<5	<2.45	<1.25	<5.62	<5.10	<5.10	<5.00	<5.38	<5.43
Di-n-octylphthalate	<10.0	<10.0	<5	<2.45	<0.865	<5.62	<5.10	<5.10	<5.00	<5.38	<5.43
4,6-Dinitro-2-methylphenol	<20.0	<20.0	<16	<9.12	<2.79	<28.1	<25.5	<25.5	<25.0	<26.9	<27.2
2,4-Dinitrophenol	<50.0	<50.0	<31	<5.78 J	<6.92	<28.1	<25.5	<25.5	<25.0	<26.9 J	<27.2
2,4-Dinitrotoluene	<10.0	<10.0	<5	<3.14	<1.54	<5.62	<5.10	<5.10	<5.00	<5.38	<5.43
2,6-Dinitrotoluene	<10.0	<10.0	<1	<2.25	<1.44	<5.62	<5.10	<5.10	<5.00	<5.38	<5.43
Fluoranthene	<10.0	<10.0	<0.5	<0.314	<0.308	<5.62	<5.10	<5.10	<5.00	<5.38	<5.43
Fluorene	<10.0	<10.0	<0.5	<0.314	<0.308	<5.62	<5.10	<5.10	<5.00	<5.38	<5.43
Hexachlorobenzene	<10.0	<10.0	<0.5	<2.75	<1.44	<5.62	<5.10	<5.10	<5.00	<5.38	<5.43
Hexachlorobutadiene	<10.0	<10.0	<1	<1.96	<1.44	<5.62	<5.10	<5.10	<5.00	<5.38	<5.43
Hexachlorocyclopentadiene	<10.0	<10.0	<16	<1.76	<1.25	<5.62	<5.10	<5.10	<5.00	<5.38 J	<5.43
Hexachloroethane	<10.0	<10.0	<5	<1.86	<2.12	<5.62	<5.10	<5.10	<5.00	<5.38	<5.43
Indeno (1,2,3-cd) Pyrene	<10.0	<10.0	<0.5	<0.402	<0.394	<5.62	<5.10	<5.10	<5.00	<5.38	<5.43
Isophorone	<10.0	<10.0	<1	<3.04	<2.12	<5.62	<5.10	<5.10	<5.00	<5.38	<5.43
2-Methylnaphthalene	<10.0	<10.0	<0.5	<0.392	<0.385	<5.62	<5.10	<5.10	<5.00	<5.38	<5.43
2-Methylphenol	<10.0	<10.0	<1	<2.25	<1.54	<5.62	<5.10	<5.10	<5.00	<5.38	<5.43
3&4-Methylphenol/4-methylphenol	<10.0	<10.0	<1	<2.16	<1.35	<5.62	<5.10	<5.10	<5.00	<5.38	<5.43
Naphthalene	<10.0	<10.0	**0.3 J**	<0.363	<0.356	<5.62	<5.10	<5.10	<5.00	<5.38	<5.43
2-Nitroaniline	<50.0	<50.0	<1	<3.63	<1.06	<28.1	<25.5	<25.5	<25.0	<26.9	<27.2
3-Nitroaniline	<50.0	<50.0	<1	<2.65	<1.54	<28.1	<25.5	<25.5	<25.0	<26.9	<27.2
4-Nitroaniline	<20.0	<20.0	<1	<3.04	<1.54	<28.1	<25.5	<25.5	<25.0	<26.9	<27.2
4-Nitrophenol	<50.0	<50.0	<31	<5.29	<1.92	<28.1	<25.5	<25.5	<25.0	<26.9	<27.2
2-Nitrophenol	<10.0	<10.0	<1	<5.2	<2.31	<5.62	<5.10	<5.10	<5.00	<5.38	<5.43
Nitrobenzene	<10.0	<10.0	<1	<2.65	<2.12	<5.62	<5.10	<5.10	<5.00	<5.38	<5.43
N-Nitroso-di-n-propylamine	<10.0	<10.0	<1	<3.33	<1.63	<5.62	<5.10	<5.10	<5.00	<5.38	<5.43
N-Nitrosodiphenylamine	<10.0	<10.0	<1	<3.53 J	<3.46	<5.62	<5.10	<5.10	<5.00	<5.38	<5.43
2,2'-Oxybis (1-chloropropane)	<10.0	<10.0	<1	<2.75	<1.73	<5.62	<5.10	<5.10	<5.00	<5.38	<5.43
Pentachlorophenol	<25.0	<25.0	<5	<1.67	<3.17	<11.2	<10.2	<10.2	<10.0	<10.8	<10.9
Phenanthrene	<10.0	<10.0	<0.5	<0.412	<0.404	<5.62	<5.10	<5.10	<5.00	<5.38	<5.43
Phenol	<10.0	<10.0	<1	<1.47	<1.44	<5.62	<5.10	<5.10	<5.00	<5.38	<5.43
Pyrene	<10.0	<10.0	<0.5	<0.343	<0.337	<5.62	<5.10	<5.10	<5.00	<5.38	<5.43
2,4,5-Trichlorophenol	<10.0	<10.0	<1	<6.96	<1.25	<5.62	<5.10	<5.10	<5.00	<5.38	<5.43
2,4,6-Trichlorophenol	<10.0	<10.0	<1	<6.67	<1.83	<5.62	<5.10	<5.10	<5.00	<5.38	<5.43
Filtered Inorganics (mg/L)											
Arsenic	<0.001	<0.001	<0.0040	**0.000729 J**	<0.000400	**0.000688 J**	<0.001	<0.002	<0.005	<0.001	<0.005
Antimony	<0.001	<0.001	<0.0020 J	<0.000695	<0.000800	<0.001	<0.001	<0.001	<0.005	<0.001	<0.005
Beryllium	**0.00018 K**	<0.0001	<0.0010	<0.001	<0.000100	<0.005	<0.002	<0.002	<0.002	<0.002	<0.002
Cadmium	<0.001	<0.0001	<0.0010	<0.0004	<0.000100	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Chromium	<0.005	<0.001	<0.0040	**0.000536 J**	<0.000500	**0.0046 J**	<0.005	<0.005	<0.005	<0.005	<0.005
Copper	**0.001 L**	<0.001	<0.0040	<0.001	<0.00120	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Lead	<0.001	<0.001	<0.0020	<0.0002	<0.000100	<0.003	<0.001	<0.001	<0.005	<0.001	<0.005
Mercury	<0.0002	<0.0002	<0.00020	<0.0001	<0.000100	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Nickel	<0.001	<0.001	<0.0040	**0.000744 J**	**0.00314**	**0.0036 J**	<0.004	<0.004	<0.02	<0.004	<0.02
Selenium	<0.001	<0.001	<0.0040	<0.0006	<0.000300	**0.00151 J**	**0.00172**	**0.00114**	<0.005	<0.001	<0.005
Thallium	<0.001	<0.001	<0.0010	<0.0005	<0.000800	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.001
Vanadium	<0.005	<0.001	<0.0010	<0.0007	<0.000700	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Zinc	**0.0214**	<0.005	<0.0300	<0.01	**0.0416**	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Field Parameters											
pH	6.59	6.78	6.83	6.8	6.69	6.63	6.48	6.58	6.49	6.80	6.68
Specific Conductance (mS/cm)	1.138	1.06	1.1	1.252	1.1214	1.204	1.168	1.149	1.147	1.181	1.162
Turbidity (ntu)	44.6	17.80	14.40	36.8	18.8	6.5	7.6	8.1	0.0	7.7	7.6
Dissolved Oxygen (mg/L)	0.27	0.01	0.08	0	0.13	0.43	0.30	0.06	0.07	0.18	0.07
Redox Potential (mV)	-75.2	-62.81	-40.40	-170.2	-27.1	-55.2	-47.0	-30.0	-51.9	-72.3	-64.3
Temperature (^{o}C)	15.93	20.40	18.35	17.15	16.12	13.94	14.71	14.09	13.65	13.40	14.09

Notes:
B - Analyte detected in associated method blank.
J - Estimated result
K - Analytical result may be biased high.
L - Analytical result may be biased low.
< - Not detected, value indicates detection limit.
R - Result flagged as unusable due to low response
EPA guidance, but validator notes that response
stable and calibration curve is within specified li
and thus should be considered useable.
[1] - Blind duplicate sample

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Historical Groundwater Sampling Results Summary
Avtex Fibers Superfund Site
Front Royal, Virginia

Parameter	Upgradient Shallow Bedrock Wells (cont.)										
	128 (cont.)							130			
	6/7/12	6/25/13	7/8/14	12/10/14	7/14/15	7/29/16	7/25/17	3/10/08	3/10/08[1]	9/18/08	9/18/08[1]
Volatile Organic Compounds (µg/L)											
Acetone	<25.0	<25.0	<25.0	<25.0	<5.0	<2.66	<2.94	<10.0 R	<10.0 R	<10.0 R	<10.0 R
Benzene	<1.00	<1.00	<5.0	NA	<0.5	<0.2	<0.2	<1.00	<1.00	<1.00	<1.00
Bromodichloromethane	<1.00	<1.00	<5.0	NA	<0.5	<0.17	<0.17	<1.00	<1.00	<1.00	<1.00
Bromoform	<1.00	<1.00	<5.0	NA	<0.5	<0.29	<0.29	<1.00	<1.00	<1.00	<1.00
Bromomethane	<2.00	<2.00	<10.0	NA	<0.5	<0.35	<0.35	<1.00	<1.00	<1.00 J	<1.00 J
2-Butanone	<5.00	<5.00	<10.0	NA	<5.0	<2.64	<2.64	<10.0	<10.0	<10.0	<10.0
Carbon Disulfide	<2.00	<2.00	<10.0	<2.0	<1.0	<0.22	<0.22	<1.00	<1.00	<1.00	<1.00
Carbon Tetrachloride	<1.00	<1.00	<5.0	NA	<0.5	<0.18	<0.18	<1.00	<1.00	<1.00	<1.00
Chlorobenzene	<1.00	<1.00	<5.0	NA	<0.5	<0.18	<0.18	<1.00	<1.00	<1.00	<1.00
Chlorodibromomethane	<1.00	<1.00	<5.0	NA	<0.5	<0.25	<0.25	<1.00	<1.00	<1.00	<1.00
Chloroethane	<1.00	<1.00	<10.0	NA	<0.5	<0.36	<0.36	<1.00	<1.00	<1.00	<1.00
Chloroform	<1.00	<1.00	<5.0	NA	<0.5	<0.23	<0.23	<1.00	<1.00	<1.00	<1.00
Chloromethane	<1.00	<1.00	<5.0	NA	<0.5	<0.36	<0.36	<1.00	<1.00	<1.00	<1.00
1,2-Dichlorobenzene	<1.00	<1.00	<5.0	NA	<0.5	<0.19	<0.19	<1.00	<1.00	<1.00	<1.00
1,3-Dichlorobenzene	<1.00	<1.00	<5.0	NA	<0.5	<0.18	<0.18	<1.00	<1.00	<1.00	<1.00
1,4-Dichlorobenzene	<1.00	<1.00	<5.0	NA	<0.5	<0.17	<0.17	<1.00	<1.00	<1.00	<1.00
1,1-Dichloroethane	<1.00	<1.00	<5.0	NA	<0.5	<0.24	<0.24	<1.00	<1.00	<1.00	<1.00
1,2-Dichloroethane	<1.00	<1.00	<5.0	NA	<0.5	<0.2	<0.2	<1.00	<1.00	<1.00	<1.00
1,1-Dichloroethene	<1.00	<1.00	<5.0	NA	<0.5	<0.25	<0.25	<1.00	<1.00	<1.00	<1.00
cis-1,2-Dichloroethene	<1.00	<1.00	<5.0	NA	<0.5	<0.21	<0.21	<1.00	<1.00	<1.00	<1.00
trans-1,2-Dichloroethene	<1.00	<1.00	<5.0	NA	<0.5	<0.23	<0.23	<1.00	<1.00	<1.00	<1.00
1,2-Dichloropropane	<1.00	<1.00	<5.0	NA	<0.5	<0.25	<0.25	<1.00	<1.00	<1.00	<1.00
cis-1,3-Dichloropropene	<1.00	<1.00	<5.0	NA	<0.5	<0.17	<0.17	<1.00	<1.00	<1.00	<1.00
trans-1,3-Dichloropropene	<1.00	<1.00	<5.0	NA	<0.5	<0.17	<0.17	<1.00	<1.00	<1.00	<1.00
Ethylbenzene	<1.00	<1.00	<5.0	NA	<0.5	<0.19	<0.19	<1.00	<1.00	<1.00	<1.00
2-Hexanone	<5.00	<5.00	<10.0	NA	<5.0	<1.28	<1.28	<10.0	<10.0	<10.0	<10.0
4-Methyl-2-Pentanone	<5.00	<5.00	<10.0	NA	<5.0	<0.81	<0.81	<10.0	<10.0	<10.0 R	<10.0 R
Methylene Chloride	<2.00	<2.00	<5.0	NA	<0.5	<1	<1	<1.00	<1.00	<1.00	<0.50
Styrene	<1.00	<1.00	<5.0	NA	<0.5	<0.28	<0.28	<1.00	<1.00	<1.00	<1.00
1,1,2,2-Tetrachloroethane	<1.00	<1.00	<5.0	NA	<0.5	<0.19	<0.19	<0.50	<0.50	<0.50	<0.50
Tetrachloroethene	<1.00	<1.00	<5.0	NA	<0.5	<0.14	<0.14	<1.00	<1.00	<1.00	<1.00
Toluene	<1.00	<1.00	<5.0	NA	<0.5	<0.17	**0.174 J**	<1.00	<1.00	<1.00	<1.00
1,2,4-Trichlorobenzene	<1.00	<1.00	<5.0	NA	<0.5	<0.2	<0.2	<1.00	<1.00	<1.00	<1.00
1,1,1-Trichloroethane	<1.00	<1.00	<5.0	NA	<0.5	<0.19	<0.19	<1.00	<1.00	<1.00	<1.00
1,1,2-Trichloroethane	<1.00	<1.00	<5.0	NA	<0.5	<0.19	<0.19	<1.00	<1.00	<1.00	<1.00
Trichloroethene	**0.73 J**	<1.00	<5.0	NA	<0.5	<0.2	<0.2	<1.00	<1.00	<1.00	<1.00
Vinyl Chloride	<1.00	<1.00	<5.0	NA	<0.5	<0.18	<0.18	<1.00	<1.00	<1.00	<1.00
Xylenes (total)	<2.00	<2.00	<10.0	NA	<0.5	<0.58	<0.58	<1.00	<1.00	<1.00	<1.00
Semivolatile Organic Compounds (µg/L)											
Acenaphthene	<10.0	<10.0	<10.0	NA	<0.5	<0.308	<0.308	<5.00	<5.00	<5.1	<5.26
Acenaphthylene	<10.0	<10.0	<10.0	NA	<0.5	<0.337	<0.337	<5.00	<5.00	<5.1	<5.26
Anthracene	<10.0	<10.0	<10.0	NA	<0.5	<0.365	<0.365	<5.00	<5.00	<5.1	<5.26
Benzo(a)anthracene	<10.0	<10.0	<10.0	NA	<0.5	<0.308	<0.308	<5.00	<5.00	<5.1	<5.26
Benzo (b) Fluoranthene	<10.0	<10.0	<10.0	NA	<0.5	<0.346	<0.346	<5.00	<5.00	<5.1	<5.26
Benzo (k) Fluoranthene	<10.0	<10.0	<10.0	NA	<0.5	<0.356	<0.356	<5.00	<5.00	<5.1	<5.26
Benzo (a) Pyrene	<10.0	<10.0	<10.0	NA	<0.5	<0.365	<0.365	<5.00	<5.00	<5.1	<5.26
Benzo (g,h,i) Perylene	<10.0	<10.0	<10.0	NA	<0.5	<0.596	<0.596	<5.00	<5.00	<5.1	<5.26
bis (2-Chloroethoxy) Methane	<10.0	<10.0	<10.0	NA	<1	<2.98	<1.83	<5.00	<5.00	<5.1	<5.26
bis (2-Chloroethyl) ether	<10.0	<10.0	<10.0	NA	<1	<2.69	<1.25	<5.00	<5.00	<5.1	<5.26
bis (2-Ethylhexyl) phthalate	<6.00	<6.00	<6.0	<6.0	<5	<5.77	<1.44	<5.00	<5.00	<5.1	<5.26
4-Bromophenyl-phenylether	<10.0	<10.0	<10.0	NA	<1	<2.6	<1.54	<5.00	<5.00	<5.1	<5.26
Butlybenzylphthalate	<10.0	<10.0	<10.0	NA	<5	<2.4	<0.962	<5.00	<5.00	<5.1	<5.26
Carbazole	<10.0	<10.0	<10.0	NA	<1	<2.69	<0.865	<5.00	<5.00	<5.1	<5.26
4-Chloroaniline	<20.0	<20.0	<20.0	NA	<4	<4.04	<1.15	<5.00	<5.00	<5.1	<5.26
4-Chloro-3-methylphenol	<20.0	<20.0	<20.0	NA	<1 R	<4.33	<1.35	<5.00	<5.00	<5.1	<5.26
2-Chloronaphthalene	<10.0	<10.0	<10.0	NA	<1	<2.69	<1.44	<5.00	<5.00	<5.1	<5.26
2-Chlorophenol	<10.0	<10.0	<10.0	NA	<1 R	<4.62	<1.63	<5.00	<5.00	<5.1	<5.26
4-Chlorophenyl-phenyl Ether	<10.0	<10.0	<10.0	NA	<1	<2.69	<1.54	<5.00	<5.00	<5.1	<5.26
Chrysene	<10.0	<10.0	<10.0	NA	<0.5	<0.317	<0.317	<5.00	<5.00	<5.1	<5.26
Dibenzo (a,h) Anthracene	<10.0	<10.0	<10.0	NA	<0.5	<0.433	<0.433	<5.00	<5.00	<5.1	<5.26
Dibenzofuran	<10.0	<10.0	<10.0	NA	<1	<2.79	<1.25	<5.00	<5.00	<5.1	<5.26
3,3'-Dichlorobenzidine	<20.0	<20.0	<20.0	NA	<5	<3.17	<1.44	<10.0	<10.0	<10.2	<10.5
2,4-Dichlorophenol	<10.0	<10.0	<10.0	NA	<1 R	<5.38	<2.12	<5.00	<5.00	<5.1	<5.26
Diethylphthalate	<10.0	<10.0	<10.0	NA	<5	<2.88	<1.15	<5.00	<5.00	<5.1	<5.26

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Historical Groundwater Sampling Results Summary
Avtex Fibers Superfund Site
Front Royal, Virginia

Parameter	Upgradient Shallow Bedrock Wells (cont.)										
	128 (cont.)							130			
	6/7/12	6/25/13	7/8/14	12/10/14	7/14/15	7/29/16	7/25/17	3/10/08	3/10/08[1]	9/18/08	9/18/08[1]
SVOCs (cont.)											
2,4-Dimethylphenol	<10.0	<10.0	<10.0	NA	<1 R	<4.04	<1.54	<5.00	<5.00	<5.1	<5.26
Dimethylphthalate	<10.0	<10.0	<10.0	NA	<5	<2.98	<1.15	<5.00	<5.00	<5.1	<5.26
Di-N-Butylphthalate	<10.0	<10.0	<10.0	NA	<5	<2.4	<1.25	<5.00	<5.00	<5.1	<5.26
Di-n-octylphthalate	<10.0	<10.0	<10.0	NA	<5	<2.4	<0.865	<5.00	<5.00	<5.1	<5.26
4,6-Dinitro-2-methylphenol	<20.0	<20.0	<20.0	NA	<15 R	<8.94	<2.79	<25.0	<25.0	<25.5	<26.3
2,4-Dinitrophenol	<50.0	<50.0	<50.0	NA	<30 R	<5.67	<6.92	<25.0	<25.0	<25.5	<26.3
2,4-Dinitrotoluene	<10.0	<10.0	<10.0	NA	<5	<3.08	<1.54	<5.00	<5.00	<5.1	<5.26
2,6-Dinitrotoluene	<10.0	<10.0	<10.0	NA	<1	<2.21	<1.44	<5.00	<5.00	<5.1	<5.26
Fluoranthene	<10.0	<10.0	<10.0	NA	<0.5	<0.308	<0.308	<5.00	<5.00	<5.1	<5.26
Fluorene	<10.0	<10.0	<10.0	NA	<0.5	<0.308	<0.308	<5.00	<5.00	<5.1	<5.26
Hexachlorobenzene	<10.0	<10.0	<10.0	NA	<0.5	<2.69	<1.44	<5.00	<5.00	<5.1	<5.26
Hexachlorobutadiene	<10.0	<10.0	<10.0	NA	<1	<1.92	<1.44	<5.00	<5.00	<5.1	<5.26
Hexachlorocyclopentadiene	<10.0	<10.0	<10.0	NA	<15	<1.73	<1.25	<5.00	<5.00	<5.1	<5.26
Hexachloroethane	<10.0	<10.0	<10.0	NA	<5	<1.83	<2.12	<5.00	<5.00	<5.1	<5.26
Indeno (1,2,3-cd) Pyrene	<10.0	<10.0	<10.0	NA	<0.5	<0.394	<0.394	<5.00	<5.00	<5.1	<5.26
Isophorone	<10.0	<10.0	<10.0	NA	<1	<2.98	<2.12	<5.00	<5.00	<5.1	<5.26
2-Methylnaphthalene	<10.0	<10.0	<10.0	NA	<0.5	<0.385	<0.385	<5.00	<5.00	<5.1	<5.26
2-Methylphenol	<10.0	<10.0	<10.0	<10.0	<1 R	<2.21	<1.54	<5.00	<5.00	<5.1	<5.26
3&4-Methylphenol/4-methylphenol	<10.0	<10.0	<10.0	<10.0	<1	<2.12	<1.35	<5.00	<5.00	<5.1	<5.26
Naphthalene	<10.0	<10.0	<10.0	<10.0	<0.5	<0.356	<0.356	<5.00	<5.00	<5.1	<5.26
2-Nitroaniline	<50.0	<50.0	<50.0	NA	<1	<3.56	<1.06	<25.0	<25.0	<25.5	<26.3
3-Nitroaniline	<50.0	<50.0	<50.0	NA	<1	<2.6	<1.54	<25.0	<25.0	<25.5	<26.3
4-Nitroaniline	<20.0	<20.0	<20.0	NA	<1	<2.98	<1.54	<25.0	<25.0	<25.5	<26.3
4-Nitrophenol	<50.0	<50.0	<50.0	NA	<30 R	<5.19	<1.92	<25.0	<25.0	<25.5	<26.3
2-Nitrophenol	<10.0	<10.0	<10.0	NA	<1 R	<5.1	<2.31	<5.00	<5.00	<5.1	<5.26
Nitrobenzene	<10.0	<10.0	<10.0	NA	<1	<2.6	<2.12	<5.00	<5.00	<5.1	<5.26
N-Nitroso-di-n-propylamine	<10.0	<10.0	<10.0	NA	<1	<3.27	<1.63	<5.00	<5.00	<5.1	<5.26
N-Nitrosodiphenylamine	<10.0	<10.0	<10.0	NA	<1	<3.46	<3.46	<5.00	<5.00	<5.1	<5.26
2,2'-Oxybis (1-chloropropane)	<10.0	<10.0	<10.0	NA	<1	<2.69	<1.73	<5.00	<5.00	<5.1	<5.26
Pentachlorophenol	<25.0	<25.0	<25.0	<25.0	<5 R	<1.63	<3.17	<10.0	<10.0	<10.2	<10.5
Phenanthrene	<10.0	<10.0	<10.0	NA	<0.5	<0.404	<0.404	<5.00	<5.00	<5.1	<5.26
Phenol	<10.0	<10.0	<10.0	<10.0	<1 R	<1.44	<1.44	<5.00	<5.00	<5.1	<5.26
Pyrene	<10.0	<10.0	<10.0	NA	<0.5	<0.337	<0.337	<5.00	<5.00	<5.1	<5.26
2,4,5-Trichlorophenol	<10.0	<10.0	<10.0	NA	<1 R	<6.83	<1.25	<5.00	<5.00	<5.1	<5.26
2,4,6-Trichlorophenol	<10.0	<10.0	<10.0	NA	<1 R	<6.54	<1.83	<5.00	<5.00	<5.1	<5.26
Filtered Inorganics (mg/L)											
Arsenic	<0.001	<0.001	<0.001	**0.00076 J**	<0.0040	**0.00157 J**	<0.000400	**0.00871 J**	**0.0011 J**	<0.001	<0.001
Antimony	<0.001	<0.001	<0.001	<0.001	<0.0020	<0.000512	<0.000800	<0.001	<0.001	<0.001	<0.001
Beryllium	<0.001	**0.00023 K**	<0.0005	NA	**0.000071 J**	<0.001	**0.000130 J**	<0.005	<0.005	<0.002	<0.002
Cadmium	<0.001	<0.001	<0.0001	<0.0001	<0.0010	<0.0004	<0.000100	<0.005	<0.005	<0.005	<0.005
Chromium	**0.0018 J**	<0.005	<0.001	<0.001	<0.0040	<0.0005	<0.000500	<0.005	<0.005	<0.005	<0.005
Copper	**0.00039 J**	**0.00095 L**	<0.001	NA	**0.00046 J**	<0.001	<0.00120	<0.01	<0.01	<0.01	<0.01
Lead	<0.001	<0.001	<0.001	<0.001	<0.0020	<0.0002	<0.000100	<0.003	<0.003	<0.001	<0.001
Mercury	<0.0002	<0.0002	<0.0002	<0.0002	<0.00020	<0.0001	<0.000100	<0.0002	<0.0002	<0.0002	<0.0002
Nickel	<0.001	<0.001	<0.001	**0.0026**	**0.0011 J**	<0.000951	**0.00252**	**0.0131**	**0.0133**	**0.0125**	**0.0131**
Selenium	<0.001	<0.001	<0.001	NA	<0.0040	<0.0006	<0.000300	**0.00099 J**	**0.0015 J**	**0.00108**	<0.001
Thallium	<0.001	<0.001	<0.001	NA	<0.0010	<0.0005	<0.000800	<0.0002	<0.0002	<0.0002	<0.0002
Vanadium	<0.005	<0.005	<0.001	<0.001	<0.0010	<0.00192	<0.000700	<0.01	<0.01	<0.05	<0.01
Zinc	**0.0033 K**	**0.0035 B**	<0.005	**0.0114**	<0.0300	<0.01	**0.0741**	<0.02	**0.0145 J**	<0.02	<0.02
Field Parameters											
pH	6.73	6.54	6.78	6.79	6.74	6.75	6.49	6.18	---	5.38	---
Specific Conductance (mS/cm)	1.048	1.349	1.43	1.501	1.3	1.4319	1.557	1.302	---	1.308	---
Turbidity (ntu)	145.4	15.2	17.90	310.6	19.8	7.13	67.7	0.7	---	1.5	---
Dissolved Oxygen (mg/L)	0.49	0.44	0.30	0	0.12	0.08	0.16	0.33	---	0.32	---
Redox Potential (mV)	-68.1	-45.8	-28.79	-35.5	-51.3	-16.1	-32.6	-3.8	---	40.5	---
Temperature (^{o}C)	14.83	17.33	22.51	12.11	18.84	18.81	18.75	14.00	---	15.21	---

Notes:
B - Analyte detected in associated method blank.
J - Estimated result
K - Analytical result may be biased high.
L - Analytical result may be biased low.
< - Not detected, value indicates detection limit.
R - Result flagged as unusable due to low response
EPA guidance, but validator notes that response
stable and calibration curve is within specified li
and thus should be considered useable.
[1] - Blind duplicate sample

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Historical Groundwater Sampling Results Summary
Avtex Fibers Superfund Site
Front Royal, Virginia

Parameter	Upgradient Shallow Bedrock Wells (cont.)										
	130R								133		
	5/20/10	6/16/11	6/4/12	6/20/13	7/24/14	7/23/15	7/31/16	7/27/17 & 2/1/18	3/7/08	9/22/08	3/23/09
Volatile Organic Compounds (µg/L)											
Acetone	<10.0	<10.0	<25.0	<25.0	<25.0	<5.0	<2.66	<7.44	<10.0 R	<10.0 R	<10.0
Benzene	<1.00	<1.00	<1.00	<1.00	<5.0	<0.5	<0.2	<0.2	<1.00	<1.00	<1.00
Bromodichloromethane	<1.00	<1.00	<1.00	<1.00	<5.0	<0.5	<0.17	<0.17	<1.00	<1.00	<1.00
Bromoform	<1.00	<1.00	<1.00	<1.00	<5.0	<0.5	<0.29	<0.29	<1.00	<1.00	<1.00
Bromomethane	<1.00	<1.00	<2.00	<2.00	<10.0	<0.5	<0.35	<0.35	<1.00	<1.00	<1.00
2-Butanone	<10.0	<10.0	<5.00	<5.00	<10.0	<5.0	<2.64	<2.64	<10.0 J	<10.0 R	<10.0
Carbon Disulfide	<1.00	<1.00	<2.00	<2.00	<10.0	<1.0	<0.22	<0.22	**1.00**	<1.00 J	<1.00
Carbon Tetrachloride	<1.00	<1.00	<1.00	<1.00	<5.0	<0.5	<0.18	<0.18	<1.00	<1.00	<1.00
Chlorobenzene	<1.00	<1.00	<1.00	<1.00	<5.0	<0.5	<0.18	<0.18	<1.00	<1.00	<1.00
Chlorodibromomethane	<1.00	<1.00	<1.00	<1.00	<5.0	<0.5	<0.25	<0.25	<1.00	<1.00	<1.00
Chloroethane	<1.00	<1.00	<1.00	<1.00	<10.0	<0.5	<0.36	<0.36	<1.00	<1.00	<1.00
Chloroform	<1.00	<1.00	<1.00	<1.00	<5.0	<0.5	<0.23	<0.23	<1.00	<1.00	<1.00
Chloromethane	<1.00	<1.00	<1.00 J	<1.00	<5.0	<0.5 J	<0.36	<0.36	<1.00	<1.00 J	<1.00
1,2-Dichlorobenzene	<1.00	<1.00	<1.00	<1.00	<5.0	<0.5	<0.19	<0.19	<1.00	<1.00	<1.00
1,3-Dichlorobenzene	<1.00	<1.00	<1.00	<1.00	<5.0	<0.5	<0.18	<0.18	<1.00	<1.00	<1.00
1,4-Dichlorobenzene	<1.00	<1.00	<1.00	<1.00	<5.0	<0.5	<0.17	<0.17	<1.00	<1.00	<1.00
1,1-Dichloroethane	<1.00	<1.00	<1.00	<1.00	<5.0	<0.5	<0.24	<0.24	<1.00	<1.00	<1.00
1,2-Dichloroethane	<1.00	<1.00	<1.00	<1.00	<5.0	<0.5	<0.2	<0.2	<1.00	<1.00	<1.00
1,1-Dichloroethene	<1.00	<1.00	<1.00	<1.00	<5.0	<0.5	<0.25	<0.25	<1.00	<1.00	<1.00
cis-1,2-Dichloroethene	<1.00	<1.00	<1.00	<1.00	<5.0	<0.5	<0.21	<0.21	<1.00	<1.00	<1.00
trans-1,2-Dichloroethene	<1.00	<1.00	<1.00	<1.00	<5.0	<0.5	<0.23	<0.23	<1.00	<1.00	<1.00
1,2-Dichloropropane	<1.00	<1.00	<1.00	<1.00	<5.0	<0.5	<0.25	<0.25	<1.00	<1.00	<1.00
cis-1,3-Dichloropropene	<1.00	<1.00	<1.00	<1.00	<5.0	<0.5	<0.17	<0.17	<1.00	<1.00	<1.00
trans-1,3-Dichloropropene	<1.00	<1.00	<1.00	<1.00	<5.0	<0.5	<0.17	<0.17	<1.00	<1.00	<1.00
Ethylbenzene	<1.00	<1.00	<1.00	<1.00	<5.0	<0.5	<0.19	<0.19	<1.00	<1.00	<1.00
2-Hexanone	<10.0	<10.0	<5.00	<5.00	<10.0	<5.0	<1.28	<1.28	<10.0	<10.0	<10.0
4-Methyl-2-Pentanone	<10.0	<10.0	<5.00	<5.00	<10.0	<5.0 J	<0.81	<0.81	<10.0 R	<10.0 R	<10.0
Methylene Chloride	<1.00	<1.00	<2.00	<2.00	<5.0	<0.5	<1	<1	<1.00	<1.00	<1.00
Styrene	<1.00	<1.00	<1.00	<1.00	<5.0	<0.5	<0.28	<0.28	<1.00	<1.00	<1.00
1,1,2,2-Tetrachloroethane	<0.50	<0.500	<1.00	<1.00	<5.0	<0.5	<0.19	<0.19	<0.50	<0.50	<0.50
Tetrachloroethene	<1.00	<1.00	<1.00	<1.00	<5.0	<0.5	<0.14	<0.14	<1.00	<1.00	<1.00
Toluene	<1.00	<1.00	<1.00	<1.00	<5.0	<0.5	<0.17	<0.17	<1.00	<1.00	<1.00
1,2,4-Trichlorobenzene	<1.00	<1.00	<1.00	<1.00	<5.0	<0.5	<0.2	<0.2	<1.00	<1.00	<1.00
1,1,1-Trichloroethane	<1.00	<1.00	<1.00	<1.00	<5.0	<0.5	<0.19	<0.19	<1.00	<1.00	<1.00
1,1,2-Trichloroethane	<1.00	<1.00	<1.00	<1.00	<5.0	<0.5	<0.19	<0.19	<1.00	<1.00	<1.00
Trichloroethene	<1.00	<1.00	<1.00	<1.00	<5.0	<0.5	<0.2	<0.2	<1.00	<1.00	<1.00
Vinyl Chloride	<1.00	<1.00	<1.00	<1.00	<5.0	<0.5	<0.18	<0.18	<1.00	<1.00	<1.00
Xylenes (total)	<1.00	<1.00	<2.00	<2.00	<10.0	<0.5	<0.58	<0.58	<1.00	<1.00	<1.00
Semivolatile Organic Compounds (µg/L)											
Acenaphthene	<5.10	<5.10	<10.0	<10.0	<10.0	<0.5	<0.333	<0.308	<5.21	<5.10	<5.78
Acenaphthylene	<5.10	<5.10	<10.0	<10.0	<10.0	<0.5	<0.365	<0.337	<5.21	<5.10	<5.78
Anthracene	<5.10	<5.10	<10.0	<10.0	<10.0	<0.5	<0.396	<0.365	<5.21	<5.10	<5.78
Benzo(a)anthracene	<5.10	<5.10	<10.0	<10.0	<10.0	<0.5	<0.333	<0.308	<5.21	<5.10	<5.78
Benzo (b) Fluoranthene	<5.10	<5.10	<10.0	<10.0	<10.0	<0.5	<0.375	<0.346	<5.21	<5.10	<5.78
Benzo (k) Fluoranthene	<5.10	<5.10	**1.1 J**	<10.0	<10.0	<0.5	<0.385	<0.356	<5.21	<5.10	<5.78
Benzo (a) Pyrene	<5.10	<5.10	<10.0	<10.0	<10.0	<0.5	<0.396	<0.365	<5.21	<5.10	<5.78
Benzo (g,h,i) Perylene	<5.10	<5.10	**1.0 J**	<10.0	<10.0	<0.5	<0.646	<0.596	<5.21	<5.10	<5.78
bis (2-Chloroethoxy) Methane	<5.10	<5.10	<10.0	<10.0	<10.0	<1	<3.23	<1.83	<5.21	<5.10	<5.78
bis (2-Chloroethyl) ether	<5.10	<5.10	<10.0	<10.0	<10.0	<1	<2.92	<1.25	<5.21	<5.10	<5.78
bis (2-Ethylhexyl) phthalate	<5.10	<5.10	<6.00	<6.00	<6.0	<5	<6.25	<1.44	<5.21	<5.10	<5.78
4-Bromophenyl-phenylether	<5.10	<5.10	<10.0	<10.0	<10.0	<1	<2.81	<1.54	<5.21	<5.10	<5.78
Butlybenzylphthalate	<5.10	<5.10	<10.0	<10.0	<10.0	<5	<2.6	<0.962	<5.21	<5.10	<5.78
Carbazole	<5.10	<5.10	<10.0	<10.0	<10.0	<1	<2.92	<0.865	<5.21	<5.10	<5.78
4-Chloroaniline	<5.10	<5.10	<20.0	<20.0	<20.0	<4	<4.38	<1.15	<5.21	<5.10	<5.78 J
4-Chloro-3-methylphenol	<5.10 J	<5.10	<20.0	<20.0	<20.0	<1	<4.69	<1.35	<5.21	<5.10	<5.78
2-Chloronaphthalene	<5.10	<5.10	<10.0	<10.0	<10.0	<1	<2.92	<1.44	<5.21	<5.10	<5.78
2-Chlorophenol	<5.10	<5.10	<10.0	<10.0	<10.0	<1	<5	<1.63	<5.21	<5.10	<5.78
4-Chlorophenyl-phenyl Ether	<5.10	<5.10	<10.0	<10.0	<10.0	<1	<2.92	<1.54	<5.21	<5.10	<5.78
Chrysene	<5.10	<5.10	<10.0	<10.0	<10.0	<0.5	<0.344	<0.317	<5.21	<5.10	<5.78
Dibenzo (a,h) Anthracene	<5.10	<5.10	<10.0	<10.0	<10.0	<0.5	<0.469	<0.433	<5.21	<5.10	<5.78
Dibenzofuran	<5.10	<5.10	<10.0	<10.0	<10.0	<1	<3.02	<1.25	<5.21	<5.10	<5.78
3,3'-Dichlorobenzidine	<10.2	<10.2	<20.0	<20.0	<20.0	<5	<3.44	<1.44	<10.4	<10.2	<11.6 J
2,4-Dichlorophenol	<5.10 J	<5.10	<10.0	<10.0	<10.0	<1	<5.83	<2.12	<5.21	<5.10	<5.78
Diethylphthalate	<5.10	<5.10	<10.0	<10.0	<10.0	<5	<3.13	<1.15	<5.21	<5.10	<5.78

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Historical Groundwater Sampling Results Summary
Avtex Fibers Superfund Site
Front Royal, Virginia

Parameter	Upgradient Shallow Bedrock Wells (cont.)										
	130R								133		
	5/20/10	6/16/11	6/4/12	6/20/13	7/24/14	7/23/15	7/31/16	7/27/17 & 2/1/18	3/7/08	9/22/08	3/23/09
SVOCs (cont.)											
2,4-Dimethylphenol	<5.10 J	<5.10	<10.0	<10.0	<10.0	<1	<4.38	<1.54	<5.21	<5.10	<5.78
Dimethylphthalate	<5.10	<5.10	<10.0	<10.0	<10.0	<5	<3.23	<1.15	<5.21	<5.10	<5.78
Di-N-Butylphthalate	<5.10	<5.10	<10.0	<10.0	<10.0	<5	<2.6	<1.25	<5.21	<5.10	<5.78
Di-n-octylphthalate	<5.10	<5.10	<10.0	<10.0	<10.0	<5	<2.6	<0.865	<5.21	<5.10	<5.78
4,6-Dinitro-2-methylphenol	<25.5	<25.5	<20.0 J	<20.0	<20.0	<15	<9.69	<2.79	<26.0	<25.5	<28.9
2,4-Dinitrophenol	<25.5	<25.5	<50.0 J	<50.0	<50.0	<31	<6.15	<6.92	<26.0	<25.5	<28.9
2,4-Dinitrotoluene	<5.10	<5.10	<10.0	<10.0	<10.0	<5	<3.33	<1.54	<5.21	<5.10	<5.78
2,6-Dinitrotoluene	<5.10	<5.10	<10.0	<10.0	<10.0	<1	<2.4	<1.44	<5.21	<5.10	<5.78
Fluoranthene	<5.10	<5.10	<10.0	<10.0	<10.0	<0.5	<0.333	<0.308	<5.21	<5.10	<5.78
Fluorene	<5.10	<5.10	<10.0	<10.0	<10.0	<0.5	<0.333	<0.308	<5.21	<5.10	<5.78
Hexachlorobenzene	<5.10	<5.10	<10.0	<10.0	<10.0	<0.5	<2.92	<1.44	<5.21	<5.10	<5.78
Hexachlorobutadiene	<5.10	<5.10	<10.0	<10.0	<10.0	<1	<2.08	<1.44	<5.21	<5.10	<5.78
Hexachlorocyclopentadiene	<5.10	<5.10	<10.0	<10.0	<10.0	<15	<1.88	<1.25	<5.21	<5.10	<5.78
Hexachloroethane	<5.10 J	<5.10	<10.0	<10.0	<10.0	<5	<1.98	<2.12	<5.21	<5.10	<5.78
Indeno (1,2,3-cd) Pyrene	<5.10	<5.10	<10.0	<10.0	<10.0	<0.5	<0.427	<0.394	<5.21	<5.10	<5.78
Isophorone	<5.10	<5.10	<10.0	<10.0	<10.0	<1	<3.23	<2.12	<5.21	<5.10	<5.78
2-Methylnaphthalene	<5.10 J	<5.10	<10.0	<10.0	<10.0	<0.5	<0.417	<0.385	<5.21	<5.10	<5.78
2-Methylphenol	<5.10 J	<5.10	<10.0	<10.0	<10.0	<1	<2.4	<1.54	<5.21	<5.10	<5.78
3&4-Methylphenol/4-methylphenol	<5.10 J	<5.10	<10.0	<10.0	<10.0	<1	<2.29	<1.35	<5.21	<5.10	<5.78
Naphthalene	<5.10	<5.10	<10.0	<10.0	<10.0	<0.5	<0.385	<0.356	<5.21	<5.10	<5.78
2-Nitroaniline	<25.5	<25.5	<50.0	<50.0	<50.0	<1	<3.85	<1.06	<26.0	<25.5	<28.9
3-Nitroaniline	<25.5	<25.5	<50.0	<50.0	<50.0	<1	<2.81	<1.54	<26.0	<25.5	<28.9 J
4-Nitroaniline	<25.5	<25.5	<20.0	<20.0	<20.0	<1	<3.23	<1.54	<26.0	<25.5	<28.9 J
4-Nitrophenol	<25.5	<25.5	<50.0	<50.0	<50.0	<31	<5.63	<1.92	<26.0	<25.5	<28.9
2-Nitrophenol	<5.10 J	<5.10	<10.0	<10.0	<10.0	<1	<5.52	<2.31	<5.21	<5.10	<5.78
Nitrobenzene	<5.10	<5.10	<10.0	<10.0	<10.0	<1	<2.81	<2.12	<5.21	<5.10	<5.78
N-Nitroso-di-n-propylamine	<5.10	<5.10	<10.0	<10.0	<10.0	<1	<3.54	<1.63	<5.21	<5.10	<5.78
N-Nitrosodiphenylamine	<5.10	<5.10	<10.0	<10.0	<10.0	<1	<3.75	<3.46	<5.21	<5.10	<5.78
2,2'-Oxybis (1-chloropropane)	<5.10	<5.10	<10.0	<10.0	<10.0	<1	<2.92	<1.73	<5.21	<5.10	<5.78
Pentachlorophenol	<10.2	<10.2	<25.0 J	<25.0	<25.0	<5	<1.77	<3.17	<10.4	<10.2	<11.6
Phenanthrene	<5.10	<5.10	<10.0	<10.0	<10.0	<0.5	<0.438	<0.404	<5.21	<5.10	<5.78
Phenol	<5.10	<5.10	<10.0	<10.0	<10.0	<1	<1.56	<1.44	<5.21	<5.10	<5.78
Pyrene	<5.10	<5.10	<10.0	<10.0	<10.0	<0.5	<0.365	<0.337	<5.21	<5.10	<5.78
2,4,5-Trichlorophenol	<5.10 J	<5.10	<10.0	<10.0	<10.0	<1	<7.4	<1.25	<5.21	<5.10	<5.78
2,4,6-Trichlorophenol	<5.10 J	<5.10	<10.0	<10.0	<10.0	<1	<7.08	<1.83	<5.21	<5.10	<5.78
Filtered Inorganics (mg/L)											
Arsenic	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0040	**0.000988 J**	<0.000400	**0.0173**	**0.0211**	**0.0237**
Antimony	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0020 J	<0.0005	<0.000800	**0.000335 J**	<0.001	<0.001
Beryllium	<0.002	<0.002	<0.001	**0.00027 K**	<0.0001	**0.000098 J**	<0.001	<0.000100	**0.000517 J**	<0.002	<0.002
Cadmium	<0.005	<0.005	<0.001	<0.001	<0.0001	<0.0010	<0.0004	<0.000100	<0.005	<0.005	<0.005
Chromium	<0.005	<0.005	<0.005	<0.005	<0.001	<0.0040	<0.0005	<0.000500	<0.005	<0.005	<0.005
Copper	<0.01	<0.01	<0.005	**0.00065 L**	<0.001	<0.0040	<0.001	**0.00122 J**	<0.01	<0.01	<0.01
Lead	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0020	<0.0002	<0.000100	<0.003	<0.001	<0.001
Mercury	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.00020	<0.0001	<0.000100	<0.0002	<0.0002	<0.0002
Nickel	<0.004	<0.004	**0.0014**	<0.001	**0.0014**	<0.0040	<0.00102	**0.000701 J**	**0.0353**	**0.0279**	**0.0245**
Selenium	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0040	<0.0006	<0.000300	**0.0101**	**0.016**	**0.00791**
Thallium	<0.0002	<0.0002	<0.001	<0.001	<0.001	<0.0010	<0.0005	<0.000800	**0.0000733 J**	<0.0002	<0.0002
Vanadium	<0.01	<0.01	<0.005	**0.00023 K**	<0.001	<0.0010	<0.00181	<0.000700	<0.01	<0.05	<0.01
Zinc	<0.02	<0.02	**0.00098 J**	**0.0018 J**	<0.005	<0.0300	<0.01	**0.0133 J**	<0.02	**0.0214**	<0.02
Field Parameters											
pH	6.62	6.65	6.65	6.49	6.92	6.78	6.84	6.61 (6.83)	6.63	6.35	6.58
Specific Conductance (mS/cm)	0.751	0.741	0.816	0.747	0.66	0.7	0.79111	0.83487 (0.40719)	9.508	9.371	7.871
Turbidity (ntu)	1.0	9.86	0	0	15.50	13.20	2.7	1.85 (9.58)	0	0	0
Dissolved Oxygen (mg/L)	0.13	0.05	0.31	0.21	2.16	0.10	0.09	0.15 (0.19)	0.29	0.24	0.04
Redox Potential (mV)	-20.6	-51.3	-75.0	-56.4	-30.90	-31.72	-38.9	-6.2 (-65.4)	-96.5	-97.1	-84.9
Temperature (^{o}C)	13.10	14.12	14.92	14.74	17.96	18.47	19.18	16.8 (14.28)	15.73	16.96	15.80

Notes:
B - Analyte detected in associated method blank.
J - Estimated result
K - Analytical result may be biased high.
L - Analytical result may be biased low.
< - Not detected, value indicates detection limit.
R - Result flagged as unusable due to low response
EPA guidance, but validator notes that response
stable and calibration curve is within specified li
and thus should be considered useable.
[1] - Blind duplicate sample

OU-10 VB 1 - 8
Historical Groundwater Sampling Results Summary
Avtex Fibers Superfund Site
Front Royal, Virginia

Parameter	Upgradient Shallow Bedrock Wells (cont.)									
	133 (cont.)									
	10/13/09	5/24/10	6/16/11	6/7/12	6/25/13	8/5/14	12/10/14	7/15/15	7/20/16	7/26/17
Volatile Organic Compounds (µg/L)										
Acetone	<10.0	<10.0 R	<10.0	<25.0	<25.0	<25.0	<25.0	<5.0	<2.66	<3.71
Benzene	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	NA	<0.5	<0.2	<0.2
Bromodichloromethane	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	NA	<0.5	<0.17	<0.17
Bromoform	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	NA	<0.5	<0.29	<0.29
Bromomethane	<1.00	<1.00	<1.00	<2.00	<2.00	<2.0	NA	<0.5	<0.35	<0.35
2-Butanone	<10.0	<10.0	<10.0	<5.00	<5.00	<5.0	NA	<5.0	<2.64	<2.64
Carbon Disulfide	<1.00	<1.00	<1.00	**3.6**	**1.9 J**	<2.0	**3.3**	**8.6**	**5.45**	**0.346 J**
Carbon Tetrachloride	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	NA	<0.5	<0.18	<0.18
Chlorobenzene	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	NA	<0.5	<0.18	<0.18
Chlorodibromomethane	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	NA	<0.5	<0.25	<0.25
Chloroethane	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0 J	NA	<0.5	<0.36	<0.36
Chloroform	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	NA	<0.5	<0.23	<0.23
Chloromethane	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	NA	<0.5	<0.36	<0.36
1,2-Dichlorobenzene	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	NA	<0.5	<0.19	<0.19
1,3-Dichlorobenzene	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	NA	<0.5	<0.18	<0.18
1,4-Dichlorobenzene	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	NA	<0.5	<0.17	<0.17
1,1-Dichloroethane	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	NA	<0.5	<0.24	<0.24
1,2-Dichloroethane	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	NA	<0.5	<0.2	<0.2
1,1-Dichloroethene	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	NA	<0.5	<0.25	<0.25
cis-1,2-Dichloroethene	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	NA	<0.5	<0.21	<0.21
trans-1,2-Dichloroethene	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	NA	<0.5	<0.23	<0.23
1,2-Dichloropropane	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	NA	<0.5	<0.25	<0.25
cis-1,3-Dichloropropene	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	NA	<0.5	<0.17	<0.17
trans-1,3-Dichloropropene	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	NA	<0.5	<0.17	<0.17
Ethylbenzene	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	NA	<0.5	<0.19	<0.19
2-Hexanone	<10.0	<10.0	<10.0	<5.00	<5.00	<5.0	NA	<5.0	<1.28	<1.28
4-Methyl-2-Pentanone	<10.0	<10.0 R	<10.0	<5.00	<5.00	<5.0	NA	<5.0	<0.81	<0.81
Methylene Chloride	<1.00	<1.00	<1.00	<2.00	<2.00	<2.0	NA	<0.5	<1	<1
Styrene	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	NA	<0.5	<0.28	<0.28
1,1,2,2-Tetrachloroethane	<0.50	<0.50	<0.50	<1.00	<1.00	<1.0	NA	<0.5	<0.19	<0.19
Tetrachloroethene	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	NA	<0.5	<0.14	<0.14
Toluene	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	NA	<0.5	<0.17	<0.17
1,2,4-Trichlorobenzene	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	NA	<0.5	<0.2	<0.2
1,1,1-Trichloroethane	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	NA	<0.5	<0.19	<0.19
1,1,2-Trichloroethane	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	NA	<0.5	<0.19	<0.19
Trichloroethene	<1.00	<1.00	<1.00	**0.68 J**	<1.00	<1.0	NA	<0.5	<0.2	<0.2
Vinyl Chloride	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	NA	<0.5	<0.18	<0.18
Xylenes (total)	<1.00	<1.00	<1.00	<2.00	<2.00	<2.0	NA	<0.5	<0.58	<0.58
Semivolatile Organic Compounds (µg/L)										
Acenaphthene	<5.00	<5.00	<5.00	<10.0	<10.0	<10.0	NA	<0.5	<0.296	<0.308
Acenaphthylene	<5.00	<5.00	<5.00	<10.0	<10.0	<10.0	NA	<0.5	<0.324	<0.337
Anthracene	<5.00	<5.00	<5.00	<10.0	<10.0	<10.0	NA	<0.5	<0.352	<0.365
Benzo(a)anthracene	<5.00	<5.00	<5.00	<10.0	<10.0	<10.0	NA	<0.5	<0.296	<0.308
Benzo (b) Fluoranthene	<5.00	<5.00	<5.00	<10.0	<10.0	<10.0	NA	<0.5	<0.333	<0.346
Benzo (k) Fluoranthene	<5.00	<5.00	<5.00	<10.0	<10.0	<10.0	NA	<0.5	<0.343	<0.356
Benzo (a) Pyrene	<5.00	<5.00	<5.00	<10.0	<10.0	<10.0	NA	<0.5	<0.352	<0.365
Benzo (g,h,i) Perylene	<5.00	<5.00	<5.00	<10.0	<10.0	<10.0	NA	<0.5	<0.574	<0.596
bis (2-Chloroethoxy) Methane	<5.00	<5.00	<5.00	<10.0	<10.0	<10.0	NA	<1	<2.87	<1.83
bis (2-Chloroethyl) ether	<5.00	<5.00	<5.00	<10.0	<10.0	<10.0	NA	<1	<2.59	<1.25
bis (2-Ethylhexyl) phthalate	<5.00	<5.00	<5.00	<6.00	<6.00	<6.0	<6.0	<5	<5.56	<1.44
4-Bromophenyl-phenylether	<5.00	<5.00	<5.00	<10.0	<10.0	<10.0	NA	<1	<2.5	<1.54
Butlybenzylphthalate	<5.00	<5.00	<5.00	<10.0	<10.0	<10.0	NA	<5	<2.31	<0.962
Carbazole	<5.00	<5.00	<5.00	<10.0	<10.0	<10.0	NA	<1	<2.59	<0.865
4-Chloroaniline	<5.00	<5.00	<5.00	<20.0	<20.0	<20.0	NA	<4	<3.89	<1.15
4-Chloro-3-methylphenol	<5.00	<5.00	<5.00	<20.0	<20.0	<20.0	NA	<1	<4.17	<1.35
2-Chloronaphthalene	<5.00	<5.00	<5.00	<10.0	<10.0	<10.0	NA	<1	<2.59	<1.44
2-Chlorophenol	<5.00	<5.00	<5.00	<10.0	<10.0	<10.0	NA	<1	<4.44	<1.63
4-Chlorophenyl-phenyl Ether	<5.00	<5.00	<5.00	<10.0	<10.0	<10.0	NA	<1	<2.59	<1.54
Chrysene	<5.00	<5.00	<5.00	<10.0	<10.0	<10.0	NA	<0.5	<0.306	<0.317
Dibenzo (a,h) Anthracene	<5.00	<5.00	<5.00	<10.0	<10.0	<10.0	NA	<0.5	<0.417	<0.433
Dibenzofuran	<5.00	<5.00	<5.00	<10.0	<10.0	<10.0	NA	<1	<2.69	<1.25
3,3'-Dichlorobenzidine	<10.0	<10.0	<10.0	<20.0	<20.0	<20.0	NA	<5	<3.06	<1.44
2,4-Dichlorophenol	<5.00	<5.00	<5.00	<10.0	<10.0	<10.0	NA	<1	<5.19	<2.12
Diethylphthalate	<5.00	<5.00	<5.00	<10.0	<10.0	<10.0	NA	<5	<2.78	<1.15

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Historical Groundwater Sampling Results Summary
Avtex Fibers Superfund Site
Front Royal, Virginia

Parameter	Upgradient Shallow Bedrock Wells (cont.)									
	133 (cont.)									
	10/13/09	5/24/10	6/16/11	6/7/12	6/25/13	8/5/14	12/10/14	7/15/15	7/20/16	7/26/17
SVOCs (cont.)										
2,4-Dimethylphenol	<5.00	<5.00	<5.00	<10.0	<10.0	<10.0	NA	<1	<3.89	<1.54
Dimethylphthalate	<5.00	<5.00	<5.00	<10.0	<10.0	<10.0	NA	<5	<2.87	<1.15
Di-N-Butylphthalate	<5.00	<5.00	<5.00	<10.0	<10.0	<10.0	NA	<5	<2.31	<1.25
Di-n-octylphthalate	<5.00	<5.00	<5.00	<10.0	<10.0	<10.0	NA	<5	<2.31	<0.865
4,6-Dinitro-2-methylphenol	<25.0	<25.0	<25.0	<20.0	<20.0	<20.0	NA	<15	<8.61	<2.79
2,4-Dinitrophenol	<25.0	<25.0	<25.0	<50.0	<50.0	<50.0	NA	<30	<5.46 J	<6.92
2,4-Dinitrotoluene	<5.00	<5.00	<5.00	<10.0	<10.0	<10.0	NA	<5	<2.96	<1.54
2,6-Dinitrotoluene	<5.00	<5.00	<5.00	<10.0	<10.0	<10.0	NA	<1	<2.13	<1.44
Fluoranthene	<5.00	<5.00	<5.00	<10.0	<10.0	<10.0	NA	<0.5	<0.296	<0.308
Fluorene	<5.00	<5.00	<5.00	<10.0	<10.0	<10.0	NA	<0.5	<0.296	<0.308
Hexachlorobenzene	<5.00	<5.00	<5.00	<10.0	<10.0	<10.0	NA	<0.5	<2.59	<1.44
Hexachlorobutadiene	<5.00	<5.00	<5.00	<10.0	<10.0	<10.0	NA	<1	<1.85	<1.44
Hexachlorocyclopentadiene	<5.00	<5.00	<5.00	<10.0	<10.0	<10.0	NA	<15	<1.67	<1.25
Hexachloroethane	<5.00	<5.00	<5.00	<10.0	<10.0	<10.0	NA	<5	<1.76	<2.12
Indeno (1,2,3-cd) Pyrene	<5.00	<5.00	<5.00	<10.0	<10.0	<10.0	NA	<0.5	<0.38	<0.394
Isophorone	<5.00	<5.00	<5.00	<10.0	<10.0	<10.0	NA	<1	<2.87	<2.12
2-Methylnaphthalene	<5.00	<5.00	<5.00	<10.0	<10.0	<10.0	NA	<0.5	<0.37	<0.385
2-Methylphenol	<5.00	<5.00	<5.00	<10.0	<10.0	<10.0	<10.0	<1	<2.13	<1.54
3&4-Methylphenol/4-methylphenol	<5.00	<5.00	<5.00	<10.0	<10.0	<10.0	<10.0	<1	<2.04	<1.35
Naphthalene	<5.00	<5.00	<5.00	<10.0	<10.0	<10.0	<10.0	<0.5	<0.343	<0.356
2-Nitroaniline	<25.0	<25.0	<25.0	<50.0	<50.0	<50.0	NA	<1	<3.43	<1.06
3-Nitroaniline	<25.0	<25.0	<25.0	<50.0	<50.0	<50.0	NA	<1	<2.5	<1.54
4-Nitroaniline	<25.0	<25.0	<25.0 L	<20.0	<20.0	<20.0 J	NA	<1	<2.87	<1.54
4-Nitrophenol	<25.0	<25.0	<25.0	<50.0	<50.0	<50.0	NA	<30	<5	<1.92
2-Nitrophenol	<5.00	<5.00	<5.00	<10.0	<10.0	<10.0	NA	<1	<4.91	<2.31
Nitrobenzene	<5.00	<5.00	<5.00	<10.0	<10.0	<10.0	NA	<1	<2.5	<2.12
N-Nitroso-di-n-propylamine	<5.00	<5.00	<5.00	<10.0	<10.0	<10.0	NA	<1	<3.15	<1.63
N-Nitrosodiphenylamine	<5.00	<5.00	<5.00	<10.0	<10.0	<10.0	NA	<1	<3.33 J	<3.46
2,2'-Oxybis (1-chloropropane)	<5.00	<5.00	<5.00	<10.0	<10.0	<10.0	NA	<1	<2.59	<1.73
Pentachlorophenol	<10.0	<10.0	<10.0	<25.0	<25.0	<25.0	<25.0	<5	<1.57	<3.17
Phenanthrene	<5.00	<5.00	<5.00	<10.0	<10.0	<10.0	NA	<0.5	<0.389	<0.404
Phenol	<5.00	<5.00	<5.00	<10.0	<10.0	<10.0	<10.0	<1	<1.39	<1.44
Pyrene	<5.00	<5.00	<5.00	<10.0	<10.0	<10.0	NA	<0.5	<0.324	<0.337
2,4,5-Trichlorophenol	<5.00	<5.00	<5.00	<10.0	<10.0	<10.0	NA	<1	<6.57	<1.25
2,4,6-Trichlorophenol	<5.00	<5.00	<5.00	<10.0	<10.0	<10.0	NA	<1	<6.3	<1.83
Filtered Inorganics (mg/L)										
Arsenic	**0.0117**	**0.0119**	**0.0113**	**0.0098**	**0.0076**	**0.0113**	**0.0112**	**0.0307**	**0.0278**	**0.00187 J**
Antimony	<0.001	<0.01	<0.005	<0.001	<0.001	<0.001	<0.002	<0.0020	<0.0005	<0.000800
Beryllium	<0.002	<0.002	<0.002	<0.001	<0.001	**0.00017**	NA	**0.00013 J**	<0.001	<0.000100
Cadmium	<0.005	<0.005	<0.005	<0.001	<0.001	<0.0001	<0.0002	<0.0010	<0.0004	<0.000100
Chromium	<0.005	<0.005	<0.005	**0.0019 J**	**0.00056 J**	<0.001	**0.0011 J**	**0.0011 J**	**0.00109 J**	<0.000500
Copper	<0.01	<0.01	<0.02	**0.0011 J**	**0.0017 L**	<0.001	NA	<0.0040	<0.001	<0.0120
Lead	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001	<0.002	<0.0020	<0.0002	<0.000100
Mercury	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	NA	<0.0002	<0.00020	<0.001	<0.000150
Nickel	**0.0268**	**0.0226**	**0.0239**	**0.0077**	**0.0059**	**0.0072**	**0.008**	**0.0184**	**0.0167**	**0.0106**
Selenium	**0.00547**	**0.0102**	**0.00758**	<0.001	<0.001	<0.001	NA	<0.0040	<0.0006	**0.000326 J**
Thallium	<0.0002	<0.0002	<0.001	<0.001	<0.001	<0.001	NA	<0.0010	<0.0005	<0.000800
Vanadium	<0.01	<0.01	<0.01	<0.005	<0.005	<0.001	<0.002	**0.00063 J**	**0.00103 J**	<0.000700
Zinc	<0.02	<0.02	<0.02	**0.0011 K**	**0.0021 B**	**0.0182**	**0.0147**	<0.0300	<0.01	<0.00520
Field Parameters										
pH	6.43	6.12	6.67	6.78	6.54	7.03	7.26	7.25	7.06	6.88
Specific Conductance (mS/cm)	9.217	9.088	8.443	7.251	1.349	5.18	5.077	7.0	6.7444	11.067
Turbidity (ntu)	0.0	3.3	1.8	0.0	15.2	0.0	12.7	8.31	1.23	6.29
Dissolved Oxygen (mg/L)	0.06	1.35	0.04	0.48	0.44	0.10	0.33	0.11	0.02	0.13
Redox Potential (mV)	-105.5	-44.0	-96.7	-105.9	-45.8	-101.82	-115.3	-84.12	-111.5	-90.1
Temperature (^{o}C)	15.50	19.65	15.53	17.61	17.33	22.96	12.47	20.29	19.43	20.91

Notes:
B - Analyte detected in associated method blank.
J - Estimated result
K - Analytical result may be biased high.
L - Analytical result may be biased low.
< - Not detected, value indicates detection limit.
R - Result flagged as unusable due to low response
EPA guidance, but validator notes that response
stable and calibration curve is within specified li
and thus should be considered useable.
[1] - Blind duplicate sample

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Historical Groundwater Sampling Results Summary
Avtex Fibers Superfund Site
Front Royal, Virginia

Parameter	Downgradient Overburden Wells										
	GPW-14										
	3/13/08	9/22/08	3/26/09	10/8/09	5/26/10	6/15/11	5/31/12	6/20/13	7/25/14	7/26/15	7/30/16
Volatile Organic Compounds (µg/L)											
Acetone	<10.0 R	**24.4 K**	**14.1 L**	<10.0 R	<10.0 R	<10.0 R	<25.0	<25.0	<25.0	**31**	<2.66
Benzene	<1.00 L	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5	<0.2
Bromodichloromethane	<1.00 L	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5	<0.17
Bromoform	<1.00 L	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5	<0.29
Bromomethane	<1.00 L	<1.00 J	<1.00	<1.00	<1.00	<1.00	<2.00	<2.00	<2.0	<0.5	<0.35
2-Butanone	<10.0 L	<10.0	<10.0	<10.0	<10.0	<10.0 R	<5.00	<5.00	<5.0	**110**	<2.64
Carbon Disulfide	<1.00 L	<1.00	<1.00	<1.00	<1.00	<1.00	<2.00	<2.00	<2.0	**0.4 J**	<0.22
Carbon Tetrachloride	<1.00 L	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5	<0.18
Chlorobenzene	<1.00 L	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5	<0.18
Chlorodibromomethane	<1.00 L	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5	<0.25
Chloroethane	<1.00 L	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5	<0.36
Chloroform	<1.00 L	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5	<0.23
Chloromethane	<1.00 L	<1.00	<1.00	<1.00 J	<1.00	<1.00	<1.00 J	<1.00	<1.0	<0.5	<0.36
1,2-Dichlorobenzene	<1.00	<1.00 L	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5	<0.19
1,3-Dichlorobenzene	<1.00	<1.00 L	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5	<0.18
1,4-Dichlorobenzene	<1.00	<1.00 L	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5	<0.17
1,1-Dichloroethane	<1.00 L	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5	<0.24
1,2-Dichloroethane	<1.00 L	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5	<0.2
1,1-Dichloroethene	<1.00 L	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5	<0.25
cis-1,2-Dichloroethene	<1.00 L	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5	<0.21
trans-1,2-Dichloroethene	<1.00 L	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5	<0.23
1,2-Dichloropropane	<1.00 L	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5	<0.25
cis-1,3-Dichloropropene	<1.00 L	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5	<0.17
trans-1,3-Dichloropropene	<1.00 L	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5	<0.17
Ethylbenzene	<1.00 L	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	**0.2 J**	<0.19
2-Hexanone	<10.0 L	<10.0	<10.0	<10.0	<10.0	<10.0	<5.00	<5.00	<5.0	**15**	<1.28
4-Methyl-2-Pentanone	<10.0 R	<10.0	<10.0 R	<10.0	<10.0 R	<10.0	<5.00	<5.00	<5.0	<5.0	<0.81
Methylene Chloride	<1.00 L	<1.00	<1.00	<1.00	<1.00	<1.00	<2.00	<2.00	<2.0	<0.5	<1
Styrene	<1.00 L	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5	<0.28
1,1,2,2-Tetrachloroethane	<0.50 L	<0.50	<0.50	<0.50	<0.50	<0.500	<1.00	<1.00	<1.0	<0.5	<0.19
Tetrachloroethene	<1.00 L	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5	<0.14
Toluene	<1.00 L	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	**0.75 J**	<1.0	**0.2 J**	<0.17
1,2,4-Trichlorobenzene	<1.00	<1.00 L	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5	<0.2
1,1,1-Trichloroethane	<1.00 L	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5	<0.19
1,1,2-Trichloroethane	<1.00 L	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5	<0.19
Trichloroethene	<1.00 L	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5	<0.2
Vinyl Chloride	<1.00 L	<1.00	<1.00	<1.00	<1.00	<1.00	**4.2**	<1.00	<1.0	<0.5	<0.18
Xylenes (total)	<1.00 L	<1.00	<1.00	<1.00	<1.00	<1.00	<2.00	<2.00	<2.0	**1.5**	<0.58
Semivolatile Organic Compounds (µg/L)											
Acenaphthene	<5.26	<5.00 L	<10.0	<5.00	<5.26	<5.00	<10.0	<10.0	<10.0	<0.5	<0.327
Acenaphthylene	<5.26	<5.00 L	<10.0	<5.00	<5.26	<5.00	<10.0	<10.0	<10.0	<0.5	<0.357
Anthracene	<5.26	<5.00 L	<10.0	<5.00	<5.26	<5.00	<10.0	<10.0	<10.0	<0.5	<0.388
Benzo(a)anthracene	<5.26	<5.00 L	<10.0	<5.00	<5.26	<5.00	**4.2 J**	<10.0	<10.0	<0.5	<0.327
Benzo (b) Fluoranthene	<5.26	<5.00 L	<10.0	<5.00	<5.26	<5.00	**2.3 J**	<10.0	<10.0	<0.5	<0.367
Benzo (k) Fluoranthene	<5.26	<5.00 L	<10.0	<5.00	<5.26	<5.00	**2.4 J**	<10.0	<10.0	<0.5	<0.378
Benzo (a) Pyrene	<5.26	<5.00 L	<10.0	<5.00	<5.26	<5.00	**2.0 J**	<10.0	<10.0	<0.5	<0.388
Benzo (g,h,i) Perylene	<5.26	<5.00 L	<10.0	<5.00	<5.26	<5.00	**1.7 J**	<10.0	<10.0	<0.5	<0.633
bis (2-Chloroethoxy) Methane	<5.26	<5.00 L	<10.0	<5.00	<5.26	<5.00 L	<10.0	<10.0	<10.0	<1	<3.16
bis (2-Chloroethyl) ether	<5.26	<5.00 L	<10.0	<5.00	<5.26	<5.00 L	<10.0	<10.0	<10.0	<1	<2.86
bis (2-Ethylhexyl) phthalate	<5.26	<5.00 L	<10.0	<5.00	**5.53**	**456 L**	**3.3 J**	<6.0	<6.0	<5	<6.12
4-Bromophenyl-phenylether	<5.26	<5.00	<10.0	<5.00	<5.26	<5.00 L	<10.0	<10.0	<10.0	<1	<2.76
Butlybenzylphthalate	<5.26	<5.00 L	<10.0	<5.00	<5.26	<5.00 L	**3.2 J**	<10.0	<10.0	<5	<2.55
Carbazole	<5.26	<5.00 L	<10.0	<5.00	<5.26	<5.00 L	**2.0 J**	<10.0	<10.0	<1	<2.86
4-Chloroaniline	<5.26	<5.00 L	<10.0	<5.00	<5.26	<5.00 L	<20.0	<20.0	<20.0	<4	<4.29
4-Chloro-3-methylphenol	<5.26	<5.00	<10.0	<5.00	<5.26	<5.00	<20.0	<20.0	<20.0	<1	<4.59
2-Chloronaphthalene	<5.26	<5.00 L	<10.0	<5.00	<5.26	<5.00 L	<10.0	<10.0	<10.0	<1	<2.86
2-Chlorophenol	<5.26	<5.00	<10.0	<5.00	<5.26	<5.00	<10.0	<10.0	<10.0	<1	<4.9
4-Chlorophenyl-phenyl Ether	<5.26	<5.00 L	<10.0	<5.00	<5.26	<5.00 L	<10.0	<10.0	<10.0	<1	<2.86
Chrysene	<5.26	<5.00 L	<10.0	<5.00	<5.26	<5.00	**4.6 J**	<10.0	<10.0	<0.5	<0.337
Dibenzo (a,h) Anthracene	<5.26	<5.00 L	<10.0	<5.00	<5.26	<5.00	**1.6 J**	<10.0	<10.0	<0.5	<0.459
Dibenzofuran	<5.26	<5.00 L	<10.0	<5.00	<5.26	<5.00 L	<10.0	<10.0	<10.0	<1	<2.96
3,3'-Dichlorobenzidine	<10.5	<10.0 L	<20.0	<10.0	<10.5	<10.0 L	**3.7 J**	<20.0	<20.0	<5	<3.37
2,4-Dichlorophenol	<5.26	<5.00	<10.0	<5.00	<5.26	<5.00	<10.0	<10.0	<10.0	<1	<5.71
Diethylphthalate	<5.26	<5.00 L	<10.0	<5.00	<5.26	<5.00 L	<10.0	<10.0	<10.0	**7**	<3.06

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Historical Groundwater Sampling Results Summary
Avtex Fibers Superfund Site
Front Royal, Virginia

Parameter	Downgradient Overburden Wells										
	GPW-14										
	3/13/08	9/22/08	3/26/09	10/8/09	5/26/10	6/15/11	5/31/12	6/20/13	7/25/14	7/26/15	7/30/16
SVOCs (cont.)											
2,4-Dimethylphenol	<5.26	<5.00	<10.0	<5.00	<5.26	<5.00	<10.0	<10.0	<10.0	<1	<4.29
Dimethylphthalate	<5.26	<5.00 L	<10.0	<5.00	<5.26	<5.00 L	<10.0	<10.0	<10.0	<5	<3.16
Di-N-Butylphthalate	<5.26	<5.00 L	<10.0	<5.00	<5.26	<5.00 L	<10.0	<10.0	<10.0	<5	<2.55
Di-n-octylphthalate	<5.26	<5.00 L	<10.0	<5.00	<5.26	<5.00 L	**3.1 J**	<10.0	<10.0	<5	<2.55
4,6-Dinitro-2-methylphenol	<26.3	<25.0	<50.0	<25.0	<26.3	<25.0	<20.0	<20.0	<20.0	<15	<9.49
2,4-Dinitrophenol	<26.3	<25.0	<50.0	<25.0	<26.3 J	<25.0	<50.0	<50.0	<50.0	<30	<6.02
2,4-Dinitrotoluene	<5.26	<5.00 L	<10.0	<5.00	<5.26	<5.00 L	<10.0	<10.0	<10.0	<5	<3.27
2,6-Dinitrotoluene	<5.26	<5.00 L	<10.0	<5.00	<5.26	<5.00 L	<10.0	<10.0	<10.0	<1	<2.35
Fluoranthene	<5.26	<5.00 L	<10.0	<5.00	<5.26	<5.00	**1.9 J**	<10.0	<10.0	<0.5	<0.327
Fluorene	<5.26	<5.00 L	<10.0	<5.00	<5.26	<5.00	<10.0	<10.0	<10.0	<0.5	<0.327
Hexachlorobenzene	<5.26	<5.00 L	<10.0	<5.00	<5.26	<5.00 L	<10.0	<10.0	<10.0	<0.5	<2.86
Hexachlorobutadiene	<5.26	<5.00 L	<10.0	<5.00	<5.26	<5.00 L	<10.0	<10.0	<10.0	<1	<2.04
Hexachlorocyclopentadiene	<5.26	<5.00 L	<10.0	<5.00	<5.26	<5.00 L	<10.0	<10.0	<10.0	<15	<1.84
Hexachloroethane	<5.26	<5.00 L	<10.0	<5.00	<5.26	<5.00 L	<10.0	<10.0	<10.0	<5	<1.94
Indeno (1,2,3-cd) Pyrene	<5.26	<5.00 L	<10.0	<5.00	<5.26	<5.00	**1.8 J**	<10.0	<10.0	<0.5	<0.418
Isophorone	<5.26	<5.00 L	<10.0	<5.00	<5.26	<5.00 L	<10.0	<10.0	<10.0	<1	<3.16
2-Methylnaphthalene	<5.26	<5.00 L	<10.0	<5.00	<5.26	<5.00 L	<10.0	<10.0	<10.0	<0.5	<0.408
2-Methylphenol	<5.26	<5.00	<10.0	<5.00	<5.26	<5.00	<10.0	<10.0	<10.0	<1	<2.35
3&4-Methylphenol/4-methylphenol	<5.26	<5.00	<10.0	<5.00	<5.26	<5.00	<10.0	<10.0	<10.0	<1	<2.24
Naphthalene	<5.26	<5.00 L	<10.0	<5.00	<5.26	<5.00	<10.0	<10.0	<10.0	**0.2 J**	<0.378
2-Nitroaniline	<26.3	<25.0 L	<50.0	<25.0	<26.3	<25.0 L	<50.0	<50.0	<50.0	<1	<3.78
3-Nitroaniline	<26.3	<25.0 L	<50.0	<25.0	<26.3	<25.0 L	<50.0	<50.0	<50.0	<1	<2.76
4-Nitroaniline	<26.3	<25.0 L	<50.0	<25.0	<26.3	<25.0 L	<20.0	<20.0	<20.0	<1	<3.16
4-Nitrophenol	<26.3	<25.0	<50.0	<25.0	<26.3	<25.0	**8.6 J**	<50.0	<50.0	<30	<5.51
2-Nitrophenol	<5.26	<5.00	<10.0	<5.00	<5.26	<5.00	<10.0	<10.0	<10.0	<1	<5.41
Nitrobenzene	<5.26	<5.00 L	<10.0	<5.00	<5.26	<5.00	<10.0	<10.0	<10.0	<1	<2.76
N-Nitroso-di-n-propylamine	<5.26	<5.00 L	<10.0	<5.00	<5.26	<5.00 L	<10.0	<10.0	<10.0	<1	<3.47
N-Nitrosodiphenylamine	<5.26	<5.00 L	<10.0	<5.00	<5.26	<5.00 L	<10.0	<10.0	<10.0	<1	<3.67
2,2'-Oxybis (1-chloropropane)	<5.26	<5.00 L	<10.0	<5.00	<5.26	<5.00 L	<10.0	<10.0	<10.0	<1	<2.86
Pentachlorophenol	<10.5	<10.0	<20.0	<10.0	<10.5	<10.0	**4.7 J**	<25.0	<25.0	<5	<1.73
Phenanthrene	<5.26	<5.00 L	<10.0	<5.00	<5.26	<5.00	<10.0	<10.0	<10.0	<0.5	<0.429
Phenol	<5.26	<5.00	<10.0	<5.00	<5.26	<5.00	<10.0	<10.0	<10.0	<1	<1.53
Pyrene	<5.26	<5.00 L	<10.0	<5.00	<5.26	<5.00	**2.4 J**	<10.0	<10.0	<0.5	<0.357
2,4,5-Trichlorophenol	<5.26	<5.00	<10.0	<5.00	<5.26	<5.00	<10.0	<10.0	<10.0	<1	<7.24
2,4,6-Trichlorophenol	<5.26	<5.00	<10.0	<5.00	<5.26	<5.00	<10.0	<10.0	<10.0	<1	<6.94
Filtered Inorganics (mg/L)											
Arsenic	**0.012 J**	**0.02670**	**0.094**	**0.093**	**0.0137**	**0.00787**	**0.00059 J**	**0.0024**	**0.0037**	**0.0078**	<0.01
Antimony	**0.000729 J**	<0.001	**0.00173**	<0.02	**0.00167**	<0.005	**0.00052 J**	**0.00055 J**	<0.005	<0.0020	<0.0132
Beryllium	**0.00106 J**	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.001	**0.00012**	<0.0010	<0.02
Cadmium	<0.005 J	<0.005	<0.005	<0.005	<0.005	<0.005	<0.001	<0.001	**0.00011**	**0.00027 J**	<0.008
Chromium	<0.005 J	<0.005	<0.005	**0.00748**	<0.005	<0.005	<0.005	**0.0034 J**	<0.001	**0.00084 J**	<0.01
Copper	**0.0121 J**	<0.02	<0.01	**0.0105**	<0.01	<0.02	**0.0015 J**	**0.0069 L**	<0.001	<0.0040	<0.02
Lead	**0.000436 J**	<0.001	**0.00196**	<0.02	**0.00165**	<0.005	<0.001	<0.001	<0.005	<0.0100	<0.004
Mercury	<0.0002 J	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.00020	<0.0001
Nickel	**0.131 J**	**0.0618**	**0.122**	**0.108**	**0.142**	**0.0889**	**0.0013**	**0.0276**	**0.0457**	**0.0457**	<0.042
Selenium	**0.036 J**	**0.044**	**0.0371**	**0.0258**	**0.0270**	**0.0168**	<0.001	**0.0012**	**0.0014**	**0.0025 J**	<0.012
Thallium	**0.000063 J**	<0.0002	<0.0002	<0.004	<0.0002	<0.001	<0.001	<0.001	<0.005	<0.0050	**0.0128 J**
Vanadium	**0.0221 J**	<0.01	**0.0183**	<0.01	<0.01	<0.01	<0.005	<0.005	**0.0022**	**0.0017**	<0.014
Zinc	**0.00603 J**	**0.024**	**0.0217**	**0.0245**	<0.02	**0.0284**	**0.0013 J**	**0.0081 J**	<0.005	<0.0300	<0.2
Field Parameters											
pH	6.56	6.67	6.81	---	6.85	6.64	6.66	6.57	6.77	6.80	5.78
Specific Conductance (mS/cm)	26.20	28.01	25.99	---	26.576	16.82	20.90	15.14	15.53	17.2	1.3648
Turbidity (ntu)	264.8	123.7	1107.3	---	1211.5	1170	1477.2	1482.6	110.00	34.2	148.47
Dissolved Oxygen (mg/L)	3.86	2.37	23.5	---	3.89	3.70	2.35	3.26	0.31	0.46	4.19
Redox Potential (mV)	-53.8	-80.9	-56.8	---	-27.1	56.5	21.6	-60.4	-3.34	78.9	140.2
Temperature (^{o}C)	10.18	19.33	9.52	---	15.78	15.37	16.12	15.94	24.08	24.51	23.09

Notes:
B - Analyte detected in associated method blank.
J - Estimated result
K - Analytical result may be biased high.
L - Analytical result may be biased low.
< - Not detected, value indicates detection limit.
R - Result flagged as unusable due to low response
EPA guidance, but validator notes that response
stable and calibration curve is within specified li
and thus should be considered useable.
[1] - Blind duplicate sample

OU-10 VB 1 - 8
Historical Groundwater Sampling Results Summary
Avtex Fibers Superfund Site
Front Royal, Virginia

Parameter	Downgradient Overburden Wells (cont.)										
	GPW-14 (cont.)	GPW-15R									
	7/27/17 & 1/13/18	3/18/09	10/8/09	5/25/10	6/20/11	6/5/12	6/19/13	7/27/14	7/25/15	8/1/16	7/29/17
Volatile Organic Compounds (µg/L)											
Acetone	<7.92	<10.0 R	<10.0 R	<10.0 R	<10.0 R	<25.0	<25.0	<25.0	<5.0	<2.66	R
Benzene	<0.2	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5	<0.2	<0.2
Bromodichloromethane	<0.17	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5	<0.17	<0.17
Bromoform	<0.29	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5	<0.29	<0.29
Bromomethane	<0.35	<1.00	<1.00	<1.00	<1.00	<2.00	<2.00	<2.0	<0.5	<0.35	<0.35
2-Butanone	<2.64	<10.0	<10.0	<10.0	<10.0	<5.00	<5.00	<5.0	<5.0	<2.64	<2.64
Carbon Disulfide	<0.22	<1.00	<1.00	<1.00	<1.00	<2.00	<2.00	<2.0	<1.0	<0.22	<0.22
Carbon Tetrachloride	<0.18	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5	<0.18	<0.18
Chlorobenzene	<0.18	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5	<0.18	<0.18
Chlorodibromomethane	<0.25	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5	<0.25	<0.25
Chloroethane	<0.36	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5	<0.36	<0.36
Chloroform	<0.23	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5	<0.23	<0.23
Chloromethane	<0.36	<1.00	<1.00	<1.00	<1.00	<1.00 J	<1.00	<1.0	<0.5	<0.36	<0.36
1,2-Dichlorobenzene	<0.19	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5	<0.19	<0.19
1,3-Dichlorobenzene	<0.18	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5	<0.18	<0.18
1,4-Dichlorobenzene	<0.17	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5	<0.17	<0.17
1,1-Dichloroethane	<0.24	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5	<0.24	<0.24
1,2-Dichloroethane	<0.2	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5	<0.2	<0.2
1,1-Dichloroethene	<0.25	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5	<0.25	<0.25
cis-1,2-Dichloroethene	<0.21	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5	<0.21	<0.21
trans-1,2-Dichloroethene	<0.23	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5	<0.23	<0.23
1,2-Dichloropropane	<0.25	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5	<0.25	<0.25
cis-1,3-Dichloropropene	<0.17	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5	<0.17	<0.17
trans-1,3-Dichloropropene	<0.17	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5	<0.17	<0.17
Ethylbenzene	<0.19	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5	<0.19	<0.19
2-Hexanone	<1.28	<10.0	<10.0	<10.0	<10.0	<5.00	<5.00	<5.0	<5.0	<1.28	<1.28
4-Methyl-2-Pentanone	<0.81	<10.0 R	<10.0	<10.0 R	<10.0	<5.00	<5.00	<5.0	<5.0	<0.81	<0.81
Methylene Chloride	<1	<1.00	<1.00	<1.00	<1.00	<2.00	<2.00	<2.0	<0.5	<1	<1
Styrene	<0.28	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5	<0.28	<0.28
1,1,2,2-Tetrachloroethane	<0.19	<0.50	<0.500	<0.500	<0.500	<1.00	<1.00	<1.0	<0.5	<0.19	<0.19
Tetrachloroethene	<0.14	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5	<0.14	<0.14
Toluene	<0.17	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5	<0.17	<0.17
1,2,4-Trichlorobenzene	<0.2	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5	<0.2	<0.2
1,1,1-Trichloroethane	<0.19	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5	<0.19	<0.19
1,1,2-Trichloroethane	<0.19	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5	<0.19	<0.19
Trichloroethene	<0.2	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5	<0.2	<0.2
Vinyl Chloride	<0.18	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5	<0.18	<0.18
Xylenes (total)	<0.58	<1.00	<1.00	<1.00	<1.00	<2.00	<2.00	<2.0	<0.5	<0.58	<0.58
Semivolatile Organic Compounds (µg/L)											
Acenaphthene	<0.308	<5.26	<5.00	<5.21	<5.26	<10.0	<10.0	<10.0	<0.5	<0.314	<0.296
Acenaphthylene	<0.337	<5.26	<5.00	<5.21	<5.26	<10.0	<10.0	<10.0	<0.5	<0.343	<0.324
Anthracene	<0.365	<5.26	<5.00	<5.21	<5.26	<10.0	<10.0	<10.0	<0.5	<0.373	<0.352
Benzo(a)anthracene	<0.308	<5.26	<5.00	<5.21	<5.26	**3.3 J**	<10.0	<10.0	<0.5	<0.314	<0.296
Benzo (b) Fluoranthene	<0.346	<5.26	<5.00	<5.21	<5.26	**2.3 J**	<10.0	<10.0	<0.5	<0.353	<0.333
Benzo (k) Fluoranthene	<0.356	<5.26	<5.00	<5.21	<5.26	**2.5 J**	<10.0	<10.0	<0.5	<0.363	<0.343
Benzo (a) Pyrene	<0.365	<5.26	<5.00	<5.21	<5.26	**2.1 J**	<10.0	<10.0	<0.5	<0.373	<0.352
Benzo (g,h,i) Perylene	<0.596	<5.26	<5.00	<5.21	<5.26	**1.8 J**	**1.1 B**	<10.0	<0.5	<0.608	<0.574
bis (2-Chloroethoxy) Methane	<1.83	<5.26	<5.00	<5.21	<5.26	<10.0	<10.0	<10.0	<1	<3.04	<1.76
bis (2-Chloroethyl) ether	<1.25	<5.26	<5.00	<5.21	<5.26	<10.0	<10.0	<10.0	<1	<2.75	<1.2
bis (2-Ethylhexyl) phthalate	<1.44	<5.26	<5.00	<5.21	<5.26	**2.1 J**	<6.0	<6.0	<5	<5.88	<1.67
4-Bromophenyl-phenylether	<1.54	<5.26	<5.00	<5.21	<5.26	<10.0	<10.0	<10.0	<1	<2.65	<1.48
Butlybenzylphthalate	<0.962	<5.26	<5.00	<5.21	<5.26	**1.7 J**	<10.0	<10.0	<5	<2.45	<0.926
Carbazole	<0.865	<5.26	<5.00	<5.21	<5.26	**1.3 J**	<10.0	<10.0	<1	<2.75	<0.833
4-Chloroaniline	<1.15	<5.26	<5.00	<5.21	<5.26	<20.0	<20.0	<20.0	<4	<4.12	<1.11
4-Chloro-3-methylphenol	<1.35	<5.26	<5.00	<5.21	<5.26	<20.0	<20.0	<20.0	<1	<4.41	<1.3
2-Chloronaphthalene	<1.44	<5.26	<5.00	<5.21	<5.26	<10.0	<10.0	<10.0	<1	<2.75	<1.39
2-Chlorophenol	<1.63	<5.26	<5.00	<5.21	<5.26	<10.0	<10.0	<10.0	<1	<4.71	<1.57
4-Chlorophenyl-phenyl Ether	<1.54	<5.26	<5.00	<5.21	<5.26	<10.0	<10.0	<10.0	<1	<2.75	<1.48
Chrysene	<0.317	<5.26	<5.00	<5.21	<5.26	**3.9 J**	<10.0	<10.0	<0.5	<0.324	<0.306
Dibenzo (a,h) Anthracene	<0.433	<5.26	<5.00	<5.21	<5.26	**1.7 J**	**1.0 B**	<10.0	<0.5	<0.441	<0.417
Dibenzofuran	<1.25	<5.26	<5.00	<5.21	<5.26	<10.0	<10.0	<10.0	<1	<2.84	<1.2
3,3'-Dichlorobenzidine	<1.44	<10.5	<10.0	<10.4	<10.5	**3.9 J**	<20.0	<20.0	<5	<3.24	<1.39
2,4-Dichlorophenol	<2.12	<5.26	<5.00	<5.21	<5.26	<10.0	<10.0	<10.0	<1	<5.49	<2.04
Diethylphthalate	<1.15	<5.26	<5.00	<5.21	<5.26	<10.0	<10.0	2.5 J	<5	<2.94	<1.11

OU-10 VB 1 - 8
Historical Groundwater Sampling Results Summary
Avtex Fibers Superfund Site
Front Royal, Virginia

Parameter	Downgradient Overburden Wells (cont.)										
	GPW-14 (cont.)	GPW-15R									
	7/27/17 & 1/13/18	3/18/09	10/8/09	5/25/10	6/20/11	6/5/12	6/19/13	7/27/14	7/25/15	8/1/16	7/29/17
SVOCs (cont.)											
2,4-Dimethylphenol	<1.54	<5.26	<5.00	<5.21	<5.26	<10.0	<10.0	<10.0	<1	<4.12	<1.48
Dimethylphthalate	<1.15	<5.26	<5.00	<5.21	<5.26	<10.0	<10.0	<10.0	<5	<3.04	<1.11
Di-N-Butylphthalate	<1.25	<5.26	<5.00	<5.21	<5.26	<10.0	<10.0	<10.0	<5	<2.45	<1.2
Di-n-octylphthalate	<0.865	<5.26	<5.00	<5.21	<5.26	<10.0	<10.0	<10.0	<5	<2.45	<0.833
4,6-Dinitro-2-methylphenol	<2.79	<26.3	<25.0	<26.0	<26.3	<20.0	<20.0	<20.0	<15	<9.12	<2.69
2,4-Dinitrophenol	<6.92	<26.3	<25.0	<26.0	<26.3	<50.0	<50.0	<50.0	<30	<5.78	<6.67
2,4-Dinitrotoluene	<1.54	<5.26	<5.00	<5.21	<5.26	<10.0	<10.0	<10.0	<5	<3.14	<1.48
2,6-Dinitrotoluene	<1.44	<5.26	<5.00	<5.21	<5.26	<10.0	<10.0	<10.0	<1	<2.25	<1.39
Fluoranthene	<0.308	<5.26	<5.00	<5.21	<5.26	**1.4 J**	<10.0	<10.0	<0.5	<0.314	<0.296
Fluorene	<0.308	<5.26	<5.00	<5.21	<5.26	<10.0	<10.0	<10.0	<0.5	<0.314	<0.296
Hexachlorobenzene	<1.44	<5.26	<5.00	<5.21	<5.26	<10.0	<10.0	<10.0	<0.5	<2.75	<1.39
Hexachlorobutadiene	<1.44	<5.26	<5.00	<5.21	<5.26	<10.0	<10.0	<10.0	<1	<1.96	<1.39
Hexachlorocyclopentadiene	<1.25	<5.26	<5.00	<5.21	<5.26	<10.0	<10.0	<10.0	<15	<1.76	R
Hexachloroethane	<2.12	<5.26	<5.00	<5.21	<5.26	<10.0	<10.0	<10.0	<5	<1.86	<2.04
Indeno (1,2,3-cd) Pyrene	<0.394	<5.26	<5.00	<5.21	<5.26	**1.7 J**	**1.1 B**	<10.0	<0.5	<0.402	<0.38
Isophorone	<2.12	<5.26	<5.00	<5.21	<5.26	<10.0	<10.0	<10.0	<1	<3.04	<2.04
2-Methylnaphthalene	<0.385	<5.26	<5.00	<5.21	<5.26	<10.0	<10.0	<10.0	<0.5	<0.392	<0.37
2-Methylphenol	<1.54	<5.26	<5.00	<5.21	<5.26	<10.0	<10.0	<10.0	<1	<2.25	<1.48
3&4-Methylphenol/4-methylphenol	<1.35	<5.26	<5.00	<5.21	<5.26	<10.0	<10.0	<10.0	<1	<2.16	<1.3
Naphthalene	<0.356	<5.26	<5.00	<5.21	<5.26	<10.0	<10.0	<10.0	<0.5	<0.363	<0.343
2-Nitroaniline	<1.06	<26.3	<25.0	<26.0	<26.3	<50.0	<50.0	<50.0	<1	<3.63	<1.02
3-Nitroaniline	<1.54	<26.3	<25.0	<26.0	<26.3	<50.0	<50.0	<50.0	<1	<2.65	<1.48
4-Nitroaniline	<1.54	<26.3	<25.0	<26.0	<26.3	<20.0	<20.0	<20.0	<1	<3.04	<1.48
4-Nitrophenol	<1.92	<26.3	<25.0	<26.0	<26.3	<50.0	<50.0	<50.0	<30	<5.29	<1.85
2-Nitrophenol	<2.31	<5.26	<5.00	<5.21	<5.26	<10.0	<10.0	<10.0	<1	<5.2	<2.22
Nitrobenzene	<2.12	<5.26	<5.00	<5.21	<5.26	<10.0	<10.0	<10.0	<1	<2.65	<2.04
N-Nitroso-di-n-propylamine	<1.63	<5.26	<5.00	<5.21	<5.26	<10.0	<10.0	<10.0	<1	<3.33	<1.57
N-Nitrosodiphenylamine	<3.46	<5.25	<5.00	<5.21	<5.26	<10.0	<10.0	<10.0	<1	<3.53	<3.33
2,2'-Oxybis (1-chloropropane)	<1.73	<5.26	<5.00	<5.21	<5.26 J	<10.0	<10.0	<10.0	<1	<2.75	<1.67
Pentachlorophenol	<3.17	<10.5	<10.0	<10.4	<10.5	<25.0	<25.0	<25.0	<5	<1.67	<3.06
Phenanthrene	<0.404	<5.26	<5.00	<5.21	<5.26	<10.0	<10.0	<10.0	<0.5	<0.412	<0.389
Phenol	<1.44	<5.26	<5.00	<5.21	<5.26	<10.0	<10.0	<10.0	<1	<1.47	<1.39
Pyrene	<0.337	<5.26	<5.00	<5.21	<5.26	**1.8 J**	<10.0	<10.0	<0.5	<0.343	<0.324
2,4,5-Trichlorophenol	<1.25	<5.26	<5.00	<5.21	<5.26	<10.0	<10.0	<10.0	<1	<6.96	<1.2
2,4,6-Trichlorophenol	<1.83	<5.26	<5.00	<5.21	<5.26	<10.0	<10.0	<10.0	<1	<6.67	<1.76
Filtered Inorganics (mg/L)											
Arsenic	**0.00208**	<0.001	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	**0.00059 J**	**0.000559 J**	<0.000400
Antimony	**0.00109 J**	<0.001	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0020	<0.0005	<0.000800
Beryllium	<0.000100	<0.002	<0.002	<0.002	<0.002	<0.001	<0.001 L	<0.0001	<0.0010	<0.001	<0.000100
Cadmium	**0.000176 J**	<0.005	<0.005	<0.005	<0.005	<0.001	<0.001 L	<0.0001	<0.0010	<0.0004	<0.000100
Chromium	**0.000658 J**	<0.005	<0.005	<0.005	<0.005	<0.005	**0.00042 L**	<0.001	<0.0040	<0.0005	<0.000500
Copper	**0.00908**	**0.0203**	<0.01	<0.01	<0.01	**0.0012 J**	**0.00089 L**	<0.001	<0.0040	<0.00321	**0.00134 J**
Lead	<0.000100	<0.001	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0020	<0.0002	**0.000650 J**
Mercury	<0.000100	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.00020	<0.0001	<0.000100
Nickel	**0.0532**	**0.00496**	<0.02	<0.004	<0.004	**0.0014**	**0.00071 J**	**0.001**	<0.0040	<0.00157	**0.00101 J**
Selenium	**0.00158 J**	**0.00128**	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0040	<0.0006	<0.000300
Thallium	<0.000800	<0.0002	<0.001	<0.0002	<0.0002	<0.001	<0.001	<0.001	<0.0010	<0.0005	<0.000800
Vanadium	**0.00204**	<0.01	<0.01	<0.01	<0.01	<0.005	<0.005 L	<0.001	<0.0010	<0.002	<0.000700
Zinc	**0.00940 J**	<0.02	<0.02	<0.02	<0.02	**0.0015 J**	**0.005 J**	<0.005	**0.0180 J**	<0.0132	**0.0519**
Field Parameters											
pH	6.58 (6.99)	6.32	6.38	6.00	6.29	6.39	6.29	6.53	6.70	6.58	6.34
Specific Conductance (mS/cm)	18.555 (11.380)	1.034	0.983	1.010	0.907	0.971	0.949	0.84	0.8	0.80141	0.79325
Turbidity (ntu)	176 (13.8)	6.3	4.7	0.0	0.0	5.0	0.0	1.69	50.3	24.35	5.87
Dissolved Oxygen (mg/L)	6.24 (5.41)	1.74	0.5	1.04	0.33	0.55	0.60	0.65	0.58	3.05	1.63
Redox Potential (mV)	79.2 (-16.4)	108.9	55.0	182.5	211.3	-77.6	146.4	98.64	251.6	66.1	106.3
Temperature (^{o}C)	21.66 (1.53)	16.04	16.70	18.01	17.73	13.88	13.48	21.31	23.76	20.32	17.82

Notes:
B - Analyte detected in associated method blank.
J - Estimated result
K - Analytical result may be biased high.
L - Analytical result may be biased low.
< - Not detected, value indicates detection limit.
R - Result flagged as unusable due to low response
EPA guidance, but validator notes that response
stable and calibration curve is within specified li
and thus should be considered useable.
[1] - Blind duplicate sample

OU-10 VB 1 - 8
Historical Groundwater Sampling Results Summary
Avtex Fibers Superfund Site
Front Royal, Virginia

Parameter	Downgradient Overburden Wells (cont.)										
	MW-11										
	3/12/08	9/16/08	3/24/09	10/6/09	5/20/10	6/21/11	6/5/12	6/18/13	7/26/14	7/26/15	8/11/16
Volatile Organic Compounds (µg/L)											
Acetone	<10.0 R	<10.0 R	<10.0 R	<10.0 R	<10.0 R	<10.0 R	<25.0	<25.0	<25.0	**3.4 J**	<2.66
Benzene	**0.135 J**	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	**0.2 J**	<0.2
Bromodichloromethane	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5	<0.17
Bromoform	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5	<0.29
Bromomethane	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<2.00	<2.00	<2.0	<0.5	<0.35
2-Butanone	<10.0	<10.0 R	<10.0	<10.0	<10.0	<10.0	<5.00	<5.00	<5.0	<5.0	<2.64
Carbon Disulfide	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<2.00	<2.00	<2.0	<1.0	<0.22
Carbon Tetrachloride	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5	<0.18
Chlorobenzene	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5	<0.18
Chlorodibromomethane	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5	<0.25
Chloroethane	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5	<0.36
Chloroform	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5	<0.23
Chloromethane	<1.00 J	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00 J	<1.00	<1.0	<0.5	<0.36
1,2-Dichlorobenzene	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5	<0.19
1,3-Dichlorobenzene	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5	<0.18
1,4-Dichlorobenzene	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5	<0.17
1,1-Dichloroethane	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5	<0.24
1,2-Dichloroethane	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5	<0.2
1,1-Dichloroethene	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5	<0.25
cis-1,2-Dichloroethene	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5	<0.21
trans-1,2-Dichloroethene	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5	<0.23
1,2-Dichloropropane	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5	<0.25
cis-1,3-Dichloropropene	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5	<0.17
trans-1,3-Dichloropropene	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5	<0.17
Ethylbenzene	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5	<0.19
2-Hexanone	<10.0	<10.0 R	<10.0	<10.0	<10.0	<10.0	<5.00	<5.00	<5.0	<5.0	<1.28
4-Methyl-2-Pentanone	<10.00	<10.0 R	<10.0 R	<10.0	<10.0 R	<10.0	<5.00	<5.00	<5.0	<5.0	<0.81
Methylene Chloride	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<2.00	<2.00	<2.0	<0.5	<1
Styrene	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5	<0.28
1,1,2,2-Tetrachloroethane	<0.50	<0.50	<0.50	<0.50	<0.50	<0.500	<1.00	<1.00	<1.0	<0.5	<0.19
Tetrachloroethene	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5	<0.14
Toluene	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5	<0.17
1,2,4-Trichlorobenzene	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5	<0.2
1,1,1-Trichloroethane	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5	<0.19
1,1,2-Trichloroethane	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5	<0.19
Trichloroethene	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5	<0.2
Vinyl Chloride	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5	<0.18
Xylenes (total)	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<2.00	<2.00	<2.0	<0.5	<0.58
Semivolatile Organic Compounds (µg/L)											
Acenaphthene	<5.15	<5.26	<5.00	<5.10	<5.15	<5.10	<10.0	<10.0	<10.0	<0.5	<0.308
Acenaphthylene	<5.15	<5.26	<5.00	<5.10	<5.15	<5.10	<10.0	<10.0	<10.0	<0.5	<0.337
Anthracene	<5.15	<5.26	<5.00	<5.10	<5.15	<5.10	<10.0	<10.0	<10.0	<0.5	<0.365
Benzo(a)anthracene	<5.15	<5.26	<5.00	<5.10	<5.15	<5.10	<10.0	<10.0	<10.0	<0.5	<0.308
Benzo (b) Fluoranthene	<5.15	<5.26	<5.00	<5.10	<5.15	<5.10	<10.0	<10.0	<10.0	<0.5	<0.346
Benzo (k) Fluoranthene	<5.15	<5.26	<5.00	<5.10	<5.15	<5.10	<10.0	<10.0	<10.0	<0.5	<0.356
Benzo (a) Pyrene	<5.15	<5.26	<5.00	<5.10	<5.15	<5.10	<10.0	<10.0	<10.0	<0.5	<0.365
Benzo (g,h,i) Perylene	<5.15	<5.26	<5.00	<5.10	<5.15	<5.10	<10.0	<10.0	<10.0	<0.5	<0.596
bis (2-Chloroethoxy) Methane	<5.15	<5.26	<5.00	<5.10	<5.15	<5.10	<10.0	<10.0	<10.0	<1	<1.83
bis (2-Chloroethyl) ether	<5.15	<5.26	<5.00	<5.10	<5.15	<5.10	<10.0	<10.0	<10.0	<1	<1.25
bis (2-Ethylhexyl) phthalate	<5.15	<5.26	**7.09 B**	<5.10	<5.15	**5.57**	<6.00	<6.00	<6.0	<5	<1.44
4-Bromophenyl-phenylether	<5.15	<5.26	<5.00	<5.10	<5.15	<5.10	<10.0	<10.0	<10.0	<1	<1.54
Butlybenzylphthalate	<5.15	<5.26	<5.00	<5.10	<5.15	<5.10	<10.0	<10.0	<10.0	<5	<0.962
Carbazole	<5.15	<5.26	<5.00	<5.10	<5.15	<5.10	<10.0	<10.0	NA	<1	<0.865
4-Chloroaniline	<5.15	<5.26	<5.00 J	<5.10	<5.15	<5.10	<20.0	<20.0	<20.0	<4	<1.15
4-Chloro-3-methylphenol	<5.15	<5.26	<5.00	<5.10	<5.15 J	<5.10	<20.0	<20.0	<20.0	<1	<1.35
2-Chloronaphthalene	<5.15	<5.26	<5.00	<5.10	<5.15	<5.10	<10.0	<10.0	<10.0	<1	<1.44
2-Chlorophenol	<5.15	<5.26	<5.00	<5.10	<5.15 J	<5.10	<10.0	<10.0	<10.0	<1	<1.63
4-Chlorophenyl-phenyl Ether	<5.15	<5.26	<5.00	<5.10	<5.15	<5.10	<10.0	<10.0	<10.0	<1	<1.54
Chrysene	<5.15	<5.26	<5.00	<5.10	<5.15	<5.10	<10.0	<10.0	<10.0	<0.5	<0.317
Dibenzo (a,h) Anthracene	<5.15	<5.26	<5.00	<5.10	<5.15	<5.10	<10.0	<10.0	<10.0	<0.5	<0.433
Dibenzofuran	<5.15	<5.26	<5.00	<5.10	<5.15	<5.10	<10.0	<10.0	<10.0	<1	<1.25
3,3'-Dichlorobenzidine	<10.3	<10.5	<10.00 J	<10.2	<10.3	<10.2	<20.0	<20.0	<20.0	<5	<1.44
2,4-Dichlorophenol	<5.15	<5.26	<5.00	< 5.10	<5.15 J	<5.10	<10.0	<10.0	<10.0	<1	<2.12
Diethylphthalate	<5.15	<5.26	<5.00	<5.10	<5.15	<5.10	<10.0	<10.0	<10.0	<5	<1.15

OU-10 VB 1 - 8
Historical Groundwater Sampling Results Summary
Avtex Fibers Superfund Site
Front Royal, Virginia

Parameter	Downgradient Overburden Wells (cont.)										
	MW-11										
	3/12/08	9/16/08	3/24/09	10/6/09	5/20/10	6/21/11	6/5/12	6/18/13	7/26/14	7/26/15	8/11/16
SVOCs (cont.)											
2,4-Dimethylphenol	<5.15	<5.26	<5.00	< 5.10	<5.15 J	<5.10	<10.0	<10.0	<10.0	<1	<1.54
Dimethylphthalate	<5.15	<5.26	<5.00	<5.10	<5.15	<5.10	<10.0	<10.0	<10.0	<5	<1.15
Di-N-Butylphthalate	<5.15	<5.26	<5.00	<5.10	<5.15	<5.10	<10.0	<10.0	<10.0	<5	<1.25
Di-n-octylphthalate	<5.15	<5.26	<5.00	<5.10	<5.15	<5.10	<10.0	<10.0	<10.0	<5	<0.865
4,6-Dinitro-2-methylphenol	<25.8	<26.3	<25.0	<25.5	<25.8	<25.5	<20.0	<20.0	<20.0	<15	<2.79
2,4-Dinitrophenol	<25.8	<26.3	<25.0	<25.5	<25.8	<25.5	<50.0	<50.0	<50.0	<31	<6.92
2,4-Dinitrotoluene	<5.15	<5.26	<5.00	<5.10	<5.15	<5.10	<10.0	<10.0	<10.0	<5	<1.54
2,6-Dinitrotoluene	<5.15	<5.26	<5.00	<5.10	<5.15	<5.10	<10.0	<10.0	<10.0	<1	<1.44
Fluoranthene	<5.15	<5.26	<5.00	<5.10	<5.15	<5.10	<10.0	<10.0	<10.0	<0.5	<0.308
Fluorene	<5.15	<5.26	<5.00	<5.10	<5.15	<5.10	<10.0	<10.0	<10.0	<0.5	<0.308
Hexachlorobenzene	<5.15	<5.26	<5.00	<5.10	<5.15	<5.10	<10.0	<10.0	<10.0	<0.5	<1.44
Hexachlorobutadiene	<5.15	<5.26	<5.00	<5.10	<5.15	<5.10	<10.0	<10.0	<10.0	<1	<1.44
Hexachlorocyclopentadiene	<5.15	<5.26	<5.00	<5.10	<5.15	<5.10	<10.0	<10.0	<10.0	<15	<1.25
Hexachloroethane	<5.15	<5.26	<5.00	<5.10	<5.15 J	<5.10	<10.0	<10.0	<10.0	<5	<2.12
Indeno (1,2,3-cd) Pyrene	<5.15	<5.26	<5.00	<5.10	<5.15	<5.10	<10.0	<10.0	<10.0	<0.5	<0.394
Isophorone	<5.15	<5.26	<5.00	<5.10	<5.15	<5.10	<10.0	<10.0	<10.0	<1	<2.12
2-Methylnaphthalene	<5.15	<5.26	<5.00	<5.10	<5.15	<5.10	<10.0	<10.0	<10.0	<0.5	<0.385
2-Methylphenol	<5.15	<5.26	<5.00	<5.10	<5.15 J	<5.10	<10.0	<10.0	<10.0	<1	<1.54
3&4-Methylphenol/4-methylphenol	<5.15	<5.26	<5.00	<5.10	<5.15 J	<5.10	<10.0	<10.0	<10.0	<1	<1.35
Naphthalene	<5.15	<5.26	<5.00	<5.10	<5.15	<5.10	<10.0	<10.0	<10.0	<0.5	<0.356
2-Nitroaniline	<25.8	<26.3	<25.0	<25.5	<25.8	<25.5	<50.0	<50.0	<50.0	<1	<1.06
3-Nitroaniline	<25.8	<26.3	<25.0 J	<25.5	<25.8	<25.5	<50.0	<50.0	<50.0	<1	<1.54
4-Nitroaniline	<25.8	<26.3	<25.0 J	<25.5	<25.8	<25.5	<20.0	<20.0	<20.0	<1	<1.54
4-Nitrophenol	<25.8	<26.3	<25.0	<25.5	<25.8	<25.5	<50.0	<50.0	<50.0	<31	<1.92
2-Nitrophenol	<5.15	<5.26	<5.00	<5.10	<5.15 J	<5.10	<10.0	<10.0	<10.0	<1	<2.31
Nitrobenzene	<5.15	<5.26	<5.00	<5.10	<5.15	<5.10	<10.0	<10.0	<10.0	<1	<2.12
N-Nitroso-di-n-propylamine	<5.15	<5.26	<5.00	<5.10	<5.15	<5.10	<10.0	<10.0	<10.0	<1	<1.63
N-Nitrosodiphenylamine	<5.15	<5.26	<5.00	<5.10	<5.15	<5.10	<10.0	<10.0	<10.0	<1	<3.46
2,2'-Oxybis (1-chloropropane)	<5.15	<5.26	<5.00	<5.10	<5.15	<5.10	<10.0	<10.0	NA	<1	<1.73
Pentachlorophenol	<10.3	<10.5	<10.00	<10.2	<10.3	<10.2	<25.0	<25.0	<25.0	<5	<3.17
Phenanthrene	<5.15	<5.26	<5.00	<5.10	<5.15	<5.10	<10.0	<10.0	<10.0	<0.5	<0.404
Phenol	<5.15	<5.26	<5.00	<5.10	<5.15	<5.10	<10.0	<10.0	<10.0	<1	<1.44
Pyrene	<5.15	<5.26	<5.00	<5.10	<5.15	<5.10	<10.0	<10.0	<10.0	<0.5	<0.337
2,4,5-Trichlorophenol	<5.15	<5.26	<5.00	<5.10	<5.15 J	<5.10	<10.0	<10.0	<10.0	<1	<1.25
2,4,6-Trichlorophenol	<5.15	<5.26	<5.00	<5.10	<5.15 J	<5.10	<10.0	<10.0	<10.0	<1	<1.83
Filtered Inorganics (mg/L)											
Arsenic	**0.00355 J**	**0.00369**	**0.00544**	**0.0928**	**0.00258**	<0.005	**0.00066 J**	**0.0014**	<0.001	**0.0021 J**	<0.005
Antimony	<0.001	<0.001	<0.001	<0.020	<0.001	<0.005	<0.001	<0.001	<0.001	<0.0020	<0.005
Beryllium	**0.000664 J**	< 0.002	< 0.002	<0.002	<0.002	<0.002	<0.001	<0.001	<0.0002	<0.0010	<0.01
Cadmium	**0.000494 J**	<0.005	<0.005	<0.005	<0.005	<0.005	<0.001	<0.001	**0.00052**	**0.00024 J**	<0.004
Chromium	**0.00313 J**	<0.005	<0.005	<0.005	<0.005	<0.005	**0.0024 J**	**0.0035 J**	<0.001	**0.0026 J**	<0.005
Copper	**0.00928 J**	**0.0407**	**0.0681**	<0.010	<0.01	<0.02	**0.0034 J**	**0.0038 L**	<0.001	<0.0040	<0.01
Lead	<0.003	<0.001	<0.001	<0.020	<0.001	<0.005	<0.001	<0.001	<0.001	**0.00023 J**	<0.002
Mercury	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	**0.000093 J**	<0.0001
Nickel	**0.069**	**0.0668**	**0.0669**	**0.121**	**0.0699**	**0.0707**	**0.0469**	**0.0462**	**0.0468**	**0.0737**	**0.0563**
Selenium	**0.0137**	<0.0145	**0.0209**	<0.020	**0.00943**	**0.00887**	**0.00051 J**	<0.001	<0.001	**0.00058 J**	<0.006
Thallium	**0.00185 J**	<0.0002	**0.000204**	<0.0002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.005
Vanadium	<0.01	<0.01	<0.01	**0.029**	<0.01	<0.01	<0.005	<0.005	<0.001	**0.00037 J**	<0.007
Zinc	**0.0168 J**	**0.0875**	**0.0298**	**0.0335**	<0.02	<0.02	**0.0158**	**0.0173**	**0.0102**	**0.0168 J**	**0.616**
Field Parameters											
pH	5.89	5.88	5.91	5.93	5.78	6.00	6.07	6.10	6.16	6.19	6.22
Specific Conductance (mS/cm)	7.387	7.448	7.125	7.264	7.493	7.907	8.776	8.507	9.19	10.3	9.8671
Turbidity (ntu)	6.0	2.8	5.1	2.7	1.4	10.7	0.8	0.0	4.99	18.00	4.29
Dissolved Oxygen (mg/L)	0.45	0.26	0.12	0.20	0.77	1.46	0.72	0.26	0.04	0.28	0.75
Redox Potential (mV)	152.7	199.5	99.1	150.7	273.9	148.3	-57.0	75.5	249.03	120.43	104.1
Temperature (^{o}C)	14.39	16.55	14.41	14.99	15.18	17.48	15.88	15.74	16.15	29.78	28.83

Notes:
B - Analyte detected in associated method blank.
J - Estimated result
K - Analytical result may be biased high.
L - Analytical result may be biased low.
< - Not detected, value indicates detection limit.
R - Result flagged as unusable due to low response
EPA guidance, but validator notes that response
stable and calibration curve is within specified li
and thus should be considered useable.
[1] - Blind duplicate sample

OU-10 VB 1 - 8
Historical Groundwater Sampling Results Summary
Avtex Fibers Superfund Site
Front Royal, Virginia

Parameter	Downgradient Overburden Wells (cont.)									
	MW-11 (cont.)	MW-12								
	7/31/17	3/12/08	9/25/08	3/19/09	10/12/09	5/25/10	6/13/11	6/5/12	6/13/13	8/6/14	7/25/15
Volatile Organic Compounds (µg/L)											
Acetone	R	<10.0 R	<10.0 R	<10.0	<10.0	<10.0 R	<10.0 R	<25.0	<25.0	<25.0	<5.0
Benzene	<0.2	**1.64 J**	**1.42**	**1.42**	**2.33**	**2.53**	**2.22**	**2.4**	**1.3**	**1.5**	**1**
Bromodichloromethane	<0.17	<1.00 J	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5
Bromoform	<0.29	<1.00 J	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5
Bromomethane	<0.35	<1.00 J	<1.00	<1.00	<1.00	<1.00	<1.00	<2.00	<2.00	<2.0 J	<0.5
2-Butanone	<2.64	<10.0 J	<10.0	<10.0	<10.0	<10.0	<10.0 R	<5.00	<5.00	<5.0	<5.0
Carbon Disulfide	<0.22	**1.72 J**	**1.15**	**1.21**	**3.92**	**1.43**	**2.07**	**1.3 J**	<2.00	<2.0	**0.5 J**
Carbon Tetrachloride	<0.18	<1.00 J	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5
Chlorobenzene	<0.18	<1.00 J	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5
Chlorodibromomethane	<0.25	<1.00 J	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5
Chloroethane	<0.36	<1.00 J	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0 J	<0.5
Chloroform	<0.23	<1.00 J	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5
Chloromethane	<0.36	<1.00 J	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0 J	<0.5
1,2-Dichlorobenzene	<0.19	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5
1,3-Dichlorobenzene	<0.18	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5
1,4-Dichlorobenzene	<0.17	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5
1,1-Dichloroethane	<0.24	<1.00 J	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5
1,2-Dichloroethane	<0.2	<1.00 J	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5
1,1-Dichloroethene	<0.25	<1.00 J	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5
cis-1,2-Dichloroethene	<0.21	<1.00 J	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5
trans-1,2-Dichloroethene	<0.23	<1.00 J	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5
1,2-Dichloropropane	<0.25	<1.00 J	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5
cis-1,3-Dichloropropene	<0.17	<1.00 J	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5
trans-1,3-Dichloropropene	<0.17	<1.00 J	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5
Ethylbenzene	<0.19	**0.808 J**	<1.00	<1.00	**1.10**	**1.09**	<1.00	**0.71 J**	<1.00	**0.41 J**	**0.2 J**
2-Hexanone	<1.28	<10.0 J	<10.0	<10.0	<10.0	<10.0	<10.0	<5.00	<5.00	<5.0	<5.0
4-Methyl-2-Pentanone	<0.81	<10.00 J	<10.0 R	<10.0	<10.0	<10.0 R	<10.0	<5.00	<5.00	<5.0	<5.0
Methylene Chloride	<1	<1.00 J	<1.00	<1.00	<1.00	<1.00	<1.00	<2.00	<2.00	<2.0	<0.5
Styrene	<0.28	<1.00 J	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5
1,1,2,2-Tetrachloroethane	<0.19	<0.50 J	<0.50	<0.50	<0.50	<0.50	<0.50	<1.00	<1.00	<1.0	<0.5
Tetrachloroethene	<0.14	<1.00 J	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5
Toluene	<0.17	**0.292 J**	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5
1,2,4-Trichlorobenzene	<0.2	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5
1,1,1-Trichloroethane	<0.19	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5
1,1,2-Trichloroethane	<0.19	<1.00 J	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5
Trichloroethene	<0.2	<1.00 J	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5
Vinyl Chloride	<0.18	<1.00 J	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<0.5
Xylenes (total)	<0.58	**6.89 J**	**4.09**	**4.65**	**7.57**	**9.47**	**6.82**	**6.3**	**1.0 J**	**2.6**	**1.1**
Semivolatile Organic Compounds (µg/L)											
Acenaphthene	<0.333	<5.38	<5.21	<5.10	<5.00	<5.10	<5.41	<10.0	<10.0	<10.0	<0.5
Acenaphthylene	<0.365	<5.38	<5.21	<5.10	<5.00	<5.10	<5.41	<10.0	<10.0	<10.0	<0.5
Anthracene	<0.396	<5.38	<5.21	<5.10	<5.00	<5.10	<5.41	<10.0	<10.0	<10.0	<0.5
Benzo(a)anthracene	<0.333	<5.38	<5.21	<5.10	<5.00	<5.10	<5.41	**1.0 J**	<10.0	<10.0	<0.5
Benzo (b) Fluoranthene	<0.375	<5.38	<5.21	<5.10	<5.00	<5.10	<5.41	**1.2 J**	<10.0	<10.0	<0.5
Benzo (k) Fluoranthene	<0.385	<5.38	<5.21	<5.10	<5.00	<5.10	<5.41	**1.3 B**	<10.0	<10.0	<0.5
Benzo (a) Pyrene	<0.396	<5.38	<5.21	<5.10	<5.00	<5.10	<5.41	<10.0	<10.0	<10.0	<0.5
Benzo (g,h,i) Perylene	<0.646	<5.38	<5.21	<5.10	<5.00	<5.10	<5.41	**1.1 J**	<10.0	<10.0	<0.5
bis (2-Chloroethoxy) Methane	<1.98	<5.38	<5.21	<5.10	<5.00	<5.10	<5.41 L	<10.0	<10.0	<10.0	<1
bis (2-Chloroethyl) ether	<1.35	<5.38	<5.21	<5.10	<5.00	<5.10	<5.41 L	<10.0	<10.0	<10.0	<1
bis (2-Ethylhexyl) phthalate	<1.56	<5.38	<5.21	<5.10	<5.00	<5.10	<5.41	<6.00	<6.00	<6.0	<5
4-Bromophenyl-phenylether	<1.67	<5.38	<5.21	<5.10	<5.00	<5.10	<5.41 L	<10.0	<10.0	<10.0	<1
Butlybenzylphthalate	<1.04	<5.38	<5.21	<5.10	<5.00	<5.10	<5.41	<10.0	<10.0	<10.0	<5
Carbazole	<0.938	<5.38	<5.21	<5.10	<5.00	<5.10	<5.41 L	<10.0	<10.0	<10.0	<1
4-Chloroaniline	<1.25	<5.38	<5.21	<5.10	<5.00	<5.10	<5.41 L	<20.0	<20.0	<20.0	<4
4-Chloro-3-methylphenol	<1.46	<5.38	<5.21	<5.10	<5.00	<5.10	<5.41	<20.0	<20.0	<20.0	<1
2-Chloronaphthalene	<1.56	<5.38	<5.21	<5.10	<5.00	<5.10	<5.41 L	<10.0	<10.0	<10.0	<1
2-Chlorophenol	<1.77	<5.38	<5.21	<5.10	<5.00	<5.10	<5.41	<10.0	<10.0	<10.0	<1
4-Chlorophenyl-phenyl Ether	<1.67	<5.38	<5.21	<5.10	<5.00	<5.10	<5.41 L	<10.0	<10.0	<10.0	<1
Chrysene	<0.344	<5.38	<5.21	<5.10	<5.00	<5.10	<5.41	**1.1 B**	<10.0	<10.0	<0.5
Dibenzo (a,h) Anthracene	<0.469	<5.38	<5.21	<5.10	<5.00	<5.10	<5.41	**1.1 J**	<10.0	<10.0	<0.5
Dibenzofuran	<1.35	<5.38	<5.21	<5.10	<5.00	<5.10	<5.41 L	<10.0	<10.0	<10.0	<1
3,3'-Dichlorobenzidine	<1.56	<10.8	<10.4	<10.2	<10.0	<10.2	<10.8 L	<20.0	<20.0	<20.0	<5
2,4-Dichlorophenol	<2.29	<5.38	<5.21	<5.10	<5.00	<5.10	<5.41	<10.0	<10.0	<10.0	<1
Diethylphthalate	<1.25	<5.38	<5.21	<5.10	<5.00	<5.10	<5.41	<10.0	<10.0	<10.0	<5

OU-10 VB 1 - 8
Historical Groundwater Sampling Results Summary
Avtex Fibers Superfund Site
Front Royal, Virginia

Parameter	Downgradient Overburden Wells (cont.)										
	MW-11 (cont.)	MW-12									
	7/31/17	3/12/08	9/25/08	3/19/09	10/12/09	5/25/10	6/13/11	6/5/12	6/13/13	8/6/14	7/25/15
SVOCs (cont.)											
2,4-Dimethylphenol	<1.67	<5.38	<5.21	<5.10	<5.00	<5.10	<5.41	<10.0	<10.0	<10.0	<1
Dimethylphthalate	<1.25	<5.38	<5.21	<5.10	<5.00	<5.10	<5.41	<10.0	<10.0	<10.0	<5
Di-N-Butylphthalate	<1.35	<5.38	<5.21	<5.10	<5.00	<5.10	<5.41	<10.0	<10.0	<10.0	<5
Di-n-octylphthalate	<0.938	<5.38	<5.21	<5.10	<5.00	<5.10	<5.41 L	<10.0	<10.0	<10.0	<5
4,6-Dinitro-2-methylphenol	<3.02	<26.9	<26.0	<25.5	<25.0	<25.5	<27.0	<20.0	<20.0	<20.0	<15
2,4-Dinitrophenol	<7.5	<26.9	<26.0	<25.5	<25.0	<25.5 J	<27.0	<50.0	<50.0	<50.0	<30
2,4-Dinitrotoluene	<1.67	<5.38	<5.21	<5.10	<5.00	<5.10	<5.41 L	<10.0	<10.0	<10.0	<5
2,6-Dinitrotoluene	<1.56	<5.38	<5.21	<5.10	<5.00	<5.10	<5.41 L	<10.0	<10.0	<10.0	<1
Fluoranthene	<0.333	<5.38	<5.21	<5.10	<5.00	<5.10	<5.41	<10.0	<10.0	<10.0	<0.5
Fluorene	<0.333	<5.38	<5.21	<5.10	<5.00	<5.10	<5.41	<10.0	<10.0	<10.0	<0.5
Hexachlorobenzene	<1.56	<5.38	<5.21	<5.10	<5.00	<5.10	<5.41 L	<10.0	<10.0	<10.0	<0.5
Hexachlorobutadiene	<1.56	<5.38	<5.21	<5.10	<5.00	<5.10	<5.41 L	<10.0	<10.0	<10.0	<1
Hexachlorocyclopentadiene	<1.35 J	<5.38	<5.21	<5.10	<5.00	<5.10	<5.41 L	<10.0	<10.0	<10.0	<15
Hexachloroethane	<2.29	<5.38	<5.21	<5.10	<5.00	<5.10	<5.41 L	<10.0	<10.0	<10.0	<5
Indeno (1,2,3-cd) Pyrene	<0.427	<5.38	<5.21	<5.10	<5.00	<5.10	<5.41	**1.2 J**	<10.0	<10.0	<0.5
Isophorone	<2.29	<5.38	<5.21	<5.10	<5.00	<5.10	<5.41 L	<10.0	<10.0	<10.0	<1
2-Methylnaphthalene	<0.417	<5.38	<5.21	<5.10	<5.00	<5.10	<5.41 L	<10.0	<10.0	<10.0	<0.5
2-Methylphenol	<1.67	<5.38	<5.21	<5.10	<5.00	<5.10	<5.41	<10.0	<10.0	<10.0	<1
3&4-Methylphenol/4-methylphenol	<1.46	<5.38	<5.21	<5.10	<5.00	<5.10	<5.41	<10.0	<10.0	<10.0	<1
Naphthalene	<0.385	<5.38	<5.21	<5.10	<5.00	<5.10	<5.41	**1.5 J**	<10.0	<10.0	**0.4 J**
2-Nitroaniline	<1.15	<26.9	<26.0	<25.5	<25.0	<25.5	<27.0 L	<50.0	<50.0	<50.0	<1
3-Nitroaniline	<1.67	<26.9	<26.0	<25.5	<25.0	<25.5	<27.0 L	<50.0	<50.0	<50.0	<1
4-Nitroaniline	<1.67	<26.9	<26.0	<25.5	<25.0	<25.5	<27.0 L	<20.0	<20.0	<20.0	<1
4-Nitrophenol	<2.08	<26.9	<26.0 L	<25.5	<25.0	<25.5	<27.0	<50.0	<50.0	<50.0	<30
2-Nitrophenol	<2.5	<5.38	<5.21	<5.10	<5.00	<5.10	<5.41	<10.0	<10.0	<10.0	<1
Nitrobenzene	<2.29	<5.38	<5.21	<5.10	<5.00	<5.10	<5.41 L	<10.0	<10.0	<10.0	<1
N-Nitroso-di-n-propylamine	<1.77	<5.38	<5.21	<5.10	<5.00	<5.10	<5.41 L	<10.0	<10.0	<10.0	<1
N-Nitrosodiphenylamine	<3.75	<5.38	<5.21	<5.10	<5.00	<5.10	<5.41 L	<10.0	<10.0	<10.0	<1
2,2'-Oxybis (1-chloropropane)	<1.88 J	<5.38	<5.21	<5.10	<5.00	<5.10	<5.41 L	<10.0	<10.0	<10.0	<1
Pentachlorophenol	<3.44 J	<10.8	<10.4	<10.2	<10.0	<10.2	<10.8	<25.0	<25.0	<25.0	<5
Phenanthrene	<0.438	<5.38	<5.21 L	<5.10	<5.00	<5.10	<5.41	<10.0	<10.0	<10.0	<0.5
Phenol	<1.56	<5.38	<5.21	<5.10	<5.00	<5.10	<5.41	<10.0	<10.0	<10.0	<1
Pyrene	<0.365	<5.38	<5.21	<5.10	<5.00	<5.10	<5.41	<10.0	<10.0	<10.0	<0.5
2,4,5-Trichlorophenol	<1.35	<5.38	<5.21	<5.10	<5.00	<5.10	<5.41	<10.0	<10.0	<10.0	<1
2,4,6-Trichlorophenol	<1.98	<5.38	<5.21	<5.10	<5.00	<5.10	<5.41	<10.0	<10.0	<10.0	<1
Filtered Inorganics (mg/L)											
Arsenic	**0.00584 J**	**0.0538 J**	**0.0641**	**0.146**	**0.0922**	**0.0795**	**0.0750**	**0.0693**	**0.0566**	**0.0542**	**0.0552**
Antimony	<0.000800 J	<0.001 J	<0.005	**0.00235**	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001	<0.0020
Beryllium	<0.000100	<0.005 J	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002 UL	<0.001	<0.0010
Cadmium	**0.000136 J**	**0.000492 J**	<0.005	<0.005	<0.005	<0.005	<0.005	<0.002	**0.000095 J**	**0.00023 J**	<0.0010
Chromium	<0.000500 J	**0.0029 J**	<0.005	<0.005	<0.005	<0.005	<0.005	**0.0022 J**	**0.0029 J**	<0.001	**0.0011 J**
Copper	<0.00120	<0.01 J	<0.01	<0.01	<0.01	<0.01	<0.01	**0.0098 J**	**0.0031 J**	**0.0031**	<0.0111
Lead	<0.000100	<0.003 J	<0.005	**0.0022**	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001	**0.00072 J**
Mercury	<0.000100	<0.0002 J	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002 J	<0.00020
Nickel	**0.0396 J**	**0.0264 J**	**0.0386**	**0.0247**	**0.0414**	**0.0481**	**0.0429**	**0.0322**	**0.0179**	**0.0296**	**0.0174**
Selenium	<0.000300	**0.0126 J**	**0.00822**	**0.0052**	**0.00692**	**0.00483**	<0.005	**0.00074 J**	**0.00084 J**	<0.001	**0.0013 J**
Thallium	<0.000800	**0.0000675 J**	<0.001	<0.0002	<0.0002	<0.0002	<0.001	<0.001	<0.001	<0.001	<0.0050
Vanadium	<0.000700	**0.0106 J**	**0.0148**	<0.01	<0.01	<0.01	**0.0106**	**0.0017 J**	<0.005 UL	**0.0041**	**0.0023**
Zinc	**0.0102 J**	<0.02 J	<0.02	<0.02	<0.02	<0.02	<0.02	**0.0081 B**	**0.0034 B**	**0.0073 J**	<0.0300
Field Parameters											
pH	6.51	8.77	8.61	8.88	8.62	6.86	8.76	8.73	8.26	8.80	8.19
Specific Conductance (mS/cm)	5.2999	12.20	11.53	12.58	11.60	13.036	13.24	14.38	13.85	13.47	14.1
Turbidity (ntu)	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	2.30	16.7
Dissolved Oxygen (mg/L)	0.23	0.43	0.29	0.02	0.09	0.39	0.02	0.21	0.23	-0.02	0.45
Redox Potential (mV)	-7.4	-92.8	-139.5	-68.7	-189.7	35.1	-198.3	-256.1	-164.4	-51.84	234.3
Temperature (^{o}C)	26.89	13.17	17.84	11.43	16.88	16.48	16.67	14.22	16.38	19.99	26.99

Notes:
B - Analyte detected in associated method blank.
J - Estimated result
K - Analytical result may be biased high.
L - Analytical result may be biased low.
< - Not detected, value indicates detection limit.
R - Result flagged as unusable due to low response
EPA guidance, but validator notes that response
stable and calibration curve is within specified li
and thus should be considered useable.
[1] - Blind duplicate sample

OU-10 VB 1 - 8
Historical Groundwater Sampling Results Summary
Avtex Fibers Superfund Site
Front Royal, Virginia

Parameter	Downgradient Shallow Bedrock Wells										
	MW-12 (cont.)		MW-5								
	7/30/16	7/29/17	3/10/08	9/24/08	3/25/09	10/6/09	5/18/10	6/15/11	5/31/12	6/20/13	7/24/14
Volatile Organic Compounds (µg/L)											
Acetone	<2.66	R	<10.0 R	<10.0	<10.0 R	<10.0 R	<10.0 J	<10.0 R	<25.0	<25.0	<25.0
Benzene	**0.658**	**0.923**	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0
Bromodichloromethane	<0.17	<0.17	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0
Bromoform	<0.29	<0.29	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0
Bromomethane	<0.35	<0.35	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<2.00	<2.00	<10.0
2-Butanone	<2.64	<2.64	<10.0 J	<10.0	<10.0	<10.0	<10.0	<10.0 R	<5.00	<5.00	<10.0
Carbon Disulfide	**0.650**	**0.284 J**	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<2.00	<2.00	<10.0
Carbon Tetrachloride	<0.18	<0.18	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0
Chlorobenzene	<0.18	<0.18	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0
Chlorodibromomethane	<0.25	<0.25	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0
Chloroethane	<0.36	<0.36	<1.00	<1.00 J	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<10.0
Chloroform	<0.23	<0.23	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0
Chloromethane	<0.36	<0.36	<1.00	<1.00 J	<1.00	<1.00	<1.00	<1.00	<1.00 J	<1.00	<5.0
1,2-Dichlorobenzene	<0.19	<0.19	<1.00	<1.00 L	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0
1,3-Dichlorobenzene	<0.18	<0.18	<1.00	<1.00 L	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0
1,4-Dichlorobenzene	<0.17	<0.17	<1.00	<1.00 L	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0
1,1-Dichloroethane	<0.24	<0.24	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0
1,2-Dichloroethane	<0.2	<0.2	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0
1,1-Dichloroethene	<0.25	<0.25	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0
cis-1,2-Dichloroethene	<0.21	<0.21	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0
trans-1,2-Dichloroethene	<0.23	<0.23	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0
1,2-Dichloropropane	<0.25	<0.25	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0
cis-1,3-Dichloropropene	<0.17	<0.17	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0
trans-1,3-Dichloropropene	<0.17	<0.17	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0
Ethylbenzene	<0.19	**0.229 J**	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0
2-Hexanone	<1.28	<1.28	<10.0	<10.0	<10.0	<10.0	<10.0 J	<10.0	<5.00	<5.00	<10.0
4-Methyl-2-Pentanone	<0.81	<0.81	<10.0 R	<10.0	<10.0 UR	<10.0	<10.0	<10.0	<5.00	<5.00	<10.0
Methylene Chloride	<1	<1	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<2.00	<2.00	<5.0
Styrene	<0.28	<0.28	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0
1,1,2,2-Tetrachloroethane	<0.19	<0.19	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<1.00	<1.00	<5.0
Tetrachloroethene	<0.14	<0.14	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0
Toluene	<0.17	<0.17	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0
1,2,4-Trichlorobenzene	<0.2	<0.2	<1.00	<1.00 L	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0
1,1,1-Trichloroethane	<0.19	<0.19	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0
1,1,2-Trichloroethane	<0.19	<0.19	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0
Trichloroethene	<0.2	<0.2	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0
Vinyl Chloride	<0.18	<0.18	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0
Xylenes (total)	<0.58	**0.923 J**	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<2.00	<2.00	<10.0
Semivolatile Organic Compounds (µg/L)											
Acenaphthene	<0.314	<0.32	<5.00	<5.10 L	<5.32	<5.00	<5.10	<5.00	<10.0	<10.0	<10.0
Acenaphthylene	<0.343	<0.35	<5.00	<5.10 L	<5.32	<5.00	<5.10	<5.00	<10.0	<10.0	<10.0
Anthracene	<0.373	<0.38	<5.00	<5.10 L	<5.32	<5.00	<5.10	<5.00	<10.0	<10.0	<10.0
Benzo(a)anthracene	<0.314	<0.32	<5.00	<5.10 L	<5.32	<5.00	<5.10	<5.00	<10.0	<10.0	<10.0
Benzo (b) Fluoranthene	<0.353	<0.36	<5.00	<5.10	<5.32	<5.00	<5.10	<5.00	<10.0	<10.0	<10.0
Benzo (k) Fluoranthene	<0.363	<0.37	<5.00	<5.10 L	<5.32	<5.00	<5.10	<5.00	<10.0	<10.0	<10.0
Benzo (a) Pyrene	<0.373	<0.38	<5.00	<5.10 L	<5.32	<5.00	<5.10	<5.00	<10.0	<10.0	<10.0
Benzo (g,h,i) Perylene	<0.608	<0.62	<5.00	<5.10 L	<5.32	<5.00	<5.10	<5.00	<10.0	<10.0	<10.0
bis (2-Chloroethoxy) Methane	<3.04	<1.9	<5.00	<5.10 L	<5.32	<5.00	<5.10	<5.00	<10.0	<10.0	<10.0
bis (2-Chloroethyl) ether	<2.75	<1.3	<5.00	<5.10 L	<5.32	<5.00	<5.10	<5.00	<10.0	<10.0	<10.0
bis (2-Ethylhexyl) phthalate	<5.88	<1.5	<5.00	<5.10 L	<5.32	**5.43 B**	<5.10	<5.00	<6.00	<6.00	<6.0
4-Bromophenyl-phenylether	<2.65	<1.6	<5.00	<5.10 L	<5.32	<5.00	<5.10	<5.00	<10.0	<10.0	<10.0
Butlybenzylphthalate	<2.45	<1	<5.00	<5.10 L	<5.32	<5.00	<5.10	<5.00	<10.0	<10.0	<10.0
Carbazole	<2.75	<0.9	<5.00	<5.10 L	<5.32	<5.00	<5.10	<5.00	<10.0	<10.0	<10.0
4-Chloroaniline	<4.12	<1.2	<5.00	<5.10 L	<5.32	<5.00	<5.10 J	<5.00	<20.0	<20.0	<20.0
4-Chloro-3-methylphenol	<4.41	<1.4	<5.00	<5.10	<5.32	<5.00	<5.10	<5.00	<20.0	<20.0	<20.0
2-Chloronaphthalene	<2.75	<1.5	<5.00	<5.10 L	<5.32	<5.00	<5.10	<5.00	<10.0	<10.0	<10.0
2-Chlorophenol	<4.71	<1.7	<5.00	<5.10	<5.32	<5.00	<5.10	<5.00	<10.0	<10.0	<10.0
4-Chlorophenyl-phenyl Ether	<2.75	<1.6	<5.00	<5.10 L	<5.32	<5.00	<5.10	<5.00	<10.0	<10.0	<10.0
Chrysene	<0.324	<0.33	<5.00	<5.10 L	<5.32	<5.00	<5.10	<5.00	<10.0	<10.0	<10.0
Dibenzo (a,h) Anthracene	<0.441	<0.45	<5.00	<5.10 L	<5.32	<5.00	<5.10	<5.00	<10.0	<10.0	<10.0
Dibenzofuran	<2.84	<1.3	<5.00	<5.10 L	<5.32	<5.00	<5.10	<5.00	<10.0	<10.0	<10.0
3,3'-Dichlorobenzidine	<3.24	<1.5	<10.0	<10.2 L	<10.6	<10.0	<10.2	<10.0	<20.0	<20.0	<20.0
2,4-Dichlorophenol	<5.49	<2.2	<5.00	<5.10	<5.32	<5.00	<5.10	<5.00	<10.0	<10.0	<10.0
Diethylphthalate	<2.94	<1.2	<5.00	<5.10 L	<5.32	<5.00	<5.10	<5.00	<10.0	<10.0	<10.0

OU-10 VB 1 - 8
Historical Groundwater Sampling Results Summary
Avtex Fibers Superfund Site
Front Royal, Virginia

Parameter	Downgradient Shallow Bedrock Wells										
	MW-12 (cont.)		MW-5								
	7/30/16	7/29/17	3/10/08	9/24/08	3/25/09	10/6/09	5/18/10	6/15/11	5/31/12	6/20/13	7/24/14
SVOCs (cont.)											
2,4-Dimethylphenol	<4.12	<1.6	<5.00	<5.10	<5.32	<5.00	<5.10	<5.00	<10.0	<10.0	<10.0
Dimethylphthalate	<3.04	<1.2	<5.00	<5.10 L	<5.32	<5.00	<5.10	<5.00	<10.0	<10.0	<10.0
Di-N-Butylphthalate	<2.45	<1.3	<5.00	<5.10 L	<5.32	<5.00	<5.10	<5.00	<10.0	<10.0	<10.0
Di-n-octylphthalate	<2.45	<0.9	<5.00	<5.10 L	<5.32	<5.00	<5.10	<5.00	<10.0	<10.0	<10.0
4,6-Dinitro-2-methylphenol	<9.12	<2.9	<25.0	<25.5	<26.6	<25.0	<25.5	<25.0	<20.0	<20.0	<20.0
2,4-Dinitrophenol	<5.78	<7.2	<25.0	<25.5	<26.6	<25.0	<25.5 J	<25.0	<50.0	<50.0	<50.0
2,4-Dinitrotoluene	<3.14	<1.6	<5.00	<5.10 L	<5.32	<5.00	<5.10	<5.00	<10.0	<10.0	<10.0
2,6-Dinitrotoluene	<2.25	<1.5	<5.00	<5.10 L	<5.32	<5.00	<5.10	<5.00	<10.0	<10.0	<10.0
Fluoranthene	<0.314	<0.32	<5.00	<5.10 L	<5.32	<5.00	<5.10	<5.00	<10.0	<10.0	<10.0
Fluorene	<0.314	<0.32	<5.00	<5.10 L	<5.32	<5.00	<5.10	<5.00	<10.0	<10.0	<10.0
Hexachlorobenzene	<2.75	<1.5	<5.00	<5.10 L	<5.32	<5.00	<5.10	<5.00	<10.0	<10.0	<10.0
Hexachlorobutadiene	<1.96	<1.5	<5.00	<5.10 L	<5.32	<5.00	<5.10	<5.00	<10.0	<10.0	<10.0
Hexachlorocyclopentadiene	<1.76	<1.3 J	<5.00	<5.10 L	<5.32	<5.00	<5.10 J	<5.00	<10.0	<10.0	<10.0
Hexachloroethane	<1.86	<2.2	<5.00	<5.10 L	<5.32	<5.00	<5.10	<5.00	<10.0	<10.0	<10.0
Indeno (1,2,3-cd) Pyrene	<0.402	<0.41	<5.00	<5.10 L	<5.32	<5.00	<5.10	<5.00	<10.0	<10.0	<10.0
Isophorone	<3.04	<2.2	<5.00	<5.10 L	<5.32	<5.00	<5.10	<5.00	<10.0	<10.0	<10.0
2-Methylnaphthalene	<0.392	<0.4	<5.00	<5.10 L	<5.32	<5.00	<5.10	<5.00	<10.0	<10.0	<10.0
2-Methylphenol	<2.25	<1.6	<5.00	<5.10	<5.32	<5.00	<5.10	<5.00	<10.0	<10.0	<10.0
3&4-Methylphenol/4-methylphenol	<2.16	<1.4	<5.00	<5.10	<5.32	<5.00	<5.10	<5.00	<10.0	<10.0	<10.0
Naphthalene	<0.363	<0.37	<5.00	<5.10 L	<5.32	<5.00	<5.10	<5.00	<10.0	<10.0	<10.0
2-Nitroaniline	<3.63	<1.1	<25.0	<25.5 L	<26.6	<25.0	<25.5	<25.0	<50.0	<50.0	<50.0
3-Nitroaniline	<2.65	<1.6	<25.0	<25.5 L	<26.6	<25.0	<25.5	<25.0	<50.0	<50.0	<50.0
4-Nitroaniline	<3.04	<1.6	<25.0	<25.5 L	<26.6	<25.0	<25.5	<25.0	<20.0	<20.0	<20.0
4-Nitrophenol	<5.29	<2 J	<25.0	<25.5	<26.6	<25.0	<25.5	<25.0	<50.0	<50.0	<50.0
2-Nitrophenol	<5.2	<2.4	<5.00	<5.10	<5.32	<5.00	<5.10	<5.00	<10.0	<10.0	<10.0
Nitrobenzene	<2.65	<2.2	<5.00	<5.10 L	<5.32	<5.00	<5.10	<5.00	<10.0	<10.0	<10.0
N-Nitroso-di-n-propylamine	<3.33	<1.7	<5.00	<5.10 L	<5.32	<5.00	<5.10	<5.00	<10.0	<10.0	<10.0
N-Nitrosodiphenylamine	<3.53	<3.6	<5.00	<5.10 L	<5.32	<5.00	<5.10	<5.00	<10.0	<10.0	<10.0
2,2'-Oxybis (1-chloropropane)	<2.75	<1.8	<5.00	<5.10 L	<5.32	<5.00	<5.10	<5.00	<10.0	<10.0	<10.0
Pentachlorophenol	<1.67	<3.3 J	<10.0	<10.2	<10.6	<5.00	<10.2	<10.0	<25.0	<25.0	<25.0
Phenanthrene	<0.412	<0.42	<5.00	<5.10 L	<5.32	<5.00	<5.10	<5.00	<10.0	<10.0	<10.0
Phenol	<1.47	<1.5	<5.00	<5.10	<5.32	<5.00	<5.10	<5.00	<10.0	<10.0	<10.0 J
Pyrene	<0.343	<0.35	<5.00	<5.10 L	<5.32	<5.00	<5.10	<5.00	<10.0	<10.0	<10.0
2,4,5-Trichlorophenol	<6.96	<1.3	<5.00	<5.10	<5.32	<5.00	<5.10	<5.00	<10.0	<10.0	<10.0
2,4,6-Trichlorophenol	<6.67	<1.9	<5.00	<5.10	<5.32	<5.00	<5.10	<5.00	<10.0	<10.0	<10.0
Filtered Inorganics (mg/L)											
Arsenic	**0.0515 J**	**0.0446**	**0.000767 J**	<0.005	<0.001	<0.005	<0.001	<0.005	**0.0005 J**	<0.001	<0.001
Antimony	<0.025	<0.00160	<0.001	<0.005	<0.001	<0.005	<0.001	<0.005	<0.001	<0.001	<0.001
Beryllium	<0.05	<0.000200	<0.005	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	**0.00037 K**	<0.0001
Cadmium	<0.02	<0.000200	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.001	<0.001	<0.0001
Chromium	<0.025	<0.00100	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	**0.00098 J**	**0.00055 J**	<0.001
Copper	<0.05	<0.00240	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	**0.00082 J**	**0.00030 L**	<0.001
Lead	<0.01	<0.000200	<0.003	<0.005	<0.001	<0.005	<0.001	<0.005	<0.001	<0.001	<0.001
Mercury	<0.0001	<0.000100	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Nickel	<0.0758	**0.00979**	**0.00458 J**	<0.02	<0.004	<0.02	<0.004	<0.02	**0.0013**	<0.001	<0.001
Selenium	<0.03	**0.00192 J**	**0.00109 J**	<0.005	**0.00121**	<0.005	<0.001	<0.005	<0.001	<0.001	<0.001
Thallium	<0.025	<0.00160	<0.0002	<0.001	<0.0002	<0.001	<0.0002	<0.001	<0.001	<0.001	<0.001
Vanadium	<0.035	**0.00572**	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.005	**0.00089 K**	<0.001
Zinc	<0.5	<0.0104	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.01	**0.0025 J**	<0.005
Field Parameters											
pH	8.3	8.31	6.66	5.96	6.81	6.59	6.84	6.70	6.54	7.51	7.33
Specific Conductance (mS/cm)	14.276	14.293	1.081	1.020	1.107	1.050	1.074	1.093	0.977	0.516	0.54
Turbidity (ntu)	4.95	8.23	3.1	0	0.9	2.1	8.7	0.0	0.0	15.4	12.60
Dissolved Oxygen (mg/L)	0.82	5.01	0.28	0.30	0.02	0.04	0.12	0.03	0.14	1.27	-0.01
Redox Potential (mV)	22.7	46.3	-33.6	-41.5	-54.0	-52.4	-81.9	-78.7	-25.2	-95.2	-51.54
Temperature (^{o}C)	27.74	18.75	13.08	14.03	13.33	13.73	25.39	13.47	14.00	16.53	20.07

Notes:
B - Analyte detected in associated method blank.
J - Estimated result
K - Analytical result may be biased high.
L - Analytical result may be biased low.
< - Not detected, value indicates detection limit.
R - Result flagged as unusable due to low response
EPA guidance, but validator notes that response
stable and calibration curve is within specified li
and thus should be considered useable.
[1] - Blind duplicate sample

OU-10 VB 1 - 8
Historical Groundwater Sampling Results Summary
Avtex Fibers Superfund Site
Front Royal, Virginia

Parameter	Downgradient Shallow Bedrock Wells (cont.)										
	MW-5 (cont.)			119							
	7/24/15	7/31/16	7/26/17	3/4/08	9/23/08	3/26/09	10/7/09	5/26/10	6/14/11	5/30/12	6/19/13
Volatile Organic Compounds (µg/L)											
Acetone	<5.0	<2.66	<3.38	<10.0 R	<10.0 R	<10.0	<10.0 R	<10.0	<10.0 R	**3.2 J**	<25.0
Benzene	<0.5	<0.2	<0.2	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
Bromodichloromethane	<0.5	<0.17	<0.17	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
Bromoform	<0.5	<0.29	<0.29	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
Bromomethane	<0.5	<0.35	<0.35	<1.00	<1.00 J	<1.00	<1.00	<1.00	<1.00	<2.00	<2.00
2-Butanone	<5.0	<2.64	<2.64	<10.0 R	<10.0	<10.0	<10.0	<10.0	<10.0 R	<5.00	<5.00
Carbon Disulfide	<1.0	<0.22	<0.22	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<2.00	<2.00
Carbon Tetrachloride	<0.5	<0.18	<0.18	<1.00 J	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
Chlorobenzene	<0.5	<0.18	<0.18	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
Chlorodibromomethane	<0.5	<0.25	<0.25	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
Chloroethane	<0.5	<0.36	<0.36	<1.00 J	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
Chloroform	<0.5	<0.23	<0.23	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
Chloromethane	<0.5 J	<0.36	<0.36	<1.00 J	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
1,2-Dichlorobenzene	<0.5	<0.19	<0.19	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
1,3-Dichlorobenzene	<0.5	<0.18	<0.18	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
1,4-Dichlorobenzene	<0.5	<0.17	<0.17	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
1,1-Dichloroethane	<0.5	<0.24	<0.24	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
1,2-Dichloroethane	<0.5	<0.2	<0.2	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
1,1-Dichloroethene	<0.5	<0.25	<0.25	<1.00 J	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
cis-1,2-Dichloroethene	<0.5	<0.21	<0.21	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
trans-1,2-Dichloroethene	<0.5	<0.23	<0.23	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
1,2-Dichloropropane	<0.5	<0.25	<0.25	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
cis-1,3-Dichloropropene	<0.5	<0.17	<0.17	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
trans-1,3-Dichloropropene	<0.5	<0.17	<0.17	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
Ethylbenzene	<0.5	<0.19	<0.19	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
2-Hexanone	<5.0	<1.28	<1.28	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<5.00	<5.00
4-Methyl-2-Pentanone	<5.0 J	<0.81	<0.81	<10.0 R	<10.0 R	<10.0	<10.0	<10.0	<10.0	<5.00	<5.00
Methylene Chloride	<0.5	<1	<1	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<2.00	<2.00
Styrene	<0.5	<0.28	<0.28	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
1,1,2,2-Tetrachloroethane	<0.5	<0.19	<0.19	<0.50	<0.50	<0.50	<0.50	<0.50	<0.500	<1.00	<1.00
Tetrachloroethene	<0.5	<0.14	<0.14	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
Toluene	<0.5	<0.17	<0.17	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
1,2,4-Trichlorobenzene	<0.5	<0.2	<0.2	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
1,1,1-Trichloroethane	<0.5	<0.19	<0.19	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
1,1,2-Trichloroethane	<0.5	<0.19	<0.19	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
Trichloroethene	<0.5	<0.2	<0.2	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
Vinyl Chloride	<0.5	<0.18	<0.18	<1.00 J	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
Xylenes (total)	<0.5	<0.58	<0.58	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<2.00	<2.00
Semivolatile Organic Compounds (µg/L)											
Acenaphthene	<0.5	<0.308	<0.308	<5.35	<5.00	<5.00	<5.00	<5.10	<5.43	<10.0	<10.0
Acenaphthylene	<0.5	<0.337	<0.337	<5.35	<5.00	<5.00	<5.00	<5.10	<5.43	<10.0	<10.0
Anthracene	<0.5	<0.365	<0.365	<5.35	<5.00	<5.00	<5.00	<5.10	<5.43	<10.0	<10.0
Benzo(a)anthracene	<0.5	<0.308	<0.308	<5.35	<5.00	<5.00	<5.00	<5.10	<5.43	<10.0	<10.0
Benzo (b) Fluoranthene	<0.5	<0.346	<0.346	<5.35	<5.00	<5.00	<5.00	<5.10	<5.43	<10.0	<10.0
Benzo (k) Fluoranthene	<0.5	<0.356	<0.356	<5.35	<5.00	<5.00	<5.00	<5.10	<5.43	<10.0	<10.0
Benzo (a) Pyrene	<0.5	<0.365	<0.365	<5.35	<5.00	<5.00	<5.00	<5.10	<5.43	<10.0	<10.0
Benzo (g,h,i) Perylene	<0.5	<0.596	<0.596	<5.35	<5.00	<5.00	<5.00	<5.10	<5.43	<10.0	<10.0
bis (2-Chloroethoxy) Methane	<1	<2.98	<1.83	<5.35	<5.00	<5.00	<5.00	<5.10	<5.43	<10.0	<10.0
bis (2-Chloroethyl) ether	<1	<2.69	<1.25	<5.35	<5.00	<5.00	<5.00	<5.10	<5.43	<10.0	<10.0
bis (2-Ethylhexyl) phthalate	<5	<5.77	<1.44	<5.35	<5.00	<5.00	<5.00	<5.10	<5.43	<6.00	<6.00
4-Bromophenyl-phenylether	<1	<2.6	<1.54	<5.35	<5.00	<5.00	<5.00	<5.10	<5.43	<10.0	<10.0
Butlybenzylphthalate	<5	<2.4	<0.962	<5.35	<5.00	<5.00	<5.00	<5.10	<5.43	<10.0	<10.0
Carbazole	<1	<2.69	<0.865	<5.35	<5.00	<5.00	<5.00	<5.10	<5.43	<10.0	<10.0
4-Chloroaniline	<4	<4.04	<1.15	<5.35	<5.00	<5.00	<5.00	<5.10 J	<5.43	<20.0	<20.0
4-Chloro-3-methylphenol	<1	<4.33	<1.35	<5.35	<5.00	<5.00	<5.00	<5.10	<5.43	<20.0	<20.0
2-Chloronaphthalene	<1	<2.69	<1.44	<5.35	<5.00	<5.00	<5.00	<5.10	<5.43	<10.0	<10.0
2-Chlorophenol	<1	<4.62	<1.63	<5.35	<5.00	<5.00	<5.00	<5.10	<5.43	<10.0	<10.0
4-Chlorophenyl-phenyl Ether	<1	<2.69	<1.54	<5.35	<5.00	<5.00	<5.00	<5.10	<5.43	<10.0	<10.0
Chrysene	<0.5	<0.317	<0.317	<5.35	<5.00	<5.00	<5.00	<5.10	<5.43	<10.0	<10.0
Dibenzo (a,h) Anthracene	<0.5	<0.433	<0.433	<5.35	<5.00	<5.00	<5.00	<5.10	<5.43	<10.0	<10.0
Dibenzofuran	<1	<2.79	<1.25	<5.35	<5.00	<5.00	<5.00	<5.10	<5.43	<10.0	<10.0
3,3'-Dichlorobenzidine	<5	<3.17	<1.44	<10.7	<10.0	<10.0	<10.0	<10.2	<10.9	<20.0	<20.0
2,4-Dichlorophenol	<1	<5.38	<2.12	<5.35	<5.00	<5.00	<5.00	<5.10	<5.43	<10.0	<10.0
Diethylphthalate	<5	<2.88	<1.15	<5.35	<5.00	<5.00	<5.00	<5.10	<5.43	<10.0	<10.0

OU-10 VB 1 - 8
Historical Groundwater Sampling Results Summary
Avtex Fibers Superfund Site
Front Royal, Virginia

Parameter	Downgradient Shallow Bedrock Wells (cont.)										
	MW-5 (cont.)			119							
	7/24/15	7/31/16	7/26/17	3/4/08	9/23/08	3/26/09	10/7/09	5/26/10	6/14/11	5/30/12	6/19/13
SVOCs (cont.)											
2,4-Dimethylphenol	<1	<4.04	<1.54	<5.35	<5.00	<5.00	<5.00	<5.10	<5.43	<10.0	<10.0
Dimethylphthalate	<5	<2.98	<1.15	<5.35	<5.00	<5.00	<5.00	<5.10	<5.43	<10.0	<10.0
Di-N-Butylphthalate	<5	<2.4	<1.25	<5.35	<5.00	<5.00	<5.00	<5.10	<5.43	<10.0	<10.0
Di-n-octylphthalate	<5	<2.4	<0.865	<5.35	<5.00	<5.00	<5.00	<5.10	<5.43	<10.0	<10.0
4,6-Dinitro-2-methylphenol	<15	<8.94	<2.79	<26.7	<25.0	<25.0	<25.0	<25.5 J	<27.2	<20.0	<20.0
2,4-Dinitrophenol	<30	<5.67	<6.92	<26.7	<25.0	<25.0	<25.0	<25.5 J	<27.2	<50.0	<50.0
2,4-Dinitrotoluene	<5	<3.08	<1.54	<5.35	<5.00	<5.00	<5.00	<5.10 J	<5.43	<10.0	<10.0
2,6-Dinitrotoluene	<1	<2.21	<1.44	<5.35	<5.00	<5.00	<5.00	<5.10 J	<5.43	<10.0	<10.0
Fluoranthene	<0.5	<0.308	<0.308	<5.35	<5.00	<5.00	<5.00	<5.10	<5.43	<10.0	<10.0
Fluorene	<0.5	<0.308	<0.308	<5.35	<5.00	<5.00	<5.00	<5.10	<5.43	<10.0	<10.0
Hexachlorobenzene	<0.5	<2.69	<1.44	<5.35	<5.00	<5.00	<5.00	<5.10	<5.43	<10.0	<10.0
Hexachlorobutadiene	<1	<1.92	<1.44	<5.35	<5.00	<5.00	<5.00	<5.10	<5.43	<10.0	<10.0
Hexachlorocyclopentadiene	<15	<1.73	<1.25	<5.35	<5.00	<5.00	<5.00	<5.10	<5.43	<10.0	<10.0
Hexachloroethane	<5	<1.83	<2.12	<5.35	<5.00	<5.00	<5.00	<5.10	<5.43	<10.0	<10.0
Indeno (1,2,3-cd) Pyrene	<0.5	<0.394	<0.394	<5.35	<5.00	<5.00	<5.00	<5.10	<5.43	<10.0	<10.0
Isophorone	<1	<2.98	<2.12	<5.35	<5.00	<5.00	<5.00	<5.10	<5.43	<10.0	<10.0
2-Methylnaphthalene	<0.5	<0.385	<0.385	<5.35	<5.00	<5.00	<5.00	<5.10	<5.43	<10.0	<10.0
2-Methylphenol	<1	<2.21	<1.54	<5.35	<5.00	<5.00	<5.00	<5.10	<5.43	<10.0	<10.0
3&4-Methylphenol/4-methylphenol	<1	<2.12	<1.35	<5.35	<5.00	<5.00	<5.00	<5.10	<5.43	<10.0	<10.0
Naphthalene	<0.5	<0.356	<0.356	<5.35	<5.00	<5.00	<5.00	<5.10	<5.43	<10.0	<10.0
2-Nitroaniline	<1	<3.56	<1.06	<26.7	<25.0	<25.0	<25.0	<25.5 J	<27.2	<50.0	<50.0
3-Nitroaniline	<1	<2.6	<1.54	<26.7	<25.0	<25.0	<25.0	<25.5 J	<27.2	<50.0	<50.0
4-Nitroaniline	<1	<2.98	<1.54	<26.7	<25.0	<25.0	<25.0	<25.5	<27.2	<20.0	<20.0
4-Nitrophenol	<30	<5.19	<1.92	<26.7	<25.0	<25.0	<25.0	<25.5 J	<27.2	<50.0	<50.0
2-Nitrophenol	<1	<5.1	<2.31	<5.35	<5.00	<5.00	<5.00	<5.10 J	<5.43	<10.0	<10.0
Nitrobenzene	<1	<2.6	<2.12	<5.35	<5.00	<5.00	<5.00	<5.10 J	<5.43	<10.0	<10.0
N-Nitroso-di-n-propylamine	<1	<3.27	<1.63	<5.35	<5.00	<5.00	<5.00	<5.10	<5.43	<10.0	<10.0
N-Nitrosodiphenylamine	<1	<3.46	<3.46	<5.35	<5.00	<5.00	<5.00	<5.10	<5.43	<10.0	<10.0
2,2'-Oxybis (1-chloropropane)	<1	<2.69	<1.73	<5.35	<5.00	<5.00	<5.00	<5.10 J	<5.43	<10.0	<10.0
Pentachlorophenol	<5	<1.63	<3.17	<10.7	<10.0	<10.0	<10.0	<10.2	<10.9	<25.0	<25.0
Phenanthrene	<0.5	<0.404	<0.404	<5.35	<5.00	<5.00	<5.00	<5.10	<5.43	<10.0	<10.0
Phenol	<1	<1.44	<1.44	<5.35	<5.00	<5.00	<5.00	<5.10	<5.43	<10.0	<10.0
Pyrene	<0.5	<0.337	<0.337	<5.35	<5.00	<5.00	<5.00	<5.10	<5.43	<10.0	<10.0
2,4,5-Trichlorophenol	<1	<6.83	<1.25	<5.35	<5.00	<5.00	<5.00	<5.10	<5.43	<10.0	<10.0
2,4,6-Trichlorophenol	<1	<6.54	<1.83	<5.35	<5.00	<5.00	<5.00	<5.10	<5.43	<10.0	<10.0
Filtered Inorganics (mg/L)											
Arsenic	<0.0040	**0.000649 J**	<0.000400	**0.00332 J**	**0.00389**	**0.00324**	<0.005	**0.00268**	**0.00255**	**0.0015**	**0.00063 J**
Antimony	<0.0020 J	<0.0005	<0.000800	<0.001	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001	<0.001
Beryllium	<0.0010	<0.001	<0.000100	**0.000359 J**	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001 L	<0.001 L
Cadmium	<0.0010	<0.0004	<0.000100	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.001	<0.001 L
Chromium	<0.0040	<0.0005	**0.00140 J**	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005 L
Copper	<0.0040	<0.001	<0.00120	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	**0.0006 J**	**0.00047 L**
Lead	<0.0020	<0.0002	<0.000100	<0.003	<0.001	<0.001	<0.005	**0.0034**	<0.001	<0.001	<0.001
Mercury	<0.00020	<0.0001	<0.000100	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Nickel	<0.0040	<0.0005	<0.000500	**0.00626 J**	**0.00478**	**0.00451**	<0.02	**0.00513**	<0.004	<0.001	<0.001
Selenium	<0.0040	<0.0006	<0.000300	**0.00229 J**	**0.00201**	**0.00189**	<0.005	**0.00167**	<0.001	<0.001	<0.001
Thallium	<0.0010	<0.0005	<0.000800	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.001	<0.001
Vanadium	<0.0010	<0.00188	<0.000700	<0.01	<0.01	<0.01	**0.0122**	<0.01	<0.01	<0.005	<0.005 L
Zinc	**0.0075 J**	<0.01	<0.00520	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.01	**0.0082 J**
Field Parameters											
pH	7.07	7.384855	9.15	6.59	6.04	6.77	6.64	5.48	6.83	7.03	7.05
Specific Conductance (mS/cm)	0.7	0.5912437	0.30624	1.257	1.458	1.359	1.443	1.278	0.970	0.716	0.635
Turbidity (ntu)	3.71	7.5	5.02	1.6	0.4	2.9	1.5	1.2	1.5	10.0	5.2
Dissolved Oxygen (mg/L)	0.05	0.299122	0.15	0.28	0.25	0.03	0.09	0.50	0.01	0.14	0.19
Redox Potential (mV)	-64.76	-134.405	-183.8	-35.5	-35.8	-43.8	-54.9	-36.3	-85.3	-94.1	-165.7
Temperature (^{o}C)	19.47	22.85947	20.45	13.00	16.60	12.9	15.39	13.41	13.62	14.04	16.16

Notes:
B - Analyte detected in associated method blank.
J - Estimated result
K - Analytical result may be biased high.
L - Analytical result may be biased low.
< - Not detected, value indicates detection limit.
R - Result flagged as unusable due to low response
EPA guidance, but validator notes that response
stable and calibration curve is within specified li
and thus should be considered useable.
[1] - Blind duplicate sample

OU-10 VB 1 - 8
Historical Groundwater Sampling Results Summary
Avtex Fibers Superfund Site
Front Royal, Virginia

Parameter	Downgradient Shallow Bedrock Wells (cont.)										
	119 (cont.)						120R				
	7/25/14	7/25/14[1]	7/23/15	7/23/15[1]	7/31/16	7/26/17	3/4/08	3/24/09	10/8/09	10/8/09[1]	5/19/10
Volatile Organic Compounds (µg/L)											
Acetone	<25.0	<25.0	<5.0	<5.0	**23.5**	<4.48	<10.0 R	<10.0 UR	<10.0	<10.0	<10.0
Benzene	<1.0	<1.0	<0.5	<0.5	<0.2	<0.2	<1.00	<1.00	<1.00	<1.00	<1.00
Bromodichloromethane	<1.0	<1.0	<0.5	<0.5	<0.17	<0.17	<1.00	<1.00	<1.00	<1.00	<1.00
Bromoform	<1.0	<1.0	<0.5	<0.5	<0.29	<0.29	<1.00	<1.00	<1.00	<1.00	<1.00
Bromomethane	<2.0	<2.0	<0.5	<0.5	<0.35	<0.35	<1.00	<1.00	<1.00	<1.00	<1.00
2-Butanone	<5.0	<5.0	**2.2 J**	<5.0	<2.64	<2.64	<10.0	<10.0	<10.0	<10.0	<10.0
Carbon Disulfide	<2.0	<2.0	<1.0	<1.0	<0.22	<0.22	<1.00	<1.00	<1.00	<1.00	<1.00
Carbon Tetrachloride	<1.0	<1.0	<0.5	<0.5	<0.18	<0.18	<1.00	<1.00	<1.00	<1.00	<1.00
Chlorobenzene	<1.0	<1.0	<0.5	<0.5	<0.18	<0.18	<1.00	<1.00	<1.00	<1.00	<1.00
Chlorodibromomethane	<1.0	<1.0	<0.5	<0.5	<0.25	<0.25	<1.00	<1.00	<1.00	<1.00	<1.00
Chloroethane	<1.0	<1.0	<0.5	<0.5	<0.36	<0.36	<1.00	<1.00	<1.00	<1.00	<1.00
Chloroform	<1.0	<1.0	<0.5	<0.5	<0.23	<0.23	<1.00	<1.00	<1.00	<1.00	<1.00
Chloromethane	<1.0	<1.0	<0.5 J	<0.5 J	<0.36	<0.36	<1.00	<1.00	<1.00	<1.00	<1.00
1,2-Dichlorobenzene	<1.0	<1.0	<0.5	<0.5	<0.19	<0.19	<1.00	<1.00	<1.00	<1.00	<1.00
1,3-Dichlorobenzene	<1.0	<1.0	<0.5	<0.5	<0.18	<0.18	<1.00	<1.00	<1.00	<1.00	<1.00
1,4-Dichlorobenzene	<1.0	<1.0	<0.5	<0.5	<0.17	<0.17	<1.00	<1.00	<1.00	<1.00	<1.00
1,1-Dichloroethane	<1.0	<1.0	<0.5	<0.5	<0.24	<0.24	<1.00	<1.00	<1.00	<1.00	<1.00
1,2-Dichloroethane	<1.0	<1.0	<0.5	<0.5	<0.2	<0.2	<1.00	<1.00	<1.00	<1.00	<1.00
1,1-Dichloroethene	<1.0	<1.0	<0.5	<0.5	<0.25	<0.25	<1.00	<1.00	<1.00	<1.00	<1.00
cis-1,2-Dichloroethene	<1.0	<1.0	<0.5	<0.5	<0.21	<0.21	<1.00	<1.00	<1.00	<1.00	<1.00
trans-1,2-Dichloroethene	<1.0	<1.0	<0.5	<0.5	<0.23	<0.23	<1.00	<1.00	<1.00	<1.00	<1.00
1,2-Dichloropropane	<1.0	<1.0	<0.5	<0.5	<0.25	<0.25	<1.00	<1.00	<1.00	<1.00	<1.00
cis-1,3-Dichloropropene	<1.0	<1.0	<0.5	<0.5	<0.17	<0.17	<1.00	<1.00	<1.00	<1.00	<1.00
trans-1,3-Dichloropropene	<1.0	<1.0	<0.5	<0.5	<0.17	<0.17	<1.00	<1.00	<1.00	<1.00	<1.00
Ethylbenzene	<1.0	<1.0	**0.2 J**	**0.2 J**	<0.19	<0.19	<1.00	<1.00	<1.00	<1.00	<1.00
2-Hexanone	<5.0	<5.0	<5.0	<5.0	<1.28	<1.28	<10.0	<10.0	<10.0	<10.0	<10.0
4-Methyl-2-Pentanone	<5.0	<5.0	<5.0 J	<5.0 J	<0.81	<0.81	<10.00	<10.00 R	<10.0	<10.0	<10.0
Methylene Chloride	<2.0	<2.0	<0.5	<0.5	<1	<1	<1.00	<1.00	<1.00	<1.00	<1.00
Styrene	<1.0	<1.0	<0.5	<0.5	<0.28	<0.28	<1.00	<1.00	<1.00	<1.00	<1.00
1,1,2,2-Tetrachloroethane	<1.0	<1.0	<0.5	<0.5	<0.19	<0.19	<0.50	<0.50	<0.500	<0.500	<0.50
Tetrachloroethene	<1.0	<1.0	<0.5	<0.5	<0.14	<0.14	<1.00	<1.00	<1.00	<1.00	<1.00
Toluene	<1.0	<1.0	**0.3 J**	**0.2 J**	<0.17	<0.17	<1.00	<1.00	<1.00	<1.00	<1.00
1,2,4-Trichlorobenzene	<1.0	<1.0	<0.5	<0.5	<0.2	<0.2	<1.00	<1.00	<1.00	<1.00	<1.00
1,1,1-Trichloroethane	<1.0	<1.0	<0.5	<0.5	<0.19	<0.19	<1.00	<1.00	<1.00	<1.00	<1.00
1,1,2-Trichloroethane	<1.0	<1.0	<0.5	<0.5	<0.19	<0.19	<1.00	<1.00	<1.00	<1.00	<1.00
Trichloroethene	<1.0	<1.0	<0.5	<0.5	<0.2	<0.2	<1.00	<1.00	<1.00	<1.00	<1.00
Vinyl Chloride	<1.0	<1.0	<0.5	<0.5	<0.18	<0.18	<1.00	<1.00	<1.00	<1.00	<1.00
Xylenes (total)	<2.0	<2.0	**1.8**	**1.3**	<0.58	<0.58	<1.00	<1.00	<1.00	<1.00	<1.00
Semivolatile Organic Compounds (µg/L)											
Acenaphthene	<10.0	<10.0	<0.5	<0.5	<0.32	<0.308	<5.15	<5.26	<5.00	<5.00	<5.21
Acenaphthylene	<10.0	<10.0	<0.5	<0.5	<0.35	<0.337	<5.15	<5.26	<5.00	<5.00	<5.21
Anthracene	<10.0	<10.0	<0.5	<0.5	<0.38	<0.365	<5.15	<5.26	<5.00	<5.00	<5.21
Benzo(a)anthracene	<10.0	<10.0	<0.5	<0.5	<0.32	<0.308	<5.15	<5.26	<5.00	<5.00	<5.21
Benzo (b) Fluoranthene	<10.0	<10.0	<0.5	<0.5	<0.36	<0.346	<5.15	<5.26	<5.00	<5.00	<5.21
Benzo (k) Fluoranthene	<10.0	<10.0	<0.5	<0.5	<0.37	<0.356	<5.15	<5.26	<5.00	<5.00	<5.21
Benzo (a) Pyrene	<10.0	<10.0	<0.5	<0.5	<0.38	<0.365	<5.15	<5.26	<5.00	<5.00	<5.21
Benzo (g,h,i) Perylene	<10.0	<10.0	<0.5	<0.5	<0.62	<0.596	<5.15	<5.26	<5.00	<5.00	<5.21
bis (2-Chloroethoxy) Methane	<10.0	<10.0	<1	<1	<3.1	<1.83	<5.15	<5.26	<5.00	<5.00	<5.21
bis (2-Chloroethyl) ether	<10.0	<10.0	<1	<1	<2.8	<1.25	<5.15	<5.26	<5.00	<5.00	<5.21
bis (2-Ethylhexyl) phthalate	<6.0	<6.0	<5	<5	<6	<1.44	<5.15	<5.26	<5.00	<5.00	<5.21
4-Bromophenyl-phenylether	<10.0	<10.0	<1	<1	<2.7	<1.54	<5.15	<5.26	<5.00	<5.00	<5.21
Butlybenzylphthalate	<10.0	<10.0	<5	<5	<2.5	<0.962	<5.15	<5.26	<5.00	<5.00	<5.21
Carbazole	NA	<10.0	<1	<1	<2.8	<0.865	<5.15	<5.26	<5.00	<5.00	<5.21
4-Chloroaniline	<20.0	<20.0	<4	<4	<4.2	<1.15	<5.15	<5.26 J	<5.00	<5.00	<5.21
4-Chloro-3-methylphenol	<20.0	<20.0	<1	<1	<4.5	<1.35	<5.15	<5.26	<5.00	<5.00	<5.21 J
2-Chloronaphthalene	<10.0	<10.0	<1 J	<1	<2.8	<1.44	<5.15	<5.26	<5.00	<5.00	<5.21
2-Chlorophenol	<10.0	<10.0	<1	<1	<4.8	<1.63	<5.15	<5.26	<5.00	<5.00	<5.21 J
4-Chlorophenyl-phenyl Ether	<10.0	<10.0	<1	<1	<2.8	<1.54	<5.15	<5.26	<5.00	<5.00	<5.21
Chrysene	<10.0	<10.0	<0.5	<0.5	<0.33	<0.317	<5.15	<5.26	<5.00	<5.00	<5.21
Dibenzo (a,h) Anthracene	<10.0	<10.0	<0.5	<0.5	<0.45	<0.433	<5.15	<5.26	<5.00	<5.00	<5.21
Dibenzofuran	<10.0	<10.0	<1	<1	<2.9	<1.25	<5.15	<5.26	<5.00	<5.00	<5.21
3,3'-Dichlorobenzidine	<20.0	<20.0	<5	<5	<3.3	<1.44	<10.3	<10.5 J	<10.0	<10.0	<10.4
2,4-Dichlorophenol	<10.0	<10.0	<1	<1	<5.6	<2.12	<5.15	<5.26	<5.00	<5.00	<5.21 J
Diethylphthalate	<10.0	<10.0	<5	<5	<3	<1.15	<5.15	<5.26	<5.00	<5.00	<5.21

OU-10 VB 1 - 8
Historical Groundwater Sampling Results Summary
Avtex Fibers Superfund Site
Front Royal, Virginia

Parameter	Downgradient Shallow Bedrock Wells (cont.)										
	119 (cont.)						120R				
	7/25/14	7/25/14[1]	7/23/15	7/23/15[1]	7/31/16	7/26/17	3/4/08	3/24/09	10/8/09	10/8/09[1]	5/19/10
SVOCs (cont.)											
2,4-Dimethylphenol	<10.0	<10.0	<1	<1	<4.2	<1.54	<5.15	<5.26	<5.00	<5.00	<5.21 J
Dimethylphthalate	<10.0	<10.0	<5	<5	<3.1	<1.15	<5.15	<5.26	<5.00	<5.00	<5.21
Di-N-Butylphthalate	<10.0	<10.0	<5	<5	<2.5	<1.25	<5.15	<5.26	<5.00	<5.00	<5.21
Di-n-octylphthalate	<10.0	<10.0	<5	<5	<2.5	<0.865	<5.15	<5.26	<5.00	<5.00	<5.21
4,6-Dinitro-2-methylphenol	<20.0	<20.0	<15	<15	<9.3	<2.79	<25.8	<26.3	<25.0	<25.0	<26.0
2,4-Dinitrophenol	<50.0	<50.0	<30	<30	<5.9	<6.92	<25.8	<26.3	<25.0	<25.0	<26.0
2,4-Dinitrotoluene	<10.0	<10.0	<5	<5	<3.2	<1.54	<5.15	<5.26	<5.00	<5.00	<5.21
2,6-Dinitrotoluene	<10.0	<10.0	<1	<1	<2.3	<1.44	<5.15	<5.26	<5.00	<5.00	<5.21
Fluoranthene	<10.0	<10.0	<0.5	<0.5	<0.32	<0.308	<5.15	<5.26	<5.00	<5.00	<5.21
Fluorene	<10.0	<10.0	<0.5	<0.5	<0.32	<0.308	<5.15	<5.26	<5.00	<5.00	<5.21
Hexachlorobenzene	<10.0	<10.0	<0.5	<0.5	<2.8	<1.44	<5.15	<5.26	<5.00	<5.00	<5.21
Hexachlorobutadiene	<10.0	<10.0	<1	<1	<2	<1.44	<5.15	<5.26	<5.00	<5.00	<5.21
Hexachlorocyclopentadiene	<10.0	<10.0	<15	<15	<1.8	<1.25	<5.15	<5.26	<5.00	<5.00	<5.21 J
Hexachloroethane	<10.0	<10.0	<5	<5	<1.9	<2.12	<5.15	<5.26	<5.00	<5.00	<5.21
Indeno (1,2,3-cd) Pyrene	<10.0	<10.0	<0.5	<0.5	<0.41	<0.394	<5.15	<5.26	<5.00	<5.00	<5.21
Isophorone	<10.0	<10.0	<1	<1	<3.1	<2.12	<5.15	<5.26	<5.00	<5.00	<5.21
2-Methylnaphthalene	<10.0	<10.0	<0.5	<0.5	<0.4	<0.385	<5.15	<5.26	<5.00	<5.00	<5.21
2-Methylphenol	<10.0	<10.0	<1	<1	<2.3	<1.54	<5.15	<5.26	<5.00	<5.00	<5.21 J
3&4-Methylphenol/4-methylphenol	<10.0	<10.0	<1	<1	<2.2	<1.35	<5.15	<5.26	<5.00	<5.00	<5.21 J
Naphthalene	<10.0	<10.0	**0.4 J**	**0.3 J**	<0.37	<0.356	<5.15	<5.26	<5.00	<5.00	<5.21
2-Nitroaniline	<50.0	<50.0	<1	<1	<3.7	<1.06	<25.8	<26.3	<25.0	<25.0	<26.0
3-Nitroaniline	<50.0	<50.0	<1	<1	<2.7	<1.54	<25.8	<26.3 J	<25.0	<25.0	<26.0
4-Nitroaniline	<20.0	<20.0	<1	<1	<3.1	<1.54	<25.8	<26.3 J	<25.0	<25.0	<26.0
4-Nitrophenol	<50.0	<50.0	<30	<30	<5.4	<1.92	<25.8	<26.3	<25.0	<25.0	<26.0
2-Nitrophenol	<10.0	<10.0	<1	<1	<5.3	<2.31	<5.15	<5.26	<5.00	<5.00	<5.21 J
Nitrobenzene	<10.0	<10.0	<1	<1	<2.7	<2.12	<5.15	<5.26	<5.00	<5.00	<5.21
N-Nitroso-di-n-propylamine	<10.0	<10.0	<1	<1	<3.4	<1.63	<5.15	<5.26	<5.00	<5.00	<5.21
N-Nitrosodiphenylamine	<10.0	<10.0	<1	<1	<3.6	<3.46	<5.15	<5.26	<5.00	<5.00	<5.21
2,2'-Oxybis (1-chloropropane)	NA	<10.0	<1	<1	<2.8	<1.73	<5.15	<5.26	<5.00	<5.00	<5.21
Pentachlorophenol	<25.0	<25.0	<5	<5	<1.7	<3.17	<10.3	<10.5	<10.0	<10.0	<10.4
Phenanthrene	<10.0	<10.0	<0.5	<0.5	<0.42	<0.404	<5.15	<5.26	<5.00	<5.00	<5.21
Phenol	<10.0 J	<10.0	<1	<1	<1.5	<1.44	<5.15	<5.26	<5.00	<5.00	<5.21
Pyrene	<10.0	<10.0	<0.5	<0.5	<0.35	<0.337	<5.15	<5.26	<5.00	<5.00	<5.21
2,4,5-Trichlorophenol	<10.0	<10.0	<1	<1	<7.1	<1.25	<5.15	<5.26	<5.00	<5.00	<5.21 J
2,4,6-Trichlorophenol	<10.0	<10.0	<1	<1	<6.8	<1.83	<5.15	<5.26	<5.00	<5.00	<5.21 J
Filtered Inorganics (mg/L)											
Arsenic	<0.001	<0.001	<0.0040	<0.0040	**0.00113 J**	<0.000400	**0.000333 J**	**0.0017**	<0.005	<0.005	<0.001
Antimony	<0.001	<0.001	<0.0020 J	**0.0046 J**	<0.000909	<0.000800	<0.001	<0.001	<0.005	<0.005	<0.001
Beryllium	<0.0001	<0.0001	<0.0010	<0.0010	<0.001	<0.000100	<0.005	<0.002	<0.002	<0.002	<0.002
Cadmium	<0.0001	<0.0001	<0.0010	<0.0010	<0.0004	<0.000100	<0.005	<0.005	<0.005	<0.005	<0.005
Chromium	<0.001	<0.001	<0.0040	<0.0040	<0.0005	<0.000500	<0.005	<0.005	<0.005	<0.005	<0.005
Copper	<0.001	<0.001	<0.0040	<0.0040	<0.001	<0.00120	<0.01	<0.01	<0.01	<0.010	<0.01
Lead	<0.001	<0.001	<0.0020	<0.0020	<0.0002	<0.000100	**0.000429 J**	<0.001	<0.005	<0.005	<0.001
Mercury	<0.0002	<0.0002	<0.00020	<0.00020	<0.0001	<0.000100	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Nickel	<0.001	<0.001	<0.0040	<0.0040	<0.0005	<0.000500	**0.00329 J**	<0.004	<0.02	<0.02	<0.004
Selenium	<0.001	<0.001	<0.0040	<0.0040	<0.0006	<0.000300	**0.00101 J**	**0.00185**	<0.005	<0.005	<0.001
Thallium	<0.001	<0.001	<0.0010	<0.0010	<0.0005	<0.000800	<0.0002	<0.0002	<0.001	<0.001	<0.0002
Vanadium	<0.001	<0.001	<0.0010	<0.0010	<0.00186	<0.000700	<0.01	<0.01	<0.01	<0.01	<0.01
Zinc	<0.005	<0.005	<0.0300	<0.0300	<0.01	**0.0630**	<0.02	<0.02	<0.02	<0.02	<0.02
Field Parameters											
pH	7.45	7.45	---	---	7.61	7.76	6.98	7.03	6.80	---	6.98
Specific Conductance (mS/cm)	0.62	0.62	---	---	0.58807	0.54984	0.786	0.733	0.761	---	0.773
Turbidity (ntu)	14.00	14.00	---	---	10.35	25.1	0	2.7	4.5	---	1.9
Dissolved Oxygen (mg/L)	0.11	0.11	---	---	0.14	0.14	0.28	0.01	0.09	---	0.08
Redox Potential (mV)	-142.65	-142.65	---	---	-149.4	-151.8	-74.8	-86.6	-83.4	---	-120.7
Temperature (^{o}C)	20.21	20.21	---	---	19.45	20.47	12.37	12.06	14.13	---	12.23

Notes:
B - Analyte detected in associated method blank.
J - Estimated result
K - Analytical result may be biased high.
L - Analytical result may be biased low.
< - Not detected, value indicates detection limit.
R - Result flagged as unusable due to low response
EPA guidance, but validator notes that response
stable and calibration curve is within specified li
and thus should be considered useable.
[1] - Blind duplicate sample

OU-10 VB 1 - 8
Historical Groundwater Sampling Results Summary
Avtex Fibers Superfund Site
Front Royal, Virginia

Parameter	Downgradient Shallow Bedrock Wells (cont.)										
	120R (cont.)										
	5/19/10[1]	6/15/11	6/15/11[1]	5/30/12	5/30/12[1]	6/19/13	6/19/13[1]	7/25/14	7/23/15	7/20/16	7/26/17
Volatile Organic Compounds (µg/L)											
Acetone	<10.0	<10.0 R	<10.0 R	<25.0	<25.0	<25.0	<25.0	<25.0	<5.0	<2.66	<3.11
Benzene	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0	<0.5	<0.2	<0.2
Bromodichloromethane	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0	<0.5	<0.17	<0.17
Bromoform	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0	<0.5	<0.29	<0.29
Bromomethane	<1.00	<1.00	<1.00	<2.00	<2.00	<2.00	<2.00	<10.0	<0.5	<0.35	<0.35
2-Butanone	<10.0	<10.0 R	<10.0 R	<5.00	<5.00	<5.00	<5.00	<10.0	<5.0	<2.64	<2.64
Carbon Disulfide	<1.00	<1.00	<1.00	<2.00	<2.00	<2.00	<2.00	<10.0	<1.0	<0.22	<0.22
Carbon Tetrachloride	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0	<0.5	<0.18	<0.18
Chlorobenzene	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0	<0.5	<0.18	<0.18
Chlorodibromomethane	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0	<0.5	<0.25	<0.25
Chloroethane	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<10.0	<0.5	<0.36	<0.36
Chloroform	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0	<0.5	<0.23	<0.23
Chloromethane	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0	<0.5 J	<0.36	<0.36
1,2-Dichlorobenzene	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0	<0.5	<0.19	<0.19
1,3-Dichlorobenzene	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0	<0.5	<0.18	<0.18
1,4-Dichlorobenzene	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0	<0.5	<0.17	<0.17
1,1-Dichloroethane	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0	<0.5	<0.24	<0.24
1,2-Dichloroethane	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0	<0.5	<0.2	<0.2
1,1-Dichloroethene	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0	<0.5	<0.25	<0.25
cis-1,2-Dichloroethene	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0	<0.5	<0.21	<0.21
trans-1,2-Dichloroethene	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0	<0.5	<0.23	<0.23
1,2-Dichloropropane	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0	<0.5	<0.25	<0.25
cis-1,3-Dichloropropene	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0	<0.5	<0.17	<0.17
trans-1,3-Dichloropropene	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0	<0.5	<0.17	<0.17
Ethylbenzene	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0	<0.5	<0.19	<0.19
2-Hexanone	<10.0	<10.0	<10.0	<5.00	<5.00	<5.00	<5.00	<10.0	<5.0	<1.28	<1.28
4-Methyl-2-Pentanone	<10.0	<10.0	<10.0	<5.00	<5.00	<5.00	<5.00	<10.0	<5.0 J	<0.81	<0.81
Methylene Chloride	<1.00	<1.00	<1.00	<2.00	<2.00	<2.00	<2.00	<5.0	<0.5	<1	<1
Styrene	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0	<0.5	<0.28	<0.28
1,1,2,2-Tetrachloroethane	<0.50	<0.50	<0.50	<0.50	<1.00	<1.00	<0.50	<5.0	<0.5	<0.19	<0.19
Tetrachloroethene	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0	<0.5	<0.14	<0.14
Toluene	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0	<0.5	<0.17	<0.17
1,2,4-Trichlorobenzene	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0	<0.5	<0.2	<0.2
1,1,1-Trichloroethane	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0	<0.5	<0.19	<0.19
1,1,2-Trichloroethane	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0	<0.5	<0.19	<0.19
Trichloroethene	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0	<0.5	<0.2	<0.2
Vinyl Chloride	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0	<0.5	<0.18	<0.18
Xylenes (total)	<1.00	<1.00	<1.00	<2.00	<2.00	<2.00	<2.00	<10.0	<0.5	<0.58	<0.58
Semivolatile Organic Compounds (µg/L)											
Acenaphthene	<5.21	<5.00	<5.00	<10.0	<10.0	<10.0	<10.0	<10.0	<0.5	<0.314	<0.308
Acenaphthylene	<5.21	<5.00	<5.00	<10.0	<10.0	<10.0	<10.0	<10.0	<0.5	<0.343	<0.337
Anthracene	<5.21	<5.00	<5.00	<10.0	<10.0	<10.0	<10.0	<10.0	<0.5	<0.373	<0.365
Benzo(a)anthracene	<5.21	<5.00	<5.00	<10.0	<10.0	<10.0	<10.0	<10.0	<0.5	<0.314	<0.308
Benzo (b) Fluoranthene	<5.21	<5.00	<5.00	<10.0	<10.0	<10.0	<10.0	<10.0	<0.5	<0.353	<0.346
Benzo (k) Fluoranthene	<5.21	<5.00	<5.00	<10.0	<10.0	<10.0	<10.0	<10.0	<0.5	<0.363	<0.356
Benzo (a) Pyrene	<5.21	<5.00	<5.00	<10.0	<10.0	<10.0	<10.0	<10.0	<0.5	<0.373	<0.365
Benzo (g,h,i) Perylene	<5.21	<5.00	<5.00	<10.0	<10.0	<10.0	<10.0	<10.0	<0.5	<0.608	<0.596
bis (2-Chloroethoxy) Methane	<5.21	<5.00	<5.00	<10.0	<10.0	<10.0	<10.0	<10.0	<1	<3.04	<1.83
bis (2-Chloroethyl) ether	<5.21	<5.00	<5.00	<10.0	<10.0	<10.0	<10.0	<10.0	<1	<2.75	<1.25
bis (2-Ethylhexyl) phthalate	<5.21	**13.6 J**	<5.00 J	<6.00	<6.00	<6.00	<6.00	<6.0	<5	<5.88	<1.44
4-Bromophenyl-phenylether	<5.21	<5.00	<5.00	<10.0	<10.0	<10.0	<10.0	<10.0	<1	<2.65	<1.54
Butlybenzylphthalate	<5.21	<5.00	<5.00	<10.0	<10.0	<10.0	<10.0	<10.0	<5	<2.45	<0.962
Carbazole	<5.21	<5.00	<5.00	<10.0	<10.0	<10.0	<10.0	<10.0	<1	<2.75	<0.865
4-Chloroaniline	<5.21	<5.00	<5.00	<10.0	<10.0	<20.0	<20.0	<20.0	<4	<4.12	<1.15
4-Chloro-3-methylphenol	<5.21 J	<5.00	<5.00	<10.0	<10.0	<20.0	<20.0	<20.0	<1	<4.41	<1.35
2-Chloronaphthalene	<5.21	<5.00	<5.00	<10.0	<10.0	<10.0	<10.0	<10.0	<1	<2.75	<1.44
2-Chlorophenol	<5.21 J	<5.00	<5.00	<10.0	<10.0	<10.0	<10.0	<10.0	<1	<4.71	<1.63
4-Chlorophenyl-phenyl Ether	<5.21	<5.00	<5.00	<10.0	<10.0	<10.0	<10.0	<10.0	<1	<2.75	<1.54
Chrysene	<5.21	<5.00	<5.00	<10.0	<10.0	<10.0	<10.0	<10.0	<0.5	<0.324	<0.317
Dibenzo (a,h) Anthracene	<5.21	<5.00	<5.00	<10.0	<10.0	<10.0	<10.0	<10.0	<0.5	<0.441	<0.433
Dibenzofuran	<5.21	<5.00	<5.00	<10.0	<10.0	<10.0	<10.0	<10.0	<1	<2.84	<1.25
3,3'-Dichlorobenzidine	<10.4	<10.0	<10.0	<20.0	<20.0	<20.0	<20.0	<20.0	<5	<3.24	<1.44
2,4-Dichlorophenol	<5.21 J	<5.00	<5.00	<10.0	<10.0	<10.0	<10.0	<10.0	<1	<5.49	<2.12
Diethylphthalate	<5.21	<5.00	<5.00	<10.0	<10.0	<10.0	<10.0	<10.0	<5	<2.94	<1.15

OU-10 VB 1 - 8
Historical Groundwater Sampling Results Summary
Avtex Fibers Superfund Site
Front Royal, Virginia

Parameter	Downgradient Shallow Bedrock Wells (cont.)										
	120R (cont.)										
	5/19/10[1]	6/15/11	6/15/11[1]	5/30/12	5/30/12[1]	6/19/13	6/19/13[1]	7/25/14	7/23/15	7/20/16	7/26/17
SVOCs (cont.)											
2,4-Dimethylphenol	<5.21 J	<5.00	<5.00	<10.0	<10.0	<10.0	<10.0	<10.0	<1	<4.12	<1.54
Dimethylphthalate	<5.21	<5.00	<5.00	<10.0	<10.0	<10.0	<10.0	<10.0	<5	<3.04	<1.15
Di-N-Butylphthalate	<5.21	<5.00	<5.00	<10.0	<10.0	<10.0	<10.0	<10.0	<5	<2.45	<1.25
Di-n-octylphthalate	<5.21	<5.00	<5.00	<10.0	<10.0	<10.0	<10.0	<10.0	<5	<2.45	<0.865
4,6-Dinitro-2-methylphenol	<26.0	<25.0	<25.0	<20.0	<20.0	<20.0	<20.0	<20.0	<16	<9.12	<2.79
2,4-Dinitrophenol	<26.0	<25.0	<25.0	<50.0	<50.0	<50.0	<50.0	<50.0	<31	<5.78 J	<6.92
2,4-Dinitrotoluene	<5.21	<5.00	<5.00	<10.0	<10.0	<10.0	<10.0	<10.0	<5	<3.14	<1.54
2,6-Dinitrotoluene	<5.21	<5.00	<5.00	<10.0	<10.0	<10.0	<10.0	<10.0	<1	<2.25	<1.44
Fluoranthene	<5.21	<5.00	<5.00	<10.0	<10.0	<10.0	<10.0	<10.0	<0.5	<0.314	<0.308
Fluorene	<5.21	<5.00	<5.00	<10.0	<10.0	<10.0	<10.0	<10.0	<0.5	<0.314	<0.308
Hexachlorobenzene	<5.21	<5.00	<5.00	<10.0	<10.0	<10.0	<10.0	<10.0	<0.5	<2.75	<1.44
Hexachlorobutadiene	<5.21	<5.00	<5.00	<10.0	<10.0	<10.0	<10.0	<10.0	<1	<1.96	<1.44
Hexachlorocyclopentadiene	<5.21 J	<5.00	<5.00	<10.0	<10.0	<10.0	<10.0	<10.0	<16	<1.76	<1.25
Hexachloroethane	<5.21	<5.00	<5.00	<10.0	<10.0	<10.0	<10.0	<10.0	<5	<1.86	<2.12
Indeno (1,2,3-cd) Pyrene	<5.21	<5.00	<5.00	<10.0	<10.0	<10.0	<10.0	<10.0	<0.5	<0.402	<0.394
Isophorone	<5.21	<5.00	<5.00	<10.0	<10.0	<10.0	<10.0	<10.0	<1	<3.04	<2.12
2-Methylnaphthalene	<5.21	<5.00	<5.00	<10.0	<10.0	<10.0	<10.0	<10.0	<0.5	<0.392	<0.385
2-Methylphenol	<5.21 J	<5.00	<5.00	<10.0	<10.0	<10.0	<10.0	<10.0	<1	<2.25	<1.54
3&4-Methylphenol/4-methylphenol	<5.21 J	<5.00	<5.00	<10.0	<10.0	<10.0	<10.0	<10.0	<1	<2.16	<1.35
Naphthalene	<5.21	<5.00	<5.00	<10.0	<10.0	<10.0	<10.0	<10.0	<0.5	<0.363	<0.356
2-Nitroaniline	<26.0	<25.0	<25.0	<50.0	<50.0	<50.0	<50.0	<50.0	<1	<3.63	<1.06
3-Nitroaniline	<26.0	<25.0	<25.0	<50.0	<50.0	<50.0	<50.0	<50.0	<1	<2.65	<1.54
4-Nitroaniline	<26.0	<25.0	<25.0	<20.0	<20.0	<20.0	<20.0	<20.0	<1	<3.04	<1.54
4-Nitrophenol	<26.0	<25.0	<25.0	<50.0	<50.0	<50.0	<50.0	<50.0	<31	<5.29	<1.92
2-Nitrophenol	<5.21 J	<5.00	<5.00	<10.0	<10.0	<10.0	<10.0	<10.0	<1	<5.2	<2.31
Nitrobenzene	<5.21	<5.00	<5.00	<10.0	<10.0	<10.0	<10.0	<10.0	<1	<2.65	<2.12
N-Nitroso-di-n-propylamine	<5.21	<5.00	<5.00	<10.0	<10.0	<10.0	<10.0	<10.0	<1	<3.33	<1.63
N-Nitrosodiphenylamine	<5.21	<5.00	<5.00	<10.0	<10.0	<10.0	<10.0	<10.0	<1	<3.53 J	<3.46
2,2'-Oxybis (1-chloropropane)	<5.21	<5.00	<5.00	<10.0	<10.0	<10.0	<10.0	<10.0	<1	<2.75	<1.73
Pentachlorophenol	<10.4	<10.0	<10.0	<25.0	<25.0	<25.0	<25.0	<25.0	<5	<1.67	<3.17
Phenanthrene	<5.21	<5.00	<5.00	<10.0	<10.0	<10.0	<10.0	<10.0	<0.5	<0.412	<0.404
Phenol	<5.21	<5.00	<5.00	<10.0	<10.0	<10.0	<10.0	<10.0	<1	<1.47	<1.44
Pyrene	<5.21	<5.00	<5.00	<10.0	<10.0	<10.0	<10.0	<10.0	<0.5	<0.343	<0.337
2,4,5-Trichlorophenol	<5.21 J	<5.00	<5.00	<10.0	<10.0	<10.0	<10.0	<10.0	<1	<6.96	<1.25
2,4,6-Trichlorophenol	<5.21 J	<5.00	<5.00	<10.0	<10.0	<10.0	<10.0	<10.0	<1	<6.67	<1.83
Filtered Inorganics (mg/L)											
Arsenic	<0.001	<0.001	<0.001	**0.00066 J**	**0.00072 J**	**0.00054 J**	<0.001	<0.001	**0.00091 J**	**0.00056 J**	<0.000400
Antimony	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0020 J	<0.0005	<0.000800
Beryllium	<0.002	<0.002	<0.002	<0.001 L	<0.001 L	<0.001 L	<0.001 L	<0.0001	<0.0010	<0.001	<0.000100
Cadmium	<0.005	<0.005	<0.005	<0.001	<0.001	<0.001 L	<0.001 L	<0.0001	<0.0010	<0.0004	<0.000100
Chromium	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005 L	<0.005 L	<0.001	<0.0040	<0.0005	<0.000500
Copper	<0.01	<0.01	<0.01	**0.00081 J**	**0.00076 J**	**0.00035 L**	<0.005 L	<0.001	<0.0040	<0.001	<0.00120
Lead	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0020	<0.0002	<0.000100
Mercury	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.00020	<0.0001	<0.000100
Nickel	<0.004	<0.004	<0.004	<0.001	**0.00084 J**	<0.001	<0.001	<0.001	<0.0040	<0.0005	<0.000500
Selenium	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0040	<0.0006	<0.000300
Thallium	<0.0002	<0.0002	<0.0002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0005	<0.000800
Vanadium	<0.01	<0.01	<0.01	<0.005	<0.005	<0.005 L	<0.005 L	<0.001	<0.0010	**0.000714 J**	<0.000700
Zinc	<0.02	<0.02	<0.02	<0.01	**0.0023 J**	**0.0082 J**	**0.0025 J**	<0.005	<0.0300	<0.01	<0.00520
Field Parameters											
pH	--	6.94	--	7.09	--	7.25	--	7.44	7.86	8.12	8.16
Specific Conductance (mS/cm)	--	0.787	--	0.929	--	0.823	--	0.79	0.5	0.52015	0.48471
Turbidity (ntu)	--	5.0	--	8.6	--	10.5	--	89.30	12.30	3.93	35.9
Dissolved Oxygen (mg/L)	--	0.02	--	0.25	--	0.21	--	0.17	0.05	0.24	0.12
Redox Potential (mV)	--	-103.2	--	-14.8	--	-147.4	--	-142.21	-192.90	-148.1	-174.8
Temperature (^{o}C)	--	13.20	--	17.26	--	15.85	--	20.03	21.28	18.52	22.1

Notes:
B - Analyte detected in associated method blank.
J - Estimated result
K - Analytical result may be biased high.
L - Analytical result may be biased low.
< - Not detected, value indicates detection limit.
R - Result flagged as unusable due to low response
EPA guidance, but validator notes that response
stable and calibration curve is within specified li
and thus should be considered useable.

[1] - Blind duplicate sample

OU-10 VB 1 - 8
Historical Groundwater Sampling Results Summary
Avtex Fibers Superfund Site
Front Royal, Virginia

Parameter	Downgradient Shallow Bedrock Wells (cont.)										
	132										
	3/7/08	9/23/08	3/26/09	10/13/09	5/27/10	6/15/11	6/5/12	6/7/13	8/5/14	8/5/14[1]	7/24/15
Volatile Organic Compounds (µg/L)											
Acetone	<10.0 R	<10.0 R	<10.0	<10.0	<10.0	<10.0 R	<25.0	<25.0	<25.0	<25.0	<5.0
Benzene	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<1.0	<0.5
Bromodichloromethane	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<1.0	<0.5
Bromoform	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<1.0	<0.5
Bromomethane	<1.00	<1.00 J	<1.00	<1.00	<1.00	<1.00	<2.00	<2.00	<2.0 J	<2.0 J	<0.5
2-Butanone	<10.0 J	<10.0	<10.0	<10.0	<10.0	<10.0 R	<5.00	<5.00	<5.0	<5.0	<5.0
Carbon Disulfide	**1.34**	<1.00	<1.00	<1.00	<1.00	<1.00	<2.00	<2.00	<2.0	<2.0	<1.0
Carbon Tetrachloride	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<1.0	<0.5
Chlorobenzene	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<1.0	<0.5
Chlorodibromomethane	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<1.0	<0.5
Chloroethane	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0 J	<1.0 J	<0.5
Chloroform	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<1.0	<0.5
Chloromethane	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<1.0	<0.5
1,2-Dichlorobenzene	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<1.0	<0.5
1,3-Dichlorobenzene	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<1.0	<0.5
1,4-Dichlorobenzene	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<1.0	<0.5
1,1-Dichloroethane	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<1.0	<0.5
1,2-Dichloroethane	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<1.0	<0.5
1,1-Dichloroethene	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<1.0	<0.5
cis-1,2-Dichloroethene	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<1.0	<0.5
trans-1,2-Dichloroethene	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<1.0	<0.5
1,2-Dichloropropane	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<1.0	<0.5
cis-1,3-Dichloropropene	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<1.0	<0.5
trans-1,3-Dichloropropene	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<1.0	<0.5
Ethylbenzene	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<1.0	<0.5
2-Hexanone	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<5.00	<5.00	<5.0	<5.0	<5.0
4-Methyl-2-Pentanone	<10.0 R	<10.0 R	<10.0	<10.0	<10.0	<10.0	<5.00	<5.00	<5.0	<5.0	<5.0
Methylene Chloride	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<2.00	<2.00	<2.0	<2.0	<0.5
Styrene	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<1.0	<0.5
1,1,2,2-Tetrachloroethane	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<1.00	<1.00	<1.0	<1.0	<0.5
Tetrachloroethene	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	**4.0 J**	**0.65 J**	<0.5
Toluene	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<1.0	<0.5
1,2,4-Trichlorobenzene	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<1.0	<0.5
1,1,1-Trichloroethane	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<1.0	<0.5
1,1,2-Trichloroethane	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<1.0	<0.5
Trichloroethene	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<1.0	<0.5
Vinyl Chloride	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	<1.0	<0.5
Xylenes (total)	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<2.00	<2.00	<2.0	<2.0	<0.5
Semivolatile Organic Compounds (µg/L)											
Acenaphthene	<5.00	<5.10	<5.10	<5.00	<5.10	<5.00	<10.0	<10.0	<10.0	<10.0	<0.5
Acenaphthylene	<5.00	<5.10	<5.10	<5.00	<5.10	<5.00	<10.0	<10.0	<10.0	<10.0	<0.5
Anthracene	<5.00	<5.10	<5.10	<5.00	<5.10	<5.00	<10.0	<10.0	<10.0	<10.0	<0.5
Benzo(a)anthracene	<5.00	<5.10	<5.10	<5.00	<5.10	<5.00	**1.2 J**	<10.0	<10.0	<10.0	<0.5
Benzo (b) Fluoranthene	<5.00	<5.10	<5.10	<5.00	<5.10	<5.00	**1.1 J**	<10.0	<10.0	<10.0	<0.5
Benzo (k) Fluoranthene	<5.00	<5.10	<5.10	<5.00	<5.10	<5.00	**1.5 B**	<10.0	<10.0	<10.0	<0.5
Benzo (a) Pyrene	<5.00	<5.10	<5.10	<5.00	<5.10	<5.00	<10.0	<10.0	<10.0	<10.0	<0.5
Benzo (g,h,i) Perylene	<5.00	<5.10	<5.10	<5.00	<5.10	<5.00	<10.0	<10.0	<10.0	<10.0	<0.5
bis (2-Chloroethoxy) Methane	<5.00	<5.10	<5.10	<5.00	<5.10	<5.00	<10.0	<10.0	<10.0	<10.0	<1
bis (2-Chloroethyl) ether	<5.00	<5.10	<5.10	<5.00	<5.10	<5.00	<10.0	<10.0	<10.0	<10.0	<1
bis (2-Ethylhexyl) phthalate	<5.00	<5.10	<5.10	<5.00	<5.10	**9.31**	<6.00	<6.00	<6.0	<6.0	<5
4-Bromophenyl-phenylether	<5.00	<5.10	<5.10	<5.00	<5.10	<5.00	<10.0	<10.0	<10.0	<10.0	<1
Butlybenzylphthalate	<5.00	<5.10	<5.10	<5.00	<5.10	<5.00	<10.0	<10.0	<10.0	<10.0	<5
Carbazole	<5.00	<5.10	<5.10	<5.00	<5.10	<5.00	<10.0	<10.0	NA	NA	<1
4-Chloroaniline	<5.00	<5.10	<5.10	<5.00	<5.10 J	<5.00	<20.0	<20.0	<20.0	<20.0	<4
4-Chloro-3-methylphenol	<5.00	<5.10	<5.10	<5.00	<5.10	<5.00	<20.0	<20.0	<20.0	<20.0	<1
2-Chloronaphthalene	<5.00	<5.10	<5.10	<5.00	<5.10	<5.00	<10.0	<10.0	<10.0	<10.0	<1
2-Chlorophenol	<5.00	<5.10	<5.10	<5.00	<5.10	<5.00	<10.0	<10.0	<10.0	<10.0	<1
4-Chlorophenyl-phenyl Ether	<5.00	<5.10	<5.10	<5.00	<5.10	<5.00	<10.0	<10.0	<10.0	<10.0	<1
Chrysene	<5.00	<5.10	<5.10	<5.00	<5.10	<5.00	**1.4 B**	<10.0	<10.0	<10.0	<0.5
Dibenzo (a,h) Anthracene	<5.00	<5.10	<5.10	<5.00	<5.10	<5.00	**1.0 J**	<10.0	<10.0	<10.0	<0.5
Dibenzofuran	<5.00	<5.10	<5.10	<5.00	<5.10	<5.00	<10.0	<10.0	<10.0	<10.0	<1
3,3'-Dichlorobenzidine	<10.0	<10.2	<10.2	<10.0	<10.2	<10.0	<20.0	<20.0	<20.0	<20.0	<5
2,4-Dichlorophenol	<5.00	<5.10	<5.10	<5.00	<5.10	<5.00	<10.0	<10.0	<10.0	<10.0	<1
Diethylphthalate	<5.00	<5.10	<5.10	<5.00	<5.10	<5.00	<10.0	<10.0	<10.0	<10.0	<5

OU-10 VB 1 - 8
Historical Groundwater Sampling Results Summary
Avtex Fibers Superfund Site
Front Royal, Virginia

Parameter	Downgradient Shallow Bedrock Wells (cont.)										
	132										
	3/7/08	9/23/08	3/26/09	10/13/09	5/27/10	6/15/11	6/5/12	6/7/13	8/5/14	8/5/14[1]	7/24/15
SVOCs (cont.)											
2,4-Dimethylphenol	<5.00	<5.10	<5.10	<5.00	<5.10	<5.00	<10.0	<10.0	<10.0	<10.0	<1
Dimethylphthalate	<5.00	<5.10	<5.10	<5.00	<5.10	<5.00	<10.0	<10.0	<10.0	<10.0	<5
Di-N-Butylphthalate	<5.00	<5.10	<5.10	<5.00	<5.10	<5.00	<10.0	<10.0	<10.0	<10.0	<5
Di-n-octylphthalate	<5.00	<5.10	<5.10	<5.00	<5.10	<5.00	<10.0	<10.0	<10.0	<10.0	<5
4,6-Dinitro-2-methylphenol	<25.0	<25.5	<25.5	<25.0	<25.5 J	<25.0	<20.0	<20.0	<20.0	<20.0	<15
2,4-Dinitrophenol	<25.0	<25.5	<25.5	<25.0	<25.5 J	<25.0	<50.0	<50.0	<50.0	<50.0	<31
2,4-Dinitrotoluene	<5.00	<5.10	<5.10	<5.00	<5.10 J	<5.00	<10.0	<10.0	<10.0	<10.0	<5
2,6-Dinitrotoluene	<5.00	<5.10	<5.10	<5.00	<5.10 J	<5.00	<10.0	<10.0	<10.0	<10.0	<1
Fluoranthene	<5.00	<5.10	<5.10	<5.00	<5.10	<5.00	<10.0	<10.0	<10.0	<10.0	<0.5
Fluorene	<5.00	<5.10	<5.10	<5.00	<5.10	<5.00	<10.0	<10.0	<10.0	<10.0	<0.5
Hexachlorobenzene	<5.00	<5.10	<5.10	<5.00	<5.10	<5.00	<10.0	<10.0	<10.0	<10.0	<0.5
Hexachlorobutadiene	<5.00	<5.10	<5.10	<5.00	<5.10	<5.00	<10.0	<10.0	<10.0	<10.0	<1
Hexachlorocyclopentadiene	<5.00	<5.10	<5.10	<5.00	<5.10	<5.00	<10.0	<10.0	<10.0	<10.0	<15
Hexachloroethane	<5.00	<5.10	<5.10	<5.00	<5.10	<5.00	<10.0	<10.0	<10.0	<10.0	<5
Indeno (1,2,3-cd) Pyrene	<5.00	<5.10	<5.10	<5.00	<5.10	<5.00	**1.0 J**	<10.0	<10.0	<10.0	<0.5
Isophorone	<5.00	<5.10	<5.10	<5.00	<5.10	<5.00	<10.0	<10.0	<10.0	<10.0	<1
2-Methylnaphthalene	<5.00	<5.10	<5.10	<5.00	<5.10	<5.00	<10.0	<10.0	<10.0	<10.0	<0.5
2-Methylphenol	<5.00	<5.10	<5.10	<5.00	<5.10	<5.00	<10.0	<10.0	<10.0	<10.0	<1
3&4-Methylphenol/4-methylphenol	<5.00	<5.10	<5.10	<5.00	<5.10	<5.00	<10.0	<10.0	<10.0	<10.0	<1
Naphthalene	<5.00	<5.10	<5.10	<5.00	<5.10	<5.00	<10.0	<10.0	<10.0	<10.0	<0.5
2-Nitroaniline	<25.0	<25.5	<25.5	<25.0	<25.5 J	<25.0	<50.0	<50.0	<50.0	<50.0	<1
3-Nitroaniline	<25.0	<25.5	<25.5	<25.0	<25.5 J	<25.0	<50.0	<50.0	<50.0	<50.0	<1
4-Nitroaniline	<25.0	<5.10	<5.10	<25.0	<25.5	<25.0	<20.0	<20.0	<20.0	<20.0	<1
4-Nitrophenol	<25.0	<25.5	<25.5	<25.0	<25.5 J	<25.0	<50.0	<50.0	<50.0	<50.0	<31
2-Nitrophenol	<5.00	<5.10	<5.10	<5.00	<5.10 J	<5.00	<10.0	<10.0	<10.0	<10.0	<1
Nitrobenzene	<5.00	<5.10	<5.10	<5.00	<5.10 J	<5.00	<10.0	<10.0	<10.0	<10.0	<1
N-Nitroso-di-n-propylamine	<5.00	<5.10	<5.10	<5.00	<5.10	<5.00	<10.0	<10.0	<10.0	<10.0	<1
N-Nitrosodiphenylamine	<5.00	<5.10	<5.10	<5.00	<5.10	<5.00	<10.0	<10.0	<10.0	<10.0	<1
2,2'-Oxybis (1-chloropropane)	<5.00	<5.10	<5.10	<5.00	<5.10 J	<5.00	<10.0	<10.0	NA	NA	<1
Pentachlorophenol	<10.0	<10.2	<10.2	<10.0	<10.2	<10.0	<25.0	<25.0	<25.0	<25.0	<5
Phenanthrene	<5.00	<5.10	<5.10	<5.00	<5.10	<5.00	<10.0	<10.0	<10.0	<10.0	<0.5
Phenol	<5.00	<5.10	<5.10	<5.00	<5.10	<5.00	<10.0	<10.0	<10.0	<10.0	<1
Pyrene	<5.00	<5.10	<5.10	<5.00	<5.10	<5.00	<10.0	<10.0	<10.0	<10.0	<0.5
2,4,5-Trichlorophenol	<5.00	<5.10	<5.10	<5.00	<5.10	<5.00	<10.0	<10.0	<10.0	<10.0	<1
2,4,6-Trichlorophenol	<5.00	<5.10	<5.10	<5.00	<5.10	<5.00	<10.0	<10.0	<10.0	<10.0	<1
Filtered Inorganics (mg/L)											
Arsenic	**0.000512 J**	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.001 UL	<0.001	<0.001	<0.0040
Antimony	<0.001	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001	<0.001	<0.0020
Beryllium	**0.000727 J**	<0.002	<0.002	<0.002	<0.002	<0.002	**0.00022 J**	**0.00024 K**	<0.0005	<0.0005	<0.0010
Cadmium	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.001	<0.001	<0.0001	<0.0001	<0.0010
Chromium	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	**0.001 J**	<0.001	<0.001	<0.0040
Copper	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	**0.00089 J**	**0.00092 L**	<0.001	<0.001	<0.0040
Lead	<0.003	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001	<0.001	<0.0020
Mercury	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.00020
Nickel	**0.00981 J**	**0.0108**	**0.00666**	**0.00668**	**0.00833**	<0.02	**0.00098 B**	<0.001	**0.0014**	**0.0013**	<0.0040
Selenium	**0.00155 J**	**0.00185**	**0.00205**	**0.00177**	**0.00159**	<0.005	<0.001	<0.001	<0.001	<0.001	<0.0040
Thallium	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010
Vanadium	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.005	<0.005	<0.001	<0.001	**0.00030 J**
Zinc	**0.00559 J**	**0.0203**	<0.02	<0.02	<0.02	<0.02	**0.0029 B**	**0.0138 B**	**0.0228**	**0.0202**	<0.0300
Field Parameters											
pH	6.58	6.22	6.51	6.41	4.49	6.42	6.58	6.55	6.66	6.66	6.66
Specific Conductance (mS/cm)	2.505	2.510	2.453	2.183	2.178	2.196	1.886	1.817	1.78	1.78	2.3
Turbidity (ntu)	1.5	3.2	0.1	0.0	0.0	2.0	0.0	0.0	0.42	0.42	2.06
Dissolved Oxygen (mg/L)	4.04	2.99	0.24	0.04	0.44	1.74	0.15	0.16	0.03	0.03	0.06
Redox Potential (mV)	-54.4	-49.2	-78.0	-101.1	6.1	-52.5	-138.7	-111.8	-55.49	-55.49	-42.23
Temperature (^{o}C)	13.49	15.33	12.53	13.79	14.20	13.97	14.74	14.44	18.09	18.09	22.00

Notes:
B - Analyte detected in associated method blank.
J - Estimated result
K - Analytical result may be biased high.
L - Analytical result may be biased low.
< - Not detected, value indicates detection limit.
R - Result flagged as unusable due to low response
EPA guidance, but validator notes that response
stable and calibration curve is within specified li
and thus should be considered useable.

[1] - Blind duplicate sample

OU-10 VB 1 - 8
Historical Groundwater Sampling Results Summary
Avtex Fibers Superfund Site
Front Royal, Virginia

Parameter	Downgradient Shallow Bedrock Wells (cont.)									
	132 (cont.)					135				
	7/24/15[1]	7/29/16	7/29/16[1]	7/27/17 & 8/10/17	7/27/17 & 8/10/17[1]	3/12/08	9/17/08	3/24/09	3/24/09[1]	10/5/09
Volatile Organic Compounds (µg/L)										
Acetone	<5.0	<2.66	<2.66	<2.66	<2.66	<10.0 R	<10.0 R	<10.0	<10.0	<10.0 R
Benzene	<0.5	<0.2	<0.2	<0.2	<0.2	<1.00	<1.00	<1.00	<1.00	<1.0
Bromodichloromethane	<0.5	<0.17	<0.17	<0.17	<0.17	<1.00	<1.00	<1.00	<1.00	<1.0
Bromoform	<0.5	<0.29	<0.29	<0.29	<0.29	<1.00	<1.00	<1.00	<1.00	<1.0
Bromomethane	<0.5	<0.35	<0.35	<0.35	<0.35	<1.00	<1.00 J	<1.00	<1.00	<1.0
2-Butanone	<5.0	<2.64	<2.64	<2.64	<2.64	<10.0	<10.0	<10.0	<10.0	<10.0
Carbon Disulfide	<1.0	<0.22	<0.22	<0.22	<0.22	**0.712 J**	<1.00	<1.00	<1.00	<1.0
Carbon Tetrachloride	<0.5	<0.18	<0.18	<0.18	<0.18	<1.00	<1.00	<1.00	<1.00	<1.0
Chlorobenzene	<0.5	<0.18	<0.18	<0.18	<0.18	<1.00	<1.00	<1.00	<1.00	<1.0
Chlorodibromomethane	<0.5	<0.25	<0.25	<0.25	<0.25	<1.00	<1.00	<1.00	<1.00	<1.0
Chloroethane	<0.5	<0.36	<0.36	<0.36	<0.36	<1.00	<1.00	<1.00	<1.00	<1.0
Chloroform	<0.5	<0.23	<0.23	<0.23	<0.23	<1.00	<1.00	<1.00	<1.00	<1.0
Chloromethane	<0.5	<0.36	<0.36	<0.36	<0.36	<1.00 J	<1.00	<1.00	<1.00	<1.0
1,2-Dichlorobenzene	<0.5	<0.19	<0.19	<0.19	<0.19	<1.00	<1.00	<1.00	<1.00	<1.0
1,3-Dichlorobenzene	<0.5	<0.18	<0.18	<0.18	<0.18	<1.00	<1.00	<1.00	<1.00	<1.0
1,4-Dichlorobenzene	<0.5	<0.17	<0.17	<0.17	<0.17	<1.00	<1.00	<1.00	<1.00	<1.0
1,1-Dichloroethane	<0.5	<0.24	<0.24	<0.24	<0.24	<1.00	<1.00	<1.00	<1.00	<1.0
1,2-Dichloroethane	<0.5	<0.2	<0.2	<0.2	<0.2	<1.00	<1.00	<1.00	<1.00	<1.0
1,1-Dichloroethene	<0.5	<0.25	<0.25	<0.25	<0.25	<1.00	<1.00	<1.00	<1.00	<1.0
cis-1,2-Dichloroethene	<0.5	<0.21	<0.21	<0.21	<0.21	<1.00	<1.00	<1.00	<1.00	<1.0
trans-1,2-Dichloroethene	<0.5	<0.23	<0.23	<0.23	<0.23	<1.00	<1.00	<1.00	<1.00	<1.0
1,2-Dichloropropane	<0.5	<0.25	<0.25	<0.25	<0.25	<1.00	<1.00	<1.00	<1.00	<1.0
cis-1,3-Dichloropropene	<0.5	<0.17	<0.17	<0.17	<0.17	<1.00	<1.00	<1.00	<1.00	<1.0
trans-1,3-Dichloropropene	<0.5	<0.17	<0.17	<0.17	<0.17	<1.00	<1.00	<1.00	<1.00	<1.0
Ethylbenzene	<0.5	<0.19	<0.19	<0.19	<0.19	<1.00	<1.00	<1.00	<1.00	<1.0
2-Hexanone	<5.0	<1.28	<1.28	<1.28	<1.28	<10.0	<10.0	<10.0	<10.0	<10.0
4-Methyl-2-Pentanone	<5.0	<0.81	<0.81	<0.81	<0.81	<10.00	<10.0 R	<10.0	<10.0	<10.0
Methylene Chloride	<0.5	<1	<1	<1	<1	<1.00	<1.00	<1.00	<1.00	<1.0
Styrene	<0.5	<0.28	<0.28	<0.28	<0.28	<1.00	<1.00	<1.00	<1.00	<1.0
1,1,2,2-Tetrachloroethane	<0.5	<0.19	<0.19	<0.19	<0.19	<0.50	<0.50	<0.50	<0.50	<0.50
Tetrachloroethene	<0.5	<0.14	<0.14	<0.14	<0.14	<1.00	<1.00	<1.00	<1.00	<1.0
Toluene	<0.5	<0.17	<0.17	<0.17	<0.17	<1.00	<1.00	<1.00	<1.00	<1.0
1,2,4-Trichlorobenzene	<0.5	<0.2	<0.2	<0.2	<0.2	<1.00	<1.00	<1.00	<1.00	<1.0
1,1,1-Trichloroethane	<0.5	<0.19	<0.19	<0.19	<0.19	<1.00	<1.00	<1.00	<1.00	<1.0
1,1,2-Trichloroethane	<0.5	<0.19	<0.19	<0.19	<0.19	<1.00	<1.00	<1.00	<1.00	<1.0
Trichloroethene	<0.5	<0.2	<0.2	<0.2	<0.2	<1.00	<1.00	<1.00	<1.00	<1.0
Vinyl Chloride	<0.5	<0.18	<0.18	<0.18	<0.18	<1.00	<1.00	<1.00	<1.00	<1.0
Xylenes (total)	<0.5	<0.58	<0.58	<0.58	<0.58	<1.00	<1.00	<1.00	<1.00	<1.0
Semivolatile Organic Compounds (µg/L)										
Acenaphthene	<0.5	<0.308	<0.296	<0.296	<0.302	<5.49	<5.21	<5.0	<5.0	<5.0
Acenaphthylene	<0.5	<0.337	<0.324	<0.324	<0.33	<5.49	<5.21	<5.0	<5.0	<5.0
Anthracene	<0.5	<0.365	<0.352	<0.352	<0.358	<5.49	<5.21	<5.0	<5.0	<5.0
Benzo(a)anthracene	<0.5	<0.308	<0.296	<0.296	<0.302	<5.49	<5.21	<5.0	<5.0	<5.0
Benzo (b) Fluoranthene	<0.5	<0.346	<0.333	<0.333	<0.34	<5.49	<5.21	<5.0	<5.0	<5.0
Benzo (k) Fluoranthene	<0.5	<0.356	<0.343	<0.343	<0.349	<5.49	<5.21	<5.0	<5.0	<5.0
Benzo (a) Pyrene	<0.5	<0.365	<0.352	<0.352	<0.358	<5.49	<5.21	<5.0	<5.0	<5.0
Benzo (g,h,i) Perylene	<0.5	<0.596	<0.574	<0.574	<0.585	<5.49	<5.21	<5.0	<5.0	<5.0
bis (2-Chloroethoxy) Methane	<1	<2.98	<2.87	<1.76	<1.79	<5.49	<5.21	<5.0	<5.0	<5.0
bis (2-Chloroethyl) ether	<1	<2.69	<2.59	<1.2	<1.23	<5.49	<5.21	<5.0	<5.0	<5.0
bis (2-Ethylhexyl) phthalate	<5	<5.77	<5.56	<2.24	<2.38	<5.49	<5.21	<5.0	<5.0	<5.0
4-Bromophenyl-phenylether	<1	<2.6	<2.5	<1.48	<1.51	<5.49	<5.21	<5.0	<5.0	<5.0
Butlybenzylphthalate	<5	<2.4	<2.31	<0.926	<0.943	<5.49	<5.21	<5.0	<5.0	<5.0
Carbazole	<1	<2.69	<2.59	<0.833	<0.849	<5.49	<5.21	<5.0	<5.0	<5.0
4-Chloroaniline	<4	<4.04	<3.89	<1.11	<1.13	<5.49	<5.21	<5.0 J	<5.0 J	<5.0
4-Chloro-3-methylphenol	<1	<4.33	<4.17	<1.3	<1.32	<5.49	<5.21	<5.0	<5.0	<5.0
2-Chloronaphthalene	<1	<2.69	<2.59	<1.39	<1.42	<5.49	<5.21	<5.0	<5.0	<5.0
2-Chlorophenol	<1	<4.62	<4.44	<1.57	<1.6	<5.49	<5.21	<5.0	<5.0	<5.0
4-Chlorophenyl-phenyl Ether	<1	<2.69	<2.59	<1.48	<1.51	<5.49	<5.21	<5.0	<5.0	<5.0
Chrysene	<0.5	<0.317	<0.306	<0.306	<0.311	<5.49	<5.21	<5.0	<5.0	<5.0
Dibenzo (a,h) Anthracene	<0.5	<0.433	<0.417	<0.417	<0.425	<5.49	<5.21	<5.0	<5.0	<5.0
Dibenzofuran	<1	<2.79	<2.69	<1.2	<1.23	<5.49	<5.21	<5.0	<5.0	<5.0
3,3'-Dichlorobenzidine	<5	<3.17	<3.06	<1.39	<1.42	<11.0	<10.4	<10.0 J	<10.0 J	<10.0
2,4-Dichlorophenol	<1	<5.38	<5.19	<2.04	<2.08	<5.49	<5.21	<5.0	<5.0	<5.0
Diethylphthalate	<5	<2.88	<2.78	<1.11	<1.13	<5.49	<5.21	<5.0	<5.0	<5.0

OU-10 VB 1 - 8
Historical Groundwater Sampling Results Summary
Avtex Fibers Superfund Site
Front Royal, Virginia

Parameter	Downgradient Shallow Bedrock Wells (cont.)									
	132 (cont.)					135				
	7/24/15[1]	7/29/16	7/29/16[1]	7/27/17 & 8/10/17	7/27/17 & 8/10/17[1]	3/12/08	9/17/08	3/24/09	3/24/09[1]	10/5/09
SVOCs (cont.)										
2,4-Dimethylphenol	<1	<4.04	<3.89	<1.48	<1.51	<5.49	<5.21	<5.0	<5.0	<5.0
Dimethylphthalate	<5	<2.98	<2.87	<1.11	<1.13	<5.49	<5.21	<5.0	<5.0	<5.0
Di-N-Butylphthalate	<5	<2.4	<2.31	<1.2	<1.23	<5.49	<5.21	<5.0	<5.0	<5.0
Di-n-octylphthalate	<5	<2.4	<2.31	<0.833	<0.849	<5.49	<5.21	<5.0	<5.0	<5.0
4,6-Dinitro-2-methylphenol	<15	<8.94	<8.61	<2.69	<2.74	<27.5	<26.0	<25.0	<25.0	<25.0
2,4-Dinitrophenol	<30	<5.67	<5.46	<6.67	<6.79	<27.5	<26.0	<25.0	<25.0	<25.0
2,4-Dinitrotoluene	<5	<3.08	<2.96	<1.48	<1.51	<5.49	<5.21	<5.0	<5.0	<5.0
2,6-Dinitrotoluene	<1	<2.21	<2.13	<1.39	<1.42	<5.49	<5.21	<5.0	<5.0	<5.0
Fluoranthene	<0.5	<0.308	<0.296	<0.296	<0.302	<5.49	<5.21	<5.0	<5.0	<5.0
Fluorene	<0.5	<0.308	<0.296	<0.296	<0.302	<5.49	<5.21	<5.0	<5.0	<5.0
Hexachlorobenzene	<0.5	<2.69	<2.59	<1.39	<1.42	<5.49	<5.21	<5.0	<5.0	<5.0
Hexachlorobutadiene	<1	<1.92	<1.85	<1.39	<1.42	<5.49	<5.21	<5.0	<5.0	<5.0
Hexachlorocyclopentadiene	<15	<1.73	<1.67	R	R	<5.49	<5.21	<5.0	<5.0	<5.0
Hexachloroethane	<5	<1.83	<1.76	<2.04	<2.08	<5.49	<5.21	<5.0	<5.0	<5.0
Indeno (1,2,3-cd) Pyrene	<0.5	<0.394	<0.38	<0.38	<0.387	<5.49	<5.21	<5.0	<5.0	<5.0
Isophorone	<1	<2.98	<2.87	<2.04	<2.08	<5.49	<5.21	<5.0	<5.0	<5.0
2-Methylnaphthalene	<0.5	<0.385	<0.37	<0.37	<0.377	<5.49	<5.21	<5.0	<5.0	<5.0
2-Methylphenol	<1	<2.21	<2.13	<1.48	<1.51	<5.49	<5.21	<5.0	<5.0	<5.0
3&4-Methylphenol/4-methylphenol	<1	<2.12	<2.04	<1.3	<1.32	<5.49	<5.21	<5.0	<5.0	<5.0
Naphthalene	<0.5	<0.356	<0.343	<0.343	<0.349	<5.49	<5.21	<5.0	<5.0	<5.0
2-Nitroaniline	<1	<3.56	<3.43	<1.02	<1.04	<27.5	<26.0	<25.0	<25.0	<25.0
3-Nitroaniline	<1	<2.6	<2.5	<1.48	<1.51	<27.5	<26.0	<25.0 J	<25.0 J	<25.0
4-Nitroaniline	<1	<2.98	<2.87	<1.48	<1.51	<27.5	<26.0	<25.0 J	<25.0 J	<25.0
4-Nitrophenol	<30	<5.19	<5	<1.85	<1.89	<27.5	<26.0	<25.0	<25.0	<25.0
2-Nitrophenol	<1	<5.1	<4.91	<2.22	<2.26	<5.49	<5.21	<5.0	<5.0	<5.0
Nitrobenzene	<1	<2.6	<2.5	<2.04	<2.08	<5.49	<5.21	<5.0	<5.0	<5.0
N-Nitroso-di-n-propylamine	<1	<3.27	<3.15	<1.57	<1.6	<5.49	<5.21	<5.0	<5.0	<5.0
N-Nitrosodiphenylamine	<1	<3.46	<3.33	<3.33	<3.4	<5.49	<5.21	<5.0	<5.0	<5.0
2,2'-Oxybis (1-chloropropane)	<1	<2.69	<2.59	<1.67	<1.7	<5.49	<5.21	<5.0	<5.0	<5.0
Pentachlorophenol	<5	<1.63	<1.57	<3.06	<3.11	<11.0	<10.4	<10.0	<10.0	<10.0
Phenanthrene	<0.5	<0.404	<0.389	<0.389	<0.396	<5.49	<5.21	<5.0	<5.0	<5.0
Phenol	<1	<1.44	<1.39	<1.39	<1.42	<5.49	<5.21	<5.0	<5.0	<5.0
Pyrene	<0.5	<0.337	<0.324	<0.324	<0.33	<5.49	<5.21	<5.0	<5.0	<5.0
2,4,5-Trichlorophenol	<1	<6.83	<6.57	<1.2	<1.23	<5.49	<5.21	<5.0	<5.0	<5.0
2,4,6-Trichlorophenol	<1	<6.54	<6.3	<1.76	<1.79	<5.49	<5.21	<5.0	<5.0	<5.0
Filtered Inorganics (mg/L)										
Arsenic	<0.0040	**0.00195 J**	**0.00186 J**	**0.00353**	**0.00281**	**0.00220 J**	**0.00243**	**0.00356**	**0.00563**	<0.005
Antimony	<0.0020	<0.000745	<0.0005	<0.000800	<0.000800	<0.001	<0.001	<0.001	<0.001	<0.005
Beryllium	**0.00036 J**	<0.001	<0.001	**0.000348 J**	**0.000356 J**	**0.000292 J**	<0.002	<0.002	<0.002	<0.002
Cadmium	<0.0010	<0.0004	<0.0004	<0.000100	<0.000100	<0.005	<0.005	<0.005	<0.005	<0.005
Chromium	<0.0040	<0.000533	<0.0005	<0.000500	<0.000500	<0.005	<0.005	<0.005	<0.005	<0.005
Copper	<0.0040	<0.00145	<0.0027	<0.00120	<0.00120	<0.01	<0.01	<0.01	<0.01	<0.01
Lead	<0.0020	<0.000203	<0.000333	**0.000106 J**	<0.000100	<0.003	<0.001	<0.001	<0.001	<0.005
Mercury	<0.00020	<0.0001	<0.0001	<0.000100	<0.000100	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Nickel	<0.0040	<0.00171	<0.00327	**0.000568 J**	**0.000989 J**	**0.0108**	**0.0087**	**0.00824**	**0.00949**	<0.02
Selenium	<0.0040	<0.0006	<0.0006	<0.000300	<0.000300	**0.00766**	**0.00869**	**0.012**	**0.0207**	<0.005
Thallium	<0.0010	<0.0005	<0.0005	<0.000800	<0.000800	**0.000117 J**	<0.0002	<0.0002	<0.0002	<0.001
Vanadium	<0.0010	<0.00108	<0.000974	<0.000700	<0.000700	<0.01	<0.05	<0.01	<0.01	**0.0195**
Zinc	<0.0300	<0.01	<0.0131	<0.00520	**0.0179 J**	<0.02	**0.0231**	**0.0204**	<0.02	**0.0200**
Field Parameters										
pH	---	6.89	6.89	6.53	6.53	6.19	5.78	6.26	---	6.19
Specific Conductance (mS/cm)	---	2.4529	2.4529	2.7582	2.7582	3.923	4.139	3.939	---	3.96
Turbidity (ntu)	---	2.57	2.57	29.2	29.2	0	0	0	---	1.8
Dissolved Oxygen (mg/L)	---	0.05	0.05	0.21	0.21	0.27	0.26	0.04	---	0.02
Redox Potential (mV)	---	-151.9	-151.9	-42.4	-42.4	-65.3	-30.6	-47.6	---	-56.1
Temperature (^{o}C)	---	18.43	18.43	20.97	20.97	14.42	14.73	14.51	---	13.51

Notes:
B - Analyte detected in associated method blank.
J - Estimated result
K - Analytical result may be biased high.
L - Analytical result may be biased low.
< - Not detected, value indicates detection limit.
R - Result flagged as unusable due to low response
EPA guidance, but validator notes that response
stable and calibration curve is within specified li
and thus should be considered useable.
[1] - Blind duplicate sample

OU-10 VB 1 - 8
Historical Groundwater Sampling Results Summary
Avtex Fibers Superfund Site
Front Royal, Virginia

Parameter	Downgradient Shallow Bedrock Wells (cont.)								
	135 (cont.)								
	5/20/10	6/21/11	6/6/12	6/18/13	7/26/14	7/26/14[1]	7/26/15	8/11/16	8/1/17
Volatile Organic Compounds (µg/L)									
Acetone	<10.0	<10.0 R	<25.0	<25.0	<25.0	<25.0	<5.0	<2.66	R
Benzene	<1.0	<1.0	<1.00	<1.00	<1.0	<1.0	<0.5	<0.2	<0.2
Bromodichloromethane	<1.0	<1.0	<1.00	<1.00	<1.0	<1.0	<0.5	<0.17	<0.17
Bromoform	<1.0	<1.0	<1.00	<1.00	<1.0	<1.0	<0.5	<0.29	<0.29
Bromomethane	<1.0	<1.0	<2.00 J	<2.00	<2.0	<2.0	<0.5	<0.35	<0.35
2-Butanone	<10.0	<10.0	<5.00	<5.00	<5.0	<5.0	<5.0	<2.64	<2.64
Carbon Disulfide	<1.0	<1.0	<2.00	<2.00	<2.0	<2.0	<1.0	<0.22	**0.267 J**
Carbon Tetrachloride	<1.0	<1.0	<1.00	<1.00	<1.0	<1.0	<0.5	<0.18	<0.18
Chlorobenzene	<1.0	<1.0	<1.00	<1.00	<1.0	<1.0	<0.5	<0.18	<0.18
Chlorodibromomethane	<1.0	<1.0	<1.00	<1.00	<1.0	<1.0	<0.5	<0.25	<0.25
Chloroethane	<1.0	<1.0	<1.00 J	<1.00	<1.0	<1.0	<0.5	<0.36	<0.36
Chloroform	<1.0	<1.0	<1.00	<1.00	<1.0	<1.0	<0.5	<0.23	<0.23
Chloromethane	<1.0	<1.0	<1.00	<1.00	<1.0	<1.0	<0.5	<0.36	<0.36
1,2-Dichlorobenzene	<1.0	<1.0	<1.00	<1.00	<1.0	<1.0	<0.5	<0.19	<0.19
1,3-Dichlorobenzene	<1.0	<1.0	<1.00	<1.00	<1.0	<1.0	<0.5	<0.18	<0.18
1,4-Dichlorobenzene	<1.0	<1.0	<1.00	<1.00	<1.0	<1.0	<0.5	<0.17	<0.17
1,1-Dichloroethane	<1.0	<1.0	<1.00	<1.00	<1.0	<1.0	<0.5	<0.24	<0.24
1,2-Dichloroethane	<1.0	<1.0	<1.00	<1.00	<1.0	<1.0	<0.5	<0.2	<0.2
1,1-Dichloroethene	<1.0	<1.0	<1.00	<1.00	<1.0	<1.0	<0.5	<0.25	<0.25
cis-1,2-Dichloroethene	<1.0	<1.0	<1.00	<1.00	<1.0	<1.0	<0.5	<0.21	<0.21
trans-1,2-Dichloroethene	<1.0	<1.0	<1.00	<1.00	<1.0	<1.0	<0.5	<0.23	<0.23
1,2-Dichloropropane	<1.0	<1.0	<1.00	<1.00	<1.0	<1.0	<0.5	<0.25	<0.25
cis-1,3-Dichloropropene	<1.0	<1.0	<1.00	<1.00	<1.0	<1.0	<0.5	<0.17	<0.17
trans-1,3-Dichloropropene	<1.0	<1.0	<1.00	<1.00	<1.0	<1.0	<0.5	<0.17	<0.17
Ethylbenzene	<1.0	<1.0	<1.00	<1.00	<1.0	<1.0	<0.5	<0.19	<0.19
2-Hexanone	<10.0	<10.0	<5.00	<5.00	<5.0	<5.0	<5.0	<1.28	<1.28
4-Methyl-2-Pentanone	<10.0	<10.0	<5.00	<5.00	<5.0	<5.0	<5.0	<0.81	<0.81
Methylene Chloride	<1.0	<1.0	<2.00	<2.00	<2.0	<2.0	<0.5	<1	<1
Styrene	<1.0	<1.0	<1.00	<1.00	<1.0	<1.0	<0.5	<0.28	<0.28
1,1,2,2-Tetrachloroethane	<0.50	<0.500	<1.00	<1.00	<1.0	<1.0	<0.5	<0.19	<0.19
Tetrachloroethene	<1.0	<1.0	<1.00	<1.00	<1.0	<1.0	<0.5	<0.14	<0.14
Toluene	<1.0	<1.0	<1.00	<1.00	<1.0	<1.0	<0.5	<0.17	<0.17
1,2,4-Trichlorobenzene	<1.0	<1.0	<1.00	<1.00	<1.0	<1.0	<0.5	<0.2	<0.2
1,1,1-Trichloroethane	<1.0	<1.0	<1.00	<1.00	<1.0	<1.0	<0.5	<0.19	<0.19
1,1,2-Trichloroethane	<1.0	<1.0	<1.00	<1.00	<1.0	<1.0	<0.5	<0.19	<0.19
Trichloroethene	<1.0	<1.0	<1.00	<1.00	<1.0	<1.0	<0.5	<0.2	<0.2
Vinyl Chloride	<1.0	<1.0	<1.00	<1.00	<1.0	<1.0	<0.5	<0.18	<0.18
Xylenes (total)	<1.0	<1.0	<2.00	<2.00	<2.0	<2.0	**0.5**	<0.58	<0.58
Semivolatile Organic Compounds (µg/L)									
Acenaphthene	<5.10	<5.10	<10.0	<10.0	<10.0	<10.0	<0.5	<0.296	<0.356
Acenaphthylene	<5.10	<5.10	<10.0	<10.0	<10.0	<10.0	<0.5	<0.324	<0.389
Anthracene	<5.10	<5.10	<10.0	<10.0	<10.0	<10.0	<0.5	<0.352	<0.422
Benzo(a)anthracene	<5.10	<5.10	<10.0	<10.0	<10.0	<10.0	<0.5	<0.296	<0.356
Benzo (b) Fluoranthene	<5.10	<5.10	<10.0	<10.0	<10.0	<10.0	<0.5	<0.333	<0.4
Benzo (k) Fluoranthene	<5.10	<5.10	<10.0	<10.0	<10.0	<10.0	<0.5	<0.343	<0.411
Benzo (a) Pyrene	<5.10	<5.10	<10.0	<10.0	<10.0	<10.0	<0.5	<0.352	<0.422
Benzo (g,h,i) Perylene	<5.10	<5.10	<10.0	<10.0	<10.0	<10.0	<0.5	<0.574	<0.689
bis (2-Chloroethoxy) Methane	<5.10	<5.10	<10.0	<10.0	<10.0	<10.0	<1	<1.76	<2.11
bis (2-Chloroethyl) ether	<5.10	<5.10	<10.0	<10.0	<10.0	<10.0	<1	<1.2	<1.44
bis (2-Ethylhexyl) phthalate	**5.4**	<5.10	<6.00	<6.00	<6.0	<6.0	<5	<1.39	<1.67
4-Bromophenyl-phenylether	<5.10	<5.10	<10.0	<10.0	<10.0	<10.0	<1	<1.48	<1.78
Butlybenzylphthalate	<5.10	<5.10	<10.0	<10.0	<10.0	<10.0	<5	<0.926	<1.11
Carbazole	<5.10	<5.10	<10.0	<10.0	NA	NA	<1	<0.833	<1
4-Chloroaniline	<5.10	<5.10	<20.0	<20.0	<20.0	<20.0	<4	<1.11	<1.33
4-Chloro-3-methylphenol	<5.10 J	<5.10	<20.0	<20.0	<20.0	<20.0	<1	<1.3	<1.56
2-Chloronaphthalene	<5.10	<5.10	<10.0	<10.0	<10.0	<10.0	<1	<1.39	<1.67
2-Chlorophenol	<5.10 J	<5.10	<10.0	<10.0	<10.0	<10.0	<1	<1.57	<1.89
4-Chlorophenyl-phenyl Ether	<5.10	<5.10	<10.0	<10.0	<10.0	<10.0	<1	<1.48	<1.78
Chrysene	<5.10	<5.10	<10.0	<10.0	<10.0	<10.0	<0.5	<0.306	<0.367
Dibenzo (a,h) Anthracene	<5.10	<5.10	<10.0	<10.0	<10.0	<10.0	<0.5	<0.417	<0.5
Dibenzofuran	<5.10	<5.10	<10.0	<10.0	<10.0	<10.0	<1	<1.2	<1.44
3,3'-Dichlorobenzidine	<10.2	<10.2	<20.0	<20.0	<20.0	<20.0	<5	<1.39	<1.67
2,4-Dichlorophenol	<5.10 J	<5.10	<10.0	<10.0	<10.0	<10.0	<1	<2.04	<2.44
Diethylphthalate	<5.10	<5.10	<10.0	<10.0	<10.0	<10.0	<5	<1.11	<1.33

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Historical Groundwater Sampling Results Summary
Avtex Fibers Superfund Site
Front Royal, Virginia

Parameter	Downgradient Shallow Bedrock Wells (cont.)								
	135 (cont.)								
	5/20/10	6/21/11	6/6/12	6/18/13	7/26/14	7/26/14[1]	7/26/15	8/11/16	8/1/17
SVOCs (cont.)									
2,4-Dimethylphenol	<5.10 J	<5.10	<10.0	<10.0	<10.0	<10.0	<1	<1.48	<1.78
Dimethylphthalate	<5.10	<5.10	<10.0	<10.0	<10.0	<10.0	<5	<1.11	<1.33
Di-N-Butylphthalate	<5.10	<5.10	<10.0	<10.0	<10.0	<10.0	<5	<1.2	<1.44
Di-n-octylphthalate	<5.10	<5.10	<10.0	<10.0	<10.0	<10.0	<5	<0.833	<1
4,6-Dinitro-2-methylphenol	<25.5	<25.5	<20.0	<20.0	<20.0	<20.0	<15	<2.69	<3.22
2,4-Dinitrophenol	<25.5	<25.5	<50.0	<50.0	<50.0	<50.0	<30	<6.67	<8
2,4-Dinitrotoluene	<5.10	<5.10	<10.0	<10.0	<10.0	<10.0	<5	<1.48	<1.78
2,6-Dinitrotoluene	<5.10	<5.10	<10.0	<10.0	<10.0	<10.0	<1	<1.39	<1.67
Fluoranthene	<5.10	<5.10	<10.0	<10.0	<10.0	<10.0	<0.5	<0.296	<0.356
Fluorene	<5.10	<5.10	<10.0	<10.0	<10.0	<10.0	<0.5	<0.296	<0.356
Hexachlorobenzene	<5.10	<5.10	<10.0	<10.0	<10.0	<10.0	<0.5	<1.39	<1.67
Hexachlorobutadiene	<5.10	<5.10	<10.0	<10.0	<10.0	<10.0	<1	<1.39	<1.67
Hexachlorocyclopentadiene	<5.10 J	<5.10	<10.0	<10.0	<10.0	<10.0	<15	<1.2	<1.44 J
Hexachloroethane	<5.10	<5.10	<10.0	<10.0	<10.0	<10.0	<5	<2.04	<2.44
Indeno (1,2,3-cd) Pyrene	<5.10	<5.10	<10.0	<10.0	<10.0	<10.0	<0.5	<0.38	<0.456
Isophorone	<5.10	<5.10	<10.0	<10.0	<10.0	<10.0	<1	<2.04	<2.44
2-Methylnaphthalene	<5.10	<5.10	<10.0	<10.0	<10.0	<10.0	<0.5	<0.37	<0.444
2-Methylphenol	<5.10 J	<5.10	<10.0	<10.0	<10.0	<10.0	<1	<1.48	<1.78
3&4-Methylphenol/4-methylphenol	<5.10 J	<5.10	<10.0	<10.0	<10.0	<10.0	<1	<1.3	<1.56
Naphthalene	<5.10	<5.10	<10.0	<10.0	<10.0	<10.0	**0.1 J**	<0.343	<0.411
2-Nitroaniline	<25.5	<25.5	<50.0	<50.0	<50.0	<50.0	<1	<1.02	<1.22
3-Nitroaniline	<25.5	<25.5	<50.0	<50.0	<50.0	<50.0	<1	<1.48	<1.78
4-Nitroaniline	<25.5	<25.5	<20.0	<20.0	<20.0	<20.0	<1	<1.48	<1.78
4-Nitrophenol	<25.5	<25.5	<50.0	<50.0	<50.0	<50.0	<30	<1.85	<2.22
2-Nitrophenol	<5.10 J	<5.10	<10.0	<10.0	<10.0	<10.0	<1	<2.22	<2.67
Nitrobenzene	<5.10	<5.10	<10.0	<10.0	<10.0	<10.0	<1	<2.04	<2.44
N-Nitroso-di-n-propylamine	<5.10	<5.10	<10.0	<10.0	<10.0	<10.0	<1	<1.57	<1.89
N-Nitrosodiphenylamine	<5.10	<5.10	<10.0	<10.0	<10.0	<10.0	<1	<3.33	<4
2,2'-Oxybis (1-chloropropane)	<5.10	<5.10 J	<10.0	<10.0	NA	NA	<1	<1.67	<2 J
Pentachlorophenol	<10.2	<10.2	<25.0	<25.0	<25.0	<25.0	<5	<3.06	<3.67 J
Phenanthrene	<5.10	<5.10	<10.0	<10.0	<10.0	<10.0	<0.5	<0.389	<0.467
Phenol	<5.10	<5.10	<10.0	<10.0	<10.0	<10.0	<1	<1.39	<1.67
Pyrene	<5.10	<5.10	<10.0	<10.0	<10.0	<10.0	<0.5	<0.324	<0.389
2,4,5-Trichlorophenol	<5.10 J	<5.10	<10.0	<10.0	<10.0	<10.0	<1	<1.2	<1.44
2,4,6-Trichlorophenol	<5.10 J	<5.10	<10.0	<10.0	<10.0	<10.0	<1	<1.76	<2.11
Filtered Inorganics (mg/L)									
Arsenic	**0.00205**	**0.00169**	**0.00053 J**	**0.00086 J**	<0.001	<0.001	<0.0040	<0.0025	<0.000400 J
Antimony	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0020	<0.0025	<0.000800 J
Beryllium	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	**0.00016 J**	<0.005	<0.000100
Cadmium	<0.005	<0.005	<0.001	<0.001	<0.0002	<0.0002	<0.0010	<0.002	<0.000100 J
Chromium	<0.005	<0.005	**0.0011 J**	<0.005	<0.001	<0.001	<0.0040	<0.0025	<0.000500 J
Copper	<0.01	<0.02	**0.0006 J**	**0.002 L**	<0.001	<0.001	<0.0040	<0.005	<0.00120
Lead	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0020	<0.001	<0.000100 J
Mercury	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.00020	<0.0001	<0.000100
Nickel	**0.00887**	**0.0103**	<0.001	**0.0008 J**	<0.001	<0.001	**0.0016 J**	<0.0025	<0.000500 J
Selenium	**0.00702**	**0.00567**	<0.001	<0.001	<0.001	<0.001	<0.0040	<0.003	<0.000300
Thallium	<0.0002	<0.0002	<0.001	<0.001	<0.001	<0.001	<0.0010	**0.00297 J**	<0.000800 J
Vanadium	<0.01	<0.01	<0.005	<0.005	<0.001	<0.001	<0.0010	<0.0035	<0.000700
Zinc	<0.02	<0.02	<0.01	**0.00096 B**	<0.005	<0.005	<0.0300	<0.05	<0.00520 J
Field Parameters									
pH	6.17	6.24	6.34	6.32	6.45	6.45	6.56	6.76	7
Specific Conductance (mS/cm)	4.2	4.092	3.865	3.436	3.40	3.40	2.8	1.3704	1.674
Turbidity (ntu)	10.2	6.0	0.0	0.0	7.06	7.06	11.80	3.71	0
Dissolved Oxygen (mg/L)	0.31	0.04	0.16	0.19	0.20	0.20	0.08	0.2	0.25
Redox Potential (mV)	-57.8	-50.6	-129.2	-103.0	-21.29	-21.29	-31.86	-98.8	-136
Temperature (^{o}C)	14.42	15.64	15.26	14.91	22.31	22.31	20.54	22.69	18.35

Notes:
B - Analyte detected in associated method blank.
J - Estimated result
K - Analytical result may be biased high.
L - Analytical result may be biased low.
< - Not detected, value indicates detection limit.
R - Result flagged as unusable due to low response
EPA guidance, but validator notes that response
stable and calibration curve is within specified li
and thus should be considered useable.

[1] - Blind duplicate sample

Table D-3

OU-10 NLF
Historical Groundwater Sampling Results Summary
Avtex Fibers Superfund Site
Front Royal, Virginia

Parameter	Upgradient Overburden Wells								
	GPW-03	GPW-03R							
	3/19/2009	5/27/10	6/20/11	6/1/12	6/24/13	7/23/14	7/21/15	7/29/16	7/24/17
Volatile Organic Compounds (µg/L)									
Acetone	<10.0	<10.0	<10.0 R	**2.2 J**	<25.0	<25.0	<5.0	<2.66	<2.66
Benzene	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0	<0.5	<0.2	<0.2
Bromodichloromethane	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0	<0.5	<0.17	<0.17
Bromoform	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0	<0.5	<0.29	<0.29
Bromomethane	<1.00	<1.00	<1.00	<2.00	<2.00	<10.0	<0.5	<0.35	<0.35
2-Butanone	<10.0	<10.0	<10.0	<5.00	<5.00	<10.0	<5.0	<2.64	<2.64
Carbon Disulfide	<1.00	<1.00	<1.00	<2.00	<2.00	<10.0	<1.0	<0.22	<0.22
Carbon Tetrachloride	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0	<0.5	<0.18	<0.18
Chlorobenzene	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0	<0.5	<0.18	<0.18
Chlorodibromomethane	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0	<0.5	<0.25	<0.25
Chloroethane	<1.00	<1.00	<1.00	<1.00	<1.00	<10.0	<0.5	<0.36	<0.36
Chloroform	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0	<0.5	<0.23	<0.23
Chloromethane	<1.00	<1.00	<1.00	<1.00 J	<1.00	<5.0	<0.5	<0.36	<0.36
1,2-Dichlorobenzene	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0	<0.5	<0.19	<0.19
1,3-Dichlorobenzene	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0	<0.5	<0.18	<0.18
1,4-Dichlorobenzene	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0	<0.5	<0.17	<0.17
1,1-Dichloroethane	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0	<0.5	<0.24	<0.24
1,2-Dichloroethane	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0	<0.5	<0.2	<0.2
1,1-Dichloroethene	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0	<0.5	<0.25	<0.25
cis-1,2-Dichloroethene	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0	<0.5	<0.21	<0.21
trans-1,2-Dichloroethene	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0	<0.5	<0.23	<0.23
1,2-Dichloropropane	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0	<0.5	<0.25	<0.25
cis-1,3-Dichloropropene	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0	<0.5	<0.17	<0.17
trans-1,3-Dichloropropene	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0	<0.5	<0.17	<0.17
Ethylbenzene	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0	<0.5	<0.19	<0.19
2-Hexanone	<10.0	<10.0	<10.0	<5.00	<5.00	<10.0	<5.0	<1.28	<1.28
4-Methyl-2-Pentanone	<10.0	<10.0	<10.0	<5.00	<5.00	<10.0	<5.0	<0.81	<0.81
Methylene Chloride	<1.00	<1.00	<1.00	<2.00	<2.00	<5.0	<0.5	<1	<1
Styrene	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0	<0.5	<0.28	<0.28
1,1,2,2-Tetrachloroethane	<0.50	<0.500	<0.50	<1.00	<1.00	<5.0	<0.5	<0.19	<0.19
Tetrachloroethene	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0	<0.5	<0.14	<0.14
Toluene	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0	<0.5	<0.17	<0.17
1,2,4-Trichlorobenzene	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0	<0.5	<0.2	<0.2
1,1,1-Trichloroethane	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0	<0.5	<0.19	<0.19
1,1,2-Trichloroethane	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0	<0.5	<0.19	<0.19
Trichloroethene	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0	<0.5	<0.2	<0.2
Vinyl Chloride	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0	<0.5	<0.18	<0.18
Xyelenes (total)	<1.00	<1.00	<1.00	<2.00	<2.00	<10.0	<0.5	<0.58	<0.58
Semivolatile Organic Compounds (µg/L)									
Acenaphthene	<5.26	<5.00	<5.49	<10.0	<10.0	<10.0	<0.5	<0.308	<0.308
Acenaphthylene	<5.26	<5.00	<5.49	<10.0	<10.0	<10.0	<0.5	<0.337	<0.337
Anthracene	<5.26	<5.00	<5.49	<10.0	<10.0	<10.0	<0.5	<0.365	<0.365
Benzo(a)anthracene	<5.26	<5.00	<5.49	<10.0	<10.0	<10.0	<0.5	<0.308	<0.308
Benzo (b) Fluoranthene	<5.26	<5.00	<5.49	<10.0	<10.0	<10.0	<0.5	<0.346	<0.346
Benzo (k) Fluoranthene	<5.26	<5.00	<5.49	<10.0	<10.0	<10.0	<0.5	<0.356	<0.356
Benzo (a) Pyrene	<5.26	<5.00	<5.49	<10.0	<10.0	<10.0	<0.5	<0.365	<0.365
Benzo (g,h,i) Perylene	<5.26	<5.00	<5.49	<10.0	<10.0	<10.0	<0.5	<0.596	<0.596
bis (2-Chloroethoxy) Methane	<5.26	<5.00	<5.49	<10.0	<10.0	<10.0	<1	<2.98	<1.83
bis (2-Chloroethyl) ether	<5.26	<5.00	<5.49	<10.0	<10.0	<10.0	<1	<2.69	<1.25
bis (2-Ethylhexyl) phthalate	<5.26	<5.00	<5.49	<6.00	<6.00	<6.0	<5	<5.77	<1.44
4-Bromophenyl-phenylether	<5.26	<5.00	<5.49	<10.0	<10.0	<10.0	<1	<2.6	<1.54
Butlybenzylphthalate	<5.26	<5.00	<5.49	<10.0	<10.0	<10.0	<5	<2.4	<0.962
Carbazole	<5.26	<5.00	<5.49	<10.0	<10.0	<10.0	<1	<2.69	<0.865
4-Chloroaniline	<5.26	<5.00 J	<5.49	<20.0	<20.0	<20.0	<4	<4.04	<1.15
4-Chloro-3-methylphenol	<5.26	<5.00	<5.49	<20.0	<20.0	<20.0	<1	<4.33	<1.35
2-Chloronaphthalene	<5.26	<5.00	<5.49	<10.0	<10.0	<10.0	<1	<2.69	<1.44
2-Chlorophenol	<5.26	<5.00	<5.49	<10.0	<10.0	<10.0	<1	<4.62	<1.63
4-Chlorophenyl-phenyl Ether	<5.26	<5.00	<5.49	<10.0	<10.0	<10.0	<1	<2.69	<1.54
Chrysene	<5.26	<5.00	<5.49	<10.0	<10.0	<10.0	<0.5	<0.317	<0.317
Dibenzo (a,h) Anthracene	<5.26	<5.00	<5.49	<10.0	<10.0	<10.0	<0.5	<0.433	<0.433
Dibenzofuran	<5.26	<5.00	<5.49	<10.0	<10.0	<10.0	<1	<2.79	<1.25
3,3'-Dichlorobenzidine	<10.5	<10.0	<11.0	<20.0	<20.0	<20.0	<5	<3.17	<1.44
2,4-Dichlorophenol	<5.26	<5.00	<5.49	<10.0	<10.0	<10.0	<1	<5.38	<2.12
Diethylphthalate	<5.26	<5.00	<5.49	<10.0	<10.0	<10.0	**2 J**	<2.88	<1.15
2,4-Dimethylphenol	<5.26	<5.00	<5.49	<10.0	<10.0	<10.0	<1	<4.04	<1.54

OU-10 NLF
Historical Groundwater Sampling Results Summary
Avtex Fibers Superfund Site
Front Royal, Virginia

Parameter	Upgradient Overburden Wells								
	GPW-03	GPW-03R							
	3/19/2009	5/27/10	6/20/11	6/1/12	6/24/13	7/23/14	7/21/15	7/29/16	7/24/17
SVOCs (cont.)									
Dimethylphthalate	<5.26	<5.00	<5.49	<10.0	<10.0	<10.0	<5	<2.98	<1.15
Di-N-Bultylphthalate	<5.26	<5.00	<5.49	<10.0	<10.0	<10.0	<5	<2.4	<1.25
Di-n-octylphthalate	<5.26	<5.00	<5.49	<10.0	<10.0	<10.0	<5	<2.4	<0.865
4,6-Dinitro-2-methylphenol	<26.3	<25.0 J	<27.5	<20.0	<20.0	<20.0	<16	<8.94	<2.79
2,4-Dinitrophenol	<26.3	<25.0 J	<27.5	<50.0	<50.0	<50.0	<32	<5.67	<6.92
2,4-Dinitrotoluene	<5.26	<5.00 J	<5.49	<10.0	<10.0	<10.0	<5	<3.08	<1.54
2,6-Dinitrotoluene	<5.26	<5.00 J	<5.49	<10.0	<10.0	<10.0	<1	<2.21	<1.44
Fluoranthene	<5.26	<5.00	<5.49	<10.0	<10.0	<10.0	<0.5	<0.308	<0.308
Fluorene	<5.26	<5.00	<5.49	<10.0	<10.0	<10.0	<0.5	<0.308	<0.308
Hexachlorobenzene	<5.26	<5.00	<5.49	<10.0	<10.0	<10.0	<0.5	<2.69	<1.44
Hexachlorobutadiene	<5.26	<5.00	<5.49	<10.0	<10.0	<10.0	<1	<1.92	<1.44
Hexachlorocyclopentadiene	<5.26	<5.00	<5.49	<10.0	<10.0	<10.0	<16	<1.73	<1.25
Hexachloroethane	<5.26	<5.00	<5.49	<10.0	<10.0	<10.0	<5	<1.83	<2.12
Indeno (1,2,3-cd) Pyrene	<5.26	<5.00	<5.49	<10.0	<10.0	<10.0	<0.5	<0.394	<0.394
Isophorone	<5.26	<5.00	<5.49	<10.0	<10.0	<10.0	<1	<2.98	<2.12
2-Methylnaphthalene	<5.26	<5.00	<5.49	<10.0	<10.0	<10.0	<0.5	<0.385	<0.385
2-Methylphenol	<5.26	<5.00	<5.49	<10.0	<10.0	<10.0	<1	<2.21	<1.54
3&4-Methylphenol/4-methylphenol	<5.26	<5.00	<5.49	<10.0	<10.0	<10.0	<1	<2.12	<1.35
Naphthalene	<5.26	<5.00	<5.49	<10.0	<10.0	<10.0	<0.5	<0.356	<0.356
2-Nitroaniline	<26.3	<25.0 J	<27.5	<50.0	<50.0	<50.0	<1	<3.56	<1.06
3-Nitroaniline	<26.3	<25.0 J	<27.5	<50.0	<50.0	<50.0	<1	<2.6	<1.54
4-Nitroaniline	<26.3	<25.0	<27.5	<20.0	<20.0	<20.0	<1	<2.98	<1.54
4-Nitrophenol	<26.3	<25.0 J	<27.5	<50.0	<50.0	<50.0	<32	<5.19	<1.92
2-Nitrophenol	<5.26	<5.00 J	<5.49	<10.0	<10.0	<10.0	<1	<5.1	<2.31
Nitrobenzene	<5.26	<5.00 J	<5.49	<10.0	<10.0	<10.0	<1	<2.6	<2.12
N-Nitroso-di-n-propylamine	<5.26	<5.00	<5.49	<10.0	<10.0	<10.0	<1	<3.27	<1.63
N-Nitrosodiphenylamine	<5.26	<5.00	<5.49	<10.0	<10.0	<10.0	<1	<3.46	<3.46
2,2'-Oxybis (1-chloropropane)	<5.26	<5.00 J	<5.49 J	<10.0	<10.0	<10.0	<1	<2.69	<1.73
Pentachlorophenol	<10.5	<10.0	<11.0	<25.0	<25.0	<25.0	<5	<1.63	<3.17
Phenanthrene	<5.26	<5.00	<5.49	<10.0	<10.0	<10.0	<0.5	<0.404	<0.404
Phenol	<5.26	<5.00	<5.49	<10.0	<10.0	<10.0 J	<1	<1.44	<1.44
Pyrene	<5.26	<5.00	<5.49	<10.0	<10.0	<10.0	<0.5	<0.337	<0.337
2,4,5-Trichlorophenol	<5.26	<5.00	<5.49	<10.0	<10.0	<10.0	<1	<6.83	<1.25
2,4,6-Trichlorophenol	<5.26	<5.00	<5.49	<10.0	<10.0	<10.0	<1	<6.54	<1.83
Filtered Inorganics (mg/L)									
Arsenic	<0.001	<0.00100	<0.001	<0.001	<0.001	<0.001	<0.0040	**0.000658 J**	<0.000400
Antimony	<0.001	<0.00100	<0.001	<0.001	<0.001	<0.001	<0.0020	<0.0005	<0.000800
Beryllium	<0.002	<0.00200	<0.002	<0.001	<0.001	<0.0001	**0.000077 J**	<0.001	<0.000100
Cadmium	<0.005	<0.00500	<0.005	<0.001	<0.001	**0.00012**	<0.0010	<0.0004	<0.000100
Chromium	<0.005	<0.00500	<0.005	**0.00042 J**	**0.00064 J**	<0.001	<0.0040	<0.0005	<0.000500
Copper	**0.0258**	<0.0100	<0.01	**0.0014 J**	**0.0012 L**	<0.001	**0.00087 J**	<0.00384	**0.0133**
Lead	**0.00155**	<0.00100	<0.001	<0.001	<0.001	<0.001	**0.00016 J**	<0.0002	**0.00146 J**
Mercury	<0.0002	<0.000200	<0.0002	<0.0002	<0.0002	<0.0002	<0.00020	<0.0001	<0.000100
Nickel	**0.0111**	**0.0455**	**0.0376**	**0.0286**	**0.0256**	**0.0239**	**0.0236**	**0.0113**	**0.00838**
Selenium	**0.00161**	**0.00218**	**0.00201**	<0.001	<0.001	<0.001	<0.0040	<0.0006	<0.000300
Thallium	<0.0002	<0.000200	<0.0002	<0.001	<0.001	<0.001	<0.0010	<0.0005	<0.000800
Vanadium	<0.01	<0.0100	<0.01	<0.005	**0.00055 K**	<0.001	<0.0010	<0.00194	<0.000700
Zinc	<0.02	<0.0200	<0.02	**0.0074 J**	**0.0128 B**	**0.0091**	**0.0105 J**	<0.0249	**0.136**
Field Parameters									
pH	5.88	4.89	5.73	5.60	5.15	5.67	5.66	5.79	5.69
Specific Conductance (mS/cm)	0.530	1099	0.974	0.989	0.866	0.72	0.7	0.65641	0.75956
Turbidity (ntu)	2.6	3.2	3.7	26.1	14.3	3.61	5.23	0.82	2.28
Dissolved Oxygen (mg/L)	2.92	2.65	7.43	2.00	1.62	1.31	1.06	0.86	1.96
Redox Potential (mV)	157.1	228.7	217.9	131.8	276.8	394.50	113.79	203	209.6
Temperature (^{o}C)	14.34	16.26	17.54	15.41	18.60	25.57	26.43	19.47	21.84

Notes:
J - Estimated result
L - Analytical result may be biased low.
K - Analytical result may be biased high.
< - Not detected, value indicates detection limit.
Bold indicates detected result.
R - Result flagged as unusable due to low response, per EPA guidance, but validator notes that response is stable and calibration curve is within specified limits, and thus should be considered useable.
[1] - Blind duplicate sample

OU-10 NLF
Historical Groundwater Sampling Results Summary
Avtex Fibers Superfund Site
Front Royal, Virginia

Parameter	Upgradient Shallow Bedrock Wells										
	128										
	3/10/08	9/18/08	3/18/09	10/8/09	5/19/10	6/16/11	6/7/12	6/25/13	7/8/14	12/10/14	7/14/15
Volatile Organic Compounds (µg/L)											
Acetone	<10.0 R	<10.0 R	<10.0 UR	<10.0 R	<10.0 J	<10.0 R	<25.0	<25.0	<25.0	<25.0	<5.0
Benzene	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0	NA	<0.5
Bromodichloromethane	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0	NA	<0.5
Bromoform	<1.00	<1.00 J	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0	NA	<0.5
Bromomethane	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<2.00	<2.00	<10.0	NA	<0.5
2-Butanone	<10.0 J	<10.0 R	<10.0	<10.0	<10.0 J	<10.0 R	<5.00	<5.00	<10.0	NA	<5.0
Carbon Disulfide	<1.00	<1.00 L	<1.00	<1.00	<1.00	<1.00	<2.00	<2.00	<10.0	<2.0	<1.0
Carbon Tetrachloride	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0	NA	<0.5
Chlorobenzene	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0	NA	<0.5
Chlorodibromomethane	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0	NA	<0.5
Chloroethane	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<10.0	NA	<0.5
Chloroform	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0	NA	<0.5
Chloromethane	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0	NA	<0.5
1,2-Dichlorobenzene	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0	NA	<0.5
1,3-Dichlorobenzene	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0	NA	<0.5
1,4-Dichlorobenzene	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0	NA	<0.5
1,1-Dichloroethane	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0	NA	<0.5
1,2-Dichloroethane	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0	NA	<0.5
1,1-Dichloroethene	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0	NA	<0.5
cis-1,2-Dichloroethene	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0	NA	<0.5
trans-1,2-Dichloroethene	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0	NA	<0.5
1,2-Dichloropropane	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0	NA	<0.5
cis-1,3-Dichloropropene	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0	NA	<0.5
trans-1,3-Dichloropropene	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0	NA	<0.5
Ethylbenzene	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0	NA	<0.5
2-Hexanone	<10.0	<10.0 R	<10.0	<10.0	<10.0	<10.0	<5.00	<5.00	<10.0	NA	<5.0
4-Methyl-2-Pentanone	<10.0 R	<10.0 R	<10.0 R	<10.0	<10.0	<10.0	<5.00	<5.00	<10.0	NA	<5.0
Methylene Chloride	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<2.00	<2.00	<5.0	NA	<0.5
Styrene	<1.00	<1.00 L	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0	NA	<0.5
1,1,2,2-Tetrachloroethane	<0.50	<0.50	<0.50	<0.50	<0.500	<0.500	<1.00	<1.00	<5.0	NA	<0.5
Tetrachloroethene	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0	NA	<0.5
Toluene	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0	NA	<0.5
1,2,4-Trichlorobenzene	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0	NA	<0.5
1,1,1-Trichloroethane	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0	NA	<0.5
1,1,2-Trichloroethane	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0	NA	<0.5
Trichloroethene	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	**0.73 J**	<1.00	<5.0	NA	<0.5
Vinyl Chloride	<1.00	<1.00 L	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0	NA	<0.5
Xyelenes (total)	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<2.00	<2.00	<10.0	NA	<0.5
Semivolatile Organic Compounds (µg/L)											
Acenaphthene	<5.62	<5.10	<5.10	<5.00	<5.38	<5.43	<10.0	<10.0	<10.0	NA	<0.5
Acenaphthylene	<5.62	<5.10	<5.10	<5.00	<5.38	<5.43	<10.0	<10.0	<10.0	NA	<0.5
Anthracene	<5.62	<5.10	<5.10	<5.00	<5.38	<5.43	<10.0	<10.0	<10.0	NA	<0.5
Benzo(a)anthracene	<5.62	<5.10	<5.10	<5.00	<5.38	<5.43	<10.0	<10.0	<10.0	NA	<0.5
Benzo (b) Fluoranthene	<5.62	<5.10	<5.10	<5.00	<5.38	<5.43	<10.0	<10.0	<10.0	NA	<0.5
Benzo (k) Fluoranthene	<5.62	<5.10	<5.10	<5.00	<5.38	<5.43	<10.0	<10.0	<10.0	NA	<0.5
Benzo (a) Pyrene	<5.62	<5.10	<5.10	<5.00	<5.38	<5.43	<10.0	<10.0	<10.0	NA	<0.5
Benzo (g,h,i) Perylene	<5.62	<5.10	<5.10	<5.00	<5.38	<5.43	<10.0	<10.0	<10.0	NA	<0.5
bis (2-Chloroethoxy) Methane	<5.62	<5.10	<5.10	<5.00	<5.38	<5.43	<10.0	<10.0	<10.0	NA	<1
bis (2-Chloroethyl) ether	<5.62	<5.10	<5.10	<5.00	<5.38	<5.43	<10.0	<10.0	<10.0	NA	<1
bis (2-Ethylhexyl) phthalate	<5.62	<5.10	<5.10	<5.00	**11.0**	<5.43	<6.00	<6.00	<6.0	<6.0	<5
4-Bromophenyl-phenylether	<5.62	<5.10	<5.10	<5.00	<5.38	<5.43	<10.0	<10.0	<10.0	NA	<1
Butlybenzylphthalate	<5.62	<5.10	<5.10	<5.00	<5.38	<5.43	<10.0	<10.0	<10.0	NA	<5
Carbazole	<5.62	<5.10	<5.10	<5.00	<5.38	<5.43	<10.0	<10.0	<10.0	NA	<1
4-Chloroaniline	<5.62	<5.10	<5.10	<5.00	<5.38 J	<5.43	<20.0	<20.0	<20.0	NA	<4
4-Chloro-3-methylphenol	<5.62	<5.10	<5.10	<5.00	<5.38	<5.43	<20.0	<20.0	<20.0	NA	<1 R
2-Chloronaphthalene	<5.62	<5.10	<5.10	<5.00	<5.38	<5.43	<10.0	<10.0	<10.0	NA	<1
2-Chlorophenol	<5.62	<5.10	<5.10	<5.00	<5.38	<5.43	<10.0	<10.0	<10.0	NA	<1 R
4-Chlorophenyl-phenyl Ether	<5.62	<5.10	<5.10	<5.00	<5.38	<5.43	<10.0	<10.0	<10.0	NA	<1
Chrysene	<5.62	<5.10	<5.10	<5.00	<5.38	<5.43	<10.0	<10.0	<10.0	NA	<0.5
Dibenzo (a,h) Anthracene	<5.62	<5.10	<5.10	<5.00	<5.38	<5.43	<10.0	<10.0	<10.0	NA	<0.5
Dibenzofuran	<5.62	<5.10	<5.10	<5.00	<5.38	<5.43	<10.0	<10.0	<10.0	NA	<1
3,3'-Dichlorobenzidine	<11.2	<10.2	<10.2	<10.0	<10.8	<10.9	<20.0	<20.0	<20.0	NA	<5
2,4-Dichlorophenol	<5.62	<5.10	<5.10	<5.00	<5.38	<5.43	<10.0	<10.0	<10.0	NA	<1 R
Diethylphthalate	<5.62	<5.10	<5.10	<5.00	<5.38	<5.43	<10.0	<10.0	<10.0	NA	<5
2,4-Dimethylphenol	<5.62	<5.10	<5.10	<5.00	<5.38	<5.43	<10.0	<10.0	<10.0	NA	<1 R

OU-10 NLF
Historical Groundwater Sampling Results Summary
Avtex Fibers Superfund Site
Front Royal, Virginia

Parameter	Upgradient Shallow Bedrock Wells										
	128										
	3/10/08	9/18/08	3/18/09	10/8/09	5/19/10	6/16/11	6/7/12	6/25/13	7/8/14	12/10/14	7/14/15
SVOCs (cont.)											
Dimethylphthalate	<5.62	<5.10	<5.10	<5.00	<5.38	<5.43	<10.0	<10.0	<10.0	NA	<5
Di-N-Bultylphthalate	<5.62	<5.10	<5.10	<5.00	<5.38	<5.43	<10.0	<10.0	<10.0	NA	<5
Di-n-octylphthalate	<5.62	<5.10	<5.10	<5.00	<5.38	<5.43	<10.0	<10.0	<10.0	NA	<5
4,6-Dinitro-2-methylphenol	<28.1	<25.5	<25.5	<25.0	<26.9	<27.2	<20.0	<20.0	<20.0	NA	<15 R
2,4-Dinitrophenol	<28.1	<25.5	<25.5	<25.0	<26.9 J	<27.2	<50.0	<50.0	<50.0	NA	<30 R
2,4-Dinitrotoluene	<5.62	<5.10	<5.10	<5.00	<5.38	<5.43	<10.0	<10.0	<10.0	NA	<5
2,6-Dinitrotoluene	<5.62	<5.10	<5.10	<5.00	<5.38	<5.43	<10.0	<10.0	<10.0	NA	<1
Fluoranthene	<5.62	<5.10	<5.10	<5.00	<5.38	<5.43	<10.0	<10.0	<10.0	NA	<0.5
Fluorene	<5.62	<5.10	<5.10	<5.00	<5.38	<5.43	<10.0	<10.0	<10.0	NA	<0.5
Hexachlorobenzene	<5.62	<5.10	<5.10	<5.00	<5.38	<5.43	<10.0	<10.0	<10.0	NA	<0.5
Hexachlorobutadiene	<5.62	<5.10	<5.10	<5.00	<5.38	<5.43	<10.0	<10.0	<10.0	NA	<1
Hexachlorocyclopentadiene	<5.62	<5.10	<5.10	<5.00	<5.38 J	<5.43	<10.0	<10.0	<10.0	NA	<15
Hexachloroethane	<5.62	<5.10	<5.10	<5.00	<5.38	<5.43	<10.0	<10.0	<10.0	NA	<5
Indeno (1,2,3-cd) Pyrene	<5.62	<5.10	<5.10	<5.00	<5.38	<5.43	<10.0	<10.0	<10.0	NA	<0.5
Isophorone	<5.62	<5.10	<5.10	<5.00	<5.38	<5.43	<10.0	<10.0	<10.0	NA	<1
2-Methylnaphthalene	<5.62	<5.10	<5.10	<5.00	<5.38	<5.43	<10.0	<10.0	<10.0	NA	<0.5
2-Methylphenol	<5.62	<5.10	<5.10	<5.00	<5.38	<5.43	<10.0	<10.0	<10.0	<10.0	<1 R
3&4-Methylphenol/4-methylphenol	<5.62	<5.10	<5.10	<5.00	<5.38	<5.43	<10.0	<10.0	<10.0	<10.0	<1
Naphthalene	<5.62	<5.10	<5.10	<5.00	<5.38	<5.43	<10.0	<10.0	<10.0	<10.0	<0.5
2-Nitroaniline	<28.1	<25.5	<25.5	<25.0	<26.9	<27.2	<50.0	<50.0	<50.0	NA	<1
3-Nitroaniline	<28.1	<25.5	<25.5	<25.0	<26.9	<27.2	<50.0	<50.0	<50.0	NA	<1
4-Nitroaniline	<28.1	<25.5	<25.5	<25.0	<26.9	<27.2	<20.0	<20.0	<20.0	NA	<1
4-Nitrophenol	<28.1	<25.5	<25.5	<25.0	<26.9	<27.2	<50.0	<50.0	<50.0	NA	<30 R
2-Nitrophenol	<5.62	<5.10	<5.10	<5.00	<5.38	<5.43	<10.0	<10.0	<10.0	NA	<1 R
Nitrobenzene	<5.62	<5.10	<5.10	<5.00	<5.38	<5.43	<10.0	<10.0	<10.0	NA	<1
N-Nitroso-di-n-propylamine	<5.62	<5.10	<5.10	<5.00	<5.38	<5.43	<10.0	<10.0	<10.0	NA	<1
N-Nitrosodiphenylamine	<5.62	<5.10	<5.10	<5.00	<5.38	<5.43	<10.0	<10.0	<10.0	NA	<1
2,2'-Oxybis (1-chloropropane)	<5.62	<5.10	<5.10	<5.00	<5.38	<5.43	<10.0	<10.0	<10.0	NA	<1
Pentachlorophenol	<11.2	<10.2	<10.2	<10.0	<10.8	<10.9	<25.0	<25.0	<25.0	<25.0	<5 R
Phenanthrene	<5.62	<5.10	<5.10	<5.00	<5.38	<5.43	<10.0	<10.0	<10.0	NA	<0.5
Phenol	<5.62	<5.10	<5.10	<5.00	<5.38	<5.43	<10.0	<10.0	<10.0	<10.0	<1 R
Pyrene	<5.62	<5.10	<5.10	<5.00	<5.38	<5.43	<10.0	<10.0	<10.0	NA	<0.5
2,4,5-Trichlorophenol	<5.62	<5.10	<5.10	<5.00	<5.38	<5.43	<10.0	<10.0	<10.0	NA	<1 R
2,4,6-Trichlorophenol	<5.62	<5.10	<5.10	<5.00	<5.38	<5.43	<10.0	<10.0	<10.0	NA	<1 R
Filtered Inorganics (mg/L)											
Arsenic	**0.000688 J**	<0.001	<0.002	<0.005	<0.00100	<0.005	<0.001	<0.001	<0.001	**0.00076 J**	<0.0040
Antimony	<0.001	<0.001	<0.001	<0.005	<0.00100	<0.005	<0.001	<0.001	<0.001	<0.001	<0.0020
Beryllium	<0.005	<0.002	<0.002	<0.002	<0.00200	<0.002	<0.001	**0.00023 K**	<0.0005	NA	**0.000071 J**
Cadmium	<0.005	<0.005	<0.005	<0.005	<0.00500	<0.005	<0.001	<0.001	<0.0001	<0.0001	<0.0010
Chromium	**0.0046 J**	<0.005	<0.005	<0.005	<0.00500	<0.005	**0.0018 J**	<0.005	<0.001	<0.001	<0.0040
Copper	<0.01	<0.01	<0.01	<0.01	<0.0100	<0.01	**0.0039 J**	**0.00095 L**	<0.001	NA	**0.00046 J**
Lead	<0.003	<0.001	<0.001	<0.005	<0.00100	<0.005	<0.001	<0.001	<0.001	<0.001	<0.0020
Mercury	<0.0002	<0.0002	<0.0002	<0.0002	<0.000200	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.00020
Nickel	**0.0036 J**	<0.004	<0.004	<0.02	<0.00400	<0.02	<0.001	<0.001	<0.001	**0.0026**	**0.0011 J**
Selenium	**0.00151 J**	**0.00172**	**0.0114**	<0.005	<0.00100	<0.005	<0.001	<0.001	<0.001	NA	<0.0040
Thallium	<0.0002	<0.0002	<0.0002	<0.001	<0.000200	<0.001	<0.001	<0.001	<0.001	NA	<0.0010
Vanadium	<0.01	<0.01	<0.01	<0.01	<0.0100	<0.01	<0.005	<0.005	<0.001	<0.001	<0.0010
Zinc	<0.02	<0.02	<0.02	<0.02	<0.0200	<0.02	**0.0033 K**	**0.0035 B**	<0.005	**0.0114**	<0.0300
Field Parameters											
pH	6.63	6.48	6.58	6.49	6.80	6.68	6.73	6.54	6.78	6.79	6.74
Specific Conductance (mS/cm)	1.204	1.168	1.149	1.147	1.181	1.162	1.048	1.349	1.43	1.501	1.3
Turbidity (ntu)	6.5	7.6	8.1	0.0	7.7	7.6	145.4	15.2	17.90	310.6	19.8
Dissolved Oxygen (mg/L)	0.43	0.30	0.06	0.07	0.18	0.07	0.49	0.44	0.30	0	0.12
Redox Potential (mV)	-55.2	-47.0	-30.0	-51.9	-72.3	-64.3	-68.1	-45.8	-28.79	-35.5	-51.3
Temperature (^{o}C)	13.94	14.71	14.09	13.65	13.40	14.09	14.83	17.33	22.51	12.11	18.84

Notes:
J - Estimated result
L - Analytical result may be biased low.
K - Analytical result may be biased high.
< - Not detected, value indicates detection li
Bold indicates detected result.
R - Result flagged as unusable due to low re
per EPA guidance, but validator notes that
response is stable and calibration curve is
specified limits, and thus should be consid
useable.
[1] - Blind duplicate sample

OU-10 NLF
Historical Groundwater Sampling Results Summary
Avtex Fibers Superfund Site
Front Royal, Virginia

Parameter	Upgradient Shallow Bedrock Wells (cont.)										
	128 (cont.)		130				130R				
	7/29/16	7/25/17	3/10/08	3/10/08[1]	9/18/08	9/18/08[1]	5/20/10	6/16/11	6/4/12	6/20/13	7/24/14
Volatile Organic Compounds (µg/L)											
Acetone	<2.66	<2.94	<10.0 R	<10.0 R	<10.0 R	<10.0 R	<10.0	<10.0	<25.0	<25.0	<25.0
Benzene	<0.2	<0.2	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0
Bromodichloromethane	<0.17	<0.17	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0
Bromoform	<0.29	<0.29	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0
Bromomethane	<0.35	<0.35	<1.00	<1.00	<1.00 J	<1.00 J	<1.00	<1.00	<2.00	<2.00	<10.0
2-Butanone	<2.64	<2.64	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<5.00	<5.00	<10.0
Carbon Disulfide	<0.22	<0.22	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<2.00	<2.00	<10.0
Carbon Tetrachloride	<0.18	<0.18	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0
Chlorobenzene	<0.18	<0.18	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0
Chlorodibromomethane	<0.25	<0.25	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0
Chloroethane	<0.36	<0.36	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<10.0
Chloroform	<0.23	<0.23	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0
Chloromethane	<0.36	<0.36	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00 J	<1.00	<5.0
1,2-Dichlorobenzene	<0.19	<0.19	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0
1,3-Dichlorobenzene	<0.18	<0.18	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0
1,4-Dichlorobenzene	<0.17	<0.17	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0
1,1-Dichloroethane	<0.24	<0.24	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0
1,2-Dichloroethane	<0.2	<0.2	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0
1,1-Dichloroethene	<0.25	<0.25	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0
cis-1,2-Dichloroethene	<0.21	<0.21	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0
trans-1,2-Dichloroethene	<0.23	<0.23	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0
1,2-Dichloropropane	<0.25	<0.25	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0
cis-1,3-Dichloropropene	<0.17	<0.17	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0
trans-1,3-Dichloropropene	<0.17	<0.17	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0
Ethylbenzene	<0.19	<0.19	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0
2-Hexanone	<1.28	<1.28	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<5.00	<5.00	<10.0
4-Methyl-2-Pentanone	<0.81	<0.81	<10.0	<10.0	<10.0 R	<10.0 R	<10.0	<10.0	<5.00	<5.00	<10.0
Methylene Chloride	<1	<1	<1.00	<1.00	<1.00	<0.50	<1.00	<1.00	<2.00	<2.00	<5.0
Styrene	<0.28	<0.28	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0
1,1,2,2-Tetrachloroethane	<0.19	<0.19	<0.50	<0.50	<0.50	<0.50	<0.500	<0.500	<1.00	<1.00	<5.0
Tetrachloroethene	<0.14	<0.14	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0
Toluene	<0.17	**0.174 J**	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0
1,2,4-Trichlorobenzene	<0.2	<0.2	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0
1,1,1-Trichloroethane	<0.19	<0.19	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0
1,1,2-Trichloroethane	<0.19	<0.19	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0
Trichloroethene	<0.2	<0.2	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0
Vinyl Chloride	<0.18	<0.18	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<5.0
Xyelenes (total)	<0.58	<0.58	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<2.00	<2.00	<10.0
Semivolatile Organic Compounds (µg/L)											
Acenaphthene	<0.308	<0.308	<5.00	<5.00	<5.1	<5.26	<5.10	<5.10	<10.0	<10.0	<10.0
Acenaphthylene	<0.337	<0.337	<5.00	<5.00	<5.1	<5.26	<5.10	<5.10	<10.0	<10.0	<10.0
Anthracene	<0.365	<0.365	<5.00	<5.00	<5.1	<5.26	<5.10	<5.10	<10.0	<10.0	<10.0
Benzo(a)anthracene	<0.308	<0.308	<5.00	<5.00	<5.1	<5.26	<5.10	<5.10	<10.0	<10.0	<10.0
Benzo (b) Fluoranthene	<0.346	<0.346	<5.00	<5.00	<5.1	<5.26	<5.10	<5.10	<10.0	<10.0	<10.0
Benzo (k) Fluoranthene	<0.356	<0.356	<5.00	<5.00	<5.1	<5.26	<5.10	<5.10	**1.1 J**	<10.0	<10.0
Benzo (a) Pyrene	<0.365	<0.365	<5.00	<5.00	<5.1	<5.26	<5.10	<5.10	<10.0	<10.0	<10.0
Benzo (g,h,i) Perylene	<0.596	<0.596	<5.00	<5.00	<5.1	<5.26	<5.10	<5.10	**1.0 J**	<10.0	<10.0
bis (2-Chloroethoxy) Methane	<2.98	<1.83	<5.00	<5.00	<5.1	<5.26	<5.10	<5.10	<10.0	<10.0	<10.0
bis (2-Chloroethyl) ether	<2.69	<1.25	<5.00	<5.00	<5.1	<5.26	<5.10	<5.10	<10.0	<10.0	<10.0
bis (2-Ethylhexyl) phthalate	<5.77	<1.44	<5.00	<5.00	<5.1	<5.26	<5.10	<5.10	<6.00	<6.00	<6.0
4-Bromophenyl-phenylether	<2.6	<1.54	<5.00	<5.00	<5.1	<5.26	<5.10	<5.10	<10.0	<10.0	<10.0
Butlybenzylphthalate	<2.4	<0.962	<5.00	<5.00	<5.1	<5.26	<5.10	<5.10	<10.0	<10.0	<10.0
Carbazole	<2.69	<0.865	<5.00	<5.00	<5.1	<5.26	<5.10	<5.10	<10.0	<10.0	<10.0
4-Chloroaniline	<4.04	<1.15	<5.00	<5.00	<5.1	<5.26	<5.10	<5.10	<20.0	<20.0	<20.0
4-Chloro-3-methylphenol	<4.33	<1.35	<5.00	<5.00	<5.1	<5.26	<5.10 J	<5.10	<20.0	<20.0	<20.0
2-Chloronaphthalene	<2.69	<1.44	<5.00	<5.00	<5.1	<5.26	<5.10	<5.10	<10.0	<10.0	<10.0
2-Chlorophenol	<4.62	<1.63	<5.00	<5.00	<5.1	<5.26	<5.10 J	<5.10	<10.0	<10.0	<10.0
4-Chlorophenyl-phenyl Ether	<2.69	<1.54	<5.00	<5.00	<5.1	<5.26	<5.10	<5.10	<10.0	<10.0	<10.0
Chrysene	<0.317	<0.317	<5.00	<5.00	<5.1	<5.26	<5.10	<5.10	<10.0	<10.0	<10.0
Dibenzo (a,h) Anthracene	<0.433	<0.433	<5.00	<5.00	<5.1	<5.26	<5.10	<5.10	<10.0	<10.0	<10.0
Dibenzofuran	<2.79	<1.25	<5.00	<5.00	<5.1	<5.26	<5.10	<5.10	<10.0	<10.0	<10.0
3,3'-Dichlorobenzidine	<3.17	<1.44	<10.0	<10.0	<10.2	<10.5	<10.2	<10.2	<20.0	<20.0	<20.0
2,4-Dichlorophenol	<5.38	<2.12	<5.00	<5.00	<5.1	<5.26	<5.10 J	<5.10	<10.0	<10.0	<10.0
Diethylphthalate	<2.88	<1.15	<5.00	<5.00	<5.1	<5.26	<5.10	<5.10	<10.0	<10.0	<10.0
2,4-Dimethylphenol	<4.04	<1.54	<5.00	<5.00	<5.1	<5.26	<5.10 J	<5.10	<10.0	<10.0	<10.0

OU-10 NLF
Historical Groundwater Sampling Results Summary
Avtex Fibers Superfund Site
Front Royal, Virginia

Parameter	Upgradient Shallow Bedrock Wells (cont.)										
	128 (cont.)		130				130R				
	7/29/16	7/25/17	3/10/08	3/10/08[1]	9/18/08	9/18/08[1]	5/20/10	6/16/11	6/4/12	6/20/13	7/24/14
SVOCs (cont.)											
Dimethylphthalate	<2.98	<1.15	<5.00	<5.00	<5.1	<5.26	<5.10	<5.10	<10.0	<10.0	<10.0
Di-N-Bultylphthalate	<2.4	<1.25	<5.00	<5.00	<5.1	<5.26	<5.10	<5.10	<10.0	<10.0	<10.0
Di-n-octylphthalate	<2.4	<0.865	<5.00	<5.00	<5.1	<5.26	<5.10	<5.10	<10.0	<10.0	<10.0
4,6-Dinitro-2-methylphenol	<8.94	<2.79	<25.0	<25.0	<25.5	<26.3	<25.5	<25.5	<20.0 J	<20.0	<20.0
2,4-Dinitrophenol	<5.67	<6.92	<25.0	<25.0	<25.5	<26.3	<25.5	<25.5	<50.0 J	<50.0	<50.0
2,4-Dinitrotoluene	<3.08	<1.54	<5.00	<5.00	<5.1	<5.26	<5.10	<5.10	<10.0	<10.0	<10.0
2,6-Dinitrotoluene	<2.21	<1.44	<5.00	<5.00	<5.1	<5.26	<5.10	<5.10	<10.0	<10.0	<10.0
Fluoranthene	<0.308	<0.308	<5.00	<5.00	<5.1	<5.26	<5.10	<5.10	<10.0	<10.0	<10.0
Fluorene	<0.308	<0.308	<5.00	<5.00	<5.1	<5.26	<5.10	<5.10	<10.0	<10.0	<10.0
Hexachlorobenzene	<2.69	<1.44	<5.00	<5.00	<5.1	<5.26	<5.10	<5.10	<10.0	<10.0	<10.0
Hexachlorobutadiene	<1.92	<1.44	<5.00	<5.00	<5.1	<5.26	<5.10	<5.10	<10.0	<10.0	<10.0
Hexachlorocyclopentadiene	<1.73	<1.25	<5.00	<5.00	<5.1	<5.26	<5.10 J	<5.10	<10.0	<10.0	<10.0
Hexachloroethane	<1.83	<2.12	<5.00	<5.00	<5.1	<5.26	<5.10	<5.10	<10.0	<10.0	<10.0
Indeno (1,2,3-cd) Pyrene	<0.394	<0.394	<5.00	<5.00	<5.1	<5.26	<5.10	<5.10	<10.0	<10.0	<10.0
Isophorone	<2.98	<2.12	<5.00	<5.00	<5.1	<5.26	<5.10	<5.10	<10.0	<10.0	<10.0
2-Methylnaphthalene	<0.385	<0.385	<5.00	<5.00	<5.1	<5.26	<5.10	<5.10	<10.0	<10.0	<10.0
2-Methylphenol	<2.21	<1.54	<5.00	<5.00	<5.1	<5.26	<5.10 J	<5.10	<10.0	<10.0	<10.0
3&4-Methylphenol/4-methylphenol	<2.12	<1.35	<5.00	<5.00	<5.1	<5.26	<5.10 J	<5.10	<10.0	<10.0	<10.0
Naphthalene	<0.356	<0.356	<5.00	<5.00	<5.1	<5.26	<5.10	<5.10	<10.0	<10.0	<10.0
2-Nitroaniline	<3.56	<1.06	<25.0	<25.0	<25.5	<26.3	<25.5	<25.5	<50.0	<50.0	<50.0
3-Nitroaniline	<2.6	<1.54	<25.0	<25.0	<25.5	<26.3	<25.5	<25.5	<50.0	<50.0	<50.0
4-Nitroaniline	<2.98	<1.54	<25.0	<25.0	<25.5	<26.3	<25.5	<25.5	<20.0	<20.0	<20.0
4-Nitrophenol	<5.19	<1.92	<25.0	<25.0	<25.5	<26.3	<25.5	<25.5	<50.0	<50.0	<50.0
2-Nitrophenol	<5.1	<2.31	<5.00	<5.00	<5.1	<5.26	<5.10 J	<5.10	<10.0	<10.0	<10.0
Nitrobenzene	<2.6	<2.12	<5.00	<5.00	<5.1	<5.26	<5.10	<5.10	<10.0	<10.0	<10.0
N-Nitroso-di-n-propylamine	<3.27	<1.63	<5.00	<5.00	<5.1	<5.26	<5.10	<5.10	<10.0	<10.0	<10.0
N-Nitrosodiphenylamine	<3.46	<3.46	<5.00	<5.00	<5.1	<5.26	<5.10	<5.10	<10.0	<10.0	<10.0
2,2'-Oxybis (1-chloropropane)	<2.69	<1.73	<5.00	<5.00	<5.1	<5.26	<5.10	<5.10	<10.0	<10.0	<10.0
Pentachlorophenol	<1.63	<3.17	<10.0	<10.0	<10.2	<10.5	<10.2	<10.2	<25.0 J	<25.0	<25.0
Phenanthrene	<0.404	<0.404	<5.00	<5.00	<5.1	<5.26	<5.10	<5.10	<10.0	<10.0	<10.0
Phenol	<1.44	<1.44	<5.00	<5.00	<5.1	<5.26	<5.10	<5.10	<10.0	<10.0	<10.0
Pyrene	<0.337	<0.337	<5.00	<5.00	<5.1	<5.26	<5.10	<5.10	<10.0	<10.0	<10.0
2,4,5-Trichlorophenol	<6.83	<1.25	<5.00	<5.00	<5.1	<5.26	<5.10 J	<5.10	<10.0	<10.0	<10.0
2,4,6-Trichlorophenol	<6.54	<1.83	<5.00	<5.00	<5.1	<5.26	<5.10 J	<5.10	<10.0	<10.0	<10.0
Filtered Inorganics (mg/L)											
Arsenic	**0.00157 J**	<0.000400	**0.00871 J**	**0.0011 J**	<0.001	<0.001	<0.00100	<0.001	<0.001	<0.001	<0.001
Antimony	<0.000512	<0.000800	<0.001	<0.001	<0.001	<0.001	<0.00100	<0.001	<0.001	<0.001	<0.001
Beryllium	<0.001	**0.000130 J**	<0.005	<0.005	<0.002	<0.002	<0.00200	<0.002	<0.001	**0.00027 K**	<0.0001
Cadmium	<0.0004	<0.000100	<0.005	<0.005	<0.005	<0.005	<0.00500	<0.005	<0.001	<0.001	<0.0001
Chromium	<0.0005	<0.000500	<0.005	<0.005	<0.005	<0.005	<0.00500	<0.005	<0.005	<0.005	<0.001
Copper	<0.001	<0.00120	<0.01	<0.01	<0.01	<0.01	<0.0100	<0.01	<0.005	**0.00065 L**	<0.001
Lead	<0.0002	<0.000100	<0.003	<0.003	<0.001	<0.001	<0.00100	<0.001	<0.001	<0.001	<0.001
Mercury	<0.0001	<0.000100	<0.0002	<0.0002	<0.0002	<0.0002	<0.000200	<0.0002	<0.0002	<0.0002	<0.0002
Nickel	<0.000951	**0.00252**	**0.0131**	**0.0133**	**0.0125**	**0.0131**	<0.00400	<0.004	**0.0014**	<0.001	**0.0014**
Selenium	<0.0006	<0.000300	**0.00099 J**	**0.0015 J**	**0.00108**	<0.001	<0.00100	<0.001	<0.001	<0.001	<0.001
Thallium	<0.0005	<0.000800	<0.0002	<0.0002	<0.0002	<0.0002	<0.000200	<0.0002	<0.001	<0.001	<0.001
Vanadium	<0.00192	<0.000700	<0.01	<0.01	<0.05	<0.01	<0.0100	<0.01	<0.005	**0.00023 K**	<0.001
Zinc	<0.01	**0.0741**	<0.02	**0.0145 J**	<0.02	<0.02	<0.0200	<0.02	**0.00098 J**	**0.0018 J**	<0.005
Field Parameters											
pH	6.75	6.49	6.18	---	5.38	---	6.62	6.65	6.65	6.49	6.92
Specific Conductance (mS/cm)	1.4319	1.557	1.302	---	1.308	---	0.751	0.741	0.816	0.747	0.66
Turbidity (ntu)	7.13	67.7	0.7	---	1.5	---	1.0	9.86	0	0	15.50
Dissolved Oxygen (mg/L)	0.08	0.16	0.33	---	0.32	---	0.13	0.05	0.31	0.21	2.16
Redox Potential (mV)	-16.1	-32.6	-3.8	---	40.5	---	-20.6	-51.3	-75.0	-56.4	-30.90
Temperature (^{o}C)	18.81	18.75	14.00	---	15.21	---	13.10	14.12	14.92	14.74	17.96

Notes:
J - Estimated result
L - Analytical result may be biased low.
K - Analytical result may be biased high.
< - Not detected, value indicates detection li
Bold indicates detected result.
R - Result flagged as unusable due to low re
per EPA guidance, but validator notes that
response is stable and calibration curve is
specified limits, and thus should be consid
useable.
[1] - Blind duplicate sample

OU-10 NLF
Historical Groundwater Sampling Results Summary
Avtex Fibers Superfund Site
Front Royal, Virginia

Parameter	Upgradient Shallow Bedrock Wells (cont.)			Downgradient Shallow Bedrock Wells						
	130R (cont.)			MW-7						
	7/23/15	7/31/16	7/27/17 & 2/1/18	3/5/08	9/17/08	3/18/09	10/13/09	5/25/10	6/22/11	5/31/12
Volatile Organic Compounds (µg/L)										
Acetone	<5.0	<2.66	<7.44	<10.0 R	<10.0 R	<10.0 R	<10.0	<10.0 R	<10.0 R	<25.0
Benzene	<0.5	<0.2	<0.2	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
Bromodichloromethane	<0.5	<0.17	<0.17	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
Bromoform	<0.5	<0.29	<0.29	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
Bromomethane	<0.5	<0.35	<0.35	<1.00	<1.00 J	<1.00	<1.00	<1.00	<1.00	<2.00
2-Butanone	<5.0	<2.64	<2.64	<10.0 J	<10.0 R	<10.0	<10.0	<10.0	<10.0	<5.00
Carbon Disulfide	<1.0	<0.22	<0.22	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<2.00
Carbon Tetrachloride	<0.5	<0.18	<0.18	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
Chlorobenzene	<0.5	<0.18	<0.18	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
Chlorodibromomethane	<0.5	<0.25	<0.25	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
Chloroethane	<0.5	<0.36	<0.36	<1.00	<1.00 J	<1.00	<1.00	<1.00	<1.00	<1.00
Chloroform	<0.5	<0.23	<0.23	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
Chloromethane	<0.5 J	<0.36	<0.36	<1.00	<1.00 J	<1.00	<1.00	<1.00	<1.00	<1.00 J
1,2-Dichlorobenzene	<0.5	<0.19	<0.19	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
1,3-Dichlorobenzene	<0.5	<0.18	<0.18	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
1,4-Dichlorobenzene	<0.5	<0.17	<0.17	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
1,1-Dichloroethane	<0.5	<0.24	<0.24	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
1,2-Dichloroethane	<0.5	<0.2	<0.2	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
1,1-Dichloroethene	<0.5	<0.25	<0.25	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
cis-1,2-Dichloroethene	<0.5	<0.21	<0.21	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
trans-1,2-Dichloroethene	<0.5	<0.23	<0.23	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
1,2-Dichloropropane	<0.5	<0.25	<0.25	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
cis-1,3-Dichloropropene	<0.5	<0.17	<0.17	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
trans-1,3-Dichloropropene	<0.5	<0.17	<0.17	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
Ethylbenzene	<0.5	<0.19	<0.19	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
2-Hexanone	<5.0	<1.28	<1.28	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<5.00
4-Methyl-2-Pentanone	<5.0 J	<0.81	<0.81	<10.0 R	<10.0 R	<10.0 R	<10.0	<10.0 R	<10.0	<5.00
Methylene Chloride	<0.5	<1	<1	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<2.00
Styrene	<0.5	<0.28	<0.28	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
1,1,2,2-Tetrachloroethane	<0.5	<0.19	<0.19	<0.50	<0.50	<0.50	<0.50	<0.50	<0.500	<1.00
Tetrachloroethene	<0.5	<0.14	<0.14	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
Toluene	<0.5	<0.17	<0.17	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
1,2,4-Trichlorobenzene	<0.5	<0.2	<0.2	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
1,1,1-Trichloroethane	<0.5	<0.19	<0.19	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
1,1,2-Trichloroethane	<0.5	<0.19	<0.19	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
Trichloroethene	<0.5	<0.2	<0.2	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
Vinyl Chloride	<0.5	<0.18	<0.18	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
Xyelenes (total)	<0.5	<0.58	<0.58	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<2.00
Semivolatile Organic Compounds (µg/L)										
Acenaphthene	<0.5	<0.333	<0.308	<5.00	<5.32	<5.10	<5.00	<5.10	<5.10	<10.0
Acenaphthylene	<0.5	<0.365	<0.337	<5.00	<5.32	<5.10	<5.00	<5.10	<5.10	<10.0
Anthracene	<0.5	<0.396	<0.365	<5.00	<5.32	<5.10	<5.00	<5.10	<5.10	<10.0
Benzo(a)anthracene	<0.5	<0.333	<0.308	<5.00	<5.32	<5.10	<5.00	<5.10	<5.10	<10.0
Benzo (b) Fluoranthene	<0.5	<0.375	<0.346	<5.00	<5.32	<5.10	<5.00	<5.10	<5.10	<10.0
Benzo (k) Fluoranthene	<0.5	<0.385	<0.356	<5.00	<5.32	<5.10	<5.00	<5.10	<5.10	<10.0
Benzo (a) Pyrene	<0.5	<0.396	<0.365	<5.00	<5.32	<5.10	<5.00	<5.10	<5.10	<10.0
Benzo (g,h,i) Perylene	<0.5	<0.646	<0.596	<5.00	<5.32	<5.10	<5.00	<5.10	<5.10	<10.0
bis (2-Chloroethoxy) Methane	<1	<3.23	<1.83	<5.00	<5.32	<5.10	<5.00	<5.10	<5.10	<10.0
bis (2-Chloroethyl) ether	<1	<2.92	<1.25	<5.00	<5.32	<5.10	<5.00	<5.10	<5.10	<10.0
bis (2-Ethylhexyl) phthalate	<5	<6.25	<1.44	<5.00	<5.32	<5.10	<5.00	<5.10	**7.16**	<6.00
4-Bromophenyl-phenylether	<1	<2.81	<1.54	<5.00	<5.32	<5.10	<5.00	<5.10	<5.10	<10.0
Butlybenzylphthalate	<5	<2.6	<0.962	<5.00	<5.32	<5.10	<5.00	<5.10	<5.10	<10.0
Carbazole	<1	<2.92	<0.865	<5.00	<5.32	<5.10	<5.00	<5.10	<5.10	<10.0
4-Chloroaniline	<4	<4.38	<1.15	<5.00	<5.32	<5.10	<5.00	<5.10	<5.10	<20.0
4-Chloro-3-methylphenol	<1	<4.69	<1.35	<5.00	<5.32	<5.10	<5.00	<5.10	<5.10	<20.0
2-Chloronaphthalene	<1	<2.92	<1.44	<5.00	<5.32	<5.10	<5.00	<5.10	<5.10	<10.0
2-Chlorophenol	<1	<5	<1.63	<5.00	<5.32	<5.10	<5.00	<5.10	<5.10	<10.0
4-Chlorophenyl-phenyl Ether	<1	<2.92	<1.54	<5.00	<5.32	<5.10	<5.00	<5.10	<5.10	<10.0
Chrysene	<0.5	<0.344	<0.317	<5.00	<5.32	<5.10	<5.00	<5.10	<5.10	<10.0
Dibenzo (a,h) Anthracene	<0.5	<0.469	<0.433	<5.00	<5.32	<5.10	<5.00	<5.10	<5.10	<10.0
Dibenzofuran	<1	<3.02	<1.25	<5.00	<5.32	<5.10	<5.00	<5.10	<5.10	<10.0
3,3'-Dichlorobenzidine	<5	<3.44	<1.44	<10.0	<10.6	<10.2	<10.0	<10.2	<10.2	<20.0
2,4-Dichlorophenol	<1	<5.83	<2.12	<5.00	<5.32	<5.10	<5.00	<5.10	<5.10	<10.0
Diethylphthalate	<5	<3.13	<1.15	<5.00	<5.32	<5.10	<5.00	<5.10	<5.10	<10.0
2,4-Dimethylphenol	<1	<4.38	<1.54	<5.00	<5.32	<5.10	<5.00	<5.10	<5.10	<10.0

OU-10 NLF
Historical Groundwater Sampling Results Summary
Avtex Fibers Superfund Site
Front Royal, Virginia

Parameter	Upgradient Shallow Bedrock Wells (cont.)			Downgradient Shallow Bedrock Wells						
	130R (cont.)			MW-7						
	7/23/15	7/31/16	7/27/17 & 2/1/18	3/5/08	9/17/08	3/18/09	10/13/09	5/25/10	6/22/11	5/31/12
SVOCs (cont.)										
Dimethylphthalate	<5	<3.23	<1.15	<5.00	<5.32	<5.10	<5.00	<5.10	<5.10	<10.0
Di-N-Bultylphthalate	<5	<2.6	<1.25	<5.00	<5.32	<5.10	<5.00	<5.10	<5.10	<10.0
Di-n-octylphthalate	<5	<2.6	<0.865	<5.00	<5.32	<5.10	<5.00	<5.10	<5.10	<10.0
4,6-Dinitro-2-methylphenol	<15	<9.69	<2.79	<25.0	<26.6	<25.5	<25.0	<25.5	<25.5	<20.0
2,4-Dinitrophenol	<31	<6.15	<6.92	<25.0	<26.6	<25.5	<25.0	<25.5	<25.5	<50.0
2,4-Dinitrotoluene	<5	<3.33	<1.54	<5.00	<5.32	<5.10	<5.00	<5.10	<5.10	<10.0
2,6-Dinitrotoluene	<1	<2.4	<1.44	<5.00	<5.32	<5.10	<5.00	<5.10	<5.10	<10.0
Fluoranthene	<0.5	<0.333	<0.308	<5.00	<5.32	<5.10	<5.00	<5.10	<5.10	<10.0
Fluorene	<0.5	<0.333	<0.308	<5.00	<5.32	<5.10	<5.00	<5.10	<5.10	<10.0
Hexachlorobenzene	<0.5	<2.92	<1.44	<5.00	<5.32	<5.10	<5.00	<5.10	<5.10	<10.0
Hexachlorobutadiene	<1	<2.08	<1.44	<5.00	<5.32	<5.10	<5.00	<5.10	<5.10	<10.0
Hexachlorocyclopentadiene	<15	<1.88	<1.25	<5.00	<5.32	<5.10	<5.00	<5.10	<5.10	<10.0
Hexachloroethane	<5	<1.98	<2.12	<5.00	<5.32	<5.10	<5.00	<5.10	<5.10	<10.0
Indeno (1,2,3-cd) Pyrene	<0.5	<0.427	<0.394	<5.00	<5.32	<5.10	<5.00	<5.10	<5.10	<10.0
Isophorone	<1	<3.23	<2.12	<5.00	<5.32	<5.10	<5.00	<5.10	<5.10	<10.0
2-Methylnaphthalene	<0.5	<0.417	<0.385	<5.00	<5.32	<5.10	<5.00	<5.10	<5.10	<10.0
2-Methylphenol	<1	<2.4	<1.54	<5.00	<5.32	<5.10	<5.00	<5.10	<5.10	<10.0
3&4-Methylphenol/4-methylphenol	<1	<2.29	<1.35	<5.00	<5.32	<5.10	<5.00	<5.10	<5.10	<10.0
Naphthalene	<0.5	<0.385	<0.356	<5.00	<5.32	<5.10	<5.00	<5.10	<5.10	<10.0
2-Nitroaniline	<1	<3.85	<1.06	<25.0	<26.6	<25.5	<25.0	<25.5	<25.5	<50.0
3-Nitroaniline	<1	<2.81	<1.54	<25.0	<26.6	<25.5	<25.0	<25.5	<25.5	<50.0
4-Nitroaniline	<1	<3.23	<1.54	<25.0	<26.6	<25.5	<25.0	<25.5	<25.5	<20.0
4-Nitrophenol	<31	<5.63	<1.92	<25.0	<26.6	<25.5	<25.0	<25.5	<25.5	<50.0
2-Nitrophenol	<1	<5.52	<2.31	<5.00	<5.32	<5.10	<5.00	<5.10	<5.10	<10.0
Nitrobenzene	<1	<2.81	<2.12	<5.00	<5.32	<5.10	<5.00	<5.10	<5.10	<10.0
N-Nitroso-di-n-propylamine	<1	<3.54	<1.63	<5.00	<5.32	<5.10	<5.00	<5.10	<5.10	<10.0
N-Nitrosodiphenylamine	<1	<3.75	<3.46	<5.00	<5.32	<5.10	<5.00	<5.10	<5.10	<10.0
2,2'-Oxybis (1-chloropropane)	<1	<2.92	<1.73	<5.00	<5.32	<5.10	<5.00	<5.10	<5.10	<10.0
Pentachlorophenol	<5	<1.77	<3.17	<10.0	<10.6	<10.2	<10.0	<10.2	<10.2	<25.0
Phenanthrene	<0.5	<0.438	<0.404	<5.00	<5.32	<5.10	<5.00	<5.10	<5.10	<10.0
Phenol	<1	<1.56	<1.44	<5.00	<5.32	<5.10	<5.00	<5.10	<5.10	<10.0 J
Pyrene	<0.5	<0.365	<0.337	<5.00	<5.32	<5.10	<5.00	<5.10	<5.10	<10.0
2,4,5-Trichlorophenol	<1	<7.4	<1.25	<5.00	<5.32	<5.10	<5.00	<5.10	<5.10	<10.0
2,4,6-Trichlorophenol	<1	<7.08	<1.83	<5.00	<5.32	<5.10	<5.00	<5.10	<5.10	<10.0
Filtered Inorganics (mg/L)										
Arsenic	<0.0040	**0.000988 J**	<0.000400	**0.000388 J**	<0.001	<0.001	<0.001	<0.00100	<0.001	**0.0022**
Antimony	<0.0020 J	<0.0005	<0.000800	<0.001	<0.001	<0.001	<0.001	<0.00100	<0.001	**0.00086 J**
Beryllium	**0.000098 J**	<0.001	<0.000100	<0.005	<0.002	<0.002	<0.002	<0.00200	<0.002	<0.005
Cadmium	<0.0010	<0.0004	<0.000100	<0.005	<0.005	<0.005	<0.005	<0.00500	<0.005	<0.005
Chromium	<0.0040	<0.0005	<0.000500	<0.005	<0.005	<0.005	<0.005	<0.00500	<0.005	**0.0078 J**
Copper	<0.0040	<0.001	**0.00122 J**	<0.01	<0.01	<0.01	<0.01	<0.0100	<0.01	**0.012 J**
Lead	<0.0020	<0.0002	<0.000100	<0.003	<0.001	<0.001	<0.001	<0.00100	<0.001	<0.001
Mercury	<0.00020	<0.0001	<0.000100	<0.0002	<0.0002	<0.0002	<0.0002	<0.000200	<0.0002	<0.0002
Nickel	<0.0040	<0.00102	**0.000701 J**	**0.00931 J**	**0.0071**	**0.00563**	**0.0071**	**0.00575**	**0.00502**	**0.05**
Selenium	<0.0040	<0.0006	<0.000300	**0.00107 J**	**0.00137**	<0.001	**0.00112**	**0.00108**	<0.001	**0.0022**
Thallium	<0.0010	<0.0005	<0.000800	<0.0002	<0.0002	<0.0002	<0.0002	<0.000200	<0.0002	<0.001
Vanadium	<0.0010	<0.00181	<0.000700	<0.01	<0.01	<0.01	<0.01	<0.0100	<0.01	<0.025
Zinc	<0.0300	<0.01	**0.0133 J**	**0.00565 J**	<0.02	<0.02	<0.02	<0.0200	<0.02	**0.0895**
Field Parameters										
pH	6.78	6.84	6.61 (6.83)	6.52	6.57	6.50	6.45	6.26	6.49	6.15
Specific Conductance (mS/cm)	0.7	0.79111	0.83487 (0.40719)	1.816	1.837	1.758	1.743	1.636	1.555	1.528
Turbidity (ntu)	13.20	2.7	1.85 (9.58)	0.2	0.4	3.4	0.0	0.4	0	8.3
Dissolved Oxygen (mg/L)	0.10	0.09	0.15 (0.19)	0.29	0.27	0.90	0.17	0.47	.09	0.36
Redox Potential (mV)	-31.72	-38.9	-6.2 (-65.4)	-48.5	-29.9	-16.2	-62.7	-18.3	-38.2	77.9
Temperature (^{o}C)	18.47	19.18	16.8 (14.28)	15.94	16.20	15.90	14.66	15.61	15.75	18.15

Notes:
J - Estimated result
L - Analytical result may be biased low.
K - Analytical result may be biased high.
< - Not detected, value indicates detection li
Bold indicates detected result.
R - Result flagged as unusable due to low re
per EPA guidance, but validator notes that
response is stable and calibration curve is
specified limits, and thus should be consid
useable.
[1] - Blind duplicate sample

Table D-3

OU-10 NLF
Historical Groundwater Sampling Results Summary
Avtex Fibers Superfund Site
Front Royal, Virginia

Parameter	Downgradient Shallow Bedrock Wells (cont.)										
	MW-7 (cont.)					MW-8					
	6/24/13	7/26/14	7/23/15	7/30/16	7/29/17	3/3/08	9/17/08	3/17/09	10/9/09	5/21/10	6/22/11
Volatile Organic Compounds (µg/L)											
Acetone	<25.0	<25.0	<5.0	**452**	R	<10.0 R	<10.0 R	<10 R	<10.0	<10.0 J	<10.0 R
Benzene	<1.00	<1.0	<0.5	<0.2	<0.2	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
Bromodichloromethane	<1.00	<1.0	<0.5	<0.17	<0.17	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
Bromoform	<1.00	<1.0	<0.5	<0.29	<0.29	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
Bromomethane	<2.00	<2.0	<0.5	<0.35	<0.35	<1.00	<1.00 J	<1.00	<1.00	<1.00	<1.00
2-Butanone	<5.00	<5.0	<5.0	<2.64	<2.64	<10.0 R	<10.0 R	<10.0	<10.0	<10.0 J	<10.0
Carbon Disulfide	<2.00	<2.0	<1.0	<0.22	<0.22	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
Carbon Tetrachloride	<1.00	<1.0	<0.5	<0.18	<0.18	<1.00 J	<1.00	<1.00	<1.00	<1.00	<1.00
Chlorobenzene	<1.00	<1.0	<0.5	<0.18	<0.18	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
Chlorodibromomethane	<1.00	<1.0	<0.5	<0.25	<0.25	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
Chloroethane	<1.00	<1.0	<0.5	<0.36	<0.36	<1.00 J	<1.00 J	<1.00	<1.00	<1.00	<1.00
Chloroform	<1.00	<1.0	<0.5	<0.23	<0.23	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
Chloromethane	<1.00	<1.0	<0.5 J	<0.36	<0.36	<1.00 J	<1.00 J	<1.00	<1.00	<1.00	<1.00
1,2-Dichlorobenzene	<1.00	<1.0	<0.5	<0.19	<0.19	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
1,3-Dichlorobenzene	<1.00	<1.0	<0.5	<0.18	<0.18	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
1,4-Dichlorobenzene	<1.00	<1.0	<0.5	<0.17	<0.17	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
1,1-Dichloroethane	<1.00	<1.0	<0.5	<0.24	<0.24	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
1,2-Dichloroethane	<1.00	<1.0	<0.5	<0.2	<0.2	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
1,1-Dichloroethene	<1.00	<1.0	<0.5	<0.25	<0.25	<1.00 J	<1.00	<1.00	<1.00	<1.00	<1.00
cis-1,2-Dichloroethene	<1.00	<1.0	<0.5	<0.21	<0.21	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
trans-1,2-Dichloroethene	<1.00	<1.0	<0.5	<0.23	<0.23	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
1,2-Dichloropropane	<1.00	<1.0	<0.5	<0.25	<0.25	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
cis-1,3-Dichloropropene	<1.00	<1.0	<0.5	<0.17	<0.17	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
trans-1,3-Dichloropropene	<1.00	<1.0	<0.5	<0.17	<0.17	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
Ethylbenzene	<1.00	<1.0	<0.5	<0.19	**0.206 J**	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
2-Hexanone	<5.00	<5.0	<5.0	<1.28	<1.28	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0
4-Methyl-2-Pentanone	<5.00	<5.0	<5.0 J	<0.81	<0.81	<10.0 R	<10.0 R	<10.0 R	<10.0	<10.0 J	<10.0
Methylene Chloride	<2.00	<2.0	<0.5	<1	<1	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
Styrene	<1.00	<1.0	<0.5	<0.28	<0.28	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
1,1,2,2-Tetrachloroethane	<1.00	<1.0	<0.5	<0.19	<0.19	<0.50	<0.50	<0.50	<0.500	<0.500	<0.500
Tetrachloroethene	<1.00	<1.0	<0.5	<0.14	<0.14	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
Toluene	<1.00	<1.0	<0.5	<0.17	**0.366 J**	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
1,2,4-Trichlorobenzene	<1.00	<1.0	<0.5	<0.2	<0.2	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
1,1,1-Trichloroethane	<1.00	<1.0	<0.5	<0.19	<0.19	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
1,1,2-Trichloroethane	<1.00	<1.0	<0.5	<0.19	<0.19	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
Trichloroethene	<1.00	<1.0	<0.5	<0.2	<0.2	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
Vinyl Chloride	**2.4**	**3.2**	**1.3**	**2.95**	**2.08**	<1.00 J	<1.00	<1.00	<1.00	<1.00	<1.00
Xyelenes (total)	<2.00	<2.0	<0.5	<0.58	**1.22 J**	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
Semivolatile Organic Compounds (µg/L)											
Acenaphthene	<10.0	<10.0	<0.5	<0.32	<0.281	<5.10	<5.10	<5.26	<5.10	<5.00	<5.00
Acenaphthylene	<10.0	<10.0	<0.5	<0.35	<0.307	<5.10	<5.10	<5.26	<5.10	<5.00	<5.00
Anthracene	<10.0	<10.0	<0.5	<0.38	<0.333	<5.10	<5.10	<5.26	<5.10	<5.00	<5.00
Benzo(a)anthracene	<10.0	<10.0	<0.5	<0.32	<0.281	<5.10	<5.10	<5.26	<5.10	<5.00	<5.00
Benzo (b) Fluoranthene	<10.0	<10.0	<0.5	<0.36	<0.316	<5.10	<5.10	<5.26	<5.10	<5.00	<5.00
Benzo (k) Fluoranthene	<10.0	<10.0	<0.5	<0.37	<0.325	<5.10	<5.10	<5.26	<5.10	<5.00	<5.00
Benzo (a) Pyrene	<10.0	<10.0	<0.5	<0.38	<0.333	<5.10	<5.10	<5.26	<5.10	<5.00	<5.00
Benzo (g,h,i) Perylene	<10.0	<10.0	<0.5	<0.62	<0.544	<5.10	<5.10	<5.26	<5.10	<5.00	<5.00
bis (2-Chloroethoxy) Methane	<10.0	<10.0	<1	<3.1	<1.67	<5.10	<5.10	<5.26	<5.10	<5.00	<5.00
bis (2-Chloroethyl) ether	<10.0	<10.0	<1	<2.8	<1.14	<5.10	<5.10	<5.26	<5.10	<5.00	<5.00
bis (2-Ethylhexyl) phthalate	<6.00	<6.0	<5	<6	<6.26	<5.10	<5.10	<5.26	<5.10	<5.00	**6.70**
4-Bromophenyl-phenylether	<10.0	<10.0	<1	<2.7	<1.4	<5.10	<5.10	<5.26	<5.10	<5.00	<5.00
Butlybenzylphthalate	<10.0	<10.0	<5	<2.5	<0.877	<5.10	<5.10	<5.26	<5.10	<5.00	<5.00
Carbazole	<10.0	NA	<1	<2.8	<0.789	<5.10	<5.10	<5.26	<5.10	<5.00	<5.00
4-Chloroaniline	<20.0	<20.0	<4	<4.2	<1.05	<5.10	<5.10	<5.26	<5.10	<5.00	<5.00
4-Chloro-3-methylphenol	<20.0	<20.0	<1	<4.5	<1.23	<5.10	<5.10	<5.26	<5.10	<5.00 J	<5.00
2-Chloronaphthalene	<10.0	<10.0	<1	<2.8	<1.32	<5.10	<5.10	<5.26	<5.10	<5.00	<5.00
2-Chlorophenol	<10.0	<10.0	<1	<4.8	<1.49	<5.10	<5.10	<5.26	<5.10	<5.00 J	<5.00
4-Chlorophenyl-phenyl Ether	<10.0	<10.0	<1	<2.8	<1.4	<5.10	<5.10	<5.26	<5.10	<5.00	<5.00
Chrysene	<10.0	<10.0	<0.5	<0.33	<0.289	<5.10	<5.10	<5.26	<5.10	<5.00	<5.00
Dibenzo (a,h) Anthracene	<10.0	<10.0	<0.5	<0.45	<0.395	<5.10	<5.10	<5.26	<5.10	<5.00	<5.00
Dibenzofuran	<10.0	<10.0	<1	<2.9	<1.14	<5.10	<5.10	<5.26	<5.10	<5.00	<5.00
3,3'-Dichlorobenzidine	<20.0	<20.0	<5	<3.3	<1.32	<10.2	<10.2	<10.5	<10.2	<10.0	<10.0
2,4-Dichlorophenol	<10.0	<10.0	<1	<5.6	<1.93	<5.10	<5.10	<5.26	<5.10	<5.00 J	<5.00
Diethylphthalate	<10.0	<10.0	<5	<3	<1.05	<5.10	<5.10	<5.26	<5.10	<5.00	<5.00
2,4-Dimethylphenol	<10.0	<10.0	<1	<4.2	<1.4	<5.10	<5.10	<5.26	<5.10	<5.00 J	<5.00

OU-10 NLF
Historical Groundwater Sampling Results Summary
Avtex Fibers Superfund Site
Front Royal, Virginia

Parameter	Downgradient Shallow Bedrock Wells (cont.)										
	MW-7 (cont.)					MW-8					
	6/24/13	7/26/14	7/23/15	7/30/16	7/29/17	3/3/08	9/17/08	3/17/09	10/9/09	5/21/10	6/22/11
SVOCs (cont.)											
Dimethylphthalate	<10.0	<10.0	<5	<3.1	<1.05	<5.10	<5.10	<5.26	<5.10	<5.00	<5.00
Di-N-Bultylphthalate	<10.0	<10.0	<5	<2.5	<1.14	<5.10	<5.10	<5.26	<5.10	<5.00	<5.00
Di-n-octylphthalate	<10.0	<10.0	<5	<2.5	<0.789	<5.10	<5.10	<5.26	<5.10	<5.00	<5.00
4,6-Dinitro-2-methylphenol	<20.0	<20.0	<15	<9.3	<2.54	<25.5	<25.5	<26.3	<25.5	<25.0	<25.0
2,4-Dinitrophenol	<50.0	<50.0	<30	<5.9	<6.32	<25.5	<25.5	<26.3	<25.5	<25.0	<25.0
2,4-Dinitrotoluene	<10.0	<10.0	<5	<3.2	<1.4	<5.10	<5.10	<5.26	<5.10	<5.00	<5.00
2,6-Dinitrotoluene	<10.0	<10.0	<1	<2.3	<1.32	<5.10	<5.10	<5.26	<5.10	<5.00	<5.00
Fluoranthene	<10.0	<10.0	<0.5	<0.32	<0.281	<5.10	<5.10	<5.26	<5.10	<5.00	<5.00
Fluorene	<10.0	<10.0	<0.5	<0.32	<0.281	<5.10	<5.10	<5.26	<5.10	<5.00	<5.00
Hexachlorobenzene	<10.0	<10.0	<0.5	<2.8	<1.32	<5.10	<5.10	<5.26	<5.10	<5.00	<5.00
Hexachlorobutadiene	<10.0	<10.0	<1	<2	<1.32	<5.10	<5.10	<5.26	<5.10	<5.00	<5.00
Hexachlorocyclopentadiene	<10.0	<10.0	<15	<1.8	R	<5.10	<5.10	<5.26	<5.10	<5.00 J	<5.00
Hexachloroethane	<10.0	<10.0	<5	<1.9	<1.93	<5.10	<5.10	<5.26	<5.10	<5.00	<5.00
Indeno (1,2,3-cd) Pyrene	<10.0	<10.0	<0.5	<0.41	<0.36	<5.10	<5.10	<5.26	<5.10	<5.00	<5.00
Isophorone	<10.0	<10.0	<1	<3.1	<1.93	<5.10	<5.10	<5.26	<5.10	<5.00	<5.00
2-Methylnaphthalene	<10.0	<10.0	<0.5	<0.4	<0.351	<5.10	<5.10	<5.26	<5.10	<5.00	<5.00
2-Methylphenol	<10.0	<10.0	<1	<2.3	<1.4	<5.10	<5.10	<5.26	<5.10	<5.00 J	<5.00
3&4-Methylphenol/4-methylphenol	<10.0	<10.0	<1	<2.2	<1.23	<5.10	<5.10	<5.26	<5.10	<5.00 J	<5.00
Naphthalene	<10.0	<10.0	<0.5	<0.37	<0.325	<5.10	<5.10	<5.26	<5.10	<5.00	<5.00
2-Nitroaniline	<50.0	<50.0	<1	<3.7	<0.965	<25.5	<25.5	<26.3	<25.5	<25.0	<25.0
3-Nitroaniline	<50.0	<50.0	<1	<2.7	<1.4	<25.5	<25.5	<26.3	<25.5	<25.0	<25.0
4-Nitroaniline	<20.0	<20.0	<1	<3.1	<1.4	<25.5	<25.5	<26.3	<25.5	<25.0	<25.0
4-Nitrophenol	<50.0	<50.0	<30	<5.4	<1.75	<25.5	<25.5	<26.3	<25.5	<25.0	<25.0
2-Nitrophenol	<10.0	<10.0	<1	<5.3	<2.11	<5.10	<5.10	<5.26	<5.10	<5.00 J	<5.00
Nitrobenzene	<10.0	<10.0	<1	<2.7	<1.93	<5.10	<5.10	<5.26	<5.10	<5.00	<5.00
N-Nitroso-di-n-propylamine	<10.0	<10.0	<1	<3.4	<1.49	<5.10	<5.10	<5.26	<5.10	<5.00	<5.00
N-Nitrosodiphenylamine	<10.0	<10.0	<1	<3.6	<3.16	<5.10	<5.10	<5.26	<5.10	<5.00	<5.00
2,2'-Oxybis (1-chloropropane)	<10.0	NA	<1	<2.8	<1.58	<5.10	<5.10	<5.26	<5.10	<5.00	<5.00
Pentachlorophenol	<25.0	<25.0	<5	<1.7	<2.89	<10.2	<10.2	<10.5	<10.2	<10.0	<10.0
Phenanthrene	<10.0	<10.0	<0.5	<0.42	<0.368	<5.10	<5.10	<5.26	<5.10	<5.00	<5.00
Phenol	<10.0	<10.0	<1	<1.5	<1.32	<5.10	<5.10	<5.26	<5.10	<5.00	<5.00
Pyrene	<10.0	<10.0	<0.5	<0.35	<0.307	<5.10	<5.10	<5.26	<5.10	<5.00	<5.00
2,4,5-Trichlorophenol	<10.0	<10.0	<1	<7.1	<1.14	<5.10	<5.10	<5.26	<5.10	<5.00 J	<5.00
2,4,6-Trichlorophenol	<10.0	<10.0	<1	<6.8	<1.67	<5.10	<5.10	<5.26	<5.10	<5.00 J	<5.00
Filtered Inorganics (mg/L)											
Arsenic	**0.00095 J**	<0.001	**0.00063 J**	**0.00254**	<0.000400	**0.000490 J**	<0.001	<0.001	<0.005	<0.00100	<0.001
Antimony	<0.001	<0.001	<0.0020 J	<0.0005	<0.000800	<0.001	<0.001	<0.001	<0.005	<0.00100	<0.001
Beryllium	<0.001	<0.0002 J	<0.0010	<0.001	<0.000100	**0.000371 J**	<0.002	<0.002	<0.002	<0.00200	<0.002
Cadmium	<0.001	<0.0001	<0.0010	<0.0004	<0.000100	<0.005	<0.005	<0.005	<0.005	<0.00500	<0.005
Chromium	<0.005	<0.001	<0.0040	<0.000552	<0.000500	<0.005	<0.005	<0.005	<0.005	<0.00500	<0.005
Copper	**0.0011 L**	<0.001	<0.0040	<0.001	<0.00120	<0.01	<0.01	<0.01	<0.01	<0.0100	<0.01
Lead	<0.001	<0.001	**0.0012 J**	<0.0002	<0.000100	<0.003	<0.001	<0.001	<0.005	<0.00100	<0.001
Mercury	<0.0002	<0.0002	<0.00020	<0.0001	<0.000100	<0.0002	<0.002	<0.0002	<0.0002	<0.000200	<0.0002
Nickel	**0.00078 J**	**0.0018**	**0.0011 J**	<0.00364	<0.000500	**0.0107**	**0.00627**	**0.00483**	<0.02	<0.00400	<0.004
Selenium	<0.001	<0.001	<0.0040	<0.0006	<0.000300	**0.00160 J**	<0.001	**0.00102**	<0.005	**0.001**	<0.001
Thallium	<0.001	<0.001	<0.0010	<0.0005	<0.000800	<0.0002	<0.0002	<0.0002	<0.001	<0.000200	<0.0002
Vanadium	<0.005	<0.001	<0.0010	<0.00167	<0.000700	<0.01	<0.01	<0.01	<0.01	<0.0100	<0.01
Zinc	**0.0039 K**	<0.005	<0.0300	**0.132**	**0.0475**	<0.02	<0.02	<0.02	<0.02	<0.0200	<0.02
Field Parameters											
pH	6.09	6.45	6.51	6.48	6.4	6.49	6.55	6.63	6.19	6.57	6.66
Specific Conductance (mS/cm)	1.430	1.43	1.4	1.6244	1.5349	1.531	1.577	1.550	1.330	1.211	1.123
Turbidity (ntu)	0.0	1.69	2.67	2.64	1.79	5.2	0.0	4.1	0.0	9.4	9.3
Dissolved Oxygen (mg/L)	2.09	0.16	0.05	0.14	0.29	0.34	0.37	0.15	0.13	0.88	.34
Redox Potential (mV)	-71.1	-29.97	-8.84	-83	-59.8	-35.7	-44.1	-40.1	39.6	-20.5	-60.0
Temperature (^{o}C)	18.77	30.26	20.71	22.08	17.92	16.08	16.30	15.96	17.01	15.49	16.08

Notes:
J - Estimated result
L - Analytical result may be biased low.
K - Analytical result may be biased high.
< - Not detected, value indicates detection li
Bold indicates detected result.
R - Result flagged as unusable due to low re
per EPA guidance, but validator notes that
response is stable and calibration curve is
specified limits, and thus should be consid
useable.
[1] - Blind duplicate sample

Table D-3

OU-10 NLF
Historical Groundwater Sampling Results Summary
Avtex Fibers Superfund Site
Front Royal, Virginia

Parameter	Downgradient Shallow Bedrock Wells (Cont.)									
	MW-8 (cont.)								133	
	6/1/12	6/21/13	7/26/14	7/25/15	7/30/16	7/30/16[1]	7/29/17	7/29/17[1]	3/7/08	9/22/08
Volatile Organic Compounds (µg/L)										
Acetone	<25.0	<25.0	<25.0	<5	<2.66	<2.66	<2.66	R	<10.0 R	<10.0 R
Benzene	<1.00	<1.00	<1.0	<0.5	<0.2	<0.2	<0.2	<0.2	<1.00	<1.00
Bromodichloromethane	<1.00	<1.00	<1.0	<0.5	<0.17	<0.17	<0.17	<0.17	<1.00	<1.00
Bromoform	<1.00	<1.00	<1.0	<0.5	<0.29	<0.29	<0.29	<0.29	<1.00	<1.00
Bromomethane	<2.00	<2.00	<2.0	<0.5	<0.35	<0.35	<0.35	<0.35	<1.00	<1.00
2-Butanone	<5.00	<5.00	<5.0	<5	<2.64	<2.64	<2.64	<2.64	<10.0 J	<10.0 R
Carbon Disulfide	<2.00	<2.00	<2.0	<1	<0.22	<0.22	<0.22	<0.22	**1.00**	<1.00 J
Carbon Tetrachloride	<1.00	<1.00	<1.0	<0.5	<0.18	<0.18	<0.18	<0.18	<1.00	<1.00
Chlorobenzene	<1.00	<1.00	<1.0	<0.5	<0.18	<0.18	<0.18	<0.18	<1.00	<1.00
Chlorodibromomethane	<1.00	<1.00	<1.0	<0.5	<0.25	<0.25	<0.25	<0.25	<1.00	<1.00
Chloroethane	<1.00	<1.00	<1.0	<0.5	<0.36	<0.36	<0.36	<0.36	<1.00	<1.00
Chloroform	<1.00	<1.00	<1.0	<0.5	<0.23	<0.23	<0.23	<0.23	<1.00	<1.00
Chloromethane	<1.00 J	<1.00	<1.0	<0.5	<0.36	<0.36	<0.36	<0.36	<1.00	<1.00 J
1,2-Dichlorobenzene	<1.00	<1.00	<1.0	<0.5	<0.19	<0.19	<0.19	<0.19	<1.00	<1.00
1,3-Dichlorobenzene	<1.00	<1.00	<1.0	<0.5	<0.18	<0.18	<0.18	<0.18	<1.00	<1.00
1,4-Dichlorobenzene	<1.00	<1.00	<1.0	<0.5	<0.17	<0.17	<0.17	<0.17	<1.00	<1.00
1,1-Dichloroethane	<1.00	<1.00	<1.0	<0.5	<0.24	<0.24	<0.24	<0.24	<1.00	<1.00
1,2-Dichloroethane	<1.00	<1.00	<1.0	<0.5	<0.2	<0.2	<0.2	<0.2	<1.00	<1.00
1,1-Dichloroethene	<1.00	<1.00	<1.0	<0.5	<0.25	<0.25	<0.25	<0.25	<1.00	<1.00
cis-1,2-Dichloroethene	<1.00	<1.00	<1.0	<0.5	<0.21	<0.21	<0.21	<0.21	<1.00	<1.00
trans-1,2-Dichloroethene	<1.00	<1.00	<1.0	<0.5	<0.23	<0.23	<0.23	<0.23	<1.00	<1.00
1,2-Dichloropropane	<1.00	<1.00	<1.0	<0.5	<0.25	<0.25	<0.25	<0.25	<1.00	<1.00
cis-1,3-Dichloropropene	<1.00	<1.00	<1.0	<0.5	<0.17	<0.17	<0.17	<0.17	<1.00	<1.00
trans-1,3-Dichloropropene	<1.00	<1.00	<1.0	<0.5	<0.17	<0.17	<0.17	<0.17	<1.00	<1.00
Ethylbenzene	<1.00	<1.00	<1.0	<0.5	<0.19	<0.19	<0.19	<0.19	<1.00	<1.00
2-Hexanone	<5.00	<5.00	<5.0	<5	<1.28	<1.28	<1.28	<1.28	<10.0	<10.0
4-Methyl-2-Pentanone	<5.00	<5.00	<5.0	<5	<0.81	<0.81	<0.81	<0.81	<10.0 R	<10.0 R
Methylene Chloride	<2.00	<2.00	<2.0	<0.5	<1	<1	<1	<1	<1.00	<1.00
Styrene	<1.00	<1.00	<1.0	<0.5	<0.28	<0.28	<0.28	<0.28	<1.00	<1.00
1,1,2,2-Tetrachloroethane	<1.00	<1.00	<1.0	<0.5	<0.19	<0.19	<0.19	<0.19	<0.50	<0.50
Tetrachloroethene	<1.00	<1.00	<1.0	<0.5	<0.14	<0.14	<0.14	<0.14	<1.00	<1.00
Toluene	<1.00	<1.00	<1.0	<0.5	<0.17	<0.17	<0.17	**0.202 J**	<1.00	<1.00
1,2,4-Trichlorobenzene	<1.00	<1.00	<1.0	<0.5	<0.2	<0.2	<0.2	<0.2	<1.00	<1.00
1,1,1-Trichloroethane	<1.00	<1.00	<1.0	<0.5	<0.19	<0.19	<0.19	<0.19	<1.00	<1.00
1,1,2-Trichloroethane	<1.00	<1.00	<1.0	<0.5	<0.19	<0.19	<0.19	<0.19	<1.00	<1.00
Trichloroethene	<1.00	<1.00	<1.0	<0.5	<0.2	<0.2	<0.2	<0.2	<1.00	<1.00
Vinyl Chloride	<1.00	<1.00	<1.0	<0.5	<0.18	<0.18	<0.18	<0.18	<1.00	<1.00
Xyelenes (total)	<2.00	<2.00	<2.0	<0.5	<0.58	<0.58	**0.835 J**	**0.765 J**	<1.00	<1.00
Semivolatile Organic Compounds (µg/L)										
Acenaphthene	<10.0	<10.0	<10.0	<0.5	<0.32	<0.308	<0.286	<0.296	<5.21	<5.10
Acenaphthylene	<10.0	<10.0	<10.0	<0.5	<0.35	<0.337	<0.313	<0.324	<5.21	<5.10
Anthracene	<10.0	<10.0	<10.0	<0.5	<0.38	<0.365	<0.339	<0.352	<5.21	<5.10
Benzo(a)anthracene	<10.0	<10.0	<10.0	<0.5	<0.32	<0.308	<0.286	<0.296	<5.21	<5.10
Benzo (b) Fluoranthene	<10.0	<10.0	<10.0	<0.5	<0.36	<0.346	<0.321	<0.333	<5.21	<5.10
Benzo (k) Fluoranthene	<10.0	<10.0	<10.0	<0.5	<0.37	<0.356	<0.33	<0.343	<5.21	<5.10
Benzo (a) Pyrene	<10.0	<10.0	<10.0	<0.5	<0.38	<0.365	<0.339	<0.352	<5.21	<5.10
Benzo (g,h,i) Perylene	<10.0	<10.0	<10.0	<0.5	<0.62	<0.596	<0.554	<0.574	<5.21	<5.10
bis (2-Chloroethoxy) Methane	<10.0	<10.0	<10.0	<1	<3.1	<2.98	<1.7	<1.76	<5.21	<5.10
bis (2-Chloroethyl) ether	<10.0	<10.0	<10.0	<1	<2.8	<2.69	<1.16	<1.2	<5.21	<5.10
bis (2-Ethylhexyl) phthalate	<6.00	<6.00	<6.0	<5	<6	<5.77	<1.76	<1.78	<5.21	<5.10
4-Bromophenyl-phenylether	<10.0	<10.0	<10.0	<1	<2.7	<2.6	<1.43	<1.48	<5.21	<5.10
Butlybenzylphthalate	<10.0	<10.0	<10.0	<5	<2.5	<2.4	<0.893	<0.926	<5.21	<5.10
Carbazole	<10.0	<10.0	NA	<1	<2.8	<2.69	<0.804	<0.833	<5.21	<5.10
4-Chloroaniline	<20.0	<20.0	<20.0	<4	<4.2	<4.04	<1.07	<1.11	<5.21	<5.10
4-Chloro-3-methylphenol	<20.0	<20.0	<20.0	<1	<4.5	<4.33	<1.25	<1.3	<5.21	<5.10
2-Chloronaphthalene	<10.0	<10.0	<10.0	<1	<2.8	<2.69	<1.34	<1.39	<5.21	<5.10
2-Chlorophenol	<10.0	<10.0	<10.0	<1	<4.8	<4.62	<1.52	<1.57	<5.21	<5.10
4-Chlorophenyl-phenyl Ether	<10.0	<10.0	<10.0	<1	<2.8	<2.69	<1.43	<1.48	<5.21	<5.10
Chrysene	<10.0	<10.0	<10.0	<0.5	<0.33	<0.317	<0.295	<0.306	<5.21	<5.10
Dibenzo (a,h) Anthracene	<10.0	<10.0	<10.0	<0.5	<0.45	<0.433	<0.402	<0.417	<5.21	<5.10
Dibenzofuran	<10.0	<10.0	<10.0	<1	<2.9	<2.79	<1.16	<1.2	<5.21	<5.10
3,3'-Dichlorobenzidine	<20.0	<20.0	<20.0	<5	<3.3	<3.17	<1.34	<1.39	<10.4	<10.2
2,4-Dichlorophenol	<10.0	<10.0	<10.0	<1	<5.6	<5.38	<1.96	<2.04	<5.21	<5.10
Diethylphthalate	<10.0	<10.0	<10.0	<5	<3	<2.88	<1.07	<1.11	<5.21	<5.10
2,4-Dimethylphenol	<10.0	<10.0	<10.0	<1	<4.2	<4.04	<1.43	<1.48	<5.21	<5.10

OU-10 NLF
Historical Groundwater Sampling Results Summary
Avtex Fibers Superfund Site
Front Royal, Virginia

Parameter	Downgradient Shallow Bedrock Wells (Cont.)									
	MW-8 (cont.)								133	
	6/1/12	6/21/13	7/26/14	7/25/15	7/30/16	7/30/16[1]	7/29/17	7/29/17[1]	3/7/08	9/22/08
SVOCs (cont.)										
Dimethylphthalate	<10.0	<10.0	<10.0	<5	<3.1	<2.98	<1.07	<1.11	<5.21	<5.10
Di-N-Bultylphthalate	<10.0	<10.0	<10.0	<5	<2.5	<2.4	<1.16	<1.2	<5.21	<5.10
Di-n-octylphthalate	<10.0	<10.0	<10.0	<5	<2.5	<2.4	<0.804	<0.833	<5.21	<5.10
4,6-Dinitro-2-methylphenol	<20.0	<20.0	<20.0	<15	<9.3	<8.94	<2.59	<2.69	<26.0	<25.5
2,4-Dinitrophenol	<50.0	<50.0	<50.0	<30	<5.9	<5.67	<6.43	<6.67	<26.0	<25.5
2,4-Dinitrotoluene	<10.0	<10.0	<10.0	<5	<3.2	<3.08	<1.43	<1.48	<5.21	<5.10
2,6-Dinitrotoluene	<10.0	<10.0	<10.0	<1	<2.3	<2.21	<1.34	<1.39	<5.21	<5.10
Fluoranthene	<10.0	<10.0	<10.0	<0.5	<0.32	<0.308	<0.286	<0.296	<5.21	<5.10
Fluorene	<10.0	<10.0	<10.0	<0.5	<0.32	<0.308	<0.286	<0.296	<5.21	<5.10
Hexachlorobenzene	<10.0	<10.0	<10.0	<0.5	<2.8	<2.69	<1.34	<1.39	<5.21	<5.10
Hexachlorobutadiene	<10.0	<10.0	<10.0	<1	<2	<1.92	<1.34	<1.39	<5.21	<5.10
Hexachlorocyclopentadiene	<10.0	<10.0	<10.0	<15	<1.8	<1.73	R	R	<5.21	<5.10
Hexachloroethane	<10.0	<10.0	<10.0	<5	<1.9	<1.83	<1.96	<2.04	<5.21	<5.10
Indeno (1,2,3-cd) Pyrene	<10.0	<10.0	<10.0	<0.5	<0.41	<0.394	<0.366	<0.38	<5.21	<5.10
Isophorone	<10.0	<10.0	<10.0	<1	<3.1	<2.98	<1.96	<2.04	<5.21	<5.10
2-Methylnaphthalene	<10.0	<10.0	<10.0	<0.5	<0.4	<0.385	<0.357	<0.37	<5.21	<5.10
2-Methylphenol	<10.0	<10.0	<10.0	<1	<2.3	<2.21	<1.43	<1.48	<5.21	<5.10
3&4-Methylphenol/4-methylphenol	<10.0	<10.0	<10.0	<1	<2.2	<2.12	<1.25	<1.3	<5.21	<5.10
Naphthalene	<10.0	<10.0	<10.0	<0.5	<0.37	<0.356	<0.33	<0.343	<5.21	<5.10
2-Nitroaniline	<50.0	<50.0	<50.0	<1	<3.7	<3.56	<0.982	<1.02	<26.0	<25.5
3-Nitroaniline	<50.0	<50.0	<50.0	<1	<2.7	<2.6	<1.43	<1.48	<26.0	<25.5
4-Nitroaniline	<20.0	<20.0	<20.0	<1	<3.1	<2.98	<1.43	<1.48	<26.0	<25.5
4-Nitrophenol	<50.0	<50.0	<50.0	<30	<5.4	<5.19	<1.79	<1.85	<26.0	<25.5
2-Nitrophenol	<10.0	<10.0	<10.0	<1	<5.3	<5.1	<2.14	<2.22	<5.21	<5.10
Nitrobenzene	<10.0	<10.0	<10.0	<1	<2.7	<2.6	<1.96	<2.04	<5.21	<5.10
N-Nitroso-di-n-propylamine	<10.0	<10.0	<10.0	<1	<3.4	<3.27	<1.52	<1.57	<5.21	<5.10
N-Nitrosodiphenylamine	<10.0	<10.0	<10.0	<1	<3.6	<3.46	<3.21	<3.33	<5.21	<5.10
2,2'-Oxybis (1-chloropropane)	<10.0	<10.0	NA	<1	<2.8	<2.69	<1.61	<1.67	<5.21	<5.10
Pentachlorophenol	<25.0	<25.0	<25.0	<5	<1.7	<1.63	<2.95	<3.06	<10.4	<10.2
Phenanthrene	<10.0	<10.0	<10.0	<0.5	<0.42	<0.404	<0.375	<0.389	<5.21	<5.10
Phenol	<10.0	<10.0	<10.0	<1	<1.5	<1.44	<1.34	<1.39	<5.21	<5.10
Pyrene	<10.0	<10.0	<10.0	<0.5	<0.35	<0.337	<0.313	<0.324	<5.21	<5.10
2,4,5-Trichlorophenol	<10.0	<10.0	<10.0	<1	<7.1	<6.83	<1.16	<1.2	<5.21	<5.10
2,4,6-Trichlorophenol	<10.0	<10.0	<10.0	<1	<6.8	<6.54	<1.7	<1.76	<5.21	<5.10
Filtered Inorganics (mg/L)										
Arsenic	<0.001	<0.001	<0.001	<0.0040	**0.00118 J**	**0.00119 J**	<0.000400	<0.000400	**0.0173**	**0.0211**
Antimony	<0.001	<0.001	<0.001	<0.0020	<0.00134	<0.0005	<0.000800	<0.000800	**0.000335 J**	<0.001
Beryllium	<0.001	**0.00026 K**	<0.0002 J	<0.0010	<0.001	<0.001	<0.000100	<0.000100	**0.000517 J**	<0.002
Cadmium	<0.001	<0.001	<0.0001	<0.0010	<0.0004	<0.0004	<0.000100	<0.000100	<0.005	<0.005
Chromium	<0.005	<0.005	<0.001	<0.0040	<0.0005	<0.0005	<0.000500	<0.000500	<0.005	<0.005
Copper	**0.0009 J**	**0.00092 L**	<0.001	<0.0040	<0.001	<0.001	<0.00120	<0.00120	<0.01	<0.01
Lead	<0.001	<0.001	<0.001	<0.0020	<0.0002	<0.0002	<0.000100	<0.000100	<0.003	<0.001
Mercury	<0.0002	<0.0002	<0.0002	<0.00020	<0.0001	<0.0001	<0.000100	<0.000100	<0.0002	<0.0002
Nickel	**0.00065 J**	<0.001	<0.001	**0.0015 J**	<0.000553	<0.0005	<0.000500	<0.000500	**0.0353**	**0.0279**
Selenium	<0.001	<0.001	<0.001	<0.0040	<0.0006	<0.0006	<0.000300	<0.000300	**0.101**	**0.016**
Thallium	<0.001	<0.001	<0.001	<0.0010	<0.000819	<0.0005	<0.000800	<0.000800	**0.0000733 J**	<0.0002
Vanadium	<0.005	<0.005	<0.001	<0.0010	<0.00174	<0.00146	<0.000700	<0.000700	<0.01	<0.05
Zinc	<0.01	**0.0016 B**	<0.005	<0.0300	<0.0614	**0.0637**	**0.0304**	**0.0383**	<0.02	**0.0214**
Field Parameters										
pH	6.69	6.36	6.81	6.65	6.76	6.76	6.55	6.55	6.63	6.35
Specific Conductance (mS/cm)	1.196	1.234	1.21	1.3	1.3648	1.3648	1.2704	1.2704	9.508	9.371
Turbidity (ntu)	84.5	10.3	6.65	148.00	45.51	45.51	82.2	82.2	0	0
Dissolved Oxygen (mg/L)	0.62	0.37	0.14	0.10	0.26	0.26	0.45	0.45	0.29	0.24
Redox Potential (mV)	5.0	-60.1	-52.68	-32.45	-29.8	-29.8	-57.5	-57.5	-96.5	-97.1
Temperature (^{o}C)	17.38	17.54	21.08	25.24	23.09	23.09	18.4	18.4	15.73	16.96

Notes:
J - Estimated result
L - Analytical result may be biased low.
K - Analytical result may be biased high.
< - Not detected, value indicates detection li
Bold indicates detected result.
R - Result flagged as unusable due to low re
per EPA guidance, but validator notes that
response is stable and calibration curve is
specified limits, and thus should be consid
useable.
[1] - Blind duplicate sample

Table D-3

OU-10 NLF
Historical Groundwater Sampling Results Summary
Avtex Fibers Superfund Site
Front Royal, Virginia

Parameter	Downgradient Shallow Bedrock Wells (Cont.)										
	133 (cont.)										
	3/23/09	10/13/09	5/24/10	6/16/11	6/7/12	6/25/13	8/5/14	12/10/14	7/15/15	7/20/16	7/26/17
Volatile Organic Compounds (µg/L)											
Acetone	<10.0	<10.0	<10.0 R	<10.0	<25.0	<25.0	<25.0	<25.0	<5.0	<2.66	<3.71
Benzene	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	NA	<0.5	<0.2	<0.2
Bromodichloromethane	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	NA	<0.5	<0.17	<0.17
Bromoform	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	NA	<0.5	<0.29	<0.29
Bromomethane	<1.00	<1.00	<1.00	<1.00	<2.00	<2.00	<2.0	NA	<0.5	<0.35	<0.35
2-Butanone	<10.0	<10.0	<10.0	<10.0	<5.00	<5.00	<5.0	NA	<5.0	<2.64	<2.64
Carbon Disulfide	<1.00	<1.00	<1.00	<1.00	**3.6**	**1.9 J**	<2.0	**3.3**	**8.6**	**5.45**	**0.346 J**
Carbon Tetrachloride	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	NA	<0.5	<0.18	<0.18
Chlorobenzene	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	NA	<0.5	<0.18	<0.18
Chlorodibromomethane	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	NA	<0.5	<0.25	<0.25
Chloroethane	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0 J	NA	<0.5	<0.36	<0.36
Chloroform	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	NA	<0.5	<0.23	<0.23
Chloromethane	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	NA	<0.5	<0.36	<0.36
1,2-Dichlorobenzene	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	NA	<0.5	<0.19	<0.19
1,3-Dichlorobenzene	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	NA	<0.5	<0.18	<0.18
1,4-Dichlorobenzene	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	NA	<0.5	<0.17	<0.17
1,1-Dichloroethane	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	NA	<0.5	<0.24	<0.24
1,2-Dichloroethane	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	NA	<0.5	<0.2	<0.2
1,1-Dichloroethene	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	NA	<0.5	<0.25	<0.25
cis-1,2-Dichloroethene	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	NA	<0.5	<0.21	<0.21
trans-1,2-Dichloroethene	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	NA	<0.5	<0.23	<0.23
1,2-Dichloropropane	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	NA	<0.5	<0.25	<0.25
cis-1,3-Dichloropropene	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	NA	<0.5	<0.17	<0.17
trans-1,3-Dichloropropene	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	NA	<0.5	<0.17	<0.17
Ethylbenzene	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	NA	<0.5	<0.19	<0.19
2-Hexanone	<10.0	<10.0	<10.0	<10.0	<5.00	<5.00	<5.0	NA	<5.0	<1.28	<1.28
4-Methyl-2-Pentanone	<10.0	<10.0	<10.0 R	<10.0	<5.00	<5.00	<5.0	NA	<5.0	<0.81	<0.81
Methylene Chloride	<1.00	<1.00	<1.00	<1.00	<2.00	<2.00	<2.0	NA	<0.5	<1	<1
Styrene	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	NA	<0.5	<0.28	<0.28
1,1,2,2-Tetrachloroethane	<0.50	<0.50	<0.50	<0.50	<1.00	<1.00	<1.0	NA	<0.5	<0.19	<0.19
Tetrachloroethene	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	NA	<0.5	<0.14	<0.14
Toluene	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	NA	<0.5	<0.17	<0.17
1,2,4-Trichlorobenzene	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	NA	<0.5	<0.2	<0.2
1,1,1-Trichloroethane	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	NA	<0.5	<0.19	<0.19
1,1,2-Trichloroethane	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	NA	<0.5	<0.19	<0.19
Trichloroethene	<1.00	<1.00	<1.00	<1.00	**0.68 J**	<1.00	<1.0	NA	<0.5	<0.2	<0.2
Vinyl Chloride	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.0	NA	<0.5	<0.18	<0.18
Xyelenes (total)	<1.00	<1.00	<1.00	<1.00	<2.00	<2.00	<2.0	NA	<0.5	<0.58	<0.58
Semivolatile Organic Compounds (µg/L)											
Acenaphthene	<5.78	<5.00	<5.00	<5.00	<10.0	<10.0	<10.0	NA	<0.5	<0.296	<0.308
Acenaphthylene	<5.78	<5.00	<5.00	<5.00	<10.0	<10.0	<10.0	NA	<0.5	<0.324	<0.337
Anthracene	<5.78	<5.00	<5.00	<5.00	<10.0	<10.0	<10.0	NA	<0.5	<0.352	<0.365
Benzo(a)anthracene	<5.78	<5.00	<5.00	<5.00	<10.0	<10.0	<10.0	NA	<0.5	<0.296	<0.308
Benzo (b) Fluoranthene	<5.78	<5.00	<5.00	<5.00	<10.0	<10.0	<10.0	NA	<0.5	<0.333	<0.346
Benzo (k) Fluoranthene	<5.78	<5.00	<5.00	<5.00	<10.0	<10.0	<10.0	NA	<0.5	<0.343	<0.356
Benzo (a) Pyrene	<5.78	<5.00	<5.00	<5.00	<10.0	<10.0	<10.0	NA	<0.5	<0.352	<0.365
Benzo (g,h,i) Perylene	<5.78	<5.00	<5.00	<5.00	<10.0	<10.0	<10.0	NA	<0.5	<0.574	<0.596
bis (2-Chloroethoxy) Methane	<5.78	<5.00	<5.00	<5.00	<10.0	<10.0	<10.0	NA	<1	<2.87	<1.83
bis (2-Chloroethyl) ether	<5.78	<5.00	<5.00	<5.00	<10.0	<10.0	<10.0	NA	<1	<2.59	<1.25
bis (2-Ethylhexyl) phthalate	<5.78	<5.00	<5.00	<5.00	<6.00	<6.00	<6.0	<6.0	<5	<5.56	<1.44
4-Bromophenyl-phenylether	<5.78	<5.00	<5.00	<5.00	<10.0	<10.0	<10.0	NA	<1	<2.5	<1.54
Butlybenzylphthalate	<5.78	<5.00	<5.00	<5.00	<10.0	<10.0	<10.0	NA	<5	<2.31	<0.962
Carbazole	<5.78	<5.00	<5.00	<5.00	<10.0	<10.0	<10.0	NA	<1	<2.59	<0.865
4-Chloroaniline	<5.78 J	<5.00	<5.00	<5.00	<20.0	<20.0	<20.0	NA	<4	<3.89	<1.15
4-Chloro-3-methylphenol	<5.78	<5.00	<5.00	<5.00	<20.0	<20.0	<20.0	NA	<1	<4.17	<1.35
2-Chloronaphthalene	<5.78	<5.00	<5.00	<5.00	<10.0	<10.0	<10.0	NA	<1	<2.59	<1.44
2-Chlorophenol	<5.78	<5.00	<5.00	<5.00	<10.0	<10.0	<10.0	NA	<1	<4.44	<1.63
4-Chlorophenyl-phenyl Ether	<5.78	<5.00	<5.00	<5.00	<10.0	<10.0	<10.0	NA	<1	<2.59	<1.54
Chrysene	<5.78	<5.00	<5.00	<5.00	<10.0	<10.0	<10.0	NA	<0.5	<0.306	<0.317
Dibenzo (a,h) Anthracene	<5.78	<5.00	<5.00	<5.00	<10.0	<10.0	<10.0	NA	<0.5	<0.417	<0.433
Dibenzofuran	<5.78	<5.00	<5.00	<5.00	<10.0	<10.0	<10.0	NA	<1	<2.69	<1.25
3,3'-Dichlorobenzidine	<11.6 J	<10.0	<10.0	<10.0	<20.0	<20.0	<20.0	NA	<5	<3.06	<1.44
2,4-Dichlorophenol	<5.78	<5.00	<5.00	<5.00	<10.0	<10.0	<10.0	NA	<1	<5.19	<2.12
Diethylphthalate	<5.78	<5.00	<5.00	<5.00	<10.0	<10.0	<10.0	NA	<5	<2.78	<1.15
2,4-Dimethylphenol	<5.78	<5.00	<5.00	<5.00	<10.0	<10.0	<10.0	NA	<1	<3.89	<1.54

OU-10 NLF
Historical Groundwater Sampling Results Summary
Avtex Fibers Superfund Site
Front Royal, Virginia

Parameter	Downgradient Shallow Bedrock Wells (Cont.)										
	133 (cont.)										
	3/23/09	10/13/09	5/24/10	6/16/11	6/7/12	6/25/13	8/5/14	12/10/14	7/15/15	7/20/16	7/26/17
SVOCs (cont.)											
Dimethylphthalate	<5.78	<5.00	<5.00	<5.00	<10.0	<10.0	<10.0	NA	<5	<2.87	<1.15
Di-N-Bultylphthalate	<5.78	<5.00	<5.00	<5.00	<10.0	<10.0	<10.0	NA	<5	<2.31	<1.25
Di-n-octylphthalate	<5.78	<5.00	<5.00	<5.00	<10.0	<10.0	<10.0	NA	<5	<2.31	<0.865
4,6-Dinitro-2-methylphenol	<28.9	<25.0	<25.0	<25.0	<20.0	<20.0	<20.0	NA	<15	<8.61	<2.79
2,4-Dinitrophenol	<28.9	<25.0	<25.0	<25.0	<50.0	<50.0	<50.0	NA	<30	<5.46 J	<6.92
2,4-Dinitrotoluene	<5.78	<5.00	<5.00	<5.00	<10.0	<10.0	<10.0	NA	<5	<2.96	<1.54
2,6-Dinitrotoluene	<5.78	<5.00	<5.00	<5.00	<10.0	<10.0	<10.0	NA	<1	<2.13	<1.44
Fluoranthene	<5.78	<5.00	<5.00	<5.00	<10.0	<10.0	<10.0	NA	<0.5	<0.296	<0.308
Fluorene	<5.78	<5.00	<5.00	<5.00	<10.0	<10.0	<10.0	NA	<0.5	<0.296	<0.308
Hexachlorobenzene	<5.78	<5.00	<5.00	<5.00	<10.0	<10.0	<10.0	NA	<0.5	<2.59	<1.44
Hexachlorobutadiene	<5.78	<5.00	<5.00	<5.00	<10.0	<10.0	<10.0	NA	<1	<1.85	<1.44
Hexachlorocyclopentadiene	<5.78	<5.00	<5.00	<5.00	<10.0	<10.0	<10.0	NA	<15	<1.67	<1.25
Hexachloroethane	<5.78	<5.00	<5.00	<5.00	<10.0	<10.0	<10.0	NA	<5	<1.76	<2.12
Indeno (1,2,3-cd) Pyrene	<5.78	<5.00	<5.00	<5.00	<10.0	<10.0	<10.0	NA	<0.5	<0.38	<0.394
Isophorone	<5.78	<5.00	<5.00	<5.00	<10.0	<10.0	<10.0	NA	<1	<2.87	<2.12
2-Methylnaphthalene	<5.78	<5.00	<5.00	<5.00	<10.0	<10.0	<10.0	NA	<0.5	<0.37	<0.385
2-Methylphenol	<5.78	<5.00	<5.00	<5.00	<10.0	<10.0	<10.0	<10.0	<1	<2.13	<1.54
3&4-Methylphenol/4-methylphenol	<5.78	<5.00	<5.00	<5.00	<10.0	<10.0	<10.0	<10.0	<1	<2.04	<1.35
Naphthalene	<5.78	<5.00	<5.00	<5.00	<10.0	<10.0	<10.0	<10.0	<0.5	<0.343	<0.356
2-Nitroaniline	<28.9	<25.0	<25.0	<25.0	<50.0	<50.0	<50.0	NA	<1	<3.43	<1.06
3-Nitroaniline	<28.9 J	<25.0	<25.0	<25.0	<50.0	<50.0	<50.0	NA	<1	<2.5	<1.54
4-Nitroaniline	<28.9 J	<25.0	<25.0	<25.0 L	<20.0	<20.0	<20.0 J	NA	<1	<2.87	<1.54
4-Nitrophenol	<28.9	<25.0	<25.0	<25.0	<50.0	<50.0	<50.0	NA	<30	<5	<1.92
2-Nitrophenol	<5.78	<5.00	<5.00	<5.00	<10.0	<10.0	<10.0	NA	<1	<4.91	<2.31
Nitrobenzene	<5.78	<5.00	<5.00	<5.00	<10.0	<10.0	<10.0	NA	<1	<2.5	<2.12
N-Nitroso-di-n-propylamine	<5.78	<5.00	<5.00	<5.00	<10.0	<10.0	<10.0	NA	<1	<3.15	<1.63
N-Nitrosodiphenylamine	<5.78	<5.00	<5.00	<5.00	<10.0	<10.0	<10.0	NA	<1	<3.33 J	<3.46
2,2'-Oxybis (1-chloropropane)	<5.78	<5.00	<5.00	<5.00	<10.0	<10.0	<10.0	NA	<1	<2.59	<1.73
Pentachlorophenol	<11.6	<10.0	<10.0	<10.0	<25.0	<25.0	<25.0	<25.0	<5	<1.57	<3.17
Phenanthrene	<5.78	<5.00	<5.00	<5.00	<10.0	<10.0	<10.0	NA	<0.5	<0.389	<0.404
Phenol	<5.78	<5.00	<5.00	<5.00	<10.0	<10.0	<10.0	<10.0	<1	<1.39	<1.44
Pyrene	<5.78	<5.00	<5.00	<5.00	<10.0	<10.0	<10.0	NA	<0.5	<0.324	<0.337
2,4,5-Trichlorophenol	<5.78	<5.00	<5.00	<5.00	<10.0	<10.0	<10.0	NA	<1	<6.57	<1.25
2,4,6-Trichlorophenol	<5.78	<5.00	<5.00	<5.00	<10.0	<10.0	<10.0	NA	<1	<6.3	<1.83
Filtered Inorganics (mg/L)											
Arsenic	**0.0237**	**0.0117**	**0.0119**	**0.0113**	**0.0098**	**0.0076**	**0.0113**	**0.0112**	**0.0307**	**0.0278**	**0.00187 J**
Antimony	<0.001	<0.001	<0.0100	<0.005	<0.001	<0.001	<0.001	<0.002	<0.0020	<0.0005	<0.000800
Beryllium	<0.002	<0.002	<0.00200	<0.002	<0.001	<0.001	**0.00017**	NA	**0.00013 J**	<0.001	<0.000100
Cadmium	<0.005	<0.005	<0.00500	<0.005	<0.001	<0.001	<0.0001	<0.0002	<0.0010	<0.0004	<0.000100
Chromium	<0.005	<0.005	<0.00500	<0.005	**0.0019 J**	**0.00056 J**	<0.001	**0.0011 J**	**0.0011 J**	**0.00109 J**	<0.000500
Copper	<0.01	<0.01	<0.0100	<0.02	**0.0011 J**	**0.0017 L**	<0.001	NA	<0.0040	<0.001	<0.0120
Lead	<0.001	<0.001	<0.00100	<0.005	<0.001	<0.001	<0.001	<0.002	<0.0020	<0.0002	<0.000100
Mercury	<0.0002	<0.0002	<0.000200	<0.0002	<0.0002	<0.0002	NA	<0.0002	<0.00020	<0.001	<0.000150
Nickel	**0.0245**	**0.0268**	**0.0226**	**0.0239**	**0.0077**	**0.0059**	**0.0072**	**0.008**	**0.0184**	**0.0167**	**0.0106**
Selenium	**0.00791**	**0.00547**	**0.0102**	**0.00758**	<0.001	<0.001	<0.001	NA	<0.0040	<0.0006	**0.000326 J**
Thallium	<0.0002	<0.0002	<0.000200	<0.001	<0.001	<0.001	<0.001	NA	<0.0010	<0.0005	<0.000800
Vanadium	<0.01	<0.01	<0.0100	<0.01	<0.005	<0.005	<0.001	<0.002	**0.00063 J**	**0.00103 J**	<0.000700
Zinc	<0.02	<0.02	<0.0200	<0.02	**0.0011 K**	**0.0021 B**	**0.0182**	**0.0147**	<0.0300	<0.01	<0.00520
Field Parameters											
pH	6.58	6.43	6.12	6.67	6.78	6.54	7.03	7.26	7.25	7.06	6.88
Specific Conductance (mS/cm)	7.871	9.217	9.088	8.443	7.251	1.349	5.18	5.077	7.0	6.7444	11.067
Turbidity (ntu)	0	0.0	3.3	1.8	0.0	15.2	0.0	12.7	8.31	1.23	6.29
Dissolved Oxygen (mg/L)	0.04	0.06	1.35	0.04	0.48	0.44	0.10	0.33	0.11	0.02	0.13
Redox Potential (mV)	-84.9	-105.5	-44.0	-96.7	-105.9	-45.8	-101.82	-115.3	-84.12	-111.5	-90.1
Temperature (^{o}C)	15.80	15.50	19.65	15.53	17.61	17.33	22.96	12.47	20.29	19.43	20.91

Notes:
J - Estimated result
L - Analytical result may be biased low.
K - Analytical result may be biased high.
< - Not detected, value indicates detection li
Bold indicates detected result.
R - Result flagged as unusable due to low res
per EPA guidance, but validator notes that
response is stable and calibration curve is
specified limits, and thus should be consid
useable.
[1] - Blind duplicate sample

Table D-4 **Historical Analytical Results - Fly Ash Basin and Sulfate Basin Wells**
Avtex Fibers Superfund Site, Front Royal, VA

	Well: 008 Unit: Fly Ash Basin Location: Upgradient Overburden																		
Parameter	May-01	Nov-01	Jun-02	Nov-02	Jun-03	Jun-04	Jun-05	Jun-06	Jun-07	Jun-08	Jun-09	Jun-10	Jun-11	Jun-12	Jun-13	Jul-14	Jul-15	Jul-16	Jul-17
Filtered Inorganics, (mg/L)																			
Arsenic	< 0.0014 J	< 0.0046 JK	<0.005 L	<0.005	<0.005	<0.005 J	<0.005 J	0.00129 BJ	0.00106	<0.00500	<0.00100	<0.00100	<0.00500	<0.001	<0.001	<0.001	0.00095 J	0.00169 J	<0.000400
Beryllium	< 0.0032	< 0.0006 J	< 0.002	< 0.002	<0.005	<0.005	<0.005	<0.00500	<0.00500	<0.00200	<0.00200	<0.00200	<0.00200	<0.001	<0.001	<0.001	<0.0010	<0.001	<0.000100
Cadmium	< 0.0015 J	< 0.0015	< 0.003	< 0.003	<0.005	<0.005	<0.005 L	<0.00500	<0.000500	<0.000500	<0.000500	<0.000500	<0.00300	<0.0001	<0.001	<0.0001	<0.0010	<0.0004	<0.000100
Chromium	< 0.0030 J	< 0.0030	< 0.005 L	< 0.005	<0.005	<0.005 LJ	<0.015 J	<0.00500	0.00264	<0.0100	0.00428	0.00233	<0.0100	<0.001	0.00057 J	<0.001	<0.0040	<0.0005	0.000602 J
Copper	< 0.0250	< 0.0250	< 0.025	< 0.025	<0.025	<0.010 LJ	<0.010	<0.0100	0.00266	0.0157	0.0078	0.00352 B	<0.0100	<0.001	0.0014 L	<0.001	0.00070 J	<0.00187	<0.00120
Lead	< 0.0030 LJ	< 0.0030 J	< 0.003 L	< 0.003 L	<0.003 L	<0.003 LJ	<0.003 J	<0.00300 L	<0.00100	<0.00100	<0.00100	<0.00100	<0.00500	<0.001	<0.001	<0.001	<0.0020	<0.0002	<0.000100
Mercury	< 0.00020 L	< 0.00020 L	< 0.0002 L	< 0.0002	<0.0002	<0.0002 J	<0.0002	<0.000200 J	<0.000200	<0.000200	<0.000200	<0.000200	<0.000242	0.0002 L	<0.0002 L	<0.0002	<0.00020	<0.0001	<0.000100
Nickel	< 0.050	< 0.050	< 0.050	< 0.050 L	<0.050	<0.010 J	<0.010 J	0.0116 J	0.0139	<0.0200	0.0111	0.00643	<0.0200	0.0011	<0.005	<0.001	0.0066	<0.00284	0.00218
Selenium	< 0.0050 J	< 0.0050 J	< 0.005 L	< 0.005 L	<0.005 L	<0.005	<0.025 L	0.00204 BJ	0.00227	<0.00500	<0.00100	<0.00100	0.00594	<0.001	<0.001	<0.001	<0.0040	<0.0006	<0.000300
Zinc	0.0759	0.151	0.103	0.677	<0.025	<0.020 J	0.394	<0.0200	<0.0200	0.0371	<0.0200	<0.0200	<0.0200	0.0058 B	0.00060 B	<0.005	<0.0300	<0.01	0.0127 J
Cations																			
Calcium	197.0	196 J	192.0	192.0	236.0	317.0	323.0	320	437	242	176	153	227	221	243	202 J	229	211	214
Magnesium	20.7	18.1	18.4	15.8	34.0	57.0	57.1	52.2	93.6	46.1	33.8	22.9	35.2	35.7	40.4	33.2	27.0	21.5	22.8
Sodium	12.9 B	17	14	12	19	42	32.2	25.4	91.0	53.1	20.6	14.9	20.1	26.6	29.4	17.7	14.0	12.6	12.3 J
Anions																			
Chloride	17	15.5	15.1	14.5	20.7	24.5	23.7	21.9	12.5	6.28	5.59	<10.0	5.17	49.1	85.2	56.6	28.7	17.5	15.8
Sulfate	297	270	260	274	445	662	692	686	1,300	635	383	318	486	322	465	419	283	302	311
Field Parameters																			
pH	6.87	6.94	7	7.36	6.87	6.73	6.46	6.43	7.76	6.73	6.68	6.99	6.55	6.96	6.89	7.12	6.75	7.14	7.1
Conductance (mS/cm)	1.13	1.33	0.829	1.2	1.53	2.1	1.79	1.68	2.539	1.580	1.145	0.927	1.282	1.372	1.572	1.58	1.133	0	1.2202
Turbidity (ntu)	119	23	14.6	22.3	21.8	9	31	7.1	0.0	3.0	8.8	5	8.7	3.8	20.8	2.72	68.60	---	11.2
Dissolved Oxygen (mg/L)	7.64	2.81	4.7	7.55	0.23	0.0	1.0	2.0	2.13	1.96	1.90	2.01	1.85	1.17	1.23	0.22	3.65	7.1	4.24
Redox Potential (mV)	-31	-129	67	3	-72	-80	77	83	80	161	174	70.3	-163.4	157.4	100.1	68.59	71.1	186.1	215.4
Temperature (°C)	10.4	13.31	12.8	13.35	13.37	16.6	14.37	17.81	15.8	17.72	13.74	14.98	15.89	15.64	12.90	18.32	20.38	19.92	20.29

	Well: 029 Unit: Fly Ash Basin Location: Upgradient Overburden																			
Parameter	May-01	Nov-01	Jun-02	Nov-02	Jun-03	Jun-04	Jun-05	Jun-06	Jun-07	Jun-08	Jun-09	Jun-10	Jun-11	Jun-12	Jun-13	Jul-14	Dec-14	Jul-15	Aug-16	Jul-17
Filtered Inorganics, (mg/L)																				
Arsenic	NA	< 0.0014 J	< 0.005 L	< 0.005 L	<0.005	<0.005 J	<0.005 J	0.000371 BJ	<0.00100	<0.00100	<0.00100	<0.00100	<0.00500	<0.001	<0.001	<0.001	<0.005	<0.0040	<0.0005	<0.000400
Beryllium	NA	< 0.0006 J	< 0.002	< 0.002	<0.005 L	<0.005	<0.005	<0.00500	<0.00500	<0.00200	<0.00200	<0.00200	<0.00200	<0.001	<0.001 L	<0.001	NA	<0.0010	<0.001	<0.000100
Cadmium	NA	< 0.0015	< 0.003	< 0.003	<0.005	<0.005	<0.005	<0.00500	<0.000500	<0.000500	<0.000500	<0.000500	<0.00300	<0.0001	<0.001	<0.0001	<0.0005	<0.0010	<0.0004	<0.000100
Chromium	NA	< 0.0030	< 0.005 L	< 0.005	<0.005	<0.005 LJ	<0.015 J	<0.00500	0.00315	0.00227	0.00253	0.00201	<0.0100	0.0006 L	<0.005	<0.001	<0.005	<0.0040	<0.0005	<0.000500
Copper	NA	< 0.0250	< 0.025	< 0.025 L	<0.025	<0.010 J	<0.010 L	<0.0100	0.00283	<0.00200	0.00625	0.00275 B	<0.0100	<0.001	0.0013 J	<0.005	NA	<0.0040	<0.001	<0.00120
Lead	NA	< 0.0030 J	< 0.003 L	< 0.003	<0.003	<0.003 LJ	<0.003 J	<0.00300	<0.00100	<0.00100	<0.00100	<0.00100	<0.00500	<0.001	<0.001	<0.001	<0.005	<0.0020	<0.0002	<0.000100
Mercury	NA	< 0.00020 L	< 0.0002 L	< 0.0002 L	<0.0002	<0.0002	<0.0002	<0.000200	<0.000200	<0.000200	<0.000200	<0.000200	<0.000254	<0.0002	<0.0002	<0.0002	<0.0002	<0.00020	<0.0001	<0.000100
Nickel	NA	< 0.050	< 0.050	< 0.050	< 0.050	<0.010 J	<0.010 J	0.00678 J	0.00567	0.00427	0.00671	0.00649	<0.0200	0.0022	<0.005	0.0018	<0.005	0.0029 J	<0.00182	0.00170 J
Selenium	NA	< 0.0050 J	< 0.005 L	< 0.005 L	<0.005	<0.005	<0.010 L	0.00192 J	0.00145	0.00195	0.00325	0.00265	<0.00500	0.0011	0.0014	0.0015	NA	0.0015 J	<0.002	0.00111 J
Zinc	NA	0.185	0.121	0.0405	<0.025	<0.020 J	<0.020 J	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	0.0038 K	0.0015 B	<0.01	0.0658	<0.0300	<0.0112	<0.00520
Cations																				
Calcium	NA	127 J	121.0	97.4	94.1	91.3	106	147	112 J	118	134	136	119	142	129	114	NA	138 J	158	155
Magnesium	NA	15.8	15.8	13.2	12.1	11.9	13.0	17.7	15.3	14.4	17.7	17.0	14.6	17.1	16.1	14.3	NA	17.5 J	18.3	19.9
Sodium	NA	88	83	75	66	66	67.5	72.9	61.4	57.8	58.4	56.3	48.0	57.1	47.2	40.1	NA	49.4	51.4	51.2 J
Anions																				
Chloride	NA	33.8	37	29.1	18.1	19.6	40.1	59.4	43.9	46.2	71.8	72.7	49.3	59.3	46.8	37.1	NA	40.0	46.1	45.3
Sulfate	NA	411	365	369	313	296	320	361	313	282	289	314	263	281	310	290	NA	321 J	342	337
Field Parameters																				
pH	NA	6.11	6.03	6.09	5.83	5.94	6.00	5.28	5.97	5.93	5.90	6.13	5.60	6.04	6.06	6.21	6.21	6.19	6.06	6.81
Conductance (mS/cm)	NA	1.27	1.1	1.01	0.95	0.85	0.746	1.10	0.966	0.909	1.031	1.075	0.936	0.959	1.006	1.09	1.156	1.1	1.1388	1.1372
Turbidity (ntu)	NA	0.9	2.6	530	53.7	59	7	36	0.0	64.6	18.1	44.3	34.1	6.4	5.3	15.00	1.4	4.52	40.57	1.97
Dissolved Oxygen (mg/L)	NA	1.23	2.99	0.25	0	0	0.65	0.59	1.71	0.69	0.59	1.00	1.08	0.33	0.86	1.09	0.51	0.84	0.47	0.32
Redox Potential (mV)	NA	-73	-7	117	146	204	224.3	381.8	196.1	153.1	297.4	146.6	-146.1	182.2	148.8	76.31	64.4	290.09	19.2	114.7
Temperature (°C)	NA	15.09	14.9	16.4	13.26	13.3	13.76	15.41	15.29	15.18	14.87	15.40	14.80	16.00	13.91	20.50	13.51	18.75	20.14	24.15

Table D-4 **Historical Analytical Results - Fly Ash Basin and Sulfate Basin Wells**
Avtex Fibers Superfund Site, Front Royal, VA

	Well: 108 Unit: Fly Ash Basin Location: Upgradient Bedrock																		
Parameter	May-01	Nov-01	Jun-02	Nov-02	Jun-03	Jun-04	Jun-05	Jun-06	Jun-07	Jun-08	Jun-09	Jun-10	Jun-11	Jun-12	Jun-13	Jul-14	Jul-15	Jul-16	Jul-17
Filtered Inorganics, (mg/L)																			
Arsenic	< 0.0014 J	< 0.0022 JK	< 0.005 L	< 0.005	<0.005	<0.005 J	<0.005 J	<0.00500 BJ	<0.00100	<0.00500	<0.00100	<0.00100	<0.00500	<0.001	<0.001	<0.001	<0.0040	0.00156 J	<0.000400
Beryllium	< 0.0032	< 0.0006 J	< 0.002	< 0.002	<0.005	<0.005	<0.005	<0.00500	<0.00500	<0.00200	<0.00200	<0.00200	<0.00200	<0.001	0.00015 K	<0.0001	<0.0010	<0.001	<0.000100
Cadmium	< 0.0015 J	< 0.0015	< 0.003	< 0.003	<0.005	<0.005	<0.005 L	<0.00500	<0.000500	<0.000500	<0.000500	<0.000500	<0.00300	<0.0001	<0.001	<0.0001	<0.0010	<0.0004	<0.000100
Chromium	< 0.0030 J	< 0.0015	< 0.005 L	< 0.005	<0.005	<0.005 LJ	<0.015 J	<0.00500	<0.00200	<0.0100	<0.00200	0.00278	<0.0100	<0.001	<0.005	<0.001	<0.0040	<0.0005	<0.000500
Copper	< 0.0250	< 0.0250	< 0.025	< 0.025	<0.025	0.033	<0.010	<0.0100	<0.00200	<0.0100	<0.00200	<0.00200	<0.0100	<0.001	0.00049 J	<0.001	<0.0040	<0.00248	<0.00120
Lead	< 0.0030 LJ	< 0.0030 J	< 0.003 L	< 0.003 L	<0.003 L	<0.003 LJ	<0.003 J	<0.00300 L	<0.00100	<0.00100	<0.00100	<0.00100	<0.00500	<0.001	<0.001	<0.001	<0.0020	<0.0002	<0.000100
Mercury	< 0.00020 L	< 0.00020 L	< 0.0002 L	< 0.0002	<0.0002	<0.0002 J	<0.0002	<0.000200 J	<0.000200	<0.000200	<0.000200	<0.000200	<0.000400	<0.0002 L	<0.0002 L	<0.0002	<0.00020	<0.0001	<0.000100
Nickel	< 0.050	< 0.050	< 0.050	< 0.050 L	<0.050	<0.010 J	<0.010 J	0.00515 J	0.00482	<0.0200	<0.00559	0.00510	<0.0200	<0.001	<0.005	<0.001	<0.0040	<0.00409	<0.000500
Selenium	< 0.0050 J	< 0.0050 J	< 0.005 L	< 0.005 L	<0.005 L	<0.005	<0.005 L	0.000898 BJ	0.00113	<0.00500	<0.00100	<0.00100	0.00815	<0.001	<0.001	<0.001	<0.0040	<0.0006	<0.000300
Zinc	0.181	0.128	<0.025	<0.025	<0.025	<0.020 J	<0.020 J	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	0.0044 B	<0.010	<0.005	<0.0300	<0.01	<0.00520
Cations																			
Calcium	179.0	189 J	182.0	178.0	182.0	172.0	172.0	180	166	167	155	144	163	176	180	156 J	189	189	191
Magnesium	16.6	17.4	17.7	16.6	16.3	15.4	15.3	15.8	15.5	14.6	14.2	14.0	14.8	14.6	15.4	13.8	16.7	15.9	17.1
Sodium	15.6 B	17	14	14	14	14	12.7	13.5	13.3	13.1	12.7	12.4	12.3	15.5	16.1	11.4	13.6	13.7	13.7 J
Anions																			
Chloride	16.8	18	17.8	18	16.2	14.5	15.6	17.0	14.9	14.2	13.2	13.6	13.3	12.4	12.9	13.3	14.0	14.7	14.9
Sulfate	293	293	290	281	277	229	245	246	258	231	225	225	230	217	262	231	259	266	238
Field Parameters																			
pH	6.81	7.1	7.28	7.53	7.09	7.01	6.69	6.68	8.23	6.91	6.90	7.06	6.52	7.00	6.91	7.07	7.21	7.04	7.38
Conductance (mS/cm)	0.95	1.28	0.774	1.1	1.04	1.0	.931	0.953	0.951	0.961	0.883	0.896	0.931	1.000	1.018	1.11	0.9	1.0102	0.67558
Turbidity (ntu)	62.3	1.1	4.2	1.7	18.1	0.0	0	4.1	4.2	9.5	9.9	0.0	23.0	34.6	80.7	81.00	108.00	104	48
Dissolved Oxygen (mg/L)	1.62	1.19	2.16	3.2	0	0.0	1.49	0.10	0.42	0.08	0.30	0.01	0.00	0.74	0.29	0.12	0.11	0.14	0.32
Redox Potential (mV)	-14	-110	-119	-83	-141	-64	-18.8	-38.0	-67.0	-72.3	-30.2	-69.2	-300.1	-49.3	-63.5	59.09	-111.15	-75.1	-48.5
Temperature (°C)	12.85	12.53	12.3	12.8	12.34	12.2	13.21	13.33	13.26	13.77	13.34	13.37	13.72	23.01	14.72	21.13	24.89	23.38	21.73

	Well: 129 Unit: Fly Ash Basin Location: Upgradient Bedrock																		
Parameter	May-01	Nov-01	Jun-02	Nov-02	Jun-03	Jun-04	Jun-05	Jun-06	Jun-07	Jun-08	Jun-09	Jun-10	May-11	Jun-12	Jun-13	Jul-14	Jul-15	Aug-16	Jul-17
Filtered Inorganics, (mg/L)																			
Arsenic	0.0059 LJ	< 0.0014 J	< 0.005 L	< 0.005 L	<0.005	<0.005 J	<0.005 J	0.00115 BJ	0.00146	0.00116	0.0011	0.00126	<0.00500	0.0011	0.0026	0.0069	0.00093 J	0.00158 J	0.000705 J
Beryllium	< 0.0032	< 0.0006 J	< 0.002	< 0.002	<0.005	<0.005	<0.005	<0.00500	<0.00500	<0.00200	<0.00200	<0.00200	<0.00200	<0.001	<0.001 L	<0.0001	<0.0010	<0.001	<0.000100
Cadmium	< 0.0015 J	< 0.0015	< 0.003	< 0.003	<0.005	<0.005	<0.005	<0.00500	<0.000500	<0.000500	<0.000500	<0.000500	<0.00300	<0.0001	<0.0001	<0.0001	<0.0010	<0.0004	<0.000100
Chromium	< 0.0030 J	< 0.0015	< 0.005 L	< 0.005	<0.005	<0.005 LJ	<0.015 J	<0.00500	<0.00200	<0.00200	0.00232	<0.00200	<0.0100	<0.001 L	0.0015 J	<0.001	<0.0040	<0.0005	<0.000500
Copper	< 0.0250	< 0.0250	< 0.025	< 0.025 L	<0.025	<0.010 J	<0.010 L	0.0187	<0.00200	0.0120	0.0306	<0.00200	<0.0100	<0.001	0.0012 J	<0.001	<0.0040	<0.001	<0.00120
Lead	< 0.0030 J	< 0.0030 J	< 0.003 L	< 0.003	<0.003 L	<0.003 LJ	<0.003 J	<0.00300	<0.00100	<0.00100	<0.00100	<0.00100	<0.00500	<0.001	<0.001	<0.001	<0.0020	<0.0002	<0.000100
Mercury	< 0.00020	< 0.00020 L	< 0.0002 L	< 0.0002 L	<0.0002	<0.0002	<0.0002	<0.000200	<0.000200	<0.000200	<0.000200	<0.000200	<0.000238	<0.0002	<0.0002	<0.0002	<0.00020	<0.0001	<0.000100
Nickel	< 0.050	< 0.050	< 0.050	< 0.050	<0.050	<0.010 J	<0.010 J	0.00895 J	0.0103	0.00501	0.00877	0.00740	<0.0200	0.0014	<0.005	<0.001	0.0011 J	<0.0012	0.00121 J
Selenium	< 0.0050 J	< 0.0050 J	< 0.005 L	< 0.005 L	<0.005 L	<0.005	<0.005 L	0.000945 BJ	0.00131	0.00148	0.00214	0.00199	0.0132	<0.001	<0.001	<0.001	<0.0040	<0.00114	<0.000300
Zinc	0.22 J	0.0729	0.116	0.0716	<0.025	0.0276 K	<0.020 J	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	0.0054 K	0.0020 B	<0.005	<0.0300	<0.01	0.00612 J
Cations																			
Calcium	218.0	206 J	203.0	181.0	158.0	227.0	224.0	241	211 J	208	199	210	216	213	229	198 J	239 J	278	262
Magnesium	27.3	25.0	24.9	23.6	18.7	26.6	25.1	26.2	25.0	24.2	23.9	24.4	24.8	24.7	26.5	23.8	28.0 J	30.2	30.6
Sodium	27	20	40	40	32	32	27	25.0	23.6	23.2	22.4	24.6	23.4	31.9	29.6	25.2	25.8	30.2	24.9 J
Anions																			
Chloride	36	36.2	36	34.7	23.4	43.4	53.9	60.6	60.9	62.3	60.7	68.2	64.5	66.3	75.8	66.9	67.8	75.0	72.5
Sulfate	414	381	465	396	271	391	387	376	367	357	330	345	331	303	394	381	415 J	478	450
Field Parameters																			
pH	6.47	7.15	6.82	7.43	7.04	7.50	7.09	6.84	7.00	6.82	6.81	6.92	6.56	6.72	6.74	6.80	6.97	7.04	7.38
Conductance (mS/cm)	1.2	1.38	1.23	1.4	1.06	1.2	1.07	1.27	1.254	1.198	1.224	1.288	1.251	1.373	1.411	1.49	1.4	1.6148	1.36
Turbidity (ntu)	40.6	51.2	0	24.1	0	10	2	0.3	0.0	0.0	0.0	0.4	0.0	1.0	2.7	18.50	2.85	8.95	1.2
Dissolved Oxygen (mg/L)	5.78	1.92	2.57	5.92	0	1.27	0.50	30.8	1.29	0.32	0.68	0.29	0.17	3.2	1.88	0.60	0.50	0.42	1.48
Redox Potential (mV)	-10	-85	84	46	-5	---	10.7	32.1	8.3	2.7	19.7	-39.9	-227.4	11.8	-24.4	94.04	68.99	10.6	39.5
Temperature (°C)	14.12	16	14.5	14.46	16.18	16.5	15.62	16.72	16.92	17.44	16.00	15.82	15.57	15.06	15.38	27.01	21.95	23.21	21.43

Table D-4 **Historical Analytical Results - Fly Ash Basin and Sulfate Basin Wells**
Avtex Fibers Superfund Site, Front Royal, VA

	Well: 012 Unit: Fly Ash Basin / Sulfate Basin Location: Downgradient Overburden / Upgradient Overburden																		
Parameter	May-01	Nov-01	Jun-02	Nov-02	Jun-03	Jun-04	Jun-05	Jun-06	Jun-07	Jun-08	Jun-09	Jun-10	May-11	Jun-12	Jun-13	Jul-14	Aug-15	Aug-16	Jul-17
Filtered Inorganics, (mg/L)																			
Arsenic	< 0.0014 LJ	< 0.0014 J	< 0.005 L	< 0.005 L	<0.005	<0.005 J	<0.005 J	0.00159 BJ	0.00156	0.00150	0.00105	0.00130	<0.00500	<0.005	<0.001	<0.001	<0.0040	0.00056 J	0.00240
Beryllium	< 0.0032	< 0.0006 J	< 0.002	< 0.002	<0.005 L	<0.005	<0.005	<0.00500	<0.00500	<0.00200	<0.00200	<0.00200	<0.00200	<0.001	<0.001 L	<0.0001	<0.0010	<0.001	<0.000100
Cadmium	< 0.0015 J	0.0015	<0.003	<0.003	<0.005	<0.005	<0.005	<0.00500	<0.000500	<0.000500	<0.000500	<0.000500	<0.00300	<0.0005	<0.001	<0.0001	<0.0010	<0.0004	<0.000100
Chromium	< 0.003 J	< 0.0030	< 0.005 L	< 0.005	<0.005	<0.005 LJ	<0.015 J	<0.00500	<0.00200	0.00200	<0.002	<0.002	<0.0100	<0.005	<0.005	<0.001	<0.0040	<0.0005	<0.000500
Copper	<0.025	< 0.025	< 0.025	< 0.025 L	<0.025	0.011	<0.010 L	<0.0100	<0.00200	0.0026	0.0253	<0.002	<0.0100	<0.005	0.00099 J	<0.001	<0.0040	<0.001	<0.00120
Lead	< 0.0030 J	< 0.0030	< 0.003 L	< 0.003	<0.003	<0.003 LJ	<0.003 J	0.0879 L	0.00231	<0.00100	<0.00100	<0.00100	<0.00500	<0.005	<0.001	<0.001	<0.0020	<0.0002	<0.000100
Mercury	< 0.00020	< 0.00020	< 0.0002 L	< 0.0002 L	<0.0002	<0.0002	<0.0002	<0.000200 J	<0.000200	<0.000200	<0.000200	<0.000200	<0.000200	<0.0002	<0.0002	<0.0002	<0.00020 J-	<0.0001	<0.000100
Nickel	< 0.050	< 0.050	< 0.050	< 0.050	<0.050	<0.010 J	<0.010 J	0.00620 J	0.00814	0.00524	0.00708	0.00556	<0.0200	<0.005	<0.005	0.0033	0.0023 J	0.00156 J	0.00175 J
Selenium	< 0.0050 J	< 0.0050	< 0.005 L	< 0.005 L	<0.005	0.006	<0.005 L	0.00570 BJ	0.00563	0.00505	0.00516	0.00447	0.01210	<0.005	<0.001	<0.001	<0.0040	<0.00124	<0.000300
Zinc	< 0.025 LJ	0.147	0.0849	0.0351	<0.025	0.034 KJ	<0.020 J	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	0.0042 J	0.003 B	<0.005	<0.0300	<0.01	0.00606 J
Cations																			
Calcium	180.0	165.0	169.0	149.0	163.0	165.0	165.0	184	164	172	161	162	173	152	160	150	165	178	132
Magnesium	24.7	22.4	23.5	22.1	23.6	24.0	21.7	24.3	23.2	23.7	22.5	22.2	24.1	19.5	21.2	20.8	23.4	22.4	18.4
Sodium	32	35	34	32	36	35	35.7	35.8	34.2	35.4	34.5	35.5	35.1	33.6	33.3	29.8	33.5	35.2	29.0
Anions																			
Chloride	46 J	44	47	42	40.3	39.6	42.6	50.6	45.7	43.6	42.4	43.3	42.2	39.2	42.6	39.8	45.0	45.7	46.0
Sulfate	344 J	330	353	339	319	313	318	346	354	327	311	312	304	325	296	306	336	347	354
Field Parameters																			
pH	6.71	7.11	7.27	8.04	7.2	7.05	6.94	6.55	7.01	6.91	6.04	7.04	6.88	7.06	7.03	7.20	7.09	7.30269	7.34
Conductance (mS/cm)	1.07	1.33	1.12	1.1	1.07	1.1	1.02	1.09	1.116	1.091	1.120	1.043	1.015	1.013	1.071	1.13	1.125	1.190538	1.0875
Turbidity (ntu)	21.4	126	0	37.9	136	8	132	1.3	0.0	0.0	7.5	4.7	28.6	6.0	44.4	229.00	87.00	4.480548	1.58
Dissolved Oxygen (mg/L)	3.3	0.6	2.73	3.01	0	0.0	1.36	0.37	0.71	0.29	0.66	0.23	0.09	0.04	031	0.27	0.13	0.142582	0.34
Redox Potential (mV)	-14	-106	-58	-82	-26	-50	-13.0	4.2	-16.9	-36.0	16.3	-37.8	-309.9	-55.7	-54.4	-42.32	163.28	-106.533	-27
Temperature (°C)	17.68	15.11	15.3	15.07	15.5	16.3	15.86	16.93	15.86	16.13	15.62	15.46	15.20	15.60	14.97	22.88	22.95	19.40497	18.11

	Well: 013 Unit: Fly Ash Basin / Sulfate Basin Location: Downgradient Overburden / Upgradient Overburden																		
Parameter	May-01	Nov-01	Jun-02	Nov-02	Jun-03	Jun-04	Jun-05	Jun-06	Jun-07	Jun-08	Jun-09	Jun-10	May-11	Jun-12	Jun-13	Jul-14	Jul-15	Aug-16	Jul-17
Filtered Inorganics, (mg/L)																			
Arsenic	< 0.0014LJ	< 0.0014 J	< 0.005	< 0.005	<0.005	<0.005 J	<0.005 J	0.00776 J	0.00270	0.00253	0.00247	0.00151	<0.00500	<0.005	0.0084 J	<0.001	0.0016 J	0.00106 J	0.00359
Beryllium	< 0.0032	< 0.0006 J	< 0.002	< 0.002	<0.005	<0.005	<0.005	<0.00500 J	<0.00500	<0.00200	<0.00200	<0.00200	<0.00200	<0.001	<0.001 L	<0.0001	<0.0010	<0.001	<0.000100
Cadmium	< 0.0015 J	< 0.0015	< 0.003	< 0.003	<0.005	<0.005	<0.005	<0.00500	<0.000500	<0.000500	<0.000500	<0.000500	<0.00300	<0.0005	<0.001	<0.0001	<0.0010	<0.0004	<0.000100
Chromium	< 0.003 J	< 0.0030	< 0.005 L	< 0.005 L	<0.005	<0.005 LJ	<0.015 J	<0.00500	<0.00200	0.00470	0.00398	<0.00200	<0.0100	<0.005	<0.005	<0.001	<0.0040	<0.0005	<0.000500
Copper	<0.025	< 0.025	< 0.025	< 0.025 L	<0.025	<0.010 J	<0.010 L	<0.0100	<0.00200	<0.00200	0.349	0.00221 B	<0.0100	<0.005	0.0020 J	<0.001	<0.0040	<0.001	<0.00120
Lead	< 0.0030 J	< 0.0030	< 0.003	< 0.003	<0.005	<0.003 LJ	<0.003 J	0.000344 J	<0.00100	<0.00100	<0.00100	<0.00100	<0.00500	<0.005	<0.001	<0.001	<0.0020	<0.0002	<0.000100
Mercury	< 0.00020	< 0.00020	< 0.0002 L	< 0.0002	<0.0002	<0.0002	<0.0002	<0.000200	<0.000200	<0.000200	<0.000200	<0.000200	<0.000200	<0.0002	<0.0002	<0.0002	<0.00020	<0.0001	<0.000100
Nickel	<0.050	< 0.050	< 0.050 L	< 0.050 L	<0.050	0.0180	0.0157 J	0.0247	0.0264	0.0202	0.0277	0.0248	0.0220	0.0133	0.0126	0.0162	0.0206	0.0162	0.0137
Selenium	< 0.0050 J	< 0.0050	< 0.005 L	< 0.005 L	<0.025 L	<0.050	<0.005 L	0.00918 BJ	0.00689	0.00633	0.00637	0.00357	0.00729	<0.005	<0.001	<0.001	<0.0040	<0.0011	<0.000300
Zinc	0.184 LJ	0.191	<0.025	0.0659	<0.025	<0.020 J	<0.020 J	<0.0200 J	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	<0.01	<0.010	<0.005	<0.0300	0.0905	<0.00520
Cations																			
Calcium	160.0	159.0	162.0	210.0	188.0	179.0	181.0	187	199	198	209	222	218	227	195	200	254	237	236
Magnesium	23.3	23.4	22.6	24.7	23.9	23.7	22.9	24.5	25.1	26.8	28.3	27.5	27.3	29.7	29.4	30.4	33.9	34.4	33.9
Sodium	77	79	82	57	73	95	91.1	91.8	87.1	85.0	84	83.3	64.8	69.5	74.9	61.9	62.9	71.5	64.2
Anions																			
Chloride	35.2 J	38	42	41	32.1	32.6	34.6	40.9	40.6	40.1	34.5	32.3	32.6	26.8	13.1	30.9	34.3	31.0	26.0
Sulfate	233 J	261	288	474	451	388	420	461	471	469	482	472	487	646	519	572	586	605	699
Field Parameters																			
pH	6.46	6.87	6.81	7.58	6.59	6.69	6.51	6.55	7.38	6.43	5.36	6.59	6.46	6.02	6.30	6.65	6.56	6.75	6.98
Conductance (mS/cm)	1.28	1.47	1.29	1.6	1.42	1.4	1.30	1.51	1.510	1.453	1.547	1.483	1.476	1.802	1.504	1.46	1.7	1.7397	1.7259
Turbidity (ntu)	4.1	1.5	6.2	260	115	160	147	135	155.9	6.7	66.8	63.5	65.8	0.0	212.6	260.00	161.00	644.85	11
Dissolved Oxygen (mg/L)	1.51	0.68	0	2.95	0	0.0	1.70	0.33	1.00	0.58	0.53	0.84	0.19	2.35	4.17	0.04	0.06	4.92	0.26
Redox Potential (mV)	8	-168	-44	-62	-94	-53	-30.6	-63.0	-52.7	-53.8	-10.6	-51.6	-214.7	-47.2	-42.1	-56.65	0.89	-64.5	-93
Temperature (°C)	18.28	17.25	19.5	16.84	16.34	16.0	15.77	15.39	16.01	16.35	15.77	15.02	19.71	16.91	15.62	18.96	20.38	20.99	22.34

Table D-4 **Historical Analytical Results - Fly Ash Basin and Sulfate Basin Wells**
Avtex Fibers Superfund Site, Front Royal, VA

	Well: 014R Unit: Fly Ash Basin/Sulfate Basin Location: Downgradient Overburden/Upgradient Overburden																		
Parameter	May-01	Nov-01	Jun-02	Nov-02	Jun-03	Jun-04	Jun-05	Jun-06	Jun-07	Jun-08	Jun-09	Jun-10	May-11	Jun-12	Jun-13	Jul-14	Jul-15	Aug-16	Jul-17
Filtered Inorganics, (mg/L)																			
Arsenic	NA	0.0657	0.0489 L	0.0491 K	0.0169	0.016 KJ	0.0177	0.0661 J	0.108	0.203	0.198	0.243	0.180	0.404	0.124	0.386	0.692	1.28	0.889
Beryllium	NA	< 0.0006 J	< 0.002	< 0.002	<0.005 L	<0.005	<0.005	<0.00500 J	<0.00500	<0.00200	<0.00200	<0.00200	<0.00200	<0.001	<0.001 L	<0.0002	<0.0010	<0.005	<0.000100
Cadmium	NA	< 0.0015	< 0.003	< 0.003	<0.005	<0.005	<0.005	<0.00500	<0.000500	<0.000500	<0.000500	<0.000500	<0.00300	<0.0005	<0.001	0.00023	<0.0010	<0.002	<0.000100
Chromium	NA	< 0.0030	< 0.005 L	< 0.005	<0.005	<0.005 LJ	<0.015 J	<0.00500	<0.00200	0.00304	0.00495	<0.00200	<0.0100	<0.005	<0.005	0.0013	<0.0040	<0.0025	<0.000500
Copper	NA	< 0.0250	< 0.025	< 0.025	<0.025	< 0.010 LJ	<0.010 L	<0.0100	0.00352	0.00432	0.0037	0.00468 B	<0.0100	<0.005	0.0038 J	0.0047	<0.0040	<0.005	<0.00120
Lead	NA	< 0.0030	< 0.003 L	< 0.003 L	<0.003	<0.003 LJ	<0.003 J	0.000302 J	<0.00100	<0.00100	<0.00100	<0.00100	<0.00500	<0.005	<0.001	0.0024	0.00016 J	<0.0002	0.000103 J
Mercury	NA	< 0.00020	< 0.0002 L	< 0.0002	<0.0002	<0.0002J	<0.0002	<0.000200	<0.000200	<0.000200	<0.000200	<0.000200	<0.000200	<0.0002	<0.0002	<0.0002	<0.00020	<0.0001	<0.000100
Nickel	NA	0.0665	0.0663 K	0.0605 L	0.066	0.0710	0.065	0.0803	0.0779	0.0687	0.0784	0.0777	0.0674	0.0690	0.0661	0.0511	0.0640	0.0580	0.0625
Selenium	NA	< 0.0050	< 0.005 L	< 0.005 L	<0.005	<0.005	<0.005 L	0.0156 BJ	0.0110	0.00833	0.0133	0.00626	0.00911	<0.005	<0.001	<0.001	<0.0040	<0.003	<0.000300
Zinc	NA	0.134	0.0923	0.0867	0.0651	0.071	0.059	0.0124 J	<0.0200	0.0255	0.0274	<0.0200	<0.0200	0.0103 K	0.0069 B	0.0084	<0.0300	<0.05	0.00555 J
Cations																			
Calcium	NA	403.0	388.0	391.0	373.0	415.0	416.0	435	491	488	440	437	399	421	451	356	384 J	386	370
Magnesium	NA	111.0	115.0	107.0	110.0	121.0	110.0	112	126	137	128	131	110	133	138	96.6	120 J	119	105
Sodium	NA	172	164	141	103	94	92	229	445	714	666	696	566	817	670	750	787	811	626
Anions																			
Chloride	NA	71	76	70	61.6	57.7	60.9	85.6	106	129	118	121	94	112	139	<250	116	117	111
Sulfate	NA	1,350	1,370	1,290	1,210	1,150	1,300	1,710	2,260	2,940	2,430	2,460	2,020	3,210	2,710	2410	2540 J	2410	2600
Field Parameters																			
pH	NA	6.12	5.95	6.41	5.83	5.95	5.94	5.80	6.43	6.17	6.03	6.25	6.02	6.03	6.29	6.59	6.72	6.89	7.12
Conductance (mS/cm)	NA	2.99	2.94	2.9	2.74	2.9	2.91	3.20	4.279	5.121	4.590	5.057	3.993	4.664	5.547	0.01	5.6	4.1619	5.0506
Turbidity (ntu)	NA	8.7	2.3	21.9	51.8	460	5	2	15.7	0	12.4	21.3	48.8	0.0	11.2	1000.00	55.70	9.48	28.8
Dissolved Oxygen (mg/L)	NA	1.82	2.58	4.24	0	0.0	1.15	0.18	1.43	0.30	0.45	0.05	0	2.36	0.16	5.07	0.02	0.41	0.25
Redox Potential (mV)	NA	-24	10	32	37	53	24.5	66.0	52.9	19.9	101.4	4.0	-282.7	-16.1	-39.3	-25.66	-21.84	-132.7	-141.5
Temperature (°C)	NA	17.97	14.9	14.25	14.22	16.8	14.05	15.02	15.21	15.69	14.98	14.24	14.48	14.96	14.80	27.96	24.41	25.84	17.63

	Well: B-48A Unit: Fly Ash Basin Location: Downgradient Overburden																		
Parameter	May-01	Nov-01	Jun-02	Nov-02	Jun-03	Jun-04	Jun-05	Jun-06	Jun-07	Jun-08	Jun-09	Jun-10	May-11	Jun-12	Jun-13	Aug-14	Jul-15	Aug-16	Jul-17
Filtered Inorganics, (mg/L)																			
Arsenic	< 0.0021 LJ	< 0.0014 J	< 0.005	< 0.005	<0.005	<0.005 J	<0.005 J	0.00926 BJ	0.00456	0.00338	0.00481	0.00509	0.00572	<0.001	<0.001	<0.001	<0.0040	<0.0005	<0.000400
Beryllium	< 0.0032	< 0.0006 J	< 0.002	< 0.002	<0.005	<0.005	<0.005	<0.00500 J	<0.00500	<0.00200	<0.00200	<0.00200	<0.00200	<0.001	<0.001 L	<0.0001	<0.0010	<0.001	<0.000100
Cadmium	< 0.0015 J	< 0.0015	< 0.003	< 0.003	<0.005	<0.005	<0.005	<0.00500	<0.000500	<0.000500	<0.000500	<0.000500	<0.00300	<0.0001	<0.001	<0.0001	<0.0010	<0.0004	<0.000100
Chromium	< 0.0030 J	< 0.0030	< 0.005 L	< 0.005	<0.005	<0.005 LJ	<0.015 J	<0.00500	<0.00400	0.00203	<0.00200	<0.00200	<0.0100	<0.001 L	<0.005	<0.001	<0.0040	<0.0005	<0.000500
Copper	<0.025	< 0.025	< 0.025	< 0.025	<0.025	< 0.010 LJ	< 0.010 L	<0.0100	<0.00400	0.00287	0.00232	0.0027 B	<0.0100	<0.001	0.0015 J	<0.001	0.00063 J	<0.001	<0.00120
Lead	0.0045 J	< 0.0030	< 0.003	< 0.003 L	<0.015 L	<0.003 LJ	<0.003 J	<0.00300 JL	<0.00200	<0.00100	<0.00100	<0.00100	<0.00500	<0.001	<0.001	<0.001	<0.0020	<0.0002	<0.000100
Mercury	< 0.00020	< 0.00020	< 0.0002 L	< 0.0002	<0.0002	<0.0002 J	<0.0002	<0.000200	<0.000200	<0.000200	<0.000200	<0.000200	<0.000200	<0.0002	<0.0002	<0.0002	<0.00020	<0.0001	<0.000100
Nickel	0.0898	0.101	0.0788 L	0.0671 L	0.0615	0.066	0.058	0.0683 J	0.0638	0.0667	0.0682	0.0690	0.0727	0.0572	0.0574	0.062	0.0585	0.0649	0.0694
Selenium	0.005 J	< 0.0050	< 0.005 L	< 0.005 L	<0.025 L	<0.005	<0.125 L	0.0336 B,J	0.0190	0.0149	0.0164	0.0182	0.0183	<0.001	<0.001	<0.001	<0.0040	<0.000764	<0.000300
Zinc	0.185 J	0.141	<0.025	<0.025	<0.025	0.031 K	0.0237 J	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	0.0032 K	0.0072 B	<0.005	<0.0300	<0.01	<0.00520
Cations																			
Calcium	130.0	110.0	173.0	196.0	242.0	205.0	238.0	225	210	215	191	185	194	170	175	182	199	196	187
Magnesium	14.4	12.2	19.8	22.3	27.6	23.0	25.6	24.1	23.9	24.5	21.7	21.0	21.2	19.2	19.9	19.8	22.8	21.4	22.0
Sodium	268	243	261	234	241	221	217	107 J	224	225	215	217	198	154	169	180	190	194	189 J
Anions																			
Chloride	35	31	35	30	4	27.2	29.2	29.5	27.7	27.3	25.8	24.4	26.1	23.7	26.9	26.3	25.9	30.3	24.9
Sulfate	606	520	760	830	100	787	821	834	745	689	641	630	596	486	568	547	600	552	529
Field Parameters																			
pH	6.74	7.52	8.11	7.47	5.9	7.28	7.20	NA	NA	NA	NA	6.73	6.78	6.89	6.68	6.92	6.95	6.94	7.27
Conductance (mS/cm)	1.72	1.89	2.02	2.41	2.41	2.2	1.71	NA	NA	NA	NA	1.857	1.791	1.827	1.734	1.77	1.9	1.7266	1.93
Turbidity (ntu)	>999	42.3	32.5	858	200	0	83	NA	NA	NA	NA	111.3	152.2	0.0	0.0	4.50	37.10	1.08	6.44
Dissolved Oxygen (mg/L)	15.65	5.38	9.91	4.38	12.3	5.13	3.9	NA	NA	NA	NA	3.27	2.64	0.0	0.26	0.19	0.21	0.13	0.45
Redox Potential (mV)	43	-7	-138	-123	120	90	71.9	NA	NA	NA	NA	230.2	-172.4	-8.4	35.9	12.47	28.34	23.4	40.1
Temperature (°C)	14.81	14.36	17.3	14.8	15.54	17.9	14.24	NA	NA	NA	NA	16.22	15.46	15.47	16.27	19.48	17.49	23.27	24.38

Table D-4 **Historical Analytical Results - Fly Ash Basin and Sulfate Basin Wells**
Avtex Fibers Superfund Site, Front Royal, VA

	Well: 110 Unit: Fly Ash Basin Location: Downgradient Bedrock																		
Parameter	May-01	Nov-01	Jun-02	Nov-02	Jun-03	Jun-04	Jun-05	Jun-06	Jun-07	Jun-08	Jun-09	Jun-10	May-11	Jun-12	Jun-13	Jul-14	Jul-15	Aug-16	Jul-17 & Feb-18
Filtered Inorganics, (mg/L)																			
Arsenic	< 0.0014 J	< 0.0014 J	< 0.005	< 0.005	<0.005	<0.005 J	<0.005 J	0.00296 BJ	0.00197	0.00144	0.00102	<0.00100	<0.00500	<0.001	<0.001	<0.001	<0.0040	<0.0005	<0.000400
Beryllium	< 0.0032	< 0.0006 J	< 0.002	< 0.002	<0.005	<0.005	<0.005	<0.00500 J	<0.00500	<0.00200	<0.00200	<0.00200	<0.00200	<0.001	<0.001	<0.0001	<0.0010	<0.001	<0.000100
Cadmium	< 0.0015 J	< 0.0015	< 0.003	< 0.003	<0.005	<0.005	<0.005 L	<0.00500	<0.000500	<0.000500	<0.000500	<0.000500	<0.00300	<0.0001	<0.001	<0.0001	<0.0010	<0.0004	<0.000100
Chromium	< 0.003 J	< 0.003	< 0.005 L	< 0.005 L	<0.005	<0.005 LJ	<0.015 J	<0.00500	<0.00200	<0.00200	0.00245	0.00226	<0.0100	<0.001 L	0.00042 J	<0.001	<0.0040	<0.0005	<0.000500
Copper	< 0.025	< 0.025	< 0.025	< 0.025 L	<0.025	<0.010 J	<0.010	<0.0100	<0.00200	0.00313	<0.002	0.00204 B	<0.0100	<0.001	0.0011 L	<0.001	<0.0040	<0.001	0.0015 J
Lead	< 0.0090 J	< 0.015	< 0.003	< 0.003	<0.015 L	<0.003 LJ	<0.003 J	0.000577 JL	<0.00100	<0.00100	<0.00100	<0.00100	<0.00500	<0.001	<0.001	<0.001	<0.0020	<0.0002	<0.000100
Mercury	< 0.00020 L	< 0.0002	< 0.0002 L	< 0.0002	<0.0002	<0.0002	<0.0002	<0.000200	<0.000200	<0.000200	<0.000200	<0.000200	<0.000200	<0.0002	<0.0002 L	<0.0002	<0.00020	<0.0001	<0.000100
Nickel	< 0.050	< 0.050	< 0.050 L	< 0.050 L	<0.050	0.0110	0.0109 J	0.0204 J	0.0224	0.0211	0.0243	0.0261	0.0319	0.0207	0.0144	0.0187	0.0211	0.0137	0.0218
Selenium	< 0.005 J	< 0.005	< 0.005 L	< 0.005 L	<0.025 L	<0.050	<0.025 L	0.00973 BJ	0.00837	0.00626	0.00634	0.00295	<0.00500	<0.001	<0.001	<0.001	<0.0040	<0.000683	<0.000300
Zinc	0.134	0.151 J	<0.025	0.0606	<0.025	<0.020 J	<0.020 J	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	0.511 K	0.0066 K	0.0042 B	<0.005	<0.0300	<0.01	0.0867
Cations																			
Calcium	298.0	276.0	259.0	285.0	287.0	294.0	267.0	263	259	231	246	250	236	195	197	185	185	59.8	199
Magnesium	65.0	48.6	47.4	50.9	51.3	53.4	46.5	46.0	44.7	42.7	46.4	44.2	42.3	33.1	31.5	28.6	32.6	14.0	35.6
Sodium	315	239	316	324	317	331	281	152 J	283	279	283	272	285	213	253	256	266	213	256
Anions																			
Chloride	22.8	23.5	23.0	23.9	21.9	20.9	22.3	24.8 J	21.8	21.4	<0.20	19.2	20.4	18.7	19.5	NA	21.3	22.8	23.2
Sulfate	1,400	1,270	1,120	1,370	1,320	1,240	1,140	1,200	1,080	1,020	1,000	949	962	760	914	NA	759	515	763
Field Parameters																			
pH	6.95	7.1	7.26	7.6	6.87	6.97	6.84	6.58	8.09	6.89	6.85	7.0	6.93	6.92	6.92	7.23	7.10	7.99	7.71 (7.18)
Conductance (mS/cm)	2.78	3.01	2.79	3	2.97	2.9	2.62	2.60	2.539	2.387	2.289	2.355	2.350	2.445	2.300	2.34	2.1	1.3273	2.2732 (1.979)
Turbidity (ntu)	62.8	18.7	0	0.3	16.9	0	3	0.9	1.6	1.3	1.0	0.6	0.0	2.6	32.8	10.30	53.60	72	19.6 (15.6)
Dissolved Oxygen (mg/L)	5.16	1.64	1.8	2.4	0	0.0	.36	0.09	1.47	0.06	0.31	0.00	0.0	0.0	0.11	0.10	0.15	0.06	0.17 (0.28)
Redox Potential (mV)	-168	-121	-113	-92	-112	-141	-54.2	-25.3	-61.8	-100.4	-3.1	-111.4	-279.6	-105.4	-78.1	-48.56	-71.50	-216.6	-35.5 (-100.5)
Temperature (°C)	13.45	14.35	13.4	13.88	13.23	13.3	13.46	13.97	13.59	13.77	13.61	13.32	13.54	13.74	12.92	15.50	18.79	17.2	17.85 (13.53)

	Well: 112 Unit: Fly Ash Basin / Sulfate Basin Location: Downgradient Bedrock / Upgradient Bedrock																		
Parameter	May-01	Nov-01	Jun-02	Nov-02	Jun-03	Jun-04	Jun-05	Jun-06	Jun-07	Jun-08	Jun-09	Jun-10	May-11	Jun-12	Jun-13	Jul-14	Aug-15	Aug-16	Jul-17
Filtered Inorganics, (mg/L)																			
Arsenic	< 0.0014 LJ	0.0419	<0.005 L	<0.005 L	<0.005	<0.005 J	<0.005 J	0.00108 BJ	<0.00100	0.00109	<0.00100	0.00120	<0.00500	<0.005	<0.001	<0.001	<0.0040	<0.0005	0.00407
Beryllium	< 0.0032	< 0.0006 J	<0.002	<0.002	<0.005 L	<0.005	<0.005	<0.00500	<0.00500	<0.00200	<0.00200	<0.00200	<0.00200	<0.001	<0.001	<0.0005	0.00015 J	<0.001	<0.000100
Cadmium	< 0.0015 J	< 0.0015	< 0.003	< 0.003	<0.005	<0.005	<0.005 L	<0.00500	<0.000500	<0.000500	<0.000500	<0.000500	<0.00300	<0.0005	<0.001	<0.0001	<0.0010	<0.0004	<0.000100
Chromium	< 0.003 J	< 0.0030	< 0.005 L	< 0.005	<0.005	<0.005 LJ	<0.015 J	<0.00500	<0.00200	<0.00200	<0.00200	<0.00200	<0.0100	<0.005	<0.005	<0.001	<0.0040	<0.0005	<0.000500
Copper	<0.025	< 0.025	< 0.025	< 0.025 L	<0.025	<0.010 J	<0.010	<0.0100	<0.00200	<0.00200	<0.00200	<0.00200	<0.0100	<0.005	0.0081 L	<0.001	<0.0040	<0.001	<0.00120
Lead	< 0.003 J	< 0.0030	< 0.003 L	< 0.003	<0.003	<0.003 LJ	<0.003 J	<0.00300 L	<0.00100	<0.00100	<0.00100	<0.00100	<0.00500	<0.005	<0.001	<0.001	<0.0020	<0.0002	<0.000100
Mercury	< 0.00020	< 0.00020	< 0.0002 L	< 0.0002 L	<0.0002	<0.0002	<0.0002	0.000103 J	<0.000200	<0.000200	<0.000200	<0.000200	<0.000200	<0.0002	<0.0002	<0.0002	<0.00020 J-	<0.0001	<0.000100
Nickel	<0.050	< 0.050	< 0.050	< 0.050	<0.050	<0.010 J	<0.010 J	0.00888 J	0.00987	0.00692	0.00126	0.0104	<0.0200	0.0066	0.0028 J	0.0017	0.0063	0.00543	0.0228
Selenium	< 0.005 J	< 0.0050	< 0.005 L	< 0.005 L	<0.005	<0.005	<0.025 L	0.00428 BJ	0.00406	0.00425	0.00437	0.00427	0.00679	<0.005	<0.001	<0.001	<0.0040	<0.000882	<0.000300
Zinc	0.064 BLJ	0.175	0.0657	<0.025	<0.025	<0.020 J	<0.020 J	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	0.0019 J	<0.010	<0.005	0.0805	0.0181 J	0.00544 J
Cations																			
Calcium	275.0	279.0	308.0	276.0	296.0	323.0	296.0	289	251	251	238	273	266	237	270	314	362	380	211
Magnesium	36.3	34.9	39.4	37.7	37.6	40.4	36.4	34.9	31.7	32.3	30.1	30.7	32.8	22.6	28.8	39.3	49.4	43.6	<0.250
Sodium	46	47	46	46	48	48	43	44.6	41.4	41.8	41.0	43.1	40.1 B	43.8	51.8	55.4	73.2	73.6	28.9
Anions																			
Chloride	51.4 J	51.5	59.4	55	53.3	54.8	56.9	64.5	60.4	57.8	59.0	60.0	58.9	47.9	49.5	51.8	53.4	55.0	44.8
Sulfate	600 J	610	670	671	632	659	520	543	532	503	499	514	530	1,360	651	932	928	873	319
Field Parameters																			
pH	6.87	6.88	6.86	6.99	7	6.8	6.63	6.49	6.74	6.73	6.32	6.77	6.72	8.93	7.43	6.92	6.81	6.86	12.69
Conductance (mS/cm)	1.57	1.87	1.8	1.76	1.74	1.8	1.76	1.53	1.516	1.483	1.558	1.462	1.458	1.406	1.637	1.93	2.2	2.1103	2.0439
Turbidity (ntu)	26.5	24.1	3.9	10.5	44.4	0	2	0	0.0	0.0	0.8	0.8	0.0	0.0	9.6	4.30	2.00	2.66	3.69
Dissolved Oxygen (mg/L)	2.39	0.7	1.47	0	0	0.0	.57	0.09	0.70	0.06	.031	0.00	0.0	2.29	0.46	0.20	0.00	0.09	0.24
Redox Potential (mV)	-56	-132	-125	-110	-95	-113	-51.4	-12.8	-39.8	-77.1	-33.3	-54.4	-323.6	432.4	-136.1	-46.45	61.16	-80.9	-218.3
Temperature (°C)	15.28	14.82	14.6	15.1	14.88	14.6	14.83	14.84	14.76	14.86	14.75	14.68	14.65	16.99	14.79	20.19	18.97	20.44	19.33

Table D-4 **Historical Analytical Results - Fly Ash Basin and Sulfate Basin Wells**
Avtex Fibers Superfund Site, Front Royal, VA

	Well: 113 Unit: Fly Ash Basin / Sulfate Basin Location: Downgradient Bedrock / Upgradient Bedrock																		
Parameter	May-01	Nov-01	Jun-02	Nov-02	Jun-03	Jun-04	Jun-05	Jun-06	Jun-07	Jun-08	Jun-09	Jun-10	May-11	Jun-12	Jun-13	Jul-14	Jul-15	Aug-16	Jul-17
Filtered Inorganics, (mg/L)																			
Arsenic	< 0.0014 LJ	< 0.0014 J	< 0.005 L	< 0.005	<0.005	<0.005 J	<0.005 J	0.00422 J	0.00205	0.00172	<0.001	0.00133	<0.00500	<0.005	<0.001	<0.001	0.00075 J	<0.0005	<0.000400
Beryllium	< 0.0032	< 0.0006 J	< 0.002	< 0.002	<0.005	<0.005	<0.005	<0.00500 J	<0.00500	<0.00200	<0.00200	<0.00200	<0.00200	<0.001	<0.001 L	<0.0001	<0.0010	<0.001	<0.000100
Cadmium	< 0.0015 J	< 0.0015	< 0.003	< 0.003	<0.005	<0.005	<0.005 L	<0.00500	<0.000500	<0.000500	<0.000500	<0.000500	<0.00300	<0.0005	<0.001	<0.0001	<0.0010	<0.0004	<0.000100
Chromium	< 0.003 J	< 0.003	< 0.005 L	< 0.005 L	<0.005	<0.005 LJ	<0.015 J	<0.00500	<0.00200	<0.00200	<0.00200	<0.00200	<0.0100	<0.005	<0.005	<0.001	<0.0040	<0.0005	<0.000500
Copper	<0.025	< 0.025	< 0.025	< 0.025 L	<0.025	<0.010 J	<0.010	<0.0100	<0.00200	<0.00200	<0.00200	0.00454 B	<0.0100	<0.005	0.00055 J	<0.001	0.00045 J	<0.001	<0.00120
Lead	< 0.003 J	< 0.003	< 0.003 L	< 0.003	<0.003 L	<0.003 LJ	<0.003 J	0.000310 J	<0.00100	<0.00100	<0.00100	<0.00100	<0.00500	<0.005	<0.001	<0.001	<0.0020	<0.0002	<0.000100
Mercury	< 0.00020	< 0.00020	< 0.0002 L	< 0.0002	<0.0002	<0.0002	<0.0002	<0.000200	<0.000200	<0.000200	<0.000200	<0.000200	<0.000200	<0.0002	<0.0002	<0.0002	<0.00020	<0.0001	<0.000100
Nickel	<0.050	< 0.050	< 0.050	< 0.050 L	<0.050	<0.010 J	<0.010 J	0.0113	0.0128	0.0109	0.0118	0.0126	<0.0200	<0.005	0.0036 J	0.0034	0.0017 J	0.00454	0.000534 J
Selenium	< 0.005 J	< 0.0050	< 0.005 L	< 0.005 L	<0.005 L	<0.005	<0.025 L	0.00476 BJ	0.00242	0.00341	0.00200	0.00209	<0.00500	<0.005	<0.001	<0.001	<0.0040	<0.00266	<0.000300
Zinc	0.119 LJ	0.117	0.0585	<0.025	<0.025	<0.020 J	<0.020 J	<0.0200 J	<0.0200	0.0249	0.0257	0.023 B	<0.0200	0.0123 K	0.0032 B	0.0121	0.0115 J	0.0314	0.00607 J
Cations																			
Calcium	301.0	319.0	312.0	312.0	303.0	311.0	281.0	281	259	262	270	288	274	341	69	298	319	102	99.6
Magnesium	35.1	36.2	35.7	36.3	30.5	34.9	31.7	31.5	29.6	29.2	30.2	32.5	31.4	38.8	7.08	35.7	37.7	10.3	11.9
Sodium	28	30	30	30	30	28	24.9	25.7	23.5	24.6	26.3	27.9	26.8 B	48.8	5.42	33.7	33.5	6.98	5.90 J
Anions																			
Chloride	28.9 J	32	35	33	30.1	27.5	27.1	35.2	30.0	29.4	31.7	32.4	31.1	47.6	4.9 J	41.0	36.8	2.55	1.83
Sulfate	700 J	740	760	780	746	680	538	747	625	540	584	590	532	928	66.7	762	676	68.0	39.9
Field Parameters																			
pH	8.73	7.13	7.12	7.83	6.9	6.97	6.74	6.70	7.95	6.83	5.34	7.01	6.89	4.18	6.98	7.06	7.19	7.22	8.41
Conductance (mS/cm)	1.51	1.86	1.72	1.8	1.78	1.6	1.46	1.66	1.510	1.474	1.531	1.540	1.439	1.567	0.433	1.66	1.7	0.64841	0.62361
Turbidity (ntu)	73.6	70.2	9.3	3.8	8.5	21	14	0.2	15.5	0	0	7.1	7.9	0.0	114.1	83.40	90.80	38.2	12.5
Dissolved Oxygen (mg/L)	0.64	0.76	1.36	2.57	0	0.0	.48	0.09	0.73	0.06	0.30	0.00	0.0	2.30	3.38	0.09	0.08	0.11	0.16
Redox Potential (mV)	-235	-163	-154	-125	-153	-62	-37.8	-56.8	-48.8	-51.5	10.5	-61.8	-321.5	244.8	-81.7	-72.35	-100.55	-101.2	-184
Temperature (°C)	16.84	15.15	14.8	14.91	15.09	14.8	15.46	15.09	15.11	15.25	15.15	14.81	14.90	15.73	17.54	22.26	19.88	18.44	22.72

	Well: 114 Unit: Fly Ash Basin / Sulfate Basin Location: Downgradient Bedrock / Upgradient Bedrock																		
Parameter	May-01	Nov-01	Jun-02	Nov-02	Jun-03	Jun-04	Jun-05	Jun-06	Jun-07	Jun-08	Jun-09	Jun-10	May-11	Jun-12	Jun-13	Jul-14	Aug-15	Aug-16	Aug-17
Filtered Inorganics, (mg/L)																			
Arsenic	< 0.0014 LJ	< 0.0014 J	< 0.005 L	0.005 K	<0.005	<0.005 J	<0.005 J	0.0200	0.00354	0.00334	0.00347	0.00379	<0.00500	0.016	0.0024	0.0029	0.0028 J	0.0101	0.0147 J
Beryllium	< 0.0032	< 0.0006 J	< 0.002	< 0.002	<0.005 L	<0.005	<0.005	0.000305 J	<0.00500	<0.00200	<0.00200	<0.00200	<0.00200	0.00019 J	<0.001 L	<0.0005	0.00029 J	<0.005	0.000590 J
Cadmium	< 0.0015 J	< 0.0015	< 0.003	< 0.003	<0.005	<0.005	<0.005 L	<0.00500	<0.000500	<0.000500	<0.000500	<0.000500	<0.00300	0.0011	<0.001	<0.0001	<0.0010	<0.002	<0.000100 J
Chromium	< 0.003 J	< 0.003	< 0.005 L	< 0.005	<0.005	<0.005 LJ	<0.015 J	<0.00500	<0.00200	0.00316	0.00398	0.00413	<0.0100	0.013	<0.005	<0.001	<0.0040	<0.0025	<0.000500 J
Copper	< 0.025	< 0.025	< 0.025	< 0.025	<0.025	0.108 L	0.010	<0.0100	<0.00200	<0.00200	<0.00200	<0.00200	<0.0100	0.0121	0.0028 J	<0.001	<0.0040	<0.005	<0.00600
Lead	< 0.003 J	< 0.003	< 0.003 L	< 0.003 L	<0.003	<0.003 LJ	<0.015 J	<0.00300 J	<0.00100	<0.00100	<0.00200	<0.00100	<0.00500	0.012	<0.001	<0.001	<0.0020	<0.0002	<0.000100 J
Mercury	< 0.00020	< 0.00020	< 0.0002 L	< 0.0002	<0.0002	<0.0002 LJ	<0.0002	<0.000200	<0.000200	<0.000200	<0.000200	<0.000200	<0.000200	<0.0002	<0.0002	<0.0002	<0.00020 J-	<0.0001	<0.000100
Nickel	< 0.050	< 0.050	< 0.050	< 0.050 L	<0.050	0.0370	0.037	0.0500	0.0497	0.0500	0.0628	0.0565	0.0635	0.0788	0.0622	0.0682	0.0826	0.0747	0.0706 J
Selenium	< 0.005 J	< 0.0050	< 0.005 L	< 0.005 L	<0.005	<0.005	<0.025 L	0.0174 BJ	0.0121	0.0109	0.0117	0.00919	0.00738	0.012	<0.001	<0.001	<0.0040	<0.003	0.00287 J
Zinc	0.0824 J	0.0822	<0.025	<0.025	<0.025	<0.020 J	<0.020 J	<0.0200 J	<0.0200	<0.0200	<0.0200	<0.0200	<0.125	0.0048 K	0.0049 B	0.0056	<0.0300	0.0999 J	0.00570 J
Cations																			
Calcium	353.0	391.0	394.0	391.0	385.0	393.0	399.0	423	401	428	431	1,090	418	420	419	428	466	444	451
Magnesium	60.3	67.1	75.9	76.9	84.3	85.3	77.5	77.0	74.6	79.0	76.2	83.6	80.9	79.9	81.8	79.9	100	96.1	97.0
Sodium	145	133	150	136	131	123	123	146	154	177	230	572	215	216	190	224	251	294	301
Anions																			
Chloride	58.8 J	59	61	66	62	56.8	59.3	71.5	70.3	75.2	85.5	84.5	81.3	84	91.2	100	96.1	100	83.4
Sulfate	860 J	990	1,140	1,050	1,100	964	975	1,150	1,070	1,100	1,180	1,210	1,140	1,510	1,420	1390	1420	1480	1430
Field Parameters																			
pH	6.04	6.4	6.44	6.8	6.11	6.24	6.15	5.58	6.75	6.27	4.37	6.29	6.16	6.16	6.11	6.37	6.49	6.43	6.66
Conductance (mS/cm)	2.33	2.65	2.69	2.8	2.77	2.9	2.56	2.61	2.737	2.753	3.011	2.883	2.765	2.442	3.259	0.02	3.3	2.9557	3.7944
Turbidity (ntu)	NA	1.4	6.1	19.1	2	0.0	5	0.2	14.8	2.8	5.6	0.0	2.7	6.1	4.0	7.41	8.96	14.14	18.8
Dissolved Oxygen (mg/L)	0.7	0.94	2.21	4.8	0	0.0	0.77	0.15	2.05	0.06	0.29	-0.02	0.0	2.44	0.27	4.75	0.33	0.15	0.27
Redox Potential (mV)	-47	-288	-112	-71	-67	-38	-23.7	21.5	-27.2	-66.7	64.7	-43.8	-326.7	-23.3	-17.2	0.93	7.10	-175	-84.5
Temperature (°C)	14.42	14.05	14.2	14.2	14.4	14.5	14.56	14.73	14.70	14.81	14.85	14.71	14.68	15.91	16.59	24.49	21.77	26.02	21.94

Table D-4 **Historical Analytical Results - Fly Ash Basin and Sulfate Basin Wells**
Avtex Fibers Superfund Site, Front Royal, VA

	Well: MW-12 Unit: Sulfate Basin Location: Upgradient Overburden																		
Parameter	May-01	Nov-01	Jun-02	Nov-02	Jun-03	Jun-04	Jun-05	Jun-06	Jun-07	Jun-08	Jun-09	Jun-10	May-11	Jun-12	Jun-13	Aug-14	Jul-15	Jul-16	Jul-17
Filtered Inorganics, (mg/L)																			
Arsenic	0.0095 L	0.114 K	0.0566 L	0.068 K	0.0569	0.0403 KJ	0.0876 K	0.0546 J	0.0767	0.0609	0.0531	0.0795	0.0736	0.0693	0.0566	0.0542	0.0552	0.0515 J	0.0446
Beryllium	<0.0032	< 0.0006 J	< 0.002	< 0.002	<0.005 L	<0.005	<0.005	<0.00500	<0.00500	<0.00200	<0.00200	<0.00200	<0.00200	<0.002	<0.001 L	<0.001	<0.0010	<0.05	<0.000200
Cadmium	< 0.0015 J	< 0.0015	< 0.003	< 0.003	<0.005	<0.005	<0.005 L	<0.00500	<0.000500	<0.000500	<0.000500	<0.000500	<0.00300	<0.002	0.000095 J	0.00023 J	<0.0010	<0.02	<0.000200
Chromium	0.0032 J	0.0048	<0.005 L	<0.005	<0.005	<0.005 LJ	<0.015 J	<0.00500	0.0164	0.00722	0.0102	0.0134	<0.0100	0.0022 J	0.0029 J	<0.001	0.0011 J	<0.025	<0.00100
Copper	< 0.025	< 0.025	< 0.025	< 0.025 L	<0.025	<0.010 LJ	<0.010	0.0104	0.00408	0.00448	0.00579	0.00485 B	<0.0100	0.0098 J	0.0031 J	0.0031	<0.0111	<0.05	<0.00240
Lead	< 0.018 J	< 0.036 J	<0.003 L	<0.003	<0.003	<0.003 LJ	<0.003 J	<0.00300	<0.00100	<0.00100	<0.00100	<0.00100	<0.00500	<0.001	<0.001	<0.001	0.00072 J	<0.01	<0.000200
Mercury	< 0.00020	< 0.00020 L	< 0.0002 L	< 0.0002 L	<0.0002	<0.0002 J	<0.0002	<0.000200	<0.000200	<0.000200	<0.000200	<0.000200	<0.000200	<0.0002	<0.0002	<0.0002 J	<0.00020	<0.0001	<0.000100
Nickel	0.0504	0.0635	0.0508 K	<0.050	<0.0538	0.0480	0.049	0.0637 J	0.0408	0.0305	0.0254	0.0508	0.0338	0.0322	0.0179	0.0296	0.0174	<0.0758	0.00979
Selenium	< 0.006 J	< 0.018 J	<0.025 L	<0.025 L	<0.005	<0.005	<0.025 L	0.00485 BJ	0.00598	0.00670	0.00754	0.00686	0.00778	0.00074 J	0.00084 J	<0.001	0.0013 J	<0.03	0.00192 J
Zinc	0.026 J	< 0.025	0.0661	<0.025	<0.025	0.0265 KJ	<0.02 J	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	<0.125	0.0081 B	0.0034 B	0.0073 J	<0.0300	<0.5	<0.0104
Cations																			
Calcium	7.21 B	4.83 J	4.6	4.0	3.8	2.9	3.30	5.03	4 J	5.92	5.19	4.92	6.80	5.86	9.07	8.09	37.9 J	14.7	16.4
Magnesium	8.9	4.4	4.2	3.8	2.7	2.1	2.34	3.60	2.44	3.51	3.31	4.07	6.96	6.31	9.67	10.4	23.2 J	23.5	27.5
Sodium	3750	3940	4030	3590	3630	3090	2990	3,060	3,030	3,430	3,240	3,530	3,460	3,010	2,930	3620	3460	3670	4540
Anions																			
Chloride	500	600	490	490	536	440	453	425	463	419	463	595	482	523	410	430	375	319	442
Sulfate	4,190	3,980	4,400	4,370	3,310	2,150	2,270	2,990	2,530	3,230	3,260	2,630	3,080	3,520	4,590	3490	4590 J	5180	3930
Field Parameters																			
pH	8.47	9.26	9.38	10.41	9.24	9.00	9.08	8.74	9.29	8.75	8.75	8.77	8.42	8.73	8.26	8.80	8.19	8.3	8.31
Conductance (mS/cm)	1.38	2.1	14.5	14	13.5	11	11.4	11.6	11.26	11.45	11.46	12.67	12.68	14.38	13.85	13.47	14.1	14.276	14.293
Turbidity (ntu)	38.8	2.4	0	9.6	0	0.0	2	0	0	0.9	0.1	0.0	0.0	0.0	0.0	2.30	16.7	4.95	8.23
Dissolved Oxygen (mg/L)	1.21	0.87	1.61	2.53	0	0.0	0.24	0.08	0.20	0.06	0.42	3.65	0.0	0.21	0.25	-0.02	0.45	0.82	5.01
Redox Potential (mV)	-144	-111	-360	-283	-249	-228	-207.8	-10.4	-115.8	-199.5	-154.8	-139.7	-200.8	-256.1	-164.4	-51.84	234.3	22.7	46.3
Temperature (°C)	14.24	17.5	14.2	15.64	13.86	15.0	15.34	16.80	15.74	15.66	14.05	18.89	15.61	14.22	16.38	19.99	26.99	27.74	18.75

	Well: 132 Unit: Sulfate Basin Location: Upgradient Bedrock																					
Parameter	May-01	Nov-01	Jun-02	Nov-02	Jun-03	Jun-04	Jun-05	Jun-06	Jun-07	Jun-08	Jun-09	Jun-10	May-11	Jun-12	Jun-13	Aug-14	Aug-14[1]	Jul-15	Jul-15[1]	Jul-16	Jul-16[1]	Jul-17	Jul-17[1]
Filtered Inorganics, (mg/L)																							
Arsenic	0.0147 K	0.0233 K	0.0099 L	<0.005 L	<0.005	<0.005 J	<0.005 J	0.00131 BJ	<0.00100	<0.00100	<0.00100	<0.00100	<0.00500	<0.001	<0.001	<0.001	<0.001	<0.0040	<0.0040	0.00195 J	0.00186 J	0.00353	0.00281
Beryllium	<0.0032	< 0.0006 J	<0.002	<0.002	<0.005 L	<0.005	<0.005	0.000519 J	<0.00500	<0.00200	<0.00200	<0.00200	<0.00200	0.00022 J	0.00024 K	<0.0005	<0.0005	<0.0010	0.00036 J	<0.001	<0.001	0.000348 J	0.000356 J
Cadmium	< 0.0015 J	< 0.0015	< 0.003	< 0.003	<0.005	<0.005	<0.005 L	<0.00500	<0.000500	<0.000500	<0.000500	<0.000500	<0.00300	<0.001	<0.001	<0.0001	<0.0001	<0.0010	<0.0010	<0.0004	<0.0004	<0.000100	<0.000100
Chromium	0.0032 J	< 0.0030	< 0.005 L	< 0.005	<0.005	<0.005 LJ	<0.015 J	<0.00500	<0.00200	0.00239	<0.00200	0.00633	<0.0100	<0.005	0.0010 J	<0.001	<0.001	<0.0040	<0.0040	<0.000533	<0.0005	<0.000500	<0.000500
Copper	< 0.025	< 0.0250	< 0.025	< 0.025 L	<0.025	<0.010 J	<0.010	<0.0100	<0.00200	<0.00200	<0.00200	<0.00200	<0.0100	0.00089 J	0.00092 L	<0.001	<0.001	<0.0040	<0.0040	<0.00145	<0.0027	<0.00120	<0.00120
Lead	< 0.0090 J	< 0.0060 J	< 0.003 L	< 0.003	<0.003	<0.003 LJ	<0.003 J	<0.00300 JL	<0.00100	<0.00100	<0.00100	<0.00100	<0.00500	<0.001	<0.001	<0.001	<0.001	<0.0020	<0.0020	<0.000203	<0.000333	0.000106 J	<0.000100
Mercury	< 0.00020	< 0.00020 L	< 0.0002 L	< 0.0002 L	<0.0002	<0.020	<0.0002	<0.000200	<0.000200	<0.000200	<0.000200	<0.000200	<0.000200	<0.0002	<0.0002	<0.0002	<0.0002	<0.00020	<0.00020	<0.0001	<0.0001	<0.000100	<0.000100
Nickel	< 0.050	< 0.050	< 0.050	< 0.050	<0.050	<0.010 J	<0.010 J	0.00964 J	0.00986	0.00604	0.00760	0.00787	0.0319	0.00098 B	<0.001	0.0014	0.0013	<0.0040	<0.0040	<0.00171	<0.00327	0.000568 J	0.000989 J
Selenium	< 0.005 J	< 0.005 J	< 0.005 L	< 0.005 L	<0.005	<0.005	<0.025 L	0.00263 BJ	0.00143	0.00150	0.00155	0.00117	<0.00500	<0.001	<0.001	<0.001	<0.001	<0.0040	<0.0040	<0.0006	<0.0006	<0.000300	<0.000300
Zinc	0.0457	0.0952	0.0264	<0.025	<0.025	<0.020 J	<0.020 J	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	0.511	0.0029 B	0.0138 B	0.0228	0.0202	<0.0300	<0.0300	<0.01	<0.0131	<0.00520	0.0179 J
Cations																							
Calcium	126.0	134.0	167.0	182.0	245.0	287.0	329.0	315	325	335	316	314	236	220	237	221 J	219 J	307 J	294 J	347	343	316	353
Magnesium	27.3	28.2	35.5	38.4	45.8	50.8	50.6	47.8	49.8	51.2	47.6	43.1	42.3	31.4	32.9	33.1	32.8	44.9 J	43.4 J	48.8	48.1	44.7	50.0
Sodium	654	588	506	372	312	289	248	133 J	265	227	207	159	285	111	108	108 J	108 J	153	163	211	211	228	255
Anions																							
Chloride	88	82	77	72	74.4	76.4	83.6	95.6 J	81.7	83.6	70.7	60	20.4	39.6	47.7	49.0	47.4	120	66.8	70.4	70.4	81.8	83.3
Sulfate	840	800	810	790	810	831	854	938	930	875	807	688	962	558	549	525	505	713 J	721 J	880	890	1080	1110
Field Parameters																							
pH	6.78	7.13	7.5	7.67	6.5	6.71	6.31	6.53	6.39	6.46	6.33	6.54	5.90	6.58	6.55	6.66	6.66	6.66	6.66	6.89	6.89	6.53	6.53
Conductance (mS/cm)	3.41	3.2	3.02	2.6	2.7	2.7	2.61	2.65	25.69	2.457	2.450	2.429	2.212	1.886	1.817	1.78	1.78	2.3	2.3	2.4529	2.4529	2.7582	2.7582
Turbidity (ntu)	450	80.1	3.6	0	4.7	22	0	0	0.5	0	6.3	2.7	0	0.0	0.0	0.42	0.42	2.06	2.06	2.57	2.57	29.2	29.2
Dissolved Oxygen (mg/L)	3.6	0.61	1.66	3.38	0	0.0	2.85	7.34	1.86	2.50	0.32	0.01	0	0.15	0.16	0.03	0.03	0.06	0.06	0.05	0.05	0.21	0.21
Redox Potential (mV)	-328	-372	-368	-326	-184	-144	-46.3	-92.0	-51.8	-80.7	-46.9	-82.3	-256.6	-138.7	-111.8	-55.49	-55.49	-42.23	-42.23	-151.9	-151.9	-42.4	-42.4
Temperature (°C)	13.16	14.97	13.4	15.49	12.89	13.4	13.85	13.69	13.84	13.59	12.79	13.96	14.76	14.74	14.44	18.09	18.09	22.00	22.00	18.43	18.43	20.97	20.97

Table D-4 **Historical Analytical Results - Fly Ash Basin and Sulfate Basin Wells**
Avtex Fibers Superfund Site, Front Royal, VA

	Well: 022 Unit: Sulfate Basin Location: Downgradient Overburden																		
Parameter	May-01	Nov-01	Jun-02	Nov-02	Jun-03	Jun-04	Jun-05	Jun-06	Jun-07	Jun-08	Jun-09	Jun-10	Jun-11	Jun-12	Jun-13	Jul-14	Aug-15	Aug-16	Jul-17
Filtered Inorganics, (mg/L)																			
Arsenic	< 0.0014 LJ	< 0.0027 JK	< 0.005	< 0.005	<0.005	<0.005 J	<0.005 J	0.00388 BJ	<0.00500	0.00226	0.0027	0.00316	<0.0100	0.0016	0.00120	<0.001	0.0018 J	0.00173 J	<0.000400
Beryllium	<0.0032	< 0.0006 J	< 0.002	< 0.002	<0.005	<0.005	<0.005	<0.00500	<0.00500	<0.00200	<0.00200	<0.00200	<0.00200	<0.001	<0.001	<0.0001	<0.0010	<0.001	<0.000100
Cadmium	< 0.0015 J	< 0.0015	< 0.003	< 0.003	<0.005	<0.005	<0.005 L	<0.00500	<0.000500	<0.000500	<0.000500	<0.000500	<0.00600	<0.0001	<0.001	<0.0001	<0.0010	<0.0004	<0.000100
Chromium	< 0.0030 J	< 0.003	< 0.005 L	< 0.005	<0.005	<0.005 LJ	<0.015 J	<0.00500	<0.0100	0.00416	0.00864	0.00472	<0.0200	0.00055 J	0.0013 J	<0.001	<0.0040	<0.0005	<0.000500
Copper	< 0.025	< 0.025	< 0.025	< 0.025	<0.025	<0.010 LJ	<0.010	<0.0100	<0.0100	0.00313	0.02960	0.00541 B	<0.0200	<0.001	0.0017 J	0.0034	<0.0040	<0.00192	<0.00120
Lead	< 0.0090 J	< 0.0030	< 0.003	< 0.003 L	<0.015 L	<0.015 LJ	<0.003 J	<0.00300 J	<0.00500	<0.00100	<0.00100	<0.00100	<0.0100	<0.001	<0.001	<0.001	<0.0020	<0.0002	<0.000100
Mercury	< 0.00020 L	< 0.00020	< 0.0002 L	< 0.0002	<0.0002	<0.0002 J	<0.0002	<0.000200	<0.000200	<0.000200	<0.000200	<0.000200	<0.000200	<0.0002	<0.0002 L	<0.0002	<0.00020 J-	<0.0001	<0.000100
Nickel	< 0.050	< 0.050	< 0.050 L	< 0.050 L	<0.050	0.0140	0.0123 J	0.0200 J	0.0286	0.0198	0.0225	0.0221	<0.0400	0.0101	0.0047 J	0.008	0.0093	<0.00244	0.000864 J
Selenium	< 0.005 J	< 0.010	0.0058 L	0.017 L	<0.005 L	<0.005	<0.050 L	0.00589 BJ	0.00638	0.00498	0.00808	0.00616	<0.0100	<0.001	<0.001	<0.001	0.00077 J	0.00077 J	<0.000300
Zinc	0.159	0.193 J	0.098	0.091	<0.025	<0.020 J	<0.020 J	<0.0200	0.0308	0.0342	<0.0200	<0.0200	<0.0200	0.0025 J	<0.010	0.0176	<0.0300	<0.01	<0.00520
Cations																			
Calcium	385.0	357.0	386.0	444.0	280.0	374.0	346.0	400	356	375	325	310	299	223	214	234	213	65.9	37.4
Magnesium	76.2	65.8	72.6	81.7	52.8	71.1	63.4	68.2	60.0	67.2	59.7	54.0	54.5	40.1	37.7	38.5	40.9	9.21	5.87
Sodium	1160	1100	1190	1230	645	1090	862	1,150	1,010 J	1,090	1,090	1,060	885	760	642	757	750	138	36.8
Anions																			
Chloride	107	116	118	146	71.7	89.3	68.3	105	94.0	107	103	91.0	85.2	77.2	66.9	NA	71.2	16.6	16.3
Sulfate	2,550	2,390	2,660	3,000	1,650	2,090	1,610	2,250	1,930	1,980	1,930	1,710	1,580	1,410	1,140	NA	1050	123	29.1
Field Parameters																			
pH	6.98	7.25	7.51	7.05	6.94	6.84	6.78	6.80	6.82	6.69	6.69	6.86	6.77	6.80	6.85	7.05	6.95	7	6.99
Conductance (mS/cm)	6.59	6.14	6.58	7.7	4.84	6.3	5.49	6.32	5.688	5.858	5.464	5.356	4.969	4.411	4.040	2.55	4.1	0.3542	0.52473
Turbidity (ntu)	19.5	27.2	0.1	6.8	0	2	9	3	7.5	68.9	0.0	9.8	8.4	13.4	13.0	0.00	9.77	9.46	50.8
Dissolved Oxygen (mg/L)	15.91	3.74	2.01	0	0	0.0	1.77	1.38	2.16	0.41	0.44	2.13	0.20	0.07	0.29	1.02	1.68	2.038991	4.22
Redox Potential (mV)	-201	-139	-237	-109	-180	-216	-49.4	-162	-94.6	-117.6	-47.7	-85.2	-241.2	-92.0	-87.8	-55.58	-69.80	-61	-20.1
Temperature (°C)	14.63	15.15	15	15	16.18	17.7	15.59	15.18	17.95	17.99	15.78	17.86	15.38	18.38	14.41	19.22	28.35	22.22	25.77

	Well: 023 Unit: Sulfate Basin Location: Downgradient Overburden																		
Parameter	May-01	Nov-01	Jun-02	Nov-02	Jun-03	Jun-04	Jun-05	Jun-06	Jun-07	Jun-08	Jun-09	Jun-10	Jun-11	Jun-12	Jun-13	Jul-14	Aug-15	Aug-16	Jul-17
Filtered Inorganics, (mg/L)																			
Arsenic	< 0.0037 J	0.0066	<0.005	0.0091 K	0.0072 KB	0.006 KJ	0.0059 K	0.00642 BJ	0.00663	0.00702	0.00697	0.00678	<0.0100	0.0071	0.0054	0.0042	0.0023 J	0.00332	0.0106
Beryllium	<0.0032	< 0.0006 J	< 0.002	< 0.002	<0.005	<0.005	<0.005	< 0.00500	< 0.00500	< 0.00200	< 0.00200	< 0.00200	<0.00200	<0.001	<0.001	<0.0001	<0.0010	<0.001	<0.000100
Cadmium	< 0.0015 J	< 0.0015	< 0.003	< 0.003	<0.005	<0.005	<0.005 L	<0.00500	<0.000500	<0.000500	<0.000500	<0.000500	<0.00600	<0.0001	<0.001	<0.0001	<0.0010	<0.0004	<0.000100
Chromium	< 0.0030 J	< 0.0030	< 0.005 L	< 0.005	<0.005	<0.005 LJ	<0.015 J	<0.00500	<0.00200	0.00260	<0.00200	<0.00200	<0.0200	0.00056 J	0.0028 J	<0.001	<0.0040	<0.0005	0.00272
Copper	< 0.025	< 0.0250	< 0.025	< 0.025	<0.025	<0.010 LJ	<0.010	<0.0100	<0.00200	0.00402	0.00585	0.00246 B	<0.0200	<0.001	0.0012 J	<0.001	<0.0040	<0.001	0.00165 J
Lead	< 0.003 J	< 0.0060 L	< 0.003	< 0.003 L	<0.015 L	<0.003 LJ	<0.003 J	<0.00300 J	<0.00100	<0.00100	<0.00100	<0.00100	<0.0100	<0.001	<0.001	<0.001	<0.0020	<0.0002	0.00158 J
Mercury	< 0.00020 L	< 0.00020	< 0.0002 L	< 0.0002	< 0.0002	< 0.0002 J	< 0.0002	<0.000200	<0.000200	<0.000200	<0.000200	<0.000200	<0.000200	<0.0002	<0.0002 L	<0.0002	<0.00020 J-	<0.0001	<0.000100
Nickel	< 0.050	< 0.050	< 0.050 L	< 0.050 L	<0.050	<0.010 J	<0.010 J	0.00433 J	0.00685	0.00595	0.00631	0.00681	<0.0400	0.0031	0.0044 J	0.0047	0.0038 J	<0.00347	0.00772
Selenium	< 0.005 J	< 0.005 L	0.0054 LK	0.0052 L	<0.025 LK	<0.005	<0.005 L	0.00234 BJ	0.00298	0.00224	0.0037	0.00101	<0.0100	<0.001	<0.001	<0.001	0.00076 J	0.000683 J	<0.000300
Zinc	0.0713	0.0571	0.0328 K	<0.025	<0.025	<0.020 J	<0.020 J	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	0.0019 J	0.0020 K	<0.005	<0.0300	<0.01	0.0423
Cations																			
Calcium	37.1	27.3	35.0	49.7	51.2	43.4	44.7	47.0	68.3	89.6	95.4	56.5	94.7	68.1	57.4	68.9	77.3	94.6	77.9
Magnesium	27.5	25.8	33.9	58.4	47.9	45.3	56.0	63.0	103	150	146	85.6	145.0	90.3	90.8	129	103	85.2	45.6
Sodium	628	578	649	704	496	361	278	268	348 J	401	357	221	356	345	378	463	364	312	126
Anions																			
Chloride	109	106	101	51	35.7	26.1	21.3	17.7	19.5	<20.0	<20.0	14.1	20.7	31.1	31.8	NA	23.3	17.8	10.0
Sulfate	497	423	587	1,260	1,010	614	581	648	884	1,180	1,170	643	1,040	727	812	NA	643	504	177
Field Parameters																			
pH	7.59	7.67	8.37	7.62	7.65	7.65	7.55	7.23	7.71	7.31	7.35	7.55	7.32	7.43	7.56	7.70	7.14	7.31	7.44
Conductance (mS/cm)	2.87	2.89	3.16	4.12	2.88	2.2	1.91	1.94	2.375	2.908	2.724	1.790	2.844	2.458	2.667	3.38	2.5	0.9864	1.4775
Turbidity (ntu)	153	18.8	3.1	0	0	0	10	10	0.0	0.0	0.0	8.0	2.1	4.3	3.3	2.09	22.90	14.62	78.7
Dissolved Oxygen (mg/L)	(a)	3.05	2.52	0	0	0.07	.48	0.38	4.15	1.38	0.40	0.51	0.20	0.0	0.25	2.34	3.62	3.08	5.96
Redox Potential (mV)	-152	-119	-238	-208	-229	-178	-139.6	-124.2	-156.9	-141.2	-139.4	-152.5	-251.7	-147.7	-142.8	-92.65	42.10	-13.4	-46
Temperature (°C)	13.93	15.37	17.4	15.6	16.06	16.8	16.16	17.86	18.23	15.97	18.04	18.08	19.81	18.96	15.33	18.70	33.25	24.74	23.66

Table D-4 **Historical Analytical Results - Fly Ash Basin and Sulfate Basin Wells**
Avtex Fibers Superfund Site, Front Royal, VA

	Well: 025 Unit: Sulfate Basin Location: Downgradient Overburden																		
Parameter	May-01	Nov-01	Jun-02	Nov-02	Jun-03	Jun-04	Jun-05	Jun-06	Jun-07	Jun-08	Jun-09	Jun-10	Jun-11	Jun-12	Jun-13	Jul-14	Jul-15	Jul-16	Jul-17
Filtered Inorganics, (mg/L)																			
Arsenic	< 0.0014 LJ	< 0.0014 J	< 0.005	< 0.005	<0.005 BK	<0.005 J	<0.005 J	0.00178 BJ	0.0466	0.00180	0.0026	0.0805	<0.0100	0.00088 J	0.00082 J	<0.001	0.0019 J	0.00173 J	0.00240
Beryllium	<0.0032	< 0.0006 J	< 0.002	< 0.002	<0.005	<0.005	<0.005	<0.00500	<0.00500	<0.00200	<0.00200	<0.00200	<0.00200	<0.001	<0.001	<0.0001	<0.0010	<0.001	<0.000100
Cadmium	< 0.0015 J	< 0.0015	< 0.003	< 0.003	<0.005	<0.005	<0.005 L	<0.00500	<0.000500	<0.000500	<0.000500	<0.000500	<0.00600	<0.0001	<0.001	<0.0001	<0.0010	<0.0004	<0.000100
Chromium	< 0.0030 J	< 0.0030	< 0.005 L	< 0.005	<0.005	<0.005 LJ	<0.015 J	<0.00500	<0.0100	0.0134	0.0115	0.0123	<0.0200	0.0012 L	0.00080 J	<0.001	<0.0040	<0.000517	0.000615 J
Copper	< 0.025	< 0.025	< 0.025	< 0.025	<0.025	<0.010 J	<0.010	<0.0100	<0.0100	<0.00200	0.00204	<0.00200	<0.0200	<0.001	0.00077 J	<0.001	0.0044	<0.00869	<0.00120
Lead	< 0.003 LJ	< 0.0090 JL	< 0.003	< 0.003 L	<0.015 L	<0.003 LJ	<0.003 J	<0.00300 J	0.00969	<0.00100	<0.00100	0.00176	<0.0100	<0.001	<0.001	<0.001	<0.0020	<0.0002	<0.000100
Mercury	< 0.00020 L	< 0.00020 L	< 0.0002 L	< 0.0002	<0.0002	<0.0002	<0.0002	<0.000200	<0.000200	<0.000200	<0.000200	<0.000200	<0.000200	<0.0002	<0.0002 L	<0.0002	<0.00020	<0.0001	<0.000100
Nickel	< 0.050	< 0.050	< 0.050 L	< 0.050 L	<0.050	<0.010 J	<0.010 J	0.00769 J	<0.0200	0.00778	0.0084	0.00714	<0.0400	0.0023	<0.005	0.0017	0.0025 J	<0.00371	0.00113 J
Selenium	< 0.005 J	< 0.0050 L	< 0.005 L	< 0.005 L	0.0073 LBK	<0.005	<0.005 L	0.00393 BJ	0.00505	0.00433	0.00669	0.00318	<0.0100	<0.001	<0.001	<0.001	<0.0040	<0.0006	<0.000300
Zinc	0.136	0.0620	0.0291 K	<0.025	<0.025	<0.020 J	<0.020 J	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	0.0028 J	<0.010	<0.005	<0.0300	<0.01	<0.00520
Cations																			
Calcium	125.0	106.0	83.9	83.5	92.0	78.3	82.5	83.0	68.1	72.4	55.1	63.6	52.7	76.8	108	144	68.8	62.4	146
Magnesium	77.2	65.5	61.9	62.4	60.1	62.9	67.4	63.3	60.5	59.2	63.3	56.4	41.0	39.6	25.3	28.5	10.6	7.39	28.5
Sodium	1530	1380	1410	1190	1210	1370	1320	1,270	1,330 J	1,320	1,230	1,320	815	413	163	188	3.92	2.92	93.4
Anions																			
Chloride	110	114	112	105	116	109	106	114	105	107	98.4	105	62.6	45.0	19.2	NA	9.5	3.44	23.9
Sulfate	552	311	307	366	147	162	271	234	104	174	40.7	179	99.0	206	58	NA	24.8	17.1	205
Field Parameters																			
pH	7.12	7.28	8.21	7.04	7.29	7.31	7.38	6.77	7.25	7.14	7.30	7.32	7.32	7.25	6.96	7.170	6.78	6.86	7.31
Conductance (mS/cm)	6.51	5.93	5.77	6.11	5.49	5.8	5.76	5.99	5.473	5.207	4.920	5.361	3.863	2.662	1.553	1.86	0.5	0.42132	1.5139
Turbidity (ntu)	24.3	19.9	0	0	52.8	1	2	0	0.0	0.0	0.0	0.0	0.8	2.8	1.3	2.87	42.70	5.26	4.07
Dissolved Oxygen (mg/L)	(a)	1.24	2.26	0	0	0.0	.91	0.02	2.29	0.08	0.29	0.00	0.08	0.0	0.13	0.06	0.43	1.15	0.13
Redox Potential (mV)	-271	-329	-340	-343	-341	-309	-290.1	-328.9	-295.5	-344.2	-146.7	-319.9	-334.3	-372.0	-290.0	-328.35	24.00	94.5	-268.2
Temperature (°C)	13.36	14.17	15.7	14.5	16.1	17.8	16.23	16.67	17.41	18.04	16.44	16.27	16.20	20.78	17.51	21.35	24.10	28.94	22.25

	Well: PZ-03 Unit: Sulfate Basin Location: Downgradient Bedrock																		
Parameter	May-01	Nov-01	Jun-02	Nov-02	Jun-03	Jun-04	Jun-05	Jun-06	Jun-07	Jun-08	Jun-09	Jun-10	Jun-11	Jun-12	Jun-13	Jul-14	Aug-15	Jul-16	Jul-17
Filtered Inorganics, (mg/L)																			
Arsenic	< 0.0014 LJ	< 0.0028 J	< 0.005	< 0.005	<0.005 K	<0.005 J	<0.005 J	0.00209 BJ	<0.00500	0.00168	0.00215	0.00168	<0.0100	<0.001	<0.001	<0.001	<0.0040	<0.0025	0.00369
Beryllium	<0.0032	< 0.0006 J	< 0.002	< 0.002	<0.005	<0.005	<0.005	<0.00500	<0.00500	<0.00200	<0.00200	<0.00200	<0.00200	0.00019 J	<0.001	<0.0005	0.00012 J	<0.001	0.000118 J
Cadmium	< 0.0015 J	< 0.0015	< 0.003	< 0.003	<0.005	<0.005	<0.005 L	<0.00500	0.000500	<0.000500	<0.000500	<0.000500	<0.00600	<0.0001	<0.001	<0.0001	<0.0010	<0.002	<0.000100
Chromium	< 0.0030 J	< 0.0030	< 0.005 L	< 0.005	<0.005	<0.005 LJ	<0.015 J	<0.00500	<0.0100	0.0102	0.00490	0.00927	<0.0200	0.0038	0.0024 J	<0.001	<0.0040	<0.0025	<0.000500
Copper	< 0.025	< 0.0250	< 0.025	< 0.025	<0.025	<0.010 J	<0.010	<0.0100	0.0180	0.00410	0.00304	0.00292 B	<0.0200	<0.001	0.0024 J	<0.001	<0.0040	<0.005	<0.00120
Lead	< 0.0110 J	< 0.0090 JL	< 0.003	< 0.003 L	<0.015 L	<0.015 LJ	0.0037 K	<0.00300 J	<0.00500	<0.00100	<0.00100	<0.00100	<0.0100	<0.001	<0.001	<0.001	<0.0020	<0.000276	<0.000100
Mercury	< 0.00020 L	< 0.00020 L	< 0.0002 L	< 0.0002	<0.0002	<0.0002	<0.0002	<0.000200	<0.000200	<0.000200	<0.000200	<0.000200	<0.000200	<0.0002	<0.0002 L	<0.0002	<0.00020 J-	<0.0001	<0.000100
Nickel	< 0.050	< 0.050	< 0.050 L	< 0.050 L	<0.050	<0.010 J	<0.010 J	0.0161 J	0.0270	0.0163	0.0209	0.0179	<0.0400	0.0062	0.0020 J	0.0033	0.0042	<0.00742	0.00296
Selenium	< 0.005 J	< 0.0060 JL	0.0135 K	< 0.005 L	<0.093 LK	<0.025	<0.025 L	0.00760 BJ	0.00855	0.00687	0.0101	0.00633	<0.0100	<0.001	<0.001	<0.001	0.00056 J	<0.003	<0.000300
Zinc	0.134	0.111	0.0318 K	<0.025	<0.025	<0.020 J	<0.020 J	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	0.0018 J	<0.010	<0.005	<0.0300	<0.05	<0.00520
Cations																			
Calcium	456.0	478.0	456.0	469.0	505.0	517.0	495.0	449	434	454	417	453	434	521	506	502	475	515	419
Magnesium	132.0	125.0	124.0	122.0	125.0	129.0	125.0	116	112	117	104	116	113	131	132	133	139	133	107
Sodium	1110	1030	1060	1060	898	1060	963	1,020	1,010 J	1,100	1,010	1,090	957	845	848	947	997	1030	806
Anions																			
Chloride	80	80	80	75	81.7	79.1	82.6	90.5	88.4	91.1	88.2	93.4	93.2	86.7	118	NA	122	159	145
Sulfate	2,400	2,290	2,340	2,600	2,420	2,230	2,130	2,190	2,080	2,020	1,900	2,070	1,990	2,580	2,610	NA	2510	3010	2920
Field Parameters																			
pH	6.75	6.88	7.17	6.6	6.74	6.70	6.59	6.44	6.21	6.63	6.61	6.74	6.65	6.59	6.66	6.87	6.78	6.67	7.51
Conductance (mS/cm)	6.64	6.37	6.38	6.76	6.41	6.3	6.01	6.27	6.021	5.837	5.789	6.126	5.946	5.820	6.074	6.66	6.4	6.2587	5.5812
Turbidity (ntu)	22.4	17.4	0	0	62.7	26	3	0	0	0	0.0	0.6	0.9	3.2	15.0	5.14	31.30	5.08	15.4
Dissolved Oxygen (mg/L)	7.82	1.21	3.32	0	0	0.0	1.00	0.17	2.79	0.07	0.28	0.01	0.0	0.04	0.24	0.07	0.13	0.08	0.19
Redox Potential (mV)	-220	-250	-155	-242	-226	-133	-88.4	-73.9	-65.0	-95.7	-66.3	-89.8	-256.3	-75.0	-120.9	-24.24	-26.35	-123.6	-13.2
Temperature (°C)	13.77	15.44	13.7	16.1	13.25	13.2	13.27	13.62	13.45	14.10	13.49	13.25	13.10	17.14	13.84	18.98	20.17	21.37	24.23

Table D-4 **Historical Analytical Results - Fly Ash Basin and Sulfate Basin Wells**
Avtex Fibers Superfund Site, Front Royal, VA

	Well: PZ-06 Unit: Sulfate Basin Location: Downgradient Bedrock																				
Parameter	May-01	Nov-01	Jun-02	Nov-02	Jun-03	Jun-04	Jun-05	Jun-06	Jun-07	Jun-08	Jun-09	Jun-10	Jun-11	Jun-12	Jun-13	Aug-14	Dec-14	Aug-15	Aug-16	Aug-16[1]	Jul-17	Jul-17[1]
Filtered Inorganics, (mg/L)																						
Arsenic	0.0066	0.0243	0.0207	0.0242 K	<0.005	0.008 KJ	0.0051 K	0.00716 BJ	0.00754	0.0226	0.00812	0.00859	0.14100	0.0396	0.0262	0.0238	0.0313	0.0082	0.00671	0.00645	0.00379	0.00418
Beryllium	<0.0032	< 0.0006 J	< 0.002	< 0.002	<0.005	<0.005	<0.005	<0.00500	<0.00500	<0.00200	<0.00200	<0.00200	<0.00200	<0.001	<0.001	<0.0001	NA	<0.0010	<0.001	<0.001	<0.000100	<0.000100
Cadmium	< 0.0015 J	< 0.0015	< 0.003	< 0.003	<0.005	<0.005	<0.005 L	<0.00500	<0.00100	<0.000500	<0.000500	<0.000500	<0.00600	<0.0001	<0.001	<0.0001	<0.0001	<0.0010	<0.0004	<0.0004	<0.000100	<0.000100
Chromium	< 0.0030 J	< 0.0030	< 0.005 L	< 0.005	<0.005	<0.005 LJ	<0.005	<0.00500	<0.00400	0.00402	0.00294	0.00270	<0.0200	<0.001	0.0027 J	0.00091 J	<0.002	<0.0040	<0.0005	<0.0005	<0.000500	0.000674 J
Copper	< 0.025	< 0.0250	< 0.025	< 0.025	<0.025	<0.010 LJ	<0.015 J	<0.0100	<0.00400	0.00220	<0.002	0.00217 B	<0.0200	<0.001	0.0014 L	0.0011	NA	<0.0040	<0.001	<0.001	<0.00120	<0.00120
Lead	< 0.0090 J	< 0.0060 L	< 0.003	< 0.003 L	<0.015 L	<0.015 LJ	<0.003 J	0.0646 J	<0.00200	<0.00100	<0.00100	<0.00100	<0.0100	<0.001	<0.001	<0.001	<0.001	<0.0020	<0.0002	<0.0002	<0.000100	<0.000100
Mercury	< 0.00020 L	< 0.00020	< 0.0002 L	< 0.0002	<0.0002	<0.0002 J	<0.0002	<0.000200	<0.000200	<0.000200	<0.000200	<0.000200	<0.000200	<0.0002	<0.0002 L	<0.0002	<0.0002	<0.00020 J-	<0.0001	<0.0001	<0.000100	<0.000100
Nickel	< 0.050	< 0.050	< 0.050 L	< 0.050 L	<0.050	<0.010 J	<0.010 J	0.00621 J	<0.00800	0.00948	0.00819	0.00671	0.0679	0.0171	0.0101	0.0091	0.012	0.0074	0.00128 J	0.00241	0.000993 J	0.00113 J
Selenium	< 0.005 J	< 0.0050 L	0.0073 LK	< 0.005 L	<0.025 L	<0.005	<0.025 L	0.00258 BJ	0.00561	0.00394	0.00569	0.00145	<0.0100	<0.001	<0.001	<0.001	NA	<0.0040	<0.000989	<0.000808	0.000427 J	<0.000300
Zinc	0.106	0.0583	<0.025	<0.025	<0.025	<0.020 J	<0.020 J	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	0.002 K	<0.010	0.0048 J	0.0067 J	<0.0300	<0.01	<0.01	0.00547 J	<0.00520
Cations																						
Calcium	37.5	40.4	60.6	62.8	52.4	45.3	47.4	43.6	56.1	77.8	59.7	58.6	73.3	91.6	79.5	61.8	NA	59.7	37.5	37.3	49.2	46.8
Magnesium	48.5	60.3	87.3	96.2	82.7	67.1	76.7	64.4	92.2	87.9	112	107	115	119	91.3	67.7	NA	60.7	18.6	18.9	15.6	14.8
Sodium	697	713	884	789	675	582	476	470	508	782	505	227	722	670	674	472	NA	426	86.9	87.3	35.5 J	34.4 J
Anions																						
Chloride	119	127	131	91	64	50.2	45.8	39.8	46.3	45.3	34.5	35.7	97.5	71.5	103	54.9	NA	50.3	17.3	18.5	14.9	14.4
Sulfate	391	570	980	1,270	1,090	827	774	762	938	1,030	972	877	1,210	1,030	1,010	649	NA	545	63.0	68.2	33.4	33.1
Field Parameters																						
pH	7.61	7.84	8.22	7.49	7.74	7.62	7.57	7.28	8.92	7.36	7.39	7.57	7.46	7.62	7.75	7.54	7.72	7.51	7.61	7.61	7.48	7.48
Conductance (mS/cm)	3.2	3.58	4.3	4.75	3.71	3.2	2.87	2.77	3.119	3.328	2.855	2.707	3.998	3.625	4.056	2.84	3.704	2.4	0.72258	0.72258	0.51039	0.51039
Turbidity (ntu)	67.8	1.9	1	0	0	0	2	0	0.0	0.0	0.0	0.0	0.0	0.6	2.2	26.20	13.9	6.48	5.03	5.03	10.8	10.8
Dissolved Oxygen (mg/L)	3.38	1.23	1.27	0	0	0.0	0.38	0.14	1.61	0.07	0.31	0.01	0.00	0.0	0.13	0.07	0	0.39	0.63	0.63	0.79	0.79
Redox Potential (mV)	-205	-179	-249	-229	-238	-211	-137.1	-165.6	-147.5	-252.7	-125.1	-319.2	-394.2	-165.2	-144.6	-165.27	-151.1	15.57	-106.4	-106.4	66.4	66.4
Temperature (°C)	13.81	16.11	13.6	15.5	13.54	13.2	13.41	13.77	13.77	13.91	13.56	13.79	13.80	15.02	13.57	24.44	11.37	20.95	23.04	23.04	18.13	18.13

	Well: PZ-07 Unit: Sulfate Basin Location: Downgradient Bedrock																		
Parameter	May-01	Nov-01	Jun-02	Nov-02	Jun-03	Jun-04	Jun-05	Jun-06	Jun-07	Jun-08	Jun-09	Jun-10	Jun-11	Jun-12	Jun-13	Jul-14	Aug-15	Aug-16	Jul-17
Filtered Inorganics, (mg/L)																			
Arsenic	< 0.0014 LJ	< 0.0014 J	<0.005	<0.005	<0.005	<0.005 J	<0.005 J	0.00486 BJ	0.00292	0.00174	0.00219	0.00252	<0.0100	<0.001	<0.001	<0.001	0.0046	0.00605	0.00666
Beryllium	<0.0032	< 0.0006 J	< 0.002	< 0.002	<0.005	<0.005	<0.005	<0.00500	<0.00500	<0.00200	<0.00200	<0.00200	<0.00200	0.00024 J	<0.001	<0.0005	0.000090 J	<0.001	<0.000100
Cadmium	< 0.0015 J	< 0.0015	< 0.003	< 0.003	<0.005	<0.005	<0.005 L	<0.00500	<0.00100	<0.000500	<0.000500	<0.000500	<0.00600	<0.0001	<0.001	<0.0001	<0.0010	<0.0004	<0.000100
Chromium	< 0.0030 J	< 0.0030	< 0.005 L	< 0.005	<0.005	<0.005 LJ	<0.015 J	<0.00500	0.00287	0.00379	0.00513	0.00559	<0.0200	0.0016	0.0014 J	0.001	0.0013 J	0.0014 J	0.00150 J
Copper	< 0.025	< 0.0250	< 0.025	< 0.025	<0.025	<0.010 LJ	<0.010	<0.0100	0.00219	0.00310	0.00267	0.00286 B	<0.0200	<0.001	0.0010 J	<0.001	<0.0040	<0.001	<0.00120
Lead	< 0.0090 J	< 0.0090 JL	< 0.003	< 0.003 L	<0.015 L	<0.015 LJ	<0.003 J	0.000485 J	<0.00100	<0.00100	<0.00100	<0.00100	<0.0100	<0.001	<0.001	<0.001	<0.0020	<0.0002	<0.000100
Mercury	< 0.00020 L	< 0.00020	< 0.0002 L	< 0.0002	<0.0002	<0.0002 J	<0.0002	<0.000200	<0.000200	<0.000200	<0.000200	<0.000200	<0.000200	<0.0002	<0.0002 L	<0.0002	<0.00020 J-	<0.0001	<0.000100
Nickel	< 0.050	< 0.050	< 0.050 L	< 0.050 L	<0.050	0.0320	0.037	0.0437 J	0.0443	0.0323	0.0359	0.0320	<0.0400	0.0139	0.011	0.012	0.0338	0.0443	0.0195
Selenium	< 0.005 J	< 0.005 L	< 0.005 L	< 0.005 L	<0.005 L	<0.005	<0.025 L	0.0178 BJ	0.0118	0.00645	0.00846	0.00767	<0.0100	<0.001	<0.001	<0.001	<0.0040	<0.000733	<0.000300
Zinc	< 0.025	0.0405	<0.025	<0.025	<0.025	<0.020 J	<0.020 J	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	0.0017 J	<0.010	<0.005	<0.0300	<0.01	0.0129 J
Cations																			
Calcium	407.0	382.0	385.0	393.0	415.0	399.0	423.0	428	423	410	370	356	378	328	292	318	345	345	294
Magnesium	75.0	65.3	70.7	68.9	70.4	71.5	72.7	71.8	69.1	72.7	64.3	62.6	64.0	48.9	48.0	48.2	58.1	54.4	47.4
Sodium	368	321	351	353	385	357	292	294	287	291	274	281	262	264	213	225	234	236	204
Anions																			
Chloride	63.4	62	70	65	66.6	57.2	55.6	54.2	56.8	59.1	54.1	56.5	57.0	58.7	65.1	NA	73.4	58.9	59.6
Sulfate	1,460	1,310	1,390	1,600	1,400	1,380	1,280	1,310	1,240	1,190	1,110	1,140	1,050	1,110	984	NA	1080	1040	1040
Field Parameters																			
pH	6.69	6.75	7.69	6.74	6.75	6.61	6.24	6.50	6.14	6.45	6.48	6.65	6.49	6.71	6.79	6.96	6.94	6.99	7.14
Conductance (mS/cm)	3.57	3.38	3.55	3.85	3.6	3.6	3.29	3.27	3.042	3.058	2.840	2.902	2.833	2.572	2.572	2.42	2.6	2.5858	2.8107
Turbidity (ntu)	15	4.1	0	13.7	0	0	2	0	0.0	0.0	0.0	0.0	0.0	0.3	2.7	2.06	1.09	2.21	2.7
Dissolved Oxygen (mg/L)	18.65	1.85	1.34	0	0	0.0	.35	-0.15	3.09	0.09	0.31	0.00	0.0	0.0	0.18	0.06	0.17	0.19	0.18
Redox Potential (mV)	-138	-337	-378	-314	-385	-320	-285.4	-280.7	-270.6	-310.0	251.9	309.8	-382.3	-311.0	-221.7	-233.8	-9.40	-125.2	-130
Temperature (°C)	14.62	16.74	13.5	16	13.49	13.0	13.3	13.6	13.93	13.81	13.26	13.55	13.81	14.26	13.42	17.12	20.74	20.6	21.14

Notes:
NA - Not Analyzed.
B - This result is qualitatively invalid because the analyte was also detected in a blank at a similar concentration.
J - This result should be considered a quantative estimate.
K - This result should be considered a biased high quantitative estimate.
L - This result should be considered a biased low quantitative estimate.
R - This result should be considered unusable due to low level calibration standards.
U - Not detected at or above adjusted sample detection limit.
mg/L - Milligrams per liter.
mS/cm - Millisiemens per centimeter; equivalent to millimhos per centimeter.
mV - Millivolts.
ntu - Nepthelometric turbidity units. A value of "0" indicates the reading was negative and the sample appeared free of turbidity.
°C - Celsius degrees.
[1] - Blind duplicate sample

Table D-5 Basins Closure Monitoring Sump Sampling Results - April 2003 - August 2015
Avtex Fibers Superfund Site, Front Royal, VA

	Screening Criteria [1]	Sample ID	AV-SUMP-FAB-6-NORTH-40303	AV-SUMP-FAB-6-SOUTH-40403	AV-SUMP-FAB-6-SOUTH-40403	AV-SUMP-FAB-1+2-040403	AV-SUMP-FAB-1+2-040403 Duplicate	AV-SUMP-FAB-3-040403	AV-SUMP-FAB-3-040403 Duplicate
		Sample Type	Filtered Grab	Unfiltered Grab	Filtered Grab	Filtered Grab	Filtered Grab	Filtered Grab	Filtered Grab
		Sample Date	4/3/2003	4/4/2003	4/4/2003	4/4/2003	4/4/2003	4/4/2003	4/4/2003
Metals (µg/L)									
Arsenic	10 [4]		**17 K**	**20**	**19**	**72 K**	**66 K**	**42 K**	**40 K**
Beryllium	--		ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)
Cadmium	1.1 [5]		ND (0.94)	ND (0.94)	ND (0.94)	ND (0.94)	ND (0.94)	ND (0.94)	ND (0.94)
Calcium	--		**398,000**	--	**396,000**	**375,000**	**376,000**	**372,000**	**370,000**
Chromium	11 [6, 7]		ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)
Copper	9 [5]		ND (2.6)	ND (2.6)	ND (2.6)	ND (2.6)	ND (2.6)	ND (2.6)	ND (2.6)
Lead	14 [5]		ND (1.2)	ND (1.2)	ND (1.2)	ND (1.2)	ND (1.2)	ND (1.2)	ND (1.2)
Magnesium	--		**67,700**	--	**63,600**	**57,400**	**57,500**	**92,400**	**101,000**
Mercury	0.05 [6]		ND (0.079)	ND (0.079)	ND (0.079)	ND (0.079)	ND (0.079)	ND (0.079)	ND (0.079)
Nickel	20 [5]		**110**	**98**	**100**	**44**	**45**	**67**	**66**
Selenium	5 [6]		**5.5**	ND (1.1)	**1.8 J**	**2.8 J**	ND (1.1)	**5.3 J**	**4.6 J**
Sodium	--		**126,000**	--	**117,000**	**58,400**	**60,000**	**529,000**	**587,000**
Zinc	120 [5]		**110**	**80**	**77**	**61**	**60**	**2,700**	**2,400**
Inorganics (µg/L)									
Chloride	--		**64,600**	--	**64,000**	**22,600**	**23,000**	**79,600**	**78,400**
Sulfate	250,000 [8]		**975,000**	--	**953,000**	**800,000**	**801,000**	**1,690,000**	**1,660,000**

	Screening Criteria [1]	Sample ID	AV-SUMP-FAB-6-NORTH-061104	AV-SUMP-FAB-6-NORTH-061104 [2]	AV-SUMP-FAB-6-SOUTH-061104	AV-SUMP-FAB-1-2-061104	AV-SUMP-FAB-3-061104	AV-SUMP-FAB-3-061104 Duplicate
		Sample Type	Filtered Grab	Filtered Grab	Filtered Grab	Filtered Grab	Filtered Grab	Filtered Grab
		Sample Date	6/11/2004	6/11/2004	6/11/2004	6/11/2004	6/11/2004	6/11/2004
Metals (µg/L)								
Arsenic	10 [4]		**24.6 KJ**	**33 KJ**	**72.2 KJ**	**196 KJ**	**422 KJ**	**436 KJ**
Beryllium	--		ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)
Cadmium	1.1 [5]		ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)
Calcium	--		**334,000**	**341,000**	**351,000**	**392,000**	**458,000**	**459,000**
Chromium	11 [6, 7]		ND (5.0) J	ND (5.0) J	ND (5.0) J	ND (5.0) J	ND (5.0) J	ND (5.0) J
Copper	9 [5]		ND (10.0) J	ND (10.0) J	ND (10.0) J	ND (10.0) J	ND (10.0) J	ND (10.0) J
Lead	14 [5]		ND (3.0) JL	ND (6.0) JL	ND (6.0) JL	ND (6.0) JL	ND (6.0) JL	ND (6.0) JL
Magnesium	--		**53,400**	**55,000**	**52,700**	**75,600**	**110,000**	**111,000**
Mercury	0.05 [6]		ND (0.028) JL	ND (0.20) L	ND (0.028) JL	ND (0.028) JL	ND (0.028) JL	ND (0.028) JL
Nickel	20 [5]		**46.5**	**46.8**	**36.8**	**63.1**	**91.4**	**91.4**
Selenium	5 [6]		ND (5.0) L	ND (5.0) L	ND (5.0) L	ND (5.0) L	ND (5.0) L	ND (5.0) L
Sodium	--		**142,000**	**149,000**	**106,000**	**69,700**	**525,000**	**525,000**
Zinc	120 [5]		ND (20.0) J	ND (20.0) J	ND (20.0) J	ND (20.0) J	**1,280**	**1,300**
Inorganics (µg/L)								
Chloride	--		**68,000**	**67,900**	**58,300**	**29,300**	**89,400**	**93,700**
Sulfate	250,000 [8]		**787,000**	**780,000**	**759,000**	**760,000**	**1,870,000**	**1,780,000**

	Screening Criteria [1]	Sample ID	AV-SUMP-FAB-6-NORTH-61305	AV-SUMP-FAB-6-NORTH-61305 (Duplicate)	AV-SUMP-FAB-6-SOUTH-61305	AV-SUMP-D-61305	AV-SUMP-FAB-1&2-61305	AV-SUMP-FAB-3-61305
		Sample Type	Filtered Grab	(Duplicate of FAB-6-North)	Filtered Grab	(Blind Duplicate of FAB-6-South)	Filtered Grab	Filtered Grab
		Sample Date	6/13/2005	6/13/2005	6/13/2005	6/13/2005	6/13/2005	6/13/2005
Metals (µg/L)								
Arsenic	10 [4]		**72.9 KJ**	**73.2 KJ**	**60.1 KJ**	**127 KJ**	**302 KJ**	**21.3 KJ**
Beryllium	--		ND(<5.0)	ND(<5.0)	ND(<5.0)	ND(<5.0)	ND(<5.0)	ND(<5.0)
Cadmium	1.1 [5]		ND(<5.0) L	ND(<5.0) L	ND(<5.0) L	ND(<5.0) L	ND(<5.0) L	ND(<5.0) L
Calcium	--		**348,000**	**360,000**	**365,000**	**354,000**	**414,000**	**452,000**
Chromium	11 [6, 7]		ND(<15.0) J	ND(<15.0) J	ND(<15.0) J	ND(<15.0) J	ND(<15.0) J	ND(<15.0) J
Copper	9 [5]		ND(<10.0)	ND(<10.0)	ND(<10.0)	ND(<10.0)	ND(<10.0)	ND(<10.0)
Lead	14 [5]		ND(<3.0) J	ND(<3.0) J	ND(<3.0) J	ND(<3.0) J	ND(<3.0) J	ND(<3.0) J
Magnesium	--		**55,900**	**55,300**	**50,800**	**50,300**	**68,300**	**109,000**
Mercury	0.05 [6]		ND(<0.2)	ND(<0.2)	ND(<0.2)	ND(<0.2)	ND(<0.2)	ND(<0.2)
Nickel	20 [5]		**50.6**	**50.9**	**48.5**	**45.7**	**77.9**	**93.1**
Selenium	5 [6]		ND(<25.0)	ND(<25.0)	ND(<50.0)	ND(<50.0)	ND(<50.0)	ND(<50.0)
Sodium	--		**93,000**	**93,200**	**101,000**	**85,000**	**59,300**	**597,000**
Zinc	120 [5]		**65.7**	**63.2**	**29.5 K**	**23.7 K**	ND(<20.0) J	**2,370**
Inorganics (µg/L)								
Chloride	--		**52,000**	**53,700**	**51,400**	**49,500**	**36,500**	**94,600**
Sulfate	250,000 [8]		**767,000**	**767,000**	**792,000**	**783,000**	**830,000**	**2,030,000**

Table D-5 Basins Closure Monitoring Sump Sampling Results - April 2003 - August 2015
Avtex Fibers Superfund Site, Front Royal, VA

	Screening Criteria [1]	Sample ID	AV-SUMP-FAB-6-NORTH-060606	AV-SUMP-FAB-6-SOUTH-060606	AV-SUMP-FAB-6-SOUTH-060606 [3]	AV-SUMP-FAB-1-2-60606	AV-SUMP-FAB-3-060606	AV-SUMP-SB-4-1-60606	AV-SUMP-SB-4-2-60606
		Sample Type	Filtered Grab	Filtered Grab	Filtered Grab	Filtered Grab	Filtered Grab	Filtered Grab	Filtered Grab
		Sample Date	6/6/2006	6/6/2006	6/6/2006	6/6/2006	6/6/2006	6/6/2006	6/6/2006
Metals (µg/L)									
Arsenic	10 [4]		**34.1**	**37.9**	**39.6**	**353**	**131**	**130**	**136**
Beryllium	--		ND (<5.0)	ND (<5.0)	ND (<5.0)	ND (<5.0)	ND (<5.0)	ND (<5.0)	ND (<5.0)
Cadmium	1.1 [5]		ND (<5.0)	ND (<5.0) J	ND (<5.0) J	**2.64 J**	ND (<5.0) J	ND (<5.0) J	ND (<5.0) J
Calcium	--		**325,000**	**354,000**	**337,000**	**373,000**	**458,000**	**531,000**	**663,000**
Chromium	11 [6, 7]		ND (<5.0)	ND (<5.0)	ND (<5.0)	ND (<5.0)	ND (<5.0)	ND (<5.0)	ND (<5.0)
Copper	9 [5]		ND (<10)	ND (<10)	ND (<10.0)	ND (<10.0)	ND (<10.0)	ND (<10.0)	ND (<10.0)
Lead	14 [5]		**0.258 J**	ND (<3.0) J	ND (<3.0) J	ND (<3.0) J	ND (<3.0) J	**1.99 J**	ND (<3.0) J
Magnesium	--		**45,900**	**48,700**	**47,200**	**61,400**	**112,000**	**157,000**	**144,000**
Mercury	0.05 [6]		ND (<0.2)	ND (<0.2)	ND (<0.2)	ND (<0.2)	ND (<0.2)	ND (<0.2)	ND (<0.2)
Nickel	20 [5]		**51.8**	**50.2**	**52.2**	**78.2**	**86.3**	**37**	**31.9**
Selenium	5 [6]		**4.70 J**	**3.66 J**	**7.27 J**	**3.89 J**	**8.2 J**	**7.97 J**	**4.68 J**
Sodium	--		**87,100**	**98,100 J**	**94,300 J**	**59,000 J**	**836,000 J**	**397,000 J**	**405,000 J**
Zinc	120 [5]		**24.3**	ND (<20)	ND (<20.0)	ND (<20.0)	**2,060**	**5,370**	**1,400**
Inorganics (µg/L)									
Chloride	--		**48,500**	**51,600**	**52,700**	**35,100**	**109,000**	**96,200**	**38,300**
Sulfate	250,000 [8]		**709,000**	**744,000**	**759,000**	**878,000**	**2,510,000**	**1,590,000**	**2,000,000**

	Screening Criteria [1]	Sample ID	AV-SUMP-FAB-6-NORTH-061207	AV-SUMP-FAB-6-SOUTH-061207	AV-SUMP-FAB-6-SOUTH-061207 [9]	AV-SUMP-FAB-1-2-061207	AV-SUMP-FAB-3-061207	AV-SUMP-SB-4-1-061207	AV-SUMP-SB-4-2-061207
		Sample Type	Filtered Grab	Filtered Grab	Filtered Grab	Filtered Grab	Filtered Grab	Filtered Grab	Filtered Grab
		Sample Date	6/12/2007	6/12/2007	6/12/2007	6/12/2007	6/12/2007	6/12/2007	6/12/2007
Metals (µg/L)									
Arsenic	10 [4]		**70.2**	**91.2**	**84.2**	**370**	**29.0**	**102**	**87.8**
Beryllium	--		ND (<5.0)	ND (<5.0)	ND (<5.0)	ND (<5.0)	ND (<5.0)	ND (<5.0)	ND (<5.0)
Cadmium	1.1 [5]		ND (<0.5)	ND (<0.5)	ND (0.5)	ND (<0.5)	ND (<1.0)	**2.25**	ND (<1.0)
Calcium	--		**300,000**	**340,000**	**335,000**	**379,000**	**382,000**	**639,000**	**493,000**
Chromium	11 [6, 7]		ND (<2.0)	ND (<2.0)	ND (<2.0)	**2.49**	ND (<4.0)	ND (<10.0)	ND (<4.0)
Copper	9 [5]		ND (<2.0)	ND (<2.0)	ND (<2.0)	ND (<2.0)	ND (<4.0)	ND (<10.0)	ND (<4.0)
Lead	14 [5]		ND (<1.0)	ND (<1.0)	ND (<1.0)	ND (<1.0)	ND (<2.0)	ND (<5.0)	ND (<2.0)
Magnesium	--		**45,100**	**48,800**	**48,700**	**63,200**	**85,600**	**147,000**	**150,000**
Mercury	0.05 [6]		ND (<0.2)	ND (<0.2)	ND (<0.2)	ND (<0.2)	ND (<0.2)	ND (<0.2)	ND (<0.2)
Nickel	20 [5]		**46.5**	**51.2**	**47.2**	**82.7**	**75.3**	**49.1**	**41.9**
Selenium	5 [6]		**7.53**	**7.44**	**7.04**	**7.39**	**8.90**	**10.7**	**10.5**
Sodium	--		**79,100**	**92,700**	**91,200**	**63,600**	**495,000**	**451,000**	**382,000**
Zinc	120 [5]		**57.3 J**	**200 J**	**39.1 J**	ND (<20.0) J	**2,630 J**	**734 J**	**3,680 J**
Inorganics (µg/L)									
Chloride	--		**38,300**	**44,500**	**44,500**	**35,300**	**71,200**	**39,400**	**92,900**
Sulfate	250,000 [8]		**628,000**	**721,000**	**735,000**	**908,000**	**1,600,000**	**1,970,000**	**1,330,000**

	Screening Criteria [1]	Sample ID	AV-SUMP-FAB-6-NORTH-061308	AV-SUMP-FAB-6-NORTH-061308 [10]	AV-SUMP-FAB-6-SOUTH-061308	AV-SUMP-FAB-1-2-061308	AV-SUMP-FAB-3-061308	AV-SUMP-SB-4-1-061308	AV-SUMP-SB-4-2-061308
		Sample Type	Filtered Grab	Filtered Grab	Filtered Grab	Filtered Grab	Filtered Grab	Filtered Grab	Filtered Grab
		Sample Date	6/13/2008	6/13/2008	6/13/2008	6/13/2008	6/13/2008	6/13/2008	6/13/2008
Metals (µg/L)									
Arsenic	10 [4]		**35.8**	**30.0**	**93.3**	**350**	**52.8**	**69.7**	**41.6**
Beryllium	--		ND (<2.0)	ND (<2.0)	ND (<2.0)	ND (<2.0)	ND (<2.0)	ND (<2.0)	ND (<2.0)
Cadmium	1.1 [5]		ND (<0.5)	ND (<0.5)	ND (<0.5)	ND (<0.5)	ND (<0.5)	ND (<0.5)	ND (<0.5)
Calcium	--		**304,000**	**295,000**	**305,000**	**355,000**	**412,000**	**440,000**	**585,000**
Chromium	11 [6, 7]		ND (<2.0)	ND (<2.0)	**3.09**	ND (<2.0)	ND (<2.0)	**3.00**	**2.81**
Copper	9 [5]		**2.93**	**2.45**	**2.69**	**3.63**	**4.78**	**3.99**	**5.22**
Lead	14 [5]		ND (<1.0)	ND (<1.0)	ND (<1.0)	ND (<1.0)	ND (<1.0)	ND (<1.0)	ND (<1.0)
Magnesium	--		**48,100**	**46,300**	**45,900**	**62,700**	**89,800**	**135,000**	**136,000**
Mercury	0.05 [6]		ND (<0.2)	ND (<0.2)	ND (<0.2)	ND (<0.2)	ND (<0.2)	ND (<0.2)	ND (<0.2)
Nickel	20 [5]		**58.0**	**60.5**	**55.9**	**79**	**70.8**	**32.3**	**35.6**
Selenium	5 [6]		**6.37**	**7.25**	**6.32**	**7.58**	**8.70**	**8.28**	**6.92**
Sodium	--		**71,300**	**68,600**	**73,300**	**59,300**	**301,000**	**357,000**	**397,000**
Zinc	120 [5]		**41.8**	**38.8**	ND (<20.0)	**32.8**	**2,030**	**1,090**	**31.6**
Inorganics (µg/L)									
Chloride	--		**33,500**	**32,300**	**34,500**	**32,100**	**50,000**	**84,300**	**40,200**
Sulfate	250,000 [8]		**595,000**	**590,000**	**615,000**	**800,000**	**1,300,000**	**1,090,000**	**1,750,000**

Table D-5 Basins Closure Monitoring Sump Sampling Results - April 2003 - August 2015
Avtex Fibers Superfund Site, Front Royal, VA

	Screening Criteria [1]	Sample ID	AV-SUMP-FAB-6-NORTH-061209	AV-SUMP-FAB-6-NORTH-061209 [11]	AV-SUMP-FAB-6-SOUTH-061209	AV-SUMP-FAB-1-2-061109	AV-SUMP-FAB-3-061109	AV-SUMP-SB-4-1-061109	AV-SUMP-SB-4-2-061209
		Sample Type	Filtered Grab	Filtered Grab	Filtered Grab	Filtered Grab	Filtered Grab	Filtered Grab	Filtered Grab
		Sample Date	6/12/2009	6/12/2009	6/12/2009	6/11/2009	6/11/2009	6/11/2009	6/12/2009
Metals (µg/L)									
Arsenic	10 [4]		**64.1 K**	**64.9 K**	**160 K**	**365 K**	**69.1 K**	**49.9 K**	**6.28 K**
Beryllium	--		ND (<2.0)	ND (<2.0)	ND (<2.0)	ND (<2.0)	ND (<2.0)	ND (<2.0)	ND (<2.0)
Cadmium	1.1 [5]		ND(<0.5)	ND (<0.5)	ND (<0.5)	ND (<0.5)	ND (<0.5)	ND (<0.5)	ND (<0.5)
Calcium	--		**290,000**	**296,000**	**282,000**	**363,000**	**389,000**	**394,000**	**206,000**
Chromium	11 [6, 7]		ND (<2.0)	ND (<2.0)	ND (<2.0)	ND (<2.0)	ND (<2.0)	**2.52**	ND (<2.0)
Copper	9 [5]		ND (<2.0)	ND (<2.0)	ND (<2.0)	ND (<2.0)	**2.56 B**	**2.11 B**	**2.55 B**
Lead	14 [5]		ND (<1.0)	ND (<1.0)	ND (<1.0)	ND (<1.0)	ND (<1.0)	ND (<1.0)	ND (<1.0)
Magnesium	--		**43,100**	**45,200**	**39,900**	**66,600**	**87,800**	**124,000**	**71,500**
Mercury	0.05 [6]		ND (<0.2)	ND (<0.2)	ND (<0.2)	**0.465**	ND (<0.2)	ND (<0.2)	ND (<0.2)
Nickel	20 [5]		**54.2**	**53.7**	**41.4**	**79.6**	**66.1**	**27.3**	**16.8**
Selenium	5 [6]		**5.71 b**	**5.54 b**	**9.2 b**	**8.35 b**	**10.8 b**	**14.2 b**	**6.85 b**
Sodium	--		**69,400**	**70,200**	**55,700**	**54,500**	**351,000**	**326,000**	**253,000**
Zinc	120 [5]		**45.0**	**45.1**	**20.8**	**32.3**	**2,110**	**330**	ND (<20.0)
Inorganics (µg/L)									
Chloride	--		**30,500**	**30,600**	**29,600**	**31,300**	**52,400**	**66,100**	**30,000**
Sulfate	250,000 [8]		**590,000**	**590,000**	**578,000**	**715,000**	**1,310,000**	**858,000**	**1,330,000**

	Screening Criteria [1]	Sample ID	AV-SUMP-FAB-6-NORTH-061710	AV-SUMP-FAB-6-NORTH-061710 [12]	AV-SUMP-FAB-6-SOUTH-061710	AV-SUMP-SB-4-1-092210	AV-SUMP-SB-4-2-061710	AV-SUMP-SB-3-1-092210	AV-SUMP-FAB-1-2 [13]	AV-SUMP-FAB-3 [13]
		Sample Type	Filtered Grab	Filtered Grab	Filtered Grab	Filtered Grab	Filtered Grab	Filtered Grab		
		Sample Date	6/17/2010	6/17/2010	6/17/2010	9/22/2010	6/17/2010	9/22/2010		
Metals (µg/L)										
Arsenic	10 [4]		**26.9**	**23.4**	**17.0**	**7.11**	**6.89**	**6.55**		
Beryllium	--		ND (<2.0)	ND (<2.0)	ND (<2.0)	ND (<2.0)	ND (<2.0)	ND (<2.0)		
Cadmium	1.1 [5]		ND(<0.5)	ND (<0.5)	ND (<0.5)	ND (<0.5)	ND (<0.5)	ND (<0.5)		
Calcium	--		**297,000**	**306,000**	**292,000**	**409,000**	**447,000**	**206,000**		
Chromium	11 [6, 7]		**4.32**	ND (<2.0)	**3.07**	ND (<2.0)	ND (<2.0)	ND (<2.0)		
Copper	9 [5]		**3.22**	ND (<2.0)	ND (<2.0)	**2.12**	**3.55**	ND (<2.0)		
Lead	14 [5]		ND (<1.0)	ND (<1.0)	ND (<1.0)	ND (<1.0)	ND (<1.0)	ND (<1.0)		
Magnesium	--		**39,300**	**40,200**	**36,000**	**129,000**	**110,000**	**93,200**		
Mercury	0.05 [6]		ND (<0.2)	ND (<0.2)	ND (<0.2)	ND (<0.2)	ND (<0.2)	ND (<0.2)		
Nickel	20 [5]		**56.2**	**54.8**	**50.1**	**27.3**	**22.9**	**21.4**		
Selenium	5 [6]		**6.79**	**5.18**	**4.81**	**6.25**	**5.89**	**5.78**		
Sodium	--		**65,200**	**65,700**	**66,000**	**365,000**	**301,000**	**537,000**		
Zinc	120 [5]		**33.2**	**34.1**	**29.6**	ND (<20.0)	ND (<20.0)	ND (<20.0)		
Inorganics (µg/L)										
Chloride	--		**29,700**	**28,900**	**29,300**	**46,600**	**36,500**	**75,500**		
Sulfate	250,000 [8]		**594,000**	**592,000**	**614,000**	**1,050,000**	**1,080,000**	**545,000**		

	Screening Criteria [1]	Sample ID	AV-SUMP-FAB-6-NORTH-060211	AV-SUMP-FAB-6-NORTH-060211 [15]	AV-SUMP-FAB-6-SOUTH-060211	AV-SUMP-FAB-1-2-060211	AV-SUMP-FAB-3-1-060211	AV-SUMP-SB-4-1-060311	AV-SUMP-SB-4-2-060211	AV-SUMP-SB-3-1-060311
		Sample Type	Filtered Grab	Filtered Grab	Filtered Grab	Filtered Grab	Filtered Grab	Filtered Grab	Filtered Grab	Filtered Grab
		Sample Date	6/2/2011	6/2/2011	6/2/2011	6/2/2011	6/2/2011	6/3/2011	6/2/2011	6/3/2011
Metals (µg/L)										
Arsenic	10 [4]		**9.91**	**9.1**	**37.6**	**79.4**	**50**	ND (<5)	ND (<5)	ND (<5)
Beryllium	--		ND (<2)	ND (<2)	ND (<2)	ND (<2)	ND (<2)	ND (<2)	ND (<2)	ND (<2)
Cadmium	1.1 [5]		ND (<6)	ND (<6)	ND (<6)	ND (<6)	ND (<6)	ND (<6)	ND (<6)	ND (<6)
Calcium	--		**346,000**	**335,000**	**322,000**	**419,000**	**417,000**	**343,000**	**404,000**	**145,000**
Chromium	11 [6, 7]		ND (<10)	ND (<10)	ND (<10)	ND (<10)	ND (<10)	ND (<10)	ND (<10)	ND (<10)
Copper	9 [5]		ND (<10)	ND (<10)	ND (<10)	ND (<10)	ND (<10)	ND (<10)	ND (<10)	ND (<10)
Lead	14 [5]		ND (<5)	ND (<5)	ND (<5)	ND (<5)	ND (<5)	ND (<5)	ND (<5)	ND (<5)
Magnesium	--		**46,100**	**45,200**	**43,100**	**76,700**	**75,200**	**106,000**	**118,000**	**105,000**
Mercury	0.77 [6, 14]		ND (<0.2)	ND (<0.2)	ND (<0.2)	ND (<0.2)	ND (<0.2)	ND (<0.2)	ND (<0.2)	ND (<0.2)
Nickel	20 [5]		**110**	**107**	**44.5**	**65.9**	**45.4**	ND (<20)	ND (<20)	**22.8**
Selenium	5 [6]		ND (<10)	ND (<10)	ND (<10)	ND (<10)	ND (<10)	ND (<10)	ND (<10)	**10.7**
Sodium	--		**67,300**	**67,600**	**51,500**	**78,900**	**124,000**	**268,000**	**296,000**	**612,000**
Zinc	120 [5]		**59.8**	**56.3**	**68.9**	**37.3**	**1,180**	ND (<20)	ND (<20)	ND (<20)
Inorganics (µg/L)										
Chloride	230,000 [6, 14]		**24,100**	**23,800**	**17,400**	**26,200**	**27,000**	**42,200**	**33,500**	**61,500**
Sulfate	250,000 [8]		**590,000**	**594,000**	**495,000**	**845,000**	**913,000**	**407,000**	**963,000**	**175,000**

Table D-5 Basins Closure Monitoring Sump Sampling Results - April 2003 - August 2015
Avtex Fibers Superfund Site, Front Royal, VA

		Sample ID	AV-SUMP-FAB-6-NORTH-062712	AV-SUMP-FAB-6-SOUTH-062712	AV-SUMP-FAB-1-2-062712	AV-SUMP-FAB-3-1-062712
	Screening	Sample Type	Filtered Grab	Filtered Grab	Filtered Grab	Filtered Grab
	Criteria [1]	Sample Date	6/27/2012	6/27/2012	6/27/2012	6/27/2012
Metals (µg/L)						
Arsenic	10 [4]		**1.6**	**1.1**	**3.4**	**12.0**
Beryllium	--		ND (<1.0)	ND (<1.0)	ND (<1.0)	ND (<1.0)
Cadmium	1.1 [5]		ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)
Calcium	--		**111,000**	**155,000**	**134,000**	**133,000**
Chromium	11 [6, 7]		**5.6 L**	**2.3 L**	**5.3 L**	**4.3 L**
Copper	9 [5]		**2.4**	**4.0**	**1.2**	**0.94 J**
Lead	14 [5]		ND (<1.0)	ND (<1.0)	ND (<1.0)	ND (<1.0)
Magnesium	--		**25,400**	**41,400**	**37,000**	**52,400**
Mercury	0.77 [6, 14]		ND (<0.20)	ND (<0.20)	ND (<0.20)	ND (<0.20)
Nickel	20 [5]		**22.5**	**37.5**	**18.1**	**12.1**
Selenium	5 [6]		**2.4**	**2.5**	ND (<1.0)	**2.9**
Sodium	--		**55,700**	**68,300**	**58,300**	**85,100 J**
Zinc	120 [5]		**8.6 K**	**9.7 K**	**5.6 K**	**9.2 K**
Inorganics (µg/L)						
Chloride	230,000 [6, 14]		**11,000**	**17,600**	**18,400**	**17,700**
Sulfate	250,000 [8]		**262,000**	**401,000**	**475,000**	**473,000**

		Sample ID	AV-SUMP-SB-4-1-062712	AV-SUMP-SB-4-2-062712	AV-SUMP-SB-3-1-062712	AV-SUMP-SB-1-1-062712	AV-SUMP-SB-1-2-062712	AV-SUMP-SB-1-3-062812	AV-SUMP-SB-1-4-062812	AV-SUMP-SB-1-4-062812 [16]
	Screening	Sample Type	Filtered Grab	Filtered Grab	Filtered Grab	Filtered Grab	Filtered Grab	Filtered Grab	Filtered Grab	Filtered Grab
	Criteria [1]	Sample Date	6/27/2012	6/27/2012	6/27/2012	6/27/2012	6/27/2012	6/28/2012	6/28/2012	6/28/2012
Metals (µg/L)										
Arsenic	10 [4]		**5.0**	**5.8**	**2.2**	**9.4**	**3.0**	**3.3**	**5.1**	**5.1**
Beryllium	--		ND (<1.0)	ND (<1.0)	ND (<1.0)	ND (<1.0)	ND (<1.0)	ND (<1.0)	ND (<1.0)	ND (<1.0)
Cadmium	1.1 [5]		ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)	ND (<0.10)
Calcium	--		**35,600**	**118,000**	**3,810**	**56,200**	**57,600**	**13,000**	**7,150**	**7,190**
Chromium	11 [6, 7]		**1.9 L**	**1.4 L**	**1.8 L**	**0.75 L**	**5.0 L**	**3.6**	**1.8**	**1.9**
Copper	9 [5]		**1.7**	**1.8**	**2.5**	**1.4**	**3.4**	**2.1**	**2.2**	**2.1**
Lead	14 [5]		ND (<1.0)	ND (<1.0)	ND (<1.0)	ND (<1.0)	ND (<1.0)	ND (<1.0)	**7.6**	**7.4**
Magnesium	--		**83,900**	**62,700**	**64,600**	**37,700**	**7,110**	**50,600**	**5,980**	**5,960**
Mercury	0.77 [6, 14]		ND (<0.20)	ND (<0.20)	ND (<0.20)	ND (<0.20)	ND (<0.20)	ND (<0.20) L	ND (<0.20) L	ND (<0.20) L
Nickel	20 [5]		**11.6**	**7.5**	**17.0**	**1.4**	**4.4**	**12.2**	**21.6**	**22.9**
Selenium	5 [6]		**0.82 J**	ND (<1.0)	ND (<1.0)	ND (<1.0)	ND (<1.0)	ND (<1.0)	**0.87 J**	**0.72 J**
Sodium	--		**205,000**	**182,000**	**423,000**	**89,400 J**	**58,600**	**85,900**	**366,000**	**384,000**
Zinc	120 [5]		**34.0 K**	**19.1 K**	**17.7 K**	**6.1 K**	**7.1 K**	**10.2 B**	**19.0 B**	**20.3 B**
Inorganics (µg/L)										
Chloride	230,000 [6, 14]		**31,200**	**20,500**	**63,300**	**19,500**	**18,300**	**82,600**	**202,000**	**95,100**
Sulfate	250,000 [8]		**388,000**	**600,000**	**308,000**	**134,000**	**145,000**	**810,000**	**405,000**	**349,000**

		Sample ID	AV-SUMP-FAB-6-NORTH-061213	AV-SUMP-FAB-6-SOUTH-061213	AV-SUMP-FAB-1-2-061213	AV-SUMP-FAB-3-1-061213
	Screening	Sample Type	Filtered Grab	Filtered Grab	Filtered Grab	Filtered Grab
	Criteria [1]	Sample Date	6/12/2013	6/12/2013	6/12/2013	6/12/2013
Metals (µg/L)						
Arsenic	10 [4]		**4.5**	**1**	**1.1**	**6.1**
Beryllium	--		ND (<1.0) L	ND (<1.0) L	ND (<1.0) L	ND (<1.0) L
Cadmium	1.1 [5]		ND (<1.0)	ND (<1.0)	ND (<1.0)	ND (<1.0)
Calcium	--		**214,000**	**224,000**	**322,000**	**225,000**
Chromium	11 [6, 7]		**0.84 L**	**1.3 J**	**0.94 L**	**0.59 L**
Copper	9 [5]		**2.3 J**	**3.3 J**	**2.7 J**	**2.3 J**
Lead	14 [5]		ND (<1.0)	ND (<1.0)	ND (<1.0)	ND (<1.0)
Magnesium	--		**35,800**	**39,600**	**56,800**	**58,900**
Mercury	0.77 [6, 14]		ND (<0.20)	ND (<0.20)	ND (<0.20)	ND (<0.20)
Nickel	20 [5]		**36.5**	**37**	**34.2**	**21.9**
Selenium	5 [6]		**1.3**	**2.6**	ND (<1.0)	**3.4**
Sodium	--		**59,500**	**61,900**	**72,500**	**144,000**
Zinc	120 [5]		**22.3 B**	**15 B**	**9.3 B**	**165**
Inorganics (µg/L)						
Chloride	230,000 [6, 14]		**18,100**	**25,300**	**29,700**	**29,500**
Sulfate	250,000 [8]		**415,000**	**483,000**	**699,000**	**769,000**

Table D-5 Basins Closure Monitoring Sump Sampling Results - April 2003 - August 2015
Avtex Fibers Superfund Site, Front Royal, VA

	Screening Criteria [1]	Sample ID	AV-SUMP-SB-4-1(NW)-061213	AV-SUMP-SB-4-2(SE)-061213	AV-SUMP-SB-3-1-061213	AV-SUMP-SB-1-1-061213	AV-SUMP-SB-1-2-061213	AV-SUMP-SB-1-3-061213	AV-SUMP-SB-1-4-061213	AV-SUMP-SB-1-4-061213[17]
		Sample Type	Filtered Grab	Filtered Grab	Filtered Grab	Filtered Grab	Filtered Grab	Filtered Grab	Filtered Grab	Filtered Grab
		Sample Date	6/12/2013	6/12/2013	6/12/2013	6/12/2013	6/12/2013	6/12/2013	6/12/2013	6/12/2013
Metals (µg/L)										
Arsenic	10 [4]		**3.4**	**43.8**	**7.7**	**21.9**	**1.3**	**2.4**	**6.2**	**6.4**
Beryllium	--		ND (<1.0) L	ND (<1.0) L	ND (<1.0) L	ND (<1.0) L	ND (<1.0) L	ND (<1.0) L	ND (<1.0) L	ND (<1.0) L
Cadmium	1.1 [5]		ND (<1.0)	ND (<1.0)	ND (<1.0)	ND (<1.0)	ND (<1.0)	ND (<1.0)	ND (<1.0)	ND (<1.0)
Calcium	--		**130,000**	**284,000**	**153,000**	**136,000**	**242,000**	**16,500**	**10,100**	**9,960**
Chromium	11 [6, 7]		**1.7 L**	**0.82 L**	**1.1 L**	ND (<5.0) L	**2.3 L**	**4.0 L**	**3.0 L**	**3.5 L**
Copper	9 [5]		**2.1 J**	**2.1 J**	**1.6 J**	**1.2 J**	**4.3 J**	**6.8**	**5.3**	**5.4**
Lead	14 [5]		ND (<1.0)	ND (<1.0)	ND (<1.0)	ND (<1.0)	ND (<1.0)	ND (<1.0)	**3**	**3**
Magnesium	--		**81,900**	**94,600**	**69,300**	**27,400**	**3,020**	**51,300**	**3,190**	**3,230**
Mercury	0.77 [6, 14]		ND (<0.20)	ND (<0.20)	ND (<0.20)	ND (<0.20)	ND (<0.20)	ND (<0.20)	ND (<0.20)	ND (<0.20)
Nickel	20 [5]		**11**	**7.9**	**11.3**	ND (<5.0)	ND (<5.0)	**13.1**	**20.2**	**19.5**
Selenium	5 [6]		**0.78 J**	ND (<1.0)	ND (<1.0)	ND (<1.0)	ND (<1.0)	**0.51 J**	**0.56 J**	**0.62 J**
Sodium	--		**224,000**	**277,000**	**363,000**	**65,200**	**7,630**	**849,000**	**381,000**	**391,000**
Zinc	120 [5]		**41**	**1.3 B**	**1.1 B**	**2.1 B**	**3.7 B**	**18.4 B**	**14.3 B**	**12.4 B**
Inorganics (µg/L)										
Chloride	230,000 [6, 14]		**37,200**	**27,700**	**56,700**	**12,900**	**6,400**	**101,000**	**96,100**	**96,500**
Sulfate	250,000 [8]		**456,000**	**968,000**	**132,000**	**62,700**	**46,800**	**818,000**	**547,000**	**545,000**

	Screening Criteria [1]	Sample ID	AV-Basin-SMP-ON-G-FAB6N-080514	AV-Basin-SMP-ON-G-FAB6ND-80514[18]	AV-Basin-SMP-ON-G-FAB6S-80514	AV-Basin-SMP-ON-G-FAB1-2-80614	AV-Basin-SMP-ON-G-FAB3-1-80614
		Sample Type	Filtered Grab	Filtered Grab	Filtered Grab	Filtered Grab	Filtered Grab
		Sample Date	8/5/2014	8/5/2014	8/5/2014	8/6/2014	8/6/2014
Metals (µg/L)							
Arsenic	10 [4]		**18.4**	**19.3**	ND (<1)	**3.8**	**32.2**
Beryllium	--		ND (<0.1)	ND (<0.1)	ND (<0.1)	ND (<0.1)	ND (<0.1)
Cadmium	1.1 [5]		ND (<0.1)	ND (<0.1)	ND (<0.1)	**0.052 J**	ND (<0.1)
Calcium	--		**273000 J**	**277000 J**	**226000 J**	**292000**	**364000**
Chromium	11 [6, 7]		ND (<1)	ND (<1)	**2**	ND (<1)	ND (<1)
Copper	9 [5]		ND (<1)	ND (<1)	**6.6**	**2.6**	ND (<1)
Lead	14 [5]		ND (<1)	ND (<1)	ND (<1)	**1.2**	**0.78 J**
Magnesium	--		**36000**	**36200**	**36600**	**53200**	**76500**
Mercury	0.77 [6, 14]		ND (<0.2) J	ND (<0.2) J	ND (<0.2) J	ND (<0.2) J	ND (<0.2) J
Nickel	20 [5]		**40.6**	**41.5**	**38**	**40.5**	**42.8**
Selenium	5 [6]		ND (<1)	ND (<1)	**5.4**	ND (<1)	ND (<1)
Sodium	--		**49400**	**49900**	**48600**	**42100**	**242000**
Zinc	120 [5]		**22.5**	**23.6**	**32.8**	**32.8**	**160**
Inorganics (µg/L)							
Chloride	230,000 [6, 14]		**22900 J**	**22900 J**	**22200 J**	**23500 J**	**43100 J**
Sulfate	250,000 [8]		**488000 J**	**492000 J**	**484000 J**	**610000 J**	**1010000 J**
Field Parameters							
pH (s.u.)			6.70	6.70	6.82	6.56	6.92
Conductance (mS/cm)			2.03	2.03	1.64	1.85	3.05
Turbidity (NTU)			NM	NM	3.48	17.10	6.38
Dissolved Oxygen (mg/L)			0.14	0.14	2.58	0.21	0.16
Redox Potential (mV)			-22.35	-22.35	450.57	40.72	-98.71
Temperature (°C)			20.23	20.23	22.26	22.39	19.95

Table D-5 Basins Closure Monitoring Sump Sampling Results - April 2003 - August 2015
Avtex Fibers Superfund Site, Front Royal, VA

	Screening Criteria [1]	Sample ID	AV-BASIN-SMP-ON-G-SB1-1-072914	AV-BASIN-SMP-ON-G-SB1-2-072914	AV-Basin-SMP-ON-G-SB1-3-080614	AV-BASIN-SMP-ON-G-SB1-4-072914	AV-Basin-SMP-ON-G-SB3-1-080614	AV-Basin-SMP-ON-G-SB4-1-080614	AV-Basin-SMP-ON-G-SB4-2-080514
		Sample Type	Filtered Grab	Filtered Grab	Filtered Grab	Filtered Grab	Filtered Grab	Filtered Grab	Filtered Grab
		Sample Date	7/29/2014	7/29/2014	8/6/2014	7/29/2014	8/6/2014	8/6/2014	8/5/2014
Metals (µg/L)									
Arsenic	10 [4]		**21**	**1.1**	**2.8**	**6.1**	**1.8**	**2.1**	**47.6**
Beryllium	--		ND (<0.1)	ND (<0.1)	ND (<0.1)	ND (<0.1)	ND (<0.1)	ND (<0.1)	ND (<0.2)
Cadmium	1.1 [5]		ND (<0.1)	ND (<0.1)	ND (<0.1)	ND (<0.1)	ND (<0.1)	ND (<0.1)	ND (<0.1)
Calcium	--		**60700**	**16500**	**130000**	**9830**	**10000**	**121000**	**520000**
Chromium	11 [6, 7]		ND (<1)	**1.8**	**0.98 J**	**3.5**	**1.3**	**0.68 J**	ND (<1)
Copper	9 [5]		ND (<1)	**3.9**	**1.5**	**3.3**	**3.7**	**2.7**	ND (<1)
Lead	14 [5]		ND (<1)	ND (<1)	ND (<1)	**2.2**	**1.5**	**0.9 J**	ND (<1)
Magnesium	--		**19200**	**1730**	**80300**	**2580**	**70800**	**84200**	**128000**
Mercury	0.77 [6, 14]		ND (<0.2)	ND (<0.2)	ND (<0.2) J	ND (<0.2)	ND (<0.2) J	ND (<0.2) J	ND (<0.2) J
Nickel	20 [5]		ND (<1)	ND (<1)	**16.3**	**21.8**	**10.9**	**11**	**15.5**
Selenium	5 [6]		ND (<1)	ND (<1)	ND (<1)	ND (<1)	ND (<1)	ND (<1)	ND (<1)
Sodium	--		**44700**	**1710 J**	**815000**	**420000**	**358000**	**236000**	**384000**
Zinc	120 [5]		**5.5**	**6.2**	**58.8**	**10.1**	**13.8**	**22.2**	**10**
Inorganics (µg/L)									
Chloride	230,000 [6, 14]		**8500**	ND (<5000)	**121000 J**	**93700**	**47600 J**	**39100 J**	**62700 J**
Sulfate	250,000 [8]		**39400**	**5300**	**1010000 J**	**516000**	**269000 J**	**441000 J**	**1800000 J**
Field Parameters									
pH (s.u.)			7.74	8.35	7.21	9.57	8.36	7.17	6.86
Conductance (mS/cm)			0.97	0.16	4.76	2.50	2.21	2.16	4.26
Turbidity (NTU)			NR	10.20	NM	2.35	31.10	182.00	18.20
Dissolved Oxygen (mg/L)			0.34	5.20	0.07	0.21	4.74	1.58	0.15
Redox Potential (mV)			166.73	163.04	-163.26	140.50	183.19	87.95	-33.65
Temperature (°C)			21.81	21.41	17.00	20.34	23.34	23.15	20.70

	Screening Criteria [1]	Sample ID	2015AN-FAB6-North	2015AN-FAB6-South	2015AN-FAB1-2	2015AN-FAB3-1
		Sample Type	Filtered Grab	Filtered Grab	Filtered Grab	Filtered Grab
		Sample Date	8/6/2015	8/6/2015	8/6/2015	8/6/2015
Metals (µg/L)						
Arsenic	10 [4]		**0.91 J**	ND (<4)	**330**	**7.3**
Beryllium	--		ND (<1)	ND (<1)	ND (<1)	ND (<1)
Cadmium	1.1 [5]		ND (<1)	ND (<1)	ND (<1)	ND (<1)
Calcium	--		**149000**	**282000**	**314000**	**335000**
Chromium	11 [6, 7]		**2.4 J**	ND (<4)	ND (<4)	ND (<4)
Copper	9 [5]		ND (<4)	**2.6 J**	ND (<4)	ND (<4)
Lead	14 [5]		ND (<2)	ND (<2)	ND (<2)	ND (<2)
Magnesium	--		**31900**	**40500**	**59800**	**87900**
Mercury	0.77 [6, 14]		ND (<0.2) J-	ND (<0.2) J-	ND (<0.2) J-	ND (<0.2) J-
Nickel	20 [5]		**25.3**	**40.9**	**48.9**	**44.8**
Selenium	5 [6]		**2.3 J**	**3.2 J**	ND (<4)	**0.7 J**
Sodium	--		**52100**	**56400**	**44700**	**285000**
Zinc	120 [5]		ND (<30)	**23.4 J**	**15.1 J**	**221**
Inorganics (µg/L)						
Chloride	230,000 [6, 14]		**15500**	**17900**	**22000**	**41600**
Sulfate	250,000 [8]		**441000**	**455000**	**577000**	**986000**
Field Parameters						
pH (s.u.)			7.32	6.8	6.5	7.03
Conductance (mS/cm)			1.3	1.9	2.2	3.3
Turbidity (NTU)			4.67	1.79	17.2	3.72
Dissolved Oxygen (mg/L)			5.59	0.05	0.11	0.08
Redox Potential (mV)			8.85	72.81	-63.42	-13.61
Temperature (°C)			23.15	20.56	25.02	20.05

Table D-5 Basins Closure Monitoring Sump Sampling Results - April 2003 - August 2015
Avtex Fibers Superfund Site, Front Royal, VA

	Screening Criteria [1]	Sample ID	2015AN-SB1-1	2015AN-SB1-2	2015AN-SB1-3	2015AN-SB1-4	2015AN-SB3-1	2015AN-SB3-1D[19]	2015AN-SB4-1	2015AN-SB4-2
		Sample Type	Filtered Grab	Filtered Grab	Filtered Grab	Filtered Grab	Filtered Grab	Filtered Grab	Filtered Grab	Filtered Grab
		Sample Date	8/6/2015	8/6/2015	8/6/2015	8/6/2015	8/6/2015	8/6/2015	8/6/2015	8/6/2015
Metals (µg/L)										
Arsenic	10 [4]		**43**	**3.7 J**	**2.5 J**	**8.5**	**12.8**	**12.8**	**0.71 J**	**53.2**
Beryllium	--		ND (<1)	ND (<1)	ND (<1)	ND (<1)	ND (<1)	ND (<1)	ND (<1)	ND (<1)
Cadmium	1.1 [5]		ND (<1)	ND (<1)	ND (<1)	ND (<1)	ND (<1)	ND (<1)	ND (<1)	ND (<1)
Calcium	--		**42800**	**38900**	**63500**	**7140**	**136000**	**139000**	**242000**	**435000**
Chromium	11 [6, 7]		ND (<4)	ND (<4)	**1.1 J**	**4.1**	ND (<4)	ND (<4)	ND (<4)	ND (<4)
Copper	9 [5]		ND (<4)	ND (<4)	**2.7 J**	**10.4**	ND (<4)	ND (<4)	ND (<4)	ND (<4)
Lead	14 [5]		ND (<2)	ND (<2)	ND (<2)	**1.3 J**	ND (<2)	ND (<2)	ND (<2)	ND (<2)
Magnesium	--		**18300**	**3970**	**89000**	**1480**	**66000**	**67500**	**90300**	**118000**
Mercury	0.77 [6, 14]		ND (<0.2) J-	ND (<0.2) J-	ND (<0.2) J-	ND (<0.2) J-	ND (<0.2) J-	ND (<0.2) J-	ND (<0.2) J-	ND (<0.2) J-
Nickel	20 [5]		**1.2 J**	**1.4 J**	**20.8**	**27**	**7.2**	**7.5**	**9.5**	**14.2**
Selenium	5 [6]		ND (<4)	ND (<4)	**1.7 J**	**1.4 J**	ND (<4)	ND (<4)	**0.51 J**	**0.61 J**
Sodium	--		**48900**	**3270**	**964000**	**440000**	**327000**	**334000**	**199000**	**334000**
Zinc	120 [5]		ND (<30)	ND (<30)	**27.4 J**	**10.6 J**	ND (<30)	ND (<30)	ND (<30)	ND (<30)
Inorganics (µg/L)										
Chloride	230,000 [6, 14]		**8000**	**2800**	**117000**	**106000**	**44000**	**41600**	**55400**	**46200**
Sulfate	250,000 [8]		**47500**	**4900 J**	**1000000**	**525000**	**176000**	**177000**	**302000**	**1330000**
Field Parameters										
pH (s.u.)			7.73	8.37	7.36	8.76	6.98	6.98	6.9	7.02
Conductance (mS/cm)			0.8	0.2	4.9	2.4	2.5	2.5	2.6	4
Turbidity (NTU)			2.01	3.55	10.9	4.88	2.06	2.06	3.72	2.84
Dissolved Oxygen (mg/L)			0.16	5.77	0.07	5.86	0.07	0.07	0.1	0.1
Redox Potential (mV)			-76.4	-84.56	-111.08	40.47	-87.7	-87.7	-78.92	-101
Temperature (°C)			22.7	21.44	17.62	23.56	20.12	20.12	21.86	21.27

	Screening Criteria [1]	Sample ID	2016AN-FAB6-North	2016AN-FAB6-South	2016AN-FAB1-2	2016AN-FAB3-1
		Sample Type	Filtered Grab	Filtered Grab	Filtered Grab	Filtered Grab
		Sample Date	8/8/2016	8/8/2016	8/8/2016	8/8/2016
Metals (µg/L)						
Arsenic	10 [4]		**1.63 J**	**6.30**	**175**	**68.0**
Beryllium	--		ND (<1)	ND (<1)	ND (<1)	ND (<1)
Cadmium	1.1 [5]		ND (<0.4)	ND (<0.4)	ND (<0.4)	ND (<0.4)
Calcium	--		**273000**	**307000**	**337000**	**302000**
Chromium	11 [6, 7]		ND (<0.5)	ND (<0.5)	ND (<0.5)	ND (<0.5)
Copper	9 [5]		ND (<1)	ND (<1)	ND (<1)	**4.99**
Lead	14 [5]		ND (<0.2)	ND (<0.2)	ND (<0.2)	**0.335 J**
Magnesium	--		**35600**	**38000**	**58000**	**80500**
Mercury	0.77 [6, 14]		ND (<0.1)	ND (<0.1)	ND (<0.1)	ND (<0.1)
Nickel	20 [5]		**34.2**	**36.6**	**48.1**	**39.6**
Selenium	5 [6]		ND (<0.6)	ND (<0.6)	ND (<0.6)	ND (<0.6)
Sodium	--		**50600**	**54000**	**44800**	**254000**
Zinc	120 [5]		**22.7 J**	**26.5**	**18.1 J**	**52.1**
Inorganics (µg/L)						
Chloride	230,000 [6, 14]		**19000**	**19800**	**20700**	**41500**
Sulfate	250,000 [8]		**492000**	**487000**	**628000**	**1130000**
Field Parameters						
pH (s.u.)			6.96	7.01	6.64	7.27
Conductance (mS/cm)			1.5876	1.7819	2.029	2.7599
Turbidity (NTU)			9	14.74	12.15	4.5
Dissolved Oxygen (mg/L)			2.85	2	1.84	1.45
Redox Potential (mV)			22.2	-77.5	-74	-85.6
Temperature (°C)			26.96	25.9	28.13	27.63

Table D-5 Basins Closure Monitoring Sump Sampling Results - April 2003 - August 2015
Avtex Fibers Superfund Site, Front Royal, VA

	Screening Criteria [1]	Sample ID	2016AN-SB1-1	2016AN-SB1-2	2016AN-SB1-3	2016AN-SB1-4	2016AN-SB3-1	2016AN-SB4-1	2016AN-SB4-2
		Sample Type	Filtered Grab	Filtered Grab	Filtered Grab	Filtered Grab	Filtered Grab	Filtered Grab	Filtered Grab
		Sample Date	8/8/2016	8/8/2016	8/8/2016	8/8/2016	8/8/2016	8/8/2016	8/8/2016
Metals (µg/L)									
Arsenic	10 [4]		**16.2**	**4.48**	**7.62**	**7.96**	**2.36**	**1.8 J**	**4.37**
Beryllium	--		ND (<1)	ND (<1)	ND (<1)	ND (<1)	ND (<1)	ND (<1)	ND (<1)
Cadmium	1.1 [5]		ND (<0.4)	ND (<0.4)	ND (<0.4)	ND (<0.4)	ND (<0.4)	ND (<0.4)	ND (<0.4)
Calcium	--		**34400**	**46400**	**46700**	**7760**	**6970**	**246000**	**61100**
Chromium	11 [6, 7]		ND (<0.5)	ND (<0.5)	**2.21**	**3.19**	ND (<0.5)	ND (<0.5)	ND (<0.5)
Copper	9 [5]		ND (<1)	ND (<1)	**3.60**	**5.07**	ND (<1)	ND (<1)	1.72 J
Lead	14 [5]		ND (<0.2)	ND (<0.2)	ND (<0.2)	**1.89 J**	ND (<0.2)	ND (<0.2)	ND (<0.2)
Magnesium	--		**13200**	**4530**	**89200**	**1120**	**61800**	**81800**	**18800**
Mercury	0.77 [6, 14]		ND (<0.1)	ND (<0.1)	ND (<0.1)	ND (<0.1)	ND (<0.1)	ND (<0.1)	ND (<0.1)
Nickel	20 [5]		**0.808 J**	**1.2 J**	**11.7**	**24.6**	**9.43**	**9.53**	**2.36**
Selenium	5 [6]		ND (<0.6)	ND (<0.6)	ND (<0.6)	**1.34 J**	ND (<0.6)	ND (<0.6)	ND (<0.6)
Sodium	--		**36300**	**4420**	**1110000**	**420000**	**302000**	**159000**	**76200**
Zinc	120 [5]		ND (<10)	ND (<10)	ND (<10)	**12.9 J**	**13 J**	ND (<10)	10.3 J
Inorganics (µg/L)									
Chloride	230,000 [6, 14]		**6080**	**2430**	**116000**	**110000**	**40300**	**45400**	**15500**
Sulfate	250,000 [8]		**46900**	**833 J**	**1050000**	**511000**	**163000**	**284000**	**206000**
Field Parameters									
pH (s.u.)			7.96	7.99	7.44	9.37	8.52	6.98	8.27
Conductance (mS/cm)			0.7194	0.39242	4.4782	2.117	1.6449	2.2	0.86939
Turbidity (NTU)			4.28	235	2.43	2.88	1.24	3.94	1.22
Dissolved Oxygen (mg/L)			1.51	0.12	1.59	0.11	6.08	1.83	6.99
Redox Potential (mV)			43.3	194.8	133.2	72.7	55.8	-94.6	49.3
Temperature (°C)			24.17	22.59	25.07	21.32	28.06	27.56	28.18

	Screening Criteria [1]	Sample ID	2017AN-FAB6-North	2017AN-FAB6-South	2017AN-FAB1-2	2017AN-FAB3-1
		Sample Type	Filtered Grab	Filtered Grab	Filtered Grab	Filtered Grab
		Sample Date	8/1/2017	8/1/2017	8/1/2017	8/1/2017
Metals (µg/L)						
Arsenic	10 [4]		**55.3 J**	**14 J**	**13.3**	**11.5 J**
Beryllium	--		ND (<0.1)	ND (<0.1)	ND (<0.1)	ND (<0.1)
Cadmium	1.1 [5]		ND (<0.1) J	ND (<0.1) J	ND (<0.1) J	ND (<0.1) J
Calcium	--		**318000**	**315000**	**212000**	**222000**
Chromium	11 [6, 7]		ND (<0.5) J	ND (<0.5) J	ND (<0.5) J	**0.635 J**
Copper	9 [5]		ND (<1.2)	ND (<1.2)	ND (<1.2)	ND (<1.2)
Lead	14 [5]		ND (<0.1)	ND (<0.1)	ND (<0.1)	ND (<0.1)
Magnesium	--		**39300**	**39800**	**54600**	**83300**
Mercury	0.77 [6, 14]		ND (<0.1)	ND (<0.1)	ND (<0.1)	ND (<0.1)
Nickel	20 [5]		**28.7 J**	**27.1 J**	**18.2 J**	**31.2 J**
Selenium	5 [6]		ND (<0.3)	ND (<0.3)	ND (<0.3)	**2.58**
Sodium	--		**55800**	**56400**	**59600**	**267000**
Zinc	120 [5]		**12.2 J**	**6.3 J**	ND (<5.2) J	**65.7 J**
Inorganics (µg/L)						
Chloride	230,000 [6, 14]		**17800**	**17300**	**18200**	**36600**
Sulfate	250,000 [8]		**399000**	**416000**	**659000**	**934000**
Field Parameters						
pH (s.u.)			7.82	7.76	7.92	7.86
Conductance (mS/cm)			1.9909	1.89	1.59	2.72
Turbidity (NTU)			11.8	3.15	4.21	3.33
Dissolved Oxygen (mg/L)			0.48	1.56	6.85	1.72
Redox Potential (mV)			-136.1	-151.9	-21.6	10.1
Temperature (°C)			28.73	31.71	39.36	27.43

Table D-5 Basins Closure Monitoring Sump Sampling Results - April 2003 - August 2015
Avtex Fibers Superfund Site, Front Royal, VA

	Screening Criteria [1]	Sample ID	2017AN-SB1-1	2017AN-SB1-2	2017AN-SB1-3	2017AN-SB1-4	2017AN-SB3-1	2017AN-SB4-1	2017AN-SB4-2
		Sample Type	Filtered Grab	Filtered Grab	Filtered Grab	Filtered Grab	Filtered Grab	Filtered Grab	Filtered Grab
		Sample Date	8/1/2017	8/1/2017	8/1/2017	8/1/2017	8/1/2017	8/1/2017	8/1/2017
Metals (µg/L)									
Arsenic	10 [4]		**44 J**	**6.02 J**	ND (<0.4) J	**8.88 J**	ND (<0.4) J	ND (<0.4) J	**43.7 J**
Beryllium	--		ND (<0.1)	ND (<0.1)	ND (<0.1)	ND (<0.1)	ND (<0.1)	ND (<0.1)	ND (<0.1)
Cadmium	1.1 [5]		ND (<0.1) J	ND (<0.1) J	ND (<0.1) J	ND (<0.1) J	ND (<0.1) J	ND (<0.1) J	ND (<0.1) J
Calcium	--		**52800**	**50600**	**36500**	**4820**	**70500**	**102000**	**206000**
Chromium	11 [6, 7]		ND (<0.5) J	**0.651 J**	**1.19 J**	**3.24 J**	ND (<0.5) J	ND (<0.5) J	ND (<0.5) J
Copper	9 [5]		ND (<1.2)	**2.62**	**3.21 J**	**6.43**	ND (<1.2)	**11.5**	ND (<1.2)
Lead	14 [5]		ND (<0.1) J	ND (<0.1)	ND (<0.1)	ND (<0.1)	ND (<0.1)	ND (<0.1) J	ND (<0.1)
Magnesium	--		**12400**	**3150**	**82700**	**606 J**	**57700**	**71500**	**68500**
Mercury	0.77 [6, 14]		ND (<0.1)	ND (<0.1)	ND (<0.1)	ND (<0.1)	ND (<0.1) J	ND (<0.1) J	ND (<0.1) J
Nickel	20 [5]		ND (<0.5) J	**0.912 J**	**8.16 J**	**21.3 J**	**4.54 J**	**6.78 J**	**4.71 J**
Selenium	5 [6]		ND (<0.3)	ND (<0.3)	ND (<0.3)	ND (<0.3)	ND (<0.3)	ND (<0.3)	ND (<0.3)
Sodium	--		**32700**	**5830**	**1790000**	**427000**	**245000**	**157000**	**191000**
Zinc	120 [5]		**7.83 J**	**5.95 J**	**9.48 J**	**11.4 J**	**9.7 J**	**18.8 J**	ND (<5.2) J
Inorganics (µg/L)									
Chloride	230,000 [6, 14]		**4220**	**2170**	**117000**	**109000**	**32700**	**43300**	**32000**
Sulfate	250,000 [8]		**30900**	**7170**	**1090000**	**388000**	**90200**	**121000**	**626000**
Field Parameters									
pH (s.u.)			7.61	8.37	8.41	9.69	7.63	7.41	7.45
Conductance (mS/cm)			0.72366	0.36107	5.09	2.0876	1.79	1.4408	2.1908
Turbidity (NTU)			142	>1000	0.01	1.21	0	13.3	23
Dissolved Oxygen (mg/L)			3.66	4.25	0.18	0.78	2.37	3.61	1.33
Redox Potential (mV)			-121.8	-43.4	-14.4	-53.7	-7.3	-35.2	-220.8
Temperature (°C)			26.67	22.89	25.49	21.33	31.1	27.45	26.52

Notes:
All samples were submitted field filtered for dissolved metals analyses, unless noted otherwise. All samples were submitted unfiltered for inorganic analyses.
"µg/L" All results are reported in micrograms per liter.
Results were reported to the Limit of Quantitation (LOQ) in order to meet screening criteria for cadmium and copper.
"---" Parameter not analyzed or screening criteria not available
"ND (#)" Parameter not detected above the noted RL.
Qualifiers - "J" Estimated value. "-" and "L" Biased low. "K" Biased high. "B" Detected in method blank.
°C - degrees Celcius
mS/cm - millisiemens per centimeter
s.u. - standard units
mV - millivolts
NTU - Nephelometric Turbidity Units

[1] - Screening value used for comparison is the lowest value of the freshwater aquatic life criterion or human health criterion.
[2] - Ground water quality data was collected in February 1994, April 1994 and August 2000 prior to well abandonment. Range of values is reported where available.
[2] - Submitted to laboratory as blind duplicate AV-SUMP-D-061104.
[3] - Submitted to laboratory as blind duplicate AV-SUMP-D-060606.
[4] - Screening criteria represents applicable criteria for protection of human health for public water supply (9VAC25-260-140).
[5] - Surface water quality criteria for dissolved metals that are hardness-dependent expressed as function of hardness of the River water (100 mg/L) and the water effects ratio of 1.0 in accordance with VADEQ's surface water quality standard.
[6] - Screening criteria based on Chronic Freshwater Criteria for Aquatic Life. Criteria represents a four day average concentration not to be exceeded more than once every three years on the average. Virginia Chronic Water Quality Criteria (9 VAC 25-260-5).
[7] - Screening value listed is for Chromium (VI)
[8] - Screening value listed is National Secondary Drinking Water Regulation based on aesthetic effects (such as taste or odor).
[9] - Submitted to laboratory as blind duplicate AV-SUMP-D-061207.
[10] - Submitted to laboratory as blind duplicate AV-SUMP-D-061308.
[11] - Submitted to laboratory as blind duplicate AV-SUMP-D-061209.
[12] - Submitted to laboratory as blind duplicate AV-SUMP-D-061710.
[13] - FAB 1-2 and FAB-3 had insufficient water at the time of sampling and therefore were not sampled in 2010.
[14] - Screening value updated based on the Virginia Water Quality Standards dated January 2011.
[15] - Submitted to laboratory as blind duplicate AV-SUMP-D-060211.
[16] - Submitted to laboratory as blind duplicate AV-SUMP-D-062812.
[17] - Submitted to laboratory as blind duplicate AV-SUMP-D-061213.
[18] - Submitted to laboratory as duplicate for AV-Basin-SMP-ON-G-FAB6N-080514.
[19] - Submitted to laboratory as duplicate for 2015AN-SB3-1.

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APPENDIX E
VSWMR CONTROL CHARTS

PARSONS

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Figure E-1
Control Chart for Carbon Disulfide
VSWMR Monitoring Network
Downgradient Overburden Well MW-09

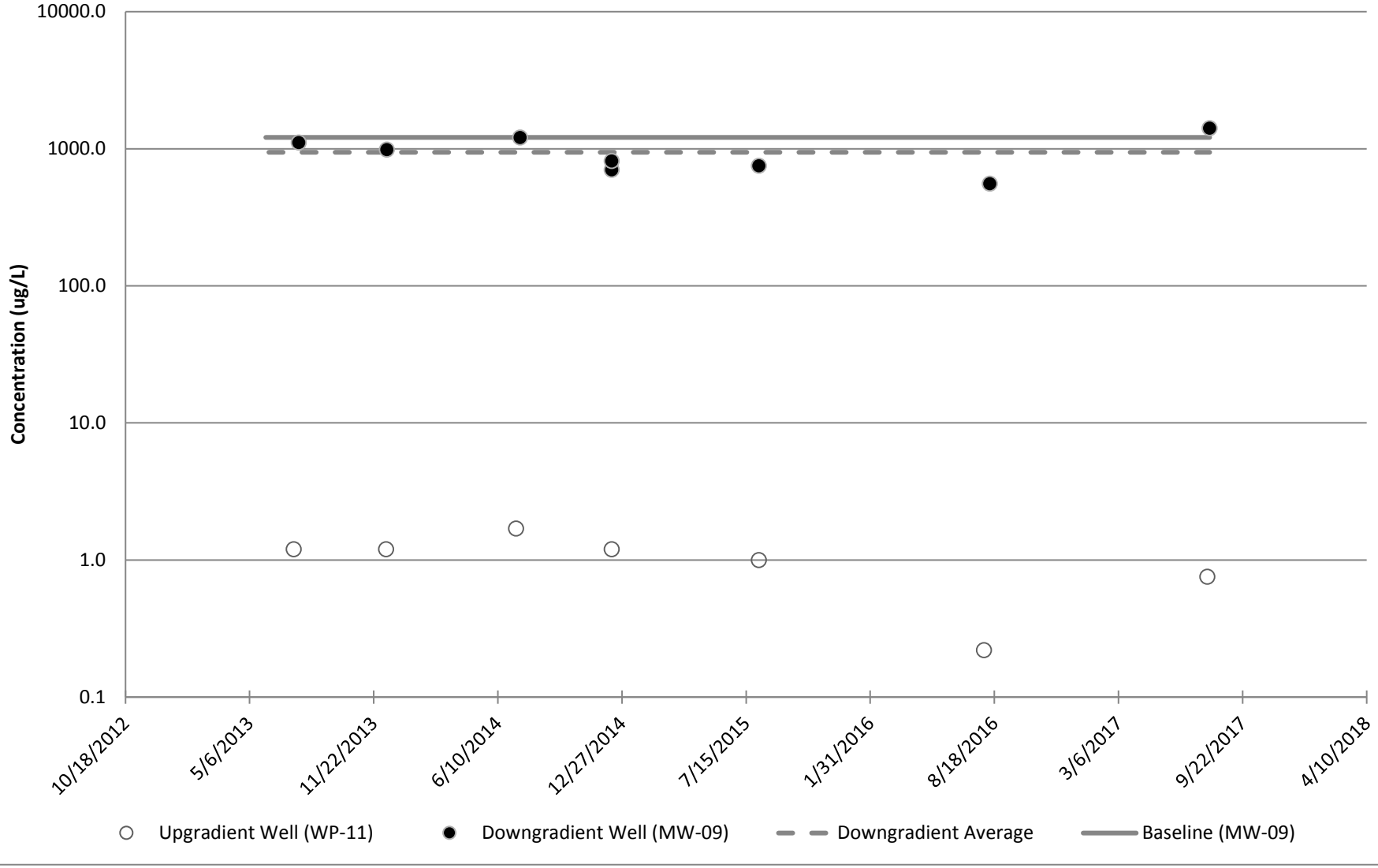


Figure E-2
Control Chart for Pentachlorophenol
VSWMR Monitoring Network
Downgradient Overburden Well MW-09

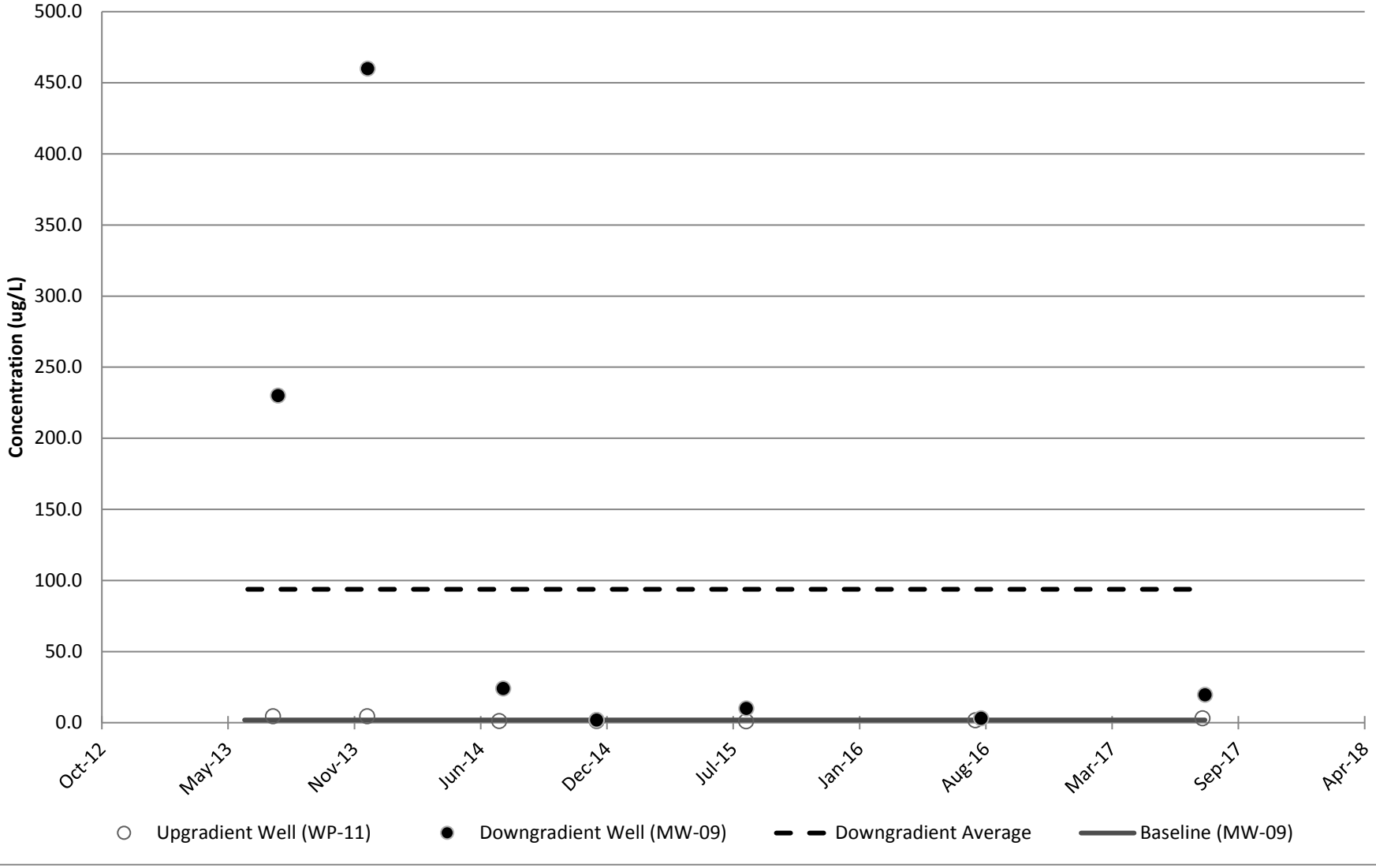


Figure E-3
Control Chart for 2-Methylphenol
VSWMR Monitoring Network
Downgradient Overburden Well MW-09

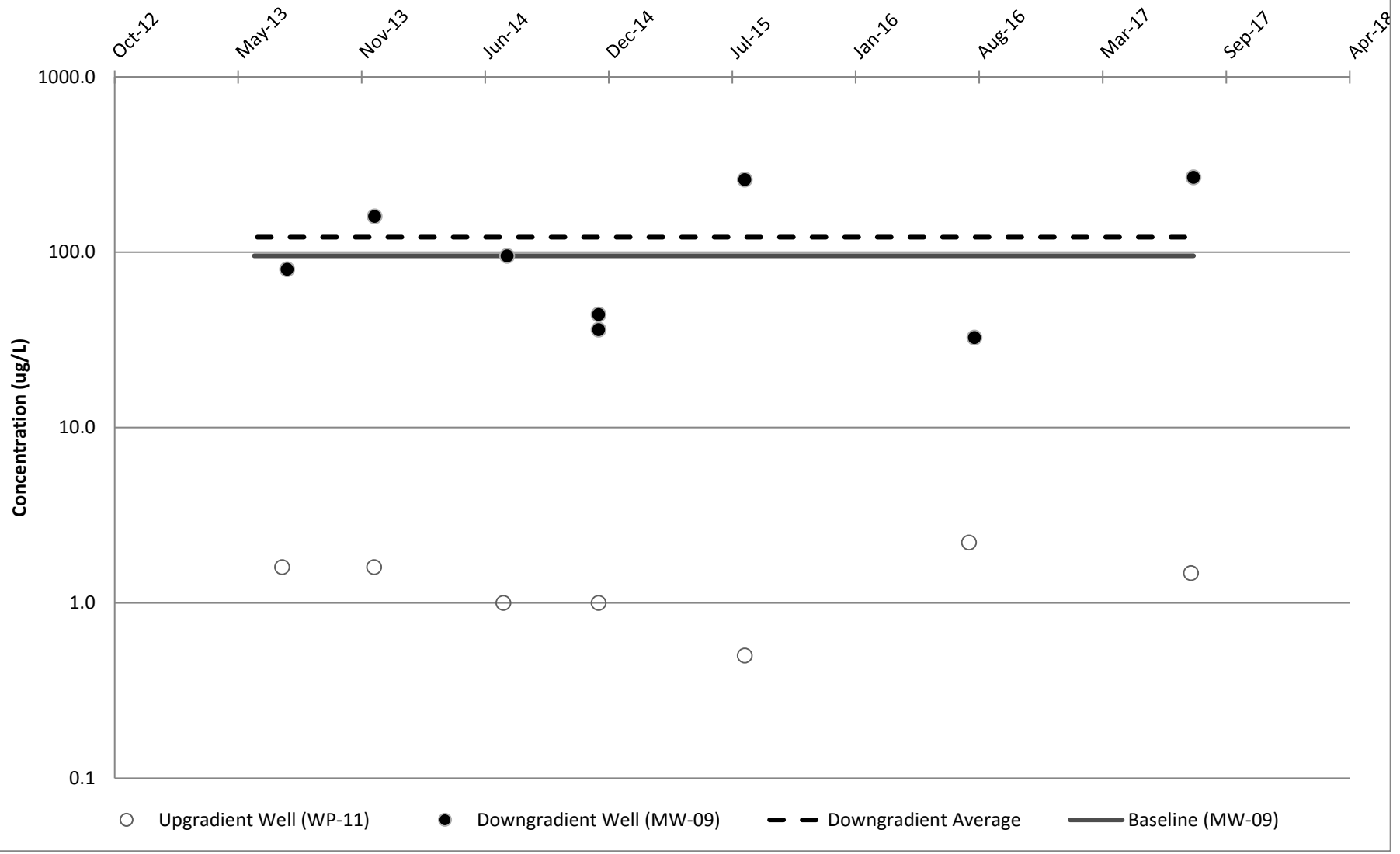


Figure E-4
Control Chart for 3&4-Methylphenol
VSWMR Monitoring Network
Downgradient Overburden Well MW-09

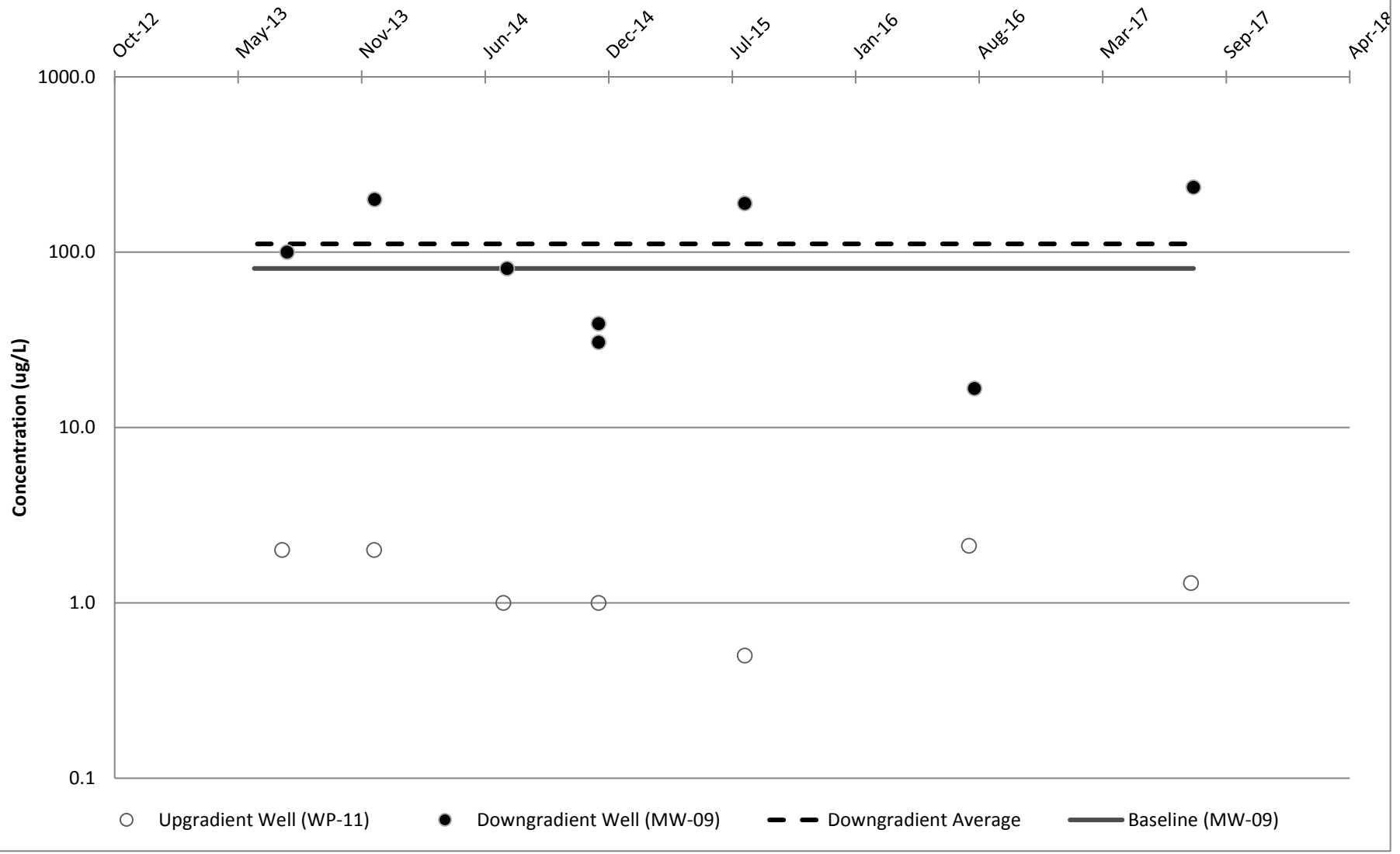


Figure E-5
Control Chart for Phenol
VSWMR Monitoring Network
Downgradient Overburden Well MW-09

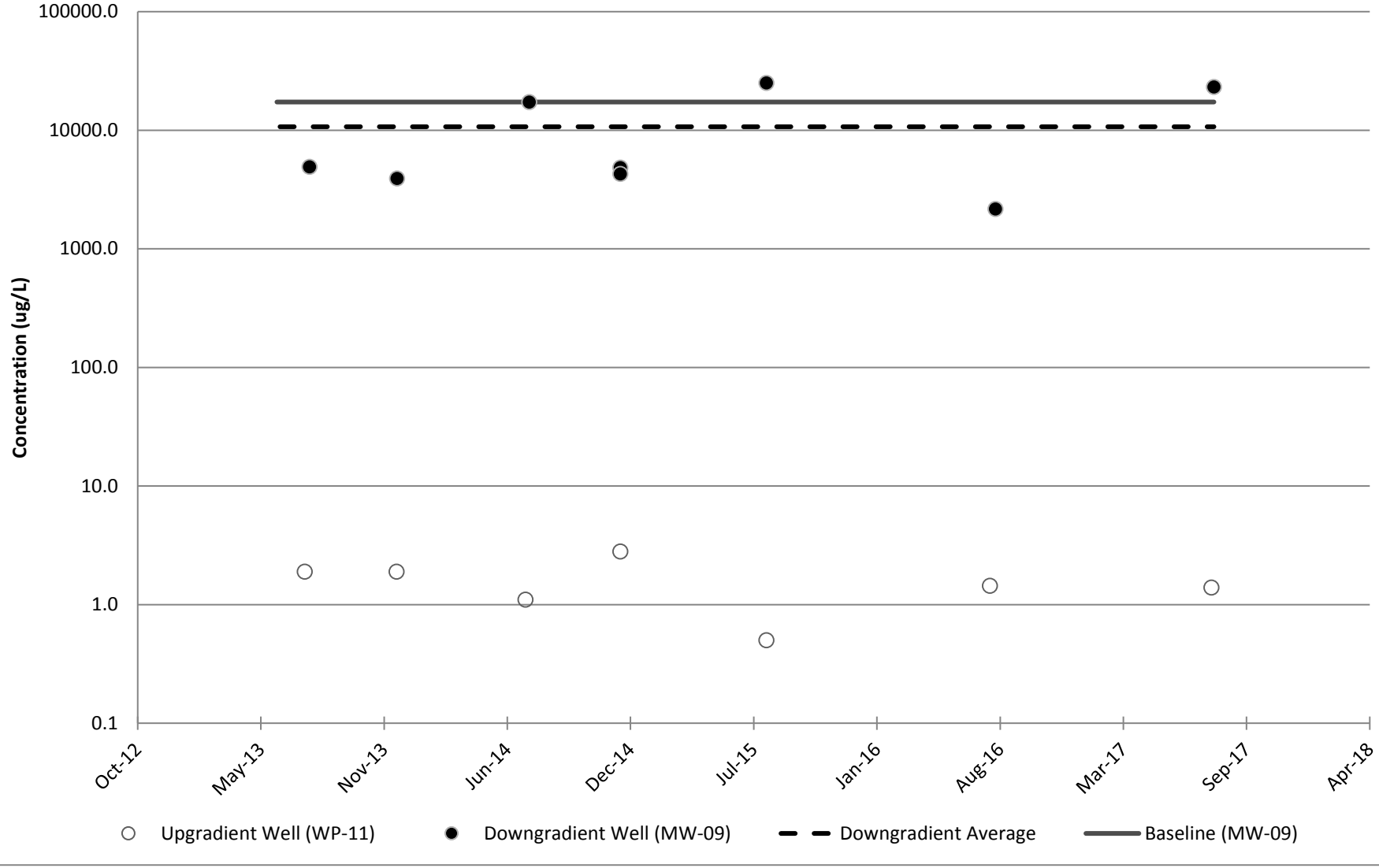


Figure E-6
Control Chart for Antimony
VSWMR Monitoring Network
Downgradient Overburden Well MW-09

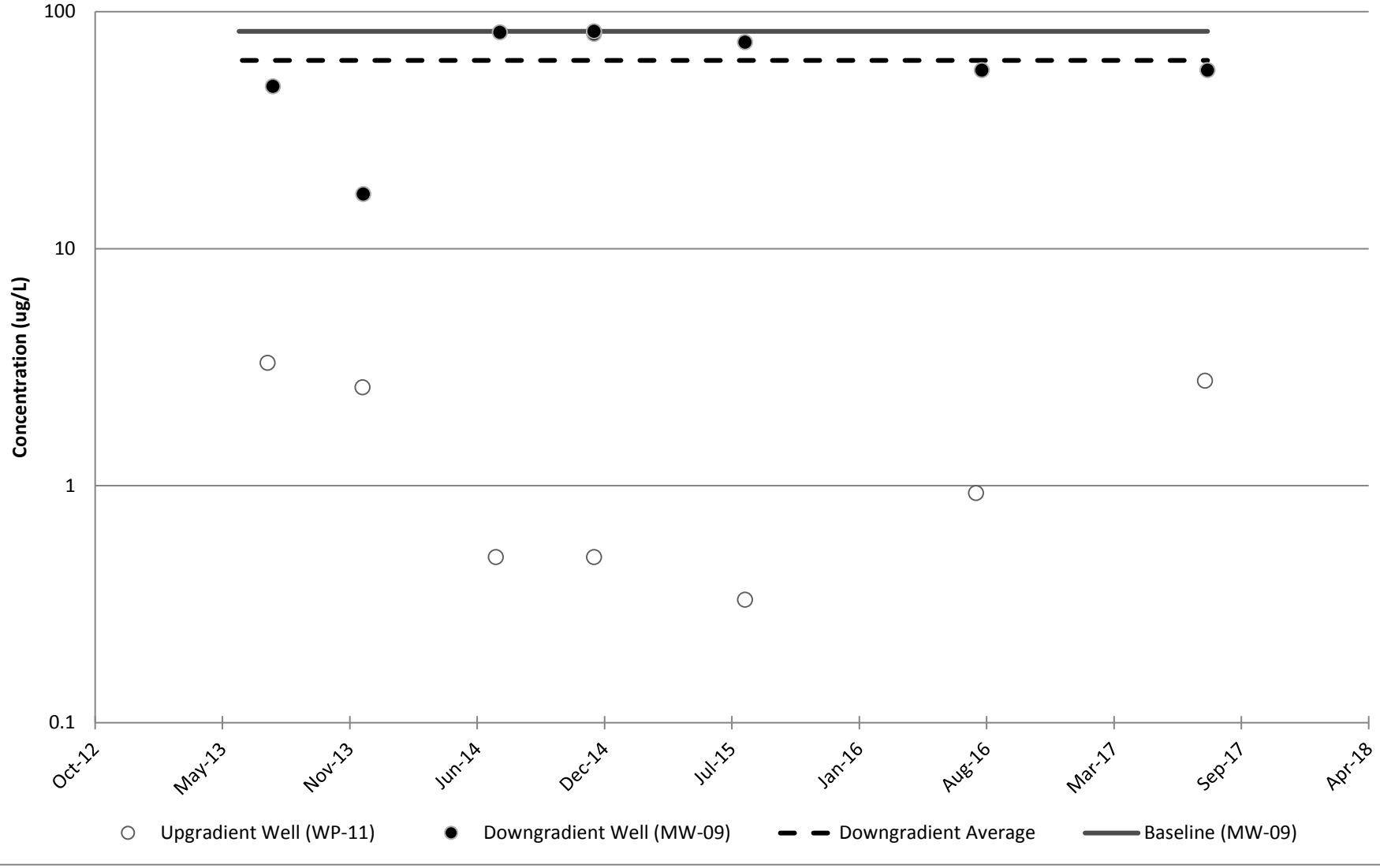


Figure E-7
Control Chart for Arsenic
VSWMR Monitoring Network
Downgradient Overburden Well MW-09

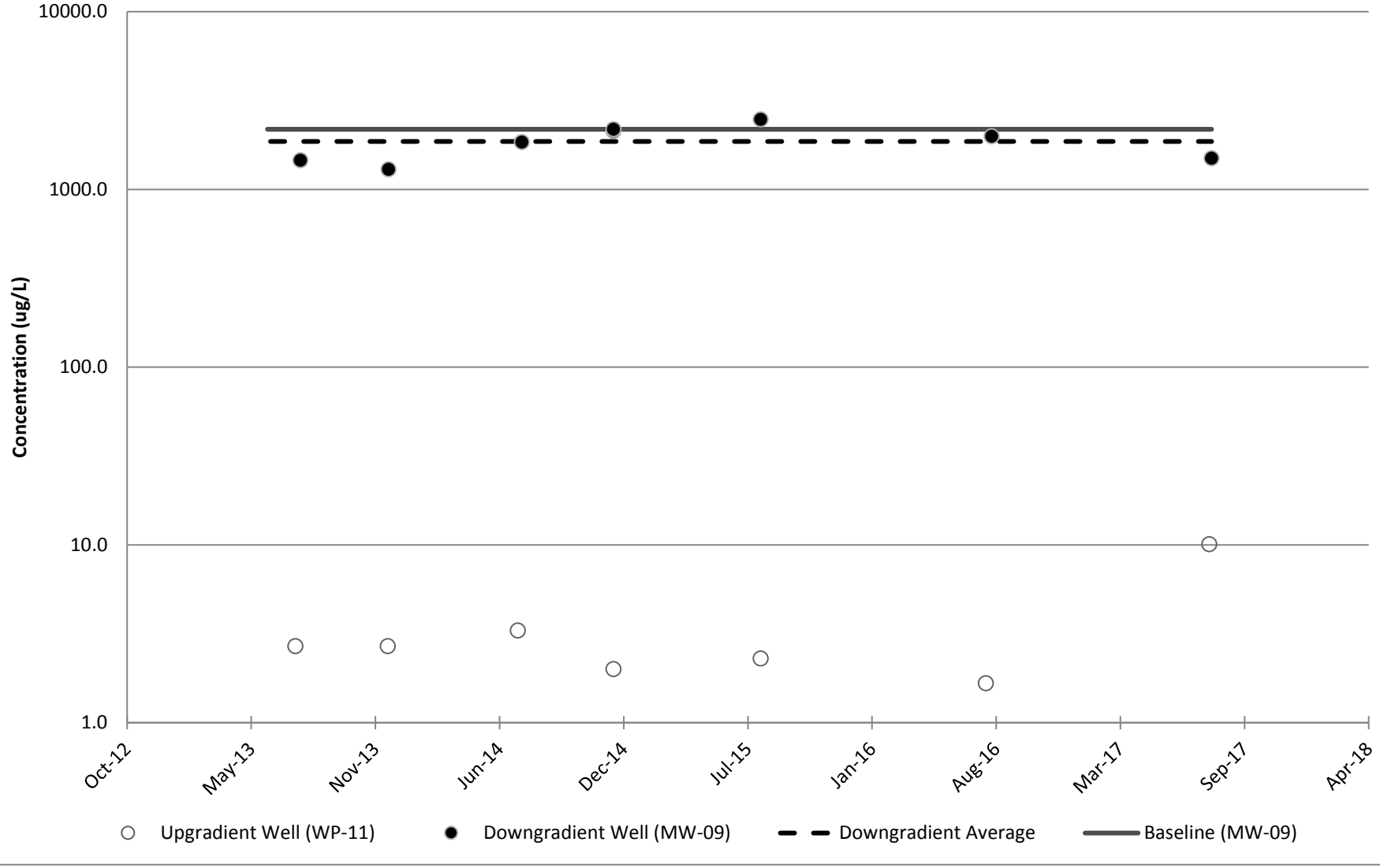


Figure E-8
Control Chart for Cadmium
VSWMR Monitoring Network
Downgradient Overburden Well MW-09

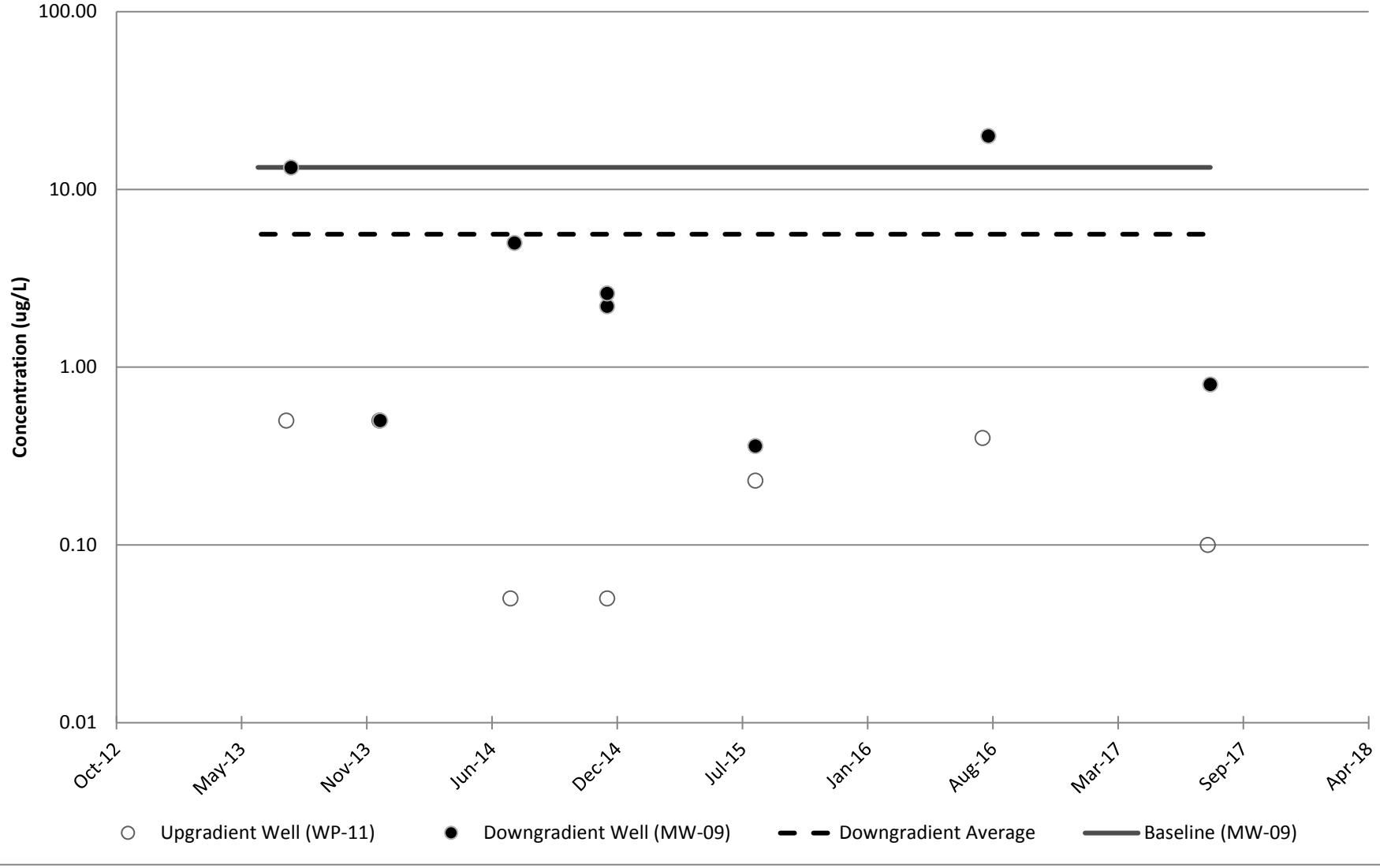


Figure E-9
Control Chart for Chromium
VSWMR Monitoring Network
Downgradient Overburden Well MW-09

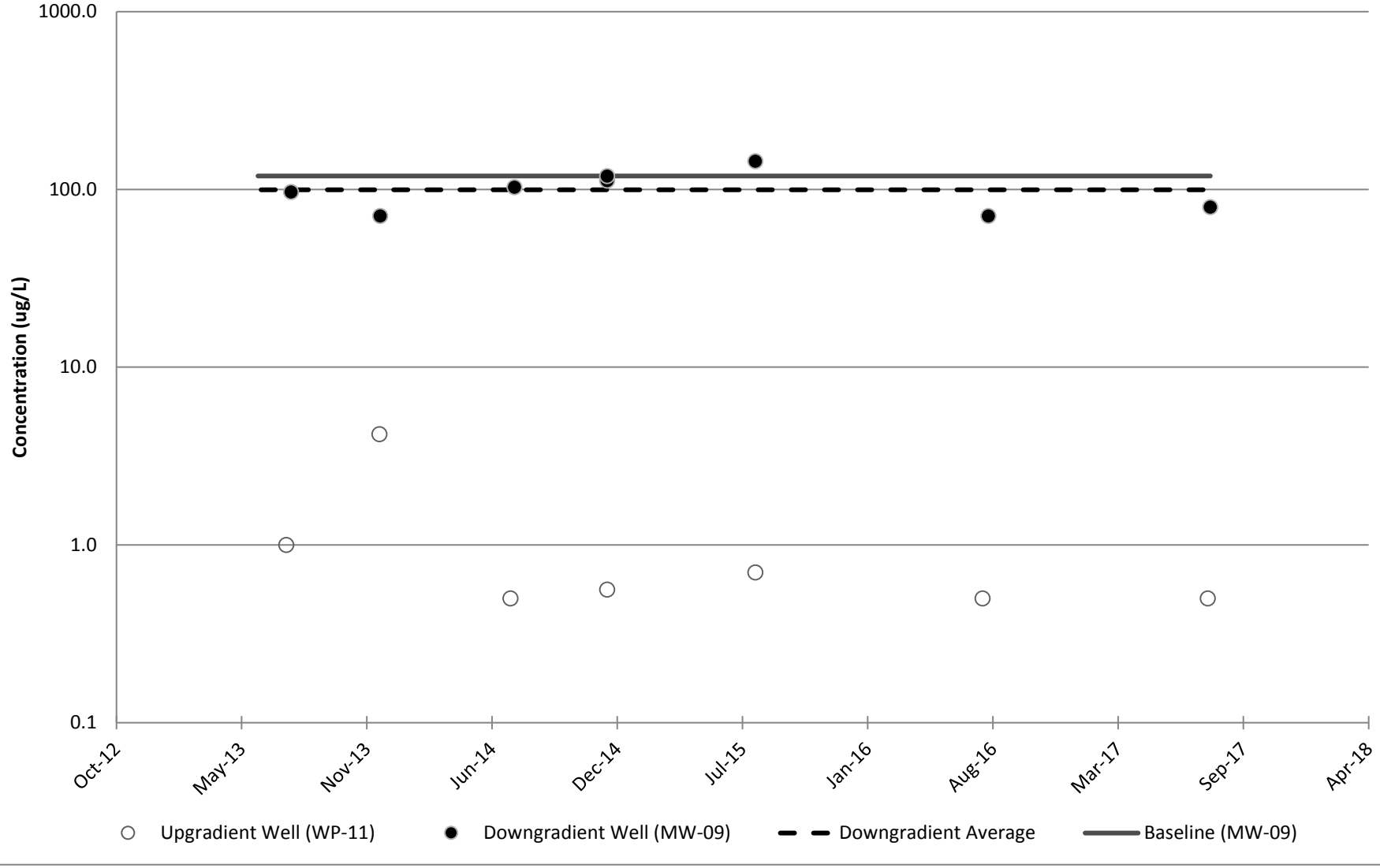


Figure E-10
Control Chart for Cobalt
VSWMR Monitoring Network
Downgradient Overburden Well MW-09

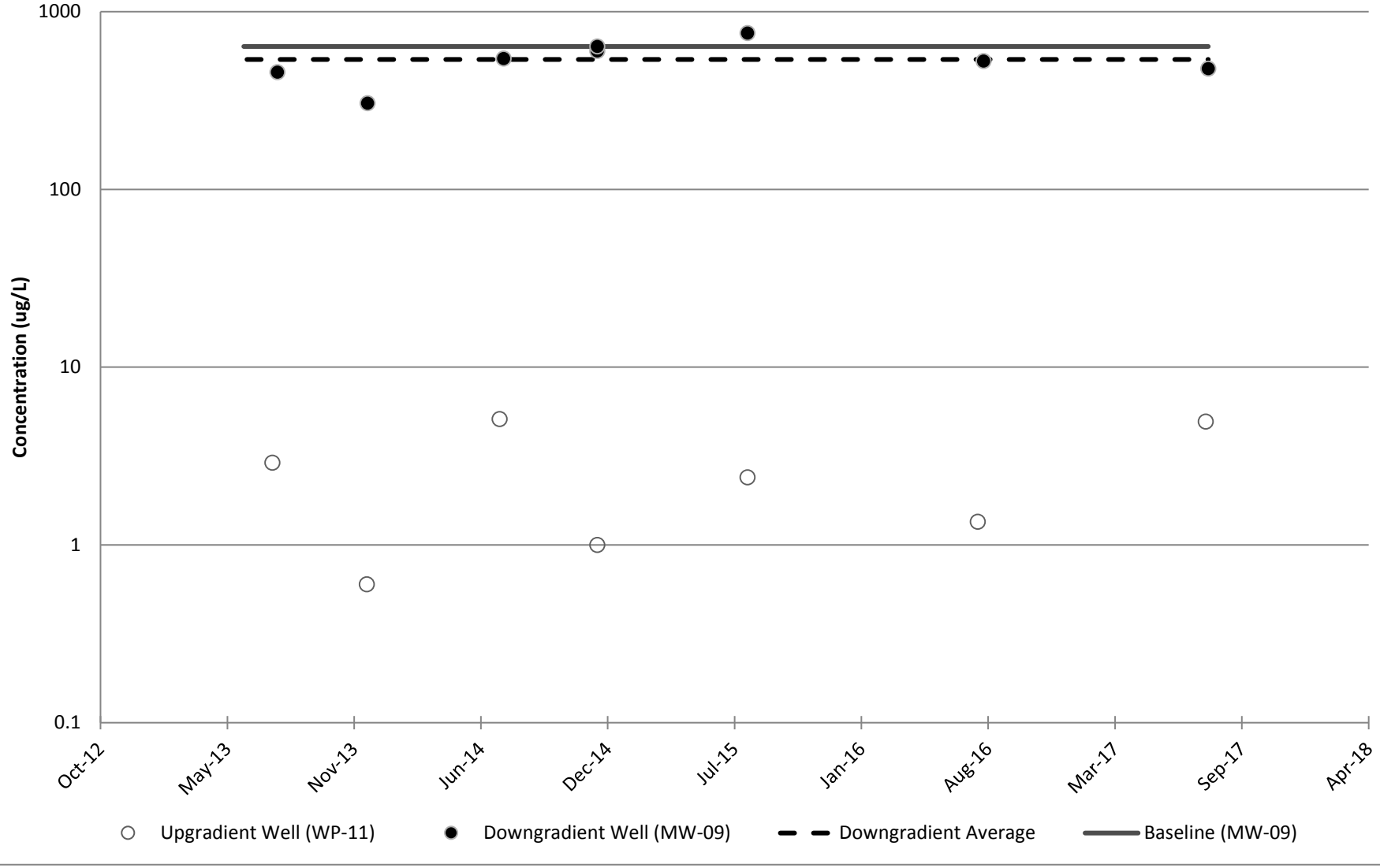


Figure E-11
Control Chart for Nickel
VSWMR Monitoring Network
Downgradient Overburden Well MW-09

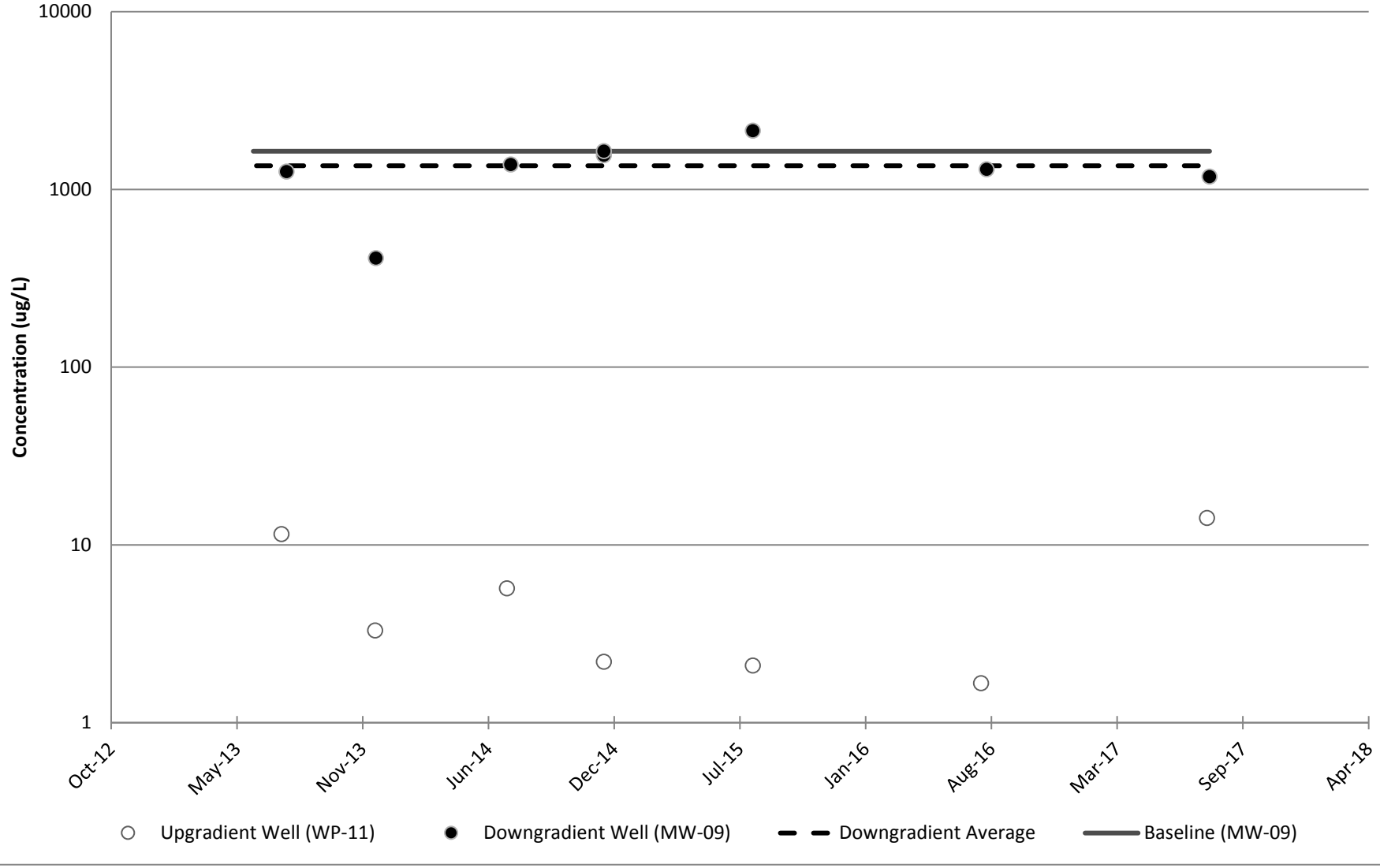


Figure E-12
Control Chart for Vanadium
VSWMR Monitoring Network
Downgradient Overburden Well MW-09

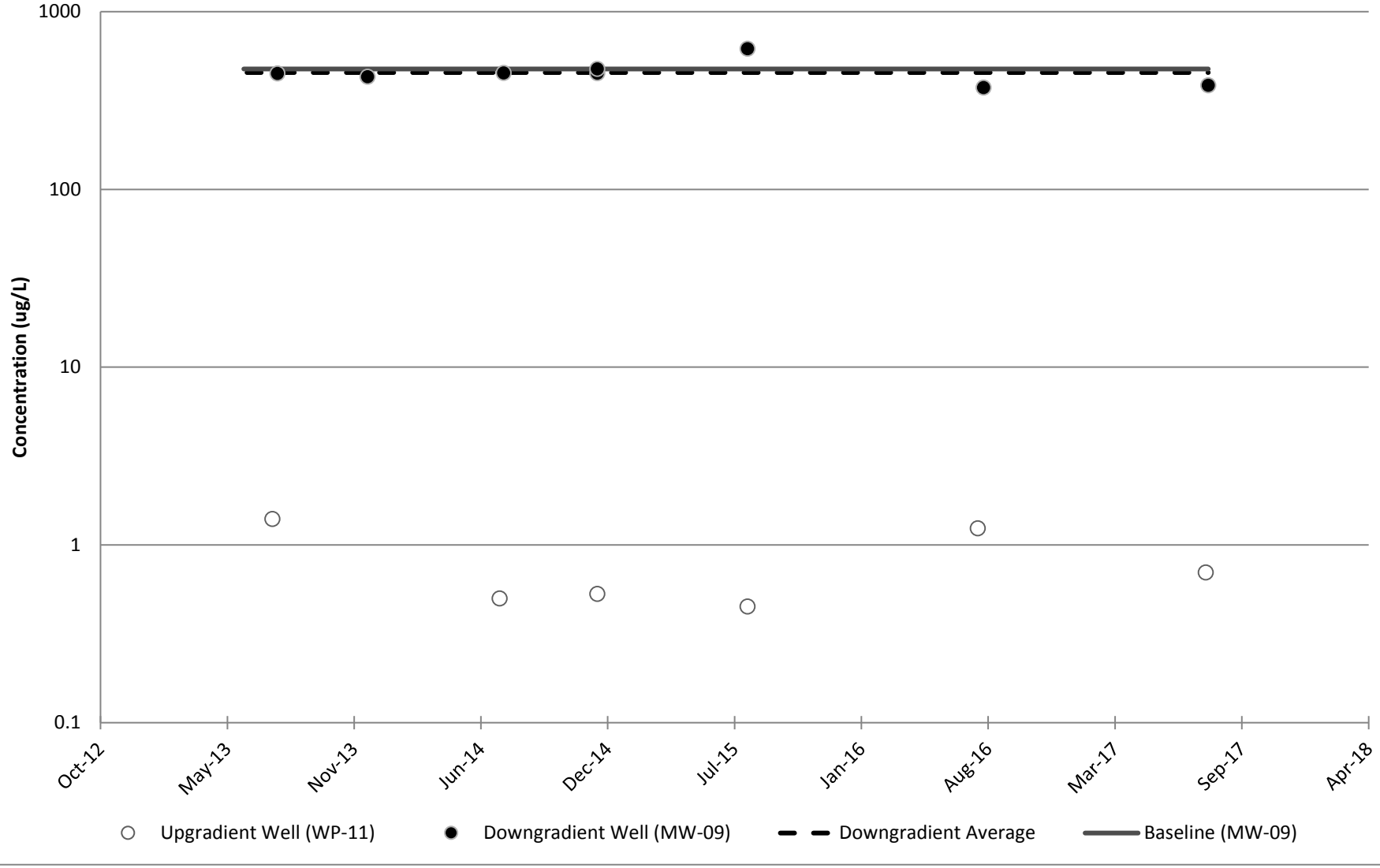


Figure E-13
Control Chart for Cyanide
VSWMR Monitoring Network
Downgradient Overburden Well MW-09

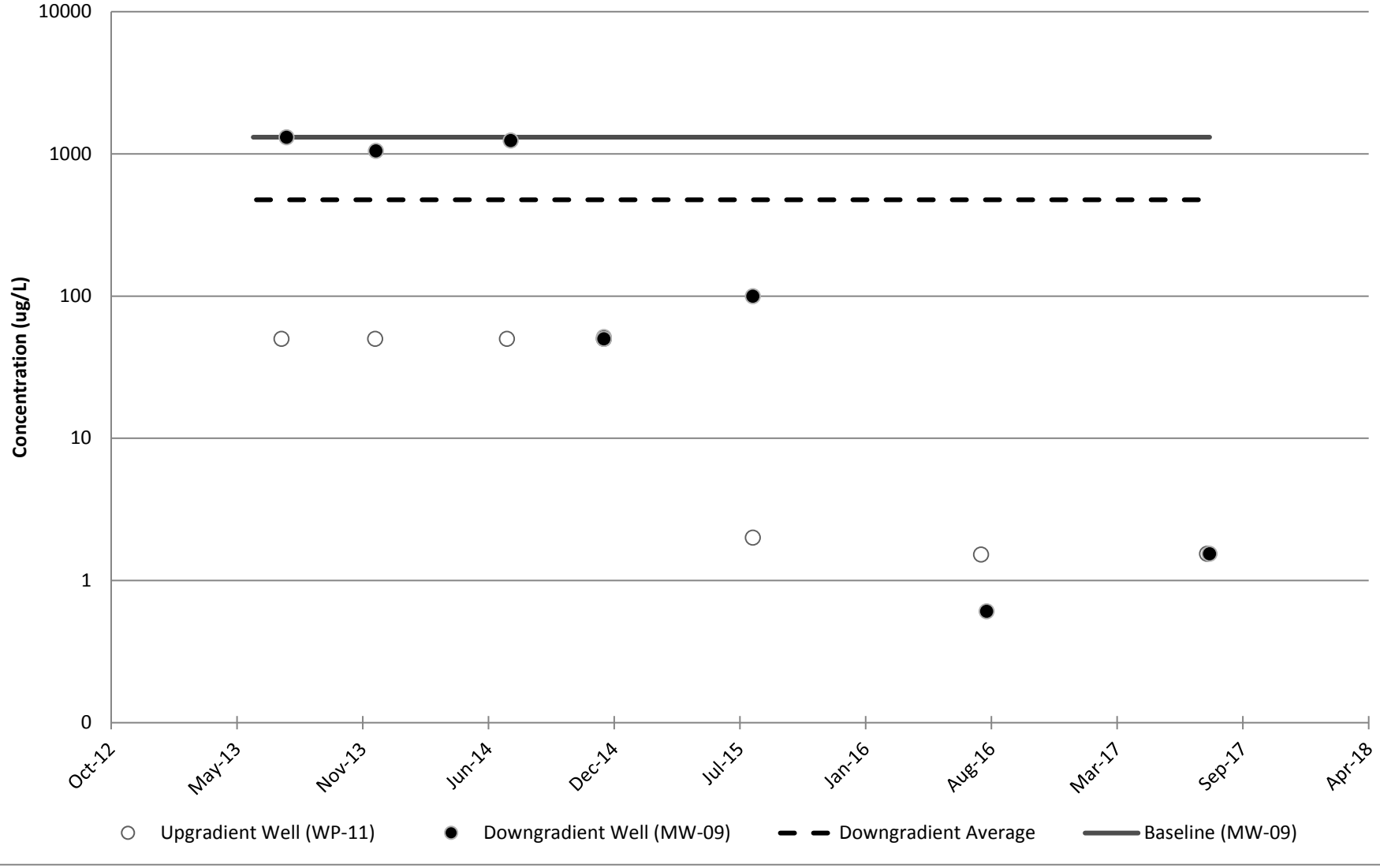


Figure E-14
Control Chart for bis(2-ethylhexyl)phthalate
VSWMR Monitoring Network
Downgradient Overburden Well MW-09

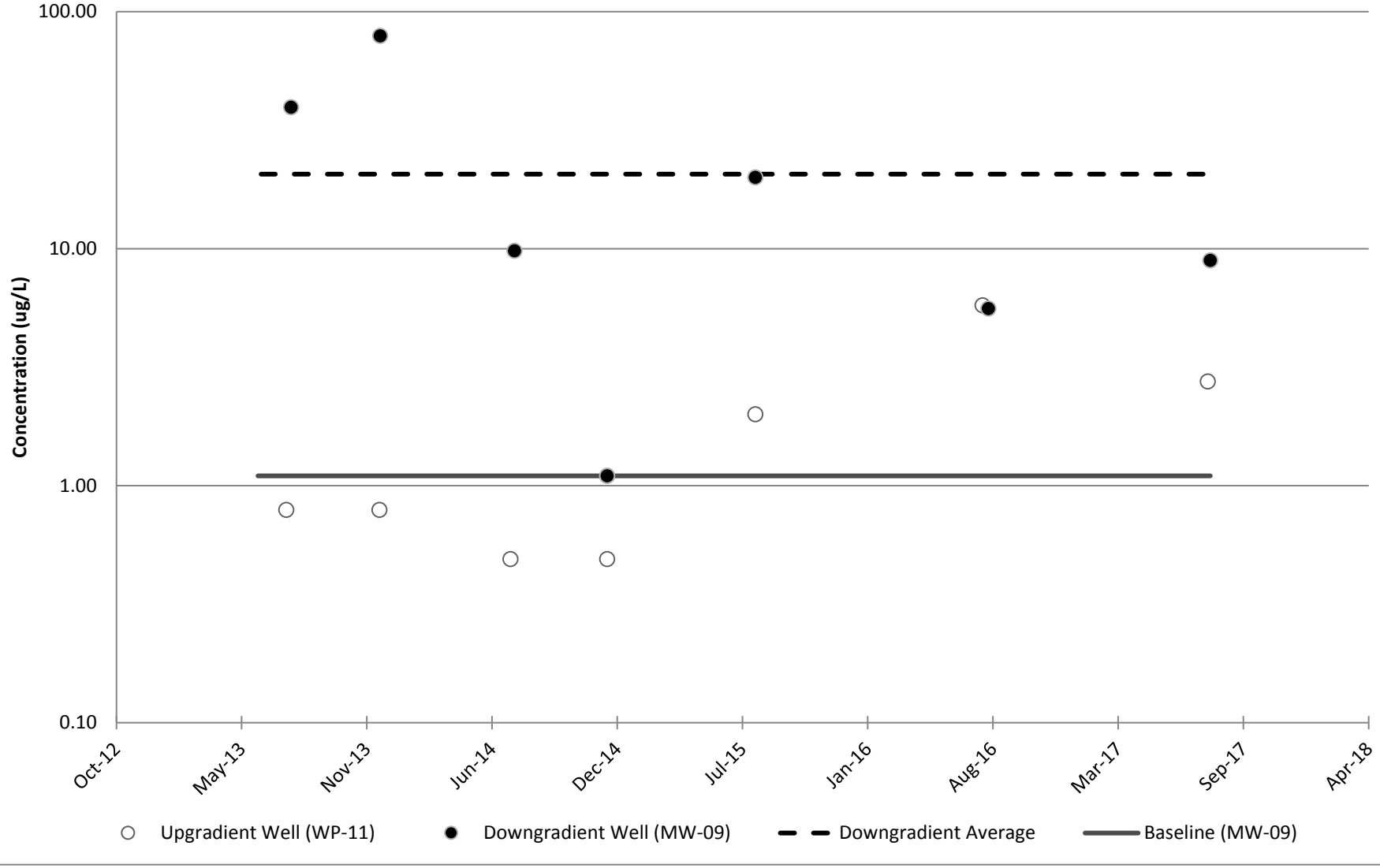


Figure E-15
Control Chart for Manganese
VSWMR Monitoring Network
Downgradient Overburden Well MW-09

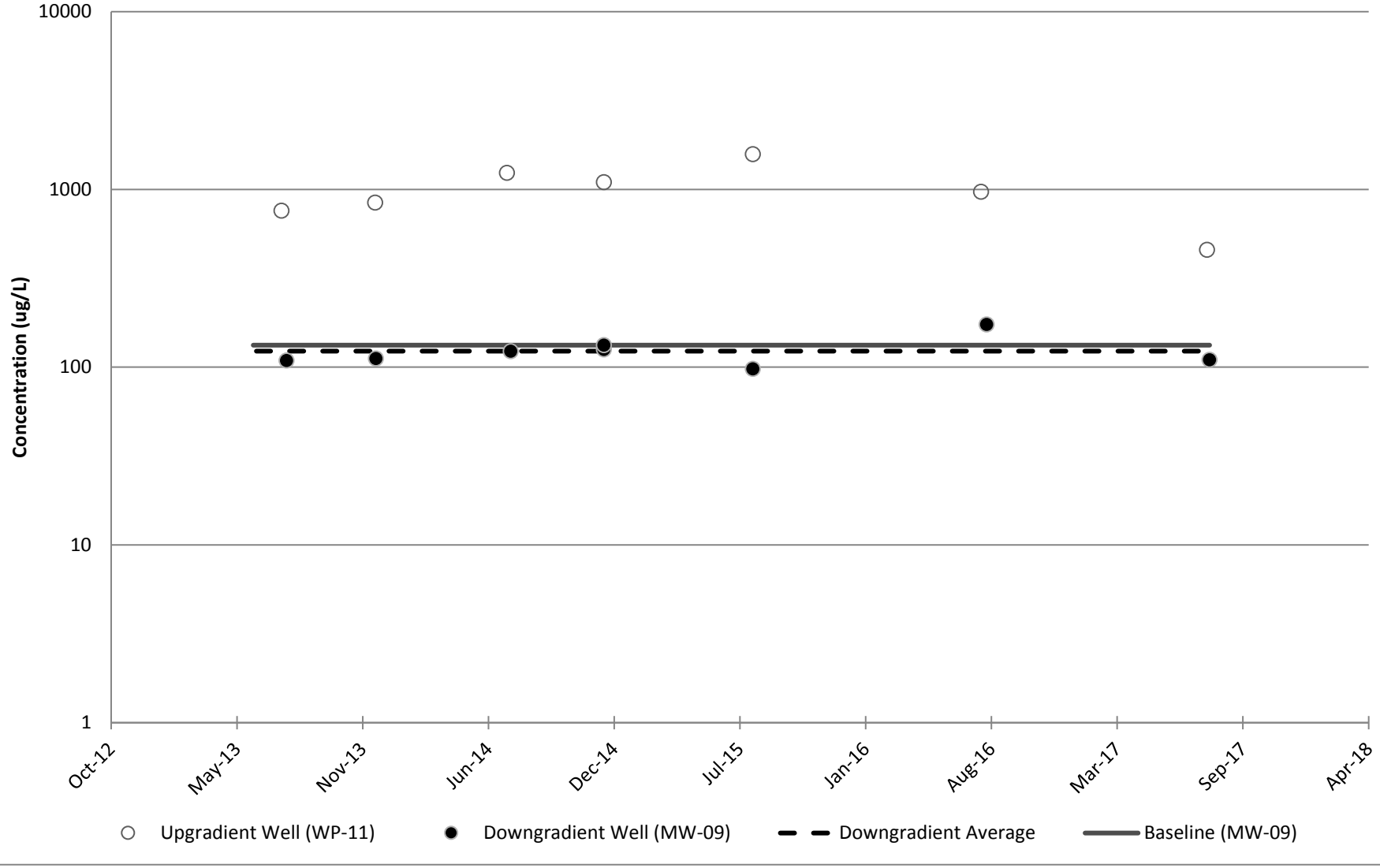


Figure E-16
Control Chart for Naphthalene
VSWMR Monitoring Network
Downgradient Overburden Well WP-10

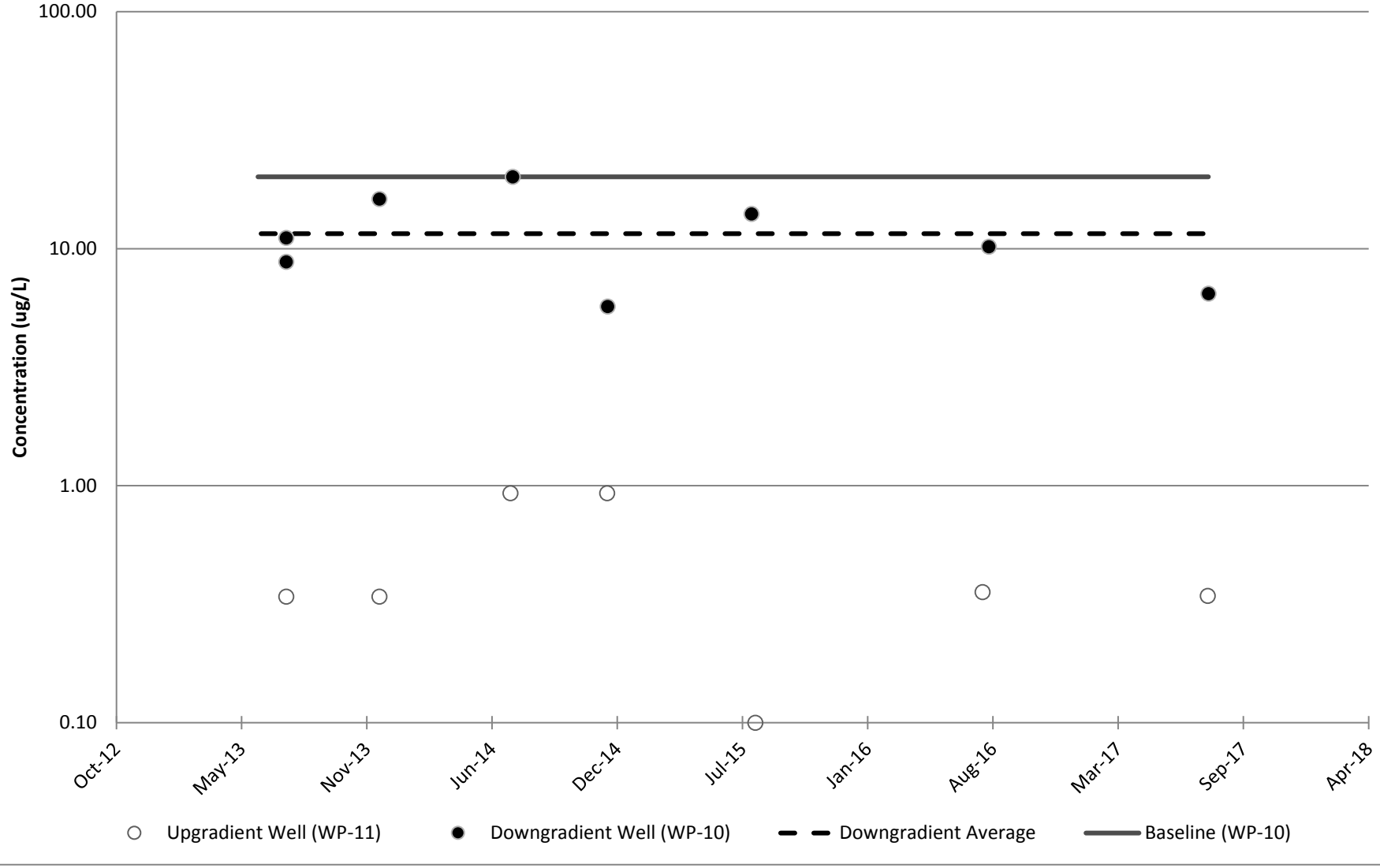


Figure E-17
Control Chart for Aluminum
VSWMR Monitoring Network
Downgradient Overburden Well WP-10

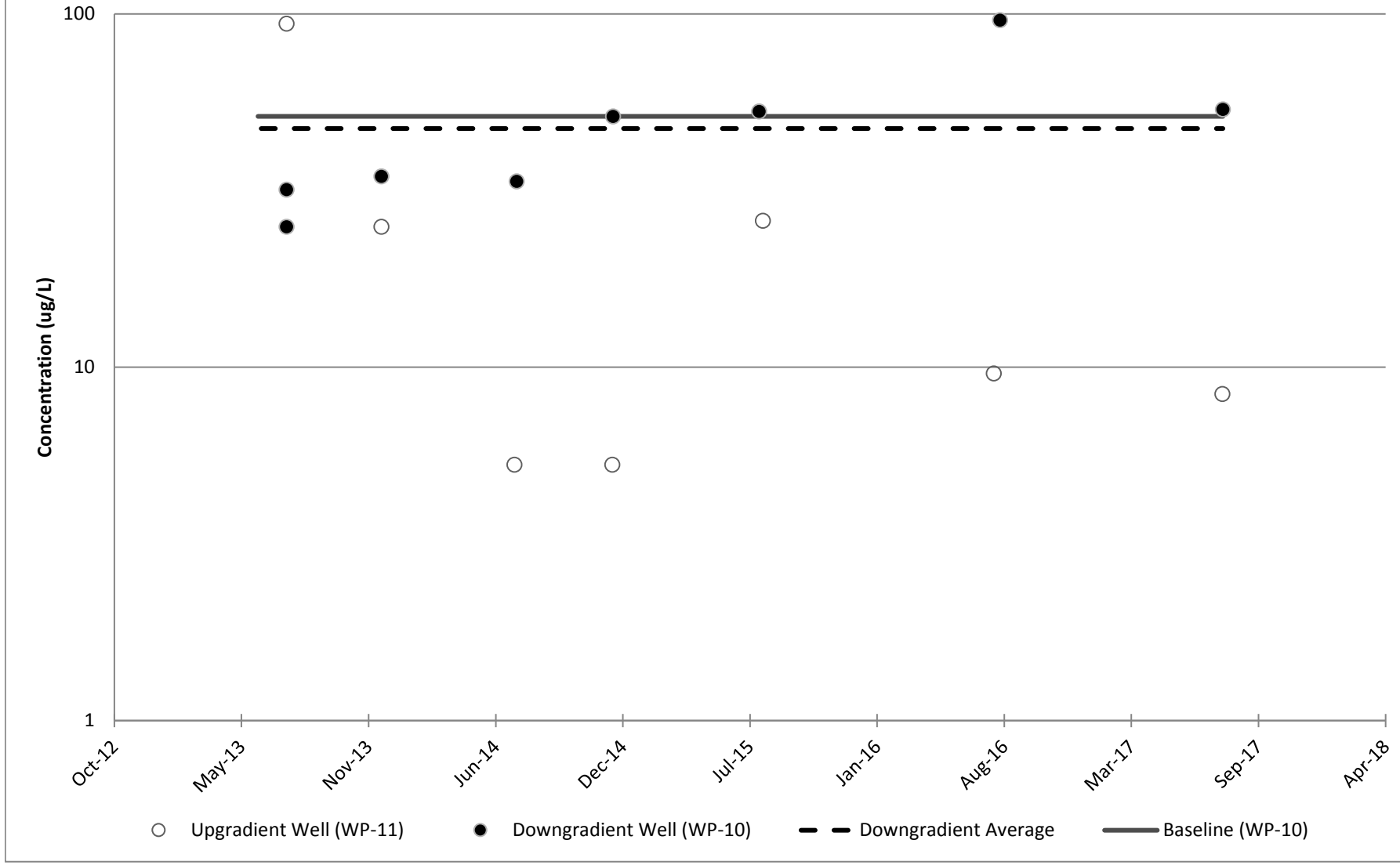


Figure E-18
Control Chart for Arsenic
VSWMR Monitoring Network
Downgradient Overburden Well WP-10

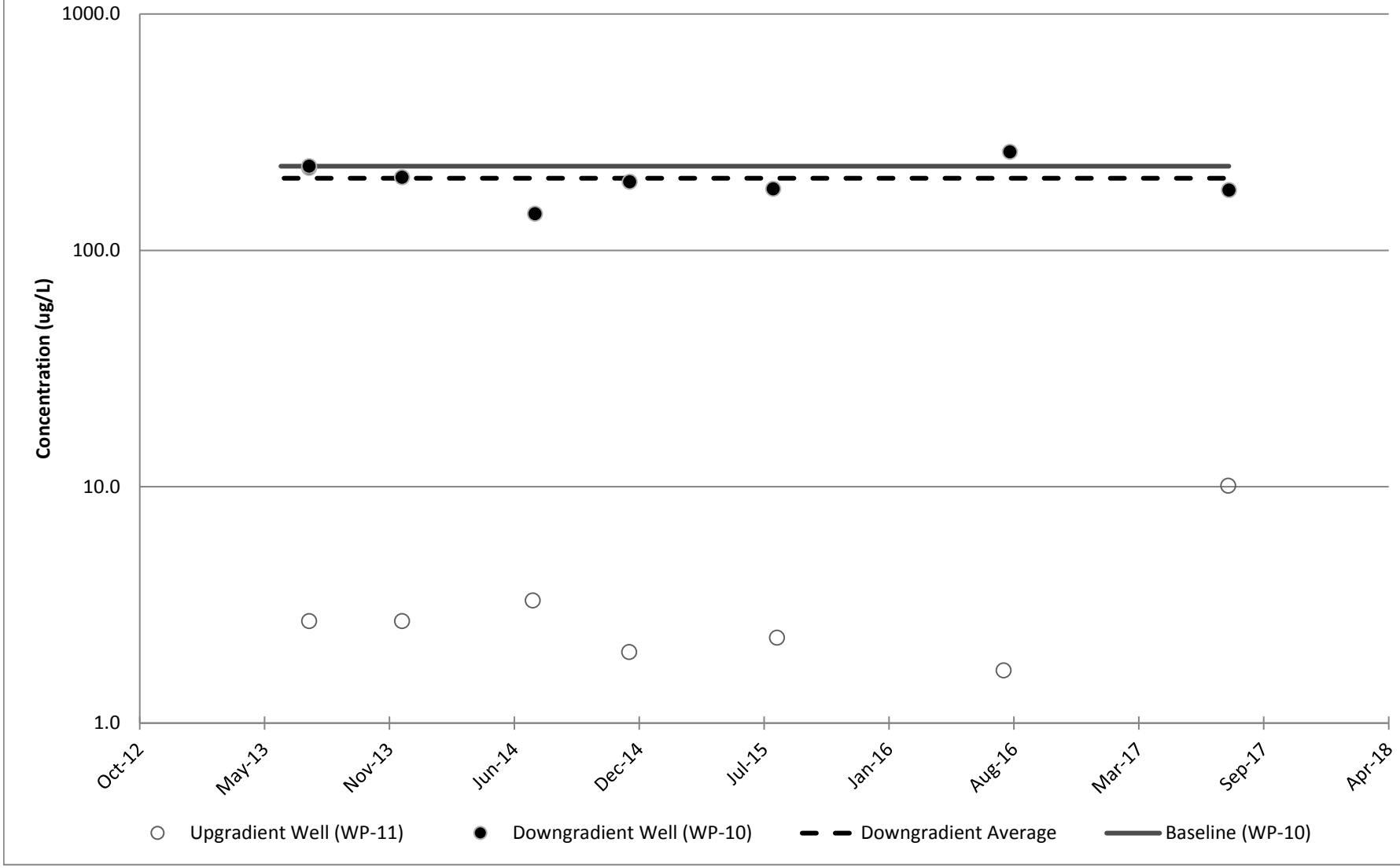


Figure E-19
Control Chart for Chromium
VSWMR Monitoring Network
Downgradient Overburden Well WP-10

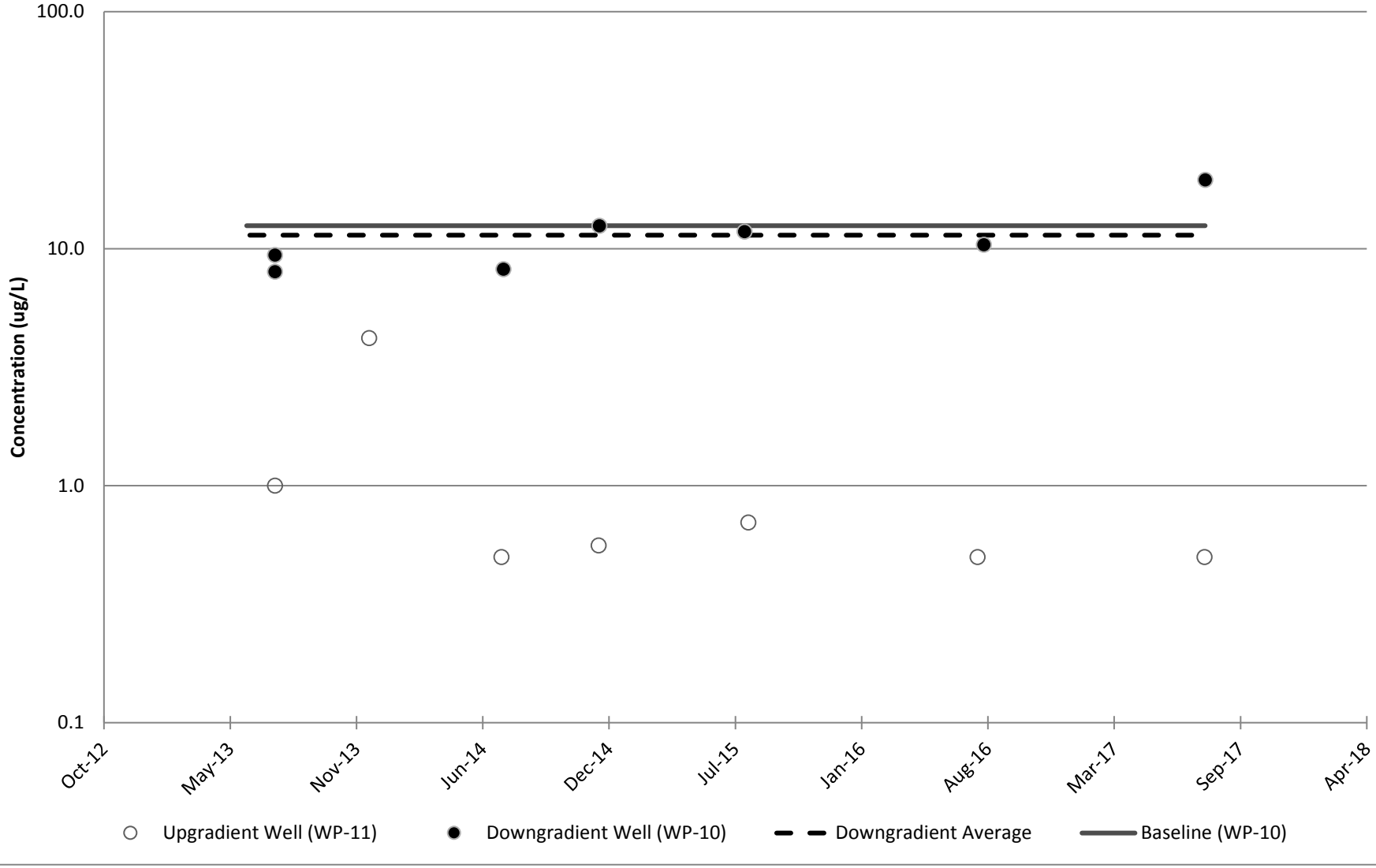


Figure E-20
Control Chart for Cobalt
VSWMR Monitoring Network
Downgradient Overburden Well WP-10

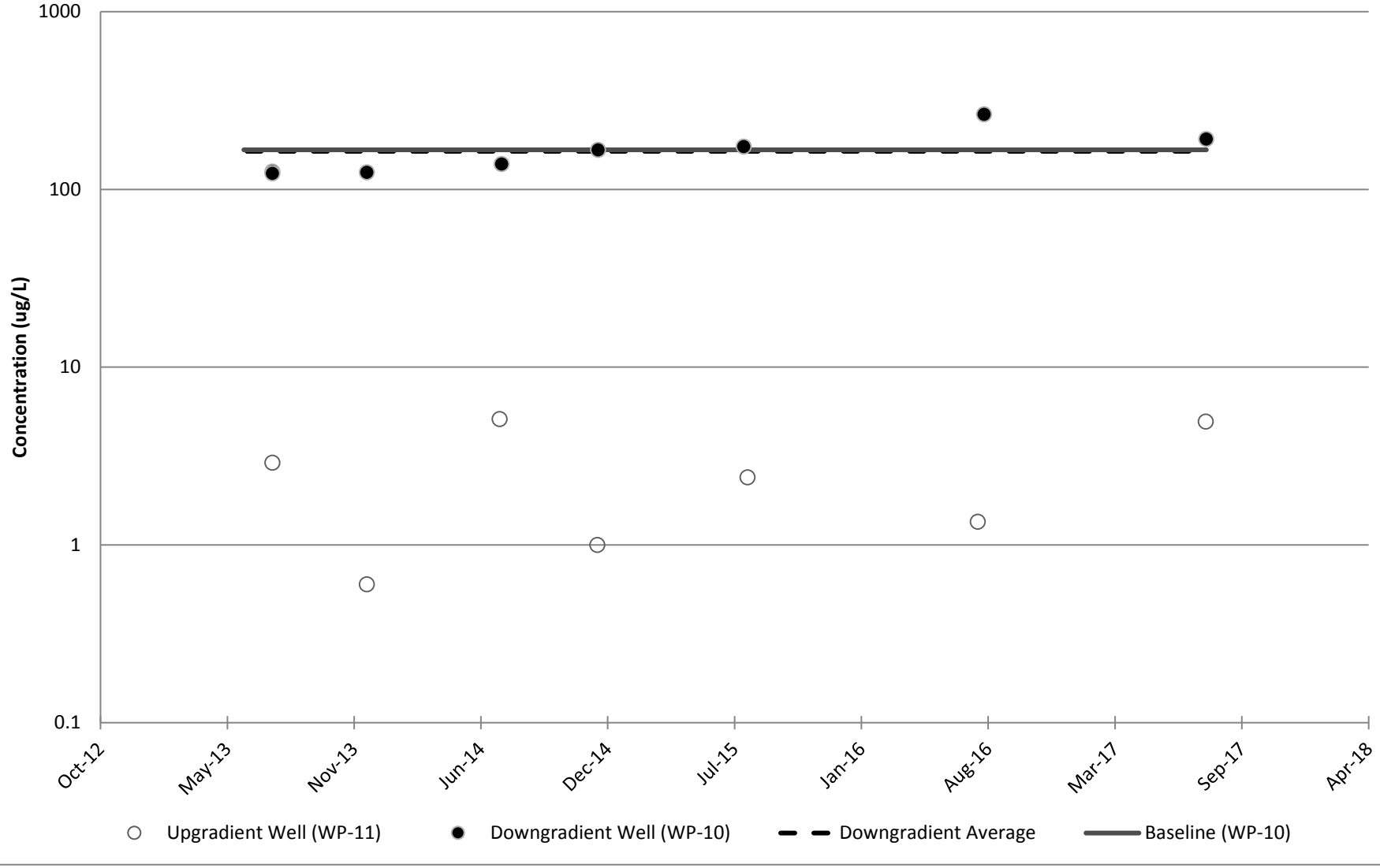


Figure E-21
Control Chart for Nickel
VSWMR Monitoring Network
Downgradient Overburden Well WP-10

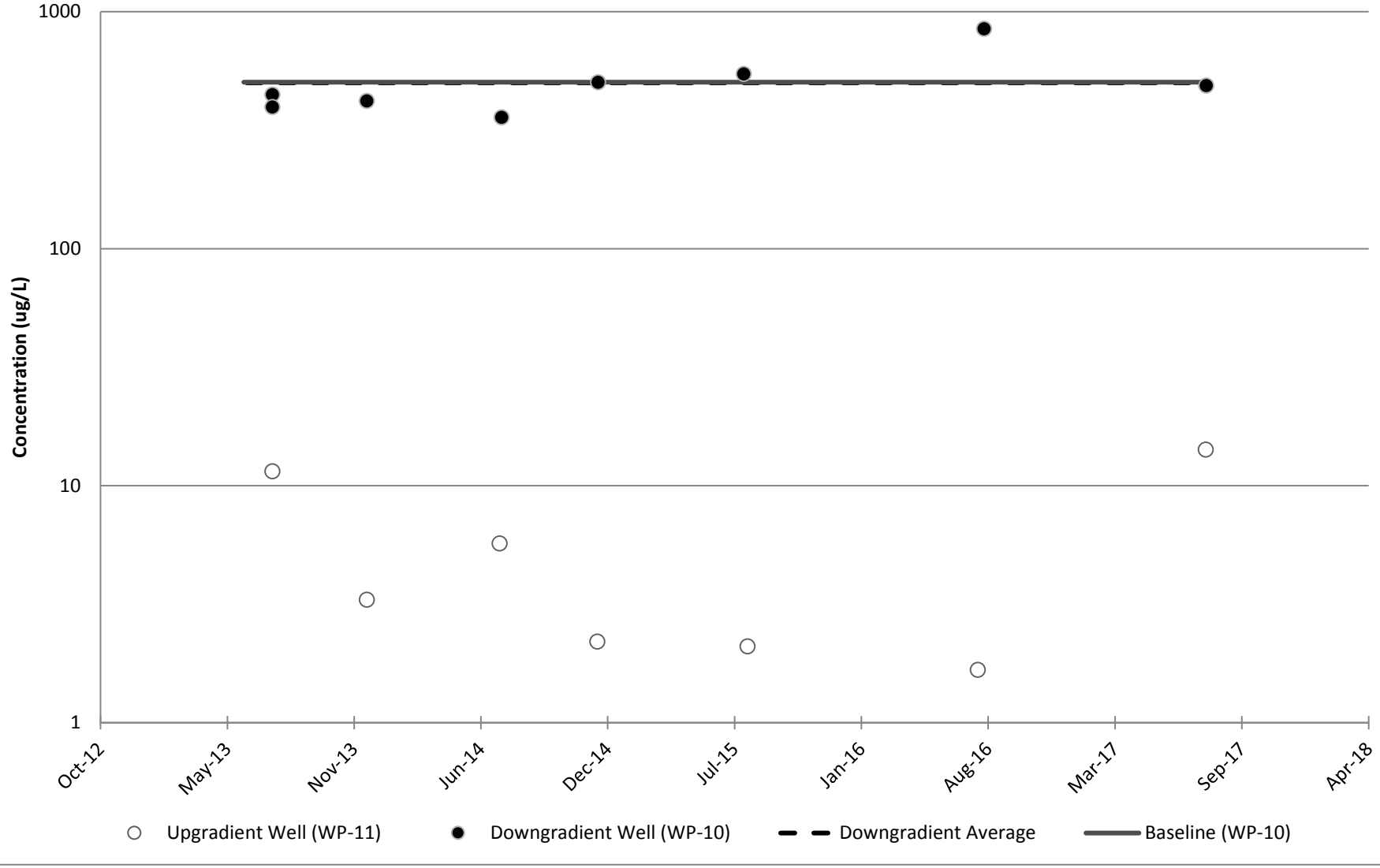


Figure E-22
Control Chart for Vanadium
VSWMR Monitoring Network
Downgradient Overburden Well WP-10

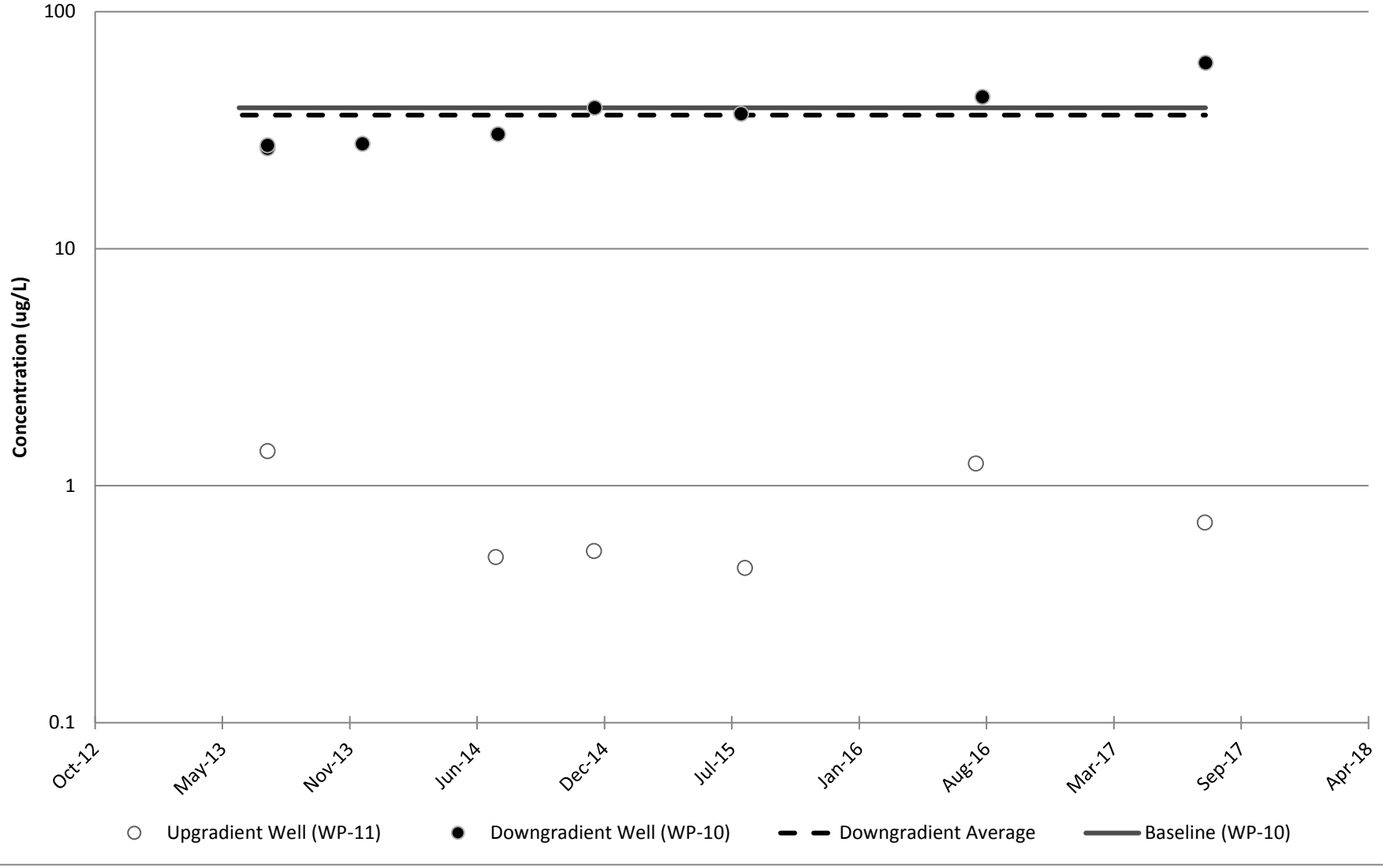


Figure E-23
Control Chart for Manganese
VSWMR Monitoring Network
Downgradient Shallow Bedrock Well 105

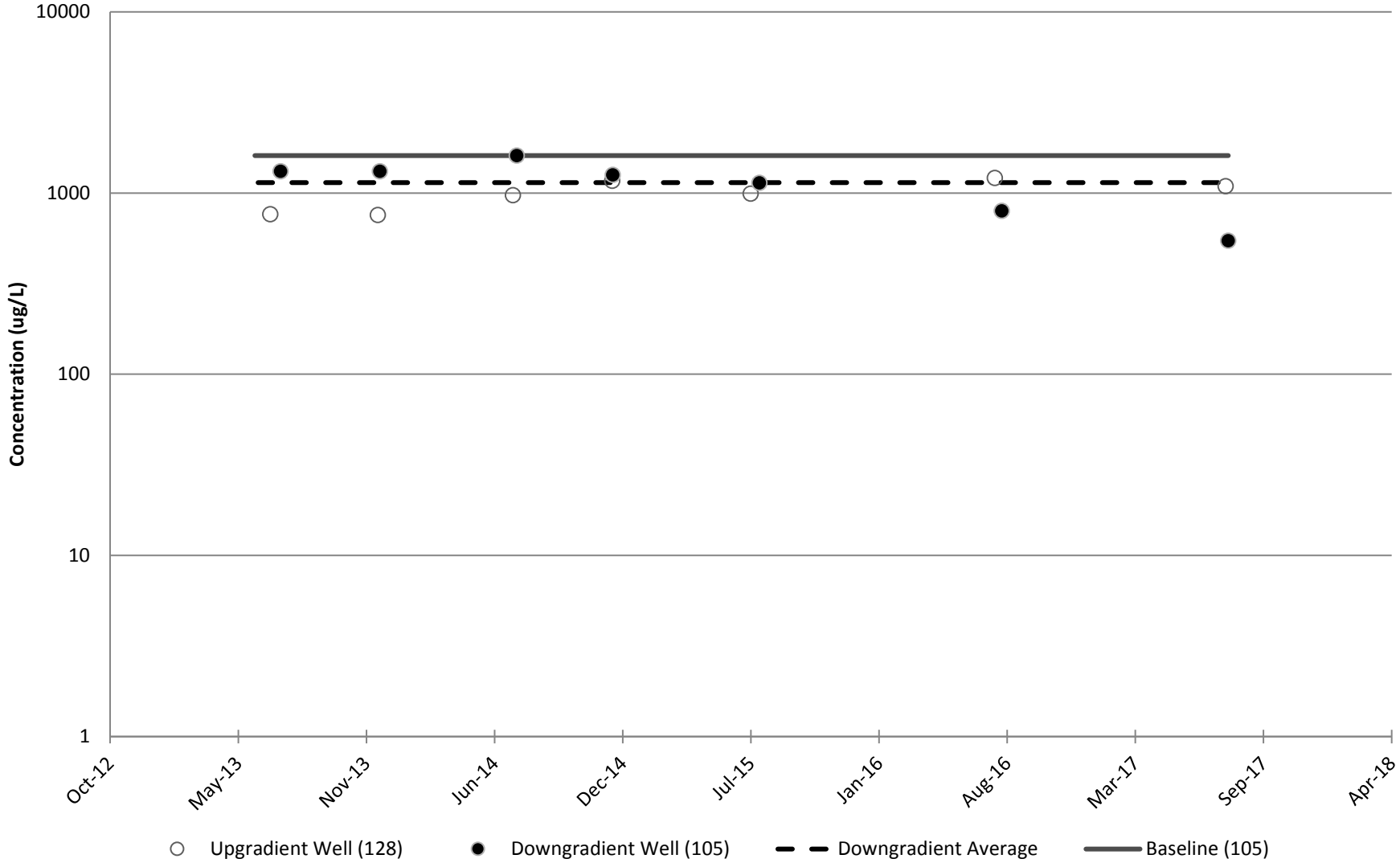


Figure E-24
Control Chart for Zinc
VSWMR Monitoring Network
Downgradient Shallow Bedrock Well 105

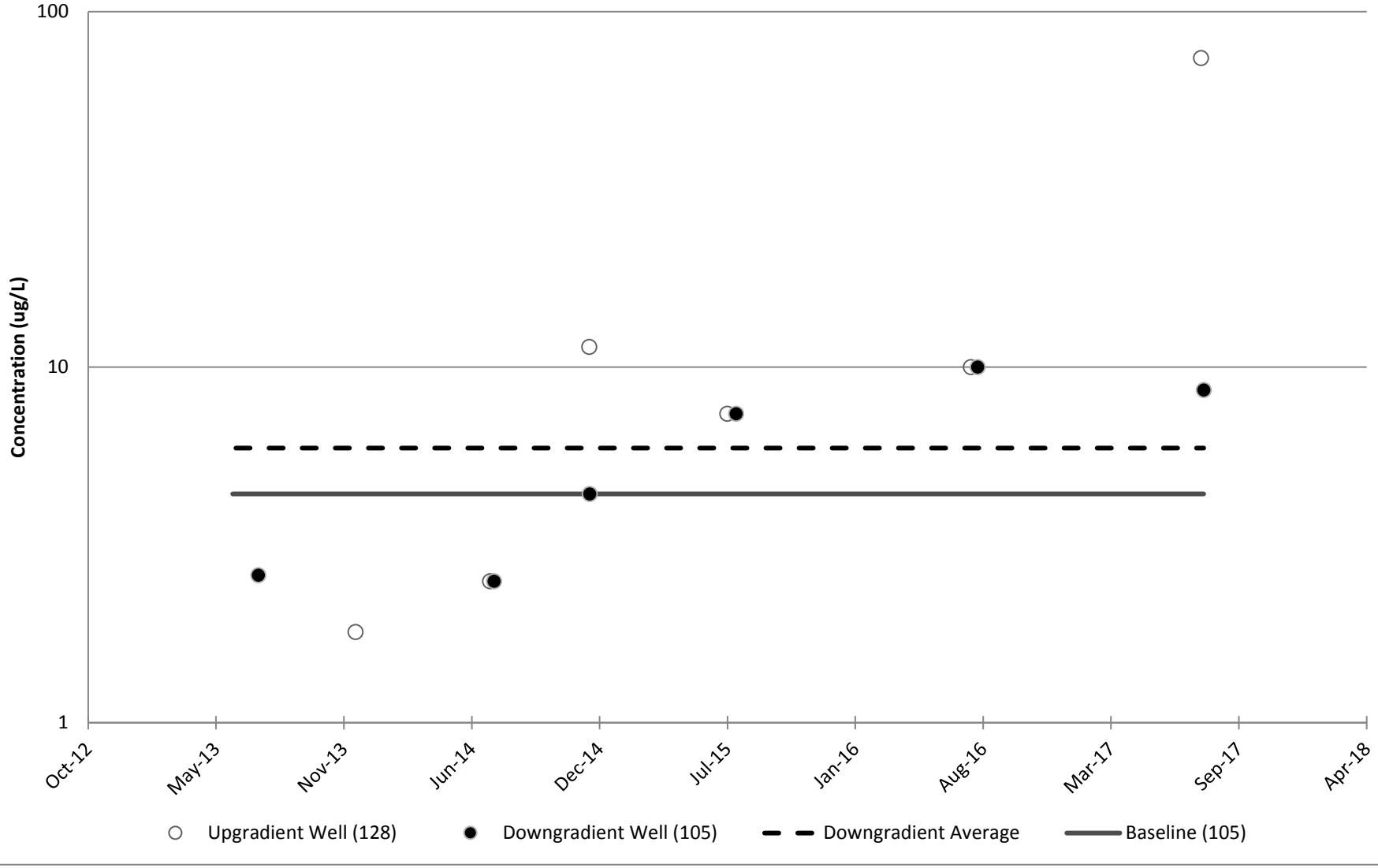


Figure E-25
Control Chart for Antimony
VSWMR Monitoring Network
Downgradient Shallow Bedrock Well 116R

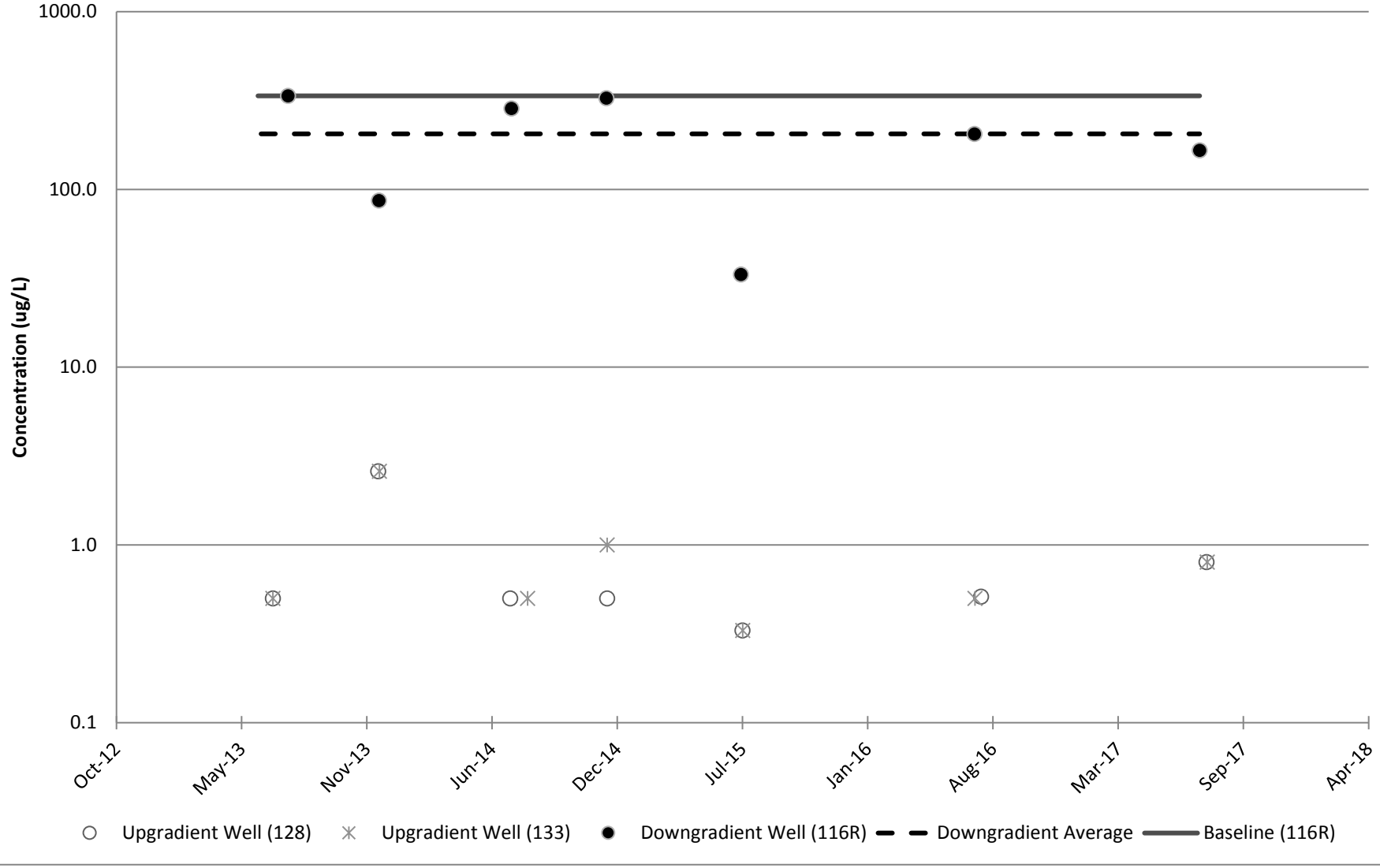


Figure E-26
Control Chart for Arsenic
VSWMR Monitoring Network
Downgradient Shallow Bedrock Well 116R

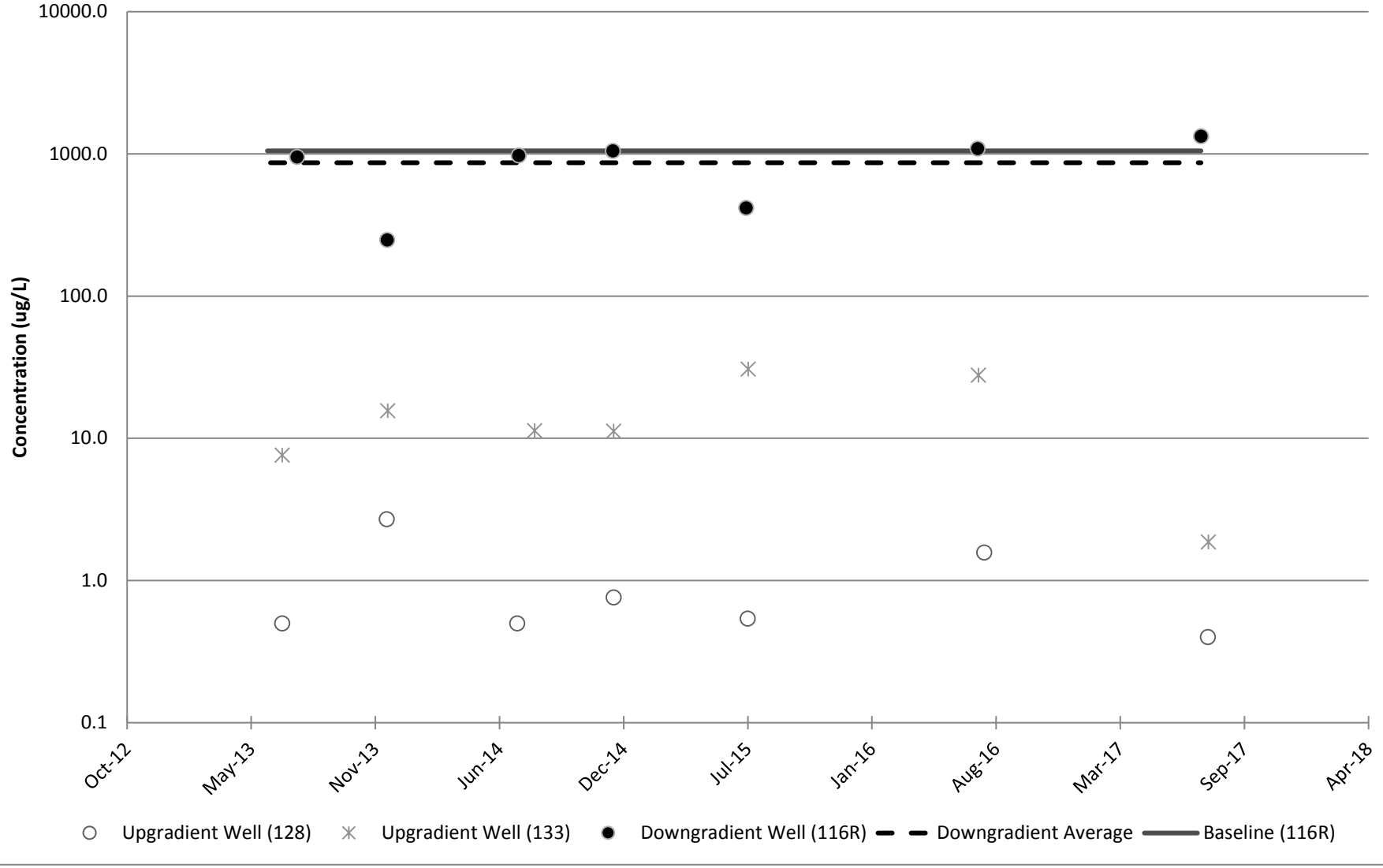


Figure E-27
Control Chart for Cadmium
VSWMR Monitoring Network
Downgradient Shallow Bedrock Well 116R

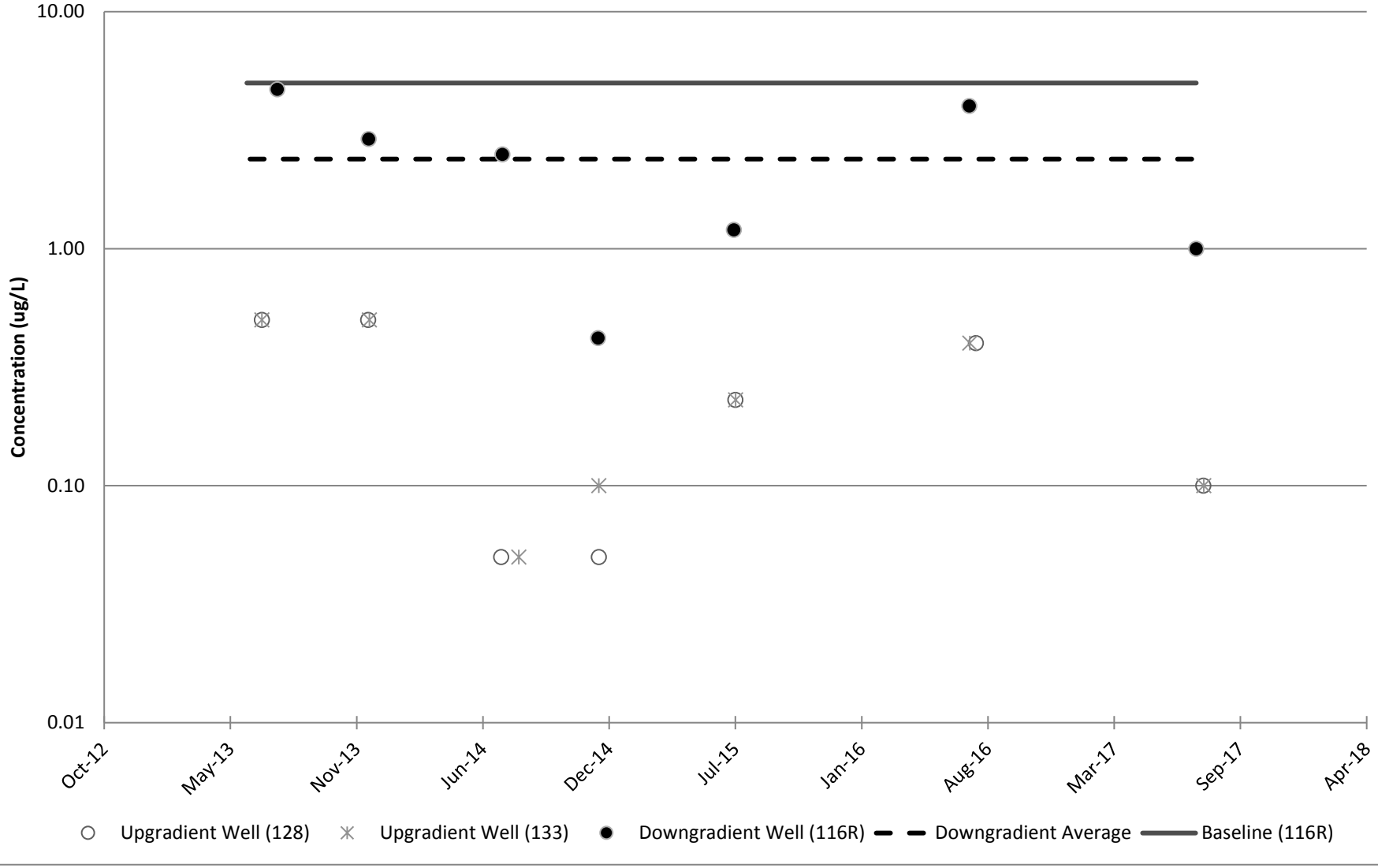


Figure E-28
Control Chart for Chromium
VSWMR Monitoring Network
Downgradient Shallow Bedrock Well 116R

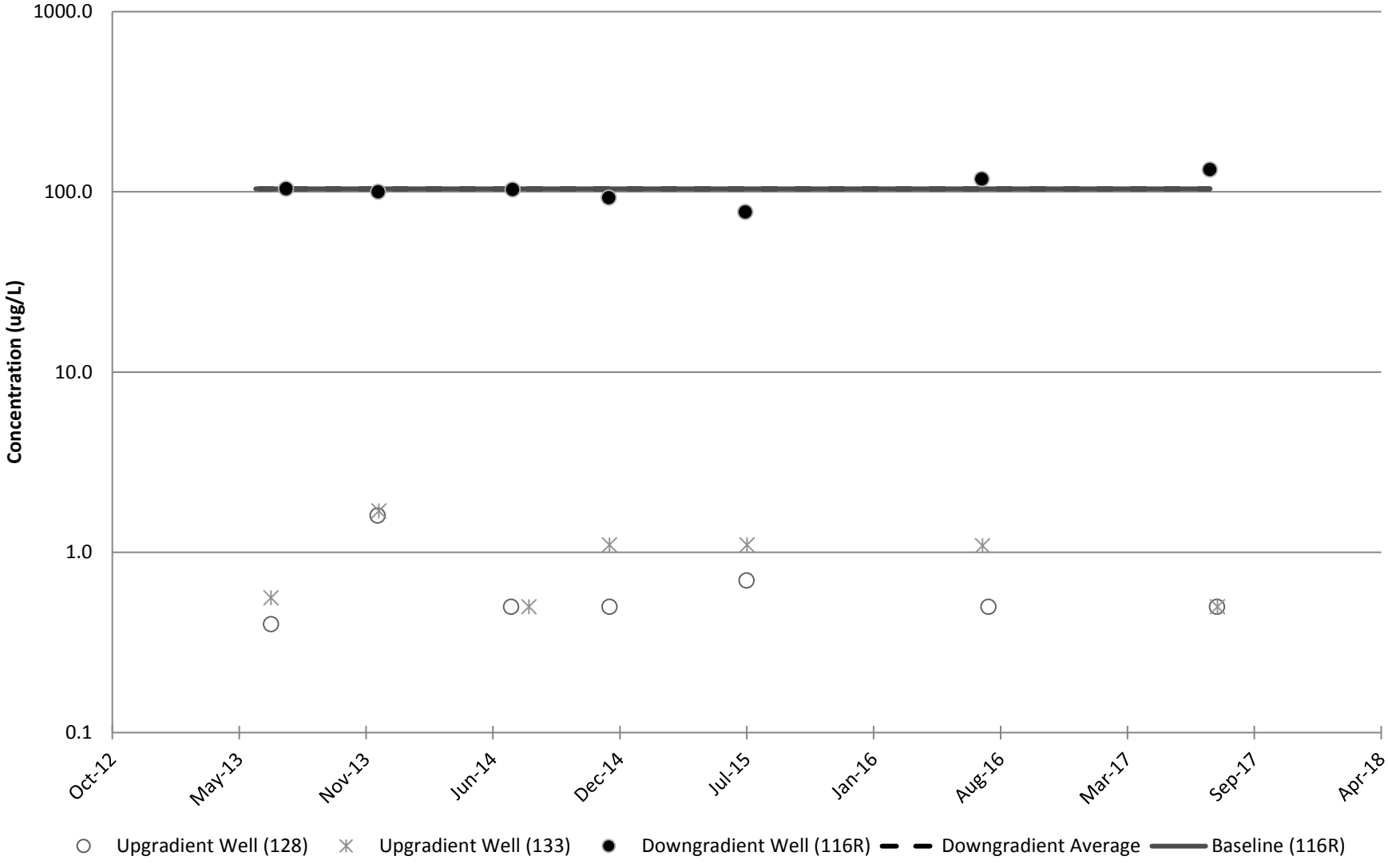


Figure E-29
Control Chart for Cobalt
VSWMR Monitoring Network
Downgradient Shallow Bedrock Well 116R

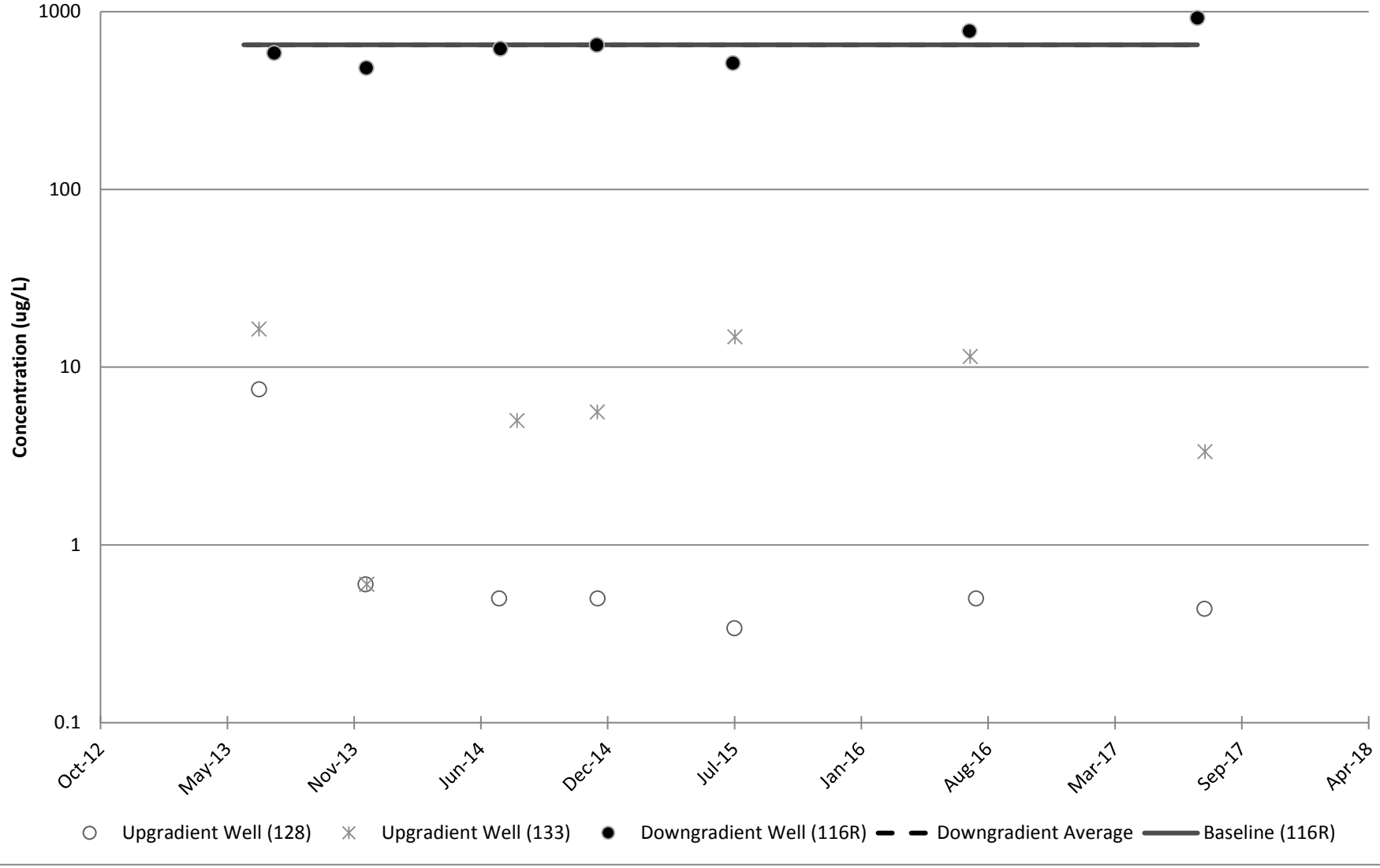


Figure E-30
Control Chart for Nickel
VSWMR Monitoring Network
Downgradient Shallow Bedrock Well 116R

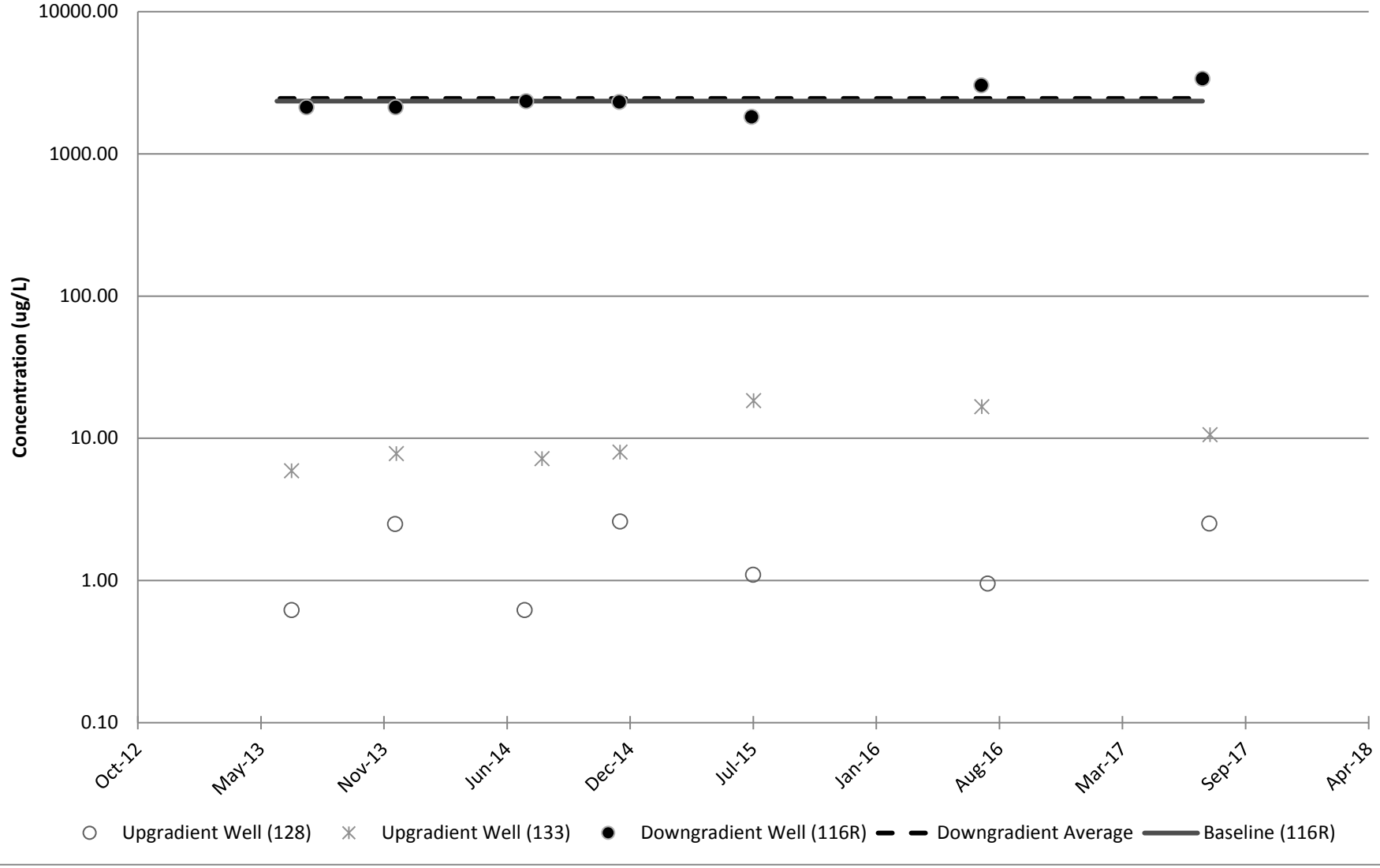


Figure E-31
Control Chart for Cyanide
VSWMR Monitoring Network
Downgradient Shallow Bedrock Well 116R

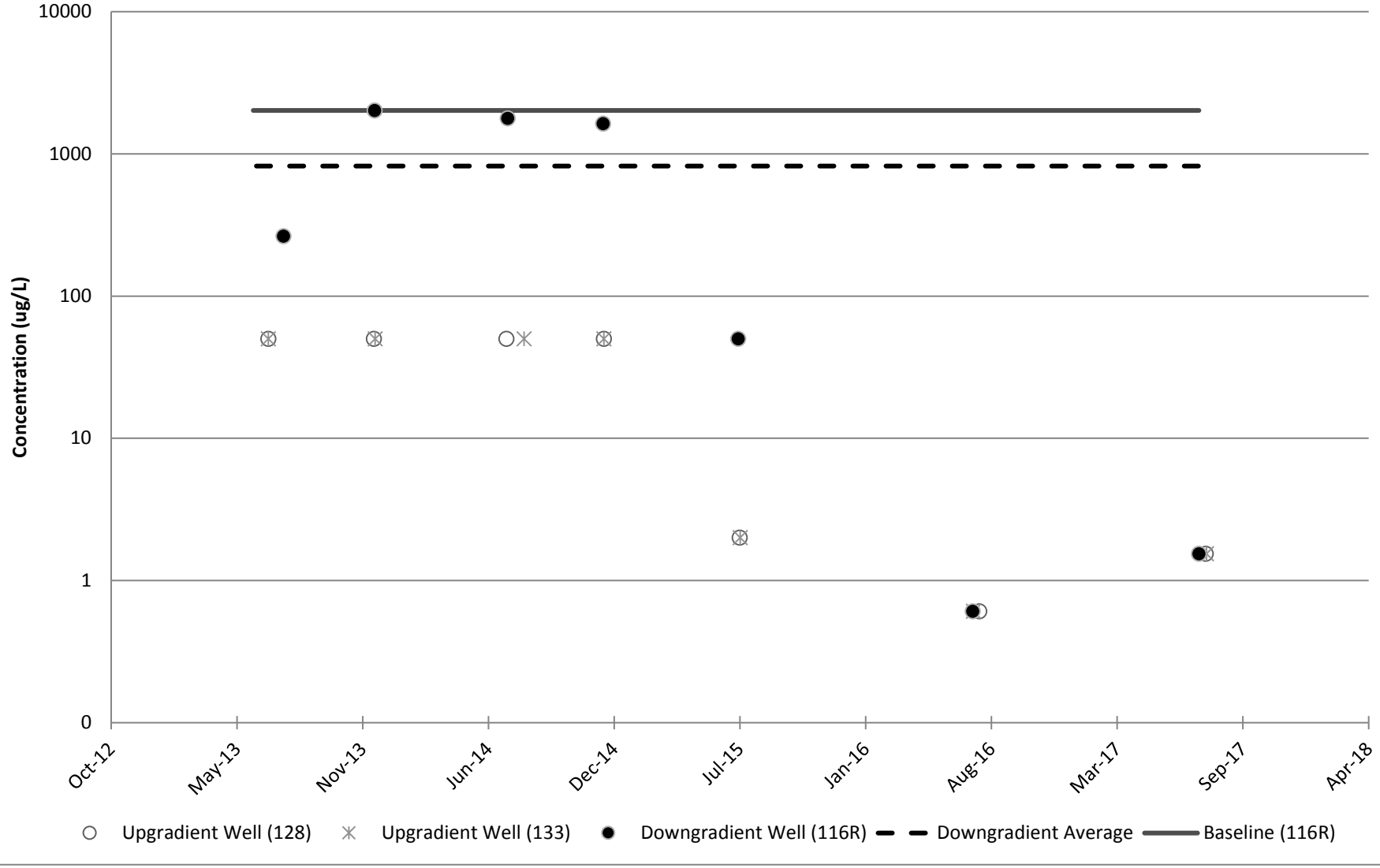


Figure E-32
Control Chart for Zinc
VSWMR Monitoring Network
Downgradient Shallow Bedrock Well 116R

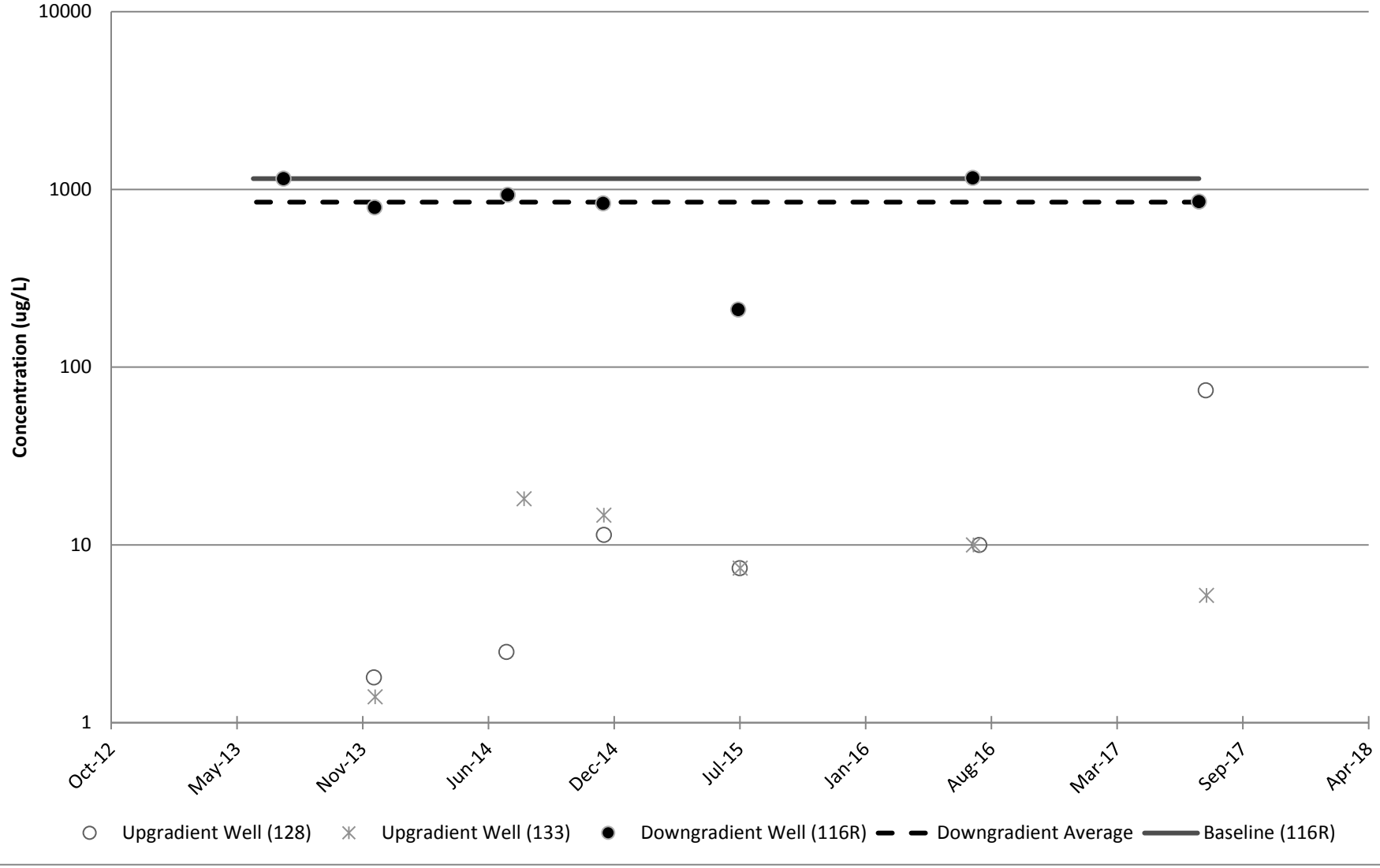


Figure E-33
Control Chart for Carbon Disulfide
VSWMR Monitoring Network
Downgradient Shallow Bedrock Well 138

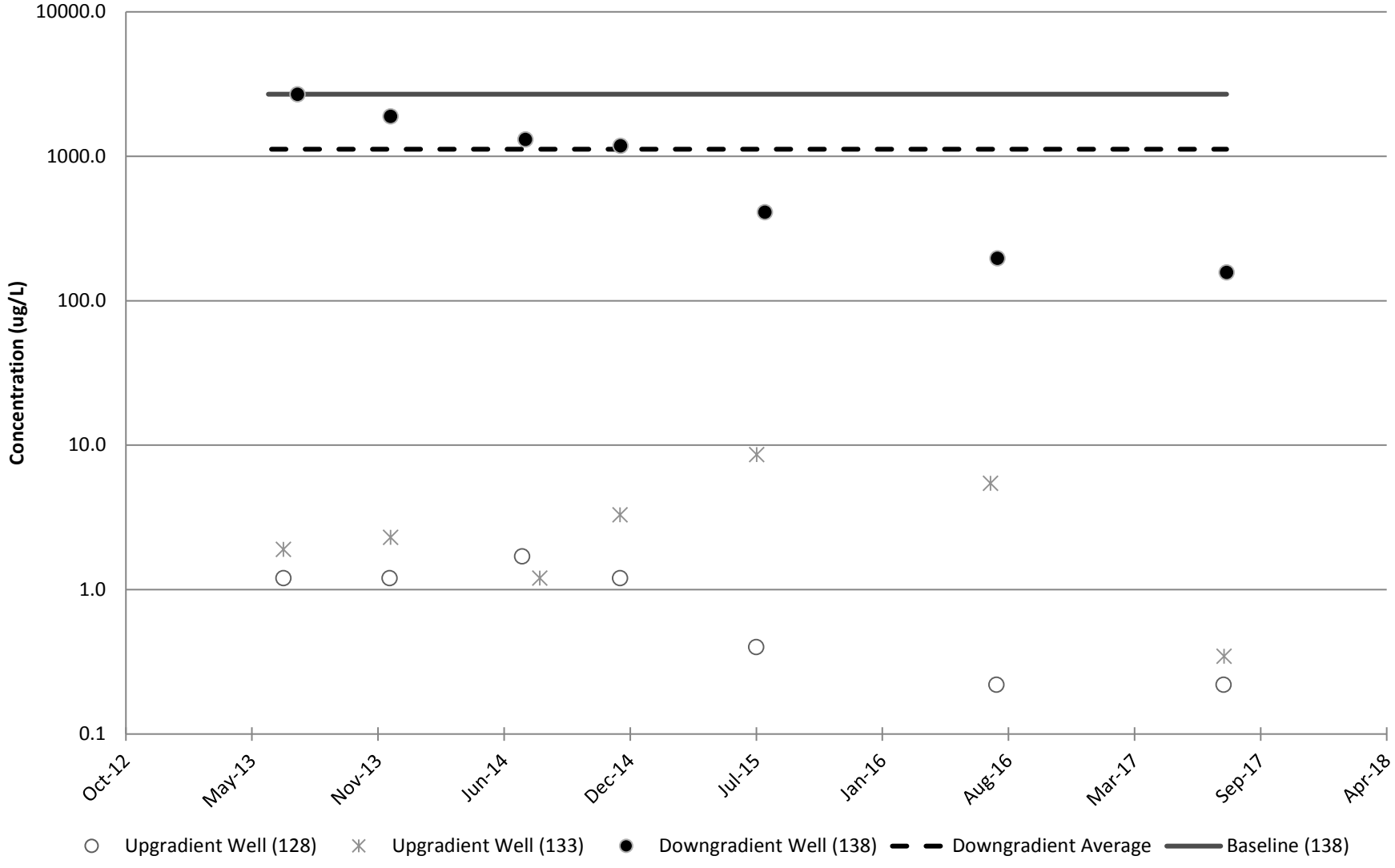


Figure E-34
Control Chart for Antimony
VSWMR Monitoring Network
Downgradient Shallow Bedrock Well 138

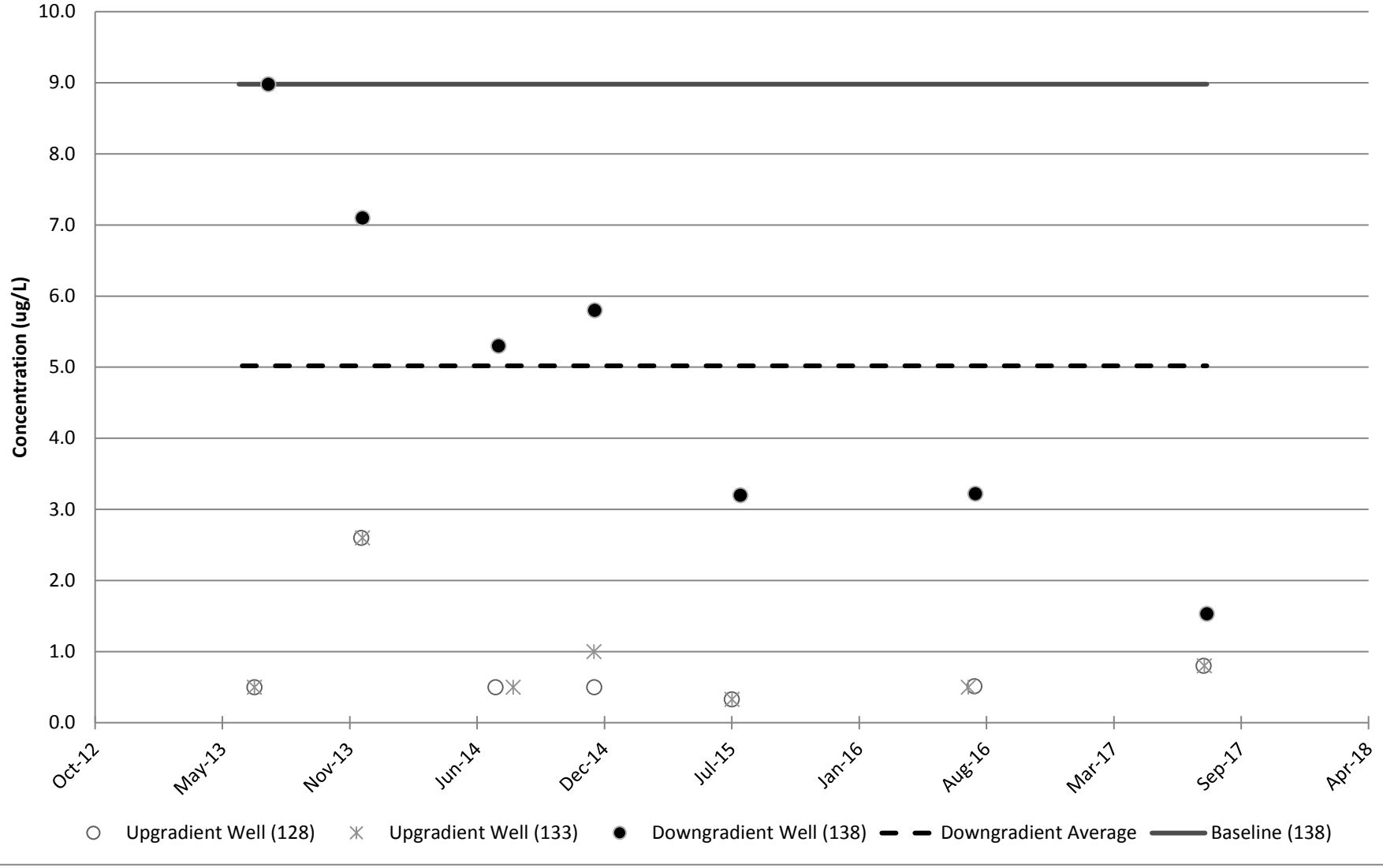


Figure E-35
Control Chart for Arsenic
VSWMR Monitoring Network
Downgradient Shallow Bedrock Well 138

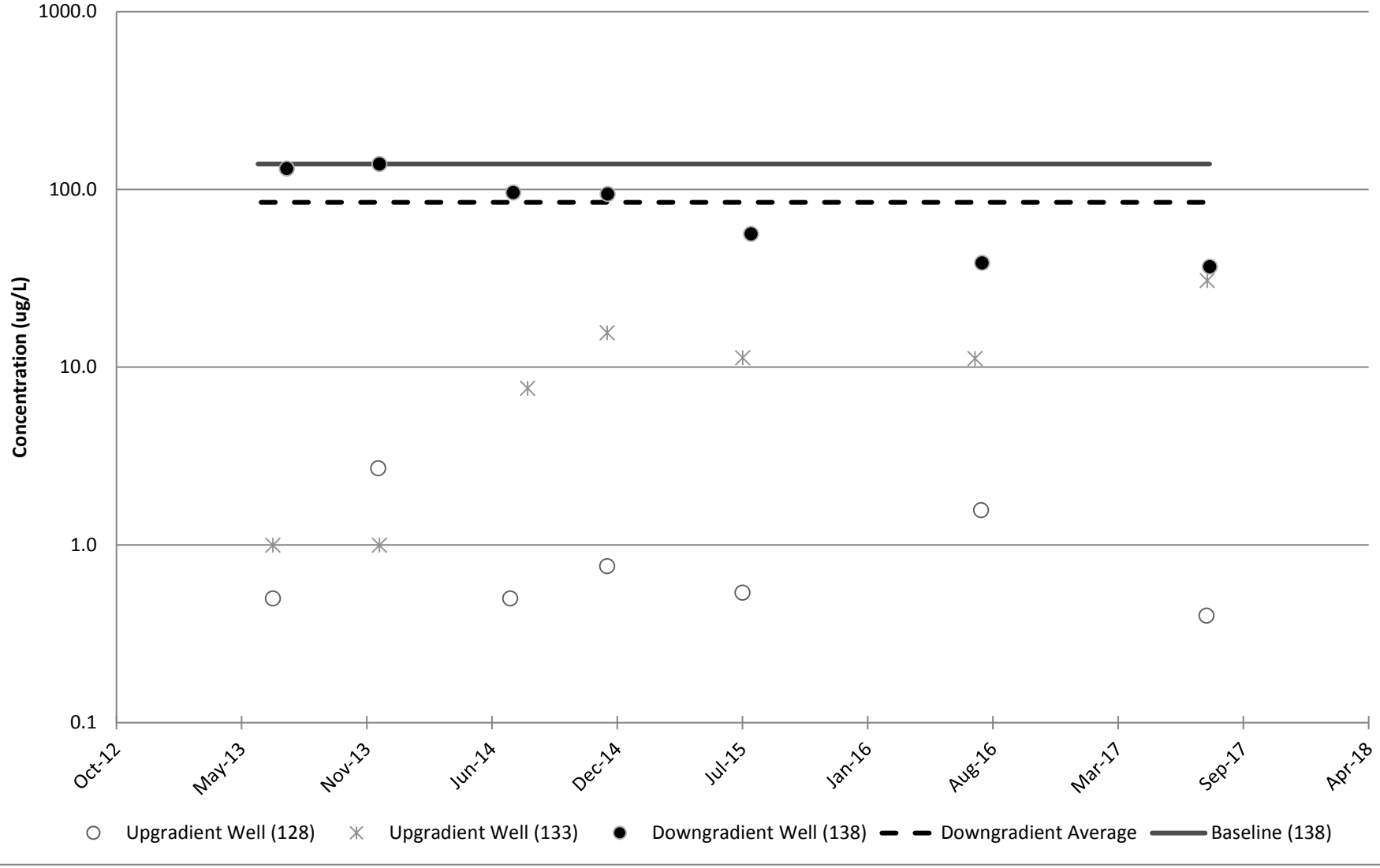


Figure E-36
Control Chart for Cobalt
VSWMR Monitoring Network
Downgradient Shallow Bedrock Well 138

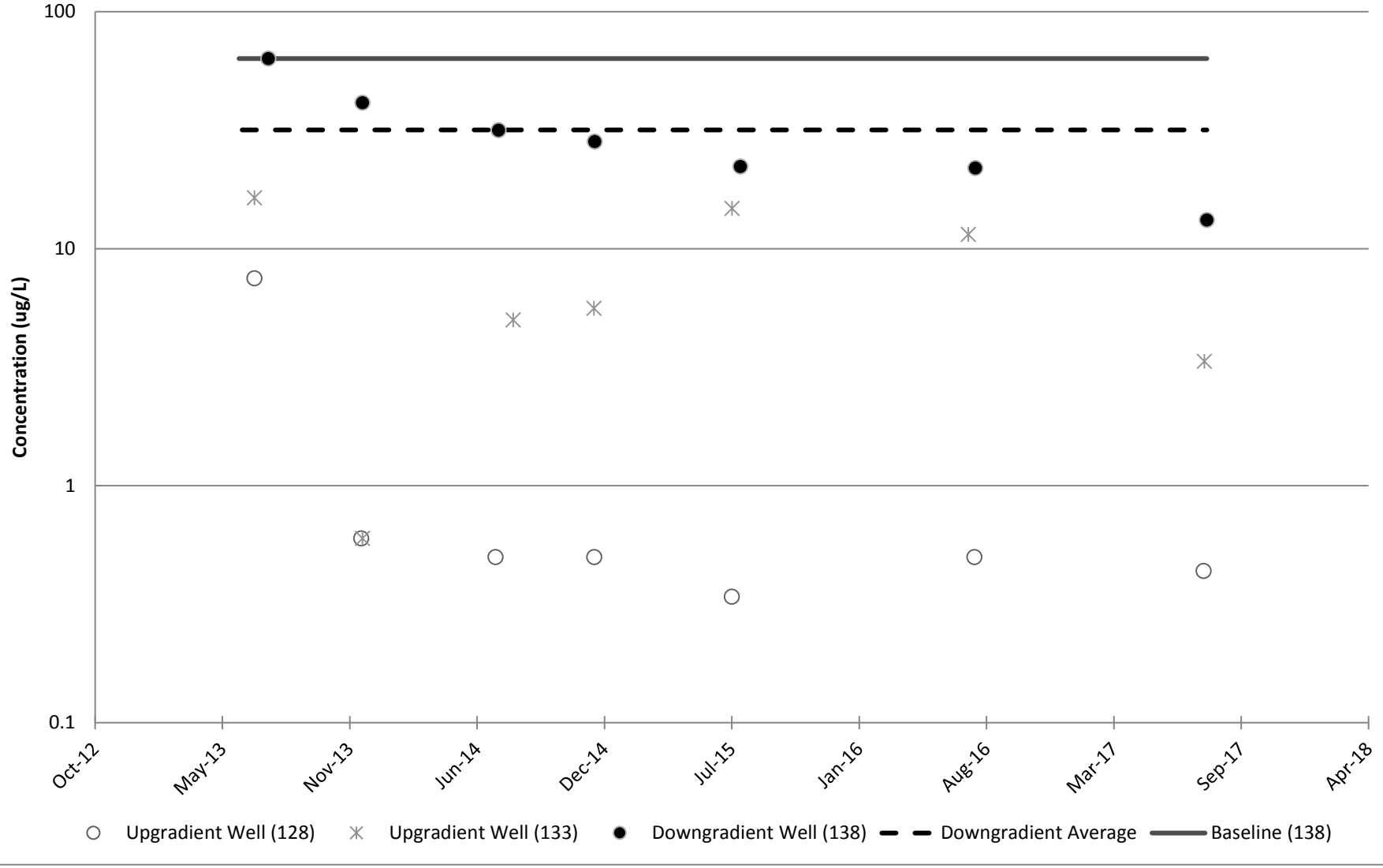


Figure E-37
Control Chart for Iron
VSWMR Monitoring Network
Downgradient Shallow Bedrock Well 138

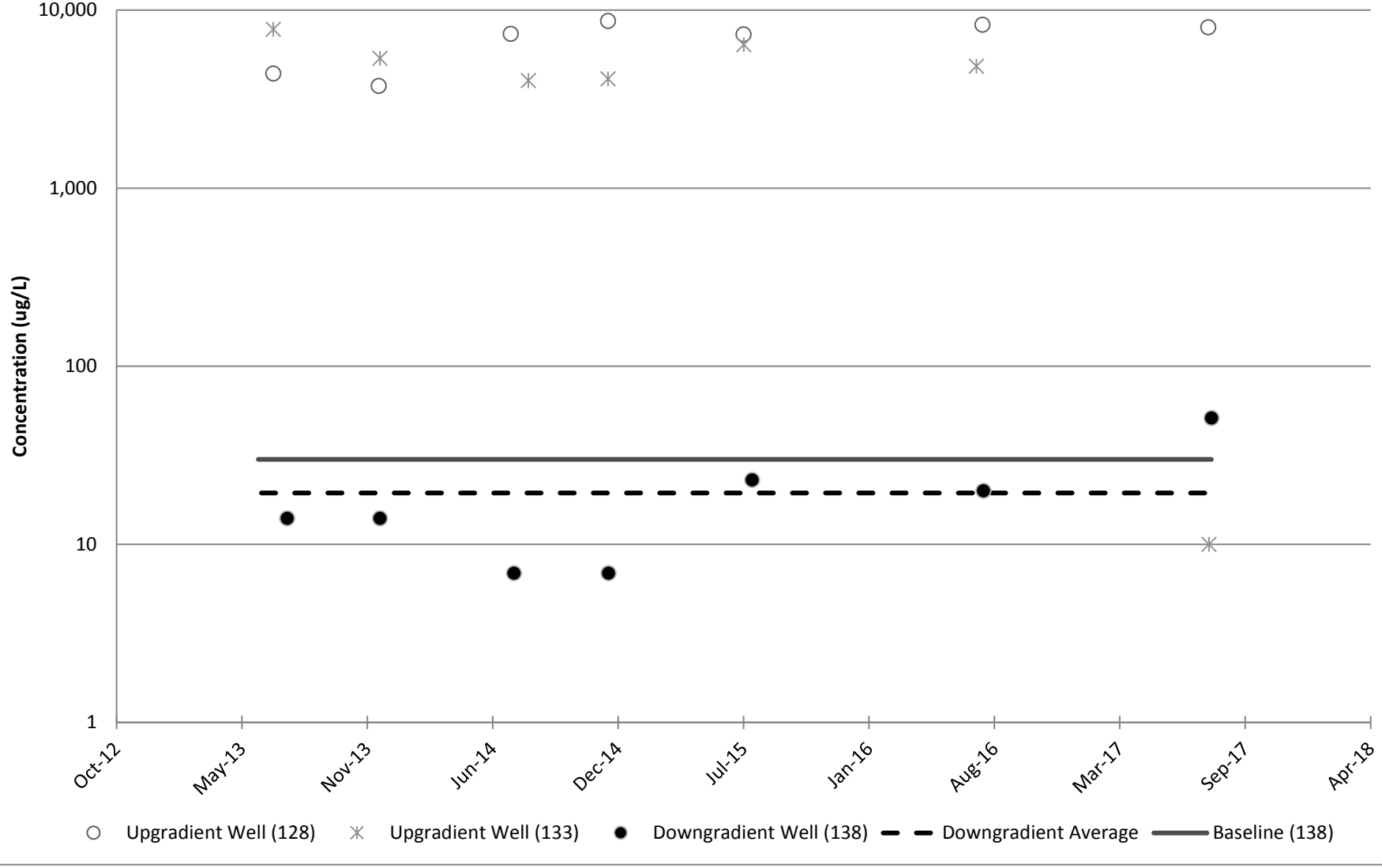


Figure E-38
Control Chart for Manganese
VSWMR Monitoring Network
Downgradient Shallow Bedrock Well 138

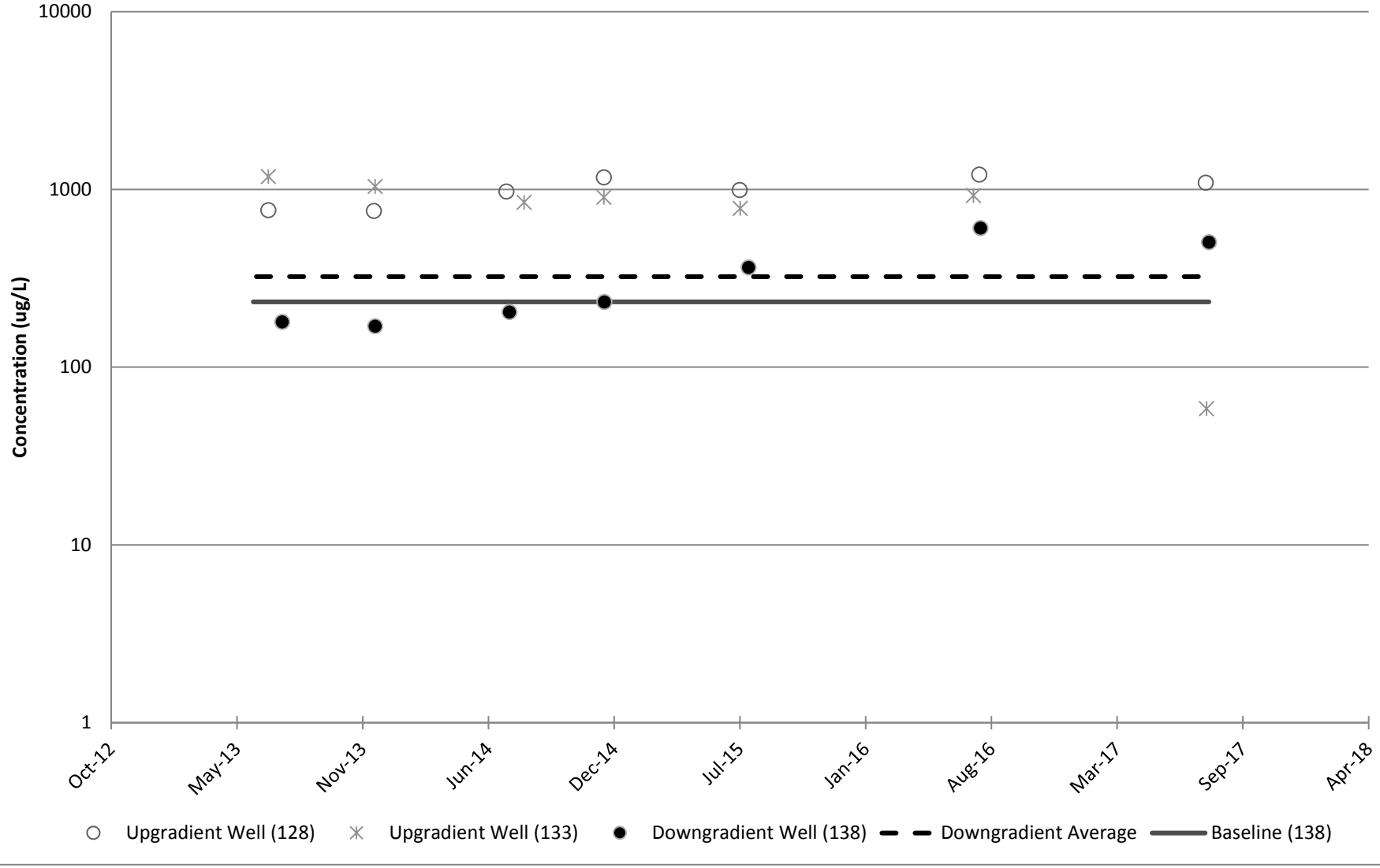


Figure E-39
Control Chart for Arsenic
VSWMR Monitoring Network
Downgradient Shallow Bedrock Well PZ-06

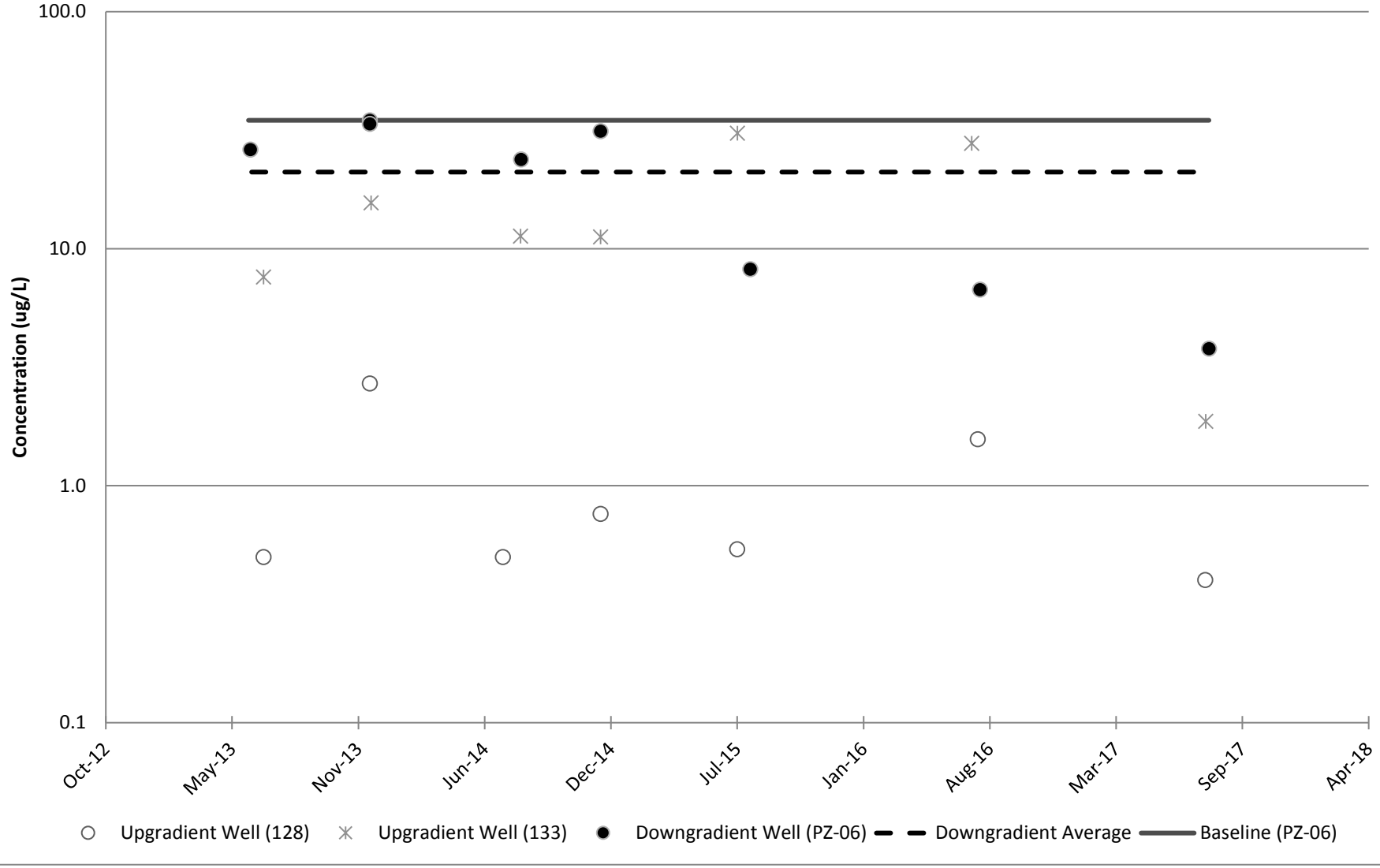
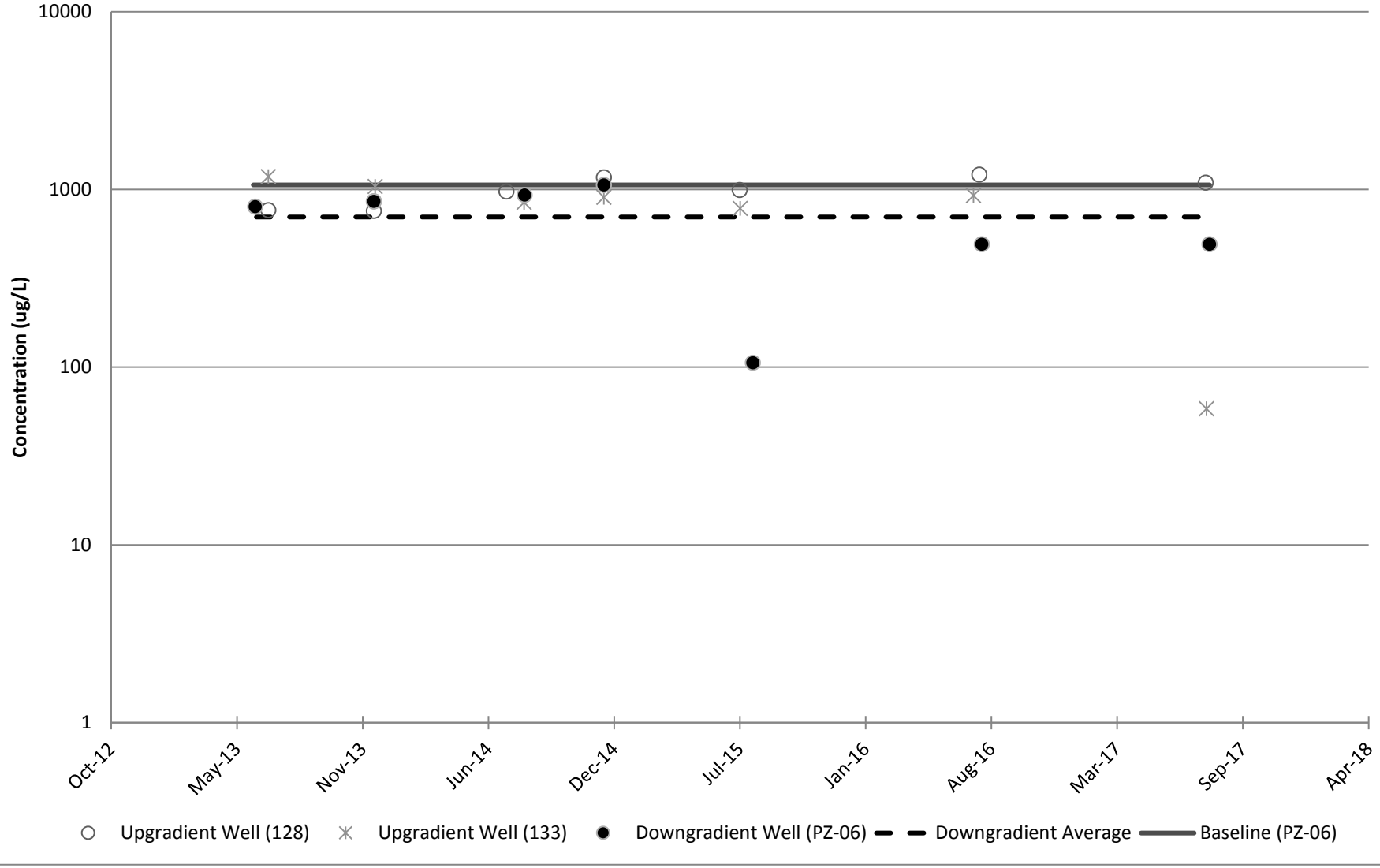


Figure E-40
Control Chart for Manganese
VSWMR Monitoring Network
Downgradient Shallow Bedrock Well PZ-06



APPENDIX F
OU-10 CONTROL CHARTS

PARSONS

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Figure F-1
Control Chart for Acetone
Operable Unit-10 Management Unit VB 1-8
Downgradient Overburden Well GPW-14

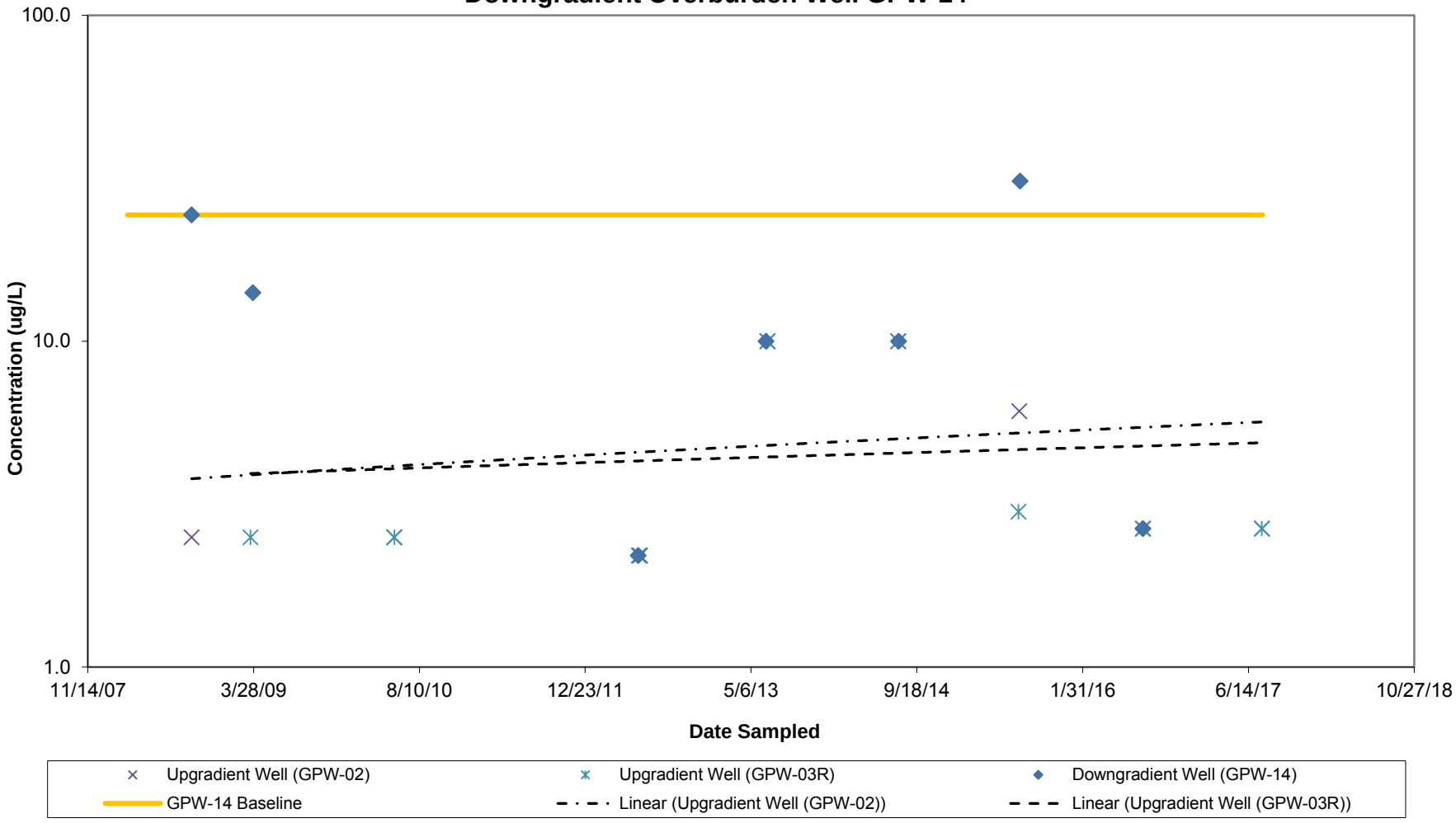


Figure F-2
Control Chart for Thallium
Operable Unit-10 Management Unit VB 1-8
Downgradient Overburden Well GPW-14

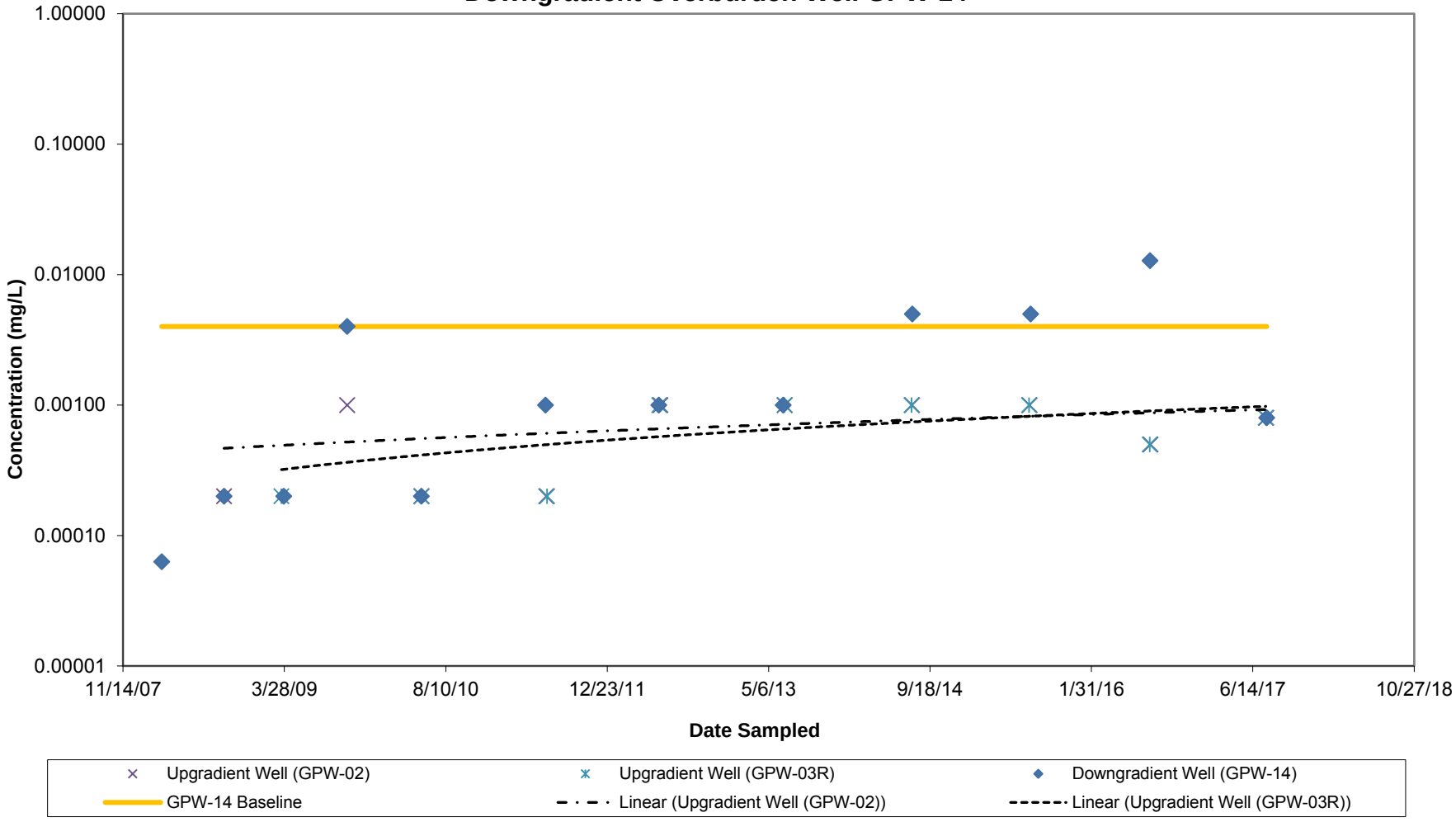


Figure F-3
Control Chart for Zinc
Operable Unit-10 Management Unit VB 1-8
Downgradient Overburden Well GPW-15R

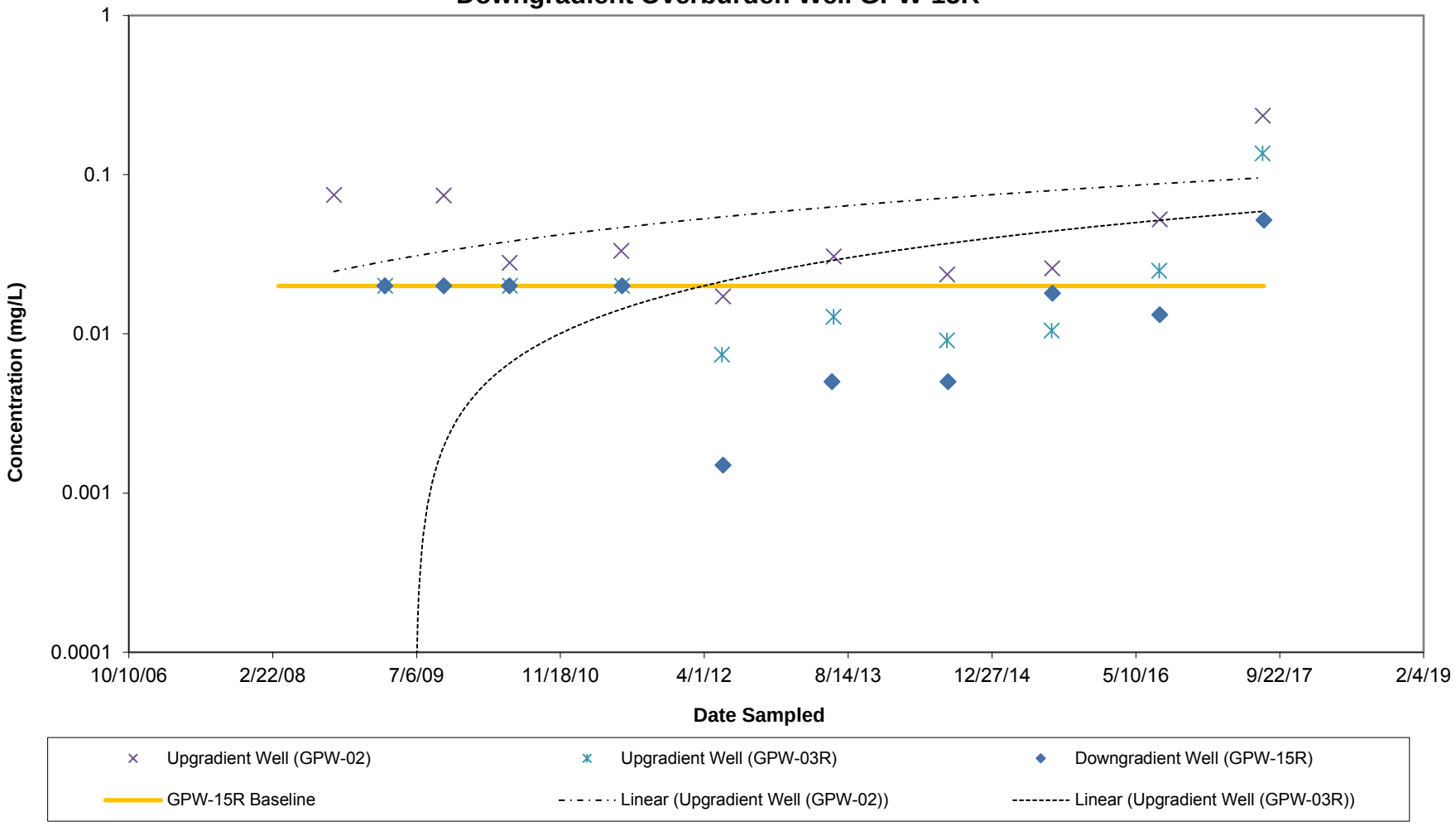


Figure F-4
Control Chart for Acetone
Operable Unit-10 Management Unit VB 1-8
Downgradient Shallow Bedrock Well 119

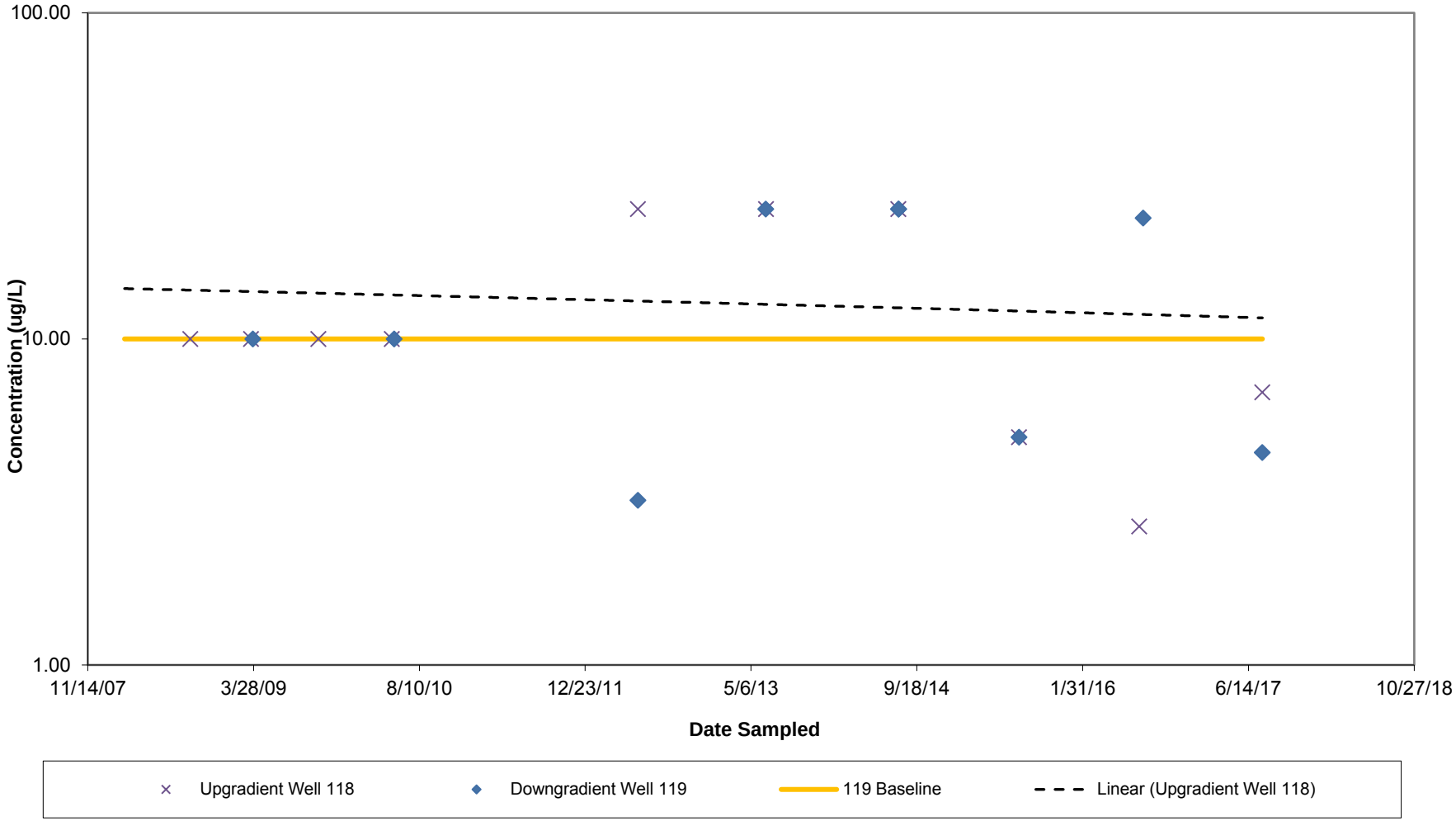


Figure F-5
Control Chart for Xylenes
Operable Unit-10 Management Unit VB 1-8
Downgradient Shallow Bedrock Well 119

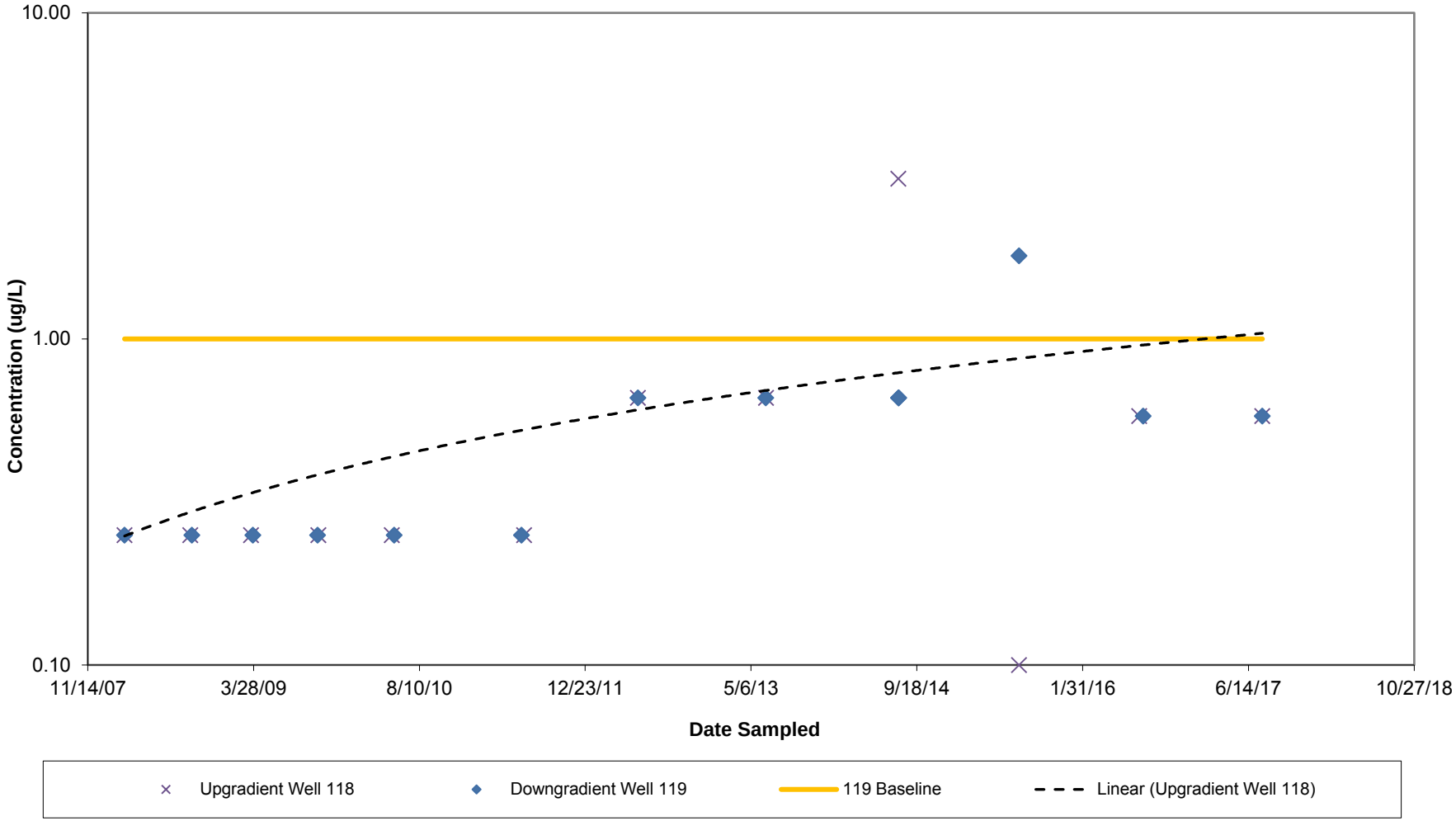


Figure F-6
Control Chart for Antimony
Operable Unit-10 Management Unit VB 1-8
Downgradient Shallow Bedrock Well 119

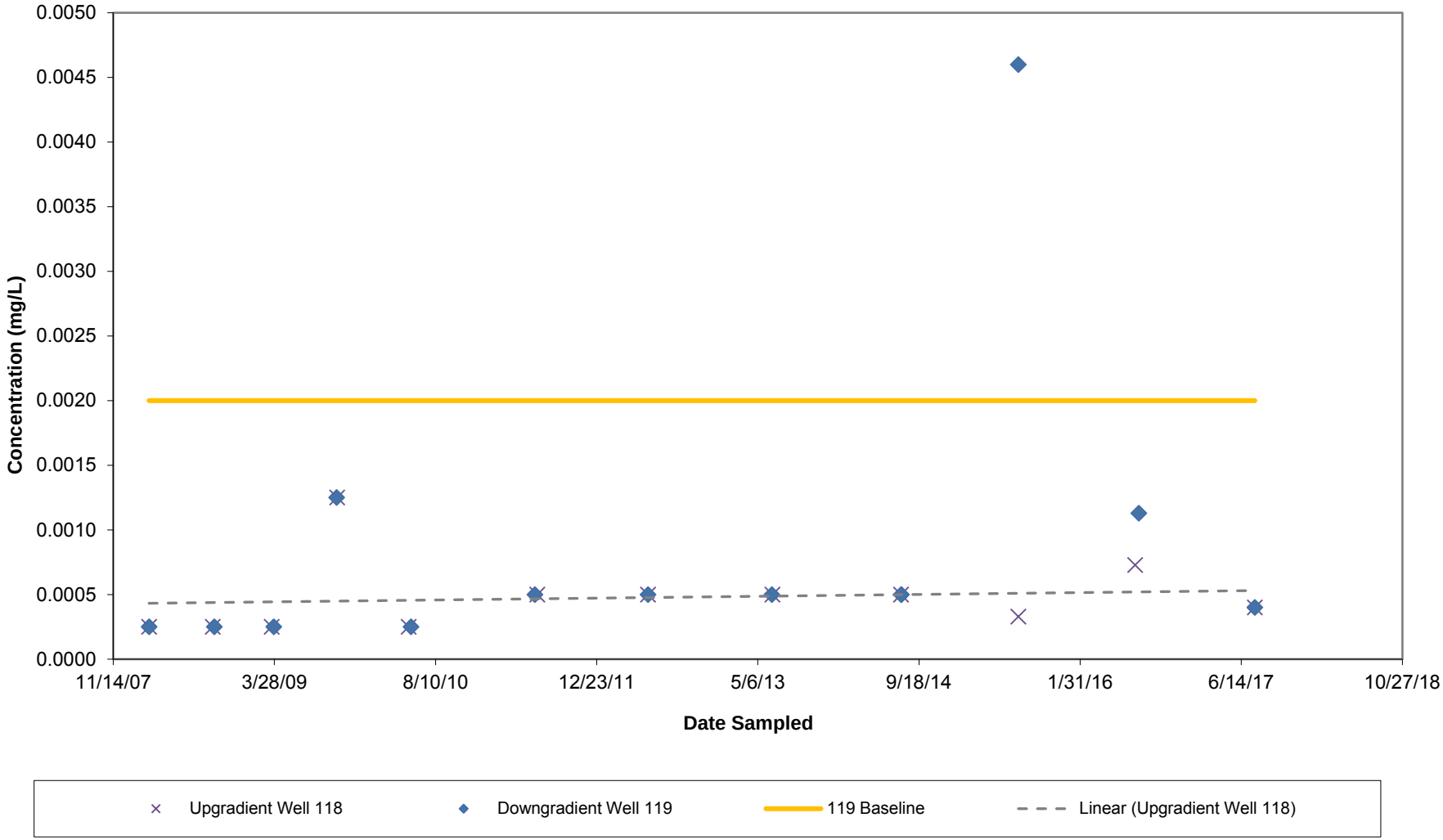


Figure F-7
Control Chart for Zinc
Operable Unit-10 Management Unit VB 1-8
Downgradient Shallow Bedrock Well 119

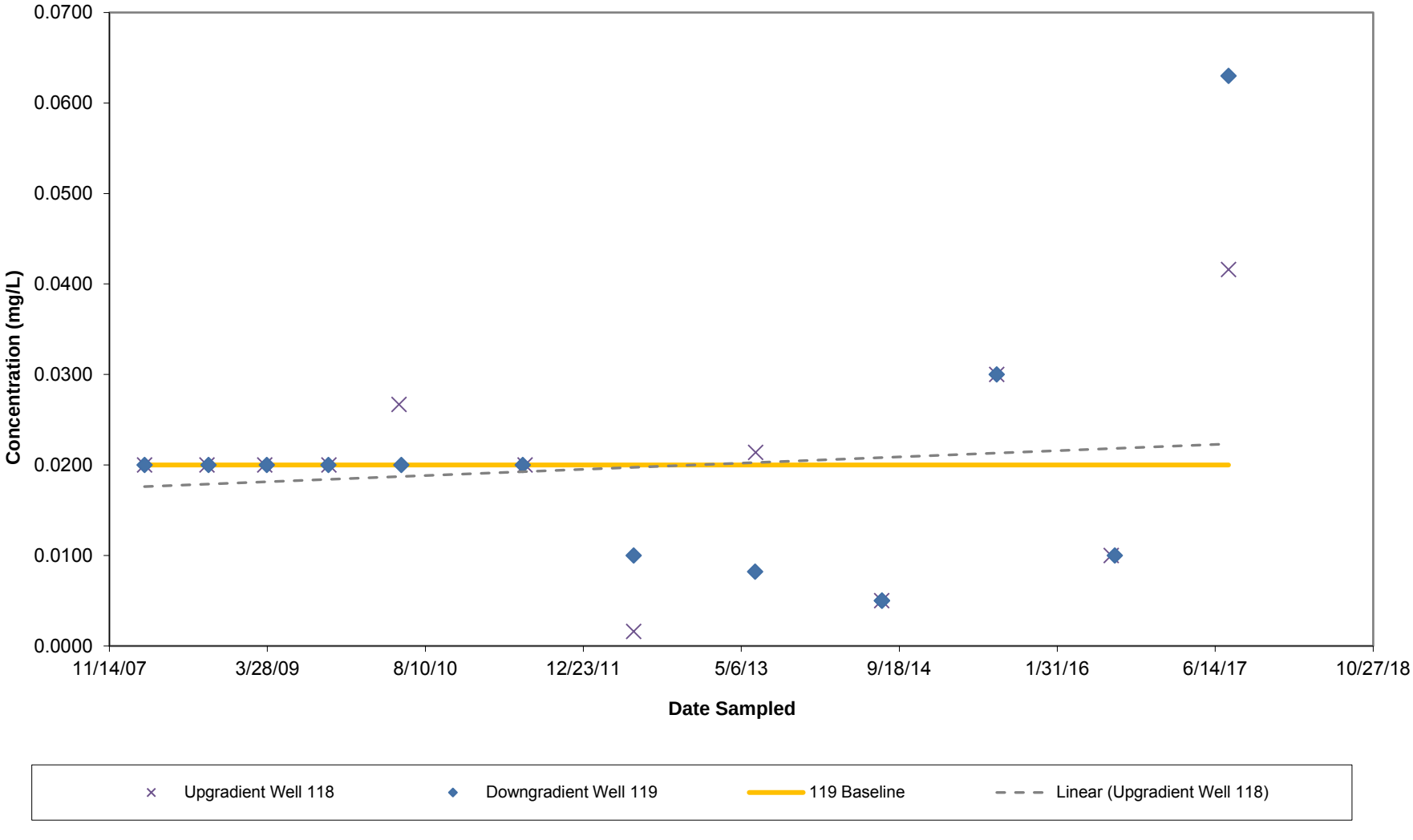


Figure F-8
Control Chart for Tetrachloroethylene
Operable Unit-10 Management Unit VB 1-8
Downgradient Shallow Bedrock Well 132

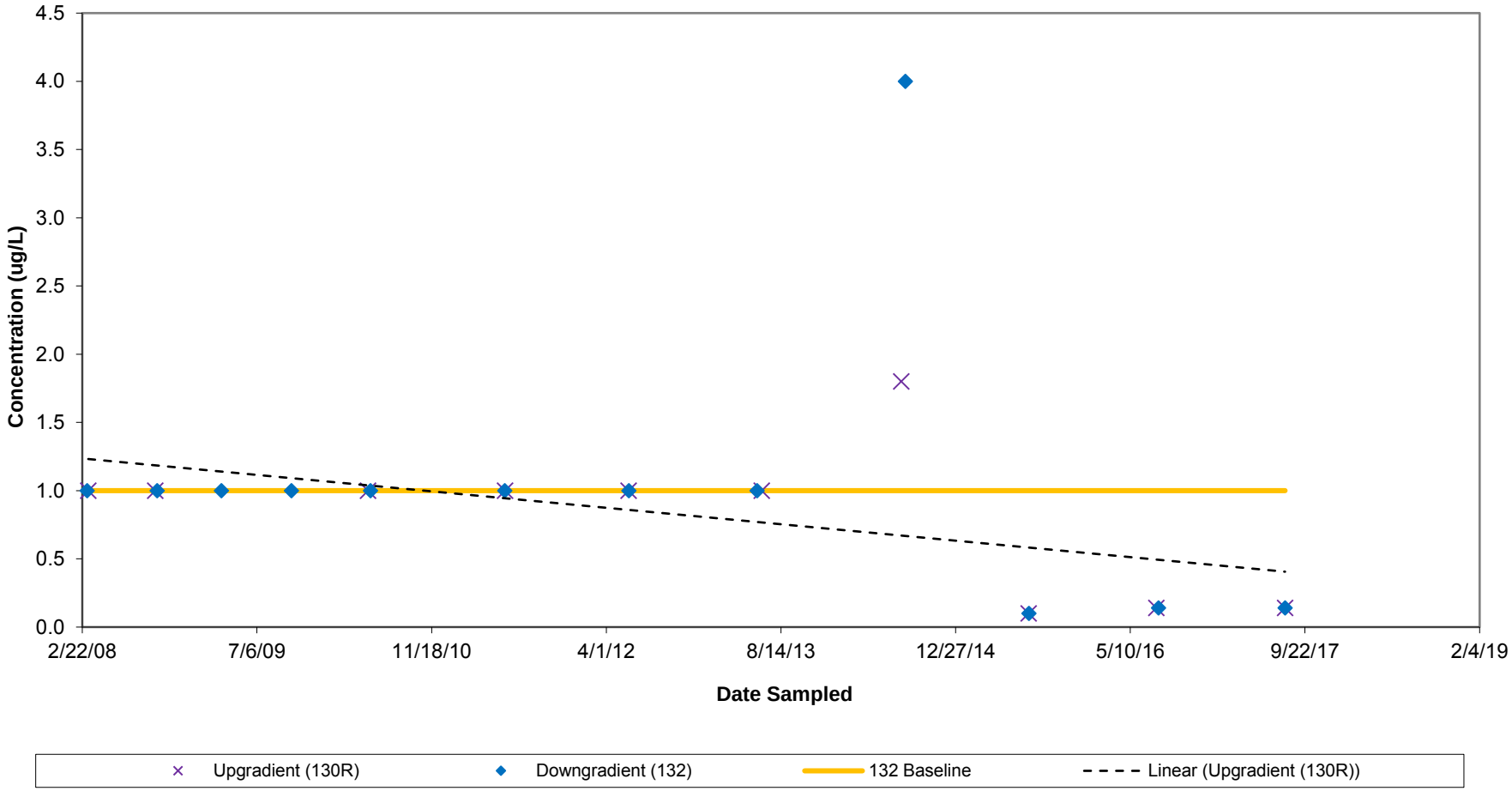


Figure F-9
Control Chart for Arsenic
Operable Unit-10 Management Unit VB 1-8
Downgradient Shallow Bedrock Well 132

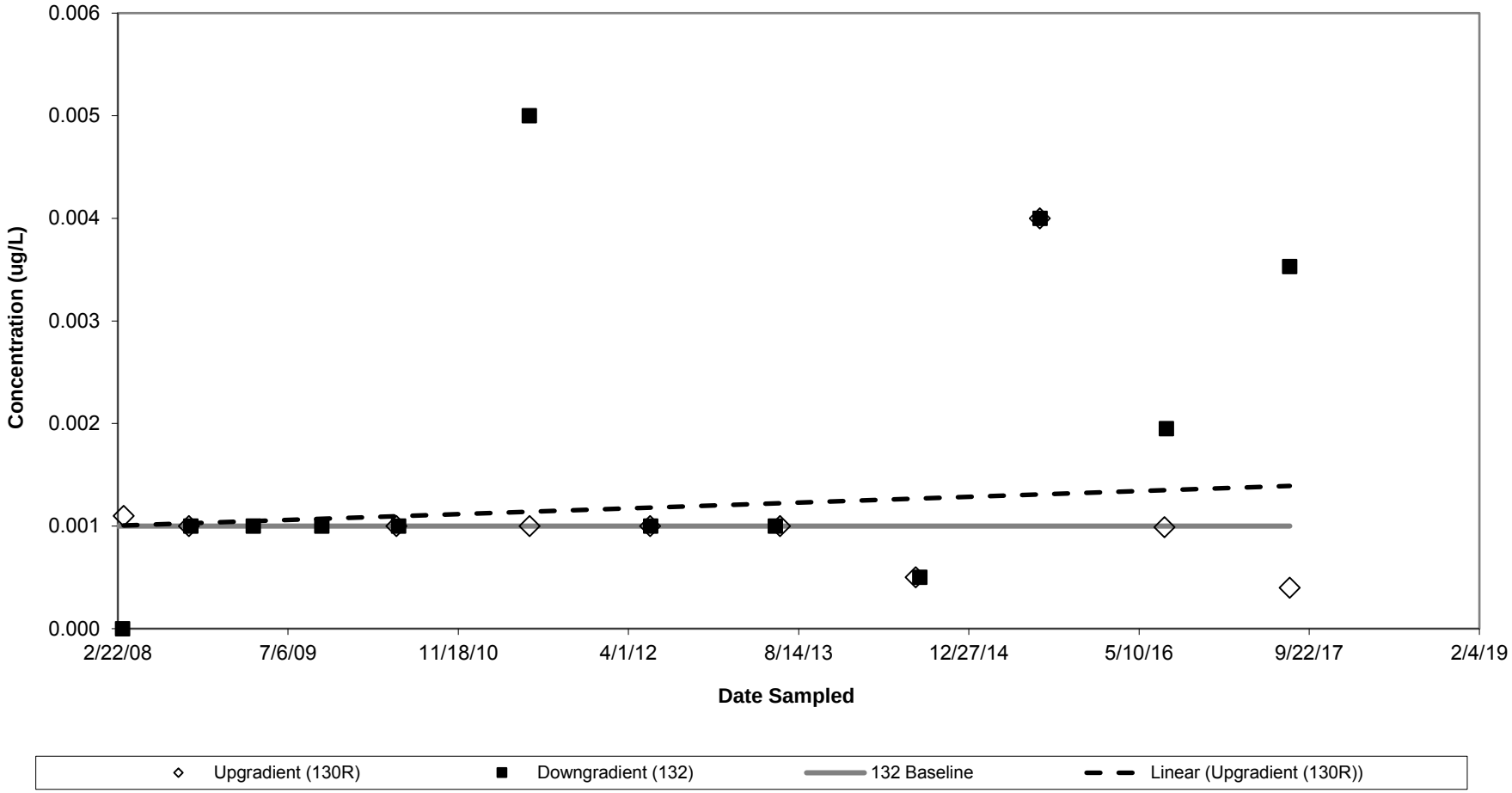


Figure F-10
Control Chart for Acetone
Operable Unit-10 Management Unit New Landfill
Downgradient Shallow Bedrock Well MW-7

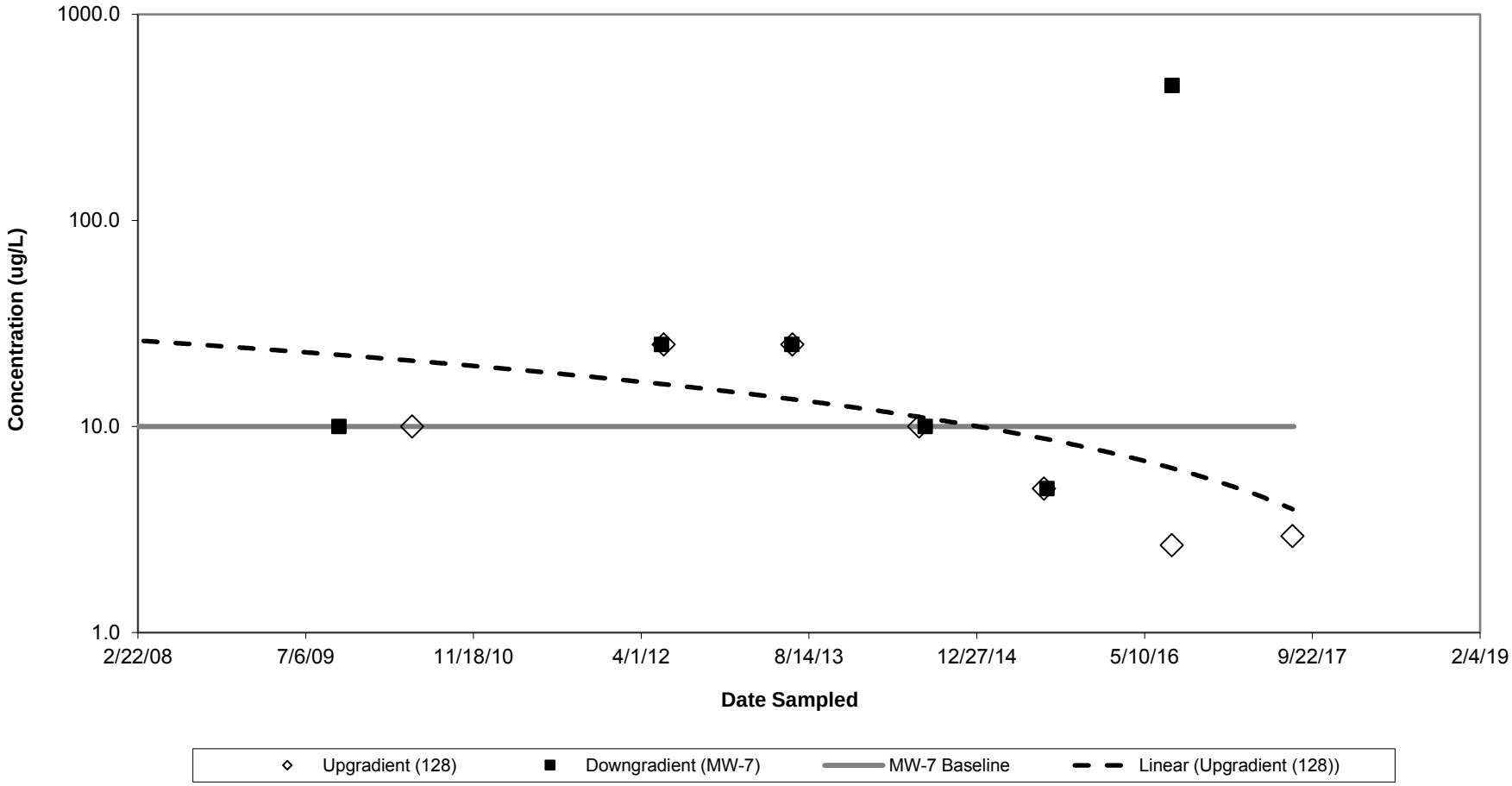


Figure F-11
Control Chart for Vinyl Chloride
Operable Unit-10 Management Unit New Landfill
Downgradient Shallow Bedrock Well MW-7

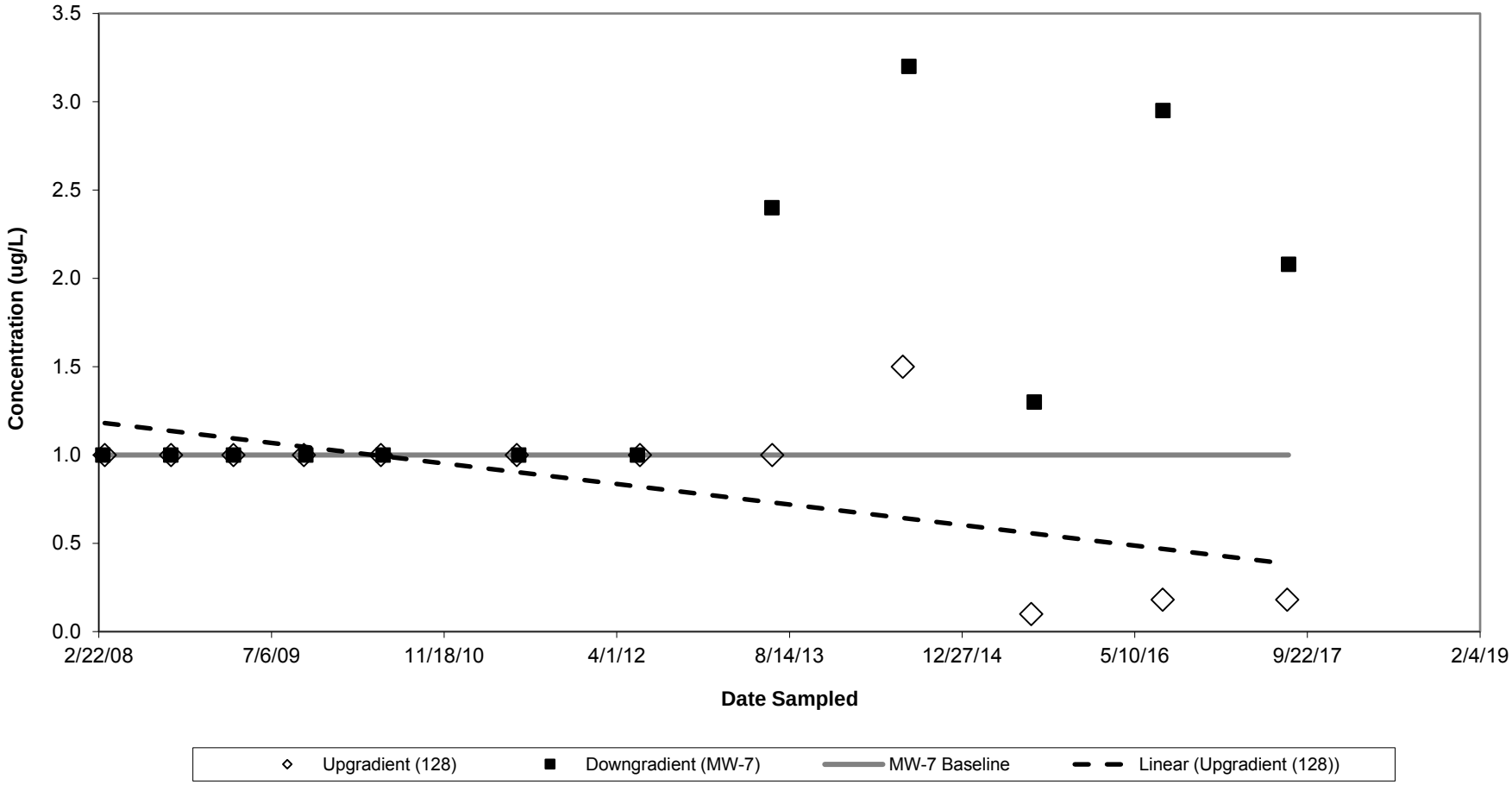


Figure F-12
Control Chart for Xylenes
Operable Unit-10 Management Unit New Landfill
Downgradient Shallow Bedrock Well MW-7

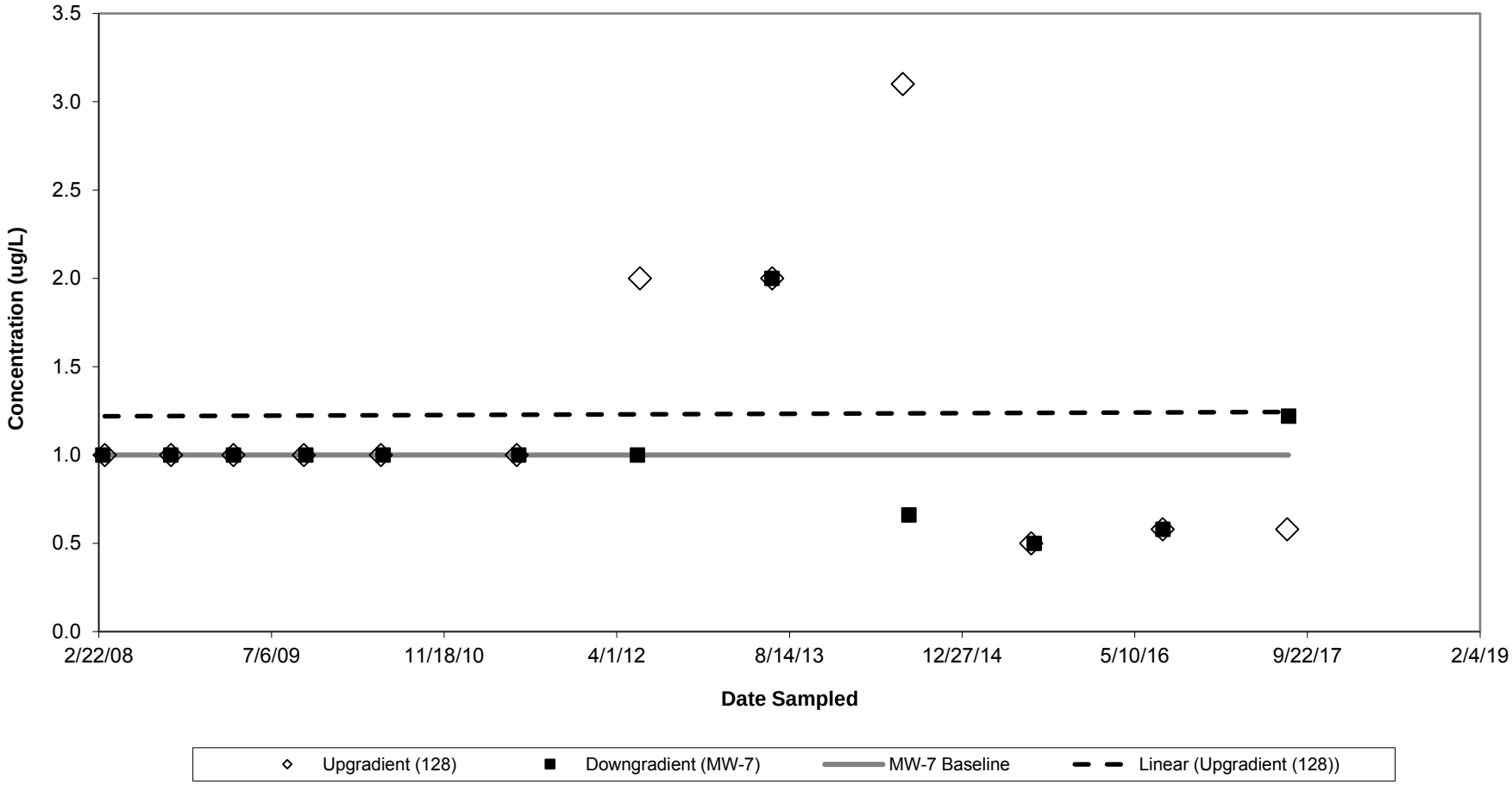


Figure F-13
Control Chart for Arsenic
Operable Unit-10 Management Unit New Landfill
Downgradient Shallow Bedrock Well MW-7

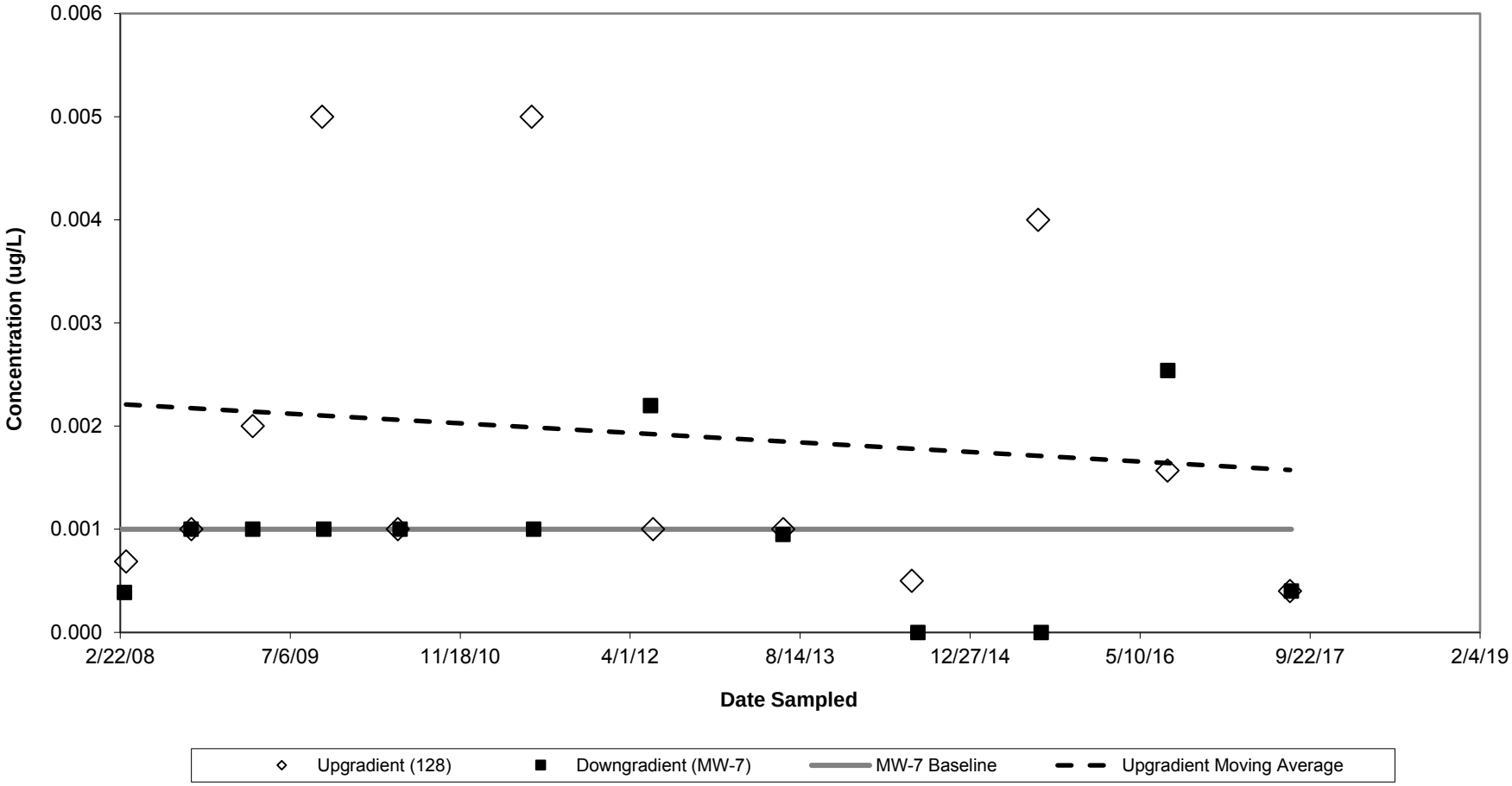


Figure F-14
Control Chart for Zinc
Operable Unit-10 Management Unit New Landfill
Downgradient Shallow Bedrock Well MW-7

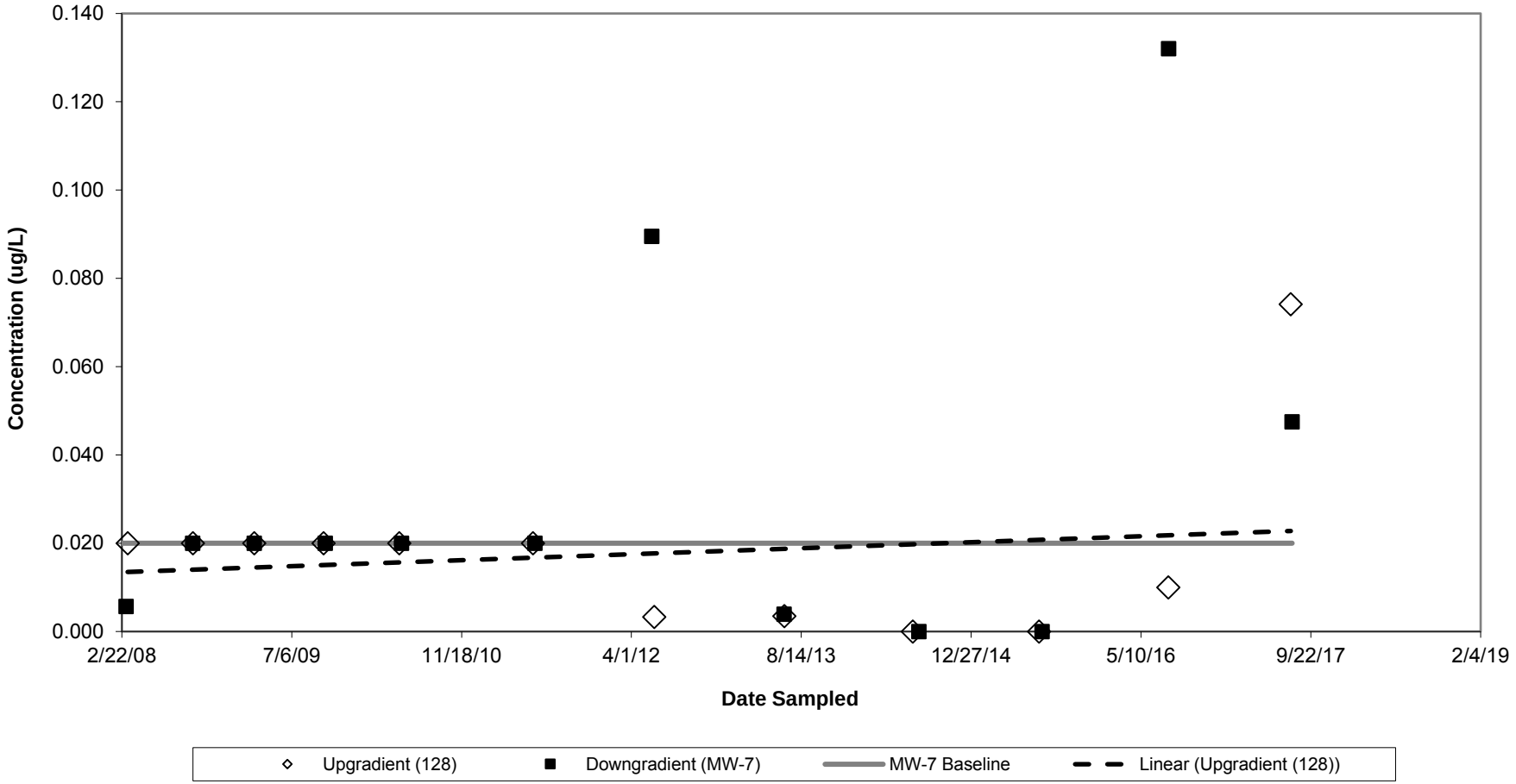


Figure F-15
Control Chart for Arsenic
Operable Unit-10 Management Unit New Landfill
Downgradient Shallow Bedrock Well MW-8

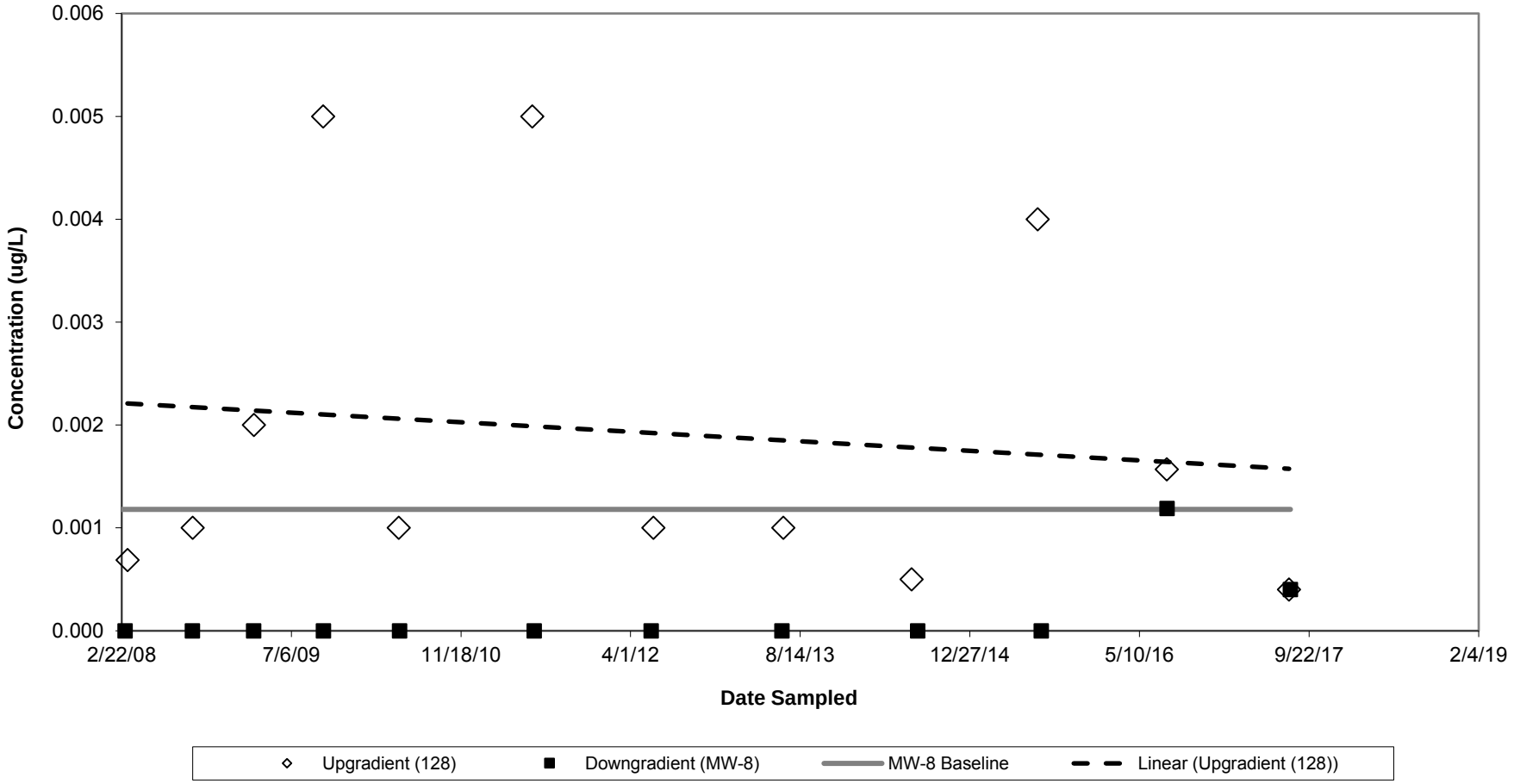


Figure F-16
Control Chart for Zinc
Operable Unit-10 Management Unit New Landfill
Downgradient Shallow Bedrock Well MW-8

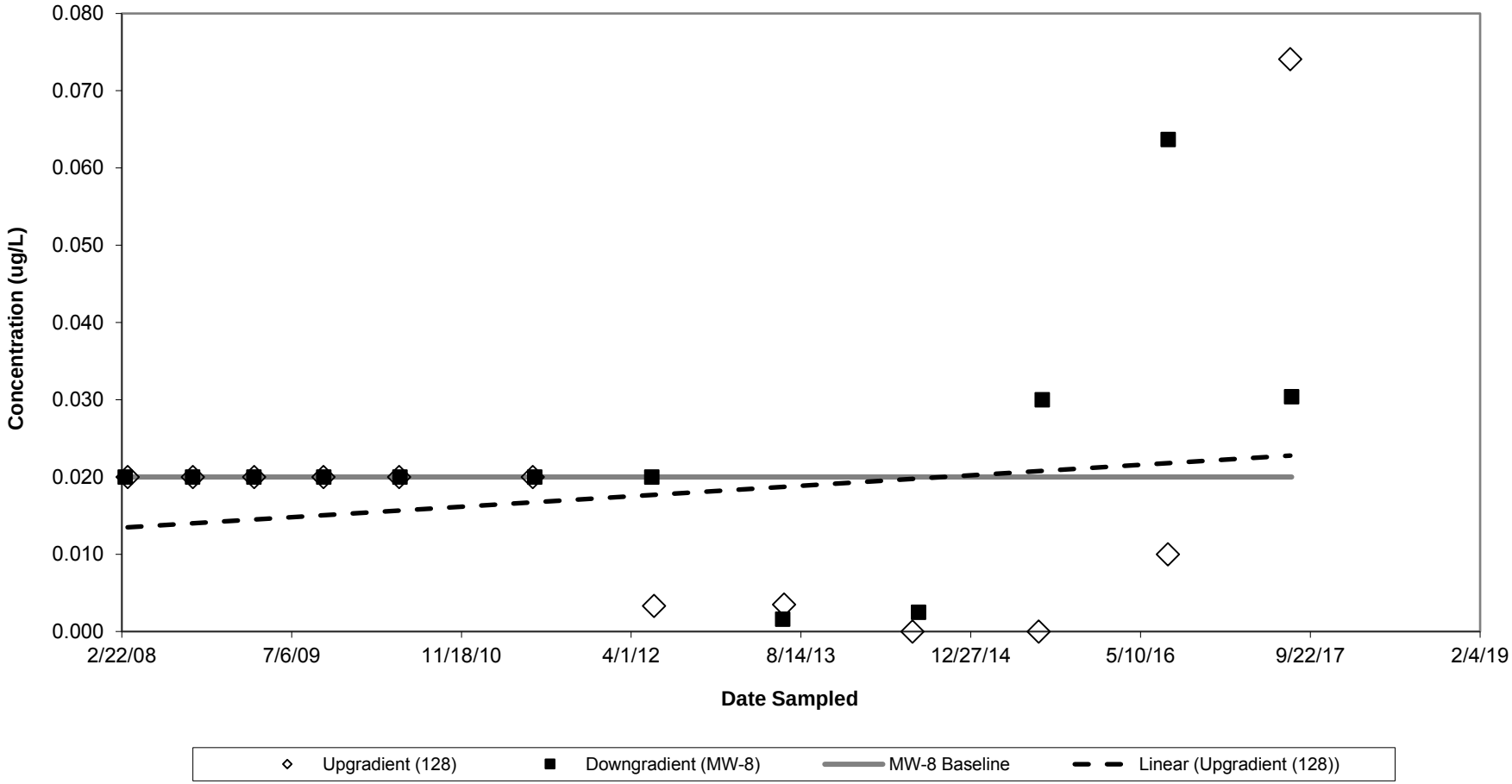


Figure F-17
Control Chart for Carbon Disulfide
Operable Unit-10 Management Unit VB 1-8
Downgradient Shallow Bedrock Well 133

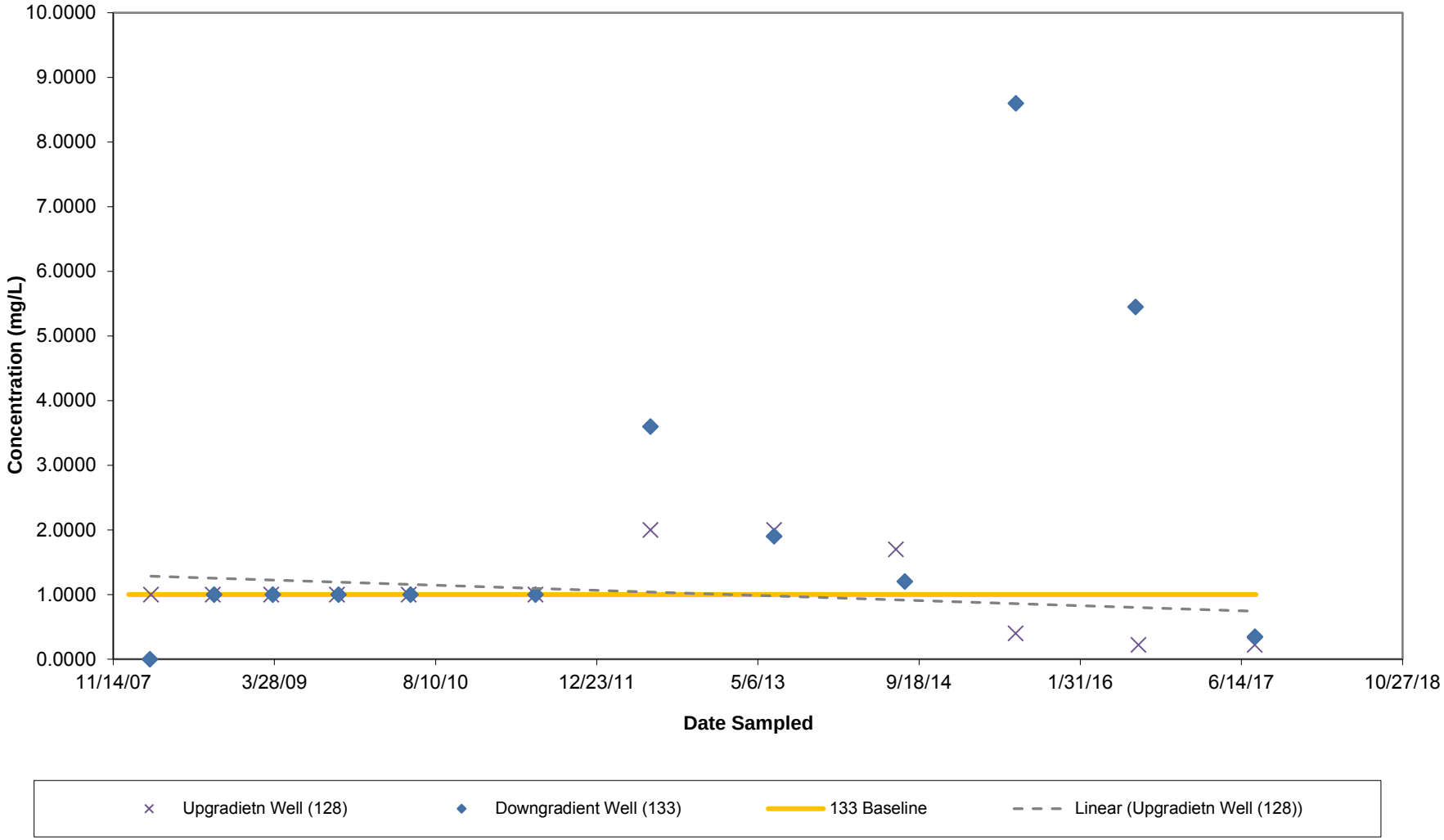


Figure F-18
Control Chart for Arsenic
Operable Unit-10 Management Unit VB 1-8
Downgradient Shallow Bedrock Well 133

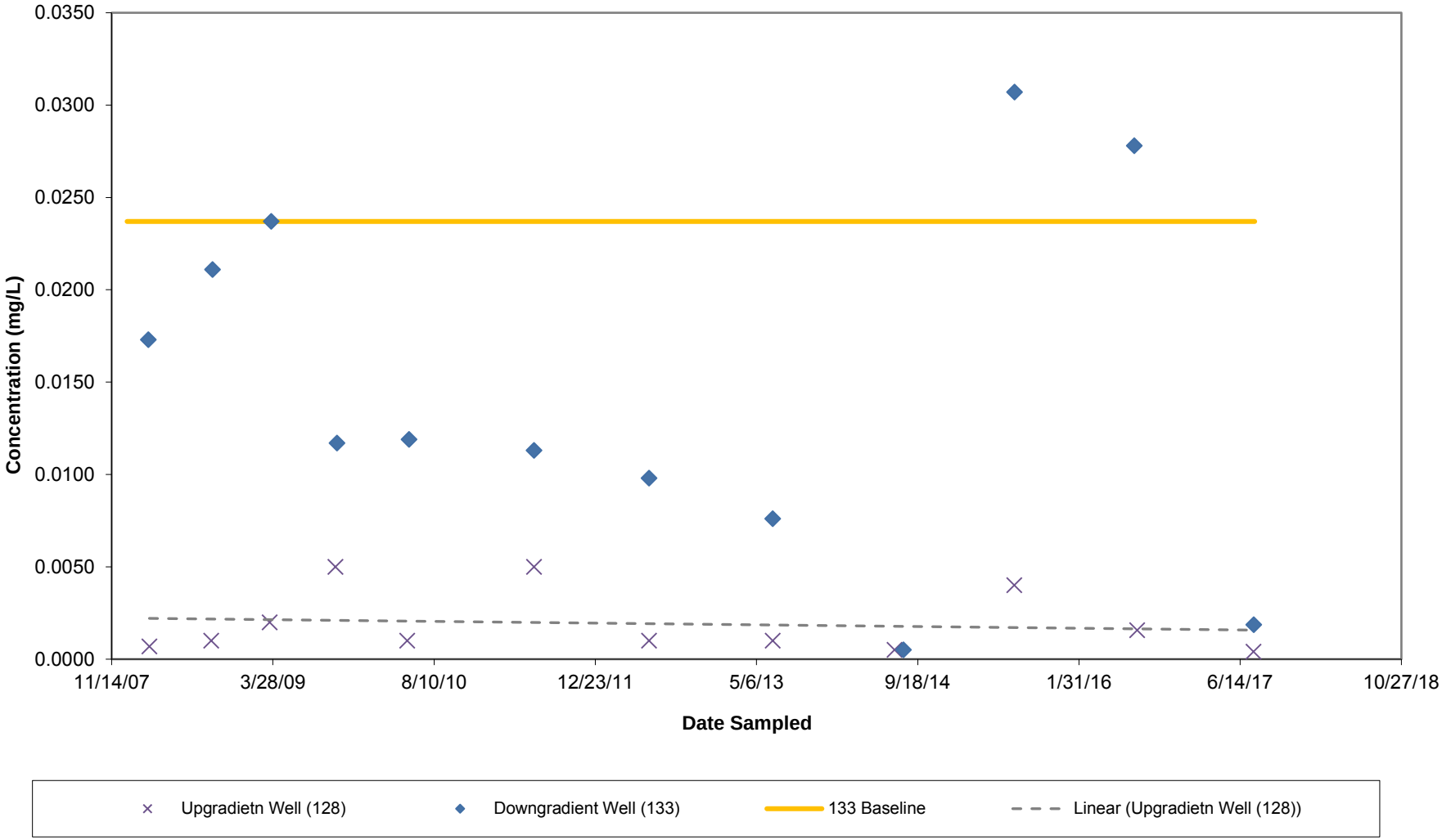
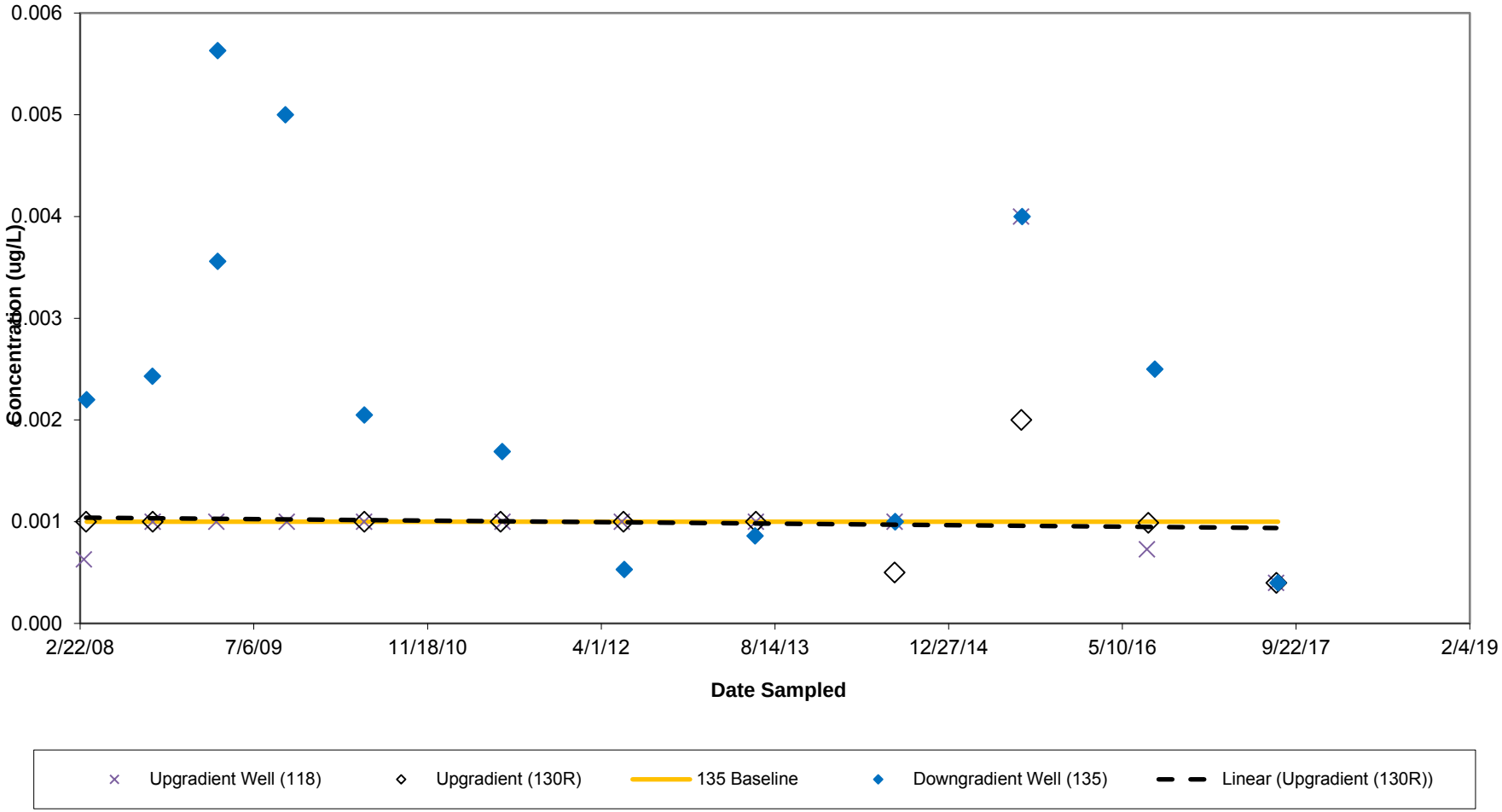


Figure F-19
Control Chart for Arsenic
Operable Unit-10 Management Unit VB 1-8
Downgradient Shallow Bedrock Well 135



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APPENDIX G
NTCRA BASIN CONTROL CHARTS

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Figure G-1
Control Chart for Arsenic
Fly Ash Basin Management Unit
Downgradient Overburden Well 014R

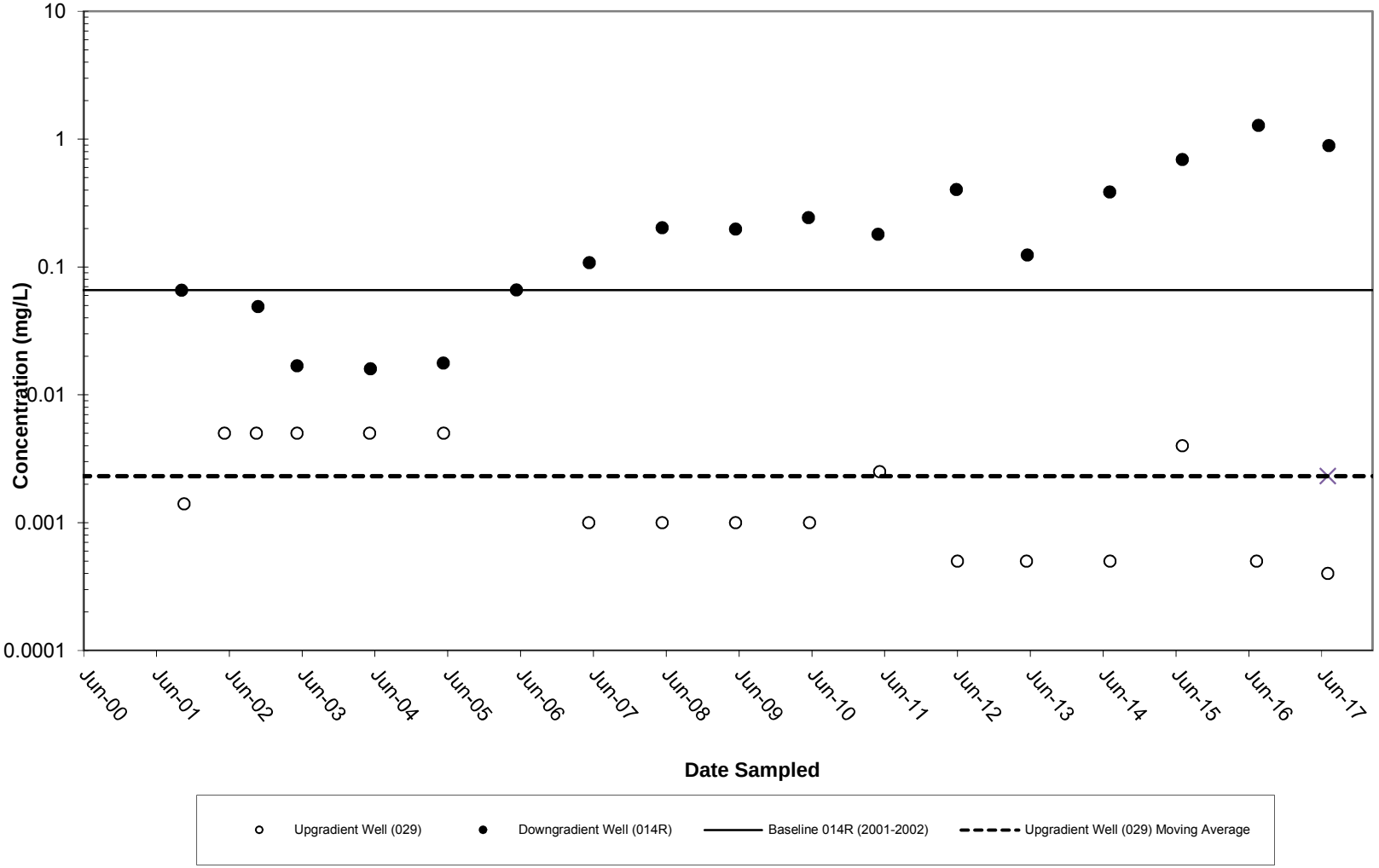


Figure G-2
Control Chart for Arsenic
Flyash Basins Management Unit
Downgradient Shallow Bedrock Well 114

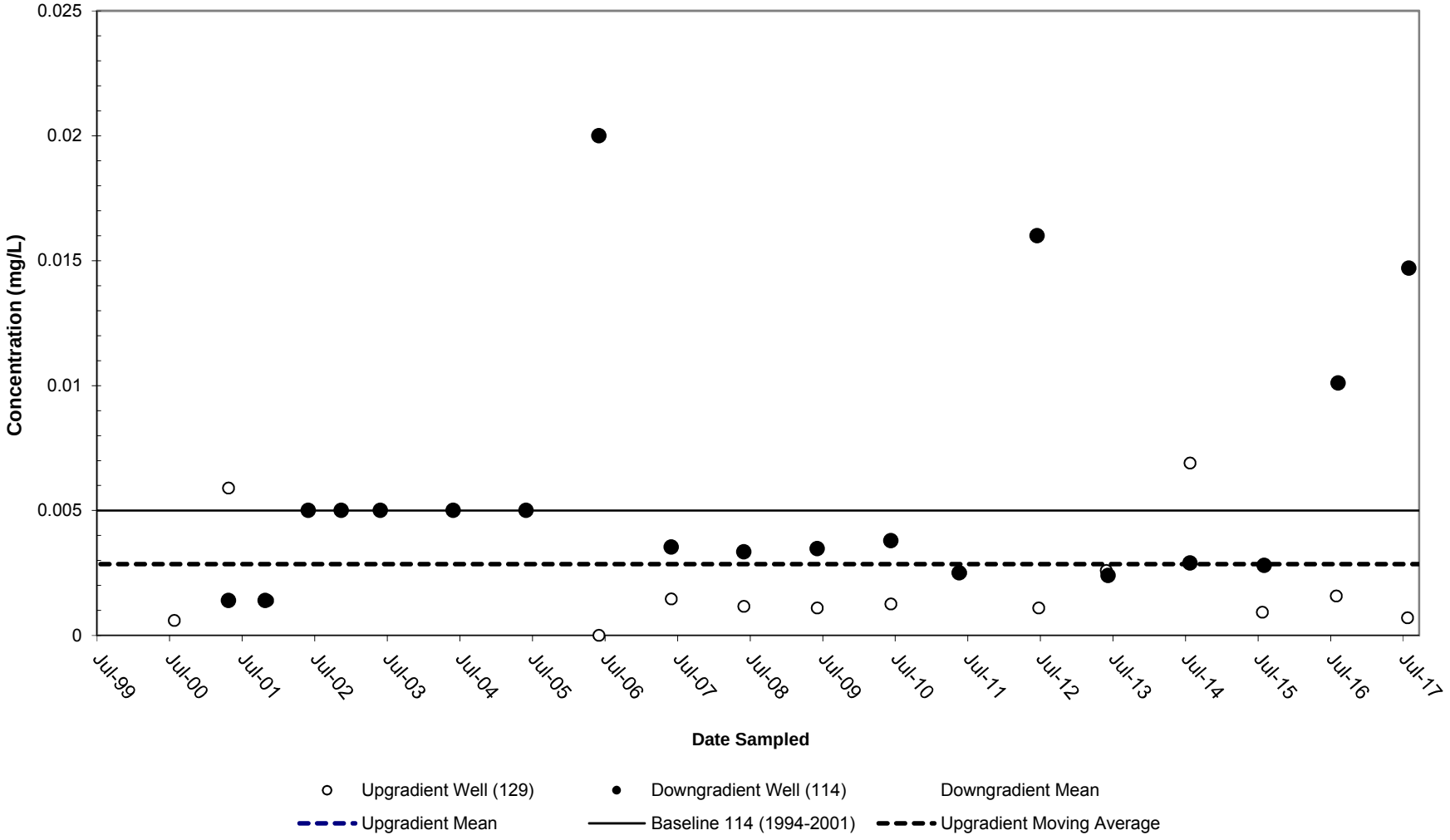


Figure G-3
Control Chart for Nickel
Fly Ash Basin Management Unit
Downgradient Shallow Bedrock Well 114

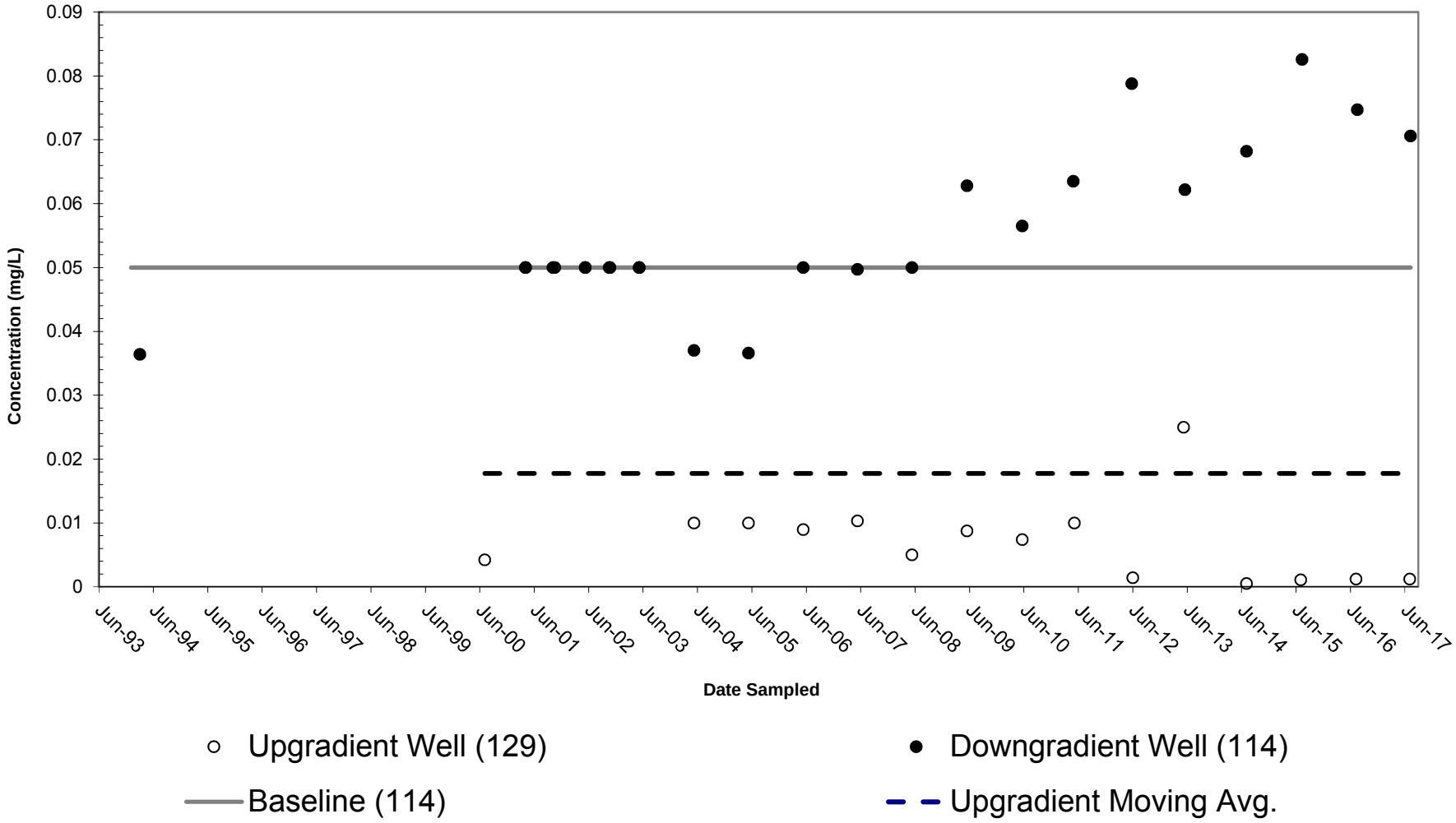


Figure G-4
Control Chart for Zinc
Flyash Basins Management Unit
Downgradient Shallow Bedrock Well 114

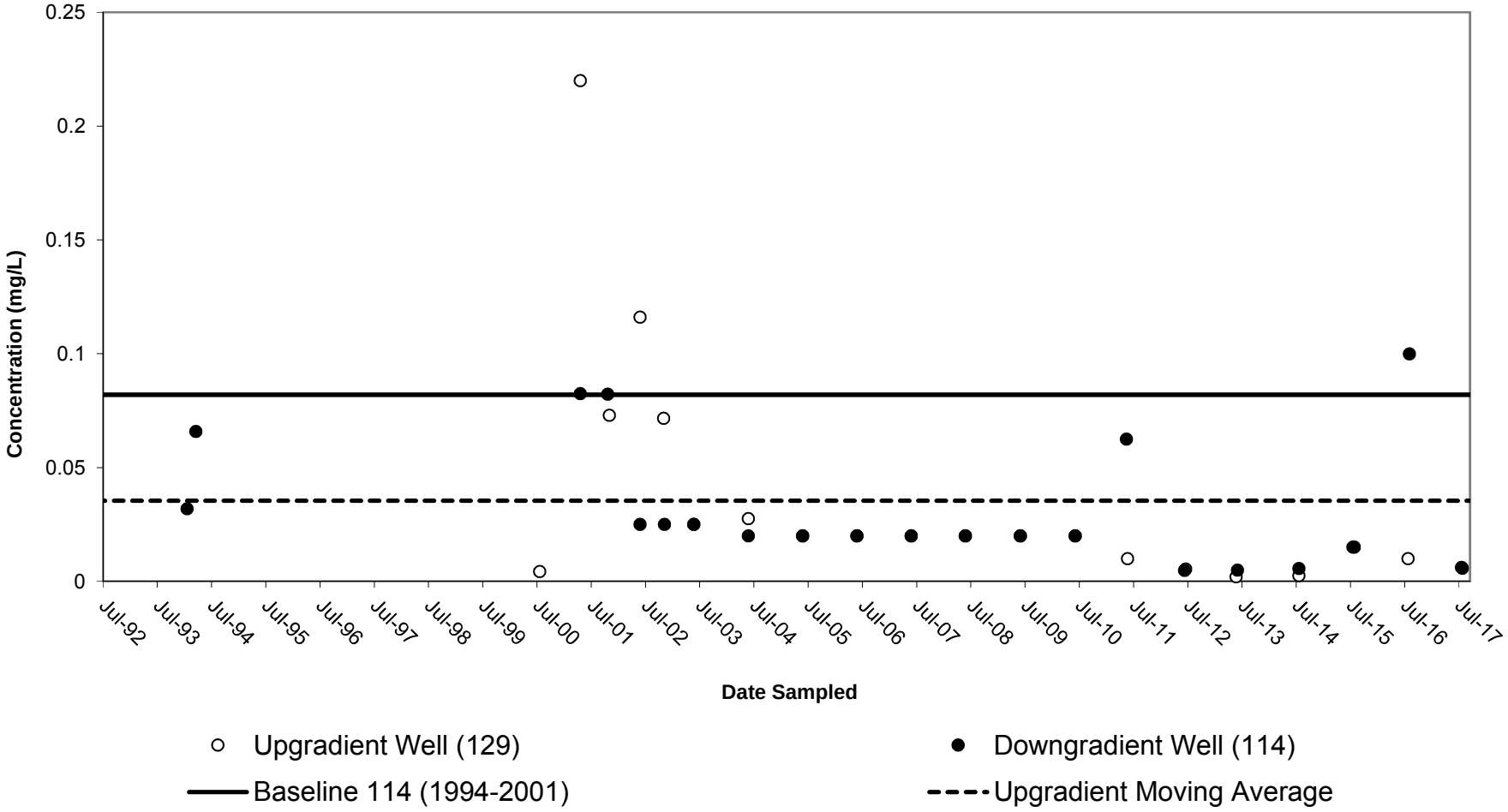


Figure G-5
Control Chart for Arsenic
Sulfate Basin Management Unit
Downgradient Overburden Well 023

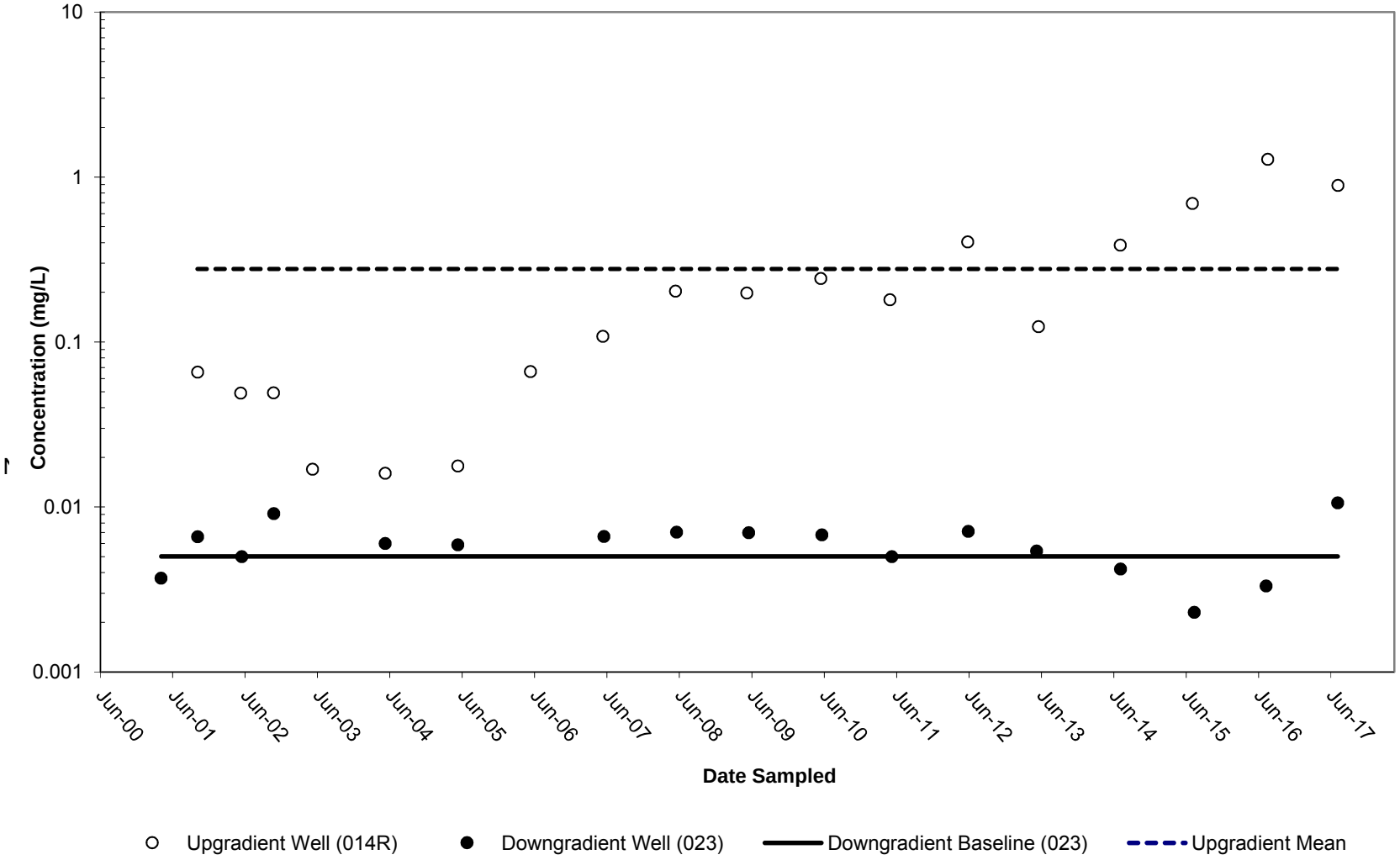
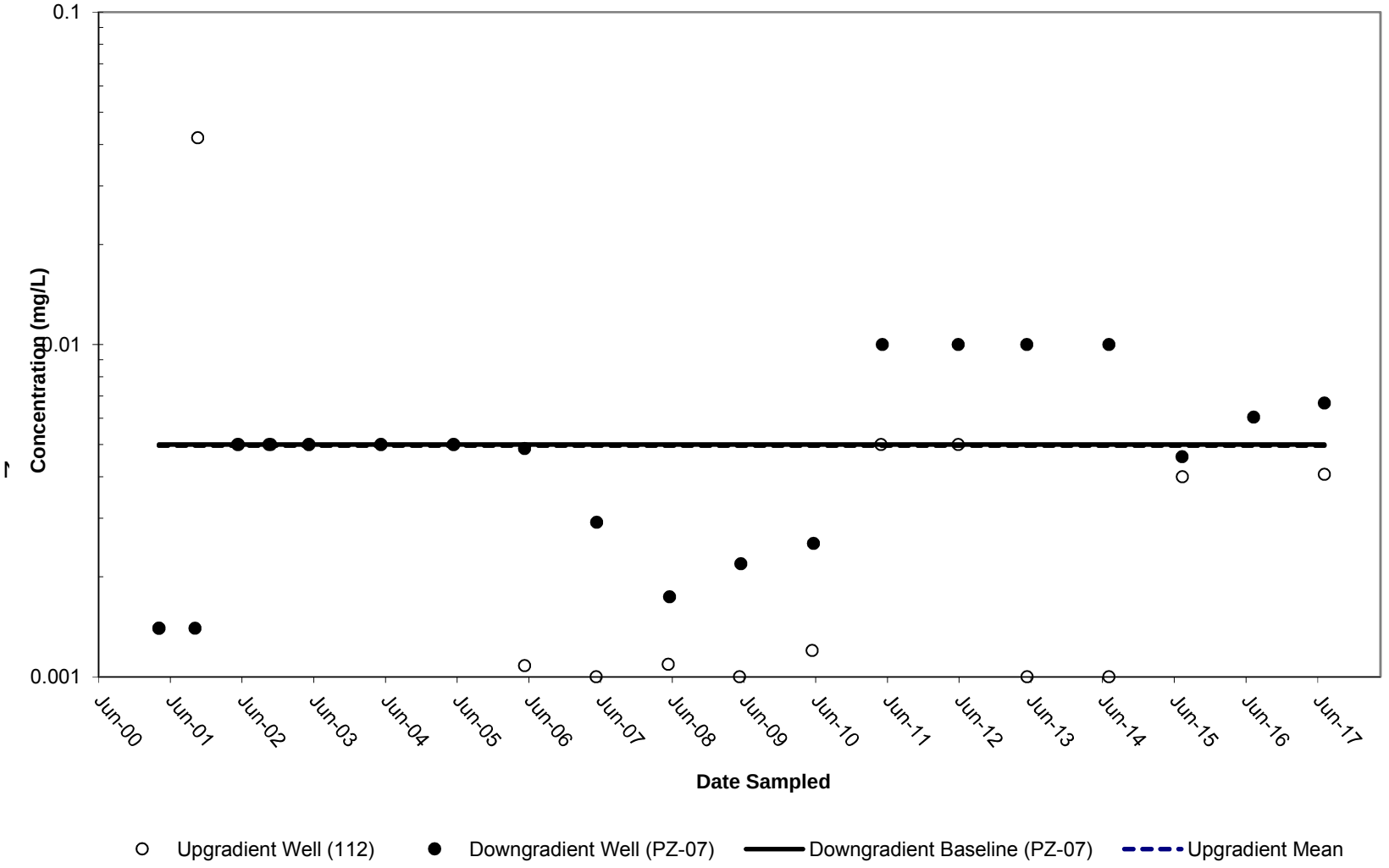


Figure G-6
Control Chart for Arsenic
Sulfate Basin Management Unit
Downgradient Overburden Well PZ-07



APPENDIX H
HISTORICAL SURFACE WATER AND SEDIMENT RESULTS

PARSONS

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Appendix H-1 - VB 9-11 Plume Sediment Quality and Grain Size Data
Avtex Fibers Superfund Site, Front Royal, VA

Parameter	EPA Region III Freshwater Sediment Screening Benchmark[1]	SD-01																			SD-02											
		8/2001			9/4/2012			9/9/2013			7/1/2014			7/11/2015			7/13/2016			7/13/2017			8/2001			9/5/2012			9/9/2013			7/1/2014		
		Conc.	RL	MDL	Conc.	RL[2]	MDL[2]	Conc.	RL[2]	MDL[2]	Conc.	RL	MDL	Conc.	RL	MDL	Conc.	RL	MDL	Conc.	RL	MDL	Conc.	RL	MDL	Conc.	RL[2]	MDL[2]	Conc.	RL[2]	MDL[2]	Conc.	RL	MDL
VOCs (µg/kg)																																
Acetone	NV	**23 J**	---	---	**69.9 K**	9.36	9.36	**29.6 K**	5.50	5.50	**98.8**	92.0	9.2	**47**	27	9	U	73.3	51.3	**24.1 J**	66.4	11.1	**22 J**	---	---	**55 K**	10.3	10.3	**52.2 K**	11.0	11.0	U	90.2	9.0
Carbon disulfide	0.851	**20**	---	---	**3.26 K**	1.87	1.87	**6.13 K**	1.10	1.10	**6.4 J**	9.2	2.8	**9**	7	1	**6.97 J**	7.33	5.27	U	6.64	4.78	**140 J, D**	---	---	**4.52 K**	2.06	2.06	**9.12 K**	2.20	2.20	U	9.0	2.7
Chlorobenzene	8.42	**4 J**	---	---	U	1.87	1.87	U	1.10	1.10	U	4.6	1.7	U	7	1	U	2.93	0.982	U	2.65	0.889	**5 J**	---	---	U	2.06	2.06	U	2.20	2.20	U	4.5	1.7
SVOCs (µg/kg)																																
2-Methylphenol (o-Cresol)	NV		---		U	382	38.2	U	410	41.0	U	425	129	U	39	19	U	483	313	U	466	302		---		U	424	42.4	U	395	39.5	U	406	123
4,3-Methylphenol	670		---		U	382	38.2	U	410	41.0	U	425	167	U	39	19	U	483	294	U	466	284		---		U	424	42.4	U	395	39.5	U	406	160
bis(2-Ethylhexyl)phthalate	180		---		U	382	38.2	U	410	41.0	U	425	116	U	200	77	U	483	300	U	466	290		---		U	424	42.4	U	395	39.5	U	406	111
Naphthalene	176		---		U	191	38.2	U	205	41.0	U	425	104	U	20	4	U	97.2	42.1	U	93.7	40.6		---		U	212	42.4	U	198	39.5	U	406	99.7
Pentachlorophenol	504		---		U	382	38.2	U	410	41.0	U	2130	77.3	U	200	39	U	972	386	U	937	372		---		U	424	42.4	U	395	39.5	U	2,030	73.8
Phenol	420		---		U	382	38.2	U	410	41.0	U	425	128	U	39	19	U	483	294	U	466	284		---		U	424	42.4	U	395	39.5	U	406	122
Inorganics (mg/kg)																																
Aluminum	NV	**5,340**	---	---	**7,370 K**	5.71	1.53	**3,850 B**	6.04	1.62	**2,720**	9.6	4.8	**6370**	46.8	8.95	**2420 J**	28.9	14.4	**1900 J**	26.9	13.4	**3,390**	---	---	**2,680 K**	6.44	1.72	**3,700 B**	5.87	1.57	**3,410**	11.0	5.5
Antimony	2	0.84 U	---	---	U	0.56	0.28	U	0.58	0.29	U	0.48	0.37	**0.0998 J-**	0.468	0.0987	UJ	0.722	0.289	U	3.51	1.4	**1 B**	---	---	U	0.60	0.30	U	0.56	0.28	U	0.55	0.43
Arsenic	9.8	**3.7**	---	---	**0.79 J**	0.56	0.28	**1.6**	0.58	0.29	**1.2**	0.96	0.48	**2.87 J-**	0.935	0.0998	**1.91**	0.722	0.289	**3.22 J**	3.51	1.4	**1.4**	---	---	**1.8 J**	0.60	0.30	**2.6**	0.56	0.28	**1.1**	1.1	0.55
Cadmium	0.99	**0.095 B**	---	---	**0.034 J**	0.068	0.034	**0.037 J**	0.070	0.035	U	0.096	0.048	**0.0844 J**	0.234	0.0236	U	0.722	0.289	U	3.51	1.4	0.068 U	---	---	**0.039 J**	0.072	0.036	**0.039 J**	0.068	0.034	U	0.11	0.06
Chromium	43.4	**30.3 N**	---	---	**20.3 B**	0.571	0.0439	**12 B**	0.604	0.0465	**8.1**	0.48	0.24	**14.1**	3.51	0.115	**8.67**	1.44	1.30	**9.66 J**	1.34	1.21	**12.3 N**	---	---	**24 B**	0.644	0.0495	**47.2 B**	0.587	0.0451	**12.4**	0.55	0.27
Cobalt	50	**5.7 B**	---	---	**3.7 K**	0.56	0.28	**3.9 L**	0.58	0.29	**4.3**	0.48	0.24	**5.13 J**	0.234	0.0234	**4.89**	0.722	0.289	**3.82**	3.51	1.4	**2.9 B**	---	---	**7.4 K**	0.60	0.30	**4.1 L**	0.56	0.28	**5.3**	0.55	0.27
Iron	20,000	**26,100**	---	---	**40,700 J**	5.71	0.40	**16,200 B**	6.04	0.424	**9,310**	9.6	4.8	**14300**	46.8	3.89	**9870 J**	57.8	28.9	**5190 J**	53.8	26.9	**14,300**	---	---	**19,500 J**	6.44	0.451	**26,600 B**	5.87	0.411	**12,500**	110	54.9
Lead	35.8	**8**	---	---	**3.9 K**	0.56	0.28	**4.8 K**	0.58	0.29	**6.5**	0.48	0.24	**9.73 J**	0.468	0.015	**7.08**	0.722	0.289	**16.1**	3.51	1.4	**4.7**	---	---	**7.6 K**	0.60	0.30	**7.2 K**	0.56	0.28	**8.6**	0.55	0.27
Manganese	460	**276**	---	---	**1,430 K**	0.571	0.0073	**184 B**	0.604	0.00774	**194**	0.48	0.24	**250**	1.17	0.097	**169**	4.33	1.44	**141 J**	4.03	1.34	**119**	---	---	**275 K**	0.644	0.00824	**462 B**	0.587	0.00751	**278**	0.55	0.27
Mercury	0.18	**0.027 B**	---	---	**0.0245**	0.023	0.0103	UL	0.0642	0.0169	**0.089**	0.0059	0.00012	**0.0913 J-**	0.234	0.0117	**0.152**	0.142	0.0427	**0.0953 J**	0.139	0.0418	**0.014 B**	---	---	**0.031**	0.0255	0.0113	UL	0.0629	0.0165	**0.13**	0.021	0.00043
Nickel	22.7	**8.2**	---	---	**19.2**	0.571	0.0793	**7.12 B**	0.604	0.0840	**4.5**	0.48	0.24	**6.62**	2.34	0.269	**5.58**	2.89	0.867	**4.25 J**	2.69	0.807	**4.3 B**	---	---	**4.4**	0.644	0.0894	**12.7 B**	0.587	0.0815	**5.9**	0.55	0.27
Vanadium	NV	**29.7**	---	---	**38.1 J**	0.571	0.0686	**13.9**	0.604	0.0727	**11.6**	0.48	0.24	**18.9**	1.17	0.175	**11.6 J**	14.4	2.89	**9.01 J**	13.4	2.69	**17.7**	---	---	**17.7 J**	0.644	0.0774	**40.9**	0.587	0.0705	**13.2**	0.55	0.27
Zinc	121	**59.5**	---	---	**45.7 B**	0.571	0.0703	**34 B**	0.604	0.0745	**24.2**	0.96	0.48	**43.3**	4.68	0.9	**21.1**	14.4	7.22	**22.6 J**	13.4	6.72	**21.6**	---	---	**19.3 B**	0.644	0.0793	**27.3 B**	0.587	0.0723	**40.8**	1.1	0.55
Other Inorganics																																
Cyanide (Total) (mg/kg)	NV		---		U	0.58	0.29	U	0.57	0.29	U	0.31	0.15	U	0.59	0.21	R	2.93	1.47	R	2.77	1.38		---		U	0.60	0.30	U	0.59	0.30	U	0.30	0.15
Cyanide (Free) (mg/kg)	0.1		---		---			---			---			U	0.7	0.23	U	2.86	0.478	U	1.51	0.43		---		---			---			---		
Percent Solids (%)	NV		---		**86**	0.0171	0.0171	**81.1**	0.01	0.01	**77.6**	0.10	0.10	**84.7**	0.5	0.5	68.3	--	--	70.8	--	--		---		**77**	0.018	0.018	**84.3**	0.01	0.01	**81.3**	0.10	0.10
Total Organic Carbon (mg/kg)	NV		---		**1,700**	460	460	**680**	490	490		---[3]		**7400**	630	210		--		**4340**	1000	380		---		**1,800**	510	510	**1,300**	470	470		---[3]	
Total Organic Carbon (mg/l)	NV		---			---			---			---			---		**2.83**	1.00	0.500		--			---			---			---			---	
Grain Size (%)																																
Gravel	NV		---		**71.4**	---	---	**43.9**	---	---		---			---		0.0	--	--	0.1	--	--		---		**49.0**	---	---	**52.2**	---	---		---	
Sand	NV		---		**27.7**	---	---	**54.7**	---	---		---			---		87.3	--	--	92.9	--	--		---		**49.5**	---	---	**45.2**	---	---		---	
Coarse Sand			---		**7.4**	---	---	**11.5**	---	---		---			---		1.0	--	--	0.2	--	--		---		**11.2**	---	---	**8.3**	---	---		---	
Medium Sand			---		**11.5**	---	---	**24.2**	---	---		---			---		9.0	--	--	6.5	--	--		---		**19.5**	---	---	**8.5**	---	---		---	
Fine Sand			---		**8.8**	---	---	**19**	---	---		---			---		77.3	--	--	86.2	--	--		---		**18.8**	---	---	**28.4**	---	---		---	
Silt	NV		---		**0.5**	---	---	**0.7**	---	---		---			---		6.6	--	--	5.2	--	--		---		**1.2**	---	---	**2.1**	---	---		---	
Clay	NV		---		**0.4**	---	---	**0.7**	---	---		---			---		6.1	--	--	1.8	--	--		---		**0.3**	---	---	**0.5**	---	---		---	
0.001 mm	NV		---			---			---			---		U	0.5	0.5		--			--			---			---			---			---	
0.002 mm	NV		---			---			---			---		U	0.5	0.5		--			--			---			---			---			---	
0.005 mm	NV		---			---			---			---		U	0.5	0.5		--			--			---			---			---			---	
0.02 mm	NV		---			---			---			---		U	0.5	0.5		--			--			---			---			---			---	
0.05 mm	NV		---			---			---			---		1.5	0.5	0.5		--			--			---			---			---			---	
0.064 mm	NV		---			---			---			---		3.5	0.5	0.5		--			--			---			---			---			---	
0.075 mm	NV		---			---			---			---		5.4	0.5	0.5		--			--			---			---			---			---	
0.15 mm	NV		---			---			---			---		10.2	0.5	0.5		--			--			---			---			---			---	
0.3 mm	NV		---			---			---			---		29.7	0.5	0.5		--			--			---			---			---			---	
0.6 mm	NV		---			---			---			---		55.5	0.5	0.5		--			--			---			---			---			---	
1.18 mm	NV		---			---			---			---		67.2	0.5	0.5		--			--			---			---			---			---	
2.36 mm	NV		---			---			---			---		76.8	0.5	0.5		--			--			---			---			---			---	
3.35 mm	NV		---			---			---			---		79.7	0.5	0.5		--			--			---			---			---			---	
4.75 mm	NV		---			---			---			---		83.2	0.5	0.5		--			--			---			---			---			---	
19 mm	NV		---			---			---			---		100	0.5	0.5		--			--			---			---			---			---	
37.5 mm	NV		---			---			---			---		100	0.5	0.5		--			--			---			---			---			---	
75 mm	NV		---			---			---			---		100	0.5	0.5		--			--			---			---			---			---	

Appendix H-1 - VB 9-11 Plume Sediment Quality and Grain Size Data
Avtex Fibers Superfund Site, Front Royal, VA

Parameter	EPA Region III Freshwater Sediment Screening Benchmark[1]	SD-01																			SD-02								
		8/2001			9/4/2012			9/9/2013			7/1/2014			7/11/2015			7/13/2016			7/13/2017			8/2001			9/5/2012			9/9/2013			7/1/2014		
		Conc.	RL	MDL	Conc.	RL[2]	MDL[2]	Conc.	RL[2]	MDL[2]	Conc.	RL	MDL	Conc.	RL	MDL	Conc.	RL	MDL	Conc.	RL	MDL	Conc.	RL	MDL	Conc.	RL[2]	MDL[2]	Conc.	RL[2]	MDL[2]	Conc.	RL	MDL
Hydrometer 1 for particle size distribution	NV		---			---			---			---			---		11.0	--	--	3.5	--	--		---			---			---			---	
Hydrometer 2 for particle size distribution	NV		---			---			---			---			---		10.2	--	--	3.5	--	--		---			---			---			---	
Hydrometer 3 for particle size distribution	NV		---			---			---			---			---		9.4	--	--	2.9	--	--		---			---			---			---	
Hydrometer 4 for particle size distribution	NV		---			---			---			---			---		7.7	--	--	2.3	--	--		---			---			---			---	
Hydrometer 5 for particle size distribution	NV		---			---			---			---			---		6.1	--	--	1.8	--	--		---			---			---			---	
Hydrometer 6 for particle size distribution	NV		---			---			---			---			---		3.7	--	--	1.3	--	--		---			---			---			---	
Hydrometer 7 for particle size distribution	NV		---			---			---			---			---		1.2	--	--	0.8	--	--		---			---			---			---	
Sieve, #10	NV		---			---			---			---			---		99.0	--	--	99.7	--	--		---			---			---			---	
Sieve, #100	NV		---			---			---			---			---		26.7	--	--	15.7	--	--		---			---			---			---	
Sieve, #20	NV		---			---			---			---			---		97.9	--	--	99.4	--	--		---			---			---			---	
Sieve, #200	NV		---			---			---			---			---		12.7	--	--	7	--	--		---			---			---			---	
Sieve, #4	NV		---			---			---			---			---		100.0	--	--	99.9	--	--		---			---			---			---	
Sieve, #40	NV		---			---			---			---			---		90.0	--	--	93.2	--	--		---			---			---			---	
Sieve, #60	NV		---			---			---			---			---		51.8	--	--	41.1	--	--		---			---			---			---	
Sieve, #80	NV		---			---			---			---			---		35.1	--	--	22.8	--	--		---			---			---			---	
Sieve, 0.375 inch	NV		---			---			---			---			---		100.0	--	--	100	--	--		---			---			---			---	
Sieve, 0.75 inch	NV		---			---			---			---			---		100.0	--	--	100	--	--		---			---			---			---	
Sieve, 1 inch	NV		---			---			---			---			---		100.0	--	--	100	--	--		---			---			---			---	
Sieve, 1.5 inch	NV		---			---			---			---			---		100.0	--	--	100	--	--		---			---			---			---	
Sieve, 2 inch	NV		---			---			---			---			---		100.0	--	--	100	--	--		---			---			---			---	
Sieve, 3 inch	NV		---			---			---			---			---		100.0	--	--	100	--	--		---			---			---			---	

Notes:
[1]- EPA Region III Freshwater Sediment Screening Benchmarks (EPA, 2006).
[2] - The RLs and MDLs are equivalent for all VOC results. The laboratory does not report VOCs to the statistical MDL due to purge-trap background.
[3] - Due to lab error, the sample was inadvertently disposed of before analysis was conducted.
Aug-01 data from the report Supplamental Field and Laboratory Data Report for Operable Unit 7 (Exponent, 2001).
VOC - Volatile Organic Compound SVOC - Semivolatile Organic Compound
ug/kg - micrograms per kilogram mg/kg - milligrams per kilogram
RL - Laboratory Reporting Limit MDL - Method Detection Limit
--- - Not analyzed
B - Contituent also detected in associated blank D - Sample was diluted
J - Reported as est. between the RL and the MDL and/or due to data validation.
K - Reported value may be biased high N - Spike sample out of control limits
U - Not detected above the laboratory reporting limit
Bold - Indicates detected result
= Constituent detected above benchmark screening value.

Appendix H-1 - VB 9-11 Plume Sediment Quality and Grain Size Data
Avtex Fibers Superfund Site, Front Royal, VA

Parameter	EPA Region III Freshwater Sediment Screening Benchmark[1]	SD-02 (Continued)									SD-03																	
		7/11/2015			7/13/2016			7/13/2017			8/2001			9/5/2012			9/9/2013			7/1/2014			7/1/2014			7/11/2015			7/13/2016			7/13/2017		
		Conc.	RL	MDL	Conc.	RL	MDL	Conc.	RL	MDL	Conc.	RL	MDL	Conc.	RL[2]	MDL[2]	Conc.	RL[2]	MDL[2]	Conc.	RL	MDL	Conc.	RL	MDL	Conc.	RL	MDL	Conc.	RL	MDL	Conc.	RL	MDL
VOCs (µg/kg)																																	
Acetone	NV	**100 J**	22	8	U	62	50.2	**32.7 J**	68.3	11.5	**56**	---	---	**54.7 K**	8.78	8.78	**14.3 K**	8.54	8.54	U	106	10.6	**140 J**	101	10.1	**22**	16	6	U	71.5	32.4	U	66.0	11.1
Carbon disulfide	0.851	**23 J**	5	1	**5.88 J**	6.2	4.47	U	6.83	4.92	68 U	---	---	**110**	88.9	88.9	**34.5 K**	1.71	1.71	**354**	10.6	3.2	**37.8**	10.1	3.0	**24**	4	0.8	**9.32**	7.15	5.14	**6.19 J**	6.60	4.75
Chlorobenzene	8.42	UR	5	1	U	2.48	0.831	U	2.73	0.915	**3 J**	---	---	U	1.76	1.76	U	1.71	1.71	U	5.3	2.0	UJ	5.1	1.9	U	4	0.8	U	2.86	0.957	U	2.64	0.884
SVOCs (µg/kg)																																	
2-Methylphenol (o-Cresol)	NV	U	43	22	U	458	297	U	479	311		---		U	372	37.2	U	394	39.4	U	461	140	U	426	129	U	39	20	U	499	324	U	459	298
4,3-Methylphenol	670	U	43	22	U	458	279	U	479	292		---		U	372	37.2	U	394	39.4	U	461	182	U	426	168	U	39	20	U	499	304	U	459	280
bis(2-Ethylhexyl)phthalate	180	U	220	86	U	458	285	U	479	298		---		U	372	37.2	U	394	39.4	U	461	126	U	426	116	U	200	78	U	499	310	U	459	285
Naphthalene	176	U	22	4	U	92.2	39.9	U	96.4	41.7		---		U	186	37.2	U	197	39.4	U	461	113	U	426	105	U	20	4	U	100	43.5	U	92.3	40.0
Pentachlorophenol	504	U	220	43	U	922	366	U	964	383		---		U	372	37.2	U	394	39.4	U	2,310	83.9	U	2,130	77.4	U	200	39	U	1000	399	U	923	367
Phenol	420	U	43	22	U	458	279	U	479	292		---		U	372	37.2	U	394	39.4	U	461	138	U	426	128	U	39	20	U	499	304	U	459	280
Inorganics (mg/kg)																																	
Aluminum	NV	**4810**	51.6	9.89	**2070 J**	27.6	13.8	**1930 J**	27.9	13.9	**4,230**	---	---	**4,850 K**	5.61	1.50	**5,030 B**	5.94	1.59	**3,390**	14.0	7.0	**3,790**	12.4	6.2	**3260**	45.2	8.67	**2740 J**	29.1	14.6	**2440 J**	26.9	13.5
Antimony	2	UJ-	0.516	0.109	UJ	0.689	0.276	U	3.49	1.39	0.83 U	---	---	U	0.53	0.27	U	0.62	0.31	U	0.70	0.55	U	0.62	0.48	UJ-	0.452	0.0955	UJ	0.728	0.291	U	3.37	1.35
Arsenic	9.8	**2.76 J-**	1.03	0.11	**1.30**	0.689	0.276	**1.53 J**	3.49	1.39	**1.7**	---	---	**1.1 J**	0.53	0.27	**1.1**	0.62	0.31	U	1.4	0.70	**0.99 J**	1.2	0.62	**2.25 J-**	0.905	0.0966	**1.59**	0.728	0.291	**2.64 J**	3.37	1.35
Cadmium	0.99	**0.0438 J**	0.258	0.0261	U	0.689	0.276	U	3.49	1.39	0.07 U	---	---	**0.046 J**	0.064	0.032	**0.056 J**	0.075	0.037	U	0.14	0.070	U	0.12	0.062	**0.0310 J**	0.226	0.0229	U	0.728	0.291	U	3.37	1.35
Chromium	43.4	**13.4**	3.87	0.127	**9.29**	1.38	1.24	**8.34 J**	1.39	1.26	**10.1 N**	---	---	**21.7 B**	0.561	0.0431	**11.5 B**	0.594	0.0457	**10.3**	0.70	0.35	**10.4**	0.62	0.31	**14.8**	3.39	0.111	**9.88**	1.46	1.31	**11.2 J**	1.35	1.21
Cobalt	50	**4.41 J**	0.258	0.0258	**3.28**	0.689	0.276	**4.08**	3.49	1.39	**3.5 B**	---	---	**4.3 K**	0.53	0.27	**6.5 L**	0.62	0.31	**5.0**	0.70	0.35	**12.8**	0.62	0.31	**3.96 J**	0.226	0.0226	**4.78**	0.728	0.291	**7.19**	3.37	1.35
Iron	20,000	**13500**	51.6	4.3	**9080 J**	55.2	27.6	**6240 J**	55.8	27.9	**11,100**	---	---	**27,800 J**	5.61	0.393	**21,700 B**	5.94	0.417	**11,700**	14.0	7.0	**10,700**	12.4	6.2	**13000**	45.2	3.77	**11800 J**	58.3	29.1	**7910 J**	53.9	26.9
Lead	35.8	**6.47 J**	0.516	0.0166	**5.83**	0.689	0.276	**6.64**	3.49	1.39	**5**	---	---	**5.4 K**	0.53	0.27	**4.3 K**	0.62	0.31	**9.1**	0.70	0.35	**8.4**	0.62	0.31	**4.24 J**	0.452	0.0145	**7.40**	0.728	0.291	**12.1**	3.37	1.35
Manganese	460	**241**	1.29	0.107	**116**	4.14	1.38	**178 J**	4.18	1.39	**261**	---	---	**224 K**	0.561	0.00717	**209 B**	0.594	0.00761	**289**	0.70	0.35	**271**	0.62	0.31	**163**	1.13	0.0939	**238**	4.37	1.46	**216 J**	4.04	1.35
Mercury	0.18	**0.123 J-**	0.251	0.0125	**0.151**	0.138	0.0415	**0.132 J**	0.147	0.0442	**0.12 B**	---	---	**0.0136 J**	0.0229	0.0101	UL	0.0635	0.0167	**0.19**	0.032	0.00064	**0.23**	0.020	0.00040	**0.0424 J-**	0.235	0.0117	**0.121 J**	0.150	0.0449	**0.118 J**	0.142	0.0426
Nickel	22.7	**5.89**	2.58	0.297	**4.66**	2.76	0.827	**5.27 J**	2.79	0.837	**4.5 B**	---	---	**9.1**	0.561	0.0779	**7.51 B**	0.594	0.0826	**5.7**	0.70	0.35	**5.5**	0.62	0.31	**4.2**	2.26	0.26	**6.00**	2.91	0.874	**5.01 J**	2.69	0.808
Vanadium	NV	**16.3**	1.29	0.194	**9.27 J**	13.8	2.76	**10.8 J**	13.9	2.79	**13.5**	---	---	**25.5 J**	0.561	0.0674	**17.9**	0.594	0.0714	**13.6**	0.70	0.35	**14.4**	0.62	0.31	**15.6**	1.13	0.17	**13.8 J**	14.6	2.91	**14.3 J**	13.5	2.69
Zinc	121	**26.8**	5.16	0.994	**28.3**	13.8	6.89	**23.6 J**	13.9	6.97	**37.3**	---	---	**32.8 B**	0.561	0.0691	**35.0 B**	0.594	0.0732	**43.3**	1.4	0.70	**45.4**	1.2	0.62	**22.1**	4.52	0.871	**30.1**	14.6	7.28	**31.6 J**	13.5	6.73
Other Inorganics																																	
Cyanide (Total) (mg/kg)	NV	U	0.62	0.22	R	2.82	1.41	R	3.02	1.51		---		U	0.59	0.29	U	0.59	0.29	UJ	0.35	0.18	U	0.31	0.16	U	0.58	0.21	R	3.02	1.51	R	2.75	1.37
Cyanide (Free) (mg/kg)	0.1	U	0.78	0.26	U	2.76	0.460	U	1.59	0.451		---			---			---			---			---		U	0.7	0.23	U	3.18	0.531	U	1.52	0.431
Percent Solids (%)	NV	**76.7**	0.5	0.5	70.8	--	--	68.3	--	--		---		**88.2**	0.0171	0.0171	**84.2**	0.01	0.01	**71.5**	0.10	0.10	**77.5**	0.10	0.10	**85**	0.5	0.5	66.1	--	--	70.7	--	--
Total Organic Carbon (mg/kg)	NV	**650**	391	130		--		**9210**	1000	380		---		**1,100**	410	410	**1,000**	470	470		---[3]			---[3]		**146 J**	353	118		--		**6830**	1000	380
Total Organic Carbon (mg/l)	NV		---		**2.14**	1.00	0.500		--			---			---			---			---			---			---			**2.13**	1.00	0.500		--	
Grain Size (%)																																	
Gravel	NV		---		0.0	--	--	0.9	--	--		---		**50.1**	---	---	**36.0**	---	---		---			---			---		2.7	--	--	33.5	--	--
Sand	NV		---		87.9	--	--	44.7	--	--		---		**48.7**	---	---	**62.3**	---	---		---			---			---		73.2	--	--	60.4	--	--
Coarse Sand			---		1.5	--	--	0.3	--	--		---		**11.2**	---	---	**13.3**	---	---		---			---			---		3.2	--	--	6.1	--	--
Medium Sand			---		3.7	--	--	5.2	--	--		---		**25.8**	---	---	**24.1**	---	---		---			---			---		17.5	--	--	21.9	--	--
Fine Sand			---		82.7	--	--	39.2	--	--		---		**11.7**	---	---	**24.9**	---	---		---			---			---		52.5	--	--	32.4	--	--
Silt	NV		---		9.5	--	--	28	--	--		---		**0.5**	---	---	**1.1**	---	---		---			---			---		17.2	--	--	2.8	--	--
Clay	NV		---		2.6	--	--	26.4	--	--		---		**0.7**	---	---	**0.6**	---	---		---			---			---		6.9	--	--	3.3	--	--
0.001 mm	NV	U	0.5	0.5		--			--			---			---			---			---			---		U	0.5	0.5		--			--	
0.002 mm	NV	U	0.5	0.5		--			--			---			---			---			---			---		U	0.5	0.5		--			--	
0.005 mm	NV	U	0.5	0.5		--			--			---			---			---			---			---		U	0.5	0.5		--			--	
0.02 mm	NV	U	0.5	0.5		--			--			---			---			---			---			---		U	0.5	0.5		--			--	
0.05 mm	NV	0.5	0.5	0.5		--			--			---			---			---			---			---		0.5	0.5	0.5		--			--	
0.064 mm	NV	2	0.5	0.5		--			--			---			---			---			---			---		1.5	0.5	0.5		--			--	
0.075 mm	NV	3	0.5	0.5		--			--			---			---			---			---			---		2.2	0.5	0.5		--			--	
0.15 mm	NV	8.5	0.5	0.5		--			--			---			---			---			---			---		3.2	0.5	0.5		--			--	
0.3 mm	NV	33.5	0.5	0.5		--			--			---			---			---			---			---		6.2	0.5	0.5		--			--	
0.6 mm	NV	80.5	0.5	0.5		--			--			---			---			---			---			---		21	0.5	0.5		--			--	
1.18 mm	NV	92.7	0.5	0.5		--			--			---			---			---			---			---		63.7	0.5	0.5		--			--	
2.36 mm	NV	94.7	0.5	0.5		--			--			---			---			---			---			---		82.4	0.5	0.5		--			--	
3.35 mm	NV	95.3	0.5	0.5		--			--			---			---			---			---			---		84.2	0.5	0.5		--			--	
4.75 mm	NV	96	0.5	0.5		--			--			---			---			---			---			---		86.4	0.5	0.5		--			--	
19 mm	NV	100	0.5	0.5		--			--			---			---			---			---			---		100	0.5	0.5		--			--	
37.5 mm	NV	100	0.5	0.5		--			--			---			---			---			---			---		100	0.5	0.5		--			--	
75 mm	NV	100	0.5	0.5		--			--			---			---			---			---			---		100	0.5	0.5		--			--	

Appendix H-1 - VB 9-11 Plume Sediment Quality and Grain Size Data
Avtex Fibers Superfund Site, Front Royal, VA

Parameter	EPA Region III Freshwater Sediment Screening Benchmark[1]	SD-02 (Continued)									SD-03																	
		7/11/2015			7/13/2016			7/13/2017			8/2001			9/5/2012			9/9/2013			7/1/2014			7/1/2014			7/11/2015			7/13/2016			7/13/2017		
		Conc.	RL	MDL	Conc.	RL	MDL	Conc.	RL	MDL	Conc.	RL	MDL	Conc.	RL[2]	MDL[2]	Conc.	RL[2]	MDL[2]	Conc.	RL	MDL	Conc.	RL	MDL	Conc.	RL	MDL	Conc.	RL	MDL	Conc.	RL	MDL
Hydrometer 1 for particle size distribution	NV		---		7.7	--	--	42.2	--	--		---			---			---			---			---			---		11.2	--	--	6.5	--	--
Hydrometer 2 for particle size distribution	NV		---		7.0	--	--	38.8	--	--		---			---			---			---			---			---		11.2	--	--	6	--	--
Hydrometer 3 for particle size distribution	NV		---		5.5	--	--	34.8	--	--		---			---			---			---			---			---		9.8	--	--	5.1	--	--
Hydrometer 4 for particle size distribution	NV		---		4.1	--	--	32.4	--	--		---			---			---			---			---			---		8.3	--	--	4.6	--	--
Hydrometer 5 for particle size distribution	NV		---		2.6	--	--	26.4	--	--		---			---			---			---			---			---		6.9	--	--	3.4	--	--
Hydrometer 6 for particle size distribution	NV		---		1.1	--	--	17.5	--	--		---			---			---			---			---			---		4.0	--	--	2.4	--	--
Hydrometer 7 for particle size distribution	NV		---		1.1	--	--	10.8	--	--		---			---			---			---			---			---		1.1	--	--	1.7	--	--
Sieve, #10	NV		---		98.5	--	--	98.8	--	--		---			---			---			---			---			---		94.1	--	--	60.4	--	--
Sieve, #100	NV		---		31.8	--	--	62.3	--	--		---			---			---			---			---			---		34.9	--	--	11.3	--	--
Sieve, #20	NV		---		98.0	--	--	98.2	--	--		---			---			---			---			---			---		89.3	--	--	51.7	--	--
Sieve, #200	NV		---		12.1	--	--	54.4	--	--		---			---			---			---			---			---		24.1	--	--	6.1	--	--
Sieve, #4	NV		---		100.0	--	--	99.1	--	--		---			---			---			---			---			---		97.3	--	--	66.5	--	--
Sieve, #40	NV		---		94.8	--	--	93.6	--	--		---			---			---			---			---			---		76.6	--	--	38.5	--	--
Sieve, #60	NV		---		63.6	--	--	74.3	--	--		---			---			---			---			---			---		50.1	--	--	19.1	--	--
Sieve, #80	NV		---		43.2	--	--	66.4	--	--		---			---			---			---			---			---		40.2	--	--	13.7	--	--
Sieve, 0.375 inch	NV		---		100.0	--	--	99.4	--	--		---			---			---			---			---			---		100.0	--	--	76.8	--	--
Sieve, 0.75 inch	NV		---		100.0	--	--	100	--	--		---			---			---			---			---			---		100.0	--	--	90.3	--	--
Sieve, 1 inch	NV		---		100.0	--	--	100	--	--		---			---			---			---			---			---		100.0	--	--	100	--	--
Sieve, 1.5 inch	NV		---		100.0	--	--	100	--	--		---			---			---			---			---			---		100.0	--	--	100	--	--
Sieve, 2 inch	NV		---		100.0	--	--	100	--	--		---			---			---			---			---			---		100.0	--	--	100	--	--
Sieve, 3 inch	NV		---		100.0	--	--	100	--	--		---			---			---			---			---			---		100.0	--	--	100	--	--

Notes:
[1]- EPA Region III Freshwater Sediment Screening Benchmarks (EPA, 2006).
[2] - The RLs and MDLs are equivalent for all VOC results. The laboratory does not report VOCs to the statistical MDL due to purge-trap background.
[3] - Due to lab error, the sample was inadvertently disposed of before analysis was conducted.
Aug-01 data from the report Supplamental Field and Laboratory Data Report for Operable Unit 7 (Exponent, 2001).
VOC - Volatile Organic Compound SVOC - Semivolatile Organic Compound
ug/kg - micrograms per kilogram mg/kg - milligrams per kilogram
RL - Laboratory Reporting Limit MDL - Method Detection Limit
--- - Not analyzed
B - Contituent also detected in associated blank D - Sample was diluted
J - Reported as est. between the RL and the MDL and/or due to data validation.
K - Reported value may be biased high N - Spike sample out of control limits
U - Not detected above the laboratory reporting limit
Bold - Indicates detected result
= Constituent detected above benchmark screening value.

Appendix H-1 - VB 9-11 Plume Sediment Quality and Grain Size Data
Avtex Fibers Superfund Site, Front Royal, VA

Parameter	EPA Region III Freshwater Sediment Screening Benchmark[1]	SD-04																						SD-05								
		8/2001			9/5/2012			9/10/2013			7/1/2014			7/11/2015			7/11/2015			7/13/2016			7/13/2017			8/2001			9/5/2012			9/10/2013		
		Conc.	RL	MDL	Conc.	RL[2]	MDL[2]	Conc.	RL[2]	MDL[2]	Conc.	RL	MDL	Conc.	RL	MDL	Conc.	RL	MDL	Conc.	RL	MDL	Conc.	RL	MDL	Conc.	RL	MDL	Conc.	RL[2]	MDL[2]	Conc.	RL[2]	MDL[2]
VOCs (µg/kg)																																
Acetone	NV	8 U	---	---	**42.5 K**	9.11	9.11	**14.5**	8.32	8.32	U	119	1.9	**66**	25	9	**60**	19	7	U	79	34.2	**46.6 J**	71.2	12.0	**26**	---	---	**48.9 K**	9.86	9.86	**12.9**	9.79	9.79
Carbon disulfide	0.851	**280**	---	---	**22.2 K**	1.82	1.82	U	1.66	1.66	U	11.9	3.6	**100**	6	1	**62**	5	0.9	**26.5**	7.9	5.69	**34.3**	7.12	5.13	**230**	---	---	**37.7 K**	1.97	1.97	**27.4**	1.96	1.96
Chlorobenzene	8.42	**4 J**	---	---	U	1.82	1.82	U	1.66	1.66	U	5.9	2.3	U	6	1	U	5	0.9	U	3.16	1.06	U	2.85	0.955	**3 J**	---	---	U	1.97	1.97	U	1.96	1.96
SVOCs (µg/kg)																																
2-Methylphenol (o-Cresol)	NV		---		U	395	39.5	U	394	39.4	U	481	146	U	44	22	U	42	21	U	512	332	U	526	341		---		U	403	40.3	U	408	40.8
4,3-Methylphenol	670		---		U	395	39.5	U	394	39.4	U	481	190	**30 J**	44	22	U	42	21	U	512	312	U	526	321		---		U	403	40.3	U	408	40.8
bis(2-Ethylhexyl)phthalate	180		---		U	395	39.5	U	394	39.4	U	481	131	U	220	88	U	210	84	U	512	318	U	526	327		---		U	403	40.3	U	408	40.8
Naphthalene	176		---		U	197	39.5	U	197	39.4	U	481	118	U	22	4	U	21	4	U	103	44.6	U	106	45.8		---		U	202	40.3	U	204	40.8
Pentachlorophenol	504		---		U	395	39.5	U	394	39.4	U	2,410	87.5	U	220	44	U	210	42	U	1030	409	U	1060	420		---		U	403	40.3	U	408	40.8
Phenol	420		---		U	395	39.5	U	394	39.4	U	481	144	U	44	22	U	42	21	U	512	312	U	526	321		---		U	403	40.3	U	408	40.8
Inorganics (mg/kg)																																
Aluminum	NV	**4,800**	---	---	**4,390 K**	5.90	1.58	**2,040 B**	5.83	1.56	**5,430**	10	5.0	**9560**	51	9.77	**9250**	50.6	9.7	**4010 J**	30.6	15.3	**4130 J**	32.7	16.3	**3,270**	---	---	**3,850 K**	6.06	1.62	**3,870 B**	6.20	1.66
Antimony	2	**1.3 B**	---	---	U	0.62	0.31	U	0.65	0.32	U	0.50	0.39	**0.295 J-**	0.51	0.108	**0.220 J-**	0.506	0.0835	UJ	0.764	0.306	U	3.97	1.59	0.74 U	---	---	U	0.60	0.30	U	0.59	0.30
Arsenic	9.8	**3.6**	---	---	**0.93 J**	0.62	0.31	**2**	0.65	0.32	**2.6**	1.0	0.50	**6.11 J-**	1.02	0.109	**4.51 J-**	1.01	0.19	**2.88**	0.764	0.306	**3.24 J**	3.97	1.59	**1.6**	---	---	**1.1 J**	0.60	0.30	**1.4**	0.59	0.30
Cadmium	0.99	0.069 U	---	---	U	0.074	0.037	U	0.078	0.039	U	0.10	0.050	**0.142 J**	0.255	0.0258	**0.0984 J**	0.253	0.0582	U	0.764	0.306	U	3.97	1.59	0.062 U	---	---	U	0.073	0.036	**0.037 J**	0.071	0.035
Chromium	43.4	**18.3 N**	---	---	**12.7 B**	0.59	0.0454	**8.40 B**	0.583	0.0449	**11.8**	0.50	0.25	**17.7**	3.83	0.125	**19**	3.8	0.124	**13.7**	1.53	1.38	**12.8 J**	1.63	1.47	**15.6 N**	---	---	**16.6 B**	0.606	0.0466	**27.5 B**	0.620	0.0477
Cobalt	50	**4.5 B**	---	---	**3.5 K**	0.62	0.31	**7.8**	0.65	0.32	**6.5**	0.50	0.25	**6.76 J**	0.255	0.0255	**6.87 J**	0.253	0.0253	**5.70**	0.764	0.306	**7.11**	3.97	1.59	**3.4 B**	---	---	**3.9 K**	0.60	0.30	**7.2**	0.59	0.30
Iron	20,000	**22,500**	---	---	**21,000 J**	5.9	0.413	**9,330 B**	5.83	0.409	**13,500**	99.9	50.0	**16800**	51	4.25	**17900**	50.6	4.22	**15500 J**	61.2	30.6	**10800 J**	65.4	32.7	**14,900**	---	---	**17,800 J**	6.06	0.425	**18,400 B**	6.20	0.435
Lead	35.8	**9.7**	---	---	**4.7 K**	0.62	0.31	**5.6**	0.65	0.32	**11.3**	0.50	0.25	**14.2 J**	0.51	0.0164	**13.2 J**	0.506	0.0329	**9.43**	0.764	0.306	**12.9**	3.97	1.59	**10**	---	---	**4.5 K**	0.60	0.30	**3.5**	0.59	0.30
Manganese	460	**211**	---	---	**524 K**	0.59	0.00755	**107 B**	0.583	0.00746	**293**	0.50	0.25	**501**	1.28	0.106	**387**	1.27	0.105	**312**	4.59	1.53	**327 J**	4.9	1.63	**129**	---	---	**242 K**	0.606	0.00776	**273 B**	0.620	0.00794
Mercury	0.18	**0.014 B**	---	---	**0.0232 J**	0.0239	0.0106	UL	0.0643	0.0169	**0.22**	0.031	0.00063	**0.672 J-**	0.265	0.0132	**0.347 J-**	0.237	0.0119	**0.315**	0.157	0.0472	**0.343**	0.163	0.0488	**0.02 B**	---	---	**0.0157 J**	0.0241	0.0107	UL	0.0653	0.0171
Nickel	22.7	**6.9**	---	---	**6.98**	0.59	0.082	**3.79 B**	0.583	0.081	**7.4**	0.50	0.25	**9.63**	2.55	0.293	**9.64**	2.53	0.291	**8.41**	3.06	0.917	**7.94 J**	3.27	0.98	**4.3 B**	---	---	**3.86**	0.606	0.0842	**8.35 B**	0.620	0.0862
Vanadium	NV	**25**	---	---	**15.1 J**	0.59	0.0709	**9.91**	0.583	0.0701	**21**	0.50	0.25	**22.9**	1.28	0.191	**22.2**	1.27	0.19	**16.7**	15.3	3.06	**19.6 J**	16.3	3.27	**17.5**	---	---	**19.5 J**	0.606	0.0729	**35.5**	0.620	0.0746
Zinc	121	**24.1**	---	---	**37.8 B**	0.59	0.0727	**14.5 B**	0.583	0.0718	**54.3**	1.0	0.50	**117**	5.1	0.982	**112**	5.06	0.975	**80.1**	15.3	7.64	**64.3 J**	16.3	8.17	**20.8**	---	---	**20 B**	0.606	0.0747	**14.9 B**	0.620	0.0764
Other Inorganics																																
Cyanide (Total) (mg/kg)	NV		---		U	0.63	0.31	U	0.58	0.29	UJ	0.34	0.17	U	0.66	0.24	U	0.6	0.21	R	3.17	1.58	R	3.12	1.56		---		U	0.61	0.31	U	0.60	0.30
Cyanide (Free) (mg/kg)	0.1		---		---			---			---			U	0.78	0.26	U	0.75	0.25	U	3.24	0.541	U	1.76	0.5		---		---			---		
Percent Solids (%)	NV		---		**83**	0.0174	0.0174	**83.8**	0.01	0.01	**68.6**	0.10	0.10	**75.4**	0.5	0.5	**79**	0.5	0.5	63.1	--	--	61.6	--	--		---		**82.2**	0.175	0.175	**80.5**	0.01	0.01
Total Organic Carbon (mg/kg)	NV		---		**1,600**	470	470	**640**	470	470		---[3]		**10500**	1140	379	**10300**	1060	352		--		**9880**	1000	380		---		**5,900**	500	500	**750**	490	490
Total Organic Carbon (mg/l)	NV		---			---			---			---			---			---			**2.28**	1.00	0.500		--			---			---		
Grain Size (%)																																
Gravel	NV		---		**48.3**	---	---	**45.2**	---	---		---			---			---		0.0	--	--	0.5	--	--		---		**48.4**	---	---	**39.0**	---	---
Sand	NV		---		**49.9**	---	---	**53.7**	---	---		---			---			---		77.5	--	--	72	--	--		---		**50.7**	---	---	**54.8**	---	---
Coarse Sand			---		**7.0**	---	---	**10.2**	---	---		---			---			---		3.9	--	--	2.2	--	--		---		**12.5**	---	---	**11.6**	---	---
Medium Sand			---		**31.9**	---	---	**30.0**	---	---		---			---			---		21.9	--	--	13.8	--	--		---		**27.3**	---	---	**26.8**	---	---
Fine Sand			---		**11.0**	---	---	**13.5**	---	---		---			---			---		51.7	--	--	56	--	--		---		**10.9**	---	---	**16.4**	---	---
Silt	NV		---		**1.4**	---	---	**0.8**	---	---		---			---			---		18.8	--	--	21.1	--	--		---		**0.5**	---	---	**5.6**	---	---
Clay	NV		---		**0.4**	---	---	**0.3**	---	---		---			---			---		3.7	--	--	6.4	--	--		---		**0.4**	---	---	**0.6**	---	---
0.001 mm	NV		---			---			---			---		U	0.5	0.5		---			--			--			---			---			---	
0.002 mm	NV		---			---			---			---		0.5	0.5	0.5		---			--			--			---			---			---	
0.005 mm	NV		---			---			---			---		4	0.5	0.5		---			--			--			---			---			---	
0.02 mm	NV		---			---			---			---		14	0.5	0.5		---			--			--			---			---			---	
0.05 mm	NV		---			---			---			---		21.5	0.5	0.5		---			--			--			---			---			---	
0.064 mm	NV		---			---			---			---		27	0.5	0.5		---			--			--			---			---			---	
0.075 mm	NV		---			---			---			---		30.7	0.5	0.5		---			--			--			---			---			---	
0.15 mm	NV		---			---			---			---		41.9	0.5	0.5		---			--			--			---			---			---	
0.3 mm	NV		---			---			---			---		63.7	0.5	0.5		---			--			--			---			---			---	
0.6 mm	NV		---			---			---			---		88.9	0.5	0.5		---			--			--			---			---			---	
1.18 mm	NV		---			---			---			---		91	0.5	0.5		---			--			--			---			---			---	
2.36 mm	NV		---			---			---			---		91.3	0.5	0.5		---			--			--			---			---			---	
3.35 mm	NV		---			---			---			---		95.7	0.5	0.5		---			--			--			---			---			---	
4.75 mm	NV		---			---			---			---		98.3	0.5	0.5		---			--			--			---			---			---	
19 mm	NV		---			---			---			---		100	0.5	0.5		---			--			--			---			---			---	
37.5 mm	NV		---			---			---			---		100	0.5	0.5		---			--			--			---			---			---	
75 mm	NV		---			---			---			---		100	0.5	0.5		---			--			--			---			---			---	

Appendix H-1 - VB 9-11 Plume Sediment Quality and Grain Size Data
Avtex Fibers Superfund Site, Front Royal, VA

Parameter	EPA Region III Freshwater Sediment Screening Benchmark[1]	SD-04																					SD-05								
		8/2001			9/5/2012			9/10/2013			7/1/2014			7/11/2015			7/11/2015			7/13/2016			7/13/2017			8/2001			9/5/2012			9/10/2013		
		Conc.	RL	MDL	Conc.	RL[2]	MDL[2]	Conc.	RL[2]	MDL[2]	Conc.	RL	MDL	Conc.	RL	MDL	Conc.	RL	MDL	Conc.	RL	MDL	Conc.	RL	MDL	Conc.	RL	MDL	Conc.	RL[2]	MDL[2]	Conc.	RL[2]	MDL[2]
Hydrometer 1 for particle size distribution	NV		---			---			---			---			---			---		11.9	--	--	14.5	--	--		---			---			---	
Hydrometer 2 for particle size distribution	NV		---			---			---			---			---			---		10.5	--	--	12.1	--	--		---			---			---	
Hydrometer 3 for particle size distribution	NV		---			---			---			---			---			---		7.8	--	--	10.3	--	--		---			---			---	
Hydrometer 4 for particle size distribution	NV		---			---			---			---			---			---		5.8	--	--	8.5	--	--		---			---			---	
Hydrometer 5 for particle size distribution	NV		---			---			---			---			---			---		3.7	--	--	6.4	--	--		---			---			---	
Hydrometer 6 for particle size distribution	NV		---			---			---			---			---			---		3.1	--	--	4.1	--	--		---			---			---	
Hydrometer 7 for particle size distribution	NV		---			---			---			---			---			---		1.0	--	--	2.7	--	--		---			---			---	
Sieve, #10	NV		---			---			---			---			---			---		96.1	--	--	97.3	--	--		---			---			---	
Sieve, #100	NV		---			---			---			---			---			---		33.1	--	--	40.6	--	--		---			---			---	
Sieve, #20	NV		---			---			---			---			---			---		92.1	--	--	95.2	--	--		---			---			---	
Sieve, #200	NV		---			---			---			---			---			---		22.5	--	--	27.5	--	--		---			---			---	
Sieve, #4	NV		---			---			---			---			---			---		100.0	--	--	99.5	--	--		---			---			---	
Sieve, #40	NV		---			---			---			---			---			---		74.2	--	--	83.5	--	--		---			---			---	
Sieve, #60	NV		---			---			---			---			---			---		48.0	--	--	57.6	--	--		---			---			---	
Sieve, #80	NV		---			---			---			---			---			---		38.4	--	--	47.3	--	--		---			---			---	
Sieve, 0.375 inch	NV		---			---			---			---			---			---		100.0	--	--	100	--	--		---			---			---	
Sieve, 0.75 inch	NV		---			---			---			---			---			---		100.0	--	--	100	--	--		---			---			---	
Sieve, 1 inch	NV		---			---			---			---			---			---		100.0	--	--	100	--	--		---			---			---	
Sieve, 1.5 inch	NV		---			---			---			---			---			---		100.0	--	--	100	--	--		---			---			---	
Sieve, 2 inch	NV		---			---			---			---			---			---		100.0	--	--	100	--	--		---			---			---	
Sieve, 3 inch	NV		---			---			---			---			---			---		100.0	--	--	100	--	--		---			---			---	

Notes:
[1]- EPA Region III Freshwater Sediment Screening Benchmarks (EPA, 2006).
[2] - The RLs and MDLs are equivalent for all VOC results. The laboratory does not report VOCs to the statistical MDL due to purge-trap background.
[3] - Due to lab error, the sample was inadvertently disposed of before analysis was conducted.
Aug-01 data from the report Supplamental Field and Laboratory Data Report for Operable Unit 7 (Exponent, 2001).
VOC - Volatile Organic Compound SVOC - Semivolatile Organic Compound
ug/kg - micrograms per kilogram mg/kg - milligrams per kilogram
RL - Laboratory Reporting Limit MDL - Method Detection Limit
--- - Not analyzed
B - Contituent also detected in associated blank D - Sample was diluted
J - Reported as est. between the RL and the MDL and/or due to data validation.
K - Reported value may be biased high N - Spike sample out of control limits
U - Not detected above the laboratory reporting limit
Bold - Indicates detected result
= Constituent detected above benchmark screening value.

Appendix H-1 - VB 9-11 Plume Sediment Quality and Grain Size Data
Avtex Fibers Superfund Site, Front Royal, VA

Parameter	EPA Region III Freshwater Sediment Screening Benchmark[1]	SD-05 (Continued)																	SD-06												
		9/10/2013			7/1/2014			7/12/2015			7/13/2016			7/13/2016			7/13/2017			8/2001			9/6/2012			9/10/2013			7/2/2014			7/12/2015		
		Conc.	RL[2]	MDL[2]	Conc.	RL	MDL	Conc.	RL	MDL	Conc.	RL	MDL	Conc.	RL	MDL	Conc.	RL	MDL	Conc.	RL	MDL	Conc.	RL[2]	MDL[2]	Conc.	RL[2]	MDL[2]	Conc.	RL	MDL	Conc.	RL	MDL
VOCs (µg/kg)																																	
Acetone	NV	**11.1 K**	8.18	8.18	**65.4 J**	117	11.7	**24**	18	6	U	76	41.3	U	65.9	30.8	**57.2 J**	69.0	11.6	**13 J**	---	---	**50.9 K**	8.04	8.04	**25.4**	9.44	9.44	U	2,200	220	**31**	25	9
Carbon disulfide	0.851	**34.8 K**	1.64	1.64	**13.3**	11.7	3.5	**16**	4	0.9	U	7.6	5.47	U	6.59	4.75	U	6.90	4.97	**2 J**	---	---	**4.74 K**	1.61	1.61	**3.75**	1.89	1.89	U	220	6.1	**4 J**	6	1
Chlorobenzene	8.42	U	1.64	1.64	U	5.8	2.2	U	4	0.9	U	3.04	1.02	U	2.64	0.883	U	2.76	0.924	**3 J**	---	---	U	1.61	1.61	U	1.89	1.89	U	110	1.9	U	6	1
SVOCs (µg/kg)																																	
2-Methylphenol (o-Cresol)	NV	U	409	40.9	U	448	136	U	40	20	U	505	328	U	467	303	U	482	313		---		U	369	36.9	U	388	38.8	U	407	123	U	50	25
4,3-Methylphenol	670	U	409	40.9	U	448	176	U	40	20	U	505	308	U	467	285	U	482	294		---		U	369	36.9	U	388	38.8	U	407	160	U	50	25
bis(2-Ethylhexyl)phthalate	180	U	409	40.9	U	448	122	U	200	80	U	505	314	U	467	290	U	482	300		---		U	369	36.9	U	388	38.8	U	407	111	U	250	100
Naphthalene	176	U	204	40.9	U	448	110	**11 J**	20	4	U	102	44	U	93.9	40.7	U	97.0	42.0		---		U	184	36.9	U	194	38.8	U	407	9.8	**10 J**	25	5
Pentachlorophenol	504	U	409	40.9	U	2,240	81.4	U	200	40	U	1020	403	U	939	373	U	970	385		---		U	369	36.9	U	388	38.8	U	2,030	73.9	U	250	50
Phenol	420	U	409	40.9	U	448	134	U	40	20	U	505	308	U	467	285	U	482	294		---		U	369	36.9	U	388	38.8	U	407	122	U	50	25
Inorganics (mg/kg)																																	
Aluminum	NV	**3,650 B**	6.22	1.66	**3,160**	9.0	4.5	**4870**	47	8.99	**3650 J**	30.3	15.2	**2430 J**	27.3	13.6	**2950 J**	28.2	14.1	**5,910**	---	---	**3,080 K**	5.48	1.47	**3,130 B**	5.84	1.56	**2,390**	12.3	6.2	**14000**	60	11.5
Antimony	2	U	0.57	0.28	U	0.45	0.35	UJ-	0.47	0.0991	UJ	0.758	0.303	UJ	0.682	0.273	U	3.65	1.46	**1.3 B**	---	---	U	0.56	0.28	U	0.64	0.32	U	0.62	0.48	**0.192 J-**	0.6	0.127
Arsenic	9.8	**1.30**	0.57	0.28	**3.3**	0.90	0.45	**2.40 J-**	0.939	0.1	**2.39**	0.758	0.303	**1.56**	0.682	0.273	**4.36**	3.65	1.46	**3.8**	---	---	**1.1 J**	0.56	0.28	**1.9**	0.64	0.32	**1.1 J**	1.2	0.62	**5.13 J-**	1.2	0.128
Cadmium	0.99	U	0.068	0.034	**0.077 J**	0.090	0.045	**0.0378 J**	0.235	0.0237	U	0.758	0.303	U	0.682	0.273	U	3.65	1.46	**0.087 B**	---	---	U	0.067	0.034	U	0.076	0.038	U	0.12	.062	**0.0765 J**	0.3	0.0303
Chromium	43.4	**39.6 B**	0.622	0.0479	**22.9**	0.45	0.23	**13**	3.52	0.115	**10.3**	1.52	1.36	**10.6**	1.36	1.23	**11.1 J**	1.41	1.27	**24.4 N**	---	---	**15.5 B**	0.548	0.0422	**15.6 B**	0.584	0.045	**6.8**	0.62	0.31	**16.4**	4.5	0.147
Cobalt	50	**7.3**	0.57	0.28	**4.4**	0.45	0.23	**4.82 J**	0.235	0.0235	**4.82**	0.758	0.303	**4.45**	0.682	0.273	**7.49**	3.65	1.46	**9.3**	---	---	**4.3 K**	0.56	0.28	**5.1**	0.64	0.32	**3.3**	0.62	0.31	**10.6 J**	0.3	0.03
Iron	20,000	**18,400 B**	6.22	0.436	**10,700**	90.5	45.2	**15900**	47	3.91	**10500 J**	60.7	30.3	**11200 J**	54.5	27.3	**6990 J**	56.5	28.2	**26,700**	---	---	**15,100 J**	5.48	0.384	**15,400 B**	5.84	0.410	**7,860**	12.3	6.2	**18600**	60	4.99
Lead	35.8	**6.4**	0.57	0.28	**9.2**	0.45	0.23	**6.49 J**	0.47	0.0151	**8.55**	0.758	0.303	**6.13**	0.682	0.273	**12.6**	3.65	1.46	**5.8**	---	---	**4.3 K**	0.56	0.28	**6.1**	0.64	0.32	**5.3**	0.62	0.31	**15.8 J**	0.6	0.0193
Manganese	460	**170 B**	0.622	0.00796	**276**	0.45	0.23	**224**	1.17	0.0974	**256**	4.55	1.52	**207**	4.09	1.36	**468 J**	4.23	1.41	**436**	---	---	**144 K**	0.548	0.00702	**179 B**	0.584	0.00748	**115**	0.62	0.31	**791**	1.5	0.124
Mercury	0.18	UL	0.0658	0.0173	**0.097**	0.0045	0.00090	**0.103 J-**	0.23	0.0115	**0.319**	0.152	0.0457	**0.151**	0.141	0.0423	**0.441**	0.142	0.0425	**0.023 B**	---	---	**0.023 J**	0.023	0.0102	UL	0.0612	0.0161	**0.066**	0.0054	0.00011	**0.0784 J-**	0.296	0.0148
Nickel	22.7	**5.52 B**	0.622	0.0864	**6.3**	0.45	0.23	**5.27**	2.35	0.27	**6.43**	3.03	0.910	**5.78**	2.73	0.818	**6.41 J**	2.82	0.847	**12**	---	---	**6.21**	0.548	0.0762	**5.99 B**	0.584	0.0812	**4.1**	0.62	0.31	**12.4**	3	0.345
Vanadium	NV	**27.1**	0.622	0.0748	**15.5**	0.45	0.23	**18**	1.17	0.176	**14.1 J**	15.2	3.03	**10.5 J**	13.6	2.73	**12.7 J**	14.1	2.82	**36**	---	---	**14 J**	0.548	0.0659	**15.3**	0.584	0.0703	**9.7**	0.62	0.31	**33.8**	1.5	0.225
Zinc	121	**18.7 B**	0.622	0.0766	**149**	0.90	0.45	**33**	4.7	0.904	**57.2**	15.2	7.58	**38.2**	13.6	6.82	**79.7 J**	14.1	7.06	**39.1**	---	---	**22.7 B**	0.548	0.0676	**22.0 B**	0.584	0.072	**20.8**	1.2	0.62	**37.4**	6	1.15
Other Inorganics																																	
Cyanide (Total) (mg/kg)	NV	U	0.59	0.29	U	0.32	0.16	U	0.6	0.22	R	3.09	1.54	R	2.85	1.43	R	2.99	1.49		---		U	0.59	0.29	U	0.63	0.31	U	0.30	0.15	U	0.73	0.26
Cyanide (Free) (mg/kg)	0.1	---			---			U	0.72	0.24	U	3.19	0.532	U	2.92	0.487	U	1.53	0.433		---		---			---			---			U	0.89	0.3
Percent Solids (%)	NV	**80.9**	0.01	0.01	**73.7**	0.10	0.10	**82.7**	0.5	0.5	64.8	--	--	70.1	--	--	68.3	--	--		---		**88.7**	0.0184	0.0184	**84.5**	0.01	0.01	**81.1**	0.10	0.10	**66.7**	0.5	0.5
Total Organic Carbon (mg/kg)	NV	**1,500**	490	490		---[3]		**3620**	678	226		--			--		**12800**	1000	380		---		**940**	460	460	**570**	470	470		---[3]		**18400**	1750	585
Total Organic Carbon (mg/l)	NV		---			---			---		**2.38**	1.00	0.500	**2.49**	1.00	0.500		--			---			---			---			---			---		
Grain Size (%)																																	
Gravel	NV	**39**	---	---		---			---		0.0	--	--	0.0	--	--	5.3	--	--		---		**42.2**	---	---	**35.5**	---	---		---			---		
Sand	NV	**54.8**	---	---		---			---		72.1	--	--	75.5	--	--	80.7	--	--		---		**56.5**	---	---	**63.5**	---	---		---			---		
Coarse Sand		**11.6**	---	---		---			---		3.6	--	--	2.3	--	--	2.3	--	--		---		**11.0**	---	---	**10.2**	---	---		---			---		
Medium Sand		**26.8**	---	---		---			---		8.9	--	--	16.6	--	--	14.3	--	--		---		**29.9**	---	---	**36.1**	---	---		---			---		
Fine Sand		**16.4**	---	---		---			---		59.6	--	--	56.6	--	--	64.1	--	--		---		**15.6**	---	---	**17.2**	---	---		---			---		
Silt	NV	**5.6**	---	---		---			---		17.2	--	--	16.7	--	--	7.9	--	--		---		**0.9**	---	---	**0.4**	---	---		---			---		
Clay	NV	**0.6**	---	---		---			---		10.7	--	--	7.8	--	--	6.1	--	--		---		**0.4**	---	---	**0.6**	---	---		---			---		
0.001 mm	NV		---			---		U	0.5	0.5		--			--			--			---			---			---			---			0.5	0.5	0.5
0.002 mm	NV		---			---		U	0.5	0.5		--			--			--			---			---			---			---			5.5	0.5	0.5
0.005 mm	NV		---			---		U	0.5	0.5		--			--			--			---			---			---			---			11.5	0.5	0.5
0.02 mm	NV		---			---		U	0.5	0.5		--			--			--			---			---			---			---			26	0.5	0.5
0.05 mm	NV		---			---		1.5	0.5	0.5		--			--			--			---			---			---			---			39	0.5	0.5
0.064 mm	NV		---			---		4	0.5	0.5		--			--			--			---			---			---			---			44.5	0.5	0.5
0.075 mm	NV		---			---		5.6	0.5	0.5		--			--			--			---			---			---			---			47.7	0.5	0.5
0.15 mm	NV		---			---		8.2	0.5	0.5		--			--			--			---			---			---			---			58.8	0.5	0.5
0.3 mm	NV		---			---		21.2	0.5	0.5		--			--			--			---			---			---			---			67.2	0.5	0.5
0.6 mm	NV		---			---		46.1	0.5	0.5		--			--			--			---			---			---			---			73.8	0.5	0.5
1.18 mm	NV		---			---		65.6	0.5	0.5		--			--			--			---			---			---			---			74.9	0.5	0.5
2.36 mm	NV		---			---		86	0.5	0.5		--			--			--			---			---			---			---			76.6	0.5	0.5
3.35 mm	NV		---			---		88	0.5	0.5		--			--			--			---			---			---			---			83.3	0.5	0.5
4.75 mm	NV		---			---		89.5	0.5	0.5		--			--			--			---			---			---			---			91.9	0.5	0.5
19 mm	NV		---			---		100	0.5	0.5		--			--			--			---			---			---			---			100	0.5	0.5
37.5 mm	NV		---			---		100	0.5	0.5		--			--			--			---			---			---			---			100	0.5	0.5
75 mm	NV		---			---		100	0.5	0.5		--			--			--			---			---			---			---			100	0.5	0.5

Appendix H-1 - VB 9-11 Plume Sediment Quality and Grain Size Data
Avtex Fibers Superfund Site, Front Royal, VA

Parameter	EPA Region III Freshwater Sediment Screening Benchmark[1]	SD-05 (Continued)																SD-06											
		9/10/2013			7/1/2014			7/12/2015			7/13/2016			7/13/2016			7/13/2017			8/2001			9/6/2012			9/10/2013			7/2/2014			7/12/2015		
		Conc.	RL[2]	MDL[2]	Conc.	RL	MDL	Conc.	RL	MDL	Conc.	RL	MDL	Conc.	RL	MDL	Conc.	RL	MDL	Conc.	RL	MDL	Conc.	RL[2]	MDL[2]	Conc.	RL[2]	MDL[2]	Conc.	RL	MDL	Conc.	RL	MDL
Hydrometer 1 for particle size distribution	NV		---			---			---		21.9	--	--	16.1	--	--	11.4	--	--		---			---			---			---			---	
Hydrometer 2 for particle size distribution	NV		---			---			---		20.1	--	--	12.8	--	--	10.3	--	--		---			---			---			---			---	
Hydrometer 3 for particle size distribution	NV		---			---			---		17.1	--	--	12.8	--	--	9.2	--	--		---			---			---			---			---	
Hydrometer 4 for particle size distribution	NV		---			---			---		15.4	--	--	11.1	--	--	8.1	--	--		---			---			---			---			---	
Hydrometer 5 for particle size distribution	NV		---			---			---		10.7	--	--	7.8	--	--	6.1	--	--		---			---			---			---			---	
Hydrometer 6 for particle size distribution	NV		---			---			---		7.9	--	--	6.2	--	--	3.8	--	--		---			---			---			---			---	
Hydrometer 7 for particle size distribution	NV		---			---			---		3.3	--	--	2.1	--	--	2.5	--	--		---			---			---			---			---	
Sieve, #10	NV		---			---			---		96.4	--	--	97.7	--	--	92.4	--	--		---			---			---			---			---	
Sieve, #100	NV		---			---			---		42.5	--	--	35.7	--	--	27.6	--	--		---			---			---			---			---	
Sieve, #20	NV		---			---			---		95.1	--	--	95.4	--	--	90	--	--		---			---			---			---			---	
Sieve, #200	NV		---			---			---		27.9	--	--	24.5	--	--	14	--	--		---			---			---			---			---	
Sieve, #4	NV		---			---			---		100.0	--	--	100.0	--	--	94.7	--	--		---			---			---			---			---	
Sieve, #40	NV		---			---			---		87.5	--	--	81.1	--	--	78.1	--	--		---			---			---			---			---	
Sieve, #60	NV		---			---			---		62.3	--	--	54.2	--	--	48.1	--	--		---			---			---			---			---	
Sieve, #80	NV		---			---			---		49.4	--	--	41.9	--	--	34.5	--	--		---			---			---			---			---	
Sieve, 0.375 inch	NV		---			---			---		100.0	--	--	100.0	--	--	97.2	--	--		---			---			---			---			---	
Sieve, 0.75 inch	NV		---			---			---		100.0	--	--	100.0	--	--	100	--	--		---			---			---			---			---	
Sieve, 1 inch	NV		---			---			---		100.0	--	--	100.0	--	--	100	--	--		---			---			---			---			---	
Sieve, 1.5 inch	NV		---			---			---		100.0	--	--	100.0	--	--	100	--	--		---			---			---			---			---	
Sieve, 2 inch	NV		---			---			---		100.0	--	--	100.0	--	--	100	--	--		---			---			---			---			---	
Sieve, 3 inch	NV		---			---			---		100.0	--	--	100.0	--	--	100	--	--		---			---			---			---			---	

Notes:
[1]- EPA Region III Freshwater Sediment Screening Benchmarks (EPA, 2006).
[2] - The RLs and MDLs are equivalent for all VOC results. The laboratory does not report VOCs to the statistical MDL due to purge-trap background.
[3] - Due to lab error, the sample was inadvertently disposed of before analysis was conducted.
Aug-01 data from the report Supplamental Field and Laboratory Data Report for Operable Unit 7 (Exponent, 2001).
VOC - Volatile Organic Compound SVOC - Semivolatile Organic Compound
ug/kg - micrograms per kilogram mg/kg - milligrams per kilogram
RL - Laboratory Reporting Limit MDL - Method Detection Limit
--- - Not analyzed
B - Contituent also detected in associated blank D - Sample was diluted
J - Reported as est. between the RL and the MDL and/or due to data validation.
K - Reported value may be biased high N - Spike sample out of control limits
U - Not detected above the laboratory reporting limit
Bold - Indicates detected result
= Constituent detected above benchmark screening value.

Appendix H-1 - VB 9-11 Plume Sediment Quality and Grain Size Data
Avtex Fibers Superfund Site, Front Royal, VA

Parameter	EPA Region III Freshwater Sediment Screening Benchmark[1]	SD-06 (Continued)									SD-07																	
		7/13/2016			7/13/2017			7/13/2017			9/6/2012			9/6/2012			9/10/2013			7/2/2014			7/2/2014			7/12/2015			7/13/2016			7/13/2017		
		Conc.	RL	MDL	Conc.	RL	MDL	Conc.	RL	MDL	Conc.	RL[2]	MDL[2]	Conc.	RL[2]	MDL[2]	Conc.	RL[2]	MDL[2]	Conc.	RL	MDL	Conc.	RL	MDL	Conc.	RL	MDL	Conc.	RL	MDL	Conc.	RL	MDL
VOCs (µg/kg)																																	
Acetone	NV	U	67.8	53.8	**49.5 J**	69.0	11.6	**54.6 J**	77.1	13.0	**36.1 K**	8.94	8.94		---[4]		**29.8 K**	8.69	8.69	**116 J**	125	2.5	**41.0 J**	123	12.3	**21**	9	3	U	65.5	37.1	**138**	98.0	16.5
Carbon disulfide	0.851	**5.23 J**	6.78	4.88	**6.67 J**	6.90	4.97	**7.23 J**	7.71	5.55	**3.51 K**	1.79	1.79		---[4]		**2.72 K**	1.74	1.74	U	12.5	3.7	U	12.3	3.7	**11**	2	0.5	**6.97**	6.55	4.71	U	9.80	7.06
Chlorobenzene	8.42	U	2.71	0.909	U	2.76	0.925	U	3.08	1.03	U	1.79	1.79		---[4]		U	1.74	1.74	U	6.2	2.4	U	6.1	2.3	U	2	0.5	U	2.62	0.877	U	3.92	1.31
SVOCs (µg/kg)																																	
2-Methylphenol (o-Cresol)	NV	U	477	309	U	509	330	U	524	340	U, J	392	39.2	U	380	38	U	402	40.2	U	498	151	U	552	167	U	40	20	U	449	291	U	661	428
4,3-Methylphenol	670	U	477	291	U	509	310	U	524	320	U, J	392	39.2	U	380	38	U	402	40.2	U	498	196	U	552	217	U	40	20	U	449	274	U	661	403
bis(2-Ethylhexyl)phthalate	180	U	477	296	U	509	317	U	524	326	U	392	39.2	U	380	38	U	402	40.2	U	498	136	U	552	150	U	200	79	U	449	279	U	661	411
Naphthalene	176	U	96	41.5	U	102	44.3	U	105	45.6	U	196	39.2	U	190	38	U	201	40.2	U	498	122	U	552	135	**5 J**	20	4	U	90.3	39.1	U	133	57.5
Pentachlorophenol	504	U	960	381	U	1020	407	U	1050	419	U, J	392	39.2	U	380	38	U	402	40.2	U	2,490	90.6	U	2,760	100	U	200	40	U	903	359	U	1330	528
Phenol	420	U	477	291	U	509	310	U	524	320	U	392	39.2	U	380	38	U	402	40.2	U	498	150	U	552	166	U	40	20	U	449	274	U	661	403
Inorganics (mg/kg)																																	
Aluminum	NV	**2970 J**	28.9	14.4	**3310 J**	30.7	15.3	**6390 J**	30.4	15.2	**2,550 K**	5.92	1.58	**2,290 K**	5.87	1.57	**2,450 B**	6.11	1.63	**3,290**	11.1	5.6	**3,410**	11.1	5.6	**6810**	46.8	8.96	**2470 J**	26.8	13.4	**1960 J**	39.4	19.7
Antimony	2	UJ	0.721	0.289	U	3.78	1.51	U	3.99	1.6	U	0.60	0.30	U	0.60	0.30	U	0.62	0.31	U	0.56	0.43	U	0.56	0.43	**0.101 J-**	0.468	0.0987	UJ	0.670	0.268	U	5	2
Arsenic	9.8	**2.00**	0.721	0.289	**2.04 J**	3.78	1.51	**3.63 J**	3.99	1.6	**0.76 J**	0.60	0.30	**1.1 J**	0.60	0.30	**1.5**	0.62	0.31	**1.3**	1.1	0.56	**1.5**	1.1	0.56	**3.04 J-**	0.936	0.0999	**1.54**	0.670	0.268	U	5	2
Cadmium	0.99	U	0.721	0.289	U	3.78	1.51	U	3.99	1.6	U	0.072	0.036	U	0.14	0.072	U	0.075	0.037	U	0.11	.056	U	0.11	0.056	**0.0899 J**	0.234	0.0236	U	0.670	0.268	U	5	2
Chromium	43.4	**8.83**	1.44	1.30	**13.2 J**	1.53	1.38	**13.1 J**	1.52	1.37	**13.5 B**	0.592	0.0455	**9.09 B**	0.587	0.0452	**10.9 B**	0.611	0.047	**9.5**	0.56	0.28	**9.6**	0.56	0.28	**10.9**	3.51	0.115	**8.15**	1.34	1.21	**8.43 J**	1.97	1.77
Cobalt	50	**5.20**	0.721	0.289	**5.4 J**	3.78	1.51	**12.6 J**	3.99	1.6	**5.8 K**	0.60	0.30	**3.2 K**	0.60	0.30	**4.8**	0.62	0.31	**5.0**	0.56	0.28	**5.0**	0.56	0.28	**5.37 J**	0.234	0.0234	**4.17**	0.670	0.268	**6.69**	5	2
Iron	20,000	**12000 J**	57.7	28.9	**11000 J**	61.4	30.7	**16300 J**	60.9	30.4	**16,700 J**	5.92	0.415	**10,800 J**	5.87	0.412	**12,100 B**	6.11	0.428	**10,500**	11.1	5.6	**10,500**	11.1	5.6	**12800**	46.8	3.9	**10500 J**	53.6	26.8	**3520 J**	78.7	39.4
Lead	35.8	**7.15**	0.721	0.289	**8.11**	3.78	1.51	**14.7**	3.99	1.6	**3.1 K**	0.60	0.30	**4.4 K**	0.60	0.30	**5.7**	0.62	0.31	**7.7**	0.56	0.28	**7.7**	0.56	0.28	**9.71 J**	0.468	0.015	**6.05**	0.670	0.268	**9.45**	5	2
Manganese	460	**294**	4.33	1.44	**285 J**	4.6	1.53	**1140 J**	4.56	1.52	**160 K**	0.592	0.00757	**134 K**	0.587	0.00752	**156 B**	0.611	0.00782	**209**	0.56	0.28	**197**	0.56	0.28	**278**	1.17	0.0971	**212**	4.02	1.34	**210 J**	5.91	1.97
Mercury	0.18	**0.200**	0.143	0.0428	**0.108 J**	0.148	0.0443	**0.0954 J**	0.157	0.047	**0.0146 J**	0.024	0.0106	**0.021 J**	0.024	0.0105	**0.0347 L**	0.0631	0.0166	**0.15**	0.026	0.00053	**0.17**	0.027	0.00053	**0.210 J-**	0.226	0.0113	**0.158**	0.135	0.0406	**0.227**	0.204	0.0613
Nickel	22.7	**6.12**	2.89	0.866	**6.81 J**	3.07	0.921	**11.1 J**	3.04	0.913	**4.91**	0.592	0.0822	**4.05**	0.587	0.0816	**4.60 B**	0.611	0.0849	**5.8**	0.56	0.28	**5.8**	0.56	0.28	**6.54**	2.34	0.269	**5.28**	2.68	0.804	**5.04 J**	3.94	1.18
Vanadium	NV	**13.4 J**	14.4	2.89	**17.9 J**	15.3	3.07	**27.6 J**	15.2	3.04	**19.6 J**	0.592	0.0712	**10 J**	0.587	0.0706	**12.8**	0.611	0.0735	**12.1**	0.56	0.28	**12.7**	0.56	0.28	**17.2**	1.17	0.175	**12.0 J**	13.4	2.68	**8.46 J**	19.7	3.94
Zinc	121	**47.8**	14.4	7.21	**26 J**	15.3	7.67	**37.1 J**	15.2	7.61	**21.9 B**	0.592	0.0729	**24.4 B**	0.587	0.0724	**17.1 B**	0.611	0.0753	**32.0**	1.1	0.56	**33.0**	1.1	0.56	**32.1**	4.68	0.901	**20.9**	13.4	6.70	**25.7 J**	19.7	9.84
Other Inorganics																																	
Cyanide (Total) (mg/kg)	NV	R	2.91	1.45	R	3.03	1.52	R	3.26	1.63	U	0.56	0.28	U	0.56	0.28	U	0.60	0.30	U	0.37	0.19	U	0.41	0.20	U	0.57	0.21	R	2.75	1.37	R	4.31	2.15
Cyanide (Free) (mg/kg)	0.1	U	3.09	0.516	U	1.48	0.421	U	1.68	0.477		---			---			---			---			---		U	0.72	0.24	U	2.98	0.497	U	2.17	0.618
Percent Solids (%)	NV	68.8	--	--	65.3	--	--	62.6	--	--	**83.1**	0.0178	0.0178	**85**	0.02	0.02	**82.6**	0.01	0.01	**66.2**	0.10	0.10	**59.8**	0.10	0.10	**83**	0.5	0.5	72.7	--	--	48.8	--	--
Total Organic Carbon (mg/kg)	NV		--		**16500**	1000	380	**7740**	1000	380	**1,500**	470	470	**1,100**	480	480	**1,300**	480	480		---[3]			---[3]		**5470**	853	284		--		**16300**	1000	380
Total Organic Carbon (mg/l)	NV	**2.70**	1.00	0.500		--			--			---			---			---			---			---			---		**2.50**	1.00	0.500		--	
Grain Size (%)																																	
Gravel	NV	3.3	--	--	14.6	--	--	1.7	--	--	**39.3**	---	---	**19.8**	---	---	**27.7**	---	---	---			---				---		18.9	--	--	3.5	--	--
Sand	NV	76.1	--	--	51.6	--	--	54.1	--	--	**59.8**	---	---	**78.3**	---	---	**68.0**	---	---	---			---				---		59.6	--	--	77.5	--	--
Coarse Sand		5.6	--	--	2.4	--	--	0.6	--	--	**12.4**	---	---	**11.9**	---	---	**13.3**	---	---	---			---				---		5.2	--	--	1.7	--	--
Medium Sand		17.5	--	--	11.8	--	--	11	--	--	**34.5**	---	---	**45.3**	---	---	**37.5**	---	---	---			---				---		15.6	--	--	4.5	--	--
Fine Sand		53.0	--	--	37.4	--	--	42.5	--	--	**12.9**	---	---	**21.1**	---	---	**17.2**	---	---	---			---				---		38.8	--	--	71.3	--	--
Silt	NV	12.8	--	--	23.5	--	--	30	--	--	**0.5**	---	---	**1.3**	---	---	**3.7**	---	---	---			---				---		13.8	--	--	14.4	--	--
Clay	NV	7.8	--	--	10.3	--	--	14.2	--	--	**0.3**	---	---	**0.6**	---	---	**0.7**	---	---	---			---				---		7.7	--	--	4.6	--	--
0.001 mm	NV		--			--			--			---			---			---		---			---			U	0.5	0.5		--			--	
0.002 mm	NV		--			--			--			---			---			---		---			---			U	0.5	0.5		--			--	
0.005 mm	NV		--			--			--			---			---			---		---			---			1	0.5	0.5		--			--	
0.02 mm	NV		--			--			--			---			---			---		---			---			6	0.5	0.5		--			--	
0.05 mm	NV		--			--			--			---			---			---		---			---			10.5	0.5	0.5		--			--	
0.064 mm	NV		--			--			--			---			---			---		---			---			14	0.5	0.5		--			--	
0.075 mm	NV		--			--			--			---			---			---		---			---			15.8	0.5	0.5		--			--	
0.15 mm	NV		--			--			--			---			---			---		---			---			23.3	0.5	0.5		--			--	
0.3 mm	NV		--			--			--			---			---			---		---			---			38.6	0.5	0.5		--			--	
0.6 mm	NV		--			--			--			---			---			---		---			---			59.2	0.5	0.5		--			--	
1.18 mm	NV		--			--			--			---			---			---		---			---			65.7	0.5	0.5		--			--	
2.36 mm	NV		--			--			--			---			---			---		---			---			69.4	0.5	0.5		--			--	
3.35 mm	NV		--			--			--			---			---			---		---			---			73	0.5	0.5		--			--	
4.75 mm	NV		--			--			--			---			---			---		---			---			76.7	0.5	0.5		--			--	
19 mm	NV		--			--			--			---			---			---		---			---			93.4	0.5	0.5		--			--	
37.5 mm	NV		--			--			--			---			---			---		---			---			100	0.5	0.5		--			--	
75 mm	NV		--			--			--			---			---			---		---			---			100	0.5	0.5		--			--	

Appendix H-1 - VB 9-11 Plume Sediment Quality and Grain Size Data
Avtex Fibers Superfund Site, Front Royal, VA

Parameter	EPA Region III Freshwater Sediment Screening Benchmark[1]	SD-06 (Continued)									SD-07																	
		7/13/2016			7/13/2017			7/13/2017			9/6/2012			9/6/2012			9/10/2013			7/2/2014			7/2/2014			7/12/2015			7/13/2016			7/13/2017		
		Conc.	RL	MDL	Conc.	RL	MDL	Conc.	RL	MDL	Conc.	RL[2]	MDL[2]	Conc.	RL[2]	MDL[2]	Conc.	RL[2]	MDL[2]	Conc.	RL	MDL	Conc.	RL	MDL	Conc.	RL	MDL	Conc.	RL	MDL	Conc.	RL	MDL
Hydrometer 1 for particle size distribution	NV	14.5	--	--	21.8	--	--	25.5	--	--	---			---			---			---			---			---			15.0	--	--	8.3	--	--
Hydrometer 2 for particle size distribution	NV	13.2	--	--	20.5	--	--	23.5	--	--	---			---			---			---			---			---			13.4	--	--	6.8	--	--
Hydrometer 3 for particle size distribution	NV	11.8	--	--	17.2	--	--	19.5	--	--	---			---			---			---			---			---			10.9	--	--	6.8	--	--
Hydrometer 4 for particle size distribution	NV	10.5	--	--	14.6	--	--	17.5	--	--	---			---			---			---			---			---			9.3	--	--	6.1	--	--
Hydrometer 5 for particle size distribution	NV	7.8	--	--	10.3	--	--	14.2	--	--	---			---			---			---			---			---			7.7	--	--	4.6	--	--
Hydrometer 6 for particle size distribution	NV	5.1	--	--	7.7	--	--	8.8	--	--	---			---			---			---			---			---			4.5	--	--	2.4	--	--
Hydrometer 7 for particle size distribution	NV	2.4	--	--	4.9	--	--	5.5	--	--	---			---			---			---			---			---			2.0	--	--	1.6	--	--
Sieve, #10	NV	91.1	--	--	83	--	--	97.7	--	--	---			---			---			---			---			---			75.9	--	--	94.8	--	--
Sieve, #100	NV	33.6	--	--	41.2	--	--	51	--	--	---			---			---			---			---			---			32.1	--	--	52.4	--	--
Sieve, #20	NV	84.3	--	--	80.8	--	--	96.8	--	--	---			---			---			---			---			---			71.1	--	--	94.2	--	--
Sieve, #200	NV	20.6	--	--	33.8	--	--	44.2	--	--	---			---			---			---			---			---			21.5	--	--	19	--	--
Sieve, #4	NV	96.7	--	--	85.4	--	--	98.3	--	--	---			---			---			---			---			---			81.1	--	--	96.5	--	--
Sieve, #40	NV	73.6	--	--	71.2	--	--	86.7	--	--	---			---			---			---			---			---			60.3	--	--	90.3	--	--
Sieve, #60	NV	51.3	--	--	50.1	--	--	60.1	--	--	---			---			---			---			---			---			43.3	--	--	73.3	--	--
Sieve, #80	NV	40.5	--	--	44.3	--	--	53.8	--	--	---			---			---			---			---			---			36.8	--	--	62	--	--
Sieve, 0.375 inch	NV	100.0	--	--	88.5	--	--	100	--	--	---			---			---			---			---			---			88.8	--	--	100	--	--
Sieve, 0.75 inch	NV	100.0	--	--	100	--	--	100	--	--	---			---			---			---			---			---			100.0	--	--	100	--	--
Sieve, 1 inch	NV	100.0	--	--	100	--	--	100	--	--	---			---			---			---			---			---			100.0	--	--	100	--	--
Sieve, 1.5 inch	NV	100.0	--	--	100	--	--	100	--	--	---			---			---			---			---			---			100.0	--	--	100	--	--
Sieve, 2 inch	NV	100.0	--	--	100	--	--	100	--	--	---			---			---			---			---			---			100.0	--	--	100	--	--
Sieve, 3 inch	NV	100.0	--	--	100	--	--	100	--	--	---			---			---			---			---			---			100.0	--	--	100	--	--

Notes:
[1]- EPA Region III Freshwater Sediment Screening Benchmarks (EPA, 2006).
[2] - The RLs and MDLs are equivalent for all VOC results. The laboratory does not report VOCs to the statistical MDL due to purge-trap background.
[3] - Due to lab error, the sample was inadvertently disposed of before analysis was conducted.
Aug-01 data from the report Supplamental Field and Laboratory Data Report for Operable Unit 7 (Exponent, 2001).
VOC - Volatile Organic Compound SVOC - Semivolatile Organic Compound
ug/kg - micrograms per kilogram mg/kg - milligrams per kilogram
RL - Laboratory Reporting Limit MDL - Method Detection Limit
--- - Not analyzed
B - Contituent also detected in associated blank D - Sample was diluted
J - Reported as est. between the RL and the MDL and/or due to data validation.
K - Reported value may be biased high N - Spike sample out of control limits
U - Not detected above the laboratory reporting limit
Bold - Indicates detected result
= Constituent detected above benchmark screening value.

Appendix H-1 - VB 9-11 Plume Sediment Quality and Grain Size Data
Avtex Fibers Superfund Site, Front Royal, VA

Parameter	EPA Region III Freshwater Sediment Screening Benchmark[1]	SD-08								
		7/12/2015			7/13/2016			7/13/2017		
		Conc.	RL	MDL	Conc.	RL	MDL	Conc.	RL	MDL
VOCs (µg/kg)										
Acetone	NV	**94**	30	11	U	95	92.1	**81.5 J**	83.2	14.0
Carbon disulfide	0.851	**3 J**	8	2	U	9.5	6.84	**6.83 J**	8.32	5.99
Chlorobenzene	8.42	U	8	2	U	3.8	1.27	U	3.33	1.11
SVOCs (µg/kg)										
2-Methylphenol (o-Cresol)	NV	U	68	34	U	640	415	U	600	389
4,3-Methylphenol	670	**1600**	68	34	U	640	390	U	600	366
bis(2-Ethylhexyl)phthalate	180	U	350	140	U	640	398	U	600	373
Naphthalene	176	**17 J**	35	7	U	129	55.7	U	121	52.2
Pentachlorophenol	504	U	350	68	U	1290	511	U	1210	479
Phenol	420	**370**	68	34	U	640	390	U	600	366
Inorganics (mg/kg)										
Aluminum	NV	**14200**	79.1	15.2	**7700 J**	38.2	19.1	**3540 J**	34.6	17.3
Antimony	2	**0.228 J-**	0.791	0.167	UJ	0.956	0.382	U	4.45	1.78
Arsenic	9.8	**5.48 J-**	1.58	0.169	**4.94**	0.956	0.382	**1.96 J**	4.45	1.78
Cadmium	0.99	**0.147 J**	0.396	0.04	U	0.956	0.382	U	4.45	1.78
Chromium	43.4	**28.5**	5.94	0.194	**21.8**	1.91	1.72	**12.4 J**	1.73	1.56
Cobalt	50	**12.9 J**	0.396	0.0396	**10.5**	0.956	0.382	**6.08**	4.45	1.78
Iron	20,000	**40300**	79.1	6.59	**28400 J**	76.5	38.2	**10300 J**	69.2	34.6
Lead	35.8	**20.1 J**	0.791	0.0254	**24.1**	0.956	0.382	**10.2**	4.45	1.78
Manganese	460	**1000**	1.98	0.164	**366**	5.73	1.91	**340 J**	5.19	1.73
Mercury	0.18	**0.302 J-**	0.4	0.02	**0.331**	0.195	0.0585	**0.416**	0.18	0.054
Nickel	22.7	**14.4**	3.96	0.455	**13.8**	3.82	1.15	**7.44 J**	3.46	1.04
Vanadium	NV	**64.3**	1.98	0.297	**37.2**	19.1	3.82	**18.1 J**	17.3	3.46
Zinc	121	**72.8**	7.91	1.52	**54.0**	19.1	9.56	**40.5 J**	17.3	8.65
Other Inorganics										
Cyanide (Total) (mg/kg)	NV	U	0.97	0.35	R	3.93	1.97	R	3.53	1.76
Cyanide (Free) (mg/kg)	0.1	U	1.2	0.41	U	3.25	0.543	U	1.87	0.532
Percent Solids (%)	NV	**48.6**	0.5	0.5	50.9	--	--	55.0	--	--
Total Organic Carbon (mg/kg)	NV	**48900**	4750	1580		--		**36500**	1000	380
Total Organic Carbon (mg/l)	NV		---		**2.00**	1.00	0.500		--	
Grain Size (%)										
Gravel	NV		---		20.3	--	--	15.8	--	--
Sand	NV		---		36.7	--	--	39	--	--
Coarse Sand			---		8.9	--	--	8.9	--	--
Medium Sand			---		7.7	--	--	5.7	--	--
Fine Sand			---		20.1	--	--	24.4	--	--
Silt	NV		---		32.1	--	--	31.1	--	--
Clay	NV		---		10.9	--	--	14.1	--	--
0.001 mm	NV	U	0.5	0.5		--			--	
0.002 mm	NV	1	0.5	0.5		--			--	
0.005 mm	NV	3	0.5	0.5		--			--	
0.02 mm	NV	13	0.5	0.5		--			--	
0.05 mm	NV	24	0.5	0.5		--			--	
0.064 mm	NV	32	0.5	0.5		--			--	
0.075 mm	NV	35.6	0.5	0.5		--			--	
0.15 mm	NV	42.7	0.5	0.5		--			--	
0.3 mm	NV	49.7	0.5	0.5		--			--	
0.6 mm	NV	56.4	0.5	0.5		--			--	
1.18 mm	NV	62.9	0.5	0.5		--			--	
2.36 mm	NV	69.3	0.5	0.5		--			--	
3.35 mm	NV	78	0.5	0.5		--			--	
4.75 mm	NV	85.4	0.5	0.5		--			--	
19 mm	NV	100	0.5	0.5		--			--	
37.5 mm	NV	100	0.5	0.5		--			--	
75 mm	NV	100	0.5	0.5		--			--	

Appendix H-1 - VB 9-11 Plume Sediment Quality and Grain Size Data
Avtex Fibers Superfund Site, Front Royal, VA

Parameter	EPA Region III Freshwater Sediment Screening Benchmark[1]	SD-08								
		7/12/2015			7/13/2016			7/13/2017		
		Conc.	RL	MDL	Conc.	RL	MDL	Conc.	RL	MDL
Hydrometer 1 for particle size distribution	NV		---		24.9	--	--	28	--	--
Hydrometer 2 for particle size distribution	NV		---		19.8	--	--	24.6	--	--
Hydrometer 3 for particle size distribution	NV		---		16.0	--	--	19.9	--	--
Hydrometer 4 for particle size distribution	NV		---		13.4	--	--	17.6	--	--
Hydrometer 5 for particle size distribution	NV		---		10.9	--	--	14.1	--	--
Hydrometer 6 for particle size distribution	NV		---		5.8	--	--	8.3	--	--
Hydrometer 7 for particle size distribution	NV		---		1.9	--	--	4.8	--	--
Sieve, #10	NV		---		70.8	--	--	75.3	--	--
Sieve, #100	NV		---		53.1	--	--	56.3	--	--
Sieve, #20	NV		---		67.3	--	--	73.5	--	--
Sieve, #200	NV		---		43.0	--	--	45.2	--	--
Sieve, #4	NV		---		79.7	--	--	84.2	--	--
Sieve, #40	NV		---		63.1	--	--	69.6	--	--
Sieve, #60	NV		---		59.3	--	--	64.5	--	--
Sieve, #80	NV		---		56.0	--	--	59.8	--	--
Sieve, 0.375 inch	NV		---		87.8	--	--	100	--	--
Sieve, 0.75 inch	NV		---		100.0	--	--	100	--	--
Sieve, 1 inch	NV		---		100.0	--	--	100	--	--
Sieve, 1.5 inch	NV		---		100.0	--	--	100	--	--
Sieve, 2 inch	NV		---		100.0	--	--	100	--	--
Sieve, 3 inch	NV		---		100.0	--	--	100	--	--

Notes:
[1]- EPA Region III Freshwater Sediment Screening Benchmarks (EPA, 2006).
[2] - The RLs and MDLs are equivalent for all VOC results. The laboratory does not report VOCs to the statistical MDL due to purge-trap background.
[3] - Due to lab error, the sample was inadvertently disposed of before analysis was conducted.
Aug-01 data from the report Supplamental Field and Laboratory Data Report for Operable Unit 7 (Exponent, 2001).
VOC - Volatile Organic Compound SVOC - Semivolatile Organic Compound
ug/kg - micrograms per kilogram mg/kg - milligrams per kilogram
RL - Laboratory Reporting Limit MDL - Method Detection Limit
--- - Not analyzed
B - Contituent also detected in associated blank D - Sample was diluted
J - Reported as est. between the RL and the MDL and/or due to data validation.
K - Reported value may be biased high N - Spike sample out of control limits
U - Not detected above the laboratory reporting limit
Bold - Indicates detected result
= Constituent detected above benchmark screening value.

Appendix H-2 - VB 9-11 Plume Surface Water Quality Data
Avtex Fibers Superfund Site, Front Royal, VA

		SW-01																				SW-02		
		8/2001			9/4/2012			9/9/2013			7/1/2014			7/11/2015			7/13/2016			7/13/2017			8/2001		
Parameter	**Screening Criteria[1]**	Conc.	RL	MDL	Conc.	RL	MDL	Conc.	RL	MDL	Conc.	RL	MDL	Conc.	RL	MDL	Conc.	RL	MDL	Conc.	RL	MDL	Conc.	RL	MDL
VOCs (ug/L)																									
Acetone	NV	6 U, R	---	---	U	5	5	U	10	10	U	25.0	10.0	U	5	3	U	25.0	2.66	R	25	2.66	6 U, R	---	---
Carbon disulfide	NV	1 U	---	---	U	1	0.5	U	2	1	U	10.0	1.7	U	1	0.4	U	1.00	0.220	U	1	0.22	1 U	---	---
Chlorobenzene	130	1 U	---	---	U	1	0.5	U	2	1	U	5.0	1.7	U	0.5	0.1	U	1.00	0.180	U	1	0.18	1 U	---	---
SVOCs (ug/L)																									
2-Methylphenol (o-Cresol)	NV		---		U, L	9.43	0.943	U	10.9	1.09	U	10.0	1.0	U	1	0.5	U	9.26	2.13	U	9.62	1.54		---	
4,3-Methylphenol	NV		---		U, L	9.43	0.943	U	10.9	1.09	U	10.0	1.0	U	1	0.5	U	9.26	2.04	U	9.62	1.35		---	
bis(2-Ethylhexyl)phthalate	NV		---		U	9.43	0.943	U	10.9	1.09	U	6.0	0.49	U	5	2	U	9.26	5.56	U	9.62	2.54		---	
Naphthalene[2]	1.1		---		U	4.72	0.943	U	5.43	1.09	U	10.0	0.93	U	0.5	0.1	U	1.85	0.343	U	1.92	0.356		---	
Pentachlorophenol	6.7		---		U, L	9.43	0.943	U	10.9	1.09	U	25.0	1.2	U	5	1	U	23.1	1.57	U	24	3.17		---	
Phenol	NV		---		U, L	9.43	0.943	UL	10.9	1.09	U	10.0	1.1	U	1	0.5	U	9.26	1.39	U	9.62	1.44		---	
Total Inorganics (mg/L)																									
Aluminum	NV		---			---			---			---		U	0.4	0.0674	U	0.100	0.0500	U	0.100	0.0500		---	
Antimony	0.0056		---			---			---			---		U	0.002	0.00033	U	0.00200	0.000500	U	0.0100	0.00400		---	
Arsenic	NV		---			---			---			---		U	0.004	0.00054	**0.000750 J**	0.00200	0.000500	U	0.0100	0.00200		---	
Cadmium	0.0011		---			---			---			---		U	0.001	0.00023	U	0.00100	0.000400	U	0.00500	0.000500		---	
Chromium	0.011		---			---			---			---		U	0.03	0.0013	U	0.00500	0.00300	U	0.00500	0.00300		---	
Cobalt	NV		---			---			---			---		**0.00014 J**	0.001	0.0001	U	0.00200	0.000500	U	0.0100	0.000500		---	
Iron	NV		---			---			---			---		**0.0600 J**	0.4	0.0334	U	0.100	0.0500	U	0.100	0.0500		---	
Lead	0.014		---			---			---			---		U	0.002	0.00013	U	0.00200	0.000681	U	0.0100	0.000500		---	
Manganese	NV		---			---			---			---		**0.0076 J**	0.01	0.00083	U	0.0150	0.00500	U	0.0150	0.00500		---	
Mercury	0.00077		---			---			---			---		U	0.0002	0.00005	U	0.000200	0.000100	U	0.000200	0.000100		---	
Nickel	0.020		---			---			---			---		U	0.02	0.0016	U	0.0100	0.00300	U	0.0100	0.00300		---	
Vanadium	NV		---			---			---			---		U	0.01	0.0019	U	0.0200	0.0100	U	0.0200	0.0100		---	
Zinc	0.120		---			---			---			---		U	0.04	0.002	U	0.0500	0.0250	U	0.0500	0.0250		---	
Dissolved Inorganics (mg/L)																									
Aluminum	NV	0.0319 U	---	---	**0.0631 B**	0.05	0.00776	U	0.05	0.0118	U	0.1	0.025	U	0.4	0.0674	U	0.100	0.0500	U	0.100	0.0500	**0.0551 J**	---	---
Antimony	0.0056	0.0024 U	---	---	U	0.001	0.0005	U	0.001	0.0005	U	0.005	0.0026	U	0.002	0.00033	U	0.00200	0.000698	U	0.0100	0.00400	0.0024 U	---	---
Arsenic	NV	0.0014 U, L	---	---	**0.00064 J**	0.001	0.0005	U	0.001	0.0005	U	0.01	0.0027	**0.00058 J**	0.004	0.00054	**0.000881 J**	0.00200	0.000500	U	0.0100	0.00200	0.0014 U, L	---	---
Cadmium	0.0011	0.00064 U	---	---	U	0.0001	0.00005	U	0.0001	0.00005	U	0.001	0.0005	U	0.001	0.00023	U	0.00100	0.000400	U	0.00500	0.000500	0.00064 U	---	---
Chromium	0.011	0.0017 U	---	---	U	0.005	0.000988	U	0.005	0.000973	U	0.005	0.0004	U	0.03	0.0013	U	0.00500	0.00300	U	0.00500	0.00300	0.0017 U	---	---
Cobalt	NV	0.0018 U	---	---	U, J	0.0001	0.00005	U	0.001	0.0005	U	0.005	0.0006	**0.00020 J**	0.001	0.0001	U	0.00200	0.000500	U	0.0100	0.000500	0.0018 U	---	---
Iron	NV	**0.098 J, B**	---	---	**0.0356 B, J**	0.05	0.00571	**0.0334 B**	0.05	0.00854	U	0.05	0.014	U	0.4	0.0334	U	0.100	0.0500	U	0.100	0.0500	**0.163 B**	---	---
Lead	0.014	0.0088 U, L	---	---	U	0.001	0.0005	**0.0027**	0.001	0.0005	U	0.005	0.004	U	0.002	0.00013	U	0.00200	0.000200	U	0.0100	0.000500	0.0088 U, L	---	---
Manganese	NV	**0.0094 J**	---	---	**0.0129**	0.005	0.000541	**0.00443 J**	0.005	0.000543	**0.0046 J**	0.005	0.0003	**0.0034 J**	0.01	0.00083	U	0.0150	0.00500	U	0.0150	0.00500	**0.0131**	---	---
Mercury	0.00077	**0.000059 J, L, B**	---	---	U	0.0002	0.0000916	UL	0.0002	0.0000589	U	0.0002	0.00009	U	0.0002	0.00005	U	0.000200	0.000100	U	0.000200	0.000100	0.000026 U, L	---	---
Nickel	0.020	0.0016 U	---	---	**0.00125 B, J**	0.005	0.00067	**0.00186 B**	0.005	0.000918	U	0.005	0.0017	U	0.02	0.0016	U	0.0100	0.00300	U	0.0100	0.00300	0.0016 U	---	---
Vanadium	NV	**0.0024 J, B**	---	---	**0.00165 B, J**	0.005	0.000394	U	0.005	0.000896	**0.00087 J**	0.005	0.0002	U	0.01	0.0019	U	0.0200	0.0100	U	0.0200	0.0100	**0.0025 J,B**	---	---
Zinc	0.120	0.0032 U, J	---	---	**0.23 B**	0.005	0.000656	**0.00452 J**	0.005	0.000969	**0.00099 J**	0.01	0.0004	U	0.04	0.002	U	0.0500	0.0250	U	0.0500	0.0250	0.0032 U, J	---	---
Other Inorganics (mg/L)																									
Cyanide (Total)[3]	0.0052		---			---			---			---		U	0.01	0.005	U	0.00500	0.000608	UJ	0.0100	0.00700		---	
Cyanide (Free)	0.0052		---		U	0.1	0.05	U	0.1	0.05	U	0.1	0.05	U	0.006	0.002	U	0.0100	0.00700	U	0.00500	0.00154		---	
Field Parameters																									
Temperature (°C)	NV		---		**21.90**	---	---	**23.70**	---	---	**30.47**	---	---	**25.6**	---	---		---		**28.47**	---	---		---	
pH	NV		---		**8.42**	---	---	**7.00**	---	---	**7.99**	---	---	**7.94**	---	---		---		**8.44**	---	---		---	
ORP (mV)	NV		---		**52.5**	---	---	**102.6**	---	---	**-42.1**	---	---	**181.8**	---	---		---		**195.9**	---	---		---	
Conductivity (mS/cm)	NV		---		**0.326**	---	---	**0.335**	---	---	**0.37**	---	---	**0.4**	---	---		---		**0.310**	---	---		---	
Turbidity (NTU)	NV		---		**213.2**	---	---	**3.6**	---	---	**3.42**	---	---	**11.5**	---	---		---		**0**	---	---		---	
DO (mg/L)	NV		---		**0.0**	---	---	**8.95**	---	---	**7.05**	---	---	**7.43**	---	---		---		**7.22**	---	---		---	

Notes:
[1]Screening criteria, where available, are based on the Virginia Quality Criteria (9 VAC 25-260-140) (updated January 2011).
[2]Screening criterion for naphthalene is based on Region III BTAG Aquatic Freshwater Screening Levels (July 2006).
[3]Screening criterion for Cyanide (Free) was used.
Aug-01 data from the report Supplamental Field and Laboratory Data Report for Operable Unit 7 (Exponent, 2001).
VOC - Volatile Organic Compound
SVOC - Semivolatile Organic Compound
ug/L - micrograms per liter
mg/L - milligrams per liter
mV - millivolts
mS/cm - millisiemens per centimeter
NTU - nephelometric turbidity units
--- - Not analyzed
RL - Laboratory Reporting Limit
MDL - Method Detection Limit
B - Constituent also detected in the associated blank
J - Reported as estimated between the RL and the MDL and/or due to data validation.
L - Reported value may be biased low R - Data unusable
U - Not detected above the laboratory reporting limit
Bold - Indicates detected result
= Constituent detected above screening value.

Appendix H-2 - VB 9-11 Plume Surface Water Quality Data
Avtex Fibers Superfund Site, Front Royal, VA

		SW-02 (Continued)																		SW-03					
		9/5/2012			9/9/2013			7/1/2014			7/11/2015			7/13/2016			7/13/2017			8/2001			9/5/2012		
Parameter	**Screening Criteria[1]**	Conc.	RL	MDL	Conc.	RL	MDL	Conc.	RL	MDL	Conc.	RL	MDL	Conc.	RL	MDL	Conc.	RL	MDL	Conc.	RL	MDL	Conc.	RL	MDL
VOCs (ug/L)																									
Acetone	NV	U	5	5	U	10	10	U	25.0	10.0	U	5	3	U	25.0	2.66	R	25	2.66	6 U, R	---	---	U	10	5
Carbon disulfide	NV	U	1	0.5	U	2	1	U	10.0	1.7	U	1	0.4	U	1.00	0.220	U	1	0.22	1 U	---	---	U	2	0.5
Chlorobenzene	130	U	1	0.5	U	2	1	U	5.0	1.7	U	0.5	0.1	U	1.00	0.180	U	1	0.18	1 U	---	---	U	2	0.5
SVOCs (ug/L)																									
2-Methylphenol (o-Cresol)	NV	U, L	10.5	1.05	U	10.0	1.0	U	10.0	1.0	U	1	0.5	U	9.62	2.21	U	10	1.6		---		U	9.71	0.971
4,3-Methylphenol	NV	U, L	10.5	1.05	U	10.0	1.0	U	10.0	1.0	U	1	0.5	U	9.62	2.12	U	10	1.4		---		U	9.71	0.971
bis(2-Ethylhexyl)phthalate	NV	U	10.5	1.05	U	10.0	1.0	U	6.0	0.49	U	5	2	U	9.62	5.77	U	10	4.75		---		U	9.71	0.971
Naphthalene[2]	1.1	U	5.26	1.05	U	5.00	1.0	U	10.0	0.93	U	0.5	0.1	U	1.92	0.356	U	2	0.37		---		U	4.85	0.971
Pentachlorophenol	6.7	U, L	10.5	1.05	U	10.0	1.0	U	25.0	1.2	U	5	1	U	24.0	1.63	U	25	3.3		---		U	9.71	0.971
Phenol	NV	U, L	10.5	1.05	UL	10.0	1.0	U	10.0	1.1	U	1	0.5	U	9.62	1.44	U	10	1.5		---		U, L	9.71	0.971
Total Inorganics (mg/L)																									
Aluminum	NV		---			---			---		U	0.4	0.0674	U	0.100	0.0500	U	0.100	0.0500		---			---	
Antimony	0.0056		---			---			---		U	0.002	0.00033	U	0.00200	0.000500	U	0.0100	0.00400		---			---	
Arsenic	NV		---			---			---		U	0.004	0.00054	**0.000773 J**	0.00200	0.000500	U	0.0100	0.00200		---			---	
Cadmium	0.0011		---			---			---		U	0.001	0.00023	U	0.00100	0.000400	U	0.00500	0.000500		---			---	
Chromium	0.011		---			---			---		U	0.03	0.0013	U	0.00500	0.00300	U	0.00500	0.00300		---			---	
Cobalt	NV		---			---			---		**0.00017 J**	0.001	0.0001	U	0.00200	0.000500	U	0.0100	0.000500		---			---	
Iron	NV		---			---			---		**0.0734 J**	0.4	0.0334	U	0.100	0.0500	U	0.100	0.0500		---			---	
Lead	0.014		---			---			---		U	0.002	0.00013	U	0.00200	0.000638	U	0.0100	0.000500		---			---	
Manganese	NV		---			---			---		**0.0082 J**	0.01	0.00083	U	0.0150	0.00500	U	0.0150	0.00500		---			---	
Mercury	0.00077		---			---			---		U	0.0002	0.00005	U	0.000200	0.000100	U	0.000200	0.000100		---			---	
Nickel	0.020		---			---			---		U	0.02	0.0016	U	0.0100	0.00300	U	0.0100	0.00300		---			---	
Vanadium	NV		---			---			---		U	0.01	0.0019	U	0.0200	0.0100	U	0.0200	0.0100		---			---	
Zinc	0.120		---			---			---		U	0.04	0.002	U	0.0500	0.0250	U	0.0500	0.0250		---			---	
Dissolved Inorganics (mg/L)																									
Aluminum	NV	**0.00794 B, J**	0.05	0.00776	U	0.05	0.0118	U	0.1	0.025	U	0.4	0.0674	U	0.100	0.0500	U	0.100	0.0500	0.0319 U	---	---	**0.00945 B, J**	0.05	0.00776
Antimony	0.0056	U	0.001	0.0005	U	0.001	0.0005	U	0.005	0.0026	U	0.002	0.00033	U	0.00200	0.000500	U	0.0100	0.00400	0.0024 U	---	---	U	0.001	0.0005
Arsenic	NV	**0.00065 J**	0.001	0.0005	**0.00052 J**	0.001	0.0005	U	0.01	0.0027	U	0.004	0.00054	**0.000831 J**	0.00200	0.000500	U	0.0100	0.00200	0.0014 U, L	---	---	**0.00062 J**	0.001	0.0005
Cadmium	0.0011	U	0.0001	0.00005	U	0.0001	0.00005	U	0.001	0.0005	U	0.001	0.00023	U	0.00100	0.000400	U	0.00500	0.000500	0.00064 U	---	---	U	0.0001	0.00005
Chromium	0.011	U	0.005	0.000988	U	0.005	0.000973	U	0.005	0.0004	U	0.03	0.0013	U	0.00500	0.00300	U	0.00500	0.00300	0.0017 U	---	---	U	0.005	0.000988
Cobalt	NV	U, J	0.0001	0.00005	U	0.001	0.0005	U	0.005	0.0006	**0.00028 J**	0.001	0.0001	U	0.00200	0.000500	U	0.0100	0.000500	0.0018 U	---	---	U, J	0.0001	0.00005
Iron	NV	**0.0174 B, J**	0.05	0.00571	**0.0384 B**	0.05	0.00854	**0.0185 J**	0.05	0.014	U	0.4	0.0334	**0.0503 J**	0.100	0.0500	U	0.100	0.0500	**0.0648 J, B**	---	---	**0.0124 B, J**	0.05	0.00571
Lead	0.014	U	0.001	0.0005	**0.0024**	0.001	0.0005	U	0.005	0.004	U	0.002	0.00013	U	0.00200	0.000200	U	0.0100	0.000500	0.0088 U, L	---	---	U	0.001	0.0005
Manganese	NV	**0.00412 B, J**	0.005	0.000541	**0.00318 J**	0.005	0.000543	**0.0062**	0.005	0.0003	**0.0035 J**	0.01	0.00083	U	0.0150	0.00500	U	0.0150	0.00500	**0.0065 J**	---	---	**0.00513 B**	0.005	0.000541
Mercury	0.00077	U	0.0002	0.0000916	UL	0.0002	0.0000589	U	0.0002	0.00009	U	0.0002	0.00005	U	0.000200	0.000100	U	0.000200	0.000100	**0.00003 J, L, B**	---	---	U	0.0002	9.16E-05
Nickel	0.020	**0.000879 B, J**	0.005	0.00067	**0.00169 B**	0.005	0.000918	U	0.005	0.0017	U	0.02	0.0016	U	0.0100	0.00300	U	0.0100	0.00300	0.0016 U	---	---	U	0.005	0.00067
Vanadium	NV	**0.000951 B, J**	0.005	0.000394	U	0.005	0.000896	**0.00081 J**	0.005	0.0002	U	0.01	0.0019	U	0.0200	0.0100	U	0.0200	0.0100	**0.0021 J, B**	---	---	**0.00178 B, J**	0.005	0.000394
Zinc	0.120	**0.00337 B, J**	0.005	0.000656	**0.0162**	0.005	0.000969	**0.0013 J**	0.01	0.0004	U	0.04	0.002	U	0.0500	0.0250	U	0.0500	0.0250	0.0032 U, J	---	---	**0.0101 B**	0.005	0.000656
Other Inorganics (mg/L)																									
Cyanide (Total)[3]	0.0052		---			---			---		U	0.01	0.005	U	0.00500	0.000608	UJ	0.0100	0.00700		---			---	
Cyanide (Free)	0.0052	U	0.1	0.05	U	0.1	0.05	U	0.1	0.05	U	0.006	0.002	U	0.0100	0.00700	U	0.00500	0.00154		---		U	0.1	0.05
Field Parameters																									
Temperature (°C)	NV	**26.91**	---	---	**24.48**	---	---	**29.67**	---	---	**25.64**	---	---		---		**28.8**	---	---		---		**29.13**	---	---
pH	NV	**8.05**	---	---	**8.15**	---	---	**8.21**	---	---	**8.31**	---	---		---		**8.5**	---	---		---		**8.86**	---	---
ORP (mV)	NV	**93.5**	---	---	**87.1**	---	---	**-73.0**	---	---	**154.7**	---	---		---		**182.6**	---	---		---		**29.0**	---	---
Conductivity (mS/cm)	NV	**0.322**	---	---	**0.336**	---	---	**0.38**	---	---	**0.3**	---	---		---		**0.300**	---	---		---		**0.306**	---	---
Turbidity (NTU)	NV	**0.0**	---	---	**1.2**	---	---	**5.46**	---	---	**33**	---	---		---		**0**	---	---		---		**0.0**	---	---
DO (mg/L)	NV	**6.47**	---	---	**9.69**	---	---	**8.20**	---	---	**7.51**	---	---		---		**7.5**	---	---		---		**11.4**	---	---

Notes:
[1]Screening criteria, where available, are based on the Virginia Quality Criteria (9 VAC 25-260-140) (updated January 2011).
[2]Screening criterion for naphthalene is based on Region III BTAG Aquatic Freshwater Screening Levels (July 2006).
[3]Screening criterion for Cyanide (Free) was used.

Aug-01 data from the report Supplamental Field and Laboratory Data Report for Operable Unit 7 (Exponent, 2001).
VOC - Volatile Organic Compound
SVOC - Semivolatile Organic Compound
ug/L - micrograms per liter
mg/L - milligrams per liter
mV - millivolts
mS/cm - millisiemens per centimeter
NTU - nephelometric turbidity units
--- - Not analyzed
RL - Laboratory Reporting Limit
MDL - Method Detection Limit
B - Constituent also detected in the associated blank
J - Reported as estimated between the RL and the MDL and/or due to data validation.
L - Reported value may be biased low R - Data unusable
U - Not detected above the laboratory reporting limit
Bold - Indicates detected result
= Constituent detected above screening value.

Appendix H-2 - VB 9-11 Plume Surface Water Quality Data
Avtex Fibers Superfund Site, Front Royal, VA

		SW-03 (Continued)															SW-04								
		9/9/2013			7/1/2014			7/11/2015			7/13/2016			7/13/2017			8/2001			9/5/2012			9/10/2013		
Parameter	**Screening Criteria[1]**	Conc.	RL	MDL	Conc.	RL	MDL	Conc.	RL	MDL	Conc.	RL	MDL	Conc.	RL	MDL	Conc.	RL	MDL	Conc.	RL	MDL	Conc.	RL	MDL
VOCs (ug/L)																									
Acetone	NV	U	10	10	U	25.0	10.0	U	5	3	U	25.0	2.66	R	25	2.66	6 U, R	---	---	U	5	5	U	10	10
Carbon disulfide	NV	U	2	1	U	10.0	1.7	U	1	0.4	U	1.00	0.220	U	1	0.22	1 U	---	---	U	1	0.5	U	2	1
Chlorobenzene	130	U	2	1	U	5.0	1.7	U	0.5	0.1	U	1.00	0.180	U	1	0.18	1 U	---	---	U	1	0.5	U	2	1
SVOCs (ug/L)																									
2-Methylphenol (o-Cresol)	NV	U	10.9	1.09	U	10.0	1.0	U	1	0.5	U	9.62	2.21	U	10	1.6		---		U	9.62	0.962	U	10.4	1.04
4,3-Methylphenol	NV	U	10.9	1.09	U	10.0	1.0	U	1	0.5	U	9.62	2.12	U	10	1.4		---		U	9.62	0.962	U	10.4	1.04
bis(2-Ethylhexyl)phthalate	NV	U	10.9	1.09	U	6.0	0.49	U	5	2	U	9.62	5.77	U	10	4.71		---		U	9.62	0.962	U	10.4	1.04
Naphthalene[2]	1.1	U	5.43	1.09	U	10.0	0.93	U	0.5	0.1	U	1.92	0.356	U	2	0.37		---		U	4.81	0.962	U	5.21	1.04
Pentachlorophenol	6.7	U	10.9	1.09	UJ	25.0	1.2	U	5	1	U	24.0	1.63	U	25	3.3		---		U	9.62	0.962	U	10.4	1.04
Phenol	NV	UL	10.9	1.09	U	10.0	1.1	U	1	0.5	U	9.62	1.44	U	10	1.5		---		U, L	9.62	0.962	UL	10.4	1.04
Total Inorganics (mg/L)																									
Aluminum	NV		---			---		U	0.4	0.0674	U	0.100	0.0500	U	0.100	0.0500		---			---			---	
Antimony	0.0056		---			---		U	0.002	0.00033	U	0.00200	0.000500	U	0.0100	0.00400		---			---			---	
Arsenic	NV		---			---		U	0.004	0.00054	**0.000796 J**	0.00200	0.000500	U	0.0100	0.00200		---			---			---	
Cadmium	0.0011		---			---		U	0.001	0.00023	U	0.00100	0.000400	U	0.00500	0.000500		---			---			---	
Chromium	0.011		---			---		U	0.03	0.0013	U	0.00500	0.00300	U	0.00500	0.00300		---			---			---	
Cobalt	NV		---			---		**0.00015 J**	0.001	0.0001	U	0.00200	0.000500	U	0.0100	0.000500		---			---			---	
Iron	NV		---			---		**0.0552 J**	0.4	0.0334	U	0.100	0.0500	U	0.100	0.0500		---			---			---	
Lead	0.014		---			---		U	0.002	0.00013	U	0.00200	0.000550	U	0.0100	0.000500		---			---			---	
Manganese	NV		---			---		**0.0068 J**	0.01	0.00083	U	0.0150	0.00500	U	0.0150	0.00500		---			---			---	
Mercury	0.00077		---			---		U	0.0002	0.00005	U	0.000200	0.000100	U	0.000200	0.000100		---			---			---	
Nickel	0.020		---			---		U	0.02	0.0016	U	0.0100	0.00300	U	0.0100	0.00300		---			---			---	
Vanadium	NV		---			---		U	0.01	0.0019	U	0.0200	0.0100	U	0.0200	0.0100		---			---			---	
Zinc	0.120		---			---		U	0.04	0.002	U	0.0500	0.0250	U	0.0500	0.0250		---			---			---	
Dissolved Inorganics (mg/L)																									
Aluminum	NV	U	0.05	0.0118	U	0.1	0.025	U	0.4	0.0674	U	0.100	0.0500	U	0.100	0.0500	0.0319 U	---	---	**0.0135 B, J**	0.05	0.00776	**0.0134 B**	0.05	0.0118
Antimony	0.0056	U	0.001	0.0005	U	0.005	0.0026	U	0.002	0.00033	U	0.00200	0.000500	U	0.0100	0.00400	0.0024 U	---	---	U	0.001	0.0005	U	0.001	0.0005
Arsenic	NV	U	0.001	0.0005	U	0.01	0.0027	U	0.004	0.00054	**0.000816 J**	0.00200	0.000500	U	0.0100	0.00200	0.0014 U, L	---	---	**0.00064 J**	0.001	0.0005	**0.0005 J**	0.001	0.0005
Cadmium	0.0011	U	0.0001	0.00005	U	0.001	0.0005	U	0.001	0.00023	U	0.00100	0.000400	U	0.00500	0.000500	0.00064 U	---	---	U	0.0001	0.00005	U	0.0001	0.00005
Chromium	0.011	U	0.005	0.000973	U	0.005	0.0004	U	0.03	0.0013	U	0.00500	0.00300	U	0.00500	0.00300	**0.0017 J**	---	---	U	0.005	0.000988	**0.00166 B**	0.005	0.000973
Cobalt	NV	U	0.001	0.0005	U	0.005	0.0006	**0.00037 J**	0.001	0.0001	U	0.00200	0.000500	U	0.0100	0.000500	0.0018 U	---	---	U, J	0.0001	0.00005	U	0.001	0.0005
Iron	NV	**0.0396 J**	0.05	0.00854	**0.0152 J**	0.05	0.014	U	0.4	0.0334	U	0.100	0.0500	U	0.100	0.0500	**0.0728 J, B**	---	---	**0.0183 B, J**	0.05	0.00571	**0.0320 B**	0.05	0.00854
Lead	0.014	**0.00058 J**	0.001	0.0005	U	0.005	0.004	U	0.002	0.00013	U	0.00200	0.000200	U	0.0100	0.000500	0.0088 U, L	---	---	U	0.001	0.0005	U	0.001	0.0005
Manganese	NV	**0.00362 J**	0.005	0.000543	**0.0055**	0.005	0.0003	**0.0032 J**	0.01	0.00083	U	0.0150	0.00500	U	0.0150	0.00500	**0.0075 J**	---	---	**0.00428 B, J**	0.005	0.000541	**0.00449 B**	0.005	0.000543
Mercury	0.00077	UL	0.0002	5.89E-05	U	0.0002	0.00009	U	0.0002	0.00005	U	0.000200	0.000100	U	0.000200	0.000100	**0.000042 J, L, B**	---	---	U	0.0002	9.16E-05	UL	0.0002	5.89E-05
Nickel	0.020	**0.00177 B**	0.005	0.000918	U	0.005	0.0017	U	0.02	0.0016	U	0.0100	0.00300	U	0.0100	0.00300	0.0016 U	---	---	U	0.005	0.00067	**0.00204 B**	0.005	0.000918
Vanadium	NV	U	0.005	0.000896	**0.0012 J**	0.005	0.0002	U	0.01	0.0019	U	0.0200	0.0100	U	0.0200	0.0100	**0.0022 J, B**	---	---	**0.00167 B, J**	0.005	0.000394	U	0.005	0.000896
Zinc	0.120	**0.122**	0.005	0.000969	**0.0018 J**	0.01	0.0004	U	0.04	0.002	U	0.0500	0.0250	U	0.0500	0.0250	0.0032 U, J	---	---	**0.00291 B, J**	0.005	0.000656	**0.00702 B**	0.005	0.000969
Other Inorganics (mg/L)																									
Cyanide (Total)[3]	0.0052		---			---		U	0.01	0.005	U	0.00500	0.000608	U	0.0100	0.00700		---			---			---	
Cyanide (Free)	0.0052	U	0.1	0.05	U	0.1	0.05	U	0.006	0.002	U	0.0100	0.00700	U	0.00500	0.00154		---		U	0.1	0.05	U	0.1	0.05
Field Parameters																									
Temperature (°C)	NV	**25.77**	---	---	**29.59**	---	---	**26.87**	---	---		---		**28.68**	---	---		---		**31.66**	---	---	**23.51**	---	---
pH	NV	**8.75**	---	---	**8.67**	---	---	**8.59**	---	---		---		**8.82**	---	---		---		**8.79**	---	---	**6.76**	---	---
ORP (mV)	NV	**70.7**	---	---	**-37.5**	---	---	**102.1**	---	---		---		**157**	---	---		---		**72.4**	---	---	**160.5**	---	---
Conductivity (mS/cm)	NV	**0.341**	---	---	**0.36**	---	---	**0.3**	---	---		---		**0.290**	---	---		---		**0.006**	---	---	**0.338**	---	---
Turbidity (NTU)	NV	**1.7**	---	---	**2.69**	---	---	**2.87**	---	---		---		**0**	---	---		---		**0.6**	---	---	**0.0**	---	---
DO (mg/L)	NV	**11.46**	---	---	**9.31**	---	---	**8.93**	---	---		---		**9.35**	---	---		---		**11.27**	---	---	**7.77**	---	---

Notes:
[1]Screening criteria, where available, are based on the Virginia Quality Criteria (9 VAC 25-260-140) (updated January 2011).
[2]Screening criterion for naphthalene is based on Region III BTAG Aquatic Freshwater Screening Levels (July 2006).
[3]Screening criterion for Cyanide (Free) was used.
Aug-01 data from the report Supplamental Field and Laboratory Data Report for Operable Unit 7 (Exponent, 2001).
VOC - Volatile Organic Compound
SVOC - Semivolatile Organic Compound
ug/L - micrograms per liter
mg/L - milligrams per liter
mV - millivolts
mS/cm - millisiemens per centimeter
NTU - nephelometric turbidity units
--- - Not analyzed
RL - Laboratory Reporting Limit
MDL - Method Detection Limit
B - Constituent also detected in the associated blank
J - Reported as estimated between the RL and the MDL and/or due to data validation.
L - Reported value may be biased low R - Data unusable
U - Not detected above the laboratory reporting limit
Bold - Indicates detected result
= Constituent detected above screening value.

Appendix H-2 - VB 9-11 Plume Surface Water Quality Data
Avtex Fibers Superfund Site, Front Royal, VA

		SW-04 (Continued)															SW-05								
		7/1/2014			7/11/2015			7/11/2015			7/13/2016			7/13/2017			9/5/2012			9/10/2013			9/10/2013		
Parameter	**Screening Criteria[1]**	Conc.	RL	MDL	Conc.	RL	MDL	Conc.	RL	MDL	Conc.	RL	MDL	Conc.	RL	MDL	Conc.	RL	MDL	Conc.	RL	MDL	Conc.	RL	MDL
VOCs (ug/L)																									
Acetone	NV	U	25.0	10.0	U	5	3	U	5	3	U	25.0	2.66	R	25	2.66	U	5	5	U	10	10	U	10	10
Carbon disulfide	NV	U	10.0	1.7	U	1	0.4	U	1	0.4	U	1.00	0.220	U	1	0.22	U	1	0.5	U	2	1	U	2	1
Chlorobenzene	130	U	5.0	1.7	U	0.5	0.1	U	0.5	0.1	U	1.00	0.180	U	1	0.18	U	1	0.5	U	2	1	U	2	1
SVOCs (ug/L)																									
2-Methylphenol (o-Cresol)	NV	U	10.0	1.0	U	1	0.5	U	1	0.5	U	9.62	2.21	U	9.62	1.54	U, L	9.43	0.943	U	10.4	1.04	UL	10.4	1.04
4,3-Methylphenol	NV	U	10.0	1.0	U	1	0.5	U	1	0.5	U	9.62	2.12	U	9.62	1.35	U, L	9.43	0.943	U	10.4	1.04	UL	10.4	1.04
bis(2-Ethylhexyl)phthalate	NV	U	6.0	0.49	U	5	2	U	5	2	U	9.62	5.77	U	9.62	3.1	U	9.43	0.943	U	10.4	1.04	U	10.4	1.04
Naphthalene[2]	1.1	U	10.0	0.93	U	0.5	0.1	U	0.5	0.1	U	1.92	0.356	U	1.92	0.356	U	4.72	0.943	U	5.21	1.04	U	5.21	1.04
Pentachlorophenol	6.7	U	25.0	1.2	UJ	5	1	U	5	1	U	24.0	1.63	U	24	3.17	U, L	9.43	0.943	U	10.4	1.04	UL	10.4	1.04
Phenol	NV	U	10.0	1.1	U	1	0.5	U	1	0.5	U	9.62	1.44	U	9.62	1.44	U, L	9.43	0.943	UL	10.4	1.04	UL	10.4	1.04
Total Inorganics (mg/L)																									
Aluminum	NV		---		U	0.4	0.0674	U	0.4	0.0674	U	0.100	0.0500	U	0.100	0.0500		---			---			---	
Antimony	0.0056		---		U	0.002	0.00033	U	0.002	0.00033	U	0.00200	0.000500	U	0.0100	0.00400		---			---			---	
Arsenic	NV		---		U	0.004	0.00054	U	0.004	0.00054	U	0.00200	0.000500	U	0.0100	0.00200		---			---			---	
Cadmium	0.0011		---		U	0.001	0.00023	U	0.001	0.00023	U	0.00100	0.000400	U	0.00500	0.000500		---			---			---	
Chromium	0.011		---		U	0.03	0.0013	U	0.03	0.0013	U	0.00500	0.00300	**0.0062**	0.00500	0.00300		---			---			---	
Cobalt	NV		---		**0.00021 J**	0.001	0.0001	**0.00015 J**	0.001	0.0001	U	0.00200	0.000500	U	0.0100	0.000500		---			---			---	
Iron	NV		---		**0.0518 J**	0.4	0.0334	**0.0479 J**	0.4	0.0334	U	0.100	0.0500	**5.49**	0.100	0.0500		---			---			---	
Lead	0.014		---		U	0.002	0.00013	U	0.002	0.00013	U	0.00200	0.000200	U	0.0100	0.000500		---			---			---	
Manganese	NV		---		**0.0066 J**	0.01	0.00083	**0.0063 J**	0.01	0.00083	U	0.0150	0.00500	**0.0261**	0.0150	0.00500		---			---			---	
Mercury	0.00077		---		U	0.0002	0.00005	U	0.0002	0.00005	U	0.000200	0.000100	U	0.000200	0.000100		---			---			---	
Nickel	0.020		---		U	0.02	0.0016	U	0.02	0.0016	U	0.0100	0.00300	**0.0057 J**	0.0100	0.00300		---			---			---	
Vanadium	NV		---		U	0.01	0.0019	U	0.01	0.0019	U	0.0200	0.0100	U	0.0200	0.0100		---			---			---	
Zinc	0.120		---		U	0.04	0.002	U	0.04	0.002	U	0.0500	0.0250	**0.533**	0.0500	0.0250		---			---			---	
Dissolved Inorganics (mg/L)																									
Aluminum	NV	U	0.1	0.025	U	0.4	0.0674	U	0.4	0.0674	U	0.100	0.0500	U	0.100	0.0500	**0.0176 B, J**	0.05	0.00776	**0.0310 J**	0.05	0.0118	U	0.05	0.0118
Antimony	0.0056	U	0.005	0.0026	U	0.002	0.00033	U	0.002	0.00033	U	0.00200	0.000500	U	0.0100	0.00400	U	0.001	0.0005	U	0.001	0.0005	U	0.001	0.0005
Arsenic	NV	U	0.01	0.0027	**0.00056 J**	0.004	0.00054	**0.00057 J**	0.004	0.00054	**0.000856 J**	0.00200	0.000500	U	0.0100	0.00200	**0.00063 J**	0.001	0.0005	U	0.001	0.0005	U	0.001	0.0005
Cadmium	0.0011	U	0.001	0.0005	U	0.001	0.00023	U	0.001	0.00023	U	0.00100	0.000400	U	0.00500	0.000500	U	0.0001	0.00005	U	0.0001	0.00005	U	0.0001	0.00005
Chromium	0.011	U	0.005	0.0004	U	0.03	0.0013	U	0.03	0.0013	U	0.00500	0.00300	U	0.00500	0.00300	U	0.005	0.000988	U	0.005	0.000973	U	0.005	0.000973
Cobalt	NV	U	0.005	0.0006	**0.00029 J**	0.001	0.0001	**0.00019 J**	0.001	0.0001	U	0.00200	0.000500	U	0.0100	0.000500	U, J	0.0001	0.00005	U	0.001	0.0005	U	0.001	0.0005
Iron	NV	**0.0146 J**	0.05	0.014	U	0.4	0.0334	U	0.4	0.0334	U	0.100	0.0500	U	0.100	0.0500	**0.0168 B, J**	0.05	0.00571	**0.0408 B**	0.05	0.00854	**0.0378 B**	0.05	0.00854
Lead	0.014	U	0.005	0.004	**0.00025 J**	0.002	0.00013	U	0.002	0.00013	U	0.00200	0.000200	U	0.0100	0.000500	U	0.001	0.0005	U	0.001	0.0005	U	0.001	0.0005
Manganese	NV	**0.0057**	0.005	0.0003	**0.0031 J**	0.01	0.00083	**0.0031 J**	0.01	0.00083	U	0.0150	0.00500	U	0.0150	0.00500	**0.00623 B**	0.005	0.000541	**0.00430 J**	0.005	0.000543	**0.00445 J**	0.005	0.000543
Mercury	0.00077	U	0.0002	0.00009	U	0.0002	0.00005	U	0.0002	0.00005	U	0.000200	0.000100	U	0.000200	0.000100	U	0.0002	0.0000916	UL	0.0002	0.0000589	UL	0.0002	0.0000589
Nickel	0.020	U	0.005	0.0017	U	0.02	0.0016	U	0.02	0.0016	U	0.0100	0.00300	U	0.0100	0.00300	**0.00104 B, J**	0.005	0.00067	**0.00174 B**	0.005	0.000918	**0.00231 B**	0.005	0.000918
Vanadium	NV	**0.00074 J**	0.005	0.0002	U	0.01	0.0019	U	0.01	0.0019	U	0.0200	0.0100	U	0.0200	0.0100	**0.00137 B, J**	0.005	0.000394	U	0.005	0.000896	U	0.005	0.000896
Zinc	0.120	**0.0015 J**	0.01	0.0004	U	0.04	0.002	U	0.04	0.002	U	0.0500	0.0250	U	0.0500	0.0250	**0.0461 B**	0.005	0.000656	**0.0231 B**	0.005	0.000969	**0.0264 B**	0.005	0.000969
Other Inorganics (mg/L)																									
Cyanide (Total)[3]	0.0052		---		U	0.01	0.005	U	0.01	0.005	U	0.00500	0.000608	U	0.0100	0.00700		---			---			---	
Cyanide (Free)	0.0052	U	0.1	0.05	U	0.006	0.002	U	0.006	0.002	U	0.0100	0.00700	U	0.00500	0.00154	U	0.1	0.05	U	0.1	0.05	U	0.1	0.05
Field Parameters																									
Temperature (°C)	NV	**30.18**	---	---	**26.89**	---	---	**26.89**	---	---		---		**28.87**	---	---	**29.46**	---	---	**23.66**	---	---	**---**	---	---
pH	NV	**8.53**	---	---	**8.65**	---	---	**8.65**	---	---		---		**8.87**	---	---	**8.88**	---	---	**8.24**	---	---	**---**	---	---
ORP (mV)	NV	**-48.7**	---	---	**88.3**	---	---	**88.3**	---	---		---		**156.9**	---	---	**59.1**	---	---	**158.4**	---	---	**---**	---	---
Conductivity (mS/cm)	NV	**0.37**	---	---	**0.3**	---	---	**0.3**	---	---		---		**0.290**	---	---	**0.288**	---	---	**0.341**	---	---	**---**	---	---
Turbidity (NTU)	NV	**2.37**	---	---	**2.5**	---	---	**2.5**	---	---		---		**0**	---	---	**0.0**	---	---	**0.0**	---	---	**---**	---	---
DO (mg/L)	NV	**9.21**	---	---	**8.98**	---	---	**8.98**	---	---		---		**9.85**	---	---	**12.06**	---	---	**7.82**	---	---	**---**	---	---

Notes:
[1]Screening criteria, where available, are based on the Virginia Quality Criteria (9 VAC 25-260-140) (updated January 2011).
[2]Screening criterion for naphthalene is based on Region III BTAG Aquatic Freshwater Screening Levels (July 2006).
[3]Screening criterion for Cyanide (Free) was used.

Aug-01 data from the report Supplamental Field and Laboratory Data Report for Operable Unit 7 (Exponent, 2001).
VOC - Volatile Organic Compound
SVOC - Semivolatile Organic Compound
ug/L - micrograms per liter
mg/L - milligrams per liter
mV - millivolts
mS/cm - millisiemens per centimeter
NTU - nephelometric turbidity units
--- - Not analyzed
RL - Laboratory Reporting Limit
MDL - Method Detection Limit
B - Constituent also detected in the associated blank
J - Reported as estimated between the RL and the MDL and/or due to data validation.
L - Reported value may be biased low R - Data unusable
U - Not detected above the laboratory reporting limit
Bold - Indicates detected result
= Constituent detected above screening value.

Appendix H-2 - VB 9-11 Plume Surface Water Quality Data
Avtex Fibers Superfund Site, Front Royal, VA

		SW-05 (Continued)															SW-06											
		7/1/2014			7/12/2015			7/13/2016			7/13/2016			7/13/2017			9/6/2012			9/10/2013			7/1/2014			7/12/2015		
Parameter	**Screening Criteria[1]**	Conc.	RL	MDL	Conc.	RL	MDL	Conc.	RL	MDL	Conc.	RL	MDL	Conc.	RL	MDL	Conc.	RL	MDL	Conc.	RL	MDL	Conc.	RL	MDL	Conc.	RL	MDL
VOCs (ug/L)																												
Acetone	NV	U	25.0	10.0	U	5	3	U	25.0	2.66	U	25.0	2.66	R	25	2.66	U	5	5	U	10	10	U	25.0	10.0	U	5	3
Carbon disulfide	NV	U	10.0	1.7	U	1	0.4	U	1.00	0.220	U	1.00	0.220	U	1	0.22	U	1	0.5	U	2	1	U	10.0	1.7	U	1	0.4
Chlorobenzene	130	U	5.0	1.7	U	0.5	0.1	U	1.00	0.180	U	1.00	0.180	U	1	0.18	U	1	0.5	U	2	1	U	5.0	1.7	U	0.5	0.1
SVOCs (ug/L)																												
2-Methylphenol (o-Cresol)	NV	U	10.0	1.0	U	1	0.5	U	9.62	2.21	U	9.62	2.21	U	9.8	0.157	U, J	9.26	0.926	U	10.4	1.04	U	10.0	1.0	U	1	0.5
4,3-Methylphenol	NV	U	10.0	1.0	U	1	0.5	U	9.62	2.12	U	9.62	2.12	U	9.8	0.137	U	9.26	0.926	U	10.4	1.04	U	10.0	1.0	U	1	0.5
bis(2-Ethylhexyl)phthalate	NV	U	6.0	0.49	U	5	2	U	9.62	5.77	U	9.62	5.77	U	9.8	0.319	U	9.26	0.926	U	10.4	1.04	U	6.0	0.49	U	5	2
Naphthalene[2]	1.1	U	10.0	0.93	U	0.5	0.1	U	1.92	0.356	U	1.92	0.356	U	1.96	0.0363	U	4.63	0.926	U	5.21	1.04	U	10.0	0.93	U	0.5	0.1
Pentachlorophenol	6.7	U	25.0	1.2	U	5	1	U	24.0	1.63	U	24.0	1.63	U	24.5	0.324	U	9.26	0.926	U	10.4	1.04	U	25.0	1.2	U	5	1
Phenol	NV	U	10.0	1.1	U	1	0.5	U	9.62	1.44	U	9.62	1.44	U	9.8	0.147	U, L	9.26	0.926	UL	10.4	1.04	U	10.0	1.1	U	1	0.5
Total Inorganics (mg/L)																												
Aluminum	NV		---		U	0.4	0.0674	**0.0659 J**	0.100	0.0500	U	0.100	0.0500	U	0.100	0.0500		---			---			---		U	0.4	0.0674
Antimony	0.0056		---		U	0.002	0.00033	U	0.00200	0.000500	U	0.00200	0.000500	U	0.0100	0.00400		---			---			---		U	0.002	0.00033
Arsenic	NV		---		U	0.004	0.00054	**0.00101 J**	0.00200	0.000500	U	0.00200	0.000500	U	0.0100	0.00200		---			---			---		U	0.004	0.00054
Cadmium	0.0011		---		U	0.001	0.00023	U	0.00100	0.000400	U	0.00100	0.000400	U	0.00500	0.000500		---			---			---		U	0.001	0.00023
Chromium	0.011		---		U	0.03	0.0013	U	0.00500	0.00300	U	0.00500	0.00300	U	0.00500	0.00300		---			---			---		U	0.03	0.0013
Cobalt	NV		---		**0.00017 J**	0.001	0.0001	U	0.00200	0.000500	U	0.00200	0.000500	U	0.0100	0.000500		---			---			---		**0.00018 J**	0.001	0.0001
Iron	NV		---		**0.0457 J**	0.4	0.0334	U	0.100	0.0500	U	0.100	0.0500	**1.29**	0.100	0.0500		---			---			---		**0.0456 J**	0.4	0.0334
Lead	0.014		---		U	0.002	0.00013	U	0.00200	0.000349	U	0.00200	0.000200	U	0.0100	0.000500		---			---			---		U	0.002	0.00013
Manganese	NV		---		**0.0060 J**	0.01	0.00083	**0.0468 J**	0.0150	0.00500	UJ	0.0150	0.00500	**0.0063 J**	0.0150	0.00500		---			---			---		**0.0056 J**	0.01	0.00083
Mercury	0.00077		---		U	0.0002	0.00005	U	0.000200	0.000100	U	0.000200	0.000100	U	0.000200	0.000100		---			---			---		U	0.0002	0.00005
Nickel	0.020		---		U	0.02	0.0016	**0.00560 J**	0.0100	0.00300	U	0.0100	0.00300	U	0.0100	0.00300		---			---			---		U	0.02	0.0016
Vanadium	NV		---		U	0.01	0.0019	U	0.0200	0.0100	U	0.0200	0.0100	U	0.0200	0.0100		---			---			---		U	0.01	0.0019
Zinc	0.120		---		U	0.04	0.002	U	0.0500	0.0250	U	0.0500	0.0250	**0.174**	0.0500	0.0250		---			---			---		U	0.04	0.002
Dissolved Inorganics (mg/L)																												
Aluminum	NV	**0.0692 J**	0.1	0.025	U	0.4	0.0674	U	0.100	0.0500	U	0.100	0.0500	U	0.100	0.0500	**0.0114 B, J**	0.05	0.00776	U	0.05	0.0118	U	0.1	0.025	U	0.4	0.0674
Antimony	0.0056	U	0.005	0.0026	U	0.002	0.00033	U	0.00200	0.000870	U	0.00200	0.000500	U	0.0100	0.00400	U	0.001	0.0005	U	0.001	0.0005	U	0.005	0.0026	U	0.002	0.00033
Arsenic	NV	U	0.01	0.0027	U	0.004	0.00054	**0.000813 J**	0.00200	0.000500	**0.000799 J**	0.00200	0.000500	U	0.0100	0.00200	**0.00061 J**	0.001	0.0005	U	0.001	0.0005	U	0.01	0.0027	U	0.004	0.00054
Cadmium	0.0011	U	0.001	0.0005	U	0.001	0.00023	U	0.00100	0.000400	U	0.00100	0.000400	U	0.00500	0.000500	U	0.0001	0.00005	U	0.0001	0.00005	U	0.001	0.0005	U	0.001	0.00023
Chromium	0.011	U	0.005	0.0004	U	0.03	0.0013	U	0.00500	0.00300	U	0.00500	0.00300	U	0.00500	0.00300	U	0.005	0.000988	**0.00134 B**	0.005	0.000973	U	0.005	0.0004	U	0.03	0.0013
Cobalt	NV	U	0.005	0.0006	**0.00020 J**	0.001	0.0001	U	0.00200	0.000500	U	0.00200	0.000500	U	0.0100	0.000500	U, J	0.0001	0.00005	U	0.001	0.0005	U	0.005	0.0006	**0.00027 J**	0.001	0.0001
Iron	NV	**0.0212 J**	0.05	0.014	U	0.4	0.0334	U	0.100	0.0500	U	0.100	0.0500	U	0.100	0.0500	**0.0326 B, J**	0.05	0.00571	**0.0363 B**	0.05	0.00854	**0.0156 J**	0.05	0.014	U	0.4	0.0334
Lead	0.014	U	0.005	0.004	U	0.002	0.00013	U	0.00200	0.000200	U	0.00200	0.000200	U	0.0100	0.000500	U	0.001	0.0005	U	0.001	0.0005	U	0.005	0.004	U	0.002	0.00013
Manganese	NV	**0.0052**	0.005	0.0003	**0.0032 J**	0.01	0.00083	U	0.0150	0.00500	U	0.0150	0.00500	U	0.0150	0.00500	**0.00674 B**	0.005	0.000541	**0.00452 J**	0.005	0.000543	**0.0048 J**	0.005	0.0003	**0.0025 J**	0.01	0.00083
Mercury	0.00077	U	0.0002	0.00009	U	0.0002	0.00005	U	0.000200	0.000100	U	0.000200	0.000100	U	0.000200	0.000100	U	0.0002	0.0000916	UL	0.0002	0.0000589	U	0.0002	0.00009	U	0.0002	0.00005
Nickel	0.020	U	0.005	0.0017	U	0.02	0.0016	U	0.0100	0.00300	U	0.0100	0.00300	U	0.0100	0.00300	**0.00078 B, J**	0.005	0.00067	**0.00194 B**	0.005	0.000918	U	0.005	0.0017	U	0.02	0.0016
Vanadium	NV	**0.0013 J**	0.005	0.0002	U	0.01	0.0019	U	0.0200	0.0100	U	0.0200	0.0100	U	0.0200	0.0100	**0.000963 B, J**	0.005	0.000394	U	0.005	0.000896	**0.00076 J**	0.005	0.0002	U	0.01	0.0019
Zinc	0.120	U	0.01	0.0004	U	0.04	0.002	U	0.0500	0.0250	U	0.0500	0.0250	U	0.0500	0.0250	**0.0163 B**	0.005	0.000656	**0.0128 B**	0.005	0.000969	**0.0011 J**	0.01	0.0004	U	0.04	0.002
Other Inorganics (mg/L)																												
Cyanide (Total)[3]	0.0052		---		U	0.01	0.005	U	0.00500	0.000608	U	0.00500	0.000608	U	0.0100	0.00700		---			---			---		U	0.01	0.005
Cyanide (Free)	0.0052	U	0.1	0.05	U	0.006	0.002	U	0.0100	0.00700	U	0.0100	0.00700	U	0.00500	0.00154	U	0.1	0.05	U	0.1	0.05	U	0.1	0.05	U	0.006	0.002
Field Parameters																												
Temperature (°C)	NV	**29.92**	---	---	**24.53**	---	---		---			---		**31.68**	---	---	**27.25**	---	---	**26.30**	---	---	**28.03**	---	---	**25.36**	---	---
pH	NV	**8.58**	---	---	**8.23**	---	---		---			---		**9.19**	---	---	**8.25**	---	---	**8.48**	---	---	**8.11**	---	---	**8.51**	---	---
ORP (mV)	NV	**-38.5**	---	---	**95.38**	---	---		---			---		**161.4**	---	---	**100.7**	---	---	**99.1**	---	---	**3.0**	---	---	**84.93**	---	---
Conductivity (mS/cm)	NV	**0.36**	---	---	**0.3**	---	---		---			---		**0.270**	---	---	**0.317**	---	---	**0.347**	---	---	**0.29**	---	---	**0.3**	---	---
Turbidity (NTU)	NV	**3.87**	---	---	**4.58**	---	---		---			---		**0.36**	---	---	**0.0**	---	---	**0.0**	---	---	**3.89**	---	---	**2.31**	---	---
DO (mg/L)	NV	**9.96**	---	---	**7.94**	---	---		---			---		**12.59**	---	---	**7.2**	---	---	**9.18**	---	---	**6.21**	---	---	**8.53**	---	---

Notes:
[1]Screening criteria, where available, are based on the Virginia Quality Criteria (9 VAC 25-260-140) (updated January 2011).
[2]Screening criterion for naphthalene is based on Region III BTAG Aquatic Freshwater Screening Levels (July 2006).
[3]Screening criterion for Cyanide (Free) was used.
Aug-01 data from the report Supplamental Field and Laboratory Data Report for Operable Unit 7 (Exponent, 2001).
VOC - Volatile Organic Compound
SVOC - Semivolatile Organic Compound
ug/L - micrograms per liter
mg/L - milligrams per liter
mV - millivolts
mS/cm - millisiemens per centimeter
NTU - nephelometric turbidity units
--- - Not analyzed
RL - Laboratory Reporting Limit
MDL - Method Detection Limit
B - Constituent also detected in the associated blank
J - Reported as estimated between the RL and the MDL and/or due to data validation.
L - Reported value may be biased low R - Data unusable
U - Not detected above the laboratory reporting limit
Bold - Indicates detected result
= Constituent detected above screening value.

Appendix H-2 - VB 9-11 Plume Surface Water Quality Data
Avtex Fibers Superfund Site, Front Royal, VA

		SW-06 (Continued)									SW-07													
		7/13/2016			7/13/2017			7/13/2017			9/6/2012			9/6/2012			9/10/2013			7/1/2014			7/1/2014		
Parameter	**Screening Criteria[1]**	Conc.	RL	MDL	Conc.	RL	MDL	Conc.	RL	MDL	Conc.	RL	MDL	Conc.	RL	MDL	Conc.	RL	MDL	Conc.	RL	MDL	Conc.	RL	MDL
VOCs (ug/L)																									
Acetone	NV	U	25.0	2.66	R	25	2.66	R	25	2.66	U	5	5	U	5	5	U	10	10	U	25.0	10.0	U	25.0	10.0
Carbon disulfide	NV	U	1.00	0.220	U	1	0.22	U	1	0.22	U	1	0.5	U	1	0.5	**1.11 B**	2	1	U	10.0	1.7	U	10.0	1.7
Chlorobenzene	130	U	1.00	0.180	U	1	0.18	U	1	0.18	U	1	0.5	U	1	0.5	U	2	1	U	5.0	1.7	U	5.0	1.7
SVOCs (ug/L)																									
2-Methylphenol (o-Cresol)	NV	U	9.62	2.21	U	10	1.6	U	9.62	1.54	U, J	9.26	0.926	U, J	9.26	0.926	UL	10.4	1.04	U	10.0	1.0	U	10.0	1.0
4,3-Methylphenol	NV	U	9.62	2.12	U	10	1.4	U	9.62	1.35	U	9.26	0.926	U	9.26	0.926	UL	10.4	1.04	U	10.0	1.0	U	10.0	1.0
bis(2-Ethylhexyl)phthalate	NV	U	9.62	5.77	U	10	3.17	U	9.62	2.66	U	9.26	0.926	U	9.26	0.926	U	10.4	1.04	U	6.0	0.49	U	6.0	0.49
Naphthalene[2]	1.1	U	1.92	0.356	U	2	0.37	U	1.92	0.356	U	4.63	0.926	U	4.63	0.926	U	5.21	1.04	U	10.0	0.93	U	10.0	0.93
Pentachlorophenol	6.7	U	24.0	1.63	U	25	3.3	U	24	3.17	U	9.26	0.926	U	9.26	0.926	UL	10.4	1.04	U	25.0	1.2	U	25.0	1.2
Phenol	NV	U	9.62	1.44	U	10	1.5	U	9.62	1.44	U, L	9.26	0.926	U, L	9.26	0.926	UL	10.4	1.04	U	10.0	1.1	U	10.0	1.1
Total Inorganics (mg/L)																									
Aluminum	NV	U	0.100	0.0500	U	0.100	0.0500	U	0.100	0.0500		---			---			---			---			---	
Antimony	0.0056	U	0.00200	0.000500	U	0.0100	0.00400	U	0.0100	0.00400		---			---			---			---			---	
Arsenic	NV	U	0.00200	0.000500	U	0.0100	0.00200	U	0.0100	0.00200		---			---			---			---			---	
Cadmium	0.0011	U	0.00100	0.000400	U	0.00500	0.000500	U	0.00500	0.000500		---			---			---			---			---	
Chromium	0.011	U	0.00500	0.00300	U	0.00500	0.00300	U	0.00500	0.00300		---			---			---			---			---	
Cobalt	NV	U	0.00200	0.000500	U	0.0100	0.000500	U	0.0100	0.000500		---			---			---			---			---	
Iron	NV	U	0.100	0.0500	U	0.100	0.0500	**0.193**	0.100	0.0500		---			---			---			---			---	
Lead	0.014	U	0.00200	0.000200	U	0.0100	0.000500	U	0.0100	0.000541		---			---			---			---			---	
Manganese	NV	U	0.0150	0.00500	U	0.0150	0.00500	U	0.0150	0.00500		---			---			---			---			---	
Mercury	0.00077	U	0.000200	0.000100	U	0.000200	0.000100	U	0.000200	0.000100		---			---			---			---			---	
Nickel	0.020	U	0.0100	0.00300	U	0.0100	0.00300	U	0.0100	0.00300		---			---			---			---			---	
Vanadium	NV	U	0.0200	0.0100	U	0.0200	0.0100	U	0.0200	0.0100		---			---			---			---			---	
Zinc	0.120	U	0.0500	0.0250	U	0.0500	0.0250	U	0.0500	0.0250		---			---			---			---			---	
Dissolved Inorganics (mg/L)																									
Aluminum	NV	U	0.100	0.0500	U	0.100	0.0500	U	0.100	0.0500	U	0.05	0.00776	U	0.05	0.00776	**0.0153 B**	0.05	0.0118	U	0.1	0.025	U	0.1	0.025
Antimony	0.0056	U	0.00200	0.000500	U	0.0100	0.00400	U	0.0100	0.00400	U	0.001	0.0005	U	0.001	0.0005	U	0.001	0.0005	U	0.005	0.0026	U	0.005	0.0026
Arsenic	NV	**0.000791 J**	0.00200	0.000500	U	0.0100	0.00200	U	0.0100	0.00200	**0.00063 J**	0.001	0.0005	**0.00056 J**	0.001	0.0005	**0.00054 J**	0.001	0.0005	U	0.01	0.0027	U	0.01	0.0027
Cadmium	0.0011	U	0.00100	0.000400	U	0.00500	0.000500	U	0.00500	0.000500	U	0.0001	0.00005	U	0.0001	0.00005	U	0.0001	0.00005	U	0.001	0.0005	U	0.001	0.0005
Chromium	0.011	U	0.00500	0.00300	U	0.00500	0.00300	U	0.00500	0.00300	U	0.005	0.000988	U	0.005	0.000988	**0.00153 B**	0.005	0.000973	U	0.005	0.0004	U	0.005	0.0004
Cobalt	NV	U	0.00200	0.000500	U	0.0100	0.000500	**0.00172 J**	0.0100	0.000500	U, J	0.0001	0.00005	U, J	0.0001	0.00005	U	0.001	0.0005	U	0.005	0.0006	U	0.005	0.0006
Iron	NV	U	0.100	0.0500	U	0.100	0.0500	U	0.100	0.0500	**0.0165 B, J**	0.05	0.00571	**0.0162 B, J**	0.05	0.00571	**0.0308 B**	0.05	0.00854	**0.0211 J**	0.05	0.014	**0.0192 J**	0.05	0.014
Lead	0.014	U	0.00200	0.000200	U	0.0100	0.000500	U	0.0100	0.000500	U	0.001	0.0005	U	0.001	0.0005	U	0.001	0.0005	U	0.005	0.004	U	0.005	0.004
Manganese	NV	U	0.0150	0.00500	**0.0071 J**	0.0150	0.00500	U	0.0150	0.00500	**0.00449 B, J**	0.005	0.000541	**0.0044 B, J**	0.005	0.000541	**0.00433 J**	0.005	0.000543	**0.0048 J**	0.005	0.0003	**0.0054**	0.005	0.0003
Mercury	0.00077	U	0.000200	0.000100	U	0.000200	0.000100	U	0.000200	0.000100	U	0.0002	0.0000916	U	0.0002	0.0000916	UL	0.0002	0.0000589	U	0.0002	0.00009	U	0.0002	0.00009
Nickel	0.020	U	0.0100	0.00300	U	0.0100	0.00300	U	0.0100	0.00300	U	0.005	0.00067	**0.000771 B, J**	0.005	0.00067	**0.00204 B**	0.005	0.000918	U	0.005	0.0017	U	0.005	0.0017
Vanadium	NV	U	0.0200	0.0100	U	0.0200	0.0100	U	0.0200	0.0100	**0.00119 B, J**	0.005	0.000394	**0.00128 B, J**	0.005	0.000394	U	0.005	0.000896	**0.001 J**	0.005	0.0002	**0.00086 J**	0.005	0.0002
Zinc	0.120	U	0.0500	0.0250	U	0.0500	0.0250	U	0.0500	0.0250	**0.00349 B, J**	0.005	0.000656	**0.00314 B, J**	0.005	0.000656	**0.0243 B**	0.005	0.000969	U	0.01	0.0004	U	0.01	0.0004
Other Inorganics (mg/L)																									
Cyanide (Total)[3]	0.0052	U	0.00500	0.000608	U	0.0100	0.00700	U	0.0100	0.00700		---			---			---			---			---	
Cyanide (Free)	0.0052	U	0.0100	0.00700	U	0.00500	0.00154	U	0.00500	0.00154	U	0.1	0.05	U	0.1	0.05	U	0.1	0.05	U	0.1	0.05	U	0.1	0.05
Field Parameters																									
Temperature (°C)	NV		---		**31.26**	---	---	**31.26**	---	---	**27.51**	---	---	**27.51**	---	---	**25.77**	---	---	**27.79**	---	---	**27.79**	---	---
pH	NV		---		**9.26**	---	---	**9.26**	---	---	**8.32**	---	---	**8.32**	---	---	**8.49**	---	---	**8.14**	---	---	**8.14**	---	---
ORP (mV)	NV		---		**177.5**	---	---	**177.5**	---	---	**110.4**	---	---	**110.4**	---	---	**81.6**	---	---	**-17.6**	---	---	**-17.6**	---	---
Conductivity (mS/cm)	NV		---		**0.260**	---	---	**0.260**	---	---	**0.315**	---	---	**0.315**	---	---	**0.342**	---	---	**0.28**	---	---	**0.28**	---	---
Turbidity (NTU)	NV		---		**0.1**	---	---	**0.1**	---	---	**0.0**	---	---	**0.0**	---	---	**0.0**	---	---	**3.91**	---	---	**3.91**	---	---
DO (mg/L)	NV		---		**13.13**	---	---	**13.13**	---	---	**7.82**	---	---	**7.82**	---	---	**9.93**	---	---	**6.40**	---	---	**6.40**	---	---

Notes:
[1]Screening criteria, where available, are based on the Virginia Quality Criteria (9 VAC 25-260-140) (updated January 2011).
[2]Screening criterion for naphthalene is based on Region III BTAG Aquatic Freshwater Screening Levels (July 2006).
[3]Screening criterion for Cyanide (Free) was used.

Aug-01 data from the report Supplamental Field and Laboratory Data Report for Operable Unit 7 (Exponent, 2001).
VOC - Volatile Organic Compound
SVOC - Semivolatile Organic Compound
ug/L - micrograms per liter
mg/L - milligrams per liter
mV - millivolts
mS/cm - millisiemens per centimeter
NTU - nephelometric turbidity units
--- - Not analyzed
RL - Laboratory Reporting Limit
MDL - Method Detection Limit
B - Constituent also detected in the associated blank
J - Reported as estimated between the RL and the MDL and/or due to data validation.
L - Reported value may be biased low R - Data unusable
U - Not detected above the laboratory reporting limit
Bold - Indicates detected result
= Constituent detected above screening value.

Appendix H-2 - VB 9-11 Plume Surface Water Quality Data
Avtex Fibers Superfund Site, Front Royal, VA

		SW-07 (Continued)									SW-08								
		7/12/2015			7/13/2016			7/13/2017			7/12/2015			7/14/2016			7/13/2017		
Parameter	**Screening Criteria[1]**	Conc.	RL	MDL	Conc.	RL	MDL	Conc.	RL	MDL	Conc.	RL	MDL	Conc.	RL	MDL	Conc.	RL	MDL
VOCs (ug/L)																			
Acetone	NV	U	5	3	U	25.0	2.66	R	25	2.66	U	5	3	U	25.0	2.66	R	25	2.66
Carbon disulfide	NV	U	1	0.4	U	1.00	0.220	U	1	0.22	U	1	0.4	U	1.00	0.220	U	1	0.22
Chlorobenzene	130	U	0.5	0.1	U	1.00	0.180	U	1	0.18	U	0.5	0.1	U	1.00	0.180	U	1	0.18
SVOCs (ug/L)																			
2-Methylphenol (o-Cresol)	NV	U	1	0.5	U	9.62	2.21	U	9.62	1.54	U	1	0.5	U	9.26	2.13	U	10	1.6
4,3-Methylphenol	NV	U	1	0.5	U	9.62	2.12	U	9.62	1.35	U	1	0.5	U	9.26	2.04	U	10	1.4
bis(2-Ethylhexyl)phthalate	NV	U	5	2	U	9.62	5.77	U	9.62	2.35	U	5	2	U	9.26	5.56	U	10	2.32
Naphthalene[2]	1.1	U	0.5	0.1	U	1.92	0.356	U	1.92	0.356	U	0.5	0.1	U	1.85	0.343	U	2	0.37
Pentachlorophenol	6.7	U	5	1	U	24.0	1.63	UJ	24	3.17	U	5	1	U	23.1	1.57	UJ	25	3.3
Phenol	NV	U	1	0.5	U	9.62	1.44	U	9.62	1.44	U	1	0.5	U	9.26	1.39	U	10	1.5
Total Inorganics (mg/L)																			
Aluminum	NV	U	0.4	0.0674	U	0.100	0.0500	U	0.100	0.0500	U	0.4	0.0674	U	0.100	0.0500	U	0.100	0.0500
Antimony	0.0056	U	0.002	0.00033	U	0.00200	0.000500	U	0.0100	0.00400	U	0.002	0.00033	U	0.00200	0.000500	U	0.0100	0.00400
Arsenic	NV	U	0.004	0.00054	**0.000583 J**	0.00200	0.000500	U	0.0100	0.00200	U	0.004	0.00054	**0.000504 J**	0.00200	0.000500	U	0.0100	0.00200
Cadmium	0.0011	U	0.001	0.00023	U	0.00100	0.000400	U	0.00500	0.000500	U	0.001	0.00023	U	0.00100	0.000400	U	0.00500	0.000500
Chromium	0.011	U	0.03	0.0013	U	0.00500	0.00300	U	0.00500	0.00300	U	0.03	0.0013	U	0.00500	0.00300	U	0.00500	0.00300
Cobalt	NV	**0.00020 J**	0.001	0.0001	U	0.00200	0.000500	U	0.0100	0.000500	**0.00020 J**	0.001	0.0001	U	0.00200	0.000500	U	0.0100	0.000500
Iron	NV	**0.0458 J**	0.4	0.0334	U	0.100	0.0500	U	0.100	0.0500	**0.0503 J**	0.4	0.0334	U	0.100	0.0500	U	0.100	0.0500
Lead	0.014	U	0.002	0.00013	U	0.00200	0.000200	U	0.0100	0.000500	U	0.002	0.00013	U	0.00200	0.000200	U	0.0100	0.000500
Manganese	NV	**0.0061 J**	0.01	0.00083	U	0.0150	0.00500	U	0.0150	0.00500	**0.0063 J**	0.01	0.00083	U	0.0150	0.00500	U	0.0150	0.00500
Mercury	0.00077	U	0.0002	0.00005	U	0.000200	0.000100	U	0.000200	0.000100	U	0.0002	0.00005	U	0.000200	0.000100	U	0.000200	0.000100
Nickel	0.020	U	0.02	0.0016	U	0.0100	0.00300	U	0.0100	0.00300	U	0.02	0.0016	U	0.0100	0.00300	U	0.0100	0.00300
Vanadium	NV	U	0.01	0.0019	U	0.0200	0.0100	U	0.0200	0.0100	U	0.01	0.0019	U	0.0200	0.0100	U	0.0200	0.0100
Zinc	0.120	U	0.04	0.002	U	0.0500	0.0250	U	0.0500	0.0250	U	0.04	0.002	U	0.0500	0.0250	U	0.0500	0.0250
Dissolved Inorganics (mg/L)																			
Aluminum	NV	U	0.4	0.0674	U	0.100	0.0500	U	0.100	0.0500	U	0.4	0.0674	U	0.100	0.0500	U	0.100	0.0500
Antimony	0.0056	U	0.002	0.00033	U	0.00200	0.000500	U	0.0100	0.00400	U	0.002	0.00033	U	0.00200	0.000500	U	0.0100	0.00400
Arsenic	NV	U	0.004	0.00054	**0.000735 J**	0.00200	0.000500	U	0.0100	0.00200	U	0.004	0.00054	**0.000893 J**	0.00200	0.000500	U	0.0100	0.00200
Cadmium	0.0011	U	0.001	0.00023	U	0.00100	0.000400	U	0.00500	0.000500	U	0.001	0.00023	U	0.00100	0.000400	U	0.00500	0.000500
Chromium	0.011	U	0.03	0.0013	U	0.00500	0.00300	U	0.00500	0.00300	U	0.03	0.0013	U	0.00500	0.00300	U	0.00500	0.00300
Cobalt	NV	**0.00016 J**	0.001	0.0001	U	0.00200	0.000500	U	0.0100	0.000500	**0.00024 J**	0.001	0.0001	U	0.00200	0.000500	U	0.0100	0.000500
Iron	NV	U	0.4	0.0334	U	0.100	0.0500	U	0.100	0.0500	U	0.4	0.0334	U	0.100	0.0500	U	0.100	0.0500
Lead	0.014	U	0.002	0.00013	U	0.00200	0.000200	U	0.0100	0.000500	U	0.002	0.00013	U	0.00200	0.000200	U	0.0100	0.000500
Manganese	NV	**0.0028 J**	0.01	0.00083	U	0.0150	0.00500	U	0.0150	0.00500	**0.0032 J**	0.01	0.00083	U	0.0150	0.00500	U	0.0150	0.00500
Mercury	0.00077	U	0.0002	0.00005	U	0.000200	0.000100	U	0.000200	0.000100	U	0.0002	0.00005	U	0.000200	0.000100	U	0.000200	0.000100
Nickel	0.020	U	0.02	0.0016	U	0.0100	0.00300	U	0.0100	0.00300	U	0.02	0.0016	U	0.0100	0.00300	U	0.0100	0.00300
Vanadium	NV	U	0.01	0.0019	U	0.0200	0.0100	U	0.0200	0.0100	U	0.01	0.0019	U	0.0200	0.0100	U	0.0200	0.0100
Zinc	0.120	U	0.04	0.002	U	0.0500	0.0250	U	0.0500	0.0250	**0.0049 J**	0.04	0.002	U	0.0500	0.0250	U	0.0500	0.0250
Other Inorganics (mg/L)																			
Cyanide (Total)[3]	0.0052	U	0.01	0.005	U	0.00500	0.000608	U	0.0100	0.00700	U	0.01	0.005	U	0.00500	0.000608	U	0.0100	0.00700
Cyanide (Free)	0.0052	U	0.006	0.002	**0.0440**	0.0100	0.00700	U	0.00500	0.00154	U	0.006	0.002	U	0.0100	0.00700	U	0.00500	0.00154
Field Parameters																			
Temperature (°C)	NV	**25.91**	---	---		---		**30.88**	---	---	**27.61**	---	---		---		**35.43**	---	---
pH	NV	**8.64**	---	---		---		**9.24**	---	---	**8.66**	---	---		---		**9.18**	---	---
ORP (mV)	NV	**81.4**	---	---		---		**141.4**	---	---	**95.51**	---	---		---		**168.4**	---	---
Conductivity (mS/cm)	NV	**0.3**	---	---		---		**0.260**	---	---	**0.3**	---	---		---		**0.270**	---	---
Turbidity (NTU)	NV	**2.32**	---	---		---		**0.05**	---	---	**1.95**	---	---		---		**1.19**	---	---
DO (mg/L)	NV	**8.78**	---	---		---		**13.03**	---	---	**9.2**	---	---		---		**11.16**	---	---

Notes:
[1]Screening criteria, where available, are based on the Virginia Quality Criteria (9 VAC 25-260-140) (updated January 2011).
[2]Screening criterion for naphthalene is based on Region III BTAG Aquatic Freshwater Screening Levels (July 2006).
[3]Screening criterion for Cyanide (Free) was used.

Aug-01 data from the report Supplamental Field and Laboratory Data Report for Operable Unit 7 (Exponent, 2001).
VOC - Volatile Organic Compound
SVOC - Semivolatile Organic Compound
ug/L - micrograms per liter
mg/L - milligrams per liter
mV - millivolts
mS/cm - millisiemens per centimeter
NTU - nephelometric turbidity units
--- - Not analyzed
RL - Laboratory Reporting Limit
MDL - Method Detection Limit
B - Constituent also detected in the associated blank
J - Reported as estimated between the RL and the MDL and/or due to data validation.
L - Reported value may be biased low R - Data unusable
U - Not detected above the laboratory reporting limit
Bold - Indicates detected result
= Constituent detected above screening value.

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