FINAL SITE INSPECTION REPORT
BLADES GROUNDWATER
TOWN OF BLADES, SUSSEX COUNTY
DELAWARE

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TOWN OF BLADES, SUSSEX COUNTY, DELAWARE

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LIST OF ACRONYMS AND ABBREVIATIONS

µg/kg	micrograms per kilogram
µg/L	micrograms per liter
bgs	below ground surface
BTAG	Biological Technical Assistance Group
CAA	Clean Air Act
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980
CFR	Code of Federal Regulations
CLP	Contract Laboratory Program
CRQL	Contract-Required Quantification Limit
Cr(VI)	Hexavalent Chromium
DGS	Delaware Geological Survey
DNREC	Delaware Department of Natural Resources and Environmental Control
DPH	Delaware Division of Public Health
EPCRA	Emergency Planning and Community-Right-to-Know Act
EPA	U.S. Environmental Protection Agency
ESAT	Environmental Services Assistance Team
FEMA	Federal Emergency Management Agency
GC/MS	gas chromatograph/mass spectrometer
HAL	EPA health advisory level
HRS	Hazard Ranking System
kg	kilogram
MACT	Maximum Achievable Control Technology
MCL	Maximum Contaminant Level
mg	milligram
MOE	Ministry of the Environment of Denmark
MSDS	Material Safety Data Sheet
ng/L	nanograms per liter
NOV	Notice of Violation

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LIST OF ACRONYMS AND ABBREVIATIONS (CONTINUED)

NPDES	National Pollutant Discharge Elimination System
OASQA	Office of Analytical Services and Quality Assurance
ODW	Office of Drinking Water, Delaware Division of Public Health
OSC	On-Scene Coordinator
OSHA	Occupational Safety and Health Administration
PA	Preliminary Assessment
PAH	polycyclic aromatic hydrocarbon
PCB	polychlorinated biphenyl
PFAS	perfluoroalkyl/polyfluoroalkyl substance
PFBS	perfluorobutanesulfonic acid
PFNA	perfluorononanoic acid
PFOA	perfluorooctanoic acid
PFOS	perfluorooctanesulfonic acid
ppb	parts per billon
ppt	parts per trillion
PVC	polyvinyl chloride
QA/QC	quality assurance/quality control
QL	quantitation level
RBC	EPA Risk-Based Concentration
RCRA	Resource Conservation and Recovery Act
RDL	reporting detection limit
RI	Remedial Investigation
RSL	EPA Regional Screening Level
SI	Site Investigation
START	Superfund Technical Assessment and Response Team
SVOC	Semivolatile Organic Compound
SWD	Seaford Water Department
TDD	Technical Direction Document
TDL	target distance limit

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LIST OF ACRONYMS AND ABBREVIATIONS (CONTINUED)

URS	Uniform Risk Based Remediation Standards
USFWS	U.S. Fish and Wildlife Service
USGS	U. S. Geological Survey
VOC	Volatile Organic Compound
WESTON®	Weston Solutions, Inc.
WQC	Water Quality Criteria
XRF	x-Ray fluorescence

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1.0 INTRODUCTION

Under the Eastern Area Superfund Technical Assessment and Response Team (START) Contract No. EP-S3-15-02, Technical Direction Document (TDD) No. W503-18-04-001, the U.S. Environmental Protection Agency (EPA) Region III tasked Weston Solutions, Inc. (WESTON®) to conduct a Preliminary Assessment/Site Inspection (PA/SI) of the Blades Groundwater site (the Site) located in the Town of Blades, Sussex County, Delaware.

The SI was conducted in accordance with EPA *Guidance for Performing Site Inspections Under CERCLA* (Reference [Ref.] 1). The purposes of the SI were to collect sufficient analytical data and information concerning conditions at the Site to assess the relative threat posed to human health and the environment with respect to actual or potential releases of hazardous substances, and to determine the need for additional action under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) based on criteria as set forth in EPA *Hazard Ranking System; Final Rule* (Ref. 2).

2.0 SITE BACKGROUND

This section presents a description of the Site and its location, provides a discussion of the Site's ownership and history, and presents a summary of previous site investigation activities.

2.1 SITE LOCATION AND DESCRIPTION

The Site is located within the Town of Blades, Sussex County, Delaware. Blades is located in western Sussex County and covers approximately 0.5 square mile. Blades lies between the Nanticoke River to the north and west and Morgan Branch to the south and east (Figure 1). The Site consists primarily of a perfluoroalkyl/polyfluoroalkyl substance (PFAS) groundwater plume. Groundwater is the sole drinking water source for both public and domestic potable water in Blades and its surroundings. Public water is supplied to most residences within the town limits of Blades; however, some residences within town limits and the residences located beyond town limits to the southwest and to the northeast rely on domestic groundwater wells for potable water (Ref. 3).

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Located in Blades, DE, is Procino Plating, an active metal plating facility, as well as the site of the former Peninsula Plating facility, which is currently vacant land. The locations of Procino Plating and former Peninsula Plating are shown in Figure 2.

Procino Plating is located at 901 Market Street in Blades. The Procino Plating facility property consists of 1.16 acres with generally flat topography and is primarily surrounded by residential properties. The facility has been an electroplating facility since the 1980s and has been operated as Procino Plating since 1996. Current operations at the facility consist of cutting and chrome-plating of griddle tops for restaurant use (Ref. 3, pp. 4, 6, and 8).

The Peninsula Plating facility was within the former Blades Commercial Complex located at the intersection of Market Street and River Road, which encompasses approximately 5.8 acres. The property formerly had six warehouse and storage buildings that were historically used for metal plating, vending, trash hauling operations, steel products, and bread distribution (Ref. 4, pp. 7, 9, 10, and 35). The building that formerly contained the Peninsula Plating facility was located in the southwestern portion of the property, near the intersection of River Road and the Conrail line (Ref. 4, p. 35). There are currently no structures remaining on the property.

Additional industrial facilities located in Blades include Anchor Enterprises, a steel fabrication facility; a concrete and cinder-block manufacturer; and Delmarva Aggregate.

2.2 OPERATIONAL HISTORY

2.2.1 Procino Plating

Procino Plating is an active plating facility that began operations in Blades in 1985, performing ornamental/decorative plating with copper, nickel, and chrome (i.e., chromium). Procino Plating applied for and was issued an Industrial Wastewater Contribution Permit by Sussex County which allowed them (subject to permit limitations) to discharge pretreated process wastewater into the sanitary sewer system (Ref. 5, pp. 11 and 12). The sanitary sewer system in the Town of Blades is managed and operated by Sussex County; it is connected to the wastewater treatment plant in Seaford, DE, which is located across the Nanticoke River from the Town of Blades (Ref. 6, p. 12). When Procino Plating moved into the facility, the building had a wooden floor

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underlain by a crawl space with a soil floor. The wood floor and crawl space were removed and a concrete slab was installed by Procino Plating in the late 1990s (Ref. 5, pp. 11 and 75). In approximately 1996, Procino Plating installed a subsurface wastewater collection and treatment system to collect and treat the wash and rinse "bath" water and the floor drains from the plant (Ref. 5, p. 11). Delaware Department of Natural Resources and Environmental Control (DNREC) representatives observed a powdery white and yellow substance on the floor around the drums and in the metal grates in the floor (Ref. 3, pp. 8 and 45). A sump and pump were located in the basement of the building (Ref. 3, p. 48).

The second building on the Site is used for the pretreatment, cutting, grinding and shaping of the metal slabs to be used as griddles. The floor in the second building was concrete and had no drains (Ref. 3, p. 8). Following business downturns, the plating process in the second building was dismantled in 2007, and the wastewater piping system and drains were sealed with concrete (Ref. 5, pp. 11).

In June 1994, Procino received a Notice of Violation (NOV) from DNREC citing labeling, training and operational deficiencies related to the handling of hazardous waste. Corrective action by Procino resulted in an October 1994 DNREC notification letter stating that the deficiencies had been corrected. In October 1995, DNREC again issued a NOV regarding hazardous waste management practices and responsive corrective action was taken and compliance attained as documented in a March 1996 DNREC letter. Another NOV was issued by DNREC in December 1998 with a subsequent corrective action. None of the NOVs cited spillage, discharges, or releases of hazardous wastes (Ref. 5, p. 12).

The EPA conducted compliance inspections of the Procino facility in September 2001 which resulted in the issuance of a February 2002 NOV citing numerous hazardous waste management violations for exceedance of the 90-day onsite storage timeframe; again no spillage, discharges or releases were involved (Ref. 5, p. 12).

In December 2007 and February 2008, DNREC and the EPA conducted inspections, collected samples and interviewed employees at the Procino Plating Site. These inspections coincided with the 2007 discontinuation of plating operations in the second building when equipment was being

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dismantled to create rental space. Procino was issued an NOV through the Resource Conservation and Recovery Act (RCRA). Procino provided a written response and documentation to EPA in October 2010 addressing EPA's concerns regarding the handling and disposal of materials observed on site during the inspections (Ref. 47, pp. 1-58)

In May 2010, the EPA exercised a search warrant and seized the company records and took samples. These actions and the follow up investigation conducted by the USEPA led to criminal charges against Procino Plating (since resolved) regarding the storage of unpermitted hazardous wastes and violations of the wastewater treatment permit, the latter due to newly imposed permit conditions prohibiting certain hazardous wastes from being treated and then discharged into the sewer system. Although the discharge of cyanide was evaluated in EPA's investigation, no evidence was shown that cyanide was spilled, disposed or released from the site. Likewise, no charges were presented indicative of a release of hazardous substances at the site. Subsequently, Procino Plating terminated its use of the industrial wastewater discharge permit, concreted the piping, and modified its operations by use of a closed loop system. Currently small quantities of hazardous waste are generated and are periodically shipped offsite for disposal at a permitted facility (Ref. 5, p. 12).

In November 2018, the Chromic Acid tank was overfilled with water and overflowed into a secondary containment and into a soil crawlspace beneath the building. The tank contained chromium trioxide mixed with deionized water and a small amount of sulfuric acid as well as a catalyst (Atotech Heef 25 MS) and mist suppressant (Atotech Fumetrol 21). Fumetrol 21 is marketed as non-PFOS, and the Safety Data Sheet lists the "hazardous ingredients" as polyfluorosulfonic acid at 1.0 to 2.5 percent and diethylene glycol monobutyl ether at 0.1 to 1.0 percent. Approximately, 1 ¼ gallons of Fumetrol is added to the 500-gallon tank plating solution. The total amount of the solution lost is unknown; however, 600 gallons was captured in secondary containment. At the time of the notification to DNREC and EPA following the spill, Procino was in the process of removing the impacted soil and their contractor, Ten Bears Environmental (Ten Bears), was planning on collecting post-excavation soil samples of the

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impacted soil in the crawlspace. Analytical results were to be submitted to DNREC for review and determination if any additional follow-up actions was required (Ref. 48, pp. 1-7).

2.2.2 Peninsula Plating

Peninsula Plating is an inactive plating facility that operated at its location in Blades from approximately 1992 to 1995 (Refs. 4, p. 10 and 7, p. 2). Peninsula Plating conducted brass, copper, and chrome plating operations. Chemicals present onsite in 1995 as noted by DNREC and EPA include the following (Refs. 4, p. 4; 7, p. 1; and 8, p. 5):

- Nickel sulfate
- Nickel chloride
- Sulfuric acid
- Chromic acid
- Hexavalent chromium, aka Cr(VI)
- Chloride
- Copper cyanide
- Copper sulfate
- Zinc cyanide
- Cadmium fluoroborate

The facility had a discharge permit issued by Sussex County, which was revoked by DNREC on May 30, 1995. DNREC closed the discharge on August 3, 1995 by pouring concrete into the drain system in front of the building (Ref. 7, p. 3). Based on information in the SI, DNREC indicated a possible septic drain field was located in the center of the Blades Commercial Complex property, behind (immediately north) of the former Peninsula Plating facility (Ref. 4, p. 8). A drainage ditch was located in the center of the property heading west towards the railroad tracks (Ref. 4, p. 259). Additionally, according to the Town of Blades Water and Maintenance Supervisor, the property on which Peninsula Plating is located was connected to the county sanitary sewer system in 2002 (Ref. 46, p. 2).

2.2.3 Electroplating and Perfluorinated Compounds

Electroplating is the electrical application of a coating of a metal such as chromium, nickel, or copper onto a surface for decoration, corrosion protection, or durability. An electrical charge is

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applied to a tank (bath) containing an electrolytic salt solution. The electrical charge causes the metal in the bath to fall out of solution and deposit onto objects placed into the plating bath. In an anodizing process, an oxide film is formed on the surface of the part. These electrolytic processes cause mist and bubbles containing Cr(VI), or other metals, to be ejected from the bath, released into the workplace, and eventually dispersed into outdoor ambient air unless controlled with add-on air pollution control equipment or chemical fume suppressants (Ref. 9, p. 5).

Chemical fume suppressants reduce surface tension and thereby control emissions. By reducing surface tension in the plating/anodizing bath, gas bubbles become smaller, and rise more slowly than larger bubbles. Slower bubbles have reduced kinetic energy so that when the bubbles do burst at the surface, the Cr(VI) or other metals, are less likely to be emitted into the air, and the droplets fall back onto the surface of the bath (Ref. 9, pp. 5 and 6).

Cr(VI) is a human carcinogen. Therefore, EPA regulates Cr(VI) electroplating or Cr(VI) anodizing tank operations by applying the Clean Air Act (CAA) Maximum Achievable Control Technology (MACT) limits. The MACT limits require control of Cr(VI) emissions to the atmosphere by either limiting the amount of Cr(VI) through use of add-on air pollution control devices or utilizing a chemical fume suppressant. These facilities are also regulated by the Occupational Safety and Health Administration (OSHA) under 29 Code of Federal Regulations (CFR) Part 1910.1026 to protect workers from occupational Cr(VI) exposure. Employers are required to use engineering and work practice controls to reduce and maintain employee exposure to Cr(VI) (Ref. 9, p. 6). The most common types of fume suppressants used in chromium electroplating and anodizing are those containing fluorinated or perfluorinated compounds or, collectively, fluorosurfactants. The active ingredients are compounds such as organic fluorosulfonate and tetraethyl ammonium perfluorooctyl sulfonate. The fluorosurfactant-based fume suppressants were an improvement over the previous hydrocarbon-based products. Fluorinated sulfonate surfactants are effective in highly acidic solutions because they are resistant to hydrolysis by strong acids. For this and other reasons, fluorosurfactants are able to reduce surface tension to levels that cannot be reached with hydrocarbon surfactants (Ref. 10, p. 87).

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A study of 222 plating facilities in California conducted by the California Air Resources Board in 2003, found that 190 of the 222 facilities used a fume suppressant, either in part or solely, to control Cr(VI) emissions. Almost all of the 190 operations used a chemical fume suppressant with perfluorooctanesulfonic acid (PFOS) as the active ingredient, and 124 facilities reported using the suppressant Fumetrol 140® (Ref. 9, p. 6). Fumetrol 140 contains 1% to 7% organic fluorosulfonate (a building block of PFOS) by weight (Ref. 11).

As noted in a 2010 PA report, the Procino Plating facility in Blades uses the mist suppressant Fumetrol 140 (Ref. 3, p. 40). It was noted in the On-Scene Coordinator (OSC) logbook for the Peninsula Plating facility that the chemical cadmium fluoroborate was present at the facility in containers (Ref. 8, p. 5). Fluoroborates are PFOS-containing compounds (Ref. 12, p. 32).

2.3 Previous Investigations

DNREC has conducted investigations at both the Procino Plating Facilities and the former Peninsula Plating facilities; additionally, EPA conducted a CERCLA Removal Action at the former Peninsula Plating facility.

2.3.1 Procino Plating

In 2010, DNREC performed a PA in cooperation with EPA and recommended a SI due to chemical use and the potential to impact soil and groundwater (Ref. 3). DNREC performed the SI activities in coordination with the Delaware Division of Public Health (DPH), Office of Drinking Water (ODW), in 2010 and 2011. The SI included sampling any registered/permitted private water supply wells within the Town of Blades limits. Water samples from outdoor spigots of residential homes were collected at each registered, accessible private well. Twelve private water supply wells surrounding the facility were sampled. Additionally, 26 soil samples were collected from 13 soil borings, and 6 groundwater monitoring wells were installed and sampled on Procino Plating property (Ref. 13, p. 8).

With the exception of the concentrations of iron in several soil samples, detected soil concentrations of volatile organic compounds (VOCs), semivolatile organic compounds

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(SVOCs), polychlorinated biphenyls (PCBs), pesticides, and inorganics did not exceed applicable DNREC regulatory and screening standards (Ref. 13, p. 12). Results indicated that dieldrin and heptachlor epoxide were detected in on-site monitoring wells at levels exceeding the EPA Regional Screening Level (RSL) for tap water. Chromium was detected in one on-site well at a concentration approximately 10 times the EPA drinking water Maximum Contaminant Level (MCL). Nickel was detected in several on-site groundwater samples; however, at concentrations below the EPA RSL for tap water (Ref. 13, p. 14).

Cyanide was detected at a concentration of 20 micrograms per liter (µg/L) in one off-site drinking water well with a screened interval depth of 43 to 48 feet below ground surface (bgs), well below the MCL of 200 µg/L. However, because cyanide-containing solutions are commonly used in plating operations and a polyethylene tank was noted on the Procino Plating property with the words "Cyanide Treatment 2" stenciled on the side, the presence of cyanide in the private well sample raised concern regarding an undetected release of cyanide from the Procino Plating facility (Ref. 13, pp. 14 and 18). Following DNREC recommendations for further investigation, Procino Plating entered into a Voluntary Cleanup Program agreement with DNREC in 2011 (Ref. 5, p. 13; 13, p. 18).

From 2012 through 2015, Ten Bears performed Remedial Investigation (RI) activities on behalf of Procino Plating to characterize subsurface stratigraphy, determine groundwater elevations and groundwater flow direction, determine the extent and magnitude of chromium and cyanide contamination, and assess potential human health risks. As part of the RI, 14 shallow and subsurface soil samples were collected beneath the concrete floor within the facility at the location of the former chrome tanks, and 12 new groundwater monitoring wells were installed and sampled. The RI also included subslab soil gas sampling within the Procino Plating facility (Ref. 5, pp. 19 and 20).

The analytical results for the soil samples collected beneath the former chromium tanks indicated chromium concentrations in the shallow (0 to 2 feet bgs) soil from 11.3 to 105 milligrams per kilogram (mg/kg), in the intermediate depth (2 to 5 feet bgs) from 2.1 to 126 mg/kg, and in the deep soil (5 to 8.5 feet bgs) from 11.6 to 199 mg/kg (Ref. 5, p. 21).

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In the RI report, it was concluded that groundwater flow direction in the water table aquifer beneath the Procino Plating facility is to the south-southwest and that a fine-grained silt or clay layer is present beneath the facility at depths ranging from 22.5 to 27 feet bgs. A deeper clay layer was also encountered at depths ranging from 42.2 to 46 feet bgs (Ref. 5, pp. 25, 29, 33).

In the RI, it was also concluded that dieldrin detected in previous investigations was a background contaminant from an upgradient source (Ref. 5, p. 22). The chromium concentration in groundwater from on-facility well MW-6 was confirmed to be approximately 10 times the drinking water MCL, based on a groundwater sample collected in May 2012 (Ref. 5, p. 30). The chromium concentration had decreased approximately one year later in 2013 (from 1,170 parts per billion [ppb] to 319 ppb) (Ref. 5 p, 30). Downgradient groundwater monitoring well MW-10 had a chromium concentration of 193 ppb in 2013, exceeding the MCL. Chromium concentrations in groundwater samples collected from other wells to the east, south, and west were below the MCL or non-detect, including deeper wells that are co-located with shallow wells MW-8 and MW-9 and are screened below the clay layer described above (Ref. 5, pp. 30, 31). The RI concluded that the human health exposure pathway was incomplete (Ref. 5, p. 50).

In 2015, an interim removal action was completed by Ten Bears, performed on behalf of Procino Plating, that consisted of removing a portion of the facility's concrete slab floor, collecting soil samples for the purpose of delineating chromium concentrations to below the DNREC total chromium soil screening level of 214 mg/kg, and removing impacted soil with a mini-excavator. Approximately 20 cubic yards of soil were removed from a 10-foot by 10-foot area to depths of 6 to 8 feet bgs (Ref. 5, p. 38). A polyvinyl chloride (PVC) piping system was also installed to facilitate potential future remedial injections (Ref. 5, p. 39).

Because PFASs are emerging as hazardous substances of concern with a very recent history of published health standards, previous investigations did not include the collection or analysis of samples for PFASs (Ref. 17, p. 1).

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2.3.2 Peninsula Plating

The former Peninsula Plating facility is located approximately 0.5 mile north of Procino Plating. In 1992 and 1993, Phase I Audits were performed at the Blades Commercial Complex, where Peninsula Plating was located. The Phase I Audits and subsequent Phase II investigations were focused primarily on underground oil tanks and related contamination associated with other businesses on the property, and were not focused on hazardous substances and potential contamination associated with the Peninsula Plating facility (Ref. 4, pp. 9 and 10).

In spring 1995, the DNREC Hazardous Waste Management Branch conducted a site visit at the Peninsula Plating facility (Refs. 4, p. 10 and 11). DNREC noted the presence of plating process chemicals, including nickel sulfate, sulfuric acid, chromic acid, Cr(VI), nickel chloride, copper cyanide, copper sulfate, zinc cyanide, and cadmium fluoroborate. Peninsula Plating closed shortly thereafter, following a history of noncompliance with industrial waste discharge permits and Emergency Planning and Community-Right-to-Know Act (EPCRA) requirements. DNREC Emergency Response and Enforcement Branches informed EPA Region III of the former plating building that contained numerous vats, tanks, drums, and containers of hazardous materials (Ref. 4, p. 10). EPA conducted a CERCLA Removal Action at the abandoned Peninsula Plating facility in mid to late 1995. The removal action included the removal of 78 55-gallon drums of hazardous waste and 30 cubic yards of hazardous solids, including flammable and corrosive liquids, oxidizers, and liquids contaminated with cadmium and chromium (Refs 4, pp. 10 and 11; 7, pp. 1-3; 8, pp. 1-63).

DNREC performed an SI at Peninsula Plating in 1999. Samples collected during the SI included a total of 28 soil samples, 17 shallow (surface to 2 feet bgs) and 11 deep (up to 8 feet bgs or groundwater), collected from 10 test pits and 6 surface areas onsite, and groundwater samples from 3 on-site monitoring wells and 1 public supply well (Ref. 4, pp. 13, 14, 21). Soil samples were field screened with X-ray fluorescence (XRF) for metals and with a gas chromatograph/mass spectrometer (GC/MS) for organics (Ref. 4, pp. 21 and 22). Based on the field screening, three surface soil samples were submitted to a laboratory for inorganic analysis and six soil samples were submitted to a laboratory for organic analysis (Ref. 4, pp. 15, 21, and

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22). With the exception of the concentrations of arsenic, inorganics were not detected in the soil samples at concentrations exceeding EPA or DNREC standards (Ref. 14, pp. 21). Chromium was detected in the three soil samples at concentrations ranging from 2.4 mg/kg to 9.4 mg/kg; however, only one soil sample, TP3, was collected in the vicinity of the former plating facility (Ref. 4, p. 81). Organic analysis of soil samples indicated several polycyclic aromatic hydrocarbons (PAHs) at concentrations exceeding EPA and DNREC standards (Ref. 4, p. 22).

Analysis of groundwater samples indicated concentrations of aluminum, iron, and manganese in the on-site monitoring wells at concentrations above DNREC regulatory standards and/or EPA MCLs. Chromium was not detected in the collected groundwater samples (Ref. 4, pp. 91 and 96). Organic constituents were not detected in groundwater at concentrations exceeding the EPA Risk-Based Concentration (RBC) Tap Water, DNREC Uniform Risk Based Remediation Standards (URS) Groundwater, or Drinking Water MCL (Ref. 4, p. 27).

Because PFASs are emerging as hazardous substances of concern with a very recent history of published health standards, previous investigations did not include the collection or analysis of samples for PFASs.

2.3.3 Public Well Sampling

The Town of Blades maintains three public supply wells approximately 300 to 400 feet north-northeast of the former Peninsula Plating facility. Based on updated information pertaining to the use of PFASs at metal plating facilities and potential hazards associated with consumption of PFASs, DNREC, in coordination with EPA, collected samples from the supply wells for PFAS analysis in early February 2018. Analytical results indicated that each of the three public supply wells had a summed total concentration of perfluorooctanoic acid (PFOA) and PFOS greater than the combined EPA health advisory level (HAL) of 70 parts per trillion (ppt; equivalent to nanograms per liter [ng/L]), ranging between 96.2 ppt and 187.1 ppt (Ref. 14).

DNREC and DPH began distributing alternative water to Blades and area residents on February 8, 2018 (Ref. 14). On February 12, 2018, WESTON, on behalf of EPA, collected groundwater samples from each of the three public supply wells for the Town of Blades as well as from a

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post-treatment point prior to distribution. The samples were analyzed for perfluorinated compounds (i.e., PFASs). Combined PFOS and PFOA concentrations in raw water from the three municipal drinking water wells, as well as the treated water, exceeded the EPA HAL of 70 ng/L (Refs. 14; 15, p. 1). PFOS was detected in the raw water and treated water samples ranging from 53 to 220 ng/L, and PFOA was detected ranging from 18 to 26 ng/L. A summary of the analytical data from February 2018 is shown in Table 1.

A carbon filtration system was installed on the Blades water supply system on February 19, 2018, which significantly reduced the total PFAS concentration to 3.4 ppt (Ref. 14). DNREC and DPH announced on February 28, 2018 that a follow-up sampling of the treated Blades water supply showed non-detect levels for PFAS (Ref. 14).

2.3.4 Residential Well Sampling

The majority of the residences within Blades are supplied with public water; however, residences outside the town limits are served by private domestic wells. In February, March, and April 2018, WESTON, on behalf of EPA, collected groundwater samples from 54 domestic wells for PFAS analysis at residences located to the northeast and west of Blades; a few samples were collected from domestic wells within the town limits not supplied potable water from the town water authority. Sample locations are shown in Figure 3. As shown in Table 2, PFAS concentrations exceeded the combined HAL of 70 ng/L for PFOS and PFOA concentrations in seven of the domestic wells located west of Blades. PFOS was the main contaminant detected with concentrations ranging from 44 to 350 ng/L.

Subsets of the domestic wells were resampled in April, May, June, July, and August 2018. A review of the analytical data from those sampling events indicated concentrations in the respective domestic wells similar to the original samples, with the exception of two wells, RW-185 and RW-209. The May 2018 sample collected from RW-185, which was previously non-detect for PFOS, contained an estimated 16 ng/L. The July 2018 sample from RW-209, which previously had combined detections below the EPA HAL, now contained combined PFOS and PFOA concentrations totaling above the EPA HAL of 70 ng/L.

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A summary of the residential well analytical results for the initial sampling, and the two resampled wells with differing results, is shown in Table 2 and further discussed in Section 4.5.2. Locations of the residential wells sampled and the PFAS concentrations detected during the residential well sampling event are shown in Figure 3.

3.0 SOURCE DESCRIPTION

For Hazard Ranking System (HRS) purposes, a source is defined as an area where a hazardous substance has been deposited, stored, or placed, as well as those soils that have become contaminated from the migration of a hazardous substance.

The source at the Site consists primarily of a PFAS groundwater plume that has impacted public and domestic drinking water wells, as documented by groundwater samples containing concentrations of PFASs, particularly PFOS, above background. Additionally, an observed release to groundwater of several inorganics, including hexavalent chromium, has been documented. Analytical results for groundwater samples collected from monitoring wells and the public supply wells as part of this SI are presented and discussed in Section 4.5. Previous analytical results for groundwater samples collected from the public supply wells and nearby domestic wells are discussed in Sections 2.2.3 and 2.2.4 of this SI Report.

As discussed in Section 2.1.3, Procino Plating and Peninsula Plating used PFAS-based chemicals as part of the plating operations, as documented by the presence of PFAS-based chemicals at the facilities. Procino Plating facility used the mist suppressant Fumetrol 140® and Peninsula Plating facility used the chemical cadmium fluoroborate (Refs. 3, p. 40; 8, p. 5). Fluoroborates are PFOS-containing compounds, and cadmium fluoroborate is a compound used to prepare electroplating baths for high steel strengths (Refs. 12, p. 32; 16, p. 2).

Previously collected soil samples were not analyzed for PFASs; however, the Procino Plating facility had a documented release from their chrome plating tanks, as noted by soil samples containing concentrations of chromium as high as 199 mg/kg at 8 feet bgs (Ref. 5, p. 21). Because the PFAS-containing mist suppressant Fumetrol 140® is used in conjunction with the

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chrome plating activities, it can be concluded that a release from the chrome tanks also contained PFOS.

At the former Peninsula Plating facility, chromium was detected in the three collected surface soil samples at concentrations ranging from 2.4 mg/kg to 9.4 mg/kg; however, only one soil sample, TP3, was collected in the vicinity of the former plating facility (Ref. 4, pp. 42 and 81). Samples collected adjacent to the building were not submitted for analysis. Additionally, soil boring samples were not collected beneath the foundation of the building or below tanks containing chemicals.

Additional possible sources for the PFAS in groundwater include Anchor Enterprises, a metal fabrication facility located 0.1 mile north of the public supply wells along High Street, and the Blades Fire Department, located 0.25 mile west of the public supply wells.

PFASs, including PFOS and PFOA, are chemically and biologically stable in the environment and resist typical environmental degradation processes, including atmospheric photo oxidation, direct photolysis, and hydrolysis. As a result, these chemicals are extremely persistent in the environment. PFOS and PFOA have very low volatility because of their ionic nature. Therefore, they will be persistent in water and soil. PFOA and PFOS are water-soluble and can migrate readily from soil to groundwater, where they can be transported long distances (Ref. 18, p. 3).

As part of the SI, four soil samples, two surface and two subsurface, were collected from two borings installed on the Procino Plating facility property and analyzed for PFASs. Soil sampling locations and analytical results are discussed in Sections 6.3 and 6.4 of this SI Report.

4.0 GROUNDWATER MIGRATION PATHWAY

This section describes the Site's hydrogeological setting, targets associated with the groundwater migration pathway, and conclusions regarding the groundwater migration pathway.

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4.1 REGIONAL AND SITE GEOLOGY

The Site is located in the Coastal Plain Physiographic Province (Ref. 18, p.4). The Coastal Plain consists of a seaward-dipping wedge of unconsolidated and semiconsolidated sediments (Ref. 18, p. 7). The sediments that compose the Coastal Plain were deposited in nonmarine, marginal marine, and marine environments. Interbedding of fine- and coarse-grained Coastal Plain sediments is complex because of shifting deltaic and alluvial deposition sites and because of repeated transgressions and regressions of the sea (Ref. 18, p. 10).

The Site is directly underlain by the Nanticoke River Group deposits, which consist of the Turtle Branch and the Kent Isle Formations (Refs. 19; 20, p. 20, 21). The Nanticoke River Group is comprised of deposits related to a rise and high stand of sea level that consisted of beach (well-sorted, cross-bedded sand), tidal flat (well-sorted sand with clay laminae), open estuary (clayey silt with oyster shells), marsh (organic silts with grass plant fragments), swamp (organic silt to organic sand with woody fragments), and fluvial (poorly-sorted sand and gravelly sand) depositional environments (Ref. 20, p. 20, 21). In Delaware, these deposits underlie terraces that flank the margins of the present Nanticoke River and its tributaries.

The Nanticoke River Group consists of heterogeneous units of interbedded fine to coarse sand, clayey silt, sandy silt, and silty clay. The Nanticoke River Group deposits are characterized by brown to light gray, fine to medium quartz sand, and finely laminated to structureless, gray to brown, clayey, sandy silt and silty, clayey sand (Ref. 19). The Nanticoke River Group is commonly capped by well-sorted, fine to medium sand within dunes found primarily on the southeast side of the Nanticoke River (Ref. 19). The Nanticoke River Group is approximately 25 feet thick and unconformably overlies the Beaverdam Formation (Ref. 19). The Nanticoke River Group sands are distinct and readily discernable from those of the Beaverdam Formation; the Nanticoke River Group sands are more well-sorted and less feldspathic, and they lack the distinctive white silty matrix of the Beaverdam Formation (Ref. 20, p. 22)

The Beaverdam Formation is a predominantly sandy, heterogeneous unit ranging from very coarse sand with pebbles to silty clay. The predominant lithologies are white to mottled light-gray and reddish-brown, silty to clayey, fine to coarse sand. Laminae and beds of very

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coarse sand with pebbles to gravel are common. Laminae and beds of bluish-gray to light-gray silty clay are also common in the subsurface, ranging in thickness from 2 to 20 feet (Ref. 20, p. 7). The clay-silt layers are not laterally continuous within the Beaverdam deposits (Ref. 21, p. 21). The Beaverdam has a total thickness of approximately 105 feet. In the vicinity of the Site, the Beaverdam Formation unconformably overlies the Manokin Formation, which is present from Seaford to the Delaware/Maryland border (Refs. 19; 21, pp. 20 and 21).

The Manokin Formation consists of a coarsening upward sequence, informally subdivided into two subunits, A and B. The lower unit (A) consists of gray, blue-gray, and brown-gray silty clayey sand and silty sand. Where exposed to oxidizing conditions, the lower unit is yellow to red. In some locations, the lower subunit is not present. The upper unit (B) consists of light to medium gray or yellow-orange to red-orange (where weathered), fine to coarse sand with common beds of gravelly sand and rare beds of clayey to silty sand. Thickness ranges from a feather-edge to as much as 50 feet. The Manokin Formation is truncated by the overlying Beaverdam Formation (Refs. 19; 22, pp. 9 and 10).

4.2 REGIONAL AND SITE HYDROGEOLOGY

The surficial aquifer (a.k.a. Columbia aquifer) extends over large parts of the Delmarva Peninsula. The aquifer consists of unconsolidated sand and gravel of marine and nonmarine origin, depending on the locality (Ref. 18, p. 11). Included in the Columbia aquifer are the Nanticoke River Group deposits, the Beaverdam Formation, and the Manokin and Columbia Formations where present. The aquifer contains water predominantly under unconfined conditions, but clay beds can create locally confined conditions. The transmissivity of the surficial aquifer (the rate at which water will move through the aquifer) is variable, ranging from 8,000 feet squared per day in the Delmarva Peninsula to 20,000 feet squared per day in buried channels (Ref. 18, p. 11).

In the vicinity of Blades, the fine-grained beds of the Manokin Formation are the base of the Columbia aquifer (Ref. 23). The aquifer functions as both an unconfined and semiconfined aquifer. Saturated thickness ranges from 30 to 100 feet. The variation in aquifer type and

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thickness is due to the complex interlaying of aquifer and semiconfining beds (Ref. 23). Clay-silt layers are common but not laterally continuous within the Beaverdam Formation (Ref. 21, p. 21).

Soil borings and monitoring wells installed in 2011 by DNREC around the perimeter of Procino Plating indicate primarily tan fine to coarse sand to a depth of 20 feet bgs. Two monitoring well logs indicate silty clay encountered at 20 feet bgs. Shallow groundwater was encountered between 9 and 12 feet bgs (Ref. 13, pp. 42, 48-60).

From 2012 to 2015, Ten Bears, on behalf of Procino Plating, installed 12 wells both onsite and offsite, nine shallow (15 to 27.5 feet bgs) and three deep (34 to 44 feet bgs), as shown on Figures 4a and 4b. The shallow wells were completed and screened just above a localized clay layer and the deeper wells were completed and screened in a sandy layer below the localized clay layer. Depth to groundwater was measured on several occasions at these wells, as well as the wells installed by DNREC. Groundwater was encountered at depths ranging from 6.43 to 12.41 feet bgs (Ref. 5, pp. 73, 82, 87, 100, 202-207, 282-288, 385-388). Shallow groundwater flow direction was determined to be slightly west of due south (Ref. 5, pp. 76, 77, 80, 84, 86, 88). Silt and/or clay layers were encountered in the subsurface at depths below 20 feet. An apparent clay layer was encountered in DMW-1 from 29.9 feet to 33.5 feet, underlain by sands to a depth of approximately 46 feet, where a second apparent clay unit was encountered. The well screen was placed from 34 to 44 feet bgs to monitor the sandy zone below the first encountered apparent clay. In DMW-2, apparent clay extended from 25 feet to 33.6 feet, below which sands were encountered down to 42.2 feet. The screen was placed from 33 to 43 feet bgs to monitor the sandy zone below the clay unit (Ref. 5, p. 29, 32, 100, 202-207, 282-288). A clay layer was not observed in DMW-3, which was drilled to 34 feet bgs and screened from 24 to 34 feet bgs. A silty layer was likely observed at approximately 24 to 33.5 feet bgs (Ref. 5, p. 388).

In October and November 2018, WESTON installed 20 monitoring wells, 10 shallow (less than 20 feet bgs), 8 intermediate (25 to 50 feet bgs), and 2 deep (76 and 96 feet bgs), throughout the Town of Blades (Figures 4a and 4b). The lithology of the wells is consistent with previous investigations: a band of clay generally observed around 20 feet bgs and a second band observed around 40 feet bgs, as shown in the well logs provided in Appendix A. However, the wells logs

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indicate that the clay layers are not contiguous because there is no significant clay layer in boring SIGW-17 at or around 20 feet bgs and no discernible clay layer at this depth in boring and SIGW-20. Additionally, no discernible clay layer was observed at or around 40 feet bgs in borings, SIGW-02, SIGW-10, and SIGW-12.

4.3 GROUNDWATER TARGETS

Potential groundwater targets include persons who obtain drinking water from private domestic wells within the 4-mile radius target distance limit (TDL) of the Site and persons supplied drinking water from public water suppliers whose water source is from groundwater wells within the 4-mile TDL. The 4-mile TDL is shown in Figure 5.

Town of Blades municipal authority provides potable water to approximately 1,600 persons within the town limits (Ref. 46, p. 2). The Town of Blades water sources are three groundwater wells completed in the Columbia aquifer at depths ranging from 95 to 102 feet bgs, screened between 65 and 95 feet bgs, and located in the vicinity of the Town Hall approximately 300 to 400 feet north-northeast of the former Peninsula Plating facility (Ref. 25, pp. 2 and 7). The wells have estimated daily usage of 160,000, 300,000, and 300,000 gallons per day (Ref. 26). The groundwater from each well is pumped to a single treatment system prior to distribution (Ref. 43, p. 16).

Seaford Water Department (SWD) supplies drinking water to 6,928 persons (Ref. 27, p. 1). Seaford's water sources are five groundwater wells that are completed in the Columbia aquifer and range in depth from 88 to 114 feet bgs (Ref. 28, p. 9). Four of the SWD wells are located between 1 and 2 miles from the Site, and the fifth well is located between 2 and 3 miles from the Site. There are numerous mobile home parks within the 4-mile TDL that supply potable water from groundwater wells to their residences and are summarized in the table below (Ref. 29). Because the exact location of public supply wells is confidential information in accordance with the Department of Homeland Security, the locations of Seaford's supply wells and the small community supply wells are not depicted on Figure 5. The general location of the public wells within 4 miles of the Site and within the TDL distance rings, as well as the populations served, is provided in the table below.

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Radial Distance (miles)	Public Supply Wells	Population Served	Total Population Served
0.00 to 0.25	3 (Blades)	1,600	1,600
0.25 to 0.50	0	0	0
0.50 to 1.0	0	0	0
1.0 to 2.0	2 (UCMHP) 4 (SWD) 2 (HVMP) 3 (TMC) 1 (SMMHP) 2 (MG)	65 5,359 207 189 279 476	6,575
2.0 to 3.0	1 (SWD) 1 (PRMHP) 2 (Green Acres)	1,340 222 213	1,775
3.0 to 4.0	1 (Dove Estates) 4 (LVMHP) 1 (Glen Acres) 3 (VCB)	111 918 40 654	1,723
Total	29	11,673	11,673

UCMHP – Upcountry Mobile Home Park
SWD = Seaford Water Department
HVMP = Holly View Mobile Home Park
TMC = Todd's Mobile Court
SMMHP = Sussex Manor Mobile Home Park
MG = Mobile Gardens I
PRMHP = Pine Ridge Mobile Home Park
LVMHP = Laurel Village Mobile Home Park
VCB = Village of Cool Branch

As presented in Section 6.2, there are approximately 19,573 people who live within a 4-mile radius of the Site (Ref. 42). For the purpose of this SI, assuming those persons who reside within the 4-mile TDL not supplied public water rely on private domestic wells for drinking water, there are approximately 7,900 persons within the 4-mile TDL who obtain drinking water from domestic wells.

4.4 SAMPLING LOCATIONS

From October 8 through 11, 2018, WESTON collected 18 groundwater samples, including a duplicate, from 17 existing monitoring wells located on and in the immediate vicinity of Procino

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Plating in accordance with *Final Field Sampling and Analysis Plan for Blades, DE* (Ref. 31. However, a sample could not be collected from Procino monitoring well MW-6 because of an obstruction in the well. Between October 16 and November 1, 2018, EPA installed 21 additional monitoring wells throughout the Town of Blades. WESTON collected groundwater samples from the newly installed wells on November 6 and 7, 2018. The new wells were installed, developed, and sampled in accordance with *Final Field Sampling and Analysis Plan for Blades, DE* (Ref. 31). On November 5 and 6, 2018, WESTON also collected groundwater samples from the three Town of Blades public supply wells as well as a groundwater sample from the Triangle Park Well owned by the Town of Blades.

All PFAS results for the groundwater samples collected from the newly installed wells in November 2018 were qualified or rejected because the pH of the samples were not within the specified range of the method. On March 26 and 27, 2019, WESTON resampled 16 wells for PFAS analysis. Resampled wells included a combination of newly installed wells, existing wells at Procino Plating, and the public supply wells.

The sample locations are shown in Figures 4a and 4b. Well logs are provided in Appendix A and field logbook notes and field data sheets are provided in Appendix B.

4.5 ANALYTICAL RESULTS

The groundwater samples were analyzed for pesticides, total metals (including mercury), cyanide, hexavalent chromium, and PFASs. Analytical summary tables for results detected above the respective reporting limits are provided in Tables 1 through 7. Table 4 is a summary of the PFAS-qualified data for the November 2018 sampling event. The table is provided for informational purposes only; the data associated with these samples is not discussed below and was not used to evaluate site conditions.

The groundwater analytical results were compared to EPA RSLs for tap water based on a cancer target risk of 1E-6 and a hazard quotient of 0.1 (Ref. 32), and to EPA drinking water MCLs (Ref. 33). RSLs are risk-based concentrations derived from standardized equations combining exposure information assumptions with EPA toxicity data. The RSLs are considered by EPA to

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be protective for human health over a lifetime. They are used for site screening and are not cleanup standards. The RSLs are used to help identify areas, contaminants, and conditions that may require further action at a particular site. EPA MCLs are legally enforceable standards that apply to public drinking water systems only. However, EPA MCLs are frequently used for evaluating and, in some cases, as a basis for remediating, contaminated sites. They are included here for comparison purposes only. Additionally, the PFAS analytical results were compared to EPA's HAL (Ref. 15). The EPA HAL is the level at or below which adverse health effects are not anticipated to occur over a lifetime of exposure.

Sample result qualifiers, where applicable, are included in the analytical summary data tables; however, they are not included in the following discussion of analytical results. The tables also reflect the elevated concentrations of compounds or elements that were detected in the samples three times above the concentrations detected in the background samples, SIGW-19 for shallow wells (screened below 20 feet bgs), SIGW-08 for intermediate wells (screened between 30 and 60 feet bgs), and TBW-01 for the deep wells (screened above 60 feet bgs) from the March 2019 sampling event. Samples containing compounds or elements that were not detected above the reporting detection limit (RDL)/quantitation level (QL) in the background sample are considered to be elevated if they were detected at a concentration equal to or greater than the background sample RDL/QL. For samples submitted to an EPA assigned contract laboratory program (CLP) laboratory or a WESTON subcontracted Tier IV laboratory, the analytical data was validated by the Environmental Services Assistance Team (ESAT) contractor under the direction of the Office of Analytical Services and Quality Assurance (OASQA) Branch. Organic and inorganic data were validated at EPA Region 3 Organic Level 2 and Inorganic Level 2, respectively, in accordance with *EPA National Functional Guidelines for Organic Superfund Methods Data Review*, USEPA-540-R-2017-002 (Ref. 11). For samples submitted to the EPA Region 3 Environmental Science Center Laboratory in Fort Meade, Maryland, the analytical data was reviewed by the EPA OASQA Branch. Laboratory analytical data packages and data validation reports are included in Attachment 1.

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4.5.1 Pesticide Analytical Results

Several pesticides, including dieldrin, were detected at low concentrations in a few groundwater samples. Detected concentrations did not exceed or approach MCLs. There is no MCL for dieldrin; however, the detected concentrations of dieldrin were generally above the EPA RSL of 0.0018 µg/L. Dieldrin was not detected in the background groundwater sample.

4.5.2 PFAS Analytical Results

As shown in Tables 1 and 5, the concentrations of the analyzed PFAS compounds in the public supply wells were elevated with respect to background (TBW-01). Samples collected form the public wells in February 2018 by the EPA Removal Program contained PFOS concentrations ranging form 53 ng/L to 210 ng/L and PFOA concentrations ranging form 19 ng/L to 26 ng/L. The concentrations of PFOS in the supply well samples collected in November 2018 ranged from 27 to 160 ng/L and the concentrations of PFOA ranged from 14 to 27 ng/L. The March 2019 public well samples had PFOS concentrations ranging from 48/ng/L to 140 ng/L and PFOA concentrations ranging from 19 ng/L to 32 ng/L. Groundwater collected from all three supply wells in February 2018 and March 2019 and from wells 1 and 3 collected in November 2018 exceed the EPA HAL of 70 ng/L for combined PFOS and PFOA. Groundwater collected from well 2 in November 2019 did not contain total PFOS and PFOA concentrations in exceedance of the EPA HAL of 70 ng/L.

As shown in Table 2, PFAS concentrations exceeded the combined HAL of 70 ppt for PFOS and PFOA concentrations in 7 of the 54 domestic wells located west of Blades that were sampled as part of the EPA removal assessment. PFOS was the main contaminant detected, with concentrations ranging from 44 ng/L in sample RW-206 to 350 ng/L in sample RW-170. PFOA concentrations in these wells ranged from 14 to 47 ng/L. An additional eight residences contained PFOS concentrations greater than three times the concentration detected in the corresponding monitoring well background sample collected as part of the SI. PFOS concentrations in these eight wells ranged from 15 ng/L in sample RW-194 to 57 ng/L in sample RW-173. As shown in Table 2, additional PFAS compounds were also detected in the wells.

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As shown in Table 3, PFOS was detected in all the existing Procino wells at elevated concentrations with respect to the corresponding background, with concentrations ranging from 73.2 ng/L in sample GW-04 to 2,820 ng/L in sample GW-02. The concentrations of PFOS alone in all the wells exceed EPA's combined PFOS and PFOA HAL of 70 ng/L. PFOA was also detected in the majority of the samples at concentrations elevated with respect to background ranging from 20.9 ng/L to 35.1 ng/L. Perfluorobutanesulfonic acid (PFBS) was also detected at elevated concentrations in all the Procino wells. The concentrations of PFBS did not exceed EPA's RSL of 40,000 ng/L.

As shown in Table 5, of the resampled newly installed wells (SIGW), PFOS and PFOA were detected at elevated concentrations with respect to background in one shallow well (SIGW-05) and three intermediate wells (SIGW-04, SIGW-06, and SIGW-13) ranging from 25 ng/L to 190 ng/L and from 34 ng/L to 610 ng/L, respectively. Concentration of the combined PFOS and PFOA in the three intermediate well samples exceeded the EPA HAL of 70 ng/L. These four wells also contained elevated concentrations of other PFAS compounds. Table 5 also provides a summary of the resampled existing Procino wells and public supply wells.

Figure 4a, depicts groundwater sample locations that have PFOS and PFOA concentrations that exceed three times the concentrations detected in in the applicable background well, as well as concentrations that exceed the EPA HAL.

4.5.3 Inorganic Analytical Results

As shown in Table 6, inorganics such as arsenic (5 samples), cobalt (2 samples), copper (2), chromium (3 samples), manganese (4 samples), mercury (1 sample), nickel (8 samples), vanadium (3 samples), and zinc (3 samples) were detected in the existing Procino wells at elevated concentrations with respect to background. Elevated concentrations of arsenic, cobalt, manganese, and mercury in several samples exceeded the EPA RSL; however, they were below applicable MCLs. Additionally, hexavalent chromium was detected in 12 of the 17 wells at elevated concentrations ranging from 0.17 µg/L to 20 µg/L. Hexavalent chromium was detected in all the wells, except DMW-01, at concentrations exceeding the EPA RSL of 0.035 µg/L; however, concentrations did not exceed the EPA MCL of 100 µg/L for total chromium. Cyanide

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was detected in laboratory blanks associated with these samples. Samples with reported detected concentrations for cyanide less than the Contract-Required Quantification Limit (CRQL) are reported at the CRQL (10 µg/L) and were qualified as non-detect.

As shown in Table 6, inorganics such as aluminum (3 samples), arsenic (6 samples), cadmium (1 sample), cobalt (7 samples), copper (2 samples), chromium (4 samples), iron (7 samples), lead (3 samples), manganese (11 samples), nickel (4 samples), and zinc (4 samples) were detected at elevated concentrations in the newly installed wells. Elevated concentrations of arsenic, cobalt, and manganese in several samples exceeded the EPA RSL; however, they were below applicable MCLs. Five samples contained an elevated concentration of hexavalent chromium ranging from 0.11 µg/L to 0.25 µg/L. Cyanide was not detected in the newly installed wells.

Figure 4b, depicts groundwater sample locations that have at least one inorganic with concentrations that exceed three times the concentration detected in in the applicable background well.

4.6 GROUNDWATER CONCLUSIONS

Based on analytical results, a PFAS groundwater plume has been documented at the Site. Public, domestic, and monitoring well samples document the presence of primarily PFOS in groundwater at concentrations three times above background levels. Additionally, the concentrations of PFOS in the public supply wells and the combined concentration of PFOS and PFOA in seven domestic wells exceed the EPA HAL of 70 ng/L. Approximately 1,600 persons are supplied drinking water by the Town of Blades public supply wells. Analytical results also show a documented metals contamination in groundwater, including hexavalent chromium.

5.0 SURFACE WATER MIGRATION PATHWAY

This section describes the Site's hydrologic setting, targets associated with the surface water migration pathway, and conclusions regarding the surface water migration pathway.

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5.1 HYDROLOGIC SETTING

As shown in Figure 6, the Town of Blades is situated inside a bend of the Nanticoke River, a major tributary to Chesapeake Bay. The Nanticoke River is located approximately 2,000 feet northwest of the former Peninsula Plating facility and approximately 1,300 feet west of the Procino Plating facility. There is no direct surface water pathway from the facilities to the river. Surface water runoff from the facilities is expected to flow into the Nanticoke River though a combination of overland flow and through storm drains. Some surface water may flow along the railroad right-of way located to the west of both facilities, then into the Nanticoke River. In general, the direction of surface water flow, based on topography, appears to be westerly toward the Nanticoke River.

The locations of the two metal plating facilities are outside the Federal Emergency Management Agency (FEMA)-designated 1% annual chance flood zone (i.e., 100-year floodplain) (Ref. 34). The Nanticoke River at Seaford and Town of Blades is tidal (Ref. 35). The 15-mile downstream TDL is completed in the Nanticoke River as shown in Figure 5.

Both the Peninsula Plating and Procino Plating facilities had National Pollutant Discharge Elimination System (NPDES) discharge permits for treated process water to the Town of Blades sanitary sewer system (Refs. 5, pp. 11 and 12; 8, p. 8). The Town of Blades sewer system is owned and operated by Sussex County. The effluent is then conveyed to Seaford's treatment plant, which is along the north side of the Nanticoke River at the southwest corner of the City of Seaford (Ref. 6, p. 12).

5.2 SURFACE WATER TARGETS

There are no drinking water intakes located along the Nanticoke River within the 15-mile TDL (Ref. 29).

The Nanticoke River is recreationally fished for many species, such as white and yellow perch, pickerel, catfish, largemouth bass, bluefish, sea trout, blue crab, and rockfish (i.e., striped bass) (Ref. 36, p. 2). There are two public boat launches in Seaford and a marina in Blades (Ref. 37). The Nanticoke River, as a tributary to the Chesapeake Bay, could potentially provide suitable

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habitat for the Federally-designated threatened species the shortnose sturgeon (*Acipenser brevirostrum)*; however, this species is mostly known to inhabit the Potomac and Susquehanna Rivers (Refs. 38, p. 2; 39, p. 2). Two state-listed endangered fish species, the blackbanded sunfish (*Enneacanthus chaetodon)* and the Ironcolor shiner *(Notropis chalybaeus),* are known to occur in Wicomico County, Maryland (Ref. 40, p. 3). The Nanticoke River State Wildlife Area is located along both the eastern and western banks of the river between 4 and 7 miles downstream of the Site (Figure 6). Approximately 15 miles of wetland frontage are located along the Nanticoke River within the 15-mile TDL (Ref. 41).

5.3 SAMPLING LOCATIONS

On September 19 and 20, 2018, WESTON collected 10 co-located surface water and sediment sample pairs, including 1 duplicate sample of each matrix. Seven surface water and seven sediment samples, including the duplicate samples and upstream background samples at two locations, were collected from Morgan Branch, a tributary to the Nanticoke River; two surface water and two sediment samples (SW/SD-05 and SW/SD-06) were collected from a marshy area along the Nanticoke River; and one surface water and one sediment sample were collected from the Nanticoke River at the marina. The surface water and sediment sample locations are shown in Figure 7. Field logbook notes are provided in Appendix A.

5.4 ANALYTICAL RESULTS

Surface water and sediment samples were submitted for laboratory analysis of metals (including mercury), cyanide, hexavalent chromium, PFASs, and pesticides. Analytical summary tables for results detected above detection limits are provided in Tables 8 through 10. The surface water sample results were compared to EPA National Recommended Water Quality Criteria for the consumption of water and organisms as well as to EPA Region 3 Biological Technical Assistance Group (BTAG) freshwater screening criteria (Refs. 43 and 44). Sediment sample results were compared to EPA Region 3 BTAG screening criteria (Ref. 44). The table also reflects the elevated concentrations of compounds or elements that were detected in the samples three times above the concentrations detected in the background samples (SW-07/SD-07 and SW-09/SD-09 for samples collected from the Morgan Branch and SW-08/SD-08 for samples

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collected from the Nanticoke River). Compounds or elements that were not detected above the detection limits in the background samples are considered to be elevated in a sample if they were detected at a concentration equal to or greater than the background sample detection limit. Sample result qualifiers, where applicable, are included in the analytical summary data tables; however, they are not included in the following discussion of analytical results. For samples submitted to an EPA assigned CLP laboratory or a WESTON subcontracted Tier IV laboratory, the analytical data were validated by the Environmental Services Assistance Team (ESAT) contractor under the direction of the OASQA Branch. Organic and inorganic data were validated at EPA Region 3 Organic Level 2 and Inorganic Level 2, respectively, in accordance with EPA National Functional Guidelines for Organic Superfund Methods Data Review, USEPA-540-R-2017-002 (Ref. 11). For samples submitted to the EPA Region 3 Environmental Science Center Laboratory in Fort Meade, Maryland, the analytical data were reviewed by OASQA. Laboratory analytical data packages and data validation reports are included in Attachment 1.

Pesticides were not detected above detection limits in the surface water and sediment samples.

As shown in Table 8, PFOS was detected in surface water sample SW-03 at an elevated concentration of 16 ng/L. PFOS, as well as PFOA, were not detected in any other surface water samples. Perfluorononanoic acid (PFNA) was detected in surface water samples SW-03, SW-04, and background sample SW-09 (and its duplicate) ranging from 14.2 to 16.6 nanograms per liter (ng/L). As shown on Table 7, low-level estimated concentrations of several PFASs were detected in the majority of the sediment samples. PFOS was only detected at an estimated concentration in the upstream background sample, SD-09 (and its duplicate), collected from Morgan Branch. PFOA was detected at estimated concentrations in SD-01, the farthest downstream location on Morgan Branch, and the background sample SD-09. PFOA was also detected at an estimated concentration of 2.1 micrograms per kilogram (µg/kg) in sample SD-06 collected in a marsh area along the Nanticoke River.

Table 9 provides a summary of the concentrations of inorganics in the surface water samples. With the exception of the concentration of lead in surface water sample SW-03, inorganics detected in samples collected from Morgan Branch were not elevated with respect to

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background. The surface water samples collected from the marsh area along the Nanticoke River, SW-05 and SW-06, contained concentrations of inorganics, such as barium, beryllium, chromium, cobalt, copper, iron, lead, nickel, vanadium, and zinc, at elevated concentrations with respect to the background sample collected from the Nanticoke River (SW-08). Sample SW-02 collected from Morgan Branch Creek contained an elevated concentration of lead. The elevated concentrations of cobalt, copper, iron, lead, vanadium, and zinc exceeded EPA BTAG screening values, but were below the EPA Water Quality Criteria (WQC). Additionally, cyanide was detected at estimated concentrations in samples SW-02 and background sample SW-09 from Morgan Branch and samples SW-05 and SW-06 from the Nanticoke River. Hexavalent chromium was detected in one surface water sample, sample SW-07, collected upstream on Morgan Branch.

As shown in Table 10, numerous inorganics were detected at elevated concentrations in sediment samples SD-01 and SD-02 collected from Morgan Branch Creek and SD-05 and SD-06 collected from the Nanticoke River. The elevated concentrations of arsenic, chromium, lead, manganese, nickel, selenium and zinc exceeded EPA BTAG screening values. There were no hexavalent chromium detections above the detection limits in the sediment samples, and results below the detection limits were qualified as unusable because hexavalent chromium was detected in the method blank associated with the sediment samples. Cyanide was not detected in the sediment samples.

5.5 SURFACE WATER CONCLUSIONS

With the exception of the concentration of PFOS in one surface water sample collected from Morgan Branch Creek, SW-03, PFASs were not detected at elevated concentrations in the surface water and sediment samples. Elevated concentrations of numerous inorganics were detected in three surface water samples and four sediment samples.

Potential targets associated with the surface water migration pathway include the Nanticoke River as a fishery, one federal-designated and two state-designated threatened or endangered species, the Nanticoke River State Wildlife Area, and the approximate 15 miles of wetland frontage located along the Nanticoke River within the 15-mile TDL.

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6.0 SOIL EXPOSURE AND AIR MIGRATION PATHWAYS

This section provides information regarding the physical conditions of the Site and targets associated with the soil exposure and air migration pathways.

6.1 PHYSICAL CONDITIONS

The Site consists primarily of a PFAS-contaminated groundwater plume within the Town of Blades. The PFAS-contaminated groundwater plume is at least partially attributable to Procino Plating, an active metal plating facility, as well as the former Peninsula Plating facility, which is currently vacant land. The locations of Procino Plating and former Peninsula Plating are shown on Figure 2.

The majority of the Procino Plating facility property is occupied by several buildings and a warehouse, as well as an asphalt parking lot. There is minimal exposed soil on the property. The location of the former Peninsula Plating facility is currently vacant land. The entire property is covered with exposed soil, vegetation, and crushed stone. The property is not fenced and is accessible to the public.

6.2 SOIL AND AIR TARGETS

There are residential properties that directly border the Procino Plating facility to the south and across 9th Street to the north. A public park and residential properties are located across River Road from the former Peninsula Plating facility. However, a soil source has not been identified associated with the Site. No residences, schools, or daycare centers are located on or within 200 feet of possible source areas. The estimated population and wetland acreage within a 4-mile radius of the Site are summarized in the tables below (Refs. 41 and 42).

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Radial Distance from Site (miles)	Population (number of persons)
0.00 - 0.25	97
>0.25 - 0.50	312
>0.50 - 1.0	2,750
>1.0 - 2.0	5,905
>2.0 - 3.0	5,308
>3.0 - 4.0	5,201
Total	19,573

Ref. 42

Radial Distance from Site (miles)	Wetlands (acreage)
0.00 - 0.25	1.88
>0.25 - 0.50	89.58
>0.50 - 1.0	136.85
>1.0 - 2.0	705.45
>2.0 - 3.0	1545.14
>3.0 - 4.0	1803.61
Total	4282.51

Ref. 41

6.3 SAMPLING LOCATIONS

On October 29 and 31, 2018, WESTON collected two surface (0 to 24 inches bgs) soil samples, plus a duplicate sample for quality assurance/quality control (QA/QC), and two subsurface (4 to 10 feet bgs) soil samples from soil borings SIGW-18 and SIGW-20 installed on the Procino Plating facility. Soil samples were not collected from the former Peninsula Plating facility property. Additionally, a background soil sample was not collected for PFAS analysis. Sampling locations are shown in Figure 4 and the field logbook notes are provided in Appendix A.

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6.4 ANALYTICAL RESULTS

The soil samples were analyzed for PFAS in accordance with a modified EPA Method 537. Analytical summary tables for results detected above detection limits are provided in Table 11. Sample result qualifiers, where applicable, are included in the analytical summary data tables; however, they are not included in the following discussion of analytical results. The analytical data were validated by the ESAT contractor under the direction of the OASQA Branch. Organic and inorganic data were validated at the EPA Region 3 Organic Level 2 and Inorganic Level 2, respectively, in accordance with *EPA National Functional Guidelines for Organic Superfund Methods Data Review*, USEPA-540-R-2017-002 (Ref. 11). Laboratory analytical data packages and data validation reports are included in Attachment 1.

The analytical results were compared to residential RSLs based on target cancer risk of 1E-06 and target hazard quotient of 1.0 (Ref. 45). RSLs for PFOS and PFOA in industrial soil have not been established. EPA RSLs are generic risk-based concentrations that are intended to assist risk assessors and others in initial screening level evaluations of environmental measurements. RSLs combine human health toxicity values with standard exposure pathway (i.e., inhalation, dermal, and ingestion) factors to estimate contaminant concentrations in environmental media (soil, air, and water) that are considered by EPA to be health protective based on human exposures over a lifetime. RSLs do not address impacts to ecological targets. RSLs are included here for site screening and to help identify areas, contaminants, and conditions that may require further action.

As shown in Table 10, surface soil sample SS-01, and its duplicate, contained 11 µg/kg PFOS and estimated concentrations, below detection limits, of PFOA, PFBS and other PFAS compounds. The subsurface soil sample collected at this location, SS-04, from 4 to 6 feet bgs, contained 2.6 µg/kg PFOS. Surface soil sample SS-02 contained 2.3 µg/kg PFOS and the subsurface soil sample at this location, SS-03 collected from 8 to 10 feet bgs, contained 0.54 µg/kg PFOS. The detected concentrations of PFOA and PFOS in the soil samples were significantly below the applicable RSLs for residential soil of 16,000 µg/kg and 6,000 µg/kg, respectively.

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6.5 SOIL EXPOSURE AND AIR MIGRATION PATHWAY CONCLUSIONS

The site consists of a PFAS-contaminated groundwater plume. With the exception of the four soil samples (two shallow and two deep) collected from soil borings on the Procino Plating facility property, soil samples were not collected as part of this SI. The four soil samples collected contained detectable concentrations of PFOA, PFOS, and PFBS. The detected concentrations were significantly below RSLs for residential soil. A background sample was not collected.

7.0 SUMMARY

The Site is located within the Town of Blades, Sussex County, Delaware. The site consists primarily of a PFAS groundwater plume. Groundwater is the sole drinking water source for both public and domestic potable water. Public water is supplied to residences within the town limits of Blades; however, some residences within town limits and the residences located beyond town limits to the southwest and to the northeast rely on domestic groundwater wells for potable water.

Located in Blades, DE, is Procino Plating, an active metal plating facility, as well as the site of the former Peninsula Plating facility, which is currently vacant land. Based on updated information pertaining to the use of PFASs at metal plating facilities and potential hazards associated with consumption of PFASs, DNREC, in coordination with EPA, collected samples from the Blades public supply wells for PFAS analysis in early February 2018. Analytical results indicated that all three public supply wells had a summed total concentration of PFOA and PFOS greater than the EPA drinking water HAL of 70 ppt, ranging between 96.2 ppt and 187.1 ppt.

Public, domestic, and monitoring well samples document the presence of primarily PFOS in groundwater at concentrations three times above background levels. Elevated concentrations of metals, including hexavalent chromium, were also detected in monitoring well samples. The concentrations of PFOS in the public supply wells and the combined concentration of PFOS and

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PFOA in seven domestic wells exceed the EPA HAL of 70 ng/L. Approximately 1,600 persons are supplied drinking water by the Town of Blades public supply wells.

With the exception of the concentration of PFOS in one surface water sample, SW-03, PFASs were not detected at elevated concentrations in the surface water and sediment samples. Elevated concentrations of numerous inorganics were detected in three surface water samples and four sediment samples. Potential targets associated with the surface water migration pathway include the Nanticoke River as a fishery, one federal-designated and two state-designated threatened or endangered species, the Nanticoke River State Wildlife Area, and the approximate 15 miles of wetland frontage located along the Nanticoke River within the 15-mile TDL.

The Site consists of a PFAS-contaminated groundwater plume. With the exception of the four soil samples (two shallow and two deep) collected from soil borings on the Procino Plating facility property, soil samples were not collected as part of this SI. The four soil samples collected contained detectable concentrations of PFOA, PFOS, and PFBS. The detected concentrations were significantly below RSLs for residential soil. A background soil sample was not collected.

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FINAL SITE INSPECTION REPORT
BLADES GROUNDWATER
TOWN OF BLADES, SUSSEX COUNTY
DELAWARE

Prepared for:

U.S. Environmental Protection Agency Region III
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June 2019

FINAL SITE INSPECTION REPORT
BLADES GROUNDWATER
TOWN OF BLADES, SUSSEX COUNTY, DELAWARE

Approved by: Ex. 4 CBI

WESTON – START Site Assessment Scope of Work Manager

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May 29, 2019

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LIST OF ACRONYMS AND ABBREVIATIONS

µg/kg	micrograms per kilogram
µg/L	micrograms per liter
bgs	below ground surface
BTAG	Biological Technical Assistance Group
CAA	Clean Air Act
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980
CFR	Code of Federal Regulations
CLP	Contract Laboratory Program
CRQL	Contract-Required Quantification Limit
Cr(VI)	Hexavalent Chromium
DGS	Delaware Geological Survey
DNREC	Delaware Department of Natural Resources and Environmental Control
DPH	Delaware Division of Public Health
EPCRA	Emergency Planning and Community-Right-to-Know Act
EPA	U.S. Environmental Protection Agency
ESAT	Environmental Services Assistance Team
FEMA	Federal Emergency Management Agency
GC/MS	gas chromatograph/mass spectrometer
HAL	EPA health advisory level
HRS	Hazard Ranking System
kg	kilogram
MACT	Maximum Achievable Control Technology
MCL	Maximum Contaminant Level
mg	milligram
MOE	Ministry of the Environment of Denmark
MSDS	Material Safety Data Sheet
ng/L	nanograms per liter
NOV	Notice of Violation

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LIST OF ACRONYMS AND ABBREVIATIONS (CONTINUED)

NPDES	National Pollutant Discharge Elimination System
OASQA	Office of Analytical Services and Quality Assurance
ODW	Office of Drinking Water, Delaware Division of Public Health
OSC	On-Scene Coordinator
OSHA	Occupational Safety and Health Administration
PA	Preliminary Assessment
PAH	polycyclic aromatic hydrocarbon
PCB	polychlorinated biphenyl
PFAS	perfluoroalkyl/polyfluoroalkyl substance
PFBS	perfluorobutanesulfonic acid
PFNA	perfluorononanoic acid
PFOA	perfluorooctanoic acid
PFOS	perfluorooctanesulfonic acid
ppb	parts per billon
ppt	parts per trillion
PVC	polyvinyl chloride
QA/QC	quality assurance/quality control
QL	quantitation level
RBC	EPA Risk-Based Concentration
RCRA	Resource Conservation and Recovery Act
RDL	reporting detection limit
RI	Remedial Investigation
RSL	EPA Regional Screening Level
SI	Site Investigation
START	Superfund Technical Assessment and Response Team
SVOC	Semivolatile Organic Compound
SWD	Seaford Water Department
TDD	Technical Direction Document
TDL	target distance limit

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LIST OF ACRONYMS AND ABBREVIATIONS (CONTINUED)

URS	Uniform Risk Based Remediation Standards
USFWS	U.S. Fish and Wildlife Service
USGS	U. S. Geological Survey
VOC	Volatile Organic Compound
WESTON®	Weston Solutions, Inc.
WQC	Water Quality Criteria
XRF	x-Ray fluorescence

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1.0 INTRODUCTION

Under the Eastern Area Superfund Technical Assessment and Response Team (START) Contract No. EP-S3-15-02, Technical Direction Document (TDD) No. W503-18-04-001, the U.S. Environmental Protection Agency (EPA) Region III tasked Weston Solutions, Inc. (WESTON®) to conduct a Preliminary Assessment/Site Inspection (PA/SI) of the Blades Groundwater site (the Site) located in the Town of Blades, Sussex County, Delaware.

The SI was conducted in accordance with EPA *Guidance for Performing Site Inspections Under CERCLA* (Reference [Ref.] 1). The purposes of the SI were to collect sufficient analytical data and information concerning conditions at the Site to assess the relative threat posed to human health and the environment with respect to actual or potential releases of hazardous substances, and to determine the need for additional action under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) based on criteria as set forth in EPA *Hazard Ranking System; Final Rule* (Ref. 2).

2.0 SITE BACKGROUND

This section presents a description of the Site and its location, provides a discussion of the Site's ownership and history, and presents a summary of previous site investigation activities.

2.1 SITE LOCATION AND DESCRIPTION

The Site is located within the Town of Blades, Sussex County, Delaware. Blades is located in western Sussex County and covers approximately 0.5 square mile. Blades lies between the Nanticoke River to the north and west and Morgan Branch to the south and east (Figure 1). The Site consists primarily of a perfluoroalkyl/polyfluoroalkyl substance (PFAS) groundwater plume. Groundwater is the sole drinking water source for both public and domestic potable water in Blades and its surroundings. Public water is supplied to most residences within the town limits of Blades; however, some residences within town limits and the residences located beyond town limits to the southwest and to the northeast rely on domestic groundwater wells for potable water (Ref. 3).

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Located in Blades, DE, is Procino Plating, an active metal plating facility, as well as the site of the former Peninsula Plating facility, which is currently vacant land. The locations of Procino Plating and former Peninsula Plating are shown in Figure 2.

Procino Plating is located at 901 Market Street in Blades. The Procino Plating facility property consists of 1.16 acres with generally flat topography and is primarily surrounded by residential properties. The facility has been an electroplating facility since the 1980s and has been operated as Procino Plating since 1996. Current operations at the facility consist of cutting and chrome-plating of griddle tops for restaurant use (Ref. 3, pp. 4, 6, and 8).

The Peninsula Plating facility was within the former Blades Commercial Complex located at the intersection of Market Street and River Road, which encompasses approximately 5.8 acres. The property formerly had six warehouse and storage buildings that were historically used for metal plating, vending, trash hauling operations, steel products, and bread distribution (Ref. 4, pp. 7, 9, 10, and 35). The building that formerly contained the Peninsula Plating facility was located in the southwestern portion of the property, near the intersection of River Road and the Conrail line (Ref. 4, p. 35). There are currently no structures remaining on the property.

Additional industrial facilities located in Blades include Anchor Enterprises, a steel fabrication facility; a concrete and cinder-block manufacturer; and Delmarva Aggregate.

2.2 OPERATIONAL HISTORY

2.2.1 Procino Plating

Procino Plating is an active plating facility that began operations in Blades in 1985, performing ornamental/decorative plating with copper, nickel, and chrome (i.e., chromium). Procino Plating applied for and was issued an Industrial Wastewater Contribution Permit by Sussex County which allowed them (subject to permit limitations) to discharge pretreated process wastewater into the sanitary sewer system (Ref. 5, pp. 11 and 12). The sanitary sewer system in the Town of Blades is managed and operated by Sussex County; it is connected to the wastewater treatment plant in Seaford, DE, which is located across the Nanticoke River from the Town of Blades (Ref. 6, p. 12). When Procino Plating moved into the facility, the building had a wooden floor

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underlain by a crawl space with a soil floor. The wood floor and crawl space were removed and a concrete slab was installed by Procino Plating in the late 1990s (Ref. 5, pp. 11 and 75). In approximately 1996, Procino Plating installed a subsurface wastewater collection and treatment system to collect and treat the wash and rinse "bath" water and the floor drains from the plant (Ref. 5, p. 11). Delaware Department of Natural Resources and Environmental Control (DNREC) representatives observed a powdery white and yellow substance on the floor around the drums and in the metal grates in the floor (Ref. 3, pp. 8 and 45). A sump and pump were located in the basement of the building (Ref. 3, p. 48).

The second building on the Site is used for the pretreatment, cutting, grinding and shaping of the metal slabs to be used as griddles. The floor in the second building was concrete and had no drains (Ref. 3, p. 8). Following business downturns, the plating process in the second building was dismantled in 2007, and the wastewater piping system and drains were sealed with concrete (Ref. 5, pp. 11).

In June 1994, Procino received a Notice of Violation (NOV) from DNREC citing labeling, training and operational deficiencies related to the handling of hazardous waste. Corrective action by Procino resulted in an October 1994 DNREC notification letter stating that the deficiencies had been corrected. In October 1995, DNREC again issued a NOV regarding hazardous waste management practices and responsive corrective action was taken and compliance attained as documented in a March 1996 DNREC letter. Another NOV was issued by DNREC in December 1998 with a subsequent corrective action. None of the NOVs cited spillage, discharges, or releases of hazardous wastes (Ref. 5, p. 12).

The EPA conducted compliance inspections of the Procino facility in September 2001 which resulted in the issuance of a February 2002 NOV citing numerous hazardous waste management violations for exceedance of the 90-day onsite storage timeframe; again no spillage, discharges or releases were involved (Ref. 5, p. 12).

In December 2007 and February 2008, DNREC and the EPA conducted inspections, collected samples and interviewed employees at the Procino Plating Site. These inspections coincided with the 2007 discontinuation of plating operations in the second building when equipment was being

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dismantled to create rental space. Procino was issued an NOV through the Resource Conservation and Recovery Act (RCRA). Procino provided a written response and documentation to EPA in October 2010 addressing EPA's concerns regarding the handling and disposal of materials observed on site during the inspections (Ref. 47, pp. 1-58)

In May 2010, the EPA exercised a search warrant and seized the company records and took samples. These actions and the follow up investigation conducted by the USEPA led to criminal charges against Procino Plating (since resolved) regarding the storage of unpermitted hazardous wastes and violations of the wastewater treatment permit, the latter due to newly imposed permit conditions prohibiting certain hazardous wastes from being treated and then discharged into the sewer system. Although the discharge of cyanide was evaluated in EPA's investigation, no evidence was shown that cyanide was spilled, disposed or released from the site. Likewise, no charges were presented indicative of a release of hazardous substances at the site. Subsequently, Procino Plating terminated its use of the industrial wastewater discharge permit, concreted the piping, and modified its operations by use of a closed loop system. Currently small quantities of hazardous waste are generated and are periodically shipped offsite for disposal at a permitted facility (Ref. 5, p. 12).

In November 2018, the Chromic Acid tank was overfilled with water and overflowed into a secondary containment and into a soil crawlspace beneath the building. The tank contained chromium trioxide mixed with deionized water and a small amount of sulfuric acid as well as a catalyst (Atotech Heef 25 MS) and mist suppressant (Atotech Fumetrol 21). Fumetrol 21 is marketed as non-PFOS, and the Safety Data Sheet lists the "hazardous ingredients" as polyfluorosulfonic acid at 1.0 to 2.5 percent and diethylene glycol monobutyl ether at 0.1 to 1.0 percent. Approximately, 1 ¼ gallons of Fumetrol is added to the 500-gallon tank plating solution. The total amount of the solution lost is unknown; however, 600 gallons was captured in secondary containment. At the time of the notification to DNREC and EPA following the spill, Procino was in the process of removing the impacted soil and their contractor, Ten Bears Environmental (Ten Bears), was planning on collecting post-excavation soil samples of the

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impacted soil in the crawlspace. Analytical results were to be submitted to DNREC for review and determination if any additional follow-up actions was required (Ref. 48, pp. 1-7).

2.2.2 Peninsula Plating

Peninsula Plating is an inactive plating facility that operated at its location in Blades from approximately 1992 to 1995 (Refs. 4, p. 10 and 7, p. 2). Peninsula Plating conducted brass, copper, and chrome plating operations. Chemicals present onsite in 1995 as noted by DNREC and EPA include the following (Refs. 4, p. 4; 7, p. 1; and 8, p. 5):

- Nickel sulfate
- Nickel chloride
- Sulfuric acid
- Chromic acid
- Hexavalent chromium, aka Cr(VI)
- Chloride
- Copper cyanide
- Copper sulfate
- Zinc cyanide
- Cadmium fluoroborate

The facility had a discharge permit issued by Sussex County, which was revoked by DNREC on May 30, 1995. DNREC closed the discharge on August 3, 1995 by pouring concrete into the drain system in front of the building (Ref. 7, p. 3). Based on information in the SI, DNREC indicated a possible septic drain field was located in the center of the Blades Commercial Complex property, behind (immediately north) of the former Peninsula Plating facility (Ref. 4, p. 8). A drainage ditch was located in the center of the property heading west towards the railroad tracks (Ref. 4, p. 259). Additionally, according to the Town of Blades Water and Maintenance Supervisor, the property on which Peninsula Plating is located was connected to the county sanitary sewer system in 2002 (Ref. 46, p. 2).

2.2.3 Electroplating and Perfluorinated Compounds

Electroplating is the electrical application of a coating of a metal such as chromium, nickel, or copper onto a surface for decoration, corrosion protection, or durability. An electrical charge is

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applied to a tank (bath) containing an electrolytic salt solution. The electrical charge causes the metal in the bath to fall out of solution and deposit onto objects placed into the plating bath. In an anodizing process, an oxide film is formed on the surface of the part. These electrolytic processes cause mist and bubbles containing Cr(VI), or other metals, to be ejected from the bath, released into the workplace, and eventually dispersed into outdoor ambient air unless controlled with add-on air pollution control equipment or chemical fume suppressants (Ref. 9, p. 5).

Chemical fume suppressants reduce surface tension and thereby control emissions. By reducing surface tension in the plating/anodizing bath, gas bubbles become smaller, and rise more slowly than larger bubbles. Slower bubbles have reduced kinetic energy so that when the bubbles do burst at the surface, the Cr(VI) or other metals, are less likely to be emitted into the air, and the droplets fall back onto the surface of the bath (Ref. 9, pp. 5 and 6).

Cr(VI) is a human carcinogen. Therefore, EPA regulates Cr(VI) electroplating or Cr(VI) anodizing tank operations by applying the Clean Air Act (CAA) Maximum Achievable Control Technology (MACT) limits. The MACT limits require control of Cr(VI) emissions to the atmosphere by either limiting the amount of Cr(VI) through use of add-on air pollution control devices or utilizing a chemical fume suppressant. These facilities are also regulated by the Occupational Safety and Health Administration (OSHA) under 29 Code of Federal Regulations (CFR) Part 1910.1026 to protect workers from occupational Cr(VI) exposure. Employers are required to use engineering and work practice controls to reduce and maintain employee exposure to Cr(VI) (Ref. 9, p. 6). The most common types of fume suppressants used in chromium electroplating and anodizing are those containing fluorinated or perfluorinated compounds or, collectively, fluorosurfactants. The active ingredients are compounds such as organic fluorosulfonate and tetraethyl ammonium perfluorooctyl sulfonate. The fluorosurfactant-based fume suppressants were an improvement over the previous hydrocarbon-based products. Fluorinated sulfonate surfactants are effective in highly acidic solutions because they are resistant to hydrolysis by strong acids. For this and other reasons, fluorosurfactants are able to reduce surface tension to levels that cannot be reached with hydrocarbon surfactants (Ref. 10, p. 87).

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A study of 222 plating facilities in California conducted by the California Air Resources Board in 2003, found that 190 of the 222 facilities used a fume suppressant, either in part or solely, to control Cr(VI) emissions. Almost all of the 190 operations used a chemical fume suppressant with perfluorooctanesulfonic acid (PFOS) as the active ingredient, and 124 facilities reported using the suppressant Fumetrol 140® (Ref. 9, p. 6). Fumetrol 140 contains 1% to 7% organic fluorosulfonate (a building block of PFOS) by weight (Ref. 11).

As noted in a 2010 PA report, the Procino Plating facility in Blades uses the mist suppressant Fumetrol 140 (Ref. 3, p. 40). It was noted in the On-Scene Coordinator (OSC) logbook for the Peninsula Plating facility that the chemical cadmium fluoroborate was present at the facility in containers (Ref. 8, p. 5). Fluoroborates are PFOS-containing compounds (Ref. 12, p. 32).

2.3 Previous Investigations

DNREC has conducted investigations at both the Procino Plating Facilities and the former Peninsula Plating facilities; additionally, EPA conducted a CERCLA Removal Action at the former Peninsula Plating facility.

2.3.1 Procino Plating

In 2010, DNREC performed a PA in cooperation with EPA and recommended a SI due to chemical use and the potential to impact soil and groundwater (Ref. 3). DNREC performed the SI activities in coordination with the Delaware Division of Public Health (DPH), Office of Drinking Water (ODW), in 2010 and 2011. The SI included sampling any registered/permitted private water supply wells within the Town of Blades limits. Water samples from outdoor spigots of residential homes were collected at each registered, accessible private well. Twelve private water supply wells surrounding the facility were sampled. Additionally, 26 soil samples were collected from 13 soil borings, and 6 groundwater monitoring wells were installed and sampled on Procino Plating property (Ref. 13, p. 8).

With the exception of the concentrations of iron in several soil samples, detected soil concentrations of volatile organic compounds (VOCs), semivolatile organic compounds

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(SVOCs), polychlorinated biphenyls (PCBs), pesticides, and inorganics did not exceed applicable DNREC regulatory and screening standards (Ref. 13, p. 12). Results indicated that dieldrin and heptachlor epoxide were detected in on-site monitoring wells at levels exceeding the EPA Regional Screening Level (RSL) for tap water. Chromium was detected in one on-site well at a concentration approximately 10 times the EPA drinking water Maximum Contaminant Level (MCL). Nickel was detected in several on-site groundwater samples; however, at concentrations below the EPA RSL for tap water (Ref. 13, p. 14).

Cyanide was detected at a concentration of 20 micrograms per liter (µg/L) in one off-site drinking water well with a screened interval depth of 43 to 48 feet below ground surface (bgs), well below the MCL of 200 µg/L. However, because cyanide-containing solutions are commonly used in plating operations and a polyethylene tank was noted on the Procino Plating property with the words "Cyanide Treatment 2" stenciled on the side, the presence of cyanide in the private well sample raised concern regarding an undetected release of cyanide from the Procino Plating facility (Ref. 13, pp. 14 and 18). Following DNREC recommendations for further investigation, Procino Plating entered into a Voluntary Cleanup Program agreement with DNREC in 2011 (Ref. 5, p. 13; 13, p. 18).

From 2012 through 2015, Ten Bears performed Remedial Investigation (RI) activities on behalf of Procino Plating to characterize subsurface stratigraphy, determine groundwater elevations and groundwater flow direction, determine the extent and magnitude of chromium and cyanide contamination, and assess potential human health risks. As part of the RI, 14 shallow and subsurface soil samples were collected beneath the concrete floor within the facility at the location of the former chrome tanks, and 12 new groundwater monitoring wells were installed and sampled. The RI also included subslab soil gas sampling within the Procino Plating facility (Ref. 5, pp. 19 and 20).

The analytical results for the soil samples collected beneath the former chromium tanks indicated chromium concentrations in the shallow (0 to 2 feet bgs) soil from 11.3 to 105 milligrams per kilogram (mg/kg), in the intermediate depth (2 to 5 feet bgs) from 2.1 to 126 mg/kg, and in the deep soil (5 to 8.5 feet bgs) from 11.6 to 199 mg/kg (Ref. 5, p. 21).

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In the RI report, it was concluded that groundwater flow direction in the water table aquifer beneath the Procino Plating facility is to the south-southwest and that a fine-grained silt or clay layer is present beneath the facility at depths ranging from 22.5 to 27 feet bgs. A deeper clay layer was also encountered at depths ranging from 42.2 to 46 feet bgs (Ref. 5, pp. 25, 29, 33).

In the RI, it was also concluded that dieldrin detected in previous investigations was a background contaminant from an upgradient source (Ref. 5, p. 22). The chromium concentration in groundwater from on-facility well MW-6 was confirmed to be approximately 10 times the drinking water MCL, based on a groundwater sample collected in May 2012 (Ref. 5, p. 30). The chromium concentration had decreased approximately one year later in 2013 (from 1,170 parts per billion [ppb] to 319 ppb) (Ref. 5 p, 30). Downgradient groundwater monitoring well MW-10 had a chromium concentration of 193 ppb in 2013, exceeding the MCL. Chromium concentrations in groundwater samples collected from other wells to the east, south, and west were below the MCL or non-detect, including deeper wells that are co-located with shallow wells MW-8 and MW-9 and are screened below the clay layer described above (Ref. 5, pp. 30, 31). The RI concluded that the human health exposure pathway was incomplete (Ref. 5, p. 50).

In 2015, an interim removal action was completed by Ten Bears, performed on behalf of Procino Plating, that consisted of removing a portion of the facility's concrete slab floor, collecting soil samples for the purpose of delineating chromium concentrations to below the DNREC total chromium soil screening level of 214 mg/kg, and removing impacted soil with a mini-excavator. Approximately 20 cubic yards of soil were removed from a 10-foot by 10-foot area to depths of 6 to 8 feet bgs (Ref. 5, p. 38). A polyvinyl chloride (PVC) piping system was also installed to facilitate potential future remedial injections (Ref. 5, p. 39).

Because PFASs are emerging as hazardous substances of concern with a very recent history of published health standards, previous investigations did not include the collection or analysis of samples for PFASs (Ref. 17, p. 1).

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2.3.2 Peninsula Plating

The former Peninsula Plating facility is located approximately 0.5 mile north of Procino Plating. In 1992 and 1993, Phase I Audits were performed at the Blades Commercial Complex, where Peninsula Plating was located. The Phase I Audits and subsequent Phase II investigations were focused primarily on underground oil tanks and related contamination associated with other businesses on the property, and were not focused on hazardous substances and potential contamination associated with the Peninsula Plating facility (Ref. 4, pp. 9 and 10).

In spring 1995, the DNREC Hazardous Waste Management Branch conducted a site visit at the Peninsula Plating facility (Refs. 4, p. 10 and 11). DNREC noted the presence of plating process chemicals, including nickel sulfate, sulfuric acid, chromic acid, Cr(VI), nickel chloride, copper cyanide, copper sulfate, zinc cyanide, and cadmium fluoroborate. Peninsula Plating closed shortly thereafter, following a history of noncompliance with industrial waste discharge permits and Emergency Planning and Community-Right-to-Know Act (EPCRA) requirements. DNREC Emergency Response and Enforcement Branches informed EPA Region III of the former plating building that contained numerous vats, tanks, drums, and containers of hazardous materials (Ref. 4, p. 10). EPA conducted a CERCLA Removal Action at the abandoned Peninsula Plating facility in mid to late 1995. The removal action included the removal of 78 55-gallon drums of hazardous waste and 30 cubic yards of hazardous solids, including flammable and corrosive liquids, oxidizers, and liquids contaminated with cadmium and chromium (Refs 4, pp. 10 and 11; 7, pp. 1-3; 8, pp. 1-63).

DNREC performed an SI at Peninsula Plating in 1999. Samples collected during the SI included a total of 28 soil samples, 17 shallow (surface to 2 feet bgs) and 11 deep (up to 8 feet bgs or groundwater), collected from 10 test pits and 6 surface areas onsite, and groundwater samples from 3 on-site monitoring wells and 1 public supply well (Ref. 4, pp. 13, 14, 21). Soil samples were field screened with X-ray fluorescence (XRF) for metals and with a gas chromatograph/mass spectrometer (GC/MS) for organics (Ref. 4, pp. 21 and 22). Based on the field screening, three surface soil samples were submitted to a laboratory for inorganic analysis and six soil samples were submitted to a laboratory for organic analysis (Ref. 4, pp. 15, 21, and

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22). With the exception of the concentrations of arsenic, inorganics were not detected in the soil samples at concentrations exceeding EPA or DNREC standards (Ref. 14, pp. 21). Chromium was detected in the three soil samples at concentrations ranging from 2.4 mg/kg to 9.4 mg/kg; however, only one soil sample, TP3, was collected in the vicinity of the former plating facility (Ref. 4, p. 81). Organic analysis of soil samples indicated several polycyclic aromatic hydrocarbons (PAHs) at concentrations exceeding EPA and DNREC standards (Ref. 4, p. 22).

Analysis of groundwater samples indicated concentrations of aluminum, iron, and manganese in the on-site monitoring wells at concentrations above DNREC regulatory standards and/or EPA MCLs. Chromium was not detected in the collected groundwater samples (Ref. 4, pp. 91 and 96). Organic constituents were not detected in groundwater at concentrations exceeding the EPA Risk-Based Concentration (RBC) Tap Water, DNREC Uniform Risk Based Remediation Standards (URS) Groundwater, or Drinking Water MCL (Ref. 4, p. 27).

Because PFASs are emerging as hazardous substances of concern with a very recent history of published health standards, previous investigations did not include the collection or analysis of samples for PFASs.

2.3.3 Public Well Sampling

The Town of Blades maintains three public supply wells approximately 300 to 400 feet north-northeast of the former Peninsula Plating facility. Based on updated information pertaining to the use of PFASs at metal plating facilities and potential hazards associated with consumption of PFASs, DNREC, in coordination with EPA, collected samples from the supply wells for PFAS analysis in early February 2018. Analytical results indicated that each of the three public supply wells had a summed total concentration of perfluorooctanoic acid (PFOA) and PFOS greater than the combined EPA health advisory level (HAL) of 70 parts per trillion (ppt; equivalent to nanograms per liter [ng/L]), ranging between 96.2 ppt and 187.1 ppt (Ref. 14).

DNREC and DPH began distributing alternative water to Blades and area residents on February 8, 2018 (Ref. 14). On February 12, 2018, WESTON, on behalf of EPA, collected groundwater samples from each of the three public supply wells for the Town of Blades as well as from a

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post-treatment point prior to distribution. The samples were analyzed for perfluorinated compounds (i.e., PFASs). Combined PFOS and PFOA concentrations in raw water from the three municipal drinking water wells, as well as the treated water, exceeded the EPA HAL of 70 ng/L (Refs. 14; 15, p. 1). PFOS was detected in the raw water and treated water samples ranging from 53 to 220 ng/L, and PFOA was detected ranging from 18 to 26 ng/L. A summary of the analytical data from February 2018 is shown in Table 1.

A carbon filtration system was installed on the Blades water supply system on February 19, 2018, which significantly reduced the total PFAS concentration to 3.4 ppt (Ref. 14). DNREC and DPH announced on February 28, 2018 that a follow-up sampling of the treated Blades water supply showed non-detect levels for PFAS (Ref. 14).

2.3.4 Residential Well Sampling

The majority of the residences within Blades are supplied with public water; however, residences outside the town limits are served by private domestic wells. In February, March, and April 2018, WESTON, on behalf of EPA, collected groundwater samples from 54 domestic wells for PFAS analysis at residences located to the northeast and west of Blades; a few samples were collected from domestic wells within the town limits not supplied potable water from the town water authority. Sample locations are shown in Figure 3. As shown in Table 2, PFAS concentrations exceeded the combined HAL of 70 ng/L for PFOS and PFOA concentrations in seven of the domestic wells located west of Blades. PFOS was the main contaminant detected with concentrations ranging from 44 to 350 ng/L.

Subsets of the domestic wells were resampled in April, May, June, July, and August 2018. A review of the analytical data from those sampling events indicated concentrations in the respective domestic wells similar to the original samples, with the exception of two wells, RW-185 and RW-209. The May 2018 sample collected from RW-185, which was previously non-detect for PFOS, contained an estimated 16 ng/L. The July 2018 sample from RW-209, which previously had combined detections below the EPA HAL, now contained combined PFOS and PFOA concentrations totaling above the EPA HAL of 70 ng/L.

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DNREC provided drinking water filters to all residents with private wells impacted by PFOA/PFOS above 52.5 ng/l (75% of the HAL). DNREC provided the filters to a total of 8 residences in February, March and July 2018, as well as replacement filters in February 2019.

A summary of the residential well analytical results for the initial sampling, and the two resampled wells with differing results, is shown in Table 2 and further discussed in Section 4.5.2. Locations of the residential wells sampled and the PFAS concentrations detected during the residential well sampling event are shown in Figure 3.

3.0 SOURCE DESCRIPTION

For Hazard Ranking System (HRS) purposes, a source is defined as an area where a hazardous substance has been deposited, stored, or placed, as well as those soils that have become contaminated from the migration of a hazardous substance.

The source at the Site consists primarily of a PFAS groundwater plume that has impacted public and domestic drinking water wells, as documented by groundwater samples containing concentrations of PFASs, particularly PFOS, above background. Additionally, an observed release to groundwater of several inorganics, including hexavalent chromium, has been documented. Analytical results for groundwater samples collected from monitoring wells and the public supply wells as part of this SI are presented and discussed in Section 4.5. Previous analytical results for groundwater samples collected from the public supply wells and nearby domestic wells are discussed in Sections 2.2.3 and 2.2.4 of this SI Report.

As discussed in Section 2.1.3, Procino Plating and Peninsula Plating used PFAS-based chemicals as part of the plating operations, as documented by the presence of PFAS-based chemicals at the facilities. Procino Plating facility used the mist suppressant Fumetrol 140® and Peninsula Plating facility used the chemical cadmium fluoroborate (Refs. 3, p. 40; 8, p. 5). Fluoroborates are PFOS-containing compounds, and cadmium fluoroborate is a compound used to prepare electroplating baths for high steel strengths (Refs. 12, p. 32; 16, p. 2).

Previously collected soil samples were not analyzed for PFASs; however, the Procino Plating facility had a documented release from their chrome plating tanks, as noted by soil samples

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containing concentrations of chromium as high as 199 mg/kg at 8 feet bgs (Ref. 5, p. 21). Because the PFAS-containing mist suppressant Fumetrol 140® is used in conjunction with the chrome plating activities, it can be concluded that a release from the chrome tanks also contained PFOS.

At the former Peninsula Plating facility, chromium was detected in the three collected surface soil samples at concentrations ranging from 2.4 mg/kg to 9.4 mg/kg; however, only one soil sample, TP3, was collected in the vicinity of the former plating facility (Ref. 4, pp. 42 and 81). Samples collected adjacent to the building were not submitted for analysis. Additionally, soil boring samples were not collected beneath the foundation of the building or below tanks containing chemicals.

Additional possible sources for the PFAS in groundwater include Anchor Enterprises, a metal fabrication facility located 0.1 mile north of the public supply wells along High Street, and the Blades Fire Department, located 0.25 mile west of the public supply wells.

PFASs, including PFOS and PFOA, are chemically and biologically stable in the environment and resist typical environmental degradation processes, including atmospheric photo oxidation, direct photolysis, and hydrolysis. As a result, these chemicals are extremely persistent in the environment. PFOS and PFOA have very low volatility because of their ionic nature. Therefore, they will be persistent in water and soil. PFOA and PFOS are water-soluble and can migrate readily from soil to groundwater, where they can be transported long distances (Ref. 18, p. 3).

As part of the SI, four soil samples, two surface and two subsurface, were collected from two borings installed on the Procino Plating facility property and analyzed for PFASs. Soil sampling locations and analytical results are discussed in Sections 6.3 and 6.4 of this SI Report.

4.0 GROUNDWATER MIGRATION PATHWAY

This section describes the Site's hydrogeological setting, targets associated with the groundwater migration pathway, and conclusions regarding the groundwater migration pathway.

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4.1 REGIONAL AND SITE GEOLOGY

The Site is located in the Coastal Plain Physiographic Province (Ref. 18, p.4). The Coastal Plain consists of a seaward-dipping wedge of unconsolidated and semiconsolidated sediments (Ref. 18, p. 7). The sediments that compose the Coastal Plain were deposited in nonmarine, marginal marine, and marine environments. Interbedding of fine- and coarse-grained Coastal Plain sediments is complex because of shifting deltaic and alluvial deposition sites and because of repeated transgressions and regressions of the sea (Ref. 18, p. 10).

The Site is directly underlain by the Nanticoke River Group deposits, which consist of the Turtle Branch and the Kent Isle Formations (Refs. 19; 20, p. 20, 21). The Nanticoke River Group is comprised of deposits related to a rise and high stand of sea level that consisted of beach (well-sorted, cross-bedded sand), tidal flat (well-sorted sand with clay laminae), open estuary (clayey silt with oyster shells), marsh (organic silts with grass plant fragments), swamp (organic silt to organic sand with woody fragments), and fluvial (poorly-sorted sand and gravelly sand) depositional environments (Ref. 20, p. 20, 21). In Delaware, these deposits underlie terraces that flank the margins of the present Nanticoke River and its tributaries.

The Nanticoke River Group consists of heterogeneous units of interbedded fine to coarse sand, clayey silt, sandy silt, and silty clay. The Nanticoke River Group deposits are characterized by brown to light gray, fine to medium quartz sand, and finely laminated to structureless, gray to brown, clayey, sandy silt and silty, clayey sand (Ref. 19). The Nanticoke River Group is commonly capped by well-sorted, fine to medium sand within dunes found primarily on the southeast side of the Nanticoke River (Ref. 19). The Nanticoke River Group is approximately 25 feet thick and unconformably overlies the Beaverdam Formation (Ref. 19). The Nanticoke River Group sands are distinct and readily discernable from those of the Beaverdam Formation; the Nanticoke River Group sands are more well-sorted and less feldspathic, and they lack the distinctive white silty matrix of the Beaverdam Formation (Ref. 20, p. 22)

The Beaverdam Formation is a predominantly sandy, heterogeneous unit ranging from very coarse sand with pebbles to silty clay. The predominant lithologies are white to mottled light-gray and reddish-brown, silty to clayey, fine to coarse sand. Laminae and beds of very

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coarse sand with pebbles to gravel are common. Laminae and beds of bluish-gray to light-gray silty clay are also common in the subsurface, ranging in thickness from 2 to 20 feet (Ref. 20, p. 7). The clay-silt layers are not laterally continuous within the Beaverdam deposits (Ref. 21, p. 21). The Beaverdam has a total thickness of approximately 105 feet. In the vicinity of the Site, the Beaverdam Formation unconformably overlies the Manokin Formation, which is present from Seaford to the Delaware/Maryland border (Refs. 19; 21, pp. 20 and 21).

The Manokin Formation consists of a coarsening upward sequence, informally subdivided into two subunits, A and B. The lower unit (A) consists of gray, blue-gray, and brown-gray silty clayey sand and silty sand. Where exposed to oxidizing conditions, the lower unit is yellow to red. In some locations, the lower subunit is not present. The upper unit (B) consists of light to medium gray or yellow-orange to red-orange (where weathered), fine to coarse sand with common beds of gravelly sand and rare beds of clayey to silty sand. Thickness ranges from a feather-edge to as much as 50 feet. The Manokin Formation is truncated by the overlying Beaverdam Formation (Refs. 19; 22, pp. 9 and 10).

4.2 REGIONAL AND SITE HYDROGEOLOGY

The surficial aquifer (a.k.a. Columbia aquifer) extends over large parts of the Delmarva Peninsula. The aquifer consists of unconsolidated sand and gravel of marine and nonmarine origin, depending on the locality (Ref. 18, p. 11). Included in the Columbia aquifer are the Nanticoke River Group deposits, the Beaverdam Formation, and the Manokin and Columbia Formations where present. The aquifer contains water predominantly under unconfined conditions, but clay beds can create locally confined conditions. The transmissivity of the surficial aquifer (the rate at which water will move through the aquifer) is variable, ranging from 8,000 feet squared per day in the Delmarva Peninsula to 20,000 feet squared per day in buried channels (Ref. 18, p. 11).

In the vicinity of Blades, the fine-grained beds of the Manokin Formation are the base of the Columbia aquifer (Ref. 23). The aquifer functions as both an unconfined and semiconfined aquifer. Saturated thickness ranges from 30 to 100 feet. The variation in aquifer type and

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thickness is due to the complex interlaying of aquifer and semiconfining beds (Ref. 23). Clay-silt layers are common but not laterally continuous within the Beaverdam Formation (Ref. 21, p. 21).

Soil borings and monitoring wells installed in 2011 by DNREC around the perimeter of Procino Plating indicate primarily tan fine to coarse sand to a depth of 20 feet bgs. Two monitoring well logs indicate silty clay encountered at 20 feet bgs. Shallow groundwater was encountered between 9 and 12 feet bgs (Ref. 13, pp. 42, 48-60).

From 2012 to 2015, Ten Bears, on behalf of Procino Plating, installed 12 wells both onsite and offsite, nine shallow (15 to 27.5 feet bgs) and three deep (34 to 44 feet bgs), as shown on Figures 4a and 4b. The shallow wells were completed and screened just above a localized clay layer and the deeper wells were completed and screened in a sandy layer below the localized clay layer. Depth to groundwater was measured on several occasions at these wells, as well as the wells installed by DNREC. Groundwater was encountered at depths ranging from 6.43 to 12.41 feet bgs (Ref. 5, pp. 73, 82, 87, 100, 202-207, 282-288, 385-388). Shallow groundwater flow direction was determined to be slightly west of due south (Ref. 5, pp. 76, 77, 80, 84, 86, 88). Silt and/or clay layers were encountered in the subsurface at depths below 20 feet. An apparent clay layer was encountered in DMW-1 from 29.9 feet to 33.5 feet, underlain by sands to a depth of approximately 46 feet, where a second apparent clay unit was encountered. The well screen was placed from 34 to 44 feet bgs to monitor the sandy zone below the first encountered apparent clay. In DMW-2, apparent clay extended from 25 feet to 33.6 feet, below which sands were encountered down to 42.2 feet. The screen was placed from 33 to 43 feet bgs to monitor the sandy zone below the clay unit (Ref. 5, p. 29, 32, 100, 202-207, 282-288). A clay layer was not observed in DMW-3, which was drilled to 34 feet bgs and screened from 24 to 34 feet bgs. A silty layer was likely observed at approximately 24 to 33.5 feet bgs (Ref. 5, p. 388).

In October and November 2018, WESTON installed 20 monitoring wells, 10 shallow (less than 20 feet bgs), 8 intermediate (25 to 50 feet bgs), and 2 deep (76 and 96 feet bgs), throughout the Town of Blades (Figures 4a and 4b). The lithology of the wells is consistent with previous investigations: a band of clay generally observed around 20 feet bgs and a second band observed around 40 feet bgs, as shown in the well logs provided in Appendix A. However, the wells logs

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indicate that the clay layers are not contiguous because there is no significant clay layer in boring SIGW-17 at or around 20 feet bgs and no discernible clay layer at this depth in boring and SIGW-20. Additionally, no discernible clay layer was observed at or around 40 feet bgs in borings, SIGW-02, SIGW-10, and SIGW-12.

4.3 GROUNDWATER TARGETS

Potential groundwater targets include persons who obtain drinking water from private domestic wells within the 4-mile radius target distance limit (TDL) of the Site and persons supplied drinking water from public water suppliers whose water source is from groundwater wells within the 4-mile TDL. The 4-mile TDL is shown in Figure 5.

Town of Blades municipal authority provides potable water to approximately 1,600 persons within the town limits (Ref. 46, p. 2). The Town of Blades water sources are three groundwater wells completed in the Columbia aquifer at depths ranging from 95 to 102 feet bgs, screened between 65 and 95 feet bgs, and located in the vicinity of the Town Hall approximately 300 to 400 feet north-northeast of the former Peninsula Plating facility (Ref. 25, pp. 2 and 7). The wells have estimated daily usage of 160,000, 300,000, and 300,000 gallons per day (Ref. 26). The groundwater from each well is pumped to a single treatment system prior to distribution (Ref. 43, p. 16).

Seaford Water Department (SWD) supplies drinking water to 6,928 persons (Ref. 27, p. 1). Seaford's water sources are five groundwater wells that are completed in the Columbia aquifer and range in depth from 88 to 114 feet bgs (Ref. 28, p. 9). Four of the SWD wells are located between 1 and 2 miles from the Site, and the fifth well is located between 2 and 3 miles from the Site. There are numerous mobile home parks within the 4-mile TDL that supply potable water from groundwater wells to their residences and are summarized in the table below (Ref. 29). Because the exact location of public supply wells is confidential information in accordance with the Department of Homeland Security, the locations of Seaford's supply wells and the small community supply wells are not depicted on Figure 5. The general location of the public wells within 4 miles of the Site and within the TDL distance rings, as well as the populations served, is provided in the table below.

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Radial Distance (miles)	Public Supply Wells	Population Served	Total Population Served
0.00 to 0.25	3 (Blades)	1,600	1,600
0.25 to 0.50	0	0	0
0.50 to 1.0	0	0	0
1.0 to 2.0	2 (UCMHP) 4 (SWD) 2 (HVMP) 3 (TMC) 1 (SMMHP) 2 (MG)	65 5,359 207 189 279 476	6,575
2.0 to 3.0	1 (SWD) 1 (PRMHP) 2 (Green Acres)	1,340 222 213	1,775
3.0 to 4.0	1 (Dove Estates) 4 (LVMHP) 1 (Glen Acres) 3 (VCB)	111 918 40 654	1,723
Total	29	11,673	11,673

UCMHP – Upcountry Mobile Home Park
SWD = Seaford Water Department
HVMP = Holly View Mobile Home Park
TMC = Todd's Mobile Court
SMMHP = Sussex Manor Mobile Home Park
MG = Mobile Gardens I
PRMHP = Pine Ridge Mobile Home Park
LVMHP = Laurel Village Mobile Home Park
VCB = Village of Cool Branch

As presented in Section 6.2, there are approximately 19,573 people who live within a 4-mile radius of the Site (Ref. 42). For the purpose of this SI, assuming those persons who reside within the 4-mile TDL not supplied public water rely on private domestic wells for drinking water, there are approximately 7,900 persons within the 4-mile TDL who obtain drinking water from domestic wells.

4.4 SAMPLING LOCATIONS

From October 8 through 11, 2018, WESTON collected 18 groundwater samples, including a duplicate, from 17 existing monitoring wells located on and in the immediate vicinity of Procino

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Plating in accordance with *Final Field Sampling and Analysis Plan for Blades, DE* (Ref. 31). However, a sample could not be collected from Procino monitoring well MW-6 because of an obstruction in the well. Between October 16 and November 1, 2018, EPA installed 21 additional monitoring wells throughout the Town of Blades. WESTON collected groundwater samples from the newly installed wells on November 6 and 7, 2018. The new wells were installed, developed, and sampled in accordance with *Final Field Sampling and Analysis Plan for Blades, DE* (Ref. 31). On November 5 and 6, 2018, WESTON also collected groundwater samples from the three Town of Blades public supply wells as well as a groundwater sample from the Triangle Park Well owned by the Town of Blades.

All PFAS results for the groundwater samples collected from the newly installed wells in November 2018 were qualified or rejected because the pH of the samples were not within the specified range of the method. On March 26 and 27, 2019, WESTON resampled 16 wells for PFAS analysis. Resampled wells included a combination of newly installed wells, existing wells at Procino Plating, and the public supply wells.

The sample locations are shown in Figures 4a and 4b. Well logs are provided in Appendix A and field logbook notes and field data sheets are provided in Appendix B.

4.5 ANALYTICAL RESULTS

The groundwater samples were analyzed for pesticides, total metals (including mercury), cyanide, hexavalent chromium, and PFASs. Analytical summary tables for results detected above the respective reporting limits are provided in Tables 1 through 7. Table 4 is a summary of the PFAS-qualified data for the November 2018 sampling event. The table is provided for informational purposes only; the data associated with these samples is not discussed below and was not used to evaluate site conditions.

The groundwater analytical results were compared to EPA RSLs for tap water based on a cancer target risk of 1E-6 and a hazard quotient of 0.1 (Ref. 32), and to EPA drinking water MCLs (Ref. 33). RSLs are risk-based concentrations derived from standardized equations combining exposure information assumptions with EPA toxicity data. The RSLs are considered by EPA to

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be protective for human health over a lifetime. They are used for site screening and are not cleanup standards. The RSLs are used to help identify areas, contaminants, and conditions that may require further action at a particular site. EPA MCLs are legally enforceable standards that apply to public drinking water systems only. However, EPA MCLs are frequently used for evaluating and, in some cases, as a basis for remediating, contaminated sites. They are included here for comparison purposes only. Additionally, the PFAS analytical results were compared to EPA's HAL (Ref. 15). The EPA HAL is the level at or below which adverse health effects are not anticipated to occur over a lifetime of exposure.

Sample result qualifiers, where applicable, are included in the analytical summary data tables; however, they are not included in the following discussion of analytical results. The tables also reflect the elevated concentrations of compounds or elements that were detected in the samples three times above the concentrations detected in the background samples, SIGW-19 for shallow wells (screened below 20 feet bgs), SIGW-08 for intermediate wells (screened between 30 and 60 feet bgs), and TBW-01 for the deep wells (screened above 60 feet bgs) from the March 2019 sampling event. Samples containing compounds or elements that were not detected above the reporting detection limit (RDL)/quantitation level (QL) in the background sample are considered to be elevated if they were detected at a concentration equal to or greater than the background sample RDL/QL. For samples submitted to an EPA assigned contract laboratory program (CLP) laboratory or a WESTON subcontracted Tier IV laboratory, the analytical data was validated by the Environmental Services Assistance Team (ESAT) contractor under the direction of the Office of Analytical Services and Quality Assurance (OASQA) Branch. Organic and inorganic data were validated at EPA Region 3 Organic Level 2 and Inorganic Level 2, respectively, in accordance with *EPA National Functional Guidelines for Organic Superfund Methods Data Review*, USEPA-540-R-2017-002 (Ref. 11). For samples submitted to the EPA Region 3 Environmental Science Center Laboratory in Fort Meade, Maryland, the analytical data was reviewed by the EPA OASQA Branch. Laboratory analytical data packages and data validation reports are included in Attachment 1.

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4.5.1 Pesticide Analytical Results

Several pesticides, including dieldrin, were detected at low concentrations in a few groundwater samples. Detected concentrations did not exceed or approach MCLs. There is no MCL for dieldrin; however, the detected concentrations of dieldrin were generally above the EPA RSL of 0.0018 µg/L. Dieldrin was not detected in the background groundwater sample.

4.5.2 PFAS Analytical Results

As shown in Tables 1 and 5, the concentrations of the analyzed PFAS compounds in the public supply wells were elevated with respect to background (TBW-01). Samples collected form the public wells in February 2018 by the EPA Removal Program contained PFOS concentrations ranging from 53 ng/L to 210 ng/L and PFOA concentrations ranging form 19 ng/L to 26 ng/L. The concentrations of PFOS in the supply well samples collected in November 2018 ranged from 27 to 160 ng/L and the concentrations of PFOA ranged from 14 to 27 ng/L. The March 2019 public well samples had PFOS concentrations ranging from 48/ng/L to 140 ng/L and PFOA concentrations ranging from 19 ng/L to 32 ng/L. Groundwater collected from all three supply wells in February 2018 and March 2019 and from wells 1 and 3 collected in November 2018 exceed the EPA HAL of 70 ng/L for combined PFOS and PFOA. Groundwater collected from well 2 in November 2019 did not contain total PFOS and PFOA concentrations in exceedance of the EPA HAL of 70 ng/L.

As shown in Table 2, PFAS concentrations exceeded the combined HAL of 70 ppt for PFOS and PFOA concentrations in 7 of the 54 domestic wells located west of Blades that were sampled as part of the EPA removal assessment. PFOS was the main contaminant detected, with concentrations ranging from 44 ng/L in sample RW-206 to 350 ng/L in sample RW-170. PFOA concentrations in these wells ranged from 14 to 47 ng/L. An additional eight residences contained PFOS concentrations greater than three times the concentration detected in the corresponding monitoring well background sample collected as part of the SI. PFOS concentrations in these eight wells ranged from 15 ng/L in sample RW-194 to 57 ng/L in sample RW-173. As shown in Table 2, additional PFAS compounds were also detected in the wells.

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As shown in Table 3, PFOS was detected in all the existing Procino wells at elevated concentrations with respect to the corresponding background, with concentrations ranging from 73.2 ng/L in sample GW-04 to 2,820 ng/L in sample GW-02. The concentrations of PFOS alone in all the wells exceed EPA's combined PFOS and PFOA HAL of 70 ng/L. PFOA was also detected in the majority of the samples at concentrations elevated with respect to background ranging from 20.9 ng/L to 35.1 ng/L. Perfluorobutanesulfonic acid (PFBS) was also detected at elevated concentrations in all the Procino wells. The concentrations of PFBS did not exceed EPA's RSL of 40,000 ng/L.

As shown in Table 5, of the resampled newly installed wells (SIGW), PFOS and PFOA were detected at elevated concentrations with respect to background in one shallow well (SIGW-05) and three intermediate wells (SIGW-04, SIGW-06, and SIGW-13) ranging from 25 ng/L to 190 ng/L and from 34 ng/L to 610 ng/L, respectively. Concentration of the combined PFOS and PFOA in the three intermediate well samples exceeded the EPA HAL of 70 ng/L. These four wells also contained elevated concentrations of other PFAS compounds. Table 5 also provides a summary of the resampled existing Procino wells and public supply wells.

Figure 4a, depicts groundwater sample locations that have PFOS and PFOA concentrations that exceed three times the concentrations detected in in the applicable background well, as well as concentrations that exceed the EPA HAL.

4.5.3 Inorganic Analytical Results

As shown in Table 6, inorganics such as arsenic (5 samples), cobalt (2 samples), copper (2), chromium (3 samples), manganese (4 samples), mercury (1 sample), nickel (8 samples), vanadium (3 samples), and zinc (3 samples) were detected in the existing Procino wells at elevated concentrations with respect to background. Elevated concentrations of arsenic, cobalt, manganese, and mercury in several samples exceeded the EPA RSL; however, they were below applicable MCLs. Additionally, hexavalent chromium was detected in 12 of the 17 wells at elevated concentrations ranging from 0.17 µg/L to 20 µg/L. Hexavalent chromium was detected in all the wells, except DMW-01, at concentrations exceeding the EPA RSL of 0.035 µg/L; however, concentrations did not exceed the EPA MCL of 100 µg/L for total chromium. Cyanide

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was detected in laboratory blanks associated with these samples. Samples with reported detected concentrations for cyanide less than the Contract-Required Quantification Limit (CRQL) are reported at the CRQL (10 µg/L) and were qualified as non-detect.

As shown in Table 6, inorganics such as aluminum (3 samples), arsenic (6 samples), cadmium (1 sample), cobalt (7 samples), copper (2 samples), chromium (4 samples), iron (7 samples), lead (3 samples), manganese (11 samples), nickel (4 samples), and zinc (4 samples) were detected at elevated concentrations in the newly installed wells. Elevated concentrations of arsenic, cobalt, and manganese in several samples exceeded the EPA RSL; however, they were below applicable MCLs. Five samples contained an elevated concentration of hexavalent chromium ranging from 0.11 µg/L to 0.25 µg/L. Cyanide was not detected in the newly installed wells.

Figure 4b, depicts groundwater sample locations that have at least one inorganic with concentrations that exceed three times the concentration detected in in the applicable background well.

4.6 GROUNDWATER CONCLUSIONS

Based on analytical results, a PFAS groundwater plume has been documented at the Site. Public, domestic, and monitoring well samples document the presence of primarily PFOS in groundwater at concentrations three times above background levels. Additionally, the concentrations of PFOS in the public supply wells and the combined concentration of PFOS and PFOA in seven domestic wells exceed the EPA HAL of 70 ng/L. Approximately 1,600 persons are supplied drinking water by the Town of Blades public supply wells. Analytical results also show a documented metals contamination in groundwater, including hexavalent chromium.

5.0 SURFACE WATER MIGRATION PATHWAY

This section describes the Site's hydrologic setting, targets associated with the surface water migration pathway, and conclusions regarding the surface water migration pathway.

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5.1 HYDROLOGIC SETTING

As shown in Figure 6, the Town of Blades is situated inside a bend of the Nanticoke River, a major tributary to Chesapeake Bay. The Nanticoke River is located approximately 2,000 feet northwest of the former Peninsula Plating facility and approximately 1,300 feet west of the Procino Plating facility. There is no direct surface water pathway from the facilities to the river. Surface water runoff from the facilities is expected to flow into the Nanticoke River though a combination of overland flow and through storm drains. Some surface water may flow along the railroad right-of way located to the west of both facilities, then into the Nanticoke River. In general, the direction of surface water flow, based on topography, appears to be westerly toward the Nanticoke River.

The locations of the two metal plating facilities are outside the Federal Emergency Management Agency (FEMA)-designated 1% annual chance flood zone (i.e., 100-year floodplain) (Ref. 34). The Nanticoke River at Seaford and Town of Blades is tidal (Ref. 35). The 15-mile downstream TDL is completed in the Nanticoke River as shown in Figure 5.

Both the Peninsula Plating and Procino Plating facilities had National Pollutant Discharge Elimination System (NPDES) discharge permits for treated process water to the Town of Blades sanitary sewer system (Refs. 5, pp. 11 and 12; 8, p. 8). The Town of Blades sewer system is owned and operated by Sussex County. The effluent is then conveyed to Seaford's treatment plant, which is along the north side of the Nanticoke River at the southwest corner of the City of Seaford (Ref. 6, p. 12).

5.2 SURFACE WATER TARGETS

There are no drinking water intakes located along the Nanticoke River within the 15-mile TDL (Ref. 29).

The Nanticoke River is recreationally fished for many species, such as white and yellow perch, pickerel, catfish, largemouth bass, bluefish, sea trout, blue crab, and rockfish (i.e., striped bass) (Ref. 36, p. 2). There are two public boat launches in Seaford and a marina in Blades (Ref. 37). The Nanticoke River, as a tributary to the Chesapeake Bay, could potentially provide suitable

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habitat for the Federally-designated threatened species the shortnose sturgeon (*Acipenser brevirostrum)*; however, this species is mostly known to inhabit the Potomac and Susquehanna Rivers (Refs. 38, p. 2; 39, p. 2). Two state-listed endangered fish species, the blackbanded sunfish (*Enneacanthus chaetodon)* and the Ironcolor shiner *(Notropis chalybaeus),* are known to occur in Wicomico County, Maryland (Ref. 40, p. 3). The Nanticoke River State Wildlife Area is located along both the eastern and western banks of the river between 4 and 7 miles downstream of the Site (Figure 6). Approximately 15 miles of wetland frontage are located along the Nanticoke River within the 15-mile TDL (Ref. 41).

5.3 SAMPLING LOCATIONS

On September 19 and 20, 2018, WESTON collected 10 co-located surface water and sediment sample pairs, including 1 duplicate sample of each matrix. Seven surface water and seven sediment samples, including the duplicate samples and upstream background samples at two locations, were collected from Morgan Branch, a tributary to the Nanticoke River; two surface water and two sediment samples (SW/SD-05 and SW/SD-06) were collected from a marshy area along the Nanticoke River; and one surface water and one sediment sample were collected from the Nanticoke River at the marina. The surface water and sediment sample locations are shown in Figure 7. Field logbook notes are provided in Appendix A.

5.4 ANALYTICAL RESULTS

Surface water and sediment samples were submitted for laboratory analysis of metals (including mercury), cyanide, hexavalent chromium, PFASs, and pesticides. Analytical summary tables for results detected above detection limits are provided in Tables 8 through 10. The surface water sample results were compared to EPA National Recommended Water Quality Criteria for the consumption of water and organisms as well as to EPA Region 3 Biological Technical Assistance Group (BTAG) freshwater screening criteria (Refs. 43 and 44). Sediment sample results were compared to EPA Region 3 BTAG screening criteria (Ref. 44). The table also reflects the elevated concentrations of compounds or elements that were detected in the samples three times above the concentrations detected in the background samples (SW-07/SD-07 and SW-09/SD-09 for samples collected from the Morgan Branch and SW-08/SD-08 for samples

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collected from the Nanticoke River). Compounds or elements that were not detected above the detection limits in the background samples are considered to be elevated in a sample if they were detected at a concentration equal to or greater than the background sample detection limit. Sample result qualifiers, where applicable, are included in the analytical summary data tables; however, they are not included in the following discussion of analytical results. For samples submitted to an EPA assigned CLP laboratory or a WESTON subcontracted Tier IV laboratory, the analytical data were validated by the Environmental Services Assistance Team (ESAT) contractor under the direction of the OASQA Branch. Organic and inorganic data were validated at EPA Region 3 Organic Level 2 and Inorganic Level 2, respectively, in accordance with EPA National Functional Guidelines for Organic Superfund Methods Data Review, USEPA-540-R-2017-002 (Ref. 11). For samples submitted to the EPA Region 3 Environmental Science Center Laboratory in Fort Meade, Maryland, the analytical data were reviewed by OASQA. Laboratory analytical data packages and data validation reports are included in Attachment 1.

Pesticides were not detected above detection limits in the surface water and sediment samples.

As shown in Table 8, PFOS was detected in surface water sample SW-03 at an elevated concentration of 16 ng/L. PFOS, as well as PFOA, were not detected in any other surface water samples. Perfluorononanoic acid (PFNA) was detected in surface water samples SW-03, SW-04, and background sample SW-09 (and its duplicate) ranging from 14.2 to 16.6 nanograms per liter (ng/L). As shown on Table 7, low-level estimated concentrations of several PFASs were detected in the majority of the sediment samples. PFOS was only detected at an estimated concentration in the upstream background sample, SD-09 (and its duplicate), collected from Morgan Branch. PFOA was detected at estimated concentrations in SD-01, the farthest downstream location on Morgan Branch, and the background sample SD-09. PFOA was also detected at an estimated concentration of 2.1 micrograms per kilogram (µg/kg) in sample SD-06 collected in a marsh area along the Nanticoke River.

Table 9 provides a summary of the concentrations of inorganics in the surface water samples. With the exception of the concentration of lead in surface water sample SW-03, inorganics detected in samples collected from Morgan Branch were not elevated with respect to

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background. The surface water samples collected from the marsh area along the Nanticoke River, SW-05 and SW-06, contained concentrations of inorganics, such as barium, beryllium, chromium, cobalt, copper, iron, lead, nickel, vanadium, and zinc, at elevated concentrations with respect to the background sample collected from the Nanticoke River (SW-08). Sample SW-02 collected from Morgan Branch Creek contained an elevated concentration of lead. The elevated concentrations of cobalt, copper, iron, lead, vanadium, and zinc exceeded EPA BTAG screening values, but were below the EPA Water Quality Criteria (WQC). Additionally, cyanide was detected at estimated concentrations in samples SW-02 and background sample SW-09 from Morgan Branch and samples SW-05 and SW-06 from the Nanticoke River. Hexavalent chromium was detected in one surface water sample, sample SW-07, collected upstream on Morgan Branch.

As shown in Table 10, numerous inorganics were detected at elevated concentrations in sediment samples SD-01 and SD-02 collected from Morgan Branch Creek and SD-05 and SD-06 collected from the Nanticoke River. The elevated concentrations of arsenic, chromium, lead, manganese, nickel, selenium and zinc exceeded EPA BTAG screening values. There were no hexavalent chromium detections above the detection limits in the sediment samples, and results below the detection limits were qualified as unusable because hexavalent chromium was detected in the method blank associated with the sediment samples. Cyanide was not detected in the sediment samples.

5.5 SURFACE WATER CONCLUSIONS

With the exception of the concentration of PFOS in one surface water sample collected from Morgan Branch Creek, SW-03, PFASs were not detected at elevated concentrations in the surface water and sediment samples. Elevated concentrations of numerous inorganics were detected in three surface water samples and four sediment samples.

Potential targets associated with the surface water migration pathway include the Nanticoke River as a fishery, one federal-designated and two state-designated threatened or endangered species, the Nanticoke River State Wildlife Area, and the approximate 15 miles of wetland frontage located along the Nanticoke River within the 15-mile TDL.

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6.0 SOIL EXPOSURE AND AIR MIGRATION PATHWAYS

This section provides information regarding the physical conditions of the Site and targets associated with the soil exposure and air migration pathways.

6.1 PHYSICAL CONDITIONS

The Site consists primarily of a PFAS-contaminated groundwater plume within the Town of Blades. The PFAS-contaminated groundwater plume is at least partially attributable to Procino Plating, an active metal plating facility, as well as the former Peninsula Plating facility, which is currently vacant land. The locations of Procino Plating and former Peninsula Plating are shown on Figure 2.

The majority of the Procino Plating facility property is occupied by several buildings and a warehouse, as well as an asphalt parking lot. There is minimal exposed soil on the property. The location of the former Peninsula Plating facility is currently vacant land. The entire property is covered with exposed soil, vegetation, and crushed stone. The property is not fenced and is accessible to the public.

6.2 SOIL AND AIR TARGETS

There are residential properties that directly border the Procino Plating facility to the south and across 9th Street to the north. A public park and residential properties are located across River Road from the former Peninsula Plating facility. However, a soil source has not been identified associated with the Site. No residences, schools, or daycare centers are located on or within 200 feet of possible source areas. The estimated population and wetland acreage within a 4-mile radius of the Site are summarized in the tables below (Refs. 41 and 42).

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Radial Distance from Site (miles)	Population (number of persons)
0.00 - 0.25	97
>0.25 - 0.50	312
>0.50 - 1.0	2,750
>1.0 - 2.0	5,905
>2.0 - 3.0	5,308
>3.0 - 4.0	5,201
Total	19,573

Ref. 42

Radial Distance from Site (miles)	Wetlands (acreage)
0.00 - 0.25	1.88
>0.25 - 0.50	89.58
>0.50 - 1.0	136.85
>1.0 - 2.0	705.45
>2.0 - 3.0	1545.14
>3.0 - 4.0	1803.61
Total	4282.51

Ref. 41

6.3 SAMPLING LOCATIONS

On October 29 and 31, 2018, WESTON collected two surface (0 to 24 inches bgs) soil samples, plus a duplicate sample for quality assurance/quality control (QA/QC), and two subsurface (4 to 10 feet bgs) soil samples from soil borings SIGW-18 and SIGW-20 installed on the Procino Plating facility. Soil samples were not collected from the former Peninsula Plating facility property. Additionally, a background soil sample was not collected for PFAS analysis. Sampling locations are shown in Figure 4 and the field logbook notes are provided in Appendix A.

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6.4 ANALYTICAL RESULTS

The soil samples were analyzed for PFAS in accordance with a modified EPA Method 537. Analytical summary tables for results detected above detection limits are provided in Table 11. Sample result qualifiers, where applicable, are included in the analytical summary data tables; however, they are not included in the following discussion of analytical results. The analytical data were validated by the ESAT contractor under the direction of the OASQA Branch. Organic and inorganic data were validated at the EPA Region 3 Organic Level 2 and Inorganic Level 2, respectively, in accordance with *EPA National Functional Guidelines for Organic Superfund Methods Data Review*, USEPA-540-R-2017-002 (Ref. 11). Laboratory analytical data packages and data validation reports are included in Attachment 1.

The analytical results were compared to residential RSLs based on target cancer risk of 1E-06 and target hazard quotient of 1.0 (Ref. 45). RSLs for PFOS and PFOA in industrial soil have not been established. EPA RSLs are generic risk-based concentrations that are intended to assist risk assessors and others in initial screening level evaluations of environmental measurements. RSLs combine human health toxicity values with standard exposure pathway (i.e., inhalation, dermal, and ingestion) factors to estimate contaminant concentrations in environmental media (soil, air, and water) that are considered by EPA to be health protective based on human exposures over a lifetime. RSLs do not address impacts to ecological targets. RSLs are included here for site screening and to help identify areas, contaminants, and conditions that may require further action.

As shown in Table 10, surface soil sample SS-01, and its duplicate, contained 11 µg/kg PFOS and estimated concentrations, below detection limits, of PFOA, PFBS and other PFAS compounds. The subsurface soil sample collected at this location, SS-04, from 4 to 6 feet bgs, contained 2.6 µg/kg PFOS. Surface soil sample SS-02 contained 2.3 µg/kg PFOS and the subsurface soil sample at this location, SS-03 collected from 8 to 10 feet bgs, contained 0.54 µg/kg PFOS. The detected concentrations of PFOA and PFOS in the soil samples were significantly below the applicable RSLs for residential soil of 16,000 µg/kg and 6,000 µg/kg, respectively.

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6.5 SOIL EXPOSURE AND AIR MIGRATION PATHWAY CONCLUSIONS

The site consists of a PFAS-contaminated groundwater plume. With the exception of the four soil samples (two shallow and two deep) collected from soil borings on the Procino Plating facility property, soil samples were not collected as part of this SI. The four soil samples collected contained detectable concentrations of PFOA, PFOS, and PFBS. The detected concentrations were significantly below RSLs for residential soil. A background sample was not collected.

7.0 SUMMARY

The Site is located within the Town of Blades, Sussex County, Delaware. The site consists primarily of a PFAS groundwater plume. Groundwater is the sole drinking water source for both public and domestic potable water. Public water is supplied to residences within the town limits of Blades; however, some residences within town limits and the residences located beyond town limits to the southwest and to the northeast rely on domestic groundwater wells for potable water.

Located in Blades, DE, is Procino Plating, an active metal plating facility, as well as the site of the former Peninsula Plating facility, which is currently vacant land. Based on updated information pertaining to the use of PFASs at metal plating facilities and potential hazards associated with consumption of PFASs, DNREC, in coordination with EPA, collected samples from the Blades public supply wells for PFAS analysis in early February 2018. Analytical results indicated that all three public supply wells had a summed total concentration of PFOA and PFOS greater than the EPA drinking water HAL of 70 ppt, ranging between 96.2 ppt and 187.1 ppt.

Public, domestic, and monitoring well samples document the presence of primarily PFOS in groundwater at concentrations three times above background levels. Elevated concentrations of metals, including hexavalent chromium, were also detected in monitoring well samples. The concentrations of PFOS in the public supply wells and the combined concentration of PFOS and

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PFOA in seven domestic wells exceed the EPA HAL of 70 ng/L. Approximately 1,600 persons are supplied drinking water by the Town of Blades public supply wells.

With the exception of the concentration of PFOS in one surface water sample, SW-03, PFASs were not detected at elevated concentrations in the surface water and sediment samples. Elevated concentrations of numerous inorganics were detected in three surface water samples and four sediment samples. Potential targets associated with the surface water migration pathway include the Nanticoke River as a fishery, one federal-designated and two state-designated threatened or endangered species, the Nanticoke River State Wildlife Area, and the approximate 15 miles of wetland frontage located along the Nanticoke River within the 15-mile TDL.

The Site consists of a PFAS-contaminated groundwater plume. With the exception of the four soil samples (two shallow and two deep) collected from soil borings on the Procino Plating facility property, soil samples were not collected as part of this SI. The four soil samples collected contained detectable concentrations of PFOA, PFOS, and PFBS. The detected concentrations were significantly below RSLs for residential soil. A background soil sample was not collected.

ED_005024_00000601-00088

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CLIENT USEPA **PROJECT NAME** Blades Groundwater

PROJECT NUMBER 30250.016.003.0207.00 **PROJECT LOCATION** Blades, DE

DEPTH (ft)	SAMPLE NUMBER	GRAPHIC LOG	MATERIAL DESCRIPTION	WELL DIAGRAM
0			Dark grayish brown well-sorted fine SAND, some silt, loose, moist (1.2)	
			Light yellowish brown well-sorted fine SAND, little silt, loose, moist, yellowish red mottling (5.2)	
5			Light yellowish brown well-sorted medium subangular SAND, little silt, loose, wet (7.0)	
			Light gray well-sorted medium SAND, little silt, loose, wet (13.6)	
10			Yellowish red well-sorted medium subangular SAND, some silt, wet	
15			Dark gray CLAY, medium firm, high plasticity, wet (18.0)	
			Dark gray well-sorted medium SAND and high plasticity CLAY, wet (19.6)	
20			Yellowish red well-sorted medium subangular SAND, some clay, slight plasticity, wet (20.0)	
			Medium gray well-sorted medium subangular SAND, some clay, slight plasticity, soft, yellowish red mottling, wet (22.0)	
			Light to medium brownish gray well-sorted medium subangular SAND, some clay, slight plasticity, yellowish red mottling, wet (23.6)	
25			Light gray CLAY, medium firm, high plasticity, wet (25.6)	
			Light gray well-sorted medium subangular SAND, dense, wet, some soft clay, trace yellowish red mottling, slight plasticity, grades to light gray well-sorted fine subangular SAND, some silt, loose, wet (28.0)	
30			Light gray well-sorted very fine to fine SAND, some silt, wet (31.2)	
			Light brownish gray CLAY, medium firm, high plasticity, wet, grades to dark brownish gray high plasticity CLAY, soft, wet (33.4)	
35			Well-sorted subangular medium SAND, some silt, medium dense, light gray with horizontal yellowish red lamination (34.0)	

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ENVIRONMENTAL BH LITHOLOGY LOGS DIGITIZED.GPJ ENVIRONMENTAL BH 4/10/19

BORING NUMBER SIGW-13

CLIENT USEPA **PROJECT NAME** Blades Groundwater

PROJECT NUMBER 30250.016.003.0207.00 **PROJECT LOCATION** Blades, DE

DEPTH (ft)	SAMPLE NUMBER	GRAPHIC LOG	MATERIAL DESCRIPTION	WELL DIAGRAM
35			Light gray to light brownish gray poorly-sorted fine to coarse subangular SAND, some poorly-sorted well-rounded fine to coarse gravel, some silt, dense, wet, some reddish yellow mottling, grades to poorly-sorted fine to coarse subangular SAND, some clay, soft, wet *(continued)*	
			37.6 Dark brownish gray CLAY, medium firm, high plasticity, wet	
			39.4	
40			40.0 Yellowish red well-sorted fine subangular SAND, some silt, dense	
			41.0 Dark brownish gray soft high plasticity CLAY, wet	
			42.0 Very light gray well-sorted fine SAND, some silt, dense, wet	
			Light gray to light brownish gray well-sorted subangular fine SAND, some silt, loose, wet, trace yellowish red mottling	
			44.0	
45			45.4 Medium brownish gray well-sorted fine subangular SAND, some clay, slight plasticity, soft	
			Light yellow well-sorted fine subangular SAND, some silt, dense, wet	
50			52.0	

Bottom of hole at 52.0 feet.

ENVIRONMENTAL BH LITHOLOGY LOGS DIGITIZED.GPJ ENVIRONMENTAL BH 4/10/19

BORING NUMBER SIGW-14

PAGE 1 OF 1

CLIENT USEPA **PROJECT NAME** Blades Groundwater

PROJECT NUMBER 30250.016.003.0207.00 **PROJECT LOCATION** Blades, DE

DEPTH (ft)	SAMPLE NUMBER	GRAPHIC LOG	MATERIAL DESCRIPTION	WELL DIAGRAM
0			Very dark grayish brown well-sorted fine subangular SAND, some silt, loose, moist (1.0)	
			Light yellowish brown well-sorted fine subangular SAND, little silt, loose, moist (1.6–2.2)	
			Very dark grayish brown well-sorted fine subangular SAND, some silt, loose, moist (2.2–4.0)	
5			Light grayish brown well-sorted fine subangular SAND, little silt, loose, moist (4.0–6.0)	
			Light yellowish brown to light yellow well-sorted fine subangular SAND, little silt, loose, moist (6.0–10.0)	
10			Light brownish gray well-sorted subangular medium SAND, little silt, loose, reddish yellow mottling (10.0–12.0)	
			Light brownish gray well-sorted subangular medium SAND, little silt, loose, reddish yellow mottling, grades to poorly-sorted fine to coarse subangular SAND (12.0–14.4)	
			Light brownish gray poorly-sorted fine to coarse subangular SAND, some silt, trace subangular fine to medium gravel, dense, wet (14.4–15.2)	
15			Yellowish red CLAY, firm, high plasticity, wet (15.2–18.0)	
			Dark gray CLAY, firm, high plasticity, wet (18.0)	

Bottom of hole at 18.0 feet.

ENVIRONMENTAL BH LITHOLOGY LOGS DIGITIZED.GPJ ENVIRONMENTAL BH 4/10/19

BORING NUMBER SIGW-15

PAGE 1 OF 1

CLIENT USEPA **PROJECT NAME** Blades Groundwater

PROJECT NUMBER 30250.016.003.0207.00 **PROJECT LOCATION** Blades, DE

DEPTH (ft)	SAMPLE NUMBER	GRAPHIC LOG	MATERIAL DESCRIPTION	WELL DIAGRAM
0			Dark grayish brown well-sorted fine SAND, some silt, loose, moist (1.2)	
			Light yellowish brown well-sorted fine SAND, little silt, loose, moist, yellowish red mottling (5.2)	
5			Light yellowish brown well-sorted medium subangular SAND, little silt, loose, wet (7.0)	
			Light gray well-sorted medium SAND, little silt, loose, wet (13.6)	
10			Yellowish red well-sorted medium subangular SAND, some silt, wet (14.0)	
			Dark gray CLAY, medium firm, high plasticity, wet	
			Bottom of hole at 13.0 feet.	

ENVIRONMENTAL BH LITHOLOGY LOGS DIGITIZED.GPJ ENVIRONMENTAL BH 4/10/19

BORING NUMBER SIGW-16

PAGE 1 OF 1

CLIENT USEPA **PROJECT NAME** Blades Groundwater

PROJECT NUMBER 30250.016.003.0207.00 **PROJECT LOCATION** Blades, DE

DEPTH (ft)	SAMPLE NUMBER	GRAPHIC LOG	MATERIAL DESCRIPTION	WELL DIAGRAM
0			Very dark brownish gray well-sorted very fine SAND, some silt, moist (1.0)	
			Light brownish gray well-sorted fine subangular SAND, some silt, loose, moist, some reddish yellow mottling (2.0)	
			Very dark gray well-sorted fine subangular SAND, some silt, loose, moist (3.0)	
5			Light yellowish brown well-sorted subangular fine SAND, some silt, loose, moist (8.0)	
10			Light grayish brown well-sorted fine subangular SAND, some silt and clay, slight plasticity, loose, some yellowish red mottling, wet at 8 feet (12.0)	
			Light reddish brown poorly-sorted fine to very coarse subangular SAND, little silt, dense, wet (13.6)	
15			Light gray well-sorted fine subangular SAND, little silt, dense, wet (14.0)	

Bottom of hole at 18.0 feet.

ENVIRONMENTAL BH LITHOLOGY LOGS DIGITIZED.GPJ ENVIRONMENTAL BH 4/10/19

BORING NUMBER SIGW-17

CLIENT USEPA **PROJECT NAME** Blades Groundwater

PROJECT NUMBER 30250.016.003.0207.00 **PROJECT LOCATION** Blades, DE

DEPTH (ft)	SAMPLE NUMBER	GRAPHIC LOG	MATERIAL DESCRIPTION	WELL DIAGRAM
0				
			1.0 Very dark brownish gray well-sorted very fine SAND, some silt, moist	
			2.0 Light brownish gray well-sorted fine subangular SAND, some silt, loose, moist, some reddish yellow mottling	
			3.0 Very dark gray well-sorted fine subangular SAND, some silt, loose, moist	
5			Light yellowish brown well-sorted subangular fine SAND, some silt, loose, moist	
			8.0 Light grayish brown well-sorted fine subangular SAND, some silt and clay, slight plasticity, loose, some yellowish red mottling, wet at 8 feet	
10			12.0 Light reddish brown poorly-sorted fine to very coarse subangular SAND, little silt, dense, wet	
			13.6 Light gray well-sorted fine subangular SAND, little silt, dense, wet	
15			14.0 Light yellowish brown poorly-sorted fine to coarse subangular SAND, some silt, dense, wet	
			15.4 Light gray well-sorted fine subangular SAND, little silt, dense, wet	
			16.0 Very pale brown well-sorted medium subangular SAND, trace silt, dense, wet	
			18.0 Pale brown poorly-sorted fine to very coarse subangular SAND, little silt, trace well-rounded fine gravel, dense, wet	
20			19.6 Light gray CLAY, high plasticity, firm, moist	
			19.8 Pale brown poorly-sorted fine to very coarse subangular SAND, little silt, trace well-rounded fine gravel, dense, wet	
			20.0 Pale brown poorly-sorted fine to very coarse subangular SAND, little silt, trace well-rounded fine gravel, dense, wet, increasing clay content with depth, grades to soft, low plasticity CLAY with yellowish red mottling	
25			21.8 Light gray well-sorted fine subangular SAND, some clay, slight plasticity, trace well-rounded fine gravel, wet	
			22.0 Light gray poorly-sorted fine to very coarse SAND, subangular, some silt, some well-rounded fine to medium gravel, dense, wet, horizontal yellowish red color laminations	
			25.6 Light gray to yellowish red well-sorted fine SAND and soft CLAY, moderate plasticity, wet	
			25.8 Well-sorted fine subangular SAND, little silt, trace well-rounded gravel, dense, wet	
30			26.0 Light brownish gray well-sorted medium SAND, trace silt, loose, dense, wet	
			27.6 Light brownish gray well-sorted fine SAND, subangular, little clay, slight plasticity, dense, wet, light reddish yellow mottling	
			28.0 Light gray well-sorted medium SAND, subangular, trace silt, loose, wet	
			33.8 Light gray well-sorted fine to coarse SAND, some silt, some subrounded fine to medium gravel, dense, wet	
35				

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ENVIRONMENTAL BH LITHOLOGY LOGS DIGITIZED.GPJ ENVIRONMENTAL BH 4/10/19

BORING NUMBER SIGW-17

CLIENT USEPA **PROJECT NAME** Blades Groundwater

PROJECT NUMBER 30250.016.003.0207.00 **PROJECT LOCATION** Blades, DE

DEPTH (ft)	SAMPLE NUMBER	GRAPHIC LOG	MATERIAL DESCRIPTION	WELL DIAGRAM
35			35.6	
			36.0 Light gray poorly-sorted fine to coarse SAND, some silt, some subrounded fine to medium gravel, dense, wet, increasing gravel content with depth, horizontal reddish yellow lamination	
			38.0 Light gray well-sorted fine to medium subangular SAND, some silt, some fine to medium subrounded gravel, horizontal reddish yellow color lamination, dense, wet	
40			40.0 Light gray well-sorted fine to medium subangular SAND, some silt, some fine to medium subrounded gravel, dense, wet	
			41.6 Very light gray well-sorted medium subangular SAND, some silt, dense, wet	
			Medium gray poorly-sorted fine to coarse subangular SAND, some silt, some fine to coarse subangular gravel, yellowish red mottling, dense, wet	
45			44.6 Dark gray CLAY, soft, high plasticity, wet	
			46.0	

Bottom of hole at 46.0 feet.

ENVIRONMENTAL BH LITHOLOGY LOGS DIGITIZED.GPJ ENVIRONMENTAL BH 4/10/19

BORING NUMBER SIGW-18

CLIENT USEPA **PROJECT NAME** Blades Groundwater

PROJECT NUMBER 30250.016.003.0207.00 **PROJECT LOCATION** Blades, DE

DEPTH (ft)	SAMPLE NUMBER	GRAPHIC LOG	MATERIAL DESCRIPTION	WELL DIAGRAM
0				
	BDE-SO-01		Black well-sorted fine SAND, subangular, some silt, some coarse angular gravel, moist, loose (1.0)	
			Yellowish brown well-sorted fine SAND, little silt, loose, moist, wet at 6 feet (6.0)	
5	BDE-SO-04			
			Light gray well-sorted fine subangular SAND, some silt, loose, reddish yellow mottling, wet (8.0)	
			Brown to orange fine SAND, little silt (10.0)	
10			Brown to yellow fine to coarse SAND, little gravel, trace silt (12.6)	
			Gray fine to medium SAND, trace to little gravel, trace to little silt (13.9)	
15			Brown to yellow to gray fine to coarse SAND, trace to little gravel, trace silt (18.1)	
			Brown to orange fine SAND, little silt (18.6)	
			Gray fine to medium SAND and SILT (19.1)	
20			Light gray fine to medium SAND, trace silt (20.0)	
			Gray fine to medium SAND, little silt, little coarse sand, trace gravel, wet (21.0)	
			Light brown to yellow fine to coarse SAND, little silt, little gravel, wet (22.1)	
			Gray to light brown to yellow fine to medium SAND, little silt, trace coarse sand, trace gravel, wet (25.0)	
25			Gray to brown SILT/CLAY, trace fine sand, wet	
30				
35				

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ENVIRONMENTAL BH LITHOLOGY LOGS DIGITIZED.GPJ ENVIRONMENTAL BH 4/10/19

BORING NUMBER SIGW-18

CLIENT USEPA **PROJECT NAME** Blades Groundwater

PROJECT NUMBER 30250.016.003.0207.00 **PROJECT LOCATION** Blades, DE

DEPTH (ft)	SAMPLE NUMBER	GRAPHIC LOG	MATERIAL DESCRIPTION	WELL DIAGRAM
35			Gray to brown SILT/CLAY, trace fine sand, wet *(continued)*	
40				
			42.0	
			Poorly-sorted fine to coarse subangular SAND, some well-rounded fine to medium gravel, little silt, dense; light gray, dark gray, and yellowish red color lamination	
45			45.0	
			Dark gray CLAY, high plasticity, soft, wet	
50				
			54.0	
55			Dark gray CLAY, high plasticity, soft, wet, trace wood fibers	
			57.8	
			58.0 Yellowish red well-sorted subangular medium SAND, some clay, slight plasticity, wet	
60			60.0 No recovery	
			Medium reddish gray, well-sorted fine to medium subangular SAND, some silt, wet	
65				
			67.6	
			68.0 Brownish yellow well-sorted fine to medium SAND, some silt, dense, wet	
			Light gray well-sorted fine to medium SAND, some silt, dense, wet	
70			69.8	
			70.0 Brownish yellow well-sorted fine to medium SAND, some silt, dense, wet	
			Light brownish gray well-sorted fine to medium subangular SAND, some silt, dense, wet	
			73.2	
			74.0 Yellowish red soft CLAY and fine to medium subangular SAND, moderate plasticity, wet	
75				

ENVIRONMENTAL BH LITHOLOGY LOGS DIGITIZED.GPJ ENVIRONMENTAL BH 4/10/19

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BORING NUMBER SIGW-18

CLIENT USEPA **PROJECT NAME** Blades Groundwater

PROJECT NUMBER 30250.016.003.0207.00 **PROJECT LOCATION** Blades, DE

DEPTH (ft)	SAMPLE NUMBER	GRAPHIC LOG	MATERIAL DESCRIPTION	WELL DIAGRAM
75			75.2 Light yellowish red well-sorted fine subangular SAND, some silt, dense, wet *(continued)*	
			75.3	
			76.0 Light gray soft high plasticity CLAY, soft	
			78.0 Light yellowish red well-sorted fine subangular SAND, some silt, dense, wet	
			Reddish brown well-sorted fine subangular SAND, some silt, dense, wet	
80			79.6 Medium brownish gray well-sorted fine SAND, some silt, dense, wet	
			Reddish yellow well-sorted fine SAND, some silt, dense, wet	
			81.6	
			Pinkish red well-sorted fine SAND, some silt, dense, wet	
			84.0	
85			Reddish brown well-sorted subangular fine SAND, some silt, very dense, wet	
90				
95				
			96.0	

Bottom of hole at 96.0 feet.

ENVIRONMENTAL BH LITHOLOGY LOGS DIGITIZED.GPJ ENVIRONMENTAL BH 4/10/19

BORING NUMBER SIGW-19

PAGE 1 OF 1

CLIENT USEPA **PROJECT NAME** Blades Groundwater

PROJECT NUMBER 30250.016.003.0207.00 **PROJECT LOCATION** Blades, DE

DEPTH (ft)	SAMPLE NUMBER	GRAPHIC LOG	MATERIAL DESCRIPTION	WELL DIAGRAM
0			0.6 Medium grayish brown well-sorted fine subangular SAND, some silt, some subangular fine gravel, loose, moist	
			2.0 Reddish brown well-sorted fine subangular SAND, loose, moist	
			Reddish brown well-sorted fine subangular SAND, loose, moist, grades to yellowish brown	
			4.0 Light yellowish brown well-sorted subangular fine SAND, little silt, loose, moist	
5			8.0 Very light gray well-sorted fine SAND, subangular, trace silt, loose, moist, reddish yellow mottling	
10			10.0 Very light gray well-sorted fine SAND, subangular, trace silt, loose, moist, reddish yellow mottling, grades to subangular medium SAND, trace silt, loose, wet at 11 feet	
15			14.0 Light to medium gray poorly-sorted fine to coarse subangular SAND, some silt, some fine to coarse subrounded gravel, firm, wet, trace reddish yellow mottling	
			18.0 Light gray poorly-sorted fine to coarse subangular SAND, little silt, loose, wet	
20			19.0 Light gray well-sorted fine subangular SAND, trace silt, dense, wet	
			22.0	

Bottom of hole at 22.0 feet.

ENVIRONMENTAL BH LITHOLOGY LOGS DIGITIZED.GPJ ENVIRONMENTAL BH 4/10/19

BORING NUMBER SIGW-20

CLIENT USEPA **PROJECT NAME** Blades Groundwater

PROJECT NUMBER 30250.016.003.0207.00 **PROJECT LOCATION** Blades, DE

DEPTH (ft)	SAMPLE NUMBER	GRAPHIC LOG	MATERIAL DESCRIPTION	WELL DIAGRAM
0	BDE-SO-02		Dark gray well-sorted fine SAND, some silt, moist, loose	
3.0			Reddish yellow well-sorted fine SAND, some silt, moist, loose, subangular, wet at 10 feet	
5				
10	BDE-SO-03			
10.0			Light brownish gray well-sorted fine SAND, some silt, loose, subangular, faint reddish yellow mottling	
14.0			Light brownish gray poorly-sorted fine to coarse subangular SAND and fine to coarse subangular GRAVEL, some silt, loose, wet	
15				
15.2			Light gray well-sorted fine SAND, loose, wet	
20				
20.0			Light brownish gray fine to coarse subangular SAND, little silt, dense, wet	
22.0			Light yellowish brown fine to coarse subangular SAND, some fine to coarse subrounded gravel, some silt, dense, wet	
25				
26.0			Light gray well-sorted fine subangular SAND, some clay, slight plasticity, soft, wet	
28.0			No recovery	
30				
30.0			Light brownish gray poorly-sorted fine to coarse subangular SAND, some subangular fine gravel, some silt, dense, wet	
32.0			Light brownish gray well-sorted subangular fine SAND, little silt, dense, wet	
34.0				
35				

(Continued Next Page)

ENVIRONMENTAL BH LITHOLOGY LOGS DIGITIZED.GPJ ENVIRONMENTAL BH 4/10/19

BORING NUMBER SIGW-20

CLIENT USEPA **PROJECT NAME** Blades Groundwater

PROJECT NUMBER 30250.016.003.0207.00 **PROJECT LOCATION** Blades, DE

DEPTH (ft)	SAMPLE NUMBER	GRAPHIC LOG	MATERIAL DESCRIPTION	WELL DIAGRAM
35				
			36.0 Light brownish gray well-sorted fine to medium subangular SAND, some silt, trace well-rounded fine gravel, dense, wet, 1/8 inch thick reddish yellow color lamination at 35.5 feet *(continued)*	
			38.0 Dark gray to light yellowish brown poorly-sorted fine to coarse subangular to angular SAND, some silt, trace shell fragments, very dense, wet	
			39.6 Light brownish gray poorly-sorted fine to coarse subangular SAND, some well-rounded fine to coarse gravel, some silt, dense, wet	
40			40.0 Light gray well-sorted fine subangular SAND, dense, wet	
			41.6 Light brownish gray poorly-sorted fine to coarse subangular SAND, some well-rounded fine to coarse gravel, some silt, dense, wet	
			42.0 Light gray well-sorted fine subangular SAND, dense, wet	
			Yellow well-sorted fine to medium subangular SAND, dense, wet	
45			45.6	
			45.8 Reddish yellow to black firm CLAY, high plasticity, wet	
			46.0 Light yellowish gray poorly-sorted fine to very coarse subangular SAND, little silt, dense, wet	
			Dark gray very firm CLAY, high plasticity, wet	
50				
55				
60				
			61.8	
			62.0 Reddish yellow high plasticity CLAY, firm, little fine subangular SAND, wet	
			Yellowish red well-sorted medium SAND, subangular, some silt, dense, wet	
65				
			69.6	
70			70.0 Light brownish yellow soft high plasticity CLAY, wet	
			No recovery, mud rotary circulation loss	
			72.0	
			Dark gray soft high plasticity CLAY, some very fine sand, wet	
75				

(Continued Next Page)

ENVIRONMENTAL BH LITHOLOGY LOGS DIGITIZED.GPJ ENVIRONMENTAL BH 4/10/19

BORING NUMBER SIGW-20

CLIENT USEPA **PROJECT NAME** Blades Groundwater

PROJECT NUMBER 30250.016.003.0207.00 **PROJECT LOCATION** Blades, DE

DEPTH (ft)	SAMPLE NUMBER	GRAPHIC LOG	MATERIAL DESCRIPTION	WELL DIAGRAM
75				
			76.0 Dark gray soft high plasticity CLAY, some very fine sand, wet *(continued)*	
			Bottom of hole at 76.0 feet.	

ENVIRONMENTAL BH LITHOLOGY LOGS DIGITIZED.GPJ ENVIRONMENTAL BH 4/10/19

APPENDIX B

FIELD NOTES AND DATA COLLECTION SHEETS

WESTON SOLUTIONS

CLIENT/SUBJECT USEPA - Blades, DE W.O. NO. 30250.012.003.0207.00

TASK DESCRIPTION SW/SED Sampling TASK NO.

PREPARED BY Ex. 4 CBI DEPT EST DATE 9-19-18

MATH CHECK BY DEPT DATE

METHOD REV. BY DEPT DATE

APPROVED BY

DEPT DATE

9-19-18 1000 - Ex. 4 CBI and Ex. 4 CBI in Blades to conduct surface water and sediment sampling, checked in with homeowner for location 9; conducted H+S meeting; collecting samples by direct dip from stream

1045/1050 - collecting samples BDE-SD-09 and duplicate sample BDE-SD-09D; BDE-SW-09 and duplicate sample BDE-SW-09D @ 1035/1040, relocating to location #7, seds homogenized w/disposable scoop/pan

1245/1250 - collecting BDE-SW-07 and BDE-SD-07, moving to location 4

1340/1345 - collecting samples BDE-SW-04 and BDE-SD-04, moving to location 2

1455/1500 - sampling BDE-SW-02 and BDE-SD-02, moving to location 1

1545 - sampling BDE-SD-01 and BDE-SW-01, cleaning up and collecting field reagent blank

9-20-18 0900 - Ex. 4 CBI and Ex. 4 CBI on site, H+S meeting setting up @ location 3

0920/0925 - collecting BDE-SW-03 and BDE-SD-03, Conor O'Loughlin (USEPA) on site

1020/1025 - collecting BDE-SW-05 and BDE-SD-05, moving to location 6

1130/1135 - collecting BDE-SW-06 and BDE-SD-06, moving to location 8

1230/1225 - at Blades Marina, collecting BDE-SD-08 and BDE-SW-08, cleaning up and collecting field reagent blank

Ex. 4 CBI

9-20-2018

Ex. 4 CBI

WESTON SOLUTIONS

CLIENT/SUBJECT USEPA - Blades, DE W.O. NO. 30250.012.003.0207.00

TASK DESCRIPTION Groundwater Sampling TASK NO. —

PREPARED BY Ex. 4 CBI DEPT EST DATE 10-8-2018

MATH CHECK BY DEPT DATE

METHOD REV. BY DEPT DATE

APPROVED BY

DEPT DATE

10-8-18 1200 - on site, H&S meeting @ Pocono Enterprises @ 901 S Market St to conduct groundwater sampling; Ex. 4 CBI and Ex. 4 CBI Ex. 4 CBI conducting sampling; wx = 80°F, humid, cloudy light wind

Instrument	Calibration
Hanna HI 98703	S/N = 03399042
Parameter (NTU)	Result (NTU)
0.1	0.13
15	15.1
100	100
750	750
YSI Pro Plus	SN = 22547
Parameter	Result
pH 7	7.00
pH 4	4.00
pH 10	10.00
Cond. 1,000 mS/cm	1,009
D.O 100%	100.8 %
ORP 231.0 mV	230.9 mV

1230 - setting up @ MW-4, well screened 8-18' bgs, 1" flush mount PVC

1259 - began purge @ MW-4

1354 - sampling MW-4 (BDE-GW-04)

1415 - setting up @ MW-3

1432 - started purge @ MW-3

1522 - Sampled MW-3 (BDE-GW-03), moving to MW-5

1604 - Began purge @ MW-5 (screened 9-19')

1644 - Sampling MW-5, relocating to MW-13, checked in with homeowner before accessing property, MW-5 sample = BDE-GW-05

1724 - Began purge @ MW-13

1740 - collected Field Reagent Blank BDE-FRB-01

1810 - collected sample @ MW-13 (BDE-GW-13), cleaning up

1845 - set up IDW drum @ Peninsula Plating property and staged purge water

Ex. 4 CBI

WESTON SOLUTIONS

CLIENT/SUBJECT USEPA - Blades, DE W.O. NO. 3258.003.012.0207.00

TASK DESCRIPTION Ground water Sampling TASK NO.

PREPARED BY Ex. 4 CBI DEPT ESIT DATE 10-9-2018

MATH CHECK BY DEPT DATE

METHOD REV. BY DEPT DATE

APPROVED BY DEPT DATE

10-9-18 0700 - on site, H+S meeting with Ex. 4 CBI and Ex. 4 CBI conducting ground water sampling; WX = cloudy, 70°F, humid

Instrument Calibration

Hanna HI 9 8703 S/N 08399042

Parameter (NTU)	Results (NTU)
0.1	0.13
15	16.0
100	102
750	776

YSI Pro Plus SN 22547

Parameter	Result
ORP 237.5 @ 20°C	237.6
pH 7	7.01
pH 4	4.00
pH 10	10.05
cond. 1,000 µS/cm	1,000
D.O. 100%	101.4

0820 - set up and began purge @ DMW-2 (screened 37-47' bgs), 2" PVC double-cased well

0910 - collecting sample @ DMW-2 (BDE-~~DMW2~~ DMW-02), setting up @ MW-9

0941 - began purge @ MW-9 (screened 7-27' bgs)

1011 - sampling MW-9 (BDE-GW-09), Ex. 4 CBI from Ten Bears Env. on site, relocating to MW-01 (screened 8-18' bgs)

1154 - collecting sample and MS/MSD @ MW-01 and FRB-02

1400 - lunch off site

1459 - began purge @ MW-2 (screened 8-18')

1524 - collected sample MW-2 and duplicate (BDE-GW-02 and BDE-GW-MW02D)

1705 - Transferring purge water to drum @ staging area

Ex. 4 CBI 10-9-2018 Ex. 4 CBI

WESTON SOLUTIONS

SHEET 3 of 4

CLIENT/SUBJECT USEPA - Blades, DE W.O. NO. 3a250, 012013, 0207.00

TASK DESCRIPTION Groundwater Sampling TASK NO.

PREPARED BY Ex. 4 CBI DEPT ESHT DATE 10-10-18

MATH CHECK BY DEPT DATE

METHOD REV. BY DEPT DATE

APPROVED BY

DEPT DATE

10-10-18 0700 - Ex. 4 CBI and Ex. 4 CBI on site, H&S meeting, continuing groundwater sampling

0715 - Instrument Calibration

Hanna HI 98703 S/N 08398042

Parameter (NTU)	Results (NTU)
0.1	0.15
15	15.1
100	100
750	750

YSI Pro Plus S/N 22547

Parameter	Results
D.O. 100%	100.6
pH 7	7.02
pH 4	3.99
pH 10	10.00
Cond. 1,000 µS/cm	1,000
ORP 237.5 @ 20°C	237.5

0800 - Began purge @ DMW-1 (screened 34-44'); Ex. 4 CBI (Ten Bears Env.) and Connor O'Loughlin (USEPA) on site

0908 - sampling DMW-2

1000 - MW-06 obstructed or collapsed @ 9.55', unable to sample, Ex. 4 CBI also indicated they hadn't been able to sample MW-06; setting up @ MW-07 (screened 18-28')

1131 - sampling MW-07 (BDE-GW-07), moving to DMW-3, water level meter malfunctioning; battery connector has a broken wire, left site to find a replacement wire connector; repaired water level meter

1606 - Began purge @ DMW-3 (screened 24-34')

1711 - Collected sample @ DMW-3

1612 - began purge @ MW-15 (screened 6-16 feet)

1842 - collected sample @ MW-15

1915 - containerizing purge water

Ex. 4 CBI

WESTON SOLUTIONS

CLIENT/SUBJECT USEPA - Blades, DE W.O. NO.

TASK DESCRIPTION Ground water Sampling TASK NO.

PREPARED BY Ex. 4 CBI DEPT GHT DATE 10-11-18

MATH CHECK BY DEPT DATE

METHOD REV. BY DEPT DATE

APPROVED BY

DEPT DATE

10-11-18 0700 - Ex. 4 CBI and Ex. 4 CBI on site to continue groundwater sampling, H+S meeting, weather = rainy, 70's °F, humid

0715 - Instrument Calibration

Hanna HI 98703	S/N 08399042
0.1	0.15
15	14.8
100	101
750	748

YSI Pro Plus	S/N = 22547
Parameters	Results
D.O. 100%	99.6
pH 7	7.01
pH 4	3.99
pH 10	10.00
Cond. 1,000 µS/cm	1,000
ORP 237.5	237.5

0803 - began purge @ MW-11 (screened 5-25')

0853 - collecting sample @ MW-11 (BDE-GW-11), moving to MW-12

0948 - began purge @ MW-12 (screened 4-24')

1023 - collected sample @ MW-12 (BDE-GW-12), Ex. 4 CBI (Ten Bears Env.) on site

1116 - began purge @ MW-8 (screened 4-24')

1156 - sampling MW-8 (BDE-GW-08), Ex. 4 CBI leaving site, moving to MW-10

1239 - began purge @ MW-10 (screened 4-24'), collected FRB-04 @ 1245

1309 - collecting sample @ MW-10 (BDE-GW-10)

1429 - sampling MW-14 (BDE-GW-14)

Ex. 4 CBI

10-11-2018

Ex. 4 CBI

Ex. 4 CBI

WESTON SOLUTIONS

SHEET 7 of

CLIENT/SUBJECT Blades, DE - USEPA W.O. NO. 30250.012.003.0207.00

TASK DESCRIPTION SF Well Installation TASK NO.

PREPARED BY Ex. 4 CBI DEPT ESFT DATE 10-15-18

MATH CHECK BY N/A DEPT N/A DATE N/A

METHOD REV. BY N/A DEPT N/A DATE N/A

APPROVED BY

DEPT DATE

1100 - on site, H+S meeting with Talon Drilling (Ex. 4 CBI Ex. 4 CBI): discussed drilling H+S, COC's, PFAS considerations; Talon moving staging area located @ former Peninsula Plating site and unloading materials

1345 - observed water discharging through 4" lay-flat hose onto Peninsula Plating property from property to the north; planned well cluster is inundated with discharge water; moved proposed location ~30' to the southwest to stay clear of the water accumulation

1510 - Ex. 4 CBI leaving site with material truck

1530 - Finished setting up decon pad, began pre-drilling auger decon using steam cleaner

1630 - Finished decon, setting drill rig (Mobile B-59) on first drilling location ~~(BGW-02)~~ SIGW-02)

1645 - Leaving site

10-16-18 0700 - On-site, H+S meeting with Talon Drilling (Ex. 4 CBI and and Ex. 4 CBI), preparing to drill well SIGW-02)

1150 - Finished split spoons @ SIGW-02 to 46' bgs

1420 - Finished installing SIGW-02, 2" PVC (Sch 40), 10-slot screen 35-45' bgs #1 sand 33-45', bentonite 31-33', Portland cement bentonite grout to surface, moved rig ~5' to the SW to install SIGW-01

1455 - Finished installing SIGW-01, 2" PVC (Sch. 40) 10-slot screen, screened interval 3-13' bgs, ~~bentonite 1-3'~~ #1 sand 2-13', bentonite to surface

1515 - Steam clean decon augers and tooling

1605 - Finished decon, moving to SIGW-04

1625 - Started continuous split spoons @ SIGW-04

1730 - Stopped HSA/split spoon @ 24' (SIGW-04), began clean-up

1745 - Leaving Site

10-17-18 0700 - on site, H+S meeting with Talon Drilling, resumed split spoon @ SIGW-04

0900 - Encountered clay layer @ 34' in SIGW-04, stopped to set screen between upper clay (13-17') and lower clay @ 34'

Ex. 4 CBI

WESTON SOLUTIONS

SHEET 2 of

CLIENT/SUBJECT Blades DE-USEPA W.O. NO. 30250.012.003.0207.00

TASK DESCRIPTION SI Well Installation TASK NO.

PREPARED BY Ex. 4 CBI DEPT EST DATE 10-17-2018 APPROVED BY

MATH CHECK BY N/A DEPT N/A DATE N/A

METHOD REV. BY N/A DEPT N/A DATE N/A DEPT DATE

10-17-18 cont. 0915 - Began setting well @ SI GW-04, screened 25-35' bgs, #1 sand 23-35', bentonite 21-23', cement-bentonite grout to surface

1145 - Finished installing SI GW-03, screened 3-13' bgs, #1 sand 2-13', bentonite to surface, began auger decon with steam cleaner @ decon pad

1315 - Began split spoons @ SI GW-06

1520 - Reached total depth @ SI GW-06; installed 2" PVC well screened (10-slot) 30-40' bgs, sand 28-40', bentonite 26-28', cement-bentonite grout to surface

1730 - Finished grouting SI GW-06, began drilling SI GW-05, 2" PVC, 10-slot screen 12-17', sand 10-17', bentonite 8-10', grout (portland-bentonite) to surface

1815 - Finished installing SI GW-05, cleaning up, taking augers to decon pad

1845 - Leaving site

10-18-18 0705 - On site, HTS meeting with Talon Drilling, steam clean decon augers used yesterday (Ex. 4 CBI)

0815 - Started split spoon @ SI GW-08

1045 - reached total depth @ SI GW-08; installing SI GW-08 screened 33-43' (2" PVC, 10-slot), #1 sand 31-43', bentonite 29-31', Portland cement-bentonite grout to surface

1200 - Finished grouting SI GW-08, cleaning up and moving to decon area; Ex. 4 CBI (Talon) on site, to start building concrete pads at finished wells

1410 - Moved drums to staging area and performed auger steam clean decon

1530 - Setting up @ SI GW-10

1730 - Stopped @ 30' @ SI GW-10

1745 - Leaving site

10-19-18 0715 - On site, HTS meeting with Talon (Ex. 4 CBI); will continue drilling SI GW-10 and installing surface completions, warming up equipment

0745 - resumed drilling SI GW-10

0945 - Reached total depth @ SI GW-10, Installing 2" PVC

Ex. 4 CBI

WESTON SOLUTIONS

SHEET 5 of

CLIENT/SUBJECT Blades, DE- USEPA W.O. NO. 30250.012.003.0207.00

TASK DESCRIPTION SI Well Installation TASK NO.

PREPARED BY Ex. 4 CBI DEPT ESFT DATE 10-19-18

MATH CHECK BY N/A DEPT N/A DATE N/A

METHOD REV. BY N/A DEPT N/A DATE N/A

APPROVED BY

DEPT DATE

10-19-18 cont.

(0945) - well, 10-slot PVC screen 34-44' bgs, #1 sand 32-44', bentonite 30-32', Portland cement - bentonite grout to surface

1100 - Finished installing SIGW-10, began istalling SIGW-09, 2" dia. PVC, 10-slot screen 3-13' bgs, sand 2-13' bgs (#1 sand), bentonite to surface

1135 - Finished installing SIGW-09, cleaning up work area, Ex. 4 CBI loading up and Ex. 4 CBI working on installing stickups + concrete pads for SIGW-09 and SIGW-10, moving drums to staging area

1400 - Leaving Site

Ex. 4 CBI

10-22-18 1030 - On site, Talon Drilling (on site, H+S meeting, reviewed SOW; warming up rig and loading up materials

1145 - Setting up @ SIGW-12

1530 - Reached total depth (46') @ SIGW-12; installing SIGW-12, 2" PVC, 10-slot PVC screen, screened 35-45' bgs; #1 sand 33-45', bentonite 31-33'; Portland cement - bentonite grout to surface

1705 - Finished installing SIGW-12, began installing SIGW-11; 2" PVC, 10-slot PVC screen 3-13' bgs; #1 sand 2-13' bgs; bentonite to surface

1800 - Finished installing SIGW-11, moving drums to staging area and taking augers to decon pad

10-23-18 0710 - on site, Talon on site warming up rig; H+S meeting

0800 - setting up @ SIGW-13

1215 - reached total depth @ SIGW-13 (52' bgs) 2" PVC well, 10-slot screen 42-52' bgs, #1 sand 40-52', bentonite 38-40' bgs, Portland cement - bentonite grout to surface

1430 - Finished grouting SIGW-13, cleaning up area, moving augers to decon pad

1600 - Finished steam clean decon, setting up @ SIGW-14

1620 - Set up @ SIGW-14

1710 - Installing SIGW-14, 2" PVC well, screen 5-15' bgs, 10-slot PVC, #1 sand 3-15, bentonite to surface

WESTON SOLUTIONS

SHEET 4 of ___

CLIENT/SUBJECT Blades, DE - USEPA W.O. NO. 30250.012.003.0207.00

TASK DESCRIPTION SI well installations TASK NO. ___

PREPARED BY Ex. 4 CBI DEPT ES+T DATE 10-23-18 to 10-24-18

MATH CHECK BY N/A DEPT N/A DATE N/A

METHOD REV. BY N/A DEPT N/A DATE N/A

APPROVED BY ___ DEPT ___ DATE ___

10-23-18 con't 10-24-18

1830 - Moving equip to staging area, leaving site

Ex. 4 CBI 10-23-2018

0710 on site, H+S meeting with Talon (Ex. 4 CBI) auger steam clean decon

0800 - set up @ SIGW-19 along parking lot of Blades Public Park, allowing rig to warm up

0820 - Began drilling SIGW-19

0920 - Reached total depth @ SIGW-19 (22'), began installing 2" PVC well, 10-slot PVC screen 10-20' bgs, #1 sand 8-20', bentonite ~~6-8'~~, ~~Portland cement bentonite grout to surface~~ 2-8', flush mount manhole / concrete pad

1130 - Finished installing SIGW-19, driller noted fraying in winch cable, stopped to replace winch cable

1420 - Installing concrete pad @ SIGW-19

1830 - Finished installing concrete pads, Leaving site

10-25-18 0710 - on site, H+S meeting with Talon (Ex. 4 CBI); warming up rig and loading up materials

0820 - At drilling location for SIGW-16, and SIGW-17, utility markings are unclear; Blades Water Dept. came to site to clarify water lines; sewer was marked by Sussex County; Sussex county indicated drill location is outside their area of responsibility; marked pipe was not detected by private utility locator; open sewer manhole; pipe in question is 6" dia. PVC, measured 4' bgs; hand clearing drill locations using post hole digger

0920 - Finished hand clearing to 5' bgs; Connor O'Laughlin (USEPA) on site; setting up to drill SIGW-17

1420 - Reached total depth @ SIGW-17 installing 2" PVC well, 10-slot PVC screen ~~35-45'~~ 34-44 bgs, #1 sand ~~33-45'~~ 32-44, bentonite ~~31-33'~~ 30-32; Portland cement - bentonite grout to surface

1615 - Finished installing SIGW-17, began drilling SIGW-16 - 2" PVC, 10-slot PVC screen 8-18' bgs, #1 sand 6-18', bentonite

1715 - Finished installing SIGW-16, moving drums to staging area, auger steam clean decon

WESTON SOLUTIONS

SHEET 5 of ____

CLIENT/SUBJECT Blades, DE - USEPA W.O. NO. 3.250.012.003.0207.00

TASK DESCRIPTION SI Well Installation TASK NO. ____

PREPARED BY Ex. 4 CBI DEPT EST DATE 10-26-18

MATH CHECK BY N/A DEPT N/A DATE N/A

METHOD REV. BY N/A DEPT N/A DATE N/A

APPROVED BY ____ DEPT ____ DATE ____

10-25-18 0710 - on site, H+S meeting with Ex. 4 CBI (Talon Drilling), warming up rig and loading up well materials

0820 - Installing SIGW-15, 2" PVC, 10-slot PVC screen 3-13' bgs, #1 sand 2-13', bentonite to surface

1030 - Finished installing SIGW-15, moving drum to staging area, steam clean decon augers

1115 - Moved to Procino Enterprises area to build concrete pads @ SIGW-16 and SIGW-17

1330 - Leaving site

10-29-18 0930 - Met Ex. 4 CBI (Weston) in Blades; conducted site orientation, reviewed H+S plan, H+S tailgate, discussed SOW;

1000 Talon Drilling (Ex. 4 CBI) on site, H+S meeting, reviewed SOW; Ex. 4 CBI will drill SIGW-18 by mud rotary with Ex. 4 CBI will begin well development with Ex. 4 CBI

1330 Setting up drill @ SIGW-18, collecting split spoon for soil (unsaturated) samples; split spoon equipment blank

1400 Collected BDE-SO-01 plus duplicate (soil 0-2' bgs @ SIGW-18 location) for PFAS

1410 Collected BDE-SO-02 from 4-6' bgs + MS/MSD @ ~~SIGW-SO-02~~ SIGW-18 location; began advancing mud rotary bit to 40' (have lithology to that depth in existing intermediate well clustered with new SIGW-18)

1735 Reached 52' with mud rotary and split spoons, cleaning up

1630 Leaving Site

10-30-18 0710 on site, H+S meeting Ex. 4 CBI and Ex. 4 CBI calibrating PID and YSI, Talon Drilling Co. (Ex. 4 CBI) warming up truck and drill rig

0800 - Ex. 4 CBI (Talon) resumed well development, Ex. 4 CBI and Ex. 4 CBI resumed drilling @ SIGW-18

0915 - Ex. 4 CBI (Ten Bears Env.) on site

1000 - Connor O'Loughlin (USEPA) on site

1130 - Ex. 4 CBI (Ten Bears Env.) on site

1410 - Connor O'Loughlin leaving site

1530 - Reached total depth (96' bgs) @ SIGW-18

WESTON SOLUTIONS

SHEET 6 of

CLIENT/SUBJECT USEPA - Blades DE W.O. NO. 30250.012.003.0207.00

TASK DESCRIPTION Well Installations - SI TASK NO.

PREPARED BY Ex. 4 CBI DEPT ES&T DATE 10-30-2018

MATH CHECK BY DEPT DATE

METHOD REV. BY DEPT DATE

APPROVED BY

DEPT DATE

10-30-18 - con't.

1530 - recirculating mud, installing 2" dia PVC well, 10-slot PVC screen 65-95', #1 sand 63-95', bentonite 61-63', Portland cement bentonite grout to surface, 7" borehole.

1620 - Driller noted slight hydraulic leak, contained with bucket and absorbent pads

1710 - Hydraulic hose repaired, resumed setting well

1820 - Finished tremie grouting SIGW-18, began cleanup; used 13 bags sand, 1 bag bentonite

1900 - Leaving site

10-31-2018

0715 - On site, H+S meeting, Ex. 4 CBI and Ex. 4 CBI (Talon) will continue well development, Joe, Joey, and Mike will move drums to staging area and steam clean decon drill tooling and spoons with Ex. 4 CBI

1030 - Finished decon, moving equipment to set up @ SIGW-20

1115 - Connor O'Loughlin (USEPA) on site; Ex. 4 CBI (Ten Bears Env.) was also on site @ 0830

1155 - collected Field reagent blank #2

1205 - collected equipment rinse blank #2

1215 - Began drilling SIGW-20

1245 - Collected soil sample BDE-SO-02, 0-2' bgs

1300 - Collected soil sample BDE-SO-03, 8-10' bgs (DTW = 10')

1830 - Stopped drilling for the night, cleaning up

1845 - Leaving site

11-1-2018

0715 - On site H+S meeting with Ex. 4 CBI (Talon), Ex. 4 CBI (Talon) and Ex. 4 CBI (Weston) will continue well development; Ex. 4 CBI Frizzell will continue drilling SIGW-20

0900 - Mud rotary circulation loss @ 70' bgs, 70-72' spoon = no recovery, 72-76' is sandy clay; discussed with Ex. 4 CBI and Connor O'Loughlin; will install 5' screen 67-72' to span high-K zone above the clay, tripping out tooling

1130 - Installing SIGW-20 with 2" PVC; 10-slot PVC screen 67-72'; #1 sand 65-72', bentonite 63-65', Portland cement bentonite grout to surface

1400 - Finished tremie grouting SIGW-20, cleaning up

WESTON SOLUTIONS

SHEET ____ of ____

CLIENT/SUBJECT ____ W.O. NO. ____

TASK DESCRIPTION Blades 11/6/18 TASK NO. ____

PREPARED BY ____ DEPT ____ DATE ____

MATH CHECK BY ____ DEPT ____ DATE ____

METHOD REV. BY ____ DEPT ____ DATE ____

APPROVED BY ____ DEPT ____ DATE ____

0700 - (SigW 9 & SigW10) START, Ex. 4 CBI, arrive at wells SigW9 & SigW10.
0705 - START conducts H&S briefing
0710 - Ex. 4 CBI calibrates the 3 YSI units while J. Frizzel ~~prepar~~ preps the wells
0715 - YSI: RFW22547 - pH4 - actual reading 3.99, pH7 - A.R. 7.01 pH 10.0 - AR. 10.02, conductivity 1000 - A.R. - 1001 µ/cm, ORP (temp 14°C) 244.0 mV - AR - 243.8 mV
DO - 100.1 %
0735 - RFW22546 unable to turn on
0737 - RFW22539 - ~~pH~~ DO - actual reading (AR) 99.6 %, pH4 - 3.96 pH7 - 6.95, pH10 - 10.06, cond - 1001, ORP cal 244.0 - A.R. 244.6
0749 - Turbidity Meter RFW22509 750NTU - actual reading 755 NTU, 100NTU - A.R. 97.5, 15NTU - A.R. - 15.3, <0.10 NTU AR - 0.10
0805 - ~~g~~ collect sample BDE-SIGW-09, total depth of well ~~12.6 ft~~ 12 ft bgs
0815 - collect sample BDE-SIGW-10, total depth 45 ft bgs
0905 START Arrives at wells 11 & 12.
0915 - Begin purging well SIGW11
0920 - begin purging well SIGW12
0952 - Collect sample BDE-SIGW-11, MS/MSD sample; 12.73 bgs
*late entry - 0942 - Collected sample BDE-SIGW-12, depth to bottom 45.21 ft bgs.
1115 - START Arrives at wells SIGW-13 and SIGW15
1125 - begin purging well SIGW13
1128 - begin purging well SIGW15
1210 - collect BDE-SIGW-13; DTB 56.90 ft bgs
1213 - collect BDE-SIGW-15; DTB 12.87 ft bgs
13:10 - Arrive at BDE-SIGW-1 & BDE-SIGW-2
1324 - Begin purging BDE-SIGW-1
1327 Begin purging BDE-SIGW-2

04P-0685

WESTON SOLUTIONS

SHEET ____ of ____

CLIENT/SUBJECT Continued W.O. NO. ____

TASK DESCRIPTION Blades 11/6/18 TASK NO. ____

PREPARED BY ____ DEPT ____ DATE ____

MATH CHECK BY ____ DEPT ____ DATE ____

METHOD REV. BY ____ DEPT ____ DATE ____

APPROVED BY ____ DEPT ____ DATE ____

1422 - collected sample BDE-SIGW-02 depth to bottom 46.72ft (bgs).
1423 - collected sample BDE-SIGW-02-D
1424 - collected sample BDE-SIGW-01, MS/MSD collected at this location; DTB (depth to bottom) 15.29ft bgs
1600 - clean up at well, head back to hotel for sample processing
1830 - Deliver samples out fed ex
1930 - arrive back at hotel, end of day

Ex. 4 CBI

11/6/18

WESTON SOLUTIONS

SHEET ____ of ____

CLIENT/SUBJECT Blades 11/7/2018 W.O. NO. ____

TASK DESCRIPTION ____ TASK NO. ____

PREPARED BY ____ DEPT ____ DATE ____

MATH CHECK BY ____ DEPT ____ DATE ____

METHOD REV. BY ____ DEPT ____ DATE ____

APPROVED BY ____ DEPT ____ DATE ____

0700, Meet with team, organize equipment in vehicle

0755 - calibrate YSI units: RFW22539 - DO - 100.3 pH 10 - reading 10.07, pH 7 - 6.97, pH 4 - 3.95 conductivity - 1000 uS/cm - AR - 980 uS/cm ORP @ 10°C 250.6 - AR 250.5

YSI unit RFW22547 - pH 10 - 10.01 (A.R), pH 7 - 7.06 pH 4 - 3.96 conductivity 1000 uS/cm - AR 1008 uS/cm, ORP ~~100.~~ @ 10°C - 250.5 - AR 250.4 DO - 100.1%

~~YSI RFW 22~~ turbidity meter RFW 22509 - 750 NTU - 776 NTU 100 NTU - 106 NTU 15 NTU - 15.8 NTU, <10 NTU - 1.45 NTU

0815 - Arrive at wells SIGW 03 & SIGW 04

0835 - Begin purging SIGW 03

0836 - Begin purging SIGW 04

0917 - Collect BDE - SIGW - 03; DTB - 15.07 ft bgs

0923 - Collect BDE - SIGW - 04 DTB - 38.12 ft bgs

~~11:09~~ 10:40 - arrive at wells ~~BDE~~ SIGW - 07 & SIGW 08

1053 - begin purging SIGW - 08

1054 - begin purging SIGW - 07

1118 - collect sample BDE - SIGW - 08, (dup was collected here at 1117 - BDESIGW-08D)

1119 - collect sample BDE - SIGW - 07

1205 - arrive at wells SIGW - 05 & SIGW 6

1228 - begin purging well SIGW-05

1248 - collect sample BDE - SIGW-05

1257 - begin purgin well SIGW-06

1317 - collect sample BDE - SIGW-06

1343 - arrive at wells SIGW-16 and SIGW-17

1405 - begin purging well SIGW-16

1407 - begin purging well SIGW-17

1430 - collect BDE - SIGW-16

1432 - collect BDE - SIGW-17

Ex. 4 CBI

2 11/5/18 Blades SI

0700 START meets at Weston office
load vehicles with supplies
And mobilize to site.
1000 Arrive in Blades
1015 H&S meeting/Ops meeting: Will be
collecting on the public supply
Wells today. Wear proper PPE.
Watch out, watch for slips/trips falls.
1030 Distribute supplies between
two vehicles.
1130 Arrive at public supply wells
1,2,&3
1145 START M.E & M.P collect
sample PSW-01
1155 Collect sample PSW-02
1207 Collect Sample PSW-03
1230 Depart township building
& begin locating wells & checking
water levels for sampling
next couple of days
1600 Departs from Blades for West
Chester to pick up cooler delivered
to the Office.
1830 Pick up cooler, end of day.

11/5/18

Ex. 4 CBI

3 11/6/18 Blades SI

1000 Arrive back in Blades to
continue sampling
1045 Buy ice for sample
shipment this afternoon
1235 Arrive at Well TBW-01
& begin setting up for sampling
1300 Begin Purging well &
collecting ~~sample~~ water quality
parameters.
1340 Collect sample TBW-01
1420 Pack up at well & head back
to hotel to begin processing
samples for shipment while other
team continues sampling wells
1600 begin packing coolers
1830 Coolers dropped off at fedex
End of day.

11/6/18

Ex. 4 CBI

Rite in the Rain

11/7/18 Blades SI

0700 Morning Meeting: Groundwater sampling will continue today. Wear proper PPE, watch for slips trips & falls. Still wet out from this weeks rain.

0730 Begin distributing equipment & supplies.

0755 Arrive at well SIGW-14 begin setting up pump

0807 Begin purging & collecting water quality parameters

0845 Collect sample SIGW-14

0915 Pack up & head to SIGW-19

0930 Arrive at SIGW-19 & begin setting up pump.

0945 Begin purging & collecting Parameters.

1025 Collect SIGW-19.

1100 Pack up & leave Well SIGW-19

~~1100~~ 1130 Arrive at well SIGW-18 & begin setting up pump

1149 Begin purging well

1220 Collect sample SIGW-18

1255 Pack up and leave Well SIGW-18 and head to next well.

Ex. 4 CBI

11/7/18 Blades SI

1325 Arrive at well SIGW-20 & begin setting up pump.

1338 ~~Begin~~ Begin Purging well & collecting parameters.

1415 Collect Sample SIGW-20

1440 Pack up supplies & head back to Hotel to begin sample management.

1630 Begin packing coolers for shipment ~~1830~~

1830 Leave to Drop off coolers at Fedex. End of day

11/7/18

Ex. 4 CBI

Rite in the Rain

WESTON SOLUTIONS

SHEET 1 of 2

CLIENT/SUBJECT EPA R III - Blades SI

W.O. NO. 30250.012.003.0207.00

TASK DESCRIPTION PFA'S Resampling GW

TASK NO.

PREPARED BY Ex. 4 CBI DEPT Start DATE 3/26/19

MATH CHECK BY DEPT DATE

METHOD REV. BY DEPT DATE

APPROVED BY

DEPT DATE

10 am STARTS Ex. 4 CBI & Ex. 4 CBI ONSite @ Blades, DE Municipal building
Weather: 39°F and sunny w/ 13 mph winds

YSI RFW # 22538 cal

Sp. Cond = 1320 (1000)
pH 7 = 7.28
pH 10 = 10.25
pH 4 = 3.89

YSI RFW # 22548

Sp. Cond =
pH 7 = 7.23
pH 10 = 10.17
pH 4 = 4.57

10 15 am Sampled public supply wells (all 3) plus FRB's.

11:00 am Staged 2 closed top plastic poly drums for IDW in old peninsula plating field.

11:30 am Ex. 4 CBI & Ex. 4 CBI split up wells.

MW-02 sampled @ 1248 pm & FRB @ 1253
MW-05 sampled @ 1415 pm & FRB @ 1425
MW-14 sampled @ 1528 pm & FRB @ 1533

@ ~~M~~ SIGW-04 sampled @ 1210 pm & FRB @ 1215
SIGW-03 sampled @ 1250 pm & FRB @ 1255
SIGW-06 sampled @ 1400 pm & FRB @ 1405
SIGW-05 sampled @ 1450 pm & FRB @ 1455
TBW-01 sampled @ 1645 pm & FRB @ 1650

1715 START Offsite for day.

Ex. 4 CBI 3/26/19

04P-0685

an employee-owned company

WESTON SOLUTIONS

SHEET 2 of 2

CLIENT/SUBJECT EPA RIII - Blades SI W.O. NO. 30250.012.003.0207.00

TASK DESCRIPTION RFA's Resampling fw TASK NO.

PREPARED BY Ex. 4 CBI DEPT START DATE 3/27/19

MATH CHECK BY DEPT DATE

METHOD REV. BY DEPT DATE

APPROVED BY

DEPT DATE

0830 START Ex. 4 CBI & Ex. 4 CBI onsite.
Weather: 29° F and cloudy / drizzling. 15mph winds.

YSI RFW#22548 cal

Sp. cond. = 1002 (1,000)
pH 7 = 6.81
pH 10 = 9.87
pH 4 = 3.98

YSI RFW#22538

Sp cond. = 1237 (1,000)
pH 7 = 7.10
pH 10 = 10.63
pH 4 = 3.86

0845 Ex. 4 CBI & Ex. 4 CBI divide up wells and split up for day of sampling.

SIGW-19 sampled @ 09:30 & FRB @ 0935
SIGW-15 sampled @ 11:10 & FRB @ 11:15
SIGW-13 sampled @ 11:15 & FRB @ 11:20
SIGW-08 sampled @ 9:55 & FRB @ 10:00
SIGW-14 sampled @ 12:29 & FRB @ 12:34
~~MW-02 sampled @ 12:40 & FRB @ 12:53~~
~~MW-05~~

RW

1300 START took one empty drum that was not used for IDW.
1315 START offsite with samples.

Ex. 4 CBI 3/26/19

an employee-owned company

ATTACHMENT 1

CLP ANALYTICAL DATA PACKAGES

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
Environmental Sciences Center
701 Mapes Road
Fort Meade, Maryland 20755-5350

DATE: 12/4/2018

SUBJECT: Region III Data QA Review

FROM: Brandon McDonald
Region III ESAT RPO(3EA22)

TO: CONNOR O'LOUGHLIN
Hazardous Site Cleanup Division (HSCD)

Attached is the data validation report for the BLADES GROUNDWATER site for RAS#47891; SDG# MC0AD2 completed by the Region III Environmental Services Assistance Team(ESAT) contractor, ICF International, under the direction of Region III EAID.

If you have any questions regarding this review, please call Brandon McDonald at (410) 305-2607 or you can call Eric Graybill at (410)-305-2665.

Attachment

cc: Ex. 4 CBI (WESTON SOLUTIONS)
Ex. 4 CBI (WESTON SOLUTIONS)

TO: #0002 TDF: #1118013

Printed on 100% recycled/recyclable paper with 100% post-consumer fiber and process chlorine free.
Customer Service Hotline: 1-800-438-2474

ICF
ESAT Region 3
US Environmental Protection Agency Environmental Science Center
701 Mapes Road Ft. Meade, MD 20755-5350
Phone 410-305-3012

Date: November 18, 2018

To: Brandon McDonald
ESAT Region 3 Project Officer

From: Ex. 4 CBI
Validator

Ex. 4 CBI
Reviewer

Subject: Inorganic Data Validation (S4VEM)
Blades Groundwater
47891 MC0AD2

Overview

This data package consisted of eighteen (18) ground water samples, including a field duplicate pair, analyzed for cyanide (CN^-) by spectrophotometry.

Analyses were performed by Chemtex (CHX) according to Contract Laboratory Program (CLP) Statement of Work (SOW) ISM02.4.

Data were validated according to the National Functional Guidelines for Inorganic Superfund Methods Data Review and applicable USEPA Region 3 modifications. Electronic validation was performed by the Electronic Data eXchange & Evaluation System (EXES). The validation report has been assigned the Superfund Data Validation Level Stage_4_Validation_Electronic_Manual (S4VEM).

The following validation narrative is an evaluation of laboratory reported data based on the hardcopy data package received by Region 3 on October 30, 2018.

Summary

Sample holding time were exceeded requiring rejection of sample results. Less significant data quality outliers requiring estimation of sample results were identified including, but not limited to, blank contamination as detailed below.

Major Problem

The technical holding time of fourteen (14) days from the time of sample collection to sample analysis has been exceeded by 1 day for samples MC0AD9, MC0AE0, MC0AE1, and MC0AE9. Quantitation limits are unusable and have been qualified "R".

Notes

CN^- has been detected in laboratory blanks associated with the samples in this SDG. Samples which reported detected concentrations for CN^- less than the Contract Required Quantitation Limit (CRQL) have been reported at the CRQL and qualified "U".

All detected concentrations were attributed to blank contamination.

Matrix spike and laboratory duplicate analyses were within control limits.

The sampling date of 01/09/2018 listed on the Chain of Custody Record for sample MC0AD8 is incorrect. The correct sampling date is 10/09/2018.

The inorganic sample prefix "M" was missing from the Chain of Custody Records for all samples. In accordance with previous direction from Region 3, the laboratory adjusted the prefix, noted the issue and proceeded with the analysis. No data were qualified based on this outlier.

The detected concentrations reported were attributed to blank contamination in field duplicate pair MC0AF3/MC0AF5. No data were qualified based on field duplicate precision.

Glossary of Inorganic Data Qualifier Codes

Validation Qualifiers	In order of descending precedence. Only one of these qualifiers may apply to any result.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the sample.
UJ	The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit
B	The result is presumed a blank contaminant. This qualifier is used for drinking water samples only.
J	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+	The result is an estimated quantity, but the result may be biased high.
J-	The result is an estimated quantity, but the result may be biased low.

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47891/EPW15007/MC0AD2** **Lab Name: CHEMTEX**

Sample Number: MC0AD2	Method: Cyanide	Matrix: Water	MA Number:
Sample Location: BDE-GW-01	pH: 10.	Sample Date: 10/09/2018	Sample Time: 11:54:00
% Moisture:		% Solids:	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Cyanide	Target	10.0	U	ug/L	4.7	J	1	YES	S4VEM

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47891/EPW15007/MC0AD2** **Lab Name: CHEMTEX**

Sample Number: MC0AD2D	Method: Cyanide	Matrix: Water	MA Number:
Sample Location:	pH: 10.	Sample Date: 10/09/2018	Sample Time: 11:54:00
% Moisture:		% Solids:	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Cyanide	Target	4.2	J	ug/L	4.2	J	1	YES	S4VEM

ED_005024_00000601-00131

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47891/EPW15007/MC0AD2** **Lab Name: CHEMTEX**

Sample Number: MC0AD2S	Method: Cyanide	Matrix: Water	MA Number:
Sample Location:	pH: 10.	Sample Date: 10/09/2018	Sample Time: 11:54:00
% Moisture:		% Solids:	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Cyanide	Spike	92.7	J	ug/L	92.7		1	YES	S4VEM

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47891/EPW15007/MC0AD2** **Lab Name: CHEMTEX**

Sample Number: MC0AD8	Method: Cyanide	Matrix: Water	MA Number:
Sample Location: BDE-GW-02	pH: 10.	Sample Date: 10/09/2018	Sample Time: 15:24:00
% Moisture:		% Solids:	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Cyanide	Target	10.0	U	ug/L	4.4	J	1	YES	S4VEM

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47891/EPW15007/MC0AD2** **Lab Name: CHEMTEX**

Sample Number: MC0AD9	Method: Cyanide	Matrix: Water	MA Number:
Sample Location: BDE-GW-03	pH: 10.	Sample Date: 10/08/2018	Sample Time: 15:22:00
% Moisture:		% Solids:	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Cyanide	Target	10.0	R	ug/L	4.1	J	1	YES	S4VEM

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47891/EPW15007/MC0AD2** **Lab Name: CHEMTEX**

Sample Number: MC0AE0	Method: Cyanide	Matrix: Water	MA Number:
Sample Location: BDE-GW-04	pH: 10.	Sample Date: 10/08/2018	Sample Time: 13:54:00
% Moisture:		% Solids:	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Cyanide	Target	10.0	R	ug/L	6.3	J	1	YES	S4VEM

ED_005024_00000601-00135

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47891/EPW15007/MC0AD2** **Lab Name: CHEMTEX**

Sample Number: MC0AE1	Method: Cyanide	Matrix: Water	MA Number:
Sample Location: BDE-GW-05	pH: 10.	Sample Date: 10/08/2018	Sample Time: 16:44:00
% Moisture:		% Solids:	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Cyanide	Target	10.0	R	ug/L	5.2	J	1	YES	S4VEM

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47891/EPW15007/MC0AD2** **Lab Name: CHEMTEX**

Sample Number: MC0AE3	Method: Cyanide	Matrix: Water	MA Number:
Sample Location: BDE-GW-07	pH: 10.	Sample Date: 10/10/2018	Sample Time: 11:31:00
% Moisture:		% Solids:	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Cyanide	Target	10.0	U	ug/L	5.0	J	1	YES	S4VEM

ED_005024_00000601-00137

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47891/EPW15007/MC0AD2** **Lab Name: CHEMTEX**

Sample Number: MC0AE4	Method: Cyanide	Matrix: Water	MA Number:
Sample Location: BDE-GW-08	pH: 10.	Sample Date: 10/11/2018	Sample Time: 11:56:00
% Moisture:		% Solids:	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Cyanide	Target	10.0	U	ug/L	4.6	J	1	YES	S4VEM

ED_005024_00000601-00138

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47891/EPW15007/MC0AD2** **Lab Name: CHEMTEX**

Sample Number: MC0AE5	Method: Cyanide	Matrix: Water	MA Number:
Sample Location: BDE-GW-09	pH: 10.	Sample Date: 10/09/2018	Sample Time: 10:01:00
% Moisture:		% Solids:	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Cyanide	Target	10.0	U	ug/L	4.9	J	1	YES	S4VEM

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47891/EPW15007/MC0AD2** **Lab Name: CHEMTEX**

Sample Number: MC0AE6	Method: Cyanide	Matrix: Water	MA Number:
Sample Location: BDE-GW-10	pH: 10.	Sample Date: 10/11/2018	Sample Time: 13:09:00
% Moisture:		% Solids:	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Cyanide	Target	10.0	U	ug/L	4.9	J	1	YES	S4VEM

ED_005024_00000601-00140

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47891/EPW15007/MC0AD2** **Lab Name: CHEMTEX**

Sample Number: MC0AE7	Method: Cyanide	Matrix: Water	MA Number:
Sample Location: BDE-GW-11	pH: 10.	Sample Date: 10/11/2018	Sample Time: 08:53:00
% Moisture:		% Solids:	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Cyanide	Target	10.0	U	ug/L	4.8	J	1	YES	S4VEM

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47891/EPW15007/MC0AD2** **Lab Name: CHEMTEX**

Sample Number: MC0AE8	Method: Cyanide	Matrix: Water	MA Number:
Sample Location: BDE-GW-12	pH: 10.	Sample Date: 10/11/2018	Sample Time: 10:23:00
% Moisture:		% Solids:	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Cyanide	Target	10.0	U	ug/L	5.8	J	1	YES	S4VEM

ED_005024_00000601-00142

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47891/EPW15007/MC0AD2** **Lab Name: CHEMTEX**

Sample Number: MC0AE9	Method: Cyanide	Matrix: Water	MA Number:
Sample Location: BDE-GW-13	pH: 10.	Sample Date: 10/08/2018	Sample Time: 18:10:00
% Moisture:		% Solids:	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Cyanide	Target	10.0	R	ug/L	5.6	J	1	YES	S4VEM

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47891/EPW15007/MC0AD2** **Lab Name: CHEMTEX**

Sample Number: MC0AF0	Method: Cyanide	Matrix: Water	MA Number:
Sample Location: BDE-GW-14	pH: 10.	Sample Date: 10/11/2018	Sample Time: 14:29:00
% Moisture:		% Solids:	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Cyanide	Target	10.0	U	ug/L	9.8	J	1	YES	S4VEM

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47891/EPW15007/MC0AD2** **Lab Name: CHEMTEX**

Sample Number: MC0AF1	Method: Cyanide	Matrix: Water	MA Number:
Sample Location: BDE-GW-15	pH: 10.	Sample Date: 10/10/2018	Sample Time: 18:42:00
% Moisture:		% Solids:	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Cyanide	Target	10.0	U	ug/L	5.1	J	1	YES	S4VEM

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47891/EPW15007/MC0AD2** **Lab Name: CHEMTEX**

Sample Number: MC0AF3	Method: Cyanide	Matrix: Water	MA Number:
Sample Location: BDE-DMW-02	pH: 10.	Sample Date: 10/09/2018	Sample Time: 09:10:00
% Moisture:		% Solids:	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Cyanide	Target	10.0	U	ug/L	4.3	J	1	YES	S4VEM

ED_005024_00000601-00146

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47891/EPW15007/MC0AD2** **Lab Name: CHEMTEX**

Sample Number: MC0AF4	Method: Cyanide	Matrix: Water	MA Number:
Sample Location: BDE-DMW-03	pH: 10.	Sample Date: 10/10/2018	Sample Time: 17:11:00
% Moisture:		% Solids:	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Cyanide	Target	10.0	U	ug/L	5.5	J	1	YES	S4VEM

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47891/EPW15007/MC0AD2** **Lab Name: CHEMTEX**

Sample Number: MC0AF5	Method: Cyanide	Matrix: Water	MA Number:
Sample Location: BDE-GW-02D	pH: 10.	Sample Date: 10/09/2018	Sample Time: 15:24:00
% Moisture:		% Solids:	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Cyanide	Target	10.0	U	ug/L	4.9	J	1	YES	S4VEM

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47891/EPW15007/MC0AD2** **Lab Name: CHEMTEX**

Sample Number: MC0AG0	Method: Cyanide	Matrix: Water	MA Number:
Sample Location: BDE-DMW-01	pH: 10.	Sample Date: 10/10/2018	Sample Time: 09:08:00
% Moisture:		% Solids:	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Cyanide	Target	10.0	U	ug/L	5.3	J	1	YES	S4VEM

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47891/EPW15007/MC0AD2** **Lab Name: CHEMTEX**

Sample Number: PBW105	Method: Cyanide	Matrix: Water	MA Number:
Sample Location:	pH:	Sample Date:	Sample Time:
% Moisture:		% Solids:	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Cyanide	Target	2.3	J	ug/L	2.3	J	1	YES	S4VEM

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
Environmental Sciences Center
701 Mapes Road
Fort Meade, Maryland 20755-5350

DATE: 12/19/2018

SUBJECT: Region III Data QA Review

FROM: Brandon McDonald
Region III ESAT RPO (3EA22)

TO: CONNOR O'LOUGHLIN
Hazardous Site Cleanup Division (HSCD)

Attached is the data validation report for the BLADES GROUNDWATER site for RAS#47948; SDG# C0AG1 completed by the Region III Environmental Services Assistance Team(ESAT) contractor, ICF International, under the direction of Region III EAID.

If you have any questions regarding this review, please call Brandon McDonald at (410) 305-2607 or you can call Eric Graybill at (410)-305-2665.

Attachment

cc: Ex. 4 CBI (WESTON SOLUTIONS)
WESTON SOLUTIONS)

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Date: December 10, 2018

To: Brandon McDonald
ESAT Region 3 Project Officer

From: Ex. 4 CBI
Validator

Ex. 4 CBI
Reviewer

Subject: Organic Data Validation (S4VEM)
Blades Groundwater
47948 C0AG1

Overview

This data package consisted of nineteen (19) water samples analyzed for Pesticides including two (2) field duplicate pairs.

Analyses were performed by Chemtech Consulting Group (CHM) through the Contract Laboratory Program (CLP) according to Statement of Work (SOW) SOM02.4.

Data were validated according to the National Functional Guidelines for Organic Superfund Methods Data Review and applicable USEPA Region 3 modifications. Electronic validation was performed by the Electronic Data eXchange & Evaluation System (EXES). The validation report has been assigned the Superfund Data Validation Label S4VEM (Stage_4_Validation_Electronic_Manual).

The following validation narrative is an evaluation of laboratory reported data based on the electronic data package available through the EXES Data Manager dated November 27, 2018.

Summary

Significant data quality outliers regarding dual column precision were identified that resulted in rejection of sample results, as detailed below. Less significant data quality outliers resulting in estimation of sample results were not identified.

Major Problems

The following analyte had Percent Difference (%D) >200% between the dual column analyses. The large %D between the two results may indicate interferences impacting the analyte. Reported results for the analyte in samples listed below have been rejected and qualified "R".

Affected Samples	Affected Analytes
C0AH4, C0AN6	Heptachlor epoxide

Notes

Target analytes detected at concentrations below Contract Required Quantitation Limits (CRQLs) are estimated and have been qualified "J".

Pesticides with percent difference (%D) between the two (2) analytical columns of >25% and < 200% were qualified as estimated "J".

Recoveries of Aldrin were outside the upper control limit on one column for the Matrix Spike/Matrix Spike Duplicate (MS/MSD) analysis of sample C0AG1. Aldrin was non-detect in the sample C0AG1. Quantitation limits are not qualified based on this outlier.

The method blank was free from contamination.

Laboratory Control Sample (LCS) reported recoveries for spiked analytes within control limits.

Matrix Spike/Matrix Spike Duplicate (MS/MSD) of sample C0AG1 reported Relative Percent Differences (RPDs) for spiked analytes within control limits.

Results reported for field duplicate pair C0AG4/C0AL0 were comparable; pesticides were not detected in the field duplicate pair C0AH0/C0AL2.

Manual integrations were performed and identified by the laboratory. A subset of these was evaluated by the reviewer and found to be accurate and consistent. No action was taken by the reviewer based on manual integrations.

Glossary of Organic Data Qualifier Codes

Validation Qualifiers	In order of descending precedence. Only one of these qualifiers may apply to any result.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the sample.
UJ	The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.
J	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+	The result is an estimated quantity, but the result may be biased high.
J-	The result is an estimated quantity, but the result may be biased low.

Additional Qualifiers	Additional qualifiers may be combined with other qualifiers.
N	The analyte has been “tentatively identified” or “presumptively” as present.
B	The result is presumed a blank contaminant. This qualifier is used for drinking water samples only.
C	The target Pesticide or Aroclor analyte identification has been confirmed by Gas Chromatography/Mass Spectrometry (GC/MS). This qualifier may be added to other qualifiers.
X	The target Pesticide or Aroclor analyte identification was not confirmed when GC/MS analysis was performed. This qualifier may be added to other qualifiers.

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47948/EPW14030/C0AG1** **Lab Name: Chemtech Consulting Group**

Sample Number: C0AG1	Method: Pesticides	Matrix: Water	MA Number:
Sample Location: BDE-SIGW-01	pH: 6	Sample Date: 11/06/2018	Sample Time: 14:24:00
% Moisture:		% Solids: 0	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
alpha-BHC	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
beta-BHC	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
delta-BHC	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
gamma-BHC (Lindane)	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Heptachlor	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Aldrin	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Heptachlor epoxide	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Endosulfan I	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Dieldrin	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
4,4-DDE	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Endrin	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Endosulfan II	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
4,4-DDD	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Endosulfan Sulfate	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
4,4-DDT	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Methoxychlor	Target	0.50	U	ug/L	0.50	U	1.0	YES	S4VEM
Endrin ketone	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Endrin Aldehyde	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
cis-Chlordane	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
trans-Chlordane	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Toxaphene	Target	5.0	U	ug/L	5.0	U	1.0	YES	S4VEM

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47948/EPW14030/C0AG1** **Lab Name: Chemtech Consulting Group**

Sample Number: C0AG1MS	Method: Pesticides	Matrix: Water	MA Number:
Sample Location:	pH: 6	Sample Date: 11/06/2018	Sample Time: 14:24:00
% Moisture:		% Solids: 0	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
alpha-BHC	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
beta-BHC	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
delta-BHC	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
gamma-BHC (Lindane)	Spike	0.55		ug/L	0.55		1.0	YES	S4VEM
Heptachlor	Spike	0.52		ug/L	0.52		1.0	YES	S4VEM
Aldrin	Spike	0.56		ug/L	0.56		1.0	YES	S4VEM
Heptachlor epoxide	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Endosulfan I	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Dieldrin	Spike	1.1		ug/L	1.1		1.0	YES	S4VEM
4,4-DDE	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Endrin	Spike	1.1		ug/L	1.1		1.0	YES	S4VEM
Endosulfan II	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
4,4-DDD	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Endosulfan Sulfate	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
4,4-DDT	Spike	1.0		ug/L	1.0		1.0	YES	S4VEM
Methoxychlor	Target	0.50	U	ug/L	0.50	U	1.0	YES	S4VEM
Endrin ketone	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Endrin Aldehyde	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
cis-Chlordane	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
trans-Chlordane	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Toxaphene	Target	5.0	U	ug/L	5.0	U	1.0	YES	S4VEM

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47948/EPW14030/C0AG1** **Lab Name: Chemtech Consulting Group**

Sample Number: C0AG1MSD	Method: Pesticides	Matrix: Water	MA Number:
Sample Location:	pH: 6	Sample Date: 11/06/2018	Sample Time: 14:24:00
% Moisture:		% Solids: 0	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
alpha-BHC	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
beta-BHC	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
delta-BHC	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
gamma-BHC (Lindane)	Spike	0.55		ug/L	0.55		1.0	YES	S4VEM
Heptachlor	Spike	0.52		ug/L	0.52		1.0	YES	S4VEM
Aldrin	Spike	0.56		ug/L	0.56		1.0	YES	S4VEM
Heptachlor epoxide	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Endosulfan I	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Dieldrin	Spike	1.1		ug/L	1.1		1.0	YES	S4VEM
4,4-DDE	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Endrin	Spike	1.1		ug/L	1.1		1.0	YES	S4VEM
Endosulfan II	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
4,4-DDD	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Endosulfan Sulfate	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
4,4-DDT	Spike	1.0		ug/L	1.0		1.0	YES	S4VEM
Methoxychlor	Target	0.50	U	ug/L	0.50	U	1.0	YES	S4VEM
Endrin ketone	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Endrin Aldehyde	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
cis-Chlordane	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
trans-Chlordane	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Toxaphene	Target	5.0	U	ug/L	5.0	U	1.0	YES	S4VEM

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47948/EPW14030/C0AG1** **Lab Name: Chemtech Consulting Group**

Sample Number: C0AG4	Method: Pesticides	Matrix: Water	MA Number:
Sample Location: BDE-SIGW-02D	pH: 6	Sample Date: 11/06/2018	Sample Time: 14:23:00
% Moisture:		% Solids: 0	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
alpha-BHC	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
beta-BHC	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
delta-BHC	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
gamma-BHC (Lindane)	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Heptachlor	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Aldrin	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Heptachlor epoxide	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Endosulfan I	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Dieldrin	Target	0.0081	J	ug/L	0.0081	JP	1.0	YES	S4VEM
4,4-DDE	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Endrin	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Endosulfan II	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
4,4-DDD	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Endosulfan Sulfate	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
4,4-DDT	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Methoxychlor	Target	0.50	U	ug/L	0.50	U	1.0	YES	S4VEM
Endrin ketone	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Endrin Aldehyde	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
cis-Chlordane	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
trans-Chlordane	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Toxaphene	Target	5.0	U	ug/L	5.0	U	1.0	YES	S4VEM

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47948/EPW14030/C0AG1** **Lab Name: Chemtech Consulting Group**

Sample Number: C0AG5	Method: Pesticides	Matrix: Water	MA Number:
Sample Location: BDE-SIGW-03	pH: 6	Sample Date: 11/07/2018	Sample Time: 09:17:00
% Moisture:		% Solids: 0	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
alpha-BHC	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
beta-BHC	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
delta-BHC	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
gamma-BHC (Lindane)	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Heptachlor	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Aldrin	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Heptachlor epoxide	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Endosulfan I	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Dieldrin	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
4,4-DDE	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Endrin	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Endosulfan II	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
4,4-DDD	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Endosulfan Sulfate	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
4,4-DDT	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Methoxychlor	Target	0.50	U	ug/L	0.50	U	1.0	YES	S4VEM
Endrin ketone	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Endrin Aldehyde	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
cis-Chlordane	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
trans-Chlordane	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Toxaphene	Target	5.0	U	ug/L	5.0	U	1.0	YES	S4VEM

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47948/EPW14030/C0AG1** **Lab Name: Chemtech Consulting Group**

Sample Number: C0AG6	Method: Pesticides	Matrix: Water	MA Number:
Sample Location: BDE-SIGW-04	pH: 6	Sample Date: 11/07/2018	Sample Time: 09:23:00
% Moisture:		% Solids: 0	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
alpha-BHC	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
beta-BHC	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
delta-BHC	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
gamma-BHC (Lindane)	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Heptachlor	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Aldrin	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Heptachlor epoxide	Target	0.0038	J	ug/L	0.0038	JP	1.0	YES	S4VEM
Endosulfan I	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Dieldrin	Target	0.0028	J	ug/L	0.0028	JP	1.0	YES	S4VEM
4,4-DDE	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Endrin	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Endosulfan II	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
4,4-DDD	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Endosulfan Sulfate	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
4,4-DDT	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Methoxychlor	Target	0.50	U	ug/L	0.50	U	1.0	YES	S4VEM
Endrin ketone	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Endrin Aldehyde	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
cis-Chlordane	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
trans-Chlordane	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Toxaphene	Target	5.0	U	ug/L	5.0	U	1.0	YES	S4VEM

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47948/EPW14030/C0AG1** **Lab Name: Chemtech Consulting Group**

Sample Number: C0AG7	Method: Pesticides	Matrix: Water	MA Number:
Sample Location: BDE-SIGW-05	pH: 6	Sample Date: 11/07/2018	Sample Time: 12:48:00
% Moisture:		% Solids: 0	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
alpha-BHC	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
beta-BHC	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
delta-BHC	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
gamma-BHC (Lindane)	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Heptachlor	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Aldrin	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Heptachlor epoxide	Target	0.0049	J	ug/L	0.0049	J	1.0	YES	S4VEM
Endosulfan I	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Dieldrin	Target	0.096	J	ug/L	0.096	J	1.0	YES	S4VEM
4,4-DDE	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Endrin	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Endosulfan II	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
4,4-DDD	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Endosulfan Sulfate	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
4,4-DDT	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Methoxychlor	Target	0.50	U	ug/L	0.50	U	1.0	YES	S4VEM
Endrin ketone	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Endrin Aldehyde	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
cis-Chlordane	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
trans-Chlordane	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Toxaphene	Target	5.0	U	ug/L	5.0	U	1.0	YES	S4VEM

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47948/EPW14030/C0AG1** **Lab Name: Chemtech Consulting Group**

Sample Number: C0AG8	Method: Pesticides	Matrix: Water	MA Number:
Sample Location: BDE-SIGW-06	pH: 6	Sample Date: 11/07/2018	Sample Time: 13:17:00
% Moisture:		% Solids: 0	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
alpha-BHC	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
beta-BHC	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
delta-BHC	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
gamma-BHC (Lindane)	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Heptachlor	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Aldrin	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Heptachlor epoxide	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Endosulfan I	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Dieldrin	Target	0.0022	J	ug/L	0.0022	JP	1.0	YES	S4VEM
4,4-DDE	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Endrin	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Endosulfan II	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
4,4-DDD	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Endosulfan Sulfate	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
4,4-DDT	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Methoxychlor	Target	0.50	U	ug/L	0.50	U	1.0	YES	S4VEM
Endrin ketone	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Endrin Aldehyde	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
cis-Chlordane	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
trans-Chlordane	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Toxaphene	Target	5.0	U	ug/L	5.0	U	1.0	YES	S4VEM

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47948/EPW14030/C0AG1** **Lab Name: Chemtech Consulting Group**

Sample Number: C0AG9	Method: Pesticides	Matrix: Water	MA Number:
Sample Location: BDE-SIGW-07	pH: 6	Sample Date: 11/07/2018	Sample Time: 11:19:00
% Moisture:		% Solids: 0	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
alpha-BHC	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
beta-BHC	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
delta-BHC	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
gamma-BHC (Lindane)	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Heptachlor	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Aldrin	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Heptachlor epoxide	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Endosulfan I	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Dieldrin	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
4,4-DDE	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Endrin	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Endosulfan II	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
4,4-DDD	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Endosulfan Sulfate	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
4,4-DDT	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Methoxychlor	Target	0.50	U	ug/L	0.50	U	1.0	YES	S4VEM
Endrin ketone	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Endrin Aldehyde	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
cis-Chlordane	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
trans-Chlordane	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Toxaphene	Target	5.0	U	ug/L	5.0	U	1.0	YES	S4VEM

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47948/EPW14030/C0AG1** **Lab Name: Chemtech Consulting Group**

Sample Number: C0AH0	Method: Pesticides	Matrix: Water	MA Number:
Sample Location: BDE-SIGW-08	pH: 6	Sample Date: 11/07/2018	Sample Time: 11:17:00
% Moisture:		% Solids: 0	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
alpha-BHC	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
beta-BHC	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
delta-BHC	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
gamma-BHC (Lindane)	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Heptachlor	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Aldrin	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Heptachlor epoxide	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Endosulfan I	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Dieldrin	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
4,4-DDE	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Endrin	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Endosulfan II	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
4,4-DDD	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Endosulfan Sulfate	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
4,4-DDT	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Methoxychlor	Target	0.50	U	ug/L	0.50	U	1.0	YES	S4VEM
Endrin ketone	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Endrin Aldehyde	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
cis-Chlordane	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
trans-Chlordane	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Toxaphene	Target	5.0	U	ug/L	5.0	U	1.0	YES	S4VEM

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47948/EPW14030/C0AG1** **Lab Name: Chemtech Consulting Group**

Sample Number: C0AH1	Method: Pesticides	Matrix: Water	MA Number:
Sample Location: BDE-SIGW-09	pH: 6	Sample Date: 11/06/2018	Sample Time: 08:05:00
% Moisture:		% Solids: 0	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
alpha-BHC	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
beta-BHC	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
delta-BHC	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
gamma-BHC (Lindane)	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Heptachlor	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Aldrin	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Heptachlor epoxide	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Endosulfan I	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Dieldrin	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
4,4-DDE	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Endrin	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Endosulfan II	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
4,4-DDD	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Endosulfan Sulfate	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
4,4-DDT	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Methoxychlor	Target	0.50	U	ug/L	0.50	U	1.0	YES	S4VEM
Endrin ketone	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Endrin Aldehyde	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
cis-Chlordane	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
trans-Chlordane	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Toxaphene	Target	5.0	U	ug/L	5.0	U	1.0	YES	S4VEM

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47948/EPW14030/C0AG1** **Lab Name: Chemtech Consulting Group**

Sample Number: C0AH2	Method: Pesticides	Matrix: Water	MA Number:
Sample Location: BDE-SIGW-10	pH: 6	Sample Date: 11/06/2018	Sample Time: 08:15:00
% Moisture:		% Solids: 0	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
alpha-BHC	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
beta-BHC	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
delta-BHC	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
gamma-BHC (Lindane)	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Heptachlor	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Aldrin	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Heptachlor epoxide	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Endosulfan I	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Dieldrin	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
4,4-DDE	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Endrin	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Endosulfan II	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
4,4-DDD	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Endosulfan Sulfate	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
4,4-DDT	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Methoxychlor	Target	0.50	U	ug/L	0.50	U	1.0	YES	S4VEM
Endrin ketone	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Endrin Aldehyde	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
cis-Chlordane	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
trans-Chlordane	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Toxaphene	Target	5.0	U	ug/L	5.0	U	1.0	YES	S4VEM

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47948/EPW14030/C0AG1** **Lab Name: Chemtech Consulting Group**

Sample Number: C0AH4	Method: Pesticides	Matrix: Water	MA Number:
Sample Location: BDE-SIGW-12	pH: 6	Sample Date: 11/06/2018	Sample Time: 09:42:00
% Moisture:		% Solids: 0	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
alpha-BHC	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
beta-BHC	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
delta-BHC	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
gamma-BHC (Lindane)	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Heptachlor	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Aldrin	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Heptachlor epoxide	Target	0.0047	R	ug/L	0.0047	JP	1.0	YES	S4VEM
Endosulfan I	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Dieldrin	Target	0.035	J	ug/L	0.035	JP	1.0	YES	S4VEM
4,4-DDE	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Endrin	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Endosulfan II	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
4,4-DDD	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Endosulfan Sulfate	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
4,4-DDT	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Methoxychlor	Target	0.50	U	ug/L	0.50	U	1.0	YES	S4VEM
Endrin ketone	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Endrin Aldehyde	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
cis-Chlordane	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
trans-Chlordane	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Toxaphene	Target	5.0	U	ug/L	5.0	U	1.0	YES	S4VEM

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47948/EPW14030/C0AG1** **Lab Name: Chemtech Consulting Group**

Sample Number: C0AH5	Method: Pesticides	Matrix: Water	MA Number:
Sample Location: BDE-SIGW-13	pH: 6	Sample Date: 11/06/2018	Sample Time: 12:10:00
% Moisture:		% Solids: 0	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
alpha-BHC	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
beta-BHC	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
delta-BHC	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
gamma-BHC (Lindane)	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Heptachlor	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Aldrin	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Heptachlor epoxide	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Endosulfan I	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Dieldrin	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
4,4-DDE	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Endrin	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Endosulfan II	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
4,4-DDD	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Endosulfan Sulfate	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
4,4-DDT	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Methoxychlor	Target	0.50	U	ug/L	0.50	U	1.0	YES	S4VEM
Endrin ketone	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Endrin Aldehyde	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
cis-Chlordane	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
trans-Chlordane	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Toxaphene	Target	5.0	U	ug/L	5.0	U	1.0	YES	S4VEM

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47948/EPW14030/C0AG1** **Lab Name: Chemtech Consulting Group**

Sample Number: C0AH6	Method: Pesticides	Matrix: Water	MA Number:
Sample Location: BDE-SIGW-14	pH: 6	Sample Date: 11/07/2018	Sample Time: 08:45:00
% Moisture:		% Solids: 0	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
alpha-BHC	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
beta-BHC	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
delta-BHC	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
gamma-BHC (Lindane)	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Heptachlor	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Aldrin	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Heptachlor epoxide	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Endosulfan I	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Dieldrin	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
4,4-DDE	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Endrin	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Endosulfan II	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
4,4-DDD	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Endosulfan Sulfate	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
4,4-DDT	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Methoxychlor	Target	0.50	U	ug/L	0.50	U	1.0	YES	S4VEM
Endrin ketone	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Endrin Aldehyde	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
cis-Chlordane	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
trans-Chlordane	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Toxaphene	Target	5.0	U	ug/L	5.0	U	1.0	YES	S4VEM

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47948/EPW14030/C0AG1** **Lab Name: Chemtech Consulting Group**

Sample Number: C0AJ2	Method: Pesticides	Matrix: Water	MA Number:
Sample Location: BDE-TBW-03	pH: 6	Sample Date: 11/06/2018	Sample Time: 13:40:00
% Moisture:		% Solids: 0	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
alpha-BHC	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
beta-BHC	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
delta-BHC	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
gamma-BHC (Lindane)	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Heptachlor	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Aldrin	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Heptachlor epoxide	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Endosulfan I	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Dieldrin	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
4,4-DDE	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Endrin	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Endosulfan II	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
4,4-DDD	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Endosulfan Sulfate	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
4,4-DDT	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Methoxychlor	Target	0.50	U	ug/L	0.50	U	1.0	YES	S4VEM
Endrin ketone	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Endrin Aldehyde	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
cis-Chlordane	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
trans-Chlordane	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Toxaphene	Target	5.0	U	ug/L	5.0	U	1.0	YES	S4VEM

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47948/EPW14030/C0AG1** **Lab Name: Chemtech Consulting Group**

Sample Number: C0AL0	Method: Pesticides	Matrix: Water	MA Number:
Sample Location: BDE-SIGW-02	pH: 6	Sample Date: 11/06/2018	Sample Time: 14:22:00
% Moisture:		% Solids: 0	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
alpha-BHC	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
beta-BHC	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
delta-BHC	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
gamma-BHC (Lindane)	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Heptachlor	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Aldrin	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Heptachlor epoxide	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Endosulfan I	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Dieldrin	Target	0.0095	J	ug/L	0.0095	J	1.0	YES	S4VEM
4,4-DDE	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Endrin	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Endosulfan II	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
4,4-DDD	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Endosulfan Sulfate	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
4,4-DDT	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Methoxychlor	Target	0.50	U	ug/L	0.50	U	1.0	YES	S4VEM
Endrin ketone	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Endrin Aldehyde	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
cis-Chlordane	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
trans-Chlordane	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Toxaphene	Target	5.0	U	ug/L	5.0	U	1.0	YES	S4VEM

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47948/EPW14030/C0AG1** **Lab Name: Chemtech Consulting Group**

Sample Number: C0AL2	Method: Pesticides	Matrix: Water	MA Number:
Sample Location: BDE-SIGW-08D	pH: 6	Sample Date: 11/07/2018	Sample Time: 11:18:00
% Moisture:		% Solids: 0	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
alpha-BHC	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
beta-BHC	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
delta-BHC	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
gamma-BHC (Lindane)	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Heptachlor	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Aldrin	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Heptachlor epoxide	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Endosulfan I	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Dieldrin	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
4,4-DDE	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Endrin	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Endosulfan II	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
4,4-DDD	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Endosulfan Sulfate	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
4,4-DDT	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Methoxychlor	Target	0.50	U	ug/L	0.50	U	1.0	YES	S4VEM
Endrin ketone	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Endrin Aldehyde	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
cis-Chlordane	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
trans-Chlordane	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Toxaphene	Target	5.0	U	ug/L	5.0	U	1.0	YES	S4VEM

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47948/EPW14030/C0AG1** **Lab Name: Chemtech Consulting Group**

Sample Number: C0AN3	Method: Pesticides	Matrix: Water	MA Number:
Sample Location: BDE-PSW-03	pH: 6	Sample Date: 11/05/2018	Sample Time: 12:07:00
% Moisture:		% Solids: 0	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
alpha-BHC	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
beta-BHC	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
delta-BHC	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
gamma-BHC (Lindane)	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Heptachlor	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Aldrin	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Heptachlor epoxide	Target	0.0074	J	ug/L	0.0074	JP	1.0	YES	S4VEM
Endosulfan I	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Dieldrin	Target	0.038	J	ug/L	0.038	JP	1.0	YES	S4VEM
4,4-DDE	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Endrin	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Endosulfan II	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
4,4-DDD	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Endosulfan Sulfate	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
4,4-DDT	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Methoxychlor	Target	0.50	U	ug/L	0.50	U	1.0	YES	S4VEM
Endrin ketone	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Endrin Aldehyde	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
cis-Chlordane	Target	0.0038	J	ug/L	0.0038	JP	1.0	YES	S4VEM
trans-Chlordane	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Toxaphene	Target	5.0	U	ug/L	5.0	U	1.0	YES	S4VEM

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47948/EPW14030/C0AG1** **Lab Name: Chemtech Consulting Group**

Sample Number: C0AN4	Method: Pesticides	Matrix: Water	MA Number:
Sample Location: BDE-PSW-02	pH: 6	Sample Date: 11/05/2018	Sample Time: 11:55:00
% Moisture:		% Solids: 0	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
alpha-BHC	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
beta-BHC	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
delta-BHC	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
gamma-BHC (Lindane)	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Heptachlor	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Aldrin	Target	0.0029	J	ug/L	0.0029	JP	1.0	YES	S4VEM
Heptachlor epoxide	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Endosulfan I	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Dieldrin	Target	0.017	J	ug/L	0.017	JP	1.0	YES	S4VEM
4,4-DDE	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Endrin	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Endosulfan II	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
4,4-DDD	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Endosulfan Sulfate	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
4,4-DDT	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Methoxychlor	Target	0.50	U	ug/L	0.50	U	1.0	YES	S4VEM
Endrin ketone	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Endrin Aldehyde	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
cis-Chlordane	Target	0.0052	J	ug/L	0.0052	JP	1.0	YES	S4VEM
trans-Chlordane	Target	0.0035	J	ug/L	0.0035	JP	1.0	YES	S4VEM
Toxaphene	Target	5.0	U	ug/L	5.0	U	1.0	YES	S4VEM

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47948/EPW14030/C0AG1** **Lab Name: Chemtech Consulting Group**

Sample Number: C0AN6	Method: Pesticides	Matrix: Water	MA Number:
Sample Location: BDE-PSW-01	pH: 6	Sample Date: 11/05/2018	Sample Time: 11:45:00
% Moisture:		% Solids: 0	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
alpha-BHC	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
beta-BHC	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
delta-BHC	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
gamma-BHC (Lindane)	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Heptachlor	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Aldrin	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Heptachlor epoxide	Target	0.0021	R	ug/L	0.0021	JP	1.0	YES	S4VEM
Endosulfan I	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Dieldrin	Target	0.011	J	ug/L	0.011	JP	1.0	YES	S4VEM
4,4-DDE	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Endrin	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Endosulfan II	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
4,4-DDD	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Endosulfan Sulfate	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
4,4-DDT	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Methoxychlor	Target	0.50	U	ug/L	0.50	U	1.0	YES	S4VEM
Endrin ketone	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Endrin Aldehyde	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
cis-Chlordane	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
trans-Chlordane	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Toxaphene	Target	5.0	U	ug/L	5.0	U	1.0	YES	S4VEM

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47948/EPW14030/C0AG1** **Lab Name: Chemtech Consulting Group**

Sample Number: PBLK55	Method: Pesticides	Matrix: Water	MA Number:
Sample Location:	pH: 6	Sample Date:	Sample Time:
% Moisture:		% Solids: 0	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
alpha-BHC	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
beta-BHC	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
delta-BHC	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
gamma-BHC (Lindane)	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Heptachlor	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Aldrin	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Heptachlor epoxide	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Endosulfan I	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Dieldrin	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
4,4-DDE	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Endrin	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Endosulfan II	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
4,4-DDD	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Endosulfan Sulfate	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
4,4-DDT	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Methoxychlor	Target	0.50	U	ug/L	0.50	U	1.0	YES	S4VEM
Endrin ketone	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Endrin Aldehyde	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
cis-Chlordane	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
trans-Chlordane	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Toxaphene	Target	5.0	U	ug/L	5.0	U	1.0	YES	S4VEM

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47948/EPW14030/C0AG1** **Lab Name: Chemtech Consulting Group**

Sample Number: PLCS55	Method: Pesticides	Matrix: Water	MA Number:
Sample Location:	pH: 6	Sample Date:	Sample Time:
% Moisture:		% Solids: 0	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
alpha-BHC	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
beta-BHC	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
delta-BHC	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
gamma-BHC (Lindane)	Spike	0.41		ug/L	0.41		1.0	YES	S4VEM
Heptachlor	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Aldrin	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Heptachlor epoxide	Spike	0.51		ug/L	0.51		1.0	YES	S4VEM
Endosulfan I	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Dieldrin	Spike	0.96		ug/L	0.96		1.0	YES	S4VEM
4,4-DDE	Spike	1.0		ug/L	1.0		1.0	YES	S4VEM
Endrin	Spike	0.93		ug/L	0.93		1.0	YES	S4VEM
Endosulfan II	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
4,4-DDD	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Endosulfan Sulfate	Spike	0.53		ug/L	0.53		1.0	YES	S4VEM
4,4-DDT	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Methoxychlor	Target	0.50	U	ug/L	0.50	U	1.0	YES	S4VEM
Endrin ketone	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Endrin Aldehyde	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
cis-Chlordane	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
trans-Chlordane	Spike	0.51		ug/L	0.51		1.0	YES	S4VEM
Toxaphene	Target	5.0	U	ug/L	5.0	U	1.0	YES	S4VEM

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
Environmental Sciences Center
701 Mapes Road
Fort Meade, Maryland 20755-5350

DATE: 2/25/2019

SUBJECT: Region III Data QA Review

FROM: Brandon McDonald
Region III ESAT RPO(3EA22)

TO: CONNOR O'LOUGHLIN
Hazardous Site Cleanup Division (HSCD)

Attached is the data validation report for the BLADES GROUNDWATER site for RAS#47948; SDG# C0AH3 completed by the Region III Environmental Services Assistance Team(ESAT) contractor, ICF International, under the direction of Region III EAID.

If you have any questions regarding this review, please call Brandon McDonald at (410) 305-2607 or you can call Eric Graybill at (410)-305-2665.

Attachment

cc: Ex. 4 CBI (WESTON SOLUTIONS)
Ex. 4 CBI (WESTON SOLUTIONS)

TO: #0002 TDF: #1218036

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ICF
ESAT Region 3
US Environmental Protection Agency Environmental Science Center
701 Mapes Road Ft. Meade, MD 20755-5350
Phone 410-305-3012

Date: February 22, 2019

To: Brandon McDonald
ESAT Region 3 Project Officer

From: Ex. 4 CBI
Validator

Ex. 4 CBI
Reviewer

Subject: Organic Data Validation (S4VEM)
Blades Groundwater
47948, C0AH3

Overview

This data package consisted of seven (7) groundwater samples analyzed for pesticide analytes.

Analyses were performed by Chemtech Consulting Group (CHM) according to Contract Laboratory Program (CLP) Statement of Work (SOW) SOM02.4.

Data were validated according to the National Functional Guidelines for Organic Superfund Methods Data Review and applicable USEPA Region 3 modifications. Electronic validation was performed by the Electronic Data eXchange & Evaluation System (EXES). The validation report has been assigned the Superfund Data Validation Label S4VEM (Stage_4_Validation_Electronic_Manual).

The following validation narrative is an evaluation of laboratory reported data based on the electronic data package available through the EXES Data Manager dated November 28, 2018.

Summary

A significant data quality outlier regarding dual column precision in pesticide fraction was identified that resulted in rejection of a sample result. Less significant data quality outliers were identified causing estimation of sample results including but not limited to surrogates as detailed below.

Major Problem

Heptachlor epoxide had a Percent Difference (%D) >200% between the dual column analyses in sample C0AH9. The large %D between the two results indicate interferences impacting the analyte quantitation. The reported result for this analyte in sample C0AH9 has been rejected and qualified "R".

Minor Problem

Recoveries of the surrogate Decachlorobiphenyl (DCB) were outside the lower control limit on both columns in sample C0AN9. No positive results were reported in this sample. Quantitation limits in this sample are estimated and have been qualified "UJ".

Notes

Detected concentrations for target analytes less than Contract Required Quantitation Limit (CRQL) are estimated and have been qualified "J".

Pesticide results with a percent difference >25% but <200% are estimated and have been qualified "J".

Laboratory Control Sample (LCS) reported recoveries of spiked analytes within control limits.

Matrix Spike/Matrix Spike Duplicate (MS/MSD) analyses of sample C0AH3 reported recoveries of spiked analytes within control limits except for aldrin, dieldrin and endrin outside the upper control limits on one column. No positive results were reported in the parent sample. No data were qualified based on these outliers.

Manual integrations were performed and identified by the laboratory. A subset of these was evaluated by the reviewer, and were found to be accurate and consistent. No action was taken by the reviewer based on manual integrations.

Glossary of Organic Data Qualifier Codes

Validation Qualifiers	In order of descending precedence. Only one of these qualifiers may apply to any result.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the sample.
UJ	The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit
J	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+	The result is an estimated quantity, but the result may be biased high.
J-	The result is an estimated quantity, but the result may be biased low.

Additional Qualifiers	Additional qualifiers may be combined with other qualifiers.
N	The analyte has been “tentatively identified” or “presumptively” as present.
B	The result is presumed a blank contaminant. This qualifier is used for drinking water samples only.
C	The target Pesticide or Aroclor analyte identification has been confirmed by Gas Chromatography/Mass Spectrometry (GC/MS). This qualifier may be added to other qualifiers.
X	The target Pesticide or Aroclor analyte identification was not confirmed when GC/MS analysis was performed. This qualifier may be added to other qualifiers.

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47948/EPW14030/C0AH3** **Lab Name: Chemtech Consulting Group**

Sample Number: C0AH3	Method: Pesticides	Matrix: Water	MA Number:
Sample Location: BDE-SIGW-11	pH: 6	Sample Date: 11/06/2018	Sample Time: 09:52:00
% Moisture:		% Solids: 0	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
alpha-BHC	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
beta-BHC	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
delta-BHC	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
gamma-BHC (Lindane)	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Heptachlor	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Aldrin	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Heptachlor epoxide	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Endosulfan I	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Dieldrin	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
4,4-DDE	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Endrin	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Endosulfan II	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
4,4-DDD	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Endosulfan Sulfate	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
4,4-DDT	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Methoxychlor	Target	0.50	U	ug/L	0.50	U	1.0	YES	S4VEM
Endrin ketone	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Endrin Aldehyde	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
cis-Chlordane	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
trans-Chlordane	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Toxaphene	Target	5.0	U	ug/L	5.0	U	1.0	YES	S4VEM

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47948/EPW14030/C0AH3** **Lab Name: Chemtech Consulting Group**

Sample Number: C0AH3MS	Method: Pesticides	Matrix: Water	MA Number:
Sample Location:	pH: 6	Sample Date: 11/06/2018	Sample Time: 09:52:00
% Moisture:		% Solids: 0	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
alpha-BHC	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
beta-BHC	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
delta-BHC	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
gamma-BHC (Lindane)	Spike	0.55		ug/L	0.55		1.0	YES	S4VEM
Heptachlor	Spike	0.54		ug/L	0.54		1.0	YES	S4VEM
Aldrin	Spike	0.59		ug/L	0.59		1.0	YES	S4VEM
Heptachlor epoxide	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Endosulfan I	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Dieldrin	Spike	1.1		ug/L	1.1		1.0	YES	S4VEM
4,4-DDE	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Endrin	Spike	1.2		ug/L	1.2		1.0	YES	S4VEM
Endosulfan II	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
4,4-DDD	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Endosulfan Sulfate	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
4,4-DDT	Spike	1.1		ug/L	1.1		1.0	YES	S4VEM
Methoxychlor	Target	0.50	U	ug/L	0.50	U	1.0	YES	S4VEM
Endrin ketone	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Endrin Aldehyde	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
cis-Chlordane	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
trans-Chlordane	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Toxaphene	Target	5.0	U	ug/L	5.0	U	1.0	YES	S4VEM

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47948/EPW14030/C0AH3** **Lab Name: Chemtech Consulting Group**

Sample Number: C0AH3MSD	Method: Pesticides	Matrix: Water	MA Number:
Sample Location:	pH: 6	Sample Date: 11/06/2018	Sample Time: 09:52:00
% Moisture:		% Solids: 0	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
alpha-BHC	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
beta-BHC	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
delta-BHC	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
gamma-BHC (Lindane)	Spike	0.56		ug/L	0.56		1.0	YES	S4VEM
Heptachlor	Spike	0.54		ug/L	0.54		1.0	YES	S4VEM
Aldrin	Spike	0.59		ug/L	0.59		1.0	YES	S4VEM
Heptachlor epoxide	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Endosulfan I	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Dieldrin	Spike	1.1		ug/L	1.1		1.0	YES	S4VEM
4,4-DDE	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Endrin	Spike	1.2		ug/L	1.2		1.0	YES	S4VEM
Endosulfan II	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
4,4-DDD	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Endosulfan Sulfate	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
4,4-DDT	Spike	1.1		ug/L	1.1		1.0	YES	S4VEM
Methoxychlor	Target	0.50	U	ug/L	0.50	U	1.0	YES	S4VEM
Endrin ketone	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Endrin Aldehyde	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
cis-Chlordane	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
trans-Chlordane	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Toxaphene	Target	5.0	U	ug/L	5.0	U	1.0	YES	S4VEM

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47948/EPW14030/C0AH3** **Lab Name: Chemtech Consulting Group**

Sample Number: C0AH7	Method: Pesticides	Matrix: Water	MA Number:
Sample Location: BDE-SIGW-15	pH: 6	Sample Date: 11/06/2018	Sample Time: 12:13:00
% Moisture:		% Solids: 0	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
alpha-BHC	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
beta-BHC	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
delta-BHC	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
gamma-BHC (Lindane)	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Heptachlor	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Aldrin	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Heptachlor epoxide	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Endosulfan I	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Dieldrin	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
4,4-DDE	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Endrin	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Endosulfan II	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
4,4-DDD	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Endosulfan Sulfate	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
4,4-DDT	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Methoxychlor	Target	0.50	U	ug/L	0.50	U	1.0	YES	S4VEM
Endrin ketone	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Endrin Aldehyde	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
cis-Chlordane	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
trans-Chlordane	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Toxaphene	Target	5.0	U	ug/L	5.0	U	1.0	YES	S4VEM

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47948/EPW14030/C0AH3** **Lab Name: Chemtech Consulting Group**

Sample Number: C0AH8	Method: Pesticides	Matrix: Water	MA Number:
Sample Location: BDE-SIGW-16	pH: 6	Sample Date: 11/07/2018	Sample Time: 14:30:00
% Moisture:		% Solids: 0	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
alpha-BHC	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
beta-BHC	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
delta-BHC	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
gamma-BHC (Lindane)	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Heptachlor	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Aldrin	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Heptachlor epoxide	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Endosulfan I	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Dieldrin	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
4,4-DDE	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Endrin	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Endosulfan II	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
4,4-DDD	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Endosulfan Sulfate	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
4,4-DDT	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Methoxychlor	Target	0.50	U	ug/L	0.50	U	1.0	YES	S4VEM
Endrin ketone	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Endrin Aldehyde	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
cis-Chlordane	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
trans-Chlordane	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Toxaphene	Target	5.0	U	ug/L	5.0	U	1.0	YES	S4VEM

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47948/EPW14030/C0AH3** **Lab Name: Chemtech Consulting Group**

Sample Number: C0AH9	Method: Pesticides	Matrix: Water	MA Number:
Sample Location: BDE-SIGW-17	pH: 6	Sample Date: 11/07/2018	Sample Time: 14:32:00
% Moisture:		% Solids: 0	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
alpha-BHC	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
beta-BHC	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
delta-BHC	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
gamma-BHC (Lindane)	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Heptachlor	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Aldrin	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Heptachlor epoxide	Target	0.0051	R	ug/L	0.0051	JP	1.0	YES	S4VEM
Endosulfan I	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Dieldrin	Target	0.056	J	ug/L	0.056	JP	1.0	YES	S4VEM
4,4-DDE	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Endrin	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Endosulfan II	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
4,4-DDD	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Endosulfan Sulfate	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
4,4-DDT	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Methoxychlor	Target	0.50	U	ug/L	0.50	U	1.0	YES	S4VEM
Endrin ketone	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Endrin Aldehyde	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
cis-Chlordane	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
trans-Chlordane	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Toxaphene	Target	5.0	U	ug/L	5.0	U	1.0	YES	S4VEM

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47948/EPW14030/C0AH3** **Lab Name: Chemtech Consulting Group**

Sample Number: C0AJ0	Method: Pesticides	Matrix: Water	MA Number:
Sample Location: BDE-SIGW-18	pH: 6	Sample Date: 11/07/2018	Sample Time: 12:20:00
% Moisture:		% Solids: 0	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
alpha-BHC	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
beta-BHC	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
delta-BHC	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
gamma-BHC (Lindane)	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Heptachlor	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Aldrin	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Heptachlor epoxide	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Endosulfan I	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Dieldrin	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
4,4-DDE	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Endrin	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Endosulfan II	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
4,4-DDD	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Endosulfan Sulfate	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
4,4-DDT	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Methoxychlor	Target	0.50	U	ug/L	0.50	U	1.0	YES	S4VEM
Endrin ketone	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Endrin Aldehyde	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
cis-Chlordane	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
trans-Chlordane	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Toxaphene	Target	5.0	U	ug/L	5.0	U	1.0	YES	S4VEM

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47948/EPW14030/C0AH3** **Lab Name: Chemtech Consulting Group**

Sample Number: C0AK7	Method: Pesticides	Matrix: Water	MA Number:
Sample Location: BDE-SIGW-19	pH: 6	Sample Date: 11/07/2018	Sample Time: 10:25:00
% Moisture:		% Solids: 0	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
alpha-BHC	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
beta-BHC	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
delta-BHC	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
gamma-BHC (Lindane)	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Heptachlor	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Aldrin	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Heptachlor epoxide	Target	0.60		ug/L	0.60		1.0	YES	S4VEM
Endosulfan I	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Dieldrin	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
4,4-DDE	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Endrin	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Endosulfan II	Target	0.022	J	ug/L	0.022	JP	1.0	YES	S4VEM
4,4-DDD	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Endosulfan Sulfate	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
4,4-DDT	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Methoxychlor	Target	0.50	U	ug/L	0.50	U	1.0	YES	S4VEM
Endrin ketone	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Endrin Aldehyde	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
cis-Chlordane	Target	0.16	J	ug/L	0.16	P	1.0	YES	S4VEM
trans-Chlordane	Target	0.17	J	ug/L	0.17	P	1.0	YES	S4VEM
Toxaphene	Target	5.0	U	ug/L	5.0	U	1.0	YES	S4VEM

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47948/EPW14030/C0AH3** **Lab Name: Chemtech Consulting Group**

Sample Number: C0AN9	Method: Pesticides	Matrix: Water	MA Number:
Sample Location: BDE-SIGW-20	pH: 6	Sample Date: 11/07/2018	Sample Time: 14:15:00
% Moisture:		% Solids: 0	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
alpha-BHC	Target	0.051	UJ	ug/L	0.051	U	1.0	YES	S4VEM
beta-BHC	Target	0.051	UJ	ug/L	0.051	U	1.0	YES	S4VEM
delta-BHC	Target	0.051	UJ	ug/L	0.051	U	1.0	YES	S4VEM
gamma-BHC (Lindane)	Target	0.051	UJ	ug/L	0.051	U	1.0	YES	S4VEM
Heptachlor	Target	0.051	UJ	ug/L	0.051	U	1.0	YES	S4VEM
Aldrin	Target	0.051	UJ	ug/L	0.051	U	1.0	YES	S4VEM
Heptachlor epoxide	Target	0.051	UJ	ug/L	0.051	U	1.0	YES	S4VEM
Endosulfan I	Target	0.051	UJ	ug/L	0.051	U	1.0	YES	S4VEM
Dieldrin	Target	0.10	UJ	ug/L	0.10	U	1.0	YES	S4VEM
4,4-DDE	Target	0.10	UJ	ug/L	0.10	U	1.0	YES	S4VEM
Endrin	Target	0.10	UJ	ug/L	0.10	U	1.0	YES	S4VEM
Endosulfan II	Target	0.10	UJ	ug/L	0.10	U	1.0	YES	S4VEM
4,4-DDD	Target	0.10	UJ	ug/L	0.10	U	1.0	YES	S4VEM
Endosulfan Sulfate	Target	0.10	UJ	ug/L	0.10	U	1.0	YES	S4VEM
4,4-DDT	Target	0.10	UJ	ug/L	0.10	U	1.0	YES	S4VEM
Methoxychlor	Target	0.51	UJ	ug/L	0.51	U	1.0	YES	S4VEM
Endrin ketone	Target	0.10	UJ	ug/L	0.10	U	1.0	YES	S4VEM
Endrin Aldehyde	Target	0.10	UJ	ug/L	0.10	U	1.0	YES	S4VEM
cis-Chlordane	Target	0.051	UJ	ug/L	0.051	U	1.0	YES	S4VEM
trans-Chlordane	Target	0.051	UJ	ug/L	0.051	U	1.0	YES	S4VEM
Toxaphene	Target	5.1	UJ	ug/L	5.1	U	1.0	YES	S4VEM

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47948/EPW14030/C0AH3** **Lab Name: Chemtech Consulting Group**

Sample Number: PBLK30	Method: Pesticides	Matrix: Water	MA Number:
Sample Location:	pH: 6	Sample Date:	Sample Time:
% Moisture:		% Solids: 0	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
alpha-BHC	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
beta-BHC	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
delta-BHC	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
gamma-BHC (Lindane)	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Heptachlor	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Aldrin	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Heptachlor epoxide	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Endosulfan I	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Dieldrin	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
4,4-DDE	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Endrin	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Endosulfan II	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
4,4-DDD	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Endosulfan Sulfate	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
4,4-DDT	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Methoxychlor	Target	0.50	U	ug/L	0.50	U	1.0	YES	S4VEM
Endrin ketone	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Endrin Aldehyde	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
cis-Chlordane	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
trans-Chlordane	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Toxaphene	Target	5.0	U	ug/L	5.0	U	1.0	YES	S4VEM

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47948/EPW14030/C0AH3** **Lab Name: Chemtech Consulting Group**

Sample Number: PLCS30	Method: Pesticides	Matrix: Water	MA Number:
Sample Location:	pH: 6	Sample Date:	Sample Time:
% Moisture:		% Solids: 0	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
alpha-BHC	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
beta-BHC	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
delta-BHC	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
gamma-BHC (Lindane)	Spike	0.40		ug/L	0.40		1.0	YES	S4VEM
Heptachlor	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Aldrin	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Heptachlor epoxide	Spike	0.52		ug/L	0.52		1.0	YES	S4VEM
Endosulfan I	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
Dieldrin	Spike	1.0		ug/L	1.0		1.0	YES	S4VEM
4,4-DDE	Spike	1.1		ug/L	1.1		1.0	YES	S4VEM
Endrin	Spike	1.0		ug/L	1.0		1.0	YES	S4VEM
Endosulfan II	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
4,4-DDD	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Endosulfan Sulfate	Spike	0.55		ug/L	0.55		1.0	YES	S4VEM
4,4-DDT	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Methoxychlor	Target	0.50	U	ug/L	0.50	U	1.0	YES	S4VEM
Endrin ketone	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
Endrin Aldehyde	Target	0.10	U	ug/L	0.10	U	1.0	YES	S4VEM
cis-Chlordane	Target	0.050	U	ug/L	0.050	U	1.0	YES	S4VEM
trans-Chlordane	Spike	0.52		ug/L	0.52		1.0	YES	S4VEM
Toxaphene	Target	5.0	U	ug/L	5.0	U	1.0	YES	S4VEM

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
Environmental Sciences Center
701 Mapes Road
Fort Meade, Maryland 20755-5350

DATE: 4/2/2019

SUBJECT: Region III Data QA Review

FROM: Brandon McDonald
Region III ESAT RPO (3EA22)

TO: CONNOR O'LOUGHLIN
Hazardous Site Cleanup Division (HSCD)

Attached is the data validation report for the BLADES GROUNDWATER site for RAS#47948; SDG# MC0AG1 completed by the Region III Environmental Services Assistance Team (ESAT) contractor, ICF International, under the direction of Region III EAID.

If you have any questions regarding this review, please call Brandon McDonald at (410) 305-2607 or you can call Eric Graybill at (410)-305-2665.

Attachment

cc: Ex. 4 CBI (WESTON SOLUTIONS)
WESTON SOLUTIONS)

TO: #0002 TDF: #1218003

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ICF
ESAT Region 3
US Environmental Protection Agency Environmental Science Center
701 Mapes Road Ft. Meade, MD 20755-5350
Phone 410-305-3012

Date: March 30, 2019

To: Brandon McDonald
ESAT Region 3 Project Officer

From: Ex. 4 CBI
Validator

Ex. 4 CBI
Reviewer

Subject: Inorganic Data Validation (S4VEM)
Blades Groundwater
47948 MC0AG1

Overview

This data package consisted of twenty (20) ground water samples, including two (2) field duplicate pairs, analyzed for total metals by ICP-MS, for mercury (Hg) by cold vapor atomic absorption technique, and for cyanide (CN^-) by spectrophotometry.

Analyses were performed by Shealy Environmental Services (EQI) according to Contract Laboratory Program (CLP) Statement of Work (SOW) ISM02.4.

Data were validated according to the National Functional Guidelines for Inorganic Superfund Methods Data Review and applicable USEPA Region 3 modifications. Electronic validation was performed by the Electronic Data eXchange & Evaluation System (EXES). The validation report has been assigned the Superfund Data Validation Level Stage_4_Validation_Electronic_Manual (S4VEM).

The following validation narrative is an evaluation of laboratory reported data based on the hardcopy data package received by Region 3 on November 29, 2018.

Summary

Lack of sample preservation for two (2) cyanide samples required rejection of sample results. Less significant data quality outliers requiring estimation of sample results were identified including, but not limited to, serial dilution percent differences and blank contamination as detailed below.

Major Problem

The cyanide aliquots for samples MC0AG7 and MC0AH7 were received at a pH of 7, which is less than the method required preservation pH of 10. The samples were preserved by the laboratory upon receipt, but the National Functional Guidelines for Inorganic Superfund Methods Data Review has no stipulation for the preservation of cyanide samples that are received improperly preserved. The quantitation limit for cyanide in these samples is unusable and has been qualified "R".

Minor Problems

Percent differences (%Ds) in the ICP serial dilution analysis were outside the control limit (>10%) for aluminum (Al), barium (Ba), calcium (Ca), iron (Fe), magnesium (Mg), manganese (Mn), and sodium (Na). Detected concentrations and quantitation limits for these analytes are estimated due to possible physical or chemical interferences in the sample matrix and have been qualified "J" and "UJ", respectively.

Laboratory instrumentation reported negative values for lead (Pb) and vanadium (V) greater than absolute values of the Method Detection Limits (MDLs) in blank analyses. Detected concentrations of these analytes less than the Contract Required Quantitation Limit (CRQL) have been reported at the CRQL and qualified "UJ". Quantitation limits for these analytes are estimated and have been qualified "UJ".

Notes

Fe and Hg have been detected in laboratory blanks associated with the samples in this SDG. Detected concentrations of these analytes less than the CRQL have been reported at the CRQL and qualified "U".

Analytes detected below the CRQL not attributed to blank contamination are estimated and have been qualified "J".

Matrix spike, laboratory duplicate, and Laboratory Control Sample analyses were within control limits.

Results reported for field duplicate pair MC0AG4/MC0AL0 were comparable within control limits of 25 Relative Percent Difference (RPD) or ± CRQL for all analytes except Al. No data were qualified based on field duplicate precision.

Results reported for field duplicate pair MC0AH0/MC0AL2 were comparable within control limits of 25 Relative Percent Difference (RPD) or ± CRQL for all analytes. No data were qualified based on field duplicate precision.

Glossary of Inorganic Data Qualifier Codes

Validation Qualifiers	In order of descending precedence. Only one of these qualifiers may apply to any result.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the sample.
UJ	The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit
B	The result is presumed a blank contaminant. This qualifier is used for drinking water samples only.
J	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+	The result is an estimated quantity, but the result may be biased high.
J-	The result is an estimated quantity, but the result may be biased low.

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47948/EPW14035/MC0AG1** **Lab Name: Shealy Environmental Services, Inc.**

Sample Number: LCS001	Method: Metals by ICP-MS	Matrix: Water	MA Number:
Sample Location:	pH:	Sample Date:	Sample Time:
% Moisture:		% Solids:	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Aluminum	Spike	35.7		ug/L	35.7		1	YES	S4VEM
Antimony	Spike	3.8		ug/L	3.8		1	YES	S4VEM
Arsenic	Spike	1.7		ug/L	1.7		1	YES	S4VEM
Barium	Spike	17.6		ug/L	17.6		1	YES	S4VEM
Beryllium	Spike	1.9		ug/L	1.9		1	YES	S4VEM
Cadmium	Spike	1.9		ug/L	1.9		1	YES	S4VEM
Calcium	Spike	915		ug/L	915		1	YES	S4VEM
Chromium	Spike	4.0		ug/L	4.0		1	YES	S4VEM
Cobalt	Spike	1.8		ug/L	1.8		1	YES	S4VEM
Copper	Spike	4.1		ug/L	4.1		1	YES	S4VEM
Iron	Spike	375		ug/L	375		1	YES	S4VEM
Lead	Spike	1.8		ug/L	1.8		1	YES	S4VEM
Magnesium	Spike	914		ug/L	914		1	YES	S4VEM
Manganese	Spike	2.0		ug/L	2.0		1	YES	S4VEM
Nickel	Spike	2.1		ug/L	2.1		1	YES	S4VEM
Potassium	Spike	1040		ug/L	1040		1	YES	S4VEM
Selenium	Spike	10.3		ug/L	10.3		1	YES	S4VEM
Silver	Spike	2.0		ug/L	2.0		1	YES	S4VEM
Sodium	Spike	996		ug/L	996		1	YES	S4VEM
Thallium	Spike	1.8		ug/L	1.8		1	YES	S4VEM
Vanadium	Spike	8.7		ug/L	8.7		1	YES	S4VEM
Zinc	Spike	4.7		ug/L	4.7		1	YES	S4VEM

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47948/EPW14035/MC0AG1** **Lab Name: Shealy Environmental Services, Inc.**

Sample Number: MC0AG1	Method: Cyanide	Matrix: Water	MA Number:
Sample Location: BDE-SIGW-01	pH: 14.0	Sample Date: 11/06/2018	Sample Time: 14:24:00
% Moisture:		% Solids:	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Cyanide	Target	10.0	U	ug/L	10.0	U	1	YES	S4VEM

ED_005024_00000601-00201

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47948/EPW14035/MC0AG1** **Lab Name: Shealy Environmental Services, Inc.**

Sample Number: MC0AG1	Method: Mercury by Cold Vapor	Matrix: Water	MA Number:
Sample Location: BDE-SIGW-01	pH: 1.5	Sample Date: 11/06/2018	Sample Time: 14:24:00
% Moisture:		% Solids:	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Mercury	Target	0.20	U	ug/L	0.045	J	1	YES	S4VEM

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47948/EPW14035/MC0AG1** **Lab Name: Shealy Environmental Services, Inc.**

Sample Number: MC0AG1	Method: Metals by ICP-MS	Matrix: Water	MA Number:
Sample Location: BDE-SIGW-01	pH: 1.5	Sample Date: 11/06/2018	Sample Time: 14:24:00
% Moisture:		% Solids:	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Aluminum	Target	538	J	ug/L	538	*	1	YES	S4VEM
Antimony	Target	0.53	J	ug/L	0.53	J	1	YES	S4VEM
Arsenic	Target	0.99	J	ug/L	0.99	J	1	YES	S4VEM
Barium	Target	27.3	J	ug/L	27.3	*	1	YES	S4VEM
Beryllium	Target	1.0	U	ug/L	1.0	U	1	YES	S4VEM
Cadmium	Target	1.0	U	ug/L	1.0	U	1	YES	S4VEM
Calcium	Target	22400	J	ug/L	22400	*	1	YES	S4VEM
Chromium	Target	1.1	J	ug/L	1.1	J	1	YES	S4VEM
Cobalt	Target	0.20	J	ug/L	0.20	J	1	YES	S4VEM
Copper	Target	1.7	J	ug/L	1.7	J	1	YES	S4VEM
Iron	Target	791	J	ug/L	791	*	1	YES	S4VEM
Lead	Target	1.0	UJ	ug/L	0.29	J	1	YES	S4VEM
Magnesium	Target	2490	J	ug/L	2490	*	1	YES	S4VEM
Manganese	Target	13.6	J	ug/L	13.6	*	1	YES	S4VEM
Nickel	Target	0.59	J	ug/L	0.59	J	1	YES	S4VEM
Potassium	Target	3410		ug/L	3410		1	YES	S4VEM
Selenium	Target	5.0	U	ug/L	5.0	U	1	YES	S4VEM
Silver	Target	1.0	U	ug/L	1.0	U	1	YES	S4VEM
Sodium	Target	3710	J	ug/L	3710	*	1	YES	S4VEM
Thallium	Target	1.0	U	ug/L	1.0	U	1	YES	S4VEM
Vanadium	Target	5.0	UJ	ug/L	1.9	J	1	YES	S4VEM
Zinc	Target	3.4		ug/L	3.4		1	YES	S4VEM

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47948/EPW14035/MC0AG1** **Lab Name: Shealy Environmental Services, Inc.**

Sample Number: MC0AG1D	Method: Cyanide	Matrix: Water	MA Number:
Sample Location:	pH: 14.0	Sample Date: 11/06/2018	Sample Time: 14:24:00
% Moisture:		% Solids:	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Cyanide	Target	10.0	U	ug/L	10.0	U	1	YES	S4VEM

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47948/EPW14035/MC0AG1** **Lab Name: Shealy Environmental Services, Inc.**

Sample Number: MC0AG1D	Method: Mercury by Cold Vapor	Matrix: Water	MA Number:
Sample Location:	pH: 1.5	Sample Date: 11/06/2018	Sample Time: 14:24:00
% Moisture:		% Solids:	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Mercury	Target	0.041	J	ug/L	0.041	J	1	YES	S4VEM

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47948/EPW14035/MC0AG1** **Lab Name: Shealy Environmental Services, Inc.**

Sample Number: MC0AG1D	Method: Metals by ICP-MS	Matrix: Water	MA Number:
Sample Location:	pH: 1.5	Sample Date: 11/06/2018	Sample Time: 14:24:00
% Moisture:		% Solids:	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Aluminum	Target	544		ug/L	544		1	YES	S4VEM
Antimony	Target	0.53	J	ug/L	0.53	J	1	YES	S4VEM
Arsenic	Target	0.70	J	ug/L	0.70	J	1	YES	S4VEM
Barium	Target	27.2		ug/L	27.2		1	YES	S4VEM
Beryllium	Target	1.0	U	ug/L	1.0	U	1	YES	S4VEM
Cadmium	Target	1.0	U	ug/L	1.0	U	1	YES	S4VEM
Calcium	Target	22400		ug/L	22400		1	YES	S4VEM
Chromium	Target	1.2	J	ug/L	1.2	J	1	YES	S4VEM
Cobalt	Target	0.18	J	ug/L	0.18	J	1	YES	S4VEM
Copper	Target	1.4	J	ug/L	1.4	J	1	YES	S4VEM
Iron	Target	789		ug/L	789		1	YES	S4VEM
Lead	Target	0.27	J	ug/L	0.27	J	1	YES	S4VEM
Magnesium	Target	2510		ug/L	2510		1	YES	S4VEM
Manganese	Target	13.5		ug/L	13.5		1	YES	S4VEM
Nickel	Target	0.64	J	ug/L	0.64	J	1	YES	S4VEM
Potassium	Target	3410		ug/L	3410		1	YES	S4VEM
Selenium	Target	5.0	U	ug/L	5.0	U	1	YES	S4VEM
Silver	Target	1.0	U	ug/L	1.0	U	1	YES	S4VEM
Sodium	Target	3760		ug/L	3760		1	YES	S4VEM
Thallium	Target	1.0	U	ug/L	1.0	U	1	YES	S4VEM
Vanadium	Target	0.54	J	ug/L	0.54	J	1	YES	S4VEM
Zinc	Target	3.5		ug/L	3.5		1	YES	S4VEM

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47948/EPW14035/MC0AG1** **Lab Name: Shealy Environmental Services, Inc.**

Sample Number: MC0AG1L	Method: Metals by ICP-MS	Matrix: Water	MA Number:
Sample Location:	pH: 1.5	Sample Date:	Sample Time:
% Moisture:		% Solids:	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Aluminum	Target	622		ug/L	622	*	5	YES	S4VEM
Antimony	Target	0.76	J	ug/L	0.76	J	5	YES	S4VEM
Arsenic	Target	5.0	U	ug/L	5.0	U	5	YES	S4VEM
Barium	Target	30.5	J	ug/L	30.5	J*	5	YES	S4VEM
Beryllium	Target	5.0	U	ug/L	5.0	U	5	YES	S4VEM
Cadmium	Target	5.0	U	ug/L	5.0	U	5	YES	S4VEM
Calcium	Target	24800		ug/L	24800	*	5	YES	S4VEM
Chromium	Target	1.5	J	ug/L	1.5	J	5	YES	S4VEM
Cobalt	Target	0.24	J	ug/L	0.24	J	5	YES	S4VEM
Copper	Target	2.1	J	ug/L	2.1	J	5	YES	S4VEM
Iron	Target	917	J	ug/L	917	J*	5	YES	S4VEM
Lead	Target	0.26	J	ug/L	0.26	J	5	YES	S4VEM
Magnesium	Target	2880		ug/L	2880	*	5	YES	S4VEM
Manganese	Target	15.2		ug/L	15.2	*	5	YES	S4VEM
Nickel	Target	0.67	J	ug/L	0.67	J	5	YES	S4VEM
Potassium	Target	3660		ug/L	3660		5	YES	S4VEM
Selenium	Target	25.0	U	ug/L	25.0	U	5	YES	S4VEM
Silver	Target	5.0	U	ug/L	5.0	U	5	YES	S4VEM
Sodium	Target	4140		ug/L	4140	*	5	YES	S4VEM
Thallium	Target	5.0	U	ug/L	5.0	U	5	YES	S4VEM
Vanadium	Target	25.0	U	ug/L	25.0	U	5	YES	S4VEM
Zinc	Target	4.2	J	ug/L	4.2	J	5	YES	S4VEM

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47948/EPW14035/MC0AG1** **Lab Name: Shealy Environmental Services, Inc.**

Sample Number: MC0AG1S	Method: Cyanide	Matrix: Water	MA Number:
Sample Location:	pH: 14.0	Sample Date: 11/06/2018	Sample Time: 14:24:00
% Moisture:		% Solids:	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Cyanide	Spike	108		ug/L	108		1	YES	S4VEM

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47948/EPW14035/MC0AG1** **Lab Name: Shealy Environmental Services, Inc.**

Sample Number: MC0AG1S	Method: Mercury by Cold Vapor	Matrix: Water	MA Number:
Sample Location:	pH: 1.5	Sample Date: 11/06/2018	Sample Time: 14:24:00
% Moisture:		% Solids:	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Mercury	Spike	1.1		ug/L	1.1		1	YES	S4VEM

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47948/EPW14035/MC0AG1** **Lab Name: Shealy Environmental Services, Inc.**

Sample Number: MC0AG1S	Method: Metals by ICP-MS	Matrix: Water	MA Number:
Sample Location:	pH: 1.5	Sample Date: 11/06/2018	Sample Time: 14:24:00
% Moisture:		% Solids:	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Spike	91.3		ug/L	91.3		1	YES	S4VEM
Arsenic	Spike	40.2		ug/L	40.2		1	YES	S4VEM
Barium	Spike	1800		ug/L	1800		1	YES	S4VEM
Beryllium	Spike	46.9		ug/L	46.9		1	YES	S4VEM
Cadmium	Spike	48.2		ug/L	48.2		1	YES	S4VEM
Chromium	Spike	182		ug/L	182		1	YES	S4VEM
Cobalt	Spike	491		ug/L	491		1	YES	S4VEM
Copper	Spike	252		ug/L	252		1	YES	S4VEM
Lead	Spike	18.3		ug/L	18.3		1	YES	S4VEM
Manganese	Spike	500		ug/L	500		1	YES	S4VEM
Nickel	Spike	498		ug/L	498		1	YES	S4VEM
Selenium	Spike	101		ug/L	101		1	YES	S4VEM
Silver	Spike	50.5		ug/L	50.5		1	YES	S4VEM
Thallium	Spike	44.7		ug/L	44.7		1	YES	S4VEM
Vanadium	Spike	516		ug/L	516		1	YES	S4VEM
Zinc	Spike	495		ug/L	495		1	YES	S4VEM

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47948/EPW14035/MC0AG1** **Lab Name: Shealy Environmental Services, Inc.**

Sample Number: MC0AG4	Method: Cyanide	Matrix: Water	MA Number:
Sample Location: BDE-SIGW-02D	pH: 14.0	Sample Date: 11/06/2018	Sample Time: 14:23:00
% Moisture:		% Solids:	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Cyanide	Target	10.0	U	ug/L	10.0	U	1	YES	S4VEM

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47948/EPW14035/MC0AG1** **Lab Name: Shealy Environmental Services, Inc.**

Sample Number: MC0AG4	Method: Mercury by Cold Vapor	Matrix: Water	MA Number:
Sample Location: BDE-SIGW-02D	pH: 1.5	Sample Date: 11/06/2018	Sample Time: 14:23:00
% Moisture:		% Solids:	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Mercury	Target	0.20	U	ug/L	0.045	J	1	YES	S4VEM

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47948/EPW14035/MC0AG1** **Lab Name: Shealy Environmental Services, Inc.**

Sample Number: MC0AG4	Method: Metals by ICP-MS	Matrix: Water	MA Number:
Sample Location: BDE-SIGW-02D	pH: 1.5	Sample Date: 11/06/2018	Sample Time: 14:23:00
% Moisture:		% Solids:	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Aluminum	Target	1440	J	ug/L	1440	*	1	YES	S4VEM
Antimony	Target	0.32	J	ug/L	0.32	J	1	YES	S4VEM
Arsenic	Target	0.88	J	ug/L	0.88	J	1	YES	S4VEM
Barium	Target	127	J	ug/L	127	*	1	YES	S4VEM
Beryllium	Target	0.58	J	ug/L	0.58	J	1	YES	S4VEM
Cadmium	Target	0.18	J	ug/L	0.18	J	1	YES	S4VEM
Calcium	Target	11100	J	ug/L	11100	*	1	YES	S4VEM
Chromium	Target	1.4	J	ug/L	1.4	J	1	YES	S4VEM
Cobalt	Target	13.8		ug/L	13.8		1	YES	S4VEM
Copper	Target	0.54	J	ug/L	0.54	J	1	YES	S4VEM
Iron	Target	1360	J	ug/L	1360	*	1	YES	S4VEM
Lead	Target	1.0	UJ	ug/L	0.73	J	1	YES	S4VEM
Magnesium	Target	3480	J	ug/L	3480	*	1	YES	S4VEM
Manganese	Target	187	J	ug/L	187	*	1	YES	S4VEM
Nickel	Target	3.7		ug/L	3.7		1	YES	S4VEM
Potassium	Target	3780		ug/L	3780		1	YES	S4VEM
Selenium	Target	5.0	U	ug/L	5.0	U	1	YES	S4VEM
Silver	Target	1.0	U	ug/L	1.0	U	1	YES	S4VEM
Sodium	Target	47900	J	ug/L	47900	*	1	YES	S4VEM
Thallium	Target	0.050	J	ug/L	0.050	J	1	YES	S4VEM
Vanadium	Target	5.0	UJ	ug/L	5.0	U	1	YES	S4VEM
Zinc	Target	15.6		ug/L	15.6		1	YES	S4VEM

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47948/EPW14035/MC0AG1** **Lab Name: Shealy Environmental Services, Inc.**

Sample Number: MC0AG5	Method: Cyanide	Matrix: Water	MA Number:
Sample Location: BDE-SIGW-03	pH: 14.0	Sample Date: 11/07/2018	Sample Time: 09:17:00
% Moisture:		% Solids:	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Cyanide	Target	10.0	U	ug/L	10.0	U	1	YES	S4VEM

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47948/EPW14035/MC0AG1** **Lab Name: Shealy Environmental Services, Inc.**

Sample Number: MC0AG5	Method: Mercury by Cold Vapor	Matrix: Water	MA Number:
Sample Location: BDE-SIGW-03	pH: 1.5	Sample Date: 11/07/2018	Sample Time: 09:17:00
% Moisture:		% Solids:	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Mercury	Target	0.20	U	ug/L	0.039	J	1	YES	S4VEM

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47948/EPW14035/MC0AG1** **Lab Name: Shealy Environmental Services, Inc.**

Sample Number: MC0AG5	Method: Metals by ICP-MS	Matrix: Water	MA Number:
Sample Location: BDE-SIGW-03	pH: 1.5	Sample Date: 11/07/2018	Sample Time: 09:17:00
% Moisture:		% Solids:	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Aluminum	Target	296	J	ug/L	296	*	1	YES	S4VEM
Antimony	Target	0.66	J	ug/L	0.66	J	1	YES	S4VEM
Arsenic	Target	0.62	J	ug/L	0.62	J	1	YES	S4VEM
Barium	Target	24.3	J	ug/L	24.3	*	1	YES	S4VEM
Beryllium	Target	1.0	U	ug/L	1.0	U	1	YES	S4VEM
Cadmium	Target	1.0	U	ug/L	1.0	U	1	YES	S4VEM
Calcium	Target	50400	J	ug/L	50400	*	1	YES	S4VEM
Chromium	Target	0.90	J	ug/L	0.90	J	1	YES	S4VEM
Cobalt	Target	0.37	J	ug/L	0.37	J	1	YES	S4VEM
Copper	Target	1.4	J	ug/L	1.4	J	1	YES	S4VEM
Iron	Target	441	J	ug/L	441	*	1	YES	S4VEM
Lead	Target	1.0	UJ	ug/L	0.19	J	1	YES	S4VEM
Magnesium	Target	4040	J	ug/L	4040	*	1	YES	S4VEM
Manganese	Target	13.5	J	ug/L	13.5	*	1	YES	S4VEM
Nickel	Target	0.93	J	ug/L	0.93	J	1	YES	S4VEM
Potassium	Target	3180		ug/L	3180		1	YES	S4VEM
Selenium	Target	5.0	U	ug/L	5.0	U	1	YES	S4VEM
Silver	Target	1.0	U	ug/L	1.0	U	1	YES	S4VEM
Sodium	Target	4340	J	ug/L	4340	*	1	YES	S4VEM
Thallium	Target	1.0	U	ug/L	1.0	U	1	YES	S4VEM
Vanadium	Target	5.0	UJ	ug/L	1.7	J	1	YES	S4VEM
Zinc	Target	1.4	J	ug/L	1.4	J	1	YES	S4VEM

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47948/EPW14035/MC0AG1** **Lab Name: Shealy Environmental Services, Inc.**

Sample Number: MC0AG6	Method: Cyanide	Matrix: Water	MA Number:
Sample Location: BDE-SIGW-04	pH: 14.0	Sample Date: 11/07/2018	Sample Time: 09:23:00
% Moisture:		% Solids:	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Cyanide	Target	10.0	U	ug/L	10.0	U	1	YES	S4VEM

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47948/EPW14035/MC0AG1** **Lab Name: Shealy Environmental Services, Inc.**

Sample Number: MC0AG6	Method: Mercury by Cold Vapor	Matrix: Water	MA Number:
Sample Location: BDE-SIGW-04	pH: 1.5	Sample Date: 11/07/2018	Sample Time: 09:23:00
% Moisture:		% Solids:	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Mercury	Target	0.20	U	ug/L	0.039	J	1	YES	S4VEM

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47948/EPW14035/MC0AG1** **Lab Name: Shealy Environmental Services, Inc.**

Sample Number: MC0AG6	Method: Metals by ICP-MS	Matrix: Water	MA Number:
Sample Location: BDE-SIGW-04	pH: 1.5	Sample Date: 11/07/2018	Sample Time: 09:23:00
% Moisture:		% Solids:	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Aluminum	Target	14.5	J	ug/L	14.5	J*	1	YES	S4VEM
Antimony	Target	2.0	U	ug/L	2.0	U	1	YES	S4VEM
Arsenic	Target	1.0	U	ug/L	1.0	U	1	YES	S4VEM
Barium	Target	47.1	J	ug/L	47.1	*	1	YES	S4VEM
Beryllium	Target	1.0	U	ug/L	1.0	U	1	YES	S4VEM
Cadmium	Target	1.0	U	ug/L	1.0	U	1	YES	S4VEM
Calcium	Target	28200	J	ug/L	28200	*	1	YES	S4VEM
Chromium	Target	0.63	J	ug/L	0.63	J	1	YES	S4VEM
Cobalt	Target	0.18	J	ug/L	0.18	J	1	YES	S4VEM
Copper	Target	0.78	J	ug/L	0.78	J	1	YES	S4VEM
Iron	Target	200	UJ	ug/L	145	J*	1	YES	S4VEM
Lead	Target	1.0	UJ	ug/L	1.0	U	1	YES	S4VEM
Magnesium	Target	3750	J	ug/L	3750	*	1	YES	S4VEM
Manganese	Target	28.0	J	ug/L	28.0	*	1	YES	S4VEM
Nickel	Target	0.54	J	ug/L	0.54	J	1	YES	S4VEM
Potassium	Target	3960		ug/L	3960		1	YES	S4VEM
Selenium	Target	5.0	U	ug/L	5.0	U	1	YES	S4VEM
Silver	Target	1.0	U	ug/L	1.0	U	1	YES	S4VEM
Sodium	Target	45100	J	ug/L	45100	*	1	YES	S4VEM
Thallium	Target	1.0	U	ug/L	1.0	U	1	YES	S4VEM
Vanadium	Target	5.0	UJ	ug/L	5.0	U	1	YES	S4VEM
Zinc	Target	0.73	J	ug/L	0.73	J	1	YES	S4VEM

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47948/EPW14035/MC0AG1** **Lab Name: Shealy Environmental Services, Inc.**

Sample Number: MC0AG7	Method: Cyanide	Matrix: Water	MA Number:
Sample Location: BDE-SIGW-05	pH: 14.0	Sample Date: 11/07/2018	Sample Time: 12:48:00
% Moisture:		% Solids:	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Cyanide	Target	10.0	R	ug/L	10.0	U	1	YES	S4VEM

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47948/EPW14035/MC0AG1** **Lab Name: Shealy Environmental Services, Inc.**

Sample Number: MC0AG7	Method: Mercury by Cold Vapor	Matrix: Water	MA Number:
Sample Location: BDE-SIGW-05	pH: 1.5	Sample Date: 11/07/2018	Sample Time: 12:48:00
% Moisture:		% Solids:	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Mercury	Target	0.20	U	ug/L	0.043	J	1	YES	S4VEM

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47948/EPW14035/MC0AG1** **Lab Name: Shealy Environmental Services, Inc.**

Sample Number: MC0AG7	Method: Metals by ICP-MS	Matrix: Water	MA Number:
Sample Location: BDE-SIGW-05	pH: 1.5	Sample Date: 11/07/2018	Sample Time: 12:48:00
% Moisture:		% Solids:	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Aluminum	Target	121	J	ug/L	121	*	1	YES	S4VEM
Antimony	Target	0.17	J	ug/L	0.17	J	1	YES	S4VEM
Arsenic	Target	0.89	J	ug/L	0.89	J	1	YES	S4VEM
Barium	Target	95.3	J	ug/L	95.3	*	1	YES	S4VEM
Beryllium	Target	1.0	U	ug/L	1.0	U	1	YES	S4VEM
Cadmium	Target	0.55	J	ug/L	0.55	J	1	YES	S4VEM
Calcium	Target	14800	J	ug/L	14800	*	1	YES	S4VEM
Chromium	Target	0.96	J	ug/L	0.96	J	1	YES	S4VEM
Cobalt	Target	4.6		ug/L	4.6		1	YES	S4VEM
Copper	Target	0.84	J	ug/L	0.84	J	1	YES	S4VEM
Iron	Target	200	UJ	ug/L	158	J*	1	YES	S4VEM
Lead	Target	1.0	UJ	ug/L	0.15	J	1	YES	S4VEM
Magnesium	Target	1830	J	ug/L	1830	*	1	YES	S4VEM
Manganese	Target	56.0	J	ug/L	56.0	*	1	YES	S4VEM
Nickel	Target	2.9		ug/L	2.9		1	YES	S4VEM
Potassium	Target	7690		ug/L	7690		1	YES	S4VEM
Selenium	Target	5.0	U	ug/L	5.0	U	1	YES	S4VEM
Silver	Target	1.0	U	ug/L	1.0	U	1	YES	S4VEM
Sodium	Target	4590	J	ug/L	4590	*	1	YES	S4VEM
Thallium	Target	0.043	J	ug/L	0.043	J	1	YES	S4VEM
Vanadium	Target	5.0	UJ	ug/L	5.0	U	1	YES	S4VEM
Zinc	Target	9.8		ug/L	9.8		1	YES	S4VEM

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47948/EPW14035/MC0AG1** **Lab Name: Shealy Environmental Services, Inc.**

Sample Number: MC0AG8	Method: Cyanide	Matrix: Water	MA Number:
Sample Location: BDE-SIGW-06	pH: 14.0	Sample Date: 11/07/2018	Sample Time: 13:17:00
% Moisture:		% Solids:	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Cyanide	Target	10.0	U	ug/L	10.0	U	1	YES	S4VEM

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47948/EPW14035/MC0AG1** **Lab Name: Shealy Environmental Services, Inc.**

Sample Number: MC0AG8	Method: Mercury by Cold Vapor	Matrix: Water	MA Number:
Sample Location: BDE-SIGW-06	pH: 1.5	Sample Date: 11/07/2018	Sample Time: 13:17:00
% Moisture:		% Solids:	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Mercury	Target	0.20	U	ug/L	0.042	J	1	YES	S4VEM

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47948/EPW14035/MC0AG1** **Lab Name: Shealy Environmental Services, Inc.**

Sample Number: MC0AG8	Method: Metals by ICP-MS	Matrix: Water	MA Number:
Sample Location: BDE-SIGW-06	pH: 1.5	Sample Date: 11/07/2018	Sample Time: 13:17:00
% Moisture:		% Solids:	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Aluminum	Target	203	J	ug/L	203	*	1	YES	S4VEM
Antimony	Target	0.16	J	ug/L	0.16	J	1	YES	S4VEM
Arsenic	Target	0.66	J	ug/L	0.66	J	1	YES	S4VEM
Barium	Target	63.3	J	ug/L	63.3	*	1	YES	S4VEM
Beryllium	Target	1.0	U	ug/L	1.0	U	1	YES	S4VEM
Cadmium	Target	1.0	U	ug/L	1.0	U	1	YES	S4VEM
Calcium	Target	14400	J	ug/L	14400	*	1	YES	S4VEM
Chromium	Target	0.87	J	ug/L	0.87	J	1	YES	S4VEM
Cobalt	Target	2.1		ug/L	2.1		1	YES	S4VEM
Copper	Target	0.56	J	ug/L	0.56	J	1	YES	S4VEM
Iron	Target	1350	J	ug/L	1350	*	1	YES	S4VEM
Lead	Target	1.0	UJ	ug/L	0.086	J	1	YES	S4VEM
Magnesium	Target	2520	J	ug/L	2520	*	1	YES	S4VEM
Manganese	Target	114	J	ug/L	114	*	1	YES	S4VEM
Nickel	Target	1.9		ug/L	1.9		1	YES	S4VEM
Potassium	Target	4530		ug/L	4530		1	YES	S4VEM
Selenium	Target	1.5	J	ug/L	1.5	J	1	YES	S4VEM
Silver	Target	1.0	U	ug/L	1.0	U	1	YES	S4VEM
Sodium	Target	46000	J	ug/L	46000	*	1	YES	S4VEM
Thallium	Target	1.0	U	ug/L	1.0	U	1	YES	S4VEM
Vanadium	Target	5.0	UJ	ug/L	5.0	U	1	YES	S4VEM
Zinc	Target	4.8		ug/L	4.8		1	YES	S4VEM

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47948/EPW14035/MC0AG1** **Lab Name: Shealy Environmental Services, Inc.**

Sample Number: MC0AG9	Method: Cyanide	Matrix: Water	MA Number:
Sample Location: BDE-SIGW-07	pH: 12.5	Sample Date: 11/07/2018	Sample Time: 11:19:00
% Moisture:		% Solids:	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Cyanide	Target	10.0	U	ug/L	10.0	U	1	YES	S4VEM

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47948/EPW14035/MC0AG1** **Lab Name: Shealy Environmental Services, Inc.**

Sample Number: MC0AG9	Method: Mercury by Cold Vapor	Matrix: Water	MA Number:
Sample Location: BDE-SIGW-07	pH: 1.5	Sample Date: 11/07/2018	Sample Time: 11:19:00
% Moisture:		% Solids:	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Mercury	Target	0.20	U	ug/L	0.042	J	1	YES	S4VEM

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47948/EPW14035/MC0AG1** **Lab Name: Shealy Environmental Services, Inc.**

Sample Number: MC0AG9	Method: Metals by ICP-MS	Matrix: Water	MA Number:
Sample Location: BDE-SIGW-07	pH: 1.5	Sample Date: 11/07/2018	Sample Time: 11:19:00
% Moisture:		% Solids:	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Aluminum	Target	461	J	ug/L	461	*	1	YES	S4VEM
Antimony	Target	1.5	J	ug/L	1.5	J	1	YES	S4VEM
Arsenic	Target	6.0		ug/L	6.0		1	YES	S4VEM
Barium	Target	51.1	J	ug/L	51.1	*	1	YES	S4VEM
Beryllium	Target	1.0	U	ug/L	1.0	U	1	YES	S4VEM
Cadmium	Target	1.0	U	ug/L	1.0	U	1	YES	S4VEM
Calcium	Target	60500	J	ug/L	60500	*	1	YES	S4VEM
Chromium	Target	1.3	J	ug/L	1.3	J	1	YES	S4VEM
Cobalt	Target	0.25	J	ug/L	0.25	J	1	YES	S4VEM
Copper	Target	1.6	J	ug/L	1.6	J	1	YES	S4VEM
Iron	Target	503	J	ug/L	503	*	1	YES	S4VEM
Lead	Target	1.0	UJ	ug/L	0.26	J	1	YES	S4VEM
Magnesium	Target	6460	J	ug/L	6460	*	1	YES	S4VEM
Manganese	Target	6.8	J	ug/L	6.8	*	1	YES	S4VEM
Nickel	Target	1.3		ug/L	1.3		1	YES	S4VEM
Potassium	Target	3580		ug/L	3580		1	YES	S4VEM
Selenium	Target	3.5	J	ug/L	3.5	J	1	YES	S4VEM
Silver	Target	1.0	U	ug/L	1.0	U	1	YES	S4VEM
Sodium	Target	50000	J	ug/L	50000	*	1	YES	S4VEM
Thallium	Target	1.0	U	ug/L	1.0	U	1	YES	S4VEM
Vanadium	Target	5.0	UJ	ug/L	1.0	J	1	YES	S4VEM
Zinc	Target	27.8		ug/L	27.8		1	YES	S4VEM

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47948/EPW14035/MC0AG1** **Lab Name: Shealy Environmental Services, Inc.**

Sample Number: MC0AH0	Method: Cyanide	Matrix: Water	MA Number:
Sample Location: BDE-SIGW-08	pH: 14.0	Sample Date: 11/07/2018	Sample Time: 11:17:00
% Moisture:		% Solids:	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Cyanide	Target	10.0	U	ug/L	10.0	U	1	YES	S4VEM

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47948/EPW14035/MC0AG1** **Lab Name: Shealy Environmental Services, Inc.**

Sample Number: MC0AH0	Method: Mercury by Cold Vapor	Matrix: Water	MA Number:
Sample Location: BDE-SIGW-08	pH: 1.5	Sample Date: 11/07/2018	Sample Time: 11:17:00
% Moisture:		% Solids:	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Mercury	Target	0.20	U	ug/L	0.038	J	1	YES	S4VEM

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47948/EPW14035/MC0AG1** **Lab Name: Shealy Environmental Services, Inc.**

Sample Number: MC0AH0	Method: Metals by ICP-MS	Matrix: Water	MA Number:
Sample Location: BDE-SIGW-08	pH: 1.5	Sample Date: 11/07/2018	Sample Time: 11:17:00
% Moisture:		% Solids:	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Aluminum	Target	54.7	J	ug/L	54.7	*	1	YES	S4VEM
Antimony	Target	2.0	U	ug/L	2.0	U	1	YES	S4VEM
Arsenic	Target	1.0	U	ug/L	1.0	U	1	YES	S4VEM
Barium	Target	212	J	ug/L	212	*	1	YES	S4VEM
Beryllium	Target	0.45	J	ug/L	0.45	J	1	YES	S4VEM
Cadmium	Target	0.21	J	ug/L	0.21	J	1	YES	S4VEM
Calcium	Target	9620	J	ug/L	9620	*	1	YES	S4VEM
Chromium	Target	0.74	J	ug/L	0.74	J	1	YES	S4VEM
Cobalt	Target	3.9		ug/L	3.9		1	YES	S4VEM
Copper	Target	0.36	J	ug/L	0.36	J	1	YES	S4VEM
Iron	Target	255	J	ug/L	255	*	1	YES	S4VEM
Lead	Target	1.0	UJ	ug/L	0.11	J	1	YES	S4VEM
Magnesium	Target	2290	J	ug/L	2290	*	1	YES	S4VEM
Manganese	Target	68.0	J	ug/L	68.0	*	1	YES	S4VEM
Nickel	Target	2.7		ug/L	2.7		1	YES	S4VEM
Potassium	Target	3630		ug/L	3630		1	YES	S4VEM
Selenium	Target	5.0	U	ug/L	5.0	U	1	YES	S4VEM
Silver	Target	1.0	U	ug/L	1.0	U	1	YES	S4VEM
Sodium	Target	19600	J	ug/L	19600	*	1	YES	S4VEM
Thallium	Target	0.029	J	ug/L	0.029	J	1	YES	S4VEM
Vanadium	Target	5.0	UJ	ug/L	5.0	U	1	YES	S4VEM
Zinc	Target	6.1		ug/L	6.1		1	YES	S4VEM

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47948/EPW14035/MC0AG1** **Lab Name: Shealy Environmental Services, Inc.**

Sample Number: MC0AH1	Method: Cyanide	Matrix: Water	MA Number:
Sample Location: BDE-SIGW-09	pH: 14.0	Sample Date: 11/06/2018	Sample Time: 08:05:00
% Moisture:		% Solids:	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Cyanide	Target	10.0	U	ug/L	10.0	U	1	YES	S4VEM

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47948/EPW14035/MC0AG1** **Lab Name: Shealy Environmental Services, Inc.**

Sample Number: MC0AH1	Method: Mercury by Cold Vapor	Matrix: Water	MA Number:
Sample Location: BDE-SIGW-09	pH: 1.5	Sample Date: 11/06/2018	Sample Time: 08:05:00
% Moisture:		% Solids:	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Mercury	Target	0.20	U	ug/L	0.040	J	1	YES	S4VEM

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47948/EPW14035/MC0AG1** **Lab Name: Shealy Environmental Services, Inc.**

Sample Number: MC0AH1	Method: Metals by ICP-MS	Matrix: Water	MA Number:
Sample Location: BDE-SIGW-09	pH: 1.5	Sample Date: 11/06/2018	Sample Time: 08:05:00
% Moisture:		% Solids:	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Aluminum	Target	216	J	ug/L	216	*	1	YES	S4VEM
Antimony	Target	0.14	J	ug/L	0.14	J	1	YES	S4VEM
Arsenic	Target	1.4		ug/L	1.4		1	YES	S4VEM
Barium	Target	15.1	J	ug/L	15.1	*	1	YES	S4VEM
Beryllium	Target	1.0	U	ug/L	1.0	U	1	YES	S4VEM
Cadmium	Target	1.0	U	ug/L	1.0	U	1	YES	S4VEM
Calcium	Target	17200	J	ug/L	17200	*	1	YES	S4VEM
Chromium	Target	3.1		ug/L	3.1		1	YES	S4VEM
Cobalt	Target	0.14	J	ug/L	0.14	J	1	YES	S4VEM
Copper	Target	1.7	J	ug/L	1.7	J	1	YES	S4VEM
Iron	Target	200	UJ	ug/L	55.3	J*	1	YES	S4VEM
Lead	Target	1.0	UJ	ug/L	1.0	U	1	YES	S4VEM
Magnesium	Target	979	J	ug/L	979	*	1	YES	S4VEM
Manganese	Target	6.9	J	ug/L	6.9	*	1	YES	S4VEM
Nickel	Target	0.65	J	ug/L	0.65	J	1	YES	S4VEM
Potassium	Target	1120		ug/L	1120		1	YES	S4VEM
Selenium	Target	5.0	U	ug/L	5.0	U	1	YES	S4VEM
Silver	Target	1.0	U	ug/L	1.0	U	1	YES	S4VEM
Sodium	Target	2860	J	ug/L	2860	*	1	YES	S4VEM
Thallium	Target	1.0	U	ug/L	1.0	U	1	YES	S4VEM
Vanadium	Target	5.0	UJ	ug/L	2.6	J	1	YES	S4VEM
Zinc	Target	1.1	J	ug/L	1.1	J	1	YES	S4VEM

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47948/EPW14035/MC0AG1** **Lab Name: Shealy Environmental Services, Inc.**

Sample Number: MC0AH2	Method: Cyanide	Matrix: Water	MA Number:
Sample Location: BDE-SIGW-10	pH: 14.0	Sample Date: 11/06/2018	Sample Time: 08:15:00
% Moisture:		% Solids:	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Cyanide	Target	10.0	U	ug/L	10.0	U	1	YES	S4VEM

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47948/EPW14035/MC0AG1** **Lab Name: Shealy Environmental Services, Inc.**

Sample Number: MC0AH2	Method: Mercury by Cold Vapor	Matrix: Water	MA Number:
Sample Location: BDE-SIGW-10	pH: 1.5	Sample Date: 11/06/2018	Sample Time: 08:15:00
% Moisture:		% Solids:	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Mercury	Target	0.20	U	ug/L	0.053	J	1	YES	S4VEM

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47948/EPW14035/MC0AG1** **Lab Name: Shealy Environmental Services, Inc.**

Sample Number: MC0AH2	Method: Metals by ICP-MS	Matrix: Water	MA Number:
Sample Location: BDE-SIGW-10	pH: 1.5	Sample Date: 11/06/2018	Sample Time: 08:15:00
% Moisture:		% Solids:	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Aluminum	Target	1380	J	ug/L	1380	*	1	YES	S4VEM
Antimony	Target	0.17	J	ug/L	0.17	J	1	YES	S4VEM
Arsenic	Target	1.6		ug/L	1.6		1	YES	S4VEM
Barium	Target	380	J	ug/L	380	*	1	YES	S4VEM
Beryllium	Target	0.19	J	ug/L	0.19	J	1	YES	S4VEM
Cadmium	Target	0.12	J	ug/L	0.12	J	1	YES	S4VEM
Calcium	Target	9160	J	ug/L	9160	*	1	YES	S4VEM
Chromium	Target	3.7		ug/L	3.7		1	YES	S4VEM
Cobalt	Target	15.3		ug/L	15.3		1	YES	S4VEM
Copper	Target	3.6		ug/L	3.6		1	YES	S4VEM
Iron	Target	2750	J	ug/L	2750	*	1	YES	S4VEM
Lead	Target	1.6		ug/L	1.6		1	YES	S4VEM
Magnesium	Target	4140	J	ug/L	4140	*	1	YES	S4VEM
Manganese	Target	158	J	ug/L	158	*	1	YES	S4VEM
Nickel	Target	8.3		ug/L	8.3		1	YES	S4VEM
Potassium	Target	6470		ug/L	6470		1	YES	S4VEM
Selenium	Target	5.0	U	ug/L	5.0	U	1	YES	S4VEM
Silver	Target	1.0	U	ug/L	1.0	U	1	YES	S4VEM
Sodium	Target	12200	J	ug/L	12200	*	1	YES	S4VEM
Thallium	Target	0.065	J	ug/L	0.065	J	1	YES	S4VEM
Vanadium	Target	5.0	UJ	ug/L	1.7	J	1	YES	S4VEM
Zinc	Target	25.2		ug/L	25.2		1	YES	S4VEM

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47948/EPW14035/MC0AG1** **Lab Name: Shealy Environmental Services, Inc.**

Sample Number: MC0AH5	Method: Cyanide	Matrix: Water	MA Number:
Sample Location: BDE-SIGW-13	pH: 14.0	Sample Date: 11/06/2018	Sample Time: 12:10:00
% Moisture:		% Solids:	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Cyanide	Target	10.0	U	ug/L	10.0	U	1	YES	S4VEM

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47948/EPW14035/MC0AG1** **Lab Name: Shealy Environmental Services, Inc.**

Sample Number: MC0AH5	Method: Mercury by Cold Vapor	Matrix: Water	MA Number:
Sample Location: BDE-SIGW-13	pH: 1.5	Sample Date: 11/06/2018	Sample Time: 12:10:00
% Moisture:		% Solids:	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Mercury	Target	0.20	U	ug/L	0.040	J	1	YES	S4VEM

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47948/EPW14035/MC0AG1** **Lab Name: Shealy Environmental Services, Inc.**

Sample Number: MC0AH5	Method: Metals by ICP-MS	Matrix: Water	MA Number:
Sample Location: BDE-SIGW-13	pH: 1.5	Sample Date: 11/06/2018	Sample Time: 12:10:00
% Moisture:		% Solids:	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Aluminum	Target	123	J	ug/L	123	*	1	YES	S4VEM
Antimony	Target	0.20	J	ug/L	0.20	J	1	YES	S4VEM
Arsenic	Target	0.59	J	ug/L	0.59	J	1	YES	S4VEM
Barium	Target	366	J	ug/L	366	*	1	YES	S4VEM
Beryllium	Target	1.5		ug/L	1.5		1	YES	S4VEM
Cadmium	Target	0.38	J	ug/L	0.38	J	1	YES	S4VEM
Calcium	Target	16500	J	ug/L	16500	*	1	YES	S4VEM
Chromium	Target	2.6		ug/L	2.6		1	YES	S4VEM
Cobalt	Target	24.7		ug/L	24.7		1	YES	S4VEM
Copper	Target	0.87	J	ug/L	0.87	J	1	YES	S4VEM
Iron	Target	200	UJ	ug/L	159	J*	1	YES	S4VEM
Lead	Target	1.0	UJ	ug/L	0.26	J	1	YES	S4VEM
Magnesium	Target	4090	J	ug/L	4090	*	1	YES	S4VEM
Manganese	Target	176	J	ug/L	176	*	1	YES	S4VEM
Nickel	Target	9.8		ug/L	9.8		1	YES	S4VEM
Potassium	Target	4610		ug/L	4610		1	YES	S4VEM
Selenium	Target	5.0	U	ug/L	5.0	U	1	YES	S4VEM
Silver	Target	1.0	U	ug/L	1.0	U	1	YES	S4VEM
Sodium	Target	7670	J	ug/L	7670	*	1	YES	S4VEM
Thallium	Target	0.076	J	ug/L	0.076	J	1	YES	S4VEM
Vanadium	Target	5.0	UJ	ug/L	5.0	U	1	YES	S4VEM
Zinc	Target	38.5		ug/L	38.5		1	YES	S4VEM

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47948/EPW14035/MC0AG1** **Lab Name: Shealy Environmental Services, Inc.**

Sample Number: MC0AH6	Method: Cyanide	Matrix: Water	MA Number:
Sample Location: BDE-SIGW-14	pH: 14.0	Sample Date: 11/07/2018	Sample Time: 08:45:00
% Moisture:		% Solids:	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Cyanide	Target	10.0	U	ug/L	10.0	U	1	YES	S4VEM

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47948/EPW14035/MC0AG1** **Lab Name: Shealy Environmental Services, Inc.**

Sample Number: MC0AH6	Method: Mercury by Cold Vapor	Matrix: Water	MA Number:
Sample Location: BDE-SIGW-14	pH: 1.5	Sample Date: 11/07/2018	Sample Time: 08:45:00
% Moisture:		% Solids:	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Mercury	Target	0.20	U	ug/L	0.040	J	1	YES	S4VEM

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47948/EPW14035/MC0AG1** **Lab Name: Shealy Environmental Services, Inc.**

Sample Number: MC0AH6	Method: Metals by ICP-MS	Matrix: Water	MA Number:
Sample Location: BDE-SIGW-14	pH: 1.5	Sample Date: 11/07/2018	Sample Time: 08:45:00
% Moisture:		% Solids:	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Aluminum	Target	81.8	J	ug/L	81.8	*	1	YES	S4VEM
Antimony	Target	0.35	J	ug/L	0.35	J	1	YES	S4VEM
Arsenic	Target	1.0	U	ug/L	1.0	U	1	YES	S4VEM
Barium	Target	32.2	J	ug/L	32.2	*	1	YES	S4VEM
Beryllium	Target	1.0	U	ug/L	1.0	U	1	YES	S4VEM
Cadmium	Target	1.0	U	ug/L	1.0	U	1	YES	S4VEM
Calcium	Target	23800	J	ug/L	23800	*	1	YES	S4VEM
Chromium	Target	0.80	J	ug/L	0.80	J	1	YES	S4VEM
Cobalt	Target	0.17	J	ug/L	0.17	J	1	YES	S4VEM
Copper	Target	1.3	J	ug/L	1.3	J	1	YES	S4VEM
Iron	Target	200	UJ	ug/L	124	J*	1	YES	S4VEM
Lead	Target	1.0	UJ	ug/L	0.094	J	1	YES	S4VEM
Magnesium	Target	4010	J	ug/L	4010	*	1	YES	S4VEM
Manganese	Target	2.1	J	ug/L	2.1	*	1	YES	S4VEM
Nickel	Target	0.53	J	ug/L	0.53	J	1	YES	S4VEM
Potassium	Target	688		ug/L	688		1	YES	S4VEM
Selenium	Target	1.3	J	ug/L	1.3	J	1	YES	S4VEM
Silver	Target	1.0	U	ug/L	1.0	U	1	YES	S4VEM
Sodium	Target	24300	J	ug/L	24300	*	1	YES	S4VEM
Thallium	Target	1.0	U	ug/L	1.0	U	1	YES	S4VEM
Vanadium	Target	5.0	UJ	ug/L	5.0	U	1	YES	S4VEM
Zinc	Target	0.97	J	ug/L	0.97	J	1	YES	S4VEM

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47948/EPW14035/MC0AG1** **Lab Name: Shealy Environmental Services, Inc.**

Sample Number: MC0AH7	Method: Cyanide	Matrix: Water	MA Number:
Sample Location: BDE-SIGW-15	pH: 10.5	Sample Date: 11/06/2018	Sample Time: 12:13:00
% Moisture:		% Solids:	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Cyanide	Target	10.0	R	ug/L	10.0	U	1	YES	S4VEM

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47948/EPW14035/MC0AG1** **Lab Name: Shealy Environmental Services, Inc.**

Sample Number: MC0AH7	Method: Mercury by Cold Vapor	Matrix: Water	MA Number:
Sample Location: BDE-SIGW-15	pH: 1.5	Sample Date: 11/06/2018	Sample Time: 12:13:00
% Moisture:		% Solids:	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Mercury	Target	0.20	U	ug/L	0.043	J	1	YES	S4VEM

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47948/EPW14035/MC0AG1** **Lab Name: Shealy Environmental Services, Inc.**

Sample Number: MC0AH7	Method: Metals by ICP-MS	Matrix: Water	MA Number:
Sample Location: BDE-SIGW-15	pH: 1.5	Sample Date: 11/06/2018	Sample Time: 12:13:00
% Moisture:		% Solids:	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Aluminum	Target	569	J	ug/L	569	*	1	YES	S4VEM
Antimony	Target	1.3	J	ug/L	1.3	J	1	YES	S4VEM
Arsenic	Target	1.2		ug/L	1.2		1	YES	S4VEM
Barium	Target	17.1	J	ug/L	17.1	*	1	YES	S4VEM
Beryllium	Target	1.0	U	ug/L	1.0	U	1	YES	S4VEM
Cadmium	Target	1.0	U	ug/L	1.0	U	1	YES	S4VEM
Calcium	Target	11000	J	ug/L	11000	*	1	YES	S4VEM
Chromium	Target	1.2	J	ug/L	1.2	J	1	YES	S4VEM
Cobalt	Target	0.54	J	ug/L	0.54	J	1	YES	S4VEM
Copper	Target	2.3		ug/L	2.3		1	YES	S4VEM
Iron	Target	434	J	ug/L	434	*	1	YES	S4VEM
Lead	Target	1.0	UJ	ug/L	0.58	J	1	YES	S4VEM
Magnesium	Target	1980	J	ug/L	1980	*	1	YES	S4VEM
Manganese	Target	14.1	J	ug/L	14.1	*	1	YES	S4VEM
Nickel	Target	1.1		ug/L	1.1		1	YES	S4VEM
Potassium	Target	2010		ug/L	2010		1	YES	S4VEM
Selenium	Target	5.0	U	ug/L	5.0	U	1	YES	S4VEM
Silver	Target	1.0	U	ug/L	1.0	U	1	YES	S4VEM
Sodium	Target	5150	J	ug/L	5150	*	1	YES	S4VEM
Thallium	Target	1.0	U	ug/L	1.0	U	1	YES	S4VEM
Vanadium	Target	5.0	UJ	ug/L	5.0	U	1	YES	S4VEM
Zinc	Target	2.7		ug/L	2.7		1	YES	S4VEM

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47948/EPW14035/MC0AG1** **Lab Name: Shealy Environmental Services, Inc.**

Sample Number: MC0AH8	Method: Cyanide	Matrix: Water	MA Number:
Sample Location: BDE-SIGW-16	pH: 12.5	Sample Date: 11/07/2018	Sample Time: 14:30:00
% Moisture:		% Solids:	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Cyanide	Target	10.0	U	ug/L	10.0	U	1	YES	S4VEM

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47948/EPW14035/MC0AG1** **Lab Name: Shealy Environmental Services, Inc.**

Sample Number: MC0AH8	Method: Mercury by Cold Vapor	Matrix: Water	MA Number:
Sample Location: BDE-SIGW-16	pH: 1.5	Sample Date: 11/07/2018	Sample Time: 14:30:00
% Moisture:		% Solids:	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Mercury	Target	0.20	U	ug/L	0.045	J	1	YES	S4VEM

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47948/EPW14035/MC0AG1** **Lab Name: Shealy Environmental Services, Inc.**

Sample Number: MC0AH8	Method: Metals by ICP-MS	Matrix: Water	MA Number:
Sample Location: BDE-SIGW-16	pH: 1.5	Sample Date: 11/07/2018	Sample Time: 14:30:00
% Moisture:		% Solids:	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Aluminum	Target	652	J	ug/L	652	*	1	YES	S4VEM
Antimony	Target	0.50	J	ug/L	0.50	J	1	YES	S4VEM
Arsenic	Target	0.61	J	ug/L	0.61	J	1	YES	S4VEM
Barium	Target	30.4	J	ug/L	30.4	*	1	YES	S4VEM
Beryllium	Target	1.0	U	ug/L	1.0	U	1	YES	S4VEM
Cadmium	Target	1.0	U	ug/L	1.0	U	1	YES	S4VEM
Calcium	Target	12500	J	ug/L	12500	*	1	YES	S4VEM
Chromium	Target	3.5		ug/L	3.5		1	YES	S4VEM
Cobalt	Target	0.23	J	ug/L	0.23	J	1	YES	S4VEM
Copper	Target	1.6	J	ug/L	1.6	J	1	YES	S4VEM
Iron	Target	368	J	ug/L	368	*	1	YES	S4VEM
Lead	Target	1.0	UJ	ug/L	0.29	J	1	YES	S4VEM
Magnesium	Target	1580	J	ug/L	1580	*	1	YES	S4VEM
Manganese	Target	4.0	J	ug/L	4.0	*	1	YES	S4VEM
Nickel	Target	0.86	J	ug/L	0.86	J	1	YES	S4VEM
Potassium	Target	2590		ug/L	2590		1	YES	S4VEM
Selenium	Target	5.0	U	ug/L	5.0	U	1	YES	S4VEM
Silver	Target	1.0	U	ug/L	1.0	U	1	YES	S4VEM
Sodium	Target	4550	J	ug/L	4550	*	1	YES	S4VEM
Thallium	Target	1.0	U	ug/L	1.0	U	1	YES	S4VEM
Vanadium	Target	5.0	UJ	ug/L	5.0	U	1	YES	S4VEM
Zinc	Target	4.1		ug/L	4.1		1	YES	S4VEM

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47948/EPW14035/MC0AG1** **Lab Name: Shealy Environmental Services, Inc.**

Sample Number: MC0AH9	Method: Cyanide	Matrix: Water	MA Number:
Sample Location: BDE-SIGW-17	pH: 12.5	Sample Date: 11/07/2018	Sample Time: 14:32:00
% Moisture:		% Solids:	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Cyanide	Target	10.0	U	ug/L	10.0	U	1	YES	S4VEM

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47948/EPW14035/MC0AG1** **Lab Name: Shealy Environmental Services, Inc.**

Sample Number: MC0AH9	Method: Mercury by Cold Vapor	Matrix: Water	MA Number:
Sample Location: BDE-SIGW-17	pH: 1.5	Sample Date: 11/07/2018	Sample Time: 14:32:00
% Moisture:		% Solids:	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Mercury	Target	0.20	U	ug/L	0.042	J	1	YES	S4VEM

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47948/EPW14035/MC0AG1** **Lab Name: Shealy Environmental Services, Inc.**

Sample Number: MC0AH9	Method: Metals by ICP-MS	Matrix: Water	MA Number:
Sample Location: BDE-SIGW-17	pH: 1.5	Sample Date: 11/07/2018	Sample Time: 14:32:00
% Moisture:		% Solids:	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Aluminum	Target	42.7	J	ug/L	42.7	*	1	YES	S4VEM
Antimony	Target	2.0	U	ug/L	2.0	U	1	YES	S4VEM
Arsenic	Target	1.0	U	ug/L	1.0	U	1	YES	S4VEM
Barium	Target	109	J	ug/L	109	*	1	YES	S4VEM
Beryllium	Target	1.0	U	ug/L	1.0	U	1	YES	S4VEM
Cadmium	Target	1.0	U	ug/L	1.0	U	1	YES	S4VEM
Calcium	Target	20800	J	ug/L	20800	*	1	YES	S4VEM
Chromium	Target	0.79	J	ug/L	0.79	J	1	YES	S4VEM
Cobalt	Target	2.7		ug/L	2.7		1	YES	S4VEM
Copper	Target	0.56	J	ug/L	0.56	J	1	YES	S4VEM
Iron	Target	203	J	ug/L	203	*	1	YES	S4VEM
Lead	Target	1.0	UJ	ug/L	0.028	J	1	YES	S4VEM
Magnesium	Target	2760	J	ug/L	2760	*	1	YES	S4VEM
Manganese	Target	49.5	J	ug/L	49.5	*	1	YES	S4VEM
Nickel	Target	3.4		ug/L	3.4		1	YES	S4VEM
Potassium	Target	3920		ug/L	3920		1	YES	S4VEM
Selenium	Target	5.0	U	ug/L	5.0	U	1	YES	S4VEM
Silver	Target	1.0	U	ug/L	1.0	U	1	YES	S4VEM
Sodium	Target	40200	J	ug/L	40200	*	1	YES	S4VEM
Thallium	Target	0.019	J	ug/L	0.019	J	1	YES	S4VEM
Vanadium	Target	5.0	UJ	ug/L	5.0	U	1	YES	S4VEM
Zinc	Target	2.2		ug/L	2.2		1	YES	S4VEM

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47948/EPW14035/MC0AG1** **Lab Name: Shealy Environmental Services, Inc.**

Sample Number: MC0AJ0	Method: Cyanide	Matrix: Water	MA Number:
Sample Location: BDE-SIGW-18	pH: 14.0	Sample Date: 11/07/2018	Sample Time: 12:20:00
% Moisture:		% Solids:	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Cyanide	Target	4.1	J	ug/L	4.1	J	1	YES	S4VEM

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47948/EPW14035/MC0AG1** **Lab Name: Shealy Environmental Services, Inc.**

Sample Number: MC0AJ0	Method: Mercury by Cold Vapor	Matrix: Water	MA Number:
Sample Location: BDE-SIGW-18	pH: 1.5	Sample Date: 11/07/2018	Sample Time: 12:20:00
% Moisture:		% Solids:	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Mercury	Target	0.20	U	ug/L	0.049	J	1	YES	S4VEM

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47948/EPW14035/MC0AG1** **Lab Name: Shealy Environmental Services, Inc.**

Sample Number: MC0AJ0	Method: Metals by ICP-MS	Matrix: Water	MA Number:
Sample Location: BDE-SIGW-18	pH: 1.5	Sample Date: 11/07/2018	Sample Time: 12:20:00
% Moisture:		% Solids:	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Aluminum	Target	1590	J	ug/L	1590	*	1	YES	S4VEM
Antimony	Target	0.21	J	ug/L	0.21	J	1	YES	S4VEM
Arsenic	Target	1.8		ug/L	1.8		1	YES	S4VEM
Barium	Target	233	J	ug/L	233	*	1	YES	S4VEM
Beryllium	Target	1.0	U	ug/L	1.0	U	1	YES	S4VEM
Cadmium	Target	0.29	J	ug/L	0.29	J	1	YES	S4VEM
Calcium	Target	14100	J	ug/L	14100	*	1	YES	S4VEM
Chromium	Target	4.7		ug/L	4.7		1	YES	S4VEM
Cobalt	Target	13.1		ug/L	13.1		1	YES	S4VEM
Copper	Target	2.6		ug/L	2.6		1	YES	S4VEM
Iron	Target	2640	J	ug/L	2640	*	1	YES	S4VEM
Lead	Target	2.1		ug/L	2.1		1	YES	S4VEM
Magnesium	Target	4370	J	ug/L	4370	*	1	YES	S4VEM
Manganese	Target	383	J	ug/L	383	*	1	YES	S4VEM
Nickel	Target	8.7		ug/L	8.7		1	YES	S4VEM
Potassium	Target	5170		ug/L	5170		1	YES	S4VEM
Selenium	Target	5.0	U	ug/L	5.0	U	1	YES	S4VEM
Silver	Target	1.0	U	ug/L	1.0	U	1	YES	S4VEM
Sodium	Target	20400	J	ug/L	20400	*	1	YES	S4VEM
Thallium	Target	0.047	J	ug/L	0.047	J	1	YES	S4VEM
Vanadium	Target	5.0	UJ	ug/L	5.0	U	1	YES	S4VEM
Zinc	Target	24.7		ug/L	24.7		1	YES	S4VEM

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47948/EPW14035/MC0AG1** **Lab Name: Shealy Environmental Services, Inc.**

Sample Number: MC0AJ2	Method: Cyanide	Matrix: Water	MA Number:
Sample Location: BDE-TBW-01	pH: 14.0	Sample Date: 11/06/2018	Sample Time: 13:40:00
% Moisture:		% Solids:	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Cyanide	Target	10.0	U	ug/L	10.0	U	1	YES	S4VEM

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47948/EPW14035/MC0AG1** **Lab Name: Shealy Environmental Services, Inc.**

Sample Number: MC0AJ2	Method: Mercury by Cold Vapor	Matrix: Water	MA Number:
Sample Location: BDE-TBW-01	pH: 1.5	Sample Date: 11/06/2018	Sample Time: 13:40:00
% Moisture:		% Solids:	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Mercury	Target	0.20	U	ug/L	0.040	J	1	YES	S4VEM

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47948/EPW14035/MC0AG1** **Lab Name: Shealy Environmental Services, Inc.**

Sample Number: MC0AJ2	Method: Metals by ICP-MS	Matrix: Water	MA Number:
Sample Location: BDE-TBW-01	pH: 1.5	Sample Date: 11/06/2018	Sample Time: 13:40:00
% Moisture:		% Solids:	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Aluminum	Target	60.8	J	ug/L	60.8	*	1	YES	S4VEM
Antimony	Target	2.0	U	ug/L	2.0	U	1	YES	S4VEM
Arsenic	Target	1.0	U	ug/L	1.0	U	1	YES	S4VEM
Barium	Target	249	J	ug/L	249	*	1	YES	S4VEM
Beryllium	Target	0.49	J	ug/L	0.49	J	1	YES	S4VEM
Cadmium	Target	0.27	J	ug/L	0.27	J	1	YES	S4VEM
Calcium	Target	7380	J	ug/L	7380	*	1	YES	S4VEM
Chromium	Target	0.74	J	ug/L	0.74	J	1	YES	S4VEM
Cobalt	Target	20.1		ug/L	20.1		1	YES	S4VEM
Copper	Target	0.39	J	ug/L	0.39	J	1	YES	S4VEM
Iron	Target	171	J	ug/L	171	J*	1	YES	S4VEM
Lead	Target	1.0	UJ	ug/L	0.21	J	1	YES	S4VEM
Magnesium	Target	3030	J	ug/L	3030	*	1	YES	S4VEM
Manganese	Target	176	J	ug/L	176	*	1	YES	S4VEM
Nickel	Target	8.1		ug/L	8.1		1	YES	S4VEM
Potassium	Target	4010		ug/L	4010		1	YES	S4VEM
Selenium	Target	5.0	U	ug/L	5.0	U	1	YES	S4VEM
Silver	Target	1.0	U	ug/L	1.0	U	1	YES	S4VEM
Sodium	Target	5310	J	ug/L	5310	*	1	YES	S4VEM
Thallium	Target	0.074	J	ug/L	0.074	J	1	YES	S4VEM
Vanadium	Target	5.0	UJ	ug/L	5.0	U	1	YES	S4VEM
Zinc	Target	41.1		ug/L	41.1		1	YES	S4VEM

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47948/EPW14035/MC0AG1** **Lab Name: Shealy Environmental Services, Inc.**

Sample Number: MC0AK7	Method: Cyanide	Matrix: Water	MA Number:
Sample Location: BDE-SIGW-19	pH: 14.0	Sample Date: 11/07/2018	Sample Time: 10:25:00
% Moisture:		% Solids:	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Cyanide	Target	10.0	U	ug/L	10.0	U	1	YES	S4VEM

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47948/EPW14035/MC0AG1** **Lab Name: Shealy Environmental Services, Inc.**

Sample Number: MC0AK7	Method: Mercury by Cold Vapor	Matrix: Water	MA Number:
Sample Location: BDE-SIGW-19	pH: 1.5	Sample Date: 11/07/2018	Sample Time: 10:25:00
% Moisture:		% Solids:	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Mercury	Target	0.20	U	ug/L	0.044	J	1	YES	S4VEM

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47948/EPW14035/MC0AG1** **Lab Name: Shealy Environmental Services, Inc.**

Sample Number: MC0AK7	Method: Metals by ICP-MS	Matrix: Water	MA Number:
Sample Location: BDE-SIGW-19	pH: 1.5	Sample Date: 11/07/2018	Sample Time: 10:25:00
% Moisture:		% Solids:	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Aluminum	Target	712	J	ug/L	712	*	1	YES	S4VEM
Antimony	Target	2.0	U	ug/L	2.0	U	1	YES	S4VEM
Arsenic	Target	1.0	U	ug/L	1.0	U	1	YES	S4VEM
Barium	Target	56.5	J	ug/L	56.5	*	1	YES	S4VEM
Beryllium	Target	1.0	U	ug/L	1.0	U	1	YES	S4VEM
Cadmium	Target	1.0	U	ug/L	1.0	U	1	YES	S4VEM
Calcium	Target	19200	J	ug/L	19200	*	1	YES	S4VEM
Chromium	Target	1.4	J	ug/L	1.4	J	1	YES	S4VEM
Cobalt	Target	0.48	J	ug/L	0.48	J	1	YES	S4VEM
Copper	Target	1.2	J	ug/L	1.2	J	1	YES	S4VEM
Iron	Target	298	J	ug/L	298	*	1	YES	S4VEM
Lead	Target	1.0	UJ	ug/L	0.59	J	1	YES	S4VEM
Magnesium	Target	6340	J	ug/L	6340	*	1	YES	S4VEM
Manganese	Target	4.1	J	ug/L	4.1	*	1	YES	S4VEM
Nickel	Target	0.69	J	ug/L	0.69	J	1	YES	S4VEM
Potassium	Target	2450		ug/L	2450		1	YES	S4VEM
Selenium	Target	1.4	J	ug/L	1.4	J	1	YES	S4VEM
Silver	Target	1.0	U	ug/L	1.0	U	1	YES	S4VEM
Sodium	Target	8240	J	ug/L	8240	*	1	YES	S4VEM
Thallium	Target	1.0	U	ug/L	1.0	U	1	YES	S4VEM
Vanadium	Target	5.0	UJ	ug/L	5.0	U	1	YES	S4VEM
Zinc	Target	18.8		ug/L	18.8		1	YES	S4VEM

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47948/EPW14035/MC0AG1** **Lab Name: Shealy Environmental Services, Inc.**

Sample Number: MC0AL0	Method: Cyanide	Matrix: Water	MA Number:
Sample Location: BDE-SIGW-02	pH: 14.0	Sample Date: 11/06/2018	Sample Time: 14:22:00
% Moisture:		% Solids:	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Cyanide	Target	10.0	U	ug/L	10.0	U	1	YES	S4VEM

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47948/EPW14035/MC0AG1** **Lab Name: Shealy Environmental Services, Inc.**

Sample Number: MC0AL0	Method: Mercury by Cold Vapor	Matrix: Water	MA Number:
Sample Location: BDE-SIGW-02	pH: 1.5	Sample Date: 11/06/2018	Sample Time: 14:22:00
% Moisture:		% Solids:	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Mercury	Target	0.20	U	ug/L	0.043	J	1	YES	S4VEM

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47948/EPW14035/MC0AG1** **Lab Name: Shealy Environmental Services, Inc.**

Sample Number: MC0AL0	Method: Metals by ICP-MS	Matrix: Water	MA Number:
Sample Location: BDE-SIGW-02	pH: 1.5	Sample Date: 11/06/2018	Sample Time: 14:22:00
% Moisture:		% Solids:	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Aluminum	Target	942	J	ug/L	942	*	1	YES	S4VEM
Antimony	Target	0.32	J	ug/L	0.32	J	1	YES	S4VEM
Arsenic	Target	0.53	J	ug/L	0.53	J	1	YES	S4VEM
Barium	Target	128	J	ug/L	128	*	1	YES	S4VEM
Beryllium	Target	0.50	J	ug/L	0.50	J	1	YES	S4VEM
Cadmium	Target	0.18	J	ug/L	0.18	J	1	YES	S4VEM
Calcium	Target	11000	J	ug/L	11000	*	1	YES	S4VEM
Chromium	Target	1.1	J	ug/L	1.1	J	1	YES	S4VEM
Cobalt	Target	14.0		ug/L	14.0		1	YES	S4VEM
Copper	Target	0.58	J	ug/L	0.58	J	1	YES	S4VEM
Iron	Target	1200	J	ug/L	1200	*	1	YES	S4VEM
Lead	Target	1.0	UJ	ug/L	0.62	J	1	YES	S4VEM
Magnesium	Target	3420	J	ug/L	3420	*	1	YES	S4VEM
Manganese	Target	188	J	ug/L	188	*	1	YES	S4VEM
Nickel	Target	4.0		ug/L	4.0		1	YES	S4VEM
Potassium	Target	3790		ug/L	3790		1	YES	S4VEM
Selenium	Target	5.0	U	ug/L	5.0	U	1	YES	S4VEM
Silver	Target	1.0	U	ug/L	1.0	U	1	YES	S4VEM
Sodium	Target	49200	J	ug/L	49200	*	1	YES	S4VEM
Thallium	Target	0.048	J	ug/L	0.048	J	1	YES	S4VEM
Vanadium	Target	5.0	UJ	ug/L	5.0	U	1	YES	S4VEM
Zinc	Target	15.0		ug/L	15.0		1	YES	S4VEM

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47948/EPW14035/MC0AG1** **Lab Name: Shealy Environmental Services, Inc.**

Sample Number: MC0AL2	Method: Cyanide	Matrix: Water	MA Number:
Sample Location: BDE-SIGW-08D	pH: 14.0	Sample Date: 11/07/2018	Sample Time: 11:18:00
% Moisture:		% Solids:	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Cyanide	Target	10.0	U	ug/L	10.0	U	1	YES	S4VEM

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47948/EPW14035/MC0AG1** **Lab Name: Shealy Environmental Services, Inc.**

Sample Number: MC0AL2	Method: Mercury by Cold Vapor	Matrix: Water	MA Number:
Sample Location: BDE-SIGW-08D	pH: 1.5	Sample Date: 11/07/2018	Sample Time: 11:18:00
% Moisture:		% Solids:	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Mercury	Target	0.20	U	ug/L	0.040	J	1	YES	S4VEM

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47948/EPW14035/MC0AG1** **Lab Name: Shealy Environmental Services, Inc.**

Sample Number: MC0AL2	Method: Metals by ICP-MS	Matrix: Water	MA Number:
Sample Location: BDE-SIGW-08D	pH: 1.5	Sample Date: 11/07/2018	Sample Time: 11:18:00
% Moisture:		% Solids:	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Aluminum	Target	50.2	J	ug/L	50.2	*	1	YES	S4VEM
Antimony	Target	2.0	U	ug/L	2.0	U	1	YES	S4VEM
Arsenic	Target	1.0	U	ug/L	1.0	U	1	YES	S4VEM
Barium	Target	225	J	ug/L	225	*	1	YES	S4VEM
Beryllium	Target	0.39	J	ug/L	0.39	J	1	YES	S4VEM
Cadmium	Target	0.24	J	ug/L	0.24	J	1	YES	S4VEM
Calcium	Target	9360	J	ug/L	9360	*	1	YES	S4VEM
Chromium	Target	1.0	J	ug/L	1.0	J	1	YES	S4VEM
Cobalt	Target	4.0		ug/L	4.0		1	YES	S4VEM
Copper	Target	0.54	J	ug/L	0.54	J	1	YES	S4VEM
Iron	Target	285	J	ug/L	285	*	1	YES	S4VEM
Lead	Target	1.0	UJ	ug/L	0.097	J	1	YES	S4VEM
Magnesium	Target	2360	J	ug/L	2360	*	1	YES	S4VEM
Manganese	Target	77.1	J	ug/L	77.1	*	1	YES	S4VEM
Nickel	Target	3.6		ug/L	3.6		1	YES	S4VEM
Potassium	Target	3850		ug/L	3850		1	YES	S4VEM
Selenium	Target	1.3	J	ug/L	1.3	J	1	YES	S4VEM
Silver	Target	1.0	U	ug/L	1.0	U	1	YES	S4VEM
Sodium	Target	18600	J	ug/L	18600	*	1	YES	S4VEM
Thallium	Target	0.030	J	ug/L	0.030	J	1	YES	S4VEM
Vanadium	Target	5.0	UJ	ug/L	5.0	U	1	YES	S4VEM
Zinc	Target	6.4		ug/L	6.4		1	YES	S4VEM

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47948/EPW14035/MC0AG1** **Lab Name: Shealy Environmental Services, Inc.**

Sample Number: PBW001	Method: Cyanide	Matrix: Water	MA Number:
Sample Location:	pH:	Sample Date:	Sample Time:
% Moisture:		% Solids:	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Cyanide	Target	10.0	U	ug/L	10.0	U	1	YES	S4VEM

ED_005024_00000601-00268

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47948/EPW14035/MC0AG1** **Lab Name: Shealy Environmental Services, Inc.**

Sample Number: PBW001	Method: Mercury by Cold Vapor	Matrix: Water	MA Number:
Sample Location:	pH:	Sample Date:	Sample Time:
% Moisture:		% Solids:	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Mercury	Target	0.039	J	ug/L	0.039	J	1	YES	S4VEM

ED_005024_00000601-00269

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47948/EPW14035/MC0AG1** **Lab Name: Shealy Environmental Services, Inc.**

Sample Number: PBW001	Method: Metals by ICP-MS	Matrix: Water	MA Number:
Sample Location:	pH:	Sample Date:	Sample Time:
% Moisture:		% Solids:	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Aluminum	Target	20.0	U	ug/L	20.0	U	1	YES	S4VEM
Antimony	Target	2.0	U	ug/L	2.0	U	1	YES	S4VEM
Arsenic	Target	1.0	U	ug/L	1.0	U	1	YES	S4VEM
Barium	Target	10.0	U	ug/L	10.0	U	1	YES	S4VEM
Beryllium	Target	1.0	U	ug/L	1.0	U	1	YES	S4VEM
Cadmium	Target	1.0	U	ug/L	1.0	U	1	YES	S4VEM
Calcium	Target	500	U	ug/L	500	U	1	YES	S4VEM
Chromium	Target	2.0	U	ug/L	2.0	U	1	YES	S4VEM
Cobalt	Target	1.0	U	ug/L	1.0	U	1	YES	S4VEM
Copper	Target	2.0	U	ug/L	2.0	U	1	YES	S4VEM
Iron	Target	200	U	ug/L	200	U	1	YES	S4VEM
Lead	Target	-0.019	J	ug/L	-0.019	J	1	YES	S4VEM
Magnesium	Target	500	U	ug/L	500	U	1	YES	S4VEM
Manganese	Target	1.0	U	ug/L	1.0	U	1	YES	S4VEM
Nickel	Target	1.0	U	ug/L	1.0	U	1	YES	S4VEM
Potassium	Target	500	U	ug/L	500	U	1	YES	S4VEM
Selenium	Target	5.0	U	ug/L	5.0	U	1	YES	S4VEM
Silver	Target	1.0	U	ug/L	1.0	U	1	YES	S4VEM
Sodium	Target	6.0	J	ug/L	6.0	J	1	YES	S4VEM
Thallium	Target	1.0	U	ug/L	1.0	U	1	YES	S4VEM
Vanadium	Target	5.0	U	ug/L	5.0	U	1	YES	S4VEM
Zinc	Target	2.0	U	ug/L	2.0	U	1	YES	S4VEM

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
Environmental Sciences Center
701 Mapes Road
Fort Meade, Maryland 20755-5350

DATE: 2/22/2019

SUBJECT: Region III Data QA Review

FROM: Brandon McDonald
Region III ESAT RPO (3EA22)

TO: CONNOR O'LOUGHLIN
Hazardous Site Cleanup Division (HSCD)

Attached is the data validation report for the BLADES GROUNDWATER site for RAS#47948; SDG# MC0AH3 completed by the Region III Environmental Services Assistance Team (ESAT) contractor, ICF International, under the direction of Region III EAID.

If you have any questions regarding this review, please call Brandon McDonald at (410) 305-2607 or you can call Eric Graybill at (410)-305-2665.

Attachment

cc: Ex. 4 CBI (WESTON SOLUTIONS)
WESTON SOLUTIONS)

TO: #0002 TDF: #1218002

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ICF
ESAT Region 3
US Environmental Protection Agency Environmental Science Center
701 Mapes Road Ft. Meade, MD 20755-5350
Phone 410-305-3012

Date: February 22, 2018

To: Brandon McDonald
ESAT Region 3 Project Officer

From: Ex. 4 CBI
Validator

Ex. 4 CBI
Reviewer

Subject: Inorganic Data Validation (S4VEM)
Blades Groundwater
47948 MC0AH3

Overview

This data package consisted of three (3) potable water samples and three (3) ground water samples, analyzed for total metals by ICP-MS, for mercury (Hg) by cold vapor atomic absorption technique, and for cyanide (CN^-) by spectrophotometry.

Analyses were performed by Shealy Environmental Services (EQI) according to Contract Laboratory Program (CLP) Statement of Work (SOW) ISM02.4.

Data were validated according to the National Functional Guidelines for Inorganic Superfund Methods Data Review and applicable USEPA Region 3 modifications. Electronic validation was performed by the Electronic Data eXchange & Evaluation System (EXES). The validation report has been assigned the Superfund Data Validation Level Stage_4_Validation_Electronic_Manual (S4VEM).

The following validation narrative is an evaluation of laboratory reported data based on the hardcopy data package received by Region 3 on November 29, 2018.

No drinking water sample in this SDG reported a result which exceeded the National Primary Drinking Water Regulations (NPDWR) Maximum Contaminant Levels (MCLs).

Summary

No significant data quality outliers or technical deficiencies were identified that would require rejection of sample results. Less significant data quality outliers requiring estimation of sample results were identified including, but not limited to, serial dilution percent differences and blank contamination as detailed below.

Minor Problems

Percent differences (%Ds) in the ICP serial dilution analysis were outside the control limit (>10%) for aluminum (Al), barium (Ba), calcium (Ca), magnesium (Mg) and sodium (Na). Detected concentrations for these analytes are estimated due to possible physical or chemical interferences in the sample matrix and have been qualified "J".

Laboratory instrumentation reported negative values for iron (Fe) and vanadium (V) greater than absolute values of the Method Detection Limits (MDLs) in blank analyses. The detected concentration reported for Fe in ground water sample MC0AH4, which was less than the Contract Required Quantitation Limit (CRQL), was reported at the CRQL and qualified "UJ". The detected concentration reported for Fe in drinking water sample MC0AN3 which was less than the CRQL, has been qualified "B" as reported. Quantitation limits for V in affected samples MC0AH3 and MC0AN3 are estimated and have been qualified "UJ".

Notes

Al, Fe, and Hg have been detected in laboratory blanks associated with the samples in this SDG. The detected concentration reported for Al in drinking water sample MC0AN6 has been qualified "B" as reported. Detected concentrations of Hg in drinking water samples which were less than the CRQL have been qualified "B" as reported. Detected concentrations of Hg in ground water samples which were less than the CRQL have been reported at the CRQL and qualified "U".

Analytes detected below the CRQL not attributed to blank contamination are estimated and have been qualified "J".

Matrix spike, laboratory duplicate, and Laboratory Control Sample analyses were within control limits.

Glossary of Inorganic Data Qualifier Codes

Validation Qualifiers	In order of descending precedence. Only one of these qualifiers may apply to any result.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the sample.
UJ	The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit
B	The result is presumed a blank contaminant. This qualifier is used for drinking water samples only.
J	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+	The result is an estimated quantity, but the result may be biased high.
J-	The result is an estimated quantity, but the result may be biased low.

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47948/EPW14035/MC0AH3** **Lab Name: Shealy Environmental Services, Inc.**

Sample Number: LCS001	Method: Metals by ICP-MS	Matrix: Water	MA Number:
Sample Location:	pH:	Sample Date:	Sample Time:
% Moisture:		% Solids:	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Aluminum	Spike	35.1		ug/L	35.1		1	YES	S4VEM
Antimony	Spike	3.8		ug/L	3.8		1	YES	S4VEM
Arsenic	Spike	1.5		ug/L	1.5		1	YES	S4VEM
Barium	Spike	18.0		ug/L	18.0		1	YES	S4VEM
Beryllium	Spike	2.0		ug/L	2.0		1	YES	S4VEM
Cadmium	Spike	1.9		ug/L	1.9		1	YES	S4VEM
Calcium	Spike	946		ug/L	946		1	YES	S4VEM
Chromium	Spike	4.2		ug/L	4.2		1	YES	S4VEM
Cobalt	Spike	1.9		ug/L	1.9		1	YES	S4VEM
Copper	Spike	4.3		ug/L	4.3		1	YES	S4VEM
Iron	Spike	379		ug/L	379		1	YES	S4VEM
Lead	Spike	1.8		ug/L	1.8		1	YES	S4VEM
Magnesium	Spike	908		ug/L	908		1	YES	S4VEM
Manganese	Spike	1.9		ug/L	1.9		1	YES	S4VEM
Nickel	Spike	2.0		ug/L	2.0		1	YES	S4VEM
Potassium	Spike	1050		ug/L	1050		1	YES	S4VEM
Selenium	Spike	10.6		ug/L	10.6		1	YES	S4VEM
Silver	Spike	2.1		ug/L	2.1		1	YES	S4VEM
Sodium	Spike	998		ug/L	998		1	YES	S4VEM
Thallium	Spike	1.8		ug/L	1.8		1	YES	S4VEM
Vanadium	Spike	7.0		ug/L	7.0		1	YES	S4VEM
Zinc	Spike	4.2		ug/L	4.2		1	YES	S4VEM

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47948/EPW14035/MC0AH3** **Lab Name: Shealy Environmental Services, Inc.**

Sample Number: MC0AH3	Method: Cyanide	Matrix: Water	MA Number:
Sample Location: BDE-SIGW-11	pH: 14.0	Sample Date: 11/06/2018	Sample Time: 09:52:00
% Moisture:		% Solids:	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Cyanide	Target	10.0	U	ug/L	10.0	U	1	YES	S4VEM

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47948/EPW14035/MC0AH3** **Lab Name: Shealy Environmental Services, Inc.**

Sample Number: MC0AH3	Method: Mercury by Cold Vapor	Matrix: Water	MA Number:
Sample Location: BDE-SIGW-11	pH: 1.5	Sample Date: 11/06/2018	Sample Time: 09:52:00
% Moisture:		% Solids:	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Mercury	Target	0.20	U	ug/L	0.044	J	1	YES	S4VEM

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47948/EPW14035/MC0AH3** **Lab Name: Shealy Environmental Services, Inc.**

Sample Number: MC0AH3	Method: Metals by ICP-MS	Matrix: Water	MA Number:
Sample Location: BDE-SIGW-11	pH: 1.5	Sample Date: 11/06/2018	Sample Time: 09:52:00
% Moisture:		% Solids:	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Aluminum	Target	347	J	ug/L	347	*	1	YES	S4VEM
Antimony	Target	0.29	J	ug/L	0.29	J	1	YES	S4VEM
Arsenic	Target	0.64	J	ug/L	0.64	J	1	YES	S4VEM
Barium	Target	42.9	J	ug/L	42.9	*	1	YES	S4VEM
Beryllium	Target	1.0	U	ug/L	1.0	U	1	YES	S4VEM
Cadmium	Target	1.0	U	ug/L	1.0	U	1	YES	S4VEM
Calcium	Target	16800	J	ug/L	16800	*	1	YES	S4VEM
Chromium	Target	0.91	J	ug/L	0.91	J	1	YES	S4VEM
Cobalt	Target	0.21	J	ug/L	0.21	J	1	YES	S4VEM
Copper	Target	1.3	J	ug/L	1.3	J	1	YES	S4VEM
Iron	Target	239		ug/L	239		1	YES	S4VEM
Lead	Target	0.18	J	ug/L	0.18	J	1	YES	S4VEM
Magnesium	Target	2400	J	ug/L	2400	*	1	YES	S4VEM
Manganese	Target	8.6		ug/L	8.6		1	YES	S4VEM
Nickel	Target	0.56	J	ug/L	0.56	J	1	YES	S4VEM
Potassium	Target	2240		ug/L	2240		1	YES	S4VEM
Selenium	Target	5.0	U	ug/L	5.0	U	1	YES	S4VEM
Silver	Target	1.0	U	ug/L	1.0	U	1	YES	S4VEM
Sodium	Target	5280	J	ug/L	5280	*	1	YES	S4VEM
Thallium	Target	1.0	U	ug/L	1.0	U	1	YES	S4VEM
Vanadium	Target	5.0	UJ	ug/L	5.0	U	1	YES	S4VEM
Zinc	Target	1.3	J	ug/L	1.3	J	1	YES	S4VEM

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47948/EPW14035/MC0AH3** **Lab Name: Shealy Environmental Services, Inc.**

Sample Number: MC0AH3D	Method: Cyanide	Matrix: Water	MA Number:
Sample Location:	pH: 14.0	Sample Date: 11/06/2018	Sample Time: 09:52:00
% Moisture:		% Solids:	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Cyanide	Target	10.0	U	ug/L	10.0	U	1	YES	S4VEM

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47948/EPW14035/MC0AH3** **Lab Name: Shealy Environmental Services, Inc.**

Sample Number: MC0AH3D	Method: Mercury by Cold Vapor	Matrix: Water	MA Number:
Sample Location:	pH: 1.5	Sample Date: 11/06/2018	Sample Time: 09:52:00
% Moisture:		% Solids:	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Mercury	Target	0.040	J	ug/L	0.040	J	1	YES	S4VEM

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47948/EPW14035/MC0AH3** **Lab Name: Shealy Environmental Services, Inc.**

Sample Number: MC0AH3D	Method: Metals by ICP-MS	Matrix: Water	MA Number:
Sample Location:	pH: 1.5	Sample Date: 11/06/2018	Sample Time: 09:52:00
% Moisture:		% Solids:	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Aluminum	Target	346		ug/L	346		1	YES	S4VEM
Antimony	Target	0.30	J	ug/L	0.30	J	1	YES	S4VEM
Arsenic	Target	1.0	U	ug/L	1.0	U	1	YES	S4VEM
Barium	Target	43.1		ug/L	43.1		1	YES	S4VEM
Beryllium	Target	1.0	U	ug/L	1.0	U	1	YES	S4VEM
Cadmium	Target	1.0	U	ug/L	1.0	U	1	YES	S4VEM
Calcium	Target	16800		ug/L	16800		1	YES	S4VEM
Chromium	Target	1.0	J	ug/L	1.0	J	1	YES	S4VEM
Cobalt	Target	0.22	J	ug/L	0.22	J	1	YES	S4VEM
Copper	Target	1.2	J	ug/L	1.2	J	1	YES	S4VEM
Iron	Target	241		ug/L	241		1	YES	S4VEM
Lead	Target	0.18	J	ug/L	0.18	J	1	YES	S4VEM
Magnesium	Target	2450		ug/L	2450		1	YES	S4VEM
Manganese	Target	8.5		ug/L	8.5		1	YES	S4VEM
Nickel	Target	0.58	J	ug/L	0.58	J	1	YES	S4VEM
Potassium	Target	2200		ug/L	2200		1	YES	S4VEM
Selenium	Target	5.0	U	ug/L	5.0	U	1	YES	S4VEM
Silver	Target	1.0	U	ug/L	1.0	U	1	YES	S4VEM
Sodium	Target	5350		ug/L	5350		1	YES	S4VEM
Thallium	Target	1.0	U	ug/L	1.0	U	1	YES	S4VEM
Vanadium	Target	5.0	U	ug/L	5.0	U	1	YES	S4VEM
Zinc	Target	1.2	J	ug/L	1.2	J	1	YES	S4VEM

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47948/EPW14035/MC0AH3** **Lab Name: Shealy Environmental Services, Inc.**

Sample Number: MC0AH3L	Method: Metals by ICP-MS	Matrix: Water	MA Number:
Sample Location:	pH: 1.5	Sample Date:	Sample Time:
% Moisture:		% Solids:	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Aluminum	Target	401		ug/L	401	*	5	YES	S4VEM
Antimony	Target	10.0	U	ug/L	10.0	U	5	YES	S4VEM
Arsenic	Target	5.0	U	ug/L	5.0	U	5	YES	S4VEM
Barium	Target	49.3	J	ug/L	49.3	J*	5	YES	S4VEM
Beryllium	Target	5.0	U	ug/L	5.0	U	5	YES	S4VEM
Cadmium	Target	5.0	U	ug/L	5.0	U	5	YES	S4VEM
Calcium	Target	18900		ug/L	18900	*	5	YES	S4VEM
Chromium	Target	1.3	J	ug/L	1.3	J	5	YES	S4VEM
Cobalt	Target	0.28	J	ug/L	0.28	J	5	YES	S4VEM
Copper	Target	1.7	J	ug/L	1.7	J	5	YES	S4VEM
Iron	Target	255	J	ug/L	255	J	5	YES	S4VEM
Lead	Target	0.15	J	ug/L	0.15	J	5	YES	S4VEM
Magnesium	Target	2800		ug/L	2800	*	5	YES	S4VEM
Manganese	Target	10.1		ug/L	10.1		5	YES	S4VEM
Nickel	Target	0.55	J	ug/L	0.55	J	5	YES	S4VEM
Potassium	Target	2390	J	ug/L	2390	J	5	YES	S4VEM
Selenium	Target	25.0	U	ug/L	25.0	U	5	YES	S4VEM
Silver	Target	5.0	U	ug/L	5.0	U	5	YES	S4VEM
Sodium	Target	6070		ug/L	6070	*	5	YES	S4VEM
Thallium	Target	5.0	U	ug/L	5.0	U	5	YES	S4VEM
Vanadium	Target	25.0	U	ug/L	25.0	U	5	YES	S4VEM
Zinc	Target	2.0	J	ug/L	2.0	J	5	YES	S4VEM

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47948/EPW14035/MC0AH3** **Lab Name: Shealy Environmental Services, Inc.**

Sample Number: MC0AH3S	Method: Cyanide	Matrix: Water	MA Number:
Sample Location:	pH: 14.0	Sample Date: 11/06/2018	Sample Time: 09:52:00
% Moisture:		% Solids:	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Cyanide	Spike	107		ug/L	107		1	YES	S4VEM

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47948/EPW14035/MC0AH3** **Lab Name: Shealy Environmental Services, Inc.**

Sample Number: MC0AH3S	Method: Mercury by Cold Vapor	Matrix: Water	MA Number:
Sample Location:	pH: 1.5	Sample Date: 11/06/2018	Sample Time: 09:52:00
% Moisture:		% Solids:	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Mercury	Spike	1.1		ug/L	1.1		1	YES	S4VEM

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47948/EPW14035/MC0AH3** **Lab Name: Shealy Environmental Services, Inc.**

Sample Number: MC0AH3S	Method: Metals by ICP-MS	Matrix: Water	MA Number:
Sample Location:	pH: 1.5	Sample Date: 11/06/2018	Sample Time: 09:52:00
% Moisture:		% Solids:	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Spike	95.0		ug/L	95.0		1	YES	S4VEM
Arsenic	Spike	40.6		ug/L	40.6		1	YES	S4VEM
Barium	Spike	1890		ug/L	1890		1	YES	S4VEM
Beryllium	Spike	49.1		ug/L	49.1		1	YES	S4VEM
Cadmium	Spike	49.7		ug/L	49.7		1	YES	S4VEM
Chromium	Spike	186		ug/L	186		1	YES	S4VEM
Cobalt	Spike	508		ug/L	508		1	YES	S4VEM
Copper	Spike	259		ug/L	259		1	YES	S4VEM
Lead	Spike	18.3		ug/L	18.3		1	YES	S4VEM
Manganese	Spike	515		ug/L	515		1	YES	S4VEM
Nickel	Spike	516		ug/L	516		1	YES	S4VEM
Selenium	Spike	104		ug/L	104		1	YES	S4VEM
Silver	Spike	52.2		ug/L	52.2		1	YES	S4VEM
Thallium	Spike	45.5		ug/L	45.5		1	YES	S4VEM
Vanadium	Spike	531		ug/L	531		1	YES	S4VEM
Zinc	Spike	514		ug/L	514		1	YES	S4VEM

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47948/EPW14035/MC0AH3** **Lab Name: Shealy Environmental Services, Inc.**

Sample Number: MC0AH4	Method: Cyanide	Matrix: Water	MA Number:
Sample Location: BDE-SIGW-12	pH: 12.5	Sample Date: 11/06/2018	Sample Time: 09:42:00
% Moisture:		% Solids:	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Cyanide	Target	10.0	U	ug/L	10.0	U	1	YES	S4VEM

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47948/EPW14035/MC0AH3** **Lab Name: Shealy Environmental Services, Inc.**

Sample Number: MC0AH4	Method: Mercury by Cold Vapor	Matrix: Water	MA Number:
Sample Location: BDE-SIGW-12	pH: 1.5	Sample Date: 11/06/2018	Sample Time: 09:42:00
% Moisture:		% Solids:	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Mercury	Target	0.20	U	ug/L	0.17	J	1	YES	S4VEM

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47948/EPW14035/MC0AH3** **Lab Name: Shealy Environmental Services, Inc.**

Sample Number: MC0AH4	Method: Metals by ICP-MS	Matrix: Water	MA Number:
Sample Location: BDE-SIGW-12	pH: 1.5	Sample Date: 11/06/2018	Sample Time: 09:42:00
% Moisture:		% Solids:	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Aluminum	Target	21.9	J	ug/L	21.9	*	1	YES	S4VEM
Antimony	Target	2.0	U	ug/L	2.0	U	1	YES	S4VEM
Arsenic	Target	0.62	J	ug/L	0.62	J	1	YES	S4VEM
Barium	Target	112	J	ug/L	112	*	1	YES	S4VEM
Beryllium	Target	0.22	J	ug/L	0.22	J	1	YES	S4VEM
Cadmium	Target	1.0	U	ug/L	1.0	U	1	YES	S4VEM
Calcium	Target	4180	J	ug/L	4180	*	1	YES	S4VEM
Chromium	Target	0.76	J	ug/L	0.76	J	1	YES	S4VEM
Cobalt	Target	9.8		ug/L	9.8		1	YES	S4VEM
Copper	Target	0.41	J	ug/L	0.41	J	1	YES	S4VEM
Iron	Target	200	UJ	ug/L	117	J	1	YES	S4VEM
Lead	Target	0.081	J	ug/L	0.081	J	1	YES	S4VEM
Magnesium	Target	1530	J	ug/L	1530	*	1	YES	S4VEM
Manganese	Target	190		ug/L	190		1	YES	S4VEM
Nickel	Target	3.0		ug/L	3.0		1	YES	S4VEM
Potassium	Target	2700		ug/L	2700		1	YES	S4VEM
Selenium	Target	5.0	U	ug/L	5.0	U	1	YES	S4VEM
Silver	Target	1.0	U	ug/L	1.0	U	1	YES	S4VEM
Sodium	Target	8920	J	ug/L	8920	*	1	YES	S4VEM
Thallium	Target	0.028	J	ug/L	0.028	J	1	YES	S4VEM
Vanadium	Target	5.0	UJ	ug/L	5.0	U	1	YES	S4VEM
Zinc	Target	9.4		ug/L	9.4		1	YES	S4VEM

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47948/EPW14035/MC0AH3** **Lab Name: Shealy Environmental Services, Inc.**

Sample Number: MC0AN3	Method: Cyanide	Matrix: Water	MA Number:
Sample Location: BDE-PSW-03	pH: 14.0	Sample Date: 11/05/2018	Sample Time: 12:07:00
% Moisture:		% Solids:	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Cyanide	Target	10.0	U	ug/L	10.0	U	1	YES	S4VEM

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47948/EPW14035/MC0AH3** **Lab Name: Shealy Environmental Services, Inc.**

Sample Number: MC0AN3	Method: Mercury by Cold Vapor	Matrix: Water	MA Number:
Sample Location: BDE-PSW-03	pH: 1.5	Sample Date: 11/05/2018	Sample Time: 12:07:00
% Moisture:		% Solids:	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Mercury	Target	0.040	JB	ug/L	0.040	J	1	YES	S4VEM

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47948/EPW14035/MC0AH3** **Lab Name: Shealy Environmental Services, Inc.**

Sample Number: MC0AN3	Method: Metals by ICP-MS	Matrix: Water	MA Number:
Sample Location: BDE-PSW-03	pH: 1.5	Sample Date: 11/05/2018	Sample Time: 12:07:00
% Moisture:		% Solids:	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Aluminum	Target	3.8	J	ug/L	3.8	J*	1	YES	S4VEM
Antimony	Target	2.0	U	ug/L	2.0	U	1	YES	S4VEM
Arsenic	Target	1.0	U	ug/L	1.0	U	1	YES	S4VEM
Barium	Target	107	J	ug/L	107	*	1	YES	S4VEM
Beryllium	Target	0.21	J	ug/L	0.21	J	1	YES	S4VEM
Cadmium	Target	1.0	U	ug/L	1.0	U	1	YES	S4VEM
Calcium	Target	10700	J	ug/L	10700	*	1	YES	S4VEM
Chromium	Target	0.70	J	ug/L	0.70	J	1	YES	S4VEM
Cobalt	Target	2.3		ug/L	2.3		1	YES	S4VEM
Copper	Target	7.7		ug/L	7.7		1	YES	S4VEM
Iron	Target	32.9	JB	ug/L	32.9	J	1	YES	S4VEM
Lead	Target	0.19	J	ug/L	0.19	J	1	YES	S4VEM
Magnesium	Target	2140	J	ug/L	2140	*	1	YES	S4VEM
Manganese	Target	31.9		ug/L	31.9		1	YES	S4VEM
Nickel	Target	2.0		ug/L	2.0		1	YES	S4VEM
Potassium	Target	3400		ug/L	3400		1	YES	S4VEM
Selenium	Target	1.4	J	ug/L	1.4	J	1	YES	S4VEM
Silver	Target	1.0	U	ug/L	1.0	U	1	YES	S4VEM
Sodium	Target	7530	J	ug/L	7530	*	1	YES	S4VEM
Thallium	Target	0.026	J	ug/L	0.026	J	1	YES	S4VEM
Vanadium	Target	5.0	UJ	ug/L	5.0	U	1	YES	S4VEM
Zinc	Target	8.3		ug/L	8.3		1	YES	S4VEM

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47948/EPW14035/MC0AH3** **Lab Name: Shealy Environmental Services, Inc.**

Sample Number: MC0AN4	Method: Cyanide	Matrix: Water	MA Number:
Sample Location: BDE-PSW-02	pH: 14.0	Sample Date: 11/05/2018	Sample Time: 11:55:00
% Moisture:		% Solids:	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Cyanide	Target	10.0	U	ug/L	10.0	U	1	YES	S4VEM

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47948/EPW14035/MC0AH3** **Lab Name: Shealy Environmental Services, Inc.**

Sample Number: MC0AN4	Method: Mercury by Cold Vapor	Matrix: Water	MA Number:
Sample Location: BDE-PSW-02	pH: 1.5	Sample Date: 11/05/2018	Sample Time: 11:55:00
% Moisture:		% Solids:	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Mercury	Target	0.040	JB	ug/L	0.040	J	1	YES	S4VEM

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47948/EPW14035/MC0AH3** **Lab Name: Shealy Environmental Services, Inc.**

Sample Number: MC0AN4	Method: Metals by ICP-MS	Matrix: Water	MA Number:
Sample Location: BDE-PSW-02	pH: 1.5	Sample Date: 11/05/2018	Sample Time: 11:55:00
% Moisture:		% Solids:	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Aluminum	Target	24.9	J	ug/L	24.9	*	1	YES	S4VEM
Antimony	Target	2.0	U	ug/L	2.0	U	1	YES	S4VEM
Arsenic	Target	1.0	U	ug/L	1.0	U	1	YES	S4VEM
Barium	Target	164	J	ug/L	164	*	1	YES	S4VEM
Beryllium	Target	0.60	J	ug/L	0.60	J	1	YES	S4VEM
Cadmium	Target	0.21	J	ug/L	0.21	J	1	YES	S4VEM
Calcium	Target	7990	J	ug/L	7990	*	1	YES	S4VEM
Chromium	Target	0.56	J	ug/L	0.56	J	1	YES	S4VEM
Cobalt	Target	4.7		ug/L	4.7		1	YES	S4VEM
Copper	Target	61.7		ug/L	61.7		1	YES	S4VEM
Iron	Target	537		ug/L	537		1	YES	S4VEM
Lead	Target	12.6		ug/L	12.6		1	YES	S4VEM
Magnesium	Target	2450	J	ug/L	2450	*	1	YES	S4VEM
Manganese	Target	93.0		ug/L	93.0		1	YES	S4VEM
Nickel	Target	5.4		ug/L	5.4		1	YES	S4VEM
Potassium	Target	3870		ug/L	3870		1	YES	S4VEM
Selenium	Target	1.3	J	ug/L	1.3	J	1	YES	S4VEM
Silver	Target	1.0	U	ug/L	1.0	U	1	YES	S4VEM
Sodium	Target	7220	J	ug/L	7220	*	1	YES	S4VEM
Thallium	Target	0.036	J	ug/L	0.036	J	1	YES	S4VEM
Vanadium	Target	5.0	UJ	ug/L	5.0	U	1	YES	S4VEM
Zinc	Target	254		ug/L	254		1	YES	S4VEM

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47948/EPW14035/MC0AH3** **Lab Name: Shealy Environmental Services, Inc.**

Sample Number: MC0AN6	Method: Cyanide	Matrix: Water	MA Number:
Sample Location: BDE-PSW-01	pH: 14.0	Sample Date: 11/05/2018	Sample Time: 11:45:00
% Moisture:		% Solids:	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Cyanide	Target	10.0	U	ug/L	10.0	U	1	YES	S4VEM

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47948/EPW14035/MC0AH3** **Lab Name: Shealy Environmental Services, Inc.**

Sample Number: MC0AN6	Method: Mercury by Cold Vapor	Matrix: Water	MA Number:
Sample Location: BDE-PSW-01	pH: 1.5	Sample Date: 11/05/2018	Sample Time: 11:45:00
% Moisture:		% Solids:	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Mercury	Target	0.044	JB	ug/L	0.044	J	1	YES	S4VEM

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47948/EPW14035/MC0AH3** **Lab Name: Shealy Environmental Services, Inc.**

Sample Number: MC0AN6	Method: Metals by ICP-MS	Matrix: Water	MA Number:
Sample Location: BDE-PSW-01	pH: 1.5	Sample Date: 11/05/2018	Sample Time: 11:45:00
% Moisture:		% Solids:	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Aluminum	Target	3.9	JB	ug/L	3.9	J*	1	YES	S4VEM
Antimony	Target	2.0	U	ug/L	2.0	U	1	YES	S4VEM
Arsenic	Target	1.0	U	ug/L	1.0	U	1	YES	S4VEM
Barium	Target	103	J	ug/L	103	*	1	YES	S4VEM
Beryllium	Target	1.0	U	ug/L	1.0	U	1	YES	S4VEM
Cadmium	Target	0.082	J	ug/L	0.082	J	1	YES	S4VEM
Calcium	Target	12500	J	ug/L	12500	*	1	YES	S4VEM
Chromium	Target	0.64	J	ug/L	0.64	J	1	YES	S4VEM
Cobalt	Target	4.1		ug/L	4.1		1	YES	S4VEM
Copper	Target	6.4		ug/L	6.4		1	YES	S4VEM
Iron	Target	1090		ug/L	1090		1	YES	S4VEM
Lead	Target	0.92	J	ug/L	0.92	J	1	YES	S4VEM
Magnesium	Target	3000	J	ug/L	3000	*	1	YES	S4VEM
Manganese	Target	109		ug/L	109		1	YES	S4VEM
Nickel	Target	1.5		ug/L	1.5		1	YES	S4VEM
Potassium	Target	3700		ug/L	3700		1	YES	S4VEM
Selenium	Target	5.0	U	ug/L	5.0	U	1	YES	S4VEM
Silver	Target	1.0	U	ug/L	1.0	U	1	YES	S4VEM
Sodium	Target	31400	J	ug/L	31400	*	1	YES	S4VEM
Thallium	Target	0.032	J	ug/L	0.032	J	1	YES	S4VEM
Vanadium	Target	5.0	UJ	ug/L	5.0	U	1	YES	S4VEM
Zinc	Target	44.9		ug/L	44.9		1	YES	S4VEM

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47948/EPW14035/MC0AH3** **Lab Name: Shealy Environmental Services, Inc.**

Sample Number: MC0AN9	Method: Cyanide	Matrix: Water	MA Number:
Sample Location: BDE-SIGW-20	pH: 14.0	Sample Date: 11/07/2018	Sample Time: 14:15:00
% Moisture:		% Solids:	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Cyanide	Target	10.0	U	ug/L	10.0	U	1	YES	S4VEM

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47948/EPW14035/MC0AH3** **Lab Name: Shealy Environmental Services, Inc.**

Sample Number: MC0AN9	Method: Mercury by Cold Vapor	Matrix: Water	MA Number:
Sample Location: BDE-SIGW-20	pH: 1.5	Sample Date: 11/07/2018	Sample Time: 14:15:00
% Moisture:		% Solids:	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Mercury	Target	0.20	U	ug/L	0.089	J	1	YES	S4VEM

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47948/EPW14035/MC0AH3** **Lab Name: Shealy Environmental Services, Inc.**

Sample Number: MC0AN9	Method: Metals by ICP-MS	Matrix: Water	MA Number:
Sample Location: BDE-SIGW-20	pH: 1.5	Sample Date: 11/07/2018	Sample Time: 14:15:00
% Moisture:		% Solids:	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Aluminum	Target	5540	J	ug/L	5540	*	1	YES	S4VEM
Antimony	Target	2.0	U	ug/L	2.0	U	1	YES	S4VEM
Arsenic	Target	2.5		ug/L	2.5		1	YES	S4VEM
Barium	Target	72.2	J	ug/L	72.2	*	1	YES	S4VEM
Beryllium	Target	0.27	J	ug/L	0.27	J	1	YES	S4VEM
Cadmium	Target	3.2		ug/L	3.2		1	YES	S4VEM
Calcium	Target	8730	J	ug/L	8730	*	1	YES	S4VEM
Chromium	Target	13.6		ug/L	13.6		1	YES	S4VEM
Cobalt	Target	4.8		ug/L	4.8		1	YES	S4VEM
Copper	Target	18.3		ug/L	18.3		1	YES	S4VEM
Iron	Target	3600		ug/L	3600		1	YES	S4VEM
Lead	Target	14.1		ug/L	14.1		1	YES	S4VEM
Magnesium	Target	1160	J	ug/L	1160	*	1	YES	S4VEM
Manganese	Target	51.0		ug/L	51.0		1	YES	S4VEM
Nickel	Target	5.4		ug/L	5.4		1	YES	S4VEM
Potassium	Target	3340		ug/L	3340		1	YES	S4VEM
Selenium	Target	1.5	J	ug/L	1.5	J	1	YES	S4VEM
Silver	Target	0.032	J	ug/L	0.032	J	1	YES	S4VEM
Sodium	Target	15600	J	ug/L	15600	*	1	YES	S4VEM
Thallium	Target	0.098	J	ug/L	0.098	J	1	YES	S4VEM
Vanadium	Target	10.6		ug/L	10.6		1	YES	S4VEM
Zinc	Target	15.8		ug/L	15.8		1	YES	S4VEM

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47948/EPW14035/MC0AH3** **Lab Name: Shealy Environmental Services, Inc.**

Sample Number: PBW001	Method: Cyanide	Matrix: Water	MA Number:
Sample Location:	pH:	Sample Date:	Sample Time:
% Moisture:		% Solids:	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Cyanide	Target	10.0	U	ug/L	10.0	U	1	YES	S4VEM

ED_005024_00000601-00302

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47948/EPW14035/MC0AH3** **Lab Name: Shealy Environmental Services, Inc.**

Sample Number: PBW001	Method: Mercury by Cold Vapor	Matrix: Water	MA Number:
Sample Location:	pH:	Sample Date:	Sample Time:
% Moisture:		% Solids:	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Mercury	Target	0.040	J	ug/L	0.040	J	1	YES	S4VEM

Sample Summary Report

Project Name: BLADES GROUNDWATER Project **GroupID: 47948/EPW14035/MC0AH3** **Lab Name: Shealy Environmental Services, Inc.**

Sample Number: PBW001	Method: Metals by ICP-MS	Matrix: Water	MA Number:
Sample Location:	pH:	Sample Date:	Sample Time:
% Moisture:		% Solids:	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Aluminum	Target	20.0	U	ug/L	20.0	U	1	YES	S4VEM
Antimony	Target	2.0	U	ug/L	2.0	U	1	YES	S4VEM
Arsenic	Target	1.0	U	ug/L	1.0	U	1	YES	S4VEM
Barium	Target	10.0	U	ug/L	10.0	U	1	YES	S4VEM
Beryllium	Target	1.0	U	ug/L	1.0	U	1	YES	S4VEM
Cadmium	Target	1.0	U	ug/L	1.0	U	1	YES	S4VEM
Calcium	Target	500	U	ug/L	500	U	1	YES	S4VEM
Chromium	Target	2.0	U	ug/L	2.0	U	1	YES	S4VEM
Cobalt	Target	1.0	U	ug/L	1.0	U	1	YES	S4VEM
Copper	Target	2.0	U	ug/L	2.0	U	1	YES	S4VEM
Iron	Target	-4.4	J	ug/L	-4.4	J	1	YES	S4VEM
Lead	Target	1.0	U	ug/L	1.0	U	1	YES	S4VEM
Magnesium	Target	500	U	ug/L	500	U	1	YES	S4VEM
Manganese	Target	1.0	U	ug/L	1.0	U	1	YES	S4VEM
Nickel	Target	1.0	U	ug/L	1.0	U	1	YES	S4VEM
Potassium	Target	500	U	ug/L	500	U	1	YES	S4VEM
Selenium	Target	5.0	U	ug/L	5.0	U	1	YES	S4VEM
Silver	Target	1.0	U	ug/L	1.0	U	1	YES	S4VEM
Sodium	Target	500	U	ug/L	500	U	1	YES	S4VEM
Thallium	Target	1.0	U	ug/L	1.0	U	1	YES	S4VEM
Vanadium	Target	5.0	U	ug/L	5.0	U	1	YES	S4VEM
Zinc	Target	2.0	U	ug/L	2.0	U	1	YES	S4VEM

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Region 3 Environmental Science Center
Office of Analytical Services and Quality Assurance
701 Mapes Road
Fort Meade, Maryland 20755-5350

Final Analytical Report

Site Name.....	BLADES GROUNDWATER
Sample Collection Date(s).....	09/19/18 10:35- 09/20/18 13:00
Contact.....	Connor O'Loughlin
Report Date.....	11/30/18 13:41
Project #.....	DAS R35442
Work Order.....	1809011

Analyses included in this report:

Percent Dry Weight (105C) by USGS
PFCs by EPA 537
Total Metals by CLP Equivalent (ICP)
Pesticides by CLP Equivalent
Total Mercury by CLP Equivalent
Total Metals by CLP Equivalent (ICPMS)

Approved for Release

OASQA Representative

Site Name: BLADES GROUNDWATER **Project #: DAS R35442**

Report Narrative

Pesticides Analysis Note:
All solid samples, 1809011-13 to 1809011-22, and toxaphene in samples 1809011-01 to 10 were analyzed according to the lab's on-demand procedures.

Quantitation limits for aldrin and 4,4'-DDE in samples 1809011-13 to 1809011-22 are qualified as estimates, possibly higher than reported (UL), because of low recoveries in the associated blank spike (BI82406-BS1).

Perfluorinated Compounds Analysis Note:
Quantitation limits for PFBS, PFHpA, PFHxS, PFOS and PFOA in sample 18009011-09 are qualified as estimated, possibly higher than reported (UL), because of low surrogate recoveries.

Results for PFNA in sample 18009011-09 are qualified as estimated, possibly higher than reported (L), because of low surrogate recoveries.

Results for PFOA in samples 18009011-03 and 10 are qualified as estimated (B), due to PFOA concentration in BI82604-BLK1 was above 1/3 of the MRL. Method 537 states that BLKs contamination be reported if above 1/3 of the MRL.

Mercury Analysis Note:
Results for sample 1809011-17 are qualified as estimates (J), because the associated duplicate sample (BI82701-DUP1) failed relative percent difference (RPD) criteria and the associated matrix spike (BI82701-MS1) failed percent recovery criteria. These failures were likely caused by the sample's non-homogenous matrix (matted leaf material), which could not be sampled representatively. Samples 1809011-14 and 1809011-18 exhibited similar non-homogenous matrices. The impact on these sample's data is not known.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Region 3 Environmental Science Center
Office of Analytical Services and Quality Assurance
701 Mapes Road
Fort Meade, Maryland 20755-5350

Site Name: BLADES GROUNDWATER **Project #: DAS R35442**

ANALYTICAL REPORT FOR SAMPLES

Station ID	Laboratory ID	Matrix	Date Sampled	Date Received
BDE-SW-01	1809011-01	Surface Water	9/19/18 15:40	9/21/18 10:30
BDE-SW-02	1809011-02	Surface Water	9/19/18 14:55	9/21/18 10:30
BDE-SW-03	1809011-03	Surface Water	9/20/18 09:20	9/21/18 10:30
BDE-SW-04	1809011-04	Surface Water	9/19/18 13:40	9/21/18 10:30
BDE-SW-05	1809011-05	Surface Water	9/20/18 10:20	9/21/18 10:30
BDE-SW-06	1809011-06	Surface Water	9/20/18 11:30	9/21/18 10:30
BDE-SW-07	1809011-07	Surface Water	9/19/18 12:45	9/21/18 10:30
BDE-SW-08	1809011-08	Surface Water	9/20/18 12:30	9/21/18 10:30
BDE-SW-09	1809011-09	Surface Water	9/19/18 10:35	9/21/18 10:30
BDE-SW-09-D	1809011-10	Surface Water	9/19/18 10:40	9/21/18 10:30
BDE-FRB-01W	1809011-11	Water	9/19/18 16:05	9/21/18 10:30
BDE-FRB-02W	1809011-12	Water	9/20/18 13:00	9/21/18 10:30
BDE-SD-01	1809011-13	Sediment	9/19/18 15:45	9/21/18 10:30
BDE-SD-02	1809011-14	Sediment	9/19/18 15:00	9/21/18 10:30
BDE-SD-03	1809011-15	Sediment	9/20/18 09:25	9/21/18 10:30
BDE-SD-04	1809011-16	Sediment	9/19/18 13:45	9/21/18 10:30
BDE-SD-05	1809011-17	Sediment	9/20/18 10:25	9/21/18 10:30
BDE-SD-06	1809011-18	Sediment	9/20/18 11:35	9/21/18 10:30
BDE-SD-07	1809011-19	Sediment	9/19/18 12:45	9/21/18 10:30
BDE-SD-08	1809011-20	Sediment	9/20/18 12:35	9/21/18 10:30
BDE-SD-09	1809011-21	Sediment	9/19/18 10:45	9/21/18 10:30
BDE-SD-09-D	1809011-22	Sediment	9/19/18 10:50	9/21/18 10:30

USEPA CLP COC (REGION COPY)
DateShipped: 9/20/2018
CarrierName: FedEx
AirbillNo: 773283604009

CHAIN OF CUSTODY RECORD
Blades GW
DAS #: R35442
Cooler #:

No: 3-092018-133538-0004
Lab: USEPA Region III
Lab Contact: Ex. 4 CBI
Lab Phone: 410-305-2938

Sample Identifier	CLP Sample No.	Matrix/Sampler	Coll. Method	Analysis/Turnaround (Days)	Tag/Preservative/Bottles	Location	Collection Date/Time	Sample Type
BDE-SW-02	C0AB1	Surface Water/ START	Grab	Pesticides(21)	1070 (4 C), 1071 (4 C) (2)	BDE-SW-02	09/19/2018 14:55	1809011 Field Sample -02
BDE-SW-03	C0AB2	Surface Water/ START	Grab	Pesticides(21)	1077 (4 C), 1078 (4 C) (2)	BDE-SW-03	09/20/2018 09:20	Field Sample -03
BDE-SW-04	C0AB3	Surface Water/ START	Grab	Pesticides(21)	1084 (4 C), 1085 (4 C) (2)	BDE-SW-04	09/19/2018 13:40	Field Sample -04
BDE-SW-01	C0AD1	Surface Water/ START	Grab	Pesticides(21)	1233 (4 C), 1234 (4 C) (2)	BDE-SW-01	09/19/2018 15:40	Field Sample -01

Special Instructions:

Shipment for Case Complete? N
Samples Transferred From Chain of Custody #

Analysis Key

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
Ex. 4 CBI	Western	9/20/18 17:30	Ex. 4 CBI	9/21/18 10:30	2.5°C CP 9/21/18

USEPA CLP COC (REGION COPY)
DateShipped: 9/20/2018
CarrierName: FedEx
AirbillNo: 773283627683

CHAIN OF CUSTODY RECORD
Blades GW
DAS #: R35442
Cooler #:

No: 3-092018-133859-0005
Lab: USEPA Region III
Lab Contact: Ex. 4 CBI
Lab Phone: 410-305-2938

Sample Identifier	CLP Sample No.	Matrix/Sampler	Coll. Method	Analysis/Turnaround (Days)	Tag/Preservative/Bottles	Location	Collection Date/Time	Sample Type
BDE-SW-06	C0AB8	Surface Water/ START	Grab	Pesticides(21)	1149 (4 C), 1150 (4 C) (2)	BDE-SW-06	09/20/2018 11:30	1809011 Field Sample -06
BDE-SW-07	C0AB9	Surface Water/ START	Grab	Pesticides(21)	1162 (4 C), 1163 (4 C) (2)	BDE-SW-07	09/19/2018 12:45	Field Sample -07
BDE-SW-09	C0AC0	Surface Water/ START	Grab	Pesticides(21)	1169 (4 C), 1170 (4 C) (2)	BDE-SW-09	09/19/2018 10:35	Field Sample -09
BDE-SW-08	C0AC1	Surface Water/ START	Grab	Pesticides(21)	1176 (4 C), 1177 (4 C) (2)	BDE-SW-08	09/20/2018 12:30	Field Sample -08

Special Instructions:

Analysis Key

Shipment for Case Complete? N
Samples Transferred From Chain of Custody #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
ENV Sample	Ex. 4 CBI Weston	9/20/18 17:30	Ex. 4 CBI	9/21/18 10:30	2.0°C CR 9/21/18

USEPA CLP COC (REGION COPY)
DateShipped: 9/20/2018
CarrierName: FedEx
AirbillNo: 773283654643

CHAIN OF CUSTODY RECORD
Blades GW
DAS #: R35442
Cooler #:

No: 3-092018-134030-0006
Lab: USEPA Region III
Lab Contact: Ex. 4 CBI
Lab Phone: 410-305-2938

Sample Identifier	CLP Sample No.	Matrix/Sampler	Coll. Method	Analysis/Turnaround (Days)	Tag/Preservative/Bottles	Location	Collection Date/Time	Sample Type
BDE-SW-05	C0AB4	Surface Water/ START	Grab	Pesticides(21)	1091 (4 C), 1092 (4 C), 1099 (4 C), 1100 (4 C), 1101 (4 C), 1102 (4 C) (6)	BDE-SW-05	09/20/2018 10:20	1809011 Lab QC
BDE-SW-09-D	C0AC2	Surface Water/ START	Grab	Pesticides(21)	1183 (4 C), 1184 (4 C) (2)	BDE-SW-09-D	09/19/2018 10:40	-05 Field Duplicate of M/C0AC1-10

Sample(s) to be used for Lab QC: BDE-SW-05 Tag 1091, BDE-SW-05 Tag 1092, BDE-SW-05 Tag 1099, BDE-SW-05 Tag 1100, BDE-SW-05 Tag 1101, BDE-SW-05 Tag 1102

Shipment for Case Complete? N
Samples Transferred From Chain of Custody #

Analysis Key

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
Env Sampler	Ex. 4 CBI Weston	9/20/18 17:30	Ex. 4 CBI	9/21/18 10:30	6°C CR 9/21/18

USEPA CLP COC (REGION COPY)
DateShipped: 9/20/2018
CarrierName: FedEx
AirbillNo: 773283766797

CHAIN OF CUSTODY RECORD
Blades GW
DAS #: R35442
Cooler #:

No: 3-092018-134702-0007
Lab: USEPA Region III
Lab Contact: Ex. 4 CBI
Lab Phone: 410-305-2938

Sample Identifier	CLP Sample No.	Matrix/Sampler	Coll. Method	Analysis/Turnaround (Days)	Tag/Preservative/Bottles	Location	Collection Date/Time	Sample Type
BDE-SW-02	C0AB1	Surface Water/ START	Grab	Perfluorinated Compounds (PFCS)(21)	1073 (4 C), 1074 (4 C) (2)	BDE-SW-02	09/19/2018 14:55	1809011 Field Sample -02
BDE-SW-03	C0AB2	Surface Water/ START	Grab	Perfluorinated Compounds (PFCS)(21)	1080 (4 C), 1081 (4 C) (2)	BDE-SW-03	09/20/2018 09:20	Field Sample -03
BDE-SW-04	C0AB3	Surface Water/ START	Grab	Perfluorinated Compounds (PFCS)(21)	1087 (4 C), 1088 (4 C) (2)	BDE-SW-04	09/19/2018 13:40	Field Sample -04
BDE-SW-05	C0AB4	Surface Water/ START	Grab	Perfluorinated Compounds (PFCS)(21)	1094 (4 C), 1095 (4 C), 1155 (4 C), 1156 (4 C), 1157 (4 C), 1158 (4 C) (6)	BDE-SW-05	09/20/2018 10:20	Lab QC -05
BDE-SW-06	C0AB8	Surface Water/ START	Grab	Perfluorinated Compounds (PFCS)(21)	1152 (4 C), 1153 (4 C) (2)	BDE-SW-06	09/20/2018 11:30	Field Sample -06
BDE-SW-07	C0AB9	Surface Water/ START	Grab	Perfluorinated Compounds (PFCS)(21)	1165 (4 C), 1166 (4 C) (2)	BDE-SW-07	09/19/2018 12:45	Field Sample -07
BDE-SW-09	C0AC0	Surface Water/ START	Grab	Perfluorinated Compounds (PFCS)(21)	1172 (4 C), 1173 (4 C) (2)	BDE-SW-09	09/19/2018 10:35	Field Sample -09
BDE-SW-08	C0AC1	Surface Water/ START	Grab	Perfluorinated Compounds (PFCS)(21)	1179 (4 C), 1180 (4 C) (2)	BDE-SW-08	09/20/2018 12:30	Field Sample -08
BDE-SW-09-D	C0AC2	Surface Water/ START	Grab	Perfluorinated Compounds (PFCS)(21)	1186 (4 C), 1187 (4 C) (2)	BDE-SW-09-D	09/19/2018 10:40	Field Duplicate of M/C0AC1 -10

Sample(s) to be used for Lab QC: BDE-SW-05 Tag 1094, BDE-SW-05 Tag 1095, BDE-SW-05 Tag 1155, BDE-SW-05 Tag 1156, BDE-SW-05 Tag 1157, BDE-SW-05 Tag 1158

Shipment for Case Complete? N
Samples Transferred From Chain of Custody #

Analysis Key

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
ENV Sampler	Ex. 4 CBI — Weston	9/20/18 17:30	Ex. 4 CBI	9/21/18 10:30	5°C CR 9/21/18

USEPA CLP COC (REGION COPY)
DateShipped: 9/20/2018
CarrierName: FedEx
AirbillNo: 773283766797

CHAIN OF CUSTODY RECORD
Blades GW
DAS #: R35442
Cooler #:

No: 3-092018-134702-0007
Lab: USEPA Region III
Lab Contact: Ex. 4 CBI
Lab Phone: 410-305-2938

Sample Identifier	CLP Sample No.	Matrix/Sampler	Coll. Method	Analysis/Turnaround (Days)	Tag/Preservative/Bottles	Location	Collection Date/Time	Sample Type 1809011
BDE-FRB-01W	C0AC3	Field Reagent Blank/ START	Grab	Perfluorinated Compounds (PFCS)(21)	1193 (4 C), 1194 (4 C) (2)	BDE-FRB-01W	09/19/2018 16:05	Field Reagent Blank -11
BDE-FRB-02W	C0AC4	Field Reagent Blank/ START	Grab	Perfluorinated Compounds (PFCS)(21)	1200 (4 C), 1201 (4 C) (2)	BDE-FRB-02W	09/20/2018 13:00	Field Reagent Blank -12
BDE-SW-01	C0AD1	Surface Water/ START	Grab	Perfluorinated Compounds (PFCS)(21)	1236 (4 C), 1237 (4 C) (2)	BDE-SW-01	09/19/2018 15:40	Field Sample -01

Special Instructions:

Shipment for Case Complete? N
Samples Transferred From Chain of Custody #

Analysis Key

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
ENV Sampler	Ex. 4 CBI Western	9/20/18 17:30	Ex. 4 CBI	9/21/18 10:30	5°C CS 9/21/18

USEPA CLP COC (REGION COPY)
DateShipped: 9/20/2018
CarrierName: FedEx
AirbillNo: 773283861776

CHAIN OF CUSTODY RECORD
Blades GW
DAS #: R35442
Cooler #:

No: 3-092018-135230-0008
Lab: USEPA Region III
Lab Contact: Ex. 4 CBI
Lab Phone: 410-305-2938

Sample Identifier	CLP Sample No.	Matrix/Sampler	Coll. Method	Analysis/Turnaround (Days)	Tag/Preservative/Bottles	Location	Collection Date/Time	Sample Type
BDE-SW-02	MC0AB1	Surface Water/ START	Grab	Metals + Hg, ISM02.4 ICP-MS(21)	1072 (HNO3 pH<2) (1)	BDE-SW-02	09/19/2018 14:55	1809011 Field Sample -02
BDE-SW-03	MC0AB2	Surface Water/ START	Grab	Metals + Hg, ISM02.4 ICP-MS(21)	1079 (HNO3 pH<2) (1)	BDE-SW-03	09/20/2018 09:20	Field Sample -03
BDE-SW-04	MC0AB3	Surface Water/ START	Grab	Metals + Hg, ISM02.4 ICP-MS(21)	1086 (HNO3 pH<2) (1)	BDE-SW-04	09/19/2018 13:40	Field Sample -04
BDE-SW-05	MC0AB4	Surface Water/ START	Grab	Metals + Hg, ISM02.4 ICP-MS(21)	1093 (HNO3 pH<2) (1)	BDE-SW-05	09/20/2018 10:20	Lab QC -05
BDE-SW-06	MC0AB8	Surface Water/ START	Grab	Metals + Hg, ISM02.4 ICP-MS(21)	1151 (HNO3 pH<2) (1)	BDE-SW-06	09/20/2018 11:30	Field Sample -06
BDE-SW-07	MC0AB9	Surface Water/ START	Grab	Metals + Hg, ISM02.4 ICP-MS(21)	1164 (HNO3 pH<2) (1)	BDE-SW-07	09/19/2018 12:45	Field Sample -07
BDE-SW-09	MC0AC0	Surface Water/ START	Grab	Metals + Hg, ISM02.4 ICP-MS(21)	1171 (HNO3 pH<2) (1)	BDE-SW-09	09/19/2018 10:35	Field Sample -09
BDE-SW-08	MC0AC1	Surface Water/ START	Grab	Metals + Hg, ISM02.4 ICP-MS(21)	1178 (HNO3 pH<2) (1)	BDE-SW-08	09/20/2018 12:30	Field Sample -08
BDE-SW-09-D	MC0AC2	Surface Water/ START	Grab	Metals + Hg, ISM02.4 ICP-MS(21)	1185 (HNO3 pH<2) (1)	BDE-SW-09-D	09/19/2018 10:40	Field Duplicate of M/C0AC1 -10
BDE-SW-01	MC0AD1	Surface Water/ START	Grab	Metals + Hg, ISM02.4 ICP-MS(21)	1235 (HNO3 pH<2) (1)	BDE-SW-01	09/19/2018 15:40	Field Sample -01

Sample(s) to be used for Lab QC: BDE-SW-05 Tag 1093

Shipment for Case Complete? N
Samples Transferred From Chain of Custody #

Analysis Key

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
Env Samples	Ex. 4 CBI Weston	9/20/18 17:30	Ex. 4 CBI	9/21/18 10:30	6°C CP 9/21/18

USEPA CLP COC (REGION COPY)
DateShipped: 9/20/2018
CarrierName: FedEx
AirbillNo: 773284356817

CHAIN OF CUSTODY RECORD
Blades GW
DAS #: R35442
Cooler #:

No: 3-092018-141802-0009
Lab: USEPA Region III
Lab Contact: Ex. 4 CBI
Lab Phone: 410-305-2938

Sample Identifier	CLP Sample No.	Matrix/Sampler	Coll. Method	Analysis/Turnaround (Days)	Tag/Preservative/Bottles	Location	Collection Date/Time	Sample Type
BDE-SD-01	MC0AA0	Sediment/ START	Grab	Metals+Hg, ISM02.4 ICP-MS/ ISM02.4 ICP-AES(21)	1002 (4 C) (1)	BDE-SD-01	09/19/2018 15:45	Field Sample
BDE-SD-02	MC0AA1	Sediment/ START	Grab	Metals+Hg, ISM02.4 ICP-MS/ ISM02.4 ICP-AES(21)	1009 (4 C) (1)	BDE-SD-02	09/19/2018 15:00	Field Sample
BDE-SD-03	MC0AA2	Sediment/ START	Grab	Metals+Hg, ISM02.4 ICP-MS/ ISM02.4 ICP-AES(21)	1015 (4 C) (1)	BDE-SD-03	09/20/2018 09:25	Field Sample
BDE-SD-04	MC0AA3	Sediment/ START	Grab	Metals+Hg, ISM02.4 ICP-MS/ ISM02.4 ICP-AES(21)	1021 (4 C) (1)	BDE-SD-04	09/19/2018 13:45	Field Sample
BDE-SD-05	MC0AA4	Sediment/ START	Grab	Metals+Hg, ISM02.4 ICP-MS/ ISM02.4 ICP-AES(21)	1027 (4 C) (1)	BDE-SD-05	09/20/2018 10:25	Lab QC
BDE-SD-06	MC0AA5	Sediment/ START	Grab	Metals+Hg, ISM02.4 ICP-MS/ ISM02.4 ICP-AES(21)	1033 (4 C) (1)	BDE-SD-06	09/20/2018 11:35	Field Sample
BDE-SD-07	MC0AA6	Sediment/ START	Grab	Metals+Hg, ISM02.4 ICP-MS/ ISM02.4 ICP-AES(21)	1039 (4 C) (1)	BDE-SD-07	09/19/2018 12:45	Field Sample
BDE-SD-08	MC0AA7	Sediment/ START	Grab	Metals+Hg, ISM02.4 ICP-MS/ ISM02.4 ICP-AES(21)	1045 (4 C) (1)	BDE-SD-08	09/20/2018 12:35	Field Sample
BDE-SD-09	MC0AA8	Sediment/ START	Grab	Metals+Hg, ISM02.4 ICP-MS/ ISM02.4 ICP-AES(21)	1051 (4 C) (1)	BDE-SD-09	09/19/2018 10:45	Field Sample
BDE-SD-09-D	MC0AA9	Sediment/ START	Grab	Metals+Hg, ISM02.4 ICP-MS/ ISM02.4 ICP-AES(21)	1057 (4 C) (1)	BDE-SD-09-D	09/19/2018 10:50	Field Duplicate of M/C0AA8

Sample(s) to be used for Lab QC: BDE-SD-05 Tag 1027

Shipment for Case Complete? N
Samples Transferred From Chain of Custody #

Analysis Key

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
Env Samples	Ex. 4 CBI Weston	9/20/18 17:30	Ex. 4 CBI	9/21/18 10:30	5°C CP 9/21/18

USEPA CLP COC (REGION COPY)
DateShipped: 9/20/2018
CarrierName: FedEx
AirbillNo: 773284356817

CHAIN OF CUSTODY RECORD
Blades GW
DAS #: R35442
Cooler #:

No: 3-092018-142021-0010
Lab: USEPA Region III
Lab Contact: Ex. 4 CBI
Lab Phone: 410-305-2938

Sample Identifier	CLP Sample No.	Matrix/Sampler	Coll. Method	Analysis/Turnaround (Days)	Tag/Preservative/Bottles	Location	Collection Date/Time	Sample Type 1809011
BDE-SD-01	C0AA0	Sediment/ START	Grab	Pesticides(21)	1001 (4 C) (1)	BDE-SD-01	09/19/2018 15:45	Field Sample -13
BDE-SD-02	C0AA1	Sediment/ START	Grab	Pesticides(21)	1008 (4 C) (1)	BDE-SD-02	09/19/2018 15:00	Field Sample -14
BDE-SD-03	C0AA2	Sediment/ START	Grab	Pesticides(21)	1014 (4 C) (1)	BDE-SD-03	09/20/2018 09:25	Field Sample -15
BDE-SD-04	C0AA3	Sediment/ START	Grab	Pesticides(21)	1020 (4 C) (1)	BDE-SD-04	09/19/2018 13:45	Field Sample -16
BDE-SD-05	C0AA4	Sediment/ START	Grab	Pesticides(21)	1026 (4 C) (1)	BDE-SD-05	09/20/2018 10:25	Lab QC -17
BDE-SD-06	C0AA5	Sediment/ START	Grab	Pesticides(21)	1032 (4 C) (1)	BDE-SD-06	09/20/2018 11:35	Field Sample -18
BDE-SD-07	C0AA6	Sediment/ START	Grab	Pesticides(21)	1038 (4 C) (1)	BDE-SD-07	09/19/2018 12:45	Field Sample -19
BDE-SD-08	C0AA7	Sediment/ START	Grab	Pesticides(21)	1044 (4 C) (1)	BDE-SD-08	09/20/2018 12:35	Field Sample -20
BDE-SD-09	C0AA8	Sediment/ START	Grab	Pesticides(21)	1050 (4 C) (1)	BDE-SD-09	09/19/2018 10:45	Field Sample -21
BDE-SD-09-D	C0AA9	Sediment/ START	Grab	Pesticides(21)	1056 (4 C) (1)	BDE-SD-09-D	09/19/2018 10:50	Field Duplicate of M/C0AA8 -22

Sample(s) to be used for Lab QC: BDE-SD-05 Tag 1026

Shipment for Case Complete? N
Samples Transferred From Chain of Custody #

Analysis Key

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
ENV Samples	Ex. 4 CBI Weston	9/20/18 17:30	Ex. 4 CBI	9/21/18 10:30	5°C CR 9/21/18

Site Name: BLADES GROUNDWATER **Project #: DAS R35442**

Physical Parameters

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID: 1809011-13								
Station ID: BDE-SD-01								
Sample Matrix: Sediment								
Collected: 09/19/2018								
% Solids	**61.5**			% by Weight	1	10/01/18	10/02/18 09:10	USGS I-5753-85/R3QA056

Physical Parameters

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID: 1809011-14								
Station ID: BDE-SD-02								
Sample Matrix: Sediment								
Collected: 09/19/2018								
% Solids	**13.1**			% by Weight	1	10/01/18	10/02/18 09:10	USGS I-5753-85/R3QA056

Physical Parameters

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID: 1809011-15								
Station ID: BDE-SD-03								
Sample Matrix: Sediment								
Collected: 09/20/2018								
% Solids	**82.8**			% by Weight	1	10/01/18	10/02/18 09:10	USGS I-5753-85/R3QA056

Site Name: BLADES GROUNDWATER **Project #: DAS R35442**

Physical Parameters

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID: 1809011-16								
Station ID: BDE-SD-04								
Sample Matrix: Sediment								
Collected: 09/19/2018								
% Solids	**87.7**			% by Weight	1	10/01/18	10/02/18 09:10	USGS I-5753-85/R3QA056

Physical Parameters

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID: 1809011-17								
Station ID: BDE-SD-05								
Sample Matrix: Sediment								
Collected: 09/20/2018								
% Solids	**11.5**			% by Weight	1	10/01/18	10/02/18 09:10	USGS I-5753-85/R3QA056

Physical Parameters

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID: 1809011-18								
Station ID: BDE-SD-06								
Sample Matrix: Sediment								
Collected: 09/20/2018								
% Solids	**12.5**			% by Weight	1	10/01/18	10/02/18 09:10	USGS I-5753-85/R3QA056

Site Name: BLADES GROUNDWATER **Project #: DAS R35442**

Physical Parameters

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID: 1809011-19								
Station ID: BDE-SD-07								
Sample Matrix: Sediment								
Collected: 09/19/2018								
% Solids	**80.9**			% by Weight	1	10/01/18	10/02/18 09:10	USGS I-5753-85/R3QA056

Physical Parameters

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID: 1809011-20								
Station ID: BDE-SD-08								
Sample Matrix: Sediment								
Collected: 09/20/2018								
% Solids	**46.6**			% by Weight	1	10/01/18	10/02/18 09:10	USGS I-5753-85/R3QA056

Physical Parameters

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID: 1809011-21								
Station ID: BDE-SD-09								
Sample Matrix: Sediment								
Collected: 09/19/2018								
% Solids	**66.0**			% by Weight	1	10/01/18	10/02/18 09:10	USGS I-5753-85/R3QA056

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Region 3 Environmental Science Center
Office of Analytical Services and Quality Assurance
701 Mapes Road
Fort Meade, Maryland 20755-5350

Site Name: BLADES GROUNDWATER **Project #: DAS R35442**

Physical Parameters

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID: 1809011-22								
Station ID: BDE-SD-09-D								
Sample Matrix: Sediment								
Collected: 09/19/2018								
% Solids	**65.4**			% by Weight	1	10/01/18	10/02/18 09:10	USGS I-5753-85/R3QA056

HPLC Identification

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID: 1809011-01								
Station ID: BDE-SW-01								
Sample Matrix: Surface Water								
Collected: 09/19/2018								
PFBS (perfluorobutanesulfonic acid)	U		8.33	ng/L	1	09/26/18	09/27/18 21:48	EPA 537/R3QA242/243
PFHpA (perfluoroheptanoic acid)	U		8.33	ng/L	1	09/26/18	09/27/18 21:48	EPA 537/R3QA242/243
PFHxS (perfluorohexanesulfonic acid)	U		8.33	ng/L	1	09/26/18	09/27/18 21:48	EPA 537/R3QA242/243
PFNA (perfluorononanoic acid)	U		8.33	ng/L	1	09/26/18	09/27/18 21:48	EPA 537/R3QA242/243
PFOS (perfluorooctanesulfonic acid)	U		8.33	ng/L	1	09/26/18	09/27/18 21:48	EPA 537/R3QA242/243
PFOA (perfluorooctanoic acid)	U		8.33	ng/L	1	09/26/18	09/27/18 21:48	EPA 537/R3QA242/243

Surrogates

Analyte	Result	Flags/ Qualifiers	**%Recovery**	Units	%Recovery Limits	Prepared	Analyzed	Method/SOP#
Lab ID: 1809011-01								
Station ID: BDE-SW-01								
Sample Matrix: Surface Water								
Collected: 09/19/2018								
Surrogate: MPFHxA	34.0		**102 %**	ng/L	*70-130*	09/26/18	09/27/18 21:48	*EPA 537/R3QA242/243*
Surrogate: MPFDA	26.9		**81 %**	ng/L	*70-130*	09/26/18	09/27/18 21:48	*EPA 537/R3QA242/243*

Site Name: BLADES GROUNDWATER **Project #: DAS R35442**

HPLC Identification

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID: 1809011-02								
Station ID: BDE-SW-02								
Sample Matrix: Surface Water								
Collected: 09/19/2018								
PFBS (perfluorobutanesulfonic acid)	U		8.77	ng/L	1	09/26/18	09/27/18 22:14	EPA 537/R3QA242/243
PFHpA (perfluoroheptanoic acid)	U		8.77	ng/L	1	09/26/18	09/27/18 22:14	EPA 537/R3QA242/243
PFHxS (perfluorohexanesulfonic acid)	U		8.77	ng/L	1	09/26/18	09/27/18 22:14	EPA 537/R3QA242/243
PFNA (perfluorononanoic acid)	U		8.77	ng/L	1	09/26/18	09/27/18 22:14	EPA 537/R3QA242/243
PFOS (perfluorooctanesulfonic acid)	U		8.77	ng/L	1	09/26/18	09/27/18 22:14	EPA 537/R3QA242/243
PFOA (perfluorooctanoic acid)	U		8.77	ng/L	1	09/26/18	09/27/18 22:14	EPA 537/R3QA242/243

Surrogates

Analyte	Result	Flags/ Qualifiers	**%Recovery**	Units	%Recovery Limits	Prepared	Analyzed	Method/SOP#
Lab ID: 1809011-02								
Station ID: BDE-SW-02								
Sample Matrix: Surface Water								
Collected: 09/19/2018								
Surrogate: MPFHxA	34.8		**99 %**	ng/L	*70-130*	09/26/18	09/27/18 22:14	*EPA 537/R3QA242/243*
Surrogate: MPFDA	30.7		**87 %**	ng/L	*70-130*	09/26/18	09/27/18 22:14	*EPA 537/R3QA242/243*

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Region 3 Environmental Science Center
Office of Analytical Services and Quality Assurance
701 Mapes Road
Fort Meade, Maryland 20755-5350

Site Name: BLADES GROUNDWATER **Project #: DAS R35442**

HPLC Identification

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID: 1809011-03								
Station ID: BDE-SW-03								
Sample Matrix: Surface Water								
Collected: 09/20/2018								
PFBS (perfluorobutanesulfonic acid)	U		8.62	ng/L	1	09/26/18	09/27/18 22:40	EPA 537/R3QA242/243
PFHpA (perfluoroheptanoic acid)	U		8.62	ng/L	1	09/26/18	09/27/18 22:40	EPA 537/R3QA242/243
PFHxS (perfluorohexanesulfonic acid)	U		8.62	ng/L	1	09/26/18	09/27/18 22:40	EPA 537/R3QA242/243
PFNA (perfluorononanoic acid)	**15.1**		8.62	ng/L	1	09/26/18	09/27/18 22:40	EPA 537/R3QA242/243
PFOS (perfluorooctanesulfonic acid)	**16.0**		8.62	ng/L	1	09/26/18	09/27/18 22:40	EPA 537/R3QA242/243
PFOA (perfluorooctanoic acid)	**9.16**	B	8.62	ng/L	1	09/26/18	09/27/18 22:40	EPA 537/R3QA242/243

Surrogates

Analyte	Result	Flags/ Qualifiers	**%Recovery**	Units	%Recovery Limits	Prepared	Analyzed	Method/SOP#
Lab ID: 1809011-03								
Station ID: BDE-SW-03								
Sample Matrix: Surface Water								
Collected: 09/20/2018								
Surrogate: MPFHxA	35.5		**103 %**	ng/L	*70-130*	09/26/18	09/27/18 22:40	*EPA 537/R3QA242/243*
Surrogate: MPFDA	34.0		**99 %**	ng/L	*70-130*	09/26/18	09/27/18 22:40	*EPA 537/R3QA242/243*

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Region 3 Environmental Science Center
Office of Analytical Services and Quality Assurance
701 Mapes Road
Fort Meade, Maryland 20755-5350

Site Name: BLADES GROUNDWATER **Project #: DAS R35442**

HPLC Identification

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID: 1809011-04								
Station ID: BDE-SW-04								
Sample Matrix: Surface Water								
Collected: 09/19/2018								
PFBS (perfluorobutanesulfonic acid)	U		8.62	ng/L	1	09/26/18	09/27/18 23:05	EPA 537/R3QA242/243
PFHpA (perfluoroheptanoic acid)	U		8.62	ng/L	1	09/26/18	09/27/18 23:05	EPA 537/R3QA242/243
PFHxS (perfluorohexanesulfonic acid)	U		8.62	ng/L	1	09/26/18	09/27/18 23:05	EPA 537/R3QA242/243
PFNA (perfluorononanoic acid)	**14.2**		8.62	ng/L	1	09/26/18	09/27/18 23:05	EPA 537/R3QA242/243
PFOS (perfluorooctanesulfonic acid)	U		8.62	ng/L	1	09/26/18	09/27/18 23:05	EPA 537/R3QA242/243
PFOA (perfluorooctanoic acid)	U		8.62	ng/L	1	09/26/18	09/27/18 23:05	EPA 537/R3QA242/243

Surrogates

Analyte	Result	Flags/ Qualifiers	**%Recovery**	Units	%Recovery Limits	Prepared	Analyzed	Method/SOP#
Lab ID: 1809011-04								
Station ID: BDE-SW-04								
Sample Matrix: Surface Water								
Collected: 09/19/2018								
Surrogate: MPFHxA	36.0		**104 %**	ng/L	*70-130*	09/26/18	09/27/18 23:05	*EPA 537/R3QA242/243*
Surrogate: MPFDA	34.5		**100 %**	ng/L	*70-130*	09/26/18	09/27/18 23:05	*EPA 537/R3QA242/243*

Site Name: BLADES GROUNDWATER **Project #: DAS R35442**

HPLC Identification

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID: 1809011-05								
Station ID: BDE-SW-05								
Sample Matrix: Surface Water								
Collected: 09/20/2018								
PFBS (perfluorobutanesulfonic acid)	U		8.62	ng/L	1	09/26/18	09/27/18 23:31	EPA 537/R3QA242/243
PFHpA (perfluoroheptanoic acid)	U		8.62	ng/L	1	09/26/18	09/27/18 23:31	EPA 537/R3QA242/243
PFHxS (perfluorohexanesulfonic acid)	U		8.62	ng/L	1	09/26/18	09/27/18 23:31	EPA 537/R3QA242/243
PFNA (perfluorononanoic acid)	U		8.62	ng/L	1	09/26/18	09/27/18 23:31	EPA 537/R3QA242/243
PFOS (perfluorooctanesulfonic acid)	U		8.62	ng/L	1	09/26/18	09/27/18 23:31	EPA 537/R3QA242/243
PFOA (perfluorooctanoic acid)	U		8.62	ng/L	1	09/26/18	09/27/18 23:31	EPA 537/R3QA242/243

Surrogates

Analyte	Result	Flags/ Qualifiers	**%Recovery**	Units	%Recovery Limits	Prepared	Analyzed	Method/SOP#
Lab ID: 1809011-05								
Station ID: BDE-SW-05								
Sample Matrix: Surface Water								
Collected: 09/20/2018								
Surrogate: MPFHxA	35.3		**102 %**	ng/L	*70-130*	09/26/18	09/27/18 23:31	*EPA 537/R3QA242/243*
Surrogate: MPFDA	30.6		**89 %**	ng/L	*70-130*	09/26/18	09/27/18 23:31	*EPA 537/R3QA242/243*

Site Name: BLADES GROUNDWATER **Project #: DAS R35442**

HPLC Identification

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID: 1809011-06								
Station ID: BDE-SW-06								
Sample Matrix: Surface Water								
Collected: 09/20/2018								
PFBS (perfluorobutanesulfonic acid)	U		9.62	ng/L	1	09/26/18	09/28/18 00:48	EPA 537/R3QA242/243
PFHpA (perfluoroheptanoic acid)	**10.0**		9.62	ng/L	1	09/26/18	09/28/18 00:48	EPA 537/R3QA242/243
PFHxS (perfluorohexanesulfonic acid)	U		9.62	ng/L	1	09/26/18	09/28/18 00:48	EPA 537/R3QA242/243
PFNA (perfluorononanoic acid)	U		9.62	ng/L	1	09/26/18	09/28/18 00:48	EPA 537/R3QA242/243
PFOS (perfluorooctanesulfonic acid)	U		9.62	ng/L	1	09/26/18	09/28/18 00:48	EPA 537/R3QA242/243
PFOA (perfluorooctanoic acid)	**14.2**	B	9.62	ng/L	1	09/26/18	09/28/18 00:48	EPA 537/R3QA242/243

Surrogates

Analyte	Result	Flags/ Qualifiers	**%Recovery**	Units	%Recovery Limits	Prepared	Analyzed	Method/SOP#
Lab ID: 1809011-06								
Station ID: BDE-SW-06								
Sample Matrix: Surface Water								
Collected: 09/20/2018								
Surrogate: MPFHxA	43.8		**114 %**	ng/L	*70-130*	09/26/18	09/28/18 00:48	*EPA 537/R3QA242/243*
Surrogate: MPFDA	32.2		**84 %**	ng/L	*70-130*	09/26/18	09/28/18 00:48	*EPA 537/R3QA242/243*

Site Name: BLADES GROUNDWATER **Project #: DAS R35442**

HPLC Identification

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID: 1809011-07								
Station ID: BDE-SW-07								
Sample Matrix: Surface Water								
Collected: 09/19/2018								
PFBS (perfluorobutanesulfonic acid)	U		8.62	ng/L	1	09/26/18	09/28/18 01:13	EPA 537/R3QA242/243
PFHpA (perfluoroheptanoic acid)	U		8.62	ng/L	1	09/26/18	09/28/18 01:13	EPA 537/R3QA242/243
PFHxS (perfluorohexanesulfonic acid)	U		8.62	ng/L	1	09/26/18	09/28/18 01:13	EPA 537/R3QA242/243
PFNA (perfluorononanoic acid)	U		8.62	ng/L	1	09/26/18	09/28/18 01:13	EPA 537/R3QA242/243
PFOS (perfluorooctanesulfonic acid)	U		8.62	ng/L	1	09/26/18	09/28/18 01:13	EPA 537/R3QA242/243
PFOA (perfluorooctanoic acid)	U		8.62	ng/L	1	09/26/18	09/28/18 01:13	EPA 537/R3QA242/243

Surrogates

Analyte	Result	Flags/ Qualifiers	**%Recovery**	Units	%Recovery Limits	Prepared	Analyzed	Method/SOP#
Lab ID: 1809011-07								
Station ID: BDE-SW-07								
Sample Matrix: Surface Water								
Collected: 09/19/2018								
Surrogate: MPFHxA	34.9		**101 %**	ng/L	*70-130*	09/26/18	09/28/18 01:13	*EPA 537/R3QA242/243*
Surrogate: MPFDA	28.7		**83 %**	ng/L	*70-130*	09/26/18	09/28/18 01:13	*EPA 537/R3QA242/243*

Site Name: BLADES GROUNDWATER **Project #: DAS R35442**

HPLC Identification

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID: 1809011-08								
Station ID: BDE-SW-08								
Sample Matrix: Surface Water								
Collected: 09/20/2018								
PFBS (perfluorobutanesulfonic acid)	U		8.93	ng/L	1	09/26/18	09/28/18 01:39	EPA 537/R3QA242/243
PFHpA (perfluoroheptanoic acid)	U		8.93	ng/L	1	09/26/18	09/28/18 01:39	EPA 537/R3QA242/243
PFHxS (perfluorohexanesulfonic acid)	U		8.93	ng/L	1	09/26/18	09/28/18 01:39	EPA 537/R3QA242/243
PFNA (perfluorononanoic acid)	U		8.93	ng/L	1	09/26/18	09/28/18 01:39	EPA 537/R3QA242/243
PFOS (perfluorooctanesulfonic acid)	U		8.93	ng/L	1	09/26/18	09/28/18 01:39	EPA 537/R3QA242/243
PFOA (perfluorooctanoic acid)	U		8.93	ng/L	1	09/26/18	09/28/18 01:39	EPA 537/R3QA242/243

Surrogates

Analyte	Result	Flags/ Qualifiers	**%Recovery**	Units	%Recovery Limits	Prepared	Analyzed	Method/SOP#
Lab ID: 1809011-08								
Station ID: BDE-SW-08								
Sample Matrix: Surface Water								
Collected: 09/20/2018								
Surrogate: MPFHxA	37.2		**104 %**	ng/L	*70-130*	09/26/18	09/28/18 01:39	*EPA 537/R3QA242/243*
Surrogate: MPFDA	29.7		**83 %**	ng/L	*70-130*	09/26/18	09/28/18 01:39	*EPA 537/R3QA242/243*

Site Name: BLADES GROUNDWATER **Project #: DAS R35442**

HPLC Identification

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID: 1809011-09								
Station ID: BDE-SW-09								
Sample Matrix: Surface Water								
Collected: 09/19/2018								
PFBS (perfluorobutanesulfonic acid)	U	UL	8.62	ng/L	1	09/26/18	09/28/18 02:05	EPA 537/R3QA242/243
PFHpA (perfluoroheptanoic acid)	U	UL	8.62	ng/L	1	09/26/18	09/28/18 02:05	EPA 537/R3QA242/243
PFHxS (perfluorohexanesulfonic acid)	U	UL	8.62	ng/L	1	09/26/18	09/28/18 02:05	EPA 537/R3QA242/243
PFNA (perfluorononanoic acid)	**14.8**	L	8.62	ng/L	1	09/26/18	09/28/18 02:05	EPA 537/R3QA242/243
PFOS (perfluorooctanesulfonic acid)	U	UL	8.62	ng/L	1	09/26/18	09/28/18 02:05	EPA 537/R3QA242/243
PFOA (perfluorooctanoic acid)	U	UL	8.62	ng/L	1	09/26/18	09/28/18 02:05	EPA 537/R3QA242/243

Surrogates

Analyte	Result	Flags/ Qualifiers	**%Recovery**	Units	%Recovery Limits	Prepared	Analyzed	Method/SOP#
Lab ID: 1809011-09								
Station ID: BDE-SW-09								
Sample Matrix: Surface Water								
Collected: 09/19/2018								
Surrogate: MPFHxA	2.15	A	**6 %**	ng/L	*70-130*	09/26/18	09/28/18 02:05	*EPA 537/R3QA242/243*
Surrogate: MPFDA	1.75	A	**5 %**	ng/L	*70-130*	09/26/18	09/28/18 02:05	*EPA 537/R3QA242/243*

Site Name: BLADES GROUNDWATER **Project #: DAS R35442**

HPLC Identification

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID: 1809011-10								
Station ID: BDE-SW-09-D								
Sample Matrix: Surface Water								
Collected: 09/19/2018								
PFBS (perfluorobutanesulfonic acid)	U		8.62	ng/L	1	09/26/18	09/28/18 02:30	EPA 537/R3QA242/243
PFHpA (perfluoroheptanoic acid)	U		8.62	ng/L	1	09/26/18	09/28/18 02:30	EPA 537/R3QA242/243
PFHxS (perfluorohexanesulfonic acid)	U		8.62	ng/L	1	09/26/18	09/28/18 02:30	EPA 537/R3QA242/243
PFNA (perfluorononanoic acid)	**16.6**		8.62	ng/L	1	09/26/18	09/28/18 02:30	EPA 537/R3QA242/243
PFOS (perfluorooctanesulfonic acid)	U		8.62	ng/L	1	09/26/18	09/28/18 02:30	EPA 537/R3QA242/243
PFOA (perfluorooctanoic acid)	**9.41**	B	8.62	ng/L	1	09/26/18	09/28/18 02:30	EPA 537/R3QA242/243

Surrogates

Analyte	Result	Flags/ Qualifiers	**%Recovery**	Units	%Recovery Limits	Prepared	Analyzed	Method/SOP#
Lab ID: 1809011-10								
Station ID: BDE-SW-09-D								
Sample Matrix: Surface Water								
Collected: 09/19/2018								
Surrogate: MPFHxA	37.3		**108 %**	ng/L	*70-130*	09/26/18	09/28/18 02:30	*EPA 537/R3QA242/243*
Surrogate: MPFDA	35.7		**103 %**	ng/L	*70-130*	09/26/18	09/28/18 02:30	*EPA 537/R3QA242/243*

Site Name: BLADES GROUNDWATER **Project #: DAS R35442**

HPLC Identification

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID: 1809011-11								
Station ID: BDE-FRB-01W								
Sample Matrix: Water								
Collected: 09/19/2018								
PFBS (perfluorobutanesulfonic acid)	U		10.0	ng/L	1	09/26/18	09/28/18 03:47	EPA 537/R3QA242/243
PFHpA (perfluoroheptanoic acid)	U		10.0	ng/L	1	09/26/18	09/28/18 03:47	EPA 537/R3QA242/243
PFHxS (perfluorohexanesulfonic acid)	U		10.0	ng/L	1	09/26/18	09/28/18 03:47	EPA 537/R3QA242/243
PFNA (perfluorononanoic acid)	U		10.0	ng/L	1	09/26/18	09/28/18 03:47	EPA 537/R3QA242/243
PFOS (perfluorooctanesulfonic acid)	U		10.0	ng/L	1	09/26/18	09/28/18 03:47	EPA 537/R3QA242/243
PFOA (perfluorooctanoic acid)	U		10.0	ng/L	1	09/26/18	09/28/18 03:47	EPA 537/R3QA242/243

Surrogates

Analyte	Result	Flags/ Qualifiers	**%Recovery**	Units	%Recovery Limits	Prepared	Analyzed	Method/SOP#
Lab ID: 1809011-11								
Station ID: BDE-FRB-01W								
Sample Matrix: Water								
Collected: 09/19/2018								
Surrogate: MPFHxA	45.7		**114 %**	ng/L	*70-130*	09/26/18	09/28/18 03:47	*EPA 537/R3QA242/243*
Surrogate: MPFDA	40.8		**102 %**	ng/L	*70-130*	09/26/18	09/28/18 03:47	*EPA 537/R3QA242/243*

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HPLC Identification

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID: 1809011-12								
Station ID: BDE-FRB-02W								
Sample Matrix: Water								
Collected: 09/20/2018								
PFBS (perfluorobutanesulfonic acid)	U		10.0	ng/L	1	09/26/18	09/28/18 04:13	EPA 537/R3QA242/243
PFHpA (perfluoroheptanoic acid)	U		10.0	ng/L	1	09/26/18	09/28/18 04:13	EPA 537/R3QA242/243
PFHxS (perfluorohexanesulfonic acid)	U		10.0	ng/L	1	09/26/18	09/28/18 04:13	EPA 537/R3QA242/243
PFNA (perfluorononanoic acid)	U		10.0	ng/L	1	09/26/18	09/28/18 04:13	EPA 537/R3QA242/243
PFOS (perfluorooctanesulfonic acid)	U		10.0	ng/L	1	09/26/18	09/28/18 04:13	EPA 537/R3QA242/243
PFOA (perfluorooctanoic acid)	U		10.0	ng/L	1	09/26/18	09/28/18 04:13	EPA 537/R3QA242/243

Surrogates

Analyte	Result	Flags/ Qualifiers	**%Recovery**	Units	%Recovery Limits	Prepared	Analyzed	Method/SOP#
Lab ID: 1809011-12								
Station ID: BDE-FRB-02W								
Sample Matrix: Water								
Collected: 09/20/2018								
Surrogate: MPFHxA	44.3		**111 %**	ng/L	*70-130*	09/26/18	09/28/18 04:13	*EPA 537/R3QA242/243*
Surrogate: MPFDA	41.6		**104 %**	ng/L	*70-130*	09/26/18	09/28/18 04:13	*EPA 537/R3QA242/243*

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Organochlorine Pesticides and PCBs

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID: 1809011-01								
Station ID: BDE-SW-01								
Sample Matrix: Surface Water								
Collected: 09/19/2018								
Aldrin	U		0.052	ug/L	1	09/24/18	10/05/18 23:04	R3QA237
alpha-BHC	U		0.052	ug/L	1	09/24/18	10/05/18 23:04	R3QA237
beta-BHC	U		0.052	ug/L	1	09/24/18	10/05/18 23:04	R3QA237
delta-BHC	U		0.052	ug/L	1	09/24/18	10/05/18 23:04	R3QA237
gamma-BHC (Lindane)	U		0.052	ug/L	1	09/24/18	10/05/18 23:04	R3QA237
alpha-Chlordane	U		0.052	ug/L	1	09/24/18	10/05/18 23:04	R3QA237
gamma-Chlordane	U		0.052	ug/L	1	09/24/18	10/05/18 23:04	R3QA237
4,4'-DDD	U		0.103	ug/L	1	09/24/18	10/05/18 23:04	R3QA237
4,4'-DDE	U		0.103	ug/L	1	09/24/18	10/05/18 23:04	R3QA237
4,4'-DDT	U		0.103	ug/L	1	09/24/18	10/05/18 23:04	R3QA237
Dieldrin	U		0.103	ug/L	1	09/24/18	10/05/18 23:04	R3QA237
Endosulfan I	U		0.052	ug/L	1	09/24/18	10/05/18 23:04	R3QA237
Endosulfan II	U		0.103	ug/L	1	09/24/18	10/05/18 23:04	R3QA237
Endosulfan sulfate	U		0.103	ug/L	1	09/24/18	10/05/18 23:04	R3QA237
Endrin	U		0.103	ug/L	1	09/24/18	10/05/18 23:04	R3QA237
Endrin aldehyde	U		0.103	ug/L	1	09/24/18	10/05/18 23:04	R3QA237
Endrin ketone	U		0.103	ug/L	1	09/24/18	10/05/18 23:04	R3QA237
Heptachlor	U		0.052	ug/L	1	09/24/18	10/05/18 23:04	R3QA237
Heptachlor epoxide	U		0.052	ug/L	1	09/24/18	10/05/18 23:04	R3QA237
Methoxychlor	U		0.515	ug/L	1	09/24/18	10/05/18 23:04	R3QA237
Toxaphene	U		5.15	ug/L	1	09/24/18	10/05/18 23:04	R3QA237

Surrogates

Analyte	Result	Flags/ Qualifiers	**%Recovery**	Units	%Recovery Limits	Prepared	Analyzed	Method/SOP#
Lab ID: 1809011-01								
Station ID: BDE-SW-01								
Sample Matrix: Surface Water								
Collected: 09/19/2018								
Surrogate: Tetrachloro-meta-xylene	0.693		**67 %**	ug/L	*30-150*	09/24/18	10/05/18 23:04	*R3QA237*
Surrogate: Decachlorobiphenyl	0.485		**47 %**	ug/L	*30-150*	09/24/18	10/05/18 23:04	*R3QA237*

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Organochlorine Pesticides and PCBs

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID: 1809011-02								
Station ID: BDE-SW-02								
Sample Matrix: Surface Water								
Collected: 09/19/2018								
Aldrin	U		0.053	ug/L	1	09/24/18	10/05/18 23:26	R3QA237
alpha-BHC	U		0.053	ug/L	1	09/24/18	10/05/18 23:26	R3QA237
beta-BHC	U		0.053	ug/L	1	09/24/18	10/05/18 23:26	R3QA237
delta-BHC	U		0.053	ug/L	1	09/24/18	10/05/18 23:26	R3QA237
gamma-BHC (Lindane)	U		0.053	ug/L	1	09/24/18	10/05/18 23:26	R3QA237
alpha-Chlordane	U		0.053	ug/L	1	09/24/18	10/05/18 23:26	R3QA237
gamma-Chlordane	U		0.053	ug/L	1	09/24/18	10/05/18 23:26	R3QA237
4,4'-DDD	U		0.105	ug/L	1	09/24/18	10/05/18 23:26	R3QA237
4,4'-DDE	U		0.105	ug/L	1	09/24/18	10/05/18 23:26	R3QA237
4,4'-DDT	U		0.105	ug/L	1	09/24/18	10/05/18 23:26	R3QA237
Dieldrin	U		0.105	ug/L	1	09/24/18	10/05/18 23:26	R3QA237
Endosulfan I	U		0.053	ug/L	1	09/24/18	10/05/18 23:26	R3QA237
Endosulfan II	U		0.105	ug/L	1	09/24/18	10/05/18 23:26	R3QA237
Endosulfan sulfate	U		0.105	ug/L	1	09/24/18	10/05/18 23:26	R3QA237
Endrin	U		0.105	ug/L	1	09/24/18	10/05/18 23:26	R3QA237
Endrin aldehyde	U		0.105	ug/L	1	09/24/18	10/05/18 23:26	R3QA237
Endrin ketone	U		0.105	ug/L	1	09/24/18	10/05/18 23:26	R3QA237
Heptachlor	U		0.053	ug/L	1	09/24/18	10/05/18 23:26	R3QA237
Heptachlor epoxide	U		0.053	ug/L	1	09/24/18	10/05/18 23:26	R3QA237
Methoxychlor	U		0.526	ug/L	1	09/24/18	10/05/18 23:26	R3QA237
Toxaphene	U		5.26	ug/L	1	09/24/18	10/05/18 23:26	R3QA237

Surrogates

Analyte	Result	Flags/ Qualifiers	**%Recovery**	Units	%Recovery Limits	Prepared	Analyzed	Method/SOP#
Lab ID: 1809011-02								
Station ID: BDE-SW-02								
Sample Matrix: Surface Water								
Collected: 09/19/2018								
Surrogate: Tetrachloro-meta-xylene	0.615		**58 %**	ug/L	*30-150*	09/24/18	10/05/18 23:26	*R3QA237*
Surrogate: Decachlorobiphenyl	0.591		**56 %**	ug/L	*30-150*	09/24/18	10/05/18 23:26	*R3QA237*

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Organochlorine Pesticides and PCBs

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID: 1809011-03								
Station ID: BDE-SW-03								
Sample Matrix: Surface Water								
Collected: 09/20/2018								
Aldrin	U		0.050	ug/L	1	09/24/18	10/05/18 23:48	R3QA237
alpha-BHC	U		0.050	ug/L	1	09/24/18	10/05/18 23:48	R3QA237
beta-BHC	U		0.050	ug/L	1	09/24/18	10/05/18 23:48	R3QA237
delta-BHC	U		0.050	ug/L	1	09/24/18	10/05/18 23:48	R3QA237
gamma-BHC (Lindane)	U		0.050	ug/L	1	09/24/18	10/05/18 23:48	R3QA237
alpha-Chlordane	U		0.050	ug/L	1	09/24/18	10/05/18 23:48	R3QA237
gamma-Chlordane	U		0.050	ug/L	1	09/24/18	10/05/18 23:48	R3QA237
4,4'-DDD	U		0.100	ug/L	1	09/24/18	10/05/18 23:48	R3QA237
4,4'-DDE	U		0.100	ug/L	1	09/24/18	10/05/18 23:48	R3QA237
4,4'-DDT	U		0.100	ug/L	1	09/24/18	10/05/18 23:48	R3QA237
Dieldrin	U		0.100	ug/L	1	09/24/18	10/05/18 23:48	R3QA237
Endosulfan I	U		0.050	ug/L	1	09/24/18	10/05/18 23:48	R3QA237
Endosulfan II	U		0.100	ug/L	1	09/24/18	10/05/18 23:48	R3QA237
Endosulfan sulfate	U		0.100	ug/L	1	09/24/18	10/05/18 23:48	R3QA237
Endrin	U		0.100	ug/L	1	09/24/18	10/05/18 23:48	R3QA237
Endrin aldehyde	U		0.100	ug/L	1	09/24/18	10/05/18 23:48	R3QA237
Endrin ketone	U		0.100	ug/L	1	09/24/18	10/05/18 23:48	R3QA237
Heptachlor	U		0.050	ug/L	1	09/24/18	10/05/18 23:48	R3QA237
Heptachlor epoxide	U		0.050	ug/L	1	09/24/18	10/05/18 23:48	R3QA237
Methoxychlor	U		0.500	ug/L	1	09/24/18	10/05/18 23:48	R3QA237
Toxaphene	U		5.00	ug/L	1	09/24/18	10/05/18 23:48	R3QA237

Surrogates

Analyte	Result	Flags/ Qualifiers	**%Recovery**	Units	%Recovery Limits	Prepared	Analyzed	Method/SOP#
Lab ID: 1809011-03								
Station ID: BDE-SW-03								
Sample Matrix: Surface Water								
Collected: 09/20/2018								
Surrogate: Tetrachloro-meta-xylene	0.685		**69 %**	ug/L	*30-150*	09/24/18	10/05/18 23:48	*R3QA237*
Surrogate: Decachlorobiphenyl	0.592		**59 %**	ug/L	*30-150*	09/24/18	10/05/18 23:48	*R3QA237*

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Organochlorine Pesticides and PCBs

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID: 1809011-04								
Station ID: BDE-SW-04								
Sample Matrix: Surface Water								
Collected: 09/19/2018								
Aldrin	U		0.052	ug/L	1	09/24/18	10/06/18 00:10	R3QA237
alpha-BHC	U		0.052	ug/L	1	09/24/18	10/06/18 00:10	R3QA237
beta-BHC	U		0.052	ug/L	1	09/24/18	10/06/18 00:10	R3QA237
delta-BHC	U		0.052	ug/L	1	09/24/18	10/06/18 00:10	R3QA237
gamma-BHC (Lindane)	U		0.052	ug/L	1	09/24/18	10/06/18 00:10	R3QA237
alpha-Chlordane	U		0.052	ug/L	1	09/24/18	10/06/18 00:10	R3QA237
gamma-Chlordane	U		0.052	ug/L	1	09/24/18	10/06/18 00:10	R3QA237
4,4'-DDD	U		0.103	ug/L	1	09/24/18	10/06/18 00:10	R3QA237
4,4'-DDE	U		0.103	ug/L	1	09/24/18	10/06/18 00:10	R3QA237
4,4'-DDT	U		0.103	ug/L	1	09/24/18	10/06/18 00:10	R3QA237
Dieldrin	U		0.103	ug/L	1	09/24/18	10/06/18 00:10	R3QA237
Endosulfan I	U		0.052	ug/L	1	09/24/18	10/06/18 00:10	R3QA237
Endosulfan II	U		0.103	ug/L	1	09/24/18	10/06/18 00:10	R3QA237
Endosulfan sulfate	U		0.103	ug/L	1	09/24/18	10/06/18 00:10	R3QA237
Endrin	U		0.103	ug/L	1	09/24/18	10/06/18 00:10	R3QA237
Endrin aldehyde	U		0.103	ug/L	1	09/24/18	10/06/18 00:10	R3QA237
Endrin ketone	U		0.103	ug/L	1	09/24/18	10/06/18 00:10	R3QA237
Heptachlor	U		0.052	ug/L	1	09/24/18	10/06/18 00:10	R3QA237
Heptachlor epoxide	U		0.052	ug/L	1	09/24/18	10/06/18 00:10	R3QA237
Methoxychlor	U		0.515	ug/L	1	09/24/18	10/06/18 00:10	R3QA237
Toxaphene	U		5.15	ug/L	1	09/24/18	10/06/18 00:10	R3QA237

Surrogates

Analyte	Result	Flags/ Qualifiers	**%Recovery**	Units	%Recovery Limits	Prepared	Analyzed	Method/SOP#
Lab ID: 1809011-04								
Station ID: BDE-SW-04								
Sample Matrix: Surface Water								
Collected: 09/19/2018								
Surrogate: Tetrachloro-meta-xylene	0.644		**62 %**	ug/L	*30-150*	09/24/18	10/06/18 00:10	*R3QA237*
Surrogate: Decachlorobiphenyl	0.565		**55 %**	ug/L	*30-150*	09/24/18	10/06/18 00:10	*R3QA237*

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Organochlorine Pesticides and PCBs

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID: 1809011-05								
Station ID: BDE-SW-05								
Sample Matrix: Surface Water								
Collected: 09/20/2018								
Aldrin	U		0.050	ug/L	1	09/24/18	10/06/18 00:32	R3QA237
alpha-BHC	U		0.050	ug/L	1	09/24/18	10/06/18 00:32	R3QA237
beta-BHC	U		0.050	ug/L	1	09/24/18	10/06/18 00:32	R3QA237
delta-BHC	U		0.050	ug/L	1	09/24/18	10/06/18 00:32	R3QA237
gamma-BHC (Lindane)	U		0.050	ug/L	1	09/24/18	10/06/18 00:32	R3QA237
alpha-Chlordane	U		0.050	ug/L	1	09/24/18	10/06/18 00:32	R3QA237
gamma-Chlordane	U		0.050	ug/L	1	09/24/18	10/06/18 00:32	R3QA237
4,4'-DDD	U		0.100	ug/L	1	09/24/18	10/06/18 00:32	R3QA237
4,4'-DDE	U		0.100	ug/L	1	09/24/18	10/06/18 00:32	R3QA237
4,4'-DDT	U		0.100	ug/L	1	09/24/18	10/06/18 00:32	R3QA237
Dieldrin	U		0.100	ug/L	1	09/24/18	10/06/18 00:32	R3QA237
Endosulfan I	U		0.050	ug/L	1	09/24/18	10/06/18 00:32	R3QA237
Endosulfan II	U		0.100	ug/L	1	09/24/18	10/06/18 00:32	R3QA237
Endosulfan sulfate	U		0.100	ug/L	1	09/24/18	10/06/18 00:32	R3QA237
Endrin	U		0.100	ug/L	1	09/24/18	10/06/18 00:32	R3QA237
Endrin aldehyde	U		0.100	ug/L	1	09/24/18	10/06/18 00:32	R3QA237
Endrin ketone	U		0.100	ug/L	1	09/24/18	10/06/18 00:32	R3QA237
Heptachlor	U		0.050	ug/L	1	09/24/18	10/06/18 00:32	R3QA237
Heptachlor epoxide	U		0.050	ug/L	1	09/24/18	10/06/18 00:32	R3QA237
Methoxychlor	U		0.500	ug/L	1	09/24/18	10/06/18 00:32	R3QA237
Toxaphene	U		5.00	ug/L	1	09/24/18	10/06/18 00:32	R3QA237

Surrogates

Analyte	Result	Flags/ Qualifiers	**%Recovery**	Units	%Recovery Limits	Prepared	Analyzed	Method/SOP#
Lab ID: 1809011-05								
Station ID: BDE-SW-05								
Sample Matrix: Surface Water								
Collected: 09/20/2018								
Surrogate: Tetrachloro-meta-xylene	0.503		**50 %**	ug/L	*30-150*	09/24/18	10/06/18 00:32	*R3QA237*
Surrogate: Decachlorobiphenyl	0.536		**54 %**	ug/L	*30-150*	09/24/18	10/06/18 00:32	*R3QA237*

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Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID: 1809011-06								
Station ID: BDE-SW-06								
Sample Matrix: Surface Water								
Collected: 09/20/2018								
Aldrin	U		0.048	ug/L	1	09/24/18	10/06/18 01:38	R3QA237
alpha-BHC	U		0.048	ug/L	1	09/24/18	10/06/18 01:38	R3QA237
beta-BHC	U		0.048	ug/L	1	09/24/18	10/06/18 01:38	R3QA237
delta-BHC	U		0.048	ug/L	1	09/24/18	10/06/18 01:38	R3QA237
gamma-BHC (Lindane)	U		0.048	ug/L	1	09/24/18	10/06/18 01:38	R3QA237
alpha-Chlordane	U		0.048	ug/L	1	09/24/18	10/06/18 01:38	R3QA237
gamma-Chlordane	U		0.048	ug/L	1	09/24/18	10/06/18 01:38	R3QA237
4,4'-DDD	U		0.095	ug/L	1	09/24/18	10/06/18 01:38	R3QA237
4,4'-DDE	U		0.095	ug/L	1	09/24/18	10/06/18 01:38	R3QA237
4,4'-DDT	U		0.095	ug/L	1	09/24/18	10/06/18 01:38	R3QA237
Dieldrin	U		0.095	ug/L	1	09/24/18	10/06/18 01:38	R3QA237
Endosulfan I	U		0.048	ug/L	1	09/24/18	10/06/18 01:38	R3QA237
Endosulfan II	U		0.095	ug/L	1	09/24/18	10/06/18 01:38	R3QA237
Endosulfan sulfate	U		0.095	ug/L	1	09/24/18	10/06/18 01:38	R3QA237
Endrin	U		0.095	ug/L	1	09/24/18	10/06/18 01:38	R3QA237
Endrin aldehyde	U		0.095	ug/L	1	09/24/18	10/06/18 01:38	R3QA237
Endrin ketone	U		0.095	ug/L	1	09/24/18	10/06/18 01:38	R3QA237
Heptachlor	U		0.048	ug/L	1	09/24/18	10/06/18 01:38	R3QA237
Heptachlor epoxide	U		0.048	ug/L	1	09/24/18	10/06/18 01:38	R3QA237
Methoxychlor	U		0.476	ug/L	1	09/24/18	10/06/18 01:38	R3QA237
Toxaphene	U		4.76	ug/L	1	09/24/18	10/06/18 01:38	R3QA237

Surrogates

Analyte	Result	Flags/ Qualifiers	**%Recovery**	Units	%Recovery Limits	Prepared	Analyzed	Method/SOP#
Lab ID: 1809011-06								
Station ID: BDE-SW-06								
Sample Matrix: Surface Water								
Collected: 09/20/2018								
Surrogate: Tetrachloro-meta-xylene	0.233	A	**24 %**	ug/L	*30-150*	09/24/18	10/06/18 01:38	*R3QA237*
Surrogate: Decachlorobiphenyl	0.464		**49 %**	ug/L	*30-150*	09/24/18	10/06/18 01:38	*R3QA237*

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Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID: 1809011-07								
Station ID: BDE-SW-07								
Sample Matrix: Surface Water								
Collected: 09/19/2018								
Aldrin	U		0.056	ug/L	1	09/24/18	10/06/18 02:00	R3QA237
alpha-BHC	U		0.056	ug/L	1	09/24/18	10/06/18 02:00	R3QA237
beta-BHC	U		0.056	ug/L	1	09/24/18	10/06/18 02:00	R3QA237
delta-BHC	U		0.056	ug/L	1	09/24/18	10/06/18 02:00	R3QA237
gamma-BHC (Lindane)	U		0.056	ug/L	1	09/24/18	10/06/18 02:00	R3QA237
alpha-Chlordane	U		0.056	ug/L	1	09/24/18	10/06/18 02:00	R3QA237
gamma-Chlordane	U		0.056	ug/L	1	09/24/18	10/06/18 02:00	R3QA237
4,4'-DDD	U		0.112	ug/L	1	09/24/18	10/06/18 02:00	R3QA237
4,4'-DDE	U		0.112	ug/L	1	09/24/18	10/06/18 02:00	R3QA237
4,4'-DDT	U		0.112	ug/L	1	09/24/18	10/06/18 02:00	R3QA237
Dieldrin	U		0.112	ug/L	1	09/24/18	10/06/18 02:00	R3QA237
Endosulfan I	U		0.056	ug/L	1	09/24/18	10/06/18 02:00	R3QA237
Endosulfan II	U		0.112	ug/L	1	09/24/18	10/06/18 02:00	R3QA237
Endosulfan sulfate	U		0.112	ug/L	1	09/24/18	10/06/18 02:00	R3QA237
Endrin	U		0.112	ug/L	1	09/24/18	10/06/18 02:00	R3QA237
Endrin aldehyde	U		0.112	ug/L	1	09/24/18	10/06/18 02:00	R3QA237
Endrin ketone	U		0.112	ug/L	1	09/24/18	10/06/18 02:00	R3QA237
Heptachlor	U		0.056	ug/L	1	09/24/18	10/06/18 02:00	R3QA237
Heptachlor epoxide	U		0.056	ug/L	1	09/24/18	10/06/18 02:00	R3QA237
Methoxychlor	U		0.562	ug/L	1	09/24/18	10/06/18 02:00	R3QA237
Toxaphene	U		5.62	ug/L	1	09/24/18	10/06/18 02:00	R3QA237

Surrogates

Analyte	Result	Flags/ Qualifiers	**%Recovery**	Units	%Recovery Limits	Prepared	Analyzed	Method/SOP#
Lab ID: 1809011-07								
Station ID: BDE-SW-07								
Sample Matrix: Surface Water								
Collected: 09/19/2018								
Surrogate: Tetrachloro-meta-xylene	0.693		**62 %**	ug/L	*30-150*	09/24/18	10/06/18 02:00	*R3QA237*
Surrogate: Decachlorobiphenyl	0.747		**66 %**	ug/L	*30-150*	09/24/18	10/06/18 02:00	*R3QA237*

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Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID: 1809011-08								
Station ID: BDE-SW-08								
Sample Matrix: Surface Water								
Collected: 09/20/2018								
Aldrin	U		0.048	ug/L	1	09/24/18	10/06/18 02:22	R3QA237
alpha-BHC	U		0.048	ug/L	1	09/24/18	10/06/18 02:22	R3QA237
beta-BHC	U		0.048	ug/L	1	09/24/18	10/06/18 02:22	R3QA237
delta-BHC	U		0.048	ug/L	1	09/24/18	10/06/18 02:22	R3QA237
gamma-BHC (Lindane)	U		0.048	ug/L	1	09/24/18	10/06/18 02:22	R3QA237
alpha-Chlordane	U		0.048	ug/L	1	09/24/18	10/06/18 02:22	R3QA237
gamma-Chlordane	U		0.048	ug/L	1	09/24/18	10/06/18 02:22	R3QA237
4,4'-DDD	U		0.095	ug/L	1	09/24/18	10/06/18 02:22	R3QA237
4,4'-DDE	U		0.095	ug/L	1	09/24/18	10/06/18 02:22	R3QA237
4,4'-DDT	U		0.095	ug/L	1	09/24/18	10/06/18 02:22	R3QA237
Dieldrin	U		0.095	ug/L	1	09/24/18	10/06/18 02:22	R3QA237
Endosulfan I	U		0.048	ug/L	1	09/24/18	10/06/18 02:22	R3QA237
Endosulfan II	U		0.095	ug/L	1	09/24/18	10/06/18 02:22	R3QA237
Endosulfan sulfate	U		0.095	ug/L	1	09/24/18	10/06/18 02:22	R3QA237
Endrin	U		0.095	ug/L	1	09/24/18	10/06/18 02:22	R3QA237
Endrin aldehyde	U		0.095	ug/L	1	09/24/18	10/06/18 02:22	R3QA237
Endrin ketone	U		0.095	ug/L	1	09/24/18	10/06/18 02:22	R3QA237
Heptachlor	U		0.048	ug/L	1	09/24/18	10/06/18 02:22	R3QA237
Heptachlor epoxide	U		0.048	ug/L	1	09/24/18	10/06/18 02:22	R3QA237
Methoxychlor	U		0.476	ug/L	1	09/24/18	10/06/18 02:22	R3QA237
Toxaphene	U		4.76	ug/L	1	09/24/18	10/06/18 02:22	R3QA237

Surrogates

Analyte	Result	Flags/ Qualifiers	**%Recovery**	Units	%Recovery Limits	Prepared	Analyzed	Method/SOP#
Lab ID: 1809011-08								
Station ID: BDE-SW-08								
Sample Matrix: Surface Water								
Collected: 09/20/2018								
Surrogate: Tetrachloro-meta-xylene	0.493		**52 %**	ug/L	*30-150*	09/24/18	10/06/18 02:22	*R3QA237*
Surrogate: Decachlorobiphenyl	0.475		**50 %**	ug/L	*30-150*	09/24/18	10/06/18 02:22	*R3QA237*

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Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID: 1809011-09								
Station ID: BDE-SW-09								
Sample Matrix: Surface Water								
Collected: 09/19/2018								
Aldrin	U		0.052	ug/L	1	09/24/18	10/06/18 02:44	R3QA237
alpha-BHC	U		0.052	ug/L	1	09/24/18	10/06/18 02:44	R3QA237
beta-BHC	U		0.052	ug/L	1	09/24/18	10/06/18 02:44	R3QA237
delta-BHC	U		0.052	ug/L	1	09/24/18	10/06/18 02:44	R3QA237
gamma-BHC (Lindane)	U		0.052	ug/L	1	09/24/18	10/06/18 02:44	R3QA237
alpha-Chlordane	U		0.052	ug/L	1	09/24/18	10/06/18 02:44	R3QA237
gamma-Chlordane	U		0.052	ug/L	1	09/24/18	10/06/18 02:44	R3QA237
4,4'-DDD	U		0.103	ug/L	1	09/24/18	10/06/18 02:44	R3QA237
4,4'-DDE	U		0.103	ug/L	1	09/24/18	10/06/18 02:44	R3QA237
4,4'-DDT	U		0.103	ug/L	1	09/24/18	10/06/18 02:44	R3QA237
Dieldrin	U		0.103	ug/L	1	09/24/18	10/06/18 02:44	R3QA237
Endosulfan I	U		0.052	ug/L	1	09/24/18	10/06/18 02:44	R3QA237
Endosulfan II	U		0.103	ug/L	1	09/24/18	10/06/18 02:44	R3QA237
Endosulfan sulfate	U		0.103	ug/L	1	09/24/18	10/06/18 02:44	R3QA237
Endrin	U		0.103	ug/L	1	09/24/18	10/06/18 02:44	R3QA237
Endrin aldehyde	U		0.103	ug/L	1	09/24/18	10/06/18 02:44	R3QA237
Endrin ketone	U		0.103	ug/L	1	09/24/18	10/06/18 02:44	R3QA237
Heptachlor	U		0.052	ug/L	1	09/24/18	10/06/18 02:44	R3QA237
Heptachlor epoxide	U		0.052	ug/L	1	09/24/18	10/06/18 02:44	R3QA237
Methoxychlor	U		0.515	ug/L	1	09/24/18	10/06/18 02:44	R3QA237
Toxaphene	U		5.15	ug/L	1	09/24/18	10/06/18 02:44	R3QA237

Surrogates

Analyte	Result	Flags/ Qualifiers	**%Recovery**	Units	%Recovery Limits	Prepared	Analyzed	Method/SOP#
Lab ID: 1809011-09								
Station ID: BDE-SW-09								
Sample Matrix: Surface Water								
Collected: 09/19/2018								
Surrogate: Tetrachloro-meta-xylene	0.743		**72 %**	ug/L	*30-150*	09/24/18	10/06/18 02:44	*R3QA237*
Surrogate: Decachlorobiphenyl	0.646		**63 %**	ug/L	*30-150*	09/24/18	10/06/18 02:44	*R3QA237*

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Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID: 1809011-10								
Station ID: BDE-SW-09-D								
Sample Matrix: Surface Water								
Collected: 09/19/2018								
Aldrin	U		0.052	ug/L	1	09/24/18	10/06/18 03:06	R3QA237
alpha-BHC	U		0.052	ug/L	1	09/24/18	10/06/18 03:06	R3QA237
beta-BHC	U		0.052	ug/L	1	09/24/18	10/06/18 03:06	R3QA237
delta-BHC	U		0.052	ug/L	1	09/24/18	10/06/18 03:06	R3QA237
gamma-BHC (Lindane)	U		0.052	ug/L	1	09/24/18	10/06/18 03:06	R3QA237
alpha-Chlordane	U		0.052	ug/L	1	09/24/18	10/06/18 03:06	R3QA237
gamma-Chlordane	U		0.052	ug/L	1	09/24/18	10/06/18 03:06	R3QA237
4,4'-DDD	U		0.103	ug/L	1	09/24/18	10/06/18 03:06	R3QA237
4,4'-DDE	U		0.103	ug/L	1	09/24/18	10/06/18 03:06	R3QA237
4,4'-DDT	U		0.103	ug/L	1	09/24/18	10/06/18 03:06	R3QA237
Dieldrin	U		0.103	ug/L	1	09/24/18	10/06/18 03:06	R3QA237
Endosulfan I	U		0.052	ug/L	1	09/24/18	10/06/18 03:06	R3QA237
Endosulfan II	U		0.103	ug/L	1	09/24/18	10/06/18 03:06	R3QA237
Endosulfan sulfate	U		0.103	ug/L	1	09/24/18	10/06/18 03:06	R3QA237
Endrin	U		0.103	ug/L	1	09/24/18	10/06/18 03:06	R3QA237
Endrin aldehyde	U		0.103	ug/L	1	09/24/18	10/06/18 03:06	R3QA237
Endrin ketone	U		0.103	ug/L	1	09/24/18	10/06/18 03:06	R3QA237
Heptachlor	U		0.052	ug/L	1	09/24/18	10/06/18 03:06	R3QA237
Heptachlor epoxide	U		0.052	ug/L	1	09/24/18	10/06/18 03:06	R3QA237
Methoxychlor	U		0.515	ug/L	1	09/24/18	10/06/18 03:06	R3QA237
Toxaphene	U		5.15	ug/L	1	09/24/18	10/06/18 03:06	R3QA237

Surrogates

Analyte	Result	Flags/ Qualifiers	**%Recovery**	Units	%Recovery Limits	Prepared	Analyzed	Method/SOP#
Lab ID: 1809011-10								
Station ID: BDE-SW-09-D								
Sample Matrix: Surface Water								
Collected: 09/19/2018								
Surrogate: Tetrachloro-meta-xylene	0.762		**74 %**	ug/L	*30-150*	09/24/18	10/06/18 03:06	*R3QA237*
Surrogate: Decachlorobiphenyl	0.531		**51 %**	ug/L	*30-150*	09/24/18	10/06/18 03:06	*R3QA237*

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Fort Meade, Maryland 20755-5350

Site Name: **BLADES GROUNDWATER** **Project #:** **DAS R35442**

Organochlorine Pesticides and PCBs

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID: 1809011-13								
Station ID: BDE-SD-01								
Sample Matrix: Sediment								
Collected: 09/19/2018								
Aldrin	U	UL	0.00271	mg/kg dry	1	09/24/18	10/06/18 06:02	R3QA237
alpha-BHC	U		0.00271	mg/kg dry	1	09/24/18	10/06/18 06:02	R3QA237
gamma-BHC (Lindane)	U		0.00271	mg/kg dry	1	09/24/18	10/06/18 06:02	R3QA237
delta-BHC	U		0.00271	mg/kg dry	1	09/24/18	10/06/18 06:02	R3QA237
beta-BHC	U		0.00271	mg/kg dry	1	09/24/18	10/06/18 06:02	R3QA237
alpha-Chlordane	U		0.00271	mg/kg dry	1	09/24/18	10/06/18 06:02	R3QA237
gamma-Chlordane	U		0.00271	mg/kg dry	1	09/24/18	10/06/18 06:02	R3QA237
4,4'-DDD	U		0.00542	mg/kg dry	1	09/24/18	10/06/18 06:02	R3QA237
4,4'-DDE	U	UL	0.00542	mg/kg dry	1	09/24/18	10/06/18 06:02	R3QA237
4,4'-DDT	U		0.00542	mg/kg dry	1	09/24/18	10/06/18 06:02	R3QA237
Dieldrin	U		0.00542	mg/kg dry	1	09/24/18	10/06/18 06:02	R3QA237
Endosulfan I	U		0.00271	mg/kg dry	1	09/24/18	10/06/18 06:02	R3QA237
Endosulfan II	U		0.00542	mg/kg dry	1	09/24/18	10/06/18 06:02	R3QA237
Endosulfan sulfate	U		0.00542	mg/kg dry	1	09/24/18	10/06/18 06:02	R3QA237
Endrin	U		0.00542	mg/kg dry	1	09/24/18	10/06/18 06:02	R3QA237
Endrin aldehyde	U		0.00542	mg/kg dry	1	09/24/18	10/06/18 06:02	R3QA237
Endrin ketone	U		0.00542	mg/kg dry	1	09/24/18	10/06/18 06:02	R3QA237
Heptachlor	U		0.00271	mg/kg dry	1	09/24/18	10/06/18 06:02	R3QA237
Heptachlor epoxide	U		0.00271	mg/kg dry	1	09/24/18	10/06/18 06:02	R3QA237
Methoxychlor	U		0.0271	mg/kg dry	1	09/24/18	10/06/18 06:02	R3QA237
Toxaphene	U		0.271	mg/kg dry	1	09/24/18	10/06/18 06:02	R3QA237

Surrogates

Analyte	Result	Flags/ Qualifiers	**%Recovery**	Units	%Recovery Limits	Prepared	Analyzed	Method/SOP#
Lab ID: 1809011-13								
Station ID: BDE-SD-01								
Sample Matrix: Sediment								
Collected: 09/19/2018								
Surrogate: Tetrachloro-meta-xylene	0.0362		**67 %**	mg/kg dry	*30-150*	09/24/18	10/06/18 06:02	*R3QA237*
Surrogate: Decachlorobiphenyl	0.0460		**85 %**	mg/kg dry	*30-150*	09/24/18	10/06/18 06:02	*R3QA237*

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
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Organochlorine Pesticides and PCBs

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID: 1809011-14								
Station ID: BDE-SD-02								
Sample Matrix: Sediment								
Collected: 09/19/2018								
Aldrin	U	UL	0.0127	mg/kg dry	1	09/24/18	10/06/18 07:07	R3QA237
alpha-BHC	U		0.0127	mg/kg dry	1	09/24/18	10/06/18 07:07	R3QA237
gamma-BHC (Lindane)	U		0.0127	mg/kg dry	1	09/24/18	10/06/18 07:07	R3QA237
delta-BHC	U		0.0127	mg/kg dry	1	09/24/18	10/06/18 07:07	R3QA237
beta-BHC	U		0.0127	mg/kg dry	1	09/24/18	10/06/18 07:07	R3QA237
alpha-Chlordane	U		0.0127	mg/kg dry	1	09/24/18	10/06/18 07:07	R3QA237
gamma-Chlordane	U		0.0127	mg/kg dry	1	09/24/18	10/06/18 07:07	R3QA237
4,4'-DDD	U		0.0254	mg/kg dry	1	09/24/18	10/06/18 07:07	R3QA237
4,4'-DDE	U	UL	0.0254	mg/kg dry	1	09/24/18	10/06/18 07:07	R3QA237
4,4'-DDT	U		0.0254	mg/kg dry	1	09/24/18	10/06/18 07:07	R3QA237
Dieldrin	U		0.0254	mg/kg dry	1	09/24/18	10/06/18 07:07	R3QA237
Endosulfan I	U		0.0127	mg/kg dry	1	09/24/18	10/06/18 07:07	R3QA237
Endosulfan II	U		0.0254	mg/kg dry	1	09/24/18	10/06/18 07:07	R3QA237
Endosulfan sulfate	U		0.0254	mg/kg dry	1	09/24/18	10/06/18 07:07	R3QA237
Endrin	U		0.0254	mg/kg dry	1	09/24/18	10/06/18 07:07	R3QA237
Endrin aldehyde	U		0.0254	mg/kg dry	1	09/24/18	10/06/18 07:07	R3QA237
Endrin ketone	U		0.0254	mg/kg dry	1	09/24/18	10/06/18 07:07	R3QA237
Heptachlor	U		0.0127	mg/kg dry	1	09/24/18	10/06/18 07:07	R3QA237
Heptachlor epoxide	U		0.0127	mg/kg dry	1	09/24/18	10/06/18 07:07	R3QA237
Methoxychlor	U		0.127	mg/kg dry	1	09/24/18	10/06/18 07:07	R3QA237
Toxaphene	U		1.27	mg/kg dry	1	09/24/18	10/06/18 07:07	R3QA237

Surrogates

Analyte	Result	Flags/ Qualifiers	**%Recovery**	Units	%Recovery Limits	Prepared	Analyzed	Method/SOP#
Lab ID: 1809011-14								
Station ID: BDE-SD-02								
Sample Matrix: Sediment								
Collected: 09/19/2018								
Surrogate: Tetrachloro-meta-xylene	0.163		**64 %**	mg/kg dry	*30-150*	09/24/18	10/06/18 07:07	*R3QA237*
Surrogate: Decachlorobiphenyl	0.125		**49 %**	mg/kg dry	*30-150*	09/24/18	10/06/18 07:07	*R3QA237*

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Organochlorine Pesticides and PCBs

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID: 1809011-15								
Station ID: BDE-SD-03								
Sample Matrix: Sediment								
Collected: 09/20/2018								
Aldrin	U	UL	0.00201	mg/kg dry	1	09/24/18	10/06/18 07:29	R3QA237
alpha-BHC	U		0.00201	mg/kg dry	1	09/24/18	10/06/18 07:29	R3QA237
gamma-BHC (Lindane)	U		0.00201	mg/kg dry	1	09/24/18	10/06/18 07:29	R3QA237
delta-BHC	U		0.00201	mg/kg dry	1	09/24/18	10/06/18 07:29	R3QA237
beta-BHC	U		0.00201	mg/kg dry	1	09/24/18	10/06/18 07:29	R3QA237
alpha-Chlordane	U		0.00201	mg/kg dry	1	09/24/18	10/06/18 07:29	R3QA237
gamma-Chlordane	U		0.00201	mg/kg dry	1	09/24/18	10/06/18 07:29	R3QA237
4,4'-DDD	U		0.00403	mg/kg dry	1	09/24/18	10/06/18 07:29	R3QA237
4,4'-DDE	U	UL	0.00403	mg/kg dry	1	09/24/18	10/06/18 07:29	R3QA237
4,4'-DDT	U		0.00403	mg/kg dry	1	09/24/18	10/06/18 07:29	R3QA237
Dieldrin	U		0.00403	mg/kg dry	1	09/24/18	10/06/18 07:29	R3QA237
Endosulfan I	U		0.00201	mg/kg dry	1	09/24/18	10/06/18 07:29	R3QA237
Endosulfan II	U		0.00403	mg/kg dry	1	09/24/18	10/06/18 07:29	R3QA237
Endosulfan sulfate	U		0.00403	mg/kg dry	1	09/24/18	10/06/18 07:29	R3QA237
Endrin	U		0.00403	mg/kg dry	1	09/24/18	10/06/18 07:29	R3QA237
Endrin aldehyde	U		0.00403	mg/kg dry	1	09/24/18	10/06/18 07:29	R3QA237
Endrin ketone	U		0.00403	mg/kg dry	1	09/24/18	10/06/18 07:29	R3QA237
Heptachlor	U		0.00201	mg/kg dry	1	09/24/18	10/06/18 07:29	R3QA237
Heptachlor epoxide	U		0.00201	mg/kg dry	1	09/24/18	10/06/18 07:29	R3QA237
Methoxychlor	U		0.0201	mg/kg dry	1	09/24/18	10/06/18 07:29	R3QA237
Toxaphene	U		0.201	mg/kg dry	1	09/24/18	10/06/18 07:29	R3QA237

Surrogates

Analyte	Result	Flags/ Qualifiers	**%Recovery**	Units	%Recovery Limits	Prepared	Analyzed	Method/SOP#
Lab ID: 1809011-15								
Station ID: BDE-SD-03								
Sample Matrix: Sediment								
Collected: 09/20/2018								
Surrogate: Tetrachloro-meta-xylene	0.0274		**68 %**	mg/kg dry	*30-150*	09/24/18	10/06/18 07:29	*R3QA237*
Surrogate: Decachlorobiphenyl	0.0392		**97 %**	mg/kg dry	*30-150*	09/24/18	10/06/18 07:29	*R3QA237*

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Organochlorine Pesticides and PCBs

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID: 1809011-16								
Station ID: BDE-SD-04								
Sample Matrix: Sediment								
Collected: 09/19/2018								
Aldrin	U	UL	0.00190	mg/kg dry	1	09/24/18	10/06/18 07:51	R3QA237
alpha-BHC	U		0.00190	mg/kg dry	1	09/24/18	10/06/18 07:51	R3QA237
gamma-BHC (Lindane)	U		0.00190	mg/kg dry	1	09/24/18	10/06/18 07:51	R3QA237
delta-BHC	U		0.00190	mg/kg dry	1	09/24/18	10/06/18 07:51	R3QA237
beta-BHC	U		0.00190	mg/kg dry	1	09/24/18	10/06/18 07:51	R3QA237
alpha-Chlordane	U		0.00190	mg/kg dry	1	09/24/18	10/06/18 07:51	R3QA237
gamma-Chlordane	U		0.00190	mg/kg dry	1	09/24/18	10/06/18 07:51	R3QA237
4,4'-DDD	U		0.00380	mg/kg dry	1	09/24/18	10/06/18 07:51	R3QA237
4,4'-DDE	U	UL	0.00380	mg/kg dry	1	09/24/18	10/06/18 07:51	R3QA237
4,4'-DDT	U		0.00380	mg/kg dry	1	09/24/18	10/06/18 07:51	R3QA237
Dieldrin	U		0.00380	mg/kg dry	1	09/24/18	10/06/18 07:51	R3QA237
Endosulfan I	U		0.00190	mg/kg dry	1	09/24/18	10/06/18 07:51	R3QA237
Endosulfan II	U		0.00380	mg/kg dry	1	09/24/18	10/06/18 07:51	R3QA237
Endosulfan sulfate	U		0.00380	mg/kg dry	1	09/24/18	10/06/18 07:51	R3QA237
Endrin	U		0.00380	mg/kg dry	1	09/24/18	10/06/18 07:51	R3QA237
Endrin aldehyde	U		0.00380	mg/kg dry	1	09/24/18	10/06/18 07:51	R3QA237
Endrin ketone	U		0.00380	mg/kg dry	1	09/24/18	10/06/18 07:51	R3QA237
Heptachlor	U		0.00190	mg/kg dry	1	09/24/18	10/06/18 07:51	R3QA237
Heptachlor epoxide	U		0.00190	mg/kg dry	1	09/24/18	10/06/18 07:51	R3QA237
Methoxychlor	U		0.0190	mg/kg dry	1	09/24/18	10/06/18 07:51	R3QA237
Toxaphene	U		0.190	mg/kg dry	1	09/24/18	10/06/18 07:51	R3QA237

Surrogates

Analyte	Result	Flags/ Qualifiers	**%Recovery**	Units	%Recovery Limits	Prepared	Analyzed	Method/SOP#
Lab ID: 1809011-16								
Station ID: BDE-SD-04								
Sample Matrix: Sediment								
Collected: 09/19/2018								
Surrogate: Tetrachloro-meta-xylene	0.0233		**61 %**	mg/kg dry	*30-150*	09/24/18	10/06/18 07:51	*R3QA237*
Surrogate: Decachlorobiphenyl	0.0376		**99 %**	mg/kg dry	*30-150*	09/24/18	10/06/18 07:51	*R3QA237*

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Organochlorine Pesticides and PCBs

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID: 1809011-17								
Station ID: BDE-SD-05								
Sample Matrix: Sediment								
Collected: 09/20/2018								
Aldrin	U	UL	0.0145	mg/kg dry	1	09/24/18	10/06/18 08:13	R3QA237
alpha-BHC	U		0.0145	mg/kg dry	1	09/24/18	10/06/18 08:13	R3QA237
gamma-BHC (Lindane)	U		0.0145	mg/kg dry	1	09/24/18	10/06/18 08:13	R3QA237
delta-BHC	U		0.0145	mg/kg dry	1	09/24/18	10/06/18 08:13	R3QA237
beta-BHC	U		0.0145	mg/kg dry	1	09/24/18	10/06/18 08:13	R3QA237
alpha-Chlordane	U		0.0145	mg/kg dry	1	09/24/18	10/06/18 08:13	R3QA237
gamma-Chlordane	U		0.0145	mg/kg dry	1	09/24/18	10/06/18 08:13	R3QA237
4,4'-DDD	U		0.0290	mg/kg dry	1	09/24/18	10/06/18 08:13	R3QA237
4,4'-DDE	U	UL	0.0290	mg/kg dry	1	09/24/18	10/06/18 08:13	R3QA237
4,4'-DDT	U		0.0290	mg/kg dry	1	09/24/18	10/06/18 08:13	R3QA237
Dieldrin	U		0.0290	mg/kg dry	1	09/24/18	10/06/18 08:13	R3QA237
Endosulfan I	U		0.0145	mg/kg dry	1	09/24/18	10/06/18 08:13	R3QA237
Endosulfan II	U		0.0290	mg/kg dry	1	09/24/18	10/06/18 08:13	R3QA237
Endosulfan sulfate	U		0.0290	mg/kg dry	1	09/24/18	10/06/18 08:13	R3QA237
Endrin	U		0.0290	mg/kg dry	1	09/24/18	10/06/18 08:13	R3QA237
Endrin aldehyde	U		0.0290	mg/kg dry	1	09/24/18	10/06/18 08:13	R3QA237
Endrin ketone	U		0.0290	mg/kg dry	1	09/24/18	10/06/18 08:13	R3QA237
Heptachlor	U		0.0145	mg/kg dry	1	09/24/18	10/06/18 08:13	R3QA237
Heptachlor epoxide	U		0.0145	mg/kg dry	1	09/24/18	10/06/18 08:13	R3QA237
Methoxychlor	U		0.145	mg/kg dry	1	09/24/18	10/06/18 08:13	R3QA237
Toxaphene	U		1.45	mg/kg dry	1	09/24/18	10/06/18 08:13	R3QA237

Surrogates

Analyte	Result	Flags/ Qualifiers	**%Recovery**	Units	%Recovery Limits	Prepared	Analyzed	Method/SOP#
Lab ID: 1809011-17								
Station ID: BDE-SD-05								
Sample Matrix: Sediment								
Collected: 09/20/2018								
Surrogate: Tetrachloro-meta-xylene	0.190		**65 %**	mg/kg dry	*30-150*	09/24/18	10/06/18 08:13	*R3QA237*
Surrogate: Decachlorobiphenyl	0.132		**46 %**	mg/kg dry	*30-150*	09/24/18	10/06/18 08:13	*R3QA237*

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Organochlorine Pesticides and PCBs

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID: 1809011-18								
Station ID: BDE-SD-06								
Sample Matrix: Sediment								
Collected: 09/20/2018								
Aldrin	U	UL	0.0133	mg/kg dry	1	09/24/18	10/06/18 08:35	R3QA237
alpha-BHC	U		0.0133	mg/kg dry	1	09/24/18	10/06/18 08:35	R3QA237
gamma-BHC (Lindane)	U		0.0133	mg/kg dry	1	09/24/18	10/06/18 08:35	R3QA237
delta-BHC	U		0.0133	mg/kg dry	1	09/24/18	10/06/18 08:35	R3QA237
beta-BHC	U		0.0133	mg/kg dry	1	09/24/18	10/06/18 08:35	R3QA237
alpha-Chlordane	U		0.0133	mg/kg dry	1	09/24/18	10/06/18 08:35	R3QA237
gamma-Chlordane	U		0.0133	mg/kg dry	1	09/24/18	10/06/18 08:35	R3QA237
4,4'-DDD	U		0.0267	mg/kg dry	1	09/24/18	10/06/18 08:35	R3QA237
4,4'-DDE	U	UL	0.0267	mg/kg dry	1	09/24/18	10/06/18 08:35	R3QA237
4,4'-DDT	U		0.0267	mg/kg dry	1	09/24/18	10/06/18 08:35	R3QA237
Dieldrin	U		0.0267	mg/kg dry	1	09/24/18	10/06/18 08:35	R3QA237
Endosulfan I	U		0.0133	mg/kg dry	1	09/24/18	10/06/18 08:35	R3QA237
Endosulfan II	U		0.0267	mg/kg dry	1	09/24/18	10/06/18 08:35	R3QA237
Endosulfan sulfate	U		0.0267	mg/kg dry	1	09/24/18	10/06/18 08:35	R3QA237
Endrin	U		0.0267	mg/kg dry	1	09/24/18	10/06/18 08:35	R3QA237
Endrin aldehyde	U		0.0267	mg/kg dry	1	09/24/18	10/06/18 08:35	R3QA237
Endrin ketone	U		0.0267	mg/kg dry	1	09/24/18	10/06/18 08:35	R3QA237
Heptachlor	U		0.0133	mg/kg dry	1	09/24/18	10/06/18 08:35	R3QA237
Heptachlor epoxide	U		0.0133	mg/kg dry	1	09/24/18	10/06/18 08:35	R3QA237
Methoxychlor	U		0.133	mg/kg dry	1	09/24/18	10/06/18 08:35	R3QA237
Toxaphene	U		1.33	mg/kg dry	1	09/24/18	10/06/18 08:35	R3QA237

Surrogates

Analyte	Result	Flags/ Qualifiers	**%Recovery**	Units	%Recovery Limits	Prepared	Analyzed	Method/SOP#
Lab ID: 1809011-18								
Station ID: BDE-SD-06								
Sample Matrix: Sediment								
Collected: 09/20/2018								
Surrogate: Tetrachloro-meta-xylene	0.168		**63 %**	mg/kg dry	*30-150*	09/24/18	10/06/18 08:35	*R3QA237*
Surrogate: Decachlorobiphenyl	0.185		**69 %**	mg/kg dry	*30-150*	09/24/18	10/06/18 08:35	*R3QA237*

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Organochlorine Pesticides and PCBs

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID: 1809011-19								
Station ID: BDE-SD-07								
Sample Matrix: Sediment								
Collected: 09/19/2018								
Aldrin	U	UL	0.00206	mg/kg dry	1	09/24/18	10/06/18 08:57	R3QA237
alpha-BHC	U		0.00206	mg/kg dry	1	09/24/18	10/06/18 08:57	R3QA237
gamma-BHC (Lindane)	U		0.00206	mg/kg dry	1	09/24/18	10/06/18 08:57	R3QA237
delta-BHC	U		0.00206	mg/kg dry	1	09/24/18	10/06/18 08:57	R3QA237
beta-BHC	U		0.00206	mg/kg dry	1	09/24/18	10/06/18 08:57	R3QA237
alpha-Chlordane	U		0.00206	mg/kg dry	1	09/24/18	10/06/18 08:57	R3QA237
gamma-Chlordane	U		0.00206	mg/kg dry	1	09/24/18	10/06/18 08:57	R3QA237
4,4'-DDD	U		0.00412	mg/kg dry	1	09/24/18	10/06/18 08:57	R3QA237
4,4'-DDE	U	UL	0.00412	mg/kg dry	1	09/24/18	10/06/18 08:57	R3QA237
4,4'-DDT	U		0.00412	mg/kg dry	1	09/24/18	10/06/18 08:57	R3QA237
Dieldrin	U		0.00412	mg/kg dry	1	09/24/18	10/06/18 08:57	R3QA237
Endosulfan I	U		0.00206	mg/kg dry	1	09/24/18	10/06/18 08:57	R3QA237
Endosulfan II	U		0.00412	mg/kg dry	1	09/24/18	10/06/18 08:57	R3QA237
Endosulfan sulfate	U		0.00412	mg/kg dry	1	09/24/18	10/06/18 08:57	R3QA237
Endrin	U		0.00412	mg/kg dry	1	09/24/18	10/06/18 08:57	R3QA237
Endrin aldehyde	U		0.00412	mg/kg dry	1	09/24/18	10/06/18 08:57	R3QA237
Endrin ketone	U		0.00412	mg/kg dry	1	09/24/18	10/06/18 08:57	R3QA237
Heptachlor	U		0.00206	mg/kg dry	1	09/24/18	10/06/18 08:57	R3QA237
Heptachlor epoxide	U		0.00206	mg/kg dry	1	09/24/18	10/06/18 08:57	R3QA237
Methoxychlor	U		0.0206	mg/kg dry	1	09/24/18	10/06/18 08:57	R3QA237
Toxaphene	U		0.206	mg/kg dry	1	09/24/18	10/06/18 08:57	R3QA237

Surrogates

Analyte	Result	Flags/ Qualifiers	**%Recovery**	Units	%Recovery Limits	Prepared	Analyzed	Method/SOP#
Lab ID: 1809011-19								
Station ID: BDE-SD-07								
Sample Matrix: Sediment								
Collected: 09/19/2018								
Surrogate: Tetrachloro-meta-xylene	0.0247		**60 %**	mg/kg dry	*30-150*	09/24/18	10/06/18 08:57	*R3QA237*
Surrogate: Decachlorobiphenyl	0.0377		**91 %**	mg/kg dry	*30-150*	09/24/18	10/06/18 08:57	*R3QA237*

Site Name: BLADES GROUNDWATER **Project #: DAS R35442**

Organochlorine Pesticides and PCBs

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID: 1809011-20								
Station ID: BDE-SD-08								
Sample Matrix: Sediment								
Collected: 09/20/2018								
Aldrin	U	UL	0.00358	mg/kg dry	1	09/24/18	10/06/18 09:19	R3QA237
alpha-BHC	U		0.00358	mg/kg dry	1	09/24/18	10/06/18 09:19	R3QA237
gamma-BHC (Lindane)	U		0.00358	mg/kg dry	1	09/24/18	10/06/18 09:19	R3QA237
delta-BHC	U		0.00358	mg/kg dry	1	09/24/18	10/06/18 09:19	R3QA237
beta-BHC	U		0.00358	mg/kg dry	1	09/24/18	10/06/18 09:19	R3QA237
alpha-Chlordane	U		0.00358	mg/kg dry	1	09/24/18	10/06/18 09:19	R3QA237
gamma-Chlordane	U		0.00358	mg/kg dry	1	09/24/18	10/06/18 09:19	R3QA237
4,4'-DDD	U		0.00715	mg/kg dry	1	09/24/18	10/06/18 09:19	R3QA237
4,4'-DDE	U	UL	0.00715	mg/kg dry	1	09/24/18	10/06/18 09:19	R3QA237
4,4'-DDT	U		0.00715	mg/kg dry	1	09/24/18	10/06/18 09:19	R3QA237
Dieldrin	U		0.00715	mg/kg dry	1	09/24/18	10/06/18 09:19	R3QA237
Endosulfan I	U		0.00358	mg/kg dry	1	09/24/18	10/06/18 09:19	R3QA237
Endosulfan II	U		0.00715	mg/kg dry	1	09/24/18	10/06/18 09:19	R3QA237
Endosulfan sulfate	U		0.00715	mg/kg dry	1	09/24/18	10/06/18 09:19	R3QA237
Endrin	U		0.00715	mg/kg dry	1	09/24/18	10/06/18 09:19	R3QA237
Endrin aldehyde	U		0.00715	mg/kg dry	1	09/24/18	10/06/18 09:19	R3QA237
Endrin ketone	U		0.00715	mg/kg dry	1	09/24/18	10/06/18 09:19	R3QA237
Heptachlor	U		0.00358	mg/kg dry	1	09/24/18	10/06/18 09:19	R3QA237
Heptachlor epoxide	U		0.00358	mg/kg dry	1	09/24/18	10/06/18 09:19	R3QA237
Methoxychlor	U		0.0358	mg/kg dry	1	09/24/18	10/06/18 09:19	R3QA237
Toxaphene	U		0.358	mg/kg dry	1	09/24/18	10/06/18 09:19	R3QA237

Surrogates

Analyte	Result	Flags/ Qualifiers	**%Recovery**	Units	%Recovery Limits	Prepared	Analyzed	Method/SOP#
Lab ID: 1809011-20								
Station ID: BDE-SD-08								
Sample Matrix: Sediment								
Collected: 09/20/2018								
Surrogate: Tetrachloro-meta-xylene	0.0600		**84 %**	mg/kg dry	*30-150*	09/24/18	10/06/18 09:19	*R3QA237*
Surrogate: Decachlorobiphenyl	0.0561		**78 %**	mg/kg dry	*30-150*	09/24/18	10/06/18 09:19	*R3QA237*

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Organochlorine Pesticides and PCBs

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID: 1809011-21								
Station ID: BDE-SD-09								
Sample Matrix: Sediment								
Collected: 09/19/2018								
Aldrin	U	UL	0.00253	mg/kg dry	1	09/24/18	10/06/18 09:41	R3QA237
alpha-BHC	U		0.00253	mg/kg dry	1	09/24/18	10/06/18 09:41	R3QA237
gamma-BHC (Lindane)	U		0.00253	mg/kg dry	1	09/24/18	10/06/18 09:41	R3QA237
delta-BHC	U		0.00253	mg/kg dry	1	09/24/18	10/06/18 09:41	R3QA237
beta-BHC	U		0.00253	mg/kg dry	1	09/24/18	10/06/18 09:41	R3QA237
alpha-Chlordane	U		0.00253	mg/kg dry	1	09/24/18	10/06/18 09:41	R3QA237
gamma-Chlordane	U		0.00253	mg/kg dry	1	09/24/18	10/06/18 09:41	R3QA237
4,4'-DDD	U		0.00505	mg/kg dry	1	09/24/18	10/06/18 09:41	R3QA237
4,4'-DDE	U	UL	0.00505	mg/kg dry	1	09/24/18	10/06/18 09:41	R3QA237
4,4'-DDT	U		0.00505	mg/kg dry	1	09/24/18	10/06/18 09:41	R3QA237
Dieldrin	U		0.00505	mg/kg dry	1	09/24/18	10/06/18 09:41	R3QA237
Endosulfan I	U		0.00253	mg/kg dry	1	09/24/18	10/06/18 09:41	R3QA237
Endosulfan II	U		0.00505	mg/kg dry	1	09/24/18	10/06/18 09:41	R3QA237
Endosulfan sulfate	U		0.00505	mg/kg dry	1	09/24/18	10/06/18 09:41	R3QA237
Endrin	U		0.00505	mg/kg dry	1	09/24/18	10/06/18 09:41	R3QA237
Endrin aldehyde	U		0.00505	mg/kg dry	1	09/24/18	10/06/18 09:41	R3QA237
Endrin ketone	U		0.00505	mg/kg dry	1	09/24/18	10/06/18 09:41	R3QA237
Heptachlor	U		0.00253	mg/kg dry	1	09/24/18	10/06/18 09:41	R3QA237
Heptachlor epoxide	U		0.00253	mg/kg dry	1	09/24/18	10/06/18 09:41	R3QA237
Methoxychlor	U		0.0253	mg/kg dry	1	09/24/18	10/06/18 09:41	R3QA237
Toxaphene	U		0.253	mg/kg dry	1	09/24/18	10/06/18 09:41	R3QA237

Surrogates

Analyte	Result	Flags/ Qualifiers	**%Recovery**	Units	%Recovery Limits	Prepared	Analyzed	Method/SOP#
Lab ID: 1809011-21								
Station ID: BDE-SD-09								
Sample Matrix: Sediment								
Collected: 09/19/2018								
Surrogate: Tetrachloro-meta-xylene	0.0418		**83 %**	mg/kg dry	*30-150*	09/24/18	10/06/18 09:41	*R3QA237*
Surrogate: Decachlorobiphenyl	0.0511		**101 %**	mg/kg dry	*30-150*	09/24/18	10/06/18 09:41	*R3QA237*

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Organochlorine Pesticides and PCBs

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID: 1809011-22								
Station ID: BDE-SD-09-D								
Sample Matrix: Sediment								
Collected: 09/19/2018								
Aldrin	U	UL	0.00255	mg/kg dry	1	09/24/18	10/06/18 10:03	R3QA237
alpha-BHC	U		0.00255	mg/kg dry	1	09/24/18	10/06/18 10:03	R3QA237
gamma-BHC (Lindane)	U		0.00255	mg/kg dry	1	09/24/18	10/06/18 10:03	R3QA237
delta-BHC	U		0.00255	mg/kg dry	1	09/24/18	10/06/18 10:03	R3QA237
beta-BHC	U		0.00255	mg/kg dry	1	09/24/18	10/06/18 10:03	R3QA237
alpha-Chlordane	U		0.00255	mg/kg dry	1	09/24/18	10/06/18 10:03	R3QA237
gamma-Chlordane	U		0.00255	mg/kg dry	1	09/24/18	10/06/18 10:03	R3QA237
4,4'-DDD	U		0.00510	mg/kg dry	1	09/24/18	10/06/18 10:03	R3QA237
4,4'-DDE	U	UL	0.00510	mg/kg dry	1	09/24/18	10/06/18 10:03	R3QA237
4,4'-DDT	U		0.00510	mg/kg dry	1	09/24/18	10/06/18 10:03	R3QA237
Dieldrin	U		0.00510	mg/kg dry	1	09/24/18	10/06/18 10:03	R3QA237
Endosulfan I	U		0.00255	mg/kg dry	1	09/24/18	10/06/18 10:03	R3QA237
Endosulfan II	U		0.00510	mg/kg dry	1	09/24/18	10/06/18 10:03	R3QA237
Endosulfan sulfate	U		0.00510	mg/kg dry	1	09/24/18	10/06/18 10:03	R3QA237
Endrin	U		0.00510	mg/kg dry	1	09/24/18	10/06/18 10:03	R3QA237
Endrin aldehyde	U		0.00510	mg/kg dry	1	09/24/18	10/06/18 10:03	R3QA237
Endrin ketone	U		0.00510	mg/kg dry	1	09/24/18	10/06/18 10:03	R3QA237
Heptachlor	U		0.00255	mg/kg dry	1	09/24/18	10/06/18 10:03	R3QA237
Heptachlor epoxide	U		0.00255	mg/kg dry	1	09/24/18	10/06/18 10:03	R3QA237
Methoxychlor	U		0.0255	mg/kg dry	1	09/24/18	10/06/18 10:03	R3QA237
Toxaphene	U		0.255	mg/kg dry	1	09/24/18	10/06/18 10:03	R3QA237

Surrogates

Analyte	Result	Flags/ Qualifiers	**%Recovery**	Units	%Recovery Limits	Prepared	Analyzed	Method/SOP#
Lab ID: 1809011-22								
Station ID: BDE-SD-09-D								
Sample Matrix: Sediment								
Collected: 09/19/2018								
Surrogate: Tetrachloro-meta-xylene	0.0349		**68 %**	mg/kg dry	*30-150*	09/24/18	10/06/18 10:03	*R3QA237*
Surrogate: Decachlorobiphenyl	0.0400		**78 %**	mg/kg dry	*30-150*	09/24/18	10/06/18 10:03	*R3QA237*

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Total Metals

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID:	1809011-01							
Station ID:	BDE-SW-01							
Sample Matrix:	Surface Water							
Collected:	09/19/2018							
Aluminum	**141**		20.0	ug/L	2.5	09/26/18	10/01/18 11:41	R3QA155/R3QA116
Antimony	U		2.0	ug/L	2.5	09/26/18	10/01/18 11:41	R3QA155/R3QA116
Arsenic	U		1.0	ug/L	2.5	09/26/18	10/01/18 11:41	R3QA155/R3QA116
Barium	**163**		10.0	ug/L	2.5	09/26/18	10/01/18 11:41	R3QA155/R3QA116
Beryllium	U		1.0	ug/L	2.5	09/26/18	10/01/18 11:41	R3QA155/R3QA116
Cadmium	U		1.0	ug/L	2.5	09/26/18	10/01/18 11:41	R3QA155/R3QA116
Calcium	**7470**		500	ug/L	1	09/26/18	10/10/18 13:17	R3QA155/R3QA159
Chromium	U		2.0	ug/L	2.5	09/26/18	10/01/18 11:41	R3QA155/R3QA116
Cobalt	**3.2**		1.0	ug/L	2.5	09/26/18	10/01/18 11:41	R3QA155/R3QA116
Copper	U		2.0	ug/L	2.5	09/26/18	10/01/18 11:41	R3QA155/R3QA116
Iron	**1190**		100	ug/L	1	09/26/18	10/10/18 13:17	R3QA155/R3QA159
Lead	U		1.0	ug/L	2.5	09/26/18	10/01/18 11:41	R3QA155/R3QA116
Magnesium	**3020**		500	ug/L	1	09/26/18	10/10/18 13:17	R3QA155/R3QA159
Manganese	**117**		1.0	ug/L	2.5	09/26/18	10/01/18 11:41	R3QA155/R3QA116
Mercury	U		0.2	ug/L	1	10/09/18	10/11/18 10:48	R3QA131
Nickel	**3.1**		1.0	ug/L	2.5	09/26/18	10/01/18 11:41	R3QA155/R3QA116
Potassium	**4320**		2000	ug/L	1	09/26/18	10/10/18 13:17	R3QA155/R3QA159
Selenium	U		5.0	ug/L	2.5	09/26/18	10/01/18 11:41	R3QA155/R3QA116
Silver	U		1.0	ug/L	2.5	09/26/18	10/01/18 11:41	R3QA155/R3QA116
Sodium	**7950**		1000	ug/L	1	09/26/18	10/10/18 13:17	R3QA155/R3QA159
Thallium	U		1.0	ug/L	2.5	09/26/18	10/01/18 11:41	R3QA155/R3QA116
Vanadium	U		5.0	ug/L	2.5	09/26/18	10/01/18 11:41	R3QA155/R3QA116
Zinc	**6.5**		2.0	ug/L	2.5	09/26/18	10/01/18 11:41	R3QA155/R3QA116

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Total Metals

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID:	1809011-02							
Station ID:	BDE-SW-02							
Sample Matrix:	Surface Water							
Collected:	09/19/2018							
Aluminum	**838**		200	ug/L	1	09/26/18	10/10/18 13:25	R3QA155/R3QA159
Antimony	U		2.0	ug/L	2.5	09/26/18	10/01/18 11:49	R3QA155/R3QA116
Arsenic	**1.4**		1.0	ug/L	2.5	09/26/18	10/01/18 11:49	R3QA155/R3QA116
Barium	**227**		10.0	ug/L	2.5	09/26/18	10/01/18 11:49	R3QA155/R3QA116
Beryllium	U		1.0	ug/L	2.5	09/26/18	10/01/18 11:49	R3QA155/R3QA116
Cadmium	U		1.0	ug/L	2.5	09/26/18	10/01/18 11:49	R3QA155/R3QA116
Calcium	**9290**		500	ug/L	1	09/26/18	10/10/18 13:25	R3QA155/R3QA159
Chromium	**3.0**		2.0	ug/L	2.5	09/26/18	10/01/18 11:49	R3QA155/R3QA116
Cobalt	**6.7**		1.0	ug/L	2.5	09/26/18	10/01/18 11:49	R3QA155/R3QA116
Copper	**2.7**		2.0	ug/L	2.5	09/26/18	10/01/18 11:49	R3QA155/R3QA116
Iron	**2310**		100	ug/L	1	09/26/18	10/10/18 13:25	R3QA155/R3QA159
Lead	**3.1**		1.0	ug/L	2.5	09/26/18	10/01/18 11:49	R3QA155/R3QA116
Magnesium	**3740**		500	ug/L	1	09/26/18	10/10/18 13:25	R3QA155/R3QA159
Manganese	**151**		1.0	ug/L	2.5	09/26/18	10/01/18 11:49	R3QA155/R3QA116
Mercury	U		0.2	ug/L	1	10/09/18	10/11/18 10:50	R3QA131
Nickel	**3.3**		1.0	ug/L	2.5	09/26/18	10/01/18 11:49	R3QA155/R3QA116
Potassium	**5660**		2000	ug/L	1	09/26/18	10/10/18 13:25	R3QA155/R3QA159
Selenium	U		5.0	ug/L	2.5	09/26/18	10/01/18 11:49	R3QA155/R3QA116
Silver	U		1.0	ug/L	2.5	09/26/18	10/01/18 11:49	R3QA155/R3QA116
Sodium	**11300**		1000	ug/L	1	09/26/18	10/10/18 13:25	R3QA155/R3QA159
Thallium	U		1.0	ug/L	2.5	09/26/18	10/01/18 11:49	R3QA155/R3QA116
Vanadium	U		5.0	ug/L	2.5	09/26/18	10/01/18 11:49	R3QA155/R3QA116
Zinc	**21.4**		2.0	ug/L	2.5	09/26/18	10/01/18 11:49	R3QA155/R3QA116

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Total Metals

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID:	1809011-03							
Station ID:	BDE-SW-03							
Sample Matrix:	Surface Water							
Collected:	09/20/2018							
Aluminum	**137**		20.0	ug/L	2.5	09/26/18	10/01/18 11:57	R3QA155/R3QA116
Antimony	U		2.0	ug/L	2.5	09/26/18	10/01/18 11:57	R3QA155/R3QA116
Arsenic	U		1.0	ug/L	2.5	09/26/18	10/01/18 11:57	R3QA155/R3QA116
Barium	**200**		10.0	ug/L	2.5	09/26/18	10/01/18 11:57	R3QA155/R3QA116
Beryllium	U		1.0	ug/L	2.5	09/26/18	10/01/18 11:57	R3QA155/R3QA116
Cadmium	U		1.0	ug/L	2.5	09/26/18	10/01/18 11:57	R3QA155/R3QA116
Calcium	**12500**		500	ug/L	1	09/26/18	10/10/18 13:32	R3QA155/R3QA159
Chromium	U		2.0	ug/L	2.5	09/26/18	10/01/18 11:57	R3QA155/R3QA116
Cobalt	**3.3**		1.0	ug/L	2.5	09/26/18	10/01/18 11:57	R3QA155/R3QA116
Copper	U		2.0	ug/L	2.5	09/26/18	10/01/18 11:57	R3QA155/R3QA116
Iron	**701**		100	ug/L	1	09/26/18	10/10/18 13:32	R3QA155/R3QA159
Lead	U		1.0	ug/L	2.5	09/26/18	10/01/18 11:57	R3QA155/R3QA116
Magnesium	**4440**		500	ug/L	1	09/26/18	10/10/18 13:32	R3QA155/R3QA159
Manganese	**59.7**		1.0	ug/L	2.5	09/26/18	10/01/18 11:57	R3QA155/R3QA116
Mercury	U		0.2	ug/L	1	10/09/18	10/11/18 10:52	R3QA131
Nickel	**2.5**		1.0	ug/L	2.5	09/26/18	10/01/18 11:57	R3QA155/R3QA116
Potassium	**7670**		2000	ug/L	1	09/26/18	10/10/18 13:32	R3QA155/R3QA159
Selenium	U		5.0	ug/L	2.5	09/26/18	10/01/18 11:57	R3QA155/R3QA116
Silver	U		1.0	ug/L	2.5	09/26/18	10/01/18 11:57	R3QA155/R3QA116
Sodium	**12300**		1000	ug/L	1	09/26/18	10/10/18 13:32	R3QA155/R3QA159
Thallium	U		1.0	ug/L	2.5	09/26/18	10/01/18 11:57	R3QA155/R3QA116
Vanadium	U		5.0	ug/L	2.5	09/26/18	10/01/18 11:57	R3QA155/R3QA116
Zinc	**16.8**		2.0	ug/L	2.5	09/26/18	10/01/18 11:57	R3QA155/R3QA116

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Total Metals

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID:	1809011-04							
Station ID:	BDE-SW-04							
Sample Matrix:	Surface Water							
Collected:	09/19/2018							
Aluminum	**239**		20.0	ug/L	2.5	09/26/18	10/01/18 12:01	R3QA155/R3QA116
Antimony	U		2.0	ug/L	2.5	09/26/18	10/01/18 12:01	R3QA155/R3QA116
Arsenic	U		1.0	ug/L	2.5	09/26/18	10/01/18 12:01	R3QA155/R3QA116
Barium	**136**		10.0	ug/L	2.5	09/26/18	10/01/18 12:01	R3QA155/R3QA116
Beryllium	U		1.0	ug/L	2.5	09/26/18	10/01/18 12:01	R3QA155/R3QA116
Cadmium	U		1.0	ug/L	2.5	09/26/18	10/01/18 12:01	R3QA155/R3QA116
Calcium	**12400**		500	ug/L	1	09/26/18	10/10/18 13:36	R3QA155/R3QA159
Chromium	U		2.0	ug/L	2.5	09/26/18	10/01/18 12:01	R3QA155/R3QA116
Cobalt	**2.0**		1.0	ug/L	2.5	09/26/18	10/01/18 12:01	R3QA155/R3QA116
Copper	U		2.0	ug/L	2.5	09/26/18	10/01/18 12:01	R3QA155/R3QA116
Iron	**1370**		100	ug/L	1	09/26/18	10/10/18 13:36	R3QA155/R3QA159
Lead	U		1.0	ug/L	2.5	09/26/18	10/01/18 12:01	R3QA155/R3QA116
Magnesium	**4610**		500	ug/L	1	09/26/18	10/10/18 13:36	R3QA155/R3QA159
Manganese	**64.9**		1.0	ug/L	2.5	09/26/18	10/01/18 12:01	R3QA155/R3QA116
Mercury	U		0.2	ug/L	1	10/09/18	10/11/18 10:54	R3QA131
Nickel	**2.3**		1.0	ug/L	2.5	09/26/18	10/01/18 12:01	R3QA155/R3QA116
Potassium	**10100**		2000	ug/L	1	09/26/18	10/10/18 13:36	R3QA155/R3QA159
Selenium	U		5.0	ug/L	2.5	09/26/18	10/01/18 12:01	R3QA155/R3QA116
Silver	U		1.0	ug/L	2.5	09/26/18	10/01/18 12:01	R3QA155/R3QA116
Sodium	**12600**		1000	ug/L	1	09/26/18	10/10/18 13:36	R3QA155/R3QA159
Thallium	U		1.0	ug/L	2.5	09/26/18	10/01/18 12:01	R3QA155/R3QA116
Vanadium	U		5.0	ug/L	2.5	09/26/18	10/01/18 12:01	R3QA155/R3QA116
Zinc	**10.2**		2.0	ug/L	2.5	09/26/18	10/01/18 12:01	R3QA155/R3QA116

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
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Office of Analytical Services and Quality Assurance
701 Mapes Road
Fort Meade, Maryland 20755-5350

Site Name: **BLADES GROUNDWATER** **Project #:** **DAS R35442**

Total Metals

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID:	1809011-05							
Station ID:	BDE-SW-05							
Sample Matrix:	Surface Water							
Collected:	09/20/2018							
Aluminum	**2240**		200	ug/L	1	09/26/18	10/10/18 13:40	R3QA155/R3QA159
Antimony	U		2.0	ug/L	2.5	09/26/18	10/01/18 12:05	R3QA155/R3QA116
Arsenic	**2.7**		1.0	ug/L	2.5	09/26/18	10/01/18 12:05	R3QA155/R3QA116
Barium	**291**		10.0	ug/L	2.5	09/26/18	10/01/18 12:05	R3QA155/R3QA116
Beryllium	U		1.0	ug/L	2.5	09/26/18	10/01/18 12:05	R3QA155/R3QA116
Cadmium	U		1.0	ug/L	2.5	09/26/18	10/01/18 12:05	R3QA155/R3QA116
Calcium	**12400**		500	ug/L	1	09/26/18	10/10/18 13:40	R3QA155/R3QA159
Chromium	**4.2**		2.0	ug/L	2.5	09/26/18	10/01/18 12:05	R3QA155/R3QA116
Cobalt	**17.2**		1.0	ug/L	2.5	09/26/18	10/01/18 12:05	R3QA155/R3QA116
Copper	**6.5**		2.0	ug/L	2.5	09/26/18	10/01/18 12:05	R3QA155/R3QA116
Iron	**7200**		100	ug/L	1	09/26/18	10/10/18 13:40	R3QA155/R3QA159
Lead	**6.1**		1.0	ug/L	2.5	09/26/18	10/01/18 12:05	R3QA155/R3QA116
Magnesium	**3820**		500	ug/L	1	09/26/18	10/10/18 13:40	R3QA155/R3QA159
Manganese	**535**		15.0	ug/L	1	09/26/18	10/10/18 13:40	R3QA155/R3QA159
Mercury	U		0.2	ug/L	1	10/09/18	10/11/18 11:00	R3QA131
Nickel	**6.7**		1.0	ug/L	2.5	09/26/18	10/01/18 12:05	R3QA155/R3QA116
Potassium	**4110**		2000	ug/L	1	09/26/18	10/10/18 13:40	R3QA155/R3QA159
Selenium	U		5.0	ug/L	2.5	09/26/18	10/01/18 12:05	R3QA155/R3QA116
Silver	U		1.0	ug/L	2.5	09/26/18	10/01/18 12:05	R3QA155/R3QA116
Sodium	**29700**		1000	ug/L	1	09/26/18	10/10/18 13:40	R3QA155/R3QA159
Thallium	U		1.0	ug/L	2.5	09/26/18	10/01/18 12:05	R3QA155/R3QA116
Vanadium	**5.0**		5.0	ug/L	2.5	09/26/18	10/01/18 12:05	R3QA155/R3QA116
Zinc	**58.3**		2.0	ug/L	2.5	09/26/18	10/01/18 12:05	R3QA155/R3QA116

Site Name: **BLADES GROUNDWATER** **Project #:** **DAS R35442**

Total Metals

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID:	1809011-06							
Station ID:	BDE-SW-06							
Sample Matrix:	Surface Water							
Collected:	09/20/2018							
Aluminum	**17800**		200	ug/L	1	09/26/18	10/10/18 13:52	R3QA155/R3QA159
Antimony	U		2.0	ug/L	2.5	09/26/18	10/01/18 12:09	R3QA155/R3QA116
Arsenic	**7.5**		1.0	ug/L	2.5	09/26/18	10/01/18 12:09	R3QA155/R3QA116
Barium	**428**		10.0	ug/L	2.5	09/26/18	10/01/18 12:09	R3QA155/R3QA116
Beryllium	**6.1**		1.0	ug/L	2.5	09/26/18	10/01/18 12:09	R3QA155/R3QA116
Cadmium	**3.7**		1.0	ug/L	2.5	09/26/18	10/01/18 12:09	R3QA155/R3QA116
Calcium	**68300**		500	ug/L	1	09/26/18	10/10/18 13:52	R3QA155/R3QA159
Chromium	**16.2**		2.0	ug/L	2.5	09/26/18	10/01/18 12:09	R3QA155/R3QA116
Cobalt	**107**		1.0	ug/L	2.5	09/26/18	10/01/18 12:09	R3QA155/R3QA116
Copper	**44.4**		2.0	ug/L	2.5	09/26/18	10/01/18 12:09	R3QA155/R3QA116
Iron	**51600**		100	ug/L	1	09/26/18	10/10/18 13:52	R3QA155/R3QA159
Lead	**125**		1.0	ug/L	2.5	09/26/18	10/01/18 12:09	R3QA155/R3QA116
Magnesium	**6590**		500	ug/L	1	09/26/18	10/10/18 13:52	R3QA155/R3QA159
Manganese	**395**		15.0	ug/L	1	09/26/18	10/10/18 13:52	R3QA155/R3QA159
Mercury	**0.3**		0.2	ug/L	1	10/09/18	10/11/18 11:06	R3QA131
Nickel	**33.8**		1.0	ug/L	2.5	09/26/18	10/01/18 12:09	R3QA155/R3QA116
Potassium	**8490**		2000	ug/L	1	09/26/18	10/10/18 13:52	R3QA155/R3QA159
Selenium	U		5.0	ug/L	2.5	09/26/18	10/01/18 12:09	R3QA155/R3QA116
Silver	U		1.0	ug/L	2.5	09/26/18	10/01/18 12:09	R3QA155/R3QA116
Sodium	**6850**		1000	ug/L	1	09/26/18	10/10/18 13:52	R3QA155/R3QA159
Thallium	U		1.0	ug/L	2.5	09/26/18	10/01/18 12:09	R3QA155/R3QA116
Vanadium	**40.8**		5.0	ug/L	2.5	09/26/18	10/01/18 12:09	R3QA155/R3QA116
Zinc	**401**		2.0	ug/L	2.5	09/26/18	10/01/18 12:09	R3QA155/R3QA116

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Total Metals

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID:	1809011-07							
Station ID:	BDE-SW-07							
Sample Matrix:	Surface Water							
Collected:	09/19/2018							
Aluminum	**184**		20.0	ug/L	2.5	09/26/18	10/01/18 12:14	R3QA155/R3QA116
Antimony	U		2.0	ug/L	2.5	09/26/18	10/01/18 12:14	R3QA155/R3QA116
Arsenic	**2.6**		1.0	ug/L	2.5	09/26/18	10/01/18 12:14	R3QA155/R3QA116
Barium	**194**		10.0	ug/L	2.5	09/26/18	10/01/18 12:14	R3QA155/R3QA116
Beryllium	U		1.0	ug/L	2.5	09/26/18	10/01/18 12:14	R3QA155/R3QA116
Cadmium	U		1.0	ug/L	2.5	09/26/18	10/01/18 12:14	R3QA155/R3QA116
Calcium	**19300**		500	ug/L	1	09/26/18	10/10/18 13:56	R3QA155/R3QA159
Chromium	U		2.0	ug/L	2.5	09/26/18	10/01/18 12:14	R3QA155/R3QA116
Cobalt	**1.5**		1.0	ug/L	2.5	09/26/18	10/01/18 12:14	R3QA155/R3QA116
Copper	**2.2**		2.0	ug/L	2.5	09/26/18	10/01/18 12:14	R3QA155/R3QA116
Iron	**681**		100	ug/L	1	09/26/18	10/10/18 13:56	R3QA155/R3QA159
Lead	U		1.0	ug/L	2.5	09/26/18	10/01/18 12:14	R3QA155/R3QA116
Magnesium	**6890**		500	ug/L	1	09/26/18	10/10/18 13:56	R3QA155/R3QA159
Manganese	**168**		1.0	ug/L	2.5	09/26/18	10/01/18 12:14	R3QA155/R3QA116
Mercury	U		0.2	ug/L	1	10/09/18	10/11/18 11:08	R3QA131
Nickel	**2.8**		1.0	ug/L	2.5	09/26/18	10/01/18 12:14	R3QA155/R3QA116
Potassium	**13400**		2000	ug/L	1	09/26/18	10/10/18 13:56	R3QA155/R3QA159
Selenium	U		5.0	ug/L	2.5	09/26/18	10/01/18 12:14	R3QA155/R3QA116
Silver	U		1.0	ug/L	2.5	09/26/18	10/01/18 12:14	R3QA155/R3QA116
Sodium	**10300**		1000	ug/L	1	09/26/18	10/10/18 13:56	R3QA155/R3QA159
Thallium	U		1.0	ug/L	2.5	09/26/18	10/01/18 12:14	R3QA155/R3QA116
Vanadium	U		5.0	ug/L	2.5	09/26/18	10/01/18 12:14	R3QA155/R3QA116
Zinc	**7.6**		2.0	ug/L	2.5	09/26/18	10/01/18 12:14	R3QA155/R3QA116

Site Name: **BLADES GROUNDWATER** **Project #:** **DAS R35442**

Total Metals

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID:	1809011-08							
Station ID:	BDE-SW-08							
Sample Matrix:	Surface Water							
Collected:	09/20/2018							
Aluminum	**226**		20.0	ug/L	2.5	09/26/18	10/01/18 12:18	R3QA155/R3QA116
Antimony	U		2.0	ug/L	2.5	09/26/18	10/01/18 12:18	R3QA155/R3QA116
Arsenic	**2.9**		1.0	ug/L	2.5	09/26/18	10/01/18 12:18	R3QA155/R3QA116
Barium	**185**		10.0	ug/L	2.5	09/26/18	10/01/18 12:18	R3QA155/R3QA116
Beryllium	U		1.0	ug/L	2.5	09/26/18	10/01/18 12:18	R3QA155/R3QA116
Cadmium	U		1.0	ug/L	2.5	09/26/18	10/01/18 12:18	R3QA155/R3QA116
Calcium	**7960**		500	ug/L	1	09/26/18	10/10/18 14:00	R3QA155/R3QA159
Chromium	U		2.0	ug/L	2.5	09/26/18	10/01/18 12:18	R3QA155/R3QA116
Cobalt	**7.3**		1.0	ug/L	2.5	09/26/18	10/01/18 12:18	R3QA155/R3QA116
Copper	**2.2**		2.0	ug/L	2.5	09/26/18	10/01/18 12:18	R3QA155/R3QA116
Iron	**1640**		100	ug/L	1	09/26/18	10/10/18 14:00	R3QA155/R3QA159
Lead	U		1.0	ug/L	2.5	09/26/18	10/01/18 12:18	R3QA155/R3QA116
Magnesium	**3060**		500	ug/L	1	09/26/18	10/10/18 14:00	R3QA155/R3QA159
Manganese	**255**		1.0	ug/L	2.5	09/26/18	10/01/18 12:18	R3QA155/R3QA116
Mercury	U		0.2	ug/L	1	10/09/18	10/11/18 11:10	R3QA131
Nickel	**4.3**		1.0	ug/L	2.5	09/26/18	10/01/18 12:18	R3QA155/R3QA116
Potassium	**4140**		2000	ug/L	1	09/26/18	10/10/18 14:00	R3QA155/R3QA159
Selenium	U		5.0	ug/L	2.5	09/26/18	10/01/18 12:18	R3QA155/R3QA116
Silver	U		1.0	ug/L	2.5	09/26/18	10/01/18 12:18	R3QA155/R3QA116
Sodium	**8060**		1000	ug/L	1	09/26/18	10/10/18 14:00	R3QA155/R3QA159
Thallium	U		1.0	ug/L	2.5	09/26/18	10/01/18 12:18	R3QA155/R3QA116
Vanadium	U		5.0	ug/L	2.5	09/26/18	10/01/18 12:18	R3QA155/R3QA116
Zinc	**14.9**		2.0	ug/L	2.5	09/26/18	10/01/18 12:18	R3QA155/R3QA116

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Site Name: **BLADES GROUNDWATER** **Project #:** **DAS R35442**

Total Metals

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID:	1809011-09							
Station ID:	BDE-SW-09							
Sample Matrix:	Surface Water							
Collected:	09/19/2018							
Aluminum	**234**		20.0	ug/L	2.5	09/26/18	10/01/18 12:38	R3QA155/R3QA116
Antimony	U		2.0	ug/L	2.5	09/26/18	10/01/18 12:38	R3QA155/R3QA116
Arsenic	U		1.0	ug/L	2.5	09/26/18	10/01/18 12:38	R3QA155/R3QA116
Barium	**106**		10.0	ug/L	2.5	09/26/18	10/01/18 12:38	R3QA155/R3QA116
Beryllium	U		1.0	ug/L	2.5	09/26/18	10/01/18 12:38	R3QA155/R3QA116
Cadmium	U		1.0	ug/L	2.5	09/26/18	10/01/18 12:38	R3QA155/R3QA116
Calcium	**11100**		500	ug/L	1	09/26/18	10/10/18 14:03	R3QA155/R3QA159
Chromium	U		2.0	ug/L	2.5	09/26/18	10/01/18 12:38	R3QA155/R3QA116
Cobalt	U		1.0	ug/L	2.5	09/26/18	10/01/18 12:38	R3QA155/R3QA116
Copper	U		2.0	ug/L	2.5	09/26/18	10/01/18 12:38	R3QA155/R3QA116
Iron	**1510**		100	ug/L	1	09/26/18	10/10/18 14:03	R3QA155/R3QA159
Lead	U		1.0	ug/L	2.5	09/26/18	10/01/18 12:38	R3QA155/R3QA116
Magnesium	**4190**		500	ug/L	1	09/26/18	10/10/18 14:03	R3QA155/R3QA159
Manganese	**22.8**		1.0	ug/L	2.5	09/26/18	10/01/18 12:38	R3QA155/R3QA116
Mercury	U		0.2	ug/L	1	10/09/18	10/11/18 11:12	R3QA131
Nickel	**1.9**		1.0	ug/L	2.5	09/26/18	10/01/18 12:38	R3QA155/R3QA116
Potassium	**9780**		2000	ug/L	1	09/26/18	10/10/18 14:03	R3QA155/R3QA159
Selenium	U		5.0	ug/L	2.5	09/26/18	10/01/18 12:38	R3QA155/R3QA116
Silver	U		1.0	ug/L	2.5	09/26/18	10/01/18 12:38	R3QA155/R3QA116
Sodium	**14300**		1000	ug/L	1	09/26/18	10/10/18 14:03	R3QA155/R3QA159
Thallium	U		1.0	ug/L	2.5	09/26/18	10/01/18 12:38	R3QA155/R3QA116
Vanadium	U		5.0	ug/L	2.5	09/26/18	10/01/18 12:38	R3QA155/R3QA116
Zinc	**9.2**		2.0	ug/L	2.5	09/26/18	10/01/18 12:38	R3QA155/R3QA116

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Site Name: **BLADES GROUNDWATER** **Project #:** **DAS R35442**

Total Metals

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID:	1809011-10							
Station ID:	BDE-SW-09-D							
Sample Matrix:	Surface Water							
Collected:	09/19/2018							
Aluminum	**239**		20.0	ug/L	2.5	09/26/18	10/01/18 12:42	R3QA155/R3QA116
Antimony	U		2.0	ug/L	2.5	09/26/18	10/01/18 12:42	R3QA155/R3QA116
Arsenic	U		1.0	ug/L	2.5	09/26/18	10/01/18 12:42	R3QA155/R3QA116
Barium	**108**		10.0	ug/L	2.5	09/26/18	10/01/18 12:42	R3QA155/R3QA116
Beryllium	U		1.0	ug/L	2.5	09/26/18	10/01/18 12:42	R3QA155/R3QA116
Cadmium	U		1.0	ug/L	2.5	09/26/18	10/01/18 12:42	R3QA155/R3QA116
Calcium	**11400**		500	ug/L	1	09/26/18	10/10/18 14:07	R3QA155/R3QA159
Chromium	U		2.0	ug/L	2.5	09/26/18	10/01/18 12:42	R3QA155/R3QA116
Cobalt	U		1.0	ug/L	2.5	09/26/18	10/01/18 12:42	R3QA155/R3QA116
Copper	U		2.0	ug/L	2.5	09/26/18	10/01/18 12:42	R3QA155/R3QA116
Iron	**1620**		100	ug/L	1	09/26/18	10/10/18 14:07	R3QA155/R3QA159
Lead	U		1.0	ug/L	2.5	09/26/18	10/01/18 12:42	R3QA155/R3QA116
Magnesium	**4270**		500	ug/L	1	09/26/18	10/10/18 14:07	R3QA155/R3QA159
Manganese	**24.3**		1.0	ug/L	2.5	09/26/18	10/01/18 12:42	R3QA155/R3QA116
Mercury	U		0.2	ug/L	1	10/09/18	10/11/18 11:14	R3QA131
Nickel	**1.8**		1.0	ug/L	2.5	09/26/18	10/01/18 12:42	R3QA155/R3QA116
Potassium	**10000**		2000	ug/L	1	09/26/18	10/10/18 14:07	R3QA155/R3QA159
Selenium	U		5.0	ug/L	2.5	09/26/18	10/01/18 12:42	R3QA155/R3QA116
Silver	U		1.0	ug/L	2.5	09/26/18	10/01/18 12:42	R3QA155/R3QA116
Sodium	**14800**		1000	ug/L	1	09/26/18	10/10/18 14:07	R3QA155/R3QA159
Thallium	U		1.0	ug/L	2.5	09/26/18	10/01/18 12:42	R3QA155/R3QA116
Vanadium	U		5.0	ug/L	2.5	09/26/18	10/01/18 12:42	R3QA155/R3QA116
Zinc	**9.0**		2.0	ug/L	2.5	09/26/18	10/01/18 12:42	R3QA155/R3QA116

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Total Metals

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID: 1809011-13								
Station ID: BDE-SD-01								
Sample Matrix: Sediment								
Collected: 09/19/2018		dry						
Aluminum	**4860**		19.7	ug/g	1	10/02/18	10/10/18 14:40	R3QA155/R3QA159
Antimony	U		0.5	ug/g	5	10/02/18	10/03/18 12:19	R3QA155/R3QA116
Arsenic	**3.7**		0.5	ug/g	5	10/02/18	10/03/18 12:19	R3QA155/R3QA116
Barium	**121**		19.7	ug/g	1	10/02/18	10/10/18 14:40	R3QA155/R3QA159
Beryllium	**0.8**		0.5	ug/g	5	10/02/18	10/03/18 12:19	R3QA155/R3QA116
Cadmium	U		0.5	ug/g	5	10/02/18	10/03/18 12:19	R3QA155/R3QA116
Calcium	**1010**		49.3	ug/g	1	10/02/18	10/10/18 14:40	R3QA155/R3QA159
Chromium	**7.9**		0.5	ug/g	5	10/02/18	10/03/18 12:19	R3QA155/R3QA116
Cobalt	**8.2**		0.5	ug/g	5	10/02/18	10/03/18 12:19	R3QA155/R3QA116
Copper	**5.8**		0.5	ug/g	5	10/02/18	10/03/18 12:19	R3QA155/R3QA116
Iron	**5670**		9.9	ug/g	1	10/02/18	10/10/18 14:40	R3QA155/R3QA159
Lead	**14.9**		0.5	ug/g	5	10/02/18	10/03/18 12:19	R3QA155/R3QA116
Magnesium	**873**		49.3	ug/g	1	10/02/18	10/10/18 14:40	R3QA155/R3QA159
Manganese	**97.9**		1.5	ug/g	1	10/02/18	10/10/18 14:40	R3QA155/R3QA159
Mercury	**0.03**		0.01	ug/g	1	10/02/18	10/04/18 12:06	R3QA131
Nickel	**6.1**		0.5	ug/g	5	10/02/18	10/03/18 12:19	R3QA155/R3QA116
Potassium	**365**		197	ug/g	1	10/02/18	10/10/18 14:40	R3QA155/R3QA159
Selenium	U		0.5	ug/g	5	10/02/18	10/03/18 12:19	R3QA155/R3QA116
Silver	U		0.5	ug/g	5	10/02/18	10/03/18 12:19	R3QA155/R3QA116
Sodium	U		98.6	ug/g	1	10/02/18	10/10/18 14:40	R3QA155/R3QA159
Thallium	U		0.5	ug/g	5	10/02/18	10/03/18 12:19	R3QA155/R3QA116
Vanadium	**12.8**		0.5	ug/g	5	10/02/18	10/03/18 12:19	R3QA155/R3QA116
Zinc	**53.8**		2.0	ug/g	1	10/02/18	10/10/18 14:40	R3QA155/R3QA159

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Total Metals

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID: 1809011-14								
Station ID: BDE-SD-02								
Sample Matrix: Sediment								
Collected: 09/19/2018		dry						
Aluminum	**7910**		19.6	ug/g	1	10/02/18	10/10/18 14:44	R3QA155/R3QA159
Antimony	**0.8**		0.5	ug/g	5	10/02/18	10/03/18 12:23	R3QA155/R3QA116
Arsenic	**8.3**		0.5	ug/g	5	10/02/18	10/03/18 12:23	R3QA155/R3QA116
Barium	**429**		19.6	ug/g	1	10/02/18	10/10/18 14:44	R3QA155/R3QA159
Beryllium	**2.9**		0.5	ug/g	5	10/02/18	10/03/18 12:23	R3QA155/R3QA116
Cadmium	**1.3**		0.5	ug/g	5	10/02/18	10/03/18 12:23	R3QA155/R3QA116
Calcium	**5730**		49.1	ug/g	1	10/02/18	10/10/18 14:44	R3QA155/R3QA159
Chromium	**8.9**		0.5	ug/g	5	10/02/18	10/03/18 12:23	R3QA155/R3QA116
Cobalt	**44.9**		0.5	ug/g	5	10/02/18	10/03/18 12:23	R3QA155/R3QA116
Copper	**21.4**		0.5	ug/g	5	10/02/18	10/03/18 12:23	R3QA155/R3QA116
Iron	**8670**		9.8	ug/g	1	10/02/18	10/10/18 14:44	R3QA155/R3QA159
Lead	**48.2**		0.5	ug/g	5	10/02/18	10/03/18 12:23	R3QA155/R3QA116
Magnesium	**1170**		49.1	ug/g	1	10/02/18	10/10/18 14:44	R3QA155/R3QA159
Manganese	**299**		1.5	ug/g	1	10/02/18	10/10/18 14:44	R3QA155/R3QA159
Mercury	**0.08**		0.01	ug/g	1	10/02/18	10/04/18 12:08	R3QA131
Nickel	**24.4**		0.5	ug/g	5	10/02/18	10/03/18 12:23	R3QA155/R3QA116
Potassium	**581**		196	ug/g	1	10/02/18	10/10/18 14:44	R3QA155/R3QA159
Selenium	**1.5**		0.5	ug/g	5	10/02/18	10/03/18 12:23	R3QA155/R3QA116
Silver	U		0.5	ug/g	5	10/02/18	10/03/18 12:23	R3QA155/R3QA116
Sodium	**178**		98.2	ug/g	1	10/02/18	10/10/18 14:44	R3QA155/R3QA159
Thallium	U		0.5	ug/g	5	10/02/18	10/03/18 12:23	R3QA155/R3QA116
Vanadium	**27.3**		0.5	ug/g	5	10/02/18	10/03/18 12:23	R3QA155/R3QA116
Zinc	**207**		2.0	ug/g	1	10/02/18	10/10/18 14:44	R3QA155/R3QA159

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Total Metals

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID: 1809011-15								
Station ID: BDE-SD-03								
Sample Matrix: Sediment								
Collected: 09/20/2018		dry						
Aluminum	**346**		19.8	ug/g	1	10/02/18	10/10/18 14:47	R3QA155/R3QA159
Antimony	U		0.5	ug/g	5	10/02/18	10/03/18 13:32	R3QA155/R3QA116
Arsenic	U		0.5	ug/g	5	10/02/18	10/03/18 13:32	R3QA155/R3QA116
Barium	**5.2**		1.0	ug/g	5	10/02/18	10/03/18 13:32	R3QA155/R3QA116
Beryllium	U		0.5	ug/g	5	10/02/18	10/03/18 13:32	R3QA155/R3QA116
Cadmium	U		0.5	ug/g	5	10/02/18	10/03/18 13:32	R3QA155/R3QA116
Calcium	U		49.6	ug/g	1	10/02/18	10/10/18 14:47	R3QA155/R3QA159
Chromium	U		0.5	ug/g	5	10/02/18	10/03/18 13:32	R3QA155/R3QA116
Cobalt	**1.5**		0.5	ug/g	5	10/02/18	10/03/18 13:32	R3QA155/R3QA116
Copper	U		0.5	ug/g	5	10/02/18	10/03/18 13:32	R3QA155/R3QA116
Iron	**615**		9.9	ug/g	1	10/02/18	10/10/18 14:47	R3QA155/R3QA159
Lead	**0.8**		0.5	ug/g	5	10/02/18	10/03/18 13:32	R3QA155/R3QA116
Magnesium	U		49.6	ug/g	1	10/02/18	10/10/18 14:47	R3QA155/R3QA159
Manganese	**14.7**		0.5	ug/g	5	10/02/18	10/03/18 13:32	R3QA155/R3QA116
Mercury	U		0.008	ug/g	1	10/02/18	10/04/18 12:10	R3QA131
Nickel	U		0.5	ug/g	5	10/02/18	10/03/18 13:32	R3QA155/R3QA116
Potassium	U		198	ug/g	1	10/02/18	10/10/18 14:47	R3QA155/R3QA159
Selenium	U		0.5	ug/g	5	10/02/18	10/03/18 13:32	R3QA155/R3QA116
Silver	U		0.5	ug/g	5	10/02/18	10/03/18 13:32	R3QA155/R3QA116
Sodium	U		99.2	ug/g	1	10/02/18	10/10/18 14:47	R3QA155/R3QA159
Thallium	U		0.5	ug/g	5	10/02/18	10/03/18 13:32	R3QA155/R3QA116
Vanadium	**1.0**	J	0.5	ug/g	5	10/02/18	10/03/18 13:32	R3QA155/R3QA116
Zinc	**3.2**		0.5	ug/g	5	10/02/18	10/03/18 13:32	R3QA155/R3QA116

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Total Metals

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID: 1809011-16								
Station ID: BDE-SD-04								
Sample Matrix: Sediment								
Collected: 09/19/2018		dry						
Aluminum	**1530**	J	19.7	ug/g	1	10/02/18	10/10/18 14:55	R3QA155/R3QA159
Antimony	U		0.5	ug/g	5	10/02/18	10/03/18 12:36	R3QA155/R3QA116
Arsenic	**0.6**		0.5	ug/g	5	10/02/18	10/03/18 12:36	R3QA155/R3QA116
Barium	**7.5**		1.0	ug/g	5	10/02/18	10/03/18 12:36	R3QA155/R3QA116
Beryllium	U		0.5	ug/g	5	10/02/18	10/03/18 12:36	R3QA155/R3QA116
Cadmium	U		0.5	ug/g	5	10/02/18	10/03/18 12:36	R3QA155/R3QA116
Calcium	**101**		49.3	ug/g	1	10/02/18	10/10/18 14:55	R3QA155/R3QA159
Chromium	**1.3**		0.5	ug/g	5	10/02/18	10/03/18 12:36	R3QA155/R3QA116
Cobalt	**22.0**		0.5	ug/g	5	10/02/18	10/03/18 12:36	R3QA155/R3QA116
Copper	**3.1**		0.5	ug/g	5	10/02/18	10/03/18 12:36	R3QA155/R3QA116
Iron	**1030**		9.9	ug/g	1	10/02/18	10/10/18 14:55	R3QA155/R3QA159
Lead	**3.6**		0.5	ug/g	5	10/02/18	10/03/18 12:36	R3QA155/R3QA116
Magnesium	**82.8**		49.3	ug/g	1	10/02/18	10/10/18 14:55	R3QA155/R3QA159
Manganese	**129**		1.5	ug/g	1	10/02/18	10/10/18 14:55	R3QA155/R3QA159
Mercury	**0.02**		0.007	ug/g	1	10/02/18	10/04/18 12:13	R3QA131
Nickel	**1.1**		0.5	ug/g	5	10/02/18	10/03/18 12:36	R3QA155/R3QA116
Potassium	U		197	ug/g	1	10/02/18	10/10/18 14:55	R3QA155/R3QA159
Selenium	U		0.5	ug/g	5	10/02/18	10/03/18 12:36	R3QA155/R3QA116
Silver	U		0.5	ug/g	5	10/02/18	10/03/18 12:36	R3QA155/R3QA116
Sodium	U		98.6	ug/g	1	10/02/18	10/10/18 14:55	R3QA155/R3QA159
Thallium	U		0.5	ug/g	5	10/02/18	10/03/18 12:36	R3QA155/R3QA116
Vanadium	**3.8**		0.5	ug/g	5	10/02/18	10/03/18 12:36	R3QA155/R3QA116
Zinc	**10.9**		0.5	ug/g	5	10/02/18	10/03/18 12:36	R3QA155/R3QA116

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Total Metals

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID: 1809011-17								
Station ID: BDE-SD-05								
Sample Matrix: Sediment								
Collected: 09/20/2018		dry						
Aluminum	**5540**		19.8	ug/g	1	10/02/18	10/10/18 15:03	R3QA155/R3QA159
Antimony	U		0.5	ug/g	5	10/02/18	10/03/18 12:44	R3QA155/R3QA116
Arsenic	**14.4**		0.5	ug/g	5	10/02/18	10/03/18 12:44	R3QA155/R3QA116
Barium	**300**		19.8	ug/g	1	10/02/18	10/10/18 15:03	R3QA155/R3QA159
Beryllium	**3.9**		0.5	ug/g	5	10/02/18	10/03/18 12:44	R3QA155/R3QA116
Cadmium	**2.1**		0.5	ug/g	5	10/02/18	10/03/18 12:44	R3QA155/R3QA116
Calcium	**6670**		49.6	ug/g	1	10/02/18	10/10/18 15:03	R3QA155/R3QA159
Chromium	**10.3**		0.5	ug/g	5	10/02/18	10/03/18 12:44	R3QA155/R3QA116
Cobalt	**134**		5.0	ug/g	1	10/02/18	10/10/18 15:03	R3QA155/R3QA159
Copper	**28.2**		0.5	ug/g	5	10/02/18	10/03/18 12:44	R3QA155/R3QA116
Iron	**13000**		9.9	ug/g	1	10/02/18	10/10/18 15:03	R3QA155/R3QA159
Lead	**23.3**		0.5	ug/g	5	10/02/18	10/03/18 12:44	R3QA155/R3QA116
Magnesium	**1200**		49.6	ug/g	1	10/02/18	10/10/18 15:03	R3QA155/R3QA159
Manganese	**501**		1.5	ug/g	1	10/02/18	10/10/18 15:03	R3QA155/R3QA159
Mercury	**0.06**	J	0.01	ug/g	1	10/02/18	10/04/18 12:14	R3QA131
Nickel	**40.2**		0.5	ug/g	5	10/02/18	10/03/18 12:44	R3QA155/R3QA116
Potassium	**492**		198	ug/g	1	10/02/18	10/10/18 15:03	R3QA155/R3QA159
Selenium	**2.1**		0.5	ug/g	5	10/02/18	10/03/18 12:44	R3QA155/R3QA116
Silver	U		0.5	ug/g	5	10/02/18	10/03/18 12:44	R3QA155/R3QA116
Sodium	**771**		99.2	ug/g	1	10/02/18	10/10/18 15:03	R3QA155/R3QA159
Thallium	**0.5**		0.5	ug/g	5	10/02/18	10/03/18 12:44	R3QA155/R3QA116
Vanadium	**19.9**		0.5	ug/g	5	10/02/18	10/03/18 12:44	R3QA155/R3QA116
Zinc	**340**		2.0	ug/g	1	10/02/18	10/10/18 15:03	R3QA155/R3QA159

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Total Metals

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID:	1809011-18							
Station ID:	BDE-SD-06							
Sample Matrix:	Sediment							
Collected:	09/20/2018	dry						
Aluminum	**3040**		19.9	ug/g	1	10/02/18	10/10/18 15:08	R3QA155/R3QA159
Antimony	**0.5**		0.5	ug/g	5	10/02/18	10/03/18 12:48	R3QA155/R3QA116
Arsenic	**6.7**		0.5	ug/g	5	10/02/18	10/03/18 12:48	R3QA155/R3QA116
Barium	**103**		19.9	ug/g	1	10/02/18	10/10/18 15:08	R3QA155/R3QA159
Beryllium	**1.2**		0.5	ug/g	5	10/02/18	10/03/18 12:48	R3QA155/R3QA116
Cadmium	**0.7**		0.5	ug/g	5	10/02/18	10/03/18 12:48	R3QA155/R3QA116
Calcium	**12700**		49.8	ug/g	1	10/02/18	10/10/18 15:08	R3QA155/R3QA159
Chromium	**3.8**		0.5	ug/g	5	10/02/18	10/03/18 12:48	R3QA155/R3QA116
Cobalt	**47.1**		0.5	ug/g	5	10/02/18	10/03/18 12:48	R3QA155/R3QA116
Copper	**12.4**		0.5	ug/g	5	10/02/18	10/03/18 12:48	R3QA155/R3QA116
Iron	**16300**		10.0	ug/g	1	10/02/18	10/10/18 15:08	R3QA155/R3QA159
Lead	**27.9**		0.5	ug/g	5	10/02/18	10/03/18 12:48	R3QA155/R3QA116
Magnesium	**774**		49.8	ug/g	1	10/02/18	10/10/18 15:08	R3QA155/R3QA159
Manganese	**126**		1.5	ug/g	1	10/02/18	10/10/18 15:08	R3QA155/R3QA159
Mercury	U		0.01	ug/g	1	10/02/18	10/04/18 12:20	R3QA131
Nickel	**14.0**		0.5	ug/g	5	10/02/18	10/03/18 12:48	R3QA155/R3QA116
Potassium	**348**		199	ug/g	1	10/02/18	10/10/18 15:08	R3QA155/R3QA159
Selenium	**1.1**		0.5	ug/g	5	10/02/18	10/03/18 12:48	R3QA155/R3QA116
Silver	U		0.5	ug/g	5	10/02/18	10/03/18 12:48	R3QA155/R3QA116
Sodium	**101**		99.6	ug/g	1	10/02/18	10/10/18 15:08	R3QA155/R3QA159
Thallium	U		0.5	ug/g	5	10/02/18	10/03/18 12:48	R3QA155/R3QA116
Vanadium	**14.2**		0.5	ug/g	5	10/02/18	10/03/18 12:48	R3QA155/R3QA116
Zinc	**94.6**		2.0	ug/g	1	10/02/18	10/10/18 15:08	R3QA155/R3QA159

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Total Metals

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID: 1809011-19								
Station ID: BDE-SD-07								
Sample Matrix: Sediment								
Collected: 09/19/2018		dry						
Aluminum	**1050**		19.8	ug/g	1	10/02/18	10/10/18 15:13	R3QA155/R3QA159
Antimony	U		0.5	ug/g	5	10/02/18	10/03/18 12:52	R3QA155/R3QA116
Arsenic	U		0.5	ug/g	5	10/02/18	10/03/18 12:52	R3QA155/R3QA116
Barium	**11.1**		1.0	ug/g	5	10/02/18	10/03/18 12:52	R3QA155/R3QA116
Beryllium	U		0.5	ug/g	5	10/02/18	10/03/18 12:52	R3QA155/R3QA116
Cadmium	U		0.5	ug/g	5	10/02/18	10/03/18 12:52	R3QA155/R3QA116
Calcium	**196**		49.5	ug/g	1	10/02/18	10/10/18 15:13	R3QA155/R3QA159
Chromium	**1.3**		0.5	ug/g	5	10/02/18	10/03/18 12:52	R3QA155/R3QA116
Cobalt	U		0.5	ug/g	5	10/02/18	10/03/18 12:52	R3QA155/R3QA116
Copper	**0.5**		0.5	ug/g	5	10/02/18	10/03/18 12:52	R3QA155/R3QA116
Iron	**520**		9.9	ug/g	1	10/02/18	10/10/18 15:13	R3QA155/R3QA159
Lead	**2.4**		0.5	ug/g	5	10/02/18	10/03/18 12:52	R3QA155/R3QA116
Magnesium	**64.6**		49.5	ug/g	1	10/02/18	10/10/18 15:13	R3QA155/R3QA159
Manganese	**29.3**		0.5	ug/g	5	10/02/18	10/03/18 12:52	R3QA155/R3QA116
Mercury	U		0.007	ug/g	1	10/02/18	10/04/18 12:22	R3QA131
Nickel	**0.5**		0.5	ug/g	5	10/02/18	10/03/18 12:52	R3QA155/R3QA116
Potassium	U		198	ug/g	1	10/02/18	10/10/18 15:13	R3QA155/R3QA159
Selenium	U		0.5	ug/g	5	10/02/18	10/03/18 12:52	R3QA155/R3QA116
Silver	U		0.5	ug/g	5	10/02/18	10/03/18 12:52	R3QA155/R3QA116
Sodium	U		99.0	ug/g	1	10/02/18	10/10/18 15:13	R3QA155/R3QA159
Thallium	U		0.5	ug/g	5	10/02/18	10/03/18 12:52	R3QA155/R3QA116
Vanadium	**1.8**		0.5	ug/g	5	10/02/18	10/03/18 12:52	R3QA155/R3QA116
Zinc	**4.1**		0.5	ug/g	5	10/02/18	10/03/18 12:52	R3QA155/R3QA116

Site Name: **BLADES GROUNDWATER** **Project #:** **DAS R35442**

Total Metals

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID: 1809011-20								
Station ID: BDE-SD-08								
Sample Matrix: Sediment								
Collected: 09/20/2018		dry						
Aluminum	**1890**		19.8	ug/g	1	10/02/18	10/10/18 15:17	R3QA155/R3QA159
Antimony	U		0.5	ug/g	5	10/02/18	10/03/18 13:13	R3QA155/R3QA116
Arsenic	**1.1**		0.5	ug/g	5	10/02/18	10/03/18 13:13	R3QA155/R3QA116
Barium	**61.3**		19.8	ug/g	1	10/02/18	10/10/18 15:17	R3QA155/R3QA159
Beryllium	U		0.5	ug/g	5	10/02/18	10/03/18 13:13	R3QA155/R3QA116
Cadmium	U		0.5	ug/g	5	10/02/18	10/03/18 13:13	R3QA155/R3QA116
Calcium	**1590**		49.6	ug/g	1	10/02/18	10/10/18 15:17	R3QA155/R3QA159
Chromium	**2.8**		0.5	ug/g	5	10/02/18	10/03/18 13:13	R3QA155/R3QA116
Cobalt	**5.1**		0.5	ug/g	5	10/02/18	10/03/18 13:13	R3QA155/R3QA116
Copper	**4.0**		0.5	ug/g	5	10/02/18	10/03/18 13:13	R3QA155/R3QA116
Iron	**2690**		9.9	ug/g	1	10/02/18	10/10/18 15:17	R3QA155/R3QA159
Lead	**3.9**		0.5	ug/g	5	10/02/18	10/03/18 13:13	R3QA155/R3QA116
Magnesium	**507**		49.6	ug/g	1	10/02/18	10/10/18 15:17	R3QA155/R3QA159
Manganese	**167**		1.5	ug/g	1	10/02/18	10/10/18 15:17	R3QA155/R3QA159
Mercury	**0.01**		0.007	ug/g	1	10/02/18	10/04/18 12:24	R3QA131
Nickel	**2.6**		0.5	ug/g	5	10/02/18	10/03/18 13:13	R3QA155/R3QA116
Potassium	U		198	ug/g	1	10/02/18	10/10/18 15:17	R3QA155/R3QA159
Selenium	U		0.5	ug/g	5	10/02/18	10/03/18 13:13	R3QA155/R3QA116
Silver	U		0.5	ug/g	5	10/02/18	10/03/18 13:13	R3QA155/R3QA116
Sodium	U		99.2	ug/g	1	10/02/18	10/10/18 15:17	R3QA155/R3QA159
Thallium	U		0.5	ug/g	5	10/02/18	10/03/18 13:13	R3QA155/R3QA116
Vanadium	**5.1**		0.5	ug/g	5	10/02/18	10/03/18 13:13	R3QA155/R3QA116
Zinc	**18.5**		0.5	ug/g	5	10/02/18	10/03/18 13:13	R3QA155/R3QA116

Site Name: **BLADES GROUNDWATER** **Project #:** **DAS R35442**

Total Metals

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID: 1809011-21								
Station ID: BDE-SD-09								
Sample Matrix: Sediment								
Collected: 09/19/2018		dry						
Aluminum	**2400**		19.6	ug/g	1	10/02/18	10/10/18 15:29	R3QA155/R3QA159
Antimony	U		0.5	ug/g	5	10/02/18	10/03/18 13:17	R3QA155/R3QA116
Arsenic	**1.7**		0.5	ug/g	5	10/02/18	10/03/18 13:17	R3QA155/R3QA116
Barium	**43.6**		1.0	ug/g	5	10/02/18	10/03/18 13:17	R3QA155/R3QA116
Beryllium	U		0.5	ug/g	5	10/02/18	10/03/18 13:17	R3QA155/R3QA116
Cadmium	U		0.5	ug/g	5	10/02/18	10/03/18 13:17	R3QA155/R3QA116
Calcium	**1100**		49.1	ug/g	1	10/02/18	10/10/18 15:29	R3QA155/R3QA159
Chromium	**1.7**		0.5	ug/g	5	10/02/18	10/03/18 13:17	R3QA155/R3QA116
Cobalt	**1.2**		0.5	ug/g	5	10/02/18	10/03/18 13:17	R3QA155/R3QA116
Copper	**3.2**		0.5	ug/g	5	10/02/18	10/03/18 13:17	R3QA155/R3QA116
Iron	**3960**		9.8	ug/g	1	10/02/18	10/10/18 15:29	R3QA155/R3QA159
Lead	**7.2**		0.5	ug/g	5	10/02/18	10/03/18 13:17	R3QA155/R3QA116
Magnesium	**80.4**		49.1	ug/g	1	10/02/18	10/10/18 15:29	R3QA155/R3QA159
Manganese	**18.0**		0.5	ug/g	5	10/02/18	10/03/18 13:17	R3QA155/R3QA116
Mercury	**0.02**		0.01	ug/g	1	10/02/18	10/04/18 12:30	R3QA131
Nickel	**1.3**		0.5	ug/g	5	10/02/18	10/03/18 13:17	R3QA155/R3QA116
Potassium	U		196	ug/g	1	10/02/18	10/10/18 15:29	R3QA155/R3QA159
Selenium	U		0.5	ug/g	5	10/02/18	10/03/18 13:17	R3QA155/R3QA116
Silver	U		0.5	ug/g	5	10/02/18	10/03/18 13:17	R3QA155/R3QA116
Sodium	U		98.2	ug/g	1	10/02/18	10/10/18 15:29	R3QA155/R3QA159
Thallium	U		0.5	ug/g	5	10/02/18	10/03/18 13:17	R3QA155/R3QA116
Vanadium	**6.3**		0.5	ug/g	5	10/02/18	10/03/18 13:17	R3QA155/R3QA116
Zinc	**22.5**		0.5	ug/g	5	10/02/18	10/03/18 13:17	R3QA155/R3QA116

Site Name: **BLADES GROUNDWATER** **Project #:** **DAS R35442**

Total Metals

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID:	1809011-22							
Station ID:	BDE-SD-09-D							
Sample Matrix:	Sediment							
Collected:	09/19/2018	dry						
Aluminum	**2720**		19.9	ug/g	1	10/02/18	10/10/18 15:32	R3QA155/R3QA159
Antimony	U		0.5	ug/g	5	10/02/18	10/03/18 13:21	R3QA155/R3QA116
Arsenic	**1.7**		0.5	ug/g	5	10/02/18	10/03/18 13:21	R3QA155/R3QA116
Barium	**62.1**		19.9	ug/g	1	10/02/18	10/10/18 15:32	R3QA155/R3QA159
Beryllium	**0.5**		0.5	ug/g	5	10/02/18	10/03/18 13:21	R3QA155/R3QA116
Cadmium	U		0.5	ug/g	5	10/02/18	10/03/18 13:21	R3QA155/R3QA116
Calcium	**1160**		49.8	ug/g	1	10/02/18	10/10/18 15:32	R3QA155/R3QA159
Chromium	**1.8**		0.5	ug/g	5	10/02/18	10/03/18 13:21	R3QA155/R3QA116
Cobalt	**1.6**		0.5	ug/g	5	10/02/18	10/03/18 13:21	R3QA155/R3QA116
Copper	**3.4**		0.5	ug/g	5	10/02/18	10/03/18 13:21	R3QA155/R3QA116
Iron	**4640**		10.0	ug/g	1	10/02/18	10/10/18 15:32	R3QA155/R3QA159
Lead	**8.0**		0.5	ug/g	5	10/02/18	10/03/18 13:21	R3QA155/R3QA116
Magnesium	**94.1**		49.8	ug/g	1	10/02/18	10/10/18 15:32	R3QA155/R3QA159
Manganese	**20.8**		0.5	ug/g	5	10/02/18	10/03/18 13:21	R3QA155/R3QA116
Mercury	**0.02**		0.01	ug/g	1	10/02/18	10/04/18 12:32	R3QA131
Nickel	**1.5**		0.5	ug/g	5	10/02/18	10/03/18 13:21	R3QA155/R3QA116
Potassium	U		199	ug/g	1	10/02/18	10/10/18 15:32	R3QA155/R3QA159
Selenium	U		0.5	ug/g	5	10/02/18	10/03/18 13:21	R3QA155/R3QA116
Silver	U		0.5	ug/g	5	10/02/18	10/03/18 13:21	R3QA155/R3QA116
Sodium	U		99.6	ug/g	1	10/02/18	10/10/18 15:32	R3QA155/R3QA159
Thallium	U		0.5	ug/g	5	10/02/18	10/03/18 13:21	R3QA155/R3QA116
Vanadium	**7.1**		0.5	ug/g	5	10/02/18	10/03/18 13:21	R3QA155/R3QA116
Zinc	**24.7**		0.5	ug/g	5	10/02/18	10/03/18 13:21	R3QA155/R3QA116

Site Name: BLADES GROUNDWATER **Project #: DAS R35442**

QC Data
Physical Parameters

Analyte	Result	Quantitation Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BI82502 - PD60/PD105										
Duplicate (BI82502-DUP1)		**Source: 1809011-17**		Prepared: 10/01/18 11:40		Analyzed: 10/02/18 09:10				
% Solids	11.6		% by Weight		11.5			0.9	20	

Site Name: BLADES GROUNDWATER **Project #: DAS R35442**

QC Data
HPLC Identification

Analyte	Result	Quantitation Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BI82604 - EPA 537										
Blank (BI82604-BLK1)				Prepared: 09/26/18 13:41			Analyzed: 09/27/18 20:31			
PFBS (perfluorobutanesulfonic acid)	U	10.0	ng/L							
PFHpA (perfluoroheptanoic acid)	U	10.0	"							
PFHxS (perfluorohexanesulfonic acid)	U	10.0	"							
PFNA (perfluorononanoic acid)	U	10.0	"							
PFOS (perfluorooctanesulfonic acid)	U	10.0	"							
PFOA (perfluorooctanoic acid)	3.68	10.0	"							
Surrogate: MPFHxA	*43.5*		*"*	*40.000*		*109*	*70-130*			
Surrogate: MPFDA	*41.8*		*"*	*40.000*		*105*	*70-130*			
LCS (BI82604-BS1)				Prepared: 09/26/18 13:41			Analyzed: 09/27/18 20:57			
PFBS (perfluorobutanesulfonic acid)	152	10.0	ng/L	140.80		108	70-130			
PFHpA (perfluoroheptanoic acid)	179	10.0	"	160.00		112	70-130			
PFHxS (perfluorohexanesulfonic acid)	171	10.0	"	150.40		114	70-130			
PFNA (perfluorononanoic acid)	184	10.0	"	160.00		115	70-130			
PFOS (perfluorooctanesulfonic acid)	151	10.0	"	153.60		98	70-130			
PFOA (perfluorooctanoic acid)	184	10.0	"	160.00		115	70-130			
Surrogate: MPFHxA	*44.4*		*"*	*40.000*		*111*	*70-130*			
Surrogate: MPFDA	*42.4*		*"*	*40.000*		*106*	*70-130*			
Matrix Spike (BI82604-MS1)	**Source: 1809011-05**			Prepared: 09/26/18 13:41			Analyzed: 09/27/18 23:56			
PFBS (perfluorobutanesulfonic acid)	124	9.26	ng/L	130.37	U	95	70-130			
PFHpA (perfluoroheptanoic acid)	148	9.26	"	148.15	U	100	70-130			
PFHxS (perfluorohexanesulfonic acid)	143	9.26	"	139.26	U	103	70-130			
PFNA (perfluorononanoic acid)	149	9.26	"	148.15	U	101	70-130			
PFOS (perfluorooctanesulfonic acid)	123	9.26	"	142.22	U	87	70-130			
PFOA (perfluorooctanoic acid)	155	9.26	"	148.15	U	105	70-130			
Surrogate: MPFHxA	*33.2*		*"*	*37.037*		*90*	*70-130*			
Surrogate: MPFDA	*30.7*		*"*	*37.037*		*83*	*70-130*			

Site Name: BLADES GROUNDWATER **Project #: DAS R35442**

QC Data
HPLC Identification

Analyte	Result	Quantitation Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BI82604 - EPA 537										
Matrix Spike Dup (BI82604-MSD1)		**Source: 1809011-05**		Prepared: 09/26/18 13:41		Analyzed: 09/28/18 00:22				
PFBS (perfluorobutanesulfonic acid)	121	12.9	ng/L	121.38	U	100	70-130	2	25	
PFHpA (perfluoroheptanoic acid)	164	12.9	"	137.93	U	119	70-130	10	25	
PFHxS (perfluorohexanesulfonic acid)	137	12.9	"	129.66	U	106	70-130	4	25	
PFNA (perfluorononanoic acid)	161	12.9	"	137.93	U	117	70-130	8	25	
PFOS (perfluorooctanesulfonic acid)	116	12.9	"	132.41	U	88	70-130	6	25	
PFOA (perfluorooctanoic acid)	171	12.9	"	137.93	U	124	70-130	10	25	
Surrogate: MPFHxA	*38.7*		*"*	*34.483*		*112*	*70-130*			
Surrogate: MPFDA	*32.0*		*"*	*34.483*		*93*	*70-130*			

Site Name: BLADES GROUNDWATER **Project #: DAS R35442**

QC Data
Organochlorine Pesticides and PCBs

Analyte	Result	Quantitation Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BI82405 - EPA 3520C PCB/Pest										
Blank (BI82405-BLK1)				Prepared: 09/24/18 08:20		Analyzed: 10/05/18 15:24				
Aldrin	U	0.050	ug/L							
alpha-BHC	U	0.050	"							
beta-BHC	U	0.050	"							
delta-BHC	U	0.050	"							
gamma-BHC (Lindane)	U	0.050	"							
alpha-Chlordane	U	0.050	"							
gamma-Chlordane	U	0.050	"							
4,4'-DDD	U	0.100	"							
4,4'-DDE	U	0.100	"							
4,4'-DDT	U	0.100	"							
Dieldrin	U	0.100	"							
Endosulfan I	U	0.050	"							
Endosulfan II	U	0.100	"							
Endosulfan sulfate	U	0.100	"							
Endrin	U	0.100	"							
Endrin aldehyde	U	0.100	"							
Endrin ketone	U	0.100	"							
Heptachlor	U	0.050	"							
Heptachlor epoxide	U	0.050	"							
Methoxychlor	U	0.500	"							
Toxaphene	U	5.00	"							
Surrogate: Tetrachloro-meta-xylene	*0.734*		*"*	*1.0000*		*73*	*30-150*			
Surrogate: Decachlorobiphenyl	*0.862*		*"*	*1.0000*		*86*	*30-150*			
LCS (BI82405-BS1)				Prepared: 09/24/18 08:20		Analyzed: 10/05/18 19:03				
Aldrin	0.320	0.050	ug/L	0.40000		80	70-130			
alpha-BHC	0.356	0.050	"	0.40000		89	70-130			
beta-BHC	0.378	0.050	"	0.40000		95	70-130			
delta-BHC	0.401	0.050	"	0.40000		100	70-130			
gamma-BHC (Lindane)	0.365	0.050	"	0.40000		91	70-130			
alpha-Chlordane	0.362	0.050	"	0.40000		90	70-130			
gamma-Chlordane	0.364	0.050	"	0.40000		91	70-130			
4,4'-DDD	0.787	0.100	"	0.80000		98	70-130			
4,4'-DDE	0.718	0.100	"	0.80000		90	70-130			
4,4'-DDT	0.796	0.100	"	0.80000		99	70-130			
Dieldrin	0.775	0.100	"	0.80000		97	70-130			
Endosulfan I	0.370	0.050	"	0.40000		92	70-130			
Endosulfan II	0.804	0.100	"	0.80000		100	70-130			
Endosulfan sulfate	0.807	0.100	"	0.80000		101	70-130			
Endrin	0.840	0.100	"	0.80000		105	70-130			
Endrin aldehyde	0.751	0.100	"	0.80000		94	70-130			
Endrin ketone	0.811	0.100	"	0.80000		101	70-130			
Heptachlor	0.322	0.050	"	0.40000		80	70-130			
Heptachlor epoxide	0.380	0.050	"	0.40000		95	70-130			
Methoxychlor	4.45	0.500	"	4.0000		111	70-130			

Site Name: BLADES GROUNDWATER **Project #: DAS R35442**

QC Data
Organochlorine Pesticides and PCBs

Analyte	Result	Quantitation Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BI82405 - EPA 3520C PCB/Pest										
LCS (BI82405-BS1)				Prepared: 09/24/18 08:20			Analyzed: 10/05/18 19:03			
Surrogate: Tetrachloro-meta-xylene	*0.787*		*ug/L*	*1.0000*		*79*	*30-150*			
Surrogate: Decachlorobiphenyl	*1.04*		*"*	*1.0000*		*104*	*30-150*			
Matrix Spike (BI82405-MS1)		**Source: 1809011-05**		Prepared: 09/24/18 08:20			Analyzed: 10/06/18 00:54			
Aldrin	0.261	0.048	ug/L	0.38462	U	68	40-120			
alpha-BHC	0.295	0.048	"	0.38462	U	77	50-150			
beta-BHC	0.277	0.048	"	0.38462	U	72	50-150			
delta-BHC	0.304	0.048	"	0.38462	U	79	50-150			
gamma-BHC (Lindane)	0.309	0.048	"	0.38462	U	80	56-123			
alpha-Chlordane	0.294	0.048	"	0.38462	U	76	50-150			
gamma-Chlordane	0.279	0.048	"	0.38462	U	73	50-150			
4,4'-DDD	0.696	0.096	"	0.76923	U	90	50-150			
4,4'-DDE	0.592	0.096	"	0.76923	U	77	50-150			
4,4'-DDT	0.683	0.096	"	0.76923	U	89	38-127			
Dieldrin	0.654	0.096	"	0.76923	U	85	52-126			
Endosulfan I	0.306	0.048	"	0.38462	U	79	50-150			
Endosulfan II	0.692	0.096	"	0.76923	U	90	50-150			
Endosulfan sulfate	0.702	0.096	"	0.76923	U	91	50-150			
Endrin	0.747	0.096	"	0.76923	U	97	56-121			
Endrin aldehyde	0.578	0.096	"	0.76923	U	75	50-150			
Endrin ketone	0.712	0.096	"	0.76923	U	93	50-150			
Heptachlor	0.248	0.048	"	0.38462	U	65	40-131			
Heptachlor epoxide	0.316	0.048	"	0.38462	U	82	50-150			
Methoxychlor	4.04	0.481	"	3.8462	U	105	50-150			
Toxaphene	U	4.81	"		U		50-150			
Surrogate: Tetrachloro-meta-xylene	*0.573*		*"*	*0.96154*		*60*	*30-150*			
Surrogate: Decachlorobiphenyl	*0.467*		*"*	*0.96154*		*49*	*30-150*			

Site Name: BLADES GROUNDWATER **Project #: DAS R35442**

QC Data
Organochlorine Pesticides and PCBs

Analyte	Result	Quantitation Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BI82405 - EPA 3520C PCB/Pest										
Matrix Spike Dup (BI82405-MSD1)		**Source: 1809011-05**		Prepared: 09/24/18 08:20		Analyzed: 10/06/18 01:16				
Aldrin	0.236	0.048	ug/L	0.38095	U	62	40-120	10	22	
alpha-BHC	0.263	0.048	"	0.38095	U	69	50-150	12	25	
beta-BHC	0.239	0.048	"	0.38095	U	63	50-150	15	25	
delta-BHC	0.276	0.048	"	0.38095	U	72	50-150	10	25	
gamma-BHC (Lindane)	0.289	0.048	"	0.38095	U	76	56-123	7	15	
alpha-Chlordane	0.270	0.048	"	0.38095	U	71	50-150	9	25	
gamma-Chlordane	0.252	0.048	"	0.38095	U	66	50-150	10	25	
4,4'-DDD	0.653	0.095	"	0.76190	U	86	50-150	6	25	
4,4'-DDE	0.551	0.095	"	0.76190	U	72	50-150	7	25	
4,4'-DDT	0.639	0.095	"	0.76190	U	84	38-127	7	27	
Dieldrin	0.601	0.095	"	0.76190	U	79	52-126	8	18	
Endosulfan I	0.278	0.048	"	0.38095	U	73	50-150	9	25	
Endosulfan II	0.630	0.095	"	0.76190	U	83	50-150	9	25	
Endosulfan sulfate	0.636	0.095	"	0.76190	U	83	50-150	10	25	
Endrin	0.691	0.095	"	0.76190	U	91	56-121	8	21	
Endrin aldehyde	0.527	0.095	"	0.76190	U	69	50-150	9	25	
Endrin ketone	0.659	0.095	"	0.76190	U	87	50-150	8	25	
Heptachlor	0.213	0.048	"	0.38095	U	56	40-131	15	20	
Heptachlor epoxide	0.288	0.048	"	0.38095	U	76	50-150	9	25	
Methoxychlor	3.79	0.476	"	3.8095	U	100	50-150	6	25	
Toxaphene	U	4.76	"		U		50-150		25	
Surrogate: Tetrachloro-meta-xylene	*0.475*		*"*	*0.95238*		*50*	*30-150*			
Surrogate: Decachlorobiphenyl	*0.481*		*"*	*0.95238*		*50*	*30-150*			
Batch BI82406 - EPA 3545A PCB/Pest										
Blank (BI82406-BLK1)				Prepared: 09/24/18 08:23		Analyzed: 10/05/18 15:46				
Aldrin	U	0.00167	mg/kg wet							
alpha-BHC	U	0.00167	"							
gamma-BHC (Lindane)	U	0.00167	"							
delta-BHC	U	0.00167	"							
beta-BHC	U	0.00167	"							
alpha-Chlordane	U	0.00167	"							
gamma-Chlordane	U	0.00167	"							
4,4'-DDD	U	0.00333	"							
4,4'-DDE	U	0.00333	"							
4,4'-DDT	U	0.00333	"							
Dieldrin	U	0.00333	"							
Endosulfan I	U	0.00167	"							
Endosulfan II	U	0.00333	"							
Endosulfan sulfate	U	0.00333	"							
Endrin	U	0.00333	"							
Endrin aldehyde	U	0.00333	"							
Endrin ketone	U	0.00333	"							
Heptachlor	U	0.00167	"							

Site Name: BLADES GROUNDWATER **Project #: DAS R35442**

QC Data
Organochlorine Pesticides and PCBs

Analyte	Result	Quantitation Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BI82406 - EPA 3545A PCB/Pest										
Blank (BI82406-BLK1)				Prepared: 09/24/18 08:23		Analyzed: 10/05/18 15:46				
Heptachlor epoxide	U	0.00167	mg/kg wet							
Methoxychlor	U	0.0167	"							
Toxaphene	U	0.167	"							
Surrogate: Tetrachloro-meta-xylene	*0.0278*		"	*0.033333*		*83*	*30-150*			
Surrogate: Decachlorobiphenyl	*0.0355*		"	*0.033333*		*106*	*30-150*			
LCS (BI82406-BS1)				Prepared: 09/24/18 08:23		Analyzed: 10/05/18 19:25				
Aldrin	0.009	0.00167	mg/kg wet	0.013333		64	70-130			A
alpha-BHC	0.009	0.00167	"	0.013333		70	70-130			
gamma-BHC (Lindane)	0.010	0.00167	"	0.013333		75	70-130			
delta-BHC	0.010	0.00167	"	0.013333		79	70-130			
beta-BHC	0.010	0.00167	"	0.013333		79	70-130			
alpha-Chlordane	0.010	0.00167	"	0.013333		71	70-130			
gamma-Chlordane	0.009	0.00167	"	0.013333		70	70-130			
4,4'-DDD	0.021	0.00333	"	0.026667		77	70-130			
4,4'-DDE	0.018	0.00333	"	0.026667		69	70-130			A
4,4'-DDT	0.020	0.00333	"	0.026667		75	70-130			
Dieldrin	0.019	0.00333	"	0.026667		72	70-130			
Endosulfan I	0.010	0.00167	"	0.013333		71	70-130			
Endosulfan II	0.021	0.00333	"	0.026667		77	70-130			
Endosulfan sulfate	0.021	0.00333	"	0.026667		77	70-130			
Endrin	0.021	0.00333	"	0.026667		80	70-130			
Endrin aldehyde	0.019	0.00333	"	0.026667		73	70-130			
Endrin ketone	0.021	0.00333	"	0.026667		78	70-130			
Heptachlor	0.012	0.00167	"	0.013333		86	70-130			
Heptachlor epoxide	0.010	0.00167	"	0.013333		72	70-130			
Methoxychlor	0.118	0.0167	"	0.13333		88	70-130			
Surrogate: Tetrachloro-meta-xylene	*0.0155*		"	*0.033333*		*46*	*30-150*			
Surrogate: Decachlorobiphenyl	*0.0273*		"	*0.033333*		*82*	*30-150*			

Site Name: BLADES GROUNDWATER **Project #: DAS R35442**

QC Data
Organochlorine Pesticides and PCBs

Analyte	Result	Quantitation Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BI82406 - EPA 3545A PCB/Pest										
Matrix Spike (BI82406-MS1)		**Source: 1809011-13**		Prepared: 09/24/18 08:23			Analyzed: 10/06/18 06:23			
Aldrin	0.013	0.00271	mg/kg dry	0.021680	U	62	34-132			
alpha-BHC	0.015	0.00271	"	0.021680	U	68	50-150			
gamma-BHC (Lindane)	0.016	0.00271	"	0.021680	U	74	46-127			
delta-BHC	0.017	0.00271	"	0.021680	U	78	50-150			
beta-BHC	0.016	0.00271	"	0.021680	U	73	50-150			
alpha-Chlordane	0.015	0.00271	"	0.021680	U	70	50-150			
gamma-Chlordane	0.013	0.00271	"	0.021680	U	62	50-150			
4,4'-DDD	0.028	0.00542	"	0.043360	U	64	50-150			
4,4'-DDE	0.029	0.00542	"	0.043360	U	68	50-150			
4,4'-DDT	0.026	0.00542	"	0.043360	U	60	23-134			
Dieldrin	0.029	0.00542	"	0.043360	U	66	31-134			
Endosulfan I	0.013	0.00271	"	0.021680	U	58	50-150			
Endosulfan II	0.028	0.00542	"	0.043360	U	65	50-150			
Endosulfan sulfate	0.029	0.00542	"	0.043360	U	68	50-150			
Endrin	0.032	0.00542	"	0.043360	U	74	42-139			
Endrin aldehyde	0.027	0.00542	"	0.043360	U	63	50-150			
Endrin ketone	0.032	0.00542	"	0.043360	U	73	50-150			
Heptachlor	0.015	0.00271	"	0.021680	U	69	35-130			
Heptachlor epoxide	0.015	0.00271	"	0.021680	U	68	50-150			
Methoxychlor	0.197	0.0271	"	0.21680	U	91	50-150			
Toxaphene	U	0.271	"		U		50-150			
Surrogate: Tetrachloro-meta-xylene	*0.0378*		"	*0.054201*		*70*	*30-150*			
Surrogate: Decachlorobiphenyl	*0.0429*		"	*0.054201*		*79*	*30-150*			
Matrix Spike Dup (BI82406-MSD1)		**Source: 1809011-13**		Prepared: 09/24/18 08:23			Analyzed: 10/06/18 06:45			
Aldrin	0.013	0.00271	mg/kg dry	0.021680	U	61	34-132	2	43	
alpha-BHC	0.014	0.00271	"	0.021680	U	65	50-150	4	25	
gamma-BHC (Lindane)	0.016	0.00271	"	0.021680	U	72	46-127	3	50	
delta-BHC	0.017	0.00271	"	0.021680	U	76	50-150	2	25	
beta-BHC	0.018	0.00271	"	0.021680	U	85	50-150	14	25	
alpha-Chlordane	0.014	0.00271	"	0.021680	U	64	50-150	8	25	
gamma-Chlordane	0.013	0.00271	"	0.021680	U	61	50-150	3	25	
4,4'-DDD	0.028	0.00542	"	0.043360	U	64	50-150	0.7	25	
4,4'-DDE	0.028	0.00542	"	0.043360	U	65	50-150	4	25	
4,4'-DDT	0.026	0.00542	"	0.043360	U	61	23-134	2	50	
Dieldrin	0.028	0.00542	"	0.043360	U	65	31-134	1	38	
Endosulfan I	0.013	0.00271	"	0.021680	U	58	50-150	0.06	25	
Endosulfan II	0.028	0.00542	"	0.043360	U	65	50-150	0.6	25	
Endosulfan sulfate	0.030	0.00542	"	0.043360	U	68	50-150	0.6	25	
Endrin	0.032	0.00542	"	0.043360	U	73	42-139	0.5	45	
Endrin aldehyde	0.026	0.00542	"	0.043360	U	59	50-150	6	25	
Endrin ketone	0.032	0.00542	"	0.043360	U	73	50-150	0.5	25	
Heptachlor	0.015	0.00271	"	0.021680	U	67	35-130	2	31	
Heptachlor epoxide	0.014	0.00271	"	0.021680	U	65	50-150	4	25	
Methoxychlor	0.195	0.0271	"	0.21680	U	90	50-150	1	25	

Site Name: BLADES GROUNDWATER **Project #: DAS R35442**

QC Data
Organochlorine Pesticides and PCBs

Analyte	Result	Quantitation Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BI82406 - EPA 3545A PCB/Pest										
Matrix Spike Dup (BI82406-MSD1)		**Source: 1809011-13**		Prepared: 09/24/18 08:23		Analyzed: 10/06/18 06:45				
Toxaphene	U	0.271	mg/kg dry		U		50-150		25	
Surrogate: Tetrachloro-meta-xylene	*0.0363*		*"*	*0.054201*		*67*	*30-150*			
Surrogate: Decachlorobiphenyl	*0.0348*		*"*	*0.054201*		*64*	*30-150*			

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QC Data
Total Metals

Analyte	Result	Quantitation Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BI82603 - Metals Water Prep										
Blank (BI82603-BLK1)				Prepared: 09/26/18 11:32		Analyzed: 10/01/18 11:18				
Antimony	U	2.0	ug/L							
Arsenic	U	1.0	"							
Barium	U	10.0	"							
Beryllium	U	1.0	"							
Cadmium	U	1.0	"							
Chromium	U	2.0	"							
Cobalt	U	1.0	"							
Copper	U	2.0	"							
Lead	U	1.0	"							
Manganese	U	1.0	"							
Nickel	U	1.0	"							
Selenium	U	5.0	"							
Silver	U	1.0	"							
Thallium	U	1.0	"							
Vanadium	U	5.0	"							
Zinc	U	2.0	"							
Aluminum	U	20.0	"							
Blank (BI82603-BLK2)				Prepared: 09/26/18 11:32		Analyzed: 10/10/18 13:06				
Aluminum	U	200	ug/L							
Calcium	U	500	"							
Iron	U	100	"							
Magnesium	U	500	"							
Potassium	U	2000	"							
Sodium	U	1000	"							
Manganese	U	15.0	"							
LCS (BI82603-BS1)				Prepared: 09/26/18 11:32		Analyzed: 10/01/18 11:35				
Antimony	48.1	2.0	ug/L	50.000		96	85-115			
Arsenic	47.8	1.0	"	50.000		96	85-115			
Barium	195	10.0	"	200.00		97	85-115			
Beryllium	4.7	1.0	"	5.0000		94	85-115			
Cadmium	4.8	1.0	"	5.0000		96	85-115			
Chromium	48.6	2.0	"	50.000		97	85-115			
Cobalt	49.4	1.0	"	50.000		99	85-115			
Copper	47.4	2.0	"	50.000		95	85-115			
Lead	48.7	1.0	"	50.000		97	85-115			
Manganese	49.6	1.0	"	50.000		99	85-115			
Nickel	48.8	1.0	"	50.000		98	85-115			
Selenium	45.7	5.0	"	50.000		91	85-115			
Silver	5.0	1.0	"	5.0000		101	85-115			
Thallium	43.1	1.0	"	50.000		86	85-115			
Vanadium	46.8	5.0	"	50.000		94	85-115			
Zinc	48.8	2.0	"	50.000		98	85-115			
Aluminum	197	20.0	"	200.00		99	85-115			

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QC Data
Total Metals

Analyte	Result	Quantitation Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BI82603 - Metals Water Prep										
LCS (BI82603-BS2)				Prepared: 09/26/18 11:32		Analyzed: 10/10/18 13:13				
Aluminum	1951.19	200	ug/L	2000.0		98	85-115			
Calcium	9855.82	500	"	10000		99	85-115			
Iron	4876.26	100	"	5000.0		98	85-115			
Magnesium	9775.71	500	"	10000		98	85-115			
Potassium	19419.1	2000	"	20000		97	85-115			
Sodium	10014.3	1000	"	10000		100	85-115			
Manganese	500.172	15.0	"	500.00		100	85-115			
Duplicate (BI82603-DUP1)		**Source: 1809011-01**		Prepared: 09/26/18 11:32		Analyzed: 10/01/18 11:45				
Antimony	0.09	2.0	ug/L		0.1			11	20	
Arsenic	2.3	1.0	"		0.7			104	20	D
Barium	157	10.0	"		163			4	20	
Beryllium	0.2	1.0	"		0.2			3	20	
Cadmium	0.02	1.0	"		0.02			5	20	
Chromium	0.7	2.0	"		0.5			36	20	D
Cobalt	3.2	1.0	"		3.2			0.3	20	
Copper	1.6	2.0	"		1.7			2	20	
Lead	0.5	1.0	"		0.5			2	20	
Manganese	113	1.0	"		117			3	20	
Nickel	3.0	1.0	"		3.1			0.1	20	
Selenium	0.5	5.0	"		0.6			14	20	
Silver	U	1.0	"		0.0007				20	
Thallium	0.04	1.0	"		0.03			20	20	
Vanadium	1.6	5.0	"		1.3			24	20	D
Zinc	6.4	2.0	"		6.5			1	20	
Aluminum	125	20.0	"		141			12	20	
Duplicate (BI82603-DUP2)		**Source: 1809011-01**		Prepared: 09/26/18 11:32		Analyzed: 10/10/18 13:21				
Calcium	7365.88	500	ug/L		7474.96			1	20	
Iron	1170.66	100	"		1191.12			2	20	
Magnesium	2985.20	500	"		3019.78			1	20	
Potassium	4262.11	2000	"		4324.57			1	20	
Sodium	7889.59	1000	"		7951.88			0.8	20	

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QC Data
Total Metals

Analyte	Result	Quantitation Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BI82603 - Metals Water Prep										
Matrix Spike (BI82603-MS1)		**Source: 1809011-02**		Prepared: 09/26/18 11:32		Analyzed: 10/01/18 11:53				
Antimony	44.1	2.0	ug/L	50.000	0.07	88	70-130			
Arsenic	49.1	1.0	"	50.000	1.4	95	70-130			
Barium	403	10.0	"	200.00	227	88	70-130			
Beryllium	5.0	1.0	"	5.0000	0.3	93	70-130			
Cadmium	4.9	1.0	"	5.0000	0.09	95	70-130			
Chromium	52.7	2.0	"	50.000	3.0	99	70-130			
Cobalt	54.8	1.0	"	50.000	6.7	96	70-130			
Copper	49.0	2.0	"	50.000	2.7	93	70-130			
Lead	49.2	1.0	"	50.000	3.1	92	70-130			
Manganese	193	1.0	"	50.000	151	83	70-130			
Nickel	50.6	1.0	"	50.000	3.3	95	70-130			
Selenium	45.0	5.0	"	50.000	0.4	89	70-130			
Silver	4.6	1.0	"	5.0000	0.004	92	70-130			
Thallium	42.0	1.0	"	50.000	0.06	84	70-130			
Vanadium	50.6	5.0	"	50.000	1.7	98	70-130			
Zinc	70.9	2.0	"	50.000	21.4	99	70-130			
Matrix Spike (BI82603-MS2)		**Source: 1809011-02**		Prepared: 09/26/18 11:32		Analyzed: 10/10/18 13:29				
Aluminum	3330.63	200	ug/L	2000.0	837.950	125	70-130			
Calcium	19646.8	500	"	10000	9289.44	104	70-130			
Iron	7303.91	100	"	5000.0	2314.48	100	70-130			
Magnesium	13488.2	500	"	10000	3740.15	97	70-130			
Potassium	25644.6	2000	"	20000	5658.47	100	70-130			
Sodium	21681.4	1000	"	10000	11285.1	104	70-130			
Batch BI82701 - Mercury 245.5/7471a Prep										
Blank (BI82701-BLK1)				Prepared: 10/02/18 10:05		Analyzed: 10/04/18 11:58				
Mercury	U	0.0002	ug/g							

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QC Data
Total Metals

Analyte	Result	Quantitation Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BI82701 - Mercury 245.5/7471a Prep										
LCS (BI82701-BS1)				Prepared: 10/02/18 10:05			Analyzed: 10/04/18 12:00			
Mercury	0.002	0.0002	ug/g	0.0020000		95	85-115			
Duplicate (BI82701-DUP1)		**Source: 1809011-17**		Prepared: 10/02/18 10:05			Analyzed: 10/04/18 12:16			
Mercury	U	0.01	ug/g		0.064				35	A
Matrix Spike (BI82701-MS1)		**Source: 1809011-17**		Prepared: 10/02/18 10:05			Analyzed: 10/04/18 12:18			
Mercury	0.127	0.01	ug/g	0.097752	0.064	65	70-130			A
Reference (BI82701-SRM1)				Prepared: 10/02/18 10:05			Analyzed: 10/04/18 12:34			
Mercury	2.44	0.1	ug/g	2.8000		87	68-132			
Batch BI82702 - Mercury 245.1/245.2/7470a Prep										
Blank (BI82702-BLK1)				Prepared: 10/09/18 09:40			Analyzed: 10/11/18 11:16			
Mercury	U	0.2	ug/L							
LCS (BI82702-BS1)				Prepared: 10/09/18 09:40			Analyzed: 10/11/18 11:19			
Mercury	1.80	0.2	ug/L	2.0000		90	85-115			
Duplicate (BI82702-DUP1)		**Source: 1809011-05**		Prepared: 10/09/18 09:40			Analyzed: 10/11/18 11:01			
Mercury	0.010	0.2	ug/L		0.020			67	20	D
Matrix Spike (BI82702-MS1)		**Source: 1809011-05**		Prepared: 10/09/18 09:40			Analyzed: 10/11/18 11:04			
Mercury	1.87	0.2	ug/L	2.0000	0.020	92	70-130			
Batch BJ80202 - Metals Solid prep										
Blank (BJ80202-BLK1)				Prepared: 10/02/18 11:05			Analyzed: 10/03/18 11:05			
Antimony	U	0.5	ug/g							
Arsenic	U	0.5	"							
Barium	U	1.0	"							
Beryllium	U	0.5	"							
Cadmium	U	0.5	"							
Chromium	U	0.5	"							
Cobalt	U	0.5	"							
Copper	U	0.5	"							
Lead	U	0.5	"							
Manganese	U	0.5	"							
Nickel	U	0.5	"							
Selenium	U	0.5	"							
Silver	U	0.5	"							
Thallium	U	0.5	"							
Vanadium	U	0.5	"							
Zinc	U	0.5	"							

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QC Data
Total Metals

Analyte	Result	Quantitation Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BJ80202 - Metals Solid prep										
Blank (BJ80202-BLK2)				Prepared: 10/02/18 11:05		Analyzed: 10/10/18 14:11				
Aluminum	U	20.0	ug/g							
Barium	U	20.0	"							
Calcium	U	50.0	"							
Cobalt	U	5.0	"							
Iron	U	10.0	"							
Magnesium	U	50.0	"							
Manganese	U	1.5	"							
Potassium	U	200	"							
Sodium	U	100	"							
Zinc	U	2.0	"							
LCS (BJ80202-BS1)				Prepared: 10/02/18 11:05		Analyzed: 10/03/18 11:48				
Antimony	4.70592	0.5	ug/g	5.0000		94	85-115			
Arsenic	5.12348	0.5	"	5.0000		102	85-115			
Barium	18.4449	1.0	"	20.000		92	85-115			
Beryllium	0.481678	0.5	"	0.50000		96	85-115			
Cadmium	0.473352	0.5	"	0.50000		95	85-115			
Chromium	4.72800	0.5	"	5.0000		95	85-115			
Cobalt	4.67460	0.5	"	5.0000		93	85-115			
Copper	4.64258	0.5	"	5.0000		93	85-115			
Lead	4.47770	0.5	"	5.0000		90	85-115			
Manganese	4.48613	0.5	"	5.0000		90	85-115			
Nickel	4.61845	0.5	"	5.0000		92	85-115			
Selenium	5.10793	0.5	"	5.0000		102	85-115			
Silver	0.440885	0.5	"	0.50000		88	85-115			
Thallium	4.27911	0.5	"	5.0000		86	85-115			
Vanadium	4.87090	0.5	"	5.0000		97	85-115			
Zinc	5.19698	0.5	"	5.0000		104	85-115			

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QC Data
Total Metals

Analyte	Result	Quantitation Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BJ80202 - Metals Solid prep										
LCS (BJ80202-BS2)				Prepared: 10/02/18 11:05		Analyzed: 10/10/18 14:19				
Aluminum	813.995	20.0	ug/g	800.00		102	85-115			
Barium	841.927	20.0	"	800.00		105	85-115			
Calcium	4117.80	50.0	"	4000.0		103	85-115			
Cobalt	195.265	5.0	"	200.00		98	85-115			
Iron	2007.39	10.0	"	2000.0		100	85-115			
Magnesium	4130.75	50.0	"	4000.0		103	85-115			
Manganese	194.928	1.5	"	200.00		97	85-115			
Potassium	8142.41	200	"	8000.0		102	85-115			
Sodium	4153.91	100	"	4000.0		104	85-115			
Zinc	202.378	2.0	"	200.00		101	85-115			
Duplicate (BJ80202-DUP1)		**Source: 1809011-15**		Prepared: 10/02/18 11:05		Analyzed: 10/03/18 12:31				
Antimony	U	0.5	ug/g		0.031292				35	
Arsenic	0.197459	0.5	"		0.273223			32	35	
Barium	4.75812	1.0	"		5.18995			9	35	
Beryllium	0.074325	0.5	"		0.107382			36	35	D
Cadmium	U	0.5	"		0.025260				35	
Chromium	0.219843	0.5	"		0.159892			32	35	
Cobalt	1.23820	0.5	"		1.47608			18	35	
Copper	0.142007	0.5	"		0.203803			36	35	D
Lead	0.597500	0.5	"		0.779892			26	35	
Manganese	12.1763	0.5	"		14.6662			19	35	
Nickel	0.221251	0.5	"		0.273700			21	35	
Selenium	U	0.5	"		0.053471				35	
Silver	U	0.5	"		0.015706				35	
Thallium	0.000392	0.5	"		0.025391			194	35	D
Vanadium	0.654881	0.5	"		0.984793			40	35	A
Zinc	2.93822	0.5	"		3.16634			7	35	

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Region 3 Environmental Science Center
Office of Analytical Services and Quality Assurance
701 Mapes Road
Fort Meade, Maryland 20755-5350

Site Name: BLADES GROUNDWATER **Project #: DAS R35442**

QC Data
Total Metals

Analyte	Result	Quantitation Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BJ80202 - Metals Solid prep										
Duplicate (BJ80202-DUP2)		**Source: 1809011-15**		Prepared: 10/02/18 11:05		Analyzed: 10/10/18 14:51				
Aluminum	311.690	19.7	ug/g		346.382			11	35	
Calcium	39.3895	49.3	"		48.7128			21	35	
Iron	553.238	9.9	"		615.178			11	35	
Magnesium	15.4811	49.3	"		16.4766			6	35	
Potassium	22.0035	197	"		22.8797			4	35	
Sodium	5.60994	98.6	"		6.34058			12	35	
Matrix Spike (BJ80202-MS1)		**Source: 1809011-16**		Prepared: 10/02/18 11:05		Analyzed: 10/03/18 12:40				
Antimony	4.35081	0.5	ug/g	4.9407	U	88	70-130			
Arsenic	5.53198	0.5	"	4.9407	0.613078	100	70-130			
Barium	26.1926	1.0	"	19.763	7.45941	95	70-130			
Beryllium	0.704947	0.5	"	0.49407	0.217048	99	70-130			
Cadmium	0.510526	0.5	"	0.49407	0.010848	101	70-130			
Chromium	6.23650	0.5	"	4.9407	1.32093	99	70-130			
Cobalt	25.6425	0.5	"	4.9407	22.0167	73	70-130			
Copper	7.90604	0.5	"	4.9407	3.12214	97	70-130			
Lead	8.01527	0.5	"	4.9407	3.55572	90	70-130			
Nickel	5.84807	0.5	"	4.9407	1.14604	95	70-130			
Selenium	5.40383	0.5	"	4.9407	0.027563	109	70-130			
Silver	0.499282	0.5	"	0.49407	U	101	70-130			
Thallium	4.34234	0.5	"	4.9407	0.014800	88	70-130			
Vanadium	8.14163	0.5	"	4.9407	3.79420	88	70-130			
Zinc	15.7859	0.5	"	4.9407	10.9003	99	70-130			
Matrix Spike (BJ80202-MS2)		**Source: 1809011-16**		Prepared: 10/02/18 11:05		Analyzed: 10/10/18 14:59				
Aluminum	5187.06	19.9	ug/g	795.23	1535.00	459	70-130			A
Calcium	4132.96	49.7	"	3976.1	101.049	101	70-130			
Iron	2965.23	9.9	"	1988.1	1029.28	97	70-130			
Magnesium	4130.45	49.7	"	3976.1	82.7863	102	70-130			
Manganese	293.738	1.5	"	198.81	129.468	83	70-130			
Potassium	7982.64	199	"	7952.3	54.5231	100	70-130			
Sodium	4059.36	99.4	"	3976.1	5.64646	102	70-130			

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Region 3 Environmental Science Center
Office of Analytical Services and Quality Assurance
701 Mapes Road
Fort Meade, Maryland 20755-5350

Site Name: BLADES GROUNDWATER **Project #: DAS R35442**

QC Data
Total Metals

Analyte	Result	Quantitation Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BJ80202 - Metals Solid prep										
Reference (BJ80202-SRM1)				Prepared: 10/02/18 11:05		Analyzed: 10/03/18 11:52				
Antimony	133.886	46.3	ug/g	94.000		142	22.7-257			
Arsenic	111.690	46.3	"	113.00		99	69.7-142.5			
Barium	155.089	92.6	"	155.00		100	72.9-174.3			
Beryllium	107.583	46.3	"	109.00		99	74.7-124.8			
Cadmium	62.0451	46.3	"	67.500		92	73.2-126.8			
Chromium	163.126	46.3	"	164.00		99	70.7-129.9			
Cobalt	88.5407	46.3	"	100.00		89	74.4-126			
Copper	115.511	46.3	"	128.00		90	75.2-125.8			
Lead	81.8947	46.3	"	90.100		91	70.1-129.9			
Manganese	321.073	46.3	"	363.00		88	75.8-124.5			
Nickel	79.4219	46.3	"	89.300		89	72-127.7			
Selenium	134.659	46.3	"	156.00		86	67.3-132.1			
Silver	49.4593	46.3	"	52.600		94	66.7-133.5			
Thallium	106.556	46.3	"	116.00		92	67.4-120.7			
Vanadium	86.3318	46.3	"	73.000		118	59.7-139.7			
Zinc	163.410	46.3	"	168.00		97	69-131.5			
Reference (BJ80202-SRM4)				Prepared: 10/02/18 11:05		Analyzed: 10/10/18 14:27				
Aluminum	6605.38	19.7	ug/g	8060.0		82	39.5-160			
Barium	152.385	19.7	"	155.00		98	72.9-174.3			
Calcium	5842.33	49.3	"	5850.0		100	73.7-126.5			
Cobalt	99.4798	4.9	"	100.00		99	74.4-126			
Iron	13072.9	9.9	"	15200		86	37.4-162.5			
Magnesium	2755.10	49.3	"	2790.0		99	65.2-135.1			
Manganese	344.639	1.5	"	363.00		95	75.8-124.5			
Potassium	2598.20	197	"	2770.0		94	61.7-138.3			
Sodium	712.263	98.6	"	686.00		104	55.8-144.2			
Zinc	166.114	2.0	"	168.00		99	69-131.5			

Site Name: BLADES GROUNDWATER **Project #: DAS R35442**

Notes and Definitions

UL	The analyte was not detected. The quantitation limit is probably higher due to indications of a low bias.
L	The identification of the analyte is acceptable; the reported value may be biased low. The actual value is expected to be greater than the reported value. Reported value is an estimate.
J	The identification of the analyte is acceptable; the reported value is an estimate.
dry	Reported on a Dry Weight Basis
D	Source sample result and/or duplicate sample result are below the quantitation limit and the RPD is artificially high. Precision data (RPD value) has no significance for this QC Sample.
B	Not detected substantially above (10 times) the level reported in the laboratory or field blanks (including field, trip, rinsate, and equipment blanks).
A	Quality control value is outside acceptance limits.
%REC	Percent Recovery
RPD	Relative Percent Difference
U	Analyte included in the analysis, but not detected at or above the quantitation limit.
NR	Not Reported

QUANTITATION LIMIT: The lowest concentration of an analyte that can be reliably measured within specified limits of precision and accuracy for a specific laboratory analytical method and that takes into account analytical adjustments made during sample preparation and analysis.

SOLID SAMPLE RESULTS - REPORTING PROTOCOL: Percent Solids (percent dry wt at 105 degrees C) determinations are routinely performed for most organic and inorganic analyses. Consequently, these samples are analyzed wet and converted to a dry weight result for reporting purposes. If metals and mercury analyses are requested, they are routinely prepared for analyses by an initial drying at 60 degrees C, homogenized prior to digestion, and are analyzed and reported on a dry weight basis. Oil-type samples are analyzed and reported on a wet weight basis for all analyses because of the nature of the sample matrix. Any exceptions to this protocol will be noted in the narrative.

ON-DEMAND: The term 'on-demand' analysis, if noted in the report narrative, refers to Section 13.1.4 in the Region III OASQA Laboratory Quality Manual, which provides procedures for non-routine analyses or analytes.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
Environmental Sciences Center
701 Mapes Road
Fort Meade, Maryland 20755-5350

DATE: 4/9/2019

SUBJECT: Region III Data QA Review

FROM: Brandon McDonald
Region III ESAT RPO (3EA22)

TO: CONNOR O'LOUGHLIN
Hazardous Site Cleanup Division (HSCD)

Attached is the data validation report for the BLADES GROUNDWATER site for DAS# R35443; SDG# C0AA0 completed by the Region III Environmental Services Assistance Team (ESAT) contractor, ICF International, under the direction of Region III EAID.

If you have any questions regarding this review, please call Brandon McDonald at (410) 305-2607 or you can call Eric Graybill at (410)-305-2665.

Attachment

cc: Ex. 4 CBI (WESTON SOLUTIONS)
Ex. 4 CBI (WESTON SOLUTIONS)

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ESAT Region 3
US Environmental Protection Agency Environmental Science Center
701 Mapes Road Ft. Meade, MD 20755-5350
Phone 410-305-3012

Date: April 2, 2019

To: Brandon McDonald
ESAT Region 3 Project Officer

From: Ex. 4 CBI
Validator

Ex. 4 CBI
Reviewer

Subject: Organic Data Validation (S4VM)
Blades Groundwater
R35443 C0AA0

Overview

This data package consisted of two (2) Field Reagent Blanks (FRBs) and ten (10) sediment samples analyzed for perfluorinated alkyl acid compounds by Liquid Chromatography/Mass Spectrometry (LC/MS). This sample set included a field duplicate sample.

Analyses were performed by Test America Sacramento (TAMC). The samples were submitted to the laboratory directly by the sampling contractor. The laboratory indicated analyses were performed according to a modified EPA Method 537 utilizing a quantitative isotope dilution-internal standard technique.

Data were validated according to the National Functional Guidelines for Organic Superfund Methods Data Review and applicable USEPA Region 3 modifications. The validation report has been assigned the Superfund Data Validation Label S4VM (Stage_4_Validation_Manual).

The following validation narrative is an evaluation of laboratory reported data based on the electronic data package received by Region 3 on December 17, 2018.

The laboratory did not provide sufficient data to determine if branched chain isomers of PFOA were included in the reporting of this analyte in field samples. No data were qualified based on this finding.

Summary

No significant data quality outliers or technical deficiencies were identified that would require rejection of sample results. Less significant data quality outliers resulting in estimation of sample results were identified including, but not limited to, surrogate recoveries as detailed below.

Minor Problem

The percent recovery for surrogate 13C2-PFHxA was outside the lower control limit for samples C0AC5 and C0AC6. These samples were not reanalyzed. These samples were non-detect for target analytes. Reporting Limits (RLs) are estimated and have been qualified "UJ".

Notes

Target analytes detected below RLs are estimated and have been qualified "J".

Region 3 policy requires a field reagent blank accompany every sample. This sample delivery group (SDG) only contains two (2) FRBs. This requirement is for purposes of determining the presence of contamination during field operations, as these target analytes are ubiquitous. Detected concentrations for target analytes in all field samples were less than the RLs. No data were qualified based on this outlier.

The laboratory did not provide a narrative for this data package. No data were qualified based on this finding.

Accuracy and precision criteria were met by the laboratory in the initial and continuing calibration verification standard analyses associated with the samples in this SDG.

Method blanks and FRBs associated with the samples in this SDG were free from contamination. FRBs reported a pH value of 7 and were found to be free of residual chlorine at the time of sample preparation by the laboratory. No data were qualified based on these findings.

Percent recoveries and Relative Percent Differences (RPDs) for target analytes in the Low Level Control Sample/Low Level Control Sample Duplicate (LLCS/LLCSD) analyses were within control limits. No data were qualified based on LLCS/LLCSD precision or accuracy.

Percent recoveries for target analytes in the Laboratory Control Sample (LCS) analyses were within control limits. No data were qualified based on LCS accuracy.

Percent recoveries and Relative Percent Differences (RPDs) for target analytes in Matrix Spike/Duplicate Matrix Spike (MS/MSD) analyses of sample C0AA4 were within control limits. No data were qualified based on MS/MSD precision or accuracy.

Results reported for field duplicate pair C0AA8/C0AA9 were comparable. No data were qualified based on field duplicate precision.

The laboratory's batch worksheet noted samples C0AA0, C0AA1, C0AA4, C0AA5, C0AA7, C0AA8 and C0AA9 were observed to be yellow in color. No data was qualified based on this finding.

Manual integrations were performed and identified by the laboratory. A subset of these was evaluated by the reviewer and found to be accurate and consistent. No action was taken by the reviewer based on manual integrations.

Glossary of Organic Data Qualifier Codes

Validation Qualifiers	In order of descending precedence. Only one of these qualifiers may apply to any result.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the sample.
UJ	The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit
J	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+	The result is an estimated quantity, but the result may be biased high.
J-	The result is an estimated quantity, but the result may be biased low.

Additional Qualifiers	Additional qualifiers may be combined with other qualifiers.
N	The analyte has been "tentatively identified" or "presumptively" as present.
B	The result is presumed a blank contaminant. This qualifier is used for drinking water samples only.
C	The target Pesticide or Aroclor analyte identification has been confirmed by Gas Chromatography/Mass Spectrometry (GC/MS). This qualifier may be added to other qualifiers.
X	The target Pesticide or Aroclor analyte identification was not confirmed when GC/MS analysis was performed. This qualifier may be added to other qualifiers.

Client: Weston Solutions, Inc.

Job Number: 320-43418-1

Client Sample ID: **C0AA0**

Lab Sample ID: 320-43418-1
Client Matrix: Solid
% Moisture: 39.3

Date Sampled: 09/19/2018 1545
Date Received: 09/21/2018 0920

537 (modified) Fluorinated Alkyl Substances

Analysis Method:	537 (modified)	Analysis Batch:	320-251903	Instrument ID:	A8_NC
Prep Method:	SHAKE	Prep Batch:	320-248055	Lab File ID:	2018.10.08LLB_025.d
Dilution:	1.0			Initial Weight/Volume:	5.03 g
Analysis Date:	10/09/2018 1055			Final Weight/Volume:	10.00 mL
Prep Date:	09/27/2018 0703			Injection Volume:	2 uL

Analyte DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Perfluorobutanesulfonic acid (PFBS)	ND		0.041	0.33
Perfluorohexanesulfonic acid (PFHxS)	0.073	J	0.051	0.33
Perfluoroheptanoic acid (PFHpA)	0.078	J	0.047	0.33
Perfluorooctanoic acid (PFOA)	0.15	J	0.14	0.33
Perfluorooctanesulfonic acid (PFOS)	ND		0.33	0.82
Perfluorononanoic acid (PFNA)	0.11	J	0.059	0.33
18O2 PFHxS	7.2			
13C4 PFHpA	7.0			
13C4 PFOA	7.6			
13C3 PFBS	6.9			
13C4 PFOS	7.0			
13C5 PFNA	7.7			

Client: Weston Solutions, Inc.

Job Number: 320-43418-1

Client Sample ID: **C0AA1**

Lab Sample ID: 320-43418-2
Client Matrix: Solid

% Moisture: 88.6

Date Sampled: 09/19/2018 1500
Date Received: 09/21/2018 0920

537 (modified) Fluorinated Alkyl Substances

Analysis Method:	537 (modified)	Analysis Batch:	320-251903	Instrument ID:	A8_NC
Prep Method:	SHAKE	Prep Batch:	320-248055	Lab File ID:	2018.10.08LLB_026.d
Dilution:	1.0			Initial Weight/Volume:	5.04 g
Analysis Date:	10/09/2018 1102			Final Weight/Volume:	10.00 mL
Prep Date:	09/27/2018 0703			Injection Volume:	2 uL

Analyte DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Perfluorobutanesulfonic acid (PFBS)	ND		0.22	1.7
Perfluorohexanesulfonic acid (PFHxS)	ND		0.27	1.7
Perfluoroheptanoic acid (PFHpA)	ND		0.25	1.7
Perfluorooctanoic acid (PFOA)	ND		0.75	1.7
Perfluorooctanesulfonic acid (PFOS)	ND		1.7	4.4
Perfluorononanoic acid (PFNA)	0.37	J	0.31	1.7
18O2 PFHxS	34			
13C4 PFHpA	35			
13C4 PFOA	37			
13C3 PFBS	33			
13C4 PFOS	18			
13C5 PFNA	29			

Client: Weston Solutions, Inc.

Job Number: 320-43418-1

Client Sample ID: **C0AA2**

Lab Sample ID: 320-43418-3
Client Matrix: Solid

% Moisture: 17.3

Date Sampled: 09/20/2018 0925
Date Received: 09/21/2018 0920

537 (modified) Fluorinated Alkyl Substances

Analysis Method:	537 (modified)	Analysis Batch:	320-251903	Instrument ID:	A8_NC
Prep Method:	SHAKE	Prep Batch:	320-248055	Lab File ID:	2018.10.08LLB_027.d
Dilution:	1.0			Initial Weight/Volume:	5.07 g
Analysis Date:	10/09/2018 1110			Final Weight/Volume:	10.00 mL
Prep Date:	09/27/2018 0703			Injection Volume:	2 uL

Analyte DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Perfluorobutanesulfonic acid (PFBS)	ND		0.030	0.24
Perfluorohexanesulfonic acid (PFHxS)	ND		0.037	0.24
Perfluoroheptanoic acid (PFHpA)	ND		0.035	0.24
Perfluorooctanoic acid (PFOA)	ND		0.10	0.24
Perfluorooctanesulfonic acid (PFOS)	ND		0.24	0.60
Perfluorononanoic acid (PFNA)	ND		0.043	0.24
18O2 PFHxS	4.7			
13C4 PFHpA	5.3			
13C4 PFOA	5.6			
13C3 PFBS	4.5			
13C4 PFOS	5.0			
13C5 PFNA	5.5			

Client: Weston Solutions, Inc.

Job Number: 320-43418-1

Client Sample ID: **C0AA3**

Lab Sample ID: 320-43418-4
Client Matrix: Solid

% Moisture: 17.2

Date Sampled: 09/19/2018 1345
Date Received: 09/21/2018 0920

537 (modified) Fluorinated Alkyl Substances

Analysis Method:	537 (modified)	Analysis Batch:	320-251903	Instrument ID:	A8_NC
Prep Method:	SHAKE	Prep Batch:	320-248055	Lab File ID:	2018.10.08LLB_028.d
Dilution:	1.0			Initial Weight/Volume:	5.10 g
Analysis Date:	10/09/2018 1117			Final Weight/Volume:	10.00 mL
Prep Date:	09/27/2018 0703			Injection Volume:	2 uL

Analyte DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Perfluorobutanesulfonic acid (PFBS)	ND		0.030	0.24
Perfluorohexanesulfonic acid (PFHxS)	ND		0.037	0.24
Perfluoroheptanoic acid (PFHpA)	ND		0.034	0.24
Perfluorooctanoic acid (PFOA)	ND		0.10	0.24
Perfluorooctanesulfonic acid (PFOS)	ND		0.24	0.59
Perfluorononanoic acid (PFNA)	ND		0.043	0.24
18O2 PFHxS	5.1			
13C4 PFHpA	5.7			
13C4 PFOA	5.8			
13C3 PFBS	4.9			
13C4 PFOS	5.1			
13C5 PFNA	5.6			

Client: Weston Solutions, Inc.

Job Number: 320-43418-1

Client Sample ID: **C0AA4**

Lab Sample ID: 320-43418-5
Client Matrix: Solid
% Moisture: 89.5

Date Sampled: 09/20/2018 1025
Date Received: 09/21/2018 0920

537 (modified) Fluorinated Alkyl Substances

Analysis Method:	537 (modified)	Analysis Batch:	320-251903	Instrument ID:	A8_NC
Prep Method:	SHAKE	Prep Batch:	320-248055	Lab File ID:	2018.10.08LLB_029.d
Dilution:	1.0			Initial Weight/Volume:	5.04 g
Analysis Date:	10/09/2018 1125			Final Weight/Volume:	10.00 mL
Prep Date:	09/27/2018 0703			Injection Volume:	2 uL

Analyte DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Perfluorobutanesulfonic acid (PFBS)	ND		0.24	1.9
Perfluorohexanesulfonic acid (PFHxS)	ND		0.29	1.9
Perfluoroheptanoic acid (PFHpA)	ND		0.27	1.9
Perfluorooctanoic acid (PFOA)	ND		0.81	1.9
Perfluorooctanesulfonic acid (PFOS)	ND		1.9	4.7
Perfluorononanoic acid (PFNA)	ND		0.34	1.9
18O2 PFHxS	39			
13C4 PFHpA	37			
13C4 PFOA	42			
13C3 PFBS	36			
13C4 PFOS	41			
13C5 PFNA	47			

Client: Weston Solutions, Inc.

Job Number: 320-43418-1

Client Sample ID: **C0AA5**

Lab Sample ID: 320-43418-6
Client Matrix: Solid

% Moisture: 89.3

Date Sampled: 09/20/2018 1135
Date Received: 09/21/2018 0920

537 (modified) Fluorinated Alkyl Substances

Analysis Method:	537 (modified)	Analysis Batch:	320-251903	Instrument ID:	A8_NC
Prep Method:	SHAKE	Prep Batch:	320-248055	Lab File ID:	2018.10.08LLB_032.d
Dilution:	1.0			Initial Weight/Volume:	5.00 g
Analysis Date:	10/09/2018 1147			Final Weight/Volume:	10.00 mL
Prep Date:	09/27/2018 0703			Injection Volume:	2 uL

Analyte DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Perfluorobutanesulfonic acid (PFBS)	ND		0.23	1.9
Perfluorohexanesulfonic acid (PFHxS)	ND		0.29	1.9
Perfluoroheptanoic acid (PFHpA)	0.31	J	0.27	1.9
Perfluorooctanoic acid (PFOA)	ND		0.80	1.9
Perfluorooctanesulfonic acid (PFOS)	2.1	J	1.9	4.7
Perfluorononanoic acid (PFNA)	0.47	J	0.34	1.9
18O2 PFHxS	35			
13C4 PFHpA	33			
13C4 PFOA	39			
13C3 PFBS	34			
13C4 PFOS	35			
13C5 PFNA	40			

Client: Weston Solutions, Inc.

Job Number: 320-43418-1

Client Sample ID: **C0AA6**

Lab Sample ID: 320-43418-7
Client Matrix: Solid
% Moisture: 24.8

Date Sampled: 09/19/2018 1245
Date Received: 09/21/2018 0920

537 (modified) Fluorinated Alkyl Substances

Analysis Method:	537 (modified)	Analysis Batch:	320-251903	Instrument ID:	A8_NC
Prep Method:	SHAKE	Prep Batch:	320-248055	Lab File ID:	2018.10.08LLB_034.d
Dilution:	1.0			Initial Weight/Volume:	5.05 g
Analysis Date:	10/09/2018 1202			Final Weight/Volume:	10.00 mL
Prep Date:	09/27/2018 0703			Injection Volume:	2 uL

Analyte DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Perfluorobutanesulfonic acid (PFBS)	ND		0.033	0.26
Perfluorohexanesulfonic acid (PFHxS)	ND		0.041	0.26
Perfluoroheptanoic acid (PFHpA)	ND		0.038	0.26
Perfluorooctanoic acid (PFOA)	ND		0.11	0.26
Perfluorooctanesulfonic acid (PFOS)	ND		0.26	0.66
Perfluorononanoic acid (PFNA)	ND		0.047	0.26
18O2 PFHxS	5.5			
13C4 PFHpA	5.9			
13C4 PFOA	6.1			
13C3 PFBS	5.3			
13C4 PFOS	5.8			
13C5 PFNA	6.4			

Client: Weston Solutions, Inc.

Job Number: 320-43418-1

Client Sample ID: **C0AA7**

Lab Sample ID: 320-43418-8
Client Matrix: Solid
% Moisture: 37.5

Date Sampled: 09/20/2018 1235
Date Received: 09/21/2018 0920

537 (modified) Fluorinated Alkyl Substances

Analysis Method:	537 (modified)	Analysis Batch:	320-251903	Instrument ID:	A8_NC
Prep Method:	SHAKE	Prep Batch:	320-248055	Lab File ID:	2018.10.08LLB_035.d
Dilution:	1.0			Initial Weight/Volume:	5.04 g
Analysis Date:	10/09/2018 1209			Final Weight/Volume:	10.00 mL
Prep Date:	09/27/2018 0703			Injection Volume:	2 uL

Analyte DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Perfluorobutanesulfonic acid (PFBS)	ND		0.040	0.32
Perfluorohexanesulfonic acid (PFHxS)	ND		0.049	0.32
Perfluoroheptanoic acid (PFHpA)	ND		0.046	0.32
Perfluorooctanoic acid (PFOA)	ND		0.14	0.32
Perfluorooctanesulfonic acid (PFOS)	ND		0.32	0.79
Perfluorononanoic acid (PFNA)	0.11	J	0.057	0.32
18O2 PFHxS	5.9			
13C4 PFHpA	6.2			
13C4 PFOA	7.1			
13C3 PFBS	5.8			
13C4 PFOS	5.8			
13C5 PFNA	6.6			

Client: Weston Solutions, Inc. Job Number: 320-43418-1

Client Sample ID: **C0AA8**

Lab Sample ID: 320-43418-9 Date Sampled: 09/19/2018 1045
Client Matrix: Solid % Moisture: 37.8 Date Received: 09/21/2018 0920

537 (modified) Fluorinated Alkyl Substances

Analysis Method:	537 (modified)	Analysis Batch:	320-251903	Instrument ID:	A8_NC
Prep Method:	SHAKE	Prep Batch:	320-248055	Lab File ID:	2018.10.08LLB_036.d
Dilution:	1.0			Initial Weight/Volume:	5.05 g
Analysis Date:	10/09/2018 1217			Final Weight/Volume:	10.00 mL
Prep Date:	09/27/2018 0703			Injection Volume:	2 uL

Analyte DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Perfluorobutanesulfonic acid (PFBS)	ND		0.040	0.32
Perfluorohexanesulfonic acid (PFHxS)	ND		0.049	0.32
Perfluoroheptanoic acid (PFHpA)	0.14	J	0.046	0.32
Perfluorooctanoic acid (PFOA)	0.22	J	0.14	0.32
Perfluorooctanesulfonic acid (PFOS)	0.43	J	0.32	0.80
Perfluorononanoic acid (PFNA)	0.27	J	0.057	0.32
18O2 PFHxS	6.6			
13C4 PFHpA	7.0			
13C4 PFOA	7.5			
13C3 PFBS	6.8			
13C4 PFOS	6.7			
13C5 PFNA	7.9			

Client: Weston Solutions, Inc.

Job Number: 320-43418-1

Client Sample ID: **C0AA9**

Lab Sample ID: 320-43418-10FD
Client Matrix: Solid
% Moisture: 38.5

Date Sampled: 09/19/2018 1050
Date Received: 09/21/2018 0920

537 (modified) Fluorinated Alkyl Substances

Analysis Method:	537 (modified)	Analysis Batch:	320-251903	Instrument ID:	A8_NC
Prep Method:	SHAKE	Prep Batch:	320-248055	Lab File ID:	2018.10.08LLB_037.d
Dilution:	1.0			Initial Weight/Volume:	5.08 g
Analysis Date:	10/09/2018 1224			Final Weight/Volume:	10.00 mL
Prep Date:	09/27/2018 0703			Injection Volume:	2 uL

Analyte DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Perfluorobutanesulfonic acid (PFBS)	ND		0.040	0.32
Perfluorohexanesulfonic acid (PFHxS)	ND		0.050	0.32
Perfluoroheptanoic acid (PFHpA)	0.13	J	0.046	0.32
Perfluorooctanoic acid (PFOA)	0.21	J	0.14	0.32
Perfluorooctanesulfonic acid (PFOS)	0.46	J	0.32	0.80
Perfluorononanoic acid (PFNA)	0.27	J	0.058	0.32
18O2 PFHxS	6.4			
13C4 PFHpA	7.2			
13C4 PFOA	7.4			
13C3 PFBS	6.5			
13C4 PFOS	7.0			
13C5 PFNA	7.9			

Client: Weston Solutions, Inc.

Job Number: 320-43418-1

Client Sample ID: **C0AC5**

Lab Sample ID: 320-43418-11FB
Client Matrix: Water

Date Sampled: 09/19/2018 1610
Date Received: 09/21/2018 0920

537 DW Perfluorinated Alkyl Acids (LC/MS)

Analysis Method:	537 DW	Analysis Batch:	320-249779	Instrument ID:	A8_N
Prep Method:	537 DW	Prep Batch:	320-249349	Lab File ID:	2018.10.04_537AA_0
Dilution:	1.0			Initial Weight/Volume:	290.2 mL
Analysis Date:	10/05/2018 0441			Final Weight/Volume:	10.00 mL
Prep Date:	10/03/2018 1137			Injection Volume:	2 uL

Analyte	Result (ng/L)	Qualifier	MDL	RL
Perfluorooctanesulfonic acid	ND	U3	0.82	1.7
Perfluorooctanoic acid	ND		2.3	5.2
Perfluorononanoic acid	ND		0.40	1.7
Perfluorohexanesulfonic acid	ND		0.55	1.7
Perfluoroheptanoic acid	ND		1.1	2.6
Perfluorobutanesulfonic acid	ND		0.69	1.7

Surrogate	%Rec	Qualifier	Acceptance Limits
13C2 PFHxA	17	X	70 - 130
13C2 PFDA	95		70 - 130

DJ
3/30/19

Client: Weston Solutions, Inc.

Job Number: 320-43418-1

Client Sample ID: **C0AC6**

Lab Sample ID: 320-43418-12FB
Client Matrix: Water

Date Sampled: 09/20/2018 1250
Date Received: 09/21/2018 0920

537 DW Perfluorinated Alkyl Acids (LC/MS)

Analysis Method:	537 DW	Analysis Batch:	320-249779	Instrument ID:	A8_N
Prep Method:	537 DW	Prep Batch:	320-249349	Lab File ID:	2018.10.04_537AA_04
Dilution:	1.0			Initial Weight/Volume:	278.8 mL
Analysis Date:	10/05/2018 0448			Final Weight/Volume:	10.00 mL
Prep Date:	10/03/2018 1137			Injection Volume:	2 uL

Analyte	Result (ng/L)	Qualifier	MDL	RL
Perfluorooctanesulfonic acid	ND	UJ	0.85	1.8
Perfluorooctanoic acid	ND		2.4	5.4
Perfluorononanoic acid	ND		0.42	1.8
Perfluorohexanesulfonic acid	ND		0.57	1.8
Perfluoroheptanoic acid	ND		1.2	2.7
Perfluorobutanesulfonic acid	ND		0.72	1.8

Surrogate	%Rec	Qualifier	Acceptance Limits
13C2 PFHxA	23	X	70 - 130
13C2 PFDA	100		70 - 130

DY 3/20/19

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
Environmental Sciences Center
701 Mapes Road
Fort Meade, Maryland 20755-5350

DATE: 4/18/2019

SUBJECT: Region III Data QA Review

FROM: Brandon McDonald
Region III ESAT RPO(3EA22)

TO: CONNOR O'LOUGHLIN
Hazardous Site Cleanup Division (HSCD)

Attached is the data validation report for the BLADES GROUNDWATER site for DAS# R35443; SDG# C0AK3 completed by the Region III Environmental Services Assistance Team(ESAT) contractor, ICF International, under the direction of Region III EAID.

If you have any questions regarding this review, please call Brandon McDonald at (410) 305-2607 or you can call Eric Graybill at (410)-305-2665.

Attachment

cc: Ex. 4 CBI (WESTON SOLUTIONS)
Ex. 4 CBI (WESTON SOLUTIONS)

TO: #0002 TDF: #1218051

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ICF
ESAT Region 3
US Environmental Protection Agency Environmental Science Center
701 Mapes Road Ft. Meade, MD 20755-5350
Phone 410-305-3012

Date: April 12, 2019

To: Brandon McDonald
ESAT Region 3 Project Officer

From: Ex. 4 CBI
Validator

Ex. 4 CBI
Reviewer

Subject: Organic Data Validation (S4VM)
Blades Groundwater
R35443 C0AK3

Overview

This data package consisted of two (2) Field Reagent Blanks (FRBs), two (2) rinsate blanks and five (5) soil samples analyzed for perfluorinated alkyl acid compounds by Liquid Chromatography/Mass Spectrometry (LC/MS). This sample set included a field duplicate sample.

Analyses were performed by Test America Sacramento (TAMC). The samples were submitted to the laboratory directly by the sampling contractor. The laboratory indicated analyses were performed according to a modified EPA Method 537 utilizing a quantitative isotope dilution-internal standard technique.

Data were validated according to the National Functional Guidelines for Organic Superfund Methods Data Review and applicable USEPA Region 3 modifications. The validation report has been assigned the Superfund Data Validation Label S4VM (Stage_4_Validation_Manual).

The following validation narrative is an evaluation of laboratory reported data based on the electronic data package received by Region 3 on December 10, 2018.

The laboratory did not provide sufficient data to determine if branched chain isomers of PFOA were included in the reporting of this analyte in field samples. No data were qualified based on this finding.

Summary

Blank contamination and technical holding time outliers were identified that required the rejection of sample results. Less significant data quality outliers resulting in estimation of sample results were identified including, but not limited to, lack of FRBs and surrogate recoveries as detailed below.

Major Problems

Samples C0AK5 and C0AN7 were re-extracted nine (9) days outside of the fourteen (14) days technical holding time due to a laboratory accident in which the rinse solvents for each sample were inadvertently poured into the other. The initial and reanalyzed results for both samples were comparable. The reanalyzed samples were reported by the reviewer. Detected concentrations in these samples are estimated and have been qualified "J-". Reporting Limits (RLs) are unusable and have been qualified "R".

Perfluorooctanoic acid (PFOA) was reported in Method Blank (MB) 320-260994/1-A greater than one-third (1/3) the RLs. Re-extracted samples C0AK5 and C0AK7 were associated with this MB and reported detected concentrations of this target analyte less than 10x the blank contamination. These results are unusable and have been qualified "R".

Minor Problems

Region 3 policy requires a field reagent blank (FRB) for each sample to evaluate contamination during field operations, as these target analytes can be ubiquitous. This sample delivery group (SDG) only contains two (2) FRBs but at least one for each day of sample collection. Detected concentrations for target analytes are estimated and have been qualified "J".

The percent recoveries for surrogate 13C2-PFHxA were outside the lower control limit for samples C0AK8 and C0AK9. These samples were re-analyzed yielding similar results. The laboratory reported the initial analyses. These samples were non-detect for target analytes. RLs are estimated and have been qualified "UJ".

Notes

Analytes detected below RLs are estimated and have been qualified "J" unless qualified "U" for blank contamination.

Accuracy and precision criteria were met by the laboratory in the initial and continuing calibration verification standard analyses associated with the samples in this SDG.

The rinsate blanks and FRBs associated with the samples in this SDG were free from contamination. FRBs reported a pH value of 8 and were found to be free of residual chlorine at the time of sample preparation by the laboratory. No data were qualified based on these findings.

MBs associated with samples in this SDG were free from contamination except for MB 320-258333/1-A and MB 320-260994/1-A. Perfluorohexanesulfonic acid (PFHxS) was reported in MB 320-258333/1-A less than one-third (1/3) the RLs. Detected concentration of this target analyte in associated sample C0AK3 has been reported and qualified "U". MB 320-260994/1-A was qualified as described in "Major Problem".

Percent recoveries for target analytes in the Laboratory Control Sample (LCS) analyses were within control limits. No field sample data were qualified based on LCS accuracy.

Percent recoveries and Relative Percent Differences (RPDs) for target analytes in the Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) analyses were within control limits. No field sample data were qualified based on these findings.

Percent recoveries and RPDs for target analytes in Matrix Spike/Duplicate Matrix Spike (MS/MSD) analyses of sample C0AK4 were within control limits. No data were qualified based on MS/MSD precision or accuracy.

The MS/MSD analyses of sample C0AK5 was performed outside of the technical holding time. Percent recoveries and RPDs for target analytes were within control limits. No data were qualified based on this these findings.

Results reported for field duplicate pair C0AK3/C0AN8 were comparable. No data were qualified based on field duplicate precision.

Manual integrations were performed and identified by the laboratory. A subset of these was evaluated by the reviewer and found to be accurate and consistent. No action was taken by the reviewer based on manual integrations.

Glossary of Organic Data Qualifier Codes

Validation Qualifiers	In order of descending precedence. Only one of these qualifiers may apply to any result.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the sample.
UJ	The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit
J	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+	The result is an estimated quantity, but the result may be biased high.
J-	The result is an estimated quantity, but the result may be biased low.

Additional Qualifiers	Additional qualifiers may be combined with other qualifiers.
N	The analyte has been "tentatively identified" or "presumptively" as present.
B	The result is presumed a blank contaminant. This qualifier is used for drinking water samples only.
C	The target Pesticide or Aroclor analyte identification has been confirmed by Gas Chromatography/Mass Spectrometry (GC/MS). This qualifier may be added to other qualifiers.
X	The target Pesticide or Aroclor analyte identification was not confirmed when GC/MS analysis was performed. This qualifier may be added to other qualifiers.

Client: Weston Solutions, Inc.

Job Number: 320-44891-1

Client Sample ID: **C0AK3**

Lab Sample ID: 320-44891-1
Client Matrix: Solid

% Moisture: 6.1

Date Sampled: 10/29/2018 1401
Date Received: 11/03/2018 0915

537 (modified) Fluorinated Alkyl Substances

Analysis Method:	537 (modified)	Analysis Batch:	320-261348	Instrument ID:	A9
Prep Method:	SHAKE	Prep Batch:	320-258333	Lab File ID:	2018.11.26LLA_024.d
Dilution:	1.0			Initial Weight/Volume:	4.99 g
Analysis Date:	11/26/2018 1259			Final Weight/Volume:	10.00 mL
Prep Date:	11/10/2018 1042			Injection Volume:	20 uL

Analyte DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Perfluorobutanesulfonic acid (PFBS)	ND		0.027	0.21
Perfluorohexanesulfonic acid (PFHxS)	0.045	~~JB~~ u	0.033	0.21
Perfluoroheptanoic acid (PFHpA)	0.060	J	0.031	0.21
Perfluorooctanoic acid (PFOA)	0.18	J	0.092	0.21
Perfluorooctanesulfonic acid (PFOS)	11	J	0.21	0.53
Perfluorononanoic acid (PFNA)	0.062	J	0.038	0.21
18O2 PFHxS	3.7			
13C4 PFHpA	4.0			
13C4 PFOA	4.3			
13C3 PFBS	3.4			
13C4 PFOS	3.7			
13C5 PFNA	4.4			

DV
4/12/19

Client: Weston Solutions, Inc.

Job Number: 320-44891-1

Client Sample ID: **C0AK4**

Lab Sample ID: 320-44891-2
Client Matrix: Solid

% Moisture: 4.6

Date Sampled: 10/29/2018 1410
Date Received: 11/03/2018 0915

537 (modified) Fluorinated Alkyl Substances

Analysis Method:	537 (modified)	Analysis Batch:	320-261575	Instrument ID:	A9
Prep Method:	SHAKE	Prep Batch:	320-258333	Lab File ID:	2018.11.27LLD_041.d
Dilution:	1.0			Initial Weight/Volume:	5.07 g
Analysis Date:	11/28/2018 0734			Final Weight/Volume:	10.00 mL
Prep Date:	11/10/2018 1042			Injection Volume:	20 uL

Analyte DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Perfluorobutanesulfonic acid (PFBS)	ND		0.026	0.21
Perfluorohexanesulfonic acid (PFHxS)	ND		0.032	0.21
Perfluoroheptanoic acid (PFHpA)	ND		0.030	0.21
Perfluorooctanoic acid (PFOA)	ND		0.089	0.21
Perfluorooctanesulfonic acid (PFOS)	2.6	J	0.21	0.52
Perfluorononanoic acid (PFNA)	ND		0.037	0.21
18O2 PFHxS	3.8			
13C4 PFHpA	4.1			
13C4 PFOA	4.6			
13C3 PFBS	3.6			
13C4 PFOS	4.3			
13C5 PFNA	4.9			

DV
4/12/19

Client: Weston Solutions, Inc. Job Number: 320-44891-1

Client Sample ID: **C0AK5**

Lab Sample ID: 320-44891-3 Date Sampled: 10/31/2018 1300
Client Matrix: Solid % Moisture: 8.9 Date Received: 11/03/2018 0915

537 (modified) Fluorinated Alkyl Substances

Analysis Method:	537 (modified)	Analysis Batch:	320-262519	Instrument ID:	A9
Prep Method:	SHAKE	Prep Batch:	320-260994	Lab File ID:	2018.12.01LLA_063.d
Dilution:	1.0			Initial Weight/Volume:	5.09 g
Analysis Date:	12/02/2018 0313	Run Type:	RE	Final Weight/Volume:	10.00 mL
Prep Date:	11/23/2018 1409			Injection Volume:	20 uL

Analyte DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Perfluorobutanesulfonic acid (PFBS)	ND	~~H~~ R	0.027	0.22
Perfluorohexanesulfonic acid (PFHxS)	ND	~~H~~ R	0.033	0.22
Perfluoroheptanoic acid (PFHpA)	ND	~~H~~ R	0.031	0.22
Perfluorooctanoic acid (PFOA)	0.14	~~H~~ B R	0.093	0.22
Perfluorooctanesulfonic acid (PFOS)	0.54	~~H~~ J	0.22	0.54
Perfluorononanoic acid (PFNA)	ND	~~H~~ R	0.039	0.22
18O2 PFHxS	4.6			
13C4 PFHpA	4.9			
13C4 PFOA	5.1			
13C3 PFBS	4.8			
13C4 PFOS	4.3			
13C5 PFNA	4.9			

DV
4/12/19

Client: Weston Solutions, Inc.

Job Number: 320-44891-1

Client Sample ID: **C0AN7**

Lab Sample ID: 320-44891-8
Client Matrix: Solid
% Moisture: 11.6

Date Sampled: 10/31/2018 1245
Date Received: 11/03/2018 0915

537 (modified) Fluorinated Alkyl Substances

Analysis Method:	537 (modified)	Analysis Batch:	320-262519	Instrument ID:	A9
Prep Method:	SHAKE	Prep Batch:	320-260994	Lab File ID:	2018.12.01LLA_066.d
Dilution:	1.0			Initial Weight/Volume:	5.07 g
Analysis Date:	12/02/2018 0336	Run Type:	RE	Final Weight/Volume:	10.00 mL
Prep Date:	11/23/2018 1409			Injection Volume:	20 uL

Analyte DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Perfluorobutanesulfonic acid (PFBS)	ND	~~H~~ R	0.028	0.22
Perfluorohexanesulfonic acid (PFHxS)	ND	~~H~~ R	0.035	0.22
Perfluoroheptanoic acid (PFHpA)	0.052	~~J H~~ J	0.032	0.22
Perfluorooctanoic acid (PFOA)	0.10	~~J H B~~ R	0.096	0.22
Perfluorooctanesulfonic acid (PFOS)	2.3	~~H~~ J	0.22	0.56
Perfluorononanoic acid (PFNA)	0.041	~~J H~~ J	0.040	0.22
18O2 PFHxS	4.3			
13C4 PFHpA	4.9			
13C4 PFOA	5.0			
13C3 PFBS	4.2			
13C4 PFOS	4.1			
13C5 PFNA	4.8			

DV
4/12/19

Client: Weston Solutions, Inc.

Job Number: 320-44891-1

Client Sample ID: **C0AN8**

Lab Sample ID: 320-44891-9
Client Matrix: Solid

% Moisture: 7.1

Date Sampled: 10/29/2018 1400
Date Received: 11/03/2018 0915

537 (modified) Fluorinated Alkyl Substances

Analysis Method:	537 (modified)	Analysis Batch:	320-261575	Instrument ID:	A9
Prep Method:	SHAKE	Prep Batch:	320-258333	Lab File ID:	2018.11.27LLD_046.d
Dilution:	1.0			Initial Weight/Volume:	5.02 g
Analysis Date:	11/28/2018 0812			Final Weight/Volume:	10.00 mL
Prep Date:	11/10/2018 1042			Injection Volume:	20 uL

Analyte DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Perfluorobutanesulfonic acid (PFBS)	ND		0.027	0.21
Perfluorohexanesulfonic acid (PFHxS)	ND		0.033	0.21
Perfluoroheptanoic acid (PFHpA)	0.061	J	0.031	0.21
Perfluorooctanoic acid (PFOA)	0.19	J	0.092	0.21
Perfluorooctanesulfonic acid (PFOS)	11	~~J~~	0.21	0.54
Perfluorononanoic acid (PFNA)	0.068	J	0.039	0.21
18O2 PFHxS	3.9			
13C4 PFHpA	4.3			
13C4 PFOA	4.7			
13C3 PFBS	3.5			
13C4 PFOS	4.1			
13C5 PFNA	4.8			

DV
4/12/19

Client: Weston Solutions, Inc.

Job Number: 320-44891-1

Client Sample ID: **C0AL3**

Lab Sample ID: 320-44891-6
Client Matrix: Water

Date Sampled: 10/29/2018 1330
Date Received: 11/03/2018 0915

537 DW Perfluorinated Alkyl Acids (LC/MS)

Analysis Method:	537 DW	Analysis Batch:	320-258584	Instrument ID:	A8_N
Prep Method:	537 DW	Prep Batch:	320-258332	Lab File ID:	2018.11.12_537A_021
Dilution:	1.0			Initial Weight/Volume:	276.5 mL
Analysis Date:	11/12/2018 1034			Final Weight/Volume:	10.00 mL
Prep Date:	11/10/2018 1040			Injection Volume:	10 uL

Analyte	Result (ng/L)	Qualifier	MDL	RL
Perfluorooctanesulfonic acid	ND		0.86	1.8
Perfluorooctanoic acid	ND		2.4	5.4
Perfluorononanoic acid	ND		0.42	1.8
Perfluorohexanesulfonic acid	ND		0.58	1.8
Perfluoroheptanoic acid	ND		1.2	2.7
Perfluorobutanesulfonic acid	ND		0.72	1.8

Surrogate	%Rec	Qualifier	Acceptance Limits
13C2 PFHxA	102		70 - 130
13C2 PFDA	99		70 - 130

Client: Weston Solutions, Inc.

Job Number: 320-44891-1

Client Sample ID: **C0AL4**

Lab Sample ID: 320-44891-7
Client Matrix: Water

Date Sampled: 10/31/2018 1205
Date Received: 11/03/2018 0915

537 DW Perfluorinated Alkyl Acids (LC/MS)

Analysis Method:	537 DW	Analysis Batch:	320-258584	Instrument ID:	A8_N
Prep Method:	537 DW	Prep Batch:	320-258332	Lab File ID:	2018.11.12_537A_022
Dilution:	1.0			Initial Weight/Volume:	278.2 mL
Analysis Date:	11/12/2018 1041			Final Weight/Volume:	10.00 mL
Prep Date:	11/10/2018 1040			Injection Volume:	10 uL

Analyte	Result (ng/L)	Qualifier	MDL	RL
Perfluorooctanesulfonic acid	ND		0.85	1.8
Perfluorooctanoic acid	ND		2.4	5.4
Perfluorononanoic acid	ND		0.42	1.8
Perfluorohexanesulfonic acid	ND		0.58	1.8
Perfluoroheptanoic acid	ND		1.2	2.7
Perfluorobutanesulfonic acid	ND		0.72	1.8

Surrogate	%Rec	Qualifier	Acceptance Limits
13C2 PFHxA	104		70 - 130
13C2 PFDA	101		70 - 130

Client: Weston Solutions, Inc.

Job Number: 320-44891-1

Client Sample ID: **C0AK8**

Lab Sample ID: 320-44891-4
Client Matrix: Water

Date Sampled: 10/29/2018 1430
Date Received: 11/03/2018 0915

537 DW Perfluorinated Alkyl Acids (LC/MS)

Analysis Method:	537 DW	Analysis Batch:	320-258584	Instrument ID:	A8_N
Prep Method:	537 DW	Prep Batch:	320-258332	Lab File ID:	2018.11.12_537A_019
Dilution:	1.0			Initial Weight/Volume:	280.2 mL
Analysis Date:	11/12/2018 1019			Final Weight/Volume:	10.00 mL
Prep Date:	11/10/2018 1040			Injection Volume:	10 uL

Analyte	Result (ng/L)	Qualifier	MDL	RL
Perfluorooctanesulfonic acid	ND	U3	0.85	1.8
Perfluorooctanoic acid	ND		2.4	5.4
Perfluorononanoic acid	ND		0.42	1.8
Perfluorohexanesulfonic acid	ND		0.57	1.8
Perfluoroheptanoic acid	ND		1.2	2.7
Perfluorobutanesulfonic acid	ND		0.71	1.8

Surrogate	%Rec	Qualifier	Acceptance Limits
13C2 PFHxA	10	X	70 - 130
13C2 PFDA	91		70 - 130

DV
4/12/19

Client: Weston Solutions, Inc.

Job Number: 320-44891-1

Client Sample ID: **C0AK9**

Lab Sample ID: 320-44891-5
Client Matrix: Water

Date Sampled: 10/31/2018 1155
Date Received: 11/03/2018 0915

537 DW Perfluorinated Alkyl Acids (LC/MS)

Analysis Method:	537 DW	Analysis Batch:	320-258584	Instrument ID:	A8_N
Prep Method:	537 DW	Prep Batch:	320-258332	Lab File ID:	2018.11.12_537A_020
Dilution:	1.0			Initial Weight/Volume:	260.7 mL
Analysis Date:	11/12/2018 1026			Final Weight/Volume:	10.00 mL
Prep Date:	11/10/2018 1040			Injection Volume:	10 uL

Analyte	Result (ng/L)	Qualifier	MDL	RL
Perfluorooctanesulfonic acid	ND	UJ	0.91	1.9
Perfluorooctanoic acid	ND		2.6	5.8
Perfluorononanoic acid	ND		0.45	1.9
Perfluorohexanesulfonic acid	ND		0.61	1.9
Perfluoroheptanoic acid	ND		1.2	2.9
Perfluorobutanesulfonic acid	ND		0.77	1.9

Surrogate	%Rec	Qualifier	Acceptance Limits
13C2 PFHxA	10	X	70 - 130
13C2 PFDA	95		70 - 130

DU
4/12/19

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
Environmental Sciences Center
701 Mapes Road
Fort Meade, Maryland 20755-5350

DATE: 11/21/2018

SUBJECT: Region III Data QA Review

FROM: Brandon McDonald
Region III ESAT RPO (3EA22)

TO: CONNOR O'LOUGHLIN
Hazardous Site Cleanup Division (HSCD)

Attached is the data validation report for the BLADES GROUNDWATER site for DAS# R35443; SDG# WES004 completed by the Region III Environmental Services Assistance Team (ESAT) contractor, ICF International, under the direction of Region III EAID.

If you have any questions regarding this review, please call Brandon McDonald at (410) 305-2607 or you can call Eric Graybill at (410)-305-2665.

Attachment

cc: Ex. 4 CBI (WESTON SOLUTIONS)
Ex. 4 CBI (WESTON SOLUTIONS)

TO: #0002 TDF: #1018054

Printed on 100% recycled/recyclable paper with 100% post-consumer fiber and process chlorine free.
Customer Service Hotline: 1-800-438-2474

ICF
ESAT Region 3
US Environmental Protection Agency Environmental Science Center
701 Mapes Road Ft. Meade, MD 20755-5350
Phone 410-305-3012

Date: November 1, 2018

To: Brandon McDonald
ESAT Region 3 Project Officer

From: Ex. 4 CBI
Validator

Ex. 4 CBI
Reviewer

Subject: Inorganic Data Validation (S4VM)
Blades Groundwater
R35443 WES004

Overview

This data package consisted of ten (10) sediment samples, including a field duplicate pair, analyzed for hexavalent chromium by colorimetry and ten (10) surface water samples, including a field duplicate pair, analyzed for hexavalent chromium by ion chromatography.

Analyses were performed by ALS Environmental (ALS). The samples were submitted to the laboratory directly by the sampling contractor. The laboratory indicated analyses were performed based on SW 846 Method 7196A (colorimetry) and EPA Method 218.7 (ion chromatography).

Data were validated according to the National Functional Guidelines for Inorganic Superfund Methods Data Review and applicable USEPA Region 3 modifications. The validation report has been assigned the Superfund Data Validation Level Stage_4_Validation_Manual (S4VM).

The following validation narrative is an evaluation of laboratory reported data based on the hard copy data package received by Region 3 on October 17, 2018.

Summary

Matrix spike recoveries outside method requirement require rejection of sample results. No less significant data quality outliers resulting in estimation of sample results were identified.

Major Problem

Both insoluble and soluble matrix spike recoveries and the post-digestion soluble spike recovery for sediment sample MC0AA9 were outside the lower control limits. Method 7196A requires reanalysis whenever the matrix spike recovery is outside control limits to ensure that no interferences or reducing condition is suppressing results. No re-analyses were performed. The sediment results are unusable and have been qualified "R".

Notes

Hexavalent chromium has been detected in the method blank associated with the sediment samples in this SDG. Samples which reported detected concentrations less than the Reporting Detection Limit (RDL) have been reported at the RDL and were qualified "R" as noted above.

All concentrations detected below the Reporting Detection Limit (RDL) were attributed to blank contamination.

Accuracy and precision criteria were met by the laboratory in the initial and continuing calibration verification standard analyses associated with the samples in this SDG.

Laboratory blanks associated with the surface water samples in this SDG were free from contamination.

Laboratory Control Sample analyses were within control limits for both matrices.

The Laboratory Duplicate analysis for sediment sample MC0AA9 was within control limits.

No detected concentrations for hexavalent chromium were reported in field duplicate pairs MC0AA8/MC0AA9 and MC0AC1/MC0AC2. No data were qualified based on field duplicate precision.

Glossary of Inorganic Data Qualifier Codes

Validation Qualifiers	In order of descending precedence. Only one of these qualifiers may apply to any result.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the sample.
UJ	The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit
B	The result is presumed a blank contaminant. This qualifier is used for drinking water samples only.
J	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+	The result is an estimated quantity, but the result may be biased high.
J-	The result is an estimated quantity, but the result may be biased low.

ALS Environmental

34 Dogwood Lane ▪ Middletown, PA 17057 ▪ Phone: 717-944-5541 ▪ Fax: 717-944-1430 ▪ www.alsglobal.com

NELAP Certifications: NJ PA010, NY 11759, PA 22-293 DoD ELAP: A2LA 0818.01
State Certifications: DE ID 11, MA PA0102, MD 128, VA 460157, WV 343

ANALYTICAL RESULTS

Workorder: 2339757 WES004|CASE R35443 30250.016.0

Lab ID: **2339757001** Date Collected: 9/19/2018 15:45 Matrix: Solid

Sample ID: **MC0AA0** Date Received: 9/21/2018 09:05

Parameters	Results	Flag	Units	RDL	MDL	Method	Prepared	By	Analyzed	By	Cntr
WET CHEMISTRY	3.2	R									
Hexavalent Chromium	~~1.25~~	~~J~~	mg/kg	3.2	0.61	SW846 7196A	9/27/18 17:25	VXF	9/27/18 21:05	VXF	A
Moisture	39.5		%	0.1	0.01	S2540G-11			9/25/18 14:23	AXD	A
Total Solids	60.5		%	0.1	0.01	S2540G-11			9/25/18 14:23	AXD	A

Ex. 4 CBI

Project Coordinator

D.V.
11/1/18

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ANALYTICAL RESULTS

Workorder: 2339757 WES004¡CASE R35443 30250.016.0

Lab ID: **2339757002** Date Collected: 9/19/2018 15:00 Matrix: Solid

Sample ID: **MC0AA1** Date Received: 9/21/2018 09:05

Parameters	Results	Flag	Units	RDL	MDL	Method	Prepared	By	Analyzed	By	Cntr
WET CHEMISTRY		R									
Hexavalent Chromium	15.1 U	~~U~~	mg/kg	15.1	2.8	SW846 7196A	9/27/18 17:25	VXF	9/27/18 21:05	VXF	A
Moisture	87.0		%	0.1	0.01	S2540G-11			9/25/18 14:23	AXD	A
Total Solids	13.0		%	0.1	0.01	S2540G-11			9/25/18 14:23	AXD	A

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ANALYTICAL RESULTS

Workorder: 2339757 WES004|CASE R35443 30250.016.0

Lab ID: **2339757003** Date Collected: 9/20/2018 09:25 Matrix: Solid

Sample ID: **MC0AA2** Date Received: 9/21/2018 09:05

Parameters	Results	Flag	Units	RDL	MDL	Method	Prepared By	Analyzed	By	Cntr
WET CHEMISTRY		R								
Hexavalent Chromium	2.5 U	~~U~~	mg/kg	2.5	0.46	SW846 7196A	9/27/18 17:25 VXF	9/27/18 21:05	VXF	A
Moisture	19.8		%	0.1	0.01	S2540G-11		9/25/18 14:23	AXD	A
Total Solids	80.2		%	0.1	0.01	S2540G-11		9/25/18 14:23	AXD	A

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ANALYTICAL RESULTS

Workorder: 2339757 WES004|CASE R35443 30250.016.0

Lab ID: **2339757004** Date Collected: 9/19/2018 13:45 Matrix: Solid

Sample ID: **MC0AA3** Date Received: 9/21/2018 09:05

Parameters	Results	Flag	Units	RDL	MDL	Method	Prepared	By	Analyzed	By	Cntr
WET CHEMISTRY		R									
Hexavalent Chromium	2.4 U	~~U~~	mg/kg	2.4	0.46	SW846 7196A	9/27/18 17:25	VXF	9/27/18 21:05	VXF	A
Moisture	19.4		%	0.1	0.01	S2540G-11			9/25/18 14:23	AXD	A
Total Solids	80.6		%	0.1	0.01	S2540G-11			9/25/18 14:23	AXD	A

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ANALYTICAL RESULTS

Workorder: 2339757 WES004|CASE R35443 30250.016.0

Lab ID: **2339757005** Date Collected: 9/20/2018 10:25 Matrix: Solid
Sample ID: **MC0AA4** Date Received: 9/21/2018 09:05

Parameters	Results	Flag	Units	RDL	MDL	Method	Prepared	By	Analyzed	By	Cntr
WET CHEMISTRY											
Hexavalent Chromium	17.2 U	R	mg/kg	17.2	3.2	SW846 7196A	9/27/18 17:25	VXF	9/27/18 21:05	VXF	A
Moisture	88.7		%	0.1	0.01	S2540G-11			9/25/18 14:23	AXD	A
Total Solids	11.3		%	0.1	0.01	S2540G-11			9/25/18 14:23	AXD	A

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ANALYTICAL RESULTS

Workorder: 2339757 WES004|CASE R35443 30250.016.0

Lab ID: **2339757006** Date Collected: 9/20/2018 11:35 Matrix: Solid

Sample ID: **MC0AA5** Date Received: 9/21/2018 09:05

Parameters	Results	Flag	Units	RDL	MDL	Method	Prepared	By	Analyzed	By	Cntr
WET CHEMISTRY	15.5	R									
Hexavalent Chromium	4.0J	✓	mg/kg	15.5	2.9	SW846 7196A	9/27/18 17:25	VXF	9/27/18 21:05	VXF	A
Moisture	87.2		%	0.1	0.01	S2540G-11			9/25/18 14:23	AXD	A
Total Solids	12.8		%	0.1	0.01	S2540G-11			9/25/18 14:23	AXD	A

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ANALYTICAL RESULTS

Workorder: 2339757 WES004|CASE R35443 30250.016.0

Lab ID: **2339757007** Date Collected: 9/19/2018 12:45 Matrix: Solid

Sample ID: **MC0AA6** Date Received: 9/21/2018 09:05

Parameters	Results	Flag	Units	RDL	MDL	Method	Prepared	By	Analyzed	By	Cntr
WET CHEMISTRY											
Hexavalent Chromium	~~0.563~~ 2.7	~~✓~~ R	mg/kg	2.7	0.51	SW846 7196A	9/27/18 17:25	VXF	9/27/18 21:05	VXF	A
Moisture	27.1		%	0.1	0.01	S2540G-11			9/25/18 14:23	AXD	A
Total Solids	72.9		%	0.1	0.01	S2540G-11			9/25/18 14:23	AXD	A

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ANALYTICAL RESULTS

Workorder: 2339757 WES004|CASE R35443 30250.016.0

Lab ID: **2339757008** Date Collected: 9/20/2018 12:35 Matrix: Solid

Sample ID: **MC0AA7** Date Received: 9/21/2018 09:05

Parameters	Results	Flag	Units	RDL	MDL	Method	Prepared	By	Analyzed	By	Cntr
WET CHEMISTRY		R									
Hexavalent Chromium	3.3 U	V	mg/kg	3.3	0.61	SW846 7196A	9/27/18 17:25	VXF	9/27/18 21:05	VXF	A
Moisture	38.8		%	0.1	0.01	S2540G-11			9/25/18 14:23	AXD	A
Total Solids	61.2		%	0.1	0.01	S2540G-11			9/25/18 14:23	AXD	A

DV
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ANALYTICAL RESULTS

Workorder: 2339757 WES004|CASE R35443 30250.016.0

Lab ID: **2339757009** Date Collected: 9/19/2018 10:45 Matrix: Solid
Sample ID: **MC0AA8** Date Received: 9/21/2018 09:05

Parameters	Results	Flag	Units	RDL	MDL	Method	Prepared	By	Analyzed	By	Cntr
WET CHEMISTRY		R									
Hexavalent Chromium	3.4 U	V	mg/kg	3.4	0.63	SW846 7196A	9/27/18 17:25	VXF	9/27/18 21:05	VXF	A
Moisture	41.4		%	0.1	0.01	S2540G-11			9/25/18 14:23	AXD	A
Total Solids	58.6		%	0.1	0.01	S2540G-11			9/25/18 14:23	AXD	A

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ANALYTICAL RESULTS

Workorder: 2339757 WES004|CASE R35443 30250.016.0

Lab ID: **2339757010** Date Collected: 9/19/2018 10:50 Matrix: Solid

Sample ID: **MC0AA9** Date Received: 9/21/2018 09:05

Parameters	Results	Flag	Units	RDL	MDL	Method	Prepared	By	Analyzed	By	Cntr
WET CHEMISTRY											
Hexavalent Chromium	3.3 U	~~U1~~ R	mg/kg	3.3	0.62	SW846 7196A	9/27/18 17:25	VXF	9/27/18 21:05	VXF	A
Moisture	39.8		%	0.1	0.01	S2540G-11			9/25/18 14:23	AXD	A
Total Solids	60.2		%	0.1	0.01	S2540G-11			9/25/18 14:23	AXD	A

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ANALYTICAL RESULTS

Workorder: 2339757 WES004|CASE R35443 30250.016.0

Lab ID: **2339757011** Date Collected: 9/19/2018 14:55 Matrix: Water

Sample ID: **MC0AB1** Date Received: 9/21/2018 09:05

Parameters	Results	Flag	Units	RDL	MDL	Method	Prepared By	Analyzed	By	Cntr
WET CHEMISTRY										
Hexavalent Chromium	0.030 U	U	ug/L	0.030	0.0061	EPA 218.7		9/29/18 04:58	MBW	A

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ANALYTICAL RESULTS

Workorder: 2339757 WES004|CASE R35443 30250.016.0

Lab ID: **2339757012** Date Collected: 9/20/2018 09:20 Matrix: Water

Sample ID: **MC0AB2** Date Received: 9/21/2018 09:05

Parameters	Results	Flag	Units	RDL	MDL	Method	Prepared By	Analyzed	By	Cntr
WET CHEMISTRY										
Hexavalent Chromium	0.030 U	U	ug/L	0.030	0.0061	EPA 218.7		9/29/18 05:08	MBW	A

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ANALYTICAL RESULTS

Workorder: 2339757 WES004|CASE R35443 30250.016.0

Lab ID: **2339757013** Date Collected: 9/19/2018 13:40 Matrix: Water

Sample ID: **MC0AB3** Date Received: 9/21/2018 09:05

Parameters	Results	Flag	Units	RDL	MDL	Method	Prepared By	Analyzed	By	Cntr
WET CHEMISTRY										
Hexavalent Chromium	0.030 U	U	ug/L	0.030	0.0061	EPA 218.7		9/29/18 05:18	MBW	A

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ANALYTICAL RESULTS

Workorder: 2339757 WES004|CASE R35443 30250.016.0

Lab ID: **2339757014** Date Collected: 9/20/2018 10:20 Matrix: Water

Sample ID: **MC0AB4** Date Received: 9/21/2018 09:05

Parameters	Results	Flag	Units	RDL	MDL	Method	Prepared By	Analyzed	By	Cntr
WET CHEMISTRY										
Hexavalent Chromium	0.030 U	U	ug/L	0.030	0.0061	EPA 218.7		9/29/18 05:28	MBW	A

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ANALYTICAL RESULTS

Workorder: 2339757 WES004|CASE R35443 30250.016.0

Lab ID: **2339757015** Date Collected: 9/20/2018 11:30 Matrix: Water

Sample ID: **MC0AB8** Date Received: 9/21/2018 09:05

Parameters	Results	Flag	Units	RDL	MDL	Method	Prepared By	Analyzed	By	Cntr
WET CHEMISTRY										
Hexavalent Chromium	0.030 U	U	ug/L	0.030	0.0061	EPA 218.7		9/29/18 05:57	MBW	A

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ANALYTICAL RESULTS

Workorder: 2339757 WES004|CASE R35443 30250.016.0

Lab ID: **2339757016** Date Collected: 9/19/2018 12:45 Matrix: Water

Sample ID: **MC0AB9** Date Received: 9/21/2018 09:05

Parameters	Results	Flag	Units	RDL	MDL	Method	Prepared By	Analyzed	By	Cntr
WET CHEMISTRY										
Hexavalent Chromium	0.048		ug/L	0.030	0.0061	EPA 218.7		9/29/18 06:07	MBW	A

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ANALYTICAL RESULTS

Workorder: 2339757 WES004|CASE R35443 30250.016.0

Lab ID: **2339757017** Date Collected: 9/19/2018 10:35 Matrix: Water
Sample ID: **MC0AC0** Date Received: 9/21/2018 09:05

Parameters	Results	Flag	Units	RDL	MDL	Method	Prepared By	Analyzed	By	Cntr
WET CHEMISTRY										
Hexavalent Chromium	0.030 U	U	ug/L	0.030	0.0061	EPA 218.7		9/29/18 06:17	MBW	A

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ANALYTICAL RESULTS

Workorder: 2339757 WES004|CASE R35443 30250.016.0

Lab ID: **2339757018** Date Collected: 9/20/2018 12:30 Matrix: Water

Sample ID: **MC0AC1** Date Received: 9/21/2018 09:05

Parameters	Results	Flag	Units	RDL	MDL	Method	Prepared By	Analyzed	By	Cntr
WET CHEMISTRY										
Hexavalent Chromium	0.030 U	U	ug/L	0.030	0.0061	EPA 218.7		9/29/18 06:27	MBW	A

Ex. 4 CBI
Project Coordinator

ALS Environmental
34 Dogwood Lane ▪ Middletown, PA 17057 ▪ Phone: 717-944-5541 ▪ Fax: 717-944-1430 ▪ www.alsglobal.com

NELAP Certifications: NJ PA010, NY 11759, PA 22-293 DoD ELAP: A2LA 0818.01
State Certifications: DE ID 11, MA PA0102, MD 128, VA 460157, WV 343

ANALYTICAL RESULTS

Workorder: 2339757 WES004|CASE R35443 30250.016.0

Lab ID: **2339757019** Date Collected: 9/19/2018 10:40 Matrix: Water
Sample ID: **MC0AC2** Date Received: 9/21/2018 09:05

Parameters	Results	Flag	Units	RDL	MDL	Method	Prepared By	Analyzed	By	Cntr
WET CHEMISTRY										
Hexavalent Chromium	0.030 U	U	ug/L	0.030	0.0061	EPA 218.7		9/29/18 06:37	MBW	A

Ex. 4 CBI
Project Coordinator

ALS Environmental

34 Dogwood Lane ▪ Middletown, PA 17057 ▪ Phone: 717-944-5541 ▪ Fax: 717-944-1430 ▪ www.alsglobal.com

NELAP Certifications: NJ PA010, NY 11759, PA 22-293 DoD ELAP: A2LA 0818.01
State Certifications: DE ID 11, MA PA0102, MD 128, VA 460157, WV 343

ANALYTICAL RESULTS

Workorder: 2339757 WES004|CASE R35443 30250.016.0

Lab ID: **2339757020** Date Collected: 9/19/2018 15:40 Matrix: Water

Sample ID: **MC0AD1** Date Received: 9/21/2018 09:05

Parameters	Results	Flag	Units	RDL	MDL	Method	Prepared By	Analyzed	By	Cntr
WET CHEMISTRY										
Hexavalent Chromium	0.030 U	U	ug/L	0.030	0.0061	EPA 218.7		9/29/18 06:47	MBW	A

Ex. 4 CBI

Project Coordinator

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Region 3 Environmental Science Center
Office of Analytical Services and Quality Assurance
701 Mapes Road
Fort Meade, Maryland 20755-5350

Final Analytical Report

Site Name.....	BLADES GROUNDWATER
Sample Collection Date(s).....	10/08/18 13:54- 10/11/18 14:29
Contact.....	Connor O'Loughlin
Report Date.....	12/20/18 15:27
Project #.....	DAS R35450
Work Order.....	1810015

Analyses included in this report:

Pesticides by CLP Equivalent
Total Mercury by CLP Equivalent
Total Metals by CLP Equivalent (ICPMS)
PFCs by EPA 537
Total Metals by CLP Equivalent (ICP)

Approved for Release

OASQA Representative

Site Name: BLADES GROUNDWATER **Project #: DAS R35450**

Report Narrative

Pesticide Analysis Note:
Toxaphene was analyzed according to the lab's on-demand procedures.

Samples 1810015-01, 02, 04, 05, 06, 08, 09, 12, 16 were received at the lab after the holding time to extract had expired. Results or quantitation limits are qualified as estimates (J or UJ respectively).

Metals Analysis Note:
The arsenic results for samples 1810015-03 and 08 were slightly negative, which put them outside the acceptance range for non-detect results at 1 ug/L. The quantitation limit was raised to 2 ug/L for these two samples to compensate for any possible matrix effects.

Mercury Analysis Note:
Samples 1810015-01 to 16 and 18 were analyzed outside of the EPA recommended holding time. Results or quantitation limits are qualified as estimates (J or UJ respectively).

PFCs Analysis Note: Results for PFHpA, PFOA and PFNA in samples 181005-11, 12, 13, 14, 15, 16, 17, 18, 19 and 20 are qualified as estimates (J or UJ respectively), due to a recovery failure of the internal standard (ISTD) (MPFOA) area of the most recent continuing calibration (CCV) of the average from the initial calibration.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Region 3 Environmental Science Center
Office of Analytical Services and Quality Assurance
701 Mapes Road
Fort Meade, Maryland 20755-5350

Site Name: BLADES GROUNDWATER **Project #: DAS R35450**

ANALYTICAL REPORT FOR SAMPLES

Station ID	Laboratory ID	Matrix	Date Sampled	Date Received
BDE-GW-02	1810015-01	Groundwater	10/09/18 15:24	10/16/18 12:15
BDE-GW-03	1810015-02	Groundwater	10/08/18 15:22	10/16/18 12:15
BDE-DMW-03	1810015-03	Groundwater	10/10/18 17:11	10/16/18 12:15
BDE-GW-02D	1810015-04	Groundwater	10/09/18 15:24	10/16/18 12:15
BDE-GW-01	1810015-05	Groundwater	10/09/18 11:54	10/16/18 12:15
BDE-DMW-02	1810015-06	Groundwater	10/09/18 09:10	10/16/18 12:15
BDE-DMW-01	1810015-07	Groundwater	10/10/18 09:08	10/16/18 12:15
BDE-GW-04	1810015-08	Groundwater	10/08/18 13:54	10/16/18 12:15
BDE-GW-05	1810015-09	Groundwater	10/08/18 16:44	10/16/18 12:15
BDE-GW-07	1810015-10	Groundwater	10/10/18 11:31	10/16/18 12:15
BDE-GW-08	1810015-11	Groundwater	10/11/18 11:56	10/16/18 12:15
BDE-GW-09	1810015-12	Groundwater	10/09/18 10:01	10/16/18 12:15
BDE-GW-10	1810015-13	Groundwater	10/11/18 13:09	10/16/18 12:15
BDE-GW-11	1810015-14	Groundwater	10/11/18 08:53	10/16/18 12:15
BDE-GW-12	1810015-15	Groundwater	10/11/18 10:23	10/16/18 12:15
BDE-GW-13	1810015-16	Groundwater	10/08/18 18:10	10/16/18 12:15
BDE-GW-14	1810015-17	Groundwater	10/11/18 14:29	10/16/18 12:15
BDE-GW-15	1810015-18	Groundwater	10/10/18 18:42	10/16/18 12:15
BDE-FRB-01	1810015-19	Water	10/08/18 17:40	10/16/18 12:15
BDE-FRB-02	1810015-20	Water	10/09/18 13:00	10/16/18 12:15
BDE-FRB-03	1810015-21	Water	10/10/18 16:00	10/16/18 12:15
BDE-FRB-04	1810015-22	Water	10/11/18 12:45	10/16/18 12:15

USEPA CLP COC (LAB COPY)
DateShipped: 10/15/2018
CarrierName: FedEx
AirbillNo: 898705788948

CHAIN OF CUSTODY RECORD

DAS #: R35450
Cooler #: 1

No: 3-101518-092135-0014
Lab: USEPA Region III
Lab Contact: Ex. 4 CBI
Lab Phone: 410-305-2938

Sample Identifier	CLP Sample No.	Matrix/Sampler	Coll. Method	Analysis/Turnaround (Days)	Tag/Preservative/Bottles	Location	Collection Date/Time	For Lab Use Only
BDE-GW-02	C0AD8	Ground Water/ START	Grab	Pesticides(21)	1282 (4 C), 1283 (4 C) (2)	BDE-GW-02	01/09/2018 15:24	1810015 -01
BDE-GW-03	C0AD9	Ground Water/ START	Grab	Pesticides(21)	1289 (4 C), 1290 (4 C) (2)	BDE-GW-03	10/08/2018 15:22	-02
BDE-DMW-03	C0AF4	Ground Water/ START	Grab	Pesticides(21)	1394 (4 C), 1395 (4 C) (2)	BDE-DMW-03	10/10/2018 17:11	-03
BDE-GW-02D	C0AF5	Ground Water/ START	Grab	Pesticides(21)	1401 (4 C), 1402 (4 C) (2)	BDE-GW-02D	10/09/2018 15:24	-04

Special Instructions:

Shipment for Case Complete? Y
Samples Transferred From Chain of Custody #

Analysis Key

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
Samples for analysis	Ex. 4 CBI (WESTON)	10-15-2018 17:00	Ex. 4 CBI	10/16/18 12:15	5.5°C CP 10/16/18

USEPA CLP COC (LAB COPY)
DateShipped: 10/15/2018
CarrierName: FedEx
AirbillNo: 898705788959

CHAIN OF CUSTODY RECORD

DAS #: R35450
Cooler #: 2

No: 3-101518-093625-0015
Lab: USEPA Region III
Lab Contact: Ex. 4 CBI
Lab Phone: 410-305-2938

Sample Identifier	CLP Sample No.	Matrix/Sampler	Coll. Method	Analysis/Turnaround (Days)	Tag/Preservative/Bottles	Location	Collection Date/Time	For Lab Use Only
BDE-GW-01	C0AD2	Ground Water/ START	Grab	Pesticides(21)	1240 (4 C), 1241 (4 C), 1407 (4 C), 1408 (4 C), 1409 (4 C), 1410 (4 C) (6)	BDE-GW-01	10/09/2018 11:54	1810015 -05
BDE-DMW-02	C0AF3	Ground Water/ START	Grab	Pesticides(21)	1387 (4 C), 1388 (4 C) (2)	BDE-DMW-02	10/09/2018 09:10	-06
BDE-DMW-01	C0AG0	Ground Water/ START	Grab	Pesticides(21)	1425 (4 C), 1426 (4 C) (2)	BDE-DMW-01	10/10/2018 09:08	-07

Sample(s) to be used for Lab QC: BDE-GW-01 Tag 1407, BDE-GW-01 Tag 1408, BDE-GW-01 Tag 1409, BDE-GW-01 Tag 1410

Shipment for Case Complete? Y
Samples Transferred From Chain of Custody #

Analysis Key

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
samples for analysis	Ex. 4 CBI (WEISON)	10-15-2018 17:00	Ex. 4 CBI	10/16/18 17:15	4.0°C CR 10/16/18

USEPA CLP COC (LAB COPY)
DateShipped: 10/15/2018
CarrierName: FedEx
AirbillNo: 898705788960

CHAIN OF CUSTODY RECORD

DAS #: R35450
Cooler #: 3

No: 3-101518-095159-0016
Lab: USEPA Region III
Lab Contact: Ex. 4 CBI
Lab Phone: 410-305-2938

Sample Identifier	CLP Sample No.	Matrix/Sampler	Coll. Method	Analysis/Turnaround (Days)	Tag/Preservative/Bottles	Location	Collection Date/Time	For Lab Use Only
BDE-GW-04	C0AE0	Ground Water/ START	Grab	Pesticides(21)	1296 (4 C), 1297 (4 C) (2)	BDE-GW-04	10/08/2020 13:54	1810015
BDE-GW-05	C0AE1	Ground Water/ START	Grab	Pesticides(21)	1303 (4 C), 1304 (4 C) (2)	BDE-GW-05	10/08/2018 16:44	-08
BDE-GW-07	C0AE3	Ground Water/ START	Grab	Pesticides(21)	1317 (4 C), 1318 (4 C) (2)	BDE-GW-07	10/10/2018 11:31	-09
BDE-GW-08	C0AE4	Ground Water/ START	Grab	Pesticides(21)	1324 (4 C), 1325 (4 C) (2)	BDE-GW-08	10/11/2018 11:56	-10
								-11

Special Instructions:

Shipment for Case Complete? Y
Samples Transferred From Chain of Custody #

Analysis Key

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
Samples for analysis	Ex. 4 CBI (WESTON)	10-15-2018 17:00	Ex. 4 CBI	10/16/18 12:15	3.5°C

USEPA CLP COC (LAB COPY)
DateShipped: 10/15/2018
CarrierName: FedEx
AirbillNo: 898705788915

CHAIN OF CUSTODY RECORD

DAS #: R35450
Cooler #: 4

No: 3-101518-095524-0017
Lab: USEPA Region III
Lab Contact: Ex. 4 CBI
Lab Phone: 410-305-2938

Sample Identifier	CLP Sample No.	Matrix/Sampler	Coll. Method	Analysis/Turnaround (Days)	Tag/Preservative/Bottles	Location	Collection Date/Time	For Lab Use Only
BDE-GW-09	C0AE5	Ground Water/ START	Grab	Pesticides(21)	1331 (4 C), 1332 (4 C) (2)	BDE-GW-09	10/09/2018 10:01	1810015 -12
BDE-GW-10	C0AE6	Ground Water/ START	Grab	Pesticides(21)	1338 (4 C), 1339 (4 C) (2)	BDE-GW-10	10/11/2018 13:09	-13
BDE-GW-11	C0AE7	Ground Water/ START	Grab	Pesticides(21)	1345 (4 C), 1346 (4 C) (2)	BDE-GW-11	10/11/2018 08:53	-14
BDE-GW-12	C0AE8	Ground Water/ START	Grab	Pesticides(21)	1352 (4 C), 1353 (4 C) (2)	BDE-GW-12	10/11/2018 10:23	-15

Special Instructions:

Shipment for Case Complete? Y
Samples Transferred From Chain of Custody #

Analysis Key

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
samples for analysis	Ex. 4 CBI	10-15-2018 @ 17:00	Ex. 4 CBI	10/16/18 12:15	6.0°C ES 10/16/18

USEPA CLP COC (LAB COPY)
DateShipped: 10/15/2018
CarrierName: FedEx
AirbillNo: 898705788981

CHAIN OF CUSTODY RECORD

DAS #: R35450
Cooler #: 5

No: 3-101518-095647-0018
Lab: USEPA Region III
Lab Contact: Ex. 4 CBI
Lab Phone: 410-305-2938

Sample Identifier	CLP Sample No.	Matrix/Sampler	Coll. Method	Analysis/Turnaround (Days)	Tag/Preservative/Bottles	Location	Collection Date/Time	For Lab Use Only
BDE-GW-13	C0AE9	Ground Water/ START	Grab	Pesticides(21)	1359 (4 C), 1360 (4 C) (2)	BDE-GW-13	10/08/2018 18:10	1810015 -16
BDE-GW-14	C0AF0	Ground Water/ START	Grab	Pesticides(21)	1366 (4 C), 1367 (4 C) (2)	BDE-GW-14	10/11/2018 14:29	-17
BDE-GW-15	C0AF1	Ground Water/ START	Grab	Pesticides(21)	1373 (4 C), 1374 (4 C) (2)	BDE-GW-15	10/10/2018 18:42	-18

Special Instructions:

Shipment for Case Complete? Y

Samples Transferred From Chain of Custody #

Analysis Key

Items/Reason	Relinquished by (Signature and Organization)		Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
Samples for analysis	Ex. 4 CBI	(WEJMN)	10-15-2018 17:00	Ex. 4 CBI	10/16/18 12:15	6.0°C CP 10/16/18

USEPA CLP COC (LAB COPY)
DateShipped: 10/15/2018
CarrierName: FedEx
AirbillNo: 898705789006

CHAIN OF CUSTODY RECORD

DAS #: R35450
Cooler #: 6

No: 3-101518-101709-0019
Lab: USEPA Region III
Lab Contact: Ex. 4 CBI
Lab Phone: 410-305-2938

Sample Identifier	CLP Sample No.	Matrix/Sampler	Coll. Method	Analysis/Turnaround (Days)	Tag/Preservative/Bottles	Location	Collection Date/Time	For Lab Use Only
BDE-GW-01	C0AD2	Ground Water/ START	Grab	Perfluorinated Compounds (PFCS)(21)	1243 (Trizma), 1244 (Trizma), 1411 (Trizma), 1412 (Trizma), 1413 (Trizma), 1414 (Trizma) (6)	BDE-GW-01	10/09/2018 11:54	1810015 -05
BDE-GW-02	C0AD8	Ground Water/ START	Grab	Perfluorinated Compounds (PFCS)(21)	1285 (Trizma), 1286 (Trizma) (2)	BDE-GW-02	01/09/2018 15:24	-01
BDE-DMW-02	C0AF3	Ground Water/ START	Grab	Perfluorinated Compounds (PFCS)(21)	1390 (Trizma), 1391 (Trizma) (2)	BDE-DMW-02	10/09/2018 09:10	-06
BDE-DMW-03	C0AF4	Ground Water/ START	Grab	Perfluorinated Compounds (PFCS)(21)	1397 (Trizma), 1398 (Trizma) (2)	BDE-DMW-03	10/10/2018 17:11	-03
BDE-GW-02D	C0AF5	Ground Water/ START	Grab	Perfluorinated Compounds (PFCS)(21)	1404 (Trizma), 1405 (Trizma) (2)	BDE-GW-02D	10/09/2018 15:24	-04
BDE-FRB-01	C0AF6	Field Reagent Blank/ START	Grab	Perfluorinated Compounds (PFCS)(21)	1416 (Trizma), 1417 (Trizma) (2)	BDE-FRB-01	10/08/2018 17:40	-19
BDE-FRB-02	C0AF7	Field Reagent Blank/ START	Grab	Perfluorinated Compounds (PFCS)(21)	1418 (Trizma), 1419 (Trizma) (2)	BDE-FRB-02	10/09/2018 13:00	-20
BDE-FRB-03	C0AF8	Field Reagent Blank/ START	Grab	Perfluorinated Compounds (PFCS)(21)	1420 (Trizma), 1421 (Trizma) (2)	BDE-FRB-03	10/10/2018 16:00	-21
BDE-FRB-04	C0AF9	Field Reagent Blank/ START	Grab	Perfluorinated Compounds (PFCS)(21)	1422 (Trizma), 1423 (Trizma) (2)	BDE-FRB-04	10/11/2018 12:45	-22

Sample(s) to be used for Lab QC: BDE-GW-01 Tag 1411, BDE-GW-01 Tag 1412, BDE-GW-01 Tag 1413, BDE-GW-01 Tag 1414

Shipment for Case Complete? Y
Samples Transferred From Chain of Custody #

Analysis Key

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
SAMPLES AZ ANALYSIS	Ex. 4 CBI	10-15-2018 17:00	Ex. 4 CBI	10/16/18 12:15	5.0°C 10/16/18

USEPA CLP COC (LAB COPY)

DateShipped: 10/15/2018
CarrierName: FedEx
AirbillNo: 898705789006

CHAIN OF CUSTODY RECORD

DAS #: R35450
Cooler #: 6

No: 3-101518-101709-0019

Lab: USEPA Region III
Lab Contact: Ex. 4 CBI
Lab Phone: 410-305-2938

Sample Identifier	CLP Sample No.	Matrix/Sampler	Coll. Method	Analysis/Turnaround (Days)	Tag/Preservative/Bottles	Location	Collection Date/Time	For Lab Use Only
BDE-DMW-01	C0AG0	Ground Water/ START	Grab	Perfluorinated Compounds (PFCS)(21)	1428 (Trizma), 1429 (Trizma) (2)	BDE-DMW-01	10/10/2018 09:08	1810015 -07

Special Instructions:

Shipment for Case Complete? Y
Samples Transferred From Chain of Custody #

Analysis Key

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
Jumpers re analysis	Ex. 4 CBI	10-15-2018 17:00	Ex. 4 CBI	10/16/18 12:15	5.0°C CT 10/16/18

USEPA CLP COC (LAB COPY)
DateShipped: 10/15/2018
CarrierName: FedEx
AirbillNo: 898705788926

CHAIN OF CUSTODY RECORD

DAS #: R35450
Cooler #: 7

No: 3-101518-102541-0020
Lab: USEPA Region III
Lab Contact: Ex. 4 CBI
Lab Phone: 410-305-2938

Sample Identifier	CLP Sample No.	Matrix/Sampler	Coll. Method	Analysis/Turnaround (Days)	Tag/Preservative/Bottles	Location	Collection Date/Time	For Lab Use Only
BDE-GW-03	C0AD9	Ground Water/ START	Grab	Perfluorinated Compounds (PFCS)(21)	1292 (Trizma), 1293 (Trizma) (2)	BDE-GW-03	10/08/2018 15:22	1810015 -02
BDE-GW-04	C0AE0	Ground Water/ START	Grab	Perfluorinated Compounds (PFCS)(21)	1299 (Trizma), 1300 (Trizma) (2)	BDE-GW-04	10/08/2020 13:54	-08
BDE-GW-05	C0AE1	Ground Water/ START	Grab	Perfluorinated Compounds (PFCS)(21)	1306 (Trizma), 1307 (Trizma) (2)	BDE-GW-05	10/08/2018 16:44	-09
BDE-GW-07	C0AE3	Ground Water/ START	Grab	Perfluorinated Compounds (PFCS)(21)	1320 (Trizma), 1321 (Trizma) (2)	BDE-GW-07	10/10/2018 11:31	-10
BDE-GW-08	C0AE4	Ground Water/ START	Grab	Perfluorinated Compounds (PFCS)(21)	1327 (Trizma), 1328 (Trizma) (2)	BDE-GW-08	10/11/2018 11:56	-11
BDE-GW-09	C0AE5	Ground Water/ START	Grab	Perfluorinated Compounds (PFCS)(21)	1334 (Trizma), 1335 (Trizma) (2)	BDE-GW-09	10/09/2018 10:01	-12
BDE-GW-10	C0AE6	Ground Water/ START	Grab	Perfluorinated Compounds (PFCS)(21)	1341 (Trizma), 1342 (Trizma) (2)	BDE-GW-10	10/11/2018 13:09	-13
BDE-GW-11	C0AE7	Ground Water/ START	Grab	Perfluorinated Compounds (PFCS)(21)	1348 (Trizma), 1349 (Trizma) (2)	BDE-GW-11	10/11/2018 08:53	-14
BDE-GW-12	C0AE8	Ground Water/ START	Grab	Perfluorinated Compounds (PFCS)(21)	1355 (Trizma), 1356 (Trizma) (2)	BDE-GW-12	10/11/2018 10:23	-15
BDE-GW-13	C0AE9	Ground Water/ START	Grab	Perfluorinated Compounds (PFCS)(21)	1362 (Trizma), 1363 (Trizma) (2)	BDE-GW-13	10/08/2018 18:10	-16

Special Instructions:

Shipment for Case Complete? Y
Samples Transferred From Chain of Custody #

Analysis Key

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
sampled for analysis	Ex. 4 CBI	10-15-2018 17:00	Ex. 4 CBI	10/16/18 12:15	5.5°C CP 10/16/18

USEPA CLP COC (LAB COPY)
DateShipped: 10/15/2018
CarrierName: FedEx
AirbillNo: 898705788926

CHAIN OF CUSTODY RECORD

DAS #: R35450
Cooler #: 7

No: 3-101518-102541-0020
Lab: USEPA Region III
Lab Contact: Ex. 4 CBI
Lab Phone: 410-305-2938

Sample Identifier	CLP Sample No.	Matrix/Sampler	Coll. Method	Analysis/Turnaround (Days)	Tag/Preservative/Bottles	Location	Collection Date/Time	For Lab Use Only
BDE-GW-14	C0AF0	Ground Water/ START	Grab	Perfluorinated Compounds (PFCS)(21)	1369 (Trizma), 1370 (Trizma) (2)	BDE-GW-14	10/11/2018 14:29	1810015 -17
BDE-GW-15	C0AF1	Ground Water/ START	Grab	Perfluorinated Compounds (PFCS)(21)	1376 (Trizma), 1377 (Trizma) (2)	BDE-GW-15	10/10/2018 18:42	-18

Special Instructions:

Shipment for Case Complete? Y
Samples Transferred From Chain of Custody #

Analysis Key

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
samples for analysis	Ex. 4 CBI	10-15-2018 17:00	Ex. 4 CBI	10/16/18 12:15	5.5°C CP 10/16/18

USEPA CLP COC (LAB COPY)
DateShipped: 10/15/2018
CarrierName: FedEx
AirbillNo: 89870578937

CHAIN OF CUSTODY RECORD

DAS #: R35450
Cooler #: 8

No: 3-101518-103305-0022
Lab: USEPA Region III
Lab Contact: Ex. 4 CBI
Lab Phone: 410-305-2938

Sample Identifier	CLP Sample No.	Matrix/Sampler	Coll. Method	Analysis/Turnaround (Days)	Tag/Preservative/Bottles	Location	Collection Date/Time	For Lab Use Only
BDE-GW-01	MC0AD2	Ground Water/ START	Grab	Metals + Hg, ISM02.4 ICP-MS(21)	1242 (HNO3 pH<2) (1)	BDE-GW-01	10/09/2018 11:54	1810015 -05
BDE-GW-02	MC0AD8	Ground Water/ START	Grab	Metals + Hg, ISM02.4 ICP-MS(21)	1284 (HNO3 pH<2) (1)	BDE-GW-02	01/09/2018 15:24	-01
BDE-GW-03	MC0AD9	Ground Water/ START	Grab	Metals + Hg, ISM02.4 ICP-MS(21)	1291 (HNO3 pH<2) (1)	BDE-GW-03	10/08/2018 15:22	-02
BDE-GW-04	MC0AE0	Ground Water/ START	Grab	Metals + Hg, ISM02.4 ICP-MS(21)	1298 (HNO3 pH<2) (1)	BDE-GW-04	10/08/2020 13:54	-08
BDE-DMW-02	MC0AF3	Ground Water/ START	Grab	Metals + Hg, ISM02.4 ICP-MS(21)	1389 (HNO3 pH<2) (1)	BDE-DMW-02	10/09/2018 09:10	-06
BDE-DMW-03	MC0AF4	Ground Water/ START	Grab	Metals + Hg, ISM02.4 ICP-MS(21)	1396 (HNO3 pH<2) (1)	BDE-DMW-03	10/10/2018 17:11	-03
BDE-GW-02D	MC0AF5	Ground Water/ START	Grab	Metals + Hg, ISM02.4 ICP-MS(21)	1403 (HNO3 pH<2) (1)	BDE-GW-02D	10/09/2018 15:24	-04
BDE-DMW-01	MC0AG0	Ground Water/ START	Grab	Metals + Hg, ISM02.4 ICP-MS(21)	1427 (HNO3 pH<2) (1)	BDE-DMW-01	10/10/2018 09:08	-07

Sample(s) to be used for Lab QC: BDE-GW-01 Tag 1242

Shipment for Case Complete? Y
Samples Transferred From Chain of Custody #

Analysis Key

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
Samples for analysis	Ex. 4 CBI	10-15-2018 17:00	Ex. 4 CBI	10/16/18 12:15	6.0°C CJ 10/16/18

USEPA CLP COC (LAB COPY)
DateShipped: 10/15/2018
CarrierName: FedEx
AirbillNo: 898705788970

CHAIN OF CUSTODY RECORD

DAS #: R35450
Cooler #: 9

No: 3-101518-104453-0023
Lab: USEPA Region III
Lab Contact: Ex. 4 CBI
Lab Phone: 410-305-2938

Sample Identifier	CLP Sample No.	Matrix/Sampler	Coll. Method	Analysis/Turnaround (Days)	Tag/Preservative/Bottles	Location	Collection Date/Time	For Lab Use Only
BDE-GW-05	MC0AE1	Ground Water/ START	Grab	Metals + Hg, ISM02.4 ICP-MS(21)	1305 (HNO3 pH<2) (1)	BDE-GW-05	10/08/2018 16:44	1810015 -09
BDE-GW-07	MC0AE3	Ground Water/ START	Grab	Metals + Hg, ISM02.4 ICP-MS(21)	1319 (HNO3 pH<2) (1)	BDE-GW-07	10/10/2018 11:31	-10
BDE-GW-08	MC0AE4	Ground Water/ START	Grab	Metals + Hg, ISM02.4 ICP-MS(21)	1326 (HNO3 pH<2) (1)	BDE-GW-08	10/11/2018 11:56	-11
BDE-GW-09	MC0AE5	Ground Water/ START	Grab	Metals + Hg, ISM02.4 ICP-MS(21)	1333 (HNO3 pH<2) (1)	BDE-GW-09	10/09/2018 10:01	-12
BDE-GW-10	MC0AE6	Ground Water/ START	Grab	Metals + Hg, ISM02.4 ICP-MS(21)	1340 (HNO3 pH<2) (1)	BDE-GW-10	10/11/2018 13:09	-13
BDE-GW-11	MC0AE7	Ground Water/ START	Grab	Metals + Hg, ISM02.4 ICP-MS(21)	1347 (HNO3 pH<2) (1)	BDE-GW-11	10/11/2018 08:53	-14
BDE-GW-12	MC0AE8	Ground Water/ START	Grab	Metals + Hg, ISM02.4 ICP-MS(21)	1354 (HNO3 pH<2) (1)	BDE-GW-12	10/11/2018 10:23	-15
BDE-GW-13	MC0AE9	Ground Water/ START	Grab	Metals + Hg, ISM02.4 ICP-MS(21)	1361 (HNO3 pH<2) (1)	BDE-GW-13	10/08/2018 18:10	-16
BDE-GW-14	MC0AF0	Ground Water/ START	Grab	Metals + Hg, ISM02.4 ICP-MS(21)	1368 (HNO3 pH<2) (1)	BDE-GW-14	10/11/2018 14:29	-17
BDE-GW-15	MC0AF1	Ground Water/ START	Grab	Metals + Hg, ISM02.4 ICP-MS(21)	1375 (HNO3 pH<2) (1)	BDE-GW-15	10/10/2018 18:42	-18

Special Instructions:

Shipment for Case Complete? Y
Samples Transferred From Chain of Custody #

Analysis Key

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
samples for analysis	Ex. 4 CBI	10-15-2018 17:00	Ex. 4 CBI	10/16/18 12:15	6.0°C CP 10/16/18

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Region 3 Environmental Science Center
Office of Analytical Services and Quality Assurance
701 Mapes Road
Fort Meade, Maryland 20755-5350

Site Name: BLADES GROUNDWATER **Project #: DAS R35450**

HPLC Identification

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID: 1810015-01								
Station ID: BDE-GW-02								
Sample Matrix: Groundwater								
Collected: 10/09/2018								
PFBS (perfluorobutanesulfonic acid)	**62.4**		8.62	ng/L	1	10/19/18	10/23/18 03:20	EPA 537/R3QA242/243
PFHpA (perfluoroheptanoic acid)	**19.8**		8.62	ng/L	1	10/19/18	10/23/18 03:20	EPA 537/R3QA242/243
PFHxS (perfluorohexanesulfonic acid)	**15.5**		8.62	ng/L	1	10/19/18	10/23/18 03:20	EPA 537/R3QA242/243
PFNA (perfluorononanoic acid)	U		8.62	ng/L	1	10/19/18	10/23/18 03:20	EPA 537/R3QA242/243
PFOS (perfluorooctanesulfonic acid)	**2820**		216	ng/L	25	10/19/18	11/06/18 00:07	EPA 537/R3QA242/243
PFOA (perfluorooctanoic acid)	U		8.62	ng/L	1	10/19/18	10/23/18 03:20	EPA 537/R3QA242/243

Surrogates

Analyte	Result	Flags/ Qualifiers	**%Recovery**	Units	%Recovery Limits	Prepared	Analyzed	Method/SOP#
Lab ID: 1810015-01								
Station ID: BDE-GW-02								
Sample Matrix: Groundwater								
Collected: 10/09/2018								
Surrogate: MPFHxA	39.8		**115 %**	ng/L	*70-130*	10/19/18	10/23/18 03:20	*EPA 537/R3QA242/243*
Surrogate: MPFDA	35.9		**104 %**	ng/L	*70-130*	10/19/18	10/23/18 03:20	*EPA 537/R3QA242/243*

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Site Name: **BLADES GROUNDWATER** **Project #:** **DAS R35450**

HPLC Identification

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID: 1810015-02								
Station ID: BDE-GW-03								
Sample Matrix: Groundwater								
Collected: 10/08/2018								
PFBS (perfluorobutanesulfonic acid)	**10.7**		8.93	ng/L	1	10/19/18	10/23/18 03:46	EPA 537/R3QA242/243
PFHpA (perfluoroheptanoic acid)	**10.9**		8.93	ng/L	1	10/19/18	10/23/18 03:46	EPA 537/R3QA242/243
PFHxS (perfluorohexanesulfonic acid)	**33.8**		8.93	ng/L	1	10/19/18	10/23/18 03:46	EPA 537/R3QA242/243
PFNA (perfluorononanoic acid)	U		8.93	ng/L	1	10/19/18	10/23/18 03:46	EPA 537/R3QA242/243
PFOS (perfluorooctanesulfonic acid)	**156**		44.6	ng/L	5	10/19/18	11/15/18 16:16	EPA 537/R3QA242/243
PFOA (perfluorooctanoic acid)	**29.1**		8.93	ng/L	1	10/19/18	10/23/18 03:46	EPA 537/R3QA242/243

Surrogates

Analyte	Result	Flags/ Qualifiers	**%Recovery**	Units	%Recovery Limits	Prepared	Analyzed	Method/SOP#
Lab ID: 1810015-02								
Station ID: BDE-GW-03								
Sample Matrix: Groundwater								
Collected: 10/08/2018								
Surrogate: MPFHxA	41.7		**117 %**	ng/L	*70-130*	10/19/18	10/23/18 03:46	*EPA 537/R3QA242/243*
Surrogate: MPFDA	39.6		**111 %**	ng/L	*70-130*	10/19/18	10/23/18 03:46	*EPA 537/R3QA242/243*

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Site Name: **BLADES GROUNDWATER** **Project #:** **DAS R35450**

HPLC Identification

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID: 1810015-03								
Station ID: BDE-DMW-03								
Sample Matrix: Groundwater								
Collected: 10/10/2018								
PFBS (perfluorobutanesulfonic acid)	**200**		43.9	ng/L	5	10/19/18	11/15/18 17:08	EPA 537/R3QA242/243
PFHpA (perfluoroheptanoic acid)	U		8.77	ng/L	1	10/19/18	10/23/18 04:12	EPA 537/R3QA242/243
PFHxS (perfluorohexanesulfonic acid)	**17.3**		8.77	ng/L	1	10/19/18	10/23/18 04:12	EPA 537/R3QA242/243
PFNA (perfluorononanoic acid)	U		8.77	ng/L	1	10/19/18	10/23/18 04:12	EPA 537/R3QA242/243
PFOS (perfluorooctanesulfonic acid)	**151**		43.9	ng/L	5	10/19/18	11/15/18 17:08	EPA 537/R3QA242/243
PFOA (perfluorooctanoic acid)	**20.9**		8.77	ng/L	1	10/19/18	10/23/18 04:12	EPA 537/R3QA242/243

Surrogates

Analyte	Result	Flags/ Qualifiers	**%Recovery**	Units	%Recovery Limits	Prepared	Analyzed	Method/SOP#
Lab ID: 1810015-03								
Station ID: BDE-DMW-03								
Sample Matrix: Groundwater								
Collected: 10/10/2018								
Surrogate: MPFHxA	35.0		**100 %**	ng/L	*70-130*	10/19/18	10/23/18 04:12	*EPA 537/R3QA242/243*
Surrogate: MPFDA	33.7		**96 %**	ng/L	*70-130*	10/19/18	10/23/18 04:12	*EPA 537/R3QA242/243*

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Site Name: **BLADES GROUNDWATER** **Project #:** **DAS R35450**

HPLC Identification

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID: 1810015-04								
Station ID: BDE-GW-02D								
Sample Matrix: Groundwater								
Collected: 10/09/2018								
PFBS (perfluorobutanesulfonic acid)	**60.6**		8.62	ng/L	1	10/19/18	10/23/18 04:37	EPA 537/R3QA242/243
PFHpA (perfluoroheptanoic acid)	**19.1**		8.62	ng/L	1	10/19/18	10/23/18 04:37	EPA 537/R3QA242/243
PFHxS (perfluorohexanesulfonic acid)	**16.7**		8.62	ng/L	1	10/19/18	10/23/18 04:37	EPA 537/R3QA242/243
PFNA (perfluorononanoic acid)	U		8.62	ng/L	1	10/19/18	10/23/18 04:37	EPA 537/R3QA242/243
PFOS (perfluorooctanesulfonic acid)	**2620**		216	ng/L	25	10/19/18	11/06/18 00:32	EPA 537/R3QA242/243
PFOA (perfluorooctanoic acid)	U		8.62	ng/L	1	10/19/18	10/23/18 04:37	EPA 537/R3QA242/243

Surrogates

Analyte	Result	Flags/ Qualifiers	**%Recovery**	Units	%Recovery Limits	Prepared	Analyzed	Method/SOP#
Lab ID: 1810015-04								
Station ID: BDE-GW-02D								
Sample Matrix: Groundwater								
Collected: 10/09/2018								
Surrogate: MPFHxA	37.4		**108 %**	ng/L	*70-130*	10/19/18	10/23/18 04:37	*EPA 537/R3QA242/243*
Surrogate: MPFDA	36.5		**106 %**	ng/L	*70-130*	10/19/18	10/23/18 04:37	*EPA 537/R3QA242/243*

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HPLC Identification

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID: 1810015-05								
Station ID: BDE-GW-01								
Sample Matrix: Groundwater								
Collected: 10/09/2018								
PFBS (perfluorobutanesulfonic acid)	**14.5**		8.62	ng/L	1	10/19/18	10/23/18 05:03	EPA 537/R3QA242/243
PFHpA (perfluoroheptanoic acid)	U		8.62	ng/L	1	10/19/18	10/23/18 05:03	EPA 537/R3QA242/243
PFHxS (perfluorohexanesulfonic acid)	U		8.62	ng/L	1	10/19/18	10/23/18 05:03	EPA 537/R3QA242/243
PFNA (perfluorononanoic acid)	U		8.62	ng/L	1	10/19/18	10/23/18 05:03	EPA 537/R3QA242/243
PFOS (perfluorooctanesulfonic acid)	**183**		43.1	ng/L	5	10/19/18	11/06/18 00:58	EPA 537/R3QA242/243
PFOA (perfluorooctanoic acid)	**10.1**		8.62	ng/L	1	10/19/18	10/23/18 05:03	EPA 537/R3QA242/243

Surrogates

Analyte	Result	Flags/ Qualifiers	**%Recovery**	Units	%Recovery Limits	Prepared	Analyzed	Method/SOP#
Lab ID: 1810015-05								
Station ID: BDE-GW-01								
Sample Matrix: Groundwater								
Collected: 10/09/2018								
Surrogate: MPFHxA	36.6		**106 %**	ng/L	*70-130*	10/19/18	10/23/18 05:03	*EPA 537/R3QA242/243*
Surrogate: MPFDA	35.3		**102 %**	ng/L	*70-130*	10/19/18	10/23/18 05:03	*EPA 537/R3QA242/243*

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Site Name: BLADES GROUNDWATER **Project #: DAS R35450**

HPLC Identification

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID: 1810015-06								
Station ID: BDE-DMW-02								
Sample Matrix: Groundwater								
Collected: 10/09/2018								
PFBS (perfluorobutanesulfonic acid)	**93.6**		8.93	ng/L	1	10/19/18	10/23/18 06:20	EPA 537/R3QA242/243
PFHpA (perfluoroheptanoic acid)	U		8.93	ng/L	1	10/19/18	10/23/18 06:20	EPA 537/R3QA242/243
PFHxS (perfluorohexanesulfonic acid)	U		8.93	ng/L	1	10/19/18	10/23/18 06:20	EPA 537/R3QA242/243
PFNA (perfluorononanoic acid)	U		8.93	ng/L	1	10/19/18	10/23/18 06:20	EPA 537/R3QA242/243
PFOS (perfluorooctanesulfonic acid)	**74.2**		8.93	ng/L	1	10/19/18	10/23/18 06:20	EPA 537/R3QA242/243
PFOA (perfluorooctanoic acid)	**16.6**		8.93	ng/L	1	10/19/18	10/23/18 06:20	EPA 537/R3QA242/243

Surrogates

Analyte	Result	Flags/ Qualifiers	**%Recovery**	Units	%Recovery Limits	Prepared	Analyzed	Method/SOP#
Lab ID: 1810015-06								
Station ID: BDE-DMW-02								
Sample Matrix: Groundwater								
Collected: 10/09/2018								
Surrogate: MPFHxA	40.7		**114 %**	ng/L	*70-130*	10/19/18	10/23/18 06:20	*EPA 537/R3QA242/243*
Surrogate: MPFDA	40.4		**113 %**	ng/L	*70-130*	10/19/18	10/23/18 06:20	*EPA 537/R3QA242/243*

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Site Name: **BLADES GROUNDWATER** **Project #:** **DAS R35450**

HPLC Identification

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID: 1810015-07								
Station ID: BDE-DMW-01								
Sample Matrix: Groundwater								
Collected: 10/10/2018								
PFBS (perfluorobutanesulfonic acid)	**52.2**		8.77	ng/L	1	10/19/18	10/23/18 06:45	EPA 537/R3QA242/243
PFHpA (perfluoroheptanoic acid)	U		8.77	ng/L	1	10/19/18	10/23/18 06:45	EPA 537/R3QA242/243
PFHxS (perfluorohexanesulfonic acid)	**9.09**		8.77	ng/L	1	10/19/18	10/23/18 06:45	EPA 537/R3QA242/243
PFNA (perfluorononanoic acid)	U		8.77	ng/L	1	10/19/18	10/23/18 06:45	EPA 537/R3QA242/243
PFOS (perfluorooctanesulfonic acid)	**122**		8.77	ng/L	1	10/19/18	10/23/18 06:45	EPA 537/R3QA242/243
PFOA (perfluorooctanoic acid)	**16.3**		8.77	ng/L	1	10/19/18	10/23/18 06:45	EPA 537/R3QA242/243

Surrogates

Analyte	Result	Flags/ Qualifiers	**%Recovery**	Units	%Recovery Limits	Prepared	Analyzed	Method/SOP#
Lab ID: 1810015-07								
Station ID: BDE-DMW-01								
Sample Matrix: Groundwater								
Collected: 10/10/2018								
Surrogate: MPFHxA	40.5		**115 %**	ng/L	*70-130*	10/19/18	10/23/18 06:45	*EPA 537/R3QA242/243*
Surrogate: MPFDA	34.5		**98 %**	ng/L	*70-130*	10/19/18	10/23/18 06:45	*EPA 537/R3QA242/243*

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Site Name: **BLADES GROUNDWATER** **Project #:** **DAS R35450**

HPLC Identification

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID: 1810015-08								
Station ID: BDE-GW-04								
Sample Matrix: Groundwater								
Collected: 10/08/2018								
PFBS (perfluorobutanesulfonic acid)	**68.7**		8.93	ng/L	1	10/19/18	10/23/18 07:11	EPA 537/R3QA242/243
PFHpA (perfluoroheptanoic acid)	**17.9**		8.93	ng/L	1	10/19/18	10/23/18 07:11	EPA 537/R3QA242/243
PFHxS (perfluorohexanesulfonic acid)	**42.0**		8.93	ng/L	1	10/19/18	10/23/18 07:11	EPA 537/R3QA242/243
PFNA (perfluorononanoic acid)	U		8.93	ng/L	1	10/19/18	10/23/18 07:11	EPA 537/R3QA242/243
PFOS (perfluorooctanesulfonic acid)	**73.2**		8.93	ng/L	1	10/19/18	10/23/18 07:11	EPA 537/R3QA242/243
PFOA (perfluorooctanoic acid)	**33.5**		8.93	ng/L	1	10/19/18	10/23/18 07:11	EPA 537/R3QA242/243

Surrogates

Analyte	Result	Flags/ Qualifiers	**%Recovery**	Units	%Recovery Limits	Prepared	Analyzed	Method/SOP#
Lab ID: 1810015-08								
Station ID: BDE-GW-04								
Sample Matrix: Groundwater								
Collected: 10/08/2018								
Surrogate: MPFHxA	41.5		**116 %**	ng/L	*70-130*	10/19/18	10/23/18 07:11	*EPA 537/R3QA242/243*
Surrogate: MPFDA	44.8		**125 %**	ng/L	*70-130*	10/19/18	10/23/18 07:11	*EPA 537/R3QA242/243*

Site Name: BLADES GROUNDWATER **Project #: DAS R35450**

HPLC Identification

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID: 1810015-09								
Station ID: BDE-GW-05								
Sample Matrix: Groundwater								
Collected: 10/08/2018								
PFBS (perfluorobutanesulfonic acid)	**31.1**		8.62	ng/L	1	10/19/18	10/23/18 07:36	EPA 537/R3QA242/243
PFHpA (perfluoroheptanoic acid)	**17.5**		8.62	ng/L	1	10/19/18	10/23/18 07:36	EPA 537/R3QA242/243
PFHxS (perfluorohexanesulfonic acid)	U		8.62	ng/L	1	10/19/18	10/23/18 07:36	EPA 537/R3QA242/243
PFNA (perfluorononanoic acid)	U		8.62	ng/L	1	10/19/18	10/23/18 07:36	EPA 537/R3QA242/243
PFOS (perfluorooctanesulfonic acid)	**215**		43.1	ng/L	5	10/19/18	11/15/18 17:33	EPA 537/R3QA242/243
PFOA (perfluorooctanoic acid)	**27.9**		8.62	ng/L	1	10/19/18	10/23/18 07:36	EPA 537/R3QA242/243

Surrogates

Analyte	Result	Flags/ Qualifiers	**%Recovery**	Units	%Recovery Limits	Prepared	Analyzed	Method/SOP#
Lab ID: 1810015-09								
Station ID: BDE-GW-05								
Sample Matrix: Groundwater								
Collected: 10/08/2018								
Surrogate: MPFHxA	39.4		**114 %**	ng/L	*70-130*	10/19/18	10/23/18 07:36	*EPA 537/R3QA242/243*
Surrogate: MPFDA	39.6		**115 %**	ng/L	*70-130*	10/19/18	10/23/18 07:36	*EPA 537/R3QA242/243*

Site Name: BLADES GROUNDWATER **Project #: DAS R35450**

HPLC Identification

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID: 1810015-10								
Station ID: BDE-GW-07								
Sample Matrix: Groundwater								
Collected: 10/10/2018								
PFBS (perfluorobutanesulfonic acid)	**32.2**		8.93	ng/L	1	10/19/18	10/23/18 08:02	EPA 537/R3QA242/243
PFHpA (perfluoroheptanoic acid)	**12.0**		8.93	ng/L	1	10/19/18	10/23/18 08:02	EPA 537/R3QA242/243
PFHxS (perfluorohexanesulfonic acid)	U		8.93	ng/L	1	10/19/18	10/23/18 08:02	EPA 537/R3QA242/243
PFNA (perfluorononanoic acid)	**11.6**		8.93	ng/L	1	10/19/18	10/23/18 08:02	EPA 537/R3QA242/243
PFOS (perfluorooctanesulfonic acid)	**347**		44.6	ng/L	5	10/19/18	11/06/18 02:15	EPA 537/R3QA242/243
PFOA (perfluorooctanoic acid)	**35.1**		8.93	ng/L	1	10/19/18	10/23/18 08:02	EPA 537/R3QA242/243

Surrogates

Analyte	Result	Flags/ Qualifiers	**%Recovery**	Units	%Recovery Limits	Prepared	Analyzed	Method/SOP#
Lab ID: 1810015-10								
Station ID: BDE-GW-07								
Sample Matrix: Groundwater								
Collected: 10/10/2018								
Surrogate: MPFHxA	43.9		**123 %**	ng/L	*70-130*	10/19/18	10/23/18 08:02	*EPA 537/R3QA242/243*
Surrogate: MPFDA	45.6		**128 %**	ng/L	*70-130*	10/19/18	10/23/18 08:02	*EPA 537/R3QA242/243*

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Site Name: **BLADES GROUNDWATER** **Project #:** **DAS R35450**

HPLC Identification

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID: 1810015-11								
Station ID: BDE-GW-08								
Sample Matrix: Groundwater								
Collected: 10/11/2018								
PFBS (perfluorobutanesulfonic acid)	**25.2**		8.77	ng/L	1	10/19/18	10/23/18 09:19	EPA 537/R3QA242/243
PFHpA (perfluoroheptanoic acid)	U	UJ	8.77	ng/L	1	10/19/18	10/23/18 09:19	EPA 537/R3QA242/243
PFHxS (perfluorohexanesulfonic acid)	U		8.77	ng/L	1	10/19/18	10/23/18 09:19	EPA 537/R3QA242/243
PFNA (perfluorononanoic acid)	U	UJ	8.77	ng/L	1	10/19/18	10/23/18 09:19	EPA 537/R3QA242/243
PFOS (perfluorooctanesulfonic acid)	**155**		8.77	ng/L	1	10/19/18	10/23/18 09:19	EPA 537/R3QA242/243
PFOA (perfluorooctanoic acid)	**10.3**	**J**	8.77	ng/L	1	10/19/18	10/23/18 09:19	EPA 537/R3QA242/243

Surrogates

Analyte	Result	Flags/ Qualifiers	**%Recovery**	Units	%Recovery Limits	Prepared	Analyzed	Method/SOP#
Lab ID: 1810015-11								
Station ID: BDE-GW-08								
Sample Matrix: Groundwater								
Collected: 10/11/2018								
Surrogate: MPFHxA	42.8		**122 %**	ng/L	*70-130*	10/19/18	10/23/18 09:19	*EPA 537/R3QA242/243*
Surrogate: MPFDA	39.3		**112 %**	ng/L	*70-130*	10/19/18	10/23/18 09:19	*EPA 537/R3QA242/243*

Site Name: BLADES GROUNDWATER **Project #: DAS R35450**

HPLC Identification

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID: 1810015-12								
Station ID: BDE-GW-09								
Sample Matrix: Groundwater								
Collected: 10/09/2018								
PFBS (perfluorobutanesulfonic acid)	**31.5**		8.62	ng/L	1	10/19/18	10/23/18 09:44	EPA 537/R3QA242/243
PFHpA (perfluoroheptanoic acid)	U	UJ	8.62	ng/L	1	10/19/18	10/23/18 09:44	EPA 537/R3QA242/243
PFHxS (perfluorohexanesulfonic acid)	U		8.62	ng/L	1	10/19/18	10/23/18 09:44	EPA 537/R3QA242/243
PFNA (perfluorononanoic acid)	U	UJ	8.62	ng/L	1	10/19/18	10/23/18 09:44	EPA 537/R3QA242/243
PFOS (perfluorooctanesulfonic acid)	**241**		43.1	ng/L	5	10/19/18	11/06/18 02:40	EPA 537/R3QA242/243
PFOA (perfluorooctanoic acid)	**18.8**	**J**	8.62	ng/L	1	10/19/18	10/23/18 09:44	EPA 537/R3QA242/243

Surrogates

Analyte	Result	Flags/ Qualifiers	**%Recovery**	Units	%Recovery Limits	Prepared	Analyzed	Method/SOP#
Lab ID: 1810015-12								
Station ID: BDE-GW-09								
Sample Matrix: Groundwater								
Collected: 10/09/2018								
Surrogate: MPFHxA	38.6		**112 %**	ng/L	*70-130*	10/19/18	10/23/18 09:44	*EPA 537/R3QA242/243*
Surrogate: MPFDA	36.3		**105 %**	ng/L	*70-130*	10/19/18	10/23/18 09:44	*EPA 537/R3QA242/243*

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HPLC Identification

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID: 1810015-13								
Station ID: BDE-GW-10								
Sample Matrix: Groundwater								
Collected: 10/11/2018								
PFBS (perfluorobutanesulfonic acid)	**40.4**		8.62	ng/L	1	10/19/18	10/23/18 10:10	EPA 537/R3QA242/243
PFHpA (perfluoroheptanoic acid)	**12.4**	J	8.62	ng/L	1	10/19/18	10/23/18 10:10	EPA 537/R3QA242/243
PFHxS (perfluorohexanesulfonic acid)	U		8.62	ng/L	1	10/19/18	10/23/18 10:10	EPA 537/R3QA242/243
PFNA (perfluorononanoic acid)	U	UJ	8.62	ng/L	1	10/19/18	10/23/18 10:10	EPA 537/R3QA242/243
PFOS (perfluorooctanesulfonic acid)	**1300**		86.2	ng/L	10	10/19/18	11/06/18 03:06	EPA 537/R3QA242/243
PFOA (perfluorooctanoic acid)	**33.0**	J	8.62	ng/L	1	10/19/18	10/23/18 10:10	EPA 537/R3QA242/243

Surrogates

Analyte	Result	Flags/ Qualifiers	**%Recovery**	Units	%Recovery Limits	Prepared	Analyzed	Method/SOP#
Lab ID: 1810015-13								
Station ID: BDE-GW-10								
Sample Matrix: Groundwater								
Collected: 10/11/2018								
Surrogate: MPFHxA	38.0		**110 %**	ng/L	*70-130*	10/19/18	10/23/18 10:10	*EPA 537/R3QA242/243*
Surrogate: MPFDA	37.0		**107 %**	ng/L	*70-130*	10/19/18	10/23/18 10:10	*EPA 537/R3QA242/243*

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HPLC Identification

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID: 1810015-14								
Station ID: BDE-GW-11								
Sample Matrix: Groundwater								
Collected: 10/11/2018								
PFBS (perfluorobutanesulfonic acid)	**61.9**		8.77	ng/L	1	10/19/18	10/23/18 10:36	EPA 537/R3QA242/243
PFHpA (perfluoroheptanoic acid)	**12.6**	J	8.77	ng/L	1	10/19/18	10/23/18 10:36	EPA 537/R3QA242/243
PFHxS (perfluorohexanesulfonic acid)	**11.8**		8.77	ng/L	1	10/19/18	10/23/18 10:36	EPA 537/R3QA242/243
PFNA (perfluorononanoic acid)	U	UJ	8.77	ng/L	1	10/19/18	10/23/18 10:36	EPA 537/R3QA242/243
PFOS (perfluorooctanesulfonic acid)	**228**		43.9	ng/L	5	10/19/18	11/16/18 00:00	EPA 537/R3QA242/243
PFOA (perfluorooctanoic acid)	**25.0**	J	8.77	ng/L	1	10/19/18	10/23/18 10:36	EPA 537/R3QA242/243

Surrogates

Analyte	Result	Flags/ Qualifiers	**%Recovery**	Units	%Recovery Limits	Prepared	Analyzed	Method/SOP#
Lab ID: 1810015-14								
Station ID: BDE-GW-11								
Sample Matrix: Groundwater								
Collected: 10/11/2018								
Surrogate: MPFHxA	40.2		**115 %**	ng/L	*70-130*	10/19/18	10/23/18 10:36	*EPA 537/R3QA242/243*
Surrogate: MPFDA	36.9		**105 %**	ng/L	*70-130*	10/19/18	10/23/18 10:36	*EPA 537/R3QA242/243*

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HPLC Identification

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID: 1810015-15								
Station ID: BDE-GW-12								
Sample Matrix: Groundwater								
Collected: 10/11/2018								
PFBS (perfluorobutanesulfonic acid)	**34.5**		8.93	ng/L	1	10/19/18	10/23/18 11:01	EPA 537/R3QA242/243
PFHpA (perfluoroheptanoic acid)	U	UJ	8.93	ng/L	1	10/19/18	10/23/18 11:01	EPA 537/R3QA242/243
PFHxS (perfluorohexanesulfonic acid)	U		8.93	ng/L	1	10/19/18	10/23/18 11:01	EPA 537/R3QA242/243
PFNA (perfluorononanoic acid)	U	UJ	8.93	ng/L	1	10/19/18	10/23/18 11:01	EPA 537/R3QA242/243
PFOS (perfluorooctanesulfonic acid)	**156**		8.93	ng/L	1	10/19/18	10/23/18 11:01	EPA 537/R3QA242/243
PFOA (perfluorooctanoic acid)	**14.8**	**J**	8.93	ng/L	1	10/19/18	10/23/18 11:01	EPA 537/R3QA242/243

Surrogates

Analyte	Result	Flags/ Qualifiers	**%Recovery**	Units	%Recovery Limits	Prepared	Analyzed	Method/SOP#
Lab ID: 1810015-15								
Station ID: BDE-GW-12								
Sample Matrix: Groundwater								
Collected: 10/11/2018								
Surrogate: MPFHxA	41.1		**115 %**	ng/L	*70-130*	10/19/18	10/23/18 11:01	*EPA 537/R3QA242/243*
Surrogate: MPFDA	39.0		**109 %**	ng/L	*70-130*	10/19/18	10/23/18 11:01	*EPA 537/R3QA242/243*

Site Name: BLADES GROUNDWATER **Project #: DAS R35450**

HPLC Identification

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID: 1810015-16								
Station ID: BDE-GW-13								
Sample Matrix: Groundwater								
Collected: 10/08/2018								
PFBS (perfluorobutanesulfonic acid)	**32.7**		8.62	ng/L	1	10/19/18	10/23/18 11:27	EPA 537/R3QA242/243
PFHpA (perfluoroheptanoic acid)	U	UJ	8.62	ng/L	1	10/19/18	10/23/18 11:27	EPA 537/R3QA242/243
PFHxS (perfluorohexanesulfonic acid)	U		8.62	ng/L	1	10/19/18	10/23/18 11:27	EPA 537/R3QA242/243
PFNA (perfluorononanoic acid)	U	UJ	8.62	ng/L	1	10/19/18	10/23/18 11:27	EPA 537/R3QA242/243
PFOS (perfluorooctanesulfonic acid)	**265**		43.1	ng/L	5	10/19/18	11/06/18 03:32	EPA 537/R3QA242/243
PFOA (perfluorooctanoic acid)	U	UJ	8.62	ng/L	1	10/19/18	10/23/18 11:27	EPA 537/R3QA242/243

Surrogates

Analyte	Result	Flags/ Qualifiers	**%Recovery**	Units	%Recovery Limits	Prepared	Analyzed	Method/SOP#
Lab ID: 1810015-16								
Station ID: BDE-GW-13								
Sample Matrix: Groundwater								
Collected: 10/08/2018								
Surrogate: MPFHxA	36.5		**106 %**	ng/L	*70-130*	10/19/18	10/23/18 11:27	*EPA 537/R3QA242/243*
Surrogate: MPFDA	35.6		**103 %**	ng/L	*70-130*	10/19/18	10/23/18 11:27	*EPA 537/R3QA242/243*

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HPLC Identification

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID: 1810015-17								
Station ID: BDE-GW-14								
Sample Matrix: Groundwater								
Collected: 10/11/2018								
PFBS (perfluorobutanesulfonic acid)	**271**		89.3	ng/L	10	10/19/18	11/15/18 18:25	EPA 537/R3QA242/243
PFHpA (perfluoroheptanoic acid)	**12.3**	J	8.93	ng/L	1	10/19/18	10/23/18 11:53	EPA 537/R3QA242/243
PFHxS (perfluorohexanesulfonic acid)	**37.0**		8.93	ng/L	1	10/19/18	10/23/18 11:53	EPA 537/R3QA242/243
PFNA (perfluorononanoic acid)	U	UJ	8.93	ng/L	1	10/19/18	10/23/18 11:53	EPA 537/R3QA242/243
PFOS (perfluorooctanesulfonic acid)	**465**		89.3	ng/L	10	10/19/18	11/15/18 18:25	EPA 537/R3QA242/243
PFOA (perfluorooctanoic acid)	**33.2**	J	8.93	ng/L	1	10/19/18	10/23/18 11:53	EPA 537/R3QA242/243

Surrogates

Analyte	Result	Flags/ Qualifiers	**%Recovery**	Units	%Recovery Limits	Prepared	Analyzed	Method/SOP#
Lab ID: 1810015-17								
Station ID: BDE-GW-14								
Sample Matrix: Groundwater								
Collected: 10/11/2018								
Surrogate: MPFHxA	36.3		**102 %**	ng/L	*70-130*	10/19/18	10/23/18 11:53	*EPA 537/R3QA242/243*
Surrogate: MPFDA	37.4		**105 %**	ng/L	*70-130*	10/19/18	10/23/18 11:53	*EPA 537/R3QA242/243*

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HPLC Identification

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID: 1810015-18								
Station ID: BDE-GW-15								
Sample Matrix: Groundwater								
Collected: 10/10/2018								
PFBS (perfluorobutanesulfonic acid)	**49.1**		8.77	ng/L	1	10/19/18	10/23/18 12:18	EPA 537/R3QA242/243
PFHpA (perfluoroheptanoic acid)	**9.12**	J	8.77	ng/L	1	10/19/18	10/23/18 12:18	EPA 537/R3QA242/243
PFHxS (perfluorohexanesulfonic acid)	U		8.77	ng/L	1	10/19/18	10/23/18 12:18	EPA 537/R3QA242/243
PFNA (perfluorononanoic acid)	U	UJ	8.77	ng/L	1	10/19/18	10/23/18 12:18	EPA 537/R3QA242/243
PFOS (perfluorooctanesulfonic acid)	**190**		43.9	ng/L	5	10/19/18	11/15/18 18:50	EPA 537/R3QA242/243
PFOA (perfluorooctanoic acid)	**22.4**	J	8.77	ng/L	1	10/19/18	10/23/18 12:18	EPA 537/R3QA242/243

Surrogates

Analyte	Result	Flags/ Qualifiers	**%Recovery**	Units	%Recovery Limits	Prepared	Analyzed	Method/SOP#
Lab ID: 1810015-18								
Station ID: BDE-GW-15								
Sample Matrix: Groundwater								
Collected: 10/10/2018								
Surrogate: MPFHxA	34.9		**99 %**	ng/L	*70-130*	10/19/18	10/23/18 12:18	*EPA 537/R3QA242/243*
Surrogate: MPFDA	36.6		**104 %**	ng/L	*70-130*	10/19/18	10/23/18 12:18	*EPA 537/R3QA242/243*

Site Name: BLADES GROUNDWATER **Project #: DAS R35450**

HPLC Identification

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID: 1810015-19								
Station ID: BDE-FRB-01								
Sample Matrix: Water								
Collected: 10/08/2018								
PFBS (perfluorobutanesulfonic acid)	U		10.0	ng/L	1	10/19/18	10/23/18 12:44	EPA 537/R3QA242/243
PFHpA (perfluoroheptanoic acid)	U	UJ	10.0	ng/L	1	10/19/18	10/23/18 12:44	EPA 537/R3QA242/243
PFHxS (perfluorohexanesulfonic acid)	U		10.0	ng/L	1	10/19/18	10/23/18 12:44	EPA 537/R3QA242/243
PFNA (perfluorononanoic acid)	U	UJ	10.0	ng/L	1	10/19/18	10/23/18 12:44	EPA 537/R3QA242/243
PFOS (perfluorooctanesulfonic acid)	U		10.0	ng/L	1	10/19/18	10/23/18 12:44	EPA 537/R3QA242/243
PFOA (perfluorooctanoic acid)	U	UJ	10.0	ng/L	1	10/19/18	10/23/18 12:44	EPA 537/R3QA242/243

Surrogates

Analyte	Result	Flags/ Qualifiers	**%Recovery**	Units	%Recovery Limits	Prepared	Analyzed	Method/SOP#
Lab ID: 1810015-19								
Station ID: BDE-FRB-01								
Sample Matrix: Water								
Collected: 10/08/2018								
Surrogate: MPFHxA	39.2		**98 %**	ng/L	*70-130*	10/19/18	10/23/18 12:44	*EPA 537/R3QA242/243*
Surrogate: MPFDA	39.0		**98 %**	ng/L	*70-130*	10/19/18	10/23/18 12:44	*EPA 537/R3QA242/243*

Site Name: **BLADES GROUNDWATER** **Project #:** **DAS R35450**

HPLC Identification

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID: 1810015-20								
Station ID: BDE-FRB-02								
Sample Matrix: Water								
Collected: 10/09/2018								
PFBS (perfluorobutanesulfonic acid)	U		10.0	ng/L	1	10/19/18	10/23/18 13:09	EPA 537/R3QA242/243
PFHpA (perfluoroheptanoic acid)	U	UJ	10.0	ng/L	1	10/19/18	10/23/18 13:09	EPA 537/R3QA242/243
PFHxS (perfluorohexanesulfonic acid)	U		10.0	ng/L	1	10/19/18	10/23/18 13:09	EPA 537/R3QA242/243
PFNA (perfluorononanoic acid)	U	UJ	10.0	ng/L	1	10/19/18	10/23/18 13:09	EPA 537/R3QA242/243
PFOS (perfluorooctanesulfonic acid)	U		10.0	ng/L	1	10/19/18	10/23/18 13:09	EPA 537/R3QA242/243
PFOA (perfluorooctanoic acid)	U	UJ	10.0	ng/L	1	10/19/18	10/23/18 13:09	EPA 537/R3QA242/243

Surrogates

Analyte	Result	Flags/ Qualifiers	**%Recovery**	Units	%Recovery Limits	Prepared	Analyzed	Method/SOP#
Lab ID: 1810015-20								
Station ID: BDE-FRB-02								
Sample Matrix: Water								
Collected: 10/09/2018								
Surrogate: MPFHxA	40.7		**102 %**	ng/L	*70-130*	10/19/18	10/23/18 13:09	*EPA 537/R3QA242/243*
Surrogate: MPFDA	39.5		**99 %**	ng/L	*70-130*	10/19/18	10/23/18 13:09	*EPA 537/R3QA242/243*

Site Name: BLADES GROUNDWATER **Project #: DAS R35450**

HPLC Identification

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID: 1810015-21								
Station ID: BDE-FRB-03								
Sample Matrix: Water								
Collected: 10/10/2018								
PFBS (perfluorobutanesulfonic acid)	U		10.0	ng/L	1	10/19/18	11/05/18 23:15	EPA 537/R3QA242/243
PFHpA (perfluoroheptanoic acid)	U		10.0	ng/L	1	10/19/18	11/05/18 23:15	EPA 537/R3QA242/243
PFHxS (perfluorohexanesulfonic acid)	U		10.0	ng/L	1	10/19/18	11/05/18 23:15	EPA 537/R3QA242/243
PFNA (perfluorononanoic acid)	U		10.0	ng/L	1	10/19/18	11/05/18 23:15	EPA 537/R3QA242/243
PFOS (perfluorooctanesulfonic acid)	U		10.0	ng/L	1	10/19/18	11/05/18 23:15	EPA 537/R3QA242/243
PFOA (perfluorooctanoic acid)	U		10.0	ng/L	1	10/19/18	11/05/18 23:15	EPA 537/R3QA242/243

Surrogates

Analyte	Result	Flags/ Qualifiers	**%Recovery**	Units	%Recovery Limits	Prepared	Analyzed	Method/SOP#
Lab ID: 1810015-21								
Station ID: BDE-FRB-03								
Sample Matrix: Water								
Collected: 10/10/2018								
Surrogate: MPFHxA	40.0		**100 %**	ng/L	*70-130*	10/19/18	11/05/18 23:15	*EPA 537/R3QA242/243*
Surrogate: MPFDA	40.8		**102 %**	ng/L	*70-130*	10/19/18	11/05/18 23:15	*EPA 537/R3QA242/243*

Site Name: **BLADES GROUNDWATER** **Project #:** **DAS R35450**

HPLC Identification

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID: 1810015-22								
Station ID: BDE-FRB-04								
Sample Matrix: Water								
Collected: 10/11/2018								
PFBS (perfluorobutanesulfonic acid)	U		10.0	ng/L	1	10/19/18	11/05/18 23:41	EPA 537/R3QA242/243
PFHpA (perfluoroheptanoic acid)	U		10.0	ng/L	1	10/19/18	11/05/18 23:41	EPA 537/R3QA242/243
PFHxS (perfluorohexanesulfonic acid)	U		10.0	ng/L	1	10/19/18	11/05/18 23:41	EPA 537/R3QA242/243
PFNA (perfluorononanoic acid)	U		10.0	ng/L	1	10/19/18	11/05/18 23:41	EPA 537/R3QA242/243
PFOS (perfluorooctanesulfonic acid)	U		10.0	ng/L	1	10/19/18	11/05/18 23:41	EPA 537/R3QA242/243
PFOA (perfluorooctanoic acid)	U		10.0	ng/L	1	10/19/18	11/05/18 23:41	EPA 537/R3QA242/243

Surrogates

Analyte	Result	Flags/ Qualifiers	**%Recovery**	Units	%Recovery Limits	Prepared	Analyzed	Method/SOP#
Lab ID: 1810015-22								
Station ID: BDE-FRB-04								
Sample Matrix: Water								
Collected: 10/11/2018								
Surrogate: MPFHxA	39.4		**99 %**	ng/L	*70-130*	10/19/18	11/05/18 23:41	*EPA 537/R3QA242/243*
Surrogate: MPFDA	38.7		**97 %**	ng/L	*70-130*	10/19/18	11/05/18 23:41	*EPA 537/R3QA242/243*

Site Name: BLADES GROUNDWATER **Project #: DAS R35450**

Organochlorine Pesticides and PCBs

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID: 1810015-01								
Station ID: BDE-GW-02								
Sample Matrix: Groundwater								
Collected: 10/09/2018								
Aldrin	U	UJ, H2	0.048	ug/L	1	10/17/18	11/01/18 23:24	R3QA237
alpha-BHC	U	UJ, H2	0.048	ug/L	1	10/17/18	11/01/18 23:24	R3QA237
beta-BHC	U	UJ, H2	0.048	ug/L	1	10/17/18	11/01/18 23:24	R3QA237
delta-BHC	U	UJ, H2	0.048	ug/L	1	10/17/18	11/01/18 23:24	R3QA237
gamma-BHC (Lindane)	U	UJ, H2	0.048	ug/L	1	10/17/18	11/01/18 23:24	R3QA237
alpha-Chlordane	U	UJ, H2	0.048	ug/L	1	10/17/18	11/01/18 23:24	R3QA237
gamma-Chlordane	U	UJ, H2	0.048	ug/L	1	10/17/18	11/01/18 23:24	R3QA237
4,4'-DDD	U	UJ, H2	0.095	ug/L	1	10/17/18	11/01/18 23:24	R3QA237
4,4'-DDE	U	UJ, H2	0.095	ug/L	1	10/17/18	11/01/18 23:24	R3QA237
4,4'-DDT	U	UJ, H2	0.095	ug/L	1	10/17/18	11/01/18 23:24	R3QA237
Dieldrin	U	UJ, H2	0.095	ug/L	1	10/17/18	11/01/18 23:24	R3QA237
Endosulfan I	U	UJ, H2	0.048	ug/L	1	10/17/18	11/01/18 23:24	R3QA237
Endosulfan II	U	UJ, H2	0.095	ug/L	1	10/17/18	11/01/18 23:24	R3QA237
Endosulfan sulfate	U	UJ, H2	0.095	ug/L	1	10/17/18	11/01/18 23:24	R3QA237
Endrin	U	UJ, H2	0.095	ug/L	1	10/17/18	11/01/18 23:24	R3QA237
Endrin aldehyde	U	UJ, H2	0.095	ug/L	1	10/17/18	11/01/18 23:24	R3QA237
Endrin ketone	U	UJ, H2	0.095	ug/L	1	10/17/18	11/01/18 23:24	R3QA237
Heptachlor	U	UJ, H2	0.048	ug/L	1	10/17/18	11/01/18 23:24	R3QA237
Heptachlor epoxide	U	UJ, H2	0.048	ug/L	1	10/17/18	11/01/18 23:24	R3QA237
Methoxychlor	U	UJ, H2	0.476	ug/L	1	10/17/18	11/01/18 23:24	R3QA237
Toxaphene	U	UJ, H2	4.76	ug/L	1	10/17/18	11/01/18 23:24	R3QA237

Surrogates

Analyte	Result	Flags/ Qualifiers	**%Recovery**	Units	%Recovery Limits	Prepared	Analyzed	Method/SOP#
Lab ID: 1810015-01								
Station ID: BDE-GW-02								
Sample Matrix: Groundwater								
Collected: 10/09/2018								
Surrogate: Tetrachloro-meta-xylene	0.643		**68 %**	ug/L	*30-150*	10/17/18	11/01/18 23:24	*R3QA237*
Surrogate: Decachlorobiphenyl	0.957		**100 %**	ug/L	*30-150*	10/17/18	11/01/18 23:24	*R3QA237*

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Region 3 Environmental Science Center
Office of Analytical Services and Quality Assurance
701 Mapes Road
Fort Meade, Maryland 20755-5350

Site Name: **BLADES GROUNDWATER** **Project #:** **DAS R35450**

Organochlorine Pesticides and PCBs

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID: 1810015-02								
Station ID: BDE-GW-03								
Sample Matrix: Groundwater								
Collected: 10/08/2018								
Aldrin	U	UJ, H2	0.048	ug/L	1	10/17/18	11/01/18 23:46	R3QA237
alpha-BHC	U	UJ, H2	0.048	ug/L	1	10/17/18	11/01/18 23:46	R3QA237
beta-BHC	U	UJ, H2	0.048	ug/L	1	10/17/18	11/01/18 23:46	R3QA237
delta-BHC	U	UJ, H2	0.048	ug/L	1	10/17/18	11/01/18 23:46	R3QA237
gamma-BHC (Lindane)	U	UJ, H2	0.048	ug/L	1	10/17/18	11/01/18 23:46	R3QA237
alpha-Chlordane	U	UJ, H2	0.048	ug/L	1	10/17/18	11/01/18 23:46	R3QA237
gamma-Chlordane	U	UJ, H2	0.048	ug/L	1	10/17/18	11/01/18 23:46	R3QA237
4,4'-DDD	U	UJ, H2	0.095	ug/L	1	10/17/18	11/01/18 23:46	R3QA237
4,4'-DDE	U	UJ, H2	0.095	ug/L	1	10/17/18	11/01/18 23:46	R3QA237
4,4'-DDT	U	UJ, H2	0.095	ug/L	1	10/17/18	11/01/18 23:46	R3QA237
Dieldrin	**0.957**	J, H2	0.095	ug/L	1	10/17/18	11/01/18 23:46	R3QA237
Endosulfan I	U	UJ, H2	0.048	ug/L	1	10/17/18	11/01/18 23:46	R3QA237
Endosulfan II	U	UJ, H2	0.095	ug/L	1	10/17/18	11/01/18 23:46	R3QA237
Endosulfan sulfate	U	UJ, H2	0.095	ug/L	1	10/17/18	11/01/18 23:46	R3QA237
Endrin	U	UJ, H2	0.095	ug/L	1	10/17/18	11/01/18 23:46	R3QA237
Endrin aldehyde	U	UJ, H2	0.095	ug/L	1	10/17/18	11/01/18 23:46	R3QA237
Endrin ketone	U	UJ, H2	0.095	ug/L	1	10/17/18	11/01/18 23:46	R3QA237
Heptachlor	U	UJ, H2	0.048	ug/L	1	10/17/18	11/01/18 23:46	R3QA237
Heptachlor epoxide	U	UJ, H2	0.048	ug/L	1	10/17/18	11/01/18 23:46	R3QA237
Methoxychlor	U	UJ, H2	0.476	ug/L	1	10/17/18	11/01/18 23:46	R3QA237
Toxaphene	U	UJ, H2	4.76	ug/L	1	10/17/18	11/01/18 23:46	R3QA237

Surrogates

Analyte	Result	Flags/ Qualifiers	**%Recovery**	Units	%Recovery Limits	Prepared	Analyzed	Method/SOP#
Lab ID: 1810015-02								
Station ID: BDE-GW-03								
Sample Matrix: Groundwater								
Collected: 10/08/2018								
Surrogate: Tetrachloro-meta-xylene	0.547		**57 %**	ug/L	*30-150*	10/17/18	11/01/18 23:46	*R3QA237*
Surrogate: Decachlorobiphenyl	1.03		**108 %**	ug/L	*30-150*	10/17/18	11/01/18 23:46	*R3QA237*

Site Name: BLADES GROUNDWATER **Project #: DAS R35450**

Organochlorine Pesticides and PCBs

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID: 1810015-03								
Station ID: BDE-DMW-03								
Sample Matrix: Groundwater								
Collected: 10/10/2018								
Aldrin	U		0.050	ug/L	1	10/17/18	11/02/18 00:08	R3QA237
alpha-BHC	U		0.050	ug/L	1	10/17/18	11/02/18 00:08	R3QA237
beta-BHC	U		0.050	ug/L	1	10/17/18	11/02/18 00:08	R3QA237
delta-BHC	U		0.050	ug/L	1	10/17/18	11/02/18 00:08	R3QA237
gamma-BHC (Lindane)	U		0.050	ug/L	1	10/17/18	11/02/18 00:08	R3QA237
alpha-Chlordane	U		0.050	ug/L	1	10/17/18	11/02/18 00:08	R3QA237
gamma-Chlordane	U		0.050	ug/L	1	10/17/18	11/02/18 00:08	R3QA237
4,4'-DDD	U		0.100	ug/L	1	10/17/18	11/02/18 00:08	R3QA237
4,4'-DDE	U		0.100	ug/L	1	10/17/18	11/02/18 00:08	R3QA237
4,4'-DDT	U		0.100	ug/L	1	10/17/18	11/02/18 00:08	R3QA237
Dieldrin	U		0.100	ug/L	1	10/17/18	11/02/18 00:08	R3QA237
Endosulfan I	U		0.050	ug/L	1	10/17/18	11/02/18 00:08	R3QA237
Endosulfan II	U		0.100	ug/L	1	10/17/18	11/02/18 00:08	R3QA237
Endosulfan sulfate	U		0.100	ug/L	1	10/17/18	11/02/18 00:08	R3QA237
Endrin	U		0.100	ug/L	1	10/17/18	11/02/18 00:08	R3QA237
Endrin aldehyde	U		0.100	ug/L	1	10/17/18	11/02/18 00:08	R3QA237
Endrin ketone	U		0.100	ug/L	1	10/17/18	11/02/18 00:08	R3QA237
Heptachlor	U		0.050	ug/L	1	10/17/18	11/02/18 00:08	R3QA237
Heptachlor epoxide	U		0.050	ug/L	1	10/17/18	11/02/18 00:08	R3QA237
Methoxychlor	U		0.500	ug/L	1	10/17/18	11/02/18 00:08	R3QA237
Toxaphene	U		5.00	ug/L	1	10/17/18	11/02/18 00:08	R3QA237

Surrogates

Analyte	Result	Flags/ Qualifiers	**%Recovery**	Units	%Recovery Limits	Prepared	Analyzed	Method/SOP#
Lab ID: 1810015-03								
Station ID: BDE-DMW-03								
Sample Matrix: Groundwater								
Collected: 10/10/2018								
Surrogate: Tetrachloro-meta-xylene	0.651		**65 %**	ug/L	*30-150*	10/17/18	11/02/18 00:08	*R3QA237*
Surrogate: Decachlorobiphenyl	0.912		**91 %**	ug/L	*30-150*	10/17/18	11/02/18 00:08	*R3QA237*

Site Name: BLADES GROUNDWATER **Project #: DAS R35450**

Organochlorine Pesticides and PCBs

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID: 1810015-04								
Station ID: BDE-GW-02D								
Sample Matrix: Groundwater								
Collected: 10/09/2018								
Aldrin	U	UJ, H2	0.048	ug/L	1	10/17/18	11/02/18 00:30	R3QA237
alpha-BHC	U	UJ, H2	0.048	ug/L	1	10/17/18	11/02/18 00:30	R3QA237
beta-BHC	U	UJ, H2	0.048	ug/L	1	10/17/18	11/02/18 00:30	R3QA237
delta-BHC	U	UJ, H2	0.048	ug/L	1	10/17/18	11/02/18 00:30	R3QA237
gamma-BHC (Lindane)	U	UJ, H2	0.048	ug/L	1	10/17/18	11/02/18 00:30	R3QA237
alpha-Chlordane	U	UJ, H2	0.048	ug/L	1	10/17/18	11/02/18 00:30	R3QA237
gamma-Chlordane	U	UJ, H2	0.048	ug/L	1	10/17/18	11/02/18 00:30	R3QA237
4,4'-DDD	U	UJ, H2	0.095	ug/L	1	10/17/18	11/02/18 00:30	R3QA237
4,4'-DDE	U	UJ, H2	0.095	ug/L	1	10/17/18	11/02/18 00:30	R3QA237
4,4'-DDT	U	UJ, H2	0.095	ug/L	1	10/17/18	11/02/18 00:30	R3QA237
Dieldrin	U	UJ, H2	0.095	ug/L	1	10/17/18	11/02/18 00:30	R3QA237
Endosulfan I	U	UJ, H2	0.048	ug/L	1	10/17/18	11/02/18 00:30	R3QA237
Endosulfan II	U	UJ, H2	0.095	ug/L	1	10/17/18	11/02/18 00:30	R3QA237
Endosulfan sulfate	U	UJ, H2	0.095	ug/L	1	10/17/18	11/02/18 00:30	R3QA237
Endrin	U	UJ, H2	0.095	ug/L	1	10/17/18	11/02/18 00:30	R3QA237
Endrin aldehyde	U	UJ, H2	0.095	ug/L	1	10/17/18	11/02/18 00:30	R3QA237
Endrin ketone	U	UJ, H2	0.095	ug/L	1	10/17/18	11/02/18 00:30	R3QA237
Heptachlor	U	UJ, H2	0.048	ug/L	1	10/17/18	11/02/18 00:30	R3QA237
Heptachlor epoxide	U	UJ, H2	0.048	ug/L	1	10/17/18	11/02/18 00:30	R3QA237
Methoxychlor	U	UJ, H2	0.476	ug/L	1	10/17/18	11/02/18 00:30	R3QA237
Toxaphene	U	UJ, H2	4.76	ug/L	1	10/17/18	11/02/18 00:30	R3QA237

Surrogates

Analyte	Result	Flags/ Qualifiers	**%Recovery**	Units	%Recovery Limits	Prepared	Analyzed	Method/SOP#
Lab ID: 1810015-04								
Station ID: BDE-GW-02D								
Sample Matrix: Groundwater								
Collected: 10/09/2018								
Surrogate: Tetrachloro-meta-xylene	0.683		**72 %**	ug/L	*30-150*	10/17/18	11/02/18 00:30	*R3QA237*
Surrogate: Decachlorobiphenyl	0.861		**90 %**	ug/L	*30-150*	10/17/18	11/02/18 00:30	*R3QA237*

Site Name: **BLADES GROUNDWATER** **Project #:** **DAS R35450**

Organochlorine Pesticides and PCBs

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID: 1810015-05								
Station ID: BDE-GW-01								
Sample Matrix: Groundwater								
Collected: 10/09/2018								
Aldrin	U	UJ, H2	0.048	ug/L	1	10/17/18	11/02/18 00:52	R3QA237
alpha-BHC	U	UJ, H2	0.048	ug/L	1	10/17/18	11/02/18 00:52	R3QA237
beta-BHC	U	UJ, H2	0.048	ug/L	1	10/17/18	11/02/18 00:52	R3QA237
delta-BHC	U	UJ, H2	0.048	ug/L	1	10/17/18	11/02/18 00:52	R3QA237
gamma-BHC (Lindane)	U	UJ, H2	0.048	ug/L	1	10/17/18	11/02/18 00:52	R3QA237
alpha-Chlordane	U	UJ, H2	0.048	ug/L	1	10/17/18	11/02/18 00:52	R3QA237
gamma-Chlordane	U	UJ, H2	0.048	ug/L	1	10/17/18	11/02/18 00:52	R3QA237
4,4'-DDD	U	UJ, H2	0.095	ug/L	1	10/17/18	11/02/18 00:52	R3QA237
4,4'-DDE	U	UJ, H2	0.095	ug/L	1	10/17/18	11/02/18 00:52	R3QA237
4,4'-DDT	U	UJ, H2	0.095	ug/L	1	10/17/18	11/02/18 00:52	R3QA237
Dieldrin	U	UJ, H2	0.095	ug/L	1	10/17/18	11/02/18 00:52	R3QA237
Endosulfan I	U	UJ, H2	0.048	ug/L	1	10/17/18	11/02/18 00:52	R3QA237
Endosulfan II	U	UJ, H2	0.095	ug/L	1	10/17/18	11/02/18 00:52	R3QA237
Endosulfan sulfate	U	UJ, H2	0.095	ug/L	1	10/17/18	11/02/18 00:52	R3QA237
Endrin	U	UJ, H2	0.095	ug/L	1	10/17/18	11/02/18 00:52	R3QA237
Endrin aldehyde	U	UJ, H2	0.095	ug/L	1	10/17/18	11/02/18 00:52	R3QA237
Endrin ketone	U	UJ, H2	0.095	ug/L	1	10/17/18	11/02/18 00:52	R3QA237
Heptachlor	U	UJ, H2	0.048	ug/L	1	10/17/18	11/02/18 00:52	R3QA237
Heptachlor epoxide	U	UJ, H2	0.048	ug/L	1	10/17/18	11/02/18 00:52	R3QA237
Methoxychlor	U	UJ, H2	0.476	ug/L	1	10/17/18	11/02/18 00:52	R3QA237
Toxaphene	U	UJ, H2	4.76	ug/L	1	10/17/18	11/02/18 00:52	R3QA237

Surrogates

Analyte	Result	Flags/ Qualifiers	**%Recovery**	Units	%Recovery Limits	Prepared	Analyzed	Method/SOP#
Lab ID: 1810015-05								
Station ID: BDE-GW-01								
Sample Matrix: Groundwater								
Collected: 10/09/2018								
Surrogate: Tetrachloro-meta-xylene	0.672		**71 %**	ug/L	*30-150*	10/17/18	11/02/18 00:52	*R3QA237*
Surrogate: Decachlorobiphenyl	0.840		**88 %**	ug/L	*30-150*	10/17/18	11/02/18 00:52	*R3QA237*

Site Name: BLADES GROUNDWATER **Project #: DAS R35450**

Organochlorine Pesticides and PCBs

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID: 1810015-06								
Station ID: BDE-DMW-02								
Sample Matrix: Groundwater								
Collected: 10/09/2018								
Aldrin	U	UJ, H2	0.048	ug/L	1	10/17/18	11/02/18 01:58	R3QA237
alpha-BHC	U	UJ, H2	0.048	ug/L	1	10/17/18	11/02/18 01:58	R3QA237
beta-BHC	U	UJ, H2	0.048	ug/L	1	10/17/18	11/02/18 01:58	R3QA237
delta-BHC	U	UJ, H2	0.048	ug/L	1	10/17/18	11/02/18 01:58	R3QA237
gamma-BHC (Lindane)	U	UJ, H2	0.048	ug/L	1	10/17/18	11/02/18 01:58	R3QA237
alpha-Chlordane	U	UJ, H2	0.048	ug/L	1	10/17/18	11/02/18 01:58	R3QA237
gamma-Chlordane	U	UJ, H2	0.048	ug/L	1	10/17/18	11/02/18 01:58	R3QA237
4,4'-DDD	U	UJ, H2	0.095	ug/L	1	10/17/18	11/02/18 01:58	R3QA237
4,4'-DDE	U	UJ, H2	0.095	ug/L	1	10/17/18	11/02/18 01:58	R3QA237
4,4'-DDT	U	UJ, H2	0.095	ug/L	1	10/17/18	11/02/18 01:58	R3QA237
Dieldrin	**0.341**	J, H2	0.095	ug/L	1	10/17/18	11/02/18 01:58	R3QA237
Endosulfan I	U	UJ, H2	0.048	ug/L	1	10/17/18	11/02/18 01:58	R3QA237
Endosulfan II	U	UJ, H2	0.095	ug/L	1	10/17/18	11/02/18 01:58	R3QA237
Endosulfan sulfate	U	UJ, H2	0.095	ug/L	1	10/17/18	11/02/18 01:58	R3QA237
Endrin	U	UJ, H2	0.095	ug/L	1	10/17/18	11/02/18 01:58	R3QA237
Endrin aldehyde	U	UJ, H2	0.095	ug/L	1	10/17/18	11/02/18 01:58	R3QA237
Endrin ketone	U	UJ, H2	0.095	ug/L	1	10/17/18	11/02/18 01:58	R3QA237
Heptachlor	U	UJ, H2	0.048	ug/L	1	10/17/18	11/02/18 01:58	R3QA237
Heptachlor epoxide	U	UJ, H2	0.048	ug/L	1	10/17/18	11/02/18 01:58	R3QA237
Methoxychlor	U	UJ, H2	0.476	ug/L	1	10/17/18	11/02/18 01:58	R3QA237
Toxaphene	U	UJ, H2	4.76	ug/L	1	10/17/18	11/02/18 01:58	R3QA237

Surrogates

Analyte	Result	Flags/ Qualifiers	**%Recovery**	Units	%Recovery Limits	Prepared	Analyzed	Method/SOP#
Lab ID: 1810015-06								
Station ID: BDE-DMW-02								
Sample Matrix: Groundwater								
Collected: 10/09/2018								
Surrogate: Tetrachloro-meta-xylene	0.700		**74 %**	ug/L	*30-150*	10/17/18	11/02/18 01:58	*R3QA237*
Surrogate: Decachlorobiphenyl	0.931		**98 %**	ug/L	*30-150*	10/17/18	11/02/18 01:58	*R3QA237*

Site Name: BLADES GROUNDWATER **Project #: DAS R35450**

Organochlorine Pesticides and PCBs

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID: 1810015-07								
Station ID: BDE-DMW-01								
Sample Matrix: Groundwater								
Collected: 10/10/2018								
Aldrin	U		0.048	ug/L	1	10/17/18	11/02/18 02:20	R3QA237
alpha-BHC	U		0.048	ug/L	1	10/17/18	11/02/18 02:20	R3QA237
beta-BHC	U		0.048	ug/L	1	10/17/18	11/02/18 02:20	R3QA237
delta-BHC	U		0.048	ug/L	1	10/17/18	11/02/18 02:20	R3QA237
gamma-BHC (Lindane)	U		0.048	ug/L	1	10/17/18	11/02/18 02:20	R3QA237
alpha-Chlordane	U		0.048	ug/L	1	10/17/18	11/02/18 02:20	R3QA237
gamma-Chlordane	U		0.048	ug/L	1	10/17/18	11/02/18 02:20	R3QA237
4,4'-DDD	U		0.095	ug/L	1	10/17/18	11/02/18 02:20	R3QA237
4,4'-DDE	U		0.095	ug/L	1	10/17/18	11/02/18 02:20	R3QA237
4,4'-DDT	U		0.095	ug/L	1	10/17/18	11/02/18 02:20	R3QA237
Dieldrin	U		0.095	ug/L	1	10/17/18	11/02/18 02:20	R3QA237
Endosulfan I	U		0.048	ug/L	1	10/17/18	11/02/18 02:20	R3QA237
Endosulfan II	U		0.095	ug/L	1	10/17/18	11/02/18 02:20	R3QA237
Endosulfan sulfate	U		0.095	ug/L	1	10/17/18	11/02/18 02:20	R3QA237
Endrin	U		0.095	ug/L	1	10/17/18	11/02/18 02:20	R3QA237
Endrin aldehyde	U		0.095	ug/L	1	10/17/18	11/02/18 02:20	R3QA237
Endrin ketone	U		0.095	ug/L	1	10/17/18	11/02/18 02:20	R3QA237
Heptachlor	U		0.048	ug/L	1	10/17/18	11/02/18 02:20	R3QA237
Heptachlor epoxide	U		0.048	ug/L	1	10/17/18	11/02/18 02:20	R3QA237
Methoxychlor	U		0.476	ug/L	1	10/17/18	11/02/18 02:20	R3QA237
Toxaphene	U		4.76	ug/L	1	10/17/18	11/02/18 02:20	R3QA237

Surrogates

Analyte	Result	Flags/ Qualifiers	**%Recovery**	Units	%Recovery Limits	Prepared	Analyzed	Method/SOP#
Lab ID: 1810015-07								
Station ID: BDE-DMW-01								
Sample Matrix: Groundwater								
Collected: 10/10/2018								
Surrogate: Tetrachloro-meta-xylene	0.699		**73 %**	ug/L	*30-150*	10/17/18	11/02/18 02:20	*R3QA237*
Surrogate: Decachlorobiphenyl	0.867		**91 %**	ug/L	*30-150*	10/17/18	11/02/18 02:20	*R3QA237*

Site Name: BLADES GROUNDWATER **Project #: DAS R35450**

Organochlorine Pesticides and PCBs

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID: 1810015-08								
Station ID: BDE-GW-04								
Sample Matrix: Groundwater								
Collected: 10/08/2018								
Aldrin	U	UJ, H2	0.048	ug/L	1	10/17/18	11/02/18 02:42	R3QA237
alpha-BHC	U	UJ, H2	0.048	ug/L	1	10/17/18	11/02/18 02:42	R3QA237
beta-BHC	U	UJ, H2	0.048	ug/L	1	10/17/18	11/02/18 02:42	R3QA237
delta-BHC	U	UJ, H2	0.048	ug/L	1	10/17/18	11/02/18 02:42	R3QA237
gamma-BHC (Lindane)	U	UJ, H2	0.048	ug/L	1	10/17/18	11/02/18 02:42	R3QA237
alpha-Chlordane	U	UJ, H2	0.048	ug/L	1	10/17/18	11/02/18 02:42	R3QA237
gamma-Chlordane	U	UJ, H2	0.048	ug/L	1	10/17/18	11/02/18 02:42	R3QA237
4,4'-DDD	U	UJ, H2	0.095	ug/L	1	10/17/18	11/02/18 02:42	R3QA237
4,4'-DDE	U	UJ, H2	0.095	ug/L	1	10/17/18	11/02/18 02:42	R3QA237
4,4'-DDT	U	UJ, H2	0.095	ug/L	1	10/17/18	11/02/18 02:42	R3QA237
Dieldrin	U	UJ, H2	0.095	ug/L	1	10/17/18	11/02/18 02:42	R3QA237
Endosulfan I	U	UJ, H2	0.048	ug/L	1	10/17/18	11/02/18 02:42	R3QA237
Endosulfan II	U	UJ, H2	0.095	ug/L	1	10/17/18	11/02/18 02:42	R3QA237
Endosulfan sulfate	U	UJ, H2	0.095	ug/L	1	10/17/18	11/02/18 02:42	R3QA237
Endrin	U	UJ, H2	0.095	ug/L	1	10/17/18	11/02/18 02:42	R3QA237
Endrin aldehyde	U	UJ, H2	0.095	ug/L	1	10/17/18	11/02/18 02:42	R3QA237
Endrin ketone	U	UJ, H2	0.095	ug/L	1	10/17/18	11/02/18 02:42	R3QA237
Heptachlor	U	UJ, H2	0.048	ug/L	1	10/17/18	11/02/18 02:42	R3QA237
Heptachlor epoxide	U	UJ, H2	0.048	ug/L	1	10/17/18	11/02/18 02:42	R3QA237
Methoxychlor	U	UJ, H2	0.476	ug/L	1	10/17/18	11/02/18 02:42	R3QA237
Toxaphene	U	UJ, H2	4.76	ug/L	1	10/17/18	11/02/18 02:42	R3QA237

Surrogates

Analyte	Result	Flags/ Qualifiers	**%Recovery**	Units	%Recovery Limits	Prepared	Analyzed	Method/SOP#
Lab ID: 1810015-08								
Station ID: BDE-GW-04								
Sample Matrix: Groundwater								
Collected: 10/08/2018								
Surrogate: Tetrachloro-meta-xylene	0.570		**60 %**	ug/L	*30-150*	10/17/18	11/02/18 02:42	*R3QA237*
Surrogate: Decachlorobiphenyl	0.985		**103 %**	ug/L	*30-150*	10/17/18	11/02/18 02:42	*R3QA237*

Site Name: BLADES GROUNDWATER **Project #: DAS R35450**

Organochlorine Pesticides and PCBs

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID: 1810015-09								
Station ID: BDE-GW-05								
Sample Matrix: Groundwater								
Collected: 10/08/2018								
Aldrin	U	UJ, H2	0.048	ug/L	1	10/17/18	11/02/18 03:04	R3QA237
alpha-BHC	U	H2, UJ	0.048	ug/L	1	10/17/18	11/02/18 03:04	R3QA237
beta-BHC	U	UJ, H2	0.048	ug/L	1	10/17/18	11/02/18 03:04	R3QA237
delta-BHC	U	UJ, H2	0.048	ug/L	1	10/17/18	11/02/18 03:04	R3QA237
gamma-BHC (Lindane)	U	UJ, H2	0.048	ug/L	1	10/17/18	11/02/18 03:04	R3QA237
alpha-Chlordane	U	UJ, H2	0.048	ug/L	1	10/17/18	11/02/18 03:04	R3QA237
gamma-Chlordane	U	UJ, H2	0.048	ug/L	1	10/17/18	11/02/18 03:04	R3QA237
4,4'-DDD	U	UJ, H2	0.095	ug/L	1	10/17/18	11/02/18 03:04	R3QA237
4,4'-DDE	U	UJ, H2	0.095	ug/L	1	10/17/18	11/02/18 03:04	R3QA237
4,4'-DDT	U	UJ, H2	0.095	ug/L	1	10/17/18	11/02/18 03:04	R3QA237
Dieldrin	**1.82**	J, H2	0.190	ug/L	2	10/17/18	11/02/18 13:21	R3QA237
Endosulfan I	U	UJ, H2	0.048	ug/L	1	10/17/18	11/02/18 03:04	R3QA237
Endosulfan II	U	UJ, H2	0.095	ug/L	1	10/17/18	11/02/18 03:04	R3QA237
Endosulfan sulfate	U	UJ, H2	0.095	ug/L	1	10/17/18	11/02/18 03:04	R3QA237
Endrin	U	UJ, H2	0.095	ug/L	1	10/17/18	11/02/18 03:04	R3QA237
Endrin aldehyde	U	UJ, H2	0.095	ug/L	1	10/17/18	11/02/18 03:04	R3QA237
Endrin ketone	**0.096**	J, H2	0.095	ug/L	1	10/17/18	11/02/18 03:04	R3QA237
Heptachlor	U	UJ, H2	0.048	ug/L	1	10/17/18	11/02/18 03:04	R3QA237
Heptachlor epoxide	U	UJ, H2	0.048	ug/L	1	10/17/18	11/02/18 03:04	R3QA237
Methoxychlor	U	UJ, H2	0.476	ug/L	1	10/17/18	11/02/18 03:04	R3QA237
Toxaphene	U	H2, UJ	4.76	ug/L	1	10/17/18	11/02/18 03:04	R3QA237

Surrogates

Analyte	Result	Flags/ Qualifiers	**%Recovery**	Units	%Recovery Limits	Prepared	Analyzed	Method/SOP#
Lab ID: 1810015-09								
Station ID: BDE-GW-05								
Sample Matrix: Groundwater								
Collected: 10/08/2018								
Surrogate: Tetrachloro-meta-xylene	0.598		**63 %**	ug/L	*30-150*	10/17/18	11/02/18 03:04	*R3QA237*
Surrogate: Decachlorobiphenyl	0.789		**83 %**	ug/L	*30-150*	10/17/18	11/02/18 03:04	*R3QA237*

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Organochlorine Pesticides and PCBs

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID: 1810015-10								
Station ID: BDE-GW-07								
Sample Matrix: Groundwater								
Collected: 10/10/2018								
Aldrin	U		0.048	ug/L	1	10/17/18	11/02/18 03:26	R3QA237
alpha-BHC	U		0.048	ug/L	1	10/17/18	11/02/18 03:26	R3QA237
beta-BHC	U		0.048	ug/L	1	10/17/18	11/02/18 03:26	R3QA237
delta-BHC	U		0.048	ug/L	1	10/17/18	11/02/18 03:26	R3QA237
gamma-BHC (Lindane)	U		0.048	ug/L	1	10/17/18	11/02/18 03:26	R3QA237
alpha-Chlordane	U		0.048	ug/L	1	10/17/18	11/02/18 03:26	R3QA237
gamma-Chlordane	U		0.048	ug/L	1	10/17/18	11/02/18 03:26	R3QA237
4,4'-DDD	U		0.095	ug/L	1	10/17/18	11/02/18 03:26	R3QA237
4,4'-DDE	U		0.095	ug/L	1	10/17/18	11/02/18 03:26	R3QA237
4,4'-DDT	U		0.095	ug/L	1	10/17/18	11/02/18 03:26	R3QA237
Dieldrin	U		0.095	ug/L	1	10/17/18	11/02/18 03:26	R3QA237
Endosulfan I	U		0.048	ug/L	1	10/17/18	11/02/18 03:26	R3QA237
Endosulfan II	U		0.095	ug/L	1	10/17/18	11/02/18 03:26	R3QA237
Endosulfan sulfate	U		0.095	ug/L	1	10/17/18	11/02/18 03:26	R3QA237
Endrin	U		0.095	ug/L	1	10/17/18	11/02/18 03:26	R3QA237
Endrin aldehyde	U		0.095	ug/L	1	10/17/18	11/02/18 03:26	R3QA237
Endrin ketone	U		0.095	ug/L	1	10/17/18	11/02/18 03:26	R3QA237
Heptachlor	U		0.048	ug/L	1	10/17/18	11/02/18 03:26	R3QA237
Heptachlor epoxide	U		0.048	ug/L	1	10/17/18	11/02/18 03:26	R3QA237
Methoxychlor	U		0.476	ug/L	1	10/17/18	11/02/18 03:26	R3QA237
Toxaphene	U		4.76	ug/L	1	10/17/18	11/02/18 03:26	R3QA237

Surrogates

Analyte	Result	Flags/ Qualifiers	**%Recovery**	Units	%Recovery Limits	Prepared	Analyzed	Method/SOP#
Lab ID: 1810015-10								
Station ID: BDE-GW-07								
Sample Matrix: Groundwater								
Collected: 10/10/2018								
Surrogate: Tetrachloro-meta-xylene	0.621		**65 %**	ug/L	*30-150*	10/17/18	11/02/18 03:26	*R3QA237*
Surrogate: Decachlorobiphenyl	0.970		**102 %**	ug/L	*30-150*	10/17/18	11/02/18 03:26	*R3QA237*

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Organochlorine Pesticides and PCBs

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID: 1810015-11								
Station ID: BDE-GW-08								
Sample Matrix: Groundwater								
Collected: 10/11/2018								
Aldrin	U		0.048	ug/L	1	10/17/18	11/02/18 03:47	R3QA237
alpha-BHC	U		0.048	ug/L	1	10/17/18	11/02/18 03:47	R3QA237
beta-BHC	U		0.048	ug/L	1	10/17/18	11/02/18 03:47	R3QA237
delta-BHC	U		0.048	ug/L	1	10/17/18	11/02/18 03:47	R3QA237
gamma-BHC (Lindane)	U		0.048	ug/L	1	10/17/18	11/02/18 03:47	R3QA237
alpha-Chlordane	U		0.048	ug/L	1	10/17/18	11/02/18 03:47	R3QA237
gamma-Chlordane	U		0.048	ug/L	1	10/17/18	11/02/18 03:47	R3QA237
4,4'-DDD	U		0.095	ug/L	1	10/17/18	11/02/18 03:47	R3QA237
4,4'-DDE	U		0.095	ug/L	1	10/17/18	11/02/18 03:47	R3QA237
4,4'-DDT	U		0.095	ug/L	1	10/17/18	11/02/18 03:47	R3QA237
Dieldrin	**0.101**		0.095	ug/L	1	10/17/18	11/02/18 03:47	R3QA237
Endosulfan I	U		0.048	ug/L	1	10/17/18	11/02/18 03:47	R3QA237
Endosulfan II	U		0.095	ug/L	1	10/17/18	11/02/18 03:47	R3QA237
Endosulfan sulfate	U		0.095	ug/L	1	10/17/18	11/02/18 03:47	R3QA237
Endrin	U		0.095	ug/L	1	10/17/18	11/02/18 03:47	R3QA237
Endrin aldehyde	U		0.095	ug/L	1	10/17/18	11/02/18 03:47	R3QA237
Endrin ketone	U		0.095	ug/L	1	10/17/18	11/02/18 03:47	R3QA237
Heptachlor	U		0.048	ug/L	1	10/17/18	11/02/18 03:47	R3QA237
Heptachlor epoxide	U		0.048	ug/L	1	10/17/18	11/02/18 03:47	R3QA237
Methoxychlor	U		0.476	ug/L	1	10/17/18	11/02/18 03:47	R3QA237
Toxaphene	U		4.76	ug/L	1	10/17/18	11/02/18 03:47	R3QA237

Surrogates

Analyte	Result	Flags/ Qualifiers	**%Recovery**	Units	%Recovery Limits	Prepared	Analyzed	Method/SOP#
Lab ID: 1810015-11								
Station ID: BDE-GW-08								
Sample Matrix: Groundwater								
Collected: 10/11/2018								
Surrogate: Tetrachloro-meta-xylene	0.697		**73 %**	ug/L	*30-150*	10/17/18	11/02/18 03:47	*R3QA237*
Surrogate: Decachlorobiphenyl	0.990		**104 %**	ug/L	*30-150*	10/17/18	11/02/18 03:47	*R3QA237*

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Organochlorine Pesticides and PCBs

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID: 1810015-12								
Station ID: BDE-GW-09								
Sample Matrix: Groundwater								
Collected: 10/09/2018								
Aldrin	U	UJ, H2	0.048	ug/L	1	10/17/18	11/02/18 04:09	R3QA237
alpha-BHC	U	UJ, H2	0.048	ug/L	1	10/17/18	11/02/18 04:09	R3QA237
beta-BHC	U	UJ, H2	0.048	ug/L	1	10/17/18	11/02/18 04:09	R3QA237
delta-BHC	U	UJ, H2	0.048	ug/L	1	10/17/18	11/02/18 04:09	R3QA237
gamma-BHC (Lindane)	U	UJ, H2	0.048	ug/L	1	10/17/18	11/02/18 04:09	R3QA237
alpha-Chlordane	U	UJ, H2	0.048	ug/L	1	10/17/18	11/02/18 04:09	R3QA237
gamma-Chlordane	U	UJ, H2	0.048	ug/L	1	10/17/18	11/02/18 04:09	R3QA237
4,4'-DDD	U	UJ, H2	0.095	ug/L	1	10/17/18	11/02/18 04:09	R3QA237
4,4'-DDE	U	UJ, H2	0.095	ug/L	1	10/17/18	11/02/18 04:09	R3QA237
4,4'-DDT	U	UJ, H2	0.095	ug/L	1	10/17/18	11/02/18 04:09	R3QA237
Dieldrin	**0.416**	J, H2	0.095	ug/L	1	10/17/18	11/02/18 04:09	R3QA237
Endosulfan I	U	UJ, H2	0.048	ug/L	1	10/17/18	11/02/18 04:09	R3QA237
Endosulfan II	U	UJ, H2	0.095	ug/L	1	10/17/18	11/02/18 04:09	R3QA237
Endosulfan sulfate	U	UJ, H2	0.095	ug/L	1	10/17/18	11/02/18 04:09	R3QA237
Endrin	U	UJ, H2	0.095	ug/L	1	10/17/18	11/02/18 04:09	R3QA237
Endrin aldehyde	U	UJ, H2	0.095	ug/L	1	10/17/18	11/02/18 04:09	R3QA237
Endrin ketone	U	UJ, H2	0.095	ug/L	1	10/17/18	11/02/18 04:09	R3QA237
Heptachlor	U	H2, UJ	0.048	ug/L	1	10/17/18	11/02/18 04:09	R3QA237
Heptachlor epoxide	U	H2, UJ	0.048	ug/L	1	10/17/18	11/02/18 04:09	R3QA237
Methoxychlor	U	UJ, H2	0.476	ug/L	1	10/17/18	11/02/18 04:09	R3QA237
Toxaphene	U	UJ, H2	4.76	ug/L	1	10/17/18	11/02/18 04:09	R3QA237

Surrogates

Analyte	Result	Flags/ Qualifiers	**%Recovery**	Units	%Recovery Limits	Prepared	Analyzed	Method/SOP#
Lab ID: 1810015-12								
Station ID: BDE-GW-09								
Sample Matrix: Groundwater								
Collected: 10/09/2018								
Surrogate: Tetrachloro-meta-xylene	0.572		**60 %**	ug/L	*30-150*	10/17/18	11/02/18 04:09	*R3QA237*
Surrogate: Decachlorobiphenyl	0.921		**97 %**	ug/L	*30-150*	10/17/18	11/02/18 04:09	*R3QA237*

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Organochlorine Pesticides and PCBs

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID: 1810015-13								
Station ID: BDE-GW-10								
Sample Matrix: Groundwater								
Collected: 10/11/2018								
Aldrin	U		0.048	ug/L	1	10/17/18	11/02/18 04:31	R3QA237
alpha-BHC	U		0.048	ug/L	1	10/17/18	11/02/18 04:31	R3QA237
beta-BHC	U		0.048	ug/L	1	10/17/18	11/02/18 04:31	R3QA237
delta-BHC	U		0.048	ug/L	1	10/17/18	11/02/18 04:31	R3QA237
gamma-BHC (Lindane)	U		0.048	ug/L	1	10/17/18	11/02/18 04:31	R3QA237
alpha-Chlordane	U		0.048	ug/L	1	10/17/18	11/02/18 04:31	R3QA237
gamma-Chlordane	U		0.048	ug/L	1	10/17/18	11/02/18 04:31	R3QA237
4,4'-DDD	U		0.095	ug/L	1	10/17/18	11/02/18 04:31	R3QA237
4,4'-DDE	U		0.095	ug/L	1	10/17/18	11/02/18 04:31	R3QA237
4,4'-DDT	U		0.095	ug/L	1	10/17/18	11/02/18 04:31	R3QA237
Dieldrin	U		0.095	ug/L	1	10/17/18	11/02/18 04:31	R3QA237
Endosulfan I	U		0.048	ug/L	1	10/17/18	11/02/18 04:31	R3QA237
Endosulfan II	U		0.095	ug/L	1	10/17/18	11/02/18 04:31	R3QA237
Endosulfan sulfate	U		0.095	ug/L	1	10/17/18	11/02/18 04:31	R3QA237
Endrin	U		0.095	ug/L	1	10/17/18	11/02/18 04:31	R3QA237
Endrin aldehyde	U		0.095	ug/L	1	10/17/18	11/02/18 04:31	R3QA237
Endrin ketone	U		0.095	ug/L	1	10/17/18	11/02/18 04:31	R3QA237
Heptachlor	U		0.048	ug/L	1	10/17/18	11/02/18 04:31	R3QA237
Heptachlor epoxide	U		0.048	ug/L	1	10/17/18	11/02/18 04:31	R3QA237
Methoxychlor	U		0.476	ug/L	1	10/17/18	11/02/18 04:31	R3QA237
Toxaphene	U		4.76	ug/L	1	10/17/18	11/02/18 04:31	R3QA237

Surrogates

Analyte	Result	Flags/ Qualifiers	**%Recovery**	Units	%Recovery Limits	Prepared	Analyzed	Method/SOP#
Lab ID: 1810015-13								
Station ID: BDE-GW-10								
Sample Matrix: Groundwater								
Collected: 10/11/2018								
Surrogate: Tetrachloro-meta-xylene	0.554		**58 %**	ug/L	*30-150*	10/17/18	11/02/18 04:31	*R3QA237*
Surrogate: Decachlorobiphenyl	0.985		**103 %**	ug/L	*30-150*	10/17/18	11/02/18 04:31	*R3QA237*

Site Name: BLADES GROUNDWATER **Project #: DAS R35450**

Organochlorine Pesticides and PCBs

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID: 1810015-14								
Station ID: BDE-GW-11								
Sample Matrix: Groundwater								
Collected: 10/11/2018								
Aldrin	U		0.049	ug/L	1	10/17/18	11/02/18 04:53	R3QA237
alpha-BHC	U		0.049	ug/L	1	10/17/18	11/02/18 04:53	R3QA237
beta-BHC	U		0.049	ug/L	1	10/17/18	11/02/18 04:53	R3QA237
delta-BHC	U		0.049	ug/L	1	10/17/18	11/02/18 04:53	R3QA237
gamma-BHC (Lindane)	U		0.049	ug/L	1	10/17/18	11/02/18 04:53	R3QA237
alpha-Chlordane	U		0.049	ug/L	1	10/17/18	11/02/18 04:53	R3QA237
gamma-Chlordane	U		0.049	ug/L	1	10/17/18	11/02/18 04:53	R3QA237
4,4'-DDD	U		0.097	ug/L	1	10/17/18	11/02/18 04:53	R3QA237
4,4'-DDE	U		0.097	ug/L	1	10/17/18	11/02/18 04:53	R3QA237
4,4'-DDT	U		0.097	ug/L	1	10/17/18	11/02/18 04:53	R3QA237
Dieldrin	**0.791**		0.097	ug/L	1	10/17/18	11/02/18 04:53	R3QA237
Endosulfan I	U		0.049	ug/L	1	10/17/18	11/02/18 04:53	R3QA237
Endosulfan II	U		0.097	ug/L	1	10/17/18	11/02/18 04:53	R3QA237
Endosulfan sulfate	U		0.097	ug/L	1	10/17/18	11/02/18 04:53	R3QA237
Endrin	U		0.097	ug/L	1	10/17/18	11/02/18 04:53	R3QA237
Endrin aldehyde	U		0.097	ug/L	1	10/17/18	11/02/18 04:53	R3QA237
Endrin ketone	U		0.097	ug/L	1	10/17/18	11/02/18 04:53	R3QA237
Heptachlor	U		0.049	ug/L	1	10/17/18	11/02/18 04:53	R3QA237
Heptachlor epoxide	U		0.049	ug/L	1	10/17/18	11/02/18 04:53	R3QA237
Methoxychlor	U		0.485	ug/L	1	10/17/18	11/02/18 04:53	R3QA237
Toxaphene	U		4.85	ug/L	1	10/17/18	11/02/18 04:53	R3QA237

Surrogates

Analyte	Result	Flags/ Qualifiers	**%Recovery**	Units	%Recovery Limits	Prepared	Analyzed	Method/SOP#
Lab ID: 1810015-14								
Station ID: BDE-GW-11								
Sample Matrix: Groundwater								
Collected: 10/11/2018								
Surrogate: Tetrachloro-meta-xylene	0.632		**65 %**	ug/L	*30-150*	10/17/18	11/02/18 04:53	*R3QA237*
Surrogate: Decachlorobiphenyl	1.03		**106 %**	ug/L	*30-150*	10/17/18	11/02/18 04:53	*R3QA237*

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Organochlorine Pesticides and PCBs

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID: 1810015-15								
Station ID: BDE-GW-12								
Sample Matrix: Groundwater								
Collected: 10/11/2018								
Aldrin	U		0.049	ug/L	1	10/17/18	11/02/18 05:15	R3QA237
alpha-BHC	U		0.049	ug/L	1	10/17/18	11/02/18 05:15	R3QA237
beta-BHC	U		0.049	ug/L	1	10/17/18	11/02/18 05:15	R3QA237
delta-BHC	U		0.049	ug/L	1	10/17/18	11/02/18 05:15	R3QA237
gamma-BHC (Lindane)	U		0.049	ug/L	1	10/17/18	11/02/18 05:15	R3QA237
alpha-Chlordane	U		0.049	ug/L	1	10/17/18	11/02/18 05:15	R3QA237
gamma-Chlordane	U		0.049	ug/L	1	10/17/18	11/02/18 05:15	R3QA237
4,4'-DDD	U		0.097	ug/L	1	10/17/18	11/02/18 05:15	R3QA237
4,4'-DDE	U		0.097	ug/L	1	10/17/18	11/02/18 05:15	R3QA237
4,4'-DDT	U		0.097	ug/L	1	10/17/18	11/02/18 05:15	R3QA237
Dieldrin	**0.136**		0.097	ug/L	1	10/17/18	11/02/18 05:15	R3QA237
Endosulfan I	U		0.049	ug/L	1	10/17/18	11/02/18 05:15	R3QA237
Endosulfan II	U		0.097	ug/L	1	10/17/18	11/02/18 05:15	R3QA237
Endosulfan sulfate	U		0.097	ug/L	1	10/17/18	11/02/18 05:15	R3QA237
Endrin	U		0.097	ug/L	1	10/17/18	11/02/18 05:15	R3QA237
Endrin aldehyde	U		0.097	ug/L	1	10/17/18	11/02/18 05:15	R3QA237
Endrin ketone	U		0.097	ug/L	1	10/17/18	11/02/18 05:15	R3QA237
Heptachlor	U		0.049	ug/L	1	10/17/18	11/02/18 05:15	R3QA237
Heptachlor epoxide	U		0.049	ug/L	1	10/17/18	11/02/18 05:15	R3QA237
Methoxychlor	U		0.485	ug/L	1	10/17/18	11/02/18 05:15	R3QA237
Toxaphene	U		4.85	ug/L	1	10/17/18	11/02/18 05:15	R3QA237

Surrogates

Analyte	Result	Flags/ Qualifiers	**%Recovery**	Units	%Recovery Limits	Prepared	Analyzed	Method/SOP#
Lab ID: 1810015-15								
Station ID: BDE-GW-12								
Sample Matrix: Groundwater								
Collected: 10/11/2018								
Surrogate: Tetrachloro-meta-xylene	0.656		**68 %**	ug/L	*30-150*	10/17/18	11/02/18 05:15	*R3QA237*
Surrogate: Decachlorobiphenyl	0.984		**101 %**	ug/L	*30-150*	10/17/18	11/02/18 05:15	*R3QA237*

Site Name: BLADES GROUNDWATER **Project #: DAS R35450**

Organochlorine Pesticides and PCBs

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID: 1810015-16								
Station ID: BDE-GW-13								
Sample Matrix: Groundwater								
Collected: 10/08/2018								
Aldrin	U	UJ, H2	0.048	ug/L	1	10/17/18	11/02/18 05:37	R3QA237
alpha-BHC	U	UJ, H2	0.048	ug/L	1	10/17/18	11/02/18 05:37	R3QA237
beta-BHC	U	UJ, H2	0.048	ug/L	1	10/17/18	11/02/18 05:37	R3QA237
delta-BHC	U	UJ, H2	0.048	ug/L	1	10/17/18	11/02/18 05:37	R3QA237
gamma-BHC (Lindane)	U	UJ, H2	0.048	ug/L	1	10/17/18	11/02/18 05:37	R3QA237
alpha-Chlordane	U	UJ, H2	0.048	ug/L	1	10/17/18	11/02/18 05:37	R3QA237
gamma-Chlordane	U	UJ, H2	0.048	ug/L	1	10/17/18	11/02/18 05:37	R3QA237
4,4'-DDD	U	UJ, H2	0.095	ug/L	1	10/17/18	11/02/18 05:37	R3QA237
4,4'-DDE	U	UJ, H2	0.095	ug/L	1	10/17/18	11/02/18 05:37	R3QA237
4,4'-DDT	U	UJ, H2	0.095	ug/L	1	10/17/18	11/02/18 05:37	R3QA237
Dieldrin	U	UJ, H2	0.095	ug/L	1	10/17/18	11/02/18 05:37	R3QA237
Endosulfan I	U	UJ, H2	0.048	ug/L	1	10/17/18	11/02/18 05:37	R3QA237
Endosulfan II	U	UJ, H2	0.095	ug/L	1	10/17/18	11/02/18 05:37	R3QA237
Endosulfan sulfate	U	UJ, H2	0.095	ug/L	1	10/17/18	11/02/18 05:37	R3QA237
Endrin	U	UJ, H2	0.095	ug/L	1	10/17/18	11/02/18 05:37	R3QA237
Endrin aldehyde	U	UJ, H2	0.095	ug/L	1	10/17/18	11/02/18 05:37	R3QA237
Endrin ketone	U	UJ, H2	0.095	ug/L	1	10/17/18	11/02/18 05:37	R3QA237
Heptachlor	U	UJ, H2	0.048	ug/L	1	10/17/18	11/02/18 05:37	R3QA237
Heptachlor epoxide	U	UJ, H2	0.048	ug/L	1	10/17/18	11/02/18 05:37	R3QA237
Methoxychlor	U	UJ, H2	0.476	ug/L	1	10/17/18	11/02/18 05:37	R3QA237
Toxaphene	U	UJ, H2	4.76	ug/L	1	10/17/18	11/02/18 05:37	R3QA237

Surrogates

Analyte	Result	Flags/ Qualifiers	**%Recovery**	Units	%Recovery Limits	Prepared	Analyzed	Method/SOP#
Lab ID: 1810015-16								
Station ID: BDE-GW-13								
Sample Matrix: Groundwater								
Collected: 10/08/2018								
Surrogate: Tetrachloro-meta-xylene	0.673		**71 %**	ug/L	*30-150*	10/17/18	11/02/18 05:37	*R3QA237*
Surrogate: Decachlorobiphenyl	0.638		**67 %**	ug/L	*30-150*	10/17/18	11/02/18 05:37	*R3QA237*

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Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID: 1810015-17								
Station ID: BDE-GW-14								
Sample Matrix: Groundwater								
Collected: 10/11/2018								
Aldrin	U		0.049	ug/L	1	10/17/18	11/02/18 05:59	R3QA237
alpha-BHC	U		0.049	ug/L	1	10/17/18	11/02/18 05:59	R3QA237
beta-BHC	U		0.049	ug/L	1	10/17/18	11/02/18 05:59	R3QA237
delta-BHC	U		0.049	ug/L	1	10/17/18	11/02/18 05:59	R3QA237
gamma-BHC (Lindane)	U		0.049	ug/L	1	10/17/18	11/02/18 05:59	R3QA237
alpha-Chlordane	**0.075**		0.049	ug/L	1	10/17/18	11/02/18 05:59	R3QA237
gamma-Chlordane	U		0.049	ug/L	1	10/17/18	11/02/18 05:59	R3QA237
4,4'-DDD	U		0.097	ug/L	1	10/17/18	11/02/18 05:59	R3QA237
4,4'-DDE	U		0.097	ug/L	1	10/17/18	11/02/18 05:59	R3QA237
4,4'-DDT	U		0.097	ug/L	1	10/17/18	11/02/18 05:59	R3QA237
Dieldrin	**0.302**		0.097	ug/L	1	10/17/18	11/02/18 05:59	R3QA237
Endosulfan I	**0.059**		0.049	ug/L	1	10/17/18	11/02/18 05:59	R3QA237
Endosulfan II	U		0.097	ug/L	1	10/17/18	11/02/18 05:59	R3QA237
Endosulfan sulfate	U		0.097	ug/L	1	10/17/18	11/02/18 05:59	R3QA237
Endrin	U		0.097	ug/L	1	10/17/18	11/02/18 05:59	R3QA237
Endrin aldehyde	U		0.097	ug/L	1	10/17/18	11/02/18 05:59	R3QA237
Endrin ketone	U		0.097	ug/L	1	10/17/18	11/02/18 05:59	R3QA237
Heptachlor	U		0.049	ug/L	1	10/17/18	11/02/18 05:59	R3QA237
Heptachlor epoxide	**0.088**		0.049	ug/L	1	10/17/18	11/02/18 05:59	R3QA237
Methoxychlor	U		0.485	ug/L	1	10/17/18	11/02/18 05:59	R3QA237
Toxaphene	U		4.85	ug/L	1	10/17/18	11/02/18 05:59	R3QA237

Surrogates

Analyte	Result	Flags/ Qualifiers	**%Recovery**	Units	%Recovery Limits	Prepared	Analyzed	Method/SOP#
Lab ID: 1810015-17								
Station ID: BDE-GW-14								
Sample Matrix: Groundwater								
Collected: 10/11/2018								
Surrogate: Tetrachloro-meta-xylene	0.677		**70 %**	ug/L	*30-150*	10/17/18	11/02/18 05:59	*R3QA237*
Surrogate: Decachlorobiphenyl	0.747		**77 %**	ug/L	*30-150*	10/17/18	11/02/18 05:59	*R3QA237*

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Organochlorine Pesticides and PCBs

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID: 1810015-18								
Station ID: BDE-GW-15								
Sample Matrix: Groundwater								
Collected: 10/10/2018								
Aldrin	U		0.048	ug/L	1	10/17/18	11/02/18 06:21	R3QA237
alpha-BHC	U		0.048	ug/L	1	10/17/18	11/02/18 06:21	R3QA237
beta-BHC	U		0.048	ug/L	1	10/17/18	11/02/18 06:21	R3QA237
delta-BHC	U		0.048	ug/L	1	10/17/18	11/02/18 06:21	R3QA237
gamma-BHC (Lindane)	U		0.048	ug/L	1	10/17/18	11/02/18 06:21	R3QA237
alpha-Chlordane	U		0.048	ug/L	1	10/17/18	11/02/18 06:21	R3QA237
gamma-Chlordane	U		0.048	ug/L	1	10/17/18	11/02/18 06:21	R3QA237
4,4'-DDD	U		0.095	ug/L	1	10/17/18	11/02/18 06:21	R3QA237
4,4'-DDE	U		0.095	ug/L	1	10/17/18	11/02/18 06:21	R3QA237
4,4'-DDT	U		0.095	ug/L	1	10/17/18	11/02/18 06:21	R3QA237
Dieldrin	**0.139**		0.095	ug/L	1	10/17/18	11/02/18 06:21	R3QA237
Endosulfan I	U		0.048	ug/L	1	10/17/18	11/02/18 06:21	R3QA237
Endosulfan II	U		0.095	ug/L	1	10/17/18	11/02/18 06:21	R3QA237
Endosulfan sulfate	U		0.095	ug/L	1	10/17/18	11/02/18 06:21	R3QA237
Endrin	U		0.095	ug/L	1	10/17/18	11/02/18 06:21	R3QA237
Endrin aldehyde	U		0.095	ug/L	1	10/17/18	11/02/18 06:21	R3QA237
Endrin ketone	U		0.095	ug/L	1	10/17/18	11/02/18 06:21	R3QA237
Heptachlor	U		0.048	ug/L	1	10/17/18	11/02/18 06:21	R3QA237
Heptachlor epoxide	U		0.048	ug/L	1	10/17/18	11/02/18 06:21	R3QA237
Methoxychlor	U		0.476	ug/L	1	10/17/18	11/02/18 06:21	R3QA237
Toxaphene	U		4.76	ug/L	1	10/17/18	11/02/18 06:21	R3QA237

Surrogates

Analyte	Result	Flags/ Qualifiers	**%Recovery**	Units	%Recovery Limits	Prepared	Analyzed	Method/SOP#
Lab ID: 1810015-18								
Station ID: BDE-GW-15								
Sample Matrix: Groundwater								
Collected: 10/10/2018								
Surrogate: Tetrachloro-meta-xylene	0.681		**72 %**	ug/L	*30-150*	10/17/18	11/02/18 06:21	*R3QA237*
Surrogate: Decachlorobiphenyl	0.758		**80 %**	ug/L	*30-150*	10/17/18	11/02/18 06:21	*R3QA237*

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Total Metals

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID:	1810015-01							
Station ID:	BDE-GW-02							
Sample Matrix:	Groundwater							
Collected:	10/09/2018							
Aluminum	**26.4**		20.0	ug/L	2.5	10/18/18	10/30/18 13:05	R3QA155/R3QA116
Antimony	U		2.0	ug/L	2.5	10/18/18	10/30/18 13:05	R3QA155/R3QA116
Arsenic	U		1.0	ug/L	2.5	10/18/18	10/30/18 13:05	R3QA155/R3QA116
Barium	**20.8**		10.0	ug/L	2.5	10/18/18	10/30/18 13:05	R3QA155/R3QA116
Beryllium	U		1.0	ug/L	2.5	10/18/18	10/30/18 13:05	R3QA155/R3QA116
Cadmium	U		1.0	ug/L	2.5	10/18/18	10/30/18 13:05	R3QA155/R3QA116
Calcium	**18100**		500	ug/L	1	10/18/18	10/30/18 18:07	R3QA155/R3QA159
Chromium	U		2.0	ug/L	2.5	10/18/18	10/30/18 13:05	R3QA155/R3QA116
Cobalt	U		1.0	ug/L	2.5	10/18/18	10/30/18 13:05	R3QA155/R3QA116
Copper	U		2.0	ug/L	2.5	10/18/18	10/30/18 13:05	R3QA155/R3QA116
Iron	U		100	ug/L	1	10/18/18	10/30/18 18:07	R3QA155/R3QA159
Lead	U		1.0	ug/L	2.5	10/18/18	10/30/18 13:05	R3QA155/R3QA116
Magnesium	**2290**		500	ug/L	1	10/18/18	10/30/18 18:07	R3QA155/R3QA159
Manganese	U		1.0	ug/L	2.5	10/18/18	10/30/18 13:05	R3QA155/R3QA116
Mercury	U	H1, UJ	0.2	ug/L	1	11/06/18	11/08/18 11:30	R3QA131
Nickel	**1.1**		1.0	ug/L	2.5	10/18/18	10/30/18 13:05	R3QA155/R3QA116
Potassium	**2380**		500	ug/L	1	10/18/18	10/30/18 18:07	R3QA155/R3QA159
Selenium	U		5.0	ug/L	2.5	10/18/18	10/30/18 13:05	R3QA155/R3QA116
Silver	U		1.0	ug/L	2.5	10/18/18	10/30/18 13:05	R3QA155/R3QA116
Sodium	**5870**		500	ug/L	1	10/18/18	10/30/18 18:07	R3QA155/R3QA159
Thallium	U		1.0	ug/L	2.5	10/18/18	10/30/18 13:05	R3QA155/R3QA116
Vanadium	U		5.0	ug/L	2.5	10/18/18	10/30/18 13:05	R3QA155/R3QA116
Zinc	**2.9**	J	2.0	ug/L	2.5	10/18/18	10/30/18 13:05	R3QA155/R3QA116

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Total Metals

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID:	1810015-02							
Station ID:	BDE-GW-03							
Sample Matrix:	Groundwater							
Collected:	10/08/2018							
Aluminum	**133**		20.0	ug/L	2.5	10/18/18	10/30/18 13:13	R3QA155/R3QA116
Antimony	U		2.0	ug/L	2.5	10/18/18	10/30/18 13:13	R3QA155/R3QA116
Arsenic	U		1.0	ug/L	2.5	10/18/18	10/30/18 13:13	R3QA155/R3QA116
Barium	**36.4**		10.0	ug/L	2.5	10/18/18	10/30/18 13:13	R3QA155/R3QA116
Beryllium	U		1.0	ug/L	2.5	10/18/18	10/30/18 13:13	R3QA155/R3QA116
Cadmium	U		1.0	ug/L	2.5	10/18/18	10/30/18 13:13	R3QA155/R3QA116
Calcium	**8970**		500	ug/L	1	10/18/18	10/30/18 18:23	R3QA155/R3QA159
Chromium	U		2.0	ug/L	2.5	10/18/18	10/30/18 13:13	R3QA155/R3QA116
Cobalt	**1.9**		1.0	ug/L	2.5	10/18/18	10/30/18 13:13	R3QA155/R3QA116
Copper	U		2.0	ug/L	2.5	10/18/18	10/30/18 13:13	R3QA155/R3QA116
Iron	U		100	ug/L	1	10/18/18	10/30/18 18:23	R3QA155/R3QA159
Lead	U		1.0	ug/L	2.5	10/18/18	10/30/18 13:13	R3QA155/R3QA116
Magnesium	**1250**		500	ug/L	1	10/18/18	10/30/18 18:23	R3QA155/R3QA159
Manganese	**18.0**		1.0	ug/L	2.5	10/18/18	10/30/18 13:13	R3QA155/R3QA116
Mercury	U	H1, UJ	0.2	ug/L	1	11/06/18	11/08/18 11:32	R3QA131
Nickel	**4.1**		1.0	ug/L	2.5	10/18/18	10/30/18 13:13	R3QA155/R3QA116
Potassium	**2240**		500	ug/L	1	10/18/18	10/30/18 18:23	R3QA155/R3QA159
Selenium	U		5.0	ug/L	2.5	10/18/18	10/30/18 13:13	R3QA155/R3QA116
Silver	U		1.0	ug/L	2.5	10/18/18	10/30/18 13:13	R3QA155/R3QA116
Sodium	**8230**		500	ug/L	1	10/18/18	10/30/18 18:23	R3QA155/R3QA159
Thallium	U		1.0	ug/L	2.5	10/18/18	10/30/18 13:13	R3QA155/R3QA116
Vanadium	U		5.0	ug/L	2.5	10/18/18	10/30/18 13:13	R3QA155/R3QA116
Zinc	**12.2**		2.0	ug/L	2.5	10/18/18	10/30/18 13:13	R3QA155/R3QA116

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Total Metals

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID:	1810015-03							
Station ID:	BDE-DMW-03							
Sample Matrix:	Groundwater							
Collected:	10/10/2018							
Aluminum	**37.0**		20.0	ug/L	2.5	10/18/18	10/30/18 13:35	R3QA155/R3QA116
Antimony	U		2.0	ug/L	2.5	10/18/18	10/30/18 13:35	R3QA155/R3QA116
Arsenic	U		2.0	ug/L	2.5	10/18/18	10/30/18 13:35	R3QA155/R3QA116
Barium	**93.7**		10.0	ug/L	2.5	10/18/18	10/30/18 13:35	R3QA155/R3QA116
Beryllium	U		1.0	ug/L	2.5	10/18/18	10/30/18 13:35	R3QA155/R3QA116
Cadmium	U		1.0	ug/L	2.5	10/18/18	10/30/18 13:35	R3QA155/R3QA116
Calcium	**8430**		500	ug/L	1	10/18/18	10/30/18 18:30	R3QA155/R3QA159
Chromium	U		2.0	ug/L	2.5	10/18/18	10/30/18 13:35	R3QA155/R3QA116
Cobalt	**3.1**		1.0	ug/L	2.5	10/18/18	10/30/18 13:35	R3QA155/R3QA116
Copper	U		2.0	ug/L	2.5	10/18/18	10/30/18 13:35	R3QA155/R3QA116
Iron	U		100	ug/L	1	10/18/18	10/30/18 18:30	R3QA155/R3QA159
Lead	U		1.0	ug/L	2.5	10/18/18	10/30/18 13:35	R3QA155/R3QA116
Magnesium	**1790**		500	ug/L	1	10/18/18	10/30/18 18:30	R3QA155/R3QA159
Manganese	**46.0**		1.0	ug/L	2.5	10/18/18	10/30/18 13:35	R3QA155/R3QA116
Mercury	**0.6**	H1, J	0.2	ug/L	1	11/06/18	11/08/18 11:34	R3QA131
Nickel	**22.1**		1.0	ug/L	2.5	10/18/18	10/30/18 13:35	R3QA155/R3QA116
Potassium	**7030**		500	ug/L	1	10/18/18	10/30/18 18:30	R3QA155/R3QA159
Selenium	U		5.0	ug/L	2.5	10/18/18	10/30/18 13:35	R3QA155/R3QA116
Silver	U		1.0	ug/L	2.5	10/18/18	10/30/18 13:35	R3QA155/R3QA116
Sodium	**13400**		500	ug/L	1	10/18/18	10/30/18 18:30	R3QA155/R3QA159
Thallium	U		1.0	ug/L	2.5	10/18/18	10/30/18 13:35	R3QA155/R3QA116
Vanadium	U		5.0	ug/L	2.5	10/18/18	10/30/18 13:35	R3QA155/R3QA116
Zinc	**7.5**		2.0	ug/L	2.5	10/18/18	10/30/18 13:35	R3QA155/R3QA116

Site Name: **BLADES GROUNDWATER** **Project #:** **DAS R35450**

Total Metals

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID:	1810015-04							
Station ID:	BDE-GW-02D							
Sample Matrix:	Groundwater							
Collected:	10/09/2018							
Aluminum	**24.5**		20.0	ug/L	2.5	10/18/18	10/30/18 13:39	R3QA155/R3QA116
Antimony	U		2.0	ug/L	2.5	10/18/18	10/30/18 13:39	R3QA155/R3QA116
Arsenic	U		1.0	ug/L	2.5	10/18/18	10/30/18 13:39	R3QA155/R3QA116
Barium	**18.3**		10.0	ug/L	2.5	10/18/18	10/30/18 13:39	R3QA155/R3QA116
Beryllium	U		1.0	ug/L	2.5	10/18/18	10/30/18 13:39	R3QA155/R3QA116
Cadmium	U		1.0	ug/L	2.5	10/18/18	10/30/18 13:39	R3QA155/R3QA116
Calcium	**17600**		500	ug/L	1	10/18/18	10/30/18 18:34	R3QA155/R3QA159
Chromium	U		2.0	ug/L	2.5	10/18/18	10/30/18 13:39	R3QA155/R3QA116
Cobalt	U		1.0	ug/L	2.5	10/18/18	10/30/18 13:39	R3QA155/R3QA116
Copper	U		2.0	ug/L	2.5	10/18/18	10/30/18 13:39	R3QA155/R3QA116
Iron	U		100	ug/L	1	10/18/18	10/30/18 18:34	R3QA155/R3QA159
Lead	U		1.0	ug/L	2.5	10/18/18	10/30/18 13:39	R3QA155/R3QA116
Magnesium	**2180**		500	ug/L	1	10/18/18	10/30/18 18:34	R3QA155/R3QA159
Manganese	U		1.0	ug/L	2.5	10/18/18	10/30/18 13:39	R3QA155/R3QA116
Mercury	U	H1, UJ	0.2	ug/L	1	11/06/18	11/08/18 11:36	R3QA131
Nickel	**1.0**		1.0	ug/L	2.5	10/18/18	10/30/18 13:39	R3QA155/R3QA116
Potassium	**2370**		500	ug/L	1	10/18/18	10/30/18 18:34	R3QA155/R3QA159
Selenium	U		5.0	ug/L	2.5	10/18/18	10/30/18 13:39	R3QA155/R3QA116
Silver	U		1.0	ug/L	2.5	10/18/18	10/30/18 13:39	R3QA155/R3QA116
Sodium	**5730**		500	ug/L	1	10/18/18	10/30/18 18:34	R3QA155/R3QA159
Thallium	U		1.0	ug/L	2.5	10/18/18	10/30/18 13:39	R3QA155/R3QA116
Vanadium	U		5.0	ug/L	2.5	10/18/18	10/30/18 13:39	R3QA155/R3QA116
Zinc	**4.7**		2.0	ug/L	2.5	10/18/18	10/30/18 13:39	R3QA155/R3QA116

Site Name: **BLADES GROUNDWATER** **Project #:** **DAS R35450**

Total Metals

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID:	1810015-05							
Station ID:	BDE-GW-01							
Sample Matrix:	Groundwater							
Collected:	10/09/2018							
Aluminum	**830**		200	ug/L	1	10/18/18	10/30/18 18:38	R3QA155/R3QA159
Antimony	U		2.0	ug/L	2.5	10/18/18	10/30/18 13:43	R3QA155/R3QA116
Arsenic	U		1.0	ug/L	2.5	10/18/18	10/30/18 13:43	R3QA155/R3QA116
Barium	U		10.0	ug/L	2.5	10/18/18	10/30/18 13:43	R3QA155/R3QA116
Beryllium	U		1.0	ug/L	2.5	10/18/18	10/30/18 13:43	R3QA155/R3QA116
Cadmium	U		1.0	ug/L	2.5	10/18/18	10/30/18 13:43	R3QA155/R3QA116
Calcium	**11800**		500	ug/L	1	10/18/18	10/30/18 18:38	R3QA155/R3QA159
Chromium	U		2.0	ug/L	2.5	10/18/18	10/30/18 13:43	R3QA155/R3QA116
Cobalt	U		1.0	ug/L	2.5	10/18/18	10/30/18 13:43	R3QA155/R3QA116
Copper	**3.2**		2.0	ug/L	2.5	10/18/18	10/30/18 13:43	R3QA155/R3QA116
Iron	**448**		100	ug/L	1	10/18/18	10/30/18 18:38	R3QA155/R3QA159
Lead	U		1.0	ug/L	2.5	10/18/18	10/30/18 13:43	R3QA155/R3QA116
Magnesium	**1630**		500	ug/L	1	10/18/18	10/30/18 18:38	R3QA155/R3QA159
Manganese	**2.3**		1.0	ug/L	2.5	10/18/18	10/30/18 13:43	R3QA155/R3QA116
Mercury	U	H1, UJ	0.2	ug/L	1	11/06/18	11/08/18 11:42	R3QA131
Nickel	U		1.0	ug/L	2.5	10/18/18	10/30/18 13:43	R3QA155/R3QA116
Potassium	**658**		500	ug/L	1	10/18/18	10/30/18 18:38	R3QA155/R3QA159
Selenium	U		5.0	ug/L	2.5	10/18/18	10/30/18 13:43	R3QA155/R3QA116
Silver	U		1.0	ug/L	2.5	10/18/18	10/30/18 13:43	R3QA155/R3QA116
Sodium	**1020**		500	ug/L	1	10/18/18	10/30/18 18:38	R3QA155/R3QA159
Thallium	U		1.0	ug/L	2.5	10/18/18	10/30/18 13:43	R3QA155/R3QA116
Vanadium	U		5.0	ug/L	2.5	10/18/18	10/30/18 13:43	R3QA155/R3QA116
Zinc	**3.6**		2.0	ug/L	2.5	10/18/18	10/30/18 13:43	R3QA155/R3QA116

Site Name: **BLADES GROUNDWATER** **Project #:** **DAS R35450**

Total Metals

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID:	1810015-06							
Station ID:	BDE-DMW-02							
Sample Matrix:	Groundwater							
Collected:	10/09/2018							
Aluminum	**53.6**		20.0	ug/L	2.5	10/18/18	10/30/18 13:47	R3QA155/R3QA116
Antimony	U		2.0	ug/L	2.5	10/18/18	10/30/18 13:47	R3QA155/R3QA116
Arsenic	U		1.0	ug/L	2.5	10/18/18	10/30/18 13:47	R3QA155/R3QA116
Barium	**115**		10.0	ug/L	2.5	10/18/18	10/30/18 13:47	R3QA155/R3QA116
Beryllium	U		1.0	ug/L	2.5	10/18/18	10/30/18 13:47	R3QA155/R3QA116
Cadmium	U		1.0	ug/L	2.5	10/18/18	10/30/18 13:47	R3QA155/R3QA116
Calcium	**12700**		500	ug/L	1	10/18/18	10/30/18 18:42	R3QA155/R3QA159
Chromium	U		2.0	ug/L	2.5	10/18/18	10/30/18 13:47	R3QA155/R3QA116
Cobalt	**7.5**		1.0	ug/L	2.5	10/18/18	10/30/18 13:47	R3QA155/R3QA116
Copper	U		2.0	ug/L	2.5	10/18/18	10/30/18 13:47	R3QA155/R3QA116
Iron	U		100	ug/L	1	10/18/18	10/30/18 18:42	R3QA155/R3QA159
Lead	U		1.0	ug/L	2.5	10/18/18	10/30/18 13:47	R3QA155/R3QA116
Magnesium	**2780**		500	ug/L	1	10/18/18	10/30/18 18:42	R3QA155/R3QA159
Manganese	**153**		1.0	ug/L	2.5	10/18/18	10/30/18 13:47	R3QA155/R3QA116
Mercury	U	H1, UJ	0.2	ug/L	1	11/06/18	11/08/18 11:48	R3QA131
Nickel	**2.7**		1.0	ug/L	2.5	10/18/18	10/30/18 13:47	R3QA155/R3QA116
Potassium	**3620**		500	ug/L	1	10/18/18	10/30/18 18:42	R3QA155/R3QA159
Selenium	U		5.0	ug/L	2.5	10/18/18	10/30/18 13:47	R3QA155/R3QA116
Silver	U		1.0	ug/L	2.5	10/18/18	10/30/18 13:47	R3QA155/R3QA116
Sodium	**13600**		500	ug/L	1	10/18/18	10/30/18 18:42	R3QA155/R3QA159
Thallium	U		1.0	ug/L	2.5	10/18/18	10/30/18 13:47	R3QA155/R3QA116
Vanadium	U		5.0	ug/L	2.5	10/18/18	10/30/18 13:47	R3QA155/R3QA116
Zinc	**16.9**		2.0	ug/L	2.5	10/18/18	10/30/18 13:47	R3QA155/R3QA116

Site Name: **BLADES GROUNDWATER** **Project #:** **DAS R35450**

Total Metals

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID:	1810015-07							
Station ID:	BDE-DMW-01							
Sample Matrix:	Groundwater							
Collected:	10/10/2018							
Aluminum	**22.2**		20.0	ug/L	2.5	10/18/18	10/30/18 13:51	R3QA155/R3QA116
Antimony	U		2.0	ug/L	2.5	10/18/18	10/30/18 13:51	R3QA155/R3QA116
Arsenic	**1.3**		1.0	ug/L	2.5	10/18/18	10/30/18 13:51	R3QA155/R3QA116
Barium	**89.2**		10.0	ug/L	2.5	10/18/18	10/30/18 13:51	R3QA155/R3QA116
Beryllium	U		1.0	ug/L	2.5	10/18/18	10/30/18 13:51	R3QA155/R3QA116
Cadmium	U		1.0	ug/L	2.5	10/18/18	10/30/18 13:51	R3QA155/R3QA116
Calcium	**20900**		500	ug/L	1	10/18/18	10/30/18 18:46	R3QA155/R3QA159
Chromium	U		2.0	ug/L	2.5	10/18/18	10/30/18 13:51	R3QA155/R3QA116
Cobalt	**1.0**		1.0	ug/L	2.5	10/18/18	10/30/18 13:51	R3QA155/R3QA116
Copper	U		2.0	ug/L	2.5	10/18/18	10/30/18 13:51	R3QA155/R3QA116
Iron	U		100	ug/L	1	10/18/18	10/30/18 18:46	R3QA155/R3QA159
Lead	U		1.0	ug/L	2.5	10/18/18	10/30/18 13:51	R3QA155/R3QA116
Magnesium	**1980**		500	ug/L	1	10/18/18	10/30/18 18:46	R3QA155/R3QA159
Manganese	**38.5**		1.0	ug/L	2.5	10/18/18	10/30/18 13:51	R3QA155/R3QA116
Mercury	U	H1, UJ	0.2	ug/L	1	11/06/18	11/08/18 11:50	R3QA131
Nickel	**1.3**		1.0	ug/L	2.5	10/18/18	10/30/18 13:51	R3QA155/R3QA116
Potassium	**13500**		500	ug/L	1	10/18/18	10/30/18 18:46	R3QA155/R3QA159
Selenium	U		5.0	ug/L	2.5	10/18/18	10/30/18 13:51	R3QA155/R3QA116
Silver	U		1.0	ug/L	2.5	10/18/18	10/30/18 13:51	R3QA155/R3QA116
Sodium	**17400**		500	ug/L	1	10/18/18	10/30/18 18:46	R3QA155/R3QA159
Thallium	U		1.0	ug/L	2.5	10/18/18	10/30/18 13:51	R3QA155/R3QA116
Vanadium	U		5.0	ug/L	2.5	10/18/18	10/30/18 13:51	R3QA155/R3QA116
Zinc	**2.0**		2.0	ug/L	2.5	10/18/18	10/30/18 13:51	R3QA155/R3QA116

Site Name: **BLADES GROUNDWATER** **Project #:** **DAS R35450**

Total Metals

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID:	1810015-08							
Station ID:	BDE-GW-04							
Sample Matrix:	Groundwater							
Collected:	10/08/2018							
Aluminum	**252**		20.0	ug/L	2.5	10/18/18	10/30/18 13:54	R3QA155/R3QA116
Antimony	U		2.0	ug/L	2.5	10/18/18	10/30/18 13:54	R3QA155/R3QA116
Arsenic	U		2.0	ug/L	2.5	10/18/18	10/30/18 13:54	R3QA155/R3QA116
Barium	**33.5**		10.0	ug/L	2.5	10/18/18	10/30/18 13:54	R3QA155/R3QA116
Beryllium	U		1.0	ug/L	2.5	10/18/18	10/30/18 13:54	R3QA155/R3QA116
Cadmium	U		1.0	ug/L	2.5	10/18/18	10/30/18 13:54	R3QA155/R3QA116
Calcium	**13800**		500	ug/L	1	10/18/18	10/30/18 18:50	R3QA155/R3QA159
Chromium	U		2.0	ug/L	2.5	10/18/18	10/30/18 13:54	R3QA155/R3QA116
Cobalt	U		1.0	ug/L	2.5	10/18/18	10/30/18 13:54	R3QA155/R3QA116
Copper	U		2.0	ug/L	2.5	10/18/18	10/30/18 13:54	R3QA155/R3QA116
Iron	**166**		100	ug/L	1	10/18/18	10/30/18 18:50	R3QA155/R3QA159
Lead	U		1.0	ug/L	2.5	10/18/18	10/30/18 13:54	R3QA155/R3QA116
Magnesium	**2230**		500	ug/L	1	10/18/18	10/30/18 18:50	R3QA155/R3QA159
Manganese	**1.9**		1.0	ug/L	2.5	10/18/18	10/30/18 13:54	R3QA155/R3QA116
Mercury	U	H1, UJ	0.2	ug/L	1	11/06/18	11/08/18 11:52	R3QA131
Nickel	U		1.0	ug/L	2.5	10/18/18	10/30/18 13:54	R3QA155/R3QA116
Potassium	**3180**		500	ug/L	1	10/18/18	10/30/18 18:50	R3QA155/R3QA159
Selenium	U		5.0	ug/L	2.5	10/18/18	10/30/18 13:54	R3QA155/R3QA116
Silver	U		1.0	ug/L	2.5	10/18/18	10/30/18 13:54	R3QA155/R3QA116
Sodium	**9500**		500	ug/L	1	10/18/18	10/30/18 18:50	R3QA155/R3QA159
Thallium	U		1.0	ug/L	2.5	10/18/18	10/30/18 13:54	R3QA155/R3QA116
Vanadium	U		5.0	ug/L	2.5	10/18/18	10/30/18 13:54	R3QA155/R3QA116
Zinc	**2.0**		2.0	ug/L	2.5	10/18/18	10/30/18 13:54	R3QA155/R3QA116

Site Name: **BLADES GROUNDWATER** **Project #:** **DAS R35450**

Total Metals

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID:	1810015-09							
Station ID:	BDE-GW-05							
Sample Matrix:	Groundwater							
Collected:	10/08/2018							
Aluminum	**55.9**		20.0	ug/L	2.5	10/18/18	10/30/18 13:58	R3QA155/R3QA116
Antimony	U		2.0	ug/L	2.5	10/18/18	10/30/18 13:58	R3QA155/R3QA116
Arsenic	**1.7**		1.0	ug/L	2.5	10/18/18	10/30/18 13:58	R3QA155/R3QA116
Barium	**34.1**		10.0	ug/L	2.5	10/18/18	10/30/18 13:58	R3QA155/R3QA116
Beryllium	U		1.0	ug/L	2.5	10/18/18	10/30/18 13:58	R3QA155/R3QA116
Cadmium	U		1.0	ug/L	2.5	10/18/18	10/30/18 13:58	R3QA155/R3QA116
Calcium	**23600**		500	ug/L	1	10/18/18	10/30/18 18:54	R3QA155/R3QA159
Chromium	U		2.0	ug/L	2.5	10/18/18	10/30/18 13:58	R3QA155/R3QA116
Cobalt	U		1.0	ug/L	2.5	10/18/18	10/30/18 13:58	R3QA155/R3QA116
Copper	U		2.0	ug/L	2.5	10/18/18	10/30/18 13:58	R3QA155/R3QA116
Iron	**115**		100	ug/L	1	10/18/18	10/30/18 18:54	R3QA155/R3QA159
Lead	U		1.0	ug/L	2.5	10/18/18	10/30/18 13:58	R3QA155/R3QA116
Magnesium	**2250**		500	ug/L	1	10/18/18	10/30/18 18:54	R3QA155/R3QA159
Manganese	U		1.0	ug/L	2.5	10/18/18	10/30/18 13:58	R3QA155/R3QA116
Mercury	U	H1, UJ	0.2	ug/L	1	11/06/18	11/08/18 11:54	R3QA131
Nickel	U		1.0	ug/L	2.5	10/18/18	10/30/18 13:58	R3QA155/R3QA116
Potassium	**3560**		500	ug/L	1	10/18/18	10/30/18 18:54	R3QA155/R3QA159
Selenium	U		5.0	ug/L	2.5	10/18/18	10/30/18 13:58	R3QA155/R3QA116
Silver	U		1.0	ug/L	2.5	10/18/18	10/30/18 13:58	R3QA155/R3QA116
Sodium	**8490**		500	ug/L	1	10/18/18	10/30/18 18:54	R3QA155/R3QA159
Thallium	U		1.0	ug/L	2.5	10/18/18	10/30/18 13:58	R3QA155/R3QA116
Vanadium	U		5.0	ug/L	2.5	10/18/18	10/30/18 13:58	R3QA155/R3QA116
Zinc	**4.7**		2.0	ug/L	2.5	10/18/18	10/30/18 13:58	R3QA155/R3QA116

Site Name: **BLADES GROUNDWATER** **Project #:** **DAS R35450**

Total Metals

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID:	1810015-10							
Station ID:	BDE-GW-07							
Sample Matrix:	Groundwater							
Collected:	10/10/2018							
Aluminum	**101**		20.0	ug/L	2.5	10/18/18	10/30/18 14:02	R3QA155/R3QA116
Antimony	U		2.0	ug/L	2.5	10/18/18	10/30/18 14:02	R3QA155/R3QA116
Arsenic	U		1.0	ug/L	2.5	10/18/18	10/30/18 14:02	R3QA155/R3QA116
Barium	**26.0**		10.0	ug/L	2.5	10/18/18	10/30/18 14:02	R3QA155/R3QA116
Beryllium	U		1.0	ug/L	2.5	10/18/18	10/30/18 14:02	R3QA155/R3QA116
Cadmium	U		1.0	ug/L	2.5	10/18/18	10/30/18 14:02	R3QA155/R3QA116
Calcium	**11900**		500	ug/L	1	10/18/18	10/30/18 18:58	R3QA155/R3QA159
Chromium	**28.2**		2.0	ug/L	2.5	10/18/18	10/30/18 14:02	R3QA155/R3QA116
Cobalt	U		1.0	ug/L	2.5	10/18/18	10/30/18 14:02	R3QA155/R3QA116
Copper	**3.6**		2.0	ug/L	2.5	10/18/18	10/30/18 14:02	R3QA155/R3QA116
Iron	**114**		100	ug/L	1	10/18/18	10/30/18 18:58	R3QA155/R3QA159
Lead	U		1.0	ug/L	2.5	10/18/18	10/30/18 14:02	R3QA155/R3QA116
Magnesium	**2090**		500	ug/L	1	10/18/18	10/30/18 18:58	R3QA155/R3QA159
Manganese	**4.5**		1.0	ug/L	2.5	10/18/18	10/30/18 14:02	R3QA155/R3QA116
Mercury	U	H1, UJ	0.2	ug/L	1	11/06/18	11/08/18 11:56	R3QA131
Nickel	**25.1**		1.0	ug/L	2.5	10/18/18	10/30/18 14:02	R3QA155/R3QA116
Potassium	**2970**		500	ug/L	1	10/18/18	10/30/18 18:58	R3QA155/R3QA159
Selenium	U		5.0	ug/L	2.5	10/18/18	10/30/18 14:02	R3QA155/R3QA116
Silver	U		1.0	ug/L	2.5	10/18/18	10/30/18 14:02	R3QA155/R3QA116
Sodium	**6820**		500	ug/L	1	10/18/18	10/30/18 18:58	R3QA155/R3QA159
Thallium	U		1.0	ug/L	2.5	10/18/18	10/30/18 14:02	R3QA155/R3QA116
Vanadium	U		5.0	ug/L	2.5	10/18/18	10/30/18 14:02	R3QA155/R3QA116
Zinc	**30.2**		2.0	ug/L	2.5	10/18/18	10/30/18 14:02	R3QA155/R3QA116

Site Name: **BLADES GROUNDWATER** **Project #:** **DAS R35450**

Total Metals

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID:	1810015-11							
Station ID:	BDE-GW-08							
Sample Matrix:	Groundwater							
Collected:	10/11/2018							
Aluminum	**21.9**		20.0	ug/L	2.5	10/18/18	10/30/18 14:06	R3QA155/R3QA116
Antimony	U		2.0	ug/L	2.5	10/18/18	10/30/18 14:06	R3QA155/R3QA116
Arsenic	**1.6**		1.0	ug/L	2.5	10/18/18	10/30/18 14:06	R3QA155/R3QA116
Barium	**54.6**		10.0	ug/L	2.5	10/18/18	10/30/18 14:06	R3QA155/R3QA116
Beryllium	U		1.0	ug/L	2.5	10/18/18	10/30/18 14:06	R3QA155/R3QA116
Cadmium	U		1.0	ug/L	2.5	10/18/18	10/30/18 14:06	R3QA155/R3QA116
Calcium	**17900**		500	ug/L	1	10/18/18	10/30/18 19:09	R3QA155/R3QA159
Chromium	U		2.0	ug/L	2.5	10/18/18	10/30/18 14:06	R3QA155/R3QA116
Cobalt	U		1.0	ug/L	2.5	10/18/18	10/30/18 14:06	R3QA155/R3QA116
Copper	U		2.0	ug/L	2.5	10/18/18	10/30/18 14:06	R3QA155/R3QA116
Iron	U		100	ug/L	1	10/18/18	10/30/18 19:09	R3QA155/R3QA159
Lead	U		1.0	ug/L	2.5	10/18/18	10/30/18 14:06	R3QA155/R3QA116
Magnesium	**2230**		500	ug/L	1	10/18/18	10/30/18 19:09	R3QA155/R3QA159
Manganese	**5.2**		1.0	ug/L	2.5	10/18/18	10/30/18 14:06	R3QA155/R3QA116
Mercury	U	H1, UJ	0.2	ug/L	1	11/06/18	11/08/18 12:04	R3QA131
Nickel	**1.1**		1.0	ug/L	2.5	10/18/18	10/30/18 14:06	R3QA155/R3QA116
Potassium	**2140**		500	ug/L	1	10/18/18	10/30/18 19:09	R3QA155/R3QA159
Selenium	U		5.0	ug/L	2.5	10/18/18	10/30/18 14:06	R3QA155/R3QA116
Silver	U		1.0	ug/L	2.5	10/18/18	10/30/18 14:06	R3QA155/R3QA116
Sodium	**9270**		500	ug/L	1	10/18/18	10/30/18 19:09	R3QA155/R3QA159
Thallium	U		1.0	ug/L	2.5	10/18/18	10/30/18 14:06	R3QA155/R3QA116
Vanadium	U		5.0	ug/L	2.5	10/18/18	10/30/18 14:06	R3QA155/R3QA116
Zinc	**6.4**		2.0	ug/L	2.5	10/18/18	10/30/18 14:06	R3QA155/R3QA116

Site Name: **BLADES GROUNDWATER** **Project #:** **DAS R35450**

Total Metals

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID:	1810015-12							
Station ID:	BDE-GW-09							
Sample Matrix:	Groundwater							
Collected:	10/09/2018							
Aluminum	**176**		20.0	ug/L	2.5	10/18/18	10/30/18 14:28	R3QA155/R3QA116
Antimony	U		2.0	ug/L	2.5	10/18/18	10/30/18 14:28	R3QA155/R3QA116
Arsenic	U		1.0	ug/L	2.5	10/18/18	10/30/18 14:28	R3QA155/R3QA116
Barium	**46.8**		10.0	ug/L	2.5	10/18/18	10/30/18 14:28	R3QA155/R3QA116
Beryllium	U		1.0	ug/L	2.5	10/18/18	10/30/18 14:28	R3QA155/R3QA116
Cadmium	U		1.0	ug/L	2.5	10/18/18	10/30/18 14:28	R3QA155/R3QA116
Calcium	**36700**		500	ug/L	1	10/18/18	10/30/18 19:17	R3QA155/R3QA159
Chromium	U		2.0	ug/L	2.5	10/18/18	10/30/18 14:28	R3QA155/R3QA116
Cobalt	U		1.0	ug/L	2.5	10/18/18	10/30/18 14:28	R3QA155/R3QA116
Copper	U		2.0	ug/L	2.5	10/18/18	10/30/18 14:28	R3QA155/R3QA116
Iron	U		100	ug/L	1	10/18/18	10/30/18 19:17	R3QA155/R3QA159
Lead	U		1.0	ug/L	2.5	10/18/18	10/30/18 14:28	R3QA155/R3QA116
Magnesium	**2830**		500	ug/L	1	10/18/18	10/30/18 19:17	R3QA155/R3QA159
Manganese	**1.4**		1.0	ug/L	2.5	10/18/18	10/30/18 14:28	R3QA155/R3QA116
Mercury	U	H1, UJ	0.2	ug/L	1	11/06/18	11/08/18 12:08	R3QA131
Nickel	**4.2**		1.0	ug/L	2.5	10/18/18	10/30/18 14:28	R3QA155/R3QA116
Potassium	**4270**		500	ug/L	1	10/18/18	10/30/18 19:17	R3QA155/R3QA159
Selenium	U		5.0	ug/L	2.5	10/18/18	10/30/18 14:28	R3QA155/R3QA116
Silver	U		1.0	ug/L	2.5	10/18/18	10/30/18 14:28	R3QA155/R3QA116
Sodium	**10400**		500	ug/L	1	10/18/18	10/30/18 19:17	R3QA155/R3QA159
Thallium	U		1.0	ug/L	2.5	10/18/18	10/30/18 14:28	R3QA155/R3QA116
Vanadium	U		5.0	ug/L	2.5	10/18/18	10/30/18 14:28	R3QA155/R3QA116
Zinc	**7.1**		2.0	ug/L	2.5	10/18/18	10/30/18 14:28	R3QA155/R3QA116

Site Name: **BLADES GROUNDWATER** **Project #:** **DAS R35450**

Total Metals

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID:	1810015-13							
Station ID:	BDE-GW-10							
Sample Matrix:	Groundwater							
Collected:	10/11/2018							
Aluminum	**77.0**		20.0	ug/L	2.5	10/18/18	10/30/18 14:35	R3QA155/R3QA116
Antimony	U		2.0	ug/L	2.5	10/18/18	10/30/18 14:35	R3QA155/R3QA116
Arsenic	U		1.0	ug/L	2.5	10/18/18	10/30/18 14:35	R3QA155/R3QA116
Barium	**26.0**		10.0	ug/L	2.5	10/18/18	10/30/18 14:35	R3QA155/R3QA116
Beryllium	U		1.0	ug/L	2.5	10/18/18	10/30/18 14:35	R3QA155/R3QA116
Cadmium	U		1.0	ug/L	2.5	10/18/18	10/30/18 14:35	R3QA155/R3QA116
Calcium	**9090**		500	ug/L	1	10/18/18	10/30/18 19:25	R3QA155/R3QA159
Chromium	**22.8**		2.0	ug/L	2.5	10/18/18	10/30/18 14:35	R3QA155/R3QA116
Cobalt	**1.1**		1.0	ug/L	2.5	10/18/18	10/30/18 14:35	R3QA155/R3QA116
Copper	**8.3**		2.0	ug/L	2.5	10/18/18	10/30/18 14:35	R3QA155/R3QA116
Iron	U		100	ug/L	1	10/18/18	10/30/18 19:25	R3QA155/R3QA159
Lead	U		1.0	ug/L	2.5	10/18/18	10/30/18 14:35	R3QA155/R3QA116
Magnesium	**1130**		500	ug/L	1	10/18/18	10/30/18 19:25	R3QA155/R3QA159
Manganese	**10.5**		1.0	ug/L	2.5	10/18/18	10/30/18 14:35	R3QA155/R3QA116
Mercury	U	UJ, H1	0.2	ug/L	1	11/06/18	11/08/18 12:12	R3QA131
Nickel	**324**		1.0	ug/L	2.5	10/18/18	10/30/18 14:35	R3QA155/R3QA116
Potassium	**3610**		500	ug/L	1	10/18/18	10/30/18 19:25	R3QA155/R3QA159
Selenium	U		5.0	ug/L	2.5	10/18/18	10/30/18 14:35	R3QA155/R3QA116
Silver	U		1.0	ug/L	2.5	10/18/18	10/30/18 14:35	R3QA155/R3QA116
Sodium	**5310**		500	ug/L	1	10/18/18	10/30/18 19:25	R3QA155/R3QA159
Thallium	U		1.0	ug/L	2.5	10/18/18	10/30/18 14:35	R3QA155/R3QA116
Vanadium	**6.2**		5.0	ug/L	2.5	10/18/18	10/30/18 14:35	R3QA155/R3QA116
Zinc	**304**		2.0	ug/L	2.5	10/18/18	10/30/18 14:35	R3QA155/R3QA116

Site Name: **BLADES GROUNDWATER** **Project #:** **DAS R35450**

Total Metals

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID:	1810015-14							
Station ID:	BDE-GW-11							
Sample Matrix:	Groundwater							
Collected:	10/11/2018							
Aluminum	**53.7**		20.0	ug/L	2.5	10/18/18	10/30/18 14:39	R3QA155/R3QA116
Antimony	U		2.0	ug/L	2.5	10/18/18	10/30/18 14:39	R3QA155/R3QA116
Arsenic	**2.3**		1.0	ug/L	2.5	10/18/18	10/30/18 14:39	R3QA155/R3QA116
Barium	**45.8**		10.0	ug/L	2.5	10/18/18	10/30/18 14:39	R3QA155/R3QA116
Beryllium	U		1.0	ug/L	2.5	10/18/18	10/30/18 14:39	R3QA155/R3QA116
Cadmium	U		1.0	ug/L	2.5	10/18/18	10/30/18 14:39	R3QA155/R3QA116
Calcium	**14000**		500	ug/L	1	10/18/18	10/30/18 19:29	R3QA155/R3QA159
Chromium	U		2.0	ug/L	2.5	10/18/18	10/30/18 14:39	R3QA155/R3QA116
Cobalt	U		1.0	ug/L	2.5	10/18/18	10/30/18 14:39	R3QA155/R3QA116
Copper	U		2.0	ug/L	2.5	10/18/18	10/30/18 14:39	R3QA155/R3QA116
Iron	**114**		100	ug/L	1	10/18/18	10/30/18 19:29	R3QA155/R3QA159
Lead	U		1.0	ug/L	2.5	10/18/18	10/30/18 14:39	R3QA155/R3QA116
Magnesium	**1660**		500	ug/L	1	10/18/18	10/30/18 19:29	R3QA155/R3QA159
Manganese	**11.2**		1.0	ug/L	2.5	10/18/18	10/30/18 14:39	R3QA155/R3QA116
Mercury	U	H1, UJ	0.2	ug/L	1	11/06/18	11/08/18 12:14	R3QA131
Nickel	**33.2**		1.0	ug/L	2.5	10/18/18	10/30/18 14:39	R3QA155/R3QA116
Potassium	**3690**		500	ug/L	1	10/18/18	10/30/18 19:29	R3QA155/R3QA159
Selenium	U		5.0	ug/L	2.5	10/18/18	10/30/18 14:39	R3QA155/R3QA116
Silver	U		1.0	ug/L	2.5	10/18/18	10/30/18 14:39	R3QA155/R3QA116
Sodium	**23200**		500	ug/L	1	10/18/18	10/30/18 19:29	R3QA155/R3QA159
Thallium	U		1.0	ug/L	2.5	10/18/18	10/30/18 14:39	R3QA155/R3QA116
Vanadium	**6.2**		5.0	ug/L	2.5	10/18/18	10/30/18 14:39	R3QA155/R3QA116
Zinc	**24.8**		2.0	ug/L	2.5	10/18/18	10/30/18 14:39	R3QA155/R3QA116

Site Name: **BLADES GROUNDWATER** **Project #:** **DAS R35450**

Total Metals

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID:	1810015-15							
Station ID:	BDE-GW-12							
Sample Matrix:	Groundwater							
Collected:	10/11/2018							
Aluminum	**114**		20.0	ug/L	2.5	10/18/18	10/30/18 14:43	R3QA155/R3QA116
Antimony	U		2.0	ug/L	2.5	10/18/18	10/30/18 14:43	R3QA155/R3QA116
Arsenic	U		1.0	ug/L	2.5	10/18/18	10/30/18 14:43	R3QA155/R3QA116
Barium	**74.0**		10.0	ug/L	2.5	10/18/18	10/30/18 14:43	R3QA155/R3QA116
Beryllium	U		1.0	ug/L	2.5	10/18/18	10/30/18 14:43	R3QA155/R3QA116
Cadmium	U		1.0	ug/L	2.5	10/18/18	10/30/18 14:43	R3QA155/R3QA116
Calcium	**29400**		500	ug/L	1	10/18/18	10/30/18 19:33	R3QA155/R3QA159
Chromium	U		2.0	ug/L	2.5	10/18/18	10/30/18 14:43	R3QA155/R3QA116
Cobalt	U		1.0	ug/L	2.5	10/18/18	10/30/18 14:43	R3QA155/R3QA116
Copper	U		2.0	ug/L	2.5	10/18/18	10/30/18 14:43	R3QA155/R3QA116
Iron	U		100	ug/L	1	10/18/18	10/30/18 19:33	R3QA155/R3QA159
Lead	U		1.0	ug/L	2.5	10/18/18	10/30/18 14:43	R3QA155/R3QA116
Magnesium	**2530**		500	ug/L	1	10/18/18	10/30/18 19:33	R3QA155/R3QA159
Manganese	**3.5**		1.0	ug/L	2.5	10/18/18	10/30/18 14:43	R3QA155/R3QA116
Mercury	U	H1, UJ	0.2	ug/L	1	11/06/18	11/08/18 12:16	R3QA131
Nickel	**2.0**		1.0	ug/L	2.5	10/18/18	10/30/18 14:43	R3QA155/R3QA116
Potassium	**6630**		500	ug/L	1	10/18/18	10/30/18 19:33	R3QA155/R3QA159
Selenium	U		5.0	ug/L	2.5	10/18/18	10/30/18 14:43	R3QA155/R3QA116
Silver	U		1.0	ug/L	2.5	10/18/18	10/30/18 14:43	R3QA155/R3QA116
Sodium	**17300**		500	ug/L	1	10/18/18	10/30/18 19:33	R3QA155/R3QA159
Thallium	U		1.0	ug/L	2.5	10/18/18	10/30/18 14:43	R3QA155/R3QA116
Vanadium	**5.0**		5.0	ug/L	2.5	10/18/18	10/30/18 14:43	R3QA155/R3QA116
Zinc	**3.1**		2.0	ug/L	2.5	10/18/18	10/30/18 14:43	R3QA155/R3QA116

Site Name: **BLADES GROUNDWATER** **Project #:** **DAS R35450**

Total Metals

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID:	1810015-16							
Station ID:	BDE-GW-13							
Sample Matrix:	Groundwater							
Collected:	10/08/2018							
Aluminum	**261**		20.0	ug/L	2.5	10/18/18	10/30/18 14:47	R3QA155/R3QA116
Antimony	U		2.0	ug/L	2.5	10/18/18	10/30/18 14:47	R3QA155/R3QA116
Arsenic	U		1.0	ug/L	2.5	10/18/18	10/30/18 14:47	R3QA155/R3QA116
Barium	**56.7**		10.0	ug/L	2.5	10/18/18	10/30/18 14:47	R3QA155/R3QA116
Beryllium	U		1.0	ug/L	2.5	10/18/18	10/30/18 14:47	R3QA155/R3QA116
Cadmium	U		1.0	ug/L	2.5	10/18/18	10/30/18 14:47	R3QA155/R3QA116
Calcium	**6840**		500	ug/L	1	10/18/18	10/30/18 19:37	R3QA155/R3QA159
Chromium	U		2.0	ug/L	2.5	10/18/18	10/30/18 14:47	R3QA155/R3QA116
Cobalt	**1.3**		1.0	ug/L	2.5	10/18/18	10/30/18 14:47	R3QA155/R3QA116
Copper	U		2.0	ug/L	2.5	10/18/18	10/30/18 14:47	R3QA155/R3QA116
Iron	U		100	ug/L	1	10/18/18	10/30/18 19:37	R3QA155/R3QA159
Lead	U		1.0	ug/L	2.5	10/18/18	10/30/18 14:47	R3QA155/R3QA116
Magnesium	**1580**		500	ug/L	1	10/18/18	10/30/18 19:37	R3QA155/R3QA159
Manganese	**31.5**		1.0	ug/L	2.5	10/18/18	10/30/18 14:47	R3QA155/R3QA116
Mercury	U	H1, UJ	0.2	ug/L	1	11/06/18	11/08/18 12:18	R3QA131
Nickel	**2.3**		1.0	ug/L	2.5	10/18/18	10/30/18 14:47	R3QA155/R3QA116
Potassium	**4470**		500	ug/L	1	10/18/18	10/30/18 19:37	R3QA155/R3QA159
Selenium	U		5.0	ug/L	2.5	10/18/18	10/30/18 14:47	R3QA155/R3QA116
Silver	U		1.0	ug/L	2.5	10/18/18	10/30/18 14:47	R3QA155/R3QA116
Sodium	**2500**		500	ug/L	1	10/18/18	10/30/18 19:37	R3QA155/R3QA159
Thallium	U		1.0	ug/L	2.5	10/18/18	10/30/18 14:47	R3QA155/R3QA116
Vanadium	U		5.0	ug/L	2.5	10/18/18	10/30/18 14:47	R3QA155/R3QA116
Zinc	**78.9**		2.0	ug/L	2.5	10/18/18	10/30/18 14:47	R3QA155/R3QA116

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Region 3 Environmental Science Center
Office of Analytical Services and Quality Assurance
701 Mapes Road
Fort Meade, Maryland 20755-5350

Site Name: **BLADES GROUNDWATER** **Project #:** **DAS R35450**

Total Metals

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID:	1810015-17							
Station ID:	BDE-GW-14							
Sample Matrix:	Groundwater							
Collected:	10/11/2018							
Aluminum	**476**		20.0	ug/L	2.5	10/18/18	10/30/18 14:51	R3QA155/R3QA116
Antimony	U		2.0	ug/L	2.5	10/18/18	10/30/18 14:51	R3QA155/R3QA116
Arsenic	**2.2**		1.0	ug/L	2.5	10/18/18	10/30/18 14:51	R3QA155/R3QA116
Barium	**15.0**		10.0	ug/L	2.5	10/18/18	10/30/18 14:51	R3QA155/R3QA116
Beryllium	U		1.0	ug/L	2.5	10/18/18	10/30/18 14:51	R3QA155/R3QA116
Cadmium	U		1.0	ug/L	2.5	10/18/18	10/30/18 14:51	R3QA155/R3QA116
Calcium	**15100**		500	ug/L	1	10/18/18	10/30/18 19:41	R3QA155/R3QA159
Chromium	U		2.0	ug/L	2.5	10/18/18	10/30/18 14:51	R3QA155/R3QA116
Cobalt	U		1.0	ug/L	2.5	10/18/18	10/30/18 14:51	R3QA155/R3QA116
Copper	**2.0**		2.0	ug/L	2.5	10/18/18	10/30/18 14:51	R3QA155/R3QA116
Iron	**254**		100	ug/L	1	10/18/18	10/30/18 19:41	R3QA155/R3QA159
Lead	U		1.0	ug/L	2.5	10/18/18	10/30/18 14:51	R3QA155/R3QA116
Magnesium	**1620**		500	ug/L	1	10/18/18	10/30/18 19:41	R3QA155/R3QA159
Manganese	U		1.0	ug/L	2.5	10/18/18	10/30/18 14:51	R3QA155/R3QA116
Mercury	U		0.2	ug/L	1	11/06/18	11/08/18 12:20	R3QA131
Nickel	U		1.0	ug/L	2.5	10/18/18	10/30/18 14:51	R3QA155/R3QA116
Potassium	**2010**		500	ug/L	1	10/18/18	10/30/18 19:41	R3QA155/R3QA159
Selenium	U		5.0	ug/L	2.5	10/18/18	10/30/18 14:51	R3QA155/R3QA116
Silver	U		1.0	ug/L	2.5	10/18/18	10/30/18 14:51	R3QA155/R3QA116
Sodium	**8790**		500	ug/L	1	10/18/18	10/30/18 19:41	R3QA155/R3QA159
Thallium	U		1.0	ug/L	2.5	10/18/18	10/30/18 14:51	R3QA155/R3QA116
Vanadium	**8.7**		5.0	ug/L	2.5	10/18/18	10/30/18 14:51	R3QA155/R3QA116
Zinc	**38.2**		2.0	ug/L	2.5	10/18/18	10/30/18 14:51	R3QA155/R3QA116

Site Name: **BLADES GROUNDWATER** **Project #:** **DAS R35450**

Total Metals

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
Lab ID:	1810015-18							
Station ID:	BDE-GW-15							
Sample Matrix:	Groundwater							
Collected:	10/10/2018							
Aluminum	**373**		20.0	ug/L	2.5	10/18/18	10/30/18 14:54	R3QA155/R3QA116
Antimony	U		2.0	ug/L	2.5	10/18/18	10/30/18 14:54	R3QA155/R3QA116
Arsenic	U		1.0	ug/L	2.5	10/18/18	10/30/18 14:54	R3QA155/R3QA116
Barium	**26.0**		10.0	ug/L	2.5	10/18/18	10/30/18 14:54	R3QA155/R3QA116
Beryllium	U		1.0	ug/L	2.5	10/18/18	10/30/18 14:54	R3QA155/R3QA116
Cadmium	U		1.0	ug/L	2.5	10/18/18	10/30/18 14:54	R3QA155/R3QA116
Calcium	**7400**		500	ug/L	1	10/18/18	10/30/18 19:44	R3QA155/R3QA159
Chromium	**16.9**		2.0	ug/L	2.5	10/18/18	10/30/18 14:54	R3QA155/R3QA116
Cobalt	U		1.0	ug/L	2.5	10/18/18	10/30/18 14:54	R3QA155/R3QA116
Copper	U		2.0	ug/L	2.5	10/18/18	10/30/18 14:54	R3QA155/R3QA116
Iron	**184**		100	ug/L	1	10/18/18	10/30/18 19:44	R3QA155/R3QA159
Lead	U		1.0	ug/L	2.5	10/18/18	10/30/18 14:54	R3QA155/R3QA116
Magnesium	**1240**		500	ug/L	1	10/18/18	10/30/18 19:44	R3QA155/R3QA159
Manganese	**20.1**		1.0	ug/L	2.5	10/18/18	10/30/18 14:54	R3QA155/R3QA116
Mercury	U	H1, UJ	0.2	ug/L	1	11/06/18	11/08/18 12:22	R3QA131
Nickel	**4.0**		1.0	ug/L	2.5	10/18/18	10/30/18 14:54	R3QA155/R3QA116
Potassium	**2140**		500	ug/L	1	10/18/18	10/30/18 19:44	R3QA155/R3QA159
Selenium	U		5.0	ug/L	2.5	10/18/18	10/30/18 14:54	R3QA155/R3QA116
Silver	U		1.0	ug/L	2.5	10/18/18	10/30/18 14:54	R3QA155/R3QA116
Sodium	**3090**		500	ug/L	1	10/18/18	10/30/18 19:44	R3QA155/R3QA159
Thallium	U		1.0	ug/L	2.5	10/18/18	10/30/18 14:54	R3QA155/R3QA116
Vanadium	U		5.0	ug/L	2.5	10/18/18	10/30/18 14:54	R3QA155/R3QA116
Zinc	**114**		2.0	ug/L	2.5	10/18/18	10/30/18 14:54	R3QA155/R3QA116

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Region 3 Environmental Science Center
Office of Analytical Services and Quality Assurance
701 Mapes Road
Fort Meade, Maryland 20755-5350

Site Name: BLADES GROUNDWATER **Project #: DAS R35450**

QC Data
HPLC Identification

Analyte	Result	Quantitation Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BJ81803 - EPA 537										
Blank (BJ81803-BLK1)				Prepared: 10/19/18 23:59			Analyzed: 10/23/18 02:03			
PFBS (perfluorobutanesulfonic acid)	U	10.0	ng/L							
PFHpA (perfluoroheptanoic acid)	U	10.0	"							
PFHxS (perfluorohexanesulfonic acid)	U	10.0	"							
PFNA (perfluorononanoic acid)	U	10.0	"							
PFOS (perfluorooctanesulfonic acid)	U	10.0	"							
PFOA (perfluorooctanoic acid)	U	10.0	"							
Surrogate: MPFHxA	*43.1*		"	*40.000*		*108*	*70-130*			
Surrogate: MPFDA	*39.1*		"	*40.000*		*98*	*70-130*			
LCS (BJ81803-BS1)				Prepared: 10/19/18 23:59			Analyzed: 10/23/18 02:29			
PFBS (perfluorobutanesulfonic acid)	97.7	10.0	ng/L	88.000		111	70-130			
PFHpA (perfluoroheptanoic acid)	110	10.0	"	100.00		110	70-130			
PFHxS (perfluorohexanesulfonic acid)	108	10.0	"	94.000		115	70-130			
PFNA (perfluorononanoic acid)	109	10.0	"	100.00		109	70-130			
PFOS (perfluorooctanesulfonic acid)	97.7	10.0	"	96.000		102	70-130			
PFOA (perfluorooctanoic acid)	109	10.0	"	100.00		109	70-130			
Surrogate: MPFHxA	*42.5*		"	*40.000*		*106*	*70-130*			
Surrogate: MPFDA	*40.0*		"	*40.000*		*100*	*70-130*			
Matrix Spike (BJ81803-MS1)	**Source: 1810015-05**			Prepared: 10/19/18 23:59			Analyzed: 10/23/18 05:28			
PFBS (perfluorobutanesulfonic acid)	93.4	8.62	ng/L	75.862	14.5	104	70-130			
PFHpA (perfluoroheptanoic acid)	100	8.62	"	86.207	U	117	70-130			
PFHxS (perfluorohexanesulfonic acid)	99.1	8.62	"	81.034	U	122	70-130			
PFNA (perfluorononanoic acid)	100	8.62	"	86.207	U	116	70-130			
PFOS (perfluorooctanesulfonic acid)	263	43.1	"	82.759	183	96	70-130			
PFOA (perfluorooctanoic acid)	108	8.62	"	86.207	10.1	113	70-130			
Surrogate: MPFHxA	*37.4*		"	*34.483*		*109*	*70-130*			
Surrogate: MPFDA	*36.5*		"	*34.483*		*106*	*70-130*			

Site Name: BLADES GROUNDWATER **Project #: DAS R35450**

QC Data
HPLC Identification

Analyte	Result	Quantitation Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BJ81803 - EPA 537										
Matrix Spike Dup (BJ81803-MSD1)		**Source: 1810015-05**		Prepared: 10/19/18 23:59		Analyzed: 10/23/18 05:54				
PFBS (perfluorobutanesulfonic acid)	101	8.62	ng/L	75.862	14.5	114	70-130	8	25	
PFHpA (perfluoroheptanoic acid)	107	8.62	"	86.207	U	124	70-130	6	25	
PFHxS (perfluorohexanesulfonic acid)	104	8.62	"	81.034	U	128	70-130	5	25	
PFNA (perfluorononanoic acid)	107	8.62	"	86.207	U	124	70-130	6	25	
PFOS (perfluorooctanesulfonic acid)	273	43.1	"	82.759	183	109	70-130	4	25	
PFOA (perfluorooctanoic acid)	113	8.62	"	86.207	10.1	119	70-130	4	25	
Surrogate: MPFHxA	*40.7*		*"*	*34.483*		*118*	*70-130*			
Surrogate: MPFDA	*39.4*		*"*	*34.483*		*114*	*70-130*			

Site Name: BLADES GROUNDWATER **Project #: DAS R35450**

QC Data
Organochlorine Pesticides and PCBs

Analyte	Result	Quantitation Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BJ81702 - EPA 3520C PCB/Pest										
Blank (BJ81702-BLK1)				Prepared: 10/17/18 08:00		Analyzed: 11/01/18 18:38				
Aldrin	U	0.050	ug/L							
alpha-BHC	U	0.050	"							
beta-BHC	U	0.050	"							
delta-BHC	U	0.050	"							
gamma-BHC (Lindane)	U	0.050	"							
alpha-Chlordane	U	0.050	"							
gamma-Chlordane	U	0.050	"							
4,4'-DDD	U	0.100	"							
4,4'-DDE	U	0.100	"							
4,4'-DDT	U	0.100	"							
Dieldrin	U	0.100	"							
Endosulfan I	U	0.050	"							
Endosulfan II	U	0.100	"							
Endosulfan sulfate	U	0.100	"							
Endrin	U	0.100	"							
Endrin aldehyde	U	0.100	"							
Endrin ketone	U	0.100	"							
Heptachlor	U	0.050	"							
Heptachlor epoxide	U	0.050	"							
Methoxychlor	U	0.500	"							
Toxaphene	U	5.00	"							
Surrogate: Tetrachloro-meta-xylene	*0.719*		*"*	*1.0000*		*72*	*30-150*			
Surrogate: Decachlorobiphenyl	*0.725*		*"*	*1.0000*		*72*	*30-150*			
LCS (BJ81702-BS1)				Prepared: 10/17/18 08:00		Analyzed: 11/01/18 19:44				
Aldrin	0.372	0.050	ug/L	0.40000		93	70-130			
alpha-BHC	0.385	0.050	"	0.40000		96	70-130			
beta-BHC	0.407	0.050	"	0.40000		102	70-130			
delta-BHC	0.416	0.050	"	0.40000		104	70-130			
gamma-BHC (Lindane)	0.394	0.050	"	0.40000		99	70-130			
alpha-Chlordane	0.390	0.050	"	0.40000		98	70-130			
gamma-Chlordane	0.396	0.050	"	0.40000		99	70-130			
4,4'-DDD	0.846	0.100	"	0.80000		106	70-130			
4,4'-DDE	0.776	0.100	"	0.80000		97	70-130			
4,4'-DDT	0.830	0.100	"	0.80000		104	70-130			
Dieldrin	0.804	0.100	"	0.80000		100	70-130			
Endosulfan I	0.391	0.050	"	0.40000		98	70-130			
Endosulfan II	0.864	0.100	"	0.80000		108	70-130			
Endosulfan sulfate	0.837	0.100	"	0.80000		105	70-130			
Endrin	0.874	0.100	"	0.80000		109	70-130			
Endrin aldehyde	0.850	0.100	"	0.80000		106	70-130			
Endrin ketone	0.895	0.100	"	0.80000		112	70-130			
Heptachlor	0.370	0.050	"	0.40000		93	70-130			
Heptachlor epoxide	0.398	0.050	"	0.40000		99	70-130			
Methoxychlor	4.55	0.500	"	4.0000		114	70-130			

Site Name: BLADES GROUNDWATER **Project #: DAS R35450**

QC Data
Organochlorine Pesticides and PCBs

Analyte	Result	Quantitation Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BJ81702 - EPA 3520C PCB/Pest										
LCS (BJ81702-BS1)				Prepared: 10/17/18 08:00			Analyzed: 11/01/18 19:44			
Surrogate: Tetrachloro-meta-xylene	*0.756*		*ug/L*	*1.0000*		*76*	*30-150*			
Surrogate: Decachlorobiphenyl	*0.753*		*"*	*1.0000*		*75*	*30-150*			
Matrix Spike (BJ81702-MS1)		**Source: 1810015-05**		Prepared: 10/17/18 08:00			Analyzed: 11/02/18 01:14			
Aldrin	0.330	0.048	ug/L	0.38095	U	87	40-120			
alpha-BHC	0.341	0.048	"	0.38095	U	90	50-150			
beta-BHC	0.382	0.048	"	0.38095	U	100	50-150			
delta-BHC	0.414	0.048	"	0.38095	U	109	50-150			
gamma-BHC (Lindane)	0.356	0.048	"	0.38095	U	94	56-123			
alpha-Chlordane	0.364	0.048	"	0.38095	U	95	50-150			
gamma-Chlordane	0.373	0.048	"	0.38095	U	98	50-150			
4,4'-DDD	0.809	0.095	"	0.76190	U	106	50-150			
4,4'-DDE	0.736	0.095	"	0.76190	U	97	50-150			
4,4'-DDT	0.792	0.095	"	0.76190	U	104	38-127			
Dieldrin	0.767	0.095	"	0.76190	U	101	52-126			
Endosulfan I	0.362	0.048	"	0.38095	U	95	50-150			
Endosulfan II	0.805	0.095	"	0.76190	U	106	50-150			
Endosulfan sulfate	0.777	0.095	"	0.76190	U	102	50-150			
Endrin	0.826	0.095	"	0.76190	U	108	56-121			
Endrin aldehyde	0.762	0.095	"	0.76190	U	100	50-150			
Endrin ketone	0.843	0.095	"	0.76190	U	111	50-150			
Heptachlor	0.330	0.048	"	0.38095	U	87	40-131			
Heptachlor epoxide	0.366	0.048	"	0.38095	U	96	50-150			
Methoxychlor	4.41	0.476	"	3.8095	U	116	50-150			
Toxaphene	U	4.76	"		U		50-150			
Surrogate: Tetrachloro-meta-xylene	*0.644*		*"*	*0.95238*		*68*	*30-150*			
Surrogate: Decachlorobiphenyl	*0.899*		*"*	*0.95238*		*94*	*30-150*			

Site Name: BLADES GROUNDWATER **Project #: DAS R35450**

QC Data
Organochlorine Pesticides and PCBs

Analyte	Result	Quantitation Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BJ81702 - EPA 3520C PCB/Pest										
Matrix Spike Dup (BJ81702-MSD1)		**Source: 1810015-05**		Prepared: 10/17/18 08:00		Analyzed: 11/02/18 01:36				
Aldrin	0.262	0.048	ug/L	0.38095	U	69	40-120	23	22	A
alpha-BHC	0.318	0.048	"	0.38095	U	83	50-150	7	25	
beta-BHC	0.362	0.048	"	0.38095	U	95	50-150	5	25	
delta-BHC	0.396	0.048	"	0.38095	U	104	50-150	4	25	
gamma-BHC (Lindane)	0.341	0.048	"	0.38095	U	89	56-123	4	15	
alpha-Chlordane	0.353	0.048	"	0.38095	U	93	50-150	3	25	
gamma-Chlordane	0.360	0.048	"	0.38095	U	94	50-150	4	25	
4,4'-DDD	0.810	0.095	"	0.76190	U	106	50-150	0.1	25	
4,4'-DDE	0.716	0.095	"	0.76190	U	94	50-150	3	25	
4,4'-DDT	0.768	0.095	"	0.76190	U	101	38-127	3	27	
Dieldrin	0.747	0.095	"	0.76190	U	98	52-126	3	18	
Endosulfan I	0.354	0.048	"	0.38095	U	93	50-150	2	25	
Endosulfan II	0.787	0.095	"	0.76190	U	103	50-150	2	25	
Endosulfan sulfate	0.763	0.095	"	0.76190	U	100	50-150	2	25	
Endrin	0.805	0.095	"	0.76190	U	106	56-121	3	21	
Endrin aldehyde	0.748	0.095	"	0.76190	U	98	50-150	2	25	
Endrin ketone	0.829	0.095	"	0.76190	U	109	50-150	2	25	
Heptachlor	0.302	0.048	"	0.38095	U	79	40-131	9	20	
Heptachlor epoxide	0.355	0.048	"	0.38095	U	93	50-150	3	25	
Methoxychlor	4.31	0.476	"	3.8095	U	113	50-150	2	25	
Toxaphene	U	4.76	"		U		50-150		25	
Surrogate: Tetrachloro-meta-xylene	*0.650*		"	*0.95238*		*68*	*30-150*			
Surrogate: Decachlorobiphenyl	*0.924*		"	*0.95238*		*97*	*30-150*			

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Site Name: BLADES GROUNDWATER **Project #: DAS R35450**

QC Data
Total Metals

Analyte	Result	Quantitation Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BJ81801 - Metals Water Prep										
Blank (BJ81801-BLK1)				Prepared: 10/18/18 10:58		Analyzed: 10/30/18 12:28				
Antimony	U	2.0	ug/L							
Arsenic	U	1.0	"							
Barium	U	10.0	"							
Beryllium	U	1.0	"							
Cadmium	U	1.0	"							
Chromium	U	2.0	"							
Cobalt	U	1.0	"							
Copper	U	2.0	"							
Lead	U	1.0	"							
Manganese	U	1.0	"							
Nickel	U	1.0	"							
Selenium	U	5.0	"							
Silver	U	1.0	"							
Thallium	U	1.0	"							
Vanadium	U	5.0	"							
Zinc	U	2.0	"							
Aluminum	U	20.0	"							
Blank (BJ81801-BLK2)				Prepared: 10/18/18 10:58		Analyzed: 10/30/18 17:56				
Aluminum	U	200	ug/L							
Calcium	U	500	"							
Iron	U	100	"							
Magnesium	U	500	"							
Potassium	U	500	"							
Sodium	U	500	"							
LCS (BJ81801-BS1)				Prepared: 10/18/18 10:58		Analyzed: 10/30/18 12:36				
Antimony	50.0	2.0	ug/L	50.000		100	85-115			
Arsenic	47.4	1.0	"	50.000		95	85-115			
Barium	190	10.0	"	200.00		95	85-115			
Beryllium	4.7	1.0	"	5.0000		95	85-115			
Cadmium	5.1	1.0	"	5.0000		101	85-115			
Chromium	50.1	2.0	"	50.000		100	85-115			
Cobalt	48.9	1.0	"	50.000		98	85-115			
Copper	48.9	2.0	"	50.000		98	85-115			
Lead	47.5	1.0	"	50.000		95	85-115			
Manganese	49.0	1.0	"	50.000		98	85-115			
Nickel	48.7	1.0	"	50.000		97	85-115			
Selenium	48.1	5.0	"	50.000		96	85-115			
Silver	5.0	1.0	"	5.0000		100	85-115			
Thallium	44.8	1.0	"	50.000		90	85-115			
Vanadium	51.6	5.0	"	50.000		103	85-115			
Zinc	47.5	2.0	"	50.000		95	85-115			
Aluminum	200	20.0	"	200.00		100	85-115			

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Site Name: BLADES GROUNDWATER **Project #: DAS R35450**

QC Data
Total Metals

Analyte	Result	Quantitation Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BJ81801 - Metals Water Prep										
LCS (BJ81801-BS2)				Prepared: 10/18/18 10:58		Analyzed: 10/30/18 18:03				
Aluminum	1931.60	200	ug/L	2000.0		97	85-115			
Calcium	9842.37	500	"	10000		98	85-115			
Iron	4889.14	100	"	5000.0		98	85-115			
Magnesium	9714.18	500	"	10000		97	85-115			
Potassium	19465.4	500	"	20000		97	85-115			
Sodium	9718.12	500	"	10000		97	85-115			
Duplicate (BJ81801-DUP1)		**Source: 1810015-01**		Prepared: 10/18/18 10:58		Analyzed: 10/30/18 13:09				
Antimony	0.1	2.0	ug/L		0.1			3	20	
Arsenic	U	1.0	"		U				20	
Barium	18.4	10.0	"		20.8			13	20	
Beryllium	0.004	1.0	"		0.008			71	20	D
Cadmium	0.02	1.0	"		0.02			42	20	D
Chromium	U	2.0	"		U				20	
Cobalt	0.1	1.0	"		0.1			4	20	
Copper	0.8	2.0	"		1.0			14	20	
Lead	0.03	1.0	"		0.04			32	20	D
Manganese	0.2	1.0	"		0.2			5	20	
Nickel	1.0	1.0	"		1.1			6	20	
Selenium	0.6	5.0	"		0.8			19	20	
Silver	U	1.0	"		U				20	
Thallium	0.003	1.0	"		0.002			5	20	
Vanadium	2.4	5.0	"		2.9			19	20	
Zinc	2.2	2.0	"		2.9			26	20	A
Aluminum	23.5	20.0	"		26.4			11	20	
Duplicate (BJ81801-DUP2)		**Source: 1810015-01**		Prepared: 10/18/18 10:58		Analyzed: 10/30/18 18:11				
Calcium	18093.5	500	ug/L		18081.6			0.07	20	
Iron	11.6095	100	"		12.1502			5	20	
Magnesium	2278.88	500	"		2290.38			0.5	20	
Potassium	2370.02	500	"		2375.84			0.2	20	
Sodium	5843.41	500	"		5867.12			0.4	20	

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Region 3 Environmental Science Center
Office of Analytical Services and Quality Assurance
701 Mapes Road
Fort Meade, Maryland 20755-5350

Site Name: BLADES GROUNDWATER **Project #: DAS R35450**

QC Data
Total Metals

Analyte	Result	Quantitation Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BJ81801 - Metals Water Prep										
Duplicate (BJ81801-DUP3)		**Source: 1810015-11**		Prepared: 10/18/18 10:58		Analyzed: 10/30/18 14:09				
Antimony	0.1	2.0	ug/L		0.1			5	20	
Arsenic	0.09	1.0	"		1.6			178	20	D
Barium	47.6	10.0	"		54.6			14	20	
Beryllium	0.03	1.0	"		0.03			9	20	
Cadmium	0.08	1.0	"		0.1			19	20	
Chromium	U	2.0	"		U				20	
Cobalt	0.6	1.0	"		0.6			0.4	20	
Copper	0.7	2.0	"		0.6			22	20	D
Lead	0.05	1.0	"		0.05			3	20	
Manganese	5.2	1.0	"		5.2			0.8	20	
Nickel	0.9	1.0	"		1.1			19	20	
Selenium	0.6	5.0	"		0.8			37	20	D
Silver	U	1.0	"		U				20	
Thallium	0.006	1.0	"		0.006			0.5	20	
Vanadium	2.0	5.0	"		1.5			29	20	D
Zinc	6.1	2.0	"		6.4			5	20	
Aluminum	19.0	20.0	"		21.9			14	20	
Duplicate (BJ81801-DUP4)		**Source: 1810015-11**		Prepared: 10/18/18 10:58		Analyzed: 10/30/18 19:13				
Calcium	17815.1	500	ug/L		17922.3			0.6	20	
Iron	2.73066	100	"		5.17234			62	20	D
Magnesium	2232.89	500	"		2231.51			0.06	20	
Potassium	2132.95	500	"		2138.82			0.3	20	
Sodium	8951.19	500	"		9274.40			4	20	
Matrix Spike (BJ81801-MS1)		**Source: 1810015-02**		Prepared: 10/18/18 10:58		Analyzed: 10/30/18 13:17				
Antimony	51.3	2.0	ug/L	50.000	0.06	102	70-130			
Arsenic	49.8	1.0	"	50.000	0.07	99	70-130			
Barium	240	10.0	"	200.00	36.4	102	70-130			
Beryllium	5.1	1.0	"	5.0000	0.1	100	70-130			
Cadmium	5.2	1.0	"	5.0000	0.05	103	70-130			
Chromium	49.0	2.0	"	50.000	U	98	70-130			
Cobalt	49.8	1.0	"	50.000	1.9	96	70-130			
Copper	50.8	2.0	"	50.000	0.9	100	70-130			
Lead	48.5	1.0	"	50.000	0.2	97	70-130			
Manganese	66.8	1.0	"	50.000	18.0	98	70-130			
Nickel	53.8	1.0	"	50.000	4.1	99	70-130			
Selenium	48.8	5.0	"	50.000	1.0	96	70-130			
Silver	4.9	1.0	"	5.0000	0.006	98	70-130			
Thallium	46.3	1.0	"	50.000	0.007	93	70-130			
Vanadium	53.1	5.0	"	50.000	0.2	106	70-130			
Zinc	59.9	2.0	"	50.000	12.2	95	70-130			
Aluminum	350	20.0	"	200.00	133	108	70-130			

Site Name: BLADES GROUNDWATER **Project #: DAS R35450**

QC Data
Total Metals

Analyte	Result	Quantitation Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BJ81801 - Metals Water Prep										
Matrix Spike (BJ81801-MS2)		**Source: 1810015-02**		Prepared: 10/18/18 10:58			Analyzed: 10/30/18 18:27			
Calcium	18992.9	500	ug/L	10000	8966.02	100	70-130			
Iron	4890.27	100	"	5000.0	27.1726	97	70-130			
Magnesium	10606.3	500	"	10000	1249.91	94	70-130			
Potassium	21436.9	500	"	20000	2239.30	96	70-130			
Sodium	17974.4	500	"	10000	8233.12	97	70-130			
Matrix Spike (BJ81801-MS3)		**Source: 1810015-12**		Prepared: 10/18/18 10:58			Analyzed: 10/30/18 14:32			
Antimony	48.8	2.0	ug/L	50.000	0.2	97	70-130			
Arsenic	48.5	1.0	"	50.000	U	97	70-130			
Barium	239	10.0	"	200.00	46.8	96	70-130			
Beryllium	4.9	1.0	"	5.0000	0.02	98	70-130			
Cadmium	4.7	1.0	"	5.0000	0.05	93	70-130			
Chromium	47.9	2.0	"	50.000	U	96	70-130			
Cobalt	46.9	1.0	"	50.000	0.2	93	70-130			
Copper	48.0	2.0	"	50.000	0.9	94	70-130			
Lead	46.3	1.0	"	50.000	0.08	92	70-130			
Manganese	49.4	1.0	"	50.000	1.4	96	70-130			
Nickel	52.0	1.0	"	50.000	4.2	96	70-130			
Selenium	47.4	5.0	"	50.000	1.1	92	70-130			
Silver	4.9	1.0	"	5.0000	U	98	70-130			
Thallium	44.5	1.0	"	50.000	0.01	89	70-130			
Vanadium	47.2	5.0	"	50.000	2.0	90	70-130			
Zinc	53.7	2.0	"	50.000	7.1	93	70-130			
Aluminum	400	20.0	"	200.00	176	112	70-130			
Matrix Spike (BJ81801-MS4)		**Source: 1810015-12**		Prepared: 10/18/18 10:58			Analyzed: 10/30/18 19:21			
Calcium	46011.8	500	ug/L	10000	36747.0	93	70-130			
Iron	5142.92	100	"	5000.0	70.0620	101	70-130			
Magnesium	12279.2	500	"	10000	2825.55	95	70-130			
Potassium	23455.5	500	"	20000	4270.67	96	70-130			
Sodium	19965.3	500	"	10000	10413.8	96	70-130			

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Region 3 Environmental Science Center
Office of Analytical Services and Quality Assurance
701 Mapes Road
Fort Meade, Maryland 20755-5350

Site Name: BLADES GROUNDWATER **Project #: DAS R35450**

QC Data
Total Metals

Analyte	Result	Quantitation Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BK80504 - Mercury 245.1/245.2/7470a Prep										
Blank (BK80504-BLK1)				Prepared: 11/06/18 10:25			Analyzed: 11/08/18 11:24			
Mercury	U	0.2	ug/L							
Blank (BK80504-BLK2)				Prepared: 11/06/18 10:25			Analyzed: 11/08/18 11:58			
Mercury	U	0.2	ug/L							
LCS (BK80504-BS1)				Prepared: 11/06/18 10:25			Analyzed: 11/08/18 11:26			
Mercury	1.88	0.2	ug/L	2.0000		94	85-115			
Duplicate (BK80504-DUP1)		**Source: 1810015-05**		Prepared: 11/06/18 10:25			Analyzed: 11/08/18 11:44			
Mercury	U	0.2	ug/L		U				20	
Duplicate (BK80504-DUP2)		**Source: 1810015-12**		Prepared: 11/06/18 10:25			Analyzed: 11/08/18 12:10			
Mercury	U	0.2	ug/L		U				20	
Matrix Spike (BK80504-MS1)		**Source: 1810015-05**		Prepared: 11/06/18 10:25			Analyzed: 11/08/18 11:46			
Mercury	1.75	0.2	ug/L	2.0000	U	88	70-130			
Matrix Spike (BK80504-MS2)		**Source: 1810015-11**		Prepared: 11/06/18 10:25			Analyzed: 11/08/18 12:06			
Mercury	1.92	0.2	ug/L	2.0000	U	96	70-130			

Site Name: BLADES GROUNDWATER **Project #: DAS R35450**

Notes and Definitions

UJ	The analyte was not detected at or above the quantitation limit. The quantitation limit is an estimate.
J	The identification of the analyte is acceptable; the reported value is an estimate.
H2	This sample was extracted outside of the EPA recommended holding time.
H1	This sample was analyzed outside the EPA recommended holding time.
D	Source sample result and/or duplicate sample result are below the quantitation limit and the RPD is artificially high. Precision data (RPD value) has no significance for this QC Sample.
A	Quality control value is outside acceptance limits.
%REC	Percent Recovery
RPD	Relative Percent Difference
U	Analyte included in the analysis, but not detected at or above the quantitation limit.
NR	Not Reported

QUANTITATION LIMIT: The lowest concentration of an analyte that can be reliably measured within specified limits of precision and accuracy for a specific laboratory analytical method and that takes into account analytical adjustments made during sample preparation and analysis.

SOLID SAMPLE RESULTS - REPORTING PROTOCOL: Percent Solids (percent dry wt at 105 degrees C) determinations are routinely performed for most organic and inorganic analyses. Consequently, these samples are analyzed wet and converted to a dry weight result for reporting purposes. If metals and mercury analyses are requested, they are routinely prepared for analyses by an initial drying at 60 degrees C, homogenized prior to digestion, and are analyzed and reported on a dry weight basis. Oil-type samples are analyzed and reported on a wet weight basis for all analyses because of the nature of the sample matrix. Any exceptions to this protocol will be noted in the narrative.

ON-DEMAND: The term 'on-demand' analysis, if noted in the report narrative, refers to Section 13.1.4 in the Region III OASQA Laboratory Quality Manual, which provides procedures for non-routine analyses or analytes.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
Environmental Sciences Center
701 Mapes Road
Fort Meade, Maryland 20755-5350

DATE: 3/14/2019

SUBJECT: Region III Data QA Review

FROM: Brandon McDonald
Region III ESAT RPO(3EA22)

TO: CONNOR O'LOUGHLIN
Hazardous Site Cleanup Division (HSCD)

Attached is the data validation report for the BLADES GROUNDWATER site for DAS# R35451; SDG# MC0AD2 completed by the Region III Environmental Services Assistance Team(ESAT) contractor, ICF International, under the direction of Region III EAID.

If you have any questions regarding this review, please call Brandon McDonald at (410) 305-2607 or you can call Eric Graybill at (410)-305-2665.

Attachment

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ESAT Region 3
US Environmental Protection Agency Environmental Science Center
701 Mapes Road Ft. Meade, MD 20755-5350
Phone 410-305-3012

Date: March 13, 2019

To: Brandon McDonald
ESAT Region 3 Project Officer

From: Ex. 4 CBI
Validator

Ex. 4 CBI
Reviewer

Subject: Inorganic Data Validation (S4VM)
Blades Groundwater
R35451 MC0AD2

Overview

This data package consisted of eighteen (18) ground water samples analyzed for hexavalent chromium.

Analyses were performed by Eurofins Eaton Analytical (EEA). The samples were submitted to the laboratory directly by the sampling contractor. The laboratory indicated analyses were performed based on EPA Method 218.7.

Data were validated according to the National Functional Guidelines for Inorganic Superfund Methods Data Review and applicable USEPA Region 3 modifications. The validation report has been assigned the Superfund Data Validation Level Stage_4_Validation_Manual (S4VM).

The following validation narrative is an evaluation of laboratory reported data based on the electronic data package received by Region 3 on December 6, 2018. Verification of residual chlorine & pH on sample receipt was requested from the lab. A response was received on February 27, 2019 indicating that sample pH had been checked upon sample receipt but not recorded and that residual chlorine checks were not performed.

The Electronic Data Deliverables (EDDs) provided were not in the proper format and were not validated.

Summary

Lack of preservation verification with analysis outside the twenty-four hour technical holding time for non-preserved samples and failure to report a valid quantitation limit required rejection of all non-detect data.

Major Problems

Sample pH and residual chlorine check results were not documented by the laboratory. As method 218.7 requires residual chlorine and pH verification to ensure preservation for samples analyzed outside of twenty-four holding time, and the samples were analyzed between eleven (11) and fourteen (14) days after the sampling dates, all reported results are estimated and have been qualified "J" and non-detected result for sample BDE-DMW-01 is unusable and has been qualified "R".

The laboratory reported data to 0.02 ug/L which is labelled Minimum Reporting Limit (MRL) but is equivalent to the Method Detection Limit (MDL). The laboratory provides no verification of this limit and notes "EEA has demonstrated it can achieve these report limits in reagent water, but can not document them in all sample matrices." Non-detects must be reported at a verifiable limit no lower than the lowest standard analyzed or a laboratory established quantitation limit. The non-detected result for sample BDE-DMW-01 is rejected as unusable and qualified "R".

Minor Problem

The laboratory reported data to 0.02 ug/L which is labelled Minimum Reporting Limit (MRL) but is equivalent to the Method Detection Limit (MDL). The laboratory provides no verification of this limit and notes "EEA has demonstrated it can achieve these report limits in reagent water, but can not document them in all sample matrices." All positive results have been qualified as estimated "J".

Notes

Accuracy and precision criteria were met by the laboratory in the initial and continuing calibration verification standard analyses associated with the samples in this SDG.

Laboratory blanks associated with the samples in this SDG were free from contamination.

Laboratory Control Sample analyses were within control limits.

Percent recoveries and Relative Percent Differences (RPDs) in Matrix Spike/Matrix Spike Duplicate (MS/MSD) analysis for sample BDE-GW-01 were within control limits.

Sample BDE-GW-02 was logged in with the sampling date of 10/9/2018 obtained from the sample bottle, which did not match the sampling date of 01/09/2018 listed on Chain of Custody Record No: 3-101218-121438-0011. No data were qualified based on this finding.

Glossary of Inorganic Data Qualifier Codes

Validation Qualifiers	In order of descending precedence. Only one of these qualifiers may apply to any result.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the sample.
UJ	The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit
B	The result is presumed a blank contaminant. This qualifier is used for drinking water samples only.
J	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+	The result is an estimated quantity, but the result may be biased high.
J-	The result is an estimated quantity, but the result may be biased low.

Client Name: Weston Solutions Inc

Report #: 433161

Sampling Point: BDE-GW-14

PWS ID: Not Supplied

General Chemistry									
Analyte ID #	Analyte	Method	Reg Limit	MRL†	Result	Units	Preparation Date	Analyzed Date	EEA ID #
18540-29-9	Chromium, Hexavalent	218.7	---	0.02	0.17 J	ug/L	---	10/22/18 19:19	4090279

Sampling Point: BDE-GW-15

PWS ID: Not Supplied

General Chemistry									
Analyte ID #	Analyte	Method	Reg Limit	MRL†	Result	Units	Preparation Date	Analyzed Date	EEA ID #
18540-29-9	Chromium, Hexavalent	218.7	---	0.02	19 J	ug/L	---	10/24/18 10:49	4090280

Sampling Point: BDE-DMW-02

PWS ID: Not Supplied

General Chemistry									
Analyte ID #	Analyte	Method	Reg Limit	MRL†	Result	Units	Preparation Date	Analyzed Date	EEA ID #
18540-29-9	Chromium, Hexavalent	218.7	---	0.02	0.09 J	ug/L	---	10/22/18 19:45	4090281

Sampling Point: BDE-DMW-03

PWS ID: Not Supplied

General Chemistry									
Analyte ID #	Analyte	Method	Reg Limit	MRL†	Result	Units	Preparation Date	Analyzed Date	EEA ID #
18540-29-9	Chromium, Hexavalent	218.7	---	0.02	0.09 J	ug/L	---	10/22/18 19:58	4090282

Sampling Point: BDE-GW-02D

PWS ID: Not Supplied

General Chemistry									
Analyte ID #	Analyte	Method	Reg Limit	MRL†	Result	Units	Preparation Date	Analyzed Date	EEA ID #
18540-29-9	Chromium, Hexavalent	218.7	---	0.02	0.47 J	ug/L	---	10/22/18 20:11	4090283

Sampling Point: BDE-DMW-01

PWS ID: Not Supplied

General Chemistry									
Analyte ID #	Analyte	Method	Reg Limit	MRL†	Result	Units	Preparation Date	Analyzed Date	EEA ID #
18540-29-9	Chromium, Hexavalent	218.7	---	0.02	< 0.02 R	ug/L	---	10/22/18 20:24	4090284

† EEA has demonstrated it can achieve these report limits in reagent water, but can not document them in all sample matrices.

Reg Limit Type:	MCL	SMCL	AL
Symbol:	*	^	!

D.V.
3/1/19

Client Name: Weston Solutions Inc

Report #: 433161

Sampling Point: BDE-GW-01

PWS ID: Not Supplied

General Chemistry									
Analyte ID #	Analyte	Method	Reg Limit	MRL†	Result	Units	Preparation Date	Analyzed Date	EEA ID #
18540-29-9	Chromium, Hexavalent	218.7	---	0.02	0.04 J	ug/L	---	10/22/18 16:04	4090265

Sampling Point: BDE-GW-02

PWS ID: Not Supplied

General Chemistry									
Analyte ID #	Analyte	Method	Reg Limit	MRL†	Result	Units	Preparation Date	Analyzed Date	EEA ID #
18540-29-9	Chromium, Hexavalent	218.7	---	0.02	0.46 J	ug/L	---	10/22/18 16:43	4090268

Sampling Point: BDE-GW-03

PWS ID: Not Supplied

General Chemistry									
Analyte ID #	Analyte	Method	Reg Limit	MRL†	Result	Units	Preparation Date	Analyzed Date	EEA ID #
18540-29-9	Chromium, Hexavalent	218.7	---	0.02	0.08 J	ug/L	---	10/22/18 16:56	4090269

Sampling Point: BDE-GW-04

PWS ID: Not Supplied

General Chemistry									
Analyte ID #	Analyte	Method	Reg Limit	MRL†	Result	Units	Preparation Date	Analyzed Date	EEA ID #
18540-29-9	Chromium, Hexavalent	218.7	---	0.02	0.12 J	ug/L	---	10/22/18 17:09	4090270

Sampling Point: BDE-GW-05

PWS ID: Not Supplied

General Chemistry									
Analyte ID #	Analyte	Method	Reg Limit	MRL†	Result	Units	Preparation Date	Analyzed Date	EEA ID #
18540-29-9	Chromium, Hexavalent	218.7	---	0.02	0.14 J	ug/L	---	10/22/18 17:22	4090271

Sampling Point: BDE-GW-07

PWS ID: Not Supplied

General Chemistry									
Analyte ID #	Analyte	Method	Reg Limit	MRL†	Result	Units	Preparation Date	Analyzed Date	EEA ID #
18540-29-9	Chromium, Hexavalent	218.7	---	0.02	18 J	ug/L	---	10/23/18 19:58	4090272

D. V.
3/1/19

Client Name: Weston Solutions Inc

Report #: 433161

Sampling Point: BDE-GW-08

PWS ID: Not Supplied

General Chemistry									
Analyte ID #	Analyte	Method	Reg Limit	MRL†	Result	Units	Preparation Date	Analyzed Date	EEA ID #
18540-29-9	Chromium, Hexavalent	218.7	---	0.02	0.07 J	ug/L	---	10/22/18 17:48	4090273

Sampling Point: BDE-GW-09

PWS ID: Not Supplied

General Chemistry									
Analyte ID #	Analyte	Method	Reg Limit	MRL†	Result	Units	Preparation Date	Analyzed Date	EEA ID #
18540-29-9	Chromium, Hexavalent	218.7	---	0.02	0.11 J	ug/L	---	10/22/18 18:01	4090274

Sampling Point: BDE-GW-10

PWS ID: Not Supplied

General Chemistry									
Analyte ID #	Analyte	Method	Reg Limit	MRL†	Result	Units	Preparation Date	Analyzed Date	EEA ID #
18540-29-9	Chromium, Hexavalent	218.7	---	0.02	20 J	ug/L	---	10/23/18 20:11	4090275

Sampling Point: BDE-GW-11

PWS ID: Not Supplied

General Chemistry									
Analyte ID #	Analyte	Method	Reg Limit	MRL†	Result	Units	Preparation Date	Analyzed Date	EEA ID #
18540-29-9	Chromium, Hexavalent	218.7	---	0.02	2.1 J	ug/L	---	10/22/18 18:40	4090276

Sampling Point: BDE-GW-12

PWS ID: Not Supplied

General Chemistry									
Analyte ID #	Analyte	Method	Reg Limit	MRL†	Result	Units	Preparation Date	Analyzed Date	EEA ID #
18540-29-9	Chromium, Hexavalent	218.7	---	0.02	0.05 J	ug/L	---	10/22/18 18:53	4090277

Sampling Point: BDE-GW-13

PWS ID: Not Supplied

General Chemistry									
Analyte ID #	Analyte	Method	Reg Limit	MRL†	Result	Units	Preparation Date	Analyzed Date	EEA ID #
18540-29-9	Chromium, Hexavalent	218.7	---	0.02	0.25 J	ug/L	---	10/22/18 19:06	4090278

D.V.
3/1/19

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
Environmental Sciences Center
701 Mapes Road
Fort Meade, Maryland 20755-5350

DATE: 3/4/2019

SUBJECT: Region III Data QA Review

FROM: Brandon McDonald
Region III ESAT RPO (3EA22)

TO: CONNOR O'LOUGHLIN
Hazardous Site Cleanup Division (HSCD)

Attached is the data validation report for the BLADES GROUNDWATER site for DAS# R35470; SDG# C0AG1 completed by the Region III Environmental Services Assistance Team (ESAT) contractor, ICF International, under the direction of Region III EAID.

If you have any questions regarding this review, please call Brandon McDonald at (410) 305-2607 or you can call Eric Graybill at (410)-305-2665.

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ESAT Region 3
US Environmental Protection Agency Environmental Science Center
701 Mapes Road Ft. Meade, MD 20755-5350
Phone 410-305-3012

Date: January 30, 2019

To: Brandon McDonald
ESAT Region 3 Project Officer

From: Ex. 4 CBI
Validator

Ex. 4 CBI
Reviewer

Subject: Organic Data Validation (S4VM)
Blades Groundwater
R35470 C0AG1

Overview

This data package consisted of two (2) Field Reagent Blanks (FRBs), ten (10) groundwater and three (3) potable water samples analyzed for perfluorinated alkyl acid compounds by Liquid Chromatography/Mass Spectrometry (LC/MS). This sample set included a field duplicate sample.

Analyses were performed by Test America Sacramento (TAMC). The samples were submitted to the laboratory directly by the sampling contractor. The laboratory indicated analyses were performed according to EPA Method 537 utilizing a quantitative isotope dilution-internal standard technique.

Data were validated according to the National Functional Guidelines for Organic Superfund Methods Data Review and applicable USEPA Region 3 modifications. The validation report has been assigned the Superfund Data Validation Label S4VM (Stage_4_Validation_Manual).

The following validation narrative is an evaluation of laboratory reported data based on the electronic data package received by Region 3 on December 10, 2018.

The laboratory did not provide sufficient data to determine if branched chain isomers of PFOA were included in the reporting of this analyte in field samples. No data were qualified based on this finding.

Summary

Preservation outliers were identified that required the rejection of sample results. Less significant data quality outliers resulting in estimation of sample results were identified including, but not limited to, surrogate recovery as detailed below.

Major Problem

There was no documentation indicating samples in the sample delivery group (SDG) were preserved with Trizma. Samples in this SDG also reported pH values outside of the optimum range except for samples C0AM0, C0AN3, C0AN4 and C0AN6. Detected concentrations in samples outside the pH range are estimated and have been qualified "J-". Non-detects are unusable and have been qualified "R".

Minor Problem

The percent recovery for surrogate 13C2-PFHxA was outside of the lower control limit for sample C0AM0. This sample was non-detect for target analytes. Non-detects are estimated and have been qualified "UJ".

Notes

Accuracy and precision criteria were met by the laboratory in the initial and continuing calibration verification standard analyses associated with the samples in this Sample Data Group (SDG).

Analytes detected below Reporting Limits are estimated and have been qualified "J".

The method blanks and FRBs associated with the samples in this SDG were free from contamination. No data were qualified based on blank contamination.

The container label for sample C0AG1 did not match the information listed on the chain of custody (COC). The laboratory logged the sample according to the COC. No data were qualified based on this finding.

The percent recovery for surrogate 13C2-PFHxA was outside of the lower control limit for sample C0AM5. This sample was not qualified based on this outlier. This sample was qualified as described in "Major Problem".

Percent recoveries for target analytes in the Laboratory Control Sample (LCS) analysis were within control limits. No field sample data were qualified based on LCS accuracy.

Percent recoveries and Relative Percent Differences (RPDs) for target analytes in LCS/LCSD analyses were within control limits. No field sample data were qualified based on these findings.

Percent recoveries and Relative Percent Differences (RPDs) for target analytes in the Matrix Spike/Matrix Spike Duplicate (MS/MSD) analyses of samples C0AG1 and C0AH3 were within control limits. No data were qualified based on MS/MSD precision or accuracy.

Results reported for field duplicate sample C0AG4 /C0AL0 were comparable. No data were qualified based on field duplicate precision.

The samples in this SDG were found to be free of residual chlorine at the time of sample preparation by the laboratory. No data were qualified based on this finding.

Manual integrations were performed and identified by the laboratory. A subset of these was evaluated by the reviewer and found to be accurate and consistent. No action was taken by the reviewer based on manual integrations.

Glossary of Organic Data Qualifier Codes

Validation Qualifiers	In order of descending precedence. Only one of these qualifiers may apply to any result.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the sample.
UJ	The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit
J	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+	The result is an estimated quantity, but the result may be biased high.
J-	The result is an estimated quantity, but the result may be biased low.

Additional Qualifiers	Additional qualifiers may be combined with other qualifiers.
N	The analyte has been "tentatively identified" or "presumptively" as present.
B	The result is presumed a blank contaminant. This qualifier is used for drinking water samples only.
C	The target Pesticide or Aroclor analyte identification has been confirmed by Gas Chromatography/Mass Spectrometry (GC/MS). This qualifier may be added to other qualifiers.
X	The target Pesticide or Aroclor analyte identification was not confirmed when GC/MS analysis was performed. This qualifier may be added to other qualifiers.

Client: Weston Solutions, Inc.

Job Number: 320-45009-1

Client Sample ID: **C0AG1**

Lab Sample ID: 320-45009-1
Client Matrix: Water

Date Sampled: 11/06/2018 1427
Date Received: 11/07/2018 1005

537 DW Perfluorinated Alkyl Acids (LC/MS)

Analysis Method:	537 DW	Analysis Batch:	320-262047	Instrument ID:	A8_N
Prep Method:	537 DW	Prep Batch:	320-260281	Lab File ID:	2018.11.29_537B_036
Dilution:	1.0			Initial Weight/Volume:	247.7 mL
Analysis Date:	11/29/2018 2005			Final Weight/Volume:	10.00 mL
Prep Date:	11/20/2018 0737			Injection Volume:	10 uL

Analyte	Result (ng/L)	Qualifier	MDL	RL
Perfluorooctanesulfonic acid	21		0.96	2.0
Perfluorooctanoic acid	43		2.7	6.1
Perfluorononanoic acid	39		0.47	2.0
Perfluorohexanesulfonic acid	2.0		0.65	2.0
Perfluoroheptanoic acid	28		1.3	3.0
Perfluorobutanesulfonic acid	1.3	J	0.81	2.0

Surrogate	%Rec	Qualifier	Acceptance Limits
13C2 PFHxA	91		70 - 130
13C2 PFDA	99		70 - 130

DV
1/30/19

Client: Weston Solutions, Inc.

Job Number: 320-45009-1

Client Sample ID: **C0AG4**

Lab Sample ID: 320-45009-2FD
Client Matrix: Water

Date Sampled: 11/06/2018 1423
Date Received: 11/07/2018 1005

537 DW Perfluorinated Alkyl Acids (LC/MS)

Analysis Method:	537 DW	Analysis Batch:	320-262047	Instrument ID:	A8_N
Prep Method:	537 DW	Prep Batch:	320-260281	Lab File ID:	2018.11.29_537B_039
Dilution:	1.0			Initial Weight/Volume:	258.5 mL
Analysis Date:	11/29/2018 2027			Final Weight/Volume:	10.00 mL
Prep Date:	11/20/2018 0737			Injection Volume:	10 uL

Analyte	Result (ng/L)	Qualifier	MDL	RL
Perfluorooctanesulfonic acid	46	J-	0.92	1.9
Perfluorooctanoic acid	14		2.6	5.8
Perfluorononanoic acid	13		0.45	1.9
Perfluorohexanesulfonic acid	17		0.62	1.9
Perfluoroheptanoic acid	5.5		1.3	2.9
Perfluorobutanesulfonic acid	6.0		0.77	1.9

Surrogate	%Rec	Qualifier	Acceptance Limits
13C2 PFHxA	84		70 - 130
13C2 PFDA	102		70 - 130

DV
11/30/19

Client: Weston Solutions, Inc.

Job Number: 320-45009-1

Client Sample ID: **C0AH1**

Lab Sample ID: 320-45009-3
Client Matrix: Water

Date Sampled: 11/06/2018 0805
Date Received: 11/07/2018 1005

537 DW Perfluorinated Alkyl Acids (LC/MS)

Analysis Method:	537 DW	Analysis Batch:	320-262047	Instrument ID:	A8_N
Prep Method:	537 DW	Prep Batch:	320-260281	Lab File ID:	2018.11.29_537B_040
Dilution:	1.0			Initial Weight/Volume:	252.3 mL
Analysis Date:	11/29/2018 2035			Final Weight/Volume:	10.00 mL
Prep Date:	11/20/2018 0737			Injection Volume:	10 uL

Analyte	Result (ng/L)	Qualifier	MDL	RL
Perfluorooctanesulfonic acid	24	J-	0.94	2.0
Perfluorooctanoic acid	ND	R	2.7	5.9
Perfluorononanoic acid	ND	R	0.47	2.0
Perfluorohexanesulfonic acid	0.79	J	0.63	2.0
Perfluoroheptanoic acid	ND	R	1.3	3.0
Perfluorobutanesulfonic acid	2.4	J-	0.79	2.0

Surrogate	%Rec	Qualifier	Acceptance Limits
13C2 PFHxA	93		70 - 130
13C2 PFDA	103		70 - 130

DV 1/30/19

Client: Weston Solutions, Inc.

Job Number: 320-45009-1

Client Sample ID: **C0AH2**

Lab Sample ID: 320-45009-4
Client Matrix: Water

Date Sampled: 11/06/2018 0815
Date Received: 11/07/2018 1005

537 DW Perfluorinated Alkyl Acids (LC/MS)

Analysis Method:	537 DW	Analysis Batch:	320-262047	Instrument ID:	A8_N
Prep Method:	537 DW	Prep Batch:	320-260281	Lab File ID:	2018.11.29_537B_041
Dilution:	1.0			Initial Weight/Volume:	251.2 mL
Analysis Date:	11/29/2018 2042			Final Weight/Volume:	10.00 mL
Prep Date:	11/20/2018 0737			Injection Volume:	10 uL

Analyte	Result (ng/L)	Qualifier	MDL	RL
Perfluorooctanesulfonic acid	3.5	J-	0.95	2.0
Perfluorooctanoic acid	3.6	J	2.7	6.0
Perfluorononanoic acid	0.57	J	0.47	2.0
Perfluorohexanesulfonic acid	ND	R	0.64	2.0
Perfluoroheptanoic acid	1.3	J	1.3	3.0
Perfluorobutanesulfonic acid	ND	R	0.80	2.0

Surrogate	%Rec	Qualifier	Acceptance Limits
13C2 PFHxA	91		70 - 130
13C2 PFDA	102		70 - 130

DV
1/30/19

Client: Weston Solutions, Inc.

Job Number: 320-45009-1

Client Sample ID: **C0AH3**

Lab Sample ID: 320-45009-5
Client Matrix: Water

Date Sampled: 11/06/2018 0952
Date Received: 11/07/2018 1005

537 DW Perfluorinated Alkyl Acids (LC/MS)

Analysis Method:	537 DW	Analysis Batch:	320-262047	Instrument ID:	A8_N
Prep Method:	537 DW	Prep Batch:	320-260281	Lab File ID:	2018.11.29_537B_042
Dilution:	1.0			Initial Weight/Volume:	253.5 mL
Analysis Date:	11/29/2018 2050			Final Weight/Volume:	10.00 mL
Prep Date:	11/20/2018 0737			Injection Volume:	10 uL

Analyte	Result (ng/L)	Qualifier	MDL	RL
Perfluorooctanesulfonic acid	23	J-	0.94	2.0
Perfluorooctanoic acid	15	↓	2.7	5.9
Perfluorononanoic acid	1.5	J	0.46	2.0
Perfluorohexanesulfonic acid	2.0	J-	0.63	2.0
Perfluoroheptanoic acid	5.3	↓	1.3	3.0
Perfluorobutanesulfonic acid	5.5	↓	0.79	2.0

Surrogate	%Rec	Qualifier	Acceptance Limits
13C2 PFHxA	95		70 - 130
13C2 PFDA	104		70 - 130

DV
1/30/19

Client: Weston Solutions, Inc.

Job Number: 320-45009-1

Client Sample ID: **C0AH4**

Lab Sample ID: 320-45009-6
Client Matrix: Water

Date Sampled: 11/06/2018 0942
Date Received: 11/07/2018 1005

537 DW Perfluorinated Alkyl Acids (LC/MS)

Analysis Method:	537 DW	Analysis Batch:	320-262049	Instrument ID:	A8_N
Prep Method:	537 DW	Prep Batch:	320-260281	Lab File ID:	2018.11.29_537B_047
Dilution:	1.0			Initial Weight/Volume:	253.6 mL
Analysis Date:	11/29/2018 2127			Final Weight/Volume:	10.00 mL
Prep Date:	11/20/2018 0737			Injection Volume:	10 uL

Analyte	Result (ng/L)	Qualifier	MDL	RL
Perfluorooctanesulfonic acid	120	J-	0.94	2.0
Perfluorooctanoic acid	8.2	J	2.7	5.9
Perfluorononanoic acid	0.54	J	0.46	2.0
Perfluorohexanesulfonic acid	5.3	J-	0.63	2.0
Perfluoroheptanoic acid	3.4	J	1.3	3.0
Perfluorobutanesulfonic acid	42	J	0.79	2.0

Surrogate	%Rec	Qualifier	Acceptance Limits
13C2 PFHxA	89		70 - 130
13C2 PFDA	113		70 - 130

DV
1/30/19

Client: Weston Solutions, Inc.

Job Number: 320-45009-1

Client Sample ID: **C0AH5**

Lab Sample ID: 320-45009-7
Client Matrix: Water

Date Sampled: 11/06/2018 1210
Date Received: 11/07/2018 1005

537 DW Perfluorinated Alkyl Acids (LC/MS)

Analysis Method:	537 DW	Analysis Batch:	320-262049	Instrument ID:	A8_N
Prep Method:	537 DW	Prep Batch:	320-260281	Lab File ID:	2018.11.29_537B_048
Dilution:	1.0			Initial Weight/Volume:	253.1 mL
Analysis Date:	11/29/2018 2134			Final Weight/Volume:	10.00 mL
Prep Date:	11/20/2018 0737			Injection Volume:	10 uL

Analyte	Result (ng/L)	Qualifier	MDL	RL
Perfluorooctanesulfonic acid	2.6	J R	0.94	2.0
Perfluorooctanoic acid	ND	R	2.7	5.9
Perfluorononanoic acid	0.47	J	0.46	2.0
Perfluorohexanesulfonic acid	ND	R	0.63	2.0
Perfluoroheptanoic acid	ND	R	1.3	3.0
Perfluorobutanesulfonic acid	1.0	J	0.79	2.0

Surrogate	%Rec	Qualifier	Acceptance Limits
13C2 PFHxA	87		70 - 130
13C2 PFDA	105		70 - 130

DV
1/30/19

Client: Weston Solutions, Inc.

Job Number: 320-45009-1

Client Sample ID: **C0AH7**

Lab Sample ID: 320-45009-8
Client Matrix: Water

Date Sampled: 11/06/2018 1213
Date Received: 11/07/2018 1005

537 DW Perfluorinated Alkyl Acids (LC/MS)

Analysis Method:	537 DW	Analysis Batch:	320-262049	Instrument ID:	A8_N
Prep Method:	537 DW	Prep Batch:	320-260281	Lab File ID:	2018.11.29_537B_049
Dilution:	1.0			Initial Weight/Volume:	253.1 mL
Analysis Date:	11/29/2018 2142			Final Weight/Volume:	10.00 mL
Prep Date:	11/20/2018 0737			Injection Volume:	10 uL

Analyte	Result (ng/L)	Qualifier	MDL	RL
Perfluorooctanesulfonic acid	61	J-	0.94	2.0
Perfluorooctanoic acid	54		2.7	5.9
Perfluorononanoic acid	8.7		0.46	2.0
Perfluorohexanesulfonic acid	2.4		0.63	2.0
Perfluoroheptanoic acid	18		1.3	3.0
Perfluorobutanesulfonic acid	33		0.79	2.0

Surrogate	%Rec	Qualifier	Acceptance Limits
13C2 PFHxA	86		70 - 130
13C2 PFDA	106		70 - 130

DV
1/30/19

Client: Weston Solutions, Inc.

Job Number: 320-45009-1

Client Sample ID: **C0AJ2**

Lab Sample ID: 320-45009-9TB
Client Matrix: Water

Date Sampled: 11/06/2018 1340
Date Received: 11/07/2018 1005

537 DW Perfluorinated Alkyl Acids (LC/MS)

Analysis Method:	537 DW	Analysis Batch:	320-262049	Instrument ID:	A8_N
Prep Method:	537 DW	Prep Batch:	320-260281	Lab File ID:	2018.11.29_537B_050
Dilution:	1.0			Initial Weight/Volume:	258.4 mL
Analysis Date:	11/29/2018 2149			Final Weight/Volume:	10.00 mL
Prep Date:	11/20/2018 0737			Injection Volume:	10 uL

Analyte	Result (ng/L)	Qualifier	MDL	RL
Perfluorooctanesulfonic acid	2.7	J	0.92	1.9
Perfluorooctanoic acid	2.7	J	2.6	5.8
Perfluorononanoic acid	ND	R	0.45	1.9
Perfluorohexanesulfonic acid	1.4	J	0.62	1.9
Perfluoroheptanoic acid	ND	R	1.3	2.9
Perfluorobutanesulfonic acid	1.6	J	0.77	1.9

Surrogate	%Rec	Qualifier	Acceptance Limits
13C2 PFHxA	85		70 - 130
13C2 PFDA	99		70 - 130

DV
1/30/19

Client: Weston Solutions, Inc.

Job Number: 320-45009-1

Client Sample ID: **C0AL0**

Lab Sample ID: 320-45009-10
Client Matrix: Water

Date Sampled: 11/06/2018 1422
Date Received: 11/07/2018 1005

537 DW Perfluorinated Alkyl Acids (LC/MS)

Analysis Method:	537 DW	Analysis Batch:	320-262049	Instrument ID:	A8_N
Prep Method:	537 DW	Prep Batch:	320-260281	Lab File ID:	2018.11.29_537B_051
Dilution:	1.0			Initial Weight/Volume:	258.5 mL
Analysis Date:	11/29/2018 2157			Final Weight/Volume:	10.00 mL
Prep Date:	11/20/2018 0737			Injection Volume:	10 uL

Analyte	Result (ng/L)	Qualifier	MDL	RL
Perfluorooctanesulfonic acid	45	J-	0.92	1.9
Perfluorooctanoic acid	13		2.6	5.8
Perfluorononanoic acid	13		0.45	1.9
Perfluorohexanesulfonic acid	18		0.62	1.9
Perfluoroheptanoic acid	5.5		1.3	2.9
Perfluorobutanesulfonic acid	5.8		0.77	1.9

Surrogate	%Rec	Qualifier	Acceptance Limits
13C2 PFHxA	88		70 - 130
13C2 PFDA	107		70 - 130

DV
11/30/19

Client: Weston Solutions, Inc.

Job Number: 320-45009-1

Client Sample ID: **C0AM0**

Lab Sample ID: 320-45009-11FB
Client Matrix: Water

Date Sampled: 11/05/2018 1230
Date Received: 11/07/2018 1005

537 DW Perfluorinated Alkyl Acids (LC/MS)

Analysis Method:	537 DW	Analysis Batch:	320-262062	Instrument ID:	A8_N
Prep Method:	537 DW	Prep Batch:	320-260239	Lab File ID:	2018.11.29_537C_021
Dilution:	1.0			Initial Weight/Volume:	288.2 mL
Analysis Date:	11/30/2018 0310			Final Weight/Volume:	10.00 mL
Prep Date:	11/19/2018 1712			Injection Volume:	14 uL

Analyte	Result (ng/L)	Qualifier	MDL	RL
Perfluorooctanesulfonic acid	ND	UJ	0.82	1.7
Perfluorooctanoic acid	ND		2.3	5.2
Perfluorononanoic acid	ND		0.41	1.7
Perfluorohexanesulfonic acid	ND		0.56	1.7
Perfluoroheptanoic acid	ND		1.1	2.6
Perfluorobutanesulfonic acid	ND		0.69	1.7

Surrogate	%Rec	Qualifier	Acceptance Limits
13C2 PFHxA	12	X	70 - 130
13C2 PFDA	100		70 - 130

DV
2/28/19

Client: Weston Solutions, Inc.

Job Number: 320-45009-1

Client Sample ID: **C0AM5**

Lab Sample ID: 320-45009-12FB
Client Matrix: Water

Date Sampled: 11/06/2018 0800
Date Received: 11/07/2018 1005

537 DW Perfluorinated Alkyl Acids (LC/MS)

Analysis Method:	537 DW	Analysis Batch:	320-262049	Instrument ID:	A8_N
Prep Method:	537 DW	Prep Batch:	320-260281	Lab File ID:	2018.11.29_537B_052
Dilution:	1.0			Initial Weight/Volume:	259.6 mL
Analysis Date:	11/29/2018 2204			Final Weight/Volume:	10.00 mL
Prep Date:	11/20/2018 0737			Injection Volume:	10 uL

Analyte	Result (ng/L)	Qualifier	MDL	RL
Perfluorooctanesulfonic acid	ND	R	0.91	1.9
Perfluorooctanoic acid	ND		2.6	5.8
Perfluorononanoic acid	ND		0.45	1.9
Perfluorohexanesulfonic acid	ND		0.62	1.9
Perfluoroheptanoic acid	ND		1.3	2.9
Perfluorobutanesulfonic acid	ND		0.77	1.9

Surrogate	%Rec	Qualifier	Acceptance Limits
13C2 PFHxA	7	X	70 - 130
13C2 PFDA	111		70 - 130

DV
1/30/19

Client: Weston Solutions, Inc.

Job Number: 320-45009-1

Client Sample ID: **C0AN3**

Lab Sample ID: 320-45009-13
Client Matrix: Water

Date Sampled: 11/05/2018 1207
Date Received: 11/07/2018 1005

537 DW Perfluorinated Alkyl Acids (LC/MS)

Analysis Method:	537 DW	Analysis Batch:	320-262062	Instrument ID:	A8_N
Prep Method:	537 DW	Prep Batch:	320-260239	Lab File ID:	2018.11.29_537C_022
Dilution:	1.0			Initial Weight/Volume:	295.6 mL
Analysis Date:	11/30/2018 0318			Final Weight/Volume:	10.00 mL
Prep Date:	11/19/2018 1712			Injection Volume:	14 uL

Analyte	Result (ng/L)	Qualifier	MDL	RL
Perfluorooctanesulfonic acid	160		0.80	1.7
Perfluorooctanoic acid	14		2.3	5.1
Perfluorononanoic acid	36		0.40	1.7
Perfluorohexanesulfonic acid	25		0.54	1.7
Perfluoroheptanoic acid	4.7		1.1	2.5
Perfluorobutanesulfonic acid	6.3		0.68	1.7

Surrogate	%Rec	Qualifier	Acceptance Limits
13C2 PFHxA	87		70 - 130
13C2 PFDA	90		70 - 130

Client: Weston Solutions, Inc. Job Number: 320-45009-1

Client Sample ID: **C0AN4**

Lab Sample ID: 320-45009-14 Date Sampled: 11/05/2018 1155
Client Matrix: Water Date Received: 11/07/2018 1005

537 DW Perfluorinated Alkyl Acids (LC/MS)

Analysis Method:	537 DW	Analysis Batch:	320-262062	Instrument ID:	A8_N
Prep Method:	537 DW	Prep Batch:	320-260239	Lab File ID:	2018.11.29_537C_023
Dilution:	1.0			Initial Weight/Volume:	250.9 mL
Analysis Date:	11/30/2018 0325			Final Weight/Volume:	10.00 mL
Prep Date:	11/19/2018 1712			Injection Volume:	14 uL

Analyte	Result (ng/L)	Qualifier	MDL	RL
Perfluorooctanesulfonic acid	27		0.95	2.0
Perfluorooctanoic acid	24		2.7	6.0
Perfluorononanoic acid	20		0.47	2.0
Perfluorohexanesulfonic acid	3.8		0.64	2.0
Perfluoroheptanoic acid	7.7		1.3	3.0
Perfluorobutanesulfonic acid	3.0		0.80	2.0

Surrogate	%Rec	Qualifier	Acceptance Limits
13C2 PFHxA	85		70 - 130
13C2 PFDA	91		70 - 130

Client: Weston Solutions, Inc.

Job Number: 320-45009-1

Client Sample ID: **C0AN6**

Lab Sample ID: 320-45009-15
Client Matrix: Water

Date Sampled: 11/05/2018 1145
Date Received: 11/07/2018 1005

537 DW Perfluorinated Alkyl Acids (LC/MS)

Analysis Method:	537 DW	Analysis Batch:	320-262062	Instrument ID:	A8_N
Prep Method:	537 DW	Prep Batch:	320-260239	Lab File ID:	2018.11.29_537C_024
Dilution:	1.0			Initial Weight/Volume:	285.5 mL
Analysis Date:	11/30/2018 0333			Final Weight/Volume:	10.00 mL
Prep Date:	11/19/2018 1712			Injection Volume:	14 uL

Analyte	Result (ng/L)	Qualifier	MDL	RL
Perfluorooctanesulfonic acid	43		0.83	1.8
Perfluorooctanoic acid	27		2.4	5.3
Perfluorononanoic acid	14		0.41	1.8
Perfluorohexanesulfonic acid	12		0.56	1.8
Perfluoroheptanoic acid	11		1.1	2.6
Perfluorobutanesulfonic acid	13		0.70	1.8

Surrogate	%Rec	Qualifier	Acceptance Limits
13C2 PFHxA	93		70 - 130
13C2 PFDA	98		70 - 130

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
Environmental Sciences Center
701 Mapes Road
Fort Meade, Maryland 20755-5350

DATE: 5/2/2019

SUBJECT: Region III Data QA Review

FROM: Brandon McDonald
Region III ESAT RPO (3EA22)

TO: CONNOR O'LOUGHLIN
Hazardous Site Cleanup Division (HSCD)

Attached is the data validation report for the BLADES GROUNDWATER site for DAS# R35470; SDG# C0AG5 completed by the Region III Environmental Services Assistance Team (ESAT) contractor, ICF International, under the direction of Region III EAID.

If you have any questions regarding this review, please call Brandon McDonald at (410) 305-2607 or you can call Eric Graybill at (410)-305-2665.

Attachment

cc: Ex. 4 CBI (WESTON SOLUTIONS)
Ex. 4 CBI (WESTON SOLUTIONS)

TO: #0002 TDF: #1218055

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ESAT Region 3
US Environmental Protection Agency Environmental Science Center
701 Mapes Road Ft. Meade, MD 20755-5350
Phone 410-305-3012

Date: April 22, 2019

To: Brandon McDonald
ESAT Region 3 Project Officer

From: Ex. 4 CBI
Validator

Ex. 4 CBI
Reviewer

Subject: Organic Data Validation (S4VM)
Blades Groundwater
R35470 C0AG5

Overview

This data package consisted of one (1) Field Reagent Blank (FRB) and thirteen (13) groundwater samples analyzed for perfluorinated alkyl acid compounds by Liquid Chromatography/Mass Spectrometry (LC/MS). This sample set included a field duplicate sample.

Analyses were performed by Test America Sacramento (TAMC). The samples were submitted to the laboratory directly by the sampling contractor. The laboratory indicated analyses were performed according to EPA Method 537 utilizing a quantitative isotope dilution-internal standard technique.

Data were validated according to the National Functional Guidelines for Organic Superfund Methods Data Review and applicable USEPA Region 3 modifications. The validation report has been assigned the Superfund Data Validation Label S4VM (Stage_4_Validation_Manual).

The following validation narrative is an evaluation of laboratory reported data based on the electronic data package received by Region 3 on December 13, 2018.

The laboratory did not provide sufficient data to determine if branched chain isomers of PFOA were included in the reporting of this analyte in field samples. No data were qualified based on this finding.

Summary

Sample preservation, surrogate recovery and lack of FRBs outliers were identified that required the rejection of sample results.

Major Problem

There was no documentation indicating samples in the sample delivery group (SDG) were preserved with Trizma. The samples listed below reported pH values outside of the optimum range. Detected concentrations in these samples are estimated and have been qualified "J-". Non-detects are unusable and have been qualified "R".

Samples
C0AG7, C0AG8, C0AH0, C0AH8, C0AH9, C0AL2, C0AM6, C0AN9

The percent recovery for surrogate 13C2-PFHxA was extremely low (<10%) for sample C0AM6. This sample was non-detect for target analytes. Non-detects are unusable and have been qualified "R".

Region 3 policy requires an FRB for each sample to evaluate contamination during field operations, as these target analytes can be ubiquitous. This SDG only contains one (1) FRB. Detected concentrations for target analytes are unusable and have been qualified "R".

Notes

Target analytes detected below Reporting Limits (RLs) are estimated and have been qualified "J".

The laboratory did not provide a narrative for this data package. No data were qualified based on this finding.

Accuracy and precision criteria were met by the laboratory in the initial and continuing calibration verification standard analyses associated with the samples in this SDG.

The method blank and FRB associated with the samples in this SDG were free from contamination. No data were qualified based on these findings.

Percent recoveries and Relative Percent Differences (RPDs) for target analytes in the Low Level Control Sample/Low Level Control Sample Duplicate (LLCS/LLCSD) analyses were within control limits. No data were qualified based on LLCS/LLCSD precision or accuracy.

Concentrations for the following target analytes exceeded the calibration range in the initial analysis for the samples listed below. These samples were reanalyzed at the dilutions listed in order to quantitate these analytes within the calibration range. Results for these analytes were reported from the dilution. There is no indication that these exceedance issues impacted subsequent sample analyses.

Samples	Dilution factors	Analytes
C0AG7	10x	Perfluorooctanoic acid, Perfluorononanoic acid Perfluoroheptanoic acid
C0AH8	2x	Perfluorooctanesulfonic acid

Results reported for field duplicate pair C0AL2/C0AH0 were comparable. No data were qualified based on field duplicate precision.

The samples in this SDG were found to be free of residual chlorine at the time of sample preparation by the laboratory. No data were qualified based on this finding.

Manual integrations were performed and identified by the laboratory. A subset of these was evaluated by the reviewer and found to be accurate and consistent. No action was taken by the reviewer based on manual integrations.

Glossary of Organic Data Qualifier Codes

Validation Qualifiers	In order of descending precedence. Only one of these qualifiers may apply to any result.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the sample.
UJ	The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit
J	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+	The result is an estimated quantity, but the result may be biased high.
J-	The result is an estimated quantity, but the result may be biased low.

Additional Qualifiers	Additional qualifiers may be combined with other qualifiers.
N	The analyte has been "tentatively identified" or "presumptively" as present.
B	The result is presumed a blank contaminant. This qualifier is used for drinking water samples only.
C	The target Pesticide or Aroclor analyte identification has been confirmed by Gas Chromatography/Mass Spectrometry (GC/MS). This qualifier may be added to other qualifiers.
X	The target Pesticide or Aroclor analyte identification was not confirmed when GC/MS analysis was performed. This qualifier may be added to other qualifiers.

Client: Weston Solutions, Inc.

Job Number: 320-45143-1

Client Sample ID: **C0AG5**

Lab Sample ID: 320-45143-1
Client Matrix: Water

Date Sampled: 11/07/2018 0917
Date Received: 11/08/2018 0930

537 DW Perfluorinated Alkyl Acids (LC/MS)

Analysis Method:	537 DW	Analysis Batch:	320-262429	Instrument ID:	A8_N
Prep Method:	537 DW	Prep Batch:	320-260576	Lab File ID:	2018.11.29_537DFD_(
Dilution:	1.0			Initial Weight/Volume:	262.9 mL
Analysis Date:	11/30/2018 2121			Final Weight/Volume:	10.00 mL
Prep Date:	11/21/2018 0819			Injection Volume:	14 uL

Analyte	Result (ng/L)	Qualifier	MDL	RL
Perfluorooctanesulfonic acid	22	Q	0.90	1.9
Perfluorooctanoic acid	17		2.6	5.7
Perfluorononanoic acid	5.7		0.45	1.9
Perfluorohexanesulfonic acid	2.4		0.61	1.9
Perfluoroheptanoic acid	11		1.2	2.9
Perfluorobutanesulfonic acid	1.9		0.76	1.9

Surrogate	%Rec	Qualifier	Acceptance Limits
13C2 PFHxA	99		70 - 130
13C2 PFDA	107		70 - 130

DV
4/22/19

Client: Weston Solutions, Inc.

Job Number: 320-45143-1

Client Sample ID: **C0AG6**

Lab Sample ID: 320-45143-2
Client Matrix: Water

Date Sampled: 11/07/2018 0923
Date Received: 11/08/2018 0930

537 DW Perfluorinated Alkyl Acids (LC/MS)

Analysis Method:	537 DW	Analysis Batch:	320-262429	Instrument ID:	A8_N
Prep Method:	537 DW	Prep Batch:	320-260576	Lab File ID:	2018.11.29_537DFD_
Dilution:	1.0			Initial Weight/Volume:	257.8 mL
Analysis Date:	11/30/2018 2128			Final Weight/Volume:	10.00 mL
Prep Date:	11/21/2018 0819			Injection Volume:	14 uL

Analyte	Result (ng/L)	Qualifier	MDL	RL
Perfluorooctanesulfonic acid	24	R	0.92	1.9
Perfluorooctanoic acid	21		2.6	5.8
Perfluorononanoic acid	6.4		0.46	1.9
Perfluorohexanesulfonic acid	7.2		0.62	1.9
Perfluoroheptanoic acid	10		1.3	2.9
Perfluorobutanesulfonic acid	8.3		0.78	1.9

Surrogate	%Rec	Qualifier	Acceptance Limits
13C2 PFHxA	90		70 - 130
13C2 PFDA	103		70 - 130

DU
4/22/19

Client: Weston Solutions, Inc.

Job Number: 320-45143-1

Client Sample ID: **C0AG7**

Lab Sample ID: 320-45143-3
Client Matrix: Water

Date Sampled: 11/07/2018 1248
Date Received: 11/08/2018 0930

537 DW Perfluorinated Alkyl Acids (LC/MS)

Analysis Method:	537 DW	Analysis Batch:	320-262429	Instrument ID:	A8_N
Prep Method:	537 DW	Prep Batch:	320-260576	Lab File ID:	2018.11.29_537DFD_(
Dilution:	1.0			Initial Weight/Volume:	259.9 mL
Analysis Date:	11/30/2018 2136			Final Weight/Volume:	10.00 mL
Prep Date:	11/21/2018 0819			Injection Volume:	14 uL

Analyte	Result (ng/L)	Qualifier	MDL	RL
Perfluorooctanesulfonic acid	120	R	0.91	1.9
Perfluorohexanesulfonic acid	4.2		0.62	1.9
Perfluorobutanesulfonic acid	3.2		0.77	1.9

Surrogate	%Rec	Qualifier	Acceptance Limits
13C2 PFHxA	105		70 - 130
13C2 PFDA	108		70 - 130

DV
4/22/19

Client: Weston Solutions, Inc.

Job Number: 320-45143-1

Client Sample ID: **C0AG7**

Lab Sample ID: 320-45143-3
Client Matrix: Water

Date Sampled: 11/07/2018 1248
Date Received: 11/08/2018 0930

537 DW Perfluorinated Alkyl Acids (LC/MS)

Analysis Method:	537 DW	Analysis Batch:	320-262522	Instrument ID:	A8_N
Prep Method:	537 DW	Prep Batch:	320-260576	Lab File ID:	2018.12.02_537AAXX
Dilution:	10			Initial Weight/Volume:	259.9 mL
Analysis Date:	12/02/2018 1736	Run Type:	DL	Final Weight/Volume:	10.00 mL
Prep Date:	11/21/2018 0819			Injection Volume:	14 uL

Analyte	Result (ng/L)	Qualifier	MDL	RL
Perfluorooctanoic acid	1100	R	26	58
Perfluorononanoic acid	600		4.5	19
Perfluoroheptanoic acid	780		13	29

Surrogate	%Rec	Qualifier	Acceptance Limits
13C2 PFHxA	109		70 - 130
13C2 PFDA	111		70 - 130

DV
4/22/19

Client: Weston Solutions, Inc.

Job Number: 320-45143-1

Client Sample ID: **C0AG8**

Lab Sample ID: 320-45143-4
Client Matrix: Water

Date Sampled: 11/07/2018 1317
Date Received: 11/08/2018 0930

537 DW Perfluorinated Alkyl Acids (LC/MS)

Analysis Method:	537 DW	Analysis Batch:	320-262522	Instrument ID:	A8_N
Prep Method:	537 DW	Prep Batch:	320-260576	Lab File ID:	2018.12.02_537AAXX
Dilution:	1.0			Initial Weight/Volume:	264.5 mL
Analysis Date:	12/02/2018 1743			Final Weight/Volume:	10.00 mL
Prep Date:	11/21/2018 0819			Injection Volume:	14 uL

Analyte	Result (ng/L)	Qualifier	MDL	RL
Perfluorooctanesulfonic acid	54	R	0.90	1.9
Perfluorooctanoic acid	38		2.6	5.7
Perfluorononanoic acid	13		0.44	1.9
Perfluorohexanesulfonic acid	16		0.60	1.9
Perfluoroheptanoic acid	15		1.2	2.8
Perfluorobutanesulfonic acid	19		0.76	1.9

Surrogate	%Rec	Qualifier	Acceptance Limits
13C2 PFHxA	95		70 - 130
13C2 PFDA	102		70 - 130

DV
4/22/19

Client: Weston Solutions, Inc.

Job Number: 320-45143-1

Client Sample ID: **C0AG9**

Lab Sample ID: 320-45143-5
Client Matrix: Water

Date Sampled: 11/07/2018 1119
Date Received: 11/08/2018 0930

537 DW Perfluorinated Alkyl Acids (LC/MS)

Analysis Method:	537 DW	Analysis Batch:	320-262429	Instrument ID:	A8_N
Prep Method:	537 DW	Prep Batch:	320-260576	Lab File ID:	2018.11.29_537DFD_
Dilution:	1.0			Initial Weight/Volume:	258.7 mL
Analysis Date:	11/30/2018 2151			Final Weight/Volume:	10.00 mL
Prep Date:	11/21/2018 0819			Injection Volume:	14 uL

Analyte	Result (ng/L)	Qualifier	MDL	RL
Perfluorooctanesulfonic acid	15		0.92	1.9
Perfluorooctanoic acid	7.9		2.6	5.8
Perfluorononanoic acid	2.3		0.45	1.9
Perfluorohexanesulfonic acid	0.85		0.62	1.9
Perfluoroheptanoic acid	4.1		1.3	2.9
Perfluorobutanesulfonic acid	2.9		0.77	1.9

Surrogate	%Rec	Qualifier	Acceptance Limits
13C2 PFHxA	97		70 - 130
13C2 PFDA	108		70 - 130

DV
4/22/19

Client: Weston Solutions, Inc.

Job Number: 320-45143-1

Client Sample ID: **C0AH0**

Lab Sample ID: 320-45143-6
Client Matrix: Water

Date Sampled: 11/07/2018 1118
Date Received: 11/08/2018 0930

537 DW Perfluorinated Alkyl Acids (LC/MS)

Analysis Method:	537 DW	Analysis Batch:	320-262429	Instrument ID:	A8_N
Prep Method:	537 DW	Prep Batch:	320-260576	Lab File ID:	2018.11.29_537DFD_(
Dilution:	1.0			Initial Weight/Volume:	259.5 mL
Analysis Date:	11/30/2018 2158			Final Weight/Volume:	10.00 mL
Prep Date:	11/21/2018 0819			Injection Volume:	14 uL

Analyte	Result (ng/L)	Qualifier	MDL	RL
Perfluorooctanesulfonic acid	6.9	Q	0.92	1.9
Perfluorooctanoic acid	ND		2.6	5.8
Perfluorononanoic acid	ND		0.45	1.9
Perfluorohexanesulfonic acid	2.6		0.62	1.9
Perfluoroheptanoic acid	ND		1.3	2.9
Perfluorobutanesulfonic acid	3.2		0.77	1.9

Surrogate	%Rec	Qualifier	Acceptance Limits
13C2 PFHxA	98		70 - 130
13C2 PFDA	109		70 - 130

DW
4/22/19

Client: Weston Solutions, Inc.

Job Number: 320-45143-1

Client Sample ID: **C0AH6**

Lab Sample ID: 320-45143-7
Client Matrix: Water

Date Sampled: 11/07/2018 0845
Date Received: 11/08/2018 0930

537 DW Perfluorinated Alkyl Acids (LC/MS)

Analysis Method:	537 DW	Analysis Batch:	320-262429	Instrument ID:	A8_N
Prep Method:	537 DW	Prep Batch:	320-260576	Lab File ID:	2018.11.29_537DFD_I
Dilution:	1.0			Initial Weight/Volume:	253.2 mL
Analysis Date:	11/30/2018 2206			Final Weight/Volume:	10.00 mL
Prep Date:	11/21/2018 0819			Injection Volume:	14 uL

Analyte	Result (ng/L)	Qualifier	MDL	RL
Perfluorooctanesulfonic acid	7.0	R	0.94	2.0
Perfluorooctanoic acid	8.4	R	2.7	5.9
Perfluorononanoic acid	1.4	JR	0.46	2.0
Perfluorohexanesulfonic acid	ND		0.63	2.0
Perfluoroheptanoic acid	3.7	R	1.3	3.0
Perfluorobutanesulfonic acid	1.0	JR	0.79	2.0

Surrogate	%Rec	Qualifier	Acceptance Limits
13C2 PFHxA	100		70 - 130
13C2 PFDA	102		70 - 130

PV
1/22/19

Client: Weston Solutions, Inc.

Job Number: 320-45143-1

Client Sample ID: **C0AH8**

Lab Sample ID: 320-45143-8
Client Matrix: Water

Date Sampled: 11/07/2018 1430
Date Received: 11/08/2018 0930

537 DW Perfluorinated Alkyl Acids (LC/MS)

Analysis Method:	537 DW	Analysis Batch:	320-262431	Instrument ID:	A8_N
Prep Method:	537 DW	Prep Batch:	320-260576	Lab File ID:	2018.11.29_537DFD_
Dilution:	1.0			Initial Weight/Volume:	258 mL
Analysis Date:	11/30/2018 2228			Final Weight/Volume:	10.00 mL
Prep Date:	11/21/2018 0819			Injection Volume:	14 uL

Analyte	Result (ng/L)	Qualifier	MDL	RL
Perfluorooctanoic acid	5.2	U R	2.6	5.8
Perfluorononanoic acid	1.3	J	0.46	1.9
Perfluorohexanesulfonic acid	1.5	J	0.62	1.9
Perfluoroheptanoic acid	13		1.3	2.9
Perfluorobutanesulfonic acid	21		0.78	1.9

Surrogate	%Rec	Qualifier	Acceptance Limits
13C2 PFHxA	94		70 - 130
13C2 PFDA	103		70 - 130

DV 4/22/19

Client: Weston Solutions, Inc.

Job Number: 320-45143-1

Client Sample ID: **C0AH8**

Lab Sample ID: 320-45143-8
Client Matrix: Water

Date Sampled: 11/07/2018 1430
Date Received: 11/08/2018 0930

537 DW Perfluorinated Alkyl Acids (LC/MS)

Analysis Method:	537 DW	Analysis Batch:	320-263355	Instrument ID:	A8_N
Prep Method:	537 DW	Prep Batch:	320-260576	Lab File ID:	2018.12.05_537A_066
Dilution:	2.0			Initial Weight/Volume:	258 mL
Analysis Date:	12/05/2018 1501	Run Type:	DL	Final Weight/Volume:	10.00 mL
Prep Date:	11/21/2018 0819			Injection Volume:	14 uL

Analyte	Result (ng/L)	Qualifier	MDL	RL
Perfluorooctanesulfonic acid	390	R	1.8	3.9

Surrogate	%Rec	Qualifier	Acceptance Limits
13C2 PFHxA	100		70 - 130
13C2 PFDA	112		70 - 130

DU
4/22/19

Client: Weston Solutions, Inc.

Job Number: 320-45143-1

Client Sample ID: **C0AH9**

Lab Sample ID: 320-45143-9
Client Matrix: Water

Date Sampled: 11/07/2018 1432
Date Received: 11/08/2018 0930

537 DW Perfluorinated Alkyl Acids (LC/MS)

Analysis Method:	537 DW	Analysis Batch:	320-262522	Instrument ID:	A8_N
Prep Method:	537 DW	Prep Batch:	320-260576	Lab File ID:	2018.12.02_537AAXX
Dilution:	1.0			Initial Weight/Volume:	261.1 mL
Analysis Date:	12/02/2018 1758			Final Weight/Volume:	10.00 mL
Prep Date:	11/21/2018 0819			Injection Volume:	14 uL

Analyte	Result (ng/L)	Qualifier	MDL	RL
Perfluorooctanesulfonic acid	58		0.91	1.9
Perfluorooctanoic acid	8.1		2.6	5.7
Perfluorononanoic acid	1.6	J	0.45	1.9
Perfluorohexanesulfonic acid	7.1		0.61	1.9
Perfluoroheptanoic acid	3.3		1.2	2.9
Perfluorobutanesulfonic acid	8.7		0.77	1.9

Surrogate	%Rec	Qualifier	Acceptance Limits
13C2 PFHxA	78		70 - 130
13C2 PFDA	82		70 - 130

DW 4/22/19

Client: Weston Solutions, Inc.

Job Number: 320-45143-1

Client Sample ID: **C0AJ0**

Lab Sample ID: 320-45143-10
Client Matrix: Water

Date Sampled: 11/07/2018 1220
Date Received: 11/08/2018 0930

537 DW Perfluorinated Alkyl Acids (LC/MS)

Analysis Method:	537 DW	Analysis Batch:	320-262431	Instrument ID:	A8_N
Prep Method:	537 DW	Prep Batch:	320-260576	Lab File ID:	2018.11.29_537DFD_
Dilution:	1.0			Initial Weight/Volume:	259.9 mL
Analysis Date:	11/30/2018 2243			Final Weight/Volume:	10.00 mL
Prep Date:	11/21/2018 0819			Injection Volume:	14 uL

Analyte	Result (ng/L)	Qualifier	MDL	RL
Perfluorooctanesulfonic acid	10	R	0.91	1.9
Perfluorooctanoic acid	ND		2.6	5.8
Perfluorononanoic acid	ND		0.45	1.9
Perfluorohexanesulfonic acid	ND		0.62	1.9
Perfluoroheptanoic acid	ND		1.3	2.9
Perfluorobutanesulfonic acid	ND		0.77	1.9

Surrogate	%Rec	Qualifier	Acceptance Limits
13C2 PFHxA	99		70 - 130
13C2 PFDA	108		70 - 130

DV 4/22/19

Client: Weston Solutions, Inc.

Job Number: 320-45143-1

Client Sample ID: **C0AK7**

Lab Sample ID: 320-45143-11
Client Matrix: Water

Date Sampled: 11/07/2018 1025
Date Received: 11/08/2018 0930

537 DW Perfluorinated Alkyl Acids (LC/MS)

Analysis Method:	537 DW	Analysis Batch:	320-262431	Instrument ID:	A8_N
Prep Method:	537 DW	Prep Batch:	320-260576	Lab File ID:	2018.11.29_537DFD_(
Dilution:	1.0			Initial Weight/Volume:	255.5 mL
Analysis Date:	11/30/2018 2250			Final Weight/Volume:	10.00 mL
Prep Date:	11/21/2018 0819			Injection Volume:	14 uL

Analyte	Result (ng/L)	Qualifier	MDL	RL
Perfluorooctanesulfonic acid	3.9	R	0.93	2.0
Perfluorooctanoic acid	13		2.6	5.9
Perfluorononanoic acid	3.9		0.46	2.0
Perfluorohexanesulfonic acid	4.1		0.63	2.0
Perfluoroheptanoic acid	7.5		1.3	2.9
Perfluorobutanesulfonic acid	6.5		0.78	2.0

Surrogate	%Rec	Qualifier	Acceptance Limits
13C2 PFHxA	102		70 - 130
13C2 PFDA	107		70 - 130

DY 4/22/19

Client: Weston Solutions, Inc.

Job Number: 320-45143-1

Client Sample ID: **C0AL2**

Lab Sample ID: 320-45143-12FD
Client Matrix: Water

Date Sampled: 11/07/2018 1117
Date Received: 11/08/2018 0930

537 DW Perfluorinated Alkyl Acids (LC/MS)

Analysis Method:	537 DW	Analysis Batch:	320-262431	Instrument ID:	A8_N
Prep Method:	537 DW	Prep Batch:	320-260576	Lab File ID:	2018.11.29_537DFD_
Dilution:	1.0			Initial Weight/Volume:	261.1 mL
Analysis Date:	11/30/2018 2258			Final Weight/Volume:	10.00 mL
Prep Date:	11/21/2018 0819			Injection Volume:	14 uL

Analyte	Result (ng/L)	Qualifier	MDL	RL
Perfluorooctanesulfonic acid	6.6	R	0.91	1.9
Perfluorooctanoic acid	ND		2.6	5.7
Perfluorononanoic acid	ND		0.45	1.9
Perfluorohexanesulfonic acid	2.5		0.61	1.9
Perfluoroheptanoic acid	ND	R	1.2	2.9
Perfluorobutanesulfonic acid	3.1	R	0.77	1.9

Surrogate	%Rec	Qualifier	Acceptance Limits
13C2 PFHxA	100		70 - 130
13C2 PFDA	107		70 - 130

DV
4/22/19

Client: Weston Solutions, Inc.

Job Number: 320-45143-1

Client Sample ID: **C0AM6**

Lab Sample ID: 320-45143-13FB
Client Matrix: Water

Date Sampled: 11/07/2018 1500
Date Received: 11/08/2018 0930

537 DW Perfluorinated Alkyl Acids (LC/MS)

Analysis Method:	537 DW	Analysis Batch:	320-262431	Instrument ID:	A8_N
Prep Method:	537 DW	Prep Batch:	320-260576	Lab File ID:	2018.11.29_537DFD_
Dilution:	1.0			Initial Weight/Volume:	256.4 mL
Analysis Date:	11/30/2018 2305			Final Weight/Volume:	10.00 mL
Prep Date:	11/21/2018 0819			Injection Volume:	14 uL

Analyte	Result (ng/L)	Qualifier	MDL	RL
Perfluorooctanesulfonic acid	ND	R	0.93	2.0
Perfluorooctanoic acid	ND		2.6	5.9
Perfluorononanoic acid	ND		0.46	2.0
Perfluorohexanesulfonic acid	ND		0.62	2.0
Perfluoroheptanoic acid	ND		1.3	2.9
Perfluorobutanesulfonic acid	ND		0.78	2.0

Surrogate	%Rec	Qualifier	Acceptance Limits
13C2 PFHxA	9	X	70 - 130
13C2 PFDA	106		70 - 130

DV 4/22/19

Client: Weston Solutions, Inc.

Job Number: 320-45143-1

Client Sample ID: **C0AN9**

Lab Sample ID: 320-45143-14
Client Matrix: Water

Date Sampled: 11/07/2018 1415
Date Received: 11/08/2018 0930

537 DW Perfluorinated Alkyl Acids (LC/MS)

Analysis Method:	537 DW	Analysis Batch:	320-262431	Instrument ID:	A8_N
Prep Method:	537 DW	Prep Batch:	320-260576	Lab File ID:	2018.11.29_537DFD_(
Dilution:	1.0			Initial Weight/Volume:	253.9 mL
Analysis Date:	11/30/2018 2313			Final Weight/Volume:	10.00 mL
Prep Date:	11/21/2018 0819			Injection Volume:	14 uL

Analyte	Result (ng/L)	Qualifier	MDL	RL
Perfluorooctanesulfonic acid	25	R	0.94	2.0
Perfluorooctanoic acid	ND		2.7	5.9
Perfluorononanoic acid	ND		0.46	2.0
Perfluorohexanesulfonic acid	1.2	J	0.63	2.0
Perfluoroheptanoic acid	ND		1.3	3.0
Perfluorobutanesulfonic acid	5.0		0.79	2.0

Surrogate	%Rec	Qualifier	Acceptance Limits
13C2 PFHxA	88		70 - 130
13C2 PFDA	99		70 - 130

DV
4/22/19

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
Environmental Sciences Center
701 Mapes Road
Fort Meade, Maryland 20755-5350

DATE: 3/4/2019

SUBJECT: Region III Data QA Review

FROM: Brandon McDonald
Region III ESAT RPO(3EA22)

TO: CONNOR O'LOUGHLIN
Hazardous Site Cleanup Division (HSCD)

Attached is the data validation report for the BLADES GROUNDWATER site for DAS# R35470; SDG# MC0AG1 completed by the Region III Environmental Services Assistance Team(ESAT) contractor, ICF International, under the direction of Region III EAID.

If you have any questions regarding this review, please call Brandon McDonald at (410) 305-2607 or you can call Eric Graybill at (410)-305-2665.

Attachment

cc: Ex. 4 CBI (WESTON SOLUTIONS)
WESTON SOLUTIONS)

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US Environmental Protection Agency Environmental Science Center
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Phone 410-305-3012

Date: February 12, 2019

To: Brandon McDonald
ESAT Region 3 Project Officer

From: Ex. 4 CBI
Validator

Ex. 4 CBI
Reviewer

Subject: Inorganic Data Validation (S4VM)
Blades Groundwater
R35470 MC0AG1

Overview

This data package consisted of three (3) drinking water samples and ten (10) ground water samples, including a field duplicate pair, analyzed for hexavalent chromium.

Analyses were performed by ALS Environmental (ALS). The samples were submitted to the laboratory directly by the sampling contractor. The laboratory indicated analyses were performed based on EPA Method 218.7.

Data were validated according to the National Functional Guidelines for Inorganic Superfund Methods Data Review and applicable USEPA Region 3 modifications. The validation report has been assigned the Superfund Data Validation Level Stage_4_Validation_Manual (S4VM).

The following validation narrative is an evaluation of laboratory reported data based on the electronic data package received by Region 3 on November 30, 2018.

Summary

No significant data quality outliers or technical deficiencies were identified that would require rejection or estimation of sample results.

Notes

Concentrations detected below the Reporting Detection Limit (RDL) are estimated and have been qualified "J".

Accuracy and precision criteria were met by the laboratory in the initial and continuing calibration verification standard analyses associated with the samples in this SDG.

Laboratory blanks associated with the samples in this SDG were free from contamination.

Laboratory Control Sample analyses were within control limits.

Percent recoveries and Relative Percent Differences (RPDs) in Matrix Spike/Matrix Spike Duplicate (MS/MSD) analysis for samples MC0AG1 and MC0AH3 were within control limits.

The samples in this SDG were found to be free of residual chlorine at the time of sample preparation by the laboratory. Sample pH data provided by the laboratory support proper preservation for all samples. No data were qualified based on these findings.

Results reported for field duplicate pair MC0AG4/MC0AL0 were not comparable. No data were qualified based on field duplicate precision.

Glossary of Inorganic Data Qualifier Codes

Validation Qualifiers	In order of descending precedence. Only one of these qualifiers may apply to any result.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the sample.
UJ	The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit
B	The result is presumed a blank contaminant. This qualifier is used for drinking water samples only.
J	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+	The result is an estimated quantity, but the result may be biased high.
J-	The result is an estimated quantity, but the result may be biased low.

(ALS) Environmental

34 Dogwood Lane ■ Middletown, PA 17057 ■ Phone: 717-944-5541 ■ Fax: 717-944-1430 ■ www.alsglobal.com

NELAP Certifications: NJ PA010, NY 11759, PA 22-293 DoD ELAP: A2LA 0818.01
State Certifications: DE ID 11, MA PA0102, MD 128, VA 460157, WV 343

ANALYTICAL RESULTS

Workorder: 2348398 WSI023|CASE R35470 30250.016.0

Lab ID: **2348398001** Date Collected: 11/6/2018 14:24 Matrix: Ground Water

Sample ID: **MC0AG1** Date Received: 11/7/2018 09:00

Parameters	Results	Flag	Units	RDL	MDL	Method	Prepared By	Analyzed	By	Cntr
WET CHEMISTRY										
Hexavalent Chromium	0.030 U	U	ug/L	0.030	0.0061	EPA 218.7		11/17/18 05:28	MBW	A

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Project Coordinator

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ANALYTICAL RESULTS

Workorder: 2348398 WSI023|CASE R35470 30250.016.0

Lab ID: **2348398002** Date Collected: 11/6/2018 14:23 Matrix: Ground Water
Sample ID: **MC0AG4** Date Received: 11/7/2018 09:00

Parameters	Results	Flag	Units	RDL	MDL	Method	Prepared By	Analyzed	By	Chtr
WET CHEMISTRY										
Hexavalent Chromium	0.030 U	U	ug/L	0.030	0.0061	EPA 218.7		11/17/18 05:54	MBW	A

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ANALYTICAL RESULTS

Workorder: 2348398 WSI023|CASE R35470 30250.016.0

Lab ID: **2348398003** Date Collected: 11/6/2018 08:05 Matrix: Ground Water

Sample ID: **MC0AH1** Date Received: 11/7/2018 09:00

Parameters	Results	Flag	Units	RDL	MDL	Method	Prepared By	Analyzed	By	Cntr
WET CHEMISTRY										
Hexavalent Chromium	2.1		ug/L	0.030	0.0061	EPA 218.7		11/17/18 06:03	MBW	A

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ANALYTICAL RESULTS

Workorder: 2348398 WSI023|CASE R35470 30250.016.0

Lab ID: **2348398004** Date Collected: 11/6/2018 08:15 Matrix: Ground Water

Sample ID: **MC0AH2** Date Received: 11/7/2018 09:00

Parameters	Results	Flag	Units	RDL	MDL	Method	Prepared By	Analyzed	By	Cntr
WET CHEMISTRY										
Hexavalent Chromium	0.14		ug/L	0.030	0.0061	EPA 218.7		11/17/18 06:12	MBW	A

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ANALYTICAL RESULTS

Workorder: 2348398 WSI023|CASE R35470 30250.016.0

Lab ID: **2348398005** Date Collected: 11/6/2018 09:52 Matrix: Ground Water
Sample ID: **MC0AH3** Date Received: 11/7/2018 09:00

Parameters	Results	Flag	Units	RDL	MDL	Method	Prepared By	Analyzed	By	Cntr
WET CHEMISTRY										
Hexavalent Chromium	0.045		ug/L	0.030	0.0061	EPA 218.7		11/17/18 06:39	MBW	A

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ANALYTICAL RESULTS

Workorder: 2348398 WSI023|CASE R35470 30250.016.0

Lab ID: **2348398006** Date Collected: 11/6/2018 09:42 Matrix: Ground Water

Sample ID: **MC0AH4** Date Received: 11/7/2018 09:00

Parameters	Results	Flag	Units	RDL	MDL	Method	Prepared By	Analyzed	By	Cntr
WET CHEMISTRY										
Hexavalent Chromium	0.030 U	U	ug/L	0.030	0.0061	EPA 218.7		11/17/18 07:15	MBW	A

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ANALYTICAL RESULTS

Workorder: 2348398 WSI023|CASE R35470 30250.016.0

Lab ID: **2348398007** Date Collected: 11/6/2018 12:10 Matrix: Ground Water
Sample ID: **MC0AH5** Date Received: 11/7/2018 09:00

Parameters	Results	Flag	Units	RDL	MDL	Method	Prepared By	Analyzed	By	Cntr
WET CHEMISTRY										
Hexavalent Chromium	0.11		ug/L	0.030	0.0061	EPA 218.7		11/17/18 07:24	MBW	A

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ANALYTICAL RESULTS

Workorder: 2348398 WSI023|CASE R35470 30250.016.0

Lab ID: **2348398008** Date Collected: 11/6/2018 12:13 Matrix: Ground Water

Sample ID: **MC0AH7** Date Received: 11/7/2018 09:00

Parameters	Results	Flag	Units	RDL	MDL	Method	Prepared By	Analyzed	By	Cntr
WET CHEMISTRY										
Hexavalent Chromium	0.030 U	U	ug/L	0.030	0.0061	EPA 218.7		11/17/18 07:33	MBW	A

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ANALYTICAL RESULTS

Workorder: 2348398 WSI023|CASE R35470 30250.016.0

Lab ID: **2348398009** Date Collected: 11/6/2018 13:40 Matrix: Ground Water
Sample ID: **MC0AJ2** Date Received: 11/7/2018 09:00

Parameters	Results	Flag	Units	RDL	MDL	Method	Prepared By	Analyzed	By	Cntr
WET CHEMISTRY										
Hexavalent Chromium	0.030 U	U	ug/L	0.030	0.0061	EPA 218.7		11/17/18 07:42	MBW	A

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ANALYTICAL RESULTS

Workorder: 2348398 WSI023|CASE R35470 30250.016.0

Lab ID: **2348398010** Date Collected: 11/6/2018 14:22 Matrix: Ground Water

Sample ID: **MC0AL0** Date Received: 11/7/2018 09:00

Parameters	Results	Flag	Units	RDL	MDL	Method	Prepared By	Analyzed	By	Cntr
WET CHEMISTRY										
Hexavalent Chromium	0.055		ug/L	0.030	0.0061	EPA 218.7		11/17/18 07:50	MBW	A

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ANALYTICAL RESULTS

Workorder: 2348398 WSI023|CASE R35470 30250.016.0

Lab ID: **2348398011** Date Collected: 11/5/2018 12:07 Matrix: Drinking Water
Sample ID: **MC0AN3** Date Received: 11/7/2018 09:00

Parameters	Results	Flag	Units	RDL	MDL	Method	Prepared By	Analyzed	By	Cntr
WET CHEMISTRY										
Hexavalent Chromium	0.030 U	U	ug/L	0.030	0.0061	EPA 218.7		11/17/18 07:59	MBW	A

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ANALYTICAL RESULTS

Workorder: 2348398 WSI023|CASE R35470 30250.016.0

Lab ID: **2348398012** Date Collected: 11/5/2018 11:55 Matrix: Drinking Water
Sample ID: **MC0AN4** Date Received: 11/7/2018 09:00

Parameters	Results	Flag	Units	RDL	MDL	Method	Prepared By	Analyzed	By	Cntr
WET CHEMISTRY										
Hexavalent Chromium	0.011J	J	ug/L	0.030	0.0061	EPA 218.7		11/17/18 08:08	MBW	A

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State Certifications: DE ID 11, MA PA0102, MD 128, VA 460157, WV 343

ANALYTICAL RESULTS

Workorder: 2348398 WSI023|CASE R35470 30250.016.0

Lab ID: **2348398013** Date Collected: 11/5/2018 11:45 Matrix: Drinking Water
Sample ID: **MC0AN6** Date Received: 11/7/2018 09:00

Parameters	Results	Flag	Units	RDL	MDL	Method	Prepared By	Analyzed	By	Cntr
WET CHEMISTRY										
Hexavalent Chromium	0.030 U	U	ug/L	0.030	0.0061	EPA 218.7		11/17/18 08:17	MBW	A

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Project Coordinator

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
Environmental Sciences Center
701 Mapes Road
Fort Meade, Maryland 20755-5350

DATE: 3/4/2019

SUBJECT: Region III Data QA Review

FROM: Brandon McDonald
Region III ESAT RPO (3EA22)

TO: CONNOR O'LOUGHLIN
Hazardous Site Cleanup Division (HSCD)

Attached is the data validation report for the BLADES GROUNDWATER site for DAS# R35470; SDG# MC0AG5 completed by the Region III Environmental Services Assistance Team (ESAT) contractor, ICF International, under the direction of Region III EAID.

If you have any questions regarding this review, please call Brandon McDonald at (410) 305-2607 or you can call Eric Graybill at (410)-305-2665.

Attachment

cc: Ex. 4 CBI (WESTON SOLUTIONS)
Ex. 4 CBI (WESTON SOLUTIONS)

TO: #0002 TDF: #1218023

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ICF
ESAT Region 3
US Environmental Protection Agency Environmental Science Center
701 Mapes Road Ft. Meade, MD 20755-5350
Phone 410-305-3012

Date: February 8, 2019

To: Brandon McDonald
ESAT Region 3 Project Officer

From: Ex. 4 CBI
Validator

Ex. 4 CBI
Reviewer

Subject: Inorganic Data Validation (S4VM)
Blades Groundwater
R35470 MC0AG5

Overview

This data package consisted of thirteen (13) ground water samples, including a field duplicate pair, analyzed for hexavalent chromium.

Analyses were performed by ALS Environmental (ALS). The samples were submitted to the laboratory directly by the sampling contractor. The laboratory indicated analyses were performed based on EPA Method 218.7.

Data were validated according to the National Functional Guidelines for Inorganic Superfund Methods Data Review and applicable USEPA Region 3 modifications. The validation report has been assigned the Superfund Data Validation Level Stage_4_Validation_Manual (S4VM).

The following validation narrative is an evaluation of laboratory reported data based on the electronic data package received by Region 3 on November 30, 2018.

Summary

No significant data quality outliers or technical deficiencies were identified that would require rejection or estimation of sample results.

Notes

Concentrations detected below the Reporting Detection Limit (RDL) are estimated and have been qualified "J".

Accuracy and precision criteria were met by the laboratory in the initial and continuing calibration verification standard analyses associated with the samples in this SDG.

Laboratory blanks associated with the samples in this SDG were free from contamination.

Laboratory Control Sample analyses were within control limits.

Percent recoveries and Relative Percent Differences (RPDs) in Matrix Spike/Matrix Spike Duplicate (MS/MSD) analysis for sample MC0AG6 and MC0AN9 were within control limits.

The samples in this SDG were found to be free of residual chlorine at the time of sample preparation by the laboratory. Sample pH data provided by the laboratory support proper preservation for all samples. No data were qualified based on these findings.

The sampling time of 11:19 listed on the Analytical Results for sample MC0AG8 does not match the sampling time of 13:17 listed on Chain of Custody Record No: 3-110718-150352-0033. No data were qualified based on this finding.

No detected concentrations for hexavalent chromium were reported in field duplicate pair MC0AH0/MC0AL2. No data were qualified based on field duplicate precision.

Glossary of Inorganic Data Qualifier Codes

Validation Qualifiers	In order of descending precedence. Only one of these qualifiers may apply to any result.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the sample.
UJ	The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit
B	The result is presumed a blank contaminant. This qualifier is used for drinking water samples only.
J	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+	The result is an estimated quantity, but the result may be biased high.
J-	The result is an estimated quantity, but the result may be biased low.

ALS Environmental

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NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: A2LA 0818.01
State Certifications: DE ID 11 , MA PA0102 , MD 128 , VA 460157 , WV 343

ANALYTICAL RESULTS

Workorder: 2349318 WSI024|CASE R35470 30250.016.0

Lab ID: **2349318001** Date Collected: 11/7/2018 09:17 Matrix: Ground Water

Sample ID: **MC0AG5** Date Received: 11/8/2018 09:13

Parameters	Results	Flag	Units	RDL	MDL	Method	Prepared By	Analyzed	By	Cntr
WET CHEMISTRY										
Hexavalent Chromium	0.021J	J	ug/L	0.030	0.0061	EPA 218.7		11/17/18 08:26	MBW	A

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Project Coordinator

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State Certifications: DE ID 11, MA PA0102, MD 128, VA 460157, WV 343

ANALYTICAL RESULTS

Workorder: 2349318 WSI024|CASE R35470 30250.016.0

Lab ID: **2349318002** Date Collected: 11/7/2018 09:23 Matrix: Ground Water

Sample ID: **MC0AG6** Date Received: 11/8/2018 09:13

Parameters	Results	Flag	Units	RDL	MDL	Method	Prepared By	Analyzed	By	Cntr
WET CHEMISTRY										
Hexavalent Chromium	0.011J	J	ug/L	0.030	0.0061	EPA 218.7		11/17/18 09:11	MBW	A

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ANALYTICAL RESULTS

Workorder: 2349318 WSI024|CASE R35470 30250.016.0

Lab ID: **2349318003** Date Collected: 11/7/2018 12:48 Matrix: Ground Water

Sample ID: **MC0AG7** Date Received: 11/8/2018 09:13

Parameters	Results	Flag	Units	RDL	MDL	Method	Prepared By	Analyzed	By	Cntr
WET CHEMISTRY										
Hexavalent Chromium	0.051		ug/L	0.030	0.0061	EPA 218.7		11/17/18 09:37	MBW	A

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ANALYTICAL RESULTS

Workorder: 2349318 WSI024|CASE R35470 30250.016.0

Lab ID: **2349318004** Date Collected: 11/7/2018 11:19 Matrix: Ground Water

Sample ID: **MC0AG8** Date Received: 11/8/2018 09:13

Parameters	Results	Flag	Units	RDL	MDL	Method	Prepared By	Analyzed	By	Cntr
WET CHEMISTRY										
Hexavalent Chromium	0.030 U	U	ug/L	0 030	0.0061	EPA 218.7		11/17/18 09:46	MBW	A

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ANALYTICAL RESULTS

Workorder: 2349318 WSI024|CASE R35470 30250.016.0

Lab ID: **2349318005** Date Collected: 11/7/2018 11:17 Matrix: Ground Water

Sample ID: **MC0AH0** Date Received: 11/8/2018 09:13

Parameters	Results	Flag	Units	RDL	MDL	Method	Prepared By	Analyzed	By	Cntr
WET CHEMISTRY										
Hexavalent Chromium	0.030 U	U	ug/L	0.030	0.0061	EPA 218.7		11/17/18 09:55	MBW	A

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ANALYTICAL RESULTS

Workorder: 2349318 WSI024|CASE R35470 30250.016.0

Lab ID: **2349318006** Date Collected: 11/7/2018 08:45 Matrix: Ground Water

Sample ID: **MC0AH6** Date Received: 11/8/2018 09:13

Parameters	Results	Flag	Units	RDL	MDL	Method	Prepared By	Analyzed	By	Cntr
WET CHEMISTRY										
Hexavalent Chromium	0.019J	J	ug/L	0.030	0.0061	EPA 218.7		11/17/18 10:04	MBW	A

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ANALYTICAL RESULTS

Workorder: 2349318 WSI024|CASE R35470 30250.016.0

Lab ID: **2349318007** Date Collected: 11/7/2018 14:30 Matrix: Ground Water

Sample ID: **MC0AH8** Date Received: 11/8/2018 09:13

Parameters	Results	Flag	Units	RDL	MDL	Method	Prepared By	Analyzed	By	Cntr
WET CHEMISTRY										
Hexavalent Chromium	2.3		ug/L	0.030	0.0061	EPA 218.7		11/17/18 10:13	MBW	A

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ANALYTICAL RESULTS

Workorder: 2349318 WSI024|CASE R35470 30250.016.0

Lab ID: **2349318008** Date Collected: 11/7/2018 14:32 Matrix: Ground Water

Sample ID: **MC0AH9** Date Received: 11/8/2018 09:13

Parameters	Results	Flag	Units	RDL	MDL	Method	Prepared By	Analyzed	By	Cntr
WET CHEMISTRY										
Hexavalent Chromium	0.030 U	U	ug/L	0.030	0.0061	EPA 218.7		11/17/18 10:22	MBW	A

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ANALYTICAL RESULTS

Workorder: 2349318 WSI024|CASE R35470 30250.016.0

Lab ID: **2349318009** Date Collected: 11/7/2018 12:20 Matrix: Ground Water

Sample ID: **MC0AJ0** Date Received: 11/8/2018 09:13

Parameters	Results	Flag	Units	RDL	MDL	Method	Prepared By	Analyzed	By	Cntr
WET CHEMISTRY										
Hexavalent Chromium	0.068		ug/L	0.030	0.0061	EPA 218.7		11/17/18 10:31	MBW	A

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Project Coordinator

(ALS) Environmental

34 Dogwood Lane ▪ Middletown, PA 17057 ▪ Phone: 717-944-5541 ▪ Fax: 717-944-1430 ▪ www.alsglobal.com

NELAP Certifications: NJ PA010, NY 11759, PA 22-293 DoD ELAP: A2LA 0818.01
State Certifications: DE ID 11, MA PA0102, MD 128, VA 460157, WV 343

ANALYTICAL RESULTS

Workorder: 2349318 WSI024|CASE R35470 30250.016.0

Lab ID: **2349318010** Date Collected: 11/7/2018 10:25 Matrix: Ground Water

Sample ID: **MC0AK7** Date Received: 11/8/2018 09:13

Parameters	Results	Flag	Units	RDL	MDL	Method	Prepared By	Analyzed	By	Cntr
WET CHEMISTRY										
Hexavalent Chromium	0.063		ug/L	0.030	0.0061	EPA 218.7		11/17/18 10:39	MBW	A

Ex. 4 CBI

Project Coordinator

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ANALYTICAL RESULTS

Workorder: 2349318 WSI024|CASE R35470 30250.016.0

Lab ID: **2349318011** Date Collected: 11/7/2018 11:18 Matrix: Ground Water

Sample ID: **MC0AL2** Date Received: 11/8/2018 09:13

Parameters	Results	Flag	Units	RDL	MDL	Method	Prepared By	Analyzed	By	Cntr
WET CHEMISTRY										
Hexavalent Chromium	0.030 U	U	ug/L	0.030	0.0061	EPA 218.7		11/17/18 10:48	MBW	A

Ex. 4 CBI

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ANALYTICAL RESULTS

Workorder: 2349318 WSI024|CASE R35470 30250.016.0

Lab ID: **2349318012** Date Collected: 11/7/2018 14:15 Matrix: Ground Water

Sample ID: **MC0AN9** Date Received: 11/8/2018 09:13

Parameters	Results	Flag	Units	RDL	MDL	Method	Prepared By	Analyzed	By	Cntr
WET CHEMISTRY										
Hexavalent Chromium	0.073		ug/L	0.030	0.0061	EPA 218.7		11/17/18 11:15	MBW	A

Ex. 4 CBI

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State Certifications: DE ID 11, MA PA0102, MD 128, VA 460157, WV 343

ANALYTICAL RESULTS

Workorder: 2349318 WSI024|CASE R35470 30250.016.0

Lab ID: **2349318013** Date Collected: 11/7/2018 11:19 Matrix: Ground Water
Sample ID: **MC0AG9** Date Received: 11/8/2018 09:13

Parameters	Results	Flag	Units	RDL	MDL	Method	Prepared By	Analyzed	By	Cntr
WET CHEMISTRY										
Hexavalent Chromium	0.25		ug/L	0.030	0.0061	EPA 218.7		11/17/18 11:42	MBW	A

Ex. 4 CBI
Project Coordinator

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
Environmental Sciences Center
701 Mapes Road
Fort Meade, Maryland 20755-5350

DATE: 5/2/2019

SUBJECT: Region III Data QA Review

FROM: Brandon McDonald
Region III ESAT RPO(3EA22)

TO: CONNOR O'LOUGHLIN
Hazardous Site Cleanup Division (HSCD)

Attached is the data validation report for the BLADES GROUNDWATER site for DAS# R35542; SDG# C0AP3 completed by the Region III Environmental Services Assistance Team(ESAT) contractor, ICF International, under the direction of Region III EAID.

If you have any questions regarding this review, please call Brandon McDonald at (410) 305-2607 or you can call Eric Graybill at (410)-305-2665.

Attachment

cc: Ex. 4 CBI

TO: #0002 TDF: #0419029

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ICF
ESAT Region 3
US Environmental Protection Agency Environmental Science Center
701 Mapes Road Ft. Meade, MD 20755-5350
Phone 410-305-3012

Date: April 29, 2019

To: Brandon McDonald
ESAT Region 3 Project Officer

From: Ex. 4 CBI
Validator

Ex. 4 CBI
Reviewer

Subject: Organic Data Validation (S4VM)
Blades Groundwater
R35542 C0AP3

Overview

This data package consisted of seven (7) Field Reagent Blanks (FRBs) and eight (8) ground water samples analyzed for perfluorinated alkyl acid compounds by Liquid Chromatography/Mass Spectrometry (LC/MS). This sample set included a field duplicate sample.

Analyses were performed by Eurofins Test America Sacramento (TAMC). The samples were submitted to the laboratory directly by the sampling contractor. The laboratory indicated analyses were performed according to EPA Method 537 utilizing a quantitative isotope dilution-internal standard technique.

Data were validated according to the National Functional Guidelines for Organic Superfund Methods Data Review and applicable USEPA Region 3 modifications. The validation report has been assigned the Superfund Data Validation Label S4VM (Stage_4_Validation_Manual).

The following validation narrative is an evaluation of laboratory reported data based on the electronic data package received by Region 3 on April 10, 2019.

The laboratory did not provide sufficient data to determine if branched chain isomers of PFOA were included in the reporting of this analyte in field samples. No data were qualified based on this finding.

Summary

No significant data quality outliers or technical deficiencies were identified that would require rejection or estimation of sample results.

Notes

Accuracy and precision criteria were met by the laboratory in the initial and continuing calibration verification standard analyses associated with the samples in this Sample Data Group (SDG).

Analytes detected below Reporting Limits are estimated and have been qualified "J".

The method blank and FRBs associated with the samples in this SDG were free from contamination. No data were qualified based on blank contamination.

Percent recoveries and Relative Percent Differences (RPDs) for target analytes in Laboratory Control Sample/ Laboratory Control Sample Duplicate LCS/LCSD analyses were within control limits. No field sample data were qualified based on these findings.

Due to insufficient sample volume received by the laboratory, Matrix Spike/Matrix Spike Duplicate (MS/MSD) analyses were not performed in this SDG. No data were qualified based on these findings.

Results reported for field duplicate sample C0AP3 /C0AX9 were comparable. No data were qualified based on field duplicate precision.

The samples in this SDG were found to be free of residual chlorine at the time of sample preparation by the laboratory. No data were qualified based on this finding.

The samples in this SDG were preserved and reported pH within the optimum range. No data were qualified based on these findings.

Manual integrations were performed and identified by the laboratory. A subset of these was evaluated by the reviewer and found to be accurate and consistent. No action was taken by the reviewer based on manual integrations.

Glossary of Organic Data Qualifier Codes

Validation Qualifiers	In order of descending precedence. Only one of these qualifiers may apply to any result.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the sample.
UJ	The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit
J	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+	The result is an estimated quantity, but the result may be biased high.
J-	The result is an estimated quantity, but the result may be biased low.

Additional Qualifiers	Additional qualifiers may be combined with other qualifiers.
N	The analyte has been “tentatively identified” or “presumptively” as present.
B	The result is presumed a blank contaminant. This qualifier is used for drinking water samples only.
C	The target Pesticide or Aroclor analyte identification has been confirmed by Gas Chromatography/Mass Spectrometry (GC/MS). This qualifier may be added to other qualifiers.
X	The target Pesticide or Aroclor analyte identification was not confirmed when GC/MS analysis was performed. This qualifier may be added to other qualifiers.

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Sacramento
Job No.: 320-48794-1
SDG No.:
Client Sample ID: C0AP3
Lab Sample ID: 320-48794-1
Matrix: Water
Lab File ID: 2019.04.02_537A_020.d
Analysis Method: 537 DW
Date Collected: 03/26/2019 12:48
Extraction Method: 537 DW
Date Extracted: 04/01/2019 15:03
Sample wt/vol: 274.7(mL)
Date Analyzed: 04/03/2019 07:13
Con. Extract Vol.: 10.00(mL)
Dilution Factor: 1
Injection Volume: 10(uL)
GC Column: GeminiC18 3x100 ID: 3(mm)
% Moisture:
GPC Cleanup:(Y/N) N
Analysis Batch No.: 285757
Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
335-67-1	Perfluorooctanoic acid	5.7		5.5	2.5
375-95-1	Perfluorononanoic acid	1.7	J	1.8	0.43
355-46-4	Perfluorohexanesulfonic acid	2.4		1.8	0.58
375-85-9	Perfluoroheptanoic acid	29		2.7	1.2
375-73-5	Perfluorobutanesulfonic acid	39		1.8	0.73

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	94		70-130
STL00996	13C2 PFDA	108		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Sacramento Job No.: 320-48794-1
SDG No.:
Client Sample ID: COAP3 DL Lab Sample ID: 320-48794-1 DL
Matrix: Water Lab File ID: 2019.04.05_537.1A_028.d
Analysis Method: 537 DW Date Collected: 03/26/2019 12:48
Extraction Method: 537 DW Date Extracted: 04/01/2019 15:03
Sample wt/vol: 274.7(mL) Date Analyzed: 04/05/2019 14:16
Con. Extract Vol.: 10.00(mL) Dilution Factor: 5
Injection Volume: 10(uL) GC Column: GeminiC18 3x100 ID: 3(mm)
% Moisture: GPC Cleanup:(Y/N) N
Analysis Batch No.: 286379 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
1763-23-1	Perfluorooctanesulfonic acid	870		9.1	4.3

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	101		70-130
STL00996	13C2 PFDA	106		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Sacramento
Job No.: 320-48794-1
SDG No.:
Client Sample ID: C0AP4
Lab Sample ID: 320-48794-2
Matrix: Water
Lab File ID: 2019.04.02_537A_021.d
Analysis Method: 537 DW
Date Collected: 03/26/2019 14:00
Extraction Method: 537 DW
Date Extracted: 04/01/2019 15:03
Sample wt/vol: 266.1(mL)
Date Analyzed: 04/03/2019 07:21
Con. Extract Vol.: 10.00(mL)
Dilution Factor: 1
Injection Volume: 10(uL)
GC Column: GeminiC18 3x100 ID: 3(mm)
% Moisture:
GPC Cleanup:(Y/N) N
Analysis Batch No.: 285757
Unite: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
1763-23-1	Perfluorooctanesulfonic acid	190		1.9	0.89
335-67-1	Perfluorooctanoic acid	30		5.6	2.5
375-95-1	Perfluorononanoic acid	6.3		1.9	0.44
355-46-4	Perfluorohexanesulfonic acid	7.6		1.9	0.60
375-85-9	Perfluoroheptanoic acid	21		2.8	1.2
375-73-5	Perfluorobutanesulfonic acid	35		1.9	0.75

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	95		70-130
STL00996	13C2 PFDA	105		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Sacramento
Job No.: 320-48794-1
SDG No.:
Client Sample ID: C0AQ9
Lab Sample ID: 320-48794-3
Matrix: Water
Lab File ID: 2019.04.02_537A_022.d
Analysis Method: 537 DW
Date Collected: 03/26/2019 15:28
Extraction Method: 537 DW
Date Extracted: 04/01/2019 15:03
Sample wt/vol: 266.2(mL)
Date Analyzed: 04/03/2019 07:28
Con. Extract Vol.: 10.00(mL)
Dilution Factor: 1
Injection Volume: 10(uL)
GC Column: GeminiC18 3x100 ID: 3(mm)
% Moisture:
GPC Cleanup:(Y/N) N
Analysis Batch No.: 285757
Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
335-67-1	Perfluorooctanoic acid	16		5.6	2.5
375-95-1	Perfluorononanoic acid	2.3		1.9	0.44
355-46-4	Perfluorohexanesulfonic acid	9.0		1.9	0.60
375-85-9	Perfluoroheptanoic acid	8.0		2.8	1.2
375-73-5	Perfluorobutanesulfonic acid	80		1.9	0.75

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	90		70-130
STL00996	13C2 PFDA	111		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Sacramento Job No.: 320-48794-1
SDG No.:
Client Sample ID: C0AQ9 DL Lab Sample ID: 320-48794-3 DL
Matrix: Water Lab File ID: 2019.04.05_537.1A_029.d
Analysis Method: 537 DW Date Collected: 03/26/2019 15:28
Extraction Method: 537 DW Date Extracted: 04/01/2019 15:03
Sample wt/vol: 266.2(mL) Date Analyzed: 04/05/2019 14:26
Con. Extract Vol.: 10.00(mL) Dilution Factor: 5
Injection Volume: 10(uL) GC Column: GeminiC18 3x100 ID: 3(mm)
% Moisture: GPC Cleanup:(Y/N) N
Analysis Batch No.: 286379 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
1763-23-1	Perfluorooctanesulfonic acid	640		9.4	4.5

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	94		70-130
STL00996	13C2 PFDA	104		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Sacramento
Job No.: 320-48794-1
SDG No.:
Client Sample ID: C0AR5
Lab Sample ID: 320-48794-4
Matrix: Water
Lab File ID: 2019.04.04_537AA_007.d
Analysis Method: 537 DW
Date Collected: 03/26/2019 16:45
Extraction Method: 537 DW
Date Extracted: 04/01/2019 15:03
Sample wt/vol: 290.4(mL)
Date Analyzed: 04/04/2019 19:29
Con. Extract Vol.: 10.00(mL)
Dilution Factor: 1
Injection Volume: 10(uL)
GC Column: GeminiC18 3x100 ID: 3(mm)
% Moisture:
GPC Cleanup:(Y/N) N
Analysis Batch No.: 286182
Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
1763-23-1	Perfluorooctanesulfonic acid	3.6		1.7	0.82
335-67-1	Perfluorooctanoic acid	3.3	J	5.2	2.3
375-95-1	Perfluorononanoic acid	ND		1.7	0.40
355-46-4	Perfluorohexanesulfonic acid	1.6	J	1.7	0.55
375-85-9	Perfluoroheptanoic acid	3.0		2.6	1.1
375-73-5	Perfluorobutanesulfonic acid	1.3	J	1.7	0.69

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	107		70-130
STL00996	13C2 PFDA	110		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Sacramento
Job No.: 320-48794-1
SDG No.:
Client Sample ID: COAR9
Lab Sample ID: 320-48794-5
Matrix: Water
Lab File ID: 2019.04.02_537A_024.d
Analysis Method: 537 DW
Date Collected: 03/26/2019 10:21
Extraction Method: 537 DW
Date Extracted: 04/01/2019 15:03
Sample wt/vol: 275.3(mL)
Date Analyzed: 04/03/2019 07:43
Con. Extract Vol.: 10.00(mL)
Dilution Factor: 1
Injection Volume: 10(uL)
GC Column: GeminiC18 3x100 ID: 3(mm)
% Moisture:
GPC Cleanup:(Y/N) N
Analysis Batch No.: 285757
Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
1763-23-1	Perfluorooctanesulfonic acid	48		1.8	0.86
335-67-1	Perfluorooctanoic acid	32		5.4	2.5
375-95-1	Perfluorononanoic acid	20		1.8	0.43
355-46-4	Perfluorohexanesulfonic acid	12		1.8	0.58
375-85-9	Perfluoroheptanoic acid	14		2.7	1.2
375-73-5	Perfluorobutanesulfonic acid	5.9		1.8	0.73

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	90		70-130
STL00996	13C2 PFDA	102		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Sacramento
Job No.: 320-48794-1
SDG No.:
Client Sample ID: COAS0
Lab Sample ID: 320-48794-6
Matrix: Water
Lab File ID: 2019.04.02_537A_025.d
Analysis Method: 537 DW
Date Collected: 03/26/2019 10:23
Extraction Method: 537 DW
Date Extracted: 04/01/2019 15:03
Sample wt/vol: 288.4(mL)
Date Analyzed: 04/03/2019 07:51
Con. Extract Vol.: 10.00(mL)
Dilution Factor: 1
Injection Volume: 10(uL)
GC Column: GeminiC18 3x100 ID: 3(mm)
% Moisture:
GPC Cleanup:(Y/N) N
Analysis Batch No.: 285757
Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
1763-23-1	Perfluorooctanesulfonic acid	140		1.7	0.82
335-67-1	Perfluorooctanoic acid	19		5.2	2.3
375-95-1	Perfluorononanoic acid	39		1.7	0.41
355-46-4	Perfluorohexanesulfonic acid	23		1.7	0.55
375-85-9	Perfluoroheptanoic acid	5.8		2.6	1.1
375-73-5	Perfluorobutanesulfonic acid	4.3		1.7	0.69

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	92		70-130
STL00996	13C2 PFDA	104		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Sacramento
Job No.: 320-48794-1
SDG No.:
Client Sample ID: COAS1
Lab Sample ID: 320-48794-7
Matrix: Water
Lab File ID: 2019.04.02_537A_026.d
Analysis Method: 537 DW
Date Collected: 03/26/2019 10:27
Extraction Method: 537 DW
Date Extracted: 04/01/2019 15:03
Sample wt/vol: 285.4(mL)
Date Analyzed: 04/03/2019 07:58
Con. Extract Vol.: 10.00(mL)
Dilution Factor: 1
Injection Volume: 10(uL)
GC Column: GeminiC18 3x100 ID: 3(mm)
% Moisture:
GPC Cleanup:(Y/N) N
Analysis Batch No.: 285757
Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
1763-23-1	Perfluorooctanesulfonic acid	95		1.8	0.83
335-67-1	Perfluorooctanoic acid	20		5.3	2.4
375-95-1	Perfluorononanoic acid	19		1.8	0.41
355-46-4	Perfluorohexanesulfonic acid	19		1.8	0.56
375-85-9	Perfluoroheptanoic acid	7.3		2.6	1.1
375-73-5	Perfluorobutanesulfonic acid	12		1.8	0.70

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	90		70-130
STL00996	13C2 PFDA	103		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Sacramento
Job No.: 320-48794-1
SDG No.:
Client Sample ID: COAS4
Lab Sample ID: 320-48794-8
Matrix: Water
Lab File ID: 2019.04.02_537A_029.d
Analysis Method: 537 DW
Date Collected: 03/26/2019 12:53
Extraction Method: 537 DW
Date Extracted: 04/01/2019 15:03
Sample wt/vol: 278.4(mL)
Date Analyzed: 04/03/2019 08:20
Con. Extract Vol.: 10.00(mL)
Dilution Factor: 1
Injection Volume: 10(uL)
GC Column: GeminiC18 3x100 ID: 3(mm)
% Moisture:
GPC Cleanup:(Y/N) N
Analysis Batch No.: 285758
Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
1763-23-1	Perfluorooctanesulfonic acid	ND		1.8	0.85
335-67-1	Perfluorooctanoic acid	ND		5.4	2.4
375-95-1	Perfluorononanoic acid	ND		1.8	0.42
355-46-4	Perfluorohexanesulfonic acid	ND		1.8	0.57
375-85-9	Perfluoroheptanoic acid	ND		2.7	1.2
375-73-5	Perfluorobutanesulfonic acid	ND		1.8	0.72

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	104		70-130
STL00996	13C2 PFDA	106		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Sacramento
Job No.: 320-48794-1
SDG No.:
Client Sample ID: COAS5
Lab Sample ID: 320-48794-9
Matrix: Water
Lab File ID: 2019.04.02_537A_030.d
Analysis Method: 537 DW
Date Collected: 03/26/2019 14:05
Extraction Method: 537 DW
Date Extracted: 04/01/2019 15:03
Sample wt/vol: 290.1(mL)
Date Analyzed: 04/03/2019 08:28
Con. Extract Vol.: 10.00(mL)
Dilution Factor: 1
Injection Volume: 10(uL)
GC Column: GeminiC18 3x100 ID: 3(mm)
% Moisture:
GPC Cleanup:(Y/N) N
Analysis Batch No.: 285758
Unite: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
1763-23-1	Perfluorooctanesulfonic acid	ND		1.7	0.82
335-67-1	Perfluorooctanoic acid	ND		5.2	2.3
375-95-1	Perfluorononanoic acid	ND		1.7	0.41
355-46-4	Perfluorohexanesulfonic acid	ND		1.7	0.55
375-85-9	Perfluoroheptanoic acid	ND		2.6	1.1
375-73-5	Perfluorobutanesulfonic acid	ND		1.7	0.69

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	103		70-130
STL00996	13C2 PFDA	108		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Sacramento
Job No.: 320-48794-1
SDG No.:
Client Sample ID: C0AS6
Lab Sample ID: 320-48794-10
Matrix: Water
Lab File ID: 2019.04.02_537A_031.d
Analysis Method: 537 DW
Date Collected: 03/26/2019 15:33
Extraction Method: 537 DW
Date Extracted: 04/01/2019 15:03
Sample wt/vol: 272.8(mL)
Date Analyzed: 04/03/2019 08:35
Con. Extract Vol.: 10.00(mL)
Dilution Factor: 1
Injection Volume: 10(uL)
GC Column: GeminiC18 3x100 ID: 3(mm)
% Moisture:
GPC Cleanup:(Y/N) N
Analysis Batch No.: 285758
Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
1763-23-1	Perfluorooctanesulfonic acid	ND		1.8	0.87
335-67-1	Perfluorooctanoic acid	ND		5.5	2.5
375-95-1	Perfluorononanoic acid	ND		1.8	0.43
355-46-4	Perfluorohexanesulfonic acid	ND		1.8	0.59
375-85-9	Perfluoroheptanoic acid	ND		2.7	1.2
375-73-5	Perfluorobutanesulfonic acid	ND		1.8	0.73

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	98		70-130
STL00996	13C2 PFDA	104		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Sacramento
Job No.: 320-48794-1
SDG No.:
Client Sample ID: C0AW5
Lab Sample ID: 320-48794-11
Matrix: Water
Lab File ID: 2019.04.02_537A_032.d
Analysis Method: 537 DW
Date Collected: 03/26/2019 16:50
Extraction Method: 537 DW
Date Extracted: 04/01/2019 15:03
Sample wt/vol: 275.1(mL)
Date Analyzed: 04/03/2019 08:43
Con. Extract Vol.: 10.00(mL)
Dilution Factor: 1
Injection Volume: 10(uL)
GC Column: GeminiC18 3x100 ID: 3(mm)
% Moisture:
GPC Cleanup:(Y/N) N
Analysis Batch No.: 285758
Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
1763-23-1	Perfluorooctanesulfonic acid	ND		1.8	0.86
335-67-1	Perfluorooctanoic acid	ND		5.5	2.5
375-95-1	Perfluorononanoic acid	ND		1.8	0.43
355-46-4	Perfluorohexanesulfonic acid	ND		1.8	0.58
375-85-9	Perfluoroheptanoic acid	ND		2.7	1.2
375-73-5	Perfluorobutanesulfonic acid	ND		1.8	0.73

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	99		70-130
STL00996	13C2 PFDA	106		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Sacramento
Job No.: 320-48794-1
SDG No.:
Client Sample ID: COAX2
Lab Sample ID: 320-48794-12
Matrix: Water
Lab File ID: 2019.04.02_537A_033.d
Analysis Method: 537 DW
Date Collected: 03/26/2019 10:22
Extraction Method: 537 DW
Date Extracted: 04/01/2019 15:03
Sample wt/vol: 273.9(mL)
Date Analyzed: 04/03/2019 08:50
Con. Extract Vol.: 10.00(mL)
Dilution Factor: 1
Injection Volume: 10(uL)
GC Column: GeminiC18 3x100 ID: 3(mm)
% Moisture:
GPC Cleanup:(Y/N) N
Analysis Batch No.: 285758
Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
1763-23-1	Perfluorooctanesulfonic acid	ND		1.8	0.87
335-67-1	Perfluorooctanoic acid	ND		5.5	2.5
375-95-1	Perfluorononanoic acid	ND		1.8	0.43
355-46-4	Perfluorohexanesulfonic acid	ND		1.8	0.58
375-85-9	Perfluoroheptanoic acid	ND		2.7	1.2
375-73-5	Perfluorobutanesulfonic acid	ND		1.8	0.73

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	100		70-130
STL00996	13C2 PFDA	106		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Sacramento
Job No.: 320-48794-1
SDG No.:
Client Sample ID: C0AX3
Lab Sample ID: 320-48794-13
Matrix: Water
Lab File ID: 2019.04.02_537A_034.d
Analysis Method: 537 DW
Date Collected: 03/26/2019 10:25
Extraction Method: 537 DW
Date Extracted: 04/01/2019 15:03
Sample wt/vol: 279(mL)
Date Analyzed: 04/03/2019 08:58
Con. Extract Vol.: 10.00(mL)
Dilution Factor: 1
Injection Volume: 10(uL)
GC Column: GeminiC18 3x100 ID: 3(mm)
% Moisture:
GPC Cleanup:(Y/N) N
Analysis Batch No.: 285758
Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
1763-23-1	Perfluorooctanesulfonic acid	ND		1.8	0.85
335-67-1	Perfluorooctanoic acid	ND		5.4	2.4
375-95-1	Perfluorononanoic acid	ND		1.8	0.42
355-46-4	Perfluorohexanesulfonic acid	ND		1.8	0.57
375-85-9	Perfluoroheptanoic acid	ND		2.7	1.2
375-73-5	Perfluorobutanesulfonic acid	ND		1.8	0.72

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	102		70-130
STL00996	13C2 PFDA	109		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Sacramento
Job No.: 320-48794-1
SDG No.:
Client Sample ID: COAX4
Lab Sample ID: 320-48794-14
Matrix: Water
Lab File ID: 2019.04.02_537A_035.d
Analysis Method: 537 DW
Date Collected: 03/26/2019 10:30
Extraction Method: 537 DW
Date Extracted: 04/01/2019 15:03
Sample wt/vol: 279.4(mL)
Date Analyzed: 04/03/2019 09:05
Con. Extract Vol.: 10.00(mL)
Dilution Factor: 1
Injection Volume: 10(uL)
GC Column: GeminiC18 3x100 ID: 3(mm)
% Moisture:
GPC Cleanup:(Y/N) N
Analysis Batch No.: 285758
Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
1763-23-1	Perfluorooctanesulfonic acid	ND		1.8	0.85
335-67-1	Perfluorooctanoic acid	ND		5.4	2.4
375-95-1	Perfluorononanoic acid	ND		1.8	0.42
355-46-4	Perfluorohexanesulfonic acid	ND		1.8	0.57
375-85-9	Perfluoroheptanoic acid	ND		2.7	1.2
375-73-5	Perfluorobutanesulfonic acid	ND		1.8	0.72

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	100		70-130
STL00996	13C2 PFDA	107		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Sacramento
Job No.: 320-48794-1
SDG No.:
Client Sample ID: C0AX9
Lab Sample ID: 320-48794-15
Matrix: Water
Lab File ID: 2019.04.02_537A_036.d
Analysis Method: 537 DW
Date Collected: 03/26/2019 12:48
Extraction Method: 537 DW
Date Extracted: 04/01/2019 15:03
Sample wt/vol: 265.3(mL)
Date Analyzed: 04/03/2019 09:13
Con. Extract Vol.: 10.00(mL)
Dilution Factor: 1
Injection Volume: 10(uL)
GC Column: GeminiC18 3x100 ID: 3(mm)
% Moisture:
GPC Cleanup:(Y/N) N
Analysis Batch No.: 285758
Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
335-67-1	Perfluorooctanoic acid	5.8		5.7	2.5
375-95-1	Perfluorononanoic acid	1.7	J	1.9	0.44
355-46-4	Perfluorohexanesulfonic acid	2.9		1.9	0.60
375-85-9	Perfluoroheptanoic acid	28		2.8	1.2
375-73-5	Perfluorobutanesulfonic acid	38		1.9	0.75

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	93		70-130
STL00996	13C2 PFDA	104		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Sacramento
Job No.: 320-48794-1
SDG No.:
Client Sample ID: COAX9 DL
Lab Sample ID: 320-48794-15 DL
Matrix: Water
Lab File ID: 2019.04.05_537.1A_030.d
Analysis Method: 537 DW
Date Collected: 03/26/2019 12:48
Extraction Method: 537 DW
Date Extracted: 04/01/2019 15:03
Sample wt/vol: 265.3(mL)
Date Analyzed: 04/05/2019 14:35
Con. Extract Vol.: 10.00(mL)
Dilution Factor: 5
Injection Volume: 10(uL)
GC Column: GeminiC18 3x100 ID: 3(mm)
% Moisture:
GPC Cleanup:(Y/N) N
Analysis Batch No.: 286379
Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
1763-23-1	Perfluorooctanesulfonic acid	940		9.4	4.5

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	94		70-130
STL00996	13C2 PFDA	104		70-130

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
Environmental Sciences Center
701 Mapes Road
Fort Meade, Maryland 20755-5350

DATE: 5/9/2019

SUBJECT: Region III Data QA Review

FROM: Brandon McDonald
Region III ESAT RPO(3EA22)

TO: CONNOR O'LOUGHLIN
Hazardous Site Cleanup Division (HSCD)

Attached is the data validation report for the BLADES GROUNDWATER site for DAS# R35542; SDG# C0AR0 completed by the Region III Environmental Services Assistance Team(ESAT) contractor, ICF International, under the direction of Region III EAID.

If you have any questions regarding this review, please call Brandon McDonald at (410) 305-2607 or you can call Eric Graybill at (410)-305-2665.

Attachment

cc: Ex. 4 CBI

TO: #0002 TDF: #0419030

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ICF
ESAT Region 3
US Environmental Protection Agency Environmental Science Center
701 Mapes Road Ft. Meade, MD 20755-5350
Phone 410-305-3012

Date: May 1, 2019

To: Brandon McDonald
ESAT Region 3 Project Officer

From: Ex. 4 CBI
Validator

Ex. 4 CBI
Reviewer

Subject: Organic Data Validation (S4VM)
Blades Groundwater
R35542 C0AR0

Overview

This data package consisted of four (4) Field Reagent Blanks (FRBs), two (2) rinsate blanks and five (5) ground water samples analyzed for perfluorinated alkyl acid compounds by Liquid Chromatography/Mass Spectrometry (LC/MS).

Analyses were performed by Eurofins Test America Sacramento (TAMC). The samples were submitted to the laboratory directly by the sampling contractor. The laboratory indicated analyses were performed according to EPA Method 537 utilizing a quantitative isotope dilution-internal standard technique.

Data were validated according to the National Functional Guidelines for Organic Superfund Methods Data Review and applicable USEPA Region 3 modifications. The validation report has been assigned the Superfund Data Validation Label S4VM (Stage_4_Validation_Manual).

The following validation narrative is an evaluation of laboratory reported data based on the electronic data package received by Region 3 on April 10, 2019.

The laboratory did not provide sufficient data to determine if branched chain isomers of PFOA were included in the reporting of this analyte in field samples. No data were qualified based on this finding.

Summary

No significant data quality outliers or technical deficiencies were identified that would require rejection. Less significant data quality outliers resulting in estimation of sample results were identified including, but not limited to, Matrix Spike/Matrix Spike Duplicate recovery as detailed below.

Minor Problem

Percent recoveries and Relative Percent Differences (RPDs) for target analytes in the Low Level Matrix Spike/ Low Level Matrix Spike Duplicate (LLMS/LLMSD) analyses of sample C0AR0 were within control limits except for perfluorooctanoic acid (PFOA). The detected concentration for PFOA in spiked sample C0AR0 is estimated and has been qualified "J".

Notes

Analytes detected below Reporting Limits (RLs) are estimated and have been qualified "J".

Accuracy and precision criteria were met by the laboratory in the initial and continuing calibration verification standard analyses associated with the samples in this Sample Data Group (SDG).

Region 3 policy requires an FRB for each sample to evaluate contamination during field operations. This SDG contains five ground water samples of which two share the same sampling location, date and time. There is an FRB per sample location. No data were qualified based on this finding.

FRBs, method and rinsate blanks associated with the samples in this SDG were free from contamination. No data were qualified based on blank contamination.

Percent recoveries for target analytes in the Low Level Control Sample (LLCS) analysis were within control limits. No field sample data were qualified based on LCS accuracy.

The samples in this SDG were found to be free of residual chlorine at the time of sample preparation by the laboratory. No data were qualified based on this finding.

The samples in this SDG were preserved and reported pH within the optimum range. No data were qualified based on these findings.

Manual integrations were performed and identified by the laboratory. A subset of these was evaluated by the reviewer and found to be accurate and consistent. No action was taken by the reviewer based on manual integrations.

Glossary of Organic Data Qualifier Codes

Validation Qualifiers	In order of descending precedence. Only one of these qualifiers may apply to any result.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the sample.
UJ	The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit
J	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+	The result is an estimated quantity, but the result may be biased high.
J-	The result is an estimated quantity, but the result may be biased low.

Additional Qualifiers	Additional qualifiers may be combined with other qualifiers.
N	The analyte has been “tentatively identified” or “presumptively” as present.
B	The result is presumed a blank contaminant. This qualifier is used for drinking water samples only.
C	The target Pesticide or Aroclor analyte identification has been confirmed by Gas Chromatography/Mass Spectrometry (GC/MS). This qualifier may be added to other qualifiers.
X	The target Pesticide or Aroclor analyte identification was not confirmed when GC/MS analysis was performed. This qualifier may be added to other qualifiers.

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Sacramento Job No.: 320-48796-1
SDG No.:
Client Sample ID: C0ARO Lab Sample ID: 320-48796-1
Matrix: Water Lab File ID: 2019.04.04_537AA_016.d
Analysis Method: 537 DW Date Collected: 03/27/2019 12:29
Extraction Method: 537 DW Date Extracted: 04/02/2019 17:08
Sample wt/vol: 280.2(mL) Date Analyzed: 04/04/2019 20:55
Con. Extract Vol.: 10.00(mL) Dilution Factor: 1
Injection Volume: 10(uL) GC Column: GeminiC18 3x100 ID: 3(mm)
% Moisture: GPC Cleanup:(Y/N) N
Analysis Batch No.: 286192 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
1763-23-1	Perfluorooctanesulfonic acid	5.2		1.8	0.85
335-67-1	Perfluorooctanoic acid	6.0	J	5.4	2.4
375-95-1	Perfluorononanoic acid	1.2	J	1.8	0.42
355-46-4	Perfluorohexanesulfonic acid	ND		1.8	0.57
375-85-9	Perfluoroheptanoic acid	2.6	J	2.7	1.2
375-73-5	Perfluorobutanesulfonic acid	ND		1.8	0.71

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	95		70-130
STL00996	13C2 PFDA	103		70-130

DV
4/30/19

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Sacramento Job No.: 320-48796-1

SDG No.:

Client Sample ID: C0AR1 Lab Sample ID: 320-48796-2

Matrix: Water Lab File ID: 2019.04.04_537AA_019.d

Analysis Method: 537 DW Date Collected: 03/27/2019 11:10

Extraction Method: 537 DW Date Extracted: 04/02/2019 17:08

Sample wt/vol: 284.5(mL) Date Analyzed: 04/04/2019 21:23

Con. Extract Vol.: 10.00(mL) Dilution Factor: 1

Injection Volume: 10(uL) GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 286192 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
1763-23-1	Perfluorooctanesulfonic acid	ND		1.8	0.83
335-67-1	Perfluorooctanoic acid	ND		5.3	2.4
375-95-1	Perfluorononanoic acid	ND		1.8	0.41
355-46-4	Perfluorohexanesulfonic acid	ND		1.8	0.56
375-85-9	Perfluoroheptanoic acid	ND		2.6	1.1
375-73-5	Perfluorobutanesulfonic acid	ND		1.8	0.70

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	98		70-130
STL00996	13C2 PFDA	106		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Sacramento
Job No.: 320-48796-1
SDG No.:
Client Sample ID: C0AR2
Lab Sample ID: 320-48796-3
Matrix: Water
Lab File ID: 2019.04.04_537AA_020.d
Analysis Method: 537 DW
Date Collected: 03/27/2019 11:15
Extraction Method: 537 DW
Date Extracted: 04/02/2019 17:08
Sample wt/vol: 285.4(mL)
Date Analyzed: 04/04/2019 21:33
Con. Extract Vol.: 10.00(mL)
Dilution Factor: 1
Injection Volume: 10(uL)
GC Column: GeminiC18 3x100 ID: 3(mm)
% Moisture:
GPC Cleanup:(Y/N) N
Analysis Batch No.: 286192
Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
1763-23-1	Perfluorooctanesulfonic acid	50		1.8	0.83
335-67-1	Perfluorooctanoic acid	72		5.3	2.4
375-95-1	Perfluorononanoic acid	9.1		1.8	0.41
355-46-4	Perfluorohexanesulfonic acid	3.8		1.8	0.56
375-85-9	Perfluoroheptanoic acid	24		2.6	1.1
375-73-5	Perfluorobutanesulfonic acid	55		1.8	0.70

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	91		70-130
STL00996	13C2 PFDA	107		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Sacramento
Job No.: 320-48796-1
SDG No.:
Client Sample ID: C0AR8
Lab Sample ID: 320-48796-4
Matrix: Water
Lab File ID: 2019.04.04_537AA_021.d
Analysis Method: 537 DW
Date Collected: 03/27/2019 09:30
Extraction Method: 537 DW
Date Extracted: 04/02/2019 17:08
Sample wt/vol: 282.9(mL)
Date Analyzed: 04/04/2019 21:42
Con. Extract Vol.: 10.00(mL)
Dilution Factor: 1
Injection Volume: 10(uL)
GC Column: GeminiC18 3x100 ID: 3(mm)
% Moisture:
GPC Cleanup:(Y/N) N
Analysis Batch No.: 286192
Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
1763-23-1	Perfluorooctanesulfonic acid	2.6		1.8	0.84
335-67-1	Perfluorooctanoic acid	7.7		5.3	2.4
375-95-1	Perfluorononanoic acid	2.5		1.8	0.42
355-46-4	Perfluorohexanesulfonic acid	3.8		1.8	0.57
375-85-9	Perfluoroheptanoic acid	3.8		2.7	1.1
375-73-5	Perfluorobutanesulfonic acid	3.1		1.8	0.71

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	91		70-130
STL00996	13C2 PFDA	105		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Sacramento
Job No.: 320-48796-1
SDG No.:
Client Sample ID: C0AS7
Lab Sample ID: 320-48796-5
Matrix: Water
Lab File ID: 2019.04.04_537AA_022.d
Analysis Method: 537 DW
Date Collected: 03/27/2019 12:34
Extraction Method: 537 DW
Date Extracted: 04/02/2019 17:08
Sample wt/vol: 277.1(mL)
Date Analyzed: 04/04/2019 21:51
Con. Extract Vol.: 10.00(mL)
Dilution Factor: 1
Injection Volume: 10(uL)
GC Column: GeminiC18 3x100 ID: 3(mm)
% Moisture:
GPC Cleanup:(Y/N) N
Analysis Batch No.: 286192
Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
1763-23-1	Perfluorooctanesulfonic acid	ND		1.8	0.86
335-67-1	Perfluorooctanoic acid	ND		5.4	2.4
375-95-1	Perfluorononanoic acid	ND		1.8	0.42
355-46-4	Perfluorohexanesulfonic acid	ND		1.8	0.58
375-85-9	Perfluoroheptanoic acid	ND		2.7	1.2
375-73-5	Perfluorobutanesulfonic acid	ND		1.8	0.72

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	98		70-130
STL00996	13C2 PFDA	101		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Sacramento Job No.: 320-48796-1

SDG No.:

Client Sample ID: C0AW2 Lab Sample ID: 320-48796-6

Matrix: Water Lab File ID: 2019.04.04_537AA_023.d

Analysis Method: 537 DW Date Collected: 03/27/2019 09:35

Extraction Method: 537 DW Date Extracted: 04/02/2019 17:08

Sample wt/vol: 283.9(mL) Date Analyzed: 04/04/2019 22:01

Con. Extract Vol.: 10.00(mL) Dilution Factor: 1

Injection Volume: 10(uL) GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 286192 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
1763-23-1	Perfluorooctanesulfonic acid	ND		1.8	0.84
335-67-1	Perfluorooctanoic acid	ND		5.3	2.4
375-95-1	Perfluorononanoic acid	ND		1.8	0.41
355-46-4	Perfluorohexanesulfonic acid	ND		1.8	0.56
375-85-9	Perfluoroheptanoic acid	ND		2.6	1.1
375-73-5	Perfluorobutanesulfonic acid	ND		1.8	0.70

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	94		70-130
STL00996	13C2 PFDA	103		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Sacramento
Job No.: 320-48796-1
SDG No.:
Client Sample ID: C0AW9
Lab Sample ID: 320-48796-7
Matrix: Water
Lab File ID: 2019.04.04_537AA_026.d
Analysis Method: 537 DW
Date Collected: 03/27/2019 11:20
Extraction Method: 537 DW
Date Extracted: 04/02/2019 17:08
Sample wt/vol: 277.8(mL)
Date Analyzed: 04/04/2019 22:29
Con. Extract Vol.: 10.00(mL)
Dilution Factor: 1
Injection Volume: 10(uL)
GC Column: GeminiC18 3x100 ID: 3(mm)
% Moisture:
GPC Cleanup:(Y/N) N
Analysis Batch No.: 286190
Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
1763-23-1	Perfluorooctanesulfonic acid	ND		1.8	0.85
335-67-1	Perfluorooctanoic acid	ND		5.4	2.4
375-95-1	Perfluorononanoic acid	ND		1.8	0.42
355-46-4	Perfluorohexanesulfonic acid	ND		1.8	0.58
375-85-9	Perfluoroheptanoic acid	ND		2.7	1.2
375-73-5	Perfluorobutanesulfonic acid	ND		1.8	0.72

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	98		70-130
STL00996	13C2 PFDA	101		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Sacramento
Job No.: 320-48796-1
SDG No.:
Client Sample ID: C0AX0
Lab Sample ID: 320-48796-8
Matrix: Water
Lab File ID: 2019.04.04_537AA_027.d
Analysis Method: 537 DW
Date Collected: 03/27/2019 11:15
Extraction Method: 537 DW
Date Extracted: 04/02/2019 17:08
Sample wt/vol: 278.2(mL)
Date Analyzed: 04/04/2019 22:39
Con. Extract Vol.: 10.00(mL)
Dilution Factor: 1
Injection Volume: 10(uL)
GC Column: GeminiC18 3x100 ID: 3(mm)
% Moisture:
GPC Cleanup:(Y/N) N
Analysis Batch No.: 286190
Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
1763-23-1	Perfluorooctanesulfonic acid	ND		1.8	0.85
335-67-1	Perfluorooctanoic acid	ND		5.4	2.4
375-95-1	Perfluorononanoic acid	ND		1.8	0.42
355-46-4	Perfluorohexanesulfonic acid	ND		1.8	0.58
375-85-9	Perfluoroheptanoic acid	ND		2.7	1.2
375-73-5	Perfluorobutanesulfonic acid	ND		1.8	0.72

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	102		70-130
STL00996	13C2 PFDA	105		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Sacramento
Job No.: 320-48796-1
SDG No.:
Client Sample ID: C0AX7
Lab Sample ID: 320-48796-9
Matrix: Water
Lab File ID: 2019.04.04_537AA_028.d
Analysis Method: 537 DW
Date Collected: 03/27/2019 16:58
Extraction Method: 537 DW
Date Extracted: 04/02/2019 17:08
Sample wt/vol: 275.4(mL)
Date Analyzed: 04/04/2019 22:48
Con. Extract Vol.: 10.00(mL)
Dilution Factor: 1
Injection Volume: 10(uL)
GC Column: GeminiC18 3x100 ID: 3(mm)
% Moisture:
GPC Cleanup:(Y/N) N
Analysis Batch No.: 286190
Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
1763-23-1	Perfluorooctanesulfonic acid	ND		1.8	0.86
335-67-1	Perfluorooctanoic acid	ND		5.4	2.5
375-95-1	Perfluorononanoic acid	ND		1.8	0.43
355-46-4	Perfluorohexanesulfonic acid	ND		1.8	0.58
375-85-9	Perfluoroheptanoic acid	ND		2.7	1.2
375-73-5	Perfluorobutanesulfonic acid	ND		1.8	0.73

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	100		70-130
STL00996	13C2 PFDA	103		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Sacramento
Job No.: 320-48796-1
SDG No.:
Client Sample ID: C0AX8
Lab Sample ID: 320-48796-10
Matrix: Water
Lab File ID: 2019.04.04_537AA_029.d
Analysis Method: 537 DW
Date Collected: 03/27/2019 12:45
Extraction Method: 537 DW
Date Extracted: 04/02/2019 17:08
Sample wt/vol: 278.4(mL)
Date Analyzed: 04/04/2019 22:58
Con. Extract Vol.: 10.00(mL)
Dilution Factor: 1
Injection Volume: 10(uL)
GC Column: GeminiC18 3x100 ID: 3(mm)
% Moisture:
GPC Cleanup:(Y/N) N
Analysis Batch No.: 286190
Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
1763-23-1	Perfluorooctanesulfonic acid	ND		1.8	0.85
335-67-1	Perfluorooctanoic acid	ND		5.4	2.4
375-95-1	Perfluorononanoic acid	ND		1.8	0.42
355-46-4	Perfluorohexanesulfonic acid	ND		1.8	0.57
375-85-9	Perfluoroheptanoic acid	ND		2.7	1.2
375-73-5	Perfluorobutanesulfonic acid	ND		1.8	0.72

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	99		70-130
STL00996	13C2 PFDA	106		70-130

FORM I

LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Sacramento Job No.: 320-48796-1

SDG No.:

Client Sample ID: C0AY0 Lab Sample ID: 320-48796-11

Matrix: Water Lab File ID: 2019.04.04_537AA_030.d

Analysis Method: 537 DW Date Collected: 03/27/2019 11:15

Extraction Method: 537 DW Date Extracted: 04/02/2019 17:08

Sample wt/vol: 276(mL) Date Analyzed: 04/04/2019 23:07

Con. Extract Vol.: 10.00(mL) Dilution Factor: 1

Injection Volume: 10(uL) GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 286190 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
1763-23-1	Perfluorooctanesulfonic acid	47		1.8	0.86
335-67-1	Perfluorooctanoic acid	63		5.4	2.4
375-95-1	Perfluorononanoic acid	8.1		1.8	0.43
355-46-4	Perfluorohexanesulfonic acid	3.5		1.8	0.58
375-85-9	Perfluoroheptanoic acid	23		2.7	1.2
375-73-5	Perfluorobutanesulfonic acid	51		1.8	0.72

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	88		70-130
STL00996	13C2 PFDA	107		70-130

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
Environmental Sciences Center
701 Mapes Road
Fort Meade, Maryland 20755-5350

DATE: 5/9/2019

SUBJECT: Region III Data QA Review

FROM: Brandon McDonald
Region III ESAT RPO(3EA22)

TO: CONNOR O'LOUGHLIN
Hazardous Site Cleanup Division (HSCD)

Attached is the data validation report for the BLADES GROUNDWATER site for DAS# R35542; SDG# C0AR3 completed by the Region III Environmental Services Assistance Team(ESAT) contractor, ICF International, under the direction of Region III EAID.

If you have any questions regarding this review, please call Brandon McDonald at (410) 305-2607 or you can call Eric Graybill at (410)-305-2665.

Attachment

cc: Ex. 4 CBI

TO: #0002 TDF: #0419031

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ICF
ESAT Region 3
US Environmental Protection Agency Environmental Science Center
701 Mapes Road Ft. Meade, MD 20755-5350
Phone 410-305-3012

Date: May 2, 2019

To: Brandon McDonald
ESAT Region 3 Project Officer

From: Ex. 4 CBI
Validator

Ex. 4 CBI
Reviewer

Subject: Organic Data Validation (S4VM)
Blades Groundwater
R35542 C0AR3

Overview

This data package consisted of five (5) Field Reagent Blanks (FRBs) and five (5) ground water samples analyzed for perfluorinated alkyl acid compounds by Liquid Chromatography/Mass Spectrometry (LC/MS).

Analyses were performed by Eurofins Test America Sacramento (TAMC). The samples were submitted to the laboratory directly by the sampling contractor. The laboratory indicated analyses were performed according to EPA Method 537 utilizing a quantitative isotope dilution-internal standard technique.

Data were validated according to the National Functional Guidelines for Organic Superfund Methods Data Review and applicable USEPA Region 3 modifications. The validation report has been assigned the Superfund Data Validation Label S4VM (Stage_4_Validation_Manual).

The following validation narrative is an evaluation of laboratory reported data based on the electronic data package received by Region 3 on April 10, 2019.

The laboratory did not provide sufficient data to determine if branched chain isomers of PFOA were included in the reporting of this analyte in field samples. No data were qualified based on this finding.

Summary

No significant data quality outliers or technical deficiencies were identified that would require rejection or estimation of sample results.

Notes

Accuracy and precision criteria were met by the laboratory in the initial and continuing calibration verification standard analyses associated with the samples in this Sample Data Group (SDG).

Analytes detected below Reporting Limits (RLs) are estimated and have been qualified "J".

The method blank and FRBs associated with the samples in this SDG were free from contamination. No data were qualified based on blank contamination.

Percent recoveries and Relative Percent Differences (RPDs) for target analytes in Laboratory Control Sample / Laboratory Control Sample Duplicate (LCS/LCSD) analyses were within control limits. No field sample data were qualified based on these findings.

Due to insufficient sample volume received by the laboratory, Matrix Spike/Matrix Spike Duplicate (MS/MSD) analyses were not performed in this SDG. No data were qualified based on these findings.

Concentrations for perfluorooctanoic acid (PFOA) and perfluoroheptanoic acid (PFHpA) exceeded the calibration range in the initial analysis for sample C0AR4. This sample was reanalyzed at a five-fold (5x) dilution in order to quantitate these analytes within the calibration range. Results for these analytes were reported from the dilution. There is no indication that these exceedance issues impacted subsequent sample analyses.

The samples in this SDG were found to be free of residual chlorine at the time of sample preparation by the laboratory. No data were qualified based on this finding.

The samples in this SDG were preserved and reported pH within the optimum range. No data were qualified based on these findings.

Manual integrations were performed and identified by the laboratory. A subset of these were evaluated by the reviewer and were found to be accurate and consistent. No action was taken by the reviewer based on manual integrations.

Glossary of Organic Data Qualifier Codes

Validation Qualifiers	In order of descending precedence. Only one of these qualifiers may apply to any result.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the sample.
UJ	The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit
J	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+	The result is an estimated quantity, but the result may be biased high.
J-	The result is an estimated quantity, but the result may be biased low.

Additional Qualifiers	Additional qualifiers may be combined with other qualifiers.
N	The analyte has been “tentatively identified” or “presumptively” as present.
B	The result is presumed a blank contaminant. This qualifier is used for drinking water samples only.
C	The target Pesticide or Aroclor analyte identification has been confirmed by Gas Chromatography/Mass Spectrometry (GC/MS). This qualifier may be added to other qualifiers.
X	The target Pesticide or Aroclor analyte identification was not confirmed when GC/MS analysis was performed. This qualifier may be added to other qualifiers.

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Sacramento Job No.: 320-48799-1

SDG No.:

Client Sample ID: C0AR3 Lab Sample ID: 320-48799-1

Matrix: Water Lab File ID: 2019.04.04_537AA_047.d

Analysis Method: 537 DW Date Collected: 03/27/2019 09:55

Extraction Method: 537 DW Date Extracted: 04/03/2019 06:57

Sample wt/vol: 285.2(mL) Date Analyzed: 04/05/2019 01:48

Con. Extract Vol.: 10.00(mL) Dilution Factor: 1

Injection Volume: 10(uL) GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 286196 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
1763-23-1	Perfluorooctanesulfonic acid	6.4		1.8	0.83
335-67-1	Perfluorooctanoic acid	9.2		5.3	2.4
375-95-1	Perfluorononanoic acid	1.6	J	1.8	0.41
355-46-4	Perfluorohexanesulfonic acid	ND		1.8	0.56
375-85-9	Perfluoroheptanoic acid	5.9		2.6	1.1
375-73-5	Perfluorobutanesulfonic acid	3.5		1.8	0.70

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	91		70-130
STL00996	13C2 PFDA	105		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Sacramento
Job No.: 320-48799-1
SDG No.:
Client Sample ID: C0AR4
Lab Sample ID: 320-48799-2
Matrix: Water
Lab File ID: 2019.04.04_537AA_048.d
Analysis Method: 537 DW
Date Collected: 03/26/2019 14:00
Extraction Method: 537 DW
Date Extracted: 04/03/2019 06:57
Sample wt/vol: 283.9(mL)
Date Analyzed: 04/05/2019 01:57
Con. Extract Vol.: 10.00(mL)
Dilution Factor: 1
Injection Volume: 10(uL)
GC Column: GeminiC18 3x100 ID: 3(mm)
% Moisture:
GPC Cleanup:(Y/N) N
Analysis Batch No.: 286196
Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
1763-23-1	Perfluorooctanesulfonic acid	190		1.8	0.84
375-95-1	Perfluorononanoic acid	290		1.8	0.41
355-46-4	Perfluorohexanesulfonic acid	2.7		1.8	0.56
375-73-5	Perfluorobutanesulfonic acid	3.2		1.8	0.70

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	87		70-130
STL00996	13C2 PFDA	112		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Sacramento
Job No.: 320-48799-1
SDG No.:
Client Sample ID: C0AR4 DL
Lab Sample ID: 320-48799-2 DL
Matrix: Water
Lab File ID: 2019.04.05_537.1A_009.d
Analysis Method: 537 DW
Date Collected: 03/26/2019 14:00
Extraction Method: 537 DW
Date Extracted: 04/03/2019 06:57
Sample wt/vol: 283.9(mL)
Date Analyzed: 04/05/2019 12:42
Con. Extract Vol.: 10.00(mL)
Dilution Factor: 5
Injection Volume: 10(uL)
GC Column: GeminiC18 3x100 ID: 3(mm)
% Moisture:
GPC Cleanup:(Y/N) N
Analysis Batch No.: 286320
Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
335-67-1	Perfluorooctanoic acid	610		26	12
375-85-9	Perfluoroheptanoic acid	510		13	5.7

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	96		70-130
STL00996	13C2 PFDA	108		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Sacramento
Job No.: 320-48799-1
SDG No.:
Client Sample ID: C0AR6
Lab Sample ID: 320-48799-3
Matrix: Water
Lab File ID: 2019.04.04_537AA_049.d
Analysis Method: 537 DW
Date Collected: 03/26/2019 12:10
Extraction Method: 537 DW
Date Extracted: 04/03/2019 06:57
Sample wt/vol: 280.4(mL)
Date Analyzed: 04/05/2019 02:07
Con. Extract Vol.: 10.00(mL)
Dilution Factor: 1
Injection Volume: 10(uL)
GC Column: GeminiC18 3x100 ID: 3(mm)
% Moisture:
GPC Cleanup:(Y/N) N
Analysis Batch No.: 286196
Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
1763-23-1	Perfluorooctanesulfonic acid	25		1.8	0.85
335-67-1	Perfluorooctanoic acid	39		5.3	2.4
375-95-1	Perfluorononanoic acid	14		1.8	0.42
355-46-4	Perfluorohexanesulfonic acid	1.8		1.8	0.57
375-85-9	Perfluoroheptanoic acid	23		2.7	1.2
375-73-5	Perfluorobutanesulfonic acid	1.0	J	1.8	0.71

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	90		70-130
STL00996	13C2 PFDA	113		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Sacramento
Job No.: 320-48799-1
SDG No.:
Client Sample ID: C0AR7
Lab Sample ID: 320-48799-4
Matrix: Water
Lab File ID: 2019.04.04_537AA_050.d
Analysis Method: 537 DW
Date Collected: 03/26/2019 12:50
Extraction Method: 537 DW
Date Extracted: 04/03/2019 06:57
Sample wt/vol: 283.3(mL)
Date Analyzed: 04/05/2019 02:16
Con. Extract Vol.: 10.00(mL)
Dilution Factor: 1
Injection Volume: 10(uL)
GC Column: GeminiC18 3x100 ID: 3(mm)
% Moisture:
GPC Cleanup:(Y/N) N
Analysis Batch No.: 286196
Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
1763-23-1	Perfluorooctanesulfonic acid	13		1.8	0.84
335-67-1	Perfluorooctanoic acid	13		5.3	2.4
375-95-1	Perfluorononanoic acid	3.9		1.8	0.41
355-46-4	Perfluorohexanesulfonic acid	3.0		1.8	0.56
375-85-9	Perfluoroheptanoic acid	5.5		2.6	1.1
375-73-5	Perfluorobutanesulfonic acid	2.6		1.8	0.71

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	90		70-130
STL00996	13C2 PFDA	111		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Sacramento Job No.: 320-48799-1

SDG No.:

Client Sample ID: C0AS2 Lab Sample ID: 320-48799-5

Matrix: Water Lab File ID: 2019.04.04_537AA_051.d

Analysis Method: 537 DW Date Collected: 03/26/2019 14:50

Extraction Method: 537 DW Date Extracted: 04/03/2019 06:57

Sample wt/vol: 284.2(mL) Date Analyzed: 04/05/2019 02:26

Con. Extract Vol.: 10.00(mL) Dilution Factor: 1

Injection Volume: 10(uL) GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 286196 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
1763-23-1	Perfluorooctanesulfonic acid	34		1.8	0.84
335-67-1	Perfluorooctanoic acid	34		5.3	2.4
375-95-1	Perfluorononanoic acid	9.5		1.8	0.41
355-46-4	Perfluorohexanesulfonic acid	12		1.8	0.56
375-85-9	Perfluoroheptanoic acid	13		2.6	1.1
375-73-5	Perfluorobutanesulfonic acid	11		1.8	0.70

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	89		70-130
STL00996	13C2 PFDA	106		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Sacramento
Job No.: 320-48799-1
SDG No.:
Client Sample ID: C0AW3
Lab Sample ID: 320-48799-6
Matrix: Water
Lab File ID: 2019.04.04_537AA_052.d
Analysis Method: 537 DW
Date Collected: 03/26/2019 12:55
Extraction Method: 537 DW
Date Extracted: 04/03/2019 06:57
Sample wt/vol: 277.9(mL)
Date Analyzed: 04/05/2019 02:35
Con. Extract Vol.: 10.00(mL)
Dilution Factor: 1
Injection Volume: 10(uL)
GC Column: GeminiC18 3x100 ID: 3(mm)
% Moisture:
GPC Cleanup:(Y/N) N
Analysis Batch No.: 286196
Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
1763-23-1	Perfluorooctanesulfonic acid	ND		1.8	0.85
335-67-1	Perfluorooctanoic acid	ND		5.4	2.4
375-95-1	Perfluorononanoic acid	ND		1.8	0.42
355-46-4	Perfluorohexanesulfonic acid	ND		1.8	0.58
375-85-9	Perfluoroheptanoic acid	ND		2.7	1.2
375-73-5	Perfluorobutanesulfonic acid	ND		1.8	0.72

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	93		70-130
STL00996	13C2 PFDA	104		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Sacramento
Job No.: 320-48799-1
SDG No.:
Client Sample ID: C0AW4
Lab Sample ID: 320-48799-7
Matrix: Water
Lab File ID: 2019.04.04_537AA_053.d
Analysis Method: 537 DW
Date Collected: 03/26/2019 12:15
Extraction Method: 537 DW
Date Extracted: 04/03/2019 06:57
Sample wt/vol: 276.6(mL)
Date Analyzed: 04/05/2019 02:45
Con. Extract Vol.: 10.00(mL)
Dilution Factor: 1
Injection Volume: 10(uL)
GC Column: GeminiC18 3x100 ID: 3(mm)
% Moisture:
GPC Cleanup:(Y/N) N
Analysis Batch No.: 286196
Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
1763-23-1	Perfluorooctanesulfonic acid	ND		1.8	0.86
335-67-1	Perfluorooctanoic acid	ND		5.4	2.4
375-95-1	Perfluorononanoic acid	ND		1.8	0.42
355-46-4	Perfluorohexanesulfonic acid	ND		1.8	0.58
375-85-9	Perfluoroheptanoic acid	ND		2.7	1.2
375-73-5	Perfluorobutanesulfonic acid	ND		1.8	0.72

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	98		70-130
STL00996	13C2 PFDA	106		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Sacramento
Job No.: 320-48799-1
SDG No.:
Client Sample ID: C0AW6
Lab Sample ID: 320-48799-8
Matrix: Water
Lab File ID: 2019.04.04_537AA_056.d
Analysis Method: 537 DW
Date Collected: 03/26/2019 14:55
Extraction Method: 537 DW
Date Extracted: 04/03/2019 06:57
Sample wt/vol: 278.4(mL)
Date Analyzed: 04/05/2019 03:13
Con. Extract Vol.: 10.00(mL)
Dilution Factor: 1
Injection Volume: 10(uL)
GC Column: GeminiC18 3x100 ID: 3(mm)
% Moisture:
GPC Cleanup:(Y/N) N
Analysis Batch No.: 286198
Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
1763-23-1	Perfluorooctanesulfonic acid	ND		1.8	0.85
335-67-1	Perfluorooctanoic acid	ND		5.4	2.4
375-95-1	Perfluorononanoic acid	ND		1.8	0.42
355-46-4	Perfluorohexanesulfonic acid	ND		1.8	0.57
375-85-9	Perfluoroheptanoic acid	ND		2.7	1.2
375-73-5	Perfluorobutanesulfonic acid	ND		1.8	0.72

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	95		70-130
STL00996	13C2 PFDA	102		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Sacramento
Job No.: 320-48799-1
SDG No.:
Client Sample ID: C0AW7
Lab Sample ID: 320-48799-9
Matrix: Water
Lab File ID: 2019.04.04_537AA_057.d
Analysis Method: 537 DW
Date Collected: 03/26/2019 14:05
Extraction Method: 537 DW
Date Extracted: 04/03/2019 06:57
Sample wt/vol: 275.1(mL)
Date Analyzed: 04/05/2019 03:23
Con. Extract Vol.: 10.00(mL)
Dilution Factor: 1
Injection Volume: 10(uL)
GC Column: GeminiC18 3x100 ID: 3(mm)
% Moisture:
GPC Cleanup:(Y/N) N
Analysis Batch No.: 286198
Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
1763-23-1	Perfluorooctanesulfonic acid	ND		1.8	0.86
335-67-1	Perfluorooctanoic acid	ND		5.5	2.5
375-95-1	Perfluorononanoic acid	ND		1.8	0.43
355-46-4	Perfluorohexanesulfonic acid	ND		1.8	0.58
375-85-9	Perfluoroheptanoic acid	ND		2.7	1.2
375-73-5	Perfluorobutanesulfonic acid	ND		1.8	0.73

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	93		70-130
STL00996	13C2 PFDA	101		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Sacramento Job No.: 320-48799-1

SDG No.:

Client Sample ID: C0AW8 Lab Sample ID: 320-48799-10

Matrix: Water Lab File ID: 2019.04.04_537AA_058.d

Analysis Method: 537 DW Date Collected: 03/27/2019 10:00

Extraction Method: 537 DW Date Extracted: 04/03/2019 06:57

Sample wt/vol: 277.1(mL) Date Analyzed: 04/05/2019 03:32

Con. Extract Vol.: 10.00(mL) Dilution Factor: 1

Injection Volume: 10(uL) GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 286198 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
1763-23-1	Perfluorooctanesulfonic acid	ND		1.8	0.86
335-67-1	Perfluorooctanoic acid	ND		5.4	2.4
375-95-1	Perfluorononanoic acid	ND		1.8	0.42
355-46-4	Perfluorohexanesulfonic acid	ND		1.8	0.58
375-85-9	Perfluoroheptanoic acid	ND		2.7	1.2
375-73-5	Perfluorobutanesulfonic acid	ND		1.8	0.72

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	86		70-130
STL00996	13C2 PFDA	105		70-130