From:	Jones, Katrina
To:	R4_SEMS_Records
Subject:	FW: TT-01-116_American Zinc Products Emergency Response Letter Report - FINAL TO EPA
Date:	Monday, October 7, 2019 2:38:10 PM
Attachments:	TT-01-116_AZP Fire_ER Ltr Report_100719_FINAL TO EPA.pdf

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From: Prys, Paul <Paul.Prys@tetratech.com>
Sent: Monday, October 7, 2019 2:15 PM
To: Rhame, Kenneth <Rhame.Kenneth@epa.gov>
Cc: Jones, Katrina <Jones.Katrina@epa.gov>; Andrew Johnson <andy.johnson@tetratech.com>; chris.jones@tetratech.com; Reed, Angel <Angel.Reed@tetratech.com>
Subject: TT-01-116_American Zinc Products Emergency Response Letter Report - FINAL TO EPA

Mr. Rhame,

The Tetra Tech, Inc. (Tetra Tech) Superfund Technical Assessment and Response Team (START) is submitting the final emergency response letter report for the American Zinc Products site (TDD No. TT-01-116) in Mooresboro, Rutherford County, North Carolina. This submission of the final report contains the report figures, summary data tables, photographic log, logbook notes, the Stage 2A data validation report, and the laboratory data package. Please review the report at your earliest convenience and we look forward to your comments.

Please contact me at 678-775-3106 if you have any questions. Thank you for allowing us to assist you on this project and we will look forward to assisting you in the future.

Paul Prys | Senior Environmental Scientist/Project Manager
Direct: 678.775.3106 | Cell: 404.849.7136 | Fax: 678.775.3138
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October 7, 2019

Mr. Ken Rhame
On-Scene Coordinator
U.S. Environmental Protection Agency, Region 4
61 Forsyth Street, SW
Atlanta, Georgia 30303

Subject: **Emergency Response Letter Report**
American Zinc Products Fire
Mooresboro, Rutherford County, North Carolina
Contract Number: EP-S4-14-03
TDD Number: TT-01-116

Dear Mr. Rhame:

The Tetra Tech, Inc. (Tetra Tech) Superfund Technical Assessment and Response Team (START) submits this report summarizing the emergency response activities conducted from April 29 to April 30, 2019 at the American Zinc Products Fire in Mooresboro, Rutherford County, North Carolina. This report includes five enclosures and one attachment. Enclosure 1 contains figures illustrating the site location, site layout, and air monitoring and surface water sample locations. Enclosure 2 contains mobile and VIPER air monitoring summary tables and surface water sample summary tables. Enclosure 3 contains a photographic log of the response activities. Enclosure 4 contains a copy of the START logbook notes. Enclosure 5 contains the Tetra Tech Stage 2A data validation report. Attachment 1 contains the laboratory analytical data package.

BACKGROUND

On April 28, 2019, at 2059 hours, Ms. Aili Spearman of American Zinc Products (AZP) reported an industrial fire to the National Response Center (NRC) (Incident Report Nos. 1244000 and 1244002). Local firefighters responded to a facility fire at the AZP site located at 484 Hicks Grove Road in Mooresboro, Rutherford County, North Carolina (see Figure 1 in Enclosure 1). The geographic coordinates of the site are latitude 35.1916330 degrees north and longitude 81.8488390 degrees west. Woodland areas are located directly north, east, and west of the site, with the Broad River located directly north of the site. A residential neighborhood is located to the northeast of the site. A church, residential neighborhoods, and commercial businesses are located to the south and southwest of the site. See Figure 2 in Enclosure 1 for the site layout.

The AZP site produces zinc metal, lead-silver concentrate, and other co-products using solvent extraction, Electrowinning, and novel brine-leach/precipitation technologies. On April 28, 2019, at approximately 1930 hours, a fire started at a tank outside of the "Cell House." The tank reportedly contained approximately 4,700 gallons of solution containing sulfuric acid, manganese, and dissolved zinc with electrolytes. The fire spread into the "Cell House" with a 600,000 gallon basement containing lead anodes and an electrolyte solution composed of 17 percent (%) sulfuric acid, 5% zinc, and 0.17% manganese. During firefighting activities, Rutherford County Emergency Management (RCEM) advised an evacuation of the residences within a half-mile of the site due to concerns regarding smoke and air

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emission from the site. Also, portions of Highway 221 in North Carolina and South Carolina were closed.

Firefighters used approximately three million gallons of fire suppression water extinguishing the fire. Runoff from firefighting activities was briefly contained in a stormwater retention pond located north of the facility. Although the stormwater discharge valve was closed, responders from the North Carolina Department of Environmental Quality (NC DEQ) Water Resources observed a seep at the stormwater discharge point. NC DEQ determined the seeping water entering the Broad River was pH 1.8.

RESPONSE ACTIVITIES - AIR MONITORING

Late on the evening of April 28, 2019, EPA mobilized START personnel to assist with emergency response activities. START arrived on site at approximately 0550 hours on April 29. START met with the Unified Command (UC), comprised of U.S. Environmental Protection Agency (EPA) On-Scene Coordinator (OSC) Ken Rhame, NC DEQ, RCEM, and AZP personnel, at Floyd's Creek Baptist Church (FCBC) in Forest City, North Carolina. The UC discussed the details of the fire and actions being taken to manage the response. During the meeting, EPA tasked START to conduct mobile air monitoring in the neighborhoods downwind of the facility. Upon arrival at the facility, START observed visible flames and a plume of smoke from the fire in the southern and southwestern neighborhoods, while the local fire department continued to control and extinguish the fire.

On April 29, 2019, from 0700 hours to 1010 hours, START conducted mobile air monitoring in the southern and southwestern neighborhoods at seven locations (see Figure 3 in Enclosure 1). START monitored airborne concentrations of volatile organic compounds (VOCs), hydrogen sulfide (H_2S), carbon monoxide (CO), oxygen (O_2), and the lower explosive limit (LEL) using a RAE Systems MultiRAE Pro photoionization detector (PID) and sulfuric acid (H_2SO_4) concentrations using a Honeywell Single Point Monitor Flex Chemcassette Tape-Based Gas Detector (SPM Flex) (see Table 1 in Enclosure 2). Mobile air monitoring was conducted at the following locations (see Figure 3 in Enclosure 1):

- Northern side of Hicks Grove Baptist Church
- Home No. 7 on Providence Farm Drive
- 716 Hicks Grove Road
- The corner of Ford Road and Hicks Grove Road on the South Carolina Border
- The railroad crossing of the Hicks Grove Road Extension
- 227 Hicks Grove Road Extension
- The corner of Hicks Grove Road and Hick Grove Road Extension

On April 29, 2019, at 0930 hours, START conducted additional mobile air monitoring in the northeastern neighborhood at four locations . START monitored airborne concentrations of VOCs, H_2S, CO, O_2, and LEL using a MultiRAE Pro PID and H_2SO_4 concentrations using a SPM Flex (see Table 1 in Enclosure 2). Mobile air monitoring was conducted at the following locations (see Figure 3 in Enclosure 1):

- 150 South River Road
- 221 South River Road
- South River Road facility gate
- 127 Craig Road

START returned to FCBC to discuss air monitoring results with EPA. EPA informed START that AZP contracted the Center for Toxicology & Environmental Health, LLC (CTEH) to conduct air monitoring on site and around the community. EPA and START spoke with CTEH concerning their planned air monitoring activities and provided them with a list of previously-monitored, mobile air monitoring locations.

On April 29, 2019, at 1900 hours through April 30, 2019, at 0730 hours, EPA and START conducted stationary air monitoring at the fire department located on the western side of AZP adjacent to the facility entrance (see Figure 3 in Enclosure 1). START monitored airborne concentrations of VOCs, H_2S, O_2, LEL, and sulfur dioxide (SO_2) using a RAE Systems AreaRAE Steel PID and H_2SO_4 concentrations using a SPM Flex (see Table 2 in Enclosure 2).

On April 29, 2019, at 2000 hours through April 30, 2019, at 0100 hours, EPA continued mobile air monitoring in the northeastern, southern, and southwestern locations to assess potential changes to air quality during the night temperature inversion. EPA reduced monitoring in the northeastern residential area to the 150 South River Road and the South River Road facility gate locations due to the lack of smoke drift in the area. EPA monitored for VOCs, H_2S, O_2, LEL, and sulfur dioxide (SO_2) using a RAE Systems AreaRAE Steel PID and H_2SO_4 concentrations using a SPM Flex (see Table 1 in Enclosure 2). EPA tasked START to replace the CO sensor with the SO_2 sensor prior to beginning monitoring activities. After 2135 hours on April 29, 2019, EPA discontinued monitoring SO_2 levels as the SO_2 sensor appeared to be faulty.

START compared the mobile and stationary ambient air quality readings for VOCs, CO, SO_2, H_2S, and H_2SO_4 to the EPA Acute Exposure Guideline Levels (AEGL), Table 3 – Chemical Plant (Fire), Level 1 (AEGL-1), 1-Hour, action levels, 2012. The AEGLs are used when there are accidental releases of chemicals into the air, expressed as specific concentrations of airborne chemicals at which health effects may occur, and are designed to protect the elderly and children, and any other individuals who may be susceptible to exposure. Level 1 refers to the airborne concentration of a substance above which it is predicted that the general population, including susceptible individuals, could experience notable discomfort, irritation, or certain asymptomatic non-sensory effects; however, the effects are not disabling and are transient and reversible upon cessation of exposure. Results of the mobile and stationary air monitoring indicated the following:

- Mobile air monitoring results for H_2SO_4 collected at the Hicks Grove Baptist Church on April 29, 2019, at 0700 hours, exceeded the AEGL for that period, but remained below the AEGL for the period average.
- The stationary air monitoring results for H_2SO_4 collected on April 29, 2019, from 2015 to 2040 hours, exceeded the AEGL, but remained below the AEGL for the period average.
- The stationary air monitoring results for SO_2 collected from April 29 through April 30, 2019, exceeded the AEGL period average.
- Mobile and stationary air monitoring results for CO, VOCs, and H_2S were below the AEGL.

START compared the mobile and stationary ambient air quality readings for O_2 and LEL to the U.S. Department of Labor (DOL), Occupational Safety and Health Administration (OSHA), 29 Code of Federal Regulation (CFR), 1910.146, Permit-required Confined Spaces (29 CFR 1910.146). Results of the mobile and stationary air monitoring for O_2 and LEL met the requirements of 29 CFR 1910.146.

See Tables 1 and 2 in Enclosure 2 for a summary of air monitoring results.

RESPONSE ACTIVITIES – SURFACE WATER SAMPLING

On April 29, 2019, EPA tasked START with collecting surface water samples from the Broad River and the stormwater retention pond located at the northern side of the AZP facility (see Figure 4 in Enclosure 1). START collected four surface water samples and three quality assurance/quality control samples from the following locations:

- Sample AZP-SW-01-042919, including the matrix spike and matrix spike duplicate, was collected approximately 50 feet upstream from the Broad River and site outfall mixture point.
- Sample AZP-SW-02-042919 was collected approximately 50 feet downstream from the Broad River and site outfall mixture point.
- Sample AZP-SW-03-042919 and duplicate sample AZP-SW-03-042919-DUP were collected at the Broad River and site outfall mixture point.
- Sample AZP-SW-04-042919 was collected from the site outfall discharge point within the stormwater retention pond.

Surface water sampling was conducted in accordance with EPA Region 4 Science and Ecosystem Support Division (SESD) Operating Procedure, SESDPROC-201-R4, Surface Water Sampling, dated December 16, 2016.

On April 30, 2019, START delivered the surface water samples to Analytical Environmental Services, Inc. (AES) located in Atlanta, Georgia, for analysis of pH and target analyte list (TAL) metals. Laboratory analytical results indicated the pH levels ranged from 7.09 to 7.44 and the following TAL metals were detected: aluminum, antimony, barium, cadmium, calcium, chromium, cobalt, copper, iron, lead, magnesium, manganese, nickel, potassium, selenium, silver, sodium, thallium, vanadium, and zinc. Analytical results were provided to NC DEQ Water Resources for further evaluation at the request of EPA.

DEMOBILIZATION

On April 30, 2019, EPA and CTEH presented air monitoring data to the UC showing air quality throughout the community had returned to background levels. After the data was reviewed by State of North Carolina and local health departments, RCEM lifted the residential evacuation. CTEH indicated they would continue air monitoring throughout the cleanup process. EPA turned over the remaining cleanup activities to NC DEQ. EPA and START demobilized from the site.

If you have any questions or need additional copies of this report, please call me at (678) 775-3081.

Sincerely,

Paul E. Prys II
START IV Project Manager

Andrew F. Johnson
START IV Program Manager

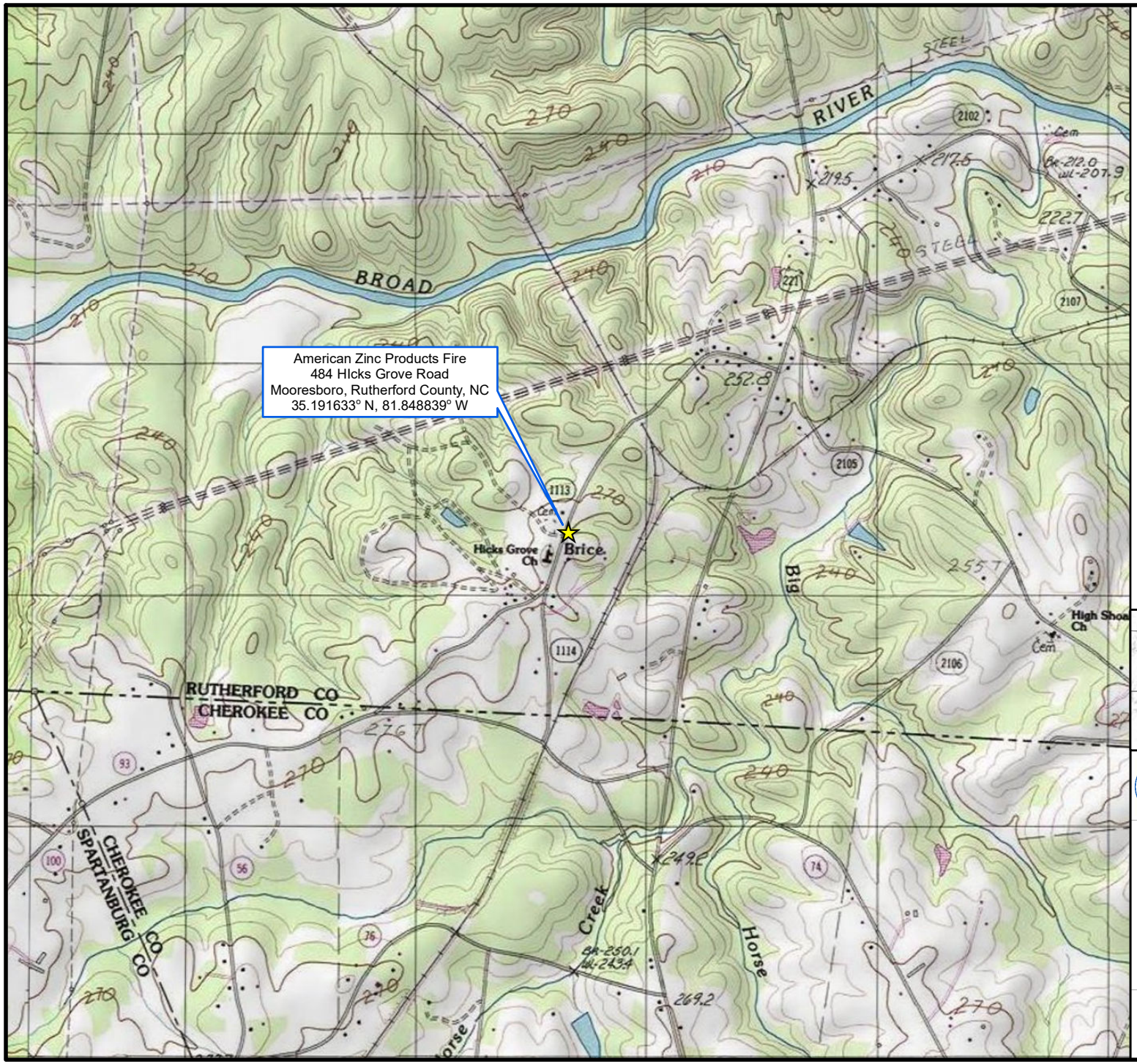
Enclosures (5)

cc: Katrina Jones, EPA Project Officer
Angel Reed, START IV Document Control Coordinator

ENCLOSURE 1

FIGURES

(Four Pages)



Legend

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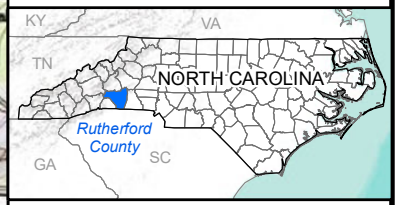
Feet

Map Sources:
USGS Topographic Quadrangle,
Chesnee, NC 1983.



United States
Environmental Protection Agency
Region 4

FIGURE 1

Site Location

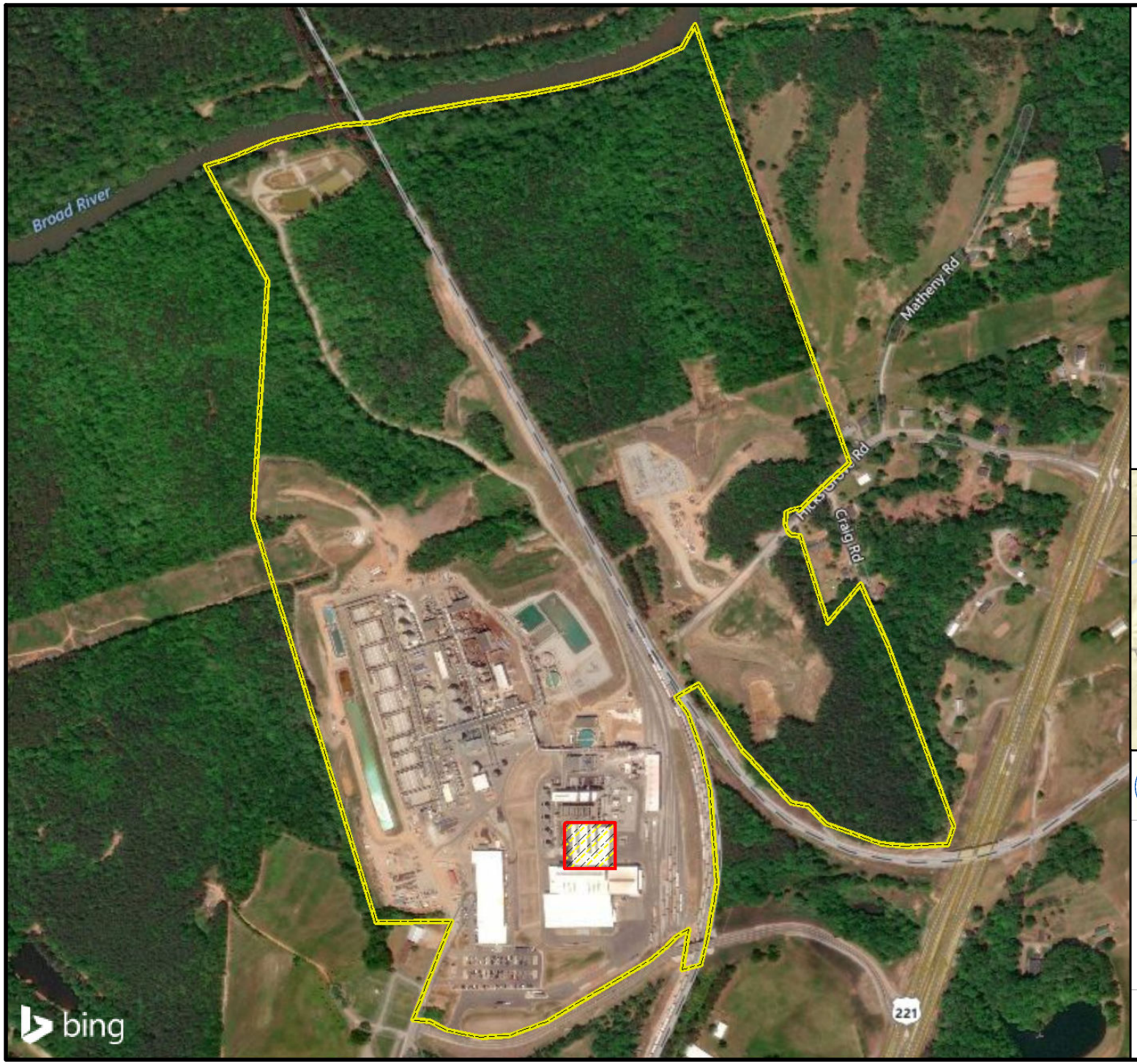
TDD Name: American Zinc Products Fire
TDD No.: TT-01-116

City:	County:	State:
Mooresboro	Rutherford	North Carolina

TETRA TECH

Date: 5/31/2019
Analyst: dale.vonbusch

File: C:\TT-01-116_American_Zinc_Products\mxd\site_location.mxd



Legend

- Extent of the facility that caught fire
- Site Boundary

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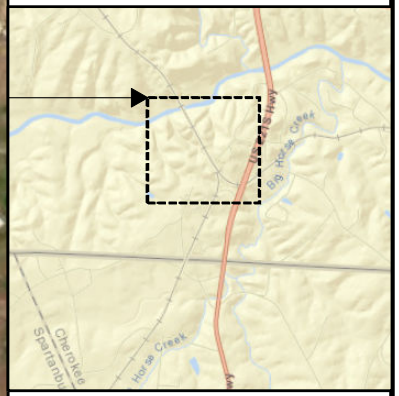
Feet

Map Sources:
USGS Topographic Quadrangle, Chesnee, NC 1983.



United States Environmental Protection Agency Region 4

FIGURE 2

Site Layout

TDD Name: American Zinc Products Fire
TDD No.: TT-01-116

City:	County:	State:
Mooresboro	Rutherford	North Carolina

TETRA TECH

Date: 6/5/2019
Analyst: dale.vonbusch

File: C:\TT-01-116_American_Zinc_Products\mxd\site_layout.mxd

Legend

- Mobile Air Monitoring Location
- Stationary Air Monitoring Location
- Extent of the facility that caught fire
- Site Boundary *(partially shown)*

N
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0 500 1,000
Feet

Map Sources:
USGS Topographic Quadrangle,
Chesnee, NC 1983.

United States Environmental Protection Agency Region 4

FIGURE 3

Air Monitoring Locations

TDD Name: American Zinc Products Fire
TDD No.: TT-01-116

City:	County:	State:
Mooresboro	Rutherford	North Carolina

TETRA TECH

Date: 6/5/2019
Analyst: dale.vonbusch

File: C:\TT-01-116_American_Zinc_Products\mxd\air_monitoring_locations.mxd

Legend

W Surface Water Sample

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Feet

Map Sources:
ESRI World Imagery, 2015.

United States
Environmental Protection Agency
Region 4

FIGURE 4

Surface Water Sample Locations

TDD Name: American Zinc Products Fire
TDD No.: TT-01-116

City:	County:	State:
Mooresboro	Rutherford	North Carolina

TETRA TECH

Date: 5/31/2019
Analyst: dale.vonbusch

File: C:\TT-01-116_American_Zinc_Products\mxd\surface_water_locations.mxd

ENCLOSURE 2

TABLES

(Five Pages)

TABLE 1
MOBILE AIR MONITORING SUMMARY TABLE
AMERICAN ZINC PRODUCTS FIRE
MOORESBORO, RUTHERFORD COUNTY, NORTH CAROLINA

Hicks Grove Baptist Church							
Instrument	Analyte	Period Average Exceedances	Number of Readings	Number of Detections	Concentration Range	Period Average	Action Level (AEGL-1/OSHA)
MultiRAE Pro / AreaRAE Steel	VOC	No	6	0	0 ppm	0 ppm	1 ppm[a]
	CO	No	2	0	0 ppm	0 ppm	83 ppm[a]
	H_2S	No	6	0	0 ppm	0 ppm	0.51 ppm[a]
	O_2	No	6	0	20.9%	20.9%	<19.5 or >23%[b]
	LEL	No	6	0	0%	0%	10%[b]
SPM Flex	Sulfuric Acid	No	6	3	0 - 58 ppb	12.3 ppb	50 ppb[a]

Providence Farm Drive (Home No. 7)							
Instrument	Analyte	Period Average Exceedances	Number of Readings	Number of Detections	Concentration Range	Period Average	Action Level (AEGL-1/OSHA)
MultiRAE Pro / AreaRAE Steel	VOC	No	6	0	0 ppm	0 ppm	1 ppm[a]
	CO	No	2	0	0 ppm	0 ppm	83 ppm[a]
	H_2S	No	6	0	0 ppm	0 ppm	0.51 ppm[a]
	O_2	No	6	0	20.9%	20.9%	<19.5 or >23%[b]
	LEL	No	6	0	0%	0%	10%[b]
SPM Flex	Sulfuric Acid	No	6	2	0 - 36 ppb	7 ppb	50 ppb[a]

716 Hicks Grove Road							
Instrument	Analyte	Period Average Exceedances	Number of Readings	Number of Detections	Concentration Range	Period Average	Action Level (AEGL-1/OSHA)
MultiRAE Pro / AreaRAE Steel	VOC	No	6	0	0 ppm	0 ppm	1 ppm[a]
	CO	No	2	0	0 ppm	0 ppm	83 ppm[a]
	H_2S	No	6	0	0 ppm	0 ppm	0.51 ppm[a]
	O_2	No	6	0	20.9%	20.9%	<19.5 or >23%[b]
	LEL	No	6	0	0%	0%	10%[b]
SPM Flex	Sulfuric Acid	No	6	1	0 - 26 ppb	4.3 ppb	50 ppb[a]

Corner of Island Ford Road & Hicks Grove Road (South Carolina Border)							
Instrument	Analyte	Period Average Exceedances	Number of Readings	Number of Detections	Concentration Range	Period Average	Action Level (AEGL-1/OSHA)
MultiRAE Pro / AreaRAE Steel	VOC	No	6	0	0 ppm	0 ppm	1 ppm[a]
	CO	No	2	0	0 ppm	0 ppm	83 ppm[a]
	H_2S	No	6	0	0 ppm	0 ppm	0.51 ppm[a]
	O_2	No	6	0	20.9%	20.9%	<19.5 or >23%[b]
	LEL	No	6	0	0%	0%	10%[b]
SPM Flex	Sulfuric Acid	No	6	2	0 - 6 ppb	1.8 ppb	50 ppb[a]

Rail Crossing at Hicks Grove Road Extension							
Instrument	Analyte	Period Average Exceedances	Number of Readings	Number of Detections	Concentration Range	Period Average	Action Level (AEGL-1/OSHA)
MultiRAE Pro / AreaRAE Steel	VOC	No	6	0	0 ppm	0 ppm	1 ppm[a]
	CO	No	2	0	0 ppm	0 ppm	83 ppm[a]
	H_2S	No	6	0	0 ppm	0 ppm	0.51 ppm[a]
	O_2	No	6	0	20.9%	20.9%	<19.5 or >23%[b]
	LEL	No	6	0	0%	0%	10%[b]
SPM Flex	Sulfuric Acid	No	6	1	0 - 5 ppb	0.8 ppb	50 ppb[a]

TABLE 1
MOBILE AIR MONITORING SUMMARY TABLE
AMERICAN ZINC PRODUCTS FIRE
MOORESBORO, RUTHERFORD COUNTY, NORTH CAROLINA

227 Hicks Grove Road Extention							
Instrument	Analyte	Period Average Exceedances	Number of Readings	Number of Detections	Concentration Range	Period Average	Action Level (AEGL-1/OSHA)
MultiRAE Pro / AreaRAE Steel	VOC	No	6	0	0 ppm	0 ppm	1 ppm[a]
	CO	No	2	0	0 ppm	0 ppm	83 ppm[a]
	H_2S	No	6	0	0 ppm	0 ppm	0.51 ppm[a]
	O_2	No	6	0	20.9%	20.9%	<19.5 or >23%[b]
	LEL	No	6	0	0%	0%	10%[b]
SPM Flex	Sulfuric Acid	No	6	0	0 ppb	0 ppb	50 ppb[a]

Corner of Hicks Grove Road & Hicks Grove Road Extension							
Instrument	Analyte	Period Average Exceedances	Number of Readings	Number of Detections	Concentration Range	Period Average	Action Level (AEGL-1/OSHA)
MultiRAE Pro / AreaRAE Steel	VOC	No	6	0	0 ppm	0 ppm	1 ppm[a]
	CO	No	2	0	0 ppm	0 ppm	83 ppm[a]
	H_2S	No	6	0	0 ppm	0 ppm	0.51 ppm[a]
	O_2	No	6	0	20.9%	20.9%	<19.5 or >23%[b]
	LEL	No	6	0	0%	0%	10%[b]
SPM Flex	Sulfuric Acid	No	6	3	0 - 34 ppb	7.3 ppb	50 ppb[a]

150 South River Road							
Instrument	Analyte	Period Average Exceedances	Number of Readings	Number of Detections	Concentration Range	Period Average	Action Level (AEGL-1/OSHA)
MultiRAE Pro / AreaRAE Steel	VOC	No	5	0	0 ppm	0 ppm	1 ppm[a]
	CO	No	1	0	0 ppm	0 ppm	83 ppm[a]
	H_2S	No	5	0	0 ppm	0 ppm	0.51 ppm[a]
	O_2	No	5	0	20.9%	20.9%	<19.5 or >23%[b]
	LEL	No	5	0	0%	0%	10%[b]
SPM Flex	Sulfuric Acid	No	5	0	0 ppb	0 ppb	50 ppb[a]

221 South River Road							
Instrument	Analyte	Period Average Exceedances	Number of Readings	Number of Detections	Concentration Range	Period Average	Action Level (AEGL-1/OSHA)
MultiRAE Pro / AreaRAE Steel	VOC	No	1	0	0 ppm	0 ppm	1 ppm[a]
	CO	No	1	0	0 ppm	0 ppm	83 ppm[a]
	H_2S	No	1	0	0 ppm	0 ppm	0.51 ppm[a]
	O_2	No	1	0	20.9%	20.9%	<19.5 or >23%[b]
	LEL	No	1	0	0%	0%	10%[b]
SPM Flex	Sulfuric Acid	No	1	0	0 ppb	0 ppb	50 ppb[a]

South River Road Facility Gate							
Instrument	Analyte	Period Average Exceedances	Number of Readings	Number of Detections	Concentration Range	Period Average	Action Level (AEGL-1/OSHA)
MultiRAE Pro / AreaRAE Steel	VOC	No	5	0	0 ppm	0 ppm	1 ppm[a]
	CO	No	1	0	0 ppm	0 ppm	83 ppm[a]
	H_2S	No	5	0	0 ppm	0 ppm	0.51 ppm[a]
	O_2	No	5	0	20.9%	20.9%	<19.5 or >23%[b]
	LEL	No	5	0	0%	0%	10%[b]
SPM Flex	Sulfuric Acid	No	5	3	0 - 10 ppb	4.2 ppb	50 ppb[a]

TABLE 1
MOBILE AIR MONITORING SUMMARY TABLE
AMERICAN ZINC PRODUCTS FIRE
MOORESBORO, RUTHERFORD COUNTY, NORTH CAROLINA

127 Craig Road							
Instrument	**Analyte**	**Period Average Exceedances**	**Number of Readings**	**Number of Detections**	**Concentration Range**	**Period Average**	**Action Level (AEGL-1/OSHA)**
MultiRAE Pro / AreaRAE Steel	VOC	No	1	0	0 ppm	0 ppm	1 ppm[a]
	CO	No	1	0	0 ppm	0 ppm	83 ppm[a]
	H_2S	No	1	0	0 ppm	0 ppm	0.51 ppm[a]
	O_2	No	1	0	20.9%	20.9%	<19.5 or >23%[b]
	LEL	No	1	0	0%	0%	10%[b]
SPM Flex	Sulfuric Acid	No	1	0	0 ppb	0 ppb	50 ppb[a]

Notes:

[a]: U.S. Environmental Protection Agency, Acute Exposure Guideline Levels, Table 3 - Chemical Plant (Fire), Level 1, 1-Hour, dated 2012
[b]: U.S. Occupational Safety and Health Adminstrations, 29 CFR 1910.146, Permit-required Confined Spaces
<: Less than
>: Greater than
%: Percent
ACGIH: American Conference of Governmental Industrial Hygienists
AEGL: Acute Exposure Guideline Levels
CO: Carbon monoxide
CFR: Code of Federal Regulation
H_2S: Hydrogen sulfide
LEL: Lower explosive limit
O_2: Oxygen
OSHA: Occupational Safety and Health Administration
ppb: Parts per billion
ppm: Parts per million
SPM: Single Point Monitor
VOC: Volatile organic compounds

TABLE 2
STATIONARY AIR MONITORING SUMMARY TABLE
AMERICAN ZINC PRODUCTS FIRE
MOORESBORO, RUTHERFORD COUNTY, NORTH CAROLINA

Fire Station Adjacent to American Zinc Products Entrance							
Instrument	**Analyte**	**Period Average Exceedances**	**Number of Readings**	**Number of Detections**	**Concentration Range**	**Period Average**	**Action Level (AEGL-1/OSHA)**
AreaRAE	VOC	No	770	549	0 - 0.5 ppm	0.17 ppm	1 ppm[a]
	SO_2	No	770	768	0 - 6.9 ppm	1.77 ppm	20 ppm[a]
	H_2S	No	770	17	0 - 0.2 ppm	0.002 ppm	0.5 ppm[a]
	O_2	No	770	0	20.9%	20.9%	<19.5 or >23%[b]
	LEL	No	770	0	0%	0%	10%[b]
SPM Flex	Sulfuric Acid	No	7876	6307	0 - 89 ppb	24.3 ppb	50 ppb[a]

Notes:

[a]: U.S. Environmental Protection Agency, Acute Exposure Guideline Levels, Table 3 - Chemical Plant (Fire), Level 1, 1-Hour, dated 2012
[b]: U.S. Occupational Safety and Health Adminstrations, 29 CFR 1910.146, Permit-required Confined Spaces
<: Less than
>: Greater than
%: Percent
ACGIH: American Conference of Governmental Industrial Hygienists
AEGL: Acute Exposure Guideline Levels
H_2S: Hydrogen sulfide
LEL: Lower explosive limit
O_2: Oxygen
OSHA: Occupational Safety and Health Administration
ppb: Parts per billion
ppm: Parts per million
SO_2: Sulfur dioxide
SPM: Single Point Monitor
VOC: Volatile organic compounds

TABLE 3
ANALYTICAL RESULTS FOR SURFACE WATER SAMPLES
AMERICAN ZINC PRODUCTS FIRE
MOORESBORO, RUTHERFORD COUNTY, NORTH CAROLINA

Analyte	AZP-SW-01-042919	AZP-SW-02-042919	AZP-SW-03-042919	AZP-SW-03-042919-DUP	AZP-SW-04-042919
	Broad River - Upstream	Broad River - Downstream	Outfall and Broad River Mixture Point	Outfall and Broad River Mixture Point	Stormwater Basin Outfall
pH					
pH	**7.35 J**	**7.41 J**	**7.42 J**	**7.44 J**	**7.09 J**
Metals (mg/L)					
Aluminum	**0.439**	**0.597**	**0.482**	**0.528**	**1.24**
Antimony	0.0200 U	0.0200 U	0.0200 U	0.0200 U	**0.111**
Barium	**0.0164 J**	**0.0175 J**	**0.0168 J**	**0.0167 J**	**0.0060 J**
Cadmium	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0808
Calcium	**2.62**	**2.71**	**2.72**	**2.60**	**84.5**
Chromium	0.0100 U	0.0100 U	0.0100 U	0.0100 U	0.0104
Cobalt	0.0200 U	0.0200 U	0.0200 U	0.0200 U	0.0301
Copper	0.0100 U	0.0100 U	0.0100 U	0.0100 U	**0.417**
Iron	**0.467**	**0.612**	**0.495**	**0.553**	**1.31**
Lead	0.0100 U	0.0100 U	0.0100 U	0.0100 U	**0.0246**
Magnesium	**1.11**	**1.16**	**1.15**	**1.12**	**6.87**
Manganese	**0.0226**	**0.0270**	**0.0230**	**0.0232**	**105**
Nickel	0.0200 U	0.0200 U	**0.0062 J**	0.0200 U	**0.138**
Potassium	**0.959**	**1.00**	**0.984**	**0.938**	**23.4**
Selenium	0.0200 U	0.0200 U	0.0200 U	0.0200 U	**0.0186 J**
Silver	0.0100 U	0.0100 U	0.0100 U	0.0100 U	**0.0085 J**
Sodium	**2.05**	**2.11**	**2.11**	**2.00**	**6500**
Thallium	0.0200 U	0.0200 U	0.0200 U	0.0200 U	**0.0104 J**
Vanadium	0.0100 U	0.0100 U	0.0100 U	0.0100 U	**0.0275**
Zinc	0.0200 U	0.0200 U	0.0200 U	0.0200 U	**247**

Notes:

Bold: Indicates analyte was positively identified at the associated value.
AZP: American Zinc Products
DUP: Duplicate sample
EPA: Enviromental Protection Agency
J: The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.
mg/L: Milligrams per liter
SW: Surface water sample
U: The analyte was not detected at or above the associated value reporting limit (RL)

ENCLOSURE 3

PHOTOGRAPHIC LOG OF RESPONSE ACTIVITIES

(Six Pages)

OFFICIAL PHOTOGRAPH NO. 1
U.S. ENVIRONMENTAL PROTECTION AGENCY

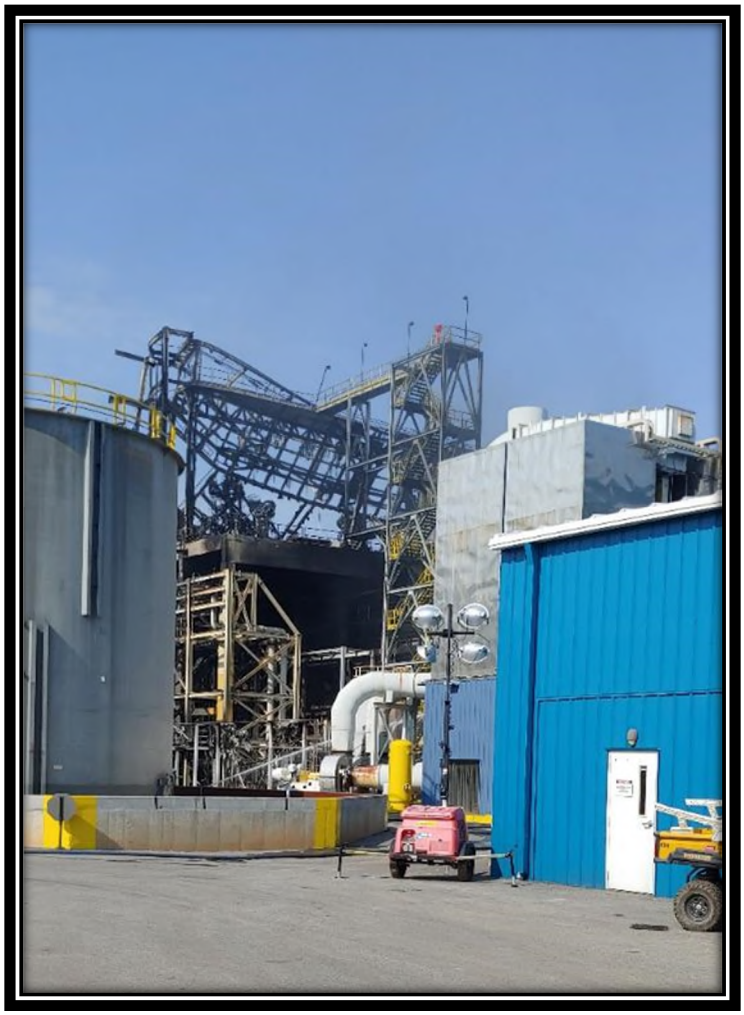
TDD Number:	TT-01-116	**Location:**	American Zinc Products Fire
Orientation:	East	**Date:**	April 29, 2019
Photographer:	Paul Prys, Tetra Tech, Inc. (Tetra Tech)	**Witness:**	Adam Acker, Tetra Tech

Subject: On April 28, 2019, U.S. Environmental Protection Agency (EPA), Region 4 and Superfund Technical Assessment and Response Team (START) personnel responded to American Zinc Products (AZP) facility fire, located at 484 Hicks Grove Road, Mooresboro, Rutherford County, North Carolina.

OFFICIAL PHOTOGRAPH NO. 2
U.S. ENVIRONMENTAL PROTECTION AGENCY

TDD Number:	TT-01-116	**Location:**	American Zinc Products Fire
Orientation:	Northwest	**Date:**	April 29, 2019
Photographer:	Adam Acker, Tetra Tech	**Witness:**	Paul Prys, Tetra Tech

Subject: Local firefighters used approximately three million gallons of water to conduct fire suppression activities.



OFFICIAL PHOTOGRAPH NO. 3
U.S. ENVIRONMENTAL PROTECTION AGENCY

TDD Number:	TT-01-116	**Location:**	American Zinc Products Fire
Orientation:	Northeast	**Date:**	April 29, 2019
Photographer:	Paul Prys, Tetra Tech	**Witness:**	Adam Acker, Tetra Tech

Subject: By the afternoon of April 29, 2019, firefighters extinguished most of the fire and continued to address the small smoldering fires remaining inside of the facility.

OFFICIAL PHOTOGRAPH NO. 4
U.S. ENVIRONMENTAL PROTECTION AGENCY

TDD Number:	TT-01-116	**Location:**	American Zinc Products Fire
Orientation:	Southwest	**Date:**	April 29, 2019
Photographer:	Paul Prys, Tetra Tech	**Witness:**	Adam Acker, Tetra Tech

Subject: Tetra Tech START conducted mobile air monitoring at eleven residential locations upwind and downwind of the site. Tetra Tech START monitored airborne concentrations of volatile organic compounds (VOCs), hydrogen sulfide (H_2S), carbon monoxide (CO), oxygen (O_2), and the lower explosive limit (LEL) using a RAE Systems MultiRAE Pro photoionization detector (PID) and sulfuric acid (H_2SO_4) concentrations using a Honeywell Single Point Monitor (SPM) Flex Chemcassette Tape-Based Gas Detector.

OFFICIAL PHOTOGRAPH NO. 5
U.S. ENVIRONMENTAL PROTECTION AGENCY

TDD Number:	TT-01-116	**Location:**	American Zinc Products Fire
Orientation:	Northeast	**Date:**	April 29, 2019
Photographer:	Kevin Eichinger, EPA	**Witness:**	Paul Prys, Tetra Tech

Subject: From the evening of April 29 to the early morning of April 30, 2019, EPA and Tetra Tech START conducted stationary air monitoring at the fire station adjacent to and downwind of the AZP facility. EPA and Tetra Tech START monitored airborne concentrations of VOCs, H_2S, O_2, LEL, and sulfur dioxide (SO_2) using a RAE Systems AreaRAE Steel Multi-Gas Monitor PID and H_2SO_4 concentrations using a Honeywell SPM Flex.

OFFICIAL PHOTOGRAPH NO. 6
U.S. ENVIRONMENTAL PROTECTION AGENCY

TDD Number:	TT-01-116	**Location:**	American Zinc Products Fire
Orientation:	North	**Date:**	April 29, 2019
Photographer:	Adam Acker, Tetra Tech	**Witness:**	Paul Prys, Tetra Tech

Subject: Tetra Tech START collected a surface water sample from outfall where the Broad River and neutralized water from the stormwater basin mixed together. In addition to this location, surface water samples were collected from locations 50 feet upstream and downstream of this outfall and from the outfall located inside the stormwater basin. Surface water samples were analyzed for target analyte list (TAL) metals and pH.

ENCLOSURE 4

START LOGBOOK

(Five Pages)

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Logbook 1 of 1

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American Zinc Products

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CONTENTS

PAGE	REFERENCE	DATE

0550 - START Prys and Acker on site to meet with all emergency parties involved at the Floyd Creek Baptist Church at 2004 Chase High Road Forest City, NC.

0600 - START Prys and Acker meet with OSC Rhenne to discuss air monitoring plan. Fire is still actively burning and ½ mile evacuation still in place. START will conduct initial air monitoring on site and at nearby church and neighborhood as well as downwind with AreaRAE Pros and SPM Flex's. Facility is "American Tire Products"

0700 - START Acker and Prys move to site of fire to conduct initial air monitoring with MultiRAE Pro + Spm Flex on Sulfuric Acid.

0710 - Take reading at Hicks Grove Baptist Church at 35.1897876, -81.8499678

Sulfuric Acid - 146 ppb high - Sustained at 58 ppb

O_2 - 20.9, CO - 0, H_2S - 0.0, VOC - 0, LEL - 0

	Location	Sulfuric Acid (ppb)	
①	35.1897876, -81.8499678	58-146	(Church)
②	35.1884872, -81.8516914	36	(716 Hicks Grove)
③	35.1868108, -81.8529772	26	(Shady Grove)
④	35.1833833, -81.8579074	~~75~~ 60	(SC Border)
⑤	35.1821505, -81.8502085	5	(Rail X-ing)
⑥	35.1849433, -81.8500023	0	(Telephone Pole)

Scale: 1 square = _____

Location	Sulfuric Acid (ppb)	Note
⑦ 35.1881570, -81.8501414	34	Corner of Hicks Grove

0830 - START back to Floyd Creek Baptist Church to meet with OSC Rhenne.

Note: CTEH on site to conduct community air monitoring on behalf of HEPACO and American Tire Products".

0930 - START Prys + Acker begin round of community roving air monitoring of sulfuric acid.

Time	Location	Sulfuric Acid Reading (PPB)
0930	1	8
0935	2	6
0945	3	0
0950	4	5
1000	5	0
1005	6	0
1010	7	5

Note: Wind blowing in direction from fire to #1-7. MultiRAE readings all at normal levels.

1020	8 (150 S. River Rd.)	0
1030	9 (221 S. River Rd.)	0
1035	10 (S. River Rd. Gate)	0
1040	11 (127 Craig Rd)	0

Note: American Tire Products located at 484 Hicks Grove Rd. Mooresboro, NC 28114.

1100 - K. Powell from N. Carolina Public Health on site

Scale: 1 square = _____

Rite in the Rain

with OSC Rhame to discuss plan moving forward. Also representatives from DEQ, Department of Health, ENR. Brent discusses RCRA implications. Waste generated from cell house contained in basement. Will be diluted and sent off according for waste. Storm water pond had low pH of 1-2 overnight and added Sodium bicarbonate to neutralize liquid. HEPACO will continue to address runoff overnight. Electroining solution composed of 5% zinc and .17M manganese. Storm Water Runoff will be brought back on site up and stored in sludge boxes. SBI also present, and CTEH (Andrew Henault). All fire/water suppression being handled on site by HEPACO and prevented from runoff into stormwater pond. Frankie Hamrills is current Incident Commander from the county. Fire believed to be related to a 13000 gallon manganese & zinc tank on the outside of the building. 17% sulfuric acid. 4700 gallons in it.

1200 - Meeting with all the stakeholders, will be reopened at 2:00 pm meeting to discuss evacuation protocols and details with analytical. 3 million gallons of water on fire, 600,000 pounds of sodium bicarbonate.

1400 - All anecdotes intact following the fire. Which CTEH believes takes the lead aspect out of the realm of testing/analytical.

Scale: 1 square =_____

1330 - START Acker and Prys on site at American Zinc Products to collect samples from outfall, river, and storm water basin. Samples info below:

Time	Sample ID	Location
1600	AZP-SW-01-042919 (MS/MSD)	50' Downstream
1607	AZP-SW-02-042919	50' Upstream
1623	AZP-SW-03-042919	Mixture at River
1623	AZP-SW-03-042919-DUP	Mixture at River
1630	AZP-SW-04-042919	Outfall (above)

Note: Samples run for TAL Metals + pH.

SW01 - 35.2006267, -81.8516612

SW02 - 35.2007212, -81.8512861

SW03 - 35.2006771, -81.8514497

SW04 - 35.2004396, -81.8513394

1600 - Attempt to set up VIPER.

1900 - Station set up at firehouse with AreaRAE w/ SO_2 and SPM Flex with Sulfuric Acid.

1910 - Begin logging at fire station. OSC Eulingen will conduct roving air monitoring during night until around midnight with AreaRAE and SPM Flex in communities.

2015 - START Acker and Prys off site.

Note - pH of outfall and river below site Broad River at pH of 7.

Scale: 1 square =_____

Rite in the Rain

Tuesday 4/30/19

Weather - Mostly sunny, high of 86°F, low of 61°F. winds at 5-7mph SSW. Chance of rain 10%.

0600 - START Prys and Acker on site at American Zinc Products to pick up overnight air monitoring equipment.

0700 - START ~~has~~ downloaded Air Monitoring data from Firehouse station.

0800 - Meeting at church with Stakeholders about overnight air monitoring and progress. All water treated on site. No significant readings. Inversion occurred around 20:30 previous night and several elevated readings of sulfuric acid up to 89ppb. Still monitored below action levels over time.

0900 - START Prys and Acker prepare data summary tables ~~for~~ and Air Monitoring Maps for OSC Eichinger.

1200 - All tables and maps sent to OSC Eichinger

1235 - START Prys and Acker off site. Drive back to Atlanta.

4/30/19

End of Logbook

4/30/19

Rite in the Rain

ENCLOSURE 5

TETRA TECH DATA VALIDATION REPORT

(Seven Pages)

DATA VALIDATION CHECKLIST – STAGE 2A

Site Name	American Zinc Products Fire		**Project No.**	TT-01-116
Data Reviewer (signature and date)	Shanna Davis May 9, 2019		**Technical Reviewer (signature and date)**	Jessica A. Vickers May 14, 2019
Laboratory Report No.	1904V15		**Laboratory**	Analytical Environmental Services, Inc.
Analyses	Metals by SW-846 Methods 6010D and 7470A and pH by Method E150.1/SM4500 H + B			
Sample	AZP-SW-01-042919, AZP-SW-02-042919, AZP-SW-03-042919, AZP-SW-04-042919			
Field Duplicate Pairs	AZP-SW-03-042919/ AZP-SW-03-042919-DUP			
Field Blanks	None			

This checklist summarizes the Stage 2A validation performed on the subject laboratory report, in accordance with the U.S. Environmental Protection Agency (EPA) *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (January 2009). Analytical data were evaluated in general accordance with the EPA *NFG for Inorganic Superfund Data Review* (January 2017) data validation guidance document, as well as the above referenced method.

OVERALL EVALUATION:

No rejection of results was required for this data package. The results may be used as qualified based on the findings of this validation effort.

Data completeness:

Within Criteria	Exceedance/Notes
Y	

Sample preservation, receipt, and holding times:

Within Criteria	Exceedance/Notes
N	The pH analysis holding time of “immediately” was exceed – flag “J” for all samples

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DATA VALIDATION CHECKLIST – STAGE 2A

Method blanks:

Within Criteria	Exceedance/Notes
N	278431: magnesium = 0.009450 mg/L and sodium = 0.1207 mg/L – no action (associated results greater than ten times blank value)

Field blanks:

Within Criteria	Exceedance/Notes
NA	

System monitoring compounds (surrogates and labeled compounds):

Within Criteria	Exceedance/Notes
NA	

MS/MSDs:

Within Criteria	Exceedance/Notes
Y	

Laboratory duplicates:

Within Criteria	Exceedance/Notes
Y	

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DATA VALIDATION CHECKLIST – STAGE 2A

Field duplicates:

Within Criteria	Exceedance/Notes
Y	

LCSs/LCSDs:

Within Criteria	Exceedance/Notes
Y	

Sample dilutions:

Within Criteria	Exceedance/Notes
Y	100x: manganese, sodium, and zinc for AZP-SW-04-042919

Re-extraction and reanalysis:

Within Criteria	Exceedance/Notes
NA	

MDLs/RLs:

Within Criteria	Exceedance/Notes
Y	Results between method detection limit and reporting limit – flagged “J” by laboratory

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DATA VALIDATION CHECKLIST – STAGE 2A

Overall Qualifications:

See results summary pages attached for changes to the laboratory qualifiers based upon this validation. The following is a list of qualifiers and definitions that may be used for the validation of this data package:

J	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.
J+	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased high.
J-	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.
NJ	The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated value is the approximate concentration of the analyte in the sample.
R	The sample result is rejected as unusable due to serious deficiencies in one or more quality control criteria. The analyte may or may not be present in the sample.
U	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).
UJ	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.

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AMERICAN ZINC PRODUCTS FIRE SURFACE WATER ANALYTICAL RESULTS SUMMARY
AES REPORT NO. 1904V15

Sample ID	Analyte	Lab Result	Lab Qual	Units	PQL	MDL	Val Result	Val Qual
AZP-SW-01-042919	pH	7.35	H	pH Units	0.0100	0.0100	7.35	J
AZP-SW-01-042919	Aluminum	0.439		mg/L	0.200	0.0211	0.439	
AZP-SW-01-042919	Antimony	0.0072	U	mg/L	0.0200	0.0072	0.0200	U
AZP-SW-01-042919	Arsenic	0.0072	U	mg/L	0.0500	0.0072	0.0500	U
AZP-SW-01-042919	Barium	0.0164	J	mg/L	0.0200	0.0027	0.0164	J
AZP-SW-01-042919	Beryllium	0.0015	U	mg/L	0.0100	0.0015	0.0100	U
AZP-SW-01-042919	Cadmium	0.0019	U	mg/L	0.0050	0.0019	0.0050	U
AZP-SW-01-042919	Calcium	2.62		mg/L	0.100	0.0356	2.62	
AZP-SW-01-042919	Chromium	0.0032	U	mg/L	0.0100	0.0032	0.0100	U
AZP-SW-01-042919	Cobalt	0.0029	U	mg/L	0.0200	0.0029	0.0200	U
AZP-SW-01-042919	Copper	0.0015	U	mg/L	0.0100	0.0015	0.0100	U
AZP-SW-01-042919	Iron	0.467		mg/L	0.100	0.0442	0.467	
AZP-SW-01-042919	Lead	0.0038	U	mg/L	0.0100	0.0038	0.0100	U
AZP-SW-01-042919	Magnesium	1.11		mg/L	0.100	0.0088	1.11	
AZP-SW-01-042919	Manganese	0.0226		mg/L	0.0150	0.0009	0.0226	
AZP-SW-01-042919	Nickel	0.0036	U	mg/L	0.0200	0.0036	0.0200	U
AZP-SW-01-042919	Potassium	0.959		mg/L	0.500	0.115	0.959	
AZP-SW-01-042919	Selenium	0.0074	U	mg/L	0.0200	0.0074	0.0200	U
AZP-SW-01-042919	Silver	0.0026	U	mg/L	0.0100	0.0026	0.0100	U
AZP-SW-01-042919	Sodium	2.05		mg/L	1.00	0.109	2.05	
AZP-SW-01-042919	Thallium	0.0088	U	mg/L	0.0200	0.0088	0.0200	U
AZP-SW-01-042919	Vanadium	0.0012	U	mg/L	0.0100	0.0012	0.0100	U
AZP-SW-01-042919	Zinc	0.0073	U	mg/L	0.0200	0.0073	0.0200	U
AZP-SW-01-042919	Mercury	0.00006	U	mg/L	0.00020	0.00006	0.00020	U
AZP-SW-02-042919	pH	7.41	H	pH Units	0.0100	0.0100	7.41	J
AZP-SW-02-042919	Aluminum	0.597		mg/L	0.200	0.0211	0.597	
AZP-SW-02-042919	Antimony	0.0072	U	mg/L	0.0200	0.0072	0.0200	U
AZP-SW-02-042919	Arsenic	0.0072	U	mg/L	0.0500	0.0072	0.0500	U
AZP-SW-02-042919	Barium	0.0175	J	mg/L	0.0200	0.0027	0.0175	J
AZP-SW-02-042919	Beryllium	0.0015	U	mg/L	0.0100	0.0015	0.0100	U
AZP-SW-02-042919	Cadmium	0.0019	U	mg/L	0.0050	0.0019	0.0050	U
AZP-SW-02-042919	Calcium	2.71		mg/L	0.100	0.0356	2.71	
AZP-SW-02-042919	Chromium	0.0032	U	mg/L	0.0100	0.0032	0.0100	U
AZP-SW-02-042919	Cobalt	0.0029	U	mg/L	0.0200	0.0029	0.0200	U
AZP-SW-02-042919	Copper	0.0015	U	mg/L	0.0100	0.0015	0.0100	U
AZP-SW-02-042919	Iron	0.612		mg/L	0.100	0.0442	0.612	
AZP-SW-02-042919	Lead	0.0038	U	mg/L	0.0100	0.0038	0.0100	U
AZP-SW-02-042919	Magnesium	1.16		mg/L	0.100	0.0088	1.16	
AZP-SW-02-042919	Manganese	0.0270		mg/L	0.0150	0.0009	0.0270	
AZP-SW-02-042919	Nickel	0.0036	U	mg/L	0.0200	0.0036	0.0200	U
AZP-SW-02-042919	Potassium	1.00		mg/L	0.500	0.115	1.00	
AZP-SW-02-042919	Selenium	0.0074	U	mg/L	0.0200	0.0074	0.0200	U
AZP-SW-02-042919	Silver	0.0026	U	mg/L	0.0100	0.0026	0.0100	U
AZP-SW-02-042919	Sodium	2.11		mg/L	1.00	0.109	2.11	
AZP-SW-02-042919	Thallium	0.0088	U	mg/L	0.0200	0.0088	0.0200	U
AZP-SW-02-042919	Vanadium	0.0012	U	mg/L	0.0100	0.0012	0.0100	U
AZP-SW-02-042919	Zinc	0.0073	U	mg/L	0.0200	0.0073	0.0200	U
AZP-SW-02-042919	Mercury	0.00006	U	mg/L	0.00020	0.00006	0.00020	U
AZP-SW-03-042919	pH	7.42	H	pH Units	0.0100	0.0100	7.42	J
AZP-SW-03-042919	Aluminum	0.482		mg/L	0.200	0.0211	0.482	
AZP-SW-03-042919	Antimony	0.0072	U	mg/L	0.0200	0.0072	0.0200	U
AZP-SW-03-042919	Arsenic	0.0072	U	mg/L	0.0500	0.0072	0.0500	U

AMERICAN ZINC PRODUCTS FIRE SURFACE WATER ANALYTICAL RESULTS SUMMARY
AES REPORT NO. 1904V15

Sample ID	Analyte	Lab Result	Lab Qual	Units	PQL	MDL	Val Result	Val Qual
AZP-SW-03-042919	Barium	0.0168	J	mg/L	0.0200	0.0027	0.0168	J
AZP-SW-03-042919	Beryllium	0.0015	U	mg/L	0.0100	0.0015	0.0100	U
AZP-SW-03-042919	Cadmium	0.0019	U	mg/L	0.0050	0.0019	0.0050	U
AZP-SW-03-042919	Calcium	2.72		mg/L	0.100	0.0356	2.72	
AZP-SW-03-042919	Chromium	0.0032	U	mg/L	0.0100	0.0032	0.0100	U
AZP-SW-03-042919	Cobalt	0.0029	U	mg/L	0.0200	0.0029	0.0200	U
AZP-SW-03-042919	Copper	0.0015	U	mg/L	0.0100	0.0015	0.0100	U
AZP-SW-03-042919	Iron	0.495		mg/L	0.100	0.0442	0.495	
AZP-SW-03-042919	Lead	0.0038	U	mg/L	0.0100	0.0038	0.0100	U
AZP-SW-03-042919	Magnesium	1.15		mg/L	0.100	0.0088	1.15	
AZP-SW-03-042919	Manganese	0.0230		mg/L	0.0150	0.0009	0.0230	
AZP-SW-03-042919	Nickel	0.0062	J	mg/L	0.0200	0.0036	0.0062	J
AZP-SW-03-042919	Potassium	0.984		mg/L	0.500	0.115	0.984	
AZP-SW-03-042919	Selenium	0.0074	U	mg/L	0.0200	0.0074	0.0200	U
AZP-SW-03-042919	Silver	0.0026	U	mg/L	0.0100	0.0026	0.0100	U
AZP-SW-03-042919	Sodium	2.11		mg/L	1.00	0.109	2.11	
AZP-SW-03-042919	Thallium	0.0088	U	mg/L	0.0200	0.0088	0.0200	U
AZP-SW-03-042919	Vanadium	0.0012	U	mg/L	0.0100	0.0012	0.0100	U
AZP-SW-03-042919	Zinc	0.0073	U	mg/L	0.0200	0.0073	0.0200	U
AZP-SW-03-042919	Mercury	0.00006	U	mg/L	0.00020	0.00006	0.00020	U
AZP-SW-03-042919-DUP	pH	7.44	H	pH Units	0.0100	0.0100	7.44	J
AZP-SW-03-042919-DUP	Aluminum	0.528		mg/L	0.200	0.0211	0.528	
AZP-SW-03-042919-DUP	Antimony	0.0072	U	mg/L	0.0200	0.0072	0.0200	U
AZP-SW-03-042919-DUP	Arsenic	0.0072	U	mg/L	0.0500	0.0072	0.0500	U
AZP-SW-03-042919-DUP	Barium	0.0167	J	mg/L	0.0200	0.0027	0.0167	J
AZP-SW-03-042919-DUP	Beryllium	0.0015	U	mg/L	0.0100	0.0015	0.0100	U
AZP-SW-03-042919-DUP	Cadmium	0.0019	U	mg/L	0.0050	0.0019	0.0050	U
AZP-SW-03-042919-DUP	Calcium	2.60		mg/L	0.100	0.0356	2.60	
AZP-SW-03-042919-DUP	Chromium	0.0032	U	mg/L	0.0100	0.0032	0.0100	U
AZP-SW-03-042919-DUP	Cobalt	0.0029	U	mg/L	0.0200	0.0029	0.0200	U
AZP-SW-03-042919-DUP	Copper	0.0015	U	mg/L	0.0100	0.0015	0.0100	U
AZP-SW-03-042919-DUP	Iron	0.553		mg/L	0.100	0.0442	0.553	
AZP-SW-03-042919-DUP	Lead	0.0038	U	mg/L	0.0100	0.0038	0.0100	U
AZP-SW-03-042919-DUP	Magnesium	1.12		mg/L	0.100	0.0088	1.12	
AZP-SW-03-042919-DUP	Manganese	0.0232		mg/L	0.0150	0.0009	0.0232	
AZP-SW-03-042919-DUP	Nickel	0.0036	U	mg/L	0.0200	0.0036	0.0200	U
AZP-SW-03-042919-DUP	Potassium	0.938		mg/L	0.500	0.115	0.938	
AZP-SW-03-042919-DUP	Selenium	0.0074	U	mg/L	0.0200	0.0074	0.0200	U
AZP-SW-03-042919-DUP	Silver	0.0026	U	mg/L	0.0100	0.0026	0.0100	U
AZP-SW-03-042919-DUP	Sodium	2.00		mg/L	1.00	0.109	2.00	
AZP-SW-03-042919-DUP	Thallium	0.0088	U	mg/L	0.0200	0.0088	0.0200	U
AZP-SW-03-042919-DUP	Vanadium	0.0012	U	mg/L	0.0100	0.0012	0.0100	U
AZP-SW-03-042919-DUP	Zinc	0.0073	U	mg/L	0.0200	0.0073	0.0200	U
AZP-SW-03-042919-DUP	Mercury	0.00006	U	mg/L	0.00020	0.00006	0.00020	U
AZP-SW-04-042919	pH	7.09	H	pH Units	0.0100	0.0100	7.09	J
AZP-SW-04-042919	Aluminum	1.24		mg/L	0.200	0.0211	1.24	
AZP-SW-04-042919	Antimony	0.111		mg/L	0.0200	0.0072	0.111	
AZP-SW-04-042919	Arsenic	0.0072	U	mg/L	0.0500	0.0072	0.0500	U
AZP-SW-04-042919	Barium	0.0060	J	mg/L	0.0200	0.0027	0.0060	J
AZP-SW-04-042919	Beryllium	0.0015	U	mg/L	0.0100	0.0015	0.0100	U
AZP-SW-04-042919	Cadmium	0.0808		mg/L	0.0050	0.0019	0.0808	
AZP-SW-04-042919	Calcium	84.5		mg/L	0.100	0.0356	84.5	

AMERICAN ZINC PRODUCTS FIRE SURFACE WATER ANALYTICAL RESULTS SUMMARY
AES REPORT NO. 1904V15

Sample ID	Analyte	Lab Result	Lab Qual	Units	PQL	MDL	Val Result	Val Qual
AZP-SW-04-042919	Chromium	0.0104		mg/L	0.0100	0.0032	0.0104	
AZP-SW-04-042919	Cobalt	0.0301		mg/L	0.0200	0.0029	0.0301	
AZP-SW-04-042919	Copper	0.417		mg/L	0.0100	0.0015	0.417	
AZP-SW-04-042919	Iron	1.31		mg/L	0.100	0.0442	1.31	
AZP-SW-04-042919	Lead	0.0246		mg/L	0.0100	0.0038	0.0246	
AZP-SW-04-042919	Magnesium	6.87		mg/L	0.100	0.0088	6.87	
AZP-SW-04-042919	Manganese	105		mg/L	1.50	0.0891	105	
AZP-SW-04-042919	Nickel	0.138		mg/L	0.0200	0.0036	0.138	
AZP-SW-04-042919	Potassium	23.4		mg/L	0.500	0.115	23.4	
AZP-SW-04-042919	Selenium	0.0186	J	mg/L	0.0200	0.0074	0.0186	J
AZP-SW-04-042919	Silver	0.0085	J	mg/L	0.0100	0.0026	0.0085	J
AZP-SW-04-042919	Sodium	6500		mg/L	100	10.9	6500	
AZP-SW-04-042919	Thallium	0.0104	J	mg/L	0.0200	0.0088	0.0104	J
AZP-SW-04-042919	Vanadium	0.0275		mg/L	0.0100	0.0012	0.0275	
AZP-SW-04-042919	Zinc	247		mg/L	2.00	0.728	247	
AZP-SW-04-042919	Mercury	0.00006	U	mg/L	0.00020	0.00006	0.00020	U

ATTACHMENT 1

LABORATORY DATA PACKAGE

(16 Sheets)

ANALYTICAL ENVIRONMENTAL SERVICES, INC.

AES

May 02, 2019

Jessica Vickers
Tetra Tech EM Inc.

1955 Evergreen Blvd.
Duluth GA 30096

RE: AZP Fire

Dear Jessica Vickers: Order No: 1904V15

Analytical Environmental Services, Inc. received 5 samples on 4/30/2019 6:44:00 PM for the analyses presented in following report.

No problems were encountered during the analyses. Additionally, all results for the associated Quality Control samples were within EPA and/or AES established limits. Any discrepancies associated with the analyses contained herein will be noted and submitted in the form of a project Case Narrative. AES' certifications are as follows:
-NELAP/Florida State Laboratory ID E87582 for analysis of Non-Potable Water, Solid & Chemical Materials, Air & Emissions for Organics, and Drinking Water Microbiology & Metals, effective 07/01/18-06/30/19.
-North Carolina Certification number 562 for analysis of Surface Water, Groundwater, Effluent, effective until 12/31/19.
-South Carolina Environmental Laboratory Certification number 98016003 effective until 6/30/19.
These results relate only to the items tested as received. This report may only be reproduced in full and with written permission from the laboratory.
If you have any questions regarding these test results, please feel free to call.
Sincerely,

Paris Masoudi

Paris Masoudi

Project Manager

3080 Presidential Drive • Atlanta, Georgia 30340 • Tel: 770.457.8177 • Fax: 770.457.8188 • Toll Free: 800.972.4889
www.aesatlanta.com

ANALYTICAL ENVIRONMENTAL SERVICES, INC
3785 Presidential Parkway, Atlanta GA 30340-3704
TEL.: (770) 457-8177 / TOLL-FREE (800) 972-4889 / FAX: (770) 457-8188

CHAIN OF CUSTODY

Work Order: 1904115

Date: 4/30/2019 Page 1 of 1

COMPANY: **Tetra Tech EM, Inc.**

ADDRESS: **1955 Evergreen Blvd, Bldg 200, Suite 300, Duluth, GA 30096**

PHONE: 404-849-7136

FAX: 678-775-3138

SAMPLED BY: Paul Prys

SIGNATURE:

Visit our website www.aesatlanta.com to check on the status of your results, place bottle orders, etc.

ANALYSIS REQUESTED

#	SAMPLE ID	SAMPLED DATE	SAMPLED TIME	Grab	Composite	Matrix (See codes)	TAL METALS (I)	pH (I)	REMARKS	No # of Containers
1	AZP-SW-01-042919	4/29/2019	16:00	X		SW	X	X	MS/MSD	6
2	AZP-SW-02-042919	4/29/2019	16:07	X		SW	X	X		2
3	AZP-SW-03-042919	4/29/2019	16:23	X		SW	X	X		2
4	AZP-SW-03-042919-DUP	4/29/2019	16:23	X		SW	X	X		2
5	AZP-SW-04-042919	4/29/2019	16:30	X		SW	X	X		2
6										
7										
8										
9										
10										
11										
12										
13										
14										

RELINQUISHED BY	DATE/TIME	RECEIVED BY	DATE/TIME
1:	4/30/19 1841	1:	4/30/19 1844
2:		2:	MS 4/30 0:44
3:		3:	

SPECIAL INSTRUCTIONS/COMMENTS:
Also email results to paul.prys@tetratech.com

SHIPMENT METHOD
OUT 4/30/19 VIA: T-T
IN / / VIA:
CLIENT FedEx UPS MAIL COURIER
GREYHOUND OTHER_____

PROJECT INFORMATION
PROJECT NAME: **AZP Fire**
PROJECT #:
SITE ADDRESS: 484 Hicks Grove Road, Mooresboro, North Carolina
SEND REPORT TO: jessica.vickers@tetratech.com
INVOICE TO: (IF DIFFERENT FROM ABOVE)
QUOTE #:_____ PO#:_____

RECEIPT
Total # of Containers: 14

Turnaround Time Request
- ○ Standard 5 Business Days
- ○ 2 Business Day Rush
- ● Next Business Day Rush
- ○ Same Day Rush (auth req.)
- ○ Other _____

STATE PROGRAM (if any): _____
E-mail? Y N; Fax? Y N
DATA PACKAGE: I II III IV

SAMPLES RECEIVED AFTER 3PM OR SATURDAY ARE CONSIDERED AS RECEIVED ON THE NEXT BUSINESS DAY; IF NO TAT IS MARKED ON COC AES WILL PROCEED AS STANDARD TAT.
SAMPLES ARE DISPOSED OF 30 DAYS AFTER COMPLETION OF REPORT UNLESS OTHER ARRANGEMENTS ARE MADE.

MATRIX CODES: A = Air GW = Groundwater SE = Sediment SO = Soil SW = Surface Water W = Water (Blanks) O = Other (specify)

PRESERVATIVE CODES: H+I = Hydrochloric acid + ice I = Ice only N = Nitric acid S+I = Sulfuric acid + ice S/M+I = Sodium Bisulfate/Methanol + ice O = Other (specify) NA = None

White Copy - Original; Yellow Copy - Client

Client: Tetra Tech EM Inc.
Project: AZP Fire
Lab ID: 1904V15

Case Narrative

pH Analysis by Method E150.1/SM4500 H+ B:

Samples for pH analysis by Method E150.1/SM4500 H+ B were received and analyzed outside holding time requirement of "immediate or 15 minutes."

Analytical Environmental Services, Inc

Date: 2-May-19

Client:	Tetra Tech EM Inc.	**Client Sample ID:**	AZP-SW-01-042919
Project Name:	AZP Fire	**Collection Date:**	4/29/2019 4:00:00 PM
Lab ID:	1904V15-001	**Matrix:**	Surface Water

Analyses	Result	Qual	MDL	Reporting Limit	Units	BatchID	DF	Date Analyzed	Analyst
METALS, TOTAL SW6010D					**(SW3010A)**				
Aluminum	0.439		0.0211	0.200	mg/L	278431	1	05/01/2019 16:48	DG
Antimony	BRL		0.0072	0.0200	mg/L	278431	1	05/01/2019 16:48	DG
Arsenic	BRL		0.0072	0.0500	mg/L	278431	1	05/01/2019 16:48	DG
Barium	0.0164	J	0.0027	0.0200	mg/L	278431	1	05/01/2019 16:48	DG
Beryllium	BRL		0.0015	0.0100	mg/L	278431	1	05/01/2019 16:48	DG
Cadmium	BRL		0.0019	0.0050	mg/L	278431	1	05/01/2019 16:48	DG
Calcium	2.62		0.0356	0.100	mg/L	278431	1	05/01/2019 16:48	DG
Chromium	BRL		0.0032	0.0100	mg/L	278431	1	05/01/2019 16:48	DG
Cobalt	BRL		0.0029	0.0200	mg/L	278431	1	05/01/2019 16:48	DG
Copper	BRL		0.0015	0.0100	mg/L	278431	1	05/01/2019 16:48	DG
Iron	0.467		0.0442	0.100	mg/L	278431	1	05/01/2019 16:48	DG
Lead	BRL		0.0038	0.0100	mg/L	278431	1	05/01/2019 16:48	DG
Magnesium	1.11		0.0088	0.100	mg/L	278431	1	05/01/2019 16:48	DG
Manganese	0.0226		0.0009	0.0150	mg/L	278431	1	05/01/2019 16:48	DG
Nickel	BRL		0.0036	0.0200	mg/L	278431	1	05/01/2019 16:48	DG
Potassium	0.959		0.115	0.500	mg/L	278431	1	05/01/2019 16:48	DG
Selenium	BRL		0.0074	0.0200	mg/L	278431	1	05/01/2019 16:48	DG
Silver	BRL		0.0026	0.0100	mg/L	278431	1	05/01/2019 16:48	DG
Sodium	2.05		0.109	1.00	mg/L	278431	1	05/01/2019 16:48	DG
Thallium	BRL		0.0088	0.0200	mg/L	278431	1	05/01/2019 16:48	DG
Vanadium	BRL		0.0012	0.0100	mg/L	278431	1	05/01/2019 16:48	DG
Zinc	BRL		0.0073	0.0200	mg/L	278431	1	05/01/2019 16:48	DG
Mercury, Total SW7470A					**(SW7470A)**				
Mercury	BRL		0.00006	0.00020	mg/L	278500	1	05/02/2019 16:56	CD
Hydrogen Ion (pH) by SM4500 H+ B									
pH	7.35	H	0.0100	0.0100	pH Units	R397084	1	05/01/2019 08:25	BK

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated value above quantitation range
BRL	Not detected at MDL	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	J	Estimated value detected below Reporting Limit
N	Analyte not NELAC certified	>	Greater than Result value
B	Analyte detected in the associated method blank	<	Less than Result value
NC	Not confirmed	Narr	See case narrative

Analytical Environmental Services, Inc

Date: 2-May-19

Client:	Tetra Tech EM Inc.	**Client Sample ID:**	AZP-SW-02-042919
Project Name:	AZP Fire	**Collection Date:**	4/29/2019 4:07:00 PM
Lab ID:	1904V15-002	**Matrix:**	Surface Water

Analyses	Result	Qual	MDL	Reporting Limit	Units	BatchID	DF	Date Analyzed	Analyst
METALS, TOTAL SW6010D					**(SW3010A)**				
Aluminum	0.597		0.0211	0.200	mg/L	278431	1	05/01/2019 17:04	DG
Antimony	BRL		0.0072	0.0200	mg/L	278431	1	05/01/2019 17:04	DG
Arsenic	BRL		0.0072	0.0500	mg/L	278431	1	05/01/2019 17:04	DG
Barium	0.0175	J	0.0027	0.0200	mg/L	278431	1	05/01/2019 17:04	DG
Beryllium	BRL		0.0015	0.0100	mg/L	278431	1	05/01/2019 17:04	DG
Cadmium	BRL		0.0019	0.0050	mg/L	278431	1	05/01/2019 17:04	DG
Calcium	2.71		0.0356	0.100	mg/L	278431	1	05/01/2019 17:04	DG
Chromium	BRL		0.0032	0.0100	mg/L	278431	1	05/01/2019 17:04	DG
Cobalt	BRL		0.0029	0.0200	mg/L	278431	1	05/01/2019 17:04	DG
Copper	BRL		0.0015	0.0100	mg/L	278431	1	05/01/2019 17:04	DG
Iron	0.612		0.0442	0.100	mg/L	278431	1	05/01/2019 17:04	DG
Lead	BRL		0.0038	0.0100	mg/L	278431	1	05/01/2019 17:04	DG
Magnesium	1.16		0.0088	0.100	mg/L	278431	1	05/01/2019 17:04	DG
Manganese	0.0270		0.0009	0.0150	mg/L	278431	1	05/01/2019 17:04	DG
Nickel	BRL		0.0036	0.0200	mg/L	278431	1	05/01/2019 17:04	DG
Potassium	1.00		0.115	0.500	mg/L	278431	1	05/01/2019 17:04	DG
Selenium	BRL		0.0074	0.0200	mg/L	278431	1	05/01/2019 17:04	DG
Silver	BRL		0.0026	0.0100	mg/L	278431	1	05/01/2019 17:04	DG
Sodium	2.11		0.109	1.00	mg/L	278431	1	05/01/2019 17:04	DG
Thallium	BRL		0.0088	0.0200	mg/L	278431	1	05/01/2019 17:04	DG
Vanadium	BRL		0.0012	0.0100	mg/L	278431	1	05/01/2019 17:04	DG
Zinc	BRL		0.0073	0.0200	mg/L	278431	1	05/01/2019 17:04	DG
Mercury, Total SW7470A					**(SW7470A)**				
Mercury	BRL		0.00006	0.00020	mg/L	278500	1	05/02/2019 17:08	CD
Hydrogen Ion (pH) by SM4500 H+ B									
pH	7.41	H	0.0100	0.0100	pH Units	R397084	1	05/01/2019 08:25	BK

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated value above quantitation range
BRL	Not detected at MDL	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	J	Estimated value detected below Reporting Limit
N	Analyte not NELAC certified	>	Greater than Result value
B	Analyte detected in the associated method blank	<	Less than Result value
NC	Not confirmed	Narr	See case narrative

Analytical Environmental Services, Inc

Date: 2-May-19

Client:	Tetra Tech EM Inc.	**Client Sample ID:**	AZP-SW-03-042919
Project Name:	AZP Fire	**Collection Date:**	4/29/2019 4:23:00 PM
Lab ID:	1904V15-003	**Matrix:**	Surface Water

Analyses	Result	Qual	MDL	Reporting Limit	Units	BatchID	DF	Date Analyzed	Analyst
METALS, TOTAL SW6010D					**(SW3010A)**				
Aluminum	0.482		0.0211	0.200	mg/L	278431	1	05/01/2019 17:06	DG
Antimony	BRL		0.0072	0.0200	mg/L	278431	1	05/01/2019 17:06	DG
Arsenic	BRL		0.0072	0.0500	mg/L	278431	1	05/01/2019 17:06	DG
Barium	0.0168	J	0.0027	0.0200	mg/L	278431	1	05/01/2019 17:06	DG
Beryllium	BRL		0.0015	0.0100	mg/L	278431	1	05/01/2019 17:06	DG
Cadmium	BRL		0.0019	0.0050	mg/L	278431	1	05/01/2019 17:06	DG
Calcium	2.72		0.0356	0.100	mg/L	278431	1	05/01/2019 17:06	DG
Chromium	BRL		0.0032	0.0100	mg/L	278431	1	05/01/2019 17:06	DG
Cobalt	BRL		0.0029	0.0200	mg/L	278431	1	05/01/2019 17:06	DG
Copper	BRL		0.0015	0.0100	mg/L	278431	1	05/01/2019 17:06	DG
Iron	0.495		0.0442	0.100	mg/L	278431	1	05/01/2019 17:06	DG
Lead	BRL		0.0038	0.0100	mg/L	278431	1	05/01/2019 17:06	DG
Magnesium	1.15		0.0088	0.100	mg/L	278431	1	05/01/2019 17:06	DG
Manganese	0.0230		0.0009	0.0150	mg/L	278431	1	05/01/2019 17:06	DG
Nickel	0.0062	J	0.0036	0.0200	mg/L	278431	1	05/01/2019 17:06	DG
Potassium	0.984		0.115	0.500	mg/L	278431	1	05/01/2019 17:06	DG
Selenium	BRL		0.0074	0.0200	mg/L	278431	1	05/01/2019 17:06	DG
Silver	BRL		0.0026	0.0100	mg/L	278431	1	05/01/2019 17:06	DG
Sodium	2.11		0.109	1.00	mg/L	278431	1	05/01/2019 17:06	DG
Thallium	BRL		0.0088	0.0200	mg/L	278431	1	05/01/2019 17:06	DG
Vanadium	BRL		0.0012	0.0100	mg/L	278431	1	05/01/2019 17:06	DG
Zinc	BRL		0.0073	0.0200	mg/L	278431	1	05/01/2019 17:06	DG
Mercury, Total SW7470A					**(SW7470A)**				
Mercury	BRL		0.00006	0.00020	mg/L	278500	1	05/02/2019 17:16	CD
Hydrogen Ion (pH) by SM4500 H+ B									
pH	7.42	H	0.0100	0.0100	pH Units	R397084	1	05/01/2019 08:25	BK

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated value above quantitation range
BRL	Not detected at MDL	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	J	Estimated value detected below Reporting Limit
N	Analyte not NELAC certified	>	Greater than Result value
B	Analyte detected in the associated method blank	<	Less than Result value
NC	Not confirmed	Narr	See case narrative

Analytical Environmental Services, Inc

Date: 2-May-19

Client:	Tetra Tech EM Inc.	**Client Sample ID:**	AZP-SW-03-042919-DUP
Project Name:	AZP Fire	**Collection Date:**	4/29/2019 4:23:00 PM
Lab ID:	1904V15-004	**Matrix:**	Surface Water

Analyses	Result	Qual	MDL	Reporting Limit	Units	BatchID	DF	Date Analyzed	Analyst
METALS, TOTAL SW6010D					**(SW3010A)**				
Aluminum	0.528		0.0211	0.200	mg/L	278431	1	05/01/2019 17:08	DG
Antimony	BRL		0.0072	0.0200	mg/L	278431	1	05/01/2019 17:08	DG
Arsenic	BRL		0.0072	0.0500	mg/L	278431	1	05/01/2019 17:08	DG
Barium	0.0167	J	0.0027	0.0200	mg/L	278431	1	05/01/2019 17:08	DG
Beryllium	BRL		0.0015	0.0100	mg/L	278431	1	05/01/2019 17:08	DG
Cadmium	BRL		0.0019	0.0050	mg/L	278431	1	05/01/2019 17:08	DG
Calcium	2.60		0.0356	0.100	mg/L	278431	1	05/01/2019 17:08	DG
Chromium	BRL		0.0032	0.0100	mg/L	278431	1	05/01/2019 17:08	DG
Cobalt	BRL		0.0029	0.0200	mg/L	278431	1	05/01/2019 17:08	DG
Copper	BRL		0.0015	0.0100	mg/L	278431	1	05/01/2019 17:08	DG
Iron	0.553		0.0442	0.100	mg/L	278431	1	05/01/2019 17:08	DG
Lead	BRL		0.0038	0.0100	mg/L	278431	1	05/01/2019 17:08	DG
Magnesium	1.12		0.0088	0.100	mg/L	278431	1	05/01/2019 17:08	DG
Manganese	0.0232		0.0009	0.0150	mg/L	278431	1	05/01/2019 17:08	DG
Nickel	BRL		0.0036	0.0200	mg/L	278431	1	05/01/2019 17:08	DG
Potassium	0.938		0.115	0.500	mg/L	278431	1	05/01/2019 17:08	DG
Selenium	BRL		0.0074	0.0200	mg/L	278431	1	05/01/2019 17:08	DG
Silver	BRL		0.0026	0.0100	mg/L	278431	1	05/01/2019 17:08	DG
Sodium	2.00		0.109	1.00	mg/L	278431	1	05/01/2019 17:08	DG
Thallium	BRL		0.0088	0.0200	mg/L	278431	1	05/01/2019 17:08	DG
Vanadium	BRL		0.0012	0.0100	mg/L	278431	1	05/01/2019 17:08	DG
Zinc	BRL		0.0073	0.0200	mg/L	278431	1	05/01/2019 17:08	DG
Mercury, Total SW7470A					**(SW7470A)**				
Mercury	BRL		0.00006	0.00020	mg/L	278500	1	05/02/2019 17:20	CD
Hydrogen Ion (pH) by SM4500 H+ B									
pH	7.44	H	0.0100	0.0100	pH Units	R397084	1	05/01/2019 08:25	BK

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated value above quantitation range
BRL	Not detected at MDL	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	J	Estimated value detected below Reporting Limit
N	Analyte not NELAC certified	>	Greater than Result value
B	Analyte detected in the associated method blank	<	Less than Result value
NC	Not confirmed	Narr	See case narrative

Analytical Environmental Services, Inc

Date: 2-May-19

Client:	Tetra Tech EM Inc.	**Client Sample ID:**	AZP-SW-04-042919
Project Name:	AZP Fire	**Collection Date:**	4/29/2019 4:30:00 PM
Lab ID:	1904V15-005	**Matrix:**	Surface Water

Analyses	Result	Qual	MDL	Reporting Limit	Units	BatchID	DF	Date Analyzed	Analyst
METALS, TOTAL SW6010D					**(SW3010A)**				
Aluminum	1.24		0.0211	0.200	mg/L	278431	1	05/02/2019 12:44	DG
Antimony	0.111		0.0072	0.0200	mg/L	278431	1	05/02/2019 12:44	DG
Arsenic	BRL		0.0072	0.0500	mg/L	278431	1	05/02/2019 12:44	DG
Barium	0.0060	J	0.0027	0.0200	mg/L	278431	1	05/02/2019 12:44	DG
Beryllium	BRL		0.0015	0.0100	mg/L	278431	1	05/02/2019 12:44	DG
Cadmium	0.0808		0.0019	0.0050	mg/L	278431	1	05/02/2019 12:44	DG
Calcium	84.5		0.0356	0.100	mg/L	278431	1	05/02/2019 12:44	DG
Chromium	0.0104		0.0032	0.0100	mg/L	278431	1	05/02/2019 12:44	DG
Cobalt	0.0301		0.0029	0.0200	mg/L	278431	1	05/02/2019 12:44	DG
Copper	0.417		0.0015	0.0100	mg/L	278431	1	05/02/2019 12:44	DG
Iron	1.31		0.0442	0.100	mg/L	278431	1	05/02/2019 12:44	DG
Lead	0.0246		0.0038	0.0100	mg/L	278431	1	05/02/2019 12:44	DG
Magnesium	6.87		0.0088	0.100	mg/L	278431	1	05/02/2019 12:44	DG
Manganese	105		0.0891	1.50	mg/L	278431	100	05/02/2019 13:02	DG
Nickel	0.138		0.0036	0.0200	mg/L	278431	1	05/02/2019 12:44	DG
Potassium	23.4		0.115	0.500	mg/L	278431	1	05/02/2019 12:44	DG
Selenium	0.0186	J	0.0074	0.0200	mg/L	278431	1	05/02/2019 12:44	DG
Silver	0.0085	J	0.0026	0.0100	mg/L	278431	1	05/02/2019 12:44	DG
Sodium	6500		10.9	100	mg/L	278431	100	05/02/2019 13:02	DG
Thallium	0.0104	J	0.0088	0.0200	mg/L	278431	1	05/02/2019 12:44	DG
Vanadium	0.0275		0.0012	0.0100	mg/L	278431	1	05/02/2019 12:44	DG
Zinc	247		0.728	2.00	mg/L	278431	100	05/02/2019 13:02	DG
Mercury, Total SW7470A					**(SW7470A)**				
Mercury	BRL		0.00006	0.00020	mg/L	278500	1	05/02/2019 17:24	CD
Hydrogen Ion (pH) by SM4500 H+ B									
pH	7.09	H	0.0100	0.0100	pH Units	R397084	1	05/01/2019 08:25	BK

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated value above quantitation range
BRL	Not detected at MDL	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	J	Estimated value detected below Reporting Limit
N	Analyte not NELAC certified	>	Greater than Result value
B	Analyte detected in the associated method blank	<	Less than Result value
NC	Not confirmed	Narr	See case narrative

Clear | Save as

AES ANALYTICAL ENVIRONMENTAL SERVICES, INC.

SAMPLE/COOLER RECEIPT CHECKLIST

1. Client Name: **Tetra Tech EM Inc.** AES Work Order Number: **1904V15**

2. Carrier: FedEx ☐ UPS ☐ USPS ☐ Client ■ Courier ☐ Other _____

		Yes	No	N/A	Details	Comments
3.	Shipping container/cooler received in good condition?	○	○	○	damaged ☐ leaking ☐ other ☐	
4.	Custody seals present on shipping container?	○	○	○		
5.	Custody seals intact on shipping container?	○	○	○		
6.	Temperature blanks present?	○	○	○		
7.	Cooler temperature(s) within limits of 0-6°C? [See item 13 and 14 for temperature recordings.]	○	○	○	Cooling initiated for recently collected samples / ice present ☐	
8.	Chain of Custody (COC) present?	○	○	○		
9.	Chain of Custody signed, dated, and timed when relinquished and received?	○	○	○		
10.	Sampler name and/or signature on COC?	○	○	○		
11.	Were all samples received within holding time?	○	○	○		
12.	TAT marked on the COC?	○	○	○	If no TAT indicated, proceeded with standard TAT per Terms & Conditions. ☐	

13. Cooler 1 Temperature 3.9 °C Cooler 2 Temperature _____ °C Cooler 3 Temperature _____ °C Cooler 4 Temperature _____ °C

14. Cooler 5 Temperature _____ °C Cooler 6 Temperature _____ °C Cooler 7 Temperature _____ °C Cooler 8 Temperature _____ °C

15. Comments: _____

I certify that I have completed sections 1-15 (dated initials). MJ 4/30/19

		Yes	No	N/A	Details	Comments
16.	Were sample containers intact upon receipt?	○	○	○		
17.	Custody seals present on sample containers?	○	○	○		
18.	Custody seals intact on sample containers?	○	○	○		
19.	Do sample container labels match the COC?	○	○	○	incomplete info ☐ illegible ☐ no label ☐ other ☐	
20.	Are analyses requested indicated on the COC?	○	○	○		
21.	Were all of the samples listed on the COC received?	○	○	○	samples received but not listed on COC ☐ samples listed on COC not received ☐	
22.	Was the sample collection date/time noted?	○	○	○		
23.	Did we receive sufficient sample volume for indicated analyses?	○	○	○		
24.	Were samples received in appropriate containers?	○	○	○		
25.	Were VOA samples received without headspace (< 1/4" bubble)?	○	○	○		
26.	Were trip blanks submitted?	○	○	○	listed on COC ☐ not listed on COC ☐	

27. Comments: _____

I certify that I have completed sections 16-27 (dated initials). BC 5/1/19

This section only applies to samples where pH can be checked at Sample Receipt.

		Yes	No	N/A	Details	Comments
28.	Have containers needing chemical preservation been checked? *	○	○	○		
29.	Containers meet preservation guidelines?	○	○	○		
30.	Was pH adjusted at Sample Receipt?	○	○	○		

* Note: Certain analyses require chemical preservation but must be checked in the laboratory and not upon Sample Receipt such as Coliforms, VOCs and Oil & Grease/TPH.

I certify that I have completed sections 28-30 (dated initials). BC 5/1/19

Analytical Environmental Services, Inc

Date: 2-May-19

Client: Tetra Tech EM Inc.
Project Name: AZP Fire
Lab Order: 1904V15

Dates Report

Lab Sample ID	Client Sample ID	Collection Date	Matrix	Test Name	TCLP Date	Prep Date	Analysis Date
1904V15-001A	AZP-SW-01-042919	4/29/2019 4:00:00PM	Surface Water	TOTAL METALS BY ICP		5/1/2019 11:02:00 AM	05/01/2019
1904V15-001A	AZP-SW-01-042919	4/29/2019 4:00:00PM	Surface Water	TOTAL MERCURY		5/2/2019 1:00:00 PM	05/02/2019
1904V15-001B	AZP-SW-01-042919	4/29/2019 4:00:00PM	Surface Water	Hydrogen Ion (pH) by SM4500 H+ B			05/01/2019
1904V15-002A	AZP-SW-02-042919	4/29/2019 4:07:00PM	Surface Water	TOTAL METALS BY ICP		5/1/2019 11:02:00 AM	05/01/2019
1904V15-002A	AZP-SW-02-042919	4/29/2019 4:07:00PM	Surface Water	TOTAL MERCURY		5/2/2019 1:00:00 PM	05/02/2019
1904V15-002B	AZP-SW-02-042919	4/29/2019 4:07:00PM	Surface Water	Hydrogen Ion (pH) by SM4500 H+ B			05/01/2019
1904V15-003A	AZP-SW-03-042919	4/29/2019 4:23:00PM	Surface Water	TOTAL METALS BY ICP		5/1/2019 11:02:00 AM	05/01/2019
1904V15-003A	AZP-SW-03-042919	4/29/2019 4:23:00PM	Surface Water	TOTAL MERCURY		5/2/2019 1:00:00 PM	05/02/2019
1904V15-003B	AZP-SW-03-042919	4/29/2019 4:23:00PM	Surface Water	Hydrogen Ion (pH) by SM4500 H+ B			05/01/2019
1904V15-004A	AZP-SW-03-042919-DUP	4/29/2019 4:23:00PM	Surface Water	TOTAL METALS BY ICP		5/1/2019 11:02:00 AM	05/01/2019
1904V15-004A	AZP-SW-03-042919-DUP	4/29/2019 4:23:00PM	Surface Water	TOTAL MERCURY		5/2/2019 1:00:00 PM	05/02/2019
1904V15-004B	AZP-SW-03-042919-DUP	4/29/2019 4:23:00PM	Surface Water	Hydrogen Ion (pH) by SM4500 H+ B			05/01/2019
1904V15-005A	AZP-SW-04-042919	4/29/2019 4:30:00PM	Surface Water	TOTAL METALS BY ICP		5/1/2019 11:02:00 AM	05/02/2019
1904V15-005A	AZP-SW-04-042919	4/29/2019 4:30:00PM	Surface Water	TOTAL MERCURY		5/2/2019 1:00:00 PM	05/02/2019
1904V15-005B	AZP-SW-04-042919	4/29/2019 4:30:00PM	Surface Water	Hydrogen Ion (pH) by SM4500 H+ B			05/01/2019

Analytical Environmental Services, Inc

Date: 2-May-19

Client: Tetra Tech EM Inc.
Project Name: AZP Fire
Workorder: 1904V15

ANALYTICAL QC SUMMARY REPORT

BatchID: 278431

Sample ID: **MB-278431** Client ID: Units: **mg/L** Prep Date: **05/01/2019** Run No: **397204**
SampleType: **MBLK** TestCode: **METALS, TOTAL SW6010D** BatchID: **278431** Analysis Date: **05/01/2019** Seq No: **8896686**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Aluminum	BRL	0.200									
Antimony	BRL	0.0200									
Arsenic	BRL	0.0500									
Barium	BRL	0.0200									
Beryllium	BRL	0.0100									
Cadmium	BRL	0.0050									
Calcium	BRL	0.100									
Chromium	BRL	0.0100									
Cobalt	BRL	0.0200									
Copper	BRL	0.0100									
Iron	BRL	0.100									
Lead	BRL	0.0100									
Magnesium	0.009450	0.100									J
Manganese	BRL	0.0150									
Nickel	BRL	0.0200									
Potassium	BRL	0.500									
Selenium	BRL	0.0200									
Silver	BRL	0.0100									
Sodium	0.1207	1.00									J
Thallium	BRL	0.0200									
Vanadium	BRL	0.0100									
Zinc	BRL	0.0200									

Sample ID: **LCS-278431** Client ID: Units: **mg/L** Prep Date: **05/01/2019** Run No: **397204**
SampleType: **LCS** TestCode: **METALS, TOTAL SW6010D** BatchID: **278431** Analysis Date: **05/01/2019** Seq No: **8896687**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: Tetra Tech EM Inc.
Project Name: AZP Fire
Workorder: 1904V15

ANALYTICAL QC SUMMARY REPORT

BatchID: 278431

Sample ID: **LCS-278431** Client ID: Units: **mg/L** Prep Date: **05/01/2019** Run No: **397204**
SampleType: **LCS** TestCode: **METALS, TOTAL SW6010D** BatchID: **278431** Analysis Date: **05/01/2019** Seq No: **8896687**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Aluminum	9.738	0.200	10.00		97.4	80	120				
Antimony	1.007	0.0200	1.000		101	80	120				
Arsenic	1.008	0.0500	1.000		101	80	120				
Barium	1.014	0.0200	1.000		101	80	120				
Beryllium	0.9781	0.0100	1.000		97.8	80	120				
Cadmium	0.9556	0.0050	1.000		95.6	80	120				
Calcium	10.11	0.100	10.00		101	80	120				
Chromium	0.9773	0.0100	1.000		97.7	80	120				
Cobalt	0.9961	0.0200	1.000		99.6	80	120				
Copper	0.9466	0.0100	1.000		94.7	80	120				
Iron	9.720	0.100	10.00		97.2	80	120				
Lead	0.9733	0.0100	1.000		97.3	80	120				
Magnesium	9.815	0.100	10.00	0.009450	98.1	80	120				
Manganese	0.9950	0.0150	1.000		99.5	80	120				
Nickel	0.9956	0.0200	1.000		99.6	80	120				
Potassium	9.571	0.500	10.00		95.7	80	120				
Selenium	0.9591	0.0200	1.000		95.9	80	120				
Silver	0.09591	0.0100	0.1000		95.9	80	120				
Sodium	10.25	1.00	10.00	0.1207	101	80	120				
Thallium	0.9808	0.0200	1.000		98.1	80	120				
Vanadium	1.002	0.0100	1.000		100	80	120				
Zinc	0.9888	0.0200	1.000		98.9	80	120				

Sample ID: **1904V15-001AMS** Client ID: **AZP-SW-01-042919** Units: **mg/L** Prep Date: **05/01/2019** Run No: **397204**
SampleType: **MS** TestCode: **METALS, TOTAL SW6010D** BatchID: **278431** Analysis Date: **05/01/2019** Seq No: **8896690**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Aluminum	10.39	0.200	10.00	0.4393	99.5	75	125				

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: Tetra Tech EM Inc.
Project Name: AZP Fire
Workorder: 1904V15

ANALYTICAL QC SUMMARY REPORT

BatchID: 278431

Sample ID: **1904V15-001AMS** Client ID: **AZP-SW-01-042919** Units: **mg/L** Prep Date: **05/01/2019** Run No: **397204**
SampleType: **MS** TestCode: **METALS, TOTAL SW6010D** BatchID: **278431** Analysis Date: **05/01/2019** Seq No: **8896690**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Antimony	1.009	0.0200	1.000		101	75	125				
Arsenic	1.010	0.0500	1.000		101	75	125				
Barium	1.033	0.0200	1.000	0.01635	102	75	125				
Beryllium	0.9856	0.0100	1.000		98.6	75	125				
Cadmium	0.9558	0.0050	1.000		95.6	75	125				
Calcium	12.69	0.100	10.00	2.615	101	75	125				
Chromium	0.9826	0.0100	1.000		98.3	75	125				
Cobalt	0.9983	0.0200	1.000		99.8	75	125				
Copper	0.9543	0.0100	1.000		95.4	75	125				
Iron	10.22	0.100	10.00	0.4670	97.6	75	125				
Lead	0.9707	0.0100	1.000		97.1	75	125				
Magnesium	10.95	0.100	10.00	1.111	98.4	75	125				
Manganese	1.020	0.0150	1.000	0.02259	99.8	75	125				
Nickel	0.9817	0.0200	1.000		98.2	75	125				
Potassium	10.62	0.500	10.00	0.9586	96.6	75	125				
Selenium	0.9632	0.0200	1.000		96.3	75	125				
Silver	0.09617	0.0100	0.1000		96.2	75	125				
Sodium	12.36	1.00	10.00	2.048	103	75	125				
Thallium	0.9812	0.0200	1.000		98.1	75	125				
Vanadium	1.008	0.0100	1.000		101	75	125				
Zinc	0.9855	0.0200	1.000		98.6	75	125				

Sample ID: **1904V15-001AMSD** Client ID: **AZP-SW-01-042919** Units: **mg/L** Prep Date: **05/01/2019** Run No: **397204**
SampleType: **MSD** TestCode: **METALS, TOTAL SW6010D** BatchID: **278431** Analysis Date: **05/01/2019** Seq No: **8896693**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Aluminum	10.25	0.200	10.00	0.4393	98.1	75	125	10.39	1.35	20	
Antimony	0.9976	0.0200	1.000		99.8	75	125	1.009	1.09	20	

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Analytical Environmental Services, Inc

Date: 2-May-19

Client: Tetra Tech EM Inc.
Project Name: AZP Fire
Workorder: 1904V15

ANALYTICAL QC SUMMARY REPORT

BatchID: 278431

Sample ID: **1904V15-001AMSD** Client ID: **AZP-SW-01-042919** Units: **mg/L** Prep Date: **05/01/2019** Run No: **397204**
SampleType: **MSD** TestCode: **METALS, TOTAL SW6010D** BatchID: **278431** Analysis Date: **05/01/2019** Seq No: **8896693**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Arsenic	1.003	0.0500	1.000		100	75	125	1.010	0.676	20	
Barium	1.020	0.0200	1.000	0.01635	100	75	125	1.033	1.26	20	
Beryllium	0.9740	0.0100	1.000		97.4	75	125	0.9856	1.18	20	
Cadmium	0.9460	0.0050	1.000		94.6	75	125	0.9558	1.04	20	
Calcium	12.46	0.100	10.00	2.615	98.5	75	125	12.69	1.81	20	
Chromium	0.9722	0.0100	1.000		97.2	75	125	0.9826	1.06	20	
Cobalt	0.9870	0.0200	1.000		98.7	75	125	0.9983	1.14	20	
Copper	0.9427	0.0100	1.000		94.3	75	125	0.9543	1.22	20	
Iron	10.09	0.100	10.00	0.4670	96.2	75	125	10.22	1.29	20	
Lead	0.9578	0.0100	1.000		95.8	75	125	0.9707	1.34	20	
Magnesium	10.80	0.100	10.00	1.111	96.9	75	125	10.95	1.41	20	
Manganese	1.008	0.0150	1.000	0.02259	98.6	75	125	1.020	1.18	20	
Nickel	0.9690	0.0200	1.000		96.9	75	125	0.9817	1.31	20	
Potassium	10.40	0.500	10.00	0.9586	94.4	75	125	10.62	2.08	20	
Selenium	0.9530	0.0200	1.000		95.3	75	125	0.9632	1.07	20	
Silver	0.09494	0.0100	0.1000		94.9	75	125	0.09617	1.29	20	
Sodium	12.06	1.00	10.00	2.048	100	75	125	12.36	2.44	20	
Thallium	0.9736	0.0200	1.000		97.4	75	125	0.9812	0.780	20	
Vanadium	0.9946	0.0100	1.000		99.5	75	125	1.008	1.39	20	
Zinc	0.9788	0.0200	1.000		97.9	75	125	0.9855	0.688	20	

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: Tetra Tech EM Inc.
Project Name: AZP Fire
Workorder: 1904V15

ANALYTICAL QC SUMMARY REPORT

BatchID: 278500

Sample ID: **MB-278500** Client ID: Units: **mg/L** Prep Date: **05/02/2019** Run No: **397281**
SampleType: **MBLK** TestCode: **Mercury, Total SW7470A** BatchID: **278500** Analysis Date: **05/02/2019** Seq No: **8898721**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Mercury	BRL	0.00020									

Sample ID: **LCS-278500** Client ID: Units: **mg/L** Prep Date: **05/02/2019** Run No: **397281**
SampleType: **LCS** TestCode: **Mercury, Total SW7470A** BatchID: **278500** Analysis Date: **05/02/2019** Seq No: **8898722**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Mercury	0.004004	0.00020	0.0040		100	80	120				

Sample ID: **1904V15-001AMS** Client ID: **AZP-SW-01-042919** Units: **mg/L** Prep Date: **05/02/2019** Run No: **397281**
SampleType: **MS** TestCode: **Mercury, Total SW7470A** BatchID: **278500** Analysis Date: **05/02/2019** Seq No: **8898724**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Mercury	0.004013	0.00020	0.0040		100	75	125				

Sample ID: **1904V15-002AMS** Client ID: **AZP-SW-02-042919** Units: **mg/L** Prep Date: **05/02/2019** Run No: **397281**
SampleType: **MS** TestCode: **Mercury, Total SW7470A** BatchID: **278500** Analysis Date: **05/02/2019** Seq No: **8898727**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Mercury	0.003972	0.00020	0.0040		99.3	75	125				

Sample ID: **1904V15-001AMSD** Client ID: **AZP-SW-01-042919** Units: **mg/L** Prep Date: **05/02/2019** Run No: **397281**
SampleType: **MSD** TestCode: **Mercury, Total SW7470A** BatchID: **278500** Analysis Date: **05/02/2019** Seq No: **8898725**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Mercury	0.003940	0.00020	0.0040		98.5	75	125	0.004013	1.84	20	

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: Tetra Tech EM Inc.
Project Name: AZP Fire
Workorder: 1904V15

ANALYTICAL QC SUMMARY REPORT

BatchID: R397084

Sample ID: **LCS-R397084** Client ID: Units: **pH Units** Prep Date: Run No: **397084**
SampleType: **LCS** TestCode: **Hydrogen Ion (pH) by SM4500 H+ B** BatchID: **R397084** Analysis Date: **05/01/2019** Seq No: **8894259**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
pH	7.000	0.0100	7.000		100	90	110				

Sample ID: **1904U26-001ADUP** Client ID: Units: **pH Units** Prep Date: Run No: **397084**
SampleType: **DUP** TestCode: **Hydrogen Ion (pH) by SM4500 H+ B** BatchID: **R397084** Analysis Date: **05/01/2019** Seq No: **8894269**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
pH	7.370	0.0100						7.370	0	20	H

Sample ID: **1904V15-001BDUP** Client ID: **AZP-SW-01-042919** Units: **pH Units** Prep Date: Run No: **397084**
SampleType: **DUP** TestCode: **Hydrogen Ion (pH) by SM4500 H+ B** BatchID: **R397084** Analysis Date: **05/01/2019** Seq No: **8894728**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
pH	7.370	0.0100						7.350	0.272	20	H

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		