INVENTUM ENGINEERING, PC

August 20, 2021

Benjamin McPherson, P.E.
Professional Engineer 1 (Environmental)
Division of Environmental Remediation
New York State Department of Environmental Conservation
270 Michigan Avenue
Buffalo, New York 14203

Subject: Sampling Activities – Post Fire Investigation
Riverview Innovation & Technology Campus
3875 River Road
Town of Tonawanda, New York
Site No. C9153353

Dear McPherson,

Following the fire of August 10, 2021, Inventum Engineering, OSC and the Department have conducted a series of investigations and analyses to determine what caused the event and what impacts, if any, have resulted. The fire occurred on the containment pad constructed using, in part, the former bag house slab (Figure 1). The fire companies that responded to the fire used water and a non-fluorine foam (Attachment A) as part of the firefighting effort. The runoff from the fire was routed (Figure 2) to the east quench pit to prevent any discharge to the storm or sanitary sewer systems.

The manufacturer of the foaming agent product indicates the product does not result in the production of any Per-and polyfluoroalkyl substances (PFAS) including Perfluorooctane Sulfonate (PFOS) and Perfluorooctanoic Acid (PFOA). The New York State Department of Environmental Conservation (NYSDEC) has requested testing to confirm the manufacturers statement. Two options for the analysis were presented, test the foaming agent used or test the soil and water potentially affected by the runoff.

Rather than indirect testing of the foaming agent, Riverview Innovation & Technology Campus (Riverview) is proposing to collect and analyze (Modified 537.1 and the TOP Assay [Attachment B]) four samples from the location of the fire and resulting water management.

The following sampling and analysis scope is proposed:

1. Soil – Two samples of the soil along the likely surface water flow path(s) between the fire and the east quench pit will be collected. The sample locations will be selected based on observations of the likely flow paths from the slab to the quench sump. The samples will be collected from 0- to 6-inches below the ground surface (BGS). The samples will be tested for PFAS in accordance with

the protocols in the Remedial Investigation Work Plan (RIWP),the NYSDECs January 2021 PFAS guidance document[1], and the TOP Assay SOP Attachment (Appendix B).

2. Pipe Residual – One sample of the pipe residual in the east quench pit will be collected. The sample will be tested for the PFAS in accordance with the protocols in the RIWP, the referenced guidance document, and the TOP SOP.
3. Water - One sample of the water from the east quench pit will be collected. The sample will be tested for PFAS in accordance with the protocols in the RIWP and the referenced guidance document.

The sample locations will be surveyed using GPS and the results of the analytical testing will be incorporated into the August 10, 2021 Fire Event Memorandum maintained by Inventum. The updated revision of the Memorandum will be provided to the NYSDEC and New York State Department of Health (NYSDOH) as soon as the results are availble and tabulated.

Please let us know questions or comments on the approach and scope.

Sincerely yours,

John P. Black
Partner

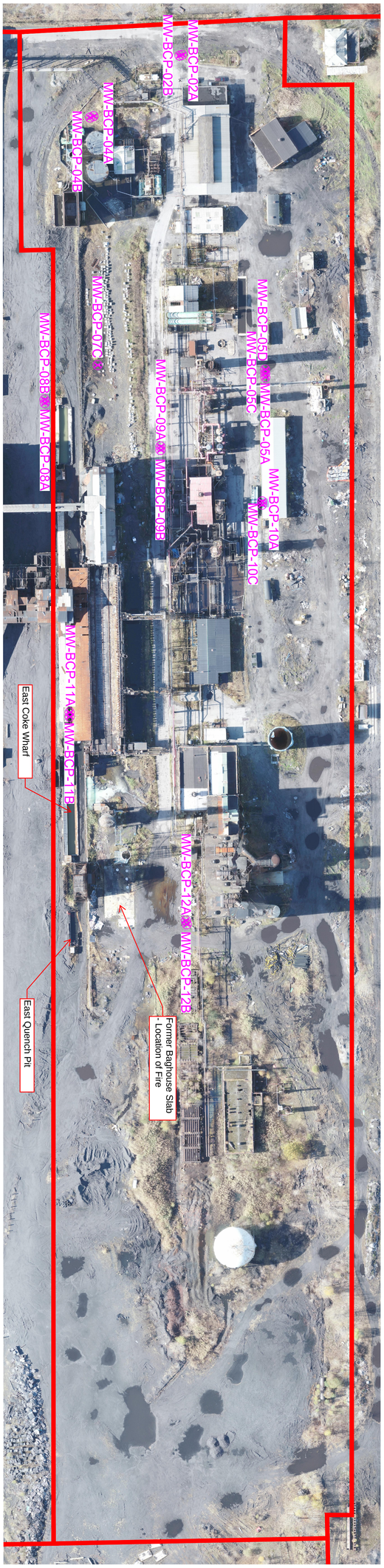
Attachments

CC: Angela Martin, NYSDOH

[1] NYSDEC. Sampling, Analysis, and Assessment of Per- and Polyfluoroalkyl Substances (PFAS) Under NYSDEC's Part 375 Remedial Programs. January 2021.

Figures

D



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PRODUCTION AREA OF INVESTIGATION

BROWNFIELD CLEANUP PROGRAM SITE
RIVERVIEW INNOVATION & TECHNOLOGY CAMPUS, INC.
3875 RIVER ROAD
TONAWANDA, NEW YORK 14150
BCP SITE No. C915353

INVENTUM ENGINEERING
481 CARLISLE DRIVE
SUITE 202
HERNDON, VIRGINIA 20170
(703) 722-6049
www.InventumEng.com

FIGURE 1

DRAWING NUMBER
A01 2

DRAWING BY	
CHECKED	
APPROVED	

N

70 0 35 70 140 280

1 INCH = 70 FEET (22X34)

D

DRAWING BY

CHECKED

APPROVED

LOCATION OF FIRE WATER RUNOFF

BROWNFIELD CLEANUP PROGRAM SITE
RIVERVIEW INNOVATION & TECHNOLOGY CAMPUS, INC.
3875 RIVER ROAD
TONAWANDA, NEW YORK 14150
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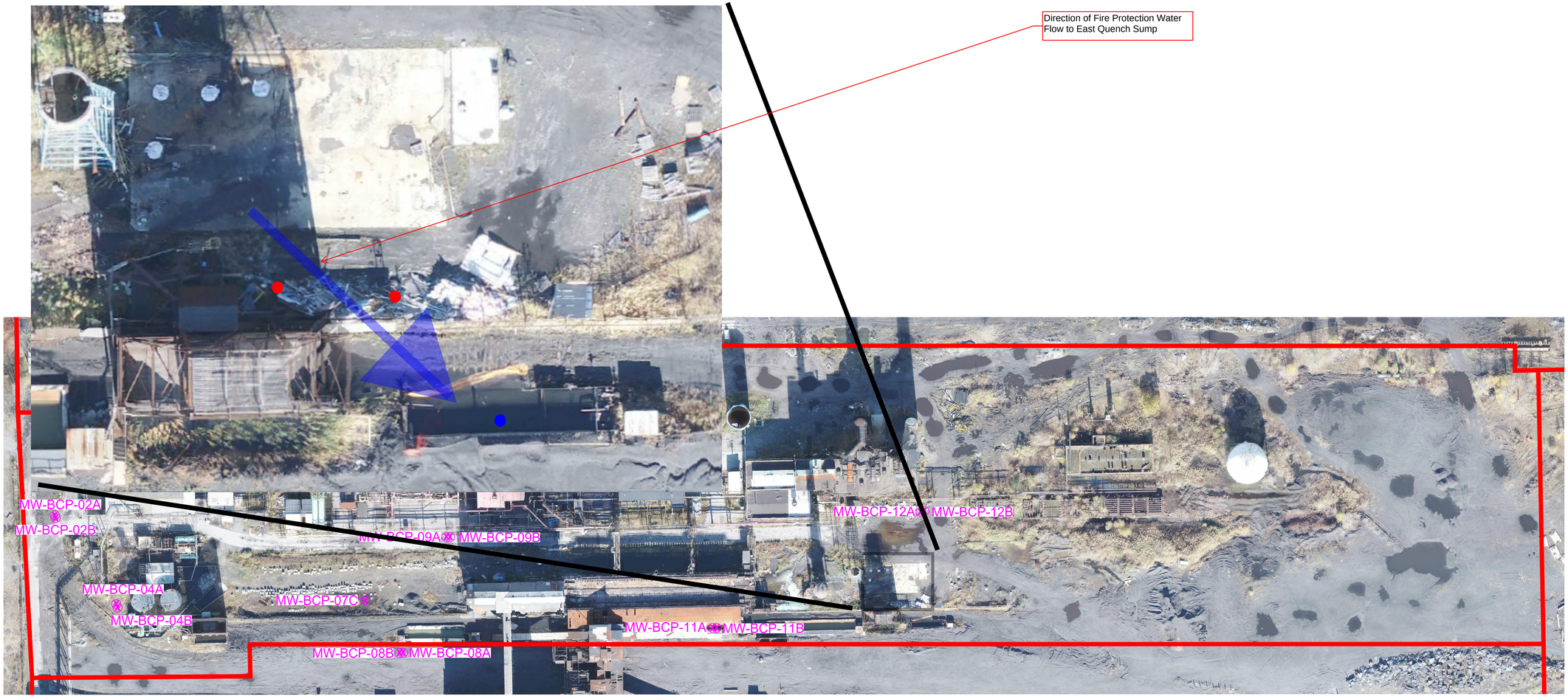
FIGURE 2

DRAWING NUMBER

AOI 2



Soil Sample - 0- to 6-inches Below Ground Surface

Water and Residual Sample Location - Quench Pit

70 0 35 70 140 280

1 INCH = 70 FEET (22X34)

D

N

DRAWING BY	
CHECKED	
APPROVED	

LOCATION OF FIRE WATER RUNOFF

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FIGURE 2

DRAWING NUMBER

AOI 2

Attachment A
SDS – Firebull

FIREBULL®

F3 Fluorine Free Foam

FireBULL is the most complete and user-friendly firefighting foam in the world!

- FLUORINE FREE
- ACID FREE
- BIODEGRADABLE

FireBULL contains vapor-sealing and rapid cooling properties that reduce the risk of exposure to carcinogenic particulates. You have to see it to believe it! Video Link: https://www.gpsinc.com/fireade

FIREBULL®

F3 Fluorine Free Foam

Firebull ® FMI Contact Fantail Services
832.242.4882 or 559.410.1933
email **info@fantailservices.com**
www.fantailservices.com

PRODUCT INFO:

FIREBULL F3 Fluorine Free Foam is a seamless transition from AFFF products for fire departments . The most complete and user friendly firefighting agent produced in the world, FIREBULL eliminates all of the long-established issues of Class B foams: it will not clog, gum, or corrode foam systems or equipment. FIREBULL offers the simplicity of using one product to extinguish multiple classifications of fire, allowing fire departments and brigades to increase their stocking supply by using just one product that serves two purposes. 20-Year Shelf Life.

FIREBULL F3 holds third party verification of concentrate free from PFOS and other PFAS available on request.

APPLICATIONS

US/European Class A Fires Wood, Grass, Coal, Tires, Hay, Cotton, Cardboard, Initial Knockdown: 0.25%

Wetting Agent:
0.25%-1.0%. Reapply as needed.

Cars, Trucks, Heavy Equipment:
0.50% up to 1.0%

US Class B, European Class B/C Fires

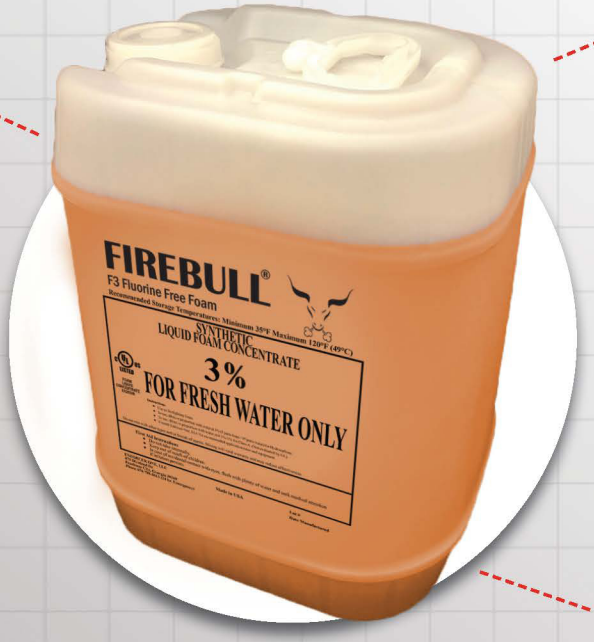
Non-Polar Solvents:
Gasoline, Gasoline w/10% Ethanol, Jet A, JP4/5/8, Crude Oil, Diesel, Etc.

3% using .1 GPM/Sq.Ft. Indirect Application

3% using .16 GPM/Sq.Ft. Direct Application

6% using .1 GPM/Sq.Ft. Indirect Application

6% using .16 GPM/Sq.Ft. Direct Application



FEATURES

Compatible with all regular and all standard equipment

Excellent burnback protection

Rapid cooling properties

Vapor barrier properties

Applicable for Training at 1%, 3%, and 6% for low, medium, and high expansion

Effective with Fresh Water

c UL US LISTED

Associated Products

FIREBULL
CLASS A WETTING AGENT

FIREBULL
TRAINING FOAM

ENFORCER 30 CAFS

ENFORCER 10 CAFS

FIREBULL F3 FLUORINE FREE FOAM

Preparation Date: 1/17/2020

1. PRODUCT AND COMPANY IDENTIFICATION

LEGEND HMIS/NFPA	
Severe	4
Serious	3
Moderate	2
Slight	1
Minimal	0

Health	1
Flammability	0
Physical Hazard	0

Product Name: **FIREBULL F3 FLUORINE FREE FOAM**

Recommended use: **Fire Fighting**

Manufacturer, supplier:
EnforcerOne, LLC
473 Dividend Dr
Peachtree City, GA 30269
Phone770-460-7793
Emergency Contact Telephone number: **770-460-7793**

2. HAZARDS IDENTIFICATION

GHS Classification

Acute oral toxicity	Category 4
Skin Irritation	Category 2
Serious Eye Irritant	Category 2A

GHS Label Element

Hazard Pictograms:

Signal Word Warning

Hazard Statements

Harmful if swallowed
Causes skin irritation
Causes serious eye irritation

Precautionary Statements:

Prevention: Wash skin thoroughly after handling. Do not eat, drink, or smoke when using this product. Wear protective gloves and eye protection.

Response:
Principal routes of exposure: Eye contact, Skin contact, Inhalation, Ingestion.
Skin: Wash contaminated area with soap or mild detergent. Remove contaminated clothing and shoes. Wash clothing before reuse. Get medical attention if irritation persists.
Eyes: If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice/attention.
Inhalation: If symptoms occur move affected person to fresh air. If not breathing, give artificial respiration. If symptoms persist, get medical attention promptly.
Ingestion: If product is swallowed, do not induce vomiting. If vomiting occurs keep head lower than hips to help prevent aspiration. Never give anything by mouth to an unconscious person. If affected person is conscious, give plenty of water to drink. Get medical attention at once.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Ingredient(s)	CAS #	Weight %
Proprietary hydrocarbon surfactant blend	NA	1 – 5
Glycol Ether	112-34-5	10
Xantham Gum	11138-66-2	< 3
Sodium Decyl Sulfate	151-21-3	7
H2O	NA	75

4. FIRST AID MEASURES

Skin contact: Wash contaminated area with soap or mild detergent. Remove contaminated clothing and shoes. Wash clothing before reuse. Get medical attention if irritation persists.
Eye contact: If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice/attention.
Inhalation: If symptoms occur, move affected person to fresh air. If not breathing, give artificial respiration. If symptoms persist, get medical attention promptly.
Ingestion: If product is swallowed, do not induce vomiting. If vomiting occurs keep head lower than hips to help prevent aspiration. Never give anything by mouth to an unconscious person. If affected person is conscious, give plenty of water to drink. Get medical attention at once.

5. FIRE-FIGHTING MEASURES

Fire Fighting Procedure: Use water vapor, foam or fog. Firefighters should wear proper protective equipment.
Fire Hazard: N/A
Flash Point (F°, TCC): None
Flammable Limits: LEL: N/A

6. ACCIDENTAL RELEASE MEASURES

Spill Clean Up: Wear appropriate protective equipment (see Section 8). Absorb with an inert material and put spilled material in appropriate waste disposal.

7. HANDLING AND STORAGE

Handling: Avoid contact with eyes, skin and clothing. Avoid breathing vapors or mists. Keep container closed. Wash thoroughly after handling.
Storage: Keep container in cool well ventilated area. Keep container tightly closed. Store away from incompatible materials. Keep out of the reach of children.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering measures to reduce exposure:
No special ventilation requirements. General room ventilation is adequate.

Personal Protective Equipment

Eyes: Safety eyewear should be used when there is a likelihood of exposure.
Hand: For prolonged or repeated handling wear impervious chemical resistant gloves.
Skin: Wear normal work place attire.
Respiratory: Avoid breathing vapors, spray or mists.

Ingredient(s)	CAS #	ACGIH	OSHA	Mexico

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	Red liquid
Odor	characteristic
Upper and lower flammability or explosive limits	not available
Vapor pressure	not available
Odor threshold	not available
Vapor density	not available
pH	7-8.5
Relative density	1.0-1.02
Melting point/freezing point	not available
Boiling Point deg. F	not available
Solubility water	soluble
Initial boiling point and boiling range	not available
Flash point	not available
Evaporation rate	not available
Auto-ignition temperature	not available
Decomposition temperature	not available
VOC content (%)	<1
Viscosity	not available

10. STABILITY AND REACTIVITY

Stability: Stable
Incompatibility: Strong oxidizing agents.

Polymerization: Will not occur.
Hazardous Decomposition: Carbon monoxide, carbon dioxide, and other organic materials.

11. TOXICOLOGICAL INFORMATION

Toxicity to animals: **NA**
Oral (LD50) Acute:
Dermal (LD50) Acute:

12. ECOLOGICAL INFORMATION

Ecological Information: Not available.
Biodegradable/OECD: Not available.

13. DISPOSAL CONSIDERATIONS

Waste Disposal Method: Liquid wastes are not permitted in landfill. Consult local, state, and federal agencies for proper disposal in your area.
Classification: Non-hazardous waste

14. TRANSPORT INFORMATION

Not regulated as hazardous by DOT 14.1 Product:
Shipping Class: 55; NMFC # 048580; Schedule B: 3813.00
14.2 Extinguishers: Shipping Class: 60; NMFC # 069185; Schedule B: 8424.10

Note: DOT classification does not necessarily apply to all sizes. For specific container size exceptions, refer to the Bill of Lading with your shipment.

15. REGULATORY INFORMATION

SARA 313 toxic chemical notification and release reporting: No product found
Clean Water Act (CWA) regulated substance: No product found
Clean Air Act (CAA) 112 regulated toxic substances: No product found
State Regulations: The following ingredients appear on various State's Right to Know lists and/or California's Proposition 65 list:

Ingredient(s)	CAS #	State List
None		

SARA 311/312 Hazard Categories
Immediate: -
Delayed: -
Fire: -
Reactivity: -
Sudden Release of Pressure: -

Canada
WHMIS Hazard Class:

16. OTHER INFORMATION

Reason for revision: Format revision
Additional advice:

Notice to Reader:
As of the date of issuance, we are providing available information relevant to the handling of this material in the workplace. All information contained herein is offered in good faith in the belief that it is accurate. This material safety data sheet shall not be deemed to constitute or imply any warranty of any kind. In the event of an adverse incident associated with this material, this safety data sheet is not intended as a substitute for consultation with appropriately trained personnel (refer to section 1). Some information presented and conclusions herein are from sources other than

test data on the substance itself. We do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with handling, storage, use or disposal of the product.

CERTIFICATE OF COMPLIANCE

Certificate Number	EX28308
Report Reference	EX28308-20201217
Date	2021-MAY-17

Issued to:

EnforcerOne LLC
473 Dividend Dr
Peachtree City GA, 30269 US

This is to certify that representative samples of

FOAM LIQUID CONCENTRATES

Firebull F3, nominal 6 percent Synthetic , +35 F minimum storage and use temperature. Hydrocarbon fuels only. For fresh water use only.
Firebull F3, nominal 3 percent Synthetic , +35 F minimum storage and use temperature. Hydrocarbon fuels only. FOR FRESH WATER USE ONLY.

Have been investigated by UL in accordance with the Standard(s) indicated on this Certificate.

Standard(s) for Safety:

UL 162, UL Standard for Safety for Foam Equipment and Liquid Concentrates

CAN/ULC S564-06, ULC Standard for Categories 1 and 2 Foam Liquid Concentrates

Additional Information:

See the UL Online Certifications Directory at https://iq.ulprospector.com for additional information

This Certificate of Compliance does not provide authorization to apply the UL Mark. Only the UL Follow-Up Services Procedure provides authorization to apply the UL Mark.

Only those products bearing the UL Mark should be considered as being UL Certified and covered under UL's Follow-Up Services.

Look for the UL Certification Mark on the product.

Bruce Mahrenholz, Director North American Certification Program

UL LLC

Attachment B

Standard Operating Procedure – TOP Assay

TOP Assay SOP Addendum

SOP Title or Method Number: **SOP 23528**, Determination of Selected Perfluorinated Alkyl Substances by Solid Phase Extraction and Liquid Chromatography/Tandem Mass Spectrometry Isotope Dilution (LC/MS/MS)

Reference Documents: **EPA Method 537**, Version 1.1, September 2009, EPA Document #: EPA/600/R-08/09EPA; **Method 537.1**, Version 1, November 2018, EPA Document #: EPA/600/R-18/352; **Department of Defense, Quality Systems Manual for Environmental Laboratories**, Version 5.2, 2019

The following modifications to the referenced SOP are as follows:

Section 7: Water Bath – Capable of monitoring recording to .1 C maintaining 85 C.

Section 8.1

Sodium Hydroxide (NaOH, CAS#: 1310-73-2) – High purity, demonstrated to be free of analytes and interferences.

Potassium Persulfate ($K_2S_2O_8$, CAS#: 7727-21-1) - High purity, demonstrated to be free of analytes and interferences.

Hydrochloric Acid (HCl, CAS#: 7647-01-0) - High purity, demonstrated to be free of analytes and interferences.

Additional table to be added to Section 8

Table 1

Isotope Labeled Standard	Conc. Top Surr Stock (ng/mL)	Vol. of Top Surr Stock (mL)	Final Vol. of Top Surr PDS (mL)	Final Conc. of Top Surr PDS (ng/mL)
M3PFPeA	1000	1.0	2.0	500
M2PFHxA	1000	1.0	2.0	500
M4PFOA	1000	1.0	2.0	500
d3-N-MeFOSAA	1000	1.0	2.0	500
d5-N-EtFOSAA	1000	1.0	2.0	500
M2-4:2FTS	935	1.0	2.0	467.5
M2-6:2FTS	949	1.0	2.0	474.5
M2-8:2FTS	958	1.0	2.0	479

Modified extracted internal standard list (Table 2) for post TOP extraction

Isotope Labeled Standard	Conc. of EIS Stock (ng/mL)	Vol. of EIS Stock (mL)	Final Vol. of EIS PDS (mL)	Final Conc. of EIS PDS (ng/mL)
M4PFBA	1000	1.0	2.0	500
M5PFPeA	1000	1.0	2.0	500
M5PFHxA	1000	1.0	2.0	500
M4PFHpA	1000	1.0	2.0	500
M8PFOA	1000	1.0	2.0	500
M9PFNA	1000	1.0	2.0	500
M6PFDA	1000	1.0	2.0	500
M7PFUdA	1000	1.0	2.0	500
MPFDoA	1000	1.0	2.0	500
M2PFTeDA	1000	1.0	2.0	500
M3PFBS	929	1.0	2.0	464.5
M3PFHxS	946	1.0	2.0	473
M8PFOS	957	1.0	2.0	478.5

Prior to Section 10.3, Cartridge SPE procedure, each sample treated with Potassium Persulfate until 60 mM (about 4 grams). Add Sodium Hydroxide until the sample is 125 mM (about 1.25 grams).
Sample should have a pH >12.

Fortify each sample with 20 µl of TOP pre-assay surrogate containing 5 negative control surrogates and 3 positive control surrogates from table 1.

Place sample in a water bath at 85 C for 6 hours.

Remove sample from water bath and adjust pH 6-8 with Hydrochloric Acid.

Following pre-treatment, extraction protocol unaltered.

Section 11, An additional calculation is added for the final reporting of the TOP assay results.

TOP Assay = Result of Post TOP assay extraction – Result of analysis from Pre-Top Assay extraction.