Standard Operating Procedure No. 042A
For Treating Liquid Investigation-Derived Material (Purge water, drilling water, and decontamination fluids

Prepared by

EA Engineering, Science, and Technology, Inc., PBC
225 Schilling Circle, Suite 400
Hunt Valley, Maryland 21031

Revision 1
March 2021

This page intentionally left blank

PROJECT-SPECIFIC VARIANCE FORM

This form is to be completed to indicate if there are any client-, project-, or site-*specific* variances to this Standard Operating Procedure (SOP).

SOP No. 042A	
SOP Section	**Variance**
General	Please note that all procedures and materials used for the treatment of Investigation-Derived Material (IDM) will be be confirmed to be Per- and polyfluoroalkyl substances (PFAS)-free.
General	This SOP covers disposal of liquid IDM associated with the PFAS Site Inspection (SI) sampling at Army National Guard (ARNG) sites. This SOP does not cover disposal of Solid IDM.

Michael O'Neill

Project Manager (Name)

Michael O'Neill 03/02/2021

Project Manager (Signature) Date

CONTENTS

Page

This page intentionally left blank

1. SCOPE AND APPLICATION

The purpose of this Standard Operating Procedure is to define the required steps for staging and treating liquid investigation-derived material (IDM) generated during Per- and polyfluoroalkyl substances (PFAS) Site Investigation (SI) field activities. IDM, as used herein, includes purged groundwater and decontamination fluids (liquids) associated with PFAS sampling. This SOP also addresses the management of residuals left in the drum.

2. MATERIALS

The following materials may be required:

Department of Transportation (DOT) approved 55-gallon open top drum (steel) containers	Drum labels and paint pen
55-gallon container containing charcoal granular activated carbon (GAC)	Drum Dolly
PFAS free transfer pump(s) and hoses	Field logbook (bound)
Prefilter for sediment removal	Waste identification labels (Non-Haz, Non-RCRA" labels)
Drum Generation Information (provided by generator)	Previous sampling results from purge/decontamination water
Any additional equipment that may be dictated by project, site location, or site-specific plans	Sampling Equipment and containers (i.e., hoses, gauges, 5-gallon buckets, etc.)
Level D personal protective equipment [long sleeves, gloves, safety vest, safety glasses, and steel toe shoes	

3. PROCEDURE

3.1 GENERAL

No container will be labeled as a “Hazardous Waste” unless the contents are in fact known to be hazardous as defined by 40 Code of Federal Regulation 261. If contents are considered hazardous (as supported by generator knowledge or analytical results), the U.S. army Corps of Engineers (USACE) and ARNG will be contacted and no handling or treatment will occur.

The IDM is considered impacted with PFAS if analytical results indicate that

perfluorooctanoic acid [PFOA], perfluorooctanesulfonic acid [PFOS] and perfluorobutanesulfonic acid (PFBS) analytes are present at or above the 2019 Office of the Secretary of Defense (OSD) screening levels (SLs) (Deputy Assistant Director of Defense, 2019). IDM impacted with PFAS at or above appropriate OSD SLs will be treated after which it may be discharged onsite if approved by USACE,[1] ARNG, and regulatory personnel and documented in an approved work plan for the site or in a separate written approval notice.

3.2 PROCEDURES FOR LIQUID INVESTIGATION-DERIVED MATERIAL DISPOSAL

The following general conditions are anticipated prior to moving forward with handling and disposal of liquid IDM.

- Water/fluids from the initial development of new SI wells, decontamination, and purge water generated during soil and groundwater sampling, has been containerized in DOT approved 55-gallon drums and staged in accessible areas.
- Water/fluid which is containerized will remain on-site until analytical results are received, and an agreeable path forward is determined.
- The disposal method after treatment (i.e., containerize and sample again, disposal to the ground surface, or other) will be approved by the USACE, ARNG, and regulatory personnel and documented in an approved work plan for the site or in a separate written approval notice prior to EA Engineering, Science, and Technology, Inc., PBC (EA) engaging in the handling and disposal of liquid IDM .

The following general sequence is anticipated for handling and disposal of liquid IDM.

1. Prior to arrival onsite:
    a. Review sampling results and confirm PFAS levels and quantity of material to be treated. If there are any other hazardous substances (as designated by EPA) or contaminants of concern in IDM other than PFAS that require management other than on site GAC treatment, immediately contact USACE, ARNG, and generator to resolve any discrepancy and confirm path forward.
    b. Based on the volume of IDM liquid and maximum PFAS concentrations, the GAC treatment cannister(s) will be sized to achieve the site-specific treatment levels with an appropriate safety factor for the type of GAC used to prevent PFAS breakthrough.
    c. Review/determine site logistics including access requirements, drum locations and general conditions (hardstand or other), and discharge requirements (i.e., containerize after treatment, dispose on ground surface in vicinity, or disposal in alternate location). Immediately contact USACE, ARNG, and generator to resolve any discrepancy and confirm path forward.

[1] Site-specific maximum PFAS levels detected at the site and total volume of IDM fluids will be used to size GAC treatment canisters with safety factor necessary to achieve treatment levels established for the site.

d. Determine if work requires any changes to SOP (i.e., use of additional equipment [i.e., Photoionization detector for VOC monitoring] or personal protective equipment beyond what is specified in SOP).

2. Upon arrival onsite:
    a. Confirm containers as to type of media, generation date of the container, point-of- generation, and points-of-contact and condition (still sealed, any damage, leaking etc.).
    b. Confirm the sampling and container identification with the description provided by the generator. If containers do not match or if there is evidence of damage, leaking, non-matching drum count is observed, immediately contact USACE, ARNG, and generator to resolve any discrepancy and confirm a path forward.
    c. Confirm site logistics and confirm treatment and discharge approach with ARNG to ensure it matches previous documentation/understanding (i.e., team not receiving new instructions).

3. Treatment of IDM will proceed in the following general sequence:
    a. Open existing 55-gallon IDM containers and confirm contents. If conditions do not match or there is evidence of damage/leaks, or if non-matching drum count is observed, immediately contact USACE, ARNG, and generator to resolve any discrepancy and confirm path forward.
    b. Set up equipment, pump, prefilter, influent and effluent hoses, and empty drum (if containerizing after treatment).
    c. Lower pump intake hose into drum being careful to keep it above any sediment/soils.
    d. Pump the liquid media through the prefilter and then through the GAC. Dispose via the approved disposal method after treatment and described in the work plan. Flow rates should be monitored with a maximum flow rate of 5 gallons per minute unless authorized by the engineer for empty bed contact time of 15 mins or greater. Treatment flow rate is likely to be lower due to filter pressure.
    e. Monitor discharge and pressure gauges to confirm back pressure.
    f. Monitor filter and stop pumping to change filter when pressures increase, or filter media is observed to be built up with sediment.
    g. Empty remaining sediment/liquids into existing soils/sediment drums onsite. Consolidate residual material per sampling location. Document the quantity, type of material, and source of material emptied into existing soil/sediment drums on-site.
    h. Rinse the drum with PFAS free water, treat the rinsate, and collect the effluent. Label drums as clean/empty. Final drum disposition is discussed below.
    i. If water is pumped into drums instead of being discharged to the ground surface after GAC treatment, one water sample will be collected from one drum of water (likely the final drum of treated water). Samples will be shipped next day for analysis of PFAS compounds (existing Table B-15 PFAS list).
    j. Document process/remaining conditions. Collect photographs of treatment

activities, empty drums, and site conditions if appropriate.

k. Provide a written summary of treatment activities to the client.
l. Post treatment GAC will be moved to a secure location as identified by the installation and left for future use.
m. Adhere a drum label to remaining drums and as a backup also label drums with a paint pen. Label drums as "GAC filtered liquid".

4. When discharge is approved by USACE and ARNG the following process will be followed:
    a. Discharge should be in an area deemed appropriate by the ARNG and regulatory personnel as documented.
    b. Discharge should conform to any received written instructions. Generally, if a discrepancy arises immediately contact USACE, ARNG, and generator to resolve any discrepancy and confirm path forward.
    c. Discharge water may be gradually infiltrated into the ground. Disposal locations must allow percolation of the water and prohibit "ponding." No discharge into a stream or municipal system.
    d. Upon completion of water discharge to ground, enter type of media, amount of media, date of disposal, and discharge point(s) in a bound Field Logbook. Collect photographs of discharge activities and discharge locations.
    e. Provide a written summary of discharge activities to the client.
    f. Confirm location and move empty drums. Adhere a drum label 2) As a backup also label with a paint pen. Installation to dispose of or recycle empty drums.

3.3 PROCEDURES FOR DECONTAMINATION SOLUTION AND PERSONAL PROTECTIVE EQUIPMENT DISPOSAL

Decontamination solutions include catch water from drill rigs, as well as smaller quantities of soapy water and rinse solutions used in decontaminating field sampling equipment. The decontamination solution will be treated as liquid IDM and combined with other liquid wastes and addressed as noted above (Section 3.2).

Personal protective equipment and disposable sampling equipment will be containerized onsite, appropriately labeled, and disposed in a designated trash receptacle.

4. MAINTENANCE

The waste disposal records collected during operations will be incorporated into the project file as soon as possible in either hard copy or electronic format. Refer to EA's Records Retention Policy for archiving information. Records will be distributed to USACE and ARNG as noted in previous sections.

5. REFERENCES

Deputy Assistant Secretary of Defense. 2019. Investigation Per- and Polyfluoroalkyl Substances within The Department of Defense Cleanup Program. United States Department of Defense. 19 October.

Environment Article Section 7-201(t).

U.S. Environmental Protection Agency. 1991. Management of Investigation-Derived Wastes during Site Inspections PB91-921331, OERR Directive 9345.3-02. Office of Emergency and Remedial Response U.S. Environmental Protection Agency, Washington, D.C. May.