Naval Facilities Engineering Systems Command Northwest
Silverdale, Washington

Final

Sampling and Analysis Plan
Monitoring of Per- and Polyfluoroalkyl Substances in Off-Base Drinking Water
Ault Field, Area 6, and Outlying Landing Field Coupeville

Naval Air Station Whidbey Island
Oak Harbor and Coupeville, Washington

October 2022

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SAP Worksheet #1—Title and Approval Page

Naval Facilities Engineering Systems Command

Naval Facilities Engineering Systems Command Northwest
Silverdale, Washington

Final

Sampling and Analysis Plan Monitoring of Per- and Polyfluoroalkyl Substances in Off-Base Drinking Water Ault Field, Area 6, and Outlying Landing Field Coupeville

Naval Air Station Whidbey Island
Oak Harbor and Coupeville, Washington

October 2022

Prepared for NAVFAC Northwest
by CH2M HILL, Inc.
Bellevue, Washington
Contract N62470-21-D-0007
CTO N4425521F4325

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SAP Worksheet #1—Title and Approval Page (continued)

Approval Signature:

____

Ken Bowers
Naval Facilities Engineering Systems Command Atlantic
Quality Assurance Officer

Other Approval Signatures:

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Kendra Clubb
Naval Facilities Engineering Systems Command Northwest
Remedial Project Manager

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Executive Summary

This Sampling and Analysis Plan (SAP) outlines the sampling activities in support of an investigation of per- and polyfluoroalkyl substances (PFAS) in drinking water sources impacted by activities at Naval Air Station (NAS) Whidbey Island near Ault Field and Area 6 in Oak Harbor, Washington, and Outlying Landing Field (OLF) Coupeville in Coupeville, Washington. This SAP describes the continuation of biannual off-Base PFAS drinking water sampling near NAS Whidbey Island conducted under the Department of the Navy Environmental Restoration Program.

From November 2016 through March 2018 at Ault Field, November 2016 through June 2017 at OLF Coupeville, and November 2017 through August 2019 at Area 6, off-Base residential and community drinking water wells located within 1 mile of potential PFAS release areas were sampled as part of a voluntary sampling program. The wells were sampled to determine whether perfluorooctane sulfonate (PFOS) and perfluorooctanoic acid (PFOA) were present above the project action limits (PALs), the United States Environmental Protection Agency's (USEPA's) lifetime health advisories of 0.07 microgram per liter (µg/L) for PFOS, PFOA, and combined PFOS/PFOA. The results of this investigation indicated that PFOS and/or PFOA were present above the lifetime health advisory in two off-Base residential drinking water wells near Ault Field, five off-Base residential and community drinking water wells near Area 6, and eight off-Base residential and community drinking water wells near OLF Coupeville. Additional details on the drinking water sampling history at NAS Whidbey Island are provided in **Worksheet #10**.

In March 2018, Naval Facilities Engineering Systems Command (NAVFAC) initiated a biannual sampling program for all off-Base drinking water wells near Ault Field and OLF Coupeville where PFAS were previously detected and in drinking water wells on parcels adjacent to wells where PFOS and/or PFOA were previously detected at concentrations above the lifetime health advisory. In October 2019, off-Base drinking water wells associated with Area 6, meeting similar criteria, were incorporated into the biannual sampling program. During the October 2019 sampling event near Area 6, results indicated that PFOS and/or PFOA were present above the lifetime health advisory in one additional drinking water well bringing the total number of drinking water wells above the lifetime health advisory for residences near Area 6 to six. Beginning in October 2019, the number of PFAS analyzed was updated from 14 to 18 to reflect a change in the specified analyte list included in the USEPA drinking water analytical method.

Based on the results of the biannual off-Base drinking water sampling program, continued biannual monitoring was recommended to collect additional data and conduct trend analysis for evaluation of temporal and spatial variability of PFAS in drinking water wells and to monitor human health protectiveness.

The objective of the investigation described within this SAP is as follows:

- Evaluate the long-term trends in PFAS concentrations associated with impacted off-Base drinking water wells near Ault Field, Area 6, and OLF Coupeville.
- Evaluate the concentrations of PFOS and/or PFOA with respect to human health protectiveness in impacted off-Base drinking water wells near Ault Field, Area 6, and OLF Coupeville.

The proposed investigation activities include continuation of biannual resampling of all drinking water wells where PFAS were previously detected (including PFOS and/or PFOA concentrations above or below the lifetime health advisory), drinking water wells adjacent to those where previous concentrations were above the lifetime health advisory, and drinking water wells adjacent to current and future waterline installation activities (where discontinued pumping of existing wells could influence flow patterns toward other private drinking water wells). Drinking water samples will be screened against the PALs listed in **Worksheet #11**. If PFAS are present in any drinking water wells above the PALs, an alternate drinking water source will be provided (or continued, if drinking water is already being provided based on previous sampling results). For the wells with previous lifetime health advisory exceedances for PFOS and/or PFOA (where alternative drinking water is already being provided), if samples collected during this investigation indicate PFOS and PFOA are not detected or are below PALs, the alternate drinking water source will continue to be provided while additional monitoring is being conducted.

If additional off-Base drinking water sampling is necessary based on ongoing on-Base investigations or off-Base drinking water results, a SAP addendum will be submitted.

This SAP consists of 37 worksheets specific to the scope of work for the follow-up monitoring of PFAS in off-Base drinking water at Ault Field including Area 6, Oak Harbor, Washington, and OLF Coupeville, Coupeville, Washington. All tables are embedded within the worksheets. All figures are included at the end of the document. Field standard operating procedures (SOPs) are included in **Appendix A**. Department of Defense Environmental Laboratory Accreditation Program Accreditation Letter are included in **Appendix B**. Laboratory SOPs are included in **Appendix C**.

The laboratory information cited in this SAP is specific to Vista Analytical Laboratory. If additional laboratory services are requested requiring modification to the existing SAP, revised SAP worksheets will be submitted to the NAVFAC for approval.

SAP Worksheets

Appendices

Tables

Figures

Acronyms and Abbreviations

°C	degree(s) Celsius
µg/L	microgram(s) per liter
AM	Activity Manager
AFFF	aqueous film-forming foam
AQM	Activity Quality Manager
bgs	below ground surface
CA	corrective action
CCV	continuing calibration verification
CH2M	CH2M HILL, Inc.
CLEAN	Comprehensive Long-term Environmental Action—Navy
COPC	contaminant of potential concern
CTO	Contract Task Order
DL	detection limit
DoD	Department of Defense
DQI	data quality indicator
DQO	data quality objective
DV	data validation
EDD	electronic data deliverable
ELAP	Environmental Laboratory Accreditation Program
FD	field duplicate
FTL	Field Team Leader
GETR	groundwater extraction, treatment, and recharge
H&S	health and safety
HQ	hazard quotient
HSM	Health and Safety Manager
HSP	Health and Safety Plan
ICAL	initial calibration
ID	identification
IS	internal standards
LCS	laboratory control sample
LOD	limit of detection
LOQ	limit of quantitation
mL	milliliter(s)
MPC	measurement performance criteria
MS	matrix spike
MSD	matrix spike duplicate
msl	mean sea level
N/A	not applicable
NAS	Naval Air Station

NAVFAC	Naval Facilities Engineering Systems Command
Navy	Department of the Navy
NTR	Navy Technical Representative
OLF	Outlying Landing Field
PAL	project action limit
PC	Project Chemist
PFAS	per- and polyfluoroalkyl substances
PFBS	perfluorobutane sulfonate
PFOA	perfluorooctanoic acid
PFOS	perfluorooctane sulfonate
PM	Project Manager
POC	point of contact
PQO	project quality objective
QA	quality assurance
QAO	Quality Assurance Officer
QC	quality control
QSM	Quality Systems Manual
RPD	relative percent difference
RPM	Remedial Project Manager
RSL	regional screening level
SAP	Sampling and Analysis Plan
SI	Site Inspection
SME	Subject Matter Expert
SOP	standard operating procedure
SSC	Site Safety Coordinator
STC	Senior Technical Consultant
TBD	to be determined
TM	Task Manager
UCL	upper control limit
USEPA	United States Environmental Protection Agency
WADOE	Washington State Department of Ecology

SAP Worksheet #2—SAP Identifying Information

Site Name/Number:	Ault Field, Oak Harbor, Washington, Area 6, Oak Harbor, Washington, and Outlying Landing Field (OLF) Coupeville, Coupeville, Washington, Naval Air Station (NAS) Whidbey Island
Operable Unit/Solid Waste Management Unit:	Not applicable (N/A)
Contractor Name:	CH2M HILL, Inc. (CH2M)
Contract Number:	N62470-21-D-0007
Contract Title:	Comprehensive Long-term Environmental Action—Navy (CLEAN) 9000 Program
Work Assignment Number (optional):	Contract Task Order (CTO) 4325

1. **This Sampling and Analysis Plan (SAP) was prepared in accordance with the requirements of the following:**
   - *Guidance for Quality Assurance Project Plans* (USEPA, 2002)
   - *Uniform Federal Policy for Quality Assurance Project Plans* (USEPA, 2005)
   - *Guidance on Systematic Planning Using the Data Quality Objectives Process* (USEPA, 2006)
   - *Interim Per- and Polyfluoroalkyl Substances (PFAS) Site Guidance for NAVFAC Remedial Project Managers (RPMs)/September 2020 Update* (Navy, 2020).
2. **Identify regulatory program: Comprehensive Environmental Response, Compensation, and Liability Act as amended by the Superfund Amendments and Reauthorization Act.**
3. **This document is a project-specific SAP.**
4. **List dates of scoping sessions that were held:**

Scoping Session	Date
Project Scoping Session (Naval Facilities Engineering Systems Command [NAVFAC] Northwest RPM and CH2M)	October 4, 2021

5. **List dates and titles of any SAP documents written for previous site work that are relevant to the current investigation.**

Final *Sampling and Analysis Plan Investigation of Perfluorinated Compounds in Drinking Water Naval Air Station Whidbey Island* (CH2M, 2017a)	January 2017
Final *Sampling and Analysis Plan Investigation of Perfluorinated Compounds in Drinking Water Outlying Landing Field Coupeville* (CH2M, 2017b)	January 2017
Final *Sampling and Analysis Plan Investigation of Per- and Polyfluoroalkyl Substances in Drinking Water Ault Field and Outlying Landing Field Coupeville* (CH2M, 2017c)	November 2017

SAP Worksheet #2—SAP Identifying Information (continued)

Final *Sampling and Analysis Plan Site Inspection of Per- and Polyfluoroalkyl Substances and Additional Characterization of 1,4-Dioxane and Vinyl Chloride in Groundwater and Drinking Water for Remedial Design Refinement Area 6, Ault Field* (CH2M, 2017d)	November 2017
Final *Sampling and Analysis Plan Addendum Site Inspection of Per- and Polyfluoroalkyl Substances and Additional Characterization of 1,4-Dioxane and Vinyl Chloride in Groundwater and Drinking Water for Remedial Design Refinement Area 6, Ault Field* (CH2M, 2018b)	July 2018
Final *Sampling and Analysis Plan Addendum 2 Site Inspection of Per- and Polyfluoroalkyl Substances and Additional Characterization of 1,4-Dioxane and Vinyl Chloride in Groundwater and Drinking Water for Remedial Design Refinement Area 6, Ault Field* (CH2M, 2018c)	August 2018
Final *Sampling and Analysis Plan Addendum Investigation of Per- and Polyfluoroalkyl Substances in Drinking Water Ault Field and Outlying Landing Field Coupeville* (CH2M, 2018d)	October 2018
Final *Sampling and Analysis Plan Investigation of Per- and Polyfluoroalkyl Substances in Off-Base Drinking Water, Ault Field, Area 6, and Outlying Landing Field Coupeville* (CH2M, 2020)	April 2020

6. List organizational partners (stakeholders) and connection with lead organization:

- NAVFAC Northwest– RPM
- United States Environmental Protection Agency (USEPA) – Regulatory Project Manager
- Washington State Department of Ecology (WADOE) – Regulatory Project Manager

7. Lead organization:

- Department of the Navy (Navy)

8. If any required SAP elements or required information are N/A to the project or are provided elsewhere, then note the omitted SAP elements and provide an explanation for their exclusion as follows:

- Crosswalk table is excluded because all required information is provided in this SAP.

SAP Worksheet #3—Distribution List

Name of SAP Recipients	Title/Role	Organization	Telephone Number	Email Address or Mailing Address
Kendra Clubb	RPM/Task Order Contracting Officer's Representative	NAVFAC Northwest	360-396-0022	kendra.r.clubb.civ@us.navy.mil
Chan Pongkhamsing	USEPA Project Manager	USEPA Region 10	206-553-1806	Pongkhamsing.Chan@epa.gov
Michael Shaljian	Washington State Department of Ecology (WADOE) Project Manager	WADOE	360-489-7853	mish461@ECY.WA.GOV
Jennifer Madsen	Activity Manager (AM)	CH2M	360-888-0281	jennifer.madsen@ch2m.com
Eric Cutler	Project Manager (PM)	CH2M	650-823-4947	eric.cutler@ch2m.com
Paul Townley	Activity Quality Manager (AQM)	CH2M	425-233-5302	paul.townley@ch2m.com
Laura Cook	Senior Technical Consultant (STC)/ PFAS Subject Matter Expert (SME)	CH2M	757-671-6214	laura.cook@ch2m.com
Tom Chalmers	Project Task Manager (TM)	CH2M	801-809-9702	tom.chalmers@ch2m.com
Janna Staszak	Program SAP Quality Reviewer	CH2M	757-671-6256	janna.staszak@ch2m.com
Anita Dodson	Program Chemist/SAP Reviewer	CH2M	757-671-6218	anita.dodson@ch2m.com
Ginger Collins	Project Chemist (PC)	CH2M	541-768-3615	ginger.collins@ch2m.com
Doug Weaver	Data Validator	Environmental Data Services (EDS)	757-564-0090	dweaver@env-data.com
To be determined (TBD)	Field Team Leader (FTL)	CH2M	TBD	TBD
TBD	Site Safety Coordinator (SSC)	CH2M	TBD	TBD
Karen Volpendesta	Laboratory PM	Vista Analytical	916-673-1520	kvolpendesta@vista-analytical.com

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SAP Worksheet #4—Project Personnel Sign-off Sheet

Name	Organization/Title/Role	Telephone Number	Signature/Email receipt	Date SAP Read
Jennifer Madsen	CH2M/AM	360-888-0281		
Eric Cutler	CH2M/PM	650-823-4947		
Paul Townley	CH2M/AQM	425-233-5302		
Laura Cook	CH2M/STC/PFAS SME	757-671-6214		
Tom Chalmers	CH2M/Project TM	801-809-9702		
Anita Dodson	CH2M/Program Chemist/SAP Reviewer	757-671-6218		
Ginger Collins	CH2M/PC	541-768-3615		
Doug Weaver	EDS/Data Validator	757-564-0090		
TBD	CH2M FTL	TBD		
TBD	CH2M SSC	TBD		
Karen Volpendesta	Vista Analytical/Laboratory PM	916-673-1520		

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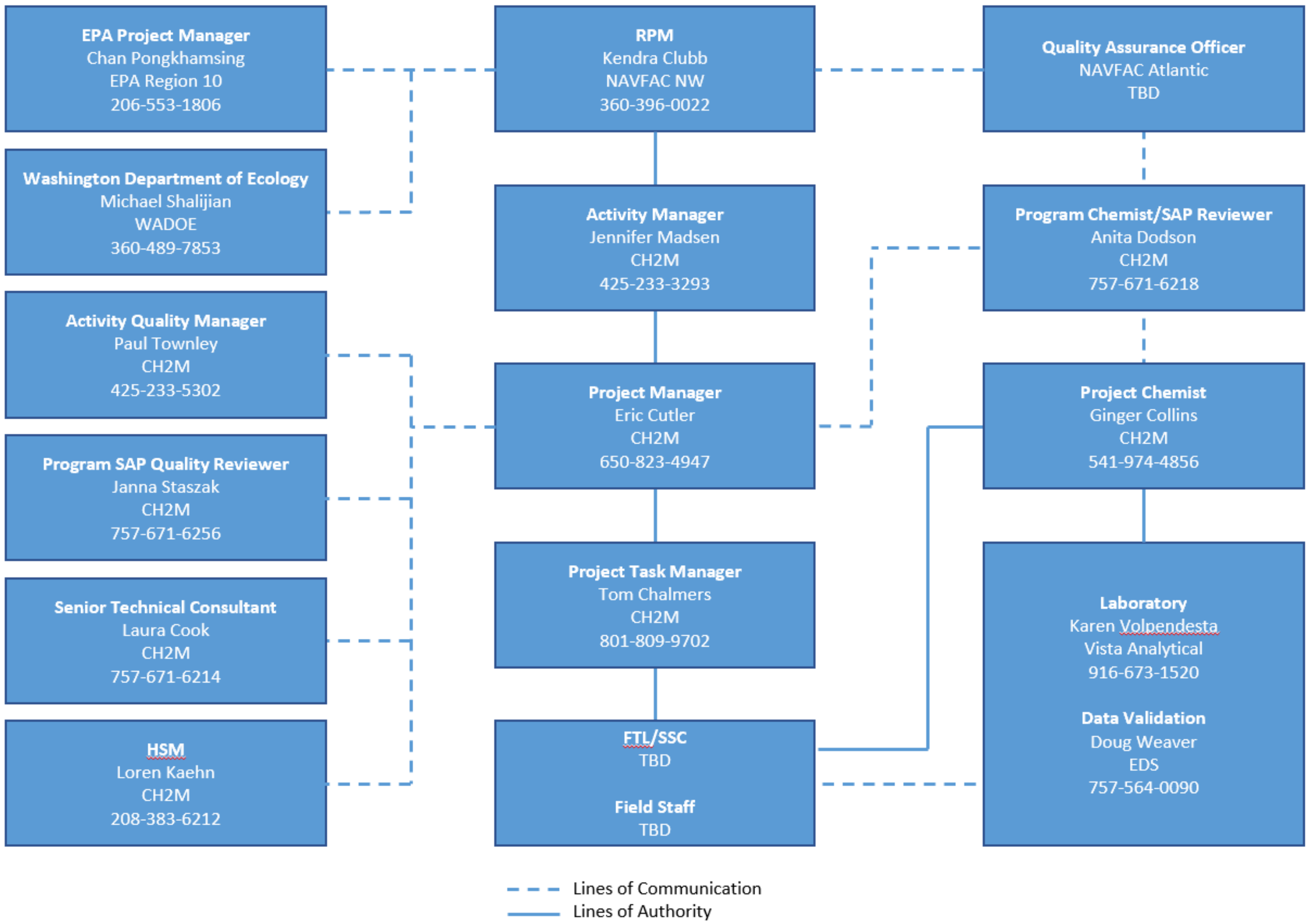
SAP Worksheet #5—Project Organizational Chart



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SAP Worksheet #6—Communication Pathways

Communication Drivers	Responsible Entity	Name	Phone Number	Procedure
Communication with Base, NTR, CH2M PM/AM, USEPA RPM, and other stakeholders	RPM	Kendra Clubb	kendra.r.clubb.civ@us.navy.mil 360-396-0022	Primary point of contact (POC) for facility; can delegate communication to other internal or external POCs. CH2M PM will notify RPM by email or telephone call within 24 hours for field changes affecting the scope or implementation of the work plan.
Communication regarding overall project status and implementation, and primary POC with RPMs and project team	CH2M PM	Eric Cutler	eric.cutler@ch2m.com 650-823-4947	Oversees project and will be informed of project status by the FTL and TM. If field changes occur, PM will work with the RPM to communicate in-field changes to the team by email within 24 hours. All data results will be communicated to the project team following data receipt and review. All information and materials about the project will be forwarded to NAVFAC, as necessary. POC for FTL, deputy PM, and STC.
Technical communications for project implementation and data interpretation	CH2M STC/PFAS SME	Laura Cook	laura.cook@ch2m.com 757-671-6214	Contact STC regarding questions/issues encountered in the field, input on data interpretation, as needed. STC will have 24 hours to respond to technical field questions as necessary. Additionally, STC will review the data as necessary before Base and NAVFAC discussions and reporting review. Contact SME regarding questions/issues encountered in the field, input on data interpretation, as needed. SME will have 24 hours to respond to technical field questions as necessary. Additionally, SME will review the data as necessary prior to Base and NAVFAC Northwest discussions and reporting review.

SAP Worksheet #6—Communication Pathways (continued)

Communication Drivers	Responsible Entity	Name	Phone Number	Procedure
Health and safety (H&S)	CH2M Health and Safety Manager (HSM)	Loren Kaehn	loren.kaehn@ch2m.com 208-383-6212	Responsible for generation of the Health and Safety Plan (HSP) and approval of the activity hazard analyses prior to the start of fieldwork. The PM will contact the HSM as needed regarding questions/issues encountered in the field.
H&S	CH2M SSC	TBD	TBD	Responsible for the adherence of team members to the site safety requirements described in the HSP. Will report H&S incidents and near-misses to the PM as soon as possible.
Stop Work Order	CH2M PM CH2M FTL/SSC Field Team Members	Eric Cutler TBD TBD	eric.cutler@ch2m.com 650-823-4947 TBD TBD	Any field member can immediately stop work if an unsafe condition that is immediately threatening to human health is observed. The field staff, FTL, or SSC should notify the RPM and the CH2M PM immediately. Ultimately, the FTL and PM can stop work for a period of time.
Work plan changes in field	FTL	TBD	TBD	Documentation of deviations from the Work Plan will be made in the field logbook, and the PM will be notified immediately. Deviations will be made only with approval from the PM. The PM will communicate changes to the RPM.
Field changes/field progress reports	FTL	TBD	TBD	Documentation of field activities and Work Plan deviations (made with the approval of the STC and/or AQM) in field logbooks; provide daily progress reports to PM.
Reporting laboratory data quality issues	Vista Analytical	Karen Volpendesta	kvolpendesta@vista-analytical.com 916-673-1520	All quality assurance (QA)/quality control (QC) issues with project field samples will be reported within 2 days to the PC by the laboratory. In the event of serious analytical issues the RPM will be contacted, who at their discretion, may wish to consult with the NAVFAC chemist.

SAP Worksheet #6—Communication Pathways (continued)

Communication Drivers	**Responsible Entity**	**Name**	**Phone Number**	**Procedure**
Communication regarding SAP changes	CH2M Program Chemist	Anita Dodson	Anita.dodson@ch2m.com 757-671-6218	Changes to the project that would prompt a SAP change that would require NAVFAC Quality Assurance Officer (QAO) approval include: the addition of an analytical suite not previously included in the SAP, the addition of an environmental matrix not previously included in the SAP, laboratory accreditation to a new Department of Defense (DoD) Quality System Manual (QSM) version, inclusion of a new laboratory into the SAP, or updates to the conceptual site model that prompt new data quality objectives (DQOs). Updated laboratory limit of quantitation (LOQ), limit of detection (LOD), and detection limit (DL) values will not prompt a SAP update for NAVFAC QAO approval unless those updates negatively impact the ability to meet project action levels.
Analytical corrective actions (CAs)	PC	Ginger Collins	ginger.collins@ch2m.com 514-768-3615	Any CAs for analytical issues will be determined by the FTL or the PC and reported to the PM within 4 hours. The PM will ensure SAP requirements are met by field staff for the duration of the project. In the event of serious analytical issues, the CH2M PM will contact the RPM, who at their discretion, may wish to consult with the NAVFAC chemist.
Data tracking from field collection to database upload release of analytical data	PC	Ginger Collins	ginger.collins@ch2m.com 514-768-3615	Tracks data from sample collection through database upload daily. No analytical data can be released until the PC validates and approves the data. The PC will review analytical results within 24 hours of receipt for release to the project team. The PC will inform the Navy CLEAN program chemist who will notify the NAVFAC QAO of any laboratory issues that would prevent the project from meeting project quality objectives (PQOs) or would cause significant delay in project schedule.

SAP Worksheet #6—Communication Pathways (continued)

Communication Drivers	Responsible Entity	Name	Phone Number	Procedure
Reporting data quality issues	Data validation (DV)	Doug Weaver	dweaver@env-data.com 757-564-0090	The data validator reviews and qualifies analytical data as necessary. The data, along with a validation narrative, are returned to the PC within 7 calendar days.
Field CAs	FTL, PM, and Project TM	TBD Eric Cutler Tom Chalmers	TBD eric.cutler@ch2m.com 650-823-4947 tom.chalmers@ch2m.com 801-809-9702	Field issues requiring CA will be determined by the FTL or PM on an as-needed basis; the PM will ensure SAP requirements are met by field staff for the duration of the project. The FTL will notify the PM via phone of any need for CA within 4 hours. The FTL will notify the PM and the PM may notify the NTR and RPM of any field issues that would negatively affect the schedule or the ability to meet project DQOs.

NTR = Navy Technical Representative

SAP Worksheet #7—Personnel Responsibilities Table

Name	Title/Role	Organizational Affiliation	Responsibilities
Kendra Clubb	RPM	NAVFAC Northwest	Oversees project for NAVFAC and provides Base-specific information and coordination with NAS Whidbey Island.
Jennifer Madsen	AM	CH2M	Oversees and manages NAS Whidbey Island projects and activities.
Eric Cutler	PM	CH2M	Oversees and manages project activities and tasks.
Paul Townley	AQM	CH2M	Oversees project delivery and execution.
Laura Cook	STC/PFAS SME	CH2M	Provides PFAS-related senior technical support for project approach and execution.
Tom Chalmers	Project TM	CH2M	Oversees and manages project tasks.
Janna Staszak	Program SAP Quality Reviewer	CH2M	Reviews and approves changes or revisions to the SAP.
Anita Dodson	Program Chemist/SAP Reviewer	CH2M	Provides SAP project delivery support, reviews and approves SAP, and performs final data evaluation and QA oversight.
Ginger Collins	PC	CH2M	Data management: Performs data evaluation and QA oversight; is the POC with laboratory and validator for analytical issues.
Loren Kaehn	HSM	CH2M	Prepares HSP and manages H&S for all field activities.
TBD	Data Validator	TBD	Validates laboratory data from an analytical standpoint prior to data use.
TBD	FTL	CH2M	Coordinates all field activities and sampling.
TBD	Field Staff Member	CH2M	Conducts field activities.
Karen Volpendesta	Laboratory PM	Vista Analytical	Manages samples tracking and maintains good communication with PC.
Teresa Morrison	Laboratory QAO	Vista Analytical	Responsible for audits, CA, and checks of QA performance within the laboratory.

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SAP Worksheet #8—Special Personnel Training Requirements Table

Specialized training beyond standard H&S training is not required for this project.

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SAP Worksheet #9—Project Scoping Session Participants Sheet

Project Name: Investigation of Per- and Polyfluoroalkyl Substances (PFAS) in Drinking Water **Projected Date(s) of Sampling:** April 2022 **PM:** Eric Cutler	**Site Name**: Area 6, Ault Field, and OLF Coupeville **Site Location:** Oak Harbor, Washington and Coupeville, Washington

Date of Session: October 4, 2021
Scoping Session Purpose: To obtain consensus on the approach for continued periodic drinking water sampling

Name	Title/Project Role	Affiliation	Phone Number	Email Address
Kendra Clubb	RPM	NAVFAC Northwest/NAS Whidbey Island	360-396-0022	kendra.r.clubb.civ@us.navy.mil
Jennifer Madsen	AM	CH2M	425-233-3293	jennifer.madsen@ch2m.com
Eric Cutler	PM	CH2M	650-823-4947	eric.cutler@ch2m.com

Comments

The purpose of the scoping session was to obtain consensus on the proposed updates for the continuation of off-Base drinking water monitoring at residential and community drinking water wells at Ault Field and OLF Coupeville. The overall sampling strategy for continued biannual sampling has not changed from the previous SAP (CH2M, 2020). A summary of topics discussed is as follows:

- Revised SAP
  - The revised SAP will incorporate Field Change Requests to the previous SAP developed for Ault Field and OLF Coupeville (CH2M, 2020) and will include updates to site background, CSM, and PFAS detection limits and laboratory information, and reworking of objectives, environmental questions, and project quality objectives to more closely align with the current off-Base drinking water monitoring program.
  - The revised SAP will not include any changes to rationale or sampling and will be developed for future use during subsequent biannual monitoring events.
- Schedule
  - The revised SAP will be developed prior to the Spring 2022 sampling planned for April 2022.

Action Item

CH2M will begin preparing the SAP.

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SAP Worksheet #10—Conceptual Site Model

Ault Field is located in Oak Harbor, Washington, and OLF Coupeville is located in Coupeville, Washington (**Figure 1**). Area 6 is located within the southern portion of Ault Field. **Figure 2** presents the site layout of Ault Field including Area 6. **Figure 3** presents the site layout of OLF Coupeville. Description and background summaries of Ault Field, Area 6, and OLF Coupeville are presented in **Tables 10-1** through **10-3**, respectively.

Table 10-1. Ault Field Area Description and Background

Site Name	Ault Field, NAS Whidbey Island, Oak Harbor, Washington (**Figures 1** and **2**)
Study Area Description	The area to be investigated consists of off-Base drinking water well locations that are impacted, or potentially impacted, by PFAS release areas associated with Ault Field.
Potential Sources	Based on historical use of aqueous film-forming foam (AFFF), there are 35 suspected or confirmed release areas at Ault Field, including the former firefighting school (Area 31), the current firefighting school, flight line area (Area 16), and the onsite drainage areas through Clover Valley (CH2M, 2018e) (**Figure 2**). In 2019, Phase 1 of a site inspection (SI) was conducted and confirmed the presence of PFAS in groundwater at 3 of the 35 potential PFAS release areas (CH2M, 2019a). In fall and winter 2019 and summer 2020, the Phase 2 SI confirmed the presence of PFAS in groundwater at 24 potential PFAS release areas (2021d).
Study Area Investigation History	Drinking water wells were identified within 1 mile downgradient of the Ault Field release areas where AFFF containing PFAS was likely used (Area 31, Current Firefighting School, and Area 16), and sampled for perfluorooctane sulfonate (PFOS), perfluorooctanoic acid (PFOA), and perfluorobutane sulfonate (PFBS), as part of Phase 1 sampling under a phased voluntary sampling program that began in November 2016 (**Figure 2**). The Phase 1 sampling area included more than 234 properties, from which 76 drinking water well samples were collected. The Phase 1 results indicate that PFOS and/or PFOA were above the USEPA lifetime health advisory in one off-Base drinking water well located south of the current Firefighting School (**Figure 2**). Based on these results and other information made available to NAVFAC, the drinking water investigation area was extended an additional 0.5 mile downgradient (toward the south) from the impacted well and included additional parcels east of the runway, and runway ditches on the eastern side of Ault Field. This area, referred to as the Phase 2 sampling area, included 63 properties, from which 17 drinking water well samples were collected. Results from Phase 2 investigation indicated that PFOS and/or PFOA were above the lifetime health advisory in one additional off-Base drinking water well located east of the Ault Field runway, and the investigation area was extended 0.5 mile downgradient of the impacted well for Phase 3 sampling. The Phase 3 sampling area included 14 properties from which 7 drinking water samples were collected. PFAS were not detected in any of the samples collected as part of the Phase 3 sampling effort at Ault Field. The sampling areas and locations with lifetime health advisory exceedances are shown on **Figure 2**. In October 2017, follow-up monitoring was conducted. Nine drinking water well samples were collected from locations where PFOS and/or PFOA were previously detected (above or below the lifetime health advisories) and at properties located adjacent to properties with PFOS and/or PFOA previously detected at concentrations above the lifetime health advisory. For this event, the analytical suite was expanded to include 11 additional PFAS for a total of 14 analytes. The results of the October 2017 sampling confirmed the lifetime health advisory exceedances in the two off-Base drinking water wells. There were no locations at which PFOS and/or PFOA concentrations exceeded the lifetime health advisory that had not exceeded the lifetime health advisory in previous sampling.

SAP Worksheet #10—Conceptual Site Model (continued)

Table 10-1. Ault Field Area Description and Background

<table>
<tr><td colspan="2">Study Area Investigation History
(continued)</td><td>In October 2018, PFOS was detected above the lifetime health advisory in stormwater runoff collected from a stormwater drain near Hangar 6 on Ault Field, and from an associated stormwater drainage system that empties into Clover Valley Stream and Dugualla Bay. Surface water was determined to potentially be hydraulically connected to groundwater used for drinking water in parcels adjacent to Clover Valley Stream and Dugualla Bay. In response, NAVFAC conducted a fourth phase of sampling for drinking water wells located within 0.5 mile to the north-northeast and south-southeast of Clover Valley Stream and Dugualla Bay. The Phase 4 sampling area included 206 properties, from which 41 drinking water well samples were collected from January through April 2019. The results of the Phase 4 sampling showed that PFOS and/or PFOA were detected at three drinking water well locations, at concentrations below the lifetime health advisory. One of the three detections was from a drinking water well located within the Phase 1 sampling area; however, it had not previously been sampled during the Phase 1 sampling event and was sampled at the same time as the Phase 4 event.

Between April 2018 and November 2021, biannual, seasonal sampling was conducted for all drinking water well locations near Ault Field where PFOS and/or PFOA were previously detected (including lifetime health advisory exceedances and non-exceedances) and for drinking water well locations adjacent to those where PFAS concentrations previously detected were above the lifetime health advisory. Starting with the October-November 2019 event, the analytical suite was expanded to include 4 additional PFAS for a total of 18 analytes.

Results of historical off-Base drinking water sampling at Ault Field are reported in previous technical memoranda (CH2M, 2019c, 2020c, 2021a, 2021c). To assess human health protectiveness and the long-term trends for PFOS and PFOA concentrations in drinking water wells, Mann-Kendall trend analysis was performed on all Ault Field off-Base drinking water samples collected from 2016 to spring 2021 with 4 or more detections of PFOA and/or PFOS (CH2M 2021c). Mann-Kendall trend analysis will continue to be performed on results from future drinking water monitoring events to provide a more extensive evaluation.</td></tr>
<tr><td colspan="2">Current Use</td><td>The area surrounding Ault Field is a low-density residential area. Drinking water is primarily supplied by private or community drinking water wells.</td></tr>
<tr><td rowspan="2">Site Conditions</td><td>Physical Characteristics</td><td>Whidbey Island, including the entire proposed sampling area, lies within the Puget Lowland, a topographic and structural depression between the Olympic Mountains and the Cascade Range.</td></tr>
<tr><td>Geology and Hydrogeology</td><td>The geologic units in the Ault Field area of Whidbey Island consist of a sequence of Quaternary-age (less than 2 million years old) glacial and interglacial deposits that may be more than 3,000 feet thick (USGS, 2005) with near-surface deposits being mostly glacial sediment of the Fraser glaciation (20,000 to 10,000 years old). The Everson and Vashon units of the Fraser glaciation, post-glacial sediment, and artificial fill make up most of the surface and near-surface soil underlying Ault Field. In general, stratigraphic units up to 100 feet thick, consisting of relatively impermeable clay, silt, and silty fine sand (Everson glaciomarine drift and Vashon Till), form the near-surface layers. Underlying the Vashon Outwash in most places are sand, silt, and clay of the Whidbey Formation.

The U.S. Geological Survey has identified five major hydrogeologic units on Whidbey Island, however, only the intermediate and shallow aquifers are present at Ault Field (USGS, 2005). Locally perched zones may exist over discontinuous areas of till or other clay-rich units (MMEC and AECOM, 2016).</td></tr>
</table>

SAP Worksheet #10—Conceptual Site Model (continued)

Table 10-1. Ault Field Area Description and Background

Site Conditions (continued)	**Geology and Hydrogeology (continued)**	The shallow aquifer is a locally discontinuous unconfined aquifer consisting of sand and gravel with an average groundwater elevation of 20 feet mean sea level (msl). At Ault Field, the shallow aquifer is found in the Vashon Outwash deposits at or near the surface. The intermediate aquifer is a moderately continuous sandy unit that is generally confined. Potentiometric surface elevations vary from 10 to 75 feet msl (URS Consultants, 1993a). In general, groundwater at Ault Field flows to the northeast toward Dugualla Bay and mimics the topography of the Clover Valley. A groundwater divide extends southwest to northeast along the topographic high of the coastal bluff in the southwestern part of Ault Field. Groundwater to the northwest of the divide flows west toward the Strait of Juan de Fuca, and groundwater to the southeast of the divide flows east toward the interior of the island before flowing to the northeast to Dugualla Bay through Clover Valley (**Figure 2**).
Drinking Water Source Evaluation		Based on Island County real estate records, 517 parcels are located downgradient of Ault Field within the Phase 1, 2, 3, and 4 sampling areas, of which 142 parcels are confirmed as served by private wells and 91 parcels are confirmed as served by community wells. Wells are generally screened at depths between 60 and 200 feet (Island County, 2005). The remaining parcels are either undeveloped or obtain drinking water from municipal sources.
Chemicals of Potential Concern (COPCs) [1]		18 PFAS (listed in **Worksheet #15**).
Nature and Extent		The nature and extent of PFAS resulting from potential or confirmed releases at Ault Field is being assessed as part of separate investigations.
Migration Pathways		The primary migration pathway of interest for this investigation is advective transport of PFAS in groundwater to off-Base private drinking water wells and community wells. Other pathways associated with migration from release areas into site media will be evaluated as part of separate investigations.
Potential Receptors/ Exposure Routes		Current and future users of drinking water wells near Ault Field (ingestion). Other potentially complete exposure pathways to humans and ecological receptors may be present at Ault Field and the surrounding area. However, the focus of this investigation is human exposure to PFAS in drinking water.

[1] Evaluation will be limited to PFOA and PFOS. Data for remaining constituents will be archived for future use if appropriate PALs become available. On June 15, 2022, the EPA established new lifetime health advisories for PFOS, PFOA, PFBS, and HFPO-DA. The Navy is evaluating how to consistently incorporate EPA's new lifetime health advisories into our drinking water response program.

SAP Worksheet #10—Conceptual Site Model (continued)

Table 10-2. Area 6 Area Description and Background

Site Name	Area 6, Ault Field, NAS Whidbey Island, Oak Harbor, Washington (**Figures 1** and **2)**
Study Area Description	Area 6 is a 260-acre tract in the southeastern corner of Ault Field. Although Area 6 is within the Ault Field installation boundary, off-Base drinking water near Area 6 was initially investigated separately from off-Base drinking water near Ault Field. Therefore, the CSM for Area 6 is treated independently from the Ault Field CSM. Area 6 is bordered by Ault Field Road to the north, State Highway 20 to the east, and the Oak Harbor landfill on the south and southwest (**Figure 2**). Privately owned forested or logged land, and a commercial sand and gravel quarry operation, are located immediately west of Area 6. Various businesses such as auto repair shops, an auto salvage yard, storage facilities, the Auld Holland Inn, and a mobile home park are located west and south of Area 6. Private residences are located to the east, west, and south of Area 6.
Potential Sources	There are two areas within Area 6 where wastes are known to have been disposed as follows: • The former industrial waste disposal area (Site 55): This feature consisted of an acid disposal pit and an oily sludge pit (Foster Wheeler, 2002). The acid disposal pit received approximately 300,000 to 700,000 gallons of acids, caustics, and solvents in the 1970s and 1980s. The oily sludge pit received approximately 100,000 to 600,000 gallons of liquid sludge between 1969 and the mid-1970s. • The Area 6 landfill: This feature included 23 cut-and-fill trenches with native materials in between and received Navy waste from 1969 through the mid-1990s (Foster Wheeler, 1997; URS Consultants, 1993; URS-AECOM, 2016). The landfill received both sanitary solid and industrial wastes (which may have contained hazardous constituents) from 1969 to 1983; Navy waste through 1992; yard waste and construction debris during 1993; and soil and sediments classified as nonhazardous (from other remedial actions) in 1995 and 1996 (Foster Wheeler, 1997; URS Consultants, 1993). There is no known disposal of regulated wastes since 1983 (URS Consultants, 1993). Although there are no records of disposal of AFFF or other PFAS-containing materials at Area 6, sampling (see subsequent section) indicates releases of PFAS occurred.
Study Area Investigation History	As part of the Area 6 SI, samples were collected for analysis of PFAS from 30 on- and off-Base groundwater monitoring wells and the groundwater extraction, treatment, and recharge (GETR) system influent/effluent between 2017 and 2019. PFBS, PFOS, and/or PFOA were detected in samples from 11 of the 19 on-Base groundwater monitoring wells and from 7 of the 11 off-Base groundwater monitoring wells sampled. PFBS, PFOS, and/or PFOA were also detected in the GETR influent/effluent. PFOA exceeded the lifetime health advisory in one on-Base groundwater monitoring well. Based on the exceedance within the on-Base groundwater well, a total of 24 drinking water and/or private groundwater well samples were collected from 282 parcels within the Phase 1 sampling area (**Figure 2**) between February 2018 and November 2019 within 1 mile of Area 6. Fourteen single-resident drinking water wells, six community drinking water wells, and four private groundwater wells (backup water supply) were sampled. PFBS, PFOA, and/or PFOS were detected in samples from 9 of the 24 drinking water wells sampled. The sum of PFOS and PFOA exceeded the lifetime health advisory at six locations (**Figure 2**). Based on the PFOS and/or PFOA detections above the lifetime health advisory within the Phase 1 area, a Phase 2 area was developed from drinking water wells within 0.5 mile of the impacted well. The Phase 2 area included a total of 373 parcels. There were no additional PFOS and/or PFOA detections within the Phase 2 sampling area. Based on the Phase 2 results, NAVFAC did not expand the drinking water sampling area near Area 6 beyond the Phase 2 area.

SAP Worksheet #10—Conceptual Site Model (continued)

Table 10-2. Area 6 Area Description and Background

Study Area Investigation History (continued)		From October-November 2019 to November 2021, biannual seasonal sampling was conducted for all drinking water well locations near Area 6 where PFOS and/or PFOA were previously detected (including lifetime health advisory exceedances and non-exceedances) and for drinking water well locations adjacent to those where PFOS and PFOA concentrations previously were above the lifetime health advisory. Starting with the October-November 2019 event, the analytical suite was expanded to include 4 additional PFAS for a total of 18 analytes. Results of historical off-Base drinking water sampling at Area 6 are reported in previous technical memoranda (CH2M, 2020b, 2020c, 2021a, 2021c). To assess human health protectiveness and the long-term temporal and spatial variability of PFOS and PFOA concentrations in drinking water wells, Mann-Kendall trend analysis was performed on all Area 6 off-Base drinking water samples collected from 2016 to spring 2021 with 4 or more detections of PFOA and/or PFOS (CH2M 2021c). Mann-Kendall trend analysis will continue to be performed on results from future drinking water monitoring events to provide a more extensive evaluation.
Current Use		The off-Base land surrounding Area 6 is used for a combination of residential and commercial purposes.
Site Status		The Area 6 landfill cap was constructed as part of the remedial action to prevent infiltration through the landfill that may result in leaching of contaminants to groundwater (Foster Wheeler, 1997). An interim soil removal action was completed in 2001 at the former industrial waste disposal area (Site 55) to reduce the mass of trichloroethene in the vadose zone source area; however, confirmation samples indicated that elevated concentrations of trichloroethene in soil remain in place post-excavation (Foster Wheeler, 2002).
Site Conditions	**Physical Characteristics**	Whidbey Island lies within the Puget lowland, a topographic and structural depression between the Olympic Mountains and the Cascade Range.
	Geology and Hydrogeology	The geologic units of Whidbey Island consist of a sequence of Quaternary-age (less than 2 million years old) glacial and interglacial deposits that may be more than 3,000 feet thick (USGS, 1982). Four glacial units have been identified at Area 6 and include, from youngest to oldest: the Vashon Recessional Outwash (thin and discontinuous layer of sand and gravel with some silt only present in the eastern part of Area 6 at the ground surface overlying the Vashon Till [CTI-URS, 2017]), which is interpreted as being predominantly unsaturated in Area 6 based on published cross sections (URS-AECOM, 2016); Vashon Till (laterally extensive layer of silty, fine sand with some gravel, containing localized layers of clay or silt typically present at the ground surface); Vashon Advance Outwash (coarse, gravelly sand that gradually becomes finer-grained with depth with local layers of silty sand, silt, or clay); and Whidbey Formation Units 1 through 4 (alternating finer-grained and coarser-grained materials). The U.S. Geological Survey has identified five major hydrogeologic units on Whidbey Island, however, only the shallow, intermediate, and deep aquifers are present at Ault Field (USGS, 2005). The shallow aquifer is an unconfined groundwater unit found in the Vashon Advance Outwash beneath Area 6. The intermediate aquifer is a moderately continuous groundwater body found in the sandy unit that corresponds to the Whidbey Formation Unit 2. The deep aquifer is also a nearly continuous confined groundwater body found near Area 6. This aquifer is confined below the silt and clay of Whidbey Formation Unit 3 (which acts as an aquitard) and occupies a thick sand layer in Whidbey Formation Unit 4. The groundwater flow direction in the shallow aquifer underlying Area 6 is predominantly to the south (Sealaska, 2017). However, there is an east to west trending groundwater divide located in the northern portion of Area 6. North of the divide the groundwater flow is to the northeast towards Clover Valley (**Figure 2**). Groundwater flow direction in the intermediate aquifer is predominantly to the southeast (URS Consultants, 1993). Groundwater elevation data from wells completed in the deep aquifer suggest groundwater flow directions ranging from southeast to southwest (URS Consultants, 1993).

SAP Worksheet #10—Conceptual Site Model (continued)

Table 10-2. Area 6 Area Description and Background

COPCs[2]	18 PFAS (listed in **Worksheet #15**).
Nature and Extent	The nature and extent of PFAS resulting from potential or confirmed releases at Area 6 is being assessed as part of a separate investigation.
Migration Pathways	The primary migration pathway of interest for this investigation is advective transport of PFAS in groundwater to off-Base private drinking water wells and community wells. Other pathways associated with migration from release areas into site media will be evaluated as part of separate investigations.
Potential Receptors/ Exposure Routes	Current and future users of drinking water wells in areas near Area 6 (ingestion). Other potentially complete exposure pathways to humans and ecological receptors may be present at Area 6 and the surrounding area. However, the focus of this investigation is human exposure to PFAS in drinking water.

2 Evaluation will be limited to PFOA and PFOS. Data for remaining constituents will be archived for future use if appropriate PALs become available. On June 15, 2022, the EPA established new lifetime health advisories for PFOS, PFOA, PFBS, and HFPO-DA. The Navy is evaluating how to consistently incorporate EPA's new lifetime health advisories into our drinking water response program.

SAP Worksheet #10—Conceptual Site Model (continued)

Table 10-3. Outlying Field Coupeville Area Description and Background

Site Name	OLF Coupeville, NAS Whidbey Island, Coupeville, Washington (**Figures 1** and **3**)
Study Area Description	The area to be investigated includes off-Base drinking water well locations impacted, or potentially impacted, by PFAS use associated with OLF Coupeville activities.
Potential Sources	Potential source areas for off-Base drinking water PFAS impacts are on-Base locations of suspected releases of AFFF, including a potential previous release of AFFF near Building 2807. Groundwater data collected during the 2016-2017 SI are consistent with this hypothesis. The runway and storage buildings located east of the runway and an off-Base aircraft crash location west of the runway are also suspected source areas, based on the potential for AFFF to have been stored, used, or released at these locations during Navy operations.
Study Area Investigation History	NAVFAC conducted on-Base drinking water sampling at OLF Coupeville in September 2016. PFOA was detected in one on-Base drinking water well below the USEPA lifetime health advisory (**Figure 3**). No previous groundwater investigations were conducted at OLF Coupeville, so there was significant uncertainty regarding groundwater flow direction. Because of the absence of confirmed PFAS release areas at the time, drinking water wells were identified within 1 mile of Building 2807 at OLF Coupeville, and sampled for PFOS, PFOA, and PFBS as part of Phase 1 sampling under a phased voluntary sampling program beginning in November 2016. The Phase 1 sampling area included 398 properties, from which 100 drinking water well samples were collected. PFOS and/or PFOA were above the lifetime health advisory in seven off-Base drinking water wells located south of the OLF runway (**Figure 3**). Based on these results, the investigation area was extended an additional 0.5 mile downgradient of this area and referred to as the Phase 2 sampling area (**Figure 3**). The Phase 2 sampling area included 796 properties. Nine drinking water samples were collected to the south of OLF Coupeville during Phase 2 sampling, and analyzed for PFOS, PFOA, and PFBS. Of those nine samples, PFOS, PFOA, and PFBS were not detected in any wells. Based on the Phase 2 results, NAVFAC did not expand the drinking water sampling area near OLF Coupeville beyond the Phase 2 area. In October 2017, follow-up monitoring was conducted. Twenty-six drinking water well samples (from 25 wells) were collected from locations where PFOS and/or PFOA were previously detected (above or below the lifetime health advisory) and at properties located adjacent to properties with previous concentrations of PFOS and/or PFOA above the lifetime health advisory. For this event, the analytical suite was expanded to include 11 additional PFAS for a total of 14 analytes. The results of the October 2017 follow-up sampling confirmed concentrations above the lifetime health advisory in the seven off-Base drinking water wells, and in one of two newly sampled locations south of OLF, resulting in a total of eight off-Base wells with PFAS concentrations above the lifetime health advisory. There were no locations at which PFOS and/or PFOA concentrations were above the lifetime health advisory that were sampled and had not been above the lifetime health advisory in previous sampling. Between April 2018 and November 2021, biannual seasonal sampling was conducted for all drinking water well locations near OLF Coupeville where PFOS and/or PFOA were previously detected (including concentrations above and below the lifetime health advisory) and for drinking water well locations adjacent to those with PFOS and/or PFOA previously detected above the lifetime health advisory. Starting with the October-November 2019 event, the analytical suite was expanded to include 4 additional PFAS for a total of 18 analytes. Additionally, the biannual drinking water well sampling program was expanded to include six parcels located in the vicinity of waterline construction south of OLF Coupeville along State Route 20 and east of Keystone Hill Road to verify that no other parcels were above the lifetime health advisory. Of these six additional samples, there were no locations at which PFOS and/or PFOA concentrations were above the lifetime health advisory.

SAP Worksheet #10—Conceptual Site Model (continued)

Table 10-3. Outlying Field Coupeville Area Description and Background

Study Area Investigation History (continued)		Results of historical off-Base drinking water sampling at OLF Coupeville are reported in previous technical memoranda (CH2M, 2019b, 2020c, 2021b, 2021c). To assess human health protectiveness and the long-term temporal and spatial variability of PFOS and PFOA concentrations in drinking water wells, Mann-Kendall trend analysis was performed on all OLF Coupeville off-Base drinking water samples collected from 2016 to spring 2021 with 4 or more detections of PFOA and/or PFOS (CH2M 2021c). Mann-Kendall trend analysis will continue to be performed on results from future drinking water monitoring events to provide a more extensive evaluation.
Current Use		The area surrounding OLF Coupeville is a low-density residential area. Drinking water is supplied by private, municipal, or community drinking water wells.
Site Conditions	**Physical Characteristics**	The area in the vicinity of OLF Coupeville, including the Phase 1 and 2 sampling areas, is located on a broad plateau of Smith Prairie in southern Whidbey Island at an elevation of approximately 195 feet above msl and lies within the Puget Lowland, a topographic and structural depression between the Olympic Mountains and the Cascade Range.
	Geology and Hydrogeology	The geologic units of Whidbey Island consist of a sequence of Quaternary-age (less than 2 million years old) glacial and interglacial deposits that may be more than 3,000 feet thick (USGS, 1982). The near-surface deposits are mostly glacial sediment of the most recent Fraser glaciation (20,000 to 10,000 years old). Surficial geology at OLF Coupeville consists of the Partridge Gravel, which was deposited by glacial meltwaters and is composed of sand, gravel, and sand-gravel mixtures with minor interlayered silt and silty sand (Polenz et al., 2005). The Partridge Gravel generally extends to depths of 180 to 200 feet below ground surface (bgs) and is characterized by fine to medium sand with intermittent occurrences of gravel and laterally discontinuous layers of silt and clay. Pleistocene deposits, including Vashon Till, lie beneath the Partridge Gravel and consist predominantly of silt and clay. Previous investigations at OLF Coupeville have identified three hydrogeologic aquifers termed the shallow, intermediate, and deep aquifers (CH2M, 2018a). With the exception of some shallow wells possibly screened within localized areas of perched groundwater, all of the wells were screened within a single aquifer system and are in hydraulic connection with one another. The terms shallow, intermediate, and deep are used to convey depth information within the aquifer system at the site for the purposes of discussing variability in flow directions, PFAS presence or absence, or other characteristics that may vary with depth.
		Groundwater levels measured in groundwater monitoring wells screened in the shallow zone are encountered between 90 and 130 feet bgs, which may support the interpretation that some are screened in perched conditions that are laterally discontinuous across the Base. Static water levels in wells screened in the intermediate zone indicate semiconfined conditions, with hydrostatic heads rising 30 to 40 feet above the base of the silt/clay aquitard (where present). Groundwater elevation data and groundwater modeling studies indicate the presence of a groundwater mound (divide) centered in the northern portion of OLF Coupeville. This interpretation is supported by the Island County Water Resource Management Plan (Island County, 2005), which suggests that OLF Coupeville is located on a hydrogeologic divide, and groundwater is likely to be flowing radially away from OLF Coupeville. The dominant flow direction in the intermediate zone over the majority of OLF Coupeville is to the southwest, shifting to the south-southeast in the southern portion of the site. Groundwater flow in the deep zone is inferred to be predominantly to the south/southeast (**Figure 3**).

SAP Worksheet #10—Conceptual Site Model (continued)

Table 10-3. Outlying Field Coupeville Area Description and Background

COPCs[3]	18 PFAS (listed in **Worksheet #15**).
Nature and Extent	The nature and extent of PFAS resulting from potential or confirmed releases at OLF Coupeville is being assessed as part of a separate investigation.
Migration Pathways	The primary migration pathway of interest for this investigation is advective transport of PFAS in groundwater to off-Base private drinking water wells and community wells. As part of the long-term solution for providing drinking water to impacted properties near OLF Coupeville, 7 homes have been connected to the Town of Coupeville water supply. Wells adjacent to the waterline construction activities will be monitored as part of this investigation to evaluate the impact of decreased pumping from wells on properties connected to the Town of Coupeville water supply on PFAS plume migration in the groundwater system and to monitor protectiveness. Other pathways associated with migration from release areas into site media will be evaluated as part of separate investigations.
Potential Receptors/ Exposure Routes	Current and future users of drinking water wells in areas near OLF Coupeville (ingestion). Other potentially complete exposure pathways to humans and ecological receptors may be present at OLF Coupeville and the surrounding area. However, the focus of this investigation is human exposure to PFAS in drinking water.

3 Evaluation will be limited to PFOA and PFOS. Data for remaining constituents will be archived for future use if appropriate PALs become available. On June 15, 2022, the EPA established new lifetime health advisories for PFOS, PFOA, PFBS, and HFPO-DA. The Navy is evaluating how to consistently incorporate EPA's new lifetime health advisories into our drinking water response program.

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SAP Worksheet #11—Project Quality Objectives/Systematic Planning Process Statements

Problem Definition, Environmental Questions, and Project Quality Objectives

PFOA and PFOS have been detected in on-Base groundwater and off-Base drinking water wells located downgradient of Ault Field, Area 6, and OLF Coupeville. To accurately assess the long-term trends in PFAS concentrations and human health protectiveness in drinking water wells on off-Base parcels where they were previously detected, in drinking water wells on parcels adjacent to those wells with prior PFOS and/or PFOA concentrations above the health advisory, and in drinking water wells adjacent to waterline installation activities, a more extensive evaluation is required.

The investigation objectives, environmental questions, general investigation approach, and PQOs are presented in **Table 11-1**.

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SAP Worksheet #11—Project Quality Objectives/ Systematic Planning Process Statements (continued)

Table 11-1. Objective, Environmental Questions, and Project Quality Objectives

<table>
<tr><th>Objective</th><th>Environmental Question(s)</th><th>General Investigation Approach</th><th>PQOs</th></tr>
<tr><td>Evaluate the long-term trends in PFOS and/or PFOA concentrations associated with impacted off-Base drinking water wells near Ault Field, Area 6, and OLF Coupeville.</td><td>Are PFOS and/or PFOA concentrations in impacted off-Base drinking water wells increasing or decreasing?</td><td rowspan="2">Drinking water samples will be collected biannually during the spring and fall, from off-Base drinking water wells on parcels where PFAS were previously detected, in drinking water wells on parcels adjacent to those wells with prior PFOS and/or PFOA exceedances, and in drinking water wells adjacent to waterline installation activities to evaluate long-term trends and to determine if PFOS and/or PFOA concentrations have increased to or remain above the lifetime health advisory.

Drinking water samples will be collected from these wells (Worksheet #17) and analyzed via USEPA Method 537.1 for the 18 PFAS listed in Worksheet #15.

If additional off-Base drinking water sampling is necessary based on ongoing on-Base investigations or off-Base drinking water results, new SAP will be submitted.

The duration of monitoring will be as follows:

At parcels with prior PFAS detections below the lifetime health advisory not adjacent to wells with prior PFOS and/or PFOA exceedances, sampling will be conducted until (1) eight rounds of sampling have been conducted and concentrations remain below the lifetime health advisory and (2) there is a lack of an increasing trend as evaluated by the Mann-Kendall Test.

At parcels adjacent to prior PFOS and/or PFOA exceedances, sampling will be conducted until (1) eight rounds of sampling have been conducted since the long-term solution was implemented on the adjacent property with a PFOS and/or PFOA exceedance and concentrations remain below the lifetime health advisory, and (2) there is a lack of an increasing trend as evaluated by the Mann-Kendall Test.

At parcels with PFOS and/or PFOA exceedances, sampling will be conducted until (1) a long-term solution is implemented (2) sampling is complete at adjacent parcels, and (3) monitoring is no longer needed as part of greater PFAS remedial investigation in area.</td><td>If PFOS and/or PFOA concentrations in a drinking water well or wells indicate an increasing trend (based on at least four rounds of sampling and evaluation using the Mann-Kendall Test), the monitoring approach will be reevaluated to further assess PFOS and/or PFOA trends and monitor protectiveness, and monitoring will continue until the conditions for duration of monitoring are met.

If PFOS and/or PFOA concentrations in a drinking water well or wells indicate a decreasing trend, no trend, or there is not enough data to determine a trend, monitoring will continue biannually until the conditions for duration of monitoring are met.</td></tr>
<tr><td>Evaluate the concentrations of PFOS and/or PFOA with respect to human health protectiveness in impacted off-Base drinking water wells near Ault Field, Area 6, and OLF Coupeville.</td><td>Are PFOS and/or PFOA present above the USEPA Lifetime Health Advisory in off-Base drinking water wells?</td><td>If PFOS and/or PFOA concentrations within a drinking water well have either decreased below the lifetime health advisory or remain above the lifetime health advisory, an alternate drinking water source will be provided to the residence or residences served until a long-term solution is implemented and finalized. Drinking water samples will continue to be collected biannually to further evaluate PFOS and/or PFOA trends until conditions for duration of monitoring are met.

If PFOS and/or PFOA concentrations within a drinking water well have increased to above the lifetime health advisory, an alternate drinking water source will be provided to the residence or residences served until a long-term solution is implemented and finalized and the sampling area will be expanded to include adjacent parcels. Monitoring will continue biannually to further evaluate PFOS and/or PFOA trends until conditions for duration of monitoring are met.

If PFOS and/or PFOA concentrations within a drinking water well remain below the lifetime health advisory, drinking water samples will continue to be collected biannually to further evaluate PFOS and/or PFOA trends until the conditions for duration of monitoring are met.</td></tr>
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SAP Worksheet #11—Project Quality Objectives/ Systematic Planning Process Statements (continued)

What are the Project Action Limits?

- USEPA lifetime health advisory for PFOA and PFOS: 0.07 microgram per liter (µg/L), unless both chemicals are detected, then 0.07 µg/L is the lifetime health advisory for the cumulative concentration of the two chemicals.
- USEPA regional screening level (RSL) for PFBS: 0.600 µg/L (based on a hazard quotient [HQ] = 0.1). The RSL will not be used as a PAL for drinking water in this SAP; no actions will be taken if the results exceed the RSL. This value is provided for informational purposes only.
- On June 15, 2022, the EPA established new lifetime health advisories for PFOS, PFOA, PFBS, and GenX (HFPO-DA). The Navy is evaluating how to consistently incorporate EPA's new lifetime health advisories into our drinking water response program. Per Navy policy, data need to be collected for all 18 analytes listed in USEPA Method 537.1 rev. 1.0 (November 2018).

For what will the data be used?

The data will be used to answer the environmental questions discussed in **Table 11-1**.

What types of data are needed (matrix, target analytes, analytical groups, field screening, onsite analytical or offsite laboratory techniques, sampling techniques)?

Data types include the following:

- PFAS analytical results for drinking water samples as listed in **Worksheet #15**
- All sampling locations are based on the rationale presented in **Worksheet #17** and in accordance with the project schedule outlined in **Worksheet #16**
- Data collected following the standard operating procedures (SOPs) presented in **Worksheet #21**

Are there any special data quality needs, field or laboratory, to support environmental decisions?

All offsite laboratory analytical data will be technically sound and defensible with respect to the aforementioned project objectives. All laboratory analysis will be performed by a DoD ELAP accredited laboratory. Additionally, laboratory-specific LODs will be less than the USEPA lifetime health advisory for PFOA and PFOS of 0.07 µg/L for the sum of the two chemicals. QC sample requirements are detailed in **Worksheet #20**. For action decisions, the laboratory will follow the Measurement Performance Criteria (MPC) in **Worksheets #24** and **#28** for laboratory QC samples. These MPC are consistent with USEPA Method 537.1.

Where, when, and how should the data be collected/generated?

The data will be collected during a 2-week sampling event to be conducted biannually. The sampling approach is summarized in **Worksheet #14.** All sampling locations are based on the rationale presented in **Worksheet #17** and in accordance with the project schedule outlined in **Worksheet #16**.

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SAP Worksheet #12—Measurement Performance Criteria Table – Field QC Samples

Matrix: Drinking Water
Analytical Group: PFAS
Concentration Level: Low

QC Sample	Analytical Group	Frequency	Data Quality Indicators (DQIs)	MPC
Matrix Spike (MS)/Matrix Spike Duplicate (MSD)	PFAS	One per 20 samples	Accuracy/Precision	See **Worksheet #28**.
Field Duplicate (FD)		One per 10 samples	Precision	Relative percent difference (RPD) less than 30%
Field Reagent Blank		One per property, per well where drinking water sampled	Bias/Contamination	No analytes detected more than 1/3 LOQ. Concentrations greater than 1/3 will require all associated samples to be re-sampled and reanalyzed; however, decision-making and/or action (i.e., providing an alternate drinking water source) may proceed in advance of the resampling and reanalysis
Cooler Temperature Indicator		One per cooler PFAS	Accuracy/Representativeness	Temperature less than or equal to 10 degrees Celsius (°C), not frozen

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SAP Worksheet #13—Secondary Data Criteria and Limitations Table

Secondary Data	Data Source (originating organization, report title and date)	Data Generator(s) (originating organization, data types, data generation/collection dates)	How Data Will Be Used	Limitations on Data Use
Drinking Water Sources	CH2M. Drinking Water Source Verification Technical Memorandum. 2016.	Desktop data search performed by CH2M in September 2016, using available historical documents and public records to identify off-Base, potentially impacted, drinking water sources.	Historical data to be used in conjunction with new data to assess temporal trends.	None
Off-Base Drinking Water Results	CH2M. *Final Technical Memorandum, Results of Investigation of Per- and Polyfluoroalkyl Substances in Off-Base Drinking Water— OLF Coupeville*. 2019	Analytical results for off-Base drinking water well sampling performed at OLF Coupeville from November 2016 through June 2017.	Historical data to be used in conjunction with new data to assess temporal trends.	None
Off-Base Drinking Water Results	CH2M. *Final Technical Memorandum, Results of Investigation of Per- and Polyfluoroalkyl Substances in Off-Base Drinking Water— Ault Field*. 2019	Analytical results for off-Base drinking water well sampling performed at Ault Field from November 2016 through June 2017.	Historical data to be used in conjunction with new data to assess temporal trends.	None
Off-Base Drinking Water Results	CH2M. *Evaluation of Per- and Polyfluoroalkyl Substances, 1,4 Dioxane, and Vinyl Chloride in Groundwater and Drinking Water - Area 6*. 2020.	Analytical results for off-Base drinking water well sampling performed at Area 6 from February 2018 through April 2019.	Historical data to be used in conjunction with new data to assess temporal trends.	None
Off-Base Drinking Water Results	CH2M. *Final Technical Memorandum, Results of Investigation of Per- and Polyfluoroalkyl Substances in Off-Base Drinking Water— Ault Field, Area 6, Coupeville*. 2020	Analytical results for off-Base drinking water well sampling performed at Ault Field and Coupeville from October 2019 through April 2020.	Historical data to be used in conjunction with new data to assess temporal trends.	None
Off-Base Drinking Water Results	CH2M. *Final Technical Memorandum, Results of Investigation of Per- and Polyfluoroalkyl Substances in Off-Base Drinking Water – Ault Field, Area 6.* 2021.	Analytical results for off-Base drinking water well sampling performed at Ault Field from October 2017 through July 2019.	Historical data to be used in conjunction with new data to assess temporal trends.	None

SAP Worksheet #13—Secondary Data Criteria and Limitations Table (continued)

Secondary Data	Data Source (originating organization, report title and date)	Data Generator(s) (originating organization, data types, data generation/collection dates)	How Data Will Be Used	Limitations on Data Use
Off-Base Drinking Water Results	CH2M. *Final Technical Memorandum, Results of Investigation of Per- and Polyfluoroalkyl Substances in Off-Base Drinking Water – OLF Coupeville*. 2021,	Analytical results for off-Base drinking water well sampling performed at OLF Coupeville from October 2017 through July 2019.	Historical data to be used in conjunction with new data to assess temporal trends.	None
Off-Base Drinking Water Results	CH2M. *Final Technical Memorandum, Results of Investigation of Per- and Polyfluoroalkyl Substances in Off-Base Drinking Water— Ault Field, Area 6, Coupeville*. 2021	Analytical results for off-Base drinking water well sampling performed at Ault Field and Coupeville from October 2020 through April 2021.	Historical data to be used in conjunction with new data to assess temporal trends.	None

SAP Worksheet #14—Summary of Project Tasks

Pre-sampling Tasks

- Subcontractor procurement
  - Analytical Laboratory
  - Data Validator
  - Bottled Water Delivery Subcontractor
- Fieldwork scheduling
- Appointment scheduling

Sampling Tasks

Applicable field book and forms should be filled out completely each day.

- Drinking Water Samples
  - Samples will be collected in accordance with **Worksheet #18** and with the SOPs listed in **Worksheet #21** and provided in **Appendix A**.
  - Drinking water samples will be collected from properties following the sampling protocol as specified in **Worksheet #18**.
  - Drinking water sample locations will vary by residence and will be collected, if possible, at an outside tap or spigot prior to any treatment or filtering system installed by the homeowner. If no outdoor location is possible, then samples will be collected from an inside sink without a filter. If an outdoor location is chosen, samples will be collected from a spigot. The first choice will be to collect the sample as close to the well as possible. Samples will be collected after 3 to 5 minutes of flushing.
  - Prior to delivery of samples to the analytical laboratory, samples will be managed, preserved, and shipped in accordance with SOPs listed in **Worksheet #21**.

Investigation-derived Waste Management

Investigation-derived waste consisting of flushed water from the sampling spigot, will be discharged to the ground at the location the sample is collected.

Demobilization

Full demobilization will occur when the project is complete and appropriate QA/QC checks have been performed. Personnel no longer needed during the course of field operations may be demobilized before the final project completion date. The following will occur before demobilization:

- Chain-of-custody records will be reviewed to verify that samples were collected as planned and submitted for appropriate analyses.
- Restoration of the site to an appropriate level will be verified by the CH2M FTL.
- Equipment will be inspected, packaged, and shipped to the appropriate location.

Analyses and Testing Tasks

- The subcontracted analytical laboratory will process and prepare samples for analyses and will analyze all samples for the 18 PFAS listed in **Worksheet #15**, in accordance with **Worksheets #18** and **#19**.

SAP Worksheet #14—Summary of Project Tasks (continued)

Quality Control Tasks

- Implement SOPs for field and laboratory activities being performed.
- QC samples are described on **Worksheets #12** and **#20**.

Secondary Data

- Refer to **Worksheet #13**.

Data Validation, Review, and Management Tasks

- Refer to **Worksheets #34** through **#36** for discussion of data management procedures.

Documentation and Reporting

- A summary of field activities as well as a data evaluation will be documented in a technical memorandum and submitted to the RPM for review and approval.
- Property owners will be provided preliminary results within 30 days of sampling via telephone for detections below the lifetime health advisory. For new detections above the lifetime health advisory, property owners will be notified in person, if possible, and provided a hard copy of their preliminary results and bottled water. Upon completion of DV, results letters will be prepared and mailed to property owners within 30 days of completion of DV.
- Results will be documented and evaluated in a technical memorandum.
- Cumulative historical trend graphs will be developed and updated to depict long-term PFAS trends. Trend graphs will be included as an attachment to the technical memorandum.
- Mann-Kendall trend analysis will be performed on all off-Base drinking water samples collected from 2016 to present with 4 or more detections of PFOA and/or PFOS. Mann-Kendall trend analysis will continue to be performed on results from future drinking water monitoring events to provide a more extensive evaluation and will be included as an attachment to the technical memorandum.

Assessment/Audit Tasks

- **Worksheets #31** and **#32**.

SAP Worksheet #15—Reference Limits and Evaluation Table

Matrix: Drinking Water
Analytical Group: PFAS (USEPA Method 537.1)

Analyte	Chemical Abstract Service (CAS) Number	Project Action Levels (µg/L)	Project Action Levels Reference	Laboratory Limits (µg/L)			LCS and MS/MSD Recovery Limits and RPD (%)[c]		
				LOQs (µg/L)	LODs (µg/L)	DLs (µg/L)	LCL[d]	UCL[d]	RPD
Perflurooctane Sulfonate (PFOS)	1763-23-1	0.07[a]	USEPA lifetime health advisory	0.002	0.0015	0.00075	70	130	30
Perfluoro-n-octanoic acid (PFOA)	335-67-1	0.07[a]	USEPA lifetime health advisory	0.002	0.0015	0.00075	70	130	30
Perfluorobutane sulfonate (PFBS)	375-73-5	0.60	Tapwater RSL HQ = 0.1[b]	0.002	0.0015	0.00075	70	130	30
Perfluorohexanoic acid (PFHxA)	307-24-4	--	--	0.002	0.0015	0.00075	70	130	30
Perfluoroheptanoic acid (PFHpA)	375-85-9	--	--	0.002	0.0015	0.00075	70	130	30
Perfluorohexane sulfonate (PFHxS)	355-46-4	--	--	0.002	0.0015	0.00075	70	130	30
Perfluorononanoic acid (PFNA)	375-95-1	--	--	0.002	0.0015	0.00075	70	130	30
Perfluorodecanoic acid (PFDA)	335-76-2	--	--	0.002	0.0015	0.00075	70	130	30
Perfluoroundecanoic acid (PFUnA)	2058-94-8	--	--	0.002	0.0015	0.00075	70	130	30
Perfluorododecanoic acid (PFDoA)	307-55-1	--	--	0.002	0.0015	0.00075	70	130	30
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	--	--	0.002	0.0015	0.00075	70	130	30
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	--	--	0.002	0.0015	0.00075	70	130	30
N-Ethylperfluoro-1-octancesulfonamidoacetic acid (EtFOSAA)	2991-50-6	--	--	0.002	0.0015	0.00075	70	130	30

SAP Worksheet #15—Reference Limits and Evaluation Table (continued)

Analyte	Chemical Abstract Service (CAS) Number	Project Action Levels (µg/L)	Project Action Levels Reference	Laboratory Limits (µg/L)			LCS and MS/MSD Recovery Limits and RPD (%)[c]		
				LOQs (µg/L)	LODs (µg/L)	DLs (µg/L)	LCL[d]	UCL[d]	RPD
N-Methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	--	--	0.002	0.0015	0.00075	70	130	30
Hexafluoropropylene oxide dimer acid (HFPO-DA)	13252-13-6	--	--	0.002	0.0015	0.00075	70	130	30
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	--	--	0.002	0.0015	0.00075	70	130	30
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	763051-58-9	--	--	0.002	0.0015	0.00075	70	130	30
9-Chlorohexadecafluoro-3-oxanone-1-sulfonic (9Cl-PF3ONS)	756426-58-1	--	--	0.002	0.0015	0.00075	70	130	30
PFOA + PFOS (calculated)[4]	--	0.07	USEPA lifetime health advisory	--	--	--	--	--	--

[a] If both PFOS and PFOA are detected, the combined concentration must be less than 0.07 µg/L. Otherwise, the chemicals will be compared to the USEPA lifetime health advisory of 0.07 µg/L individually.

[b] The RSL for PFBS was updated from the value listed in previous SAPs for this project to the May 2021 RSL table (USEPA, 2021). However, this value is not considered a PAL for this project as no action will be taken based on concentrations that exceed the RSL.

[c] Accuracy and precision limits follow USEPA Method 537.1 per Navy policy.

[d] Limits for spikes greater than 2 times the LOQ, 50 to 150 percent recovery and less than or equal to 50% RPD for spikes at or below 2 times the LOQ. These limit requirements follow USEPA Method 537.1.

LCL = lower control limit; LCS = laboratory control sample; UCL = upper control limit

SAP Worksheet #16—Project Schedule/Timeline Table[4]

Activities	Organization	Dates (MM/DD/YY)		Deliverable
		Anticipated Date of Initiation	Anticipated Date of Completion	
SAP Schedule				
Draft SAP Preparation	CH2M	October 2021	December 2021	Draft SAP
NAVFAC SAP Review	NAVFAC Northwest	December 2021	June 2022	Comments
Draft Final SAP Preparation	CH2M	July 2022	August 2022	Draft Final SAP
Stakeholder Review	Various	September 2022	October 2022	Comments
Final SAP	CH2M	October 2022	October 2022	Final SAP
Sampling Schedule				
Off-Base Drinking Water Sampling	CH2M	TBD	TBD	N/A
Analytical Data	Subcontractor	10-day turnaround time		
Rapid Response – Drinking Water Supply (as needed)	CH2M	Within 24 hours of date of receipt of sample results, if warranted (See **Worksheet #11**)	Within 24 hours of date of receipt of sample results (See **Worksheet #11**)	N/A
Offsite Drinking Water Sampling Step-out	CH2M	TBD	TBD	N/A
Analytical Data	Subcontractor	10- business day turnaround time		
Data Management	CH2M	TBD	TBD	N/A
Reporting	CH2M	TBD	TBD	Results Technical Memorandum

4 Future sampling events will follow a similar schedule.

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SAP Worksheet #17—Sampling Design and Rationale

Table 17-1. Ault Field and Outlying Field Coupeville Sampling Strategy and Rationale

Matrix	Depth of Samples	Analysis and Method	Number of Samples	Sampling Strategy and Rationale
Drinking Water	N/A	PFAS USEPA Method 537.1	1 at each of 49 locations per biannual monitoring event	Off-Base drinking water wells on parcels where PFAS were previously detected will be sampled biannually to monitor human health protectiveness and determine if PFOS and/or PFOA concentrations have increased or decreased over time. Drinking water wells on parcels adjacent to wells with prior concentrations of PFOS and/or PFOA above the lifetime health advisory will be sampled biannually to monitor human health protectiveness and evaluate the spatial distribution of the PFAS plume. Additionally, drinking water wells on parcels adjacent to the Navy’s waterline installation activities for off-Base PFAS impacted properties will be sampled biannually to monitor human health protectiveness and evaluate the spatial distribution of the PFAS plume under decreased pumping conditions resulting from waterline connections.

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SAP Worksheet #18—Sampling Locations and Methods/SOP Requirements Table

Station Identification (ID)	Sample ID	Matrix	Depth (feet bgs)	Analytical Group	Number of Samples (identify field duplicates)	Sampling SOP Reference
Area 6 - Community and Private Wells						
WI-A06-RW03	WI-A06-RW03-MMYY	Drinking Water[a]	N/A	PFAS	2 (FD)	**Worksheet #21**
	WI-A06-RW03P-MMYY					
WI-A06-RW04	WI-A06-RW04-MMYY				1	
WI-A06-RW05	WI-A06-RW05-MMYY				3 (MS/MSD)	
	WI-A06-RW05-MMYY-MS					
	WI-A06-RW05-MMYY-MSD					
WI-A06-RW08	WI-A06-RW08-MMYY				1	
WI-A06-RW14	WI-A06-RW14-MMYY				1	
WI-A06-RW18	WI-A06-RW18-MMYY				1	
WI-A06-RW19	WI-A06-RW19-MMYY				1	
WI-A06-RW20	WI-A06-RW20-MMYY				1	
WI-A06-RW24	WI-A06-RW24-MMYY				1	
Ault Field - Community and Private Wells						
WI-AF-1RW01	WI-AF-1RW01-MMYY	Drinking Water[a]	N/A		1	**Worksheet #21**
WI-AF-1RW12	WI-AF-1RW12-MMYY				2 (FD)	
	WI-AF-1RW12P-MMYY					
WI-AF-1RW25	WI-AF-1RW25-MMYY				1	

SAP Worksheet #18—Sampling Locations and Methods/SOP Requirements Table (continued)

Station Identification (ID)	Sample ID	Matrix	Depth (feet bgs)	Analytical Group	Number of Samples[b] (identify field duplicates)	Sampling SOP Reference
WI-AF-1RW28	WI-AF-1RW28-MMYY	Drinking Water[a]	N/A	PFAS	3 (MS/MSD)	**Worksheet #21**
	WI-AF-1RW28-MMYY-MS					
	WI-AF-1RW28-MMYY-MSD					
WI-AF-1RW32	WI-AF-1RW32P-MMYY				2 (FD)	
	WI-AF-1RW32-MMYY					
WI-AF-1RW33	WI-AF-1RW33-MMYY				1	
WI-AF-1RW40	WI-AF-1RW40-MMYY				1	
WI-AF-1RW51	WI-AF-1RW51-MMYY				1	
WI-AF-1RW68	WI-AF-1RW68-MMYY				1	
WI-AF-1RW77	WI-AF-1RW77-MMYY				1	
WI-AF-3RW18	WI-AF-3RW18-MMYY				1	
WI-AF-3RW41	WI-AF-3RW41-MMYY				1	
Coupeville - Community and Private Wells						
WI-CV-1RW01	WI-CV-1RW01-MMYY	Drinking Water[a]	N/A	PFAS	1	**Worksheet #21**
WI-CV-1RW07	WI-CV-1RW07-MMYY				3 (2 FDs)	
	WI-CV-1RW07P-MMYY					
	WI-CV-1RW07PP-MMYY					
WI-CV-1RW09	WI-CV-1RW09-MMYY				1	
WI-CV-1RW14	WI-CV-1RW14-MMYY				1	
WI-CV-1RW22	WI-CV-1RW22-MMYY				1	
WI-CV-1RW23	WI-CV-1RW23-MMYY				1	
WI-CV-1RW24	WI-CV-1RW24-MMYY				1	
WI-CV-1RW25	WI-CV-1RW25-MMYY				1	

SAP Worksheet #18—Sampling Locations and Methods/SOP Requirements Table (continued)

Station Identification (ID)	Sample ID	Matrix	Depth (feet bgs)	Analytical Group	Number of Samples[b] (identify field duplicates)	Sampling SOP Reference
WI-CV-1RW26	WI-CV-1RW26-MMYY	Drinking Water[a]	N/A	PFAS	1	**Worksheet #21**
WI-CV-1RW27	WI-CV-1RW27-MMYY				1	
WI-CV-1RW34	WI-CV-1RW34-MMYY				3 (MS/MSD)	
	WI-CV-1RW34-MMYY-MS					
	WI-CV-1RW34-MMYY-MSD					
WI-CV-1RW37	WI-CV-1RW37-MMYY				1	
WI-CV-1RW40	WI-CV-1RW40-MMYY				2 (FD)	
	WI-CV-1RW40P-MMYY					
WI-CV-1RW53	WI-CV-1RW53-MMYY				1	
WI-CV-1RW60	WI-CV-1RW60-MMYY				1	
WI-CV-1RW67	WI-CV-1RW67-MMYY				1	
WI-CV-1RW72	WI-CV-1RW72-MMYY				1	
WI-CV-1RW89	WI-CV-1RW89-MMYY				1	
WI-CV-1RW90	WI-CV-1RW90-MMYY				1	
WI-CV-2RW02	WI-CV-2RW02-MMYY				1	
WI-CV-2RW04	WI-CV-2RW04-MMYY				3 (MS/MSD)	
	WI-CV-2RW04-MMYY-MS					
	WI-CV-2RW04-MMYY-MSD					
WI-CV-2RW06	WI-CV-2RW06-MMYY				1	
WI-CV-3RW04	WI-CV-3RW04-MMYY				1	
WI-CV-3RW07	WI-CV-3RW07-MMYY				1	
WI-CV-3RW10	WI-CV-3RW10-MMYY				1	

SAP Worksheet #18—Sampling Locations and Methods/SOP Requirements Table (continued)

Station Identification (ID)	Sample ID	Matrix	Depth (feet bgs)	Analytical Group	Number of Samples[b] (identify field duplicates)	Sampling SOP Reference
WI-CV-3RW11	WI-CV-3RW11-MMYY	Drinking Water[a]	N/A	PFAS	2 (FD)	**Worksheet #21**
	WI-CV-3RW11P-MMYY					
WI-CV-3RW17	WI-CV-3RW17-MMYY				1	
WI-CV-3RW18	WI-CV-3RW18-MMYY				1	
Quality Control						
WI-A06-QC	WI-A06-FB03-MMYY	PFAS free water	N/A	PFAS	1	**Worksheet #21**
	WI-A06-FB04-MMYY				1	
	WI-A06-FB05-MMYY				1	
	WI-A06-FB08-MMYY				1	
	WI-A06-FB14-MMYY				1	
	WI-A06-FB18-MMYY				1	
	WI-A06-FB19-MMYY				1	
	WI-A06-FB20-MMYY				1	
	WI-A06-FB24-MMYY				1	
WI-AF-QC	WI-AF-1FB01-MMYY				1	
	WI-AF-1FB12-MMYY				1	
	WI-AF-1FB25-MMYY				1	
	WI-AF-1FB28-MMYY				1	
	WI-AF-1FB32-MMYY				1	
	WI-AF-1FB33-MMYY				1	
	WI-AF-1FB40-MMYY				1	
	WI-AF-1FB51-MMYY				1	
	WI-AF-1FB68-MMYY				1	

SAP Worksheet #18—Sampling Locations and Methods/SOP Requirements Table (continued)

Station Identification (ID)	Sample ID	Matrix	Depth (feet bgs)	Analytical Group	Number of Samples[b] (identify field duplicates)	Sampling SOP Reference
WI-AF-QC	WI-AF-1FB77-MMYY	PFAS free water	N/A	PFAS	1	**Worksheet #21**
	WI-AF-3FB18-MMYY				1	
	WI-AF-3FB41-MMYY				1	
WI-CV-QC	WI-CV-1FB01-MMYY				1	
	WI-CV-1FB07-MMYY				1	
	WI-CV-1FB07PP-MMYY				1	
	WI-CV-1FB09-MMYY				1	
	WI-CV-1FB14-MMYY				1	
	WI-CV-1FB22-MMYY				1	
	WI-CV-1FB23-MMYY				1	
	WI-CV-1FB24-MMYY				1	
	WI-CV-1FB25-MMYY				1	
	WI-CV-1FB26-MMYY				1	
	WI-CV-1FB27-MMYY				1	
	WI-CV-1FB34-MMYY				1	
	WI-CV-1FB37-MMYY				1	
	WI-CV-1FB40-MMYY				1	
	WI-CV-1FB53-MMYY				1	
	WI-CV-1FB60-MMYY				1	
	WI-CV-1FB67-MMYY				1	
	WI-CV-1FB72-MMYY				1	
	WI-CV-1FB89-MMYY				1	
	WI-CV-1FB90-MMYY				1	

SAP Worksheet #18—Sampling Locations and Methods/SOP Requirements Table (continued)

Station Identification (ID)	Sample ID	Matrix	Depth (feet bgs)	Analytical Group	Number of Samples[b] (identify field duplicates)	Sampling SOP Reference
WI-CV-QC	WI-CV-2FB02-MMYY	PFAS free water	N/A	PFAS	1	**Worksheet #21**
	WI-CV-2FB04-MMYY				1	
	WI-CV-2FB06-MMYY				1	
	WI-CV-3FB04-MMYY				1	
	WI-CV-3FB07-MMYY				1	
	WI-CV-3FB10-MMYY				1	
	WI-CV-3FB11-MMYY				1	
	WI-CV-3FB17-MMYY				1	
	WI-CV-3FB18-MMYY				1	

[a] Drinking water samples will be collected as described in **Worksheet #14**.

[b] Field duplicates will be collected at a rate of 1 per 10 samples; MS/MSDs will be collected at a rate of 1 per 20 samples.

SAP Worksheet #19—Analytical SOP Requirements Table

Matrix	Analytical Group	Analytical and Preparation Method/ SOP Reference	Containers	Sample Volume	Preservation Requirements	Maximum Holding Time[a] (preparation/analysis)
Drinking Water	PFAS	USEPA Method 537.1/ SOP-64	2 x 250 milliliters (mL) polypropylene	250 mL	Trizma (5.0 grams per liter); ≤10°C at laboratory receipt, storage in the laboratory ≤6°C, but not frozen	14 days/28 days

[a] Maximum holding time is calculated from the time the sample is collected to the time the sample is prepared/extracted.

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SAP Worksheet #20—Field Quality Control Sample Summary Table

Matrix	Analytical Group	No. of Sampling Locations[a]	No. of Field Duplicates[b]	No. of MS/MSDs[b]	No. of Equip. Blanks[b]	No. of Field Reagent Blanks[c]	No. of Trip Blanks[b]	Total No. of Samples to Lab[b]
Ault Field – Community and Private Wells								
Drinking Water	PFAS	12	2	1/1	-	12	-	28
OLF Coupeville – Community and Private Wells								
Drinking Water	PFAS	28	3	2/2	-	28	-	63
Area 6 – Community and Private Wells								
Drinking Water	PFAS	9	1	1/1	-	9	-	21
Overall Sample Totals – Community and Private Wells								
Drinking Water	PFAS	49	6	4/4	-	49	-	112

[a] Sample counts are for each sampling event.

[b] Samples will be collected as detailed in **Worksheets #14, #17,** and **#18** of this SAP. Field QA/QC samples will be collected as detailed in **Worksheet #12**. Sample counts include properties with previous detections, properties adjacent to previous detections above the health advisory, and properties adjacent to waterline installation activities.

[c] A field reagent blank will be collected at each station during each drinking water sampling event.

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SAP Worksheet #21—Project Sampling SOP References Table

Reference Number	Title, Revision Date and/or Number	Originating Organization of Sampling SOP	Equipment Type	Modified for Project Work? (Yes/No)	Comments
SOP- 001	Chain-of-Custody, rev. 02/2021	CH2M	Chain-of-custody form	No	
SOP-002	Drinking water Sampling for Per- and Polyfluoroalkyl Substances, rev. 11/2021	CH2M	Drinking water sample bottles (polypropylene bottle with polypropylene screw cap), laboratory pre-filled Polypropylene bottles containing field blank water, loose-leaf paper without waterproof coating, clip board, pen (not Sharpie), nitrile or latex gloves	No	No Teflon components, PFAS-free shipping materials
SOP-003	Logbooks rev. 02/2021	CH2M	Loose-leaf paper without waterproof coating	Yes	No Teflon components, acceptable substitutes would be a sewn notebook without a plastic cover or loose-leaf paper
SOP-004	Packaging and Shipping Procedures for Low Concentration Samples, rev. 02/2021	CH2M	Plastic bags, ice, tape	Yes	No Teflon supplies, no Blue Ice. Samples will be kept on ice and samples shipped to laboratory via FedEx.

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SAP Worksheet #22—Field Equipment Calibration, Maintenance, Testing, and Inspection Table

Field equipment requiring calibration, maintenance, testing, and inspection will not be used for this project.

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SAP Worksheet #23—Analytical SOP References Table

Lab SOP Number	Title, Revision Date, and/or Number	Date Reviewed if not Revised	Definitive or Screening Data	Matrix and Analytical Group	Instrument	Organization Performing Analysis	Variance to QSM (Yes/No)	Modified for Project Work (Yes/No)
SOP-10	*Instrument Maintenance Logbooks and Schedule, 03/29/19; rev. 5*	**09/21/21**	N/A	Drinking Water/PFAS	LC/MS/MS	Vista Analytical Laboratory	No	No
SOP-12	*Sample Receiving and Sample Control Procedures; 12/10/21; rev. 21*	--	N/A	Drinking Water/PFAS	N/A	Vista Analytical Laboratory	No	No
SOP-14	*Bottle Order Preparation; 07/14/21; rev. 8*	**07/14/22**	N/A	Drinking Water/PFAS	N/A	Vista Analytical Laboratory	No	No
SOP-64	*Preparation and Analysis for the Determination of Per and Polyfluorinated Compounds in Drinking Water; 06/16/21; rev. 11*	**07/15/22**	Definitive	Drinking Water/ PFAS	LC/MS/MS	Vista Analytical Laboratory	No	No

Notes:

DoD Environmental Laboratory Accreditation Program (ELAP) certification is required for all definitive data. Vista Analytical has DoD ELAP certification that is valid through September 30, 2023.

LC/MS/MS = liquid chromatography tandem mass spectrometry

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SAP Worksheet #24—Analytical Instrument Calibration Table

Instrument	Calibration Procedure	Frequency of Calibration	Acceptance Criteria	CA	Person Responsible for CA	SOP Reference
LC/MS/MS (PFAS - Drinking Water)	Initial Calibration (ICAL)	Initial calibration prior to sample analysis	Minimum 5 point linear regression or quadratic calibration curve forced through zero for each analyte. The lowest calibration point must be at or below the minimum reporting limit (or LOQ). Each target compound within each calibration level must be within 70 to 130% of the true value, except for the lowest point of the curve which must be within 50 to 150% of the true value. Surrogate concentrations must be within 70 to 130% of the true value.	Evaluate standards, chromatography, and mass spectrometer response. If problem found with above, correct as appropriate, then repeat initial calibration.	Lab Manager/ Analyst	SOP 64
	Peak Asymmetry Verification	With initial calibration	Calculated factor in the range of 0.8 to 1.5.	Change instrument conditions to correct, then repeat initial calibration.		
	Retention Time Windows	Prior to sample analysis	Retention time windows should be based on measurements of actual retention time variation for each method analyte over the course of time. A value of plus or minus three times the standard deviation of the retention time obtained for each method analyte while establishing the initial calibration and completing the initial demonstration of capability can be used to calculate a suggested retention time window size. However, the experience of the analyst should weigh heavily on the determination of the appropriate retention window size.	Dilute extract and reanalyze. Recalibrate if necessary to reestablish retention times.		

SAP Worksheet #24—Analytical Instrument Calibration Table (continued)

Instrument	Calibration Procedure	Frequency of Calibration	Acceptance Criteria	CA	Person Responsible for CA	SOP Reference
LC/MS/MS (PFAS - Drinking Water)	Second-source calibration verification	Once per initial calibration, following initial calibration.	All reported analytes and labeled compounds within ± 30 percent of true value.	Evaluate data. If problem (e.g., concentrated standard, plugged transfer line) found, correct, then repeat second source verification. If it still fails, then repeat initial calibration.	Lab Manager/ Analyst	SOP 64
	Continuing Calibration Verification (CCV)	Verify initial calibration by analyzing a low level (at the LOQ or below) CCV prior to analyzing samples. CCVs are then injected after every 10 samples and after the last sample, rotating concentrations to cover the calibrated range of the instrument.	Recovery for each analyte and surrogate must be within 70-130% of the true value for all but the lowest level of calibration. Recovery for each analyte in the lowest CAL level CCV must be within 50-150% of the true value and the surrogate must be within 70-130% of the true value.	Recalibrate, and reanalyze all affected samples since the last acceptable CCV. OR Immediately analyze two additional consecutive CCVs. If both pass, samples may be reported without reanalysis. If either fails, take corrective action(s) and re-calibrate; then reanalyze all affected samples since the last acceptable CCV. If reanalysis cannot be performed, data must be qualified and explained in the case narrative.		

Notes:

± = plus or minus

SAP Worksheet #25—Analytical Instrument and Equipment Maintenance, Testing, and Inspection Table

Instrument/ Equipment	Maintenance Activity	Testing Activity	Inspection Activity	Frequency	Acceptance Criteria	CA	Responsible Person	SOP Reference
TQS-MICRO	Source cleaning	N/A	Visual inspection sample/gas cone cleaning	As needed	N/A	N/A	Analyst/ Supervisor	SOP 10
Aquity UPLC	Needle replacement	N/A	Visual inspection contamination Bent needle	As needed	Leak test in software	Repeat if leak test fails	Analyst/ Supervisor	SOP 10
TQS-MICRO	Source heater	N/A	Source not at 150 degrees	As needed	Source maintains 150 degrees	Repeat with new heater if sources do not heat	Service Provider/ Analyst/ Supervisor	SOP 10
Sciex 4000 QTrap	Cleaning Q0	N/A	Visual inspection curtain plate cleaning	As needed	N/A	N/A	Analyst/ Supervisor	SOP 10

UPLC = ultra performance liquid chromatography

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SAP Worksheet #26—Sample Handling System

SAMPLE COLLECTION, PACKAGING, AND SHIPMENT
Sample Collection (Personnel/Organization): Project Field Team, FTL/CH2M. Field SOPs are in **Appendix A** of this SAP
Sample Packaging (Personnel/Organization): Project Field Team, FTL/CH2M. Field SOPs are in **Appendix A** of this SAP
Coordination of Shipment (Personnel/Organization): FTL/CH2M
Type of Shipment/Carrier: FedEx Priority Overnight to respective laboratory
SAMPLE RECEIPT AND ANALYSIS
Sample Receipt (Personnel/Organization): Sample Receiving – Vista Analytical
Sample Custody and Storage (Personnel/Organization): Sample Receiving – Vista Analytical
Sample Preparation (Personnel/Organization): Vista Analytical
Sample Determinative Analysis (Personnel/Organization): Vista Analytical
SAMPLE ARCHIVING
Field Sample Storage (No. of days from sample collection): 45 days
Sample Extract/Digestate Storage (No. of days from extraction/digestion): 90 days
Biological Sample Storage (No. of days from sample collection): N/A
SAMPLE DISPOSAL
Personnel/Organization): Sample Disposal – Vista Analytical
Number of Days from Analysis: 45 days

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SAP Worksheet #27—Sample Custody Requirements Table

Field Sample Custody Procedures (sample collection, packaging, shipment, and delivery to laboratory): Samples will be collected by field team members under the supervision of the FTL. As samples are collected, they will be placed into containers and labeled. Labels will be taped to the jar to ensure they do not separate. Samples will be cushioned with packaging material and placed into coolers containing enough ice to keep the samples less than 10°C for the first 48 hours until they are received by the laboratory. The chain-of-custody form will be placed into the cooler in a resealable zip-top plastic bag. Coolers will be taped and shipped to the laboratories via FedEx overnight, with the air bill number indicated on the chain-of-custody form (to relinquish custody). Upon delivery, the laboratory will log each cooler and report the status of the samples to CH2M. Refer to **Worksheet #21** for SOPs containing sample custody guidance. The CH2M field team will ship all environmental samples directly to the laboratory performing the analysis. This will require shipment to Vista Analytical in El Dorado Hills, California.
Laboratory Sample Custody Procedures (receipt of samples, archiving, disposal): Laboratory custody procedures can be found in the laboratory SOPs, which will be provided upon request.
Sample ID Procedures: Sample labels will include, at a minimum, client name, site, sample ID, date/time collected, analysis group or method, preservation, and sampler's initials. The field logbook will identify the sample ID with the location and time collected and the parameters requested. The laboratory will assign each field sample a laboratory sample ID based on information in the chain of custody. The laboratory will send sample log-in forms to the PC to check that sample IDs and parameters are correct.
Chain-of-custody Procedures: Chain-of-custody forms will include, at a minimum, laboratory contact information, client contact information, sample information, and relinquished by/received by information. Sample information will include sample ID. Date/time collected, number and type of containers, preservative information, analysis method, and comments. The chain-of-custody form will link location of the sample from the field logbook to the laboratory receipt of the sample. The laboratory will use the sample information to populate the Laboratory Information Management Systems database for each sample.

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SAP Worksheet #28—Laboratory QC Samples Table

Matrix: Drinking Water

Analytical Group: PFAS

Analytical Method/SOP Reference: USEPA Method 537.1/SOP 64

<table>
<tr><th>QC Sample</th><th>Frequency/Number</th><th>Method/SOP QC Acceptance Limits</th><th>CA</th><th>Person(s) Responsible for CA</th><th>DQI</th><th>MPC</th></tr>
<tr><td>Method Blank</td><td>One per prep. batch of up to 20 samples.</td><td>For the determination of native PFAS, the levels measured in the method blank of all method analytes must be below 1/3 the LOQ.</td><td>Correct problem. Reprep and reanalyze method blank and all samples processed with the contaminated blank.
If reanalysis cannot be performed, the data must be qualified and explained in the case narrative.</td><td rowspan="3">Analyst/ Supervisor</td><td>Bias/ Contamination</td><td rowspan="3">Same as Method/ SOP QC Acceptance Limits</td></tr>
<tr><td>LCS</td><td>One LCS is required for each extraction batch of up to 20 Field Samples. Rotate the fortified concentrations between low, medium and high amounts.</td><td>Recoveries at mid and high levels must be within 70-130% and within 50-150% at the low-level fortified amount (≤2 times the LOQ).</td><td>Correct problem, reprep and reanalyze LCS and all samples in associated batch for failed analytes. If reanalysis cannot be performed, the data must be qualified and explained in the case narrative.</td><td>Accuracy/ Bias</td></tr>
<tr><td>MS</td><td>Analyze one MS per extraction batch (20 samples or less) fortified with method analytes at a concentration close to but greater than the native concentration, if known.</td><td>Recoveries at mid and high levels must be within 70-130% and within 50-150% at the low-level fortified amount (≤2 times the LOQ).</td><td>Evaluate the data to determine if the failed criteria are due to sample matrix or laboratory error. Re-prep if sufficient sample is available when lab error is suspected, otherwise qualify data with narrative.</td><td>Accuracy/ Bias</td></tr>
</table>

SAP Worksheet #28—Laboratory QC Samples Table (continued)

QC Sample	Frequency/Number	Method/ SOP QC Acceptance Limits	CA	Person(s) Responsible for CA	DQI	MPC
MSD	Analyze one MSD per extraction batch (20 samples or less) fortified with method analytes at a concentration close to but greater than the native concentration, if known.	Recoveries at mid and high levels must be within 70-130% and within 50-150% at the low-level fortified amount (≤2 times the LOQ). Method analyte RPDs for the MSD or field duplicate must be ≤30% at mid and high levels of fortification and ≤50% when fortification is ≤2 times the LOQ.	Evaluate the data to determine if the failed criteria are due to sample matrix or laboratory error. Re-prep if sufficient sample is available when lab error is suspected, otherwise qualify data with narrative.	Analyst/ Supervisor	Precision/ Accuracy/ Bias	Same as Method/ SOP QC Acceptance Limits
IS	Every field sample, standard, blank, and QC sample.	Peak area counts for all ISs in all injections must be within ± 50% of the average peak area calculated during the initial calibration and 70-140% from the most recent CCV. If ISs do not meet this criterion, corresponding target results are invalid.	If peak areas are unacceptable, analyze a second aliquot of the extract or sample if enough extract remains. If there is not enough extract, reanalyze the first aliquot. If second analysis meets acceptance criteria, report the second analysis. If it fails, either analysis may be reported with the appropriate flags.		Accuracy	
Surrogates	Every field sample, standard, blank, and QC sample	Within 70 to 130% of true value	Identify and correct the problem. Reprepare and reanalyze all samples with failed surrogates in the associated preparatory batch. If obvious chromatographic interference with surrogate is present, reanalysis may not be necessary. Qualify all applicable data if acceptance criteria are not met and explain in case narrative.		Accuracy/ Bias	

≤ = less than or equal to

SAP Worksheet #29—Project Documents and Records Table

Document	Where Maintained
• Field notes • Chain-of-custody records • Air bills • Custody seals • CA forms • Electronic data deliverables (EDDs) • ID of QC samples • Meteorological data from field • Sampling locations and sampling plan • Sampling notes • Sample Receipt, Chain of Custody, and Tracking Records • Standard traceability logs • Sample preparation logs • Run logs • Equipment maintenance, testing, and inspection logs • Reported field sample results • Reported Result for Standards, QC Checks, and QC Samples • Instrument printouts (raw data) for field samples, standards, QC checks, and QC samples • Data package completeness checklists • Sample disposal records • Extraction/cleanup records • Raw data (archived per Navy CLEAN contract) • DV reports	• Field data deliverables (for example, logbook entries, chains of custody, air bills, and EDDs) will be kept on CH2M's network server. • Analytical laboratory hard copy deliverables and DV reports will be saved on the network server and archived per the Navy CLEAN contract. • Electronic data from the laboratory will be loaded into Navy database. • Following project completion, hard copy project-related deliverables (for example, documents, reports, logbooks, chains of custody) will be archived at Iron Mountain: Iron Mountain Headquarters 745 Atlantic Avenue Boston, Massachusetts 02111 800-899-IRON • Following project completion, hard copy data deliverables including chains of custody and raw data will be archived at the at NAVFAC NW in Silverdale, WA, as part of the administrative record: Naval Facilities Engineering Systems Command Northwest 1101 Tautog Circle, Room 110 Silverdale, WA 98315

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SAP Worksheet #30—Analytical Services Table

Matrix	Analytical Group	Sample Locations/ID	Analytical Method	Data Package Turnaround Time	Laboratory/Organization	Backup Laboratory/ Organization[a]
Drinking Water	PFAS	Refer to **Worksheets #18** and **#20**	USEPA Method 537.1	14 Calendar Days	Vista Analytical Laboratory 1104 Windfield Way, El Dorado Hills, California 95762 Contact: Karen Volpendesta 916-673-1520	Battelle 141 Longwater Drive; Suite 202 Norwell, Massachusetts 02061 Contact: Jonathan Thorn 781-681-5565

[a] Should the backup laboratory be needed for sample analysis, laboratory SAP worksheets will be submitted to the NAVFAC QAO for review prior to sample collection.

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SAP Worksheet #31—Planned Project Assessments Table

Assessment Type	Frequency	Internal or External	Organization Performing Assessment	Person(s) Responsible for Performing Assessment (title and organizational affiliation)	Person(s) Responsible for Responding to Assessment Findings (title and organizational affiliation)	Person(s) Responsible for Identifying and Implementing CA (title and organizational affiliation)	Person(s) Responsible for Monitoring Effectiveness of CA (title and organizational affiliation)
Field Performance Audit	One during sampling event	Internal	CH2M	PM CH2M	FTL CH2M	PM CH2M	PM CH2M
Safe Work Observation	One during sampling event	Internal	CH2M	SSC CH2M	Field Team Member observed CH2M	HSM CH2M	SSC CH2M
Field Document Review	Daily during sampling event	Internal	CH2M	PM or TM CH2M	FTL CH2M	PM CH2M	PM CH2M

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SAP Worksheet #32—Assessment Findings and Corrective Action Responses

Assessment Type	Nature of Deficiencies Documentation	Individual(s) Notified of Findings (name, title, organization)	Timeframe of Notification	Nature of CA Response Documentation	Individual(s) Receiving CA Response (name, title, organization)	Timeframe for Response
Field Performance Audit	Checklist and written audit report	FTL CH2M	Within 1 day of audit	Verbal and memorandum	FTL CH2M	Within 1 day of receipt of CA Form
Safe Observation Report (SOR)	SOR form	HSM CH2M	Within 1 week of safe behavior observation	Memorandum	Field Team Member CH2M	Immediately
Field Document Review	Markup copy of field documentation	FTL CH2M	Within 1 day of review	Verbal and memorandum	FTL CH2M	Within 1 day of receipt of markup

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SAP Worksheet #32-1—Laboratory Corrective Action Form

Person initiating CA: ______________________________ Date: ____________

Description of problem and when identified:

____
____
____
____
____

Cause of problem, if known or suspected:

____
____
____
____
____

Sequence of CA: (including date implemented, action planned and personnel/data affected)

____
____
____
____
____

CA implemented by: ______________________________ Date: ____________

CA initially approved by: ______________________________ Date: ____________

Follow-up date: ______________________________

Final CA approved by: ______________________________ Date: ____________

Information copies to:

Anita Dodson, CH2M Navy CLEAN Program Chemist

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____
____
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SAP Worksheet #32-2—Field Performance Audit Checklist

Project Responsibilities

Project No.: ______________________ Date: ______________________

Project Location: ______________________ Signature: ______________________

Team Members

Yes No 1) Is the approved Work Plan being followed?

Comments ______________________

Yes No 2) Was a briefing held for project participants?

Comments ______________________

Yes No 3) Were additional instructions given to project participants?

Comments ______________________

Sample Collection

Yes No 1) Is there a written list of sampling locations and descriptions?

Comments ______________________

Yes No 2) Are samples collected as stated in the Master SOPs?

Comments ______________________

Yes No 3) Are samples collected in the type of containers specified in the Work Plan?

Comments ______________________

Yes No 4) Are samples preserved as specified in the Work Plan?

Comments ______________________

Yes No 5) Are the number, frequency, and type of samples collected as specified in the Work Plan?

Comments ______________________

Worksheet #32-2—Field Performance Audit Checklist (continued)

Yes No 6) Are QA checks performed as specified in the Work Plan?

Comments ____

____

Yes No 7) Are photographs taken and documented?

Comments ____

____

Document Control

Yes No 1) Have any accountable documents been lost?

Comments ____

____

Yes No 2) Have any accountable documents been voided?

Comments ____

____

Yes No 3) Have any accountable documents been disposed of?

Comments ____

____

Yes No 4) Are the samples identified with sample tags?

Comments ____

____

Yes No 5) Are blank and duplicate samples properly identified?

Comments ____

____

Yes No 6) Are samples listed on a chain-of-custody record?

Comments ____

____

Yes No 7) Is chain of custody documented and maintained?

Comments ____

____

SAP Worksheet #33—QA Management Reports Table

Type of Report	Frequency (daily, weekly monthly, quarterly, annually, and so forth)	Projected Delivery Date(s)	Person(s) Responsible for Report Preparation (title and organizational affiliation)	Report Recipient(s) (title and organizational affiliation)
Field Audit Report	One during sampling event	TBD	PM CH2M	Included in project files

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SAP Worksheet #34-36—Data Verification and Validation (Steps I and IIa/IIb) Process Table

Data Review Input	Description[a]	Responsible for Verification or Validation	Step I/IIa/IIb[b]	Internal/ External[c]
Field Notebooks	Field notebooks will be reviewed internally and placed into the project file for archival at project closeout.	FTL/CH2M	Step I	Internal
Chains of Custody and Shipping Forms	Chain-of-custody forms and shipping documentation will be reviewed internally upon their completion and verified against the packed sample coolers they represent. The shipper's signature on the chain-of-custody forms will be initialed by the reviewer, a copy of the chain-of-custody forms retained in the site file, and the original and remaining copies taped inside the cooler for shipment. Chain-of-custody forms will also be reviewed for adherence to the SAP by the PC.	FTL/CH2M PC/CH2M	Step I	Internal and External
Sample Condition upon Receipt	Any discrepancies, missing, or broken containers will be communicated to the PC in the form of laboratory logins.	PC/CH2M	Step I	External
Documentation of Laboratory Method Deviations	Laboratory method deviations not included in the laboratory SOP and therefore not included in the DoD ELAP Accreditation letter, are not allowed for this project. Any method deviations must be reviewed and approved as part of the DoD ELAP Accreditation process.	PC/CH2M	Step I	External
EDDs	EDDs will be compared against hard copy laboratory results (10 percent check). If discrepancies are found, a 25% check of the EDD against the hardcopy will be carried out on the SDG in which the discrepancy was found, if additional discrepancies are found a 100% check will be completed.	PC/CH2M	Step I	External
Case Narrative	Case narratives will be reviewed by the data validator during the DV process. This is verification that they were generated and applicable to the data packages.	Data Validator	Step I	External
Laboratory Data	All laboratory data packages will be verified internally by the laboratory performing the work for completeness and technical accuracy prior to submittal.	Laboratory QAO	Step I	Internal

SAP Worksheet #34-36—Data Verification and Validation (Steps I and IIa/IIb) Process Table (continued)

Data Review Input	Description[a]	Responsible for Verification or Validation	Step I/IIa/IIb[b]	Internal/ External[c]
Laboratory Data	The data will be verified for completeness by the PC. To ensure completeness, EDDs will be compared to the SAP. This is a verification that all samples were included in the laboratory data and that correct analyte lists were reported.	PC/CH2M	Step I	External
Audit Reports	Upon report completion, a copy of all audit reports will be placed in the site file. If CAs are required, a copy of the documented CA taken will be attached to the appropriate audit report in the QA site file. Periodically, and at the completion of site work, site file audit reports and CA forms will be reviewed internally to ensure that all appropriate CAs have been taken and that CA reports are attached. If CAs have not been taken, the site manager will be notified to ensure action is taken.	PM/CH2M PC/CH2M	Step I	Internal
CA Reports	CA reports will be reviewed by the PC or PM and placed into the project file for archival at project closeout.	PM/CH2M PC/CH2M	Step I	External
Laboratory Methods	During the pre-validation check, ensure that the laboratory analyzed samples using the correct methods specified in the SAP. If methods other than those specified in the SAP were used, the reason will be determined and documented.	PC/CH2M	Step IIa	External
Target Compound List and Target Analyte List	During the pre-validation check, ensure that the laboratory reported all analytes from each analysis group as per **Worksheet #15**. If the target compound list is not correct, then it must be corrected prior to sending the data for validation. Once the checks are complete, the PM is notified via email.	PC/CH2M	Step IIa	External
Laboratory Limits (DL/LOD/LOQs)	During the pre-validation check, the laboratory limits (DL, LOD, LOQs) will be compared to those listed in the project SAP. If limits were not met, the laboratory will be contacted and asked to provide an explanation, which will then be discussed in the associated project report. Often times the cause for minor laboratory limit deviation from those presented in the SAP is due to the quarterly update of laboratory LOD.	PC/CH2M	Step IIb	External

SAP Worksheet #34-36—Data Verification and Validation (Steps I and IIa/IIb) Process Table (continued)

Data Review Input	Description[a]	Responsible for Verification or Validation	Step I/IIa/IIb[b]	Internal/ External[c]
Laboratory SOPs	Ensure that approved analytical laboratory SOPs were followed. Any such discrepancies will be discussed first in the DV narrative and will be included in the associated project report.	Laboratory QAO	Step IIa	Internal
Sample Chronology	Holding times from collection to extraction or analysis and from extraction to analysis will be considered during the DV process.	Data Validator	Step IIa and IIb	External
Raw Data	100 percent Stage 4 review of raw data to confirm laboratory calculations and manual integrations. For a recalculated result, the DV attempts to recreate the reported numerical value. The laboratory is asked for clarification if a discrepancy is identified which cannot reasonably be attributed to rounding. In general, this is outside 5% difference.	Data Validator	Step IIa	External
Documentation of Method QC Results	Establish that all required QC samples were run and met limits.	Data Validator	Step IIa	External
Documentation of Field QC Sample Results	Establish that all required QC samples were run and met limits, and will be discussed in the associated project report.	PC/CH2M	Step IIa	Internal
DoD ELAP Evaluation	Ensure that each laboratory is DoD ELAP certified for the analyses they are to perform. Ensure evaluation timeframe does not expire.	PC/CH2M	Step I	External

SAP Worksheet #34-36—Data Verification and Validation (Steps I and IIa/IIb) Process Table (continued)

Data Review Input	Description[a]	Responsible for Verification or Validation	Step I/IIa/IIb[b]	Internal/ External[c]
Analytical Data for PFAS in Drinking Water	Analytical methods and laboratory SOPs will be evaluated against QA/QC criteria to ensure compliance, as presented in this SAP. QA/QC criteria for field QC samples are presented in **Worksheet #12**. LOQs, LODs, and DLs are presented in **Worksheet #15**. QA/QC criteria for calibrations are presented in laboratory SOPs (referenced in **Worksheet #23**). QA/QC criteria for laboratory QC samples are presented in **Worksheet #28**. Data may be qualified if QA/QC exceedances have occurred. Guidance and qualifiers from United States Department of Defense *General Data Validation Guidelines* (DoD, 2019) and reference USEPA's *Data Review and Validation Guidelines for Perfluoroalkyl Substances (PFASs) Analyzed Using EPA Method 537* (USEPA, 2018) will be applied as appropriate and may also reference *Per- and Polyfluoroalkyl Substances (PFAS): Reviewing Analytical Methods Data for Environmental Samples* (USEPA, 2019). As specific modules for the analytical methods in this project are published, the data validators will refer to those modules for guidance. In the meantime, if specific guidance is not given for these methods in the *General Data Validation Guidelines*, the data validator may adapt the guidance from USEPA's *National Functional Guidelines for Organic Superfund Methods Data Review* (USEPA, 2020).	Data Validator	Step IIa and IIb	External

[a] Should CH2M find discrepancies during the verification or validation procedures herein, an email documenting the issue will be circulated to the internal project team, and a Corrections to File Memo will be prepared identifying the issues and the CA needed. This memo will be sent to the laboratory, or applicable party, and maintained in the project file.

[b] Verification (Step I) is a completeness check that is performed before the data review process continues to determine whether the required information (complete data package) is available for further review. Validation (Step IIa) is a review that the data generated is in compliance with analytical methods, procedures, and contracts. Validation (Step IIb) is a comparison of generated data against MPC in the SAP (both sampling and analytical).

[c] Internal or external is in relation to the data generator.

SAP Worksheet #37—Usability Assessment

Summarize the usability assessment process and all procedures, including interim steps and any statistics, equations, and computer algorithms that will be used.

- Nondetected site contaminants will be evaluated to ensure that project required quantitation limits in **Worksheet #15** were achieved. If project quantitation limits were achieved and the verification and validation steps yielded acceptable data, then the data are considered usable.
- During verification and validation steps, data may be qualified as estimated with the following qualifiers: J or UJ. Upon completion of analytical DV, each data point will be assessed as nonqualified, qualified as estimated (“J”, “J+”, “J-”, or “UJ” qualified), or qualified as recommended for rejection (“X” qualified) based upon the acceptance criteria, and analytical DV flags will be added to the project data. The project team will assess the validation report, taking into consideration DQOs, and decide if the “X” qualified results can be used for project decisions. If results cannot be used the “R” qualifier will be applied. In most cases the “R” qualified result is not considered for project decisions.
  - J = Analyte present. Reported value may or may not be accurate or precise.
  - J+ = Analyte present. Reported value may be biased high. Actual value is expected to be lower.
  - J- = Analyte present. Reported value may be biased low. Actual value is expected to be higher.
  - UJ = Analyte not detected. Associated nondetect value may be inaccurate or imprecise.
  - X = Result recommended for rejection by data validator.
  - R = Rejected result, project team decision. Result not reliable.
- The following additional qualifiers may be given by the validator:
  - N = Tentative ID. Consider Present. Special methods may be needed to confirm its presence or absence in future sampling efforts.
  - NJ = Qualitative ID questionable due to poor resolution. Presumptively present at approximate quantity.
  - U = Not Detected.
- Analytical data will be checked to ensure the values and any qualifiers are appropriately transferred to the electronic database. The checks include comparison of hard copy data and qualifiers to the EDD. Once the data have been uploaded into the electronic database, another check will be performed to ensure all results were loaded accurately.
- Field and laboratory precision will be compared as RPD between the two results.
- Deviations from the SAP will be reviewed to assess whether CA is warranted and to assess impacts to achievement of project objectives.

Describe the evaluative procedures used to assess overall measurement error associated with the project.

- To assess whether a sufficient quantity of acceptable data is available for decision-making, the data will be compared to the 100-percent completeness goal and reconciled with MPC following validation and review of DQI.
- If significant biases are detected with laboratory QA/QC samples, they will be evaluated to assess impact on decision-making. Low biases will be described in greater detail as they represent a possible inability to detect compounds that may be present at the site.
- If significant deviations are noted between laboratory and field precision, the cause will be further evaluated to assess impact on decision-making.

SAP Worksheet #37—Usability Assessment (continued)

Describe the documentation that will be generated during the usability assessment and how usability assessment results will be presented so that they identify trends, relationships (correlations), and anomalies.

The following will be prepared by CH2M and presented to and submitted to NAVFAC and Base for review and decisions on the path forward for the site:

- Data tables will be produced to reflect detected and nondetected site analytes and geochemical parameters.
- Data qualifiers will be reflected in the tables and discussed in the data quality evaluation and will be provided in a technical memorandum.

Identify the personnel responsible for performing the usability assessment.

The CH2M Team, including the PM and PC, will review the data and present to NAVFAC for review and approval of usability.

References

CH2M HILL, Inc. (CH2M). 2016. *Technical Memorandum: Results of Desktop Evaluation to Verify Off-Base Drinking Water Sources.* September.

CH2M. 2017a. *Sampling and Analysis Plan Investigation of Perfluorinated Compounds in Drinking Water, Naval Air Station Whidbey Island.* Final. January.

CH2M. 2017b. *Sampling and Analysis Plan Investigation of Perfluorinated Compounds in Drinking Water, Outlying Landing Field Coupeville.* Final. January.

CH2M. 2017c. *Sampling and Analysis Plan Investigation of Per- and Polyfluoroalkyl Substances in Drinking Water, Ault Field and Outlying Landing Field, Coupeville.* Final. November.

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CH2M. 2020b. Evaluation of Per- and Polyfluoroalkyl Substances, 1,4 Dioxane, and Vinyl Chloride in Groundwater and Drinking Water, Ault Field, Area 6 Naval Air Station Whidbey Island, Oak Harbor, Washington. June.

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Figures

Legend
- City
- Secondary Road
- Local Connecting Road
- Important Local Road
- Base Boundary

N

0 1 2 Miles

1 inch = 2 miles

NAS - Naval Air Station
OLF - Outlying Landing Field

Figure 1
Base Location Map
Investigation of Per- and Polyfluoroalkyl Substances in Off-Base Drinking Water
Ault Field, Area 6, and Outlying Landing Field, Coupeville
Coupeville, WA

\\dc1vs01\GISNavyClean\MULTI_REGION\PFC_679580\MapFiles\NW\Whidbey_NAS\CTO4041\Whidbey\SAP\PFAS\Figure_2_Periodic_Off-Base_DrinkingWater_PFAS_SiteLayout.mxd9/12/2022DRUCKC

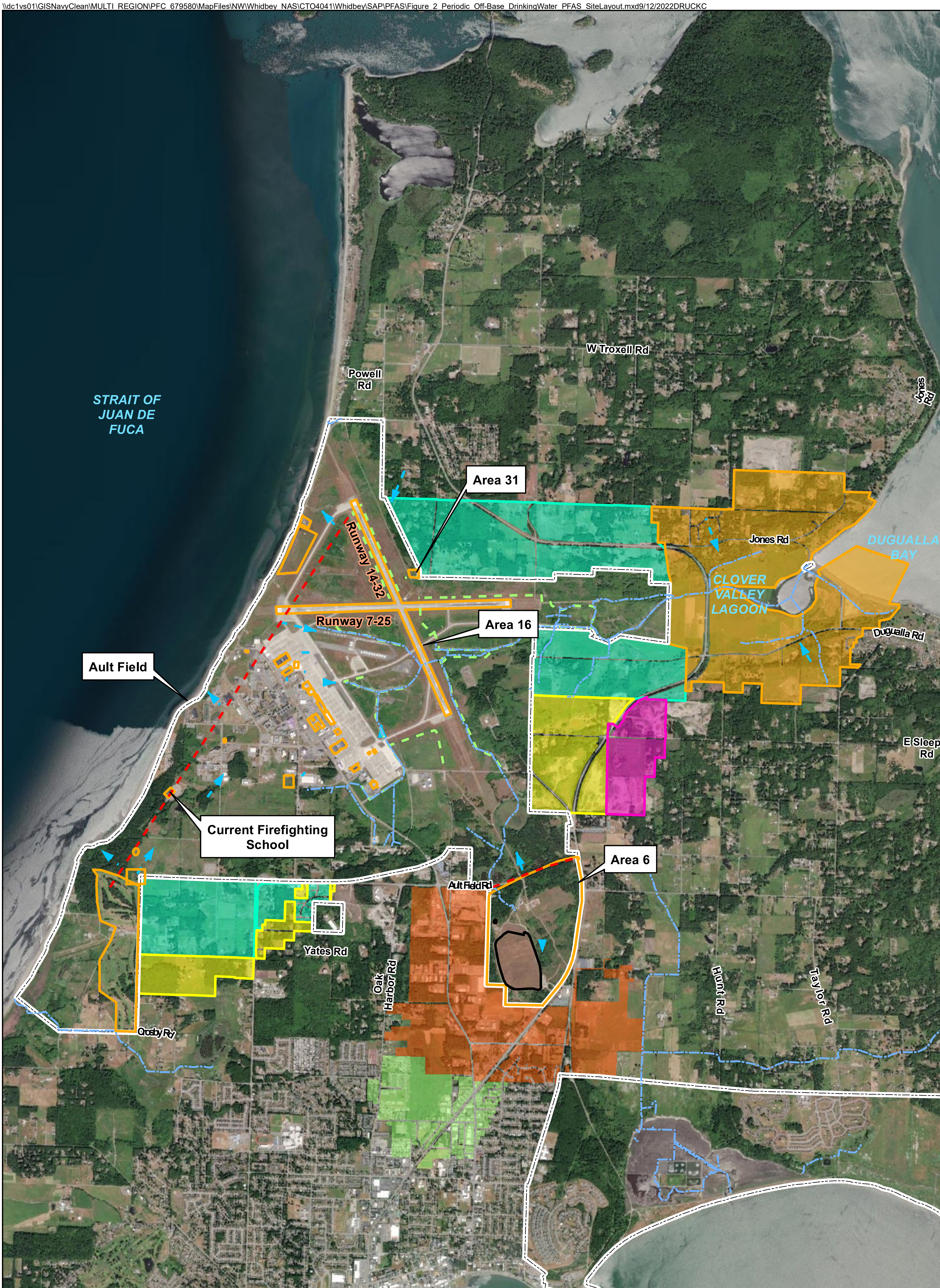

Figure 2
Site Layout Map - Ault Field
Investigation of Per- and Polyfluoroalkyl Substances in Off-Base Drinking Water
Ault Field, Area 6, and Outlying Landing Field, Coupeville
Coupeville, WA

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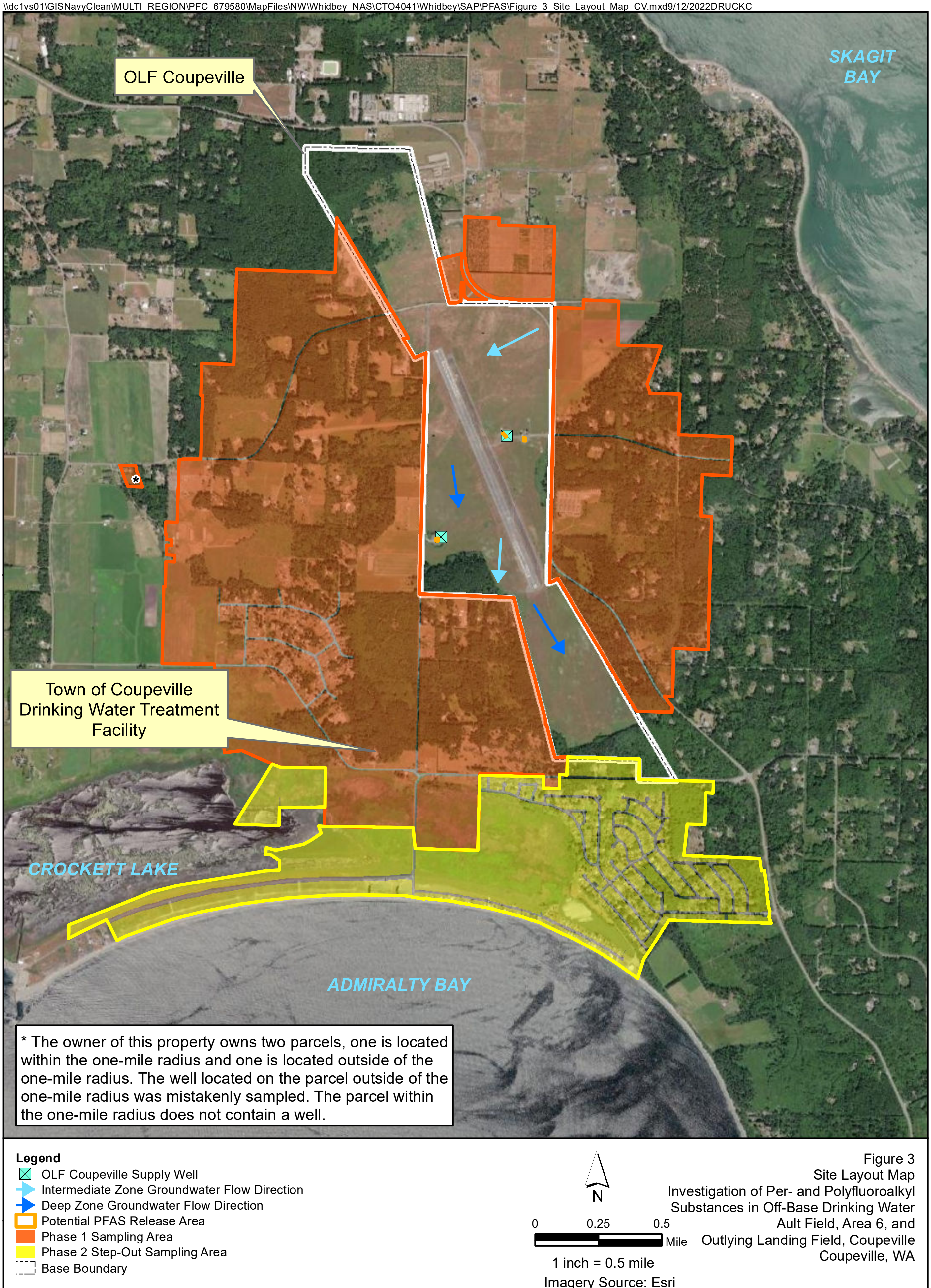

Figure 3
Site Layout Map
Investigation of Per- and Polyfluoroalkyl Substances in Off-Base Drinking Water
Ault Field, Area 6, and Outlying Landing Field, Coupeville
Coupeville, WA

Appendix A
Field Standard Operating Procedures

Appendix A – Table of Contents

Chain-of-Custody

I Purpose

The purpose of this SOP is to provide information on chain-of-custody procedures to be used under the CLEAN Program.

II Scope

This procedure describes the steps necessary for transferring samples through the use of Chain-of-Custody Records. A Chain-of-Custody Record is required, without exception, for the tracking and recording of samples collected for on-site or off-site analysis (chemical or geotechnical) during program activities (except wellhead samples taken for measurement of field parameters). Use of the Chain-of-Custody Record Form creates an accurate written record that can be used to trace the possession and handling of the sample from the moment of its collection through analysis. This procedure identifies the necessary custody records and describes their completion. This procedure does not take precedence over region specific or site-specific requirements for chain-of-custody.

III Definitions

Chain-of-Custody Record Form - A Chain-of-Custody Record Form is a printed two-part form that accompanies a sample or group of samples as custody of the sample(s) is transferred from one custodian to another custodian. One copy of the form must be retained in the project file.

Custodian - The person responsible for the custody of samples at a particular time, until custody is transferred to another person (and so documented), who then becomes custodian. A sample is under one's custody if:

- It is in one's actual possession.
- It is in one's view, after being in one's physical possession.
- It was in one's physical possession and then he/she locked it up to prevent tampering.
- It is in a designated and identified secure area.

Sample - A sample is physical evidence collected from a facility or the environment, which is representative of conditions at the point and time that it was collected.

IV. Procedures

The term “chain-of-custody” refers to procedures which ensure that evidence presented in a court of law is valid. The chain-of-custody procedures track the evidence from the time and place it is first obtained to the courtroom, as well as providing security for the evidence as it is moved and/or passed from the custody of one individual to another.

Chain-of-custody procedures, recordkeeping, and documentation are an important part of the management control of samples. Regulatory agencies must be able to provide the chain-of-possession and custody of any samples that are offered for evidence, or that form the basis of analytical test results introduced as evidence. Written procedures must be available and followed whenever evidence samples are collected, transferred, stored, analyzed, or destroyed.

Sample Identification

The method of identification of a sample depends on the type of measurement or analysis performed. When *in situ* measurements are made, the data are recorded directly in bound logbooks or other field data records with identifying information.

Information which shall be recorded in the field logbook, when in-situ measurements or samples for laboratory analysis are collected, includes:

- Field Sampler(s),
- Contract Task Order (CTO) Number,
- Project Sample Number,
- Sample location or sampling station number,
- Date and time of sample collection and/or measurement,
- Field observations,
- Equipment used to collect samples and measurements, and
- Calibration data for equipment used

Measurements and observations shall be recorded using waterproof ink.

Sample Label

Samples, other than for *in situ* measurements, are removed and transported from the sample location to a laboratory or other location for analysis. Before removal, however, a sample is often divided into portions, depending upon the analyses to be performed. Each portion is preserved in accordance with the Sampling and Analysis Plan. Each sample container is identified by a sample label (see Attachment A). Sample labels are provided, along with sample containers, by the analytical laboratory. The information recorded on the sample label includes:

- Project – Name of project site.

- Sample Identification - The unique sample number identifying this sample.

- Date - A six-digit number indicating the day, month, and year of sample collection (e.g., 05/21/17).
- Time - A four-digit number indicating the 24-hour time of collection (for example: 0954 is 9:54 a.m., and 1629 is 4:29 p.m.).
- Medium - Water, soil, sediment, sludge, waste, etc.
- Sample Type - Grab or composite.
- Preservation - Type and quantity of preservation added.
- Analysis - VOA, BNAs, PCBs, pesticides, metals, cyanide, other.
- Sampled By - Printed name or initials of the sampler.
- Remarks - Any pertinent additional information.

The field team should always follow the sample ID system prepared by the Project Chemist and reviewed by the Project Manager.

Chain-of-Custody Procedures

After collection, separation, identification, and preservation, the sample is maintained under chain-of-custody procedures until it is in the custody of the analytical laboratory and has been stored or disposed.

Field Custody Procedures

- Samples are collected as described in the site Sampling and Analysis Plan. Care must be taken to record precisely the sample location and to ensure that the sample number on the label matches the Chain-of-Custody Record exactly.
- A Chain-of-Custody Record will be prepared for each individual cooler shipped and will include *only* the samples contained within that particular cooler. The Chain-of-Custody Record for that cooler will then be sealed in a zip-log bag and placed in the cooler prior to sealing. This ensures that the laboratory properly attributes trip blanks with the correct cooler and allows for easier tracking should a cooler become lost during transit.
- The person undertaking the actual sampling in the field is responsible for the care and custody of the samples collected until they are properly transferred or dispatched.
- When photographs are taken of the sampling as part of the documentation procedure, the name of the photographer, date, time, site location, and site description are entered sequentially in the site logbook as photos are taken. Once downloaded to the server or developed, the electronic files or photographic prints shall be serially numbered, corresponding to the logbook descriptions; photographic prints will be stored in the project files. To identify sample

locations in photographs, an easily read sign with the appropriate sample location number should be included.

- Sample labels shall be completed for each sample, using waterproof ink unless prohibited by weather conditions (e.g., a logbook notation would explain that a pencil was used to fill out the sample label if the pen would not function in freezing weather.)

Transfer of Custody and Shipment

Samples are accompanied by a Chain-of-Custody Record Form. A Chain-of-Custody Record Form must be completed for each cooler and should include only the samples contained within that cooler. A Chain-of-Custody Record Form example is shown in Attachment B. When transferring the possession of samples, the individuals relinquishing and receiving will sign, date, and note the time on the Record. This Record documents sample custody transfer from the sampler, often through another person, to the analyst in the laboratory. The Chain-of-Custody Record is filled out as given below:

- Enter header information (CTO number, samplers, and project name).

- Enter sample specific information (sample number, media, sample analysis required and analytical method grab or composite, number and type of sample containers, and date/time sample was collected).

- Sign, date, and enter the time under “Relinquished by” entry.

- Have the person receiving the sample sign the “Received by” entry. If shipping samples by a common carrier, print the carrier to be used and enter the airbill number under “Remarks,” in the bottom right corner;

- Place the original (top, signed copy) of the Chain-of-Custody Record Form in a plastic zipper-type bag or other appropriate sample-shipping package. Retain the copy with field records.

- Sign and date the custody seal, a 1-inch by 3-inch white paper label with black lettering and an adhesive backing. Attachment C is an example of a custody seal. The custody seal is part of the chain-of-custody process and is used to prevent tampering with samples after they have been collected in the field. Custody seals shall be provided by the analytical laboratory.

- Place the seal across the shipping container opening (front and back) so that it would be broken if the container were to be opened.

- Complete other carrier-required shipping papers.

The custody record is completed using waterproof ink. Any corrections are made by drawing a line through and initialing and dating the change, then entering the correct information. Erasures are not permitted.

Common carriers will usually not accept responsibility for handling Chain-of-Custody Record Forms; this necessitates packing the record in the shipping container (enclosed with other documentation in a plastic zipper-type bag). As long as custody forms are sealed inside the shipping container and the custody seals are intact, commercial carriers are not required to sign the custody form.

The laboratory representative who accepts the incoming sample shipment signs and dates the Chain-of-Custody Record, completing the sample transfer process. It is then the laboratory's responsibility to maintain internal logbooks and custody records throughout sample preparation and analysis.

V Quality Assurance Records

Once samples have been packaged and shipped, the Chain-of-Custody copy and airbill receipt become part of the quality assurance record.

VI Attachments

A. Sample Label
B. Chain of Custody Form
C. Custody Seal

VII References

USEPA. *User's Guide to the Contract Laboratory Program*. Office of Emergency and Remedial Response, Washington, D.C. (EPA/540/P-91/002), January 1991.

Attachment A

Example Sample Label

QAL

Quality Analytical Laboratories, Inc.
2567 Fairlane Drive
Montgomery, Alabama 36116
PH. (334)271-2440

Client ____________________
Sample No. ____________________
Location ____________________

Analysis ____________________

Preservative HCL
Date ____________ By ____________

CEIMIC CORPORATION
10 Dean Knauss Drive, Narragansett, R.I. 02882 • (401) 782-8900

SITE NAME	DATE
ANALYSIS	TIME
	PRESERVATIVE

SAMPLE TYPE

☐ Grab ☐ Composite ☐ Other ________

COLLECTED BY:

Attachment B

Example Chain-of-Custody Record

CH2M HILL
APPLIED SCIENCES LABORATORY

CHAIN OF CUSTODY RECORD AND AGREEMENT TO PERFORM SERVICES

CH2M Hill Project # ☐☐☐☐☐☐☐☐.☐☐.☐☐

Purchase Order #

Project Name

Company Name CH2M HILL Office

Project Manager & Phone #
Mr. [ ]
Ms. [ ]
Dr. [ ]

Report Copy to:

Requested Completion Date:

Sampling Requirements: SDWA ☐ NPDES ☐ RCRA ☐ OTHER ____

Sample Disposal: Dispose ☐ Return ☐

OF CONTAINERS

LAB TEST CODES

ANALYSES REQUESTED

SHADED AREA– FOR LAB USE ONLY

Lab 1 #	Lab 2 #
Quote #	Kit Request #
Project #	
No. of Samples	Page of
Login	LIMS Ver

Sampling Date	Sampling Time	Type COMP	Type GRAB	Matrix WATER	Matrix SOIL	Matrix AIR	CLIENT SAMPLE ID (9 CHARACTERS)	# OF CONTAINERS	ANALYSES REQUESTED	REMARKS	LAB 1 ID	LAB 2 ID

Sampled By & Title (Please sign and print name)	Date/Time	Relinquished By (Please sign and print name)	Date/Time
Received By (Please sign and print name)	Date/Time	Relinquished By (Please sign and print name)	Date/Time
Received By (Please sign and print name)	Date/Time	Relinquished By (Please sign and print name)	Date/Time
Received By (Please sign and print name)	Date/Time	Shipped Via UPS BUS Fed-Ex Hand Other ____	Shipping #
Work Authorized By (Please sign and print name)	Remarks		

QC Level: 1 2 3 Other: ____

COC Rec	ICE
Ana Req	TEMP
Cust Seal	Ph

Instructions and Agreement Provisions on Reverse Side

DISTRIBUTION: Original - LAB, Yellow - LAB, Pink - Client

REV 3/94 FORM 340

Attachment C
Example Custody Seal

CH2M HILL

CUSTODY SEAL

Date ______________________ ______________________

Signature ______________________ ______________________

Drinking Water Sampling when Analyzing for Per- and Polyfluoroalkyl Substances (PFASs)

I. Purpose and Scope

This SOP provides guidelines for drinking water sample collection for samples that will be analyzed for per- and polyfluoroalklyl substances (PFAS), aka perfluorinated compounds (PFCs), including perfluorooctane sulfonate (PFOS) and perfluorooctanoic acid (PFOA) via EPA Method 537.1 (not modified).

Standard techniques for collecting representative samples are summarized. These procedures are specific to the Navy Comprehensive Long-term Environmental Action Navy (CLEAN) Program.

II. Equipment and Materials

A. Equipment and Materials Required

- Drinking water sample containers (polypropylene bottle with polypropylene screw cap and Trizma preservative)
- Laboratory pre-filled polypropylene bottles containing field reagent blank water and Trizma preservative
- Field Reagent Blank sample containers (polypropylene bottle with polypropylene screw cap and no preservative)
- Shipping supplies (labels [if available][1], coolers, and ice)
- Loose leaf paper without waterproof coating or tablet (see tablet use notes below)
- Clip board (if using loose leaf paper)
- Pen (not Sharpie)
- Nitrile or latex gloves

B. Equipment and Materials to Avoid During Sampling

Equipment and materials used to collect drinking water samples should not contain any fluorinated compounds, including polytetrafluoroethylene (PTFE), Teflon® or synthetic rubber with fluoropolymer elastomers (e.g., Viton®).

[1] Efforts will be made to obtain PFAS-free labels; however, information on labels is scarce and labels are frequently mounted on PFAS-coated paper to allow for easy removal.

Specifically, the following material should be avoided during sampling:

- Gore-Tex brand or similar high-performance outdoor clothing, clothing treated with ScotchGuard® brand or similar water repellent, fluoropolymer-coated Tyvek®, wrinkle-resistant fabrics, and fire-resistant clothing with fluorochemical treatment or anything advertised as water repellant.
- Weather-proof log books with fluorochemical coatings.

The sample collection area should be clear of the following items:

- Pre-packaged food wrappers (e.g., fast food sandwich wrappers, pizza boxes, etc.)
- Microwave popcorn bags
- Blue ice containers
- Aluminum foil
- Kim-Wipes
- Sunscreen, insect repellant and other personal hygiene products that may contain PFAS (contact your PFAS SME for an approved list of sunscreens and insect repellants)

Sample bottles should be polypropylene in accordance with Method 537.1. PFAS have a tendency to adhere to glass surfaces. Contact the project manager (PM) if the lab sends glass bottles. Sample vials should not have PTFE/Teflon® lined bottles or caps.

The use of electronics (e.g., cell phones and tablets) should be avoided without the implementation of precautionary measures outlined below:

- All devices should be used with clean, ungloved hands and an approved stylus (if desired).

Following the use of a device, hands must be washed with soap and water and clean gloves should be used prior to contact with sampling equipment (bottleware, tubing, etc.).

III. Procedures and Guidelines

A. Setup

1. Obtain well construction information from homeowner, if available, in accordance with homeowner questionnaire developed for your project.
2. Record personnel onsite, address, homeowner name, and designated sample ID in the field notes. Sample IDs should not contain identifying information about the property location due to potential privacy issues, so be sure both address and designated ID are carefully recorded for tracking. Sample IDs and addresses on the sample labels and in the sample notes must be checked by both field team members and the address in the field notes should be confirmed with the homeowner or resident.
3. As feasible, select a sampling collection point prior to any treatment system installed by the homeowner. For example, if the homeowner has a point of use reverse osmosis or granular activated carbon filter in their kitchen sink, collect at the bathroom sink. If there is a point of entry filtration system, ask if there is a sampling port between the well and the system. If there is no way to bypass the existing treatment system without disconnecting pump components or potentially damaging the system, collect a treated sample and note that the sample was collected post-treatment. Avoid collecting samples through hoses. Instead, disconnect the hose and sample from the spigot if an outside collection station is selected.

4. Wash hands before sampling with dish detergent and don nitrile gloves.
5. Open the cold water tap and allow the system to flush for three to five minutes. Do not open bottles until you are ready to sample. Do not sample from the hot water tap, as a hot water sample may have been contained for in a hot water heater and may not reflect water quality of water drawn directly from the private well.

B. Sample Collection

Once flushing is complete, samples can be collected.

The steps to be followed for sample collection are as follows:

1. Turn the tap off briefly. Remove the cap from the sample bottle. Position the sample bottle under the tap and turn the tap on.
2. Fill the bottle, taking care not to flush out the sample preservative. Do not fill bottles past the middle of the bottle shoulder. Bottles should have headspace.
3. After collecting the sample, cap the bottle and agitate by hand until the preservative is dissolved.
4. Affix labels immediately after bottles have been closed; collect home sample prior to field reagent blank to avoid mislabeling.
5. Pack the sample on ice immediately for shipment to the offsite laboratory.

C. Field Reagent Blank Collection

A field reagent blank is required at each drinking water sampling location and is to be collected immediately following collection of the drinking water sample. The steps to complete collection of the field reagent blank are as follows:

1. A preserved field reagent blank for each sample location will be provided by the laboratory along with empty bottles for the field reagent blanks. While still at the drinking water sample collection point, open the preserved field reagent blank water bottle and an empty unpreserved sample bottle.
2. Pour the preserved reagent blank water from the preserved bottle into the unpreserved blank container.
3. Affix the label to the field reagent blank bottle and pack in the same cooler as the associated drinking water sampling for shipment to the offsite laboratory.

IV. References

United States Environmental Protection Agency (USEPA), 2009. *Determination of Selected Perfluorinated Alkyl Acids in Drinking Water by Solid Phase Extraction and Liquid Chromatography/Tandem Mass Spectrometry (LC/MS/MS).* September

STANDARD OPERATING PROCEDURE

Preparing Field Log Books

I. Purpose

This SOP provides general guidelines for entering field data into log books (hard copy and electronic) during site investigation and remediation activities.

II. Scope

This is a general description of data requirements and format for field log books. Log books are needed to properly document all field activities in support of data evaluation and possible legal activities. Field notes may be recorded in field log books or electronically on computer tablets.

III. Equipment and Materials

- Log book
- Indelible pen
- Jacobs supplied electronic tablet or laptop with notebook software

IV. Procedures and Guidelines

Properly completed field log books are a requirement for all of the work we perform under the Navy CLEAN contract. Log books are legal documents and, as such, must be prepared following specific procedures and must contain required information to ensure their integrity and legitimacy. This SOP describes the basic requirements for field log book entries.

A. PROCEDURES FOR COMPLETING FIELD LOG BOOKS

1. Field notes commonly are kept in bound, hard-cover logbooks used by surveyors and produced, for example, by Peninsular Publishing Company and Sesco, Inc. Pages should be water resistant and notes should be taken only with water-proof, non-erasable permanent ink, such as that provided in Rite in the Rain® or Sanford Sharpie® permanent markers. Note: for sites where PFC is being analyzed for, Rite-in-the-Rain®, Sanford Sharpie®, or anything water-resistant or with Teflon® cannot be used in the field. All field book materials must be “fluorine free”. Acceptable substitutes would be a sewn notebook

without a plastic cover, or loose-leaf notebook paper.

2. Alternatively, field notes may be recorded electronically in Jacobs provided field tablets or laptop computers. Notes are recorded in appropriate note collection software; e.g., Microsoft One Note. At the end of each day, the electronic notes must be digitally signed by the author and downloaded for electronic file storage. The notes may be converted to an Adobe pdf file prior to storage. It is important that the field notes be downloaded daily to ensure the electronic time stamp of the notes is the same as the day the notes were recorded.

3. On the inside cover of the log book the following information should be included:

    - Company name and address
    - Log-holders name if log book was assigned specifically to that person
    - Activity or location
    - Project name
    - Project manager's name
    - Phone numbers of the company, supervisors, emergency response, etc.

4. All lines of all pages should be used to prevent later additions of text, which could later be questioned. Any line not used should be marked through with a line and initialed and dated. Any pages not used should be marked through with a line, the author's initials, the date, and the note "Intentionally Left Blank."

5. If field notes are recorded electronically, the author will not have any spaces between entries.

6. If errors are made in the log book, cross a single line through the error and enter the correct information. All corrections shall be initialed and dated by the personnel performing the correction. If possible, all corrections should be made by the individual who made the error.

7. Daily entries will be made chronologically.

8. Information will be recorded directly in the field log book during the work activity. Information will not be written on a separate sheet and then later transcribed into the log book.

9. Each page of the log book will have the date of the work and the note takers initials.

10. The final page of each day's notes will include the note-takers

signature as well as the date.

11. Only information relevant to the subject project will be added to the log book.

12. The field notes will be copied and the copies sent to the Project Manager or designee in a timely manner (at least by the end of each week of work being performed).

B. INFORMATION TO BE INCLUDED IN FIELD LOG BOOKS

1. Entries into the log book should be as detailed and descriptive as possible so that a particular situation can be recalled without reliance on the collector's memory. Entries must be legible and complete.

2. General project information will be recorded at the beginning of each field project. This will include the project title, the project number, and project staff.

3. Scope: Describe the general scope of work to be performed each day.

4. Weather: Record the weather conditions and any significant changes in the weather during the day.

5. Tail Gate Safety Meetings: Record time and location of meeting, who was present, topics discussed, issues/problems/concerns identified, and corrective actions or adjustments made to address concerns/ problems, and other pertinent information.

6. Standard Health and Safety Procedures: Record level of personal protection being used (e.g., level D PPE), record air monitoring data on a regular basis and note where data were recording (e.g., reading in borehole, reading in breathing zone, etc). Also record other required health and safety procedures as specified in the project specific health and safety plan.

7. Instrument Calibration; Record calibration information for each piece of health and safety and field equipment.

8. Personnel: Record names of all personnel present during field activities and list their roles and their affiliation. Record when personnel and visitors enter and leave a project site and their level of personal protection.

9. Communications: Record communications with project manager, subcontractors, regulators, facility personnel, and others that impact performance of the project.

10. Time: Keep a running time log explaining field activities as they occur chronologically throughout the day.

11. Deviations from the Work Plan: Record any deviations from the work

plan and document why these were required and any communications authorizing these deviations.

12. Heath and Safety Incidents: Record any health and safety incidents and immediately report any incidents to the Project Manager.

13. Subcontractor Information: Record name of company, record names and roles of subcontractor personnel, list type of equipment being used and general scope of work. List times of starting and stopping work and quantities of consumable equipment used if it is to be billed to the project.

14. Problems and Corrective Actions: Clearly describe any problems encountered during the field work and the corrective actions taken to address these problems.

15. Technical and Project Information: Describe the details of the work being performed. The technical information recorded will vary significantly between projects. The project work plan will describe the specific activities to be performed and may also list requirements for note taking. Discuss note-taking expectations with the Project Manager prior to beginning the field work.

16. Any conditions that might adversely affect the work or any data obtained (e.g., nearby construction that might have introduced excessive amounts of dust into the air).

17. Sampling Information; Specific information that will be relevant to most sampling jobs includes the following:

    - Description of the general sampling area – site name, buildings and streets in the area, etc.
    - Station/Location identifier
    - Description of the sample location – estimate location in comparison to two fixed points – draw a diagram in the field log book indicating sample location relative to these fixed points – include distances in feet.
    - Sample matrix and type
    - Sample date and time
    - Sample identifier
    - Draw a box around the sample ID so that it stands out in the field notes
    - Information on how the sample was collected – distinguish between “grab,” “composite,” and “discrete” samples
    - Number and type of sample containers collected
    - Record of any field measurements taken (i.e. pH, turbidity, dissolved oxygen, and temperature, and conductivity)

- Parameters to be analyzed for, if appropriate
- Descriptions of soil samples and drilling cuttings can be entered in depth sequence, along with PID readings and other observations. Include any unusual appearances of the samples.

C. SUGGESTED FORMAT FOR RECORDING FIELD DATA

1. Use the left side border to record times and the remainder of the page to record information (see attached example).
2. Use tables to record sampling information and field data from multiple samples.
3. Sketch sampling locations and other pertinent information.
4. Sketch well construction diagrams.

V. Attachments

Example field notes.

STANDARD OPERATING PROCEDURE

Packaging and Shipping Procedures for Low-Concentration Samples

I. Purpose and Scope

The purpose of this guideline is to describe the packaging and shipping of low-concentration samples of various media to a laboratory for analysis.

II. Scope

The guideline only discusses the packaging and shipping of samples that are anticipated to have low concentrations of chemical constituents. Whether or not samples should be classified as low-concentration or otherwise will depend upon the site history, observation of the samples in the field, odor, and photoionization-detector readings.

If the site is known to have produced high-concentration samples in the past or the sampler suspects that high concentrations of contaminants might be present in the samples, then the sampler should conservatively assume that the samples cannot be classified as low-concentration. Samples that are anticipated to have medium to high concentrations of constituents should be packaged and shipped accordingly.

If warranted, procedures for dangerous-goods shipping may be implemented. Dangerous goods and hazardous materials pose an unreasonable risk to health, safety, or property during transportation without special handling. As a result only employees who are trained under Jacobs Dangerous Goods Shipping course may ship or transport dangerous goods. Employees should contact a designated Jacobs HazMat advisor with questions.

III. Equipment and Materials

- Coolers
- Clear tape
- Strapping tape
- Contractor bags
- Absorbent pads or equivalent
- Resealable bags
- Bubble bags (for glass bottle ware)
- Bubble wrap (if needed)
- Ice

- Chain-of-Custody form (completed)
- Custody seals

IV. Procedures and Guidelines

Low-Concentration Samples

A. Prepare coolers for shipment:

- Tape drains shut.
- Place mailing label with laboratory address on top of coolers.
- Fill bottom of coolers with absorbent pads or similar material.
- Place a contractor bag inside the cooler.

B. Affix appropriate adhesive sample labels to each container. Protect with clear packing tape.

C. Arrange decontaminated sample containers in groups by sample number. Consolidate VOC samples into one cooler to minimize the need for trip blanks. Cross check CoC to ensure all samples are present.

D. Seal each glass sample bottle within a separate bubble bag (VOCs grouped per sample location). Sample labels should be visible through the bag. Whenever possible, group samples per location for all analytes and place in resealable bags. Make sure to release as much air as practicable from the bag before sealing.

E. Arrange sample bottles in coolers so that they do not touch.

F. If ice is required to preserve the samples, cubes should be repackaged in resealable bags and placed on and around the containers.

G. Fill remaining spaces with bubble wrap if needed.

H. Complete and sign chain-of-custody form (or obtain signature) and indicate the time and date it was relinquished to Federal Express or the courier.

J Close lid and latch.

K. Carefully peel custody seals from backings and place intact over lid openings (right front and left back). Cover seals with clear packing tape.

L. Tape cooler shut on both ends, making several complete revolutions with strapping tape. Cover custody seals with clear packing tape to avoid seals being able to be peeled from the cooler.

M. Relinquish to Federal Express or to a courier arranged with the laboratory. Scan airbill receipt and CoC and send to the sample documentation coordinator along with the other documentation.

Medium- and High-Concentration Samples:

Medium- and high-concentration samples are packaged using the same techniques used to package low-concentration samples, with potential additional restrictions. If applicable, the sample handler must refer to instructions associated with the shipping of dangerous goods for the necessary procedures for shipping by Federal Express or other overnight carrier. If warranted, procedures for dangerous-goods shipping may be implemented. Dangerous goods and hazardous materials pose an unreasonable risk to health, safety, or property during transportation without special handling. As a result, only employees who are trained under Jacobs Dangerous Goods Shipping course may ship or transport dangerous goods. Employees should contact a designated Jacobs HazMat advisor with questions.

V. Attachments

None.

VI. Key Checks and Items

- Be sure laboratory address is correct on the mailing label
- Pack sample bottles carefully, with adequate packaging and without allowing bottles to touch
- Be sure there is adequate ice
- Include chain-of-custody form
- Include custody seals

Appendix B
Department of Defense Environmental Laboratory Accreditation Program Accreditation Letters

SCOPE OF ACCREDITATION TO ISO/IEC 17025:2017

VISTA ANALYTICAL LABORATORY
1104 Windfield Way
El Dorado Hills, CA 95762
Bahar Amiri Phone: 916-673-1520

ENVIRONMENTAL

Valid To: September 30, 2023 Certificate Number: 3091.01

In recognition of the successful completion of the A2LA evaluation process, (including an assessment of the laboratory's compliance with the 2009 TNI Environmental Testing Laboratory Standard, the requirements of the DoD Environmental Laboratory Accreditation Program (DoD ELAP) as detailed in version 5.3 of the DoD Quality Systems Manual for Environmental Laboratories), accreditation is granted to this laboratory to perform recognized EPA methods using the following testing technologies and in the analyte categories identified below:

Testing Technologies

High Resolution Gas Chromatography / Mass Spectrometry
Liquid Chromatography Mass Spectrometry / Mass Spectrometry

Parameter/Analyte	**Nonpotable Water**	**Solid Hazardous Waste**	**Tissue**
Dioxins/Furans			
Clean Up Method	EPA 3620C	EPA 3620C	EPA 3620C
1,2,3,4,6,7,8-Heptachlorodibenzofuran	EPA 1613B EPA 8290	EPA 1613B EPA 8290	EPA 1613B EPA 8290
1,2,3,4,7,8,9-Heptachlorodibenzofuran	EPA 1613B EPA 8290	EPA 1613B EPA 8290	EPA 1613B EPA 8290
1,2,3,4,7,8-Hexachlorodibenzofuran	EPA 1613B EPA 8290	EPA 1613B EPA 8290	EPA 1613B EPA 8290
1,2,3,6,7,8-Hexachlorodibenzofuran	EPA 1613B EPA 8290	EPA 1613B EPA 8290	EPA 1613B EPA 8290
1,2,3,7,8,9-Hexachlorodibenzofuran	EPA 1613B EPA 8290	EPA 1613B EPA 8290	EPA 1613B EPA 8290
2,3,4,6,7,8-Hexachlorodibenzofuran	EPA 1613B EPA 8290	EPA 1613B EPA 8290	EPA 1613B EPA 8290
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	EPA 1613B EPA 8290	EPA 1613B EPA 8290	EPA 1613B EPA 8290
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	EPA 1613B EPA 8290	EPA 1613B EPA 8290	EPA 1613B EPA 8290
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	EPA 1613B EPA 8290	EPA 1613B EPA 8290	EPA 1613B EPA 8290
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	EPA 1613B EPA 8290	EPA 1613B EPA 8290	EPA 1613B EPA 8290

Parameter/Analyte	Nonpotable Water	Solid Hazardous Waste	Tissue
1,2,3,4,6,7,8,9-Octachlorodibenzofuran	EPA 1613B EPA 8290	EPA 1613B EPA 8290	EPA 1613B EPA 8290
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin	EPA 1613B EPA 8290	EPA 1613B EPA 8290	EPA 1613B EPA 8290
1,2,3,7,8-Pentachlorodibenzofuran	EPA 1613B EPA 8290	EPA 1613B EPA 8290	EPA 1613B EPA 8290
2,3,4,7,8-Pentachlorodibenzofuran	EPA 1613B EPA 8290	EPA 1613B EPA 8290	EPA 1613B EPA 8290
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	EPA 1613B EPA 8290	EPA 1613B EPA 8290	EPA 1613B EPA 8290
2,3,7,8-Tetrachlorodibenzofuran	EPA 1613B EPA 8290	EPA 1613B EPA 8290	EPA 1613B EPA 8290
2,3,7,8-Tetrachlorodibenzo-p-dioxin	EPA 1613B EPA 8290	EPA 1613B EPA 8290	EPA 1613B EPA 8290
Total Heptachlorodibenzofuran	EPA 1613B EPA 8290	EPA 1613B EPA 8290	EPA 1613B EPA 8290
Total Heptachlorodibenzo-p-dioxin	EPA 1613B EPA 8290	EPA 1613B EPA 8290	EPA 1613B EPA 8290
Total Hexachlorodibenzofuran	EPA 1613B EPA 8290	EPA 1613B EPA 8290	EPA 1613B EPA 8290
Total Hexachlorodibenzo-p-dioxin	EPA 1613B EPA 8290	EPA 1613B EPA 8290	EPA 1613B EPA 8290
Total Pentachlorodibenzofuran	EPA 1613B EPA 8290	EPA 1613B EPA 8290	EPA 1613B EPA 8290
Total Pentachlorodibenzo-p-dioxin	EPA 1613B EPA 8290	EPA 1613B EPA 8290	EPA 1613B EPA 8290
Total Tetrachlorodibenzofuran	EPA 1613B EPA 8290	EPA 1613B EPA 8290	EPA 1613B EPA 8290
Total Tetrachlorodibenzo-p-dioxin	EPA 1613B EPA 8290	EPA 1613B EPA 8290	EPA 1613B EPA 8290
PCBs			
2-Chlorobiphenyl (1)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
3-Chlorobiphenyl (2)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
4-Chlorobiphenyl (3)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,2'-Dichlorobiphenyl (4)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,3-Dichlorobiphenyl (5)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,3'-Dichlorobiphenyl (6)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,4-Dichlorobiphenyl (7)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,4'-Dichlorobiphenyl (8)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,5-Dichlorobiphenyl (9)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,6-Dichlorobiphenyl (10)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
3,3'-Dichlorobiphenyl (11)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
3,4-Dichlorobiphenyl (12)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
3,4'-Dichlorobiphenyl (13)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
3,5-Dichlorobiphenyl (14)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
4,4'-Dichlorobiphenyl (15)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C

Parameter/Analyte	Nonpotable Water	Solid Hazardous Waste	Tissue
2,2',3-Trichlorobiphenyl (16)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,2',4-Trichlorobiphenyl (17)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,2',5-Trichlorobiphenyl (18)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,2',6-Trichlorobiphenyl (19)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,3,3'-Trichlorobiphenyl (20)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,3,4-Trichlorobiphenyl (21)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,3,4'-Trichlorobiphenyl (22)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,3,5-Trichlorobiphenyl (23)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,3,6-Trichlorobiphenyl (24)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,3',4-Trichlorobiphenyl (25)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,3',5-Trichlorobiphenyl (26)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,3',6-Trichlorobiphenyl (27)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,4,4'-Trichlorobiphenyl (28)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,4,5-Trichlorobiphenyl (29)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,4,6-Trichlorobiphenyl (30)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,4',5-Trichlorobiphenyl (31)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,4',6-Trichlorobiphenyl (32)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2',3,4-Trichlorobiphenyl (33)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2',3,5-Trichlorobiphenyl (34)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
3,3',4-Trichlorobiphenyl (35)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
3,3',5-Trichlorobiphenyl (36)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
3,4,4'-Trichlorobiphenyl (37)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
3,4,5-Trichlorobiphenyl (38)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
3,4',5-Trichlorobiphenyl (39)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,2',3,3'-Tetrachlorobiphenyl (40)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,2',3,4-Tetrachlorobiphenyl (41)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,2',3,4'-Tetrachlorobiphenyl (42)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,2',3,5-Tetrachlorobiphenyl (43)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,2',3,5'-Tetrachlorobiphenyl (44)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,2',3,6-Tetrachlorobiphenyl (45)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,2',3,6'-Tetrachlorobiphenyl (46)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,2',4,4'-Tetrachlorobiphenyl (47)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,2',4,5-Tetrachlorobiphenyl (48)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,2',4,5'-Tetrachlorobiphenyl (49)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,2',4,6-Tetrachlorobiphenyl (50)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,2',4,6'-Tetrachlorobiphenyl (51)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,2',5,5'-Tetrachlorobiphenyl (52)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,2',5,6'-Tetrachlorobiphenyl (53)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,2',6,6'-Tetrachlorobiphenyl (54)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,3,3',4'-Tetrachlorobiphenyl (55)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,3,3',4'-Tetrachlorobiphenyl (56)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,3,3',5-Tetrachlorobiphenyl (57)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,3,3',5'-Tetrachlorobiphenyl (58)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,3,3',6-Tetrachlorobiphenyl (59)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,3,4,4'-Tetrachlorobiphenyl (60)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,3,4,5-Tetrachlorobiphenyl (61)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,3,4,6-Tetrachlorobiphenyl (62)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C

Parameter/Analyte	Nonpotable Water	Solid Hazardous Waste	Tissue
2,3,4',5-Tetrachlorobiphenyl (63)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,3,4',6-Tetrachlorobiphenyl (64)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,3,5,6-Tetrachlorobiphenyl (65)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,3',4,4'-Tetrachlorobiphenyl (66)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,3',4,5-Tetrachlorobiphenyl (67)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,3',4,5'-Tetrachlorobiphenyl (68)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,3',4,6-Tetrachlorobiphenyl (69)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,3',4',5-Tetrachlorobiphenyl (70)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,3',4',6-Tetrachlorobiphenyl (71)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,3',5,5'-Tetrachlorobiphenyl (72)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,3',5',6-Tetrachlorobiphenyl (73)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,4,4',5-Tetrachlorobiphenyl (74)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,4,4',6-Tetrachlorobiphenyl (75)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2',3,4,5-Tetrachlorobiphenyl (76)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
3,3',4,4'-Tetrachlorobiphenyl (77)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
3,3',4,5-Tetrachlorobiphenyl (78)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
3,3',4,5'-Tetrachlorobiphenyl (79)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
3,3',5,5'-Tetrachlorobiphenyl (80)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
3,4,4',5-Tetrachlorobiphenyl (81)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,2',3,3',4-Pentachlorobiphenyl (82)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,2',3,3',5-Pentachlorobiphenyl (83)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,2',3,3',6-Pentachlorobiphenyl (84)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,2',3,4,4'-Pentachlorobiphenyl (85)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,2',3,4,5-Pentachlorobiphenyl (86)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,2',3,4,5'-Pentachlorobiphenyl (87)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,2',3,4,6-Pentachlorobiphenyl (88)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,2',3,4,6'-Pentachlorobiphenyl (89)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,2',3,4',5-Pentachlorobiphenyl (90)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,2',3,4',6-Pentachlorobiphenyl (91)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,2',3,5,5'-Pentachlorobiphenyl (92)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,2',3,5,6-Pentachlorobiphenyl (93)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,2',3,5,6'-Pentachlorobiphenyl (94)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,2',3,5',6-Pentachlorobiphenyl (95)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,2',3,6,6'-Pentachlorobiphenyl (96)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,2',3',4,5-Pentachlorobiphenyl (97)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,2',3',4,6-Pentachlorobiphenyl (98)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,2',4,4',5-Pentachlorobiphenyl (99)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,2',4,4',6-Pentachlorobiphenyl (100)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,2',4,5,5'-Pentachlorobiphenyl (101)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,2',4,5,6'-Pentachlorobiphenyl (102)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,2',4,5,'6-Pentachlorobiphenyl (103)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,2',4,6,6'-Pentachlorobiphenyl (104)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,3,3',4,4'-Pentachlorobiphenyl (105)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,3,3',4,5-Pentachlorobiphenyl (106)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,3,3',4',5-Pentachlorobiphenyl (107)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,3,3',4,5'-Pentachlorobiphenyl (108)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,3,3',4,6-Pentachlorobiphenyl (109)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C

Parameter/Analyte	Nonpotable Water	Solid Hazardous Waste	Tissue
2,3,3',4',6-Pentachlorobiphenyl (110)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,3,3',5,5'-Pentachlorobiphenyl (111)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,3,3',5,6-Pentachlorobiphenyl (112)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,3,3',5',6-Pentachlorobiphenyl (113)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,3,4,4',5-Pentachlorobiphenyl (114)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,3,4,4',6-Pentachlorobiphenyl (115)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,3,4,5,6-Pentachlorobiphenyl (116)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,3,4',5,6-Pentachlorobiphenyl (117)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,3',4,4',5-Pentachlorobiphenyl (118)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,3',4,4',6-Pentachlorobiphenyl (119)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,3',4,5,5'-Pentachlorobiphenyl (120)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,3',4,5,'6-Pentachlorobiphenyl (121)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2',3,3',4,5-Pentachlorobiphenyl (122)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2',3,4,4',5-Pentachlorobiphenyl (123)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2',3,4,5,5'-Pentachlorobiphenyl (124)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2',3,4,5,6'-Pentachlorobiphenyl (125)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
3,3',4,4',5-Pentachlorobiphenyl (126)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
3,3',4,5,5'-Pentachlorobiphenyl (127)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,2',3,3',4,4'-Hexachlorobiphenyl (128)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,2',3,3',4,5-Hexachlorobiphenyl (129)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,2',3,3',4,5'-Hexachlorobiphenyl (130)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,2',3,3',4,6-Hexachlorobiphenyl (131)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,2',3,3',4,6'-Hexachlorobiphenyl (132)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,2',3,3',5,5'-Hexachlorobiphenyl (133)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,2',3,3',5,6-Hexachlorobiphenyl (134)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,2',3,3',5,6'-Hexachlorobiphenyl (135)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,2',3,3',6,6'-Hexachlorobiphenyl (136)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,2',3,4,4',5-Hexachlorobiphenyl (137)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,2',3,4,4',5'-Hexachlorobiphenyl (138)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,2',3,4,4',6-Hexachlorobiphenyl (139)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,2',3,4,4',6'-Hexachlorobiphenyl (140)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,2',3,4,5,5'-Hexachlorobiphenyl (141)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,2',3,4,5,6-Hexachlorobiphenyl (142)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,2',3,4,5,6'-Hexachlorobiphenyl (143)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,2',3,4,5',6-Hexachlorobiphenyl (144)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,2',3,4,6,6'-Hexachlorobiphenyl (145)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,2',3,4',5,5'-Hexachlorobiphenyl (146)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,2',3,4',5,6-Hexachlorobiphenyl (147)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,2',3,4',5,6'-Hexachlorobiphenyl (148)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,2',3,4',5',6-Hexachlorobiphenyl (149)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,2',3,4',6,6'-Hexachlorobiphenyl (150)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,2',3,5,5',6-Hexachlorobiphenyl (151)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,2',3,5,6,6'-Hexachlorobiphenyl (152)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,2',4,4',5,5'-Hexachlorobiphenyl (153)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,2',4,4',5',6-Hexachlorobiphenyl (154)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,2',4,4',6,6'-Hexachlorobiphenyl (155)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,3,3',4,4',5-Hexachlorobiphenyl (156)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C

Parameter/Analyte	**Nonpotable Water**	**Solid Hazardous Waste**	**Tissue**
2,3,3',4,4',5'-Hexachlorobiphenyl (157)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,3,3',4,4',6-Hexachlorobiphenyl (158)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,3,3',4,5,5'-Hexachlorobiphenyl (159)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,3,3',4,5,6-Hexachlorobiphenyl (160)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,3,3',4,5',6-Hexachlorobiphenyl (161)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,3,3',4',5,5'-Hexachlorobiphenyl (162)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,3,3',4',5,6-Hexachlorobiphenyl (163)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,3,3',4',5',6-Hexachlorobiphenyl (164)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,3,3',5,5',6-Hexachlorobiphenyl (165)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,3,4,4',5,6-Hexachlorobiphenyl (166)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,3',4,4',5,5'-Hexachlorobiphenyl (167)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,3',4,4',5',6-Hexachlorobiphenyl (168)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
3,3',4,4',5,5'-Hexachlorobiphenyl (169)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,2',3,3',4,4',5-Heptachlorobiphenyl (170)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,2'3,3',4,4',6-Heptachlorobiphenyl (171)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,2',3,3',4,5,5'-Heptachlorobiphenyl (172)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,2',3,3',4,5,6-Heptachlorobiphenyl (173)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,2',3,3',4,5,6'-Heptachlorobiphenyl (174)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,2',3,3',4,5',6-Heptachlorobiphenyl (175)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,2',3,3',4,6,6'-Heptachlorobiphenyl (176)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,2',3,3',4',5,6-Heptachlorobiphenyl (177)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,2',3,3',5,5',6-Heptachlorobiphenyl (178)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,2',3,3',5,6,6'-Heptachlorobiphenyl (179)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,2',3,4,4',5,5'-Heptachlorobiphenyl (180)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,2',3,4,4',5,6-Heptachlorobiphenyl (181)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,2',3,4,4',5,6'-Heptachlorobiphenyl (182)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,2',3,4,4',5',6-Heptachlorobiphenyl (183)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,2',3,4,4',6,6'-Heptachlorobiphenyl (184)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,2',3,4,5,5',6-Heptachlorobiphenyl (185)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,2',3,4,5,6,6'-Heptachlorobiphenyl (186)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,2',3,4',5,5',6-Heptachlorobiphenyl (187)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,2',3,4',5,6,6'-Heptachlorobiphenyl (188)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,3,3',4,4',5,5'-Heptachlorobiphenyl (189)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,3,3',4,4',5,6-Heptachlorobiphenyl (190)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,3,3',4,4',5',6-Heptachlorobiphenyl (191)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,3,3',4,5,5',6-Heptachlorobiphenyl (192)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,3,3',4',5,5',6-Heptachlorobiphenyl (193)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,2',3,3',4,4',5,5'-Octachlorobiphenyl (194)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,2',3,3',4,4',5,6-Octachlorobiphenyl (195)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,2',3,3',4,4',5,6'-Octachlorobiphenyl (196)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,2',3,3',4,4',6,6'-Octachlorobiphenyl (197)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,2',3,3',4,5,5',6-Octachlorobiphenyl (198)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,2',3,3',4,5,5',6'-Octachlorobiphenyl (199)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,2',3,3',4,5,6,6'-Octachlorobiphenyl (200)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,2',3,3',4,5',6,6'-Octachlorobiphenyl (201)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,2',3,3',5,5',6,6'-Octachlorobiphenyl (202)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,2',3,4,4',5,5',6-Octachlorobiphenyl (203)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C

Parameter/Analyte	Nonpotable Water	Solid Hazardous Waste	Tissue
2,2',3,4,4',5,6,6'-Octachlorobiphenyl (204)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,3,3',4,4',5,5',6-Octachlorobiphenyl (205)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl (206)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,2',3,3',4,4',5,6,6'-Nonachlorobiphenyl (207)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
2,2',3,3',4,5,5',6,6'-Nonachlorobiphenyl (208)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
Decachlorobiphenyl (209)	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
Decachlorobiphenyl, Total	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
Dichlorobiphenyl, Total	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
Heptachlorobiphenyl, Total	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
Hexachlorobiphenyl, Total	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
Monochlorobiphenyl, Total	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
Nonachlorobiphenyl, Total	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
Octachlorobiphenyl, Total	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
Pentachlorobiphenyl, Total	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
Tetrachlorobiphenyl, Total	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C
Trichlorobiphenyl, Total	EPA 1668A/1668C	EPA 1668A/1668C	EPA 1668A/1668C

Parameter/Analyte	**Potable Water**	**Aqueous Film Forming Foams (AFFF)**	**Non Potable Water**	**Solid Hazardous Waste (Liquids and Solids)**	**Tissue**
Per-and Polyfluoroalkyl Substances (PFAS)					
6:2 Fluorotelomer sulfanate (6:2 FTS)	EPA 533 EPA 537.1 mod	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15
8:2 Fluorotelomer sulfanate (8:2 FTS)	EPA 533 EPA 537.1 mod	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15
N-ethyl perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	EPA 537.1 EPA 537.1 mod	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15

Parameter/Analyte	Potable Water	Aqueous Film Forming Foams (AFFF)	Non Potable Water	Solid Hazardous Waste (Liquids and Solids)	Tissue
N-ethylperfluoro-1-octanesulfonamide (N-EtFOSA)	EPA 537.1 mod	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15
N-ethylperfluoro-1-octanesulfonamido ethanol (N-EtFOSE)	EPA 537.1 mod	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15
N-methyl perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	EPA 537.1 EPA 537.1 mod	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15
N-methylperfluoro-1-octanesulfonamide (N-MeFOSA)	EPA 537.1 mod	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15
N-methylperfluoro-1-octanesulfonamido ethanol (N-MeFOSE)	EPA 537.1 mod	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15
Perfluorobutanesulfonic acid (PFBS)	EPA 537.1 EPA 533 EPA 537.1 mod	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15
Perfluorobutanoic acid (PFBA)	EPA 533 EPA 537.1 mod	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15

Parameter/Analyte	**Potable Water**	**Aqueous Film Forming Foams (AFFF)**	**Non Potable Water**	**Solid Hazardous Waste (Liquids and Solids)**	**Tissue**
Perfluorodecanesulfonate (PFDS)	EPA 537.1 mod	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15
Perfluorodecanoic acid (PFDA)	EPA 537.1 EPA 533 EPA 537.1 mod	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15
Perfluorododecanoic acid (PFDoA)	EPA 537.1 EPA 533 EPA 537.1 mod	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15
Perfluoroheptanesulfonate (PFHpS)	EPA 533 EPA 537.1 mod	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15
Perfluoroheptanonic acid (PFHpA)	EPA 537.1 EPA 533 EPA 537.1 mod	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15
Perfluorohexadecanoic acid (PFHxDA)	EPA 537.1 mod	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15
Perfluorohexanesulfononic acid (PFHxS)	EPA 537.1 EPA 533 EPA 537.1 mod	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15

Parameter/Analyte	**Potable Water**	**Aqueous Film Forming Foams (AFFF)**	**Non Potable Water**	**Solid Hazardous Waste (Liquids and Solids)**	**Tissue**
Perfluorohexanoic acid (PFHxA)	EPA 537.1 EPA 533 EPA 537.1 mod	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15
Perfluorononaoic acid (PFNA)	EPA 537.1 EPA 533 EPA 537.1 mod	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15
Perfluorooctane sulfonamide (PFOSA)	EPA 537.1 mod	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15
Perfluorooctanesulfonic acid (PFOS)	EPA 537.1 EPA 533 EPA 537.1 mod	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15
Perfluorooctanoic acid (PFOA)	EPA 537.1 EPA 533 EPA 537.1 mod	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15
Perfluoropentanoic acid (PFPeA)	EPA 533 EPA 537.1 mod	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15
Perfluorotetradecanoic acid (PFTeDA)	EPA 537.1 EPA 537.1 mod	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15

Parameter/Analyte	**Potable Water**	**Aqueous Film Forming Foams (AFFF)**	**Non Potable Water**	**Solid Hazardous Waste (Liquids and Solids)**	**Tissue**
Perfluorotridecanoic acid (PFTrDA)	EPA 537.1 EPA 537.1 mod	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15
Perfluoroundecanoic acid (PFUdA)	EPA 537.1 EPA 533 EPA 537.1 mod	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15
Hexafluoropropylene oxide dimer acid (HFPO-DA)	EPA 537.1 EPA 533 EPA 537.1 mod	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	EPA 537.1 EPA 533 EPA 537.1 mod	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	EPA 537.1 EPA 533 EPA 537.1 mod	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	EPA 537.1 EPA 533 EPA 537.1 mod	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	EPA 533 EPA 537.1 mod	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15
Perfluorononane sulfonic acid (PFNS)	EPA 537.1 mod	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15

Parameter/Analyte	**Potable Water**	**Aqueous Film Forming Foams (AFFF)**	**Non Potable Water**	**Solid Hazardous Waste (Liquids and Solids)**	**Tissue**
Perfluorooctadecanoic acid (PFODA)	EPA 537.1 mod	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15
Perfluoropentane sulfonic acid (PFPeS)	EPA 533 EPA 537.1 mod	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	EPA 537.1 mod	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15
4,4,5,5,6,6,6-Heptafluorohexanoic acid (3:3 FTCA)	EPA 537.1 mod	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15
2H,2H,3H,3H-Perfluorodecanoic acid (7:3 FTCA)	EPA 537.1 mod	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15
2H,2H,3H,3H-Perfluorooctanoic acid (5:3 FTCA)	EPA 537.1 mod	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15
Potassium perfluoro-4-ethylcyclohexanesufonate (PFecHS)	EPA 537.1 mod	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15

Parameter/Analyte	**Potable Water**	**Aqueous Film Forming Foams (AFFF)**	**Non Potable Water**	**Solid Hazardous Waste (Liquids and Solids)**	**Tissue**
Sodium perfluoro-1-propanesulfonate (PFPrS)_	EPA 537.1 mod	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15
Sodium perfluoro-1-dodecanesulfonate (PFDoS)	EPA 537.1 mod	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15
Perfluoror(2-ethoxyethane)sulfonic acid (PFEESA)	EPA 533 EPA 537.1 mod	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15
Perfluoro-3-methoxypropanoic acid (PFMPA)	EPA 533 EPA 537.1 mod	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15
Perfluoro-4-methoxybutanoic acid (PFMBA)	EPA 533 EPA 537.1 mod	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	EPA 533 EPA 537.1 mod	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15	PFAS by LCMSMS Compliant with QSM 5.3 Table B-15

Parameter/Analyte	**Air**
Dioxins/Furans	
1,2,3,4,7,8-HxCDD	EPA TO-9A
1,2,3,6,7,8-HxCDD	EPA TO-9A
1,2,3,7,8,9-HxCDD	EPA TO-9A
1,2,3,4,7,8-HxCDF	EPA TO-9A
1,2,3,6,7,8-HxCDF	EPA TO-9A
1,2,3,7,8,9-HxCDF	EPA TO-9A
2,3,4,6,7,8-HxCDF	EPA TO-9A
1,2,3,4,6,7,8-HpCDD	EPA TO-9A
1,2,3,4,6,7,8-HpCDF	EPA TO-9A
1,2,3,4,7,8,9-HpCDF	EPA TO-9A
OCDD	EPA TO-9A
OCDF	EPA TO-9A
1,2,3,7,8-PeCDD	EPA TO-9A
1,2,3,7,8-PeCDF	EPA TO-9A
2,3,4,7,8-PeCDF	EPA TO-9A
2,3,7,8-TCDD	EPA TO-9A
2,3,7,8-TCDF	EPA TO-9A
Total HPCDD	EPA TO-9A
Total HPCDF	EPA TO-9A
Total HxCDD	EPA TO-9A
Total HxCDF	EPA TO-9A
Total TCDD	EPA TO-9A
Total TCDF	EPA TO-9A
Total PCDF	EPA TO-9A
Total PCDD	EPA TO-9A

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VISTA ANALYTICAL LABORATORY

El Dorado Hills, CA

for technical competence in the field of

Environmental Testing

In recognition of the successful completion of the A2LA evaluation process that includes an assessment of the laboratory's compliance with ISO/IEC 17025:2017, the 2009 TNI Environmental Testing Laboratory Standard, and the requirements of the Department of Defense Environmental Laboratory Accreditation Program (DoD ELAP) as detailed in version 5.3 of the DoD Quality System Manual for Environmental Laboratories (QSM), accreditation is granted to this laboratory to perform recognized EPA methods as defined on the associated A2LA Environmental Scope of Accreditation. This accreditation demonstrates technical competence for this defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communiqué dated *April 2017*).

Presented this 7th day of July 2021.

Vice President, Accreditation Services
For the Accreditation Council
Certificate Number 3091.01
Valid to September 30, 2023

For the tests to which this accreditation applies, please refer to the laboratory's Environmental Scope of Accreditation.

Appendix C
Laboratory Standard Operating Procedures

Sampling and Analysis Plan
Monitoring of Per- and Polyfluoroalkyl Substances in Off-Base Drinking Water
Ault Field, Area 6, and Outlying Landing Field Coupeville
Naval Air Station Whidbey Island
Oak Harbor and Coupeville, Washington

NOTIFICATION: APPENDIX C CONTAINS SENSITIVE BUT UNCLASSIFIED INFORMATION WHICH IS PROTECTED BY THE FREEDOM OF INFORMATION ACT

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