

ALASKA MARINE HIGHWAY SYSTEM DOT/PF

***QUALITY ASSURANCE PROJECT PLAN
FOR
SAMPLING AND ANALYSIS OF
TREATED SEWAGE AND GRAYWATER
FROM
SMALL COMMERCIAL PASSENGER VESSELS***

September 2022

**Submitted to fulfill certain requirements of
Alaska Statute 46.03.460-46.03.490
and 18 AAC 69.025**



**Alaska Department of Environmental Conservation
Division of Water**

Acronyms/Abbreviations Used

ADEC	Alaska Department of Environmental Conservation
BMP	Best Management Practices
BNA	Base/Neutrals & Acids
BOD	Biochemical Oxygen Demand
CFR	Code of Federal Regulations
CLIA	Cruise Line International Association
COC	Chain of Custody
COD	Chemical Oxygen Demand
CPV	Commercial Passenger Vessel
DOW	Department of Water
EPA	Environmental Protection Agency
HDPE	High Density Polyethylene
HCl	Hydrochloric Acid
H ₂ SO ₄	Sulfuric Acid
HNO ₃	Nitric Acid
MDL	Method Detection Limit
MQO	Measurement Quality Objective
MSD	Marine Sanitation Device
NaOH	Sodium Hydroxide
%R	Percent Recovery
PQL	Practical Quantitation Limit (Minimum Reporting Level)
QA	Quality Assurance
QAPP	Quality Assurance Project Plan
QMP	Quality Management Plan
QC	Quality Control
RL	Reporting Limit
RPD	Relative Percent Difference
RSD	Relative Standard Deviation
RQ	Reportable Quantity per 40 CFR part 302
SM	Standard Methods
SW-846	Solid Waste Methods (e.g. -846)
SOP	Standard Operating Procedures
TSS	Total Suspended Solids
UAS	University of Alaska Southeast
USCG	U.S. Coast Guard
VOCs	Volatile Organic Compounds
VSSP	Vessel Specific Sampling Plan
WQS	Water Quality Standards

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A. PROJECT MANAGEMENT ELEMENTS**A.1 TITLE AND APPROVALS:**

Title: Alaska Marine Highway System Tier II Quality Assurance Project Plan for Sampling and Analysis of Treated Blackwater & Graywater from Small Commercial Passenger Vessels

Operator Project Manager
Amanda Millay, AMHS Environmental Program Specialist

Signature: Amanda M Millay

Date: 9/27/2022

Project Quality Assurance Manager
David Wetzel, Admiralty Environmental

Signature: David Wetzel

Date: 9/27/2022

ADEC Project Manager
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Signature: Johnny Zutz

Date: 9/28/22

ADEC Quality Assurance Officer
John Clark, ADEC-WQSR

Signature: John M Clark

Date: 10/5/2022

Contact information for signatories located in Table 1.

A.2 PLAN EXPIRATION

This Quality Assurance Project Plan (QAPP) is valid for 3 years from the date listed on the cover page unless significant changes are made to document. The Alaska Department of Environmental Conservation (ADEC or Department) will determine what is significant and will notify other parties in writing if a new plan is required.

Position changes and contact updates can be listed below Table 1; be sure to rename QAPP (i.e. Revision 1) to reflect updated info has been submitted. **Note:** updating contact info will not extend the QAPP expiration date.

A.3 DISTRIBUTION LIST

This list includes the names and addresses of those who receive copies of the approved QAPP and subsequent revisions.

TABLE 1. Distribution List

Name	Position	Company / Agency	Division / Section	Contact Information
Amanda Millay	Project Manager (Environmental Program Specialist)	DOT&PF	Alaska Marine Highway System	Phone: 907-420-4426 Email: Amanda.millay@alaska.gov
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CHANGES AND REVISIONS for Table 1.

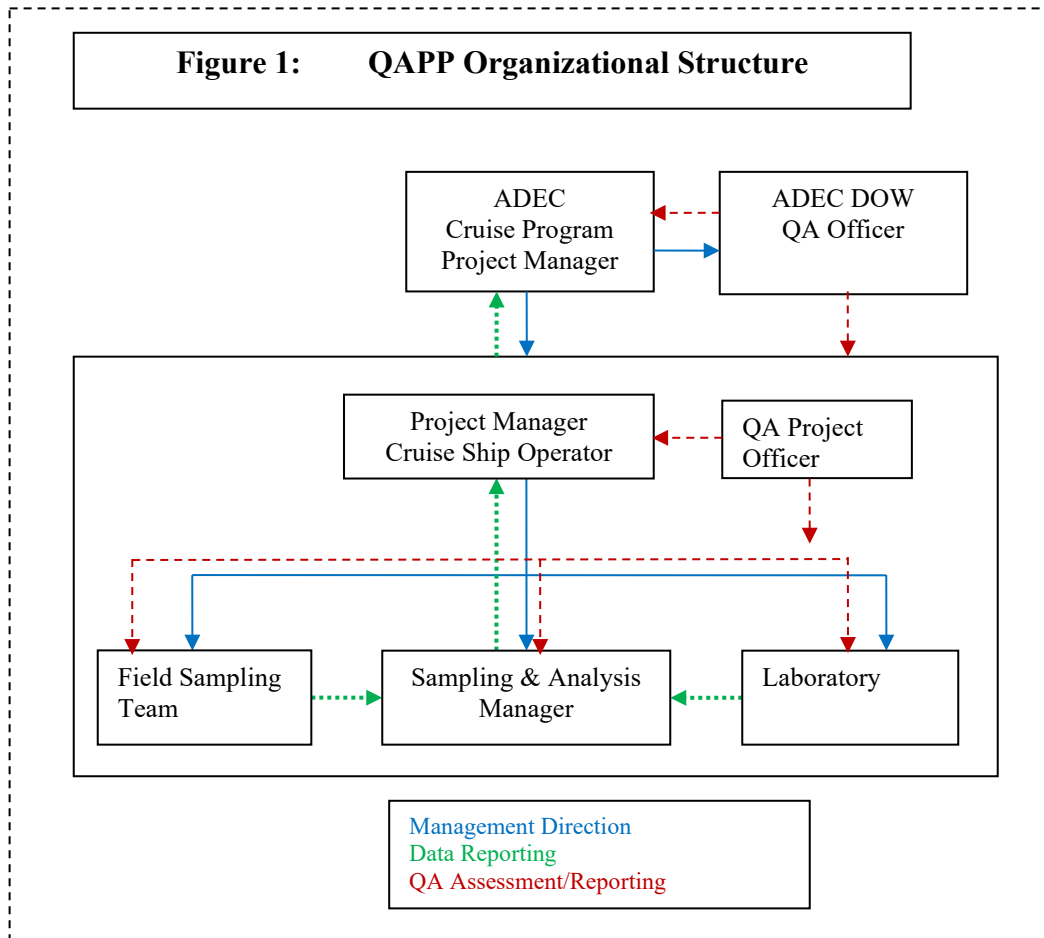
Name		Date	Revision
Amanda Millay	Replaces Christen Harrington	9/16/2022	1

A.4 PROJECT TASK/ORGANIZATION

Duties and responsibilities of key individuals are listed in **Table 2, Position Responsibilities:**

TABLE 2. Position Responsibilities

Agency/Company	Position	Responsibilities
State of Alaska DOT&PF Alaska Marine Highway System (AMHS)	Project Manager	The project manager is responsible for compliance with this Small Cruise Ship Quality Assurance Project Plan (QAPP). Responsibilities include: • Ensuring coordination among vessels crew, samplers, lab, and ADEC. • Communicating project information to the sampler, lab, and ADEC • Assuring that project participants have necessary training. • Fielding questions and requests for information that arises during and after the project. • Managing the financial aspect of the project. • Attaching field notes to sample results, chain of custody and providing the ADEC with any deviations to the QAPP or Vessel Specific Sampling Plan (VSSP).
Admiralty Environmental	Sampling Manager/Team	The sampling manager responsibilities include: • Will design a tentative sampling schedule. • Will submit the schedule to the ADEC with the VSSP. • Will ensure coordination among vessels crew, samplers, lab, and ADEC for all monitoring operations. • Will notify the ADEC a minimum of 36 hours prior to the sampling. This notice gives ADEC the opportunity to audit the ship's sampling procedures. • Will be responsible for sample collection, sample integrity and custody, field measurements, and accurate notes. • Will provide to the laboratory personnel and vessel representative and the Project Quality Assurance Officer upon completion of all sampling a compilation of field notes, deviations from VSSP or QA/QCP plans (if applicable), and Chain of Custody.
Laboratory under contract (Admiralty Environmental) to the Alaska Marine Highway System	Laboratory Manager	Responsible for the timely analysis of samples and overall review and approval of contracted laboratory analytical work, responding to sample result inquiries and method specific details.
	Laboratory QA Manager/Officer	Responsible for QA/QC of water quality laboratory analyses as specified in the QAPP. Along with Laboratory Manager, the Lab QA Officer reviews and verifies the validity of sample data results as specified in the QAPP and appropriate EPA approved analytical methods
Field Sampling Staff	Sample Collection	Field Sampling Staff will be responsible for training, sample collection, field measurements, accurate and complete field notes, sample integrity, and sample custody.
ADEC DOW Cruise ship Program	Project Manager	The ADEC Project Manager is responsible for managing the program to meet the requirements in the Alaska Statute, regulation, and the approved QA/QC plan.
ADEC DOW	QA Officer	Responsible for QA review and approval of plan and oversight of QA activities ensuring collected data meets project's stated data quality goals.



A.5 PROBLEM DEFINITION/BACKGROUND AND PROJECT OBJECTIVES

A.5.1 Problem Definition

This document is prepared and submitted to fulfill requirements of Alaska Statute 46.03.460-46.03.490, and 18 AAC 69.025. ADEC requires at least one **sampling event** per vessel in a season. A “sampling event” is the collection of representative samples¹ of each wastewater type being discharged within Alaska waters. Number of sampling events is determined by ADEC and will be outlined in the annual Vessel Specific Sampling Plan (VSSP) approved by the Department. The number of samples in a sampling event is based on the ship configuration, vessel wastewater management practices, and the wastewater quantities discharged to Alaskan waters. The samples must be taken at a point in the system directly before being discharged overboard as determined by the approved VSSP. The samples must be taken while the vessel is discharging into ambient water.

A.5.2 Project Background

Alaska law requires that the owner or operator of a small commercial passenger vessel (50 to 249 overnight passengers), registered under the Commercial Passenger Vessel Environmental Compliance (CPVEC) Program, may not discharge treated sewage, graywater, and other wastewater in Alaska waters unless the vessel meets certain requirements, such as sampling. The original law was enacted in 2001 and modified in 2004 to allow operations under alternative terms and conditions described at AS

¹ The VSSP for each vessel will list the proper location and timing of wastewater sampling. The samples will be taken in a manner that seeks to capture a typical wastewater discharge while still meeting the fecal coliform 8-hour holding time.

46.03.462 (k). The 2004 law allowed vessel operators to exceed Alaska Water Quality Standards once a Department approved Best Management Practices (BMP) Plan was in place. The BMP plan must minimize discharges to Alaskan waters and meet all requirements at 18 AAC 69.046. Unlike the large commercial passenger vessels that operate under a single QAPP, most smaller operators have a fleetwide QAPP. The QAPPs will be reviewed for consistency so that data among all small vessels follow the same QA/QC structure.

A.5.3 Project Objective(s)

The objectives of this document are to guide the collection of quality and representative wastewater samples from small cruise ships in Alaskan waters to monitor compliance with ADEC water quality standards and adherence to the goals of the vessels BMP; to minimize impacts on the environment to the greatest extent feasible.

A.6 PROJECT DESCRIPTION and SCHEDULE

A.6.1 Project Description

This QAPP specifies the minimum requirements for sampling and analysis of treated sewage and/or graywater and other wastewaters as defined in AS 46.03.490. All sampling events required by AS 46.03 shall be conducted in accordance with this QAPP. Owner/operator must provide documentation verifying their compliance with the guidelines in AS 46.03.460-46.03.490, and 18 AAC 69, 18 AAC 70 and this plan.

Each vessel discharging wastewater must be sampled at the beginning of the cruise ship season to assess the quality of effluent discharged to Alaskan waters; typically, within 10 days of initial entry into Alaska waters or the start of revenue passenger service in Alaska waters. Vessels are subject to sampling audits at any time while in state waters and ADEC may perform additional sampling and analysis inspections as necessary to implement AS 46.03. Samples that fail to provide valid results for all required parameters will be subject to resampling to the satisfaction of ADEC. Sampling events exceeding the standards below will typically warrant a resample:

- AS 46.03.463 (b) prohibits discharge of sewage from a commercial passenger vessel into marine waters of the state if the discharge has suspended solids greater than 150mg/L or a fecal coliform count greater than 200 colonies per 100 ml. (see 33 CFR § 159.319). BMPs allow for Department discretion regarding resampling.
- Department policy will determine if exceedance of other parameters will require resampling. Total residual chlorine (TRC) is not listed at CFR, but the Department is concerned with high chlorine values in wastewater effluent (i.e., TRC>10 mg/L). MSD units on small vessels often use chlorine as an integral final step. Historically, this parameter has been shown high exceedances from the Alaska water quality standards (WQS) and are indicative of improperly functioning MSD or the overuse of chlorine in the wastewater treatment prior to discharge.

A.6.1 Project Schedule

The vessel wastewater sampling schedule is outlined in the VSSP. This document is approved annually for each vessel operating in AK waters. The VSSP is the primary reference document for sampling required for a specific vessel, as sampling may change annually.

Conventional I	Priority
Temperature (field) pH (field) Chlorine (Free & Total Residual; field) Fecal coliform (FC) Total Suspended solids (TSS) Biochemical Oxygen Demand (BOD) Specific Conductance	Base Neutrals & Acids (BNAs) Volatile Organic Compounds (VOCs) Total Recoverable Metals List Dissolved Metals List (except Hg)
Conventional II	Nutrients
<u>Ammonia (Total)</u> <u>Settleable Solids</u> <u>Chemical Oxygen Demand (COD)</u> <u>Alkalinity</u> <u>Hardness</u> <u>Oil and Grease</u>	Total Organic Carbon (COD) Total Kjeldahl Nitrogen Nitrate/Nitrite Total Phosphorus Ammonia (Total) [1]
[1] Ammonia (Total) add to Nutrients list if Conventional II parameters are not taken.	

Samples sent to a lab for analysis must be analyzed by a laboratory with current certification under one of the following laboratory certification programs:

ADEC-Drinking Water Certified Laboratory for Chemistries [1]
https://dec.alaska.gov/eh/lab/chem-lab-cert-status.aspx
ADEC-Drinking Water Certified Laboratory for Microbiological / Fecal Coliforms [1, 2]
https://dec.alaska.gov/eh/lab/micro-lab-cert-status/
Washington State Department of Ecology (WA DOE) Certified Water/Wastewater Laboratory for Chemistries
https://ecology.wa.gov/Regulations-Permits/Permits-certifications/Laboratory-Accreditation
NELAC Certified Water/Wastewater Laboratory
https://lams.nelac-institute.org/
[1] ADEC does not certify laboratories for water/wastewater analyses. Although water/wastewater methodologies may differ somewhat from drinking water analytical methods, an ADEC drinking water-approved laboratory lends credibility to a laboratory's quality assurance and quality control processes. [2] For microbiological analyses conducted in state waters, only in-state labs with a current ADEC drinking water certification may be used. Due to the short sample holding time requirements.

A.7 DATA QUALITY OBJECTIVES AND CRITERIA FOR MEASUREMENT DATA

A.7.1 Data Quality Objectives (DQOs)

Data Quality Objectives (DQOs, [EPAQA/G4](#)). DQOs are qualitative and quantitative statements derived from the DQO Process that:

- Clarify the monitoring objectives (i.e., determine water/wastewater pollutant concentrations of interest and how these values compare to water quality standards regulatory limits).
- Define the appropriate type of data needed. To accomplish the monitoring objectives, the appropriate type of data needed is defined by the respective WQS. For WQS pollutants, compliance with the WQS is determined by specific measurement requirements. The measurement system is designed to produce water pollutant concentration data that are of the appropriate quantity and quality to assess compliance.

A.7.2 Measurement Quality Objectives (MQOs)

Measurement Quality Objectives (MQOs) are a subset of DQOs. MQOs are derived from the monitoring project's DQOs. MQOs are designed to evaluate and control various phases (sampling, preparation, and analysis) of the measurement process to ensure that total measurement uncertainty is within the range prescribed by the project's DQOs. MQOs define the acceptable quality (data validity) of field and laboratory data for the project. MQOs are defined in terms of the following data quality indicators:

- Detectability
- Precision
- Bias/Accuracy
- Completeness
- Representativeness
- Comparability

Detectability is the ability of the method to reliably measure a pollutant concentration above background. DEC DOW uses two components to define detectability: method detection limit (MDL) and practical quantification limit (PQL) or reporting limit (RL). Individual analyte MDL and PQL limits are listed in Table 3.

- The MDL is the minimum value which the instrument can discern above background but no certainty to the accuracy of the measured value. For field measurements the manufacturer's listed instrument detection limit (IDL) can be used.
- The PQL or RL is the minimum value that can be reported with confidence (usually some multiple of the MDL).

Sample data measured below the MDL is reported as ND or non-detect. Sample data measured $\geq$ MDL but $\leq$ PQL or RL is reported as estimated data. Sample data measured above the PQL or RL is reported as reliable data unless otherwise qualified per the specific sample analysis.

Precision is the degree of agreement among repeated measurements of the same parameter and provides information about the consistency of methods. Precision is expressed in terms of the relative percent difference between two measurements (A and B).

For field measurements, precision is assessed by measuring replicate (paired) samples at the same locations and as soon as possible to limit temporal variance in sample results. Field and laboratory precision are measured by collecting blind (to the laboratory) field replicate or duplicate samples. For paired and small data sets project precision is calculated using the following formula:

$$RPD = \frac{(A - B)}{((A + B)/2)} \times 100$$

RPD = relative percent difference

A = primary sample

B = replicate field sample or laboratory duplicate sample

Bias (Accuracy) is a measure of confidence that describes how close a measurement is to its “true” value. Acceptance limits for Bias for each analyte are listed in Table 3. Methods to determine and assess accuracy of field and laboratory measurements include, instrument calibrations, various types of QC checks (e.g., sample split measurements, sample spike recoveries, matrix spike duplicates, continuing calibration verification checks, internal standards, sample blank measurements (field and lab blanks), external standards, performance audit samples (DMRQA, blind Water Supply or Water Pollution PE samples from A2LA certified, etc. Bias/Accuracy is usually assessed using the following formula:

$$Accuracy = \frac{MeasuredValue}{TrueValue} \times 100$$

Completeness is a measure of the percentage of valid samples collected and analyzed to yield sufficient information to make informed decisions with statistical confidence. The completeness criterion for this project is 80 percent of the compiled analytical data per each analytical parameter for each vessel participating in the program. Because of the variety of vessels and discharges sampled, and the possibility for weather or other shipping-related delays resulting in missed holding times, a completeness criterion of less than 100% is to be expected.

Project completeness is determined for each pollutant parameter using the following formula:

$$\frac{T - (I + NC)}{T} \times (100\%) = \text{Completeness}$$

T = Total number of expected sample measurements

I = Number of invalid sample measurements

NC = Number of sample measurements not produced (e.g., spilled sample, etc.).

Representativeness is a measure of how well the sample reflects the typical wastewater effluent. Sample representativeness will be established by collecting cruise ship graywater, blackwater, and other wastewater discharge samples following vessel specific sampling plans (VSSP). The

owner and operator are responsible for developing and submitting VSSPs to both agencies for each vessel participating in the program

The treatment system effluent will be considered representative for the two samples only if the vessel normally discharges continuously. The VSSP is designed to ensure that consistent sampling methods are followed and that samples are collected from appropriate and representative locations at appropriate times.

Vessel operation that differs from the approved VSSP may result in rejection of samples by the Department.

Comparability is a measure that shows how data can be compared to other data collected by using standardized methods of sampling and analysis. Comparability is shown by referencing the appropriate measurement method approved by as specified in federal and/or state regulatory and guidance documents/methods for the parameter/s to be sampled and measured (e.g., ASTM, Standard Methods, Alaska Water Quality Standards², EPA Guidelines Establishing Test Procedures for the Analysis of Pollutants Under the Clean Water Act; National Primary Drinking Water Regulations; and National Secondary Drinking Water Regulations; Analysis and Sampling Procedures³, etc.). As with representativeness and completeness, comparability is determined during project development and must be specified in the QAPP.

For each parameter to be sampled/measured, list the measurement method to be used and the MQOs to meet the overall data quality objectives. This applies to both direct field measurements (e.g., field pH meters, DO meters, etc.) as well as samples collected for subsequent laboratory analyses.

Because of the different source types found on different vessels (e.g., a holding tank on some ships may contain both blackwater and graywater, while on others it may only contain graywater), careful definition of discharge types will be made in the VSSP. It is essential that these definitions be carried through to the end data user, as these differences could erroneously bias data interpretation.

The sampling team must make full use of ship records and logs, especially the Graywater and Sewage Discharge Record Book which includes the latitude and longitude at the beginning and end of discharge, identifying tanks, estimating volumes, and calculating discharge rates (if any) at the time the sample is drawn. If the vessel is discharging continuously (not just certified but is in practice) then the sampler does not need to record latitude and longitude at the beginning and end of discharge, identifying tanks, estimating volumes of those tanks. The sampler needs to identify which treatment unit is discharging and the discharge rate. The vessel speed and longitude/latitude must be obtained by the sampler if the sample is taken while the vessel is discharging underway. Information added to the VSSP or changes to the VSSP during the sampling event must be recorded on the VSSP, COC, or in the field notes and must accompany the samples to the lab and be provided to the project data recipients as part of the complete unannounced sampling report.

² <http://www.dec.state.ak.us/water/wqsar/wqs/index.htm>

³ <http://www.epa.gov/fedrgstr/EPA-WATER/2007/March/Day-12/w1073.htm>

TABLE 3. Project Measurement Quality Objectives (MQOs)

PARAMETER	Analytical Methods	MDL (mg/L)	PQL (mg/L)	PRECISION (RPD, RSD)	BIAS (% Recovery)
Conventional Pollutants / Nutrients					
Alkalinity	SM 2320 B	2	20	<20%	85 - 115 %
Ammonia (Total)	EPA 350.1 Hach 10205	0.1	0.5	<20%	80 - 120 %
Biochemical Oxygen Demand (BOD)	EPA 405.1 SM 5210	2.0	2.0	<20%	70 - 130 %
Chemical Oxygen Demand (COD)	EPA 410.4 Rev 2.0	9.2	15.0	<20%	85 - 115 %
Chlorine Residual (Total/Free)	SM 4500-Cl (G)	0.05	0.1	<20%	N/A
E. coli	SM 9223B	1.0	1.0	no precision criteria	N/A
Fecal Coliforms (FC)	SM 9222 D	1.0 FC/100 ml	2.0 FC/100 ml	no precision criteria	N/A
Hardness	SM 2340 B	0.43	20	<20%	75 - 125 %
Nitrate	EPA 300.0	0.1	0.5	<20%	90 - 110 %
Nitrate/Nitrite (NO ₂ /NO ₃)	EPA 350.1 EPA 300.0	0.1	0.5	<20%	90 - 110 %
Oil and Grease	EPA 1664B	1.4	5.0	<18%	78-114%
pH	SM 4500 EPA 150.1	0.1 standard units	0.1 standard units	<20%	N/A
Settleable Solids	SM 2540 F	0.1 ml/L	0.1 ml/L	<20%	N/A
Specific Conductance	SM 2510 B	1.3 µmHos/cm	5 µmHos/cm	<20%	85 - 115 %
Total Kjeldahl Nitrogen (TKN)	EPA 351.2 Rev 2.0 Hach 10242*	0.60	5.0	<20%	85 - 115 %
Total Organic Carbon (TOC)	SM 5310C	0.22	1	<20%	85 - 115 %
Total Phosphorus	EPA 365.1 Rev 2.0	0.045	0.2	<20%	90 - 110 %
Total Suspended Solids (TSS)	EPA 160.2 SM 2540D	1.0	4.0	<20%	85 - 115 %
*Hach Method 10242 was recently approved in the 2021 CLIA QAPP, this method has not been approved for small vessel sampling if high conductivity or high chlorine levels are expected.					

LAB PARAMETER	Method	MDL (ug/L)	PQL (ug/L)	PRECISION (RPD)	BIAS (% Recovery)
Priority Pollutants					
Recoverable Metals					
Antimony	EPA 200.8 Rev 5.4	0.52	2.5	<20%	85 - 115 %
Arsenic		0.27	2.5	<20%	85 - 115 %
Beryllium		0.04	1.5	<20%	85 - 115 %
Cadmium		0.1	2.0	<20%	85 - 115 %
Chromium		0.28	2.5	<20%	85 - 115 %
Copper		0.18	1.0	<20%	85 - 115 %
Lead		0.26	1.0	<20%	85 - 115 %
Nickel		0.23	1.5	<20%	85 - 115 %
Selenium		0.56	5.0	<20%	85 - 115 %
Silver		0.053	1.0	<20%	85 - 115 %
Thallium		0.1	1.0	<20%	85 - 115 %
Zinc		2.0	2.5	<20%	85 - 115 %
Mercury (Total)	EPA 245.1 Rev 3.0	0.13	2.0	<20%	85 - 115 %
Dissolved Metals					
Antimony	EPA 200.8 Rev 5.4	0.52	2.5	<20%	85 - 115 %
Arsenic		0.27	2.5	<20%	85 - 115 %
Beryllium		0.11	1.5	<20%	85 - 115 %
Cadmium		0.1	2.0	<20%	85 - 115 %
Chromium		0.28	2.5	<20%	85 - 115 %
Copper		0.18	1.0	<20%	85 - 115 %
Lead		0.26	1.0	<20%	85 - 115 %
Nickel		0.23	1.5	<20%	85 - 115 %
Selenium		0.56	5.0	<20%	85 - 115 %
Silver		0.053	1.0	<20%	85 - 115 %
Thallium		0.1	1.0	<20%	85 - 115 %
Zinc		2.0	2.5	<20%	85 - 115 %

LAB PARAMETER	Method	MDL (ug/L)	PQL (ug/L)	PRECISION (RPD)	BIAS (% Recovery)
Volatile Organic Compounds					
1,1,1-Trichloroethane	EPA 624.1	0.232	5	<30%	70-130%
1,1,2,2-Tetrachloroethane	EPA 624.1	0.324	5	<30%	60-140%
1,1,2-Trichloroethane	EPA 624.1	0.262	5	<30%	70-130%
1,1-Dichloroethane	EPA 624.1	0.246	5	<30%	70-130%
1,1-Dichloroethene	EPA 624.1	0.231	5	<30%	50-150%
1,1-Dichloropropene	EPA 624.1	0.224	5	<30%	80-132%
1,2-Dichloroethane	EPA 624.1	0.375	5	<30%	70-130%
1,2,3-Trichlorobenzene	EPA 624.1	0.233	5	<30%	66.1-126%
1,2,3-Trichloropropane	EPA 624.1	0.29	5	<30%	64.4-110%
1,2,4-Trichlorobenzene	EPA 624.1	0.233	5	<30%	66.1-126%
1,2,4-Trimethylbenzene	EPA 624.1	0.243	5	<30%	90-130%
1,2-Dibromo-3-Chloropropane	EPA 624.1	0.32	10	<30%	61.7-113%
1,2-Dichlorobenzene	EPA 624.1	0.302	10	<30%	65-135%
1,2-Dichloropropane	EPA 624.1	0.19	5	<30%	35-165%
1,3,5-Trimethylbenzene	EPA 624.1	0.254	2	<30%	86-126%
1,3-Dichlorobenzene	EPA 624.1	0.243	10	<30%	70-130%
1,3-Dichloropropane	EPA 624.1	0.286	2	<30%	80-120%
1,4-Dichlorobenzene	EPA 624.1	0.275	10	<30%	65-135%
2,2-Dichloropropane	EPA 624.1	0.265	5	<30%	65.6-156%
2-Butanone	EPA 624.1	0.179	50	<30%	56.7-121%
2-Chloroethyl Vinyl Ether	EPA 624.1	0.188	10	<30%	1-225%
2-Chlorotoluene	EPA 624.1	0.234	10	<30%	87-137%
2-Hexanone	EPA 624.1	0.298	20	<30%	44.7-116%
4-Chlorotoluene	EPA 624.1	0.234	10	<30%	81-121%
4-Isopropyltoluene	EPA 624.1	0.262	3	<30%	86.6-132%
4-Methyl-2-Pentanone	EPA 624.1	0.231	20	<30%	49.4-116%
Acetone	EPA 624.1	0.592	50	<30%	51.8-114%
Acrolein	EPA 624.1	2.2	100	<30%	50.7-121%
Acrylonitrile	EPA 624.1	2.2	100	<30%	62.6-128%
Benzene	EPA 624.1	0.154	5	<30%	65-135%
Bromobenzene	EPA 624.1	0.246	5	<30%	72.4-112%
Bromochloromethane	EPA 624.1	0.233	3	<30%	68.5-125%
Bromodichloromethane	EPA 624.1	0.214	5	<30%	65-135%
Bromoform	EPA 624.1	0.25	5	<30%	70-130%
Bromomethane	EPA 624.1	0.291	10	<30%	15-185%

LAB PARAMETER	Method	MDL (ug/L)	PQL (ug/L)	PRECISION (RPD)	BIAS (% Recovery)
Volatile Organic Compounds (continued)					
Carbon Disulfide	EPA 624.1	0.225	10	<30%	29.3-150%
Carbon Tetrachloride	EPA 624.1	0.246	5	<30%	70-130%
Chlorobenzene	EPA 624.1	0.259	5	<30%	65-135%
Chloroethane	EPA 624.1	0.215	10	<30%	40-160%
Chloroform	EPA 624.1	0.26	5	<30%	70-135%
Chloromethane	EPA 624.1	0.245	10	<30%	0-205%
Cis-1,2-Dichloroethene	EPA 624.1	0.228	5	<30%	82-122%
Cis-1,3-Dichloropropene	EPA 624.1	0.263	5	<30%	25-175%
Dibromochloromethane	EPA 624.1	0.238	5	<30%	70-135%
Dibromomethane	EPA 624.1	0.263	5	<30%	73.2-113%
Dichlorodifluoromethane	EPA 624.1	0.296	10	<30%	10-168%
Ethylbenzene	EPA 624.1	0.247	5	<30%	60-140%
Hexachlorobutadiene	EPA 624.1	0.347	50	<30%	77.8-144%
Iodomethane	EPA 624.1	0.143	5	<30%	50-150%
Isopropylbenzene	EPA 624.1	0.255	5	<30%	87.4-124%
m&p Xylenes	EPA 624.1	0.489	5	<30%	88.9-120%
Methylene Chloride	EPA 624.1	2.0	10	<30%	60-140%
n-Butylbenzene	EPA 624.1	0.214	5	<30%	85.7-160%
n-Propylbenzene	EPA 624.1	0.24	10	<30%	80.6-133%
O-Xylene	EPA 624.1	0.264	5	<30%	87-117%
sec-Butylbenzene	EPA 624.1	0.242	5	<30%	90-144%
Styrene	EPA 624.1	0.217	5	<30%	74.1-116%
tert-Butyl Methyl Ether	EPA 624.1	0.256	5	<30%	64.5-113%
tert-Butylbenzene	EPA 624.1	0.248	5	<30%	86.1-132%
Tetrachloroethene	EPA 624.1	0.259	5	<30%	70-130%
Toluene	EPA 624.1	0.304	5	<30%	70-130%
Trans 1,2-Dichloroethene	EPA 624.1	0.217	5	<30%	70-130%
trans-1,3-Dichloropropene	EPA 624.1	0.262	5	<30%	50-150%
trans-1,4-Dichloro-2 Butene	EPA 624.1	0.212	10	<30%	50-150%
Trichloroethene	EPA 624.1	0.259	5	<30%	65-135%
Trichlorofluoromethane	EPA 624.1	0.67	10	<30%	50-150%
1,1,2-Trichloro-1,2,2-Trifluoroethane	EPA 624.1	0.286	10	<30%	50-150%
Vinyl Acetate	EPA 624.1	0.222	5	<30%	55-126%
Vinyl Chloride	EPA 624.1	0.258	2	<30%	5-195%

LAB PARAMETER	Method	MDL (ug/L)	PQL (ug/L)	PRECISION (RPD)	BIAS (% Recovery)
Base/Neutral & Acids					
1,2-Diphenylhydrazine	EPA 625.1	1.0	5	<30%	40-140%
2,2'-Oxybis (1-chloropropane)	EPA 625.1	0.68	5	<30%	25-121%
2,4,5-Trichlorophenol	EPA 625.1	0.76	5	<30%	40-140%
2,4,6-Trichlorophenol	EPA 625.1	0.74	5	<30%	40-140%
2,4-Dichlorophenol	EPA 625.1	0.61	5	<30%	40-140%
2,4-Dimethylphenol	EPA 625.1	0.68	15	<30%	32-119%
2,4-Dinitrophenol	EPA 625.1	0.3	25	<30%	28.7-110%
2,4-Dinitrotoluene	EPA 625.1	0.47	5	<30%	48-110%
2,6-Dinitrotoluene	EPA 625.1	0.57	5	<30%	10-153%
2-Chloronaphthalene	EPA 625.1	0.71	10	<30%	30.5-122%
2-Chlorophenol	EPA 625.1	0.72	5	<30%	35-110%
2-Methylnaphthalene	EPA 625.1	1.6	5	<30%	38-110%
2-Methylphenol	EPA 625.1	0.76	5	<30%	30.4-70.4%
2-Nitroaniline	EPA 625.1	0.49	5	<30%	40-140%
2-Nitrophenol	EPA 625.1	0.91	5	<30%	40-140%
3,3'-Dichlorobenzidine	EPA 625.1	1.3	25	<30%	47-145%
3/4-Methylphenol	EPA 625.1	0.83	5	<30%	32.6-63.7%
3-Nitroaniline	EPA 625.1	0.8	50	<30%	38-110%
4,6-Dinitro-2-methylphenol	EPA 625.1	0.34	25	<30%	40-140%
4-Bromophenyl Phenyl ether	EPA 625.1	0.67	5	<30%	53-127%
4-chloro-3-methylphenol	EPA 625.1	0.76	10	<30%	42-110%
4-Chloroaniline	EPA 625.1	0.69	5	<30%	32-126%
4-Chlorophenylmethylsulfone	EPA 625.1	10	20	<30%	30-170%
4-Chlorophenyl Phenyl ether	EPA 625.1	0.69	5	<30%	32-126%
4-Nitroaniline	EPA 625.1	1.0	50	<30%	40-140%
4-Nitrophenol	EPA 625.1	0.83	25	<30%	10-50%
Acenaphthene	EPA 625.1	0.12	5	<30%	36-110%
Acenaphthylene	EPA 625.1	0.06	5	<30%	33-110%
Anthracene	EPA 625.1	0.07	5	<30%	40-115%
Benzidine	EPA 625.1	50	200	<30%	30-170%
Benzo (A) Anthracene	EPA 625.1	0.07	5	<30%	44-110%
Benzo (A) Pyrene	EPA 625.1	0.06	5	<30%	17-163%
Benzo (B) Fluoranthene	EPA 625.1	0.08	5	<30%	52-125%
Benzo (g,h,i) Perylene	EPA 625.1	0.07	5	<30%	34-110%
Benzo (K) Fluoranthene	EPA 625.1	0.097	5	<30%	40-110%
Benzoic Acid	EPA 625.1	0.5	5	<30%	13.8-43.3%
Benzyl Alcohol	EPA 625.1	0.66	10	<30%	40-140%
Bis (2-Chloroethoxy) methane	EPA 625.1	0.85	5	<30%	40-140%
Bis (2-chloroethyl) ether	EPA 625.1	0.77	5	<30%	29.1-110%

LAB PARAMETER	Method	MDL (ug/L)	PQL (ug/L)	PRECISION (RPD)	BIAS (% Recovery)
Base/Neutral & Acids (continued)					
Bis (2-Ethylhexyl) Phthalate	EPA 625.1	1.2	5	<30%	30-140%
Butyl Benzyl Phthalate	EPA 625.1	0.91	5	<30%	10-152%
Chrysene	EPA 625.1	0.09	5	<30%	36-110%
Dibenzo (a,h) Anthracene	EPA 625.1	0.06	5	<30%	40-116%
Dibenzofuran	EPA 625.1	0.68	5	<30%	40-140%
Diethyl Phthalate	EPA 625.1	0.82	5	<30%	5-114%
Dimethyl Phthalate	EPA 625.1	0.68	5	<30%	10-144%
Di-N-Butyl Phthalate	EPA 625.1	0.82	5	<30%	40-140%
Di-N-Octyl Phthalate	EPA 625.1	0.7	5	<30%	25.9-110%
Fluoranthene	EPA 625.1	0.06	5	<30%	26-137%
Fluorene	EPA 625.1	1.3	5	<30%	35-110%
Hexachlorobenzene	EPA 625.1	0.96	5	<30%	40-140%
Hexachlorocyclopentadiene	EPA 625.1	0.4	10	<30%	11-110%
Hexachloroethane	EPA 625.1	1.0	5	<30%	14.1-76.7%
Indeno (1,2,3-CD) Pyrene	EPA 625.1	0.05	5	<30%	42-120%
Isophorone	EPA 625.1	0.8	5	<30%	21-196%
Napthalene	EPA 625.1	0.09	10	<30%	29-110%
Nitrobenzene	EPA 625.1	0.79	5	<30%	35-180%
N-Nitrosodimethylamine	EPA 625.1	0.91	5	<30%	25.7-49.4%
N-Nitrosodi-N-Propylamine	EPA 625.1	0.99	5	<30%	39-110%
N-Nitrosodiphenylamine	EPA 625.1	0.72	10	<30%	31-110%
Pentachlorophenol	EPA 625.1	0.31	25	<30%	33-110%
Phenanthrene	EPA 625.1	0.06	5	<30%	37-110%
Phenol	EPA 625.1	0.37	5	<30%	10-50%
Pyrene	EPA 625.1	0.07	5	<30%	47-124%

A.8 SPECIAL TRAINING REQUIREMENTS/CERTIFICATION

The vessel owner/operator shall ensure that sampling is conducted by a qualified, approved person as required by 18 AAC 69.090. The owner/operator must submit information describing the qualifications of field personnel to be approved no later than 21 days before sampling is conducted. To determine whether a person is qualified the department will consider whether the person is:

- 1) trained in sampling methodology, sample handling, chain of custody, field measurements, and quality assurance procedures; and
- 2) is familiar with this QAPP and the vessel specific VSSP.

Training records should be available upon request and operators. Operators should train staff in updated methods or procedures to ensure quality of sampling. Additionally, samplers will receive appropriate training relating to shipboard safety procedures.

Laboratories used will have a current Alaska Department of Environmental Conservation Drinking Water certification or be a current NELAC certified laboratory. Due to the short holding time for fecal coliform samples collected within Alaska, only DEC Drinking Water Certified laboratories will be used. Laboratory analysts will be trained in accordance with each laboratory's QA Plan and Standard Operating Procedures (SOPs).

A.9 DOCUMENTS AND RECORDS

A.9.1 Sample schedule and Vessel/Sample Identification

The sampler must include a tentative schedule in the Vessel Specific Sampling Plan. The sampler must also notify the ADEC of its intent to sample at least 36 hours prior to sample collection. The two sampling events must be a minimum of 21 days apart unless being conducted as a "re-sampling" allowed under 18 AAC 69.070.

Samples will be identified clearly on the chain of custody and sample bottles. For example, a sample from the Graywater from the *M/V Hypothetica* will be identified as "Graywater Overboard Discharge," as the description with associated dates and times. The Sample ID should clearly state where the sample was taken. For example, a mixed black and gray sample taken from the MSD discharge line is MSD BW as its sample ID. Holding tanks should be HT. Collection tanks should be labeled CT. All samplers should use the same sample ID system

A.9.2 Field Records (Required for ADEC compliance samples)

Field notes Requirements:

- Field records will be recorded in bound field notebooks with sequential page numbering **or** pre-printed forms with specific sampling information (see next section)
- Entries will be made legibly with pencil or blue/**black ink**.
- Data corrections shall be done by drawing a single line through the incorrect data and initialing/dating the new data. Under no circumstances should the incorrect material be erased, made illegible or obscured so that it cannot be read.

- On-board staff will witness the sampling and will initial the field notes.

Field notes for each sample should include:

- Vessel name (e.g., *M/V HYPOTHETICA*),
- Sample date and times (start/stop)
- Location/Speed: Latitude/longitude (or Port/City name) and speed during sample event.
- Sampling personnel,
- Shipboard assistants,
- Waste type: blackwater, graywater, or mixed,
- Type of sample: Composite or Grab,
- Samples collected: Conventional I/ Conventional II/Priority/Nutrients
- Discharge rate during sample event & holding tank volumes (underway only)
- Field measurements: pH, free chlorine, total chlorine, and temperature
- Calibration dates of instruments used (Unique names of devices if applicable)
- Signature/initials by vessel crew indicating that the sample port is correct,
- Deviations from VSSP and/or QAPP,
- Comments: Note any unusual conditions and explanation of data anomalies,
- Copy of Discharge Logs (printout/photo) showing wastewater flow rate.
- Photo of sample port.

A.9.3 Laboratory Records

Upon completion of laboratory analysis, laboratory data review, and data validation, the laboratory will issue a full report in a level III electronic format describing the results of analysis for each sample submitted.

A.9.4 Chain of Custody

The original chain of custody form will accompany the sample to the laboratory. When portions of the sample are sent to another laboratory (e.g., for many of the priority pollutants), a copy of the chain of custody will be made and this will accompany the samples. At each transfer of the sample, the transfer will be indicated on the chain of custody form. The person listed on the Chain of Custody should always have full sight or control of the sample until it the COC is relinquished by that person and received by the next party signed on the COC.

A copy of the original chain of custody will be included with the final report, including copies of the COC's transferring samples to other labs.

A.9.5 Sampling Documents

Table 4 described the retention time for documents referenced in the QAPP. In additions to any written report, data collected for sampling will be submitted electronically to ADEC.

TABLE 4. Documents Location and Retention

Categories	Record/Document Types	Location	Retention Time
Vessel Specific Sampling Plan	Annual approved VSSP	Vessel, Project Manager	Until replaced by updated VSSP
Environmental Data Operations	QA Project Plan	ADEC/Vessel	5 years
	Field Notebooks	Vessel	5 years

	Sample collection/measurement records	Vessel	5 years
	Sample Handling & Custody Records	Vessel	5 years
	Chemical labels, MSDS sheets	Vessel	5 years
	Inspection/Maintenance Records	Vessel	5 years
Raw Data	Lab data (sample, QC, and calibration) including data entry forms	Lab	5 years

B. DATA GENERATION AND ACQUISITION

B.1 SAMPLING PROCESS DESIGN

A vessel specific sampling plan (VSSP) will be developed for each ship by the project manager and submitted to the sampling team 21 days prior to sampling. This plan needs to be approved by the ADEC. The plan will include elements listed in 18 AAC 69.030, and as a minimum, the following:

- Vessel name.
- Passenger and crew capacity of ship.
- Daily water use per individual.
- Locations and capacities for treated sewage, graywater, and other wastewater tanks.
- Type of wastewater treatment systems.
- Each discharge pump type and rate
- Vessel schematic of discharge ports and corresponding sampling ports.
- Description of discharges, including anticipated flow rates and tank volumes.
- Table containing type of discharge, type of sample (grab or composite), parameters (conventional or priority pollutants), location on the vessel where each sample is to be collected, and special circumstances.
- A narrative description of the time at which each sample is to be taken based upon circumstances that will yield a sample most likely to be representative of the average discharge that passes through the location where the sample is taken
- A description of the standards the owner or operator will use to determine a deviation from the plan
- Equipment required.

Each VSSP will be dated, and a copy will be provided to the ADEC. The ADEC must approve the VSSP prior to sampling. After the first sampling event on a vessel, the VSSP may be updated. If it is updated, copies of the updated sampling plan and approved by the ADEC before the second round of sampling occurs.

B.2 SAMPLING METHOD REQUIREMENTS

Specific sampling techniques for each vessel will be detailed in the VSSP. The following general guidelines are listed to provide consistency among the vessels utilizing this QAPP.

Samples will reflect a representative discharge of treated blackwater, graywater and other wastewaters into applicable waters of Alaska from an operable marine sanitation device, other treatment system, a

holding tank or some combination as specified in the VSSP. In port sampling, in compliance with ADEC sampling events, will be conducted only if the vessel is certified to discharge in port. If samples must be taken while the ship is underway, care will be taken to assure sample representativeness and homogeneity. See VSSP for further details on sampling.

Samplers will work in teams of two for sampling events that must be performed while the vessel is underway to ensure that proper sampling techniques are followed, adequate notes are taken during the sampling event, and proper sample custody is maintained. One sampler will be sufficient for all in-port sampling events.

Samplers should wear disposable gloves and safety eyewear, if needed, and observe precautions while collecting samples, remaining aware of the potential chemical and biological hazards present. The Project Sampling Staff collecting samples will take care not to touch the insides of bottles or lids/caps during sampling.

Samplers will contain all solid and liquid wastes generated during sampling (used gloves, paper towels, chlorine test waste, and overflow from filling of VOC sampling vials) and will dispose of it properly at the conclusion of the sampling event.

Samplers will take care not to touch the insides of bottles or lids/caps during sampling.

B.2.1 Sample Types

Samples will be listed as “composite” or “grab” on the Chain-of- Custody or Transmission Form and in field logbook or field data sheets.

B.2.2 Sample Containers and Equipment

In this section describe specific sample handling and custody requirements (If the results of a sampling program may be used as **evidence**, a strict written record (**Chain of Custody**) must be documented tracking location and possession of the sample/data at all times).

All sampling equipment and sample containers will be cleaned according to the equipment specifications and/or the analytical laboratory. Bottles supplied by a laboratory are pre-cleaned and must never be rinsed and will be filled only once with sample.

For samples requiring cooling, a temperature blank shall accompany each cooler (min/max thermometer preferred). The thermometer shall be certified NIST traceable, readable to at least 0.2°C and within the listed certification period (Note: Infrared thermometers are unacceptable for use in measuring temperature blanks and sample shipment/receipt temperatures).

Use example table below to list specific analyte/method criteria for parameter holding times and preservation methods. All Parameters in Table 5 are to be collected as grab samples.

TABLE 5. Sample Containers, Preservation, Holding Times, and Sample Types

Parameter	Container	Preservation	Maximum Hold Time	Minimum Representative Volume
Total Suspended Solids (TSS)	P, FP, G	Cool, $\leq 6^{\circ}$ C	7 days	100 ml
Settleable Solids	P, FP, G	Cool, $\leq 6^{\circ}$ C	48 hours	1000 ml
Alkalinity	P, FP, G	Cool, $\leq 6^{\circ}$ C	14 days	100 ml
Ammonia – Total	P, FP, G	Cool, $\leq 6^{\circ}$ C, H ₂ SO ₄ to pH <2	28 days	400 ml
Biochemical Oxygen Demand – 5 day (BOD)	P, FP, G	Cool, $\leq 6^{\circ}$ C	48 hours	1000 ml
Chemical Oxygen Demand	P, FP, G	Cool, $\leq 6^{\circ}$ C, H ₂ SO ₄ to pH <2, do not freeze	28 days	50 ml
Chlorine Free	P, G	None required	< 15 minutes in field	100 ml
Chlorine Residual (TRC)	P, G	None required	< 15 minutes in field	100 ml
Specific Conductance	P, FP, G	Cool, $\leq 6^{\circ}$ C, do not freeze	28 days	100 ml
Fecal Coliforms (FC)	Sterile PA, G	Cool, $\leq 10^{\circ}$ C with no indication of sample freezing 0.0008% Na ₂ S ₂ O ₃	8 hours from sample collection analysis***	100 ml
Hardness	P, FP, G	HN0 ₃ or H ₂ SO ₄ to pH <2	6 months	100 ml
Nitrate/Nitrite****	P, FP, G	Cool, $\leq 6^{\circ}$ C, do not Freeze, H ₂ SO ₄ to pH <2	28 days	100 ml
Oil and Grease	G	Cool, $\leq 6^{\circ}$ C, HCL or H ₂ SO ₄ to pH <2, do not freeze	28 days	1000 ml
pH	P, FP, G	None required.	< 15 minutes in field	25 ml
Temperature	P, FP, G	None required	< 15 minutes in field	1000 ml
Total Kjeldahl Nitrogen (TKN)	P, FP, G	Cool, $\leq 6^{\circ}$ C, H ₂ SO ₄ to pH <2, do not freeze	28 days	500 ml
Total Organic Carbon (TOC)	P, FP, G	Cool, $\leq 6^{\circ}$ C, HCL, H ₂ SO ₄ or H ₃ PO ₄ to pH <2, do not freeze	28 days	50 ml
Total Phosphorus	P, FP, G	Cool, $\leq 6^{\circ}$ C, H ₂ SO ₄ to pH <2	28 days	50 ml

Parameter	Container	Preservation	Maximum Hold Time	Minimum Representative Volume
Priority Pollutants				
BNA*	G, FP-lined cap	Cool, $\leq 6^{\circ}\text{C}$, 0.008%, do not freeze, $\text{Na}_2\text{S}_2\text{O}_3$ if residual chlorine is detected above 0.1 mg/L	7 days until extraction, 40 days after extraction	1000 ml
VOCs (except acrolein, acrylonitrile, and 2-chloroethyl vinyl ether)	G, FP-lined septum	Cool, $\leq 6^{\circ}\text{C}$, do not freeze, 0.008% $\text{Na}_2\text{S}_2\text{O}_3$ or ascorbic acid if residual chlorine is detected above 0.1 mg/L, HCl to pH <2, sample filled to convex meniscus, no air volume in vial before sealing	14 days	Each sample collected in duplicate 40ml vials
2-chloroethyl vinyl ether	G, FP-lined septum	Cool, $\leq 6^{\circ}\text{C}$, do not freeze, 0.008% $\text{Na}_2\text{S}_2\text{O}_3$ or ascorbic acid if residual chlorine is detected above 0.1 mg/L	7 days	40 ml vial
Acrolein and Acrylonitrile	G, FP-lined septum	Cool, $\leq 6^{\circ}\text{C}$, do not freeze, pres. HCl to pH 4-5, 0.008% $\text{Na}_2\text{S}_2\text{O}_3$ or ascorbic acid if residual chlorine is detected above 0.1 mg/L	3 days if no acid preservative, 14 days if pH is 4-5	40 ml vial
Total Aromatic and Total Aqueous Hydrocarbons**	See BNAs and VOCs			
Total Mercury (CVAA)	P, FP, G	HNO_3 to pH <2, do not freeze	28 days	100 ml
Total Recoverable Metals	P, FP, G	HNO_3 to pH <2, do not freeze	6 months	100 ml
Dissolved Metals	P, FP, G	Filtration w/0.45-micron filter within 15 minutes of sample collection, HNO_3 to pH <2, do not freeze	6 months	200 ml
P = polyethylene, FP = fluoropolymer, G = glass, PA = autoclavable plastic				

Notes Table 5:

*Additional volume of sample is required for matrix spike determination during the BNA analysis.

The sampling team will take an additional 2L of sample from all priority pollutant replicate sampling events for this purpose to provide matrix spike data at a frequency of 10% for project related samples.

** Total Aromatic and total Aqueous Hydrocarbons will be calculated from the BNA and VOC results.

*** Holding time reference: 29806 Federal Register / Vol. 77, No. 97 / Friday, May 18, 2012 / Rules and Regulations

****** Nitrate and nitrite can be analyzed individually in an unpreserved fraction or analyzed together in a fraction preserved with H₂SO₄. Results will be reported as nitrate plus nitrite regardless of preservation decision.**

B.2.3 Sampling Methods

The required field tests will be performed prior to sampling to determine if residual chlorine is present. This will dictate the preservation procedures for the VOC and BNA analyses.

The practical quantitation limit for chlorine testing using field equipment is 0.1 mg/L. Some field instruments may display values below this level. Any values observed below this limit will be recorded as actual readings on the field notes but as <0.1 mg/L final data reports.

Sample containers will normally be pre-preserved by the laboratory. If chlorine residual is detected above 0.1 mg/L during field measurement of chlorine, ascorbic acid provided by the lab will be added in the field to the BNA until no chlorine is detected. The lab must provide decanting bottles with ascorbic acid. When chlorine is detected, the sample will be added first to the decanting bottle, and then will be decanted into the VOC vials.

Sample fractions for microbiology will be cooled immediately in an ice-water bath and then placed into a cooler containing frozen blue ice or ice and water mixture to maintain a sample temperature of 0 - 10° C. Temperature will be measured and recorded at the time of sample collection and a note shall be made of the temperature of the cooler contents upon arrival at the laboratory. Infrared thermometers may not be used to measure sample temperatures for microbiological analyses.

Sample bottles will be filled sequentially. Bottles will normally be filled to the shoulder of the bottle, leaving a small space for expansion and mixing. VOC bottles will not be intentionally over-filled but carefully filled to achieve a convex meniscus at the top of the bottle, with no air bubbles present; when the VOC lid is screwed on a small volume of water will be displaced and no air will be present in the bottle.

EPA guidelines in 40 CFR 136 indicate that samples to be analyzed for dissolved metals must be filtered and preserved with nitric acid within 15 minutes after sample collection. Due to the risk of sample contamination through filtering of metals samples in typical vessel sampling locations in engine room spaces, filtering of dissolved metals will be performed immediately onboard ship using a closed filtration system using cubitainer and sealed pre-cleaned in-line disposable metals filters. A separate ADEC approved standard operating procedure will be provided to sampling staff and lead regulatory personnel that will outline the procedures for metals filtration

Note 1: Peristaltic pumps are not to be used for collection of VOC samples due to potential loss of volatile components.

Grab Samples – Sample bottles will be filled sequentially, normally being filled to the shoulder of the bottle, leaving a small space for expansion and mixing. Note that some sample types such as volatile organic compounds and fecal coliform bacteria have specific bottle filling requirements. The laboratory will provide sampling instructions with the sample bottles. If necessary, samplers will consult with the laboratory regarding sampling procedures.

Composite Samples – Samples will be composited directly into the sample bottles and collected sequentially. Between composite aliquots, bottles will be kept in a cooler with ice, to reach and maintain a sample temperature of $4 \pm 2^{\circ}\text{C}$. The time of the initial portion of the composite, composite intervals, and the final compositing time will be noted in the field logbook or data sheets. Sample time listed on the Chain-of- Custody or Transmission Form and the sample bottle will be the time of the final sample composite portion.

B.3 SAMPLE HANDLING AND CUSTORY REQUIREMENTS

B.3.1 Sampling Procedures

See Section B.2 of this QAPP – Sampling Method Requirements

B.3.2 Sample Custody Procedures

Samples and sample containers will be maintained in a secure environment, from the time the bottles leave the laboratory until the time the samples are received at the laboratory. The laboratories will maintain custody of bottles and samples using their normal custody procedures.

Blind field duplicates will be identified with discrete sampling labels and recorded as blind field duplicates in the sampler's field notebook.

To maintain the secure environment for samples on board ship and during transport, samples must be: 1) in the sampler's possession (line of sight); or 2) in a cooler sealed with signed and dated friable evidence tape on opposing sides of the cooler; or 3) in a locked cooler for which only the sampler has the key. When the cooler is sealed, the method of securing the samples must be such that tampering with samples or bottles is not possible: The cooler must be secured so that the lid cannot be removed without breaking the evidence tape or cutting the lock, so that tampering would be evident.

Transfer of samples will be accomplished using the laboratory's chain of custody form. When samples are transferred between personnel, such transfer will be indicated on the chain of custody form with signature, date, and time of transfer. The chain of custody will remain with the samples, sealed inside the cooler, until received by the laboratory.

At any time during sample transfer, if custody is broken, a note must be made on the chain of custody form accompanying the sample. Upon receipt at the laboratory, the laboratory sample custodian will make note if a breach of custody has occurred (for example, if a custody seal has broken during transport).

B.3.3 Shipping Requirements

Samples will be held within the respective method specified sample temperature holding requirements (see Table 5. Sample Containers, Preservations, Holding Times, and Sample Type). A 1-liter temperature blank will accompany all samples and will be measured at the laboratory upon receipt of the samples to verify the temperature. The temperature of this blank will be recorded on the chain of custody upon receipt of the sample at the lab.

To maintain the temperature, extra blue ice will be kept frozen on-board ship or ship ice will be used. Blue ice or ship ice will be exchanged just before shipment of samples to the lab and may be exchanged more frequently during the sampling trip, as required.

Some samples may be at a temperature near body temperature (37° C) at time of sample collection. This temperature encourages growth of fecal coliform bacteria and thus these samples must be cooled as quickly as possible, without freezing them. These samples shall be placed in a water bath containing ice cubes provided on board ship. The bottles should be immersed in the water to the shoulder, rotated frequently, and ice should be added/water drained off as the ice melts for approximately one hour until the sample reaches a temperature of <10° C. To ensure custody of these samples (the sample bottles may not be able to be sealed in the cooler until the temperature is lowered) these bottles can be sealed with custody tape individually, as necessary.

Holding time limitations must be considered when decisions are made regarding sampling and shipping times. Sample holding times are as described in Table 5 above. Planned sample shipping schedules will allow for the meeting of these holding times.

The most critical holding time will be that of fecal coliforms, which is defined by EPA as 6 hours from sample collection to laboratory receipt of sample and an additional time of 2 hours from sample receipt at lab to initiating the sample incubation period. **Hold time for fecal coliform samples will be 8 hours from collection to the start of analysis. This mirrors the time frame approved for the CLIA QAPP (used by large commercial passenger vessels), and reflects guidance provided to ADEC by the EPA.**

B.4 ANALYTICAL METHODS AND REQUIREMENTS

Laboratories providing analytical support to the Small Cruise Ship Program for water/wastewater samples collected within Alaska at a minimum must meet the specifications found in section A.6.1, Project Description.

Monitoring shall be conducted in accordance with EPA-approved analytical procedures and in compliance with 40 CFR Part 136, *Guidelines Establishing Test Procedures for Analysis of Pollutants*. Reference the Project's MQO Table 4 (section A.7.2) of this QAPP for list of parameters of concern, approved analytical methods, method-specific detection and reporting limits, accuracy and precision criteria limits applicable to this project. 40 CFR, Part 136.6 lists other regulated pollutant parameters not listed in Table 4. **Only approved methods for water/wastewater (not drinking water) will be used for the analysis of microbiological, chemical, and physical measurements.**

Any lab performing analytical work on samples collected within Alaska must provide (or have on file with the DEC DOW QA Officer) a current electronic copy of their approved Laboratory Quality Assurance Manual (and respective measurement method SOPs to the ADEC Division of Water QA Officer and DEC Project Manager. These documents must specify calibration and quality control (QC) criteria, practices and procedures for each method employed that are essential in the review, validation, and verification and reporting of sample result data.

B.5 QUALITY CONTROL REQUIREMENTS

Quality Control (QC) is the overall system of technical activities that measures the attributes and performance of a process, item, or service against defined standards to verify that they meet the monitoring project's data quality objectives.

For the Small Cruise Ship Monitoring Program QC activities are separated into:

- Field Quality Control Measures, and
- Analytical Laboratory Quality Control Measures.

In this section define the quality control activities that will be used to control the monitoring process to validate sample data. Use separate tables to define field QC measurements and Lab QC measurement and their criteria for accepting/rejecting project specific water quality measurement data.

B.5.1 Field Quality Control (QC) Measures

Quality Control measures in the field that will be used to control the monitoring process to validate sample data include but are not limited to:

- Proper cleaning of sample containers and sampling equipment.
- Maintenance, cleaning, and calibration of field equipment/ kits per the manufacturer's and/or laboratory's specifications, and field Standard Operating Procedures (SOPs).
- Chemical reagents and standard reference materials are used prior to expiration dates.
- Proper field sample collection and analysis techniques.
- Correct sample labeling and data entry.
- Proper sample handling and shipping/transport techniques.
- Field blind replicate sample (blind to the laboratory) sample.
- Field replicate measurements.

Field Replicate samples will be collected for all repeat sampling events (regardless of the reason for the resample). This means one field replicate per vessel being resampled and per sample being resampled. Example: Two ships need resampling = 2 primary samples and 2 replicates; One ship has an exceedance on two different occasions = two primary and two replicates. Replicate samples collected for subsequent laboratory analysis will be submitted as "blind replicate samples" to the lab for analysis.

QC acceptance criteria for field/lab replicate (precision) samples are listed in Table 4 Section A.7.2 under the precision column.

B.5.2 Laboratory Quality Control (QC) Measures

Sub-contracted laboratories will provide analytical results after verification and validation by the laboratory QA Officer. The laboratory must provide all relevant QC information (including method/parameter specific QC acceptance criteria limits) with its summary of data results so that the project manager and project QA officer can perform field data verification and validation and review the laboratory reports. The project manager reviews these data to ensure that the required QC measurement criteria have been met. If a QC concern is identified in the review process, the Project Manager and Project QA Officer will seek additional information from the sub-contracted laboratory to resolve the issue and take appropriate corrective action/s.

B.6 INSTRUMENT/EQUIPMENT TESTING, INSPECTION AND MAINTENANCE REQUIREMENTS

Field instruments include a pH test kit, chlorine residual colorimeter instrument, and a calibration /verification thermometer.

Maintenance of the chlorine residual colorimeter instrument includes keeping the sample cell rinsed after sample measurement, keeping the cell clean and free of fingerprints and oils, and checking the instrument annually against a known set of standards. An extra cell will be kept with the test kit in case of breakage or scratches to the sample cell. The field kit will be checked against the lab kit at the beginning and end of the sampling season. The traceability of this calibration/verification will be documented in the respective instrument field book.

The analysis of pH in the field will be used for reference purposes only and will be verified through laboratory analysis. A pH probe shall be used that ensures the most accurate reading possible in the expected range of pH values. The laboratory will supply pH 4.0, 7.0 and 10.0 reference buffers to the sampling team for field verification along with standard reference traceability documents.

Prior to a sampling event, all sampling instruments and equipment are to be tested and inspected in accordance with the manufacturers' specifications. All equipment standards (thermometers, barometers, etc.) are calibrated appropriately and within stated certification periods prior to use.

Monitoring staff will document that required acceptance testing, inspection and maintenance have been performed. Records of this documentation should be kept with the instrument/equipment kit in bound logbooks or data sheets.

B.7 INSTRUMENT CALIBRATION AND FREQUENCY

Field instruments include a pH test kit, chlorine residual colorimeter instrument, and a thermometer.

Field instruments shall be calibrated where appropriate prior to using the instruments. For example, pH meters shall be calibrated according to the manufacturer's specifications using pH buffers at 4.0, 7.0 (mid-range) and 10.0 that are within their certification period (expiration date has not lapsed). If equipment and/or kits require calibration immediately prior to the sampling event, the calibration date will be recorded in the operator's field logbook or field data sheets. When field instruments require only periodic calibration, the record of this calibration should be kept with the instrument.

Maintenance of the chlorine residual colorimeter instrument includes keeping the sample cell rinsed after sample measurement, keeping the cell clean and free of fingerprints and oils, and checking the instrument annually against a known set of standards. An extra cell will be kept with the test kit in case of breakage or scratches to the sample cell. The field kit is to be checked against the lab kit once per season. The calibration of these instruments will be documented in field books.

Other instruments not described will follow the recommended procedures in the respective user manuals or other approved standard procedures.

B.8 INSPECTION/ACCEPTANCE OF SUPPLIES AND CONSUMABLES

Sample bottles will be visually inspected prior to sampling. If problems with bottles are noted, such as a cap that has fallen off an empty bottle, note of the problem will be made on the chain of custody form.

Spare parts will be available for all equipment used and Standard Reference Materials and test kit reagents used in sampling will be checked to ensure that they are within expiration dates.

All reagents, calibration standards, and kit chemicals are to be inspected to ensure that expiration dates have not been exceeded prior to use in the monitoring project.

All sample collection devices and equipment will be appropriately cleaned prior to use in the monitoring project.

All sample containers, tubing, filters, etc. provided by a laboratory or by commercial vendor, will be certified clean for the analyses of interest. The sampling manager/person will make note of the information on the certificate of analysis that accompanies sample containers to ensure that they meet the specifications and guidance for contaminant-free sample containers for the analyses of interest.

No standard solutions, buffers, or other chemical additives will be used if the expiration date has expired. It is the responsibility of the sampling manager or his/her designee to keep appropriate records, such as logbook entries or checklists, to verify the inspection/acceptance of supplies and consumables and restock these supplies and consumables when necessary.

Contracted and sub-contracted laboratories will follow procedures in their laboratory's QAP and SOPs for inspection/acceptance of supplies and consumables.

B.9 DATA MANAGEMENT

The success of a monitoring project relies on data and their interpretation. It is critical that data be available to users and that these data are:

- Of known quality,
- Reliable,
- Aggregated in a manner consistent with their prime use, and
- Accessible to a variety of users.

Data Management includes accurate field notebook entries, completed Chain-of-Custody forms and laboratory data management documents. Laboratory data management procedures and processes are described in the respective Laboratory's Quality Assurance Plan. This document must be available upon request.

The Vessel Representative will report data directly to the ADEC Project Manager after thorough review by the sampling manager and the laboratory QA Manager within the regulatory time limits.

Quality Assurance/Quality Control (QA/QC) of data management begins with the raw data and ends with a defensible report, preferably through the computerized messaging of raw data.

C.1 ASSESSMENTS AND RESPONSE ACTIONS

C.1.1 Field Assessments

ADEC may perform a field sampling audit on randomly chosen sampling events during the season to evaluate the performance of the samplers. Follow-up field audits may be necessary pending audit findings. Audits will concentrate on sampling technique, sample handling, field records, field testing methods, and adherence to vessel specific sampling plans and the QAPP. ADEC will send these audit reports to the responsible vessel operator within 14 days of the audit. These reports will include corrective actions, if necessary.

C.1.2 Laboratory Assessments

Laboratories are subject to periodic and extensive audits by regulatory agency personnel as part of their certification. Reports of these audits will be made available to the ADEC Project Manager and ADEC Water Quality Assurance Officer. The ADEC project manager may review any recent and pertinent technical systems audit reports of the analytical laboratories involved in this project.

C.1.3 Replicates

One blind conventional and priority replicate sample will be collected for each vessel resampling event for each sample resampled. Acceptance criteria for blind replicate samples will be the same as the method specific MQO precision criteria (Table 4).

C.1.4 Corrective Action

If errors are found by the laboratory or sampling personnel, the ADEC Project Manager and Vessel Representative should be notified immediately. The responsible party will then immediately correct the problem and will send those corrections via email to the Vessel Representative, ADEC Project Manager and, the ADEC DOW QA Officer.

C.2 REVISIONS TO QAPP

Annually the QAPP will be reviewed and revised as needed. Minor revisions may be made without formal comment. Such minor revisions may include changes to non-signatory identified project staff, QAPP distribution list and/or minor editorial changes.

The QAPP will be approved for three years. At that time a new QAPP will be submitted for ADEC approval.

Revisions to the QAPP that affect stated monitoring Data Quality Objectives, Method Quality Objectives, method specific data validation “critical” criteria and/or inclusion of new monitoring methods must solicit input/ and pre-approval by DEC DOW QA Officer/DEC Project Management before being implemented.

D. DATA VALIDATION AND USABILITY

D.1 DATA REVIEW, VERIFICATION AND VALIDATION REQUIREMENTS

During the overall small ship sampling project, the ADEC Project Manager or their designee will review field notes and laboratory data packages to detect correctable problems for the remainder of the study.

Upon receipt of these completed data packages from the Vessel Representative the ADEC Project Manager or designee will review data and field notes to verify that this QAPP was followed. Items reviewed will include:

- Comparison of dated vessel specific sampling plans with the QAPP to assure that the correct samples were taken.
- Comparison of dated sampling plans with field notes and custody forms to assure that planned samples were collected.
- Review of field notes and data to assure that information specified in the QAPP has been recorded.
- Review of laboratory data packets, particularly the QA/QC laboratory sheets.

Any problems noted must be immediately brought to the attention of the Vessel Representative who will notify the Lab Manager or sampler who will take appropriate corrective action as necessary.

D1.1 Data validation

Data validation means determining if data satisfy QAPP-defined user requirements; that is, that the data refer to the overall data quality objectives. Data validation is an analyte and sample-specific process that extends the evaluation of data beyond method, procedural, or contractual compliance (i.e., data verification) to determine the analytical quality of a specific data set to ensure that the reported data values meet the quality goals of the environmental data operations (method specific data validation criteria).

D1.2 Data Verification

Data Verification is the process of evaluating the completeness, correctness, and conformance/compliance of a specific data set against the method, procedural, or contractual requirements.

D1.3 Data Review

Data Review is the process that evaluates the overall data package to ensure procedures were followed and that reported data is reasonable and consistent with associated QA/QC results.

D.2 VERIFICATION AND VALIDATION METHODS

D2.1 Validation Methods

Data validation determines whether the data sets meet the requirements of the project-specific intended use as described in the QAPP. That is, were the data results of the right type, quality, and quantity to support their intended use? Data validation also attempts to give reasons for sampling and analysis anomalies, and the effect that these anomalies have on the overall value of the data.

All data generated shall be validated in accordance with the QA/QC requirements specified in the methods and the technical specifications outlined in this QAPP. Raw field data will be maintained by the Program staff who collect it. Raw laboratory data shall be maintained by the laboratory. The laboratory may archive the analytical data into their laboratory data management system. All data will be kept a minimum of 5 years.

The summary of all laboratory analytical results will be reported to the Project supervisor/manager staff. Data validation will be performed by the laboratory for all analyses prior to the release of data. All laboratory data will be validated according to the laboratory's QA Manual and SOPs and as specified in the Monitoring Project's QAPP. The rationale for any anomalies in the QA/QC of the laboratory data will be provided to the Project Manager with the data results. Completed Chain-of-Custody or Transmission forms (if required) will be sent back from the laboratory to the Project Manager.

D2.2 Verification Methods

The primary goal of verification is to document that applicable method, procedural and contractual requirements were met in field sampling and laboratory analysis. Verification checks to see if the data were complete, if sampling and analysis matched QAPP requirements, and if Standard Operating Procedures (SOPs) were followed.

Verification of data is the responsibility of the Project QA Officer. The Project QA Officer should verify at least 10% of generated project data.

D.3 RECONCILIATION WITH USER REQUIREMENTS

The Project Manager and the Project QA Officer will review and validate data against the Project's defined MQOs prior to final reporting stages. If there are any problems with quality sampling and analysis, these issues will be addressed immediately, and methods will be modified to ensure that data quality objectives are being met. Modifications to monitoring will require notification to ADEC and subsequent edits to the approved QAPP.

Only data that have been validated and qualified, as necessary, shall be provided to ADEC Division of Water.

Appendix A - Alaska Small Cruise Ship Sampling Checklist

Vessel Name	
Date	
Sample Type (Source)	
Sampler Name(s)	
Sample Number	

Notification:

- ☐ ADEC project manager notified 36 hours prior to the sampling event.

Type of Sampling (Mark all that apply)

- ☐ Conventional I
☐ Conventional II
☐ Priority pollutant
☐ Nutrients
☐ Resample

Samples will reflect a representative discharge of treated wastewater to waters of the state. Second sample event should not occur within 21 days of the previous sample.

Equipment: Check that equipment is operational/ recently calibrated

- ☐ Digital Thermometer
- ☐ pH Meter
- ☐ CI Meter

Note: Applicable Calibration records to be included in the field notes.

Protective Equipment- check condition and availability

- ☐ Goggles
- ☐ Gloves

Sampling Bottles

- ☐ Inventory Sampling Bottles/ Fill out bottle labels.
- ☐ Bottles are pre-cleaned and will not require rinsing with sample.
- ☐ When sample bottles are pre-preserved, bottles are not rinsed, only filled once.
- ☐ Fill out Custody Form based on type of sampling being conducted.
- ☐ Samples will be listed as “grab” on the COC form.
- ☐ Sampling Identification
 - Sample ID should clearly state where the sample was taken. For example, a mixed black and gray sample taken from the MSD discharge line = MSD BW&GW.
 - Source of the WW should be identified. For example- mixed galley and laundry graywater should be identified as GW Mixed- Laundry and Galley.
 - If sampling a tank- identify the tank using the naming conventions in the VSSP.
- ☐ Have ice/cooler on hand to ensure samples are cool.

Verify Sampling Site

- ☐ Sample ports within 50 feet of the point of overboard discharge.
- ☐ Determine what sampling sites are to be used for the event.
- ☐ Ensure functioning of sampling port.

Review VSSP and BMP

- ☐ Specific sampling techniques for each vessel will be detailed in the VSSP.
- ☐ Note any deviations from submitted plans.

Pre sampling brief with vessel Master

- ☐ Confirm location and time of sampling.
- ☐ Vessel is discharging overboard, if not note conditions.
- ☐ Discuss any deviations from submitted plans.

Sampling Field Notes will include:

- ☐ Vessel name
- ☐ Names of sampling personnel, names of shipboard assistants
- ☐ Signature or initials of the sampler indicating that the sample port is correct.
- ☐ Sample ID clearly stating where the sample was taken.
- ☐ COC properly completed (i.e., Sample date / times / signatures)
- ☐ Records collected on discharge flow rates.
- ☐ Nature of sample recorded (composite or grab).
- ☐ Waste type recorded (blackwater, graywater, or mixed)
- ☐ If deviations from VSSP and/or QAPP noted, reported to ADEC.

- ☐ If unannounced sampling, sampler verified that vessel is discharging.
- ☐ Latitude/longitude and vessel speed (underway only)
- ☐ Copy of the Discharge record for the sampled discharge included.
- ☐ Samples delivered to laboratory within holding times for analyses. *Maximum of 8 hours.*

Sampling event

- ☐ Care will be taken to assure sample representativeness and homogeneity.
- ☐ Pre-sampling assembling of equipment
 - Bucket for flushing system
 - Cooler filled with ice / ice water.
 - Field testing equipment / Field sheets
- ☐ Sampling Procedures
 - Record time, Latitude, Longitude, waste sample, sample location,
 - Sample was flushed: Flushing a volume of water equal to at least ten times the volume of the sample discharge line to minimize contamination.
 - Samplers will take care not to touch the insides of bottles or lids/caps during sampling.
 - Check Chlorine and record pH, and temperature in the field notebook
 - VOC bottles filled to avoid air bubbles. VOC bottles will be filled leaving a convex meniscus at the top of the bottle (no air bubbles) and when the VOC lid is screwed on a small volume of water will be displaced.
 - All bottles (other than VOC) filled leaving a small space for expansion and mixing.
 - Samples will be cooled immediately on ice; stored in a cooler containing ice/ ice and water mixture to maintain a sample temperature of 4 +/-2° C.
- ☐ Secure cooler for transport to laboratory with custody seals.
The cooler must be secured or in sight of custody holder. Record every custody change on COC form. Each person receiving needs to sign and date with time of transfer.
- ☐ Samples delivered to laboratory within holding times for analysis.
The cooler must be either secured or under observation to ensure it is not tampered with. Record on COC form each time the cooler changes custody.

Appendix B - Alaska Small Cruise Ship Data Review Checklist

Vessel Name	
Date	
Sampling Location	
Sampling Team	
Laboratory	

Sample Reason:

- ☐ Routine sample
- ☐ Resample (e.g., previous exceedance, missed sample)
- ☐ Performance (vessel not discharging overboard)

Samples Type:

- ☐ Conventional I / Conventional II / Priority / Nutrients / Other

Final Report Package Includes:

- ☐ Sampling event summary sheet
- ☐ Analytical Report
- ☐ Ship name
- ☐ Sample ID Number
- ☐ Sample date and time collected
- ☐ Parameter names and method references
- ☐ Analytical results
- ☐ Method Detection Limits (MDL's)
- ☐ Practical Quantitation Limits (PQL's/reporting limits)
- ☐ Date and time of sample preparation
- ☐ Date and time of analysis
- ☐ Verification that holding times were met
- ☐ Quality control information: blank results, spiked blank of laboratory control standard recovery, matrix spike/spike duplicate recoveries, and relative percent differences between duplicate spike analyses
- ☐ Case narrative describing sample: deviations from methods, procedural problems with sample analysis, explanation of data abnormalities, & inconsistencies with QAPP/VSSP. Narrative should describe results outside precision/accuracy limits and the corrective actions taken to rectify QC problems.
- ☐ Chain of custody form
- ☐ Cooler receipt forms with temperature indicated
- ☐ Discharge logs covering time of sampling; Explanation if no log is provided
- ☐ Field notes
- ☐ Name of discharge port sampled
- ☐ Latitude and longitude information & Vessel Speed (if underway)
- ☐ Completed sampling checklist
- ☐ Completed data review checklist
- ☐ Photo of wastewater sample port(s) sampled

Appendix C – QAPP Deadlines*

***Please Note- these deadlines can change due to regulatory or statute changes. Please consult the latest ADEC regulations.**

Applications:

QAPP: March 1st

VSSP: 21 days before sampling (ADEC). Preferable to provide VSSP application well in advance of this date, this to allow for ADEC CPVEC staff adequate review time.

Sampler qualifications: 21 days before sampling.

Notifications:

Deviations from VSSP: Immediately.

Deviations from BMP Plan: Immediately.

Sample Event- 36 hours prior.

Audit event: 36 hours prior.

Errors noted by lab or samplers: 7 days

Non-Compliance: within 24 hours of discovery.

Actions taken by the vessel to avoid re-occurrence: immediately after discovery / See BMP plan.

Analytical Reports:

21 days after completion of lab analysis.

Audits

Initial audit: Within 30 days of project initiation.

Second audit: Midway through the project.

Reporting:

Sampler training/certification information: when requested.

Sample scheduling, date, time, and location. At the beginning of the season

Sample Value exceedance: Report immediately when discovery notification of the lab. See BMP procedure.

Field instruments calibration and certification: Due May 31st and July 31st.

Audit reports due within 14 days. Draft reports are due with 7 days.

Technical laboratory audits: Draft due 1-2 weeks of end audit, final due 2-4 weeks of end audit.

First data review: Due by June 15th

Other data reviews: equally spaced through the season

Data review with problems noted: Immediately notify & submit report within 40 days of sample event.