TAHOE-TRUCKEE SANITATION AGENCY
A Public Agency
13720 Butterfield Drive
TRUCKEE, CALIFORNIA 96161
(530) 587-2525 • FAX (530) 587-5840

January 13, 2021

Christine Soleto
State Water Resources Control Board
1001 I Street
Sacramento, CA 95814

RE: Notice of Violation and Order to Correct, Certificate No. 1144

Ms. Christine Soleto,

Please accept this letter as evidence that the Tahoe-Truckee Sanitation Agency has provided the appropriate corrective action as identified in the Notice of Violation and Order to Correct, Certificate No. 1144.

The following will provide references to the appropriate corrective actions and will correlate to the sequence listed in the violation.

1. *TTSA's laboratory director and operations management must identify that the appointed laboratory director maintains the authority to implement and be responsible for all items listed in CCR § 64817(d). Documentation must include, at a minimum:*
    a. *A timeline of any laboratory director absence from January 1, 2019 to present, affirmed to be true and correct by operations management.*
        - ***Please reference Exhibit A***

    b. *An attestation from operational management that the laboratory director has the authority to uphold all items listed in CCR § 64817(d), including:*
        (1) *all analytical and operational activities of the laboratory, including those of any auxiliary or mobile laboratory facilities; and*
        (2) *supervision of all personnel employed by the laboratory, including those assigned to work in any auxiliary or mobile laboratory facilities, and those persons designated as Principle Analysts; and*
        (3) *the accuracy and quality of all data reported by the laboratory, including any auxiliary or mobile laboratory facilities.*
        - ***Please reference page 5, section (D)(2) of Exhibit B***

c. *A policy to ensure that laboratory management and all personnel who work in the laboratory are free from any undue internal and external commercial, financial and other pressures and influences that may adversely affect the quality of their work. This policy must be included in the laboratory's QAM.*
   - ***Please reference page 6, section (B) of Exhibit B***

d. *Signatures with dates affirming that the materials provided in response to this required corrective action are true and correct, from the laboratory director and operational management.*
   - ***Please reference Exhibit C***

2. *TTSA must submit a corrective action report which contains, at a minimum, the following:*
   a. *An update to the Quality Assurance Manual and applicable Standard Operating Procedures containing corrections necessitated by this Order.*
      - ***Please reference Exhibit B***
      - ***Please reference page 3, section 8.1 and page 7, section 10.3 for the US EPA Method 300.0 SOP and page 8, section 8.16 and 8.17 for the SM 9221 SOP in Exhibit D***

   b. *Records demonstrating the staff who work in the laboratory have reviewed and been trained to the updated QAM and any SOPs.*
      - ***Please reference Exhibit E***
      - ***Please reference Exhibit F***

   c. *Documentation specified in item 1, above.*
      - ***Please reference exhibits above***

If there are questions, please do not hesitate to contact either Michael Peak, Operations Manager, or myself.

Bill Pindar
Laboratory Director

Enclosures: Exhibit A - Timeline of any laboratory director absence
Exhibit B - Quality Manual
Exhibit C - Laboratory director and operational management affirmation
Exhibit D - US EPA Method 300.0 and SM 9221 SOPs
Exhibit E - QM training acknowledgement
Exhibit F - Demonstration of capabilities for analysis

Exhibit A

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RE: Notice of Violation and Order to Correct, Certificate No. 1144

In accordance with corrective action No. 1.a of Notice of Violation and Order to Correct, Certificate No. 1144, the timeline of any laboratory director absence from January 1, 2019 to present, affirmed to be true and correct by operations management, is as follows:

- January 1, 2019: Laura Mader is acting Laboratory Director.
- April 9, 2020: Bill Pindar is assigned as acting Temporary Laboratory Director.
- June 18, 2020: Laura Mader is assigned as acting Laboratory Director.
- July 1, 2020: Kristin Davis is assigned as acting Temporary Laboratory Director.
- September 21, 2020: Kristin Davis is assigned as acting Laboratory Director.
- November 24, 2020: Bill Pindar is assigned as acting Laboratory Director.

Michael Peak
Operations Manager

Exhibit B

Tahoe-Truckee Sanitation Agency
Laboratory
Quality Manual

Tahoe-Truckee Sanitation Agency
13720 Butterfield Dr.
Truckee, CA 96161
530-587-2525
www.ttsa.net

January 2021

Table of Contents

Scope and Application

This quality manual (QM) shall address the quality assurance and quality control practices to be employed by the laboratory and shall include at a minimum, quality assurance and quality control requirements specified in the test methods for which the laboratory seeks to obtain or maintain accreditation and documents, or references to documents, that contain the following elements:

1. Laboratory organization and job descriptions.
2. Ethics and integrity clause.
3. Quality assurance objectives for measurement data.
4. Sampling procedures (when the laboratory performs the sampling).
5. Procedures for sample acceptance/rejection, custody, handling, and disposal of samples.
6. Calibration procedures and frequency.
7. Analytical procedures.
8. Acquisition, reduction, validation and reporting of data.
9. Internal quality control checks.
10. Performance and system audits.
11. Preventive maintenance.
12. Assessment of precision and accuracy.
13. Corrective action.
14. Quality assurance reports.

Each of the above references shall be discussed further in the QM. As required, the QM will be reviewed and updated annually as needed.

Organization and Job Descriptions

The Tahoe-Truckee Sanitation Agency (TTSA) is a publicly owned wastewater treatment facility in California serving North Lake Tahoe and Truckee areas. Discharge compliance monitoring requirements are detailed in TTSA's Monitoring and Reporting Program and Waste Discharge Requirements issued by the California State Water Resources Control Board. The facility has one main analytical laboratory and several smaller satellite laboratories. All compliance testing for reporting purposes is done within the main TTSA Laboratory, in accordance with CCR § 64810.00, or is completed using field testing methods.

TTSA laboratory personnel include a Technical Manager (TM) and numerous Analysts. The Technical Manager is the Agency Laboratory Director. Analysts consist of Agency Chemists (e.g. Chemist I/II/III) and wastewater treatment plant operators (e.g. Operations Manager, Chief Plant Operator, Operations Supervisor, Operations Shift Supervisors and Operators OIT/I/II/III) whom received the required Demonstration of Capability (DOC) for the appropriate sampling analysis.

The analysts are under direct supervision and report to the Technical Manager and the Technical Manager reports to the Operations Manager. When wastewater treatment plant operators

perform the duties of an analyst, they shall report to the Technical Manager. A copy of the Agency organization chart along with job descriptions are found in the Agency website (https://www.ttsa.net).

For reporting purposes, the Technical Manager, or designee, provides sampling analysis data to the Chief Plant Operator.

The laboratory shall designate a Technical Manager. Except as provided in subdivisions (b) and/or (c), below, the Technical Manager shall have at minimum:

(A) Technical Manager
1) A baccalaureate degree in chemistry, biochemistry, biology, microbiology, natural or physical science, environmental engineering, sanitary engineering, or chemical engineering; and
2) Three (3) years' experience in the analysis of chemical, biological, or microbiological samples in an environmental laboratory, prior to being designated Technical Manager, subject to the following allowances:
   a. A master's degree in chemistry, biochemistry, biology, microbiology, natural or physical science, environmental engineering, sanitary engineering, or chemical engineering may be substituted for one (1) year of the required experience;
   b. A doctorate in chemistry, biochemistry, biology, microbiology, natural or physical science, environmental engineering, sanitary engineering, or chemical engineering may be substituted for two (2) years of the required experience.

(B) An employee of a drinking water or wastewater treatment facility, who holds a valid CWEA Laboratory Analyst certification or CA-NV/AWWA Water Quality Analyst certification, shall be deemed to meet the qualifications of Technical Manager if the grade of certification has educational and experience requirements appropriate to the scope of analytical testing in the facility's laboratory. The following table states the grades of certification and the required training or experience to obtain for each grade.

Analyst Certification grades and Required Training or Experience

CA-NV AWWA	**CWEA**	**Required Training or Experience**
I	I	Microbiological Methods
		Solids Methods
		Biochemical Oxygen Demand (BOD) Methods
		Carbonaceous BOD Methods
II	II	Titrimetric Methods
		Methods using Specific Ion
		Electrode Technologies
		Colorimetric Methods

III	III	Methods using Ion Chromatography
		Methods using Flame Atomic Absorption
		Methods using Graphite Furnace Atomic Absorption
IV	IV	Methods using Gas or Liquid Chromatography Technologies
		Methods using Inductively Coupled Plasma Technologies

(C) The following shall be exempt from meeting the requirements in subdivisions (A) and (B), above:
1) An individual who has continuously held the position of Technical Manager at an environmental testing laboratory since the laboratory was first accredited, provided that the accreditation date was on or before December 31, 1994; and
2) A director of a public health laboratory, pursuant to Health and Safety Code sections 101150 and 101160.

(D) The Technical Manager, and/or designee, shall:
1) Comply with 2016 TNI Standard - Revision 2.1, Volume 1, Module 2, Sections 4.1.7.2, herein incorporated by reference (with the exception of part [f]); or
2) Be responsible for:
   a. All analytical and operational activities of the laboratory, including activities of satellite or mobile laboratories under the same certificate of accreditation;
   b. Supervision of all personnel employed by the laboratory, including personnel assigned to work in satellite or mobile laboratories under the same certificate of accreditation; and
   c. The accuracy and quality of all data reported by the laboratory, including data from satellite or mobile laboratories under the same certificate of accreditation.

(E) Subdivision (D)(2), above, will become invalid three (3) years from the effective date of CCR § 64812.00, and laboratories will be required comply with subdivision (D)(1), above.

(F) If a Technical Manager is absent for a period of time exceeding:
1) Fifteen (15) consecutive days, a person meeting the qualifications of the Technical Manager shall be designated to serve as a temporary Technical Manager; or
2) Thirty-five (35) consecutive days, ELAP shall be notified in writing.

(G) Three (3) years from the effective date of CCR § 64812.00, a laboratory shall designate a Quality Manager. The Quality Manager, and/or their designee, shall comply with 2016 TNI Standard - Revision 2.1, Volume 1, Module 2, Section 4.1.5(i), 4.1.7.1, 4.2.6, 4.2.8.2, and 4.14.1, herein incorporated by reference.

An analyst is a designated individual who performs the “hands-on” analytical methods and associated techniques, and who is the one responsible for applying required laboratory practices and other pertinent quality controls to meet the required level of quality.

TTSA laboratory personnel certification requirements are in accordance with the requirements for the Technical Manager and corresponding job descriptions.

In accordance with the 2016 TNI Standard - Revision 2.0, Volume 1, Module 2, Section 4: Management Requirements, the laboratory shall:

(A) Have the authority and resources needed to carry out their duties, including the implementation, maintenance and improvement of the management system, and to identify the occurrence of departures from the management system or from the procedures for performing tests and/or calibrations, and to initiate actions to prevent or minimize such departures;
(B) Be free from any undue internal and external commercial, financial and other pressures and influences that may adversely affect the quality of their work;
(C) Ensure the protection of its customers' confidential information and proprietary rights, including procedures for protecting the electronic storage and transmission of results;
(D) Avoid involvement in any activities that would diminish confidence in its competence, impartiality, judgment or operational integrity;
(E) Specify the responsibility, authority and interrelationships of all personnel who manage, perform or verify work affecting the quality of the tests and/or calibrations;
(F) Provide adequate supervision of testing and calibration staff, including trainees, by persons familiar with methods and procedures, purpose of each test and/or calibration, and with the assessment of the test or calibration results;
(G) Overall responsibility for the technical operations and the provision of the resources needed to ensure the required quality of laboratory operations;
(H) Ensure that its personnel are aware of the relevance and importance of their activities and how they contribute to the achievement of the objectives of the management system.

Ethics and Integrity Clause

Laboratory personnel are required to uphold the highest ethics and integrity. This is accomplished by being honest, accountable, and trustworthy.

Additionally, TTSA has adopted Core Values (https://www.ttsa.net/core-values) which consist of:

- Service
- Professionalism
- Teamwork
- Initiative
- Communication

Quality Assurance Objectives for Measurement Data

The objective of the quality control program at TTSA is to assure 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 stated requirements established (e.g. Standard Methods for the Examination Water and Wastewater and Methods for the Chemical Analysis of Water and Wastes published by the Environmental Protection Agency); operational techniques and activities that are used to fulfill requirements for quality; also the system of activities and checks used to ensure that measurement systems are maintained within prescribed limits, providing protection against "out of control" conditions and ensuring that the results are of acceptable quality.

Sampling Procedures (when the laboratory performs the sampling)

Sampling in the plant is performed with automated composite sampling devices. Samples may also be a grab samples as needed or required. Composite sampling devices are programmed to sample a minimum of 8 timer per 24-hour period. The final effluent composite sampler is programmed to collect a sample volume based on current effluent flow (flow-based sampling). Operational requirements dictate additional sampling that may include multiple plant process sites and increased frequency of most constituents. Operations personnel involved in sample collection will log sample time collection on reportable composite samples.

Sampling techniques, holding times and any required sample preservation follow the Standard Methods for the Examination Water and Wastewater or Methods for the Chemical Analysis of Water and Wastes published by the Environmental Protection Agency. Refrigeration and acidification are the most common means of preservation. The laboratory prefers to perform the required analyses of its samples as soon as possible so hold times and preservation are not a consideration in most cases. Samples that do not meet the storage and preservation requirements per Standard Operating Procedures (SOP) will be rejected.

Groundwater sampling is done monthly and weekly by trained laboratory personnel. The number of wells sampled is determined by laboratory personnel availability. Field analysis is performed on each well for temperature, static well level, and pH. A calibrated field meter is used to measure pH and temperature after purging the well. A conductivity depth sounder is used to measure depth to water and calculate well volume to perform a three-volume purge of the wells. Well samples are obtained by a well pump or well bailer using appropriate calculations on TTSA Well Chain of Custody forms. Samplers are to be rinsed with DI water between usages. Samples should be kept in ice chests in the field and delivered to the laboratory as soon as practical. Pre-marked bottles are rinsed three times except for the special bottles (VOA and Sterile Bottles) that have preservatives and are not to be rinsed. Samples will be kept in a 4° C refrigerator and analyzed for required constituents as soon as possible.

Surface water sampling is performed twice a month. Laboratory personnel perform this sampling after trained in the specific Quality Assurance Project Plans (QAPP's), Surface Water Ambient Monitoring Program (SWAMP) procedures, and TTSA Laboratory Field Method SOP's. The

samples are filtered in the field (when applicable) and transported on ice. A chain of custody form is completed for all surface water samples.

Procedures for Sampling Acceptance/Rejection, Custody, Handling, and Disposal of Samples

(A) Drinking Water Analysis Custody:

Public water purveyors and owners of private wells deliver samples to the TTSA laboratory for Total Coliform and Fecal Coliform Drinking Water (P/A) analysis. The laboratory will only accept these samples in bottles provided by the Agency. The Agency provides information related to appropriate sampling techniques and allowable hold times to all interested parties. Specific information regarding sample rejection protocol is listed in the Sample Receiving, Notification, and Reporting of Total Coliforms and E. Coli. in Drinking Water SOP. All information relating to the sample must be logged on the Chain of Custody forms as requested. Phone numbers, addresses, fax numbers are critical information for the laboratory to contact the appropriate parties if samples were to fail.

(B) Sample Acceptance/Rejection:

All samples must contain the required information, be within the acceptable hold times and have the appropriate documentation (e.g. Chain of Custody form) prior to being accepted.

(C) Sample Handling:

All samples are handled in accordance with corresponding SOPs.

(D) Waste Disposal:

Microbiological samples will be autoclaved before being disposed of. Hazardous waste is kept in appropriate containers and is disposed of through a certified waste disposal company. The regular hazardous waste stream consists of COD waste and SEAL auto-analyzer waste. The plant chemical inventory is reviewed periodically to determine if additional out-of-use or expired chemicals need to be disposed of.

Calibration Procedures and Frequency

Instrument calibration and frequency will be done at regular intervals as recommended by instrument manuals and /or method requirements.

Temperatures are recorded daily for ovens, incubators and refrigerators except for the microbiology incubators which are recorded twice per day at least 4 hours apart, when laboratory personnel are present. Semi-annual temperature checks with NIST certified thermometers are

performed to ensure precise temperature controls. These thermometers are replaced or recalibrated every 5 years.

Calibration of pH meter(s) is done before the use of the pH probe using single aliquots of 2 different buffers with a check of a third buffer. Electrodes will be replaced when the recorded slope values show failure or when response times become unacceptable.

Spectrophotometers have internal wavelength checks each time they are used, and lamps will be replaced as needed. Flow through cells will be cleaned daily and if poor reproducibility is observed additional cleaning will be attempted before replacement.

Calibration curves are performed as required for each analysis, some as often as each batch and others as new reagents are incorporated into the analysis. Calibration curve information such as slope and correlation coefficient are calculated and recorded with raw data and checked with previous curves for acceptability. Correlation coefficients should be at least 0.995 and the standard curve values should fully bracket expected concentrations of samples analyzed. Samples which exceed the maximum standard curve concentration will require dilutions and reanalysis.

Analytical Procedures

All analytical procedures are performed as stated in the laboratory SOPs. All SOPs are reviewed and updated annually or as needed.

The analytical procedures used at TTSA are listed in the following table.

Procedure	**Procedure #**	**Reporting Levels/MDL's**
Microbiology of Drinking Water		
Total Coliform	SM9223 B Colilert	Present/Absent
E. Coli	SM9223 B Colilert	Present/Absent
Microbiological Methods for Non-Potable Water and Sewage Sludge		
Total Coliform	SM9221 B, C	<1.8 MPN
Fecal Coliform	SM9221 C, E	<1.8 MPN
Inorganic Constituents in Non-Potable Water		
Chloride	EPA 300.0	0.1 mg/L
Nitrate	EPA 300.0	0.01 mg/L
Nitrite	EPA 300.0	0.01 mg/L
Nitrate-nitrite, Total	EPA 300.0	0.01 mg/L

Sulfate	EPA 300.0	0.1 mg/L
Total Kjeldahl Nitrogen	EPA 351.2	0.1 mg/L
Turbidity	SM2130 B	0.1 mg/L
Alkalinity	SM2320 B	5 mg/L
Residue, Filterable (TDS)	SM2540 C	1 mg/L
Residue, Non-filterable (TSS)	SM2540 D	0.1 mg/L
pH	SM4500-H+ B	1-13 SU
Ammonia	SM4500-NH3 G	0.1 mg/L
Dissolved Oxygen	SM4500-O G	0.1 mg/L
Phosphate, Ortho	SM4500-P E	0.01 mg/L
Phosphate, Total	SM4500-P E	0.01 mg/L
Biochemical Oxygen Demand	SM5210 B	5 mg/L
Total Organic Carbon	SM5310 B	0.1 mg/L
Chemical Oxygen Demand	HACH 8000	11 mg/L
Temperature	SM2550 B	0.1 °C
Metals and Trace Elements in Non-Potable Water		
Iron	SM3500-Fe B	0.01 mg/L

Laboratory personnel conducting sample analysis on reportable data are to complete an initial Demonstration of Capability (DOC) for each procedure before reporting results. All laboratory personnel are required to perform a DOC per procedure annually.

The laboratory is developing a training program to ensure compliance samples are analyzed in accordance with the QM. The training program includes the initial observation of procedure(s) by the Technical Manager, or designee, followed by a “hands on” demonstration on real samples until the analysts are able to successfully complete the DOC.

All training documentation shall be maintained for record keeping.

Acquisition, Reduction, Validation and Reporting of Data

Data is acquired through the development of worksheets, which are maintained in the laboratory and used for regulatory reporting and plant operational control. Standard curves, control, duplicate samples, and matrix spikes will all be run as appropriate with unknown samples to validate results. Appropriate sample size is known for most samples and multiple sample sizes will be analyzed as conditions dictate. Caution is given to reporting results in the required units and questionable results will be immediately reported to the Technical Manager, or designee; the Chief Plant Operator; and/or Operations Manager. All worksheets and analysis will be reviewed by the Technical Manager, or designee.

Internal Quality Control Checks

Appropriate high- and low-level controls, duplicates and matrix spike samples will be run with unknown samples. Quality control charts will be maintained with plus or minus 3 standard deviations used as control limits for appropriate methods. Duplicates should generally not be greater than 10% relative percent difference and matrix spike recoveries should be 80% – 120%. Exceptions to these controls' limits may be occasionally observed when dealing with samples of very low concentrations. Analyses will be repeated when indicated by quality control samples.

Performance and System Audits

Performance audits are done by proficiency testing of unknown samples which are either purchased from vendors approved by ELAP or are created by Technical Manager or designee. These samples are analyzed by laboratory procedures and the results are compared to the known values. The Technical Manager, or designee, will perform annual system audits documenting compliance with all laboratory policies and procedures. Corrective actions will be noted, and audit reports shall be provided as requested.

Preventative Maintenance

Laboratory instruments are to be kept clean and properly maintained per manufacturer's specifications and recommendations. Maintenance logs for each piece of equipment are kept for service provided by laboratory personnel and major repairs, if needed, will be performed by the instrument's manufacturer.

Currently the laboratory contracts annually with Mettler-Toledo for analytical balance preventive maintenance as well as SEAL Analytical for service on the AQ+ autoanalyzer.

Certified weights are sent out for re-calibration and re-certification every five years or as required.

Assessment of Precision and Accuracy

The assessment of precision and accuracy is a continual process using quality control charts, record of duplicates and spike recoveries. Historical trends of TTSA's plant operation can also serve as a check, as sample values do not typically vary significantly from day to day.

Each test batch performed by an analyst is to be reviewed by the Technical Manager, or designee.

Corrective Action

Any non-conforming work detected through audits, management reviews, QC charts, or personnel observations will undergo an investigation to determine the root cause(s) of the problem.

When corrective action is needed, the laboratory shall identify potential corrective actions based on the most likely way to prevent recurrence. The laboratory shall document any required changes resulting from corrective action investigations.

If a new method is needed. The procedure will be done following Section 1040B of the Standard Methods for the Examination Water and Wastewater. Equivalency testing will be performed as necessary when a new method will be replacing an old method. Extensive analyses will be performed to demonstrate the appropriateness of any new method/procedure for the laboratory.

Quality Assurance Reports

Quality control charts should be reviewed monthly for any shift in bias. The monthly reports are made available for inspection, as requested, and are kept on file for 5 years.

This Quality Manual has been reviewed and amended, as needed.

Bill Pindar, Technical Manager:

Signature 1/13/2021 Date

Michael Peak, Operations Manager:

Signature 01/13/2021 Date

Exhibit C

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January 13, 2021

RE: Notice of Violation and Order to Correct, Certificate No. 1144

In accordance with corrective action No. 1.d of Notice of Violation and Order to Correct, Certificate No. 1144, the laboratory director and operational management affirms the materials provided in response to this required corrective action are true and correct.

Bill Pindar
Laboratory Director

Michael Peak
Operations Manager

Exhibit D

Tahoe Truckee Sanitation Agency
Standard Operating Procedure

Title:	Ion Chromatography for Anions
Method Number:	EPA 300.0 (1993 Rev_2.1)
Date Updated:	12/28/2020
Prepared by:	B. Pindar
Approved by (Signature/Date)	12/28/20

1. Sample Handling and Preservation

Plastic or Glass

Chloride: No preservation 28 Days

Nitrite: Cool to 4°C, 48 hours

Nitrate: Cool to 4°C, 48 hours

Sulfate: Cool to 4°C, 28 days

2. Scope and Application

This method is used to detect chloride, nitrite, nitrate, and sulfate anions in wastewater, groundwater, and surface waters.

3. Summary of Method

A sample is introduced with an autosampler, into a sample loop of known volume. A buffered eluent solution known as the mobile phase carries the sample from the loop onto a column that contains a stationary phase material. The target analytes (anions) are retained on the stationary phase but can be eluted by increasing the concentration of a similarly charged species that will displace the analyte ions from the stationary phase. The analytes of interest are then detected by conductivity and plotted on a graph for determination.

4. Safety

Uniform or lab coat and safety glasses should be worn when handling liquid samples. Care should be taken as the system lines are under high pressure. Helium gas tank should be properly secured when in service.

5. Interferences

5.1 Interferences can be caused by substances with retention times that are similar and overlap those of the anion of interest. Large amounts of anion can interfere with the peak resolution of an adjacent anion. Sample dilution and/or fortification can be used to solve most interference problems associated with retention times.

5.2 Method interferences may be caused by contaminants in the reagent water, reagents, glassware, and other sample processing apparatus that lead to discrete artifacts or elevated baseline in ion chromatograms.

5.3 Samples containing particulates larger than 0.45 microns should be filtered to prevent interference and damage to equipment.

6. Apparatus and Equipment

6.1 Dionex ICS-1600 Ion Chromatography Unit

6.2 Dionex AS-DV Automated Sampler

6.3 Computer Workstation with Chromeleon Software

6.4 IonPac AS9-HC 4x250mm Anion-Exchange Column

6.5 IonPac AG9-HC 4x50mm Guard Column

6.6 AERS 500 Self Regenerating Suppressor

6.7 2L Plastic Eluent Bottle

6.8 5 ml Polyvials with Filter Caps

7. Reagents

7.1 High Quality Di Water

7.2 0.18N Sodium Carbonate Eluent

7.3 Stock Anion Standard Solutions

8. Sample Preparation

8.1 All samples including the method blank (Di Water) will be filtered using the vacuum filter flask and collected in filter tubes prior to analysis.

8.2 Filtered samples should be diluted based on the expected concentration to fall into the calibration range for each anion. In general, Influent wastewater is diluted 20:1 and wastewater effluent is diluted 10:1. Dilutions are made by pipetting known volumes into a Class A Volumetric Flask.

8.3 Once filtered and diluted each sample should be transferred into a clean 5 ml polyvial. Once the vial is full a black filter cap should be set on top and the filter cap tool should be used to press the cap into place.

9. Procedure

9.1 Instrument start-up

a) Check the eluent level in the 2L eluent reservoir on the top of the unit. If there is not enough remaining eluent for the expected length of the run prepare new eluent before starting the instrument.

b) Turn on the computer system and open the Chromeleon program.

c) Prior to analyzing samples, the system must equilibrate. Typically, the column should be flushed for 20-30 minutes to ensure a stable baseline. To equilibrate the system, go to the Instruments Tab on the bottom left of the screen. Pick the Pump_ECD Tab, go to the Pump section and press ON. Set the flow rate for 1.0 ml/min and press enter. The pump should click on and the eluent should begin to flow.

d) The pressure will start to rise in the column. As soon as it is over 200 psi it is safe to turn the suppressor on. Slide the suppressor control from on to off, pick ASRS_4mm from the drop-down menu and set the current to 45 mA. The light symbol will go from red to green when the suppressor starts.

e) Once the pump and suppressor are on the conductivity should be monitored to determine when the baseline is stable. Click the Monitor Baseline button on the top menu and then switch to the Home Tab to view the baseline.

f) After 20-30 minutes the baseline should be stabilized when zoomed in to the appropriate level and the run can be started at any time.

9.2 Schedule Set-up

a) Prior to starting a run, the analyst must set up a sequence of samples to be analyzed. This includes telling the instrument which method to analyze the samples by, whether the samples are calibrations standards or regular samples, the dilution factor for each sample, and which data file to store the collected information into. A new sequence can be created each time, or an old sequence can be modified for a current run.

b) To create a sequence switch from the Instrument Tab to the Data Tab at the bottom left of the Chromeleon screen.

c) To create a new sequence, go to the Menu Bar and pick Create -> Sequence. Select ICS-1600 and press Next. This will create a blank sequence that needs to be filled in manually.

d) Fill out each line item on the sequence editor with sample name, sample type, sample position, current instrument method, current processing method, and dilution factor. The Level field only needs to be used during a calibration run. When completed save the schedule to the appropriate folder.

e) To modify a previous sequence, pick the sequence and use File -> Save As to rename as needed and save to the appropriate folder. Make all needed modifications, being sure to change all sample names, dates, and dilution values and checking the sampler position values if rows have been added or deleted. Save again once modifications are complete.

f) The instrument should be programmed to automatically shut down at the end of all sample runs. Do this by ending each sample sequence with a final line that uses the shutdown instrument method. This will shut down the eluent flow by turning off the pump and shutting off the suppressor. If the shutdown is not programmed the pump and suppressor must be turned off manually from the instrument tab. Never let the suppressor stay on when the flow is not running.

9.3 Test Procedure

a) Once the samples have been prepared, the sequence has been created, and the baseline is stable the run can be started.

b) Place each sample vial in the correctly numbered slot in the autosampler. If necessary, the sampler carousel can be released using the button on the inside left corner.

c) Close the autosampler lid once the samples have been placed.

d) Record the pressure and conductivity readings for the run in the appropriate binder.

e) Press the Start button at the top of the sequence to initiate the run. Press Okay to stop monitoring the baseline and start the run. Once the run starts the first sample will be highlighted in green and the autosampler will move into place.

9.4 Data Review

a) Once a sample has finished it can be reviewed in Chromeleon Studio. Double click on any finished sample to open the run in the Studio screen.

b) Go to the Data Processing tab on the bottom left of the Studio screen and a list of all samples will appear in the left-hand column. The user can click between them or pin multiple samples to view at once.

c) At minimum, the Chromatogram and Interactive Results sheets should be opened in the Studio screen.

d) View the chromatogram to ensure that peaks are correctly identified, and peak areas are correct. Adjust only as necessary to ensure the peak ends are near the baseline and then save each sample.

e) Sample results can be recorded from the Results screen into the laboratory log sheet.

10. Quality Control

10.1 Demonstration of Capability (DOC):

Ion Chromatography for Anions SOP is read by all analysts prior to training. Analysts must demonstrate capability by performing reference and duplicate samples to the satisfaction of the training analyst and meeting laboratory control limits for precision and accuracy. This process is repeated annually for an Ongoing Demonstration of Capability.

10.2 Method Detection Limit (MDL):

An MDL study is performed annually or whenever there is a change to the instrument. Seven replicates of a low-level standard are run, and results are calculated and stored in the IC results binder MDL section.

10.3 Laboratory Method (Reagent) Blank (LRB):

The laboratory analyzes a method blank with each batch of samples to confirm there is no contamination within the system or in other procedure apparatus. Values that exceed the MDL indicate possible contamination and corrective actions must be taken before continuing the analysis.

10.4 Laboratory fortified blank (LFB):

The laboratory analyzes a prepared high and low value LFB sample with each batch and an LFB is required for every 10 samples at minimum. LFB values span the range of expected results and vary depending on the type of sample being analyzed. LFB's are prepared in the laboratory and preparation is recorded in the reagent logbook. LBF's are prepared from a different source than the calibration standards.

10.5 Matrix spike (MS) and Matrix spike duplicate (MSD):

A sample duplicate and a matrix spike are added to each sample batch. Duplicate and MS are typically run on the daily Effluent sample but may be run on a different process sample if Effluent is not being run.

10.6 Internal standards: (surrogate standards):

Not applicable to inorganic analysis.

10.7 Initial calibration verification (ICV) and continuing calibration verification (CCV):

A six-point calibration including a blank is performed semi-annually or more frequent if any changes are made to the system such as column replacement or other service. Calibration may be performed at any time if results are unexpected or QC values are out of range.

10.8 Control charts (trend analysis):

Control charts are created for the high and low level LFB's run with each batch and monthly charts are available in the QC binder.

10.9 Corrective action (root cause analysis):

All corrective actions are documented, and data is qualified or invalidated dependent upon the error. QC outside the acceptance criteria typically results in re-calibration, re-creation of prepared standards, and the creation of a new batch.

10.10 QC acceptance criteria:

Reagent blank must be less than MDL.

LFB's should be 90% to 110% of expected value.

MSD Recovery should be 80% to 120%.

Duplicate RPD should be less than 10%.

10.11 Definitions of preparation and analytical batches that may drive QC frequencies:

A defined batch is a single sample sequence. Additional runs on the same day will be saved as separate report files and all QC elements are included in each batch.

10.12 Minimum frequency for conducting all QC elements:

All QC checks are performed on a per batch basis and all prior to reporting of data to any client.

Tahoe Truckee Sanitation Agency
Standard Operating Procedure

Title:	Total and Fecal Coliform by Multiple-Tube Fermentation
Method Number:	SM 9221 B, C-2006, SM 9221 C, E-2006
Date Updated:	12/28/2020
Prepared by:	K. Schrandt
Approved by: (Signature/Date)	12/28/20

1. Sample Handling and Preservation

Hold time: Delivered to the laboratory within 6 Hours for Nonpotable Water

Preservations: Sodium Thiosulfate

Container: 125 mL sterile container

1.1 For most accurate results, process samples within 1 hour of collection. If sample cannot be processed within 1 hour of collection, keep sample at ≤ 10°C and unfrozen.

1.2 Samples must be collected in 125mL sterile containers containing sodium thiosulfate.

1.3 No dilution is required for chlorinated wastewater effluent, surface water, or ground waters that have historically not required dilution. Unknown samples are set up full strength and duplicated using a 1:10 diluted sample with commercial buffer dilution water. When duplicated and diluted, the result is the median of the results.

1.3 The analysis must be performed within 8 hours of collection.

1.4 All microbiological waste is sterilized by running through the autoclave for 30 minutes before disposal via sink.

1.5 Agar or broth in loose-cap tubes can be stored up to 2 weeks, while agar or broth in tightly closed screw-cap tubes can be stored up to 3 months.

2. Scope and Application

2.1 To determine a Most Probably Number (MPN) through a multiple tube dilution method using a fermentation technique, estimating the density of coliforms in the sample.

3. Summary of Method

3.1 The Multiple Tube Fermentation procedure is a tube-dilution method using a nutrient rich medium that supports the growth of environmentally stressed organisms. The coliform group consists of several genera of bacteria belonging to the family Enterobacteriaceae. The general definition of this group has been based on lactose fermentation. Thus, when this fermentation technique is used, this group is defined as all facultative anaerobic, gram-negative, non-spore-forming, rod-shaped bacteria that ferment lactose with gas and acid formation within 48 hours at 35°. After the 'Presumptive Stage' and the 'Confirmed Stage', an MPN can be determined based on the number of tubes used.

4. Safety

4.1 Wash hands with disinfectant before and after handling samples. The sample may contain bacteria, viruses, or parasites, including HIV, Polio or Giardia.

4.2 Safe Laboratory practice must always be followed.

4.3 Avoid skin contact, ingestion and inhalation of samples and reagents

4.4 Wear safety glasses, gloves, and uniform or lab coat.

4.5 Disinfect work area before and after setting the samples using a dilute bleach solution of a 1-part bleach to 9 parts water (10:1).

5. Interferences

5.1 The concentration of test medium must be adjusted so that sample addition does not reduce ingredient concentrations below that of standard medium.

5.2 Source/surface water samples that produce turbid growth in absence of gas/acid production in LTB are invalidated and another sample obtained, which may be tested with another method.

6. Apparatus and Equipment

6.1 Autoclave – required for sterilizing the culture media. Total sterilization time should not exceed 45 minutes for carbohydrate containing media while the required time for autoclaving material at 121 ± 2°C is between 12-15 minutes.

6.2 Incubator – must be fitted with a temperature control and should be capable of maintaining a uniform temperature of 35 ± 0.5°C

6.3 Water bath – must be fitted with a temperature control and should be capable of maintaining a uniform temperature of 44.5 ± 0.2°C

6.4 180° oven – for pipet sterilization. Run pore strips monthly to confirm sterilization occurs.

6.5 Balance – needed for weighing powdered culture medium. It should have accuracy and scale graduations within ± 0.1 g.

6.6 Pipettes: 1 mL pipet with graduated 0.1 mL increments. 10-11 mL pipet capable of expelling 10 mL of solution as well as an additional 1 mL of solution.

6.7 Culture tubes and racks: 16 x 150 mm in size for 1 ml and 0.1 mL sample volumes (in addition to 10 mL of culture medium) and 20 x 150 mm for 10 mL sample volumes plus culture medium.

6.8 Durham tubes – inverted in culture tube. Culture tubes must contain medium plus sample without being more than 3/4 full

6.9 Media preparation equipment: 2 L glass beaker, stirrer, automatic pipette

6.10 Bunsen burner

6.11 Inoculation Loop – metal loops of nickel alloy or platinum

7. Reagents and Media

7.1 High quality deionized reagent water. Conductivity of reagent water should be checked with each batch of media prepared.

7.2 Single strength Lauryl Tryptose Broth – Dissolve 64 g of commercially purchased LTB into 1.8 L of DI (pH 6.8 ± 0.2).

7.3 Double strength Lauryl Tryptose Broth – Dissolve 128 g of commercially purchased LTB into 1.8 L of DI (pH 6.8 ± 0.2).

Lauryl Tryptose Broth:

Tryptose 20.0 g

Lactose 5.0 g

Dipotassium hydrogen phosphate (K_2HPO_4) 2.75 g

Potassium dihydrogen phosphate (KH_2PO_4) 2.75 g

Sodium chloride (NaCl) 5.0 g

Sodium lauryl sulfate 0.1 g

Reagent-grade water 1 L

7.4 Brilliant Green Bile Broth – Dissolve 40 g of commercially purchased BGB into 1.8 L of DI (pH 7.2 ± 0.2).

Brilliant Green Bile Broth:

Peptone 10.0 g

Lactose 10.0 g

Oxgall 20.0 g

Brilliant green 0.0133 g

Reagent-grade water 1 L

7.5 EC Medium – Dissolve 37 g of commercially purchased EC medium into 1.8 L of DI (pH 6.9 ± 0.2)

EC Medium:

Tryptose or trypticase 20.0 g

Lactose 5.0 g

Bile salts mixture or bile salts No. 3 1.5 g

Dipotassium hydrogen phosphate (K_2HPO_4) 4.0 g

Potassium dihydrogen phosphate (KH_2PO_4) 1.5 g

Sodium chloride (NaCl) 5.0 g

Reagent-grade water 1 L

7.6 Dispense 10 mL of above media into culture tubes with an inverted durham tube and then cap. Double strength LTB should be dispensed into 20 x 150 mm culture tubes while single strength LTB, EC, and BGB media dispensed into 16 x 150 mm tubes.

7.7 Sterilize media in an autoclave at 121 ± 2°C. Total sterilization time should not exceed 45 minutes for carbohydrate containing media while the required time for autoclaving material at 121°C is between 12-15 minutes.

7.8 Media should be stored in a cool dry location at <30° with recorded date of preparation, type of medium, manufacturer and lot number, sterilization time and temperature, initial and final pH, and technician's initials.

7.9 Culti-Loops™: Escherichia Coli
Klebsiella Pneumoniae
Pseudomonas Aeruginosa
Enterobacter Aerogenes

7.10 Nutrient agar slants

7.11 1 mL Lauryl Tryptose Broth vials

8. Procedure

8.1 There are 3 phases: Presumptive, confirmed, and completed phase.

8.2 Shake sample vigorously for 5 seconds.

8.3 With a sterile graduated 1 mL pipet, dispense 0.1 mL of sample into the first of five tubes containing single strength LTB as replicate sample volumes.

8.4 With a sterile 10-11 mL pipet, dispense 1 mL into a culture tube containing single strength LTB and then dispense the remaining 10 mL into a culture tube containing double strength LTB. Repeat for the remaining 8 tubes (4 single strength and 4 double strength tubes). It is advisable to swirl the tubes to gently agitate distribute sample uniformly throughout the medium.

8.5 Incubate inoculated tubes at 35 ± 0.5°C. After 24 ± 2 hours, swirl each tube gently and examine it for growth, gas, and acidic reaction (shades of yellow color) and, if no gas or acidic reaction is evident, re-incubate and reexamine at the end of 48 ± 3 hours.

8.6 Record presence or absence of growth, gas, and acid production using a (+ or -).

8.7 Production of an acidic reaction or gas in the tubes or bottles within 48 ± 3 hours constitutes a positive presumptive reaction. Submit tubes with a positive presumptive reaction to the confirmed phase.

8.8 The absence of acidic reaction or gas formation at the end of 48 ± 3 hours of incubation constitutes a negative test.

8.9 Submit all presumptive tubes or bottles showing growth, any amount of gas, or acidic reaction within 24 ± 2 hours of incubation to the confirmed phase.

8.10 Gently shake or rotate presumptive tubes or bottles showing gas or acidic growth to re-suspend the organisms. With a sterile loop 3.0 to 3.5 mm in diameter, transfer one or more loop-full of culture to a fermentation tube containing brilliant green bile broth. Repeat for all other positive presumptive tubes. Incubate the inoculated BGB at 35 ± 0.5°C.

8.11 Formation of gas in any amount in the inverted vial of the BGB tube at any time within 48 ± 3 hour constitutes a positive confirmed phase. Calculate the MPN value from the number of positive BGB tubes.

8.12 For the completed phase, simultaneously inoculate into BGB for total coliforms and EC broth for fecal coliforms (the same loop can be used for both if you inoculate the EC medium first).

8.13 Incubate EC media in a 44.5 ± 0.2°C water bath within 30 minutes of inoculation. Place in water bath for 24 ± 2 hours to determine if fecal coliforms are present.

8.14 Consider positive EC broths elevated temperature results as a positive completed test response.

8.15 Parallel positive BGB cultures with negative EC cultures indicate the presence of non-fecal coliforms.

8.16 To interpret the results, **use table SM9221: IV (pg. 14).**

8.17 If the result is not referenced in table SM9221: IV, use the following equation:

$$-\frac{230.3}{z_s}\log_{10}\left(1-\frac{x_s z_s}{\sum_{j=s}^{K} n_j z_j}\right)$$

where:
z_s = the amount of the original sample inoculated into each tube of the *s*th dilution, and
x_s = the number of positive tubes in the *s*th dilution,
K = the number of dilutions,
j = a dilution,
s = the highest dilution with at least one positive tube,
n_j = the number of tubes in the *j*th dilution, and
z_j = the amount of the original sample inoculated into each tube in the *j*th dilution.

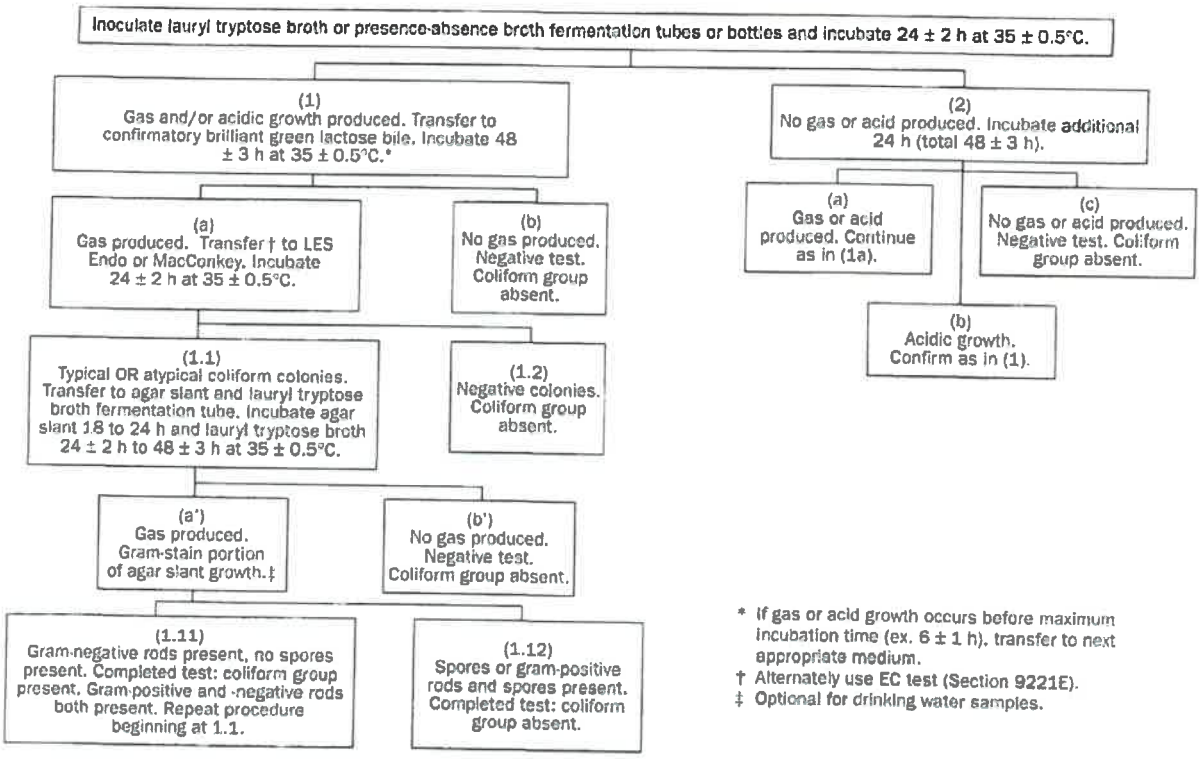

Figure 9221:1. Schematic outline of presumptive, confirmed, and completed phases for total coliform detection.

9. Quality Control Steps

9.1 Each new lot of media must be checked against known total coliforms and fecal coliforms. For the following, the analyst is handling biohazard material. Take the utmost precautionary measures for safety.

9.2 When preparing sample collection bottles in-house, add enough sodium thiosulfate to neutralize a 100mL sample with up to 15 mg/L chlorine (approximately 0.1 mL of a 10% $Na_2S_2O_3$ solution). Run through the autoclave for 30 minutes and record the maximum temperature and pressure. Once cooled, aseptically add 40 mL of tryptic soy broth and then transfer to a commercial IDEXX bottle. Check for growth after 24 hours.

9.3 Create control organism slants using commercially purchased Culti-Loops™ which should include the following: *Escherichia coli, Klebsiella pneumoniae, Pseudomonas aeruginosa,* and *Enterobacter aerogenes*. To create the slants, aseptically transfer each Culti-Loop™ tip into a purchased 1ml tube of TSB and incubate the tube for one hour at 35 ± 0.5°C. Warm purchased agar slant tubes to room temperature. After incubation, aseptically inoculate each agar slant tube with the appropriate bacterium and label each tube. Incubate the batch of 4 agar slants at 35 ± 0.5°C for 24 hours, then move to the 4°C refrigerator for storage. Slants are usable for one month after preparation. Record the date of preparation, manufacturer lot number of each organism, and TTSA lot number for the set on the Microbiology Controls Log Sheet. TTSA lot number should be in the format QC-TTSA-MMDDYY.

9.4 Aseptically inoculate each bacterium into a culture tube of the newly made media. There will be 5 total culture tubes including one blank. Incubate the double strength LTB, single strength LTB, or BGB tubes in the incubator for 24 ± 2 hours at 35 ± 0.5°C while the EC medium incubates in a 44.5 ± 0.2°C water bath for 24 ± 2 hours. Record the TTSA lot number of the slant media used on the Media Preparation Log sheet.

9.5 The results should be as follows:

Double Strength/Single Strength Lauryl Tryptose broth and Brilliant Green Bile Broth:

E. Coli	Positive
K. Pneumoniae	Positive
P. Aeruginosa	Negative
E. Aerogenes	Positive

EC Medium:

E. Coli	Positive
K. Pneumoniae	Negative
P. Aeruginosa	Negative
E. Aerogenes	Negative

10. QA/QC Quality System

10.1 Demonstration of Capability (DOC):

The Multiple Tube Fermentation (MTF) SOP is read by all analysts prior to training. Analysts must demonstrate capability by performing reference and duplicate samples to the satisfaction of the training analyst and meeting laboratory control limits for precision and accuracy.

10.2 Method Detection Limit (MDL):

MDL is not applicable for this method.

10.3 Laboratory reagent blank (LRB):

There is no applicable reagent blank for this method, however a control sample is run with each set of quality control checks for each batch and is used to indicate contamination in the media or from the laboratory.

10.4 Laboratory fortified blank (LFB):

Quality control checks are run on each batch of prepared media and compared for expected positive/negative results for each media type. QC compliance is additionally indicated by successful completion of annual proficiency testing.

10.5 Matrix spike (MS) and Matrix spike duplicate (MSD):

Matrix spike and duplicate are not applicable to this method.

10.6 Internal standards: (surrogate standards):

Not applicable to microbiological analysis.

10.7 Initial calibration verification (ICV) and continuing calibration verification (CCV):

Calibration is not applicable to this method.

10.8 Control charts (trend analysis):

Control charts are not applicable to this analysis.

10.9 Corrective action (root cause analysis):

All corrective actions are documented, and data is qualified or invalidated dependent upon the error. QC outside the acceptance criteria typically results in the analysis of a new batch.

10.10 QC acceptance criteria:

Quality control for this method consists of the media checks listed above and expected results for each media type are shown in the applicable table. QC control check is expected to be negative for Total and Fecal Coliform.

10.11 Definitions of preparation and analytical batches that may drive QC frequencies:

A defined batch consists of all samples tested on a particular lot of prepared media. QC checks are re-done each time a batch of media is prepared.

10.12 Minimum frequency for conducting all QC elements:

All QC checks are performed on a per batch basis and all prior to reporting of data to any client.

Table 9221: IV. MPN Index and 95% Confidence Limits for Various Combinations of Positive Results When Five Tubes Are Used per Dilution (10 mL, 1.0 mL, 0.1 mL)*

Combination of Positives	MPN Index/100 mL	Confidence Limits		Combination of Positives	MPN Index/100 mL	Confidence Limits	
		Low	High			Low	High
0-0-0	<1.8	—	6.8	4-0-3	25	9.8	70
0-0-1	1.8	0.090	6.8	4-1-0	17	6.0	40
0-1-0	1.8	0.090	6.9	4-1-1	21	6.8	42
0-1-1	3.6	0.70	10	4-1-2	26	9.8	70
0-2-0	3.7	0.70	10	4-1-3	31	10	70
0-2-1	5.5	1.8	15	4-2-0	22	6.8	50
0-3-0	5.6	1.8	15	4-2-1	26	9.8	70
1-0-0	2.0	0.10	10	4-2-2	32	10	70
1-0-1	4.0	0.70	10	4-2-3	38	14	100
1-0-2	6.0	1.8	15	4-3-0	27	9.9	70
1-1-0	4.0	0.71	12	4-3-1	33	10	70
1-1-1	6.1	1.8	15	4-3-2	39	14	100
1-1-2	8.1	3.4	22	4-4-0	34	14	100
1-2-0	6.1	1.8	15	4-4-1	40	14	100
1-2-1	8.2	3.4	22	4-4-2	47	15	120
1-3-0	8.3	3.4	22	4-5-0	41	14	100
1-3-1	10	3.5	22	4-5-1	48	15	120
1-4-0	11	3.5	22	5-0-0	23	6.8	70
2-0-0	4.5	0.79	15	5-0-1	31	10	70
2-0-1	6.8	1.8	15	5-0-2	43	14	100
2-0-2	9.1	3.4	22	5-0-3	58	22	150
2-1-0	6.8	1.8	17	5-1-0	33	10	100
2-1-1	9.2	3.4	22	5-1-1	46	14	120
2-1-2	12	4.1	26	5-1-2	63	22	150
2-2-0	9.3	3.4	22	5-1-3	84	34	220
2-2-1	12	4.1	26	5-2-0	49	15	150
2-2-2	14	5.9	36	5-2-1	70	22	170
2-3-0	12	4.1	26	5-2-2	94	34	230
2-3-1	14	5.9	36	5-2-3	120	36	250
2-4-0	15	5.9	36	5-2-4	150	58	400
3-0-0	7.8	2.1	22	5-3-0	79	22	220
3-0-1	11	3.5	23	5-3-1	110	34	250
3-0-2	13	5.6	35	5-3-2	140	52	400
3-1-0	11	3.5	26	5-3-3	170	70	400
3-1-1	14	5.6	36	5-3-4	210	70	400
3-1-2	17	6.0	36	5-4-0	130	36	400
3-2-0	14	5.7	36	5-4-1	170	58	400
3-2-1	17	6.8	40	5-4-2	220	70	440
3-2-2	20	6.8	40	5-4-3	280	100	710
3-3-0	17	6.8	40	5-4-4	350	100	710
3-3-1	21	6.8	40	5-4-5	430	150	1100
3-3-2	24	9.8	70	5-5-0	240	70	710
3-4-0	21	6.8	40	5-5-1	350	100	1100
3-4-1	24	9.8	70	5-5-2	540	150	1700
3-5-0	25	9.8	70	5-5-3	920	220	2600
4-0-0	13	4.1	35	5-5-4	1600	400	4600
4-0-1	17	5.9	36	5-5-5	>1600	700	—
4-0-2	21	6.8	40				

*Results to two significant figures.

Exhibit E

TAHOE-TRUCKEE SANITATION AGENCY
A Public Agency
13720 Butterfield Drive
TRUCKEE, CALIFORNIA 96161
(530) 587-2525 • FAX (530) 587-5840

January 13, 2021

RE: Notice of Violation and Order to Correct, Certificate No. 1144

In accordance with corrective action No. 2.b of Notice of Violation and Order to Correct, Certificate No. 1144, the following is the record demonstrating the staff who work in the laboratory have reviewed and been trained to the updated QM and any SOPs.

I attest I have been trained to the updated Quality Manual and Standard Operating Procedures for the US EPA Method 300.0 and SM 9221.

Bill Pindar
Laboratory Director

Kristin Davis
Laboratory Analyst

Kristin Schrandt
Laboratory Analyst

Exhibit F

Tahoe-Truckee Sanitation Agency Laboratory

13720 Butterfield Dr.

Truckee, CA 96161

Demonstration of Capability (DOC) Form for Chemistry

Scope and Application: This document describes the events necessary to take place prior to an analyst performing compliance testing in the TTSA Laboratory.

Name (Print): Kristin Davis **Initials:** KD

Analytical Method Name: Alkalinity

SOP Method Number and revision year: SM 2320 B-2011

☒ **I have read, understand, and will comply with the above SOP, Reference Method, and Safety Data Sheet (SDS) for every chemical or reagent used in the analysis (Date/Initial)** 1/5/2021 KD

Reason(s) for this DOC: ☐ New Method ☐ Change to Procedure

☒ Annual Demonstration (Ongoing) ☐ New Analyst

DOC Data Source:

☒ Proficiency Testing Study Company: ERA Study ID # WP-307

Test Date: 9/9/20 Report Date: 9/28/20

☐ QC Sample Source: _____ Lot# _____

☐ Actual Sample Description: _____

Target Analyte(s): Alkalinity as $CaCO_3$

Instrument Name (Model#, Serial #): Mettler-Toledo FiveEasy F20 serial#: B646322219

Preparation Analyst Name (Print): _____

Summary Chart (Only applicable to DOC's using 'Actual Samples or QC Samples' for the data source) PT Data will be attached to this document.

All samples are unknown to analyst.

*Acceptable Recovery: +/- 10%

Run #	Analysis Date	Sample ID	True Value	Recovered Value	% Recovery	Pass/Fail (P/F)
Blank						
1						
2						
3						
4						

Mean Recovery (%) _____, Std Deviation of Recovered Values: _____

Relative Std Deviation (%) _____ Proficiency Test Z-Score: -0.227

☒ PASS ☐ FAIL

Kristin Davis Kristo Davis 1/5/2021

Analyst Name (print) Analyst Signature Date

_____

Training Analyst Name (print) Signature Date

Bill PINDAR 1/5/21

Laboratory Director (print) Signature Approval Date

Revision 1

December 22, 2020

ERA
A Waters Company

Final Evaluation Report

Study: WP-307

ERA Customer Number: T047401

Laboratory Name: Tahoe Truckee Sanitation Agency

Inorganic Results

WP-307 Final Evaluation Report

ERA
A Waters Company

Kristin Davis
Chemist
Tahoe Truckee Sanitation Agency
13720 Butterfield Dr
Truckee, CA 96161
(530) 587-2525

EPA ID: CA00203
ERA Customer Number: T047401
Report Issued: 09/28/20
Study Dates: 08/10/20 - 09/24/20

TNI Analyte Code	Analyte	Units	Reported Value	Assigned Value	Acceptance Limits	Performance Evaluation	Method Description	Analysis Date	Z Score	Study Mean	Study Standard Deviation	Analyst Name
WP Minerals (cat# 581, lot# P307-506)												
1505	Alkalinity as CaCO3	mg/L	123	124	105 - 143	Acceptable	SM 2320 B-2011 2011	9/9/2020	-0.227	124	3.43	
1575	Chloride	mg/L	50.2	47.9	41.5 - 54.5	Acceptable	EPA 300.0 2.1 1993	9/17/2020	0.601	49.2	1.71	
1610	Conductivity at 25°C	µmhos/cm		448	403 - 493	Not Reported				454	8.21	
1730	Fluoride	mg/L		3.48	2.82 - 4.00	Not Reported				3.41	0.187	
1125	Potassium	mg/L		24.0	19.2 - 28.8	Not Reported				24.1	0.889	
1155	Sodium	mg/L		86.8	69.4 - 104	Not Reported				87.5	3.18	
2000	Sulfate	mg/L	21.0	20.7	16.3 - 24.2	Acceptable	EPA 300.0 2.1 1993	9/17/2020	-0.0534	21.1	1.06	
1955	Total Dissolved Solids at 180°C	mg/L	388	399	354 - 444	Acceptable	SM 2540 C-2011 2011	9/15/2020	-0.0465	389	27.5	
1950	Total Solids at 105°C	mg/L		424	379 - 469	Not Reported				410	25.5	
WP Hardness (cat# 580, lot# P307-507)												
1960	Total Suspended Solids	mg/L	24.5	26.8	18.3 - 32.6	Acceptable	SM 2540 D-2011 2011	9/15/2020	-0.281	25.1	2.08	
1035	Calcium	mg/L		22.7	19.3 - 26.1	Not Reported				23.3	0.850	
1085	Magnesium	mg/L		23.3	19.8 - 26.8	Not Reported				23.9	1.34	
1550	Calcium Hardness as CaCO3	mg/L		56.8	48.3 - 65.3	Not Reported				78.4	48.1	
1755	Total Hardness as CaCO3	mg/L		153	130 - 176	Not Reported				158	5.70	
WP pH (cat# 577, lot# P307-977)												
1900	pH	S.U.	7.96	7.90	7.70 - 8.10	Acceptable	SM 4500-H+ B-2011 2011	9/18/2020	0.136	7.95	0.0623	

This report is scored by the criteria in the 2016 TNI Standard, Volume 3, instead of by the criteria in the 2009 TNI Standard to which the Proficiency Testing Provider is accredited. This is a planned change and is endorsed by the TNI Proficiency Testing Program Executive Committee for transition to the 2016 TNI Standard.

CERTIFICATE OF EXCELLENCE

In recognition of the quality of your laboratory in proficiency testing for

WP-307

Tahoe Truckee Sanitation Agency

is issued this certificate of achievement by ERA. This laboratory has been recognized as a Laboratory of Excellence for achieving 100% acceptable data in this study which included 329 participating laboratories. This achievement is a demonstration of the superior quality of the laboratory in evaluation of the standards listed below.

Complex Nutrients	Demand
Hardness	Minerals
Nitrite	pH
Simple Nutrients	Trace Metals
Turbidity	WasteWatR™ Coliform
	MicrobE™ - SM 9221

Matthew Seebeck
Quality Officer

T047401

Tahoe-Truckee Sanitation Agency Laboratory

13720 Butterfield Dr.

Truckee, CA 96161

Demonstration of Capability (DOC) Form for Chemistry

Scope and Application: **This document describes the events necessary to take place prior to an analyst performing compliance testing in the TTSA Laboratory.**

Name (Print): Kristin Davis **Initials:** KD

Analytical Method Name: Ammonia

SOP Method Number and revision year: SM 4500-NH3 G-2011

☒ **I have read, understand, and will comply with the above SOP, Reference Method, and Safety Data Sheet (SDS) for every chemical or reagent used in the analysis (Date/Initial)** 1/5/2021 KD

Reason(s) for this DOC: ☐ New Method ☐ Change to Procedure

☒ Annual Demonstration (Ongoing) ☐ New Analyst

DOC Data Source:

☒ Proficiency Testing Study Company: ERA Study ID # WP-307

Test Date: 9/2/20 Report Date: 9/28/20

☐ QC Sample Source: _____ Lot# _____

☐ Actual Sample Description: _____

Target Analyte(s): Ammonia

Instrument Name (Model#, Serial #): SEAL AQ2+ serial#: 09x633

Preparation Analyst Name (Print): _____

Summary Chart (Only applicable to DOC's using 'Actual Samples or QC Samples' for the data source) PT Data will be attached to this document.

All samples are unknown to analyst.

*Acceptable Recovery: +/- 10%

Run #	Analysis Date	Sample ID	True Value	Recovered Value	% Recovery	Pass/Fail (P/F)
Blank						
1						
2						
3						
4						

Mean Recovery (%) _____, Std Deviation of Recovered Values: _____

Relative Std Deviation (%) _____ Proficiency Test Z-Score: -0.254

☒ PASS ☐ FAIL

Kristin Davis Kristin Davis 1/5/2021

Analyst Name (print) Analyst Signature Date

_____

Training Analyst Name (print) Signature Date

Bill Pindar 1/5/21

Laboratory Director (print) Signature Approval Date

ERA
A Waters Company

Final Evaluation Report

Study: WP-307

ERA Customer Number: T047401

Laboratory Name: Tahoe Truckee Sanitation Agency

Inorganic Results

WP-307 Final Evaluation Report

A Waters Company

Kristin Davis
Chemist
Tahoe Truckee Sanitation Agency
13720 Butterfield Dr
Truckee, CA 96161
(530) 587-2525

EPA ID: CA00203
ERA Customer Number: T047401
Report Issued: 09/28/20
Study Dates: 08/10/20 - 09/24/20

TNI Analyte Code	Analyte	Units	Reported Value	Assigned Value	Acceptance Limits	Performance Evaluation	Method Description	Analysis Date	Z Score	Study Mean	Study Standard Deviation	Analyst Name
WP Simple Nutrients (cat# 584, lot# P307-505)												
1515	Ammonia as N	mg/L	2.27	2.34	1.70 - 3.06	Acceptable	SM 4500-NH3 G-2011 2011	9/2/2020	-0.254	2.32	0.207	
1820	Nitrate + Nitrite as N	mg/L	6.01	6.10	5.02 - 7.12	Acceptable	EPA 300.0 2.1 1993	9/2/2020	0.0630	6.00	0.206	
1810	Nitrate as N	mg/L	6.01	6.10	4.97 - 7.20	Acceptable	EPA 300.0 2.1 1993	9/2/2020	-0.174	6.07	0.348	
1870	ortho-Phosphate as P	mg/L	1.90	1.78	1.51 - 2.05	Acceptable	SM 4500-P E-2011 2011	9/2/2020	0.529	1.82	0.143	
WP Complex Nutrients (cat# 579, lot# P307-525)												
1795	Total Kjeldahl Nitrogen	mg/L	10.0	10.3	7.55 - 12.9	Acceptable	EPA 351.2 2 1993	9/18/2020	-0.280	10.2	0.655	
1910	Total phosphorus as P	mg/L	4.47	4.31	3.56 - 5.02	Acceptable	SM 4500-P E-2011 2011	8/28/2020	0.976	4.27	0.204	
WP Nitrite (cat# 888, lot# P307-770)												
1840	Nitrite as N	mg/L	2.94	3.12	2.69 - 3.55	Acceptable	EPA 300.0 2.1 1993	9/15/2020	-1.33	3.14	0.149	
WP Demand (cat# 578, lot# P307-516)												
1530	BOD	mg/L	51.6	51.7	26.9 - 76.4	Acceptable	SM 5210 B-2011 2011	9/17/2020	0.247	49.7	7.64	
1555	CBOD	mg/L		46.8	20.7 - 72.9	Not Reported				45.0	7.81	
1565	COD	mg/L	82.3	83.5	62.0 - 102	Acceptable	HACH 8000	9/17/2020	0.135	81.3	7.13	
2040	TOC	mg/L	35.0	33.0	27.2 - 38.7	Acceptable	SM 5310 B-2011 2011	9/18/2020	1.12	32.9	1.89	

This report is scored by the criteria in the 2016 TNI Standard, Volume 3, instead of by the criteria in the 2009 TNI Standard to which the Proficiency Testing Provider is accredited. This is a planned change and is endorsed by the TNI Proficiency Testing Program Executive Committee for transition to the 2016 TNI Standard.

CERTIFICATE OF EXCELLENCE

In recognition of the quality of your laboratory in proficiency testing for

WP-307

Tahoe Truckee Sanitation Agency

is issued this certificate of achievement by ERA. This laboratory has been recognized as a Laboratory of Excellence for achieving 100% acceptable data in this study which included 329 participating laboratories. This achievement is a demonstration of the superior quality of the laboratory in evaluation of the standards listed below.

Complex Nutrients	Demand
Hardness	Minerals
Nitrite	pH
Simple Nutrients	Trace Metals
Turbidity	WasteWatR™ Coliform
	MicrobE™ - SM 9221

Matthew Seebeck
Quality Officer

T047401

Tahoe-Truckee Sanitation Agency Laboratory

13720 Butterfield Dr.

Truckee, CA 96161

Demonstration of Capability (DOC) Form for Chemistry

Scope and Application: **This document describes the events necessary to take place prior to an analyst performing compliance testing in the TTSA Laboratory.**

Name (Print): Kristin Davis **Initials:** KD

Analytical Method Name: Biochemical Oxygen Demand

SOP Method Number and revision year: SM 5210 B-2011

☒ **I have read, understand, and will comply with the above SOP, Reference Method, and Safety Data Sheet (SDS) for every chemical or reagent used in the analysis (Date/Initial)** 1/5/2021 KD

Reason(s) for this DOC: ☐ New Method ☐ Change to Procedure

☒ Annual Demonstration (Ongoing) ☐ New Analyst

DOC Data Source:

☒ Proficiency Testing Study Company: ERA Study ID # WP-307

Test Date: 9/17/20 Report Date: 9/28/20

☐ QC Sample Source: _____ Lot# _____

☐ Actual Sample Description: _____

Target Analyte(s): Biochemical Oxygen Demand

Instrument Name (Model#, Serial #): HACH HQ40D serial#: 081000025257

Preparation Analyst Name (Print): _____

Summary Chart (Only applicable to DOC's using 'Actual Samples or QC Samples' for the data source) PT Data will be attached to this document.

All samples are unknown to analyst.

*Acceptable Recovery: +/- 10%

Run #	Analysis Date	Sample ID	True Value	Recovered Value	% Recovery	Pass/Fail (P/F)
Blank						
1						
2						
3						
4						

Mean Recovery (%) _____, Std Deviation of Recovered Values: _____

Relative Std Deviation (%) _____ Proficiency Test Z-Score: 0.247

☒ PASS ☐ FAIL

Kristin Davis Kristin Davis 1/5/2021

Analyst Name (print) Analyst Signature Date

_____

Training Analyst Name (print) Signature Date

Bill Pindar 1/5/21

Laboratory Director (print) Signature Approval Date

Revision 1

December 22, 2020

ERA
A Waters Company

Final Evaluation Report

Study: WP-307

ERA Customer Number: T047401

Laboratory Name: Tahoe Truckee Sanitation Agency

Inorganic Results

WP-307 Final Evaluation Report

A Waters Company

Kristin Davis
Chemist
Tahoe Truckee Sanitation Agency
13720 Butterfield Dr
Truckee, CA 96161
(530) 587-2525

EPA ID: CA00203
ERA Customer Number: T047401
Report Issued: 09/28/20
Study Dates: 08/10/20 - 09/24/20

TNI Analyte Code	Analyte	Units	Reported Value	Assigned Value	Acceptance Limits	Performance Evaluation	Method Description	Analysis Date	Z Score	Study Mean	Study Standard Deviation	Analyst Name
WP Simple Nutrients (cat# 584, lot# P307-505)												
1515	Ammonia as N	mg/L	2.27	2.34	1.70 - 3.06	Acceptable	SM 4500-NH3 G-2011 2011	9/2/2020	-0.254	2.32	0.207	
1820	Nitrate + Nitrite as N	mg/L	6.01	6.10	5.02 - 7.12	Acceptable	EPA 300.0 2.1 1993	9/2/2020	0.0630	6.00	0.206	
1810	Nitrate as N	mg/L	6.01	6.10	4.97 - 7.20	Acceptable	EPA 300.0 2.1 1993	9/2/2020	-0.174	6.07	0.348	
1870	ortho-Phosphate as P	mg/L	1.90	1.78	1.51 - 2.05	Acceptable	SM 4500-P E-2011 2011	9/2/2020	0.529	1.82	0.143	
WP Complex Nutrients (cat# 579, lot# P307-525)												
1795	Total Kjeldahl Nitrogen	mg/L	10.0	10.3	7.55 - 12.9	Acceptable	EPA 351.2 2 1993	9/18/2020	-0.280	10.2	0.655	
1910	Total phosphorus as P	mg/L	4.47	4.31	3.56 - 5.02	Acceptable	SM 4500-P E-2011 2011	8/28/2020	0.976	4.27	0.204	
WP Nitrite (cat# 888, lot# P307-770)												
1840	Nitrite as N	mg/L	2.94	3.12	2.69 - 3.55	Acceptable	EPA 300.0 2.1 1993	9/15/2020	-1.33	3.14	0.149	
WP Demand (cat# 578, lot# P307-516)												
1530	BOD	mg/L	51.6	51.7	26.9 - 76.4	Acceptable	SM 5210 B-2011 2011	9/17/2020	0.247	49.7	7.64	
1555	CBOD	mg/L		46.8	20.7 - 72.9	Not Reported				45.0	7.81	
1565	COD	mg/L	82.3	83.5	62.0 - 102	Acceptable	HACH 8000	9/17/2020	0.135	81.3	7.13	
2040	TOC	mg/L	35.0	33.0	27.2 - 38.7	Acceptable	SM 5310 B-2011 2011	9/18/2020	1.12	32.9	1.89	

This report is scored by the criteria in the 2016 TNI Standard, Volume 3, instead of by the criteria in the 2009 TNI Standard to which the Proficiency Testing Provider is accredited. This is a planned change and is endorsed by the TNI Proficiency Testing Program Executive Committee for transition to the 2016 TNI Standard.

CERTIFICATE OF EXCELLENCE

In recognition of the quality of your laboratory in proficiency testing for

WP-307

Tahoe Truckee Sanitation Agency

is issued this certificate of achievement by ERA. This laboratory has been recognized as a Laboratory of Excellence for achieving 100% acceptable data in this study which included 329 participating laboratories. This achievement is a demonstration of the superior quality of the laboratory in evaluation of the standards listed below.

Complex Nutrients	Demand
Hardness	Minerals
Nitrite	pH
Simple Nutrients	Trace Metals
Turbidity	WasteWatR™ Coliform
	MicrobE™ - SM 9221

Matthew Seebeck
Quality Officer

T047401

Tahoe-Truckee Sanitation Agency Laboratory

13720 Butterfield Dr.

Truckee, CA 96161

Demonstration of Capability (DOC) Form for Chemistry

Scope and Application: **This document describes the events necessary to take place prior to an analyst performing compliance testing in the TTSA Laboratory.**

Name (Print): Kristin Davis **Initials:** KD

Analytical Method Name: Chemical Oxygen Demand

SOP Method Number and revision year: HACH 8000

☒ **I have read, understand, and will comply with the above SOP, Reference Method, and Safety Data Sheet (SDS) for every chemical or reagent used in the analysis (Date/Initial)** 1/5/2021 KD

Reason(s) for this DOC: ☐ New Method ☐ Change to Procedure

☒ Annual Demonstration (Ongoing) ☐ New Analyst

DOC Data Source:

☒ Proficiency Testing Study Company: ERA Study ID # WP-307

Test Date: 9/17/20 Report Date: 9/28/20

☐ QC Sample Source: _____ Lot# _____

☐ Actual Sample Description: _____

Target Analyte(s): Chemical Oxygen Demand

Instrument Name (Model#, Serial #): HACH DR2700 serial#: 1329847, HACH DRB200 serial#: 171100C342

Preparation Analyst Name (Print): _____

Summary Chart (Only applicable to DOC's using 'Actual Samples or QC Samples' for the data source) PT Data will be attached to this document.

All samples are unknown to analyst.

*Acceptable Recovery: +/- 10%

Run #	Analysis Date	Sample ID	True Value	Recovered Value	% Recovery	Pass/Fail (P/F)
Blank						
1						
2						
3						
4						

Mean Recovery (%) _____, Std Deviation of Recovered Values: _____

Relative Std Deviation (%) _____ Proficiency Test Z-Score: 0.135

☒ PASS ☐ FAIL

Kristin Davis	Kristin Davis	1/5/2021
Analyst Name (print)	Analyst Signature	Date

Training Analyst Name (print)	Signature	Date

Bill Pindar		1/5/21
Laboratory Director (print)	Signature	Approval Date

ERA
A Waters Company

Final Evaluation Report

Study: WP-307

ERA Customer Number: T047401

Laboratory Name: Tahoe Truckee Sanitation Agency

Inorganic Results

WP-307 Final Evaluation Report

ERA
A Waters Company

Kristin Davis
Chemist
Tahoe Truckee Sanitation Agency
13720 Butterfield Dr
Truckee, CA 96161
(530) 587-2525

EPA ID: CA00203
ERA Customer Number: T047401
Report Issued: 09/28/20
Study Dates: 08/10/20 - 09/24/20

TNI Analyte Code	Analyte	Units	Reported Value	Assigned Value	Acceptance Limits	Performance Evaluation	Method Description	Analysis Date	Z Score	Study Mean	Study Standard Deviation	Analyst Name
WP Simple Nutrients (cat# 584, lot# P307-505)												
1515	Ammonia as N	mg/L	2.27	2.34	1.70 - 3.06	Acceptable	SM 4500-NH3 G-2011 2011	9/2/2020	-0.254	2.32	0.207	
1820	Nitrate + Nitrite as N	mg/L	6.01	6.10	5.02 - 7.12	Acceptable	EPA 300.0 2.1 1993	9/2/2020	0.0630	6.00	0.206	
1810	Nitrate as N	mg/L	6.01	6.10	4.97 - 7.20	Acceptable	EPA 300.0 2.1 1993	9/2/2020	-0.174	6.07	0.348	
1870	ortho-Phosphate as P	mg/L	1.90	1.78	1.51 - 2.05	Acceptable	SM 4500-P E-2011 2011	9/2/2020	0.529	1.82	0.143	
WP Complex Nutrients (cat# 579, lot# P307-525)												
1795	Total Kjeldahl Nitrogen	mg/L	10.0	10.3	7.55 - 12.9	Acceptable	EPA 351.2 2 1993	9/18/2020	-0.280	10.2	0.655	
1910	Total phosphorus as P	mg/L	4.47	4.31	3.56 - 5.02	Acceptable	SM 4500-P E-2011 2011	8/28/2020	0.976	4.27	0.204	
WP Nitrite (cat# 888, lot# P307-770)												
1840	Nitrite as N	mg/L	2.94	3.12	2.69 - 3.55	Acceptable	EPA 300.0 2.1 1993	9/15/2020	-1.33	3.14	0.149	
WP Demand (cat# 578, lot# P307-516)												
1530	BOD	mg/L	51.6	51.7	26.9 - 76.4	Acceptable	SM 5210 B-2011 2011	9/17/2020	0.247	49.7	7.64	
1555	CBOD	mg/L		46.8	20.7 - 72.9	Not Reported				45.0	7.81	
1565	COD	mg/L	82.3	83.5	62.0 - 102	Acceptable	HACH 8000	9/17/2020	0.135	81.3	7.13	
2040	TOC	mg/L	35.0	33.0	27.2 - 38.7	Acceptable	SM 5310 B-2011 2011	9/18/2020	1.12	32.9	1.89	

This report is scored by the criteria in the 2016 TNI Standard, Volume 3, instead of by the criteria in the 2009 TNI Standard to which the Proficiency Testing Provider is accredited. This is a planned change and is endorsed by the TNI Proficiency Testing Program Executive Committee for transition to the 2016 TNI Standard.

CERTIFICATE OF EXCELLENCE

In recognition of the quality of your laboratory in proficiency testing for

WP-307

Tahoe Truckee Sanitation Agency

is issued this certificate of achievement by ERA. This laboratory has been recognized as a Laboratory of Excellence for achieving 100% acceptable data in this study which included 329 participating laboratories. This achievement is a demonstration of the superior quality of the laboratory in evaluation of the standards listed below.

Complex Nutrients	Demand
Hardness	Minerals
Nitrite	pH
Simple Nutrients	Trace Metals
Turbidity	WasteWatR™ Coliform MicrobE™ - SM 9221

Matthew Seebeck
Quality Officer

T047401

Tahoe-Truckee Sanitation Agency Laboratory

13720 Butterfield Dr.

Truckee, CA 96161

Demonstration of Capability (DOC) Form for Chemistry

Scope and Application: **This document describes the events necessary to take place prior to an analyst performing compliance testing in the TTSA Laboratory.**

Name (Print): Kristin Davis **Initials:** KD

Analytical Method Name: Dissolved Oxygen

SOP Method Number and revision year: SM 4500-O H (2006)

☒ **I have read, understand, and will comply with the above SOP, Reference Method, and Safety Data Sheet (SDS) for every chemical or reagent used in the analysis (Date/Initial)** 1/5/2021 KD

Reason(s) for this DOC: ☐ New Method ☐ Change to Procedure

☒ Annual Demonstration (Ongoing) ☐ New Analyst

DOC Data Source:

☒ Proficiency Testing Study Company: ERA Study ID # WP-309

Test Date: 11/5/20 Report Date: 11/25/20

☐ QC Sample Source: _____ Lot# _____

☐ Actual Sample Description: _____

Target Analyte(s): Dissolved oxygen

Instrument Name (Model#, Serial #): HACH HQ40D S/N 0E100625257

Preparation Analyst Name (Print): _____

Summary Chart (Only applicable to DOC's using 'Actual Samples or QC Samples' for the data source) PT Data will be attached to this document.

All samples are unknown to analyst.

*Acceptable Recovery: +/- 10%

Run #	Analysis Date	Sample ID	True Value	Recovered Value	% Recovery	Pass/Fail (P/F)
Blank						
1						
2						
3						
4						

Mean Recovery (%) _____, Std Deviation of Recovered Values: _____

Relative Std Deviation (%) _____ Proficiency Test Z-Score: 0.276

☒ PASS ☐ FAIL

Kristin Davis Kristin Davis 1/5/2021

Analyst Name (print) Analyst Signature Date

_____

Training Analyst Name (print) Signature Date

Bill Pundar _____ 1/5/21

Laboratory Director (print) Signature Approval Date

ERA
A Waters Company

Final Evaluation Report

Study: WP-309

ERA Customer Number: T047401

Laboratory Name: Tahoe Truckee Sanitation Agency

Inorganic Results

WP-309 Final Evaluation Report

A Waters Company

Kristin Davis
Chemist
Tahoe Truckee Sanitation Agency
13720 Butterfield Dr
Truckee, CA 96161
(530) 587-2525

EPA ID: CA00203
ERA Customer Number: T047401
Report Issued: 11/25/20
Study Dates: 10/09/20 - 11/23/20

TNI Analyte Code	Analyte	Units	Reported Value	Assigned Value	Acceptance Limits	Performance Evaluation	Method Description	Analysis Date	Z Score	Study Mean	Study Standard Deviation	Analyst Name
WP Dissolved Oxygen (cat# 212, lot# P309-213)												
1880	Oxygen, Dissolved	mg/L	12.3	13.2	9.24 - 17.2	Acceptable	SM 4500-O G-2011 2011	11/5/2020	0.276	12.1	0.808	

This report is scored by the criteria in the 2016 TNI Standard, Volume 3, instead of by the criteria in the 2009 TNI Standard to which the Proficiency Testing Provider is accredited. This is a planned change and is endorsed by the TNI Proficiency Testing Program Executive Committee for transition to the 2016 TNI Standard.

CERTIFICATE OF EXCELLENCE

In recognition of the quality of your laboratory in proficiency testing for

WP-309

Tahoe Truckee Sanitation Agency

is issued this certificate of achievement by ERA. This laboratory has been recognized as a Laboratory of Excellence for achieving 100% acceptable data in this study which included 1032 participating laboratories. This achievement is a demonstration of the superior quality of the laboratory in evaluation of the standards listed below.

Dissolved Oxygen

Matthew Seebeck
Quality Officer

T047401

Tahoe-Truckee Sanitation Agency Laboratory

13720 Butterfield Dr.

Truckee, CA 96161

Demonstration of Capability (DOC) Form for Chemistry

Scope and Application: **This document describes the events necessary to take place prior to an analyst performing compliance testing in the TTSA Laboratory.**

Name (Print): BILL PINDAR **Initials:** BP

Analytical Method Name: ~~IP~~ ION CHROMATOGRAPHY

SOP Method Number and revision year: EPA 300 1993 REV 2.1

☒ **I have read, understand, and will comply with the above SOP, Reference Method, and Safety Data Sheet (SDS) for every chemical or reagent used in the analysis (Date/Initial)** 1/12/21 BP

Reason(s) for this DOC: ☐ New Method ☐ Change to Procedure

☒ Annual Demonstration (Ongoing) ☐ New Analyst

DOC Data Source:

☒ Proficiency Testing Study Company: ERA Study ID # WP-307

Test Date: 9/17/20 Report Date: 9/28/20

☐ QC Sample Source: _____ Lot# _____

☐ Actual Sample Description: _____

Target Analyte(s): CHLORIDE, NITRITE-NITRATE, SULFATE

Instrument Name (Model#, Serial #): DIONEX ICS-1600

Preparation Analyst Name (Print): _____

Summary Chart (Only applicable to DOC's using 'Actual Samples or QC Samples' for the data source) PT Data will be attached to this document.

All samples are unknown to analyst.

*Acceptable Recovery: +/- 10%

Run #	Analysis Date	Sample ID	True Value	Recovered Value	% Recovery	Pass/Fail (P/F)
Blank						
1						
2						
3						
4						

Mean Recovery (%) _____, Std Deviation of Recovered Values: _____

Relative Std Deviation (%) _____ Proficiency Test Z-Score: 0.601 (Cl^-)

SULFATE −0.05 NO_2/NO_3 0.06 NO_2 −1.33 NO_3 −0.17

☒ PASS ☐ FAIL

BILL PINDAR _____ +~~2~~ (RP) 1/12/21

Analyst Name (print) Analyst Signature Date

_____

Training Analyst Name (print) Signature Date

BILL PINDAR _____ 1/12/21

Laboratory Director (print) Signature Approval Date

ERA
A Waters Company

Final Evaluation Report

Study: WP-307

ERA Customer Number: T047401

Laboratory Name: Tahoe Truckee Sanitation Agency

Inorganic Results

WP-307 Final Evaluation Report

ERA
A Waters Company

Kristin Davis
Chemist
Tahoe Truckee Sanitation Agency
13720 Butterfield Dr
Truckee, CA 96161
(530) 587-2525

EPA ID: CA00203
ERA Customer Number: T047401
Report Issued: 09/28/20
Study Dates: 08/10/20 - 09/24/20

TNI Analyte Code	Analyte	Units	Reported Value	Assigned Value	Acceptance Limits	Performance Evaluation	Method Description	Analysis Date	Z Score	Study Mean	Study Standard Deviation	Analyst Name
WP Minerals (cat# 581, lot# P307-506)												
1505	Alkalinity as CaCO3	mg/L	123	124	105 - 143	Acceptable	SM 2320 B-2011 2011	9/9/2020	-0.227	124	3.43	
1575	Chloride	mg/L	50.2	47.9	41.5 - 54.5	Acceptable	EPA 300.0 2.1 1993	9/17/2020	0.601	49.2	1.71	
1610	Conductivity at 25°C	µmhos/cm		448	403 - 493	Not Reported				454	8.21	
1730	Fluoride	mg/L		3.48	2.82 - 4.00	Not Reported				3.41	0.187	
1125	Potassium	mg/L		24.0	19.2 - 28.8	Not Reported				24.1	0.889	
1155	Sodium	mg/L		86.8	69.4 - 104	Not Reported				87.5	3.18	
2000	Sulfate	mg/L	21.0	20.7	16.3 - 24.2	Acceptable	EPA 300.0 2.1 1993	9/17/2020	-0.0534	21.1	1.06	
1955	Total Dissolved Solids at 180°C	mg/L	388	399	354 - 444	Acceptable	SM 2540 C-2011 2011	9/15/2020	-0.0465	389	27.5	
1950	Total Solids at 105°C	mg/L		424	379 - 469	Not Reported				410	25.5	
WP Hardness (cat# 580, lot# P307-507)												
1960	Total Suspended Solids	mg/L	24.5	26.8	18.3 - 32.6	Acceptable	SM 2540 D-2011 2011	9/15/2020	-0.281	25.1	2.08	
1035	Calcium	mg/L		22.7	19.3 - 26.1	Not Reported				23.3	0.850	
1085	Magnesium	mg/L		23.3	19.8 - 26.8	Not Reported				23.9	1.34	
1550	Calcium Hardness as CaCO3	mg/L		56.8	48.3 - 65.3	Not Reported				78.4	48.1	
1755	Total Hardness as CaCO3	mg/L		153	130 - 176	Not Reported				158	5.70	
WP pH (cat# 577, lot# P307-977)												
1900	pH	S.U.	7.96	7.90	7.70 - 8.10	Acceptable	SM 4500-H+ B-2011 2011	9/18/2020	0.136	7.95	0.0623	

This report is scored by the criteria in the 2016 TNI Standard, Volume 3, instead of by the criteria in the 2009 TNI Standard to which the Proficiency Testing Provider is accredited. This is a planned change and is endorsed by the TNI Proficiency Testing Program Executive Committee for transition to the 2016 TNI Standard.

WP-307 Final Evaluation Report

ERA
A Waters Company

Kristin Davis
Chemist
Tahoe Truckee Sanitation Agency
13720 Butterfield Dr
Truckee, CA 96161
(530) 587-2525

EPA ID: CA00203
ERA Customer Number: T047401
Report Issued: 09/28/20
Study Dates: 08/10/20 - 09/24/20

TNI Analyte Code	Analyte	Units	Reported Value	Assigned Value	Acceptance Limits	Performance Evaluation	Method Description	Analysis Date	Z Score	Study Mean	Study Standard Deviation	Analyst Name
WP Simple Nutrients (cat# 584, lot# P307-505)												
1515	Ammonia as N	mg/L	2.27	2.34	1.70 - 3.06	Acceptable	SM 4500-NH3 G-2011 2011	9/2/2020	-0.254	2.32	0.207	
1820	Nitrate + Nitrite as N	mg/L	6.01	6.10	5.02 - 7.12	Acceptable	EPA 300.0 2.1 1993	9/2/2020	0.0630	6.00	0.206	
1810	Nitrate as N	mg/L	6.01	6.10	4.97 - 7.20	Acceptable	EPA 300.0 2.1 1993	9/2/2020	-0.174	6.07	0.348	
1870	ortho-Phosphate as P	mg/L	1.90	1.78	1.51 - 2.05	Acceptable	SM 4500-P E-2011 2011	9/2/2020	0.529	1.82	0.143	
WP Complex Nutrients (cat# 579, lot# P307-525)												
1795	Total Kjeldahl Nitrogen	mg/L	10.0	10.3	7.55 - 12.9	Acceptable	EPA 351.2 2 1993	9/18/2020	-0.280	10.2	0.655	
1910	Total phosphorus as P	mg/L	4.47	4.31	3.56 - 5.02	Acceptable	SM 4500-P E-2011 2011	8/28/2020	0.976	4.27	0.204	
WP Nitrite (cat# 888, lot# P307-770)												
1840	Nitrite as N	mg/L	2.94	3.12	2.69 - 3.55	Acceptable	EPA 300.0 2.1 1993	9/15/2020	-1.33	3.14	0.149	
WP Demand (cat# 578, lot# P307-516)												
1530	BOD	mg/L	51.6	51.7	26.9 - 76.4	Acceptable	SM 5210 B-2011 2011	9/17/2020	0.247	49.7	7.64	
1555	CBOD	mg/L		46.8	20.7 - 72.9	Not Reported				45.0	7.81	
1565	COD	mg/L	82.3	83.5	62.0 - 102	Acceptable	HACH 8000	9/17/2020	0.135	81.3	7.13	
2040	TOC	mg/L	35.0	33.0	27.2 - 38.7	Acceptable	SM 5310 B-2011 2011	9/18/2020	1.12	32.9	1.89	

This report is scored by the criteria in the 2016 TNI Standard, Volume 3, instead of by the criteria in the 2009 TNI Standard to which the Proficiency Testing Provider is accredited. This is a planned change and is endorsed by the TNI Proficiency Testing Program Executive Committee for transition to the 2016 TNI Standard.

Tahoe-Truckee Sanitation Agency Laboratory

13720 Butterfield Dr.

Truckee, CA 96161

Demonstration of Capability (DOC) Form for Chemistry

Scope and Application: This document describes the events necessary to take place prior to an analyst performing compliance testing in the TTSA Laboratory.

Name (Print): BILL PINDAR **Initials:** BP

Analytical Method Name: IRON

SOP Method Number and revision year: SM 3500-Fe B 2011

☒ **I have read, understand, and will comply with the above SOP, Reference Method, and Safety Data Sheet (SDS) for every chemical or reagent used in the analysis (Date/Initial)** 1/7/21 BP

Reason(s) for this DOC: ☐ New Method ☐ Change to Procedure

☒ Annual Demonstration (Ongoing) ☐ New Analyst

DOC Data Source:

☒ Proficiency Testing Study Company: ERA Study ID # WP-307

Test Date: 9/16/20 Report Date: 9/28/20

☐ QC Sample Source: _____ Lot# _____

☐ Actual Sample Description: _____

Target Analyte(s): TOTAL IRON

Instrument Name (Model#, Serial #): _____

Preparation Analyst Name (Print): _____

Summary Chart (Only applicable to DOC's using 'Actual Samples or QC Samples' for the data source) PT Data will be attached to this document.

All samples are unknown to analyst.

*Acceptable Recovery: +/- 10%

Run #	Analysis Date	Sample ID	True Value	Recovered Value	% Recovery	Pass/Fail (P/F)
Blank						
1						
2						
3						
4						

Mean Recovery (%) _____, Std Deviation of Recovered Values: _____

Relative Std Deviation (%) _____ Proficiency Test Z-Score: 0.306

☒ PASS ☐ FAIL

BILL PINDAR _____ 1/7/21

Analyst Name (print) Analyst Signature Date

_____

Training Analyst Name (print) Signature Date

BILL PINDAR _____ 1/7/21

Laboratory Director (print) Signature Approval Date

ERA
A Waters Company

Final Evaluation Report

Study: **WP-307**

ERA Customer Number: **T047401**

Laboratory Name: **Tahoe Truckee Sanitation Agency**

Inorganic Results

WP-307 Final Evaluation Report

ERA
A Waters Company

Kristin Davis
Chemist
Tahoe Truckee Sanitation Agency
13720 Butterfield Dr
Truckee, CA 96161
(530) 587-2525

EPA ID: CA00203
ERA Customer Number: T047401
Report Issued: 09/28/20
Study Dates: 08/10/20 - 09/24/20

TNI Analyte Code	Analyte	Units	Reported Value	Assigned Value	Acceptance Limits	Performance Evaluation	Method Description	Analysis Date	Z Score	Study Mean	Study Standard Deviation	Analyst Name
WP Trace Metals (cat# 586, lot# P307-500)												
1000	Aluminum	µg/L		3310	2760 - 3760	Not Reported				3290	206	
1005	Antimony	µg/L		868	714 - 996	Not Reported				854	49.4	
1010	Arsenic	µg/L		435	362 - 503	Not Reported				414	26.2	
1015	Barium	µg/L		1040	884 - 1200	Not Reported				1030	47.6	
1020	Beryllium	µg/L		464	394 - 534	Not Reported				456	17.8	
1025	Boron	µg/L		1450	1230 - 1670	Not Reported				1430	64.7	
1030	Cadmium	µg/L		707	601 - 813	Not Reported				694	25.2	
1040	Chromium	µg/L		112	95.2 - 129	Not Reported				111	5.79	
1050	Cobalt	µg/L		855	727 - 983	Not Reported				869	46.8	
1055	Copper	µg/L		409	348 - 470	Not Reported				404	25.2	
1070	Iron	µg/L	2304	2260	1920 - 2600	Acceptable	SM 3500-Fe B-2011 2011	9/16/2020	0.306	2260	158	
1075	Lead	µg/L		844	717 - 971	Not Reported				850	38.3	
1090	Manganese	µg/L		1650	1400 - 1900	Not Reported				1680	74.9	
1100	Molybdenum	µg/L		223	189 - 254	Not Reported				218	10.0	
1105	Nickel	µg/L		1210	1070 - 1360	Not Reported				1210	74.0	
1140	Selenium	µg/L		803	683 - 923	Not Reported				802	48.3	
1150	Silver	µg/L		692	588 - 796	Not Reported				695	25.8	
1160	Strontium	µg/L		350	298 - 402	Not Reported				346	19.0	
1165	Thallium	µg/L		369	300 - 431	Not Reported				374	22.7	
1185	Vanadium	µg/L		759	645 - 873	Not Reported				747	38.0	

This report is scored by the criteria in the 2016 TNI Standard, Volume 3, instead of by the criteria in the 2009 TNI Standard to which the Proficiency Testing Provider is accredited. This is a planned change and is endorsed by the TNI Proficiency Testing Program Executive Committee for transition to the 2016 TNI Standard.

CERTIFICATE OF EXCELLENCE

In recognition of the quality of your laboratory in proficiency testing for

WP-307

Tahoe Truckee Sanitation Agency

is issued this certificate of achievement by ERA. This laboratory has been recognized as a Laboratory of Excellence for achieving 100% acceptable data in this study which included 329 participating laboratories. This achievement is a demonstration of the superior quality of the laboratory in evaluation of the standards listed below.

Complex Nutrients	Demand
Hardness	Minerals
Nitrite	pH
Simple Nutrients	Trace Metals
Turbidity	WasteWatR™ Coliform
	MicrobE™ - SM 9221

Matthew Seebeck
Quality Officer

T047401

Tahoe-Truckee Sanitation Agency Laboratory

13720 Butterfield Dr.

Truckee, CA 96161

Demonstration of Capability (DOC) Form for Chemistry

Scope and Application: **This document describes the events necessary to take place prior to an analyst performing compliance testing in the TTSA Laboratory.**

Name (Print): BILL PINDAR **Initials:** BP

Analytical Method Name: TOTAL & FECAL COLIFORMS BY MTF

SOP Method Number and revision year: SM 9221 B, C-2006, E-2006

☒ **I have read, understand, and will comply with the above SOP, Reference Method, and Safety Data Sheet (SDS) for every chemical or reagent used in the analysis (Date/Initial)** 12/31/20 BP

Reason(s) for this DOC: ☐ New Method ☐ Change to Procedure

☒ Annual Demonstration (Ongoing) ☐ New Analyst

DOC Data Source:

☒ Proficiency Testing Study Company: ERA Study ID # WP-310

Test Date: 12/14/20 Report Date: 12/30/20

☐ QC Sample Source: _____ Lot# _____

☐ Actual Sample Description: _____

Target Analyte(s): _____

Instrument Name (Model#, Serial #): _____

Preparation Analyst Name (Print): _____

Summary Chart (Only applicable to DOC's using 'Actual Samples or QC Samples' for the data source) PT Data will be attached to this document.

All samples are unknown to analyst.

*Acceptable Recovery: +/- 10%

Run #	Analysis Date	Sample ID	True Value	Recovered Value	% Recovery	Pass/Fail (P/F)
Blank						
1						
2						
3						
4						

Mean Recovery (%) _____, Std Deviation of Recovered Values: 730 / 791

Relative Std Deviation (%) _____ Proficiency Test Z-Score: −0.06 / −0.05

☒ PASS ☐ FAIL

Bill Pindar		12/31/20
Analyst Name (print)	Analyst Signature	Date

Training Analyst Name (print)	Signature	Date

Bill Pindar		12/31/20
Laboratory Director (print)	Signature	Approval Date

ERA

A Waters Company

Final Evaluation Report

Study: WP-310

ERA Customer Number: T047401

Laboratory Name: Tahoe Truckee Sanitation Agency

Microbiology Results

WP-310 Final Evaluation Report

A Waters Company

Bill Pindar
Chemist
Tahoe Truckee Sanitation Agency
13720 Butterfield Dr
Truckee, CA 96161
(530) 587-2525

EPA ID: CA00203
ERA Customer Number: T047401
Report Issued: 12/30/20
Study Dates: 11/13/20 - 12/28/20

TNI Analyte Code	Analyte	Units	Reported Value	Assigned Value	Acceptance Limits	Performance Evaluation	Method Description	Analysis Date	Z Score	Study Mean	Study Standard Deviation	Analyst Name
WP WasteWatR™ Coliform MicrobE™ - SM 9221 (cat# 576A, lot# P310-083A)												
2500	Total Coliform (MPN-Multiple Tube)	MPN/100mL	124	181	7.48 - 4390	Acceptable	SM 9221 B + C-2006 2006	12/14/2020	-0.0575	181	730	
2530	Fecal Coliform (MPN-Multiple Tube)	MPN/100mL	124	176	6.53 - 4750	Acceptable	SM 9221 B + C-2006 2006	12/14/2020	-0.0526	176	791	
2525	E.coli (MPN-Multiple Tube)	MPN/100mL		137	6.68 - 2810	Not Reported				137	467	

CERTIFICATE OF EXCELLENCE

In recognition of the quality of your laboratory in proficiency testing for

WP-310

Tahoe Truckee Sanitation Agency

is issued this certificate of achievement by ERA. This laboratory has been recognized as a Laboratory of Excellence for achieving 100% acceptable data in this study which included 393 participating laboratories. This achievement is a demonstration of the superior quality of the laboratory in evaluation of the standards listed below.

WasteWatR™ Coliform
MicrobE™ - SM 9221

Matthew Seebeck
Quality Officer

T047401

Tahoe-Truckee Sanitation Agency Laboratory

13720 Butterfield Dr.

Truckee, CA 96161

Demonstration of Capability (DOC) Form for Chemistry

Scope and Application: **This document describes the events necessary to take place prior to an analyst performing compliance testing in the TTSA Laboratory.**

Name (Print): Bill Pindar **Initials:** BP

Analytical Method Name: ORTHO - PHOSPHATE

SOP Method Number and revision year: SM 4500 P E -2011

☒ **I have read, understand, and will comply with the above SOP, Reference Method, and Safety Data Sheet (SDS) for every chemical or reagent used in the analysis (Date/Initial)** 1/12/21 BP

Reason(s) for this DOC: ☐ New Method ☐ Change to Procedure

☒ Annual Demonstration (Ongoing) ☐ New Analyst

DOC Data Source:

☐ Proficiency Testing Study Company: ERA Study ID # WP-307

Test Date: 9/2/20 Report Date: 9/28/20

☐ QC Sample Source: _____ Lot# _____

☐ Actual Sample Description: _____

Target Analyte(s): ORTHO PHOSPHATE

Instrument Name (Model#, Serial #): _____

Preparation Analyst Name (Print): _____

Summary Chart (Only applicable to DOC's using 'Actual Samples or QC Samples' for the data source) PT Data will be attached to this document.

All samples are unknown to analyst.

*Acceptable Recovery: +/- 10%

Run #	Analysis Date	Sample ID	True Value	Recovered Value	% Recovery	Pass/Fail (P/F)
Blank						
1						
2						
3						
4						

Mean Recovery (%) _____, Std Deviation of Recovered Values: _____

Relative Std Deviation (%) _____ Proficiency Test Z-Score: 0.529

☒PASS ☐ FAIL

Analyst Name (print)	Analyst Signature	Date
Bill Pindar		1/12/21

Training Analyst Name (print)	Signature	Date

Laboratory Director (print)	Signature	Approval Date
Bill Pindar		1/12/21

ERA

A Waters Company

Final Evaluation Report

Study: WP-307

ERA Customer Number: T047401

Laboratory Name: Tahoe Truckee Sanitation Agency

Inorganic Results

WP-307 Final Evaluation Report

ERA
A Waters Company

Kristin Davis
Chemist
Tahoe Truckee Sanitation Agency
13720 Butterfield Dr
Truckee, CA 96161
(530) 587-2525

EPA ID: CA00203
ERA Customer Number: T047401
Report Issued: 09/28/20
Study Dates: 08/10/20 - 09/24/20

TNI Analyte Code	Analyte	Units	Reported Value	Assigned Value	Acceptance Limits	Performance Evaluation	Method Description	Analysis Date	Z Score	Study Mean	Study Standard Deviation	Analyst Name
VP Simple Nutrients (cat# 584, lot# P307-505)												
1515	Ammonia as N	mg/L	2.27	2.34	1.70 - 3.06	Acceptable	SM 4500-NH3 G-2011 2011	9/2/2020	-0.254	2.32	0.207	
1820	Nitrate + Nitrite as N	mg/L	6.01	6.10	5.02 - 7.12	Acceptable	EPA 300.0 2.1 1993	9/2/2020	0.0630	6.00	0.206	
1810	Nitrate as N	mg/L	6.01	6.10	4.97 - 7.20	Acceptable	EPA 300.0 2.1 1993	9/2/2020	-0.174	6.07	0.348	
1870	ortho-Phosphate as P	mg/L	1.90	1.78	1.51 - 2.05	Acceptable	SM 4500-P E-2011 2011	9/2/2020	0.529	1.82	0.143	
VP Complex Nutrients (cat# 579, lot# P307-525)												
1795	Total Kjeldahl Nitrogen	mg/L	10.0	10.3	7.55 - 12.9	Acceptable	EPA 351.2 2 1993	9/18/2020	-0.280	10.2	0.655	
1910	Total phosphorus as P	mg/L	4.47	4.31	3.56 - 5.02	Acceptable	SM 4500-P E-2011 2011	8/28/2020	0.976	4.27	0.204	
VP Nitrite (cat# 888, lot# P307-770)												
1840	Nitrite as N	mg/L	2.94	3.12	2.69 - 3.55	Acceptable	EPA 300.0 2.1 1993	9/15/2020	-1.33	3.14	0.149	
VP Demand (cat# 578, lot# P307-516)												
1530	BOD	mg/L	51.6	51.7	26.9 - 76.4	Acceptable	SM 5210 B-2011 2011	9/17/2020	0.247	49.7	7.64	
1555	CBOD	mg/L		46.8	20.7 - 72.9	Not Reported				45.0	7.81	
1565	COD	mg/L	82.3	83.5	62.0 - 102	Acceptable	HACH 8000	9/17/2020	0.135	81.3	7.13	
2040	TOC	mg/L	35.0	33.0	27.2 - 38.7	Acceptable	SM 5310 B-2011 2011	9/18/2020	1.12	32.9	1.89	

This report is scored by the criteria in the 2016 TNI Standard, Volume 3, instead of by the criteria in the 2009 TNI Standard to which the Proficiency Testing Provider is accredited. This is a planned change and is endorsed by the TNI Proficiency Testing Program Executive Committee for transition to the 2016 TNI Standard.

Tahoe-Truckee Sanitation Agency Laboratory

13720 Butterfield Dr.

Truckee, CA 96161

Demonstration of Capability (DOC) Form for Chemistry

Scope and Application: **This document describes the events necessary to take place prior to an analyst performing compliance testing in the TTSA Laboratory.**

Name (Print): BILL PINDAR **Initials:** BP

Analytical Method Name: TOTAL COLIFORM & E. COLI by COLILERT

SOP Method Number and revision year: SM223 B

☒ **I have read, understand, and will comply with the above SOP, Reference Method, and Safety Data Sheet (SDS) for every chemical or reagent used in the analysis (Date/Initial)** 12/28/20 BP

Reason(s) for this DOC: ☐ New Method ☐ Change to Procedure

☒ Annual Demonstration (Ongoing) ☐ New Analyst

DOC Data Source:

☒ Proficiency Testing Study Company: ERA Study ID # WS-292

Test Date: 12/9/20 Report Date: 12/21/20

☐ QC Sample Source: _____ Lot# _____

☐ Actual Sample Description: _____

Target Analyte(s): _____

Instrument Name (Model#, Serial #): _____

Preparation Analyst Name (Print): _____

Summary Chart (Only applicable to DOC's using 'Actual Samples or QC Samples' for the data source) PT Data will be attached to this document.

All samples are unknown to analyst.

*Acceptable Recovery: +/- 10%

Run #	Analysis Date	Sample ID	True Value	Recovered Value	% Recovery	Pass/Fail (P/F)
Blank						
1						
2						
3						
4						

Mean Recovery (%) _____, Std Deviation of Recovered Values: _____

Relative Std Deviation (%) _____ Proficiency Test Z-Score: N/A

☒ PASS ☐ FAIL

Bill Pindar	[signature]	12/28/20
Analyst Name (print)	Analyst Signature	Date

Training Analyst Name (print)	Signature	Date

Bill Pindar	[signature]	12/28/20
Laboratory Director (print)	Signature	Approval Date

ERA
A Waters Company

Final Evaluation Report

Study: **WS-292**

ERA Customer Number: **T047401**

Laboratory Name: **Tahoe Truckee Sanitation Agency**

Microbiology Results

WS-292 Final Evaluation Report

A Waters Company

Bill Pindar
Chemist
Tahoe Truckee Sanitation Agency
13720 Butterfield Dr
Truckee, CA 96161
(530) 587-2525

EPA ID: CA00203
ERA Customer Number: T047401
Report Issued: 12/21/20
Study Dates: 11/02/20 - 12/17/20

TNI Analyte Code	Analyte	Units	Reported Value	Assigned Value	Acceptance Limits	Performance Evaluation	Method Description	Analysis Date	Z Score	Study Mean	Study Standard Deviation	Analyst Name
WS MicrobE™ (Coliforms) (cat# 080B, lot# S292-085B)												
2500	Total Coliforms - Sample 1	CFU/100mL	Presence	Presence	Presence	Acceptable	SM 9223 B (Colilert)-2004 2004	12/9/2020				
2500	Total Coliforms - Sample 2	CFU/100mL	Presence	Presence	Presence	Acceptable	SM 9223 B (Colilert)-2004 2004	12/9/2020				
2500	Total Coliforms - Sample 3	CFU/100mL	Presence	Presence	Presence	Acceptable	SM 9223 B (Colilert)-2004 2004	12/9/2020				
2500	Total Coliforms - Sample 4	CFU/100mL	Absence	Absence	Absence	Acceptable	SM 9223 B (Colilert)-2004 2004	12/9/2020				
2500	Total Coliforms - Sample 5	CFU/100mL	Presence	Presence	Presence	Acceptable	SM 9223 B (Colilert)-2004 2004	12/9/2020				
2500	Total Coliforms - Sample 6	CFU/100mL	Absence	Absence	Absence	Acceptable	SM 9223 B (Colilert)-2004 2004	12/9/2020				
2500	Total Coliforms - Sample 7	CFU/100mL	Presence	Presence	Presence	Acceptable	SM 9223 B (Colilert)-2004 2004	12/9/2020				
2500	Total Coliforms - Sample 8	CFU/100mL	Presence	Presence	Presence	Acceptable	SM 9223 B (Colilert)-2004 2004	12/9/2020				
2500	Total Coliforms - Sample 9	CFU/100mL	Absence	Absence	Absence	Acceptable	SM 9223 B (Colilert)-2004 2004	12/9/2020				
2500	Total Coliforms - Sample 10	CFU/100mL	Absence	Absence	Absence	Acceptable	SM 9223 B (Colilert)-2004 2004	12/9/2020				

Total Coliforms Evaluation : Acceptable
Fecal Coliforms Evaluation : Not Reported
E.coli Evaluation : Acceptable

Fecal Coliform Organism - Escherichia coli (ATCC 35421), Samples 1, 3 and 8
Total Coliform Organism - Enterobacter cloacae (NCTC 10005), Samples 2, 5 and 7
Negative (1) Coliform Organism - Proteus mirabilis (NCIMB 13283), Sample 6
Negative (2) Coliform Organism - Pseudomonas aeruginosa (NCIMB 12469), Sample 10
Blank - Blank Pellet (Qualitative), Samples 4 and 9

WS-292 Final Evaluation Report

A Waters Company

Bill Pindar
Chemist
Tahoe Truckee Sanitation Agency
13720 Butterfield Dr
Truckee, CA 96161
(530) 587-2525

EPA ID: CA00203
ERA Customer Number: T047401
Report Issued: 12/21/20
Study Dates: 11/02/20 - 12/17/20

TNI Analyte Code	Analyte	Units	Reported Value	Assigned Value	Acceptance Limits	Performance Evaluation	Method Description	Analysis Date	Z Score	Study Mean	Study Standard Deviation	Analyst Name
WS MicrobE™ (Coliforms) (cat# 080B, lot# S292-085B) (Continued)												
2525	E.coli - Sample 1	CFU/100mL	Presence	Presence	Presence	Acceptable	SM 9223 B (Colilert)-2004 2004	12/9/2020				
2525	E.coli - Sample 2	CFU/100mL	Absence	Absence	Absence	Acceptable	SM 9223 B (Colilert)-2004 2004	12/9/2020				
2525	E.coli - Sample 3	CFU/100mL	Presence	Presence	Presence	Acceptable	SM 9223 B (Colilert)-2004 2004	12/9/2020				
2525	E.coli - Sample 4	CFU/100mL	Absence	Absence	Absence	Acceptable	SM 9223 B (Colilert)-2004 2004	12/9/2020				
2525	E.coli - Sample 5	CFU/100mL	Absence	Absence	Absence	Acceptable	SM 9223 B (Colilert)-2004 2004	12/9/2020				
2525	E.coli - Sample 6	CFU/100mL	Absence	Absence	Absence	Acceptable	SM 9223 B (Colilert)-2004 2004	12/9/2020				
2525	E.coli - Sample 7	CFU/100mL	Absence	Absence	Absence	Acceptable	SM 9223 B (Colilert)-2004 2004	12/9/2020				
2525	E.coli - Sample 8	CFU/100mL	Presence	Presence	Presence	Acceptable	SM 9223 B (Colilert)-2004 2004	12/9/2020				
2525	E.coli - Sample 9	CFU/100mL	Absence	Absence	Absence	Acceptable	SM 9223 B (Colilert)-2004 2004	12/9/2020				
2525	E.coli - Sample 10	CFU/100mL	Absence	Absence	Absence	Acceptable	SM 9223 B (Colilert)-2004 2004	12/9/2020				

Total Coliforms Evaluation : Acceptable
Fecal Coliforms Evaluation : Not Reported
E.coli Evaluation : Acceptable

Fecal Coliform Organism - Escherichia coli (ATCC 35421), Samples 1, 3 and 8
Total Coliform Organism - Enterobacter cloacae (NCTC 10005), Samples 2, 5 and 7
Negative (1) Coliform Organism - Proteus mirabilis (NCIMB 13283), Sample 6
Negative (2) Coliform Organism - Pseudomonas aeruginosa (NCIMB 12469), Sample 10
Blank - Blank Pellet (Qualitative), Samples 4 and 9

CERTIFICATE OF EXCELLENCE

In recognition of the quality of your laboratory in proficiency testing for

WS-292

Tahoe Truckee Sanitation Agency

is issued this certificate of achievement by ERA. This laboratory has been recognized as a Laboratory of Excellence for achieving 100% acceptable data in this study which included 238 participating laboratories. This achievement is a demonstration of the superior quality of the laboratory in evaluation of the standards listed below.

MicrobE™ (Coliforms)

Matthew Seebeck
Quality Officer

T047401

Tahoe-Truckee Sanitation Agency Laboratory

13720 Butterfield Dr.

Truckee, CA 96161

Demonstration of Capability (DOC) Form for Chemistry

Scope and Application: **This document describes the events necessary to take place prior to an analyst performing compliance testing in the TTSA Laboratory.**

Name (Print): Kristin Davis **Initials:** KD

Analytical Method Name: pH

SOP Method Number and revision year: SM 4500-H+ B-2011

☒ **I have read, understand, and will comply with the above SOP, Reference Method, and Safety Data Sheet (SDS) for every chemical or reagent used in the analysis (Date/Initial)** 1/5/2021 KD

Reason(s) for this DOC: ☐ New Method ☐ Change to Procedure

☒ Annual Demonstration (Ongoing) ☐ New Analyst

DOC Data Source:

☒ Proficiency Testing Study Company: ERA Study ID # WP-307

Test Date: 9/18/20 Report Date: 9/28/20

☐ QC Sample Source: _____ Lot# _____

☐ Actual Sample Description: _____

Target Analyte(s): pH

Instrument Name (Model#, Serial #): Mettler-Toledo FiveEasy F20 serial#:B604a322219

Preparation Analyst Name (Print): _____

Summary Chart (Only applicable to DOC's using 'Actual Samples or QC Samples' for the data source) PT Data will be attached to this document.

All samples are unknown to analyst.

*Acceptable Recovery: +/- 10%

Run #	Analysis Date	Sample ID	True Value	Recovered Value	% Recovery	Pass/Fail (P/F)
Blank						
1						
2						
3						
4						

Mean Recovery (%) _____, Std Deviation of Recovered Values: _____

Relative Std Deviation (%) _____ Proficiency Test Z-Score: 0.136

☒ PASS ☐ FAIL

Kristin Davis Kristin Davis 1/5/2021

Analyst Name (print) Analyst Signature Date

_____

Training Analyst Name (print) Signature Date

Bill Pindar 1/5/21

Laboratory Director (print) Signature Approval Date

Revision 1

December 22, 2020

ERA
A Waters Company

Final Evaluation Report

Study: WP-307

ERA Customer Number: T047401

Laboratory Name: Tahoe Truckee Sanitation Agency

Inorganic Results

WP-307 Final Evaluation Report

ERA
A Waters Company

Kristin Davis
Chemist
Tahoe Truckee Sanitation Agency
13720 Butterfield Dr
Truckee, CA 96161
(530) 587-2525

EPA ID: CA00203
ERA Customer Number: T047401
Report Issued: 09/28/20
Study Dates: 08/10/20 - 09/24/20

TNI Analyte Code	Analyte	Units	Reported Value	Assigned Value	Acceptance Limits	Performance Evaluation	Method Description	Analysis Date	Z Score	Study Mean	Study Standard Deviation	Analyst Name
WP Minerals (cat# 581, lot# P307-506)												
1505	Alkalinity as CaCO3	mg/L	123	124	105 - 143	Acceptable	SM 2320 B-2011 2011	9/9/2020	-0.227	124	3.43	
1575	Chloride	mg/L	50.2	47.9	41.5 - 54.5	Acceptable	EPA 300.0 2.1 1993	9/17/2020	0.601	49.2	1.71	
1610	Conductivity at 25°C	µmhos/cm		448	403 - 493	Not Reported				454	8.21	
1730	Fluoride	mg/L		3.48	2.82 - 4.00	Not Reported				3.41	0.187	
1125	Potassium	mg/L		24.0	19.2 - 28.8	Not Reported				24.1	0.889	
1155	Sodium	mg/L		86.8	69.4 - 104	Not Reported				87.5	3.18	
2000	Sulfate	mg/L	21.0	20.7	16.3 - 24.2	Acceptable	EPA 300.0 2.1 1993	9/17/2020	-0.0534	21.1	1.06	
1955	Total Dissolved Solids at 180°C	mg/L	388	399	354 - 444	Acceptable	SM 2540 C-2011 2011	9/15/2020	-0.0465	389	27.5	
1950	Total Solids at 105°C	mg/L		424	379 - 469	Not Reported				410	25.5	
WP Hardness (cat# 580, lot# P307-507)												
1960	Total Suspended Solids	mg/L	24.5	26.8	18.3 - 32.6	Acceptable	SM 2540 D-2011 2011	9/15/2020	-0.281	25.1	2.08	
1035	Calcium	mg/L		22.7	19.3 - 26.1	Not Reported				23.3	0.850	
1085	Magnesium	mg/L		23.3	19.8 - 26.8	Not Reported				23.9	1.34	
1550	Calcium Hardness as CaCO3	mg/L		56.8	48.3 - 65.3	Not Reported				78.4	48.1	
1755	Total Hardness as CaCO3	mg/L		153	130 - 176	Not Reported				158	5.70	
WP pH (cat# 577, lot# P307-977)												
1900	pH	S.U.	7.96	7.90	7.70 - 8.10	Acceptable	SM 4500-H+ B-2011 2011	9/18/2020	0.136	7.95	0.0623	

This report is scored by the criteria in the 2016 TNI Standard, Volume 3, instead of by the criteria in the 2009 TNI Standard to which the Proficiency Testing Provider is accredited. This is a planned change and is endorsed by the TNI Proficiency Testing Program Executive Committee for transition to the 2016 TNI Standard.

CERTIFICATE OF EXCELLENCE

In recognition of the quality of your laboratory in proficiency testing for

WP-307

Tahoe Truckee Sanitation Agency

is issued this certificate of achievement by ERA. This laboratory has been recognized as a Laboratory of Excellence for achieving 100% acceptable data in this study which included 329 participating laboratories. This achievement is a demonstration of the superior quality of the laboratory in evaluation of the standards listed below.

Complex Nutrients	Demand
Hardness	Minerals
Nitrite	pH
Simple Nutrients	Trace Metals
Turbidity	WasteWatR™ Coliform
	MicrobE™ - SM 9221

Matthew Seebeck
Quality Officer

T047401

Tahoe-Truckee Sanitation Agency Laboratory

13720 Butterfield Dr.

Truckee, CA 96161

Demonstration of Capability (DOC) Form for Chemistry

Scope and Application: **This document describes the events necessary to take place prior to an analyst performing compliance testing in the TTSA Laboratory.**

Name (Print): BILL PINDAR **Initials:** BP

Analytical Method Name: TDS

SOP Method Number and revision year: SM 2540 C-2011

☒ **I have read, understand, and will comply with the above SOP, Reference Method, and Safety Data Sheet (SDS) for every chemical or reagent used in the analysis (Date/Initial)** 1/12/21 BP

Reason(s) for this DOC: ☐ New Method ☐ Change to Procedure

☒ Annual Demonstration (Ongoing) ☐ New Analyst

DOC Data Source:

☒ Proficiency Testing Study Company: ERA Study ID # WP-307

Test Date: 9/15/20 Report Date: 9/28/20

☐ QC Sample Source: _____ Lot# _____

☐ Actual Sample Description: _____

Target Analyte(s): TDS mg/L

Instrument Name (Model#, Serial #): N/A

Preparation Analyst Name (Print): _____

Summary Chart (Only applicable to DOC's using 'Actual Samples or QC Samples' for the data source) PT Data will be attached to this document.

All samples are unknown to analyst.

*Acceptable Recovery: +/- 10%

Run #	Analysis Date	Sample ID	True Value	Recovered Value	% Recovery	Pass/Fail (P/F)
Blank						
1						
2						
3						
4						

Mean Recovery (%) _____, Std Deviation of Recovered Values: _____

Relative Std Deviation (%) _____ Proficiency Test Z-Score: -0.04

☒ PASS ☐ FAIL

Bill Pindar	[signature]	1/12/21
Analyst Name (print)	Analyst Signature	Date

Training Analyst Name (print)	Signature	Date

Bill Pindar	[signature]	1/12/21
Laboratory Director (print)	Signature	Approval Date

ERA

A Waters Company

Final Evaluation Report

Study: WP-307

ERA Customer Number: T047401

Laboratory Name: Tahoe Truckee Sanitation Agency

Inorganic Results

WP-307 Final Evaluation Report

A Waters Company

Kristin Davis
Chemist
Tahoe Truckee Sanitation Agency
13720 Butterfield Dr
Truckee, CA 96161
(530) 587-2525

EPA ID: CA00203
ERA Customer Number: T047401
Report Issued: 09/28/20
Study Dates: 08/10/20 - 09/24/20

TNI Analyte Code	Analyte	Units	Reported Value	Assigned Value	Acceptance Limits	Performance Evaluation	Method Description	Analysis Date	Z Score	Study Mean	Study Standard Deviation	Analyst Name
WP Minerals (cat# 581, lot# P307-506)												
1505	Alkalinity as CaCO3	mg/L	123	124	105 - 143	Acceptable	SM 2320 B-2011 2011	9/9/2020	-0.227	124	3.43	
1575	Chloride	mg/L	50.2	47.9	41.5 - 54.5	Acceptable	EPA 300.0 2.1 1993	9/17/2020	0.601	49.2	1.71	
1610	Conductivity at 25°C	µmhos/cm		448	403 - 493	Not Reported				454	8.21	
1730	Fluoride	mg/L		3.48	2.82 - 4.00	Not Reported				3.41	0.187	
1125	Potassium	mg/L		24.0	19.2 - 28.8	Not Reported				24.1	0.889	
1155	Sodium	mg/L		86.8	69.4 - 104	Not Reported				87.5	3.18	
2000	Sulfate	mg/L	21.0	20.7	16.3 - 24.2	Acceptable	EPA 300.0 2.1 1993	9/17/2020	-0.0534	21.1	1.06	
1955	Total Dissolved Solids at 180°C	mg/L	388	399	354 - 444	Acceptable	SM 2540 C-2011 2011	9/15/2020	-0.0465	389	27.5	
1950	Total Solids at 105°C	mg/L		424	379 - 469	Not Reported				410	25.5	
WP Hardness (cat# 580, lot# P307-507)												
1960	Total Suspended Solids	mg/L	24.5	26.8	18.3 - 32.6	Acceptable	SM 2540 D-2011 2011	9/15/2020	-0.281	25.1	2.08	
1035	Calcium	mg/L		22.7	19.3 - 26.1	Not Reported				23.3	0.850	
1085	Magnesium	mg/L		23.3	19.8 - 26.8	Not Reported				23.9	1.34	
1550	Calcium Hardness as CaCO3	mg/L		56.8	48.3 - 65.3	Not Reported				78.4	48.1	
1755	Total Hardness as CaCO3	mg/L		153	130 - 176	Not Reported				158	5.70	
WP pH (cat# 577, lot# P307-977)												
1900	pH	S.U.	7.96	7.90	7.70 - 8.10	Acceptable	SM 4500-H+ B-2011 2011	9/18/2020	0.136	7.95	0.0623	

This report is scored by the criteria in the 2016 TNI Standard, Volume 3, instead of by the criteria in the 2009 TNI Standard to which the Proficiency Testing Provider is accredited. This is a planned change and is endorsed by the TNI Proficiency Testing Program Executive Committee for transition to the 2016 TNI Standard.

Tahoe-Truckee Sanitation Agency Laboratory

13720 Butterfield Dr.

Truckee, CA 96161

Demonstration of Capability (DOC) Form for Chemistry

Scope and Application: **This document describes the events necessary to take place prior to an analyst performing compliance testing in the TTSA Laboratory.**

Name (Print): Kristin Davis **Initials:** KD

Analytical Method Name: Total Kjeldahl Nitrogen

SOP Method Number and revision year: EPA 351.2 Rev.2 1993

☒ **I have read, understand, and will comply with the above SOP, Reference Method, and Safety Data Sheet (SDS) for every chemical or reagent used in the analysis (Date/Initial)** 1/5/2021 KD

Reason(s) for this DOC: ☐ New Method ☐ Change to Procedure

☒ Annual Demonstration (Ongoing) ☐ New Analyst

DOC Data Source:

☒ Proficiency Testing Study Company: ERA Study ID # WP-307

Test Date: 9/18/20 Report Date: 9/28/20

☐ QC Sample Source: _____ Lot# _____

☐ Actual Sample Description: _____

Target Analyte(s): Total Kjeldahl Nitrogen

Instrument Name (Model#, Serial #): SEAL AQ2+ serial#:090633

Preparation Analyst Name (Print): _____

Summary Chart (Only applicable to DOC's using 'Actual Samples or QC Samples' for the data source) PT Data will be attached to this document.

All samples are unknown to analyst.

*Acceptable Recovery: +/- 10%

Run #	Analysis Date	Sample ID	True Value	Recovered Value	% Recovery	Pass/Fail (P/F)
Blank						
1						
2						
3						
4						

Mean Recovery (%) _____, Std Deviation of Recovered Values: _____

Relative Std Deviation (%) _____ Proficiency Test Z-Score: -0.280

☒ PASS ☐ FAIL

Kristin Davis Kristin Davis 1/5/2021

Analyst Name (print) Analyst Signature Date

_____

Training Analyst Name (print) Signature Date

Bill Pridar 1/5/21

Laboratory Director (print) Signature Approval Date

Revision 1

December 22, 2020

ERA
A Waters Company

Final Evaluation Report

Study: WP-307

ERA Customer Number: T047401

Laboratory Name: Tahoe Truckee Sanitation Agency

Inorganic Results

WP-307 Final Evaluation Report

ERA
A Waters Company

Kristin Davis
Chemist
Tahoe Truckee Sanitation Agency
13720 Butterfield Dr
Truckee, CA 96161
(530) 587-2525

EPA ID: CA00203
ERA Customer Number: T047401
Report Issued: 09/28/20
Study Dates: 08/10/20 - 09/24/20

TNI Analyte Code	Analyte	Units	Reported Value	Assigned Value	Acceptance Limits	Performance Evaluation	Method Description	Analysis Date	Z Score	Study Mean	Study Standard Deviation	Analyst Name
WP Simple Nutrients (cat# 584, lot# P307-505)												
1515	Ammonia as N	mg/L	2.27	2.34	1.70 - 3.06	Acceptable	SM 4500-NH3 G-2011 2011	9/2/2020	-0.254	2.32	0.207	
1820	Nitrate + Nitrite as N	mg/L	6.01	6.10	5.02 - 7.12	Acceptable	EPA 300.0 2.1 1993	9/2/2020	0.0630	6.00	0.206	
1810	Nitrate as N	mg/L	6.01	6.10	4.97 - 7.20	Acceptable	EPA 300.0 2.1 1993	9/2/2020	-0.174	6.07	0.348	
1870	ortho-Phosphate as P	mg/L	1.90	1.78	1.51 - 2.05	Acceptable	SM 4500-P E-2011 2011	9/2/2020	0.529	1.82	0.143	
WP Complex Nutrients (cat# 579, lot# P307-525)												
1795	Total Kjeldahl Nitrogen	mg/L	10.0	10.3	7.55 - 12.9	Acceptable	EPA 351.2 2 1993	9/18/2020	-0.280	10.2	0.655	
1910	Total phosphorus as P	mg/L	4.47	4.31	3.56 - 5.02	Acceptable	SM 4500-P E-2011 2011	8/28/2020	0.976	4.27	0.204	
WP Nitrite (cat# 888, lot# P307-770)												
1840	Nitrite as N	mg/L	2.94	3.12	2.69 - 3.55	Acceptable	EPA 300.0 2.1 1993	9/15/2020	-1.33	3.14	0.149	
WP Demand (cat# 578, lot# P307-516)												
1530	BOD	mg/L	51.6	51.7	26.9 - 76.4	Acceptable	SM 5210 B-2011 2011	9/17/2020	0.247	49.7	7.64	
1555	CBOD	mg/L		46.8	20.7 - 72.9	Not Reported				45.0	7.81	
1565	COD	mg/L	82.3	83.5	62.0 - 102	Acceptable	HACH 8000	9/17/2020	0.135	81.3	7.13	
2040	TOC	mg/L	35.0	33.0	27.2 - 38.7	Acceptable	SM 5310 B-2011 2011	9/18/2020	1.12	32.9	1.89	

This report is scored by the criteria in the 2016 TNI Standard, Volume 3, instead of by the criteria in the 2009 TNI Standard to which the Proficiency Testing Provider is accredited. This is a planned change and is endorsed by the TNI Proficiency Testing Program Executive Committee for transition to the 2016 TNI Standard.

CERTIFICATE OF EXCELLENCE

In recognition of the quality of your laboratory in proficiency testing for

WP-307

Tahoe Truckee Sanitation Agency

is issued this certificate of achievement by ERA. This laboratory has been recognized as a Laboratory of Excellence for achieving 100% acceptable data in this study which included 329 participating laboratories. This achievement is a demonstration of the superior quality of the laboratory in evaluation of the standards listed below.

Complex Nutrients	Demand
Hardness	Minerals
Nitrite	pH
Simple Nutrients	Trace Metals
Turbidity	WasteWatR™ Coliform
	MicrobE™ - SM 9221

Matthew Seebeck
Quality Officer

T047401

Tahoe-Truckee Sanitation Agency Laboratory

13720 Butterfield Dr.

Truckee, CA 96161

Demonstration of Capability (DOC) Form for Chemistry

Scope and Application: **This document describes the events necessary to take place prior to an analyst performing compliance testing in the TTSA Laboratory.**

Name (Print): BILL PINDAR **Initials:** BP

Analytical Method Name: TOTAL ORGANIC CARBON

SOP Method Number and revision year: SM 5310 B-2011

☒ **I have read, understand, and will comply with the above SOP, Reference Method, and Safety Data Sheet (SDS) for every chemical or reagent used in the analysis (Date/Initial)** 1/12/21 BP

Reason(s) for this DOC: ☐ New Method ☐ Change to Procedure

☒ Annual Demonstration (Ongoing) ☐ New Analyst

DOC Data Source:

☒ Proficiency Testing Study Company: ERA Study ID # WP-307

Test Date: 9/18/20 Report Date: 9/28/20

☐ QC Sample Source: _____ Lot# _____

☐ Actual Sample Description: _____

Target Analyte(s): TOC / DOC

Instrument Name (Model#, Serial #): LOTIX COMBUSTION

Preparation Analyst Name (Print): _____

ERA

A Waters Company

Final Evaluation Report

Study: WP-307

ERA Customer Number: T047401

Laboratory Name: Tahoe Truckee Sanitation Agency

Inorganic Results

WP-307 Final Evaluation Report

ERA
A Waters Company

Kristin Davis
Chemist
Tahoe Truckee Sanitation Agency
13720 Butterfield Dr
Truckee, CA 96161
(530) 587-2525

EPA ID: CA00203
ERA Customer Number: T047401
Report Issued: 09/28/20
Study Dates: 08/10/20 - 09/24/20

TNI Analyte Code	Analyte	Units	Reported Value	Assigned Value	Acceptance Limits	Performance Evaluation	Method Description	Analysis Date	Z Score	Study Mean	Study Standard Deviation	Analyst Name
WP Simple Nutrients (cat# 584, lot# P307-505)												
1515	Ammonia as N	mg/L	2.27	2.34	1.70 - 3.06	Acceptable	SM 4500-NH3 G-2011 2011	9/2/2020	-0.254	2.32	0.207	
1820	Nitrate + Nitrite as N	mg/L	6.01	6.10	5.02 - 7.12	Acceptable	EPA 300.0 2.1 1993	9/2/2020	0.0630	6.00	0.206	
1810	Nitrate as N	mg/L	6.01	6.10	4.97 - 7.20	Acceptable	EPA 300.0 2.1 1993	9/2/2020	-0.174	6.07	0.348	
1870	ortho-Phosphate as P	mg/L	1.90	1.78	1.51 - 2.05	Acceptable	SM 4500-P E-2011 2011	9/2/2020	0.529	1.82	0.143	
WP Complex Nutrients (cat# 579, lot# P307-525)												
1795	Total Kjeldahl Nitrogen	mg/L	10.0	10.3	7.55 - 12.9	Acceptable	EPA 351.2 2 1993	9/18/2020	-0.280	10.2	0.655	
1910	Total phosphorus as P	mg/L	4.47	4.31	3.56 - 5.02	Acceptable	SM 4500-P E-2011 2011	8/28/2020	0.976	4.27	0.204	
WP Nitrite (cat# 888, lot# P307-770)												
1840	Nitrite as N	mg/L	2.94	3.12	2.69 - 3.55	Acceptable	EPA 300.0 2.1 1993	9/15/2020	-1.33	3.14	0.149	
WP Demand (cat# 578, lot# P307-516)												
1530	BOD	mg/L	51.6	51.7	26.9 - 76.4	Acceptable	SM 5210 B-2011 2011	9/17/2020	0.247	49.7	7.64	
1555	CBOD	mg/L		46.8	20.7 - 72.9	Not Reported				45.0	7.81	
1565	COD	mg/L	82.3	83.5	62.0 - 102	Acceptable	HACH 8000	9/17/2020	0.135	81.3	7.13	
2040	TOC	mg/L	35.0	33.0	27.2 - 38.7	Acceptable	SM 5310 B-2011 2011	9/18/2020	1.12	32.9	1.89	

This report is scored by the criteria in the 2016 TNI Standard, Volume 3, instead of by the criteria in the 2009 TNI Standard to which the Proficiency Testing Provider is accredited. This is a planned change and is endorsed by the TNI Proficiency Testing Program Executive Committee for transition to the 2016 TNI Standard.

Summary Chart (Only applicable to DOC's using 'Actual Samples or QC Samples' for the data source) PT Data will be attached to this document.

All samples are unknown to analyst.

*Acceptable Recovery: +/- 10%

Run #	Analysis Date	Sample ID	True Value	Recovered Value	% Recovery	Pass/Fail (P/F)
Blank						
1						
2						
3						
4						

Mean Recovery (%) _____, Std Deviation of Recovered Values: _____

Relative Std Deviation (%) _____ Proficiency Test Z-Score: 1.12

☒ PASS ☐ FAIL

BILL PINDAR _____ 1/12/21

Analyst Name (print) Analyst Signature Date

_____

Training Analyst Name (print) Signature Date

BILL PINDAR _____ 1/12/21

Laboratory Director (print) Signature Approval Date

Tahoe-Truckee Sanitation Agency Laboratory

13720 Butterfield Dr.

Truckee, CA 96161

Demonstration of Capability (DOC) Form for Chemistry

Scope and Application: **This document describes the events necessary to take place prior to an analyst performing compliance testing in the TTSA Laboratory.**

Name (Print): BILL PINDAR **Initials:** BP

Analytical Method Name: TOTAL PHOSPHORUS

SOP Method Number and revision year: SM4500 P E-2011

☒ **I have read, understand, and will comply with the above SOP, Reference Method, and Safety Data Sheet (SDS) for every chemical or reagent used in the analysis (Date/Initial)** 1/12/21 BP

Reason(s) for this DOC: ☐ New Method ☐ Change to Procedure

☒ Annual Demonstration (Ongoing) ☐ New Analyst

DOC Data Source:

☒ Proficiency Testing Study Company: ERA Study ID # WP-307

Test Date: 8/26/20 Report Date: 9/28/20

☐ QC Sample Source: _____ Lot# _____

☐ Actual Sample Description: _____

Target Analyte(s): TOTAL PHOSPHORUS

Instrument Name (Model#, Serial #): _____

Preparation Analyst Name (Print): _____

Summary Chart (Only applicable to DOC's using 'Actual Samples or QC Samples' for the data source) PT Data will be attached to this document.

All samples are unknown to analyst.

*Acceptable Recovery: +/- 10%

Run #	Analysis Date	Sample ID	True Value	Recovered Value	% Recovery	Pass/Fail (P/F)
Blank						
1						
2						
3						
4						

Mean Recovery (%) _____, Std Deviation of Recovered Values: _____

Relative Std Deviation (%) _____ Proficiency Test Z-Score: 0.98

☒ PASS ☐ FAIL

Bill Pindar		1/12/21
Analyst Name (print)	Analyst Signature	Date

Training Analyst Name (print)	Signature	Date

Bill Pindar		1/12/21
Laboratory Director (print)	Signature	Approval Date

ERA

A Waters Company

Final Evaluation Report

Study: **WP-307**

ERA Customer Number: **T047401**

Laboratory Name: **Tahoe Truckee Sanitation Agency**

Inorganic Results

WP-307 Final Evaluation Report

A Waters Company

Kristin Davis
Chemist
Tahoe Truckee Sanitation Agency
13720 Butterfield Dr
Truckee, CA 96161
(530) 587-2525

EPA ID: CA00203
ERA Customer Number: T047401
Report Issued: 09/28/20
Study Dates: 08/10/20 - 09/24/20

TNI Analyte Code	Analyte	Units	Reported Value	Assigned Value	Acceptance Limits	Performance Evaluation	Method Description	Analysis Date	Z Score	Study Mean	Study Standard Deviation	Analyst Name
WP Simple Nutrients (cat# 584, lot# P307-505)												
1515	Ammonia as N	mg/L	2.27	2.34	1.70 - 3.06	Acceptable	SM 4500-NH3 G-2011 2011	9/2/2020	-0.254	2.32	0.207	
1820	Nitrate + Nitrite as N	mg/L	6.01	6.10	5.02 - 7.12	Acceptable	EPA 300.0 2.1 1993	9/2/2020	0.0630	6.00	0.206	
1810	Nitrate as N	mg/L	6.01	6.10	4.97 - 7.20	Acceptable	EPA 300.0 2.1 1993	9/2/2020	-0.174	6.07	0.348	
1870	ortho-Phosphate as P	mg/L	1.90	1.78	1.51 - 2.05	Acceptable	SM 4500-P E-2011 2011	9/2/2020	0.529	1.82	0.143	
WP Complex Nutrients (cat# 579, lot# P307-525)												
1795	Total Kjeldahl Nitrogen	mg/L	10.0	10.3	7.55 - 12.9	Acceptable	EPA 351.2 2 1993	9/18/2020	-0.280	10.2	0.655	
1910	Total phosphorus as P	mg/L	4.47	4.31	3.56 - 5.02	Acceptable	SM 4500-P E-2011 2011	8/28/2020	0.976	4.27	0.204	
WP Nitrite (cat# 888, lot# P307-770)												
1840	Nitrite as N	mg/L	2.94	3.12	2.69 - 3.55	Acceptable	EPA 300.0 2.1 1993	9/15/2020	-1.33	3.14	0.149	
WP Demand (cat# 578, lot# P307-516)												
1530	BOD	mg/L	51.6	51.7	26.9 - 76.4	Acceptable	SM 5210 B-2011 2011	9/17/2020	0.247	49.7	7.64	
1555	CBOD	mg/L		46.8	20.7 - 72.9	Not Reported				45.0	7.81	
1565	COD	mg/L	82.3	83.5	62.0 - 102	Acceptable	HACH 8000	9/17/2020	0.135	81.3	7.13	
2040	TOC	mg/L	35.0	33.0	27.2 - 38.7	Acceptable	SM 5310 B-2011 2011	9/18/2020	1.12	32.9	1.89	

This report is scored by the criteria in the 2016 TNI Standard, Volume 3, instead of by the criteria in the 2009 TNI Standard to which the Proficiency Testing Provider is accredited. This is a planned change and is endorsed by the TNI Proficiency Testing Program Executive Committee for transition to the 2016 TNI Standard.

Tahoe-Truckee Sanitation Agency Laboratory

13720 Butterfield Dr.

Truckee, CA 96161

Demonstration of Capability (DOC) Form for Chemistry

Scope and Application: This document describes the events necessary to take place prior to an analyst performing compliance testing in the TTSA Laboratory.

Name (Print): BILL RINDAL **Initials:** BR

Analytical Method Name: TSS

SOP Method Number and revision year: SM 2540 D 2011

☒ **I have read, understand, and will comply with the above SOP, Reference Method, and Safety Data Sheet (SDS) for every chemical or reagent used in the analysis (Date/Initial)** 1/12/21 BR

Reason(s) for this DOC: ☐ New Method ☐ Change to Procedure

☒ Annual Demonstration (Ongoing) ☐ New Analyst

DOC Data Source:

☐ Proficiency Testing Study Company: ERA Study ID # WP-307

Test Date: 9/15/20 Report Date: 9/28/20

☐ QC Sample Source: _____ Lot# _____

☐ Actual Sample Description: _____

Target Analyte(s): TOTAL SUSPENDED SOLIDS

Instrument Name (Model#, Serial #): N/A

Preparation Analyst Name (Print): _____

Summary Chart (Only applicable to DOC's using 'Actual Samples or QC Samples' for the data source) PT Data will be attached to this document.

All samples are unknown to analyst.

*Acceptable Recovery: +/- 10%

Run #	Analysis Date	Sample ID	True Value	Recovered Value	% Recovery	Pass/Fail (P/F)
Blank						
1						
2						
3						
4						

Mean Recovery (%) _____, Std Deviation of Recovered Values: _____

Relative Std Deviation (%) _____ Proficiency Test Z-Score: -0.28

☒PASS ☐ FAIL

BILL PINDAL _____ 1/12/21

Analyst Name (print) Analyst Signature Date

_____

Training Analyst Name (print) Signature Date

BILL PINDAL _____ 1/12/21

Laboratory Director (print) Signature Approval Date

ERA

A Waters Company

Final Evaluation Report

Study: WP-307

ERA Customer Number: T047401

Laboratory Name: Tahoe Truckee Sanitation Agency

Inorganic Results

WP-307 Final Evaluation Report

ERA
A Waters Company

Kristin Davis
Chemist
Tahoe Truckee Sanitation Agency
13720 Butterfield Dr
Truckee, CA 96161
(530) 587-2525

EPA ID: CA00203
ERA Customer Number: T047401
Report Issued: 09/28/20
Study Dates: 08/10/20 - 09/24/20

TNI Analyte Code	Analyte	Units	Reported Value	Assigned Value	Acceptance Limits	Performance Evaluation	Method Description	Analysis Date	Z Score	Study Mean	Study Standard Deviation	Analyst Name
VP Minerals (cat# 581, lot# P307-506)												
1505	Alkalinity as CaCO3	mg/L	123	124	105 - 143	Acceptable	SM 2320 B-2011 2011	9/9/2020	-0.227	124	3.43	
1575	Chloride	mg/L	50.2	47.9	41.5 - 54.5	Acceptable	EPA 300.0 2.1 1993	9/17/2020	0.601	49.2	1.71	
1610	Conductivity at 25°C	µmhos/cm		448	403 - 493	Not Reported				454	8.21	
1730	Fluoride	mg/L		3.48	2.82 - 4.00	Not Reported				3.41	0.187	
1125	Potassium	mg/L		24.0	19.2 - 28.8	Not Reported				24.1	0.889	
1155	Sodium	mg/L		86.8	69.4 - 104	Not Reported				87.5	3.18	
2000	Sulfate	mg/L	21.0	20.7	16.3 - 24.2	Acceptable	EPA 300.0 2.1 1993	9/17/2020	-0.0534	21.1	1.06	
1955	Total Dissolved Solids at 180°C	mg/L	388	399	354 - 444	Acceptable	SM 2540 C-2011 2011	9/15/2020	-0.0465	389	27.5	
1950	Total Solids at 105°C	mg/L		424	379 - 469	Not Reported				410	25.5	
VP Hardness (cat# 580, lot# P307-507)												
1960	Total Suspended Solids	mg/L	24.5	26.8	18.3 - 32.6	Acceptable	SM 2540 D-2011 2011	9/15/2020	-0.281	25.1	2.08	
1035	Calcium	mg/L		22.7	19.3 - 26.1	Not Reported				23.3	0.850	
1085	Magnesium	mg/L		23.3	19.8 - 26.8	Not Reported				23.9	1.34	
1550	Calcium Hardness as CaCO3	mg/L		56.8	48.3 - 65.3	Not Reported				78.4	48.1	
1755	Total Hardness as CaCO3	mg/L		153	130 - 176	Not Reported				158	5.70	
VP pH (cat# 577, lot# P307-977)												
1900	pH	S.U.	7.96	7.90	7.70 - 8.10	Acceptable	SM 4500-H+ B-2011 2011	9/18/2020	0.136	7.95	0.0623	

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Tahoe-Truckee Sanitation Agency Laboratory

13720 Butterfield Dr.

Truckee, CA 96161

Demonstration of Capability (DOC) Form for Chemistry

Scope and Application: This document describes the events necessary to take place prior to an analyst performing compliance testing in the TTSA Laboratory.

Name (Print): Kristin Davis **Initials:** KD

Analytical Method Name: Turbidity

SOP Method Number and revision year: SM 2130 B-2011

☒ **I have read, understand, and will comply with the above SOP, Reference Method, and Safety Data Sheet (SDS) for every chemical or reagent used in the analysis (Date/Initial)** 1/5/2021 KD

Reason(s) for this DOC: ☐ New Method ☐ Change to Procedure

☒ Annual Demonstration (Ongoing) ☐ New Analyst

DOC Data Source:

☒ Proficiency Testing Study Company: ERA Study ID # WP-307

Test Date: 9/22/20 Report Date: 9/28/20

☐ QC Sample Source: _____ Lot# _____

☐ Actual Sample Description: _____

Target Analyte(s): Turbidity

Instrument Name (Model#, Serial #): HACH TL2360 serial #: 20201002C0048

Preparation Analyst Name (Print): _____

Summary Chart (Only applicable to DOC's using 'Actual Samples or QC Samples' for the data source) PT Data will be attached to this document.

All samples are unknown to analyst.

*Acceptable Recovery: +/- 10%

Run #	Analysis Date	Sample ID	True Value	Recovered Value	% Recovery	Pass/Fail (P/F)
Blank						
1						
2						
3						
4						

Mean Recovery (%) _____, Std Deviation of Recovered Values: _____

Relative Std Deviation (%) _____ Proficiency Test Z-Score: -0.5164

☒ PASS ☐ FAIL

Kristin Davis Kristin Davis 1/5/2021

Analyst Name (print) Analyst Signature Date

_____

Training Analyst Name (print) Signature Date

Bill Pindar [signature] 1/5/21

Laboratory Director (print) Signature Approval Date

Revision 1

December 22, 2020

ERA
A Waters Company

Final Evaluation Report

Study: **WP-307**

ERA Customer Number: **T047401**

Laboratory Name: **Tahoe Truckee Sanitation Agency**

Inorganic Results

WP-307 Final Evaluation Report

A Waters Company

Kristin Davis
Chemist
Tahoe Truckee Sanitation Agency
13720 Butterfield Dr
Truckee, CA 96161
(530) 587-2525

EPA ID: CA00203
ERA Customer Number: T047401
Report Issued: 09/28/20
Study Dates: 08/10/20 - 09/24/20

TNI Analyte Code	Analyte	Units	Reported Value	Assigned Value	Acceptance Limits	Performance Evaluation	Method Description	Analysis Date	Z Score	Study Mean	Study Standard Deviation	Analyst Name
WP Trace Metals (cat# 586, lot# P307-500) (Continued)												
1190	Zinc	µg/L		503	428 - 578	Not Reported				504	28.5	
WP Turbidity (cat# 893, lot# P307-777)												
2055	Turbidity	NTU	24.9	25.9	21.8 - 30.1	Acceptable	SM 2130 B-2011 2011	9/22/2020	-0.564	25.5	1.10	

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CERTIFICATE OF EXCELLENCE

In recognition of the quality of your laboratory in proficiency testing for

WP-307

Tahoe Truckee Sanitation Agency

is issued this certificate of achievement by ERA. This laboratory has been recognized as a Laboratory of Excellence for achieving 100% acceptable data in this study which included 329 participating laboratories. This achievement is a demonstration of the superior quality of the laboratory in evaluation of the standards listed below.

Complex Nutrients	Demand
Hardness	Minerals
Nitrite	pH
Simple Nutrients	Trace Metals
Turbidity	WasteWatR™ Coliform
	MicrobE™ - SM 9221

Matthew Seebeck
Quality Officer

T047401