TRIBAL WATER QUALITY MONITORING STRATEGY

(2019-2024)

PREPARED BY:
THE CULTURE AND NATURAL RESOURCES DEPARTMENT

CONFEDERATED TRIBES OF
COOS, LOWER UMPQUA, AND SIUSLAW INDIANS

DEPARTMENT OF CULTURE AND NATURAL RESOURCES

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Table of Contents

Elements of a Monitoring Strategy

I. Monitoring Program Strategy

Introduction and Scope

The Environmental Protection Agency (EPA)'s Final Guidance on Awards of Grants to Indian Tribes under Section 106 of the Clean Water Act (CWA) requires tribes, whose CWA 106 grants start in calendar year 2007 with fiscal year 2007 funding, to develop a Tribal Assessment Report (TAR). These TARs are comprised of three elements: (1) a description of the monitoring strategy, (2) a water quality assessment, and (3) electronic copies of surface water quality data for nine basic parameters submitted in a STORET-compatible format. This document addresses development of a water quality monitoring strategy, satisfying element (1) of the TAR. The purpose of this strategy is to provide a long-term plan for meeting identified water resource objectives. This strategy describes current and future monitoring strategies and incorporates a timeline for implementation, with associated milestones, to address needed enhancements.

Consistent with the CWA's mission "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters", (33 U.S.C § 1251(a)), the Confederated Tribes of the Coos, Lower Umpqua, and Siuslaw Indians (CTCLUSI or Tribe) also strives to restore, protect and enhance not only the chemical, physical, and biological integrity of impaired waters within our Ancestral Territory, but also to restore, protect, enhance, and sustain the native flora and fauna that depends on those waters.

In an effort to protect and manage Tribal waters for their multiple ecological, cultural, economic, and intrinsic values for the next seven generations, the Tribe has developed this water monitoring strategy and established an Integrated Water Quality Monitoring Program (IWQMP). The purpose of the IWQMP is to generate scientific data that documents short-term variability and long-term changes in estuarine, stream, and lake water quality of waters of/pertaining to Tribal lands. Data collected through the program will inform the Tribe about the ecological health of aquatic resources within Tribal lands as well as the Tribe's Ancestral Territory. Moreover, data will aid in the development of strategic action plans addressing point and non-point source pollution, management plans, best management practices, stewardships, total maximum daily loads (TMDLs), and ordinances.

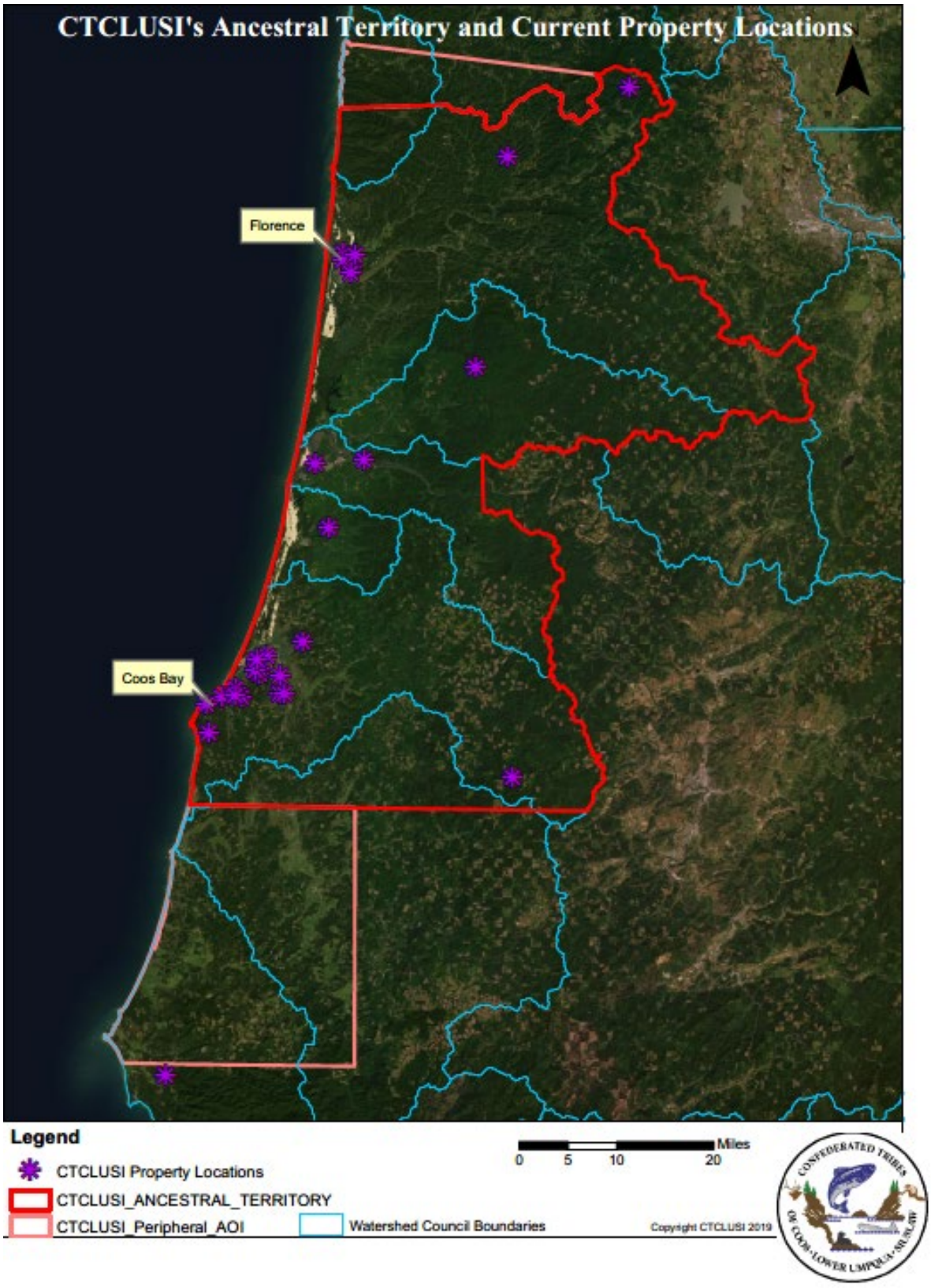
The ancestral homelands of the Tribe totals approximately 1.6 million acres located in southwestern Oregon (Figure 1). CTCLUSI's landholdings are composed of 94 parcels that total approximately 15,000 acres over seven watersheds**.** These lands are scattered among the Siuslaw River, Lower Umpqua River,

Lower Smith River, Lower Umpqua, Tenmile Lakes, Coos River, and Sixes River watersheds. The parcels themselves consist of riparian areas, wetlands, forestlands, coastal beach front, lakefront, rural residential and commercial development land uses. In total, this land base includes approximately .8 miles of shoreline, 26 miles of rivers and streams, and 243 acres of wetlands.

Environmental issues occur within all of these watersheds and are negatively impacting the Tribe's cultural and natural resources in numerous noticeable conditions, including:

- Impacts linked to natural resource extraction and recreation;
- Water quality degradation due to point and non-point water pollution, including from agriculture, timber harvesting, construction, wastewater management, and residential dumping;
- Urban, industrial, and energy production discharges;
- Downward trend of salmonid, lamprey, herring, eulachon, flounder, and green sturgeon returns;
- Downward trend of other aquatic/marine traditional foods, such as abalone;
- Maritime and chemical spills;
- Toxins within water, sediments, cultural resources, and traditional foods;
- Ocean acidification and hypoxia;
- Environmental changes attributed to climate change, such as the reoccurrence of drought, flooding, wildfires, harmful algal blooms, and invasive species, such as greenhouse thrips and green crabs;
- Shellfish closures due to harmful algal blooms;
- Spreading of existing and new non-native invasive species.

Figure 1.


CTCLUSI's Ancestral Territory and Current Property Locations
Florence
Coos Bay
Legend
CTCLUSI Property Locations
CTCLUSI_ANCESTRAL_TERRITORY
CTCLUSI_Peripheral_AOI
Watershed Council Boundaries
Miles
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Background

In 2002, EPA approved the Tribe's "treatment in a manner similar to a state" or TAS application under Section 106 of the Clean Water Act. With this TAS approval, the Tribe became eligible to apply for EPA grants under CWA 106 to develop and implement a Tribal water quality program. Initially, the development of a water quality monitoring program was the primary focus. Late in 2003, the WQP completed its first ever Quality Assurance Project Plan (QAPP) for surface water quality monitoring. Soon after receiving EPA approval for QAPP 1.8, the WQP collected its first ever water sample on February 5, 2004 on the North Fork of the Siuslaw River. Water quality monitoring was targeted on four core water quality parameters in addition to salinity/specific conductivity:

- dissolved oxygen
- pH
- water temperature, and
- turbidity.

In December 2005, EPA approved QAPP 2.0, which incorporated YSI 6600 continuous data loggers at three estuarine monitoring sites. In addition, QAPP 2.0 added measurement for the parameters of depth, bacteria (*Escherichia coli* and enterococci), and chlorophyll monitoring to the WQP. QAPP 2.0 improved the program's ability to document and understand tidally influenced water quality fluctuations and improved scheduled monitoring times. QAPP 2.0 also significantly increased the amount of data collected, which resulted in the development of a Microsoft Access database capable of storing and manipulating the dataset. The database was designed so that water quality data stored in the database could be exported into a STORET compatible format.

Then in April 2007, a new revision for QAPP 3.0 received EPA and Tribal approval. The purpose of QAPP 3.0 was to meet new requirements identified under *EPA's Final Guidance on Awards of Grants to Indian Tribes under Section 106 of the Clean Water Act for Fiscal Years 2007 and Beyond.* (EPA 832-R-06-003). Four new water quality parameters were added to measure phosphorous and total nitrogen, identify macroinvertebrates, and document basic habitat information.

In 2016, EPA approved QAPP 4.0, which added fresh water Harmful Algal Blooms (HABs) monitoring, two new monitoring sites, required limits for the parameters measured for all previous QAPPs listed above, and replaced YSI 6600 continuous data loggers with YSI EXO 2's and 3's. This latest revision of the QAPP now listed a total of 14 water quality indicators measured.

More recently in 2018, the Western Oregon Tribal Fairness Act of Public Law 115-103, 131 Stat. 2253 was enacted and approximately 15,000 acres of Oregon and California Railroad Revested Lands (O&C

Lands) were conveyed to CTCLUSI, expanding the Tribe's reservation and trust lands from less than 165 acres. Due to this significant increase in land management, IWMQP staff are currently revising for QAPP 5.0 to include additional water quality monitoring sites and additional water quality indicators, including organic pollutants (e.g. diesel, oil, pesticides, pharmaceuticals), heavy metals (e.g. arsenic, mercury, lead), as well as microbiota (e.g. phytoplankton, zooplankton, diatoms, dinoflagellates, and cyanobacteria).

II. Monitoring Objectives

The main goals of the Tribe's IWQMP are to perform water quality investigations. Data generated from these investigations will inform the Tribe about the ecological health of aquatic resources within Tribal lands as well as the Tribe's Ancestral Territory. Collected data will help to evaluate water quality trends, determine water quality assessments, aid in the development and implementation of management plans and best management practices, and advance Tribal Water Quality Standards (WQS), TMDLs, and ordinances that protect both human and aquatic health.

Table 1.

Monitoring Objectives	
Program Area	**Objectives**
Overall Water Quality Program	1. Establish baseline water quality conditions for all waters of/pertaining to newly conveyed lands for all pertinent uses. 2. Continue to document short term and long-term water quality trends for all waters of/pertaining to Tribal lands. 3. Assess whether water quality standards are being met and beneficial uses are being supported. 4. Identify waters needing restoration 5. Identify waters needing protection. 6. Develop restoration/protection plans. 7. Evaluate restoration/protection projects. 8. Develop Data Management Plan with partners/water quality stakeholders.

Water Quality Standards	1. Continue to develop and refine Tribal water quality standards. 2. Complete water quality standards and submit to EPA by 2021. 3. Adopt Tribal water quality standards. 4. Assess whether water quality standards are being met and beneficial uses are being supported. 5. Obtain 303 Certification 6. Develop TMDLs in collaboration with Oregon Department of Environmental Quality (ODEQ). 7. Develop 401 Certification Program 8. Develop a regulatory framework that ensures water quality standards are being met and beneficial uses are being supported.
Nonpoint Source (NPS) Program	1. Continue to identify impaired waters. 2. Identify causes/sources (point and nonpoint). 3. Identify waters needing restoration. 4. Identify waters needing protection. 5. Develop restoration/protection plans. 6. Employ post monitoring techniques to determine and quantify the effectiveness of NPS projects in meeting water quality standards and supporting beneficial uses. 7. Build partnerships/stewardships with water quality stakeholders and private land owners to address NPS issues. 8. Develop watershed improvement projects with partners. 9. Evaluate cumulative watershed impacts from best management practice (BMP) implementation.
Wetlands	1. Develop indicators and assess beneficial use attainment. 2. Continue to identify degraded/impaired wetlands. 3. Identify vulnerable wetlands needing protection. 4. Develop restoration plans to restore degraded/impaired wetlands. 5. Develop protection plans to protect vulnerable wetlands. 6. Evaluate restoration/protection projects. 7. Employ post monitoring techniques to determine and quantify the effectiveness of restoration/protection projects in meeting water quality standards and supporting beneficial uses.
Biomonitoring	1. Biological assessment of macroinvertebrate communities. 2. Biological assessment of fish communities, where appropriate. 3. Biological assessment of algal communities.
Harmful Algal Blooms (HABs)	1. Continue to develop a Harmful Algal Bloom Monitoring Program.

Contaminants of Concern (COCs) Monitoring	1. Establish baseline conditions for COC's in water, sediment, culturally significant vegetation, and fish tissue. 2. Document short term and long-term water quality trends. 3. Assess whether water quality standards are being met and beneficial uses are being supported. 4. Identify waters needing restoration. 5. Identify waters needing protection.
Emergency Monitoring	1. Develop an emergency monitoring program for waters impaired by oil spills or other chemical/pathological releases.

III. Monitoring Design

The IWQMP has identified 14 new water monitoring sites (for a total of 21 sites) in which the Tribe would like to expand water monitoring capabilities (see **Attachment A**). Most of these new water monitoring sites are located on the newly conveyed lands and represent an initial assessment of recognized water uses, including salmonid critical habitat or recreational activities. The other additional sites have been identified as a result of emerging issues associated with increased pathological releases. NPS effectiveness monitoring locations will be identified prior to any NPS project implementation and parameters to be monitored will be determined on a project by project basis. Wetland monitoring sites will be selected as soon as all wetlands on Tribal lands are assessed and degraded/impaired and vulnerable wetlands have been identified. Sites for emergency monitoring will be selected based on reported spill and sewage events, such as from the National Response Center and Oregon Office of Emergency Management, that have been evaluated to have potential contamination to waters or other vulnerable resources.

Table 2.

Monitoring Activities and Design					
Program Area	**Design**	**# Sites**	**Frequency**	**Resources**	**Program Description**
Overall Water Quality	Fixed Station & Targeted Sites	7 sites WQ	Continuous	Annual Avg. of 3 FTE	Begun in 2005 Fixed YSI EXO dataloggers located in the
		7 sites Bacteria	Once a month		

		14 sites WQ+Bacteria	Seasonally (Once a month)		estuary that are of/pertaining to Tribal lands and at North Tenmile Lakes. Long-term sites for trends. Seasonal Sites will usually extend from May until October. Plan to continue monitoring strategies as long as resources allow to support TMDLs.
		9 sites Dissolved Oxygen & Temperature	Continuous (Launched Seasonally)		
		9 sites WQ+ Nutrients	Biannually		
Water Quality Status & Trends	Same As Above	Same As Above	Same As Above	Same As Above	Same As Above
		Same As Above	Same As Above		
		Same As Above	Same As Above		
		Same As Above	Same As Above		
		Same As Above	Same As Above		
NPS Effectiveness Monitoring	Targeted design upstream/ downstream of NPS projects	To Be Developed	To Be Developed	To Be Determined	NPS sampling targets sites above and below restoration/ BMP implementation projects. Sampling timeframe for each project

					will be project specific.
Wetlands	To Be Developed	To Be Determined	To Be Developed	To Be Determined	To Be Developed
Biomonitoring	Targeted Sites	9 sites Macro Communities WQ	Biannually	2 FTE for 2 months	Sixes River- Started in 2007 Johnson Creek- 2 sites Spencer Creek- 2 sites Lake Creek - 4 sites Pucker Creek- 1 site
		Sites To Be Determined Fish Communities WQ+Habitat Assessment+ Flow	Seasonally	3 FTE for 4 months	Monitoring to begin after training has been completed (2020) Lake Creek Pucker Creek Spencer Creek Johnson Creek Sixes River
		3 (Additional sites as needed in response to newly emergent algal bloom events) Algal Communities WQ +Nutrients	Seasonally	2 FTE for 3 months	Monitoring to begin after equipment has been procured and training has been completed. Discrete grab samples will be collected at North Tenmile Lakes, Fossil Point & Gregory Point

HABs	Targeted Sites	3 (Additional sites as needed in response to newly emergent algal bloom events) WQ+ Nutrients	Seasonally/As Often As Needed	2 FTE for 3 months	Discrete grab samples and/or fish tissue samples will be collected at North Tenmile Lakes, Fossil Point & Gregory Point
COCs	Targeted Sites	5 (Additional sites as needed in response to newly discovered/ suspected contaminated sites	Seasonally/As Often As Needed	To Be Determined	Discrete water, soil, vegetation, and/or fish tissue samples at Lake Creek & Coos Bay
Emergency Monitoring	To Be Developed	Contingent upon extent of release/ bloom	As needed, in response to incidents/ releases	Contingent upon extent of release/ bloom	Discrete water, soil, vegetation, and fish tissue samples contingent upon type of incident/release

The monitoring design will be reviewed at the end of Water Year 2020. At that time, Environmental Protection Staff will assess and make changes to the monitoring design, if necessary, to ensure that water monitoring objectives are being met.

IV. Core and Supplemental Water Quality Indicators

In 2018, the Tribe was awarded the BIA Tribal Resilience Program Ocean and Coastal Management Planning Grant, which significantly increased the Tribe's capacity to monitor additional water quality indicators, particularly Contaminants of Concern and Contaminants of Emerging Concern. Efforts are currently being been made to obtain additional equipment and training to further expand the Tribe's capacity and monitor for heavy metals (e.g. arsenic, mercury, lead) and microbiota (e.g. phytoplankton, zooplankton, diatoms, dinoflagellates, harmful algal blooms (HABs), and cyanobacteria).

The following table shows the core and supplemental water quality indicators that the Tribe will monitor for the next five years as part of their water quality investigations.

Table 3.

Indicator Categories Sampled by Program Area															
Program Area	Dissolved Oxygen	pH	Water Temperature	Turbidity	Salinity	Conductivity	Pathogens	Chlorophyll	Nutrients (TP/TN)	Biological Communities	Habitat Assessment	HABs	COCs	Flow	Wetland Hydrogeomorphic Settings & Function
Overall Water Quality	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Water Quality Status & Trends	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
NPS Effectiveness Monitoring	X	X	X	X	X	X	X	X	X	X	X	X	X		
Wetlands	X	X	X	X	X	X	X	X	X		X	X	X		X
Biomonitoring	X	X	X	X	X	X		X	X	X	X	X	X	X	
HABs	X	X	X	X	X	X		X	X	X		X			
COCs													X		
Emergency Monitoring							X					X	X		

Data generated through monitoring the indicators listed in the table above will aid the Tribe in meeting our monitoring objectives. Continuous samples of the surface water quality parameters (dissolved oxygen, pH, water temperature, turbidity, salinity, and specific conductivity) and physical parameters (depth/tidal stage) will be collected using automated data loggers at six estuarine sites and one freshwater site every 15 minutes. Seasonal continuous dissolved oxygen, where appropriate, and temperature data will be collected using automated data loggers at 9 stream sites every 15 minutes.

Discrete samples of the surface water quality parameters (dissolved oxygen, pH, water temperature, turbidity, salinity, and specific conductivity) and physical parameters (depth) are collected using a hand-held meter at all other sites seasonally. In addition, monthly water samples will be collected for the quantitative analysis of bacteria (*E.coli* and enterococcus where appropriate) at the continuous data logging sites, seasonally for enterococcus at beach sites, and seasonally for *E.coli* at all other sites. Discrete nutrient sampling will be conducted twice in a season at 9 of the 21 water monitoring sites. Nutrient samples will also be collected at algal communities and HABs monitoring sites.

Macroinvertebrate samples will be collected seasonally at 9 stream sites. Aquatic inventories, particularly fish communities assessments, habitat assessments, and flow sampling sites are yet to be determined but initial determinations suggest that these will likely occur at the 9 stream sites. Algal communities and toxic algal samples will be taken seasonally at 3 sites and additionally as needed in response to newly emergent algal bloom events.

COCs samples will be collected at least seasonally at 5 sites to establish baseline data and additionally as needed in response to newly discovered sites or suspected contamination events. Emergency monitoring for pathogens, HABs, and COCs will be contingent upon type of incident/release and extent.

V. Quality Assurance

Table 4. QAPPs in Place for Water Quality Investigations

QA System Documents			
Type	**Title and Grant Number**	**Completion Date**	**EPA Approval Date**
QAPP	QAPP 5.0 for the Tribal Integrated Water Quality Monitoring Program	In Progress	In Progress
QAPP	QAPP 4.0 for the Tribal Integrated Water Quality Monitoring Program	2/26/2016	3/17/2016
QAPP	QAPP 3.1 for the Tribal Water Quality Monitoring Program	10/31/2008	02/25/2009
QAPP	QAPP 3.0 for the Tribal Water Quality Monitoring Program	12/28/2006	4/30/2007
QA/QC	YSI 6600 Data Editing and Management	09/06/2006	NA
QA/QC	YSI 556 & YSI 650 Data Upload	3/10/2006	NA
QAPP	QAPP 2.0 for Water Quality Monitoring on the Tribal Reservation	12/16/2005	01/03/2006
QAPP	QAPP 1.8 for Baseline Water Quality Monitoring Project on the Tribal Reservation	12/10/2003	12/29/2003

Standard Operating Procedures (SOPs) have been effective for a number of parameters, including for the YSI EXO1 and EXO2 Sonde Multi-Parameter Dataloggers (5/31/2016), the YSI 6600 EDS Sonde Retrieval (6/6/2006), and the Water Quality Monitoring Program (6/5/2006) as a whole. As seen in **Table 4**, several QA/QC procedures exist for data management. However, due to the program's steady maturation, the IWQP is currently formulating a more comprehensive QA/QC management plan. Although not yet formalized, this mission recognizes needed elements in the quality system, such as:

- management of quality records and other documents
- management of chemicals and other materials
- equipment tracking and maintenance tracking;
- training procedures;
- ubiquitous health and safety considerations in field and laboratory undertakings;
- quality control of data outputs and reports;
- understanding nonconformances and deviations; a

- scheduling regular auditing of procedures.

In the long-term, these formalized procedures will result in validated data, sufficiently and standardized cross-trained staff, and foremost, ensure the quality of data. As a result of these findings, the IWMQP has completed a number of SOPs to initiate the process that span several categories: document management (DM); materials management (MM); field operating procedures (FOP); laboratory operating procedures (LOP); equipment operation, maintenance, and calibration (EQ); data and information management (IM); facility and safety (FS), quality assurance (QA), and chain of custody (CC). **Table 5.** provides a list of (newly or planned revision) completed and anticipated SOPs. Moreover, SOPs for field and laboratory procedures are currently being updated and are in the process of being reviewed and formally adopted into an updated QAPP.

The IWQMP has identified an issue to capacity building that encompasses smaller issues in efficiency, deliverables, and overall capacity building. Quality assurance and quality control (QA/QC) should be supervisory to the quality management system and oversee the correct implementation of checks and balances of all procedures. This need can be realized with 1.0 FTE. This staff person would handle quality control of field and laboratory processes, put control measures and validate data outputs, and ensure health and safety and other appropriate procedural trainings. With an increase in the programs ability to measure water quality indicators, ensuring the quality management system is essential, and a quality manager is thus paramount.

Table 5. New or Anticipated SOPs in the IWQMP Quality System

Doc ID	Version	Date last worked	Title
CC-01			Sample Tracking
CC-02			Sample Archival and Disposal
DM-01	x	working excel	Document Management
DM-02	1.0	finalized	Preparation of Standard Operating Procedure
DM-03	1.0	finalized	Completion of Quality Records
DM-04	1.0	finalized	Record Retention
EQ-01	x	in process	Equipment Tracking
EQ-02	x	in process	Labconco Protector Basic Fume Hood
EQ-03	x	in process	EXO Sondes and Handheld
EQ-04			Leica Microscope
EQ			Gas Chromatography Mass Spectrometer
EQ			Olympus Camera
EQ			Centrifuge
EQ			Balance
EQ			NIST Thermometer
EQ			Incubator
EQ-10	x	in process	Radiance Research M903 Integrating Nephelometer
EQ			MET Air Station
FOP			Field Sampling for Bacteria
FOP			Field Sampling for Nutrient
FOP			Field Sampling for Macroinvertebrates
FS-01	1.0	finalized	Laboratory Cleaning and Maintenance
FS-02	1.0	finalized	Personnel Hygiene Practices
IM-01	x	in process	Computer Security
IM			Data Management
LOP			Sample Selection
LOP			Photo Documentation of Samples Received
LOP			Sample Preparation for chemical extraction for GCMS analys
LOP-05	x	in process	Bacteria Analysis
LOP			Measurement of Chemical Extracts by GCMS
LOP			Analyzing Measurement by GCMS
LOP			Washing Glassware and Plastic Ware
LOP			HABs
MM-02	1.0	finalized	Management of Manufactured Reagents
MM			Waste Disposal
QA-01			Management Responsibility
QA-02			Management Review
QA-03			Quality Manager
QA-04	1.0	finalized	Training Program
QA-05			Qualification and Monitoring of Suppliers and Service Provid
QA-06			Resolving Complaints
QA-07			Deviations
QA-08			Nonconformances
QA-09			Internal Audits
QA-10			CAPA
Other		powerpoint updates	General Laboratory Practice and Safety
Other		powerpoint updates	Hazards in the Laboratory; Health and Safety
Other			Quality Plan
Other			Quality Policy
Other			Process Chart
Other			Quality Manual

VI. Data Management

The Department of Culture and Natural Resources is responsible for water quality investigations data management for the Tribe. Water quality data generated from these investigations is managed by various means, and is more explicitly outlined in **Table 6**.

Table 6. Data Management System Currently Employed by the IWQMP

Data Management				
Water Resource Type and/or CWA Program Area and/or Monitoring Objectives	**Data Mgmt –on site**	**Storet**	**Land Use Data**	**Geo-referencing**
Overall Water Quality	Data is entered into MS Excel Files are backed-up daily	All data, except for continuous data, will be exported into STORET using the Central Data Exchange (CDX) annually. New staff will need trained on STORET	CTCLUSI is new to managing land use data and is currently developing a GIS database and team. 1:24,000 scale	Yes
Water Quality Status & Trends	Same As Above	Same As Above	Same As Above	Yes
NPS Effectiveness Monitoring	NA	NA	Same As Above	Yes
Wetlands	NA	NA	Same As Above	Yes
Biomonitoring	Same As Above	Same As Above	Same As Above	Yes
HABs	Same As Above	Same As Above	Same As Above	Yes
COCs	Same As Above	Same As Above	Same As Above	Yes
Emergency Monitoring	Same As Above	Same As Above	Same As Above	Yes

Continuous monitoring data (dissolved oxygen, pH, water temperature, turbidity, salinity, specific conductivity, and depth) generated by data loggers is initially collected and stored on the data logger. After the logger is retrieved from the field, the data is then transferred from the data logger to the laboratory work station computer via the data logger's associated installed software and stored as an xlsx file on the Culture and Natural Resources Department's dedicated server. After the raw data is transferred, it will remain on the data loggers as back-up. At the end of the fiscal water year, the data is combined, trimmed, and used in writing the water quality annual assessment report and shared with our partners/water quality stakeholders. Raw data is kept intact and copies are used when combining and manipulating data in case of overwrite errors. Technical assistance is needed in order to save continuous data in a STORET compatible xlsx file.

Discrete water quality grab sample data is recorded on rain proof field data sheets that will include basic information, such as station id, date, time, water/weather conditions, tide, and any other information deemed useful for that particular water quality investigation. Once in the laboratory, the data will be written into an xlsx file and saved on the departmental server. Since bacteria data is generated in house, it is automatically saved in a STORET compatible xlsx file after it is analyzed and uploaded to WQX via CDX biannually. Nutrients and Macroinvertebrates data are sent from the associated processing lab in an xlsx file format. Technical assistance is still also needed for other discrete water quality grab samples and assessments, such as other physical-chemical data (COCs), nutrients, macroinvertebrates, habitat, biological, in order to save that data in a STORET compatible xlsx file and upload it to WQX via CDX.

The Tribe is currently working with the Siuslaw Watershed Council (SWC) to receive guidance on how to save data in a STORET compatible xlsx file and may be uploaded to ODEQ's Ambient Water Quality Monitoring Portal for the interim.

Monitoring locations and data are georeferenced to the Projected Coordinate System NAD 1983 2011 StatePlane Oregon South FIPS 3602 Ft Intl. All scales are 1:24,000 or less, as scales are typically customized to the audience, required formatting, and feature visibility. Garmin and Trimble data collectors are used for field deployment and further manipulated with standardized software, such as ESRI ArcGIS. Data is manipulated in reference to shared data, such as protected species critical habitat layers from USFS and ODFW, hydrography layers from BLM, and spill response layers from NOAA and USCG, to name a few. Formal published map products are generated by both internal and external department staff under team-managed data permissions. CTCLUSI's formalized GIS Team regularly meets to discuss and collaborate on projects, data management, and resource procurement.

VII. Data Analysis/Assessment

The Tribe uses Microsoft Excel and RStudio to analyze data for Water Quality Annual Assessment Reports. Furthermore, formal training using EPA recommended statistical analyses specific to trend analyses of water quality data and project design would help build departmental capacity.

The Tribe currently does not have a documented method for assessing attainment of water quality standards. However, the Tribe currently includes an assessment of Tribally adopted water quality standards in our annual water quality report. For the purposes of TAS for CWA 303 and 401 certification, we will need to develop an assessment methodology, which will consist of a panel of Environmental Protection Staff members who report to Tribal Council. This panel will analyze monitoring data from CTCLUSI, as well as from Oregon Department of Environmental Quality (ODEQ), Oregon Health Authority (OHA), South Slough National Estuarine Research Reserve (SSNERR), United States Department of Agriculture (USDA), and other water quality partners/stakeholders (e.g. watershed councils) data, where appropriate. The panel will then forward its findings and recommendations to the Tribal Council on an annual basis at minimum, and on an emergency basis when the need arises. Determinations derived from discussions with Tribal Council will be included in the Tribe's annual Tribal Assessment Report (TAR) (i.e water quality assessment report).

VIII. Reporting

An annual Tribal Water Quality Assessment Report (TAR) is completed and submitted to our EPA Tribal Coordinator at the end of each water calendar year. The report includes a graphical display of the data collected during the water year (October thru September) and provides a brief narrative for each monitoring site. The final report is available on the Tribe's website (www.ctclusi.org) within the Water Quality Program page. In addition, Quarterly Performance Reports are completed thirty days after each fiscal quarter. These reports describe the quarterly activities completed by the IWQP and are provided to our EPA Tribal Coordinator.

Table 7.

Tribal Reports			
Report	**Timeframe**	**Entities receiving copies of the report**	**Comments**
Annual Water Quality Assessment Report	Annually by December 1st	EPA Posted on CTCLUSI Website for public	Summary of WQ data with comparisons to WQ criteria
Quarterly Performance Report	Quarterly	EPA	
Nonpoint Source Pollution Assessment Report	2022	EPA Posted on CTCLUSI Website for public	Updated report that includes newly conveyed lands
Wetland Inventory and Assessment Report	2022	EPA Posted on CTCLUSI Website for public	Updated report that includes newly conveyed lands

IX. Programmatic Evaluation

The Director of the Department of Cultural and Natural Resources and Environmental Protection Staff will meet at the beginning of every new water calendar year (beginning October 1st) to evaluate the performance of the IWQMP. During the evaluation, emerging issues, data needs, and resource gaps identified during the previous year's water monitoring investigations and assessments will be addressed. Objectives will be reprioritized based on data needs and resource availability. Emerging issues and resource gaps may also be addressed anytime during the water calendar year to ensure that water

monitoring investigations are meeting program objectives. Programmatic coordination for effectiveness monitoring and assessments with partners/water quality stake holders will also be evaluated at the beginning of every new water calendar year.

The Tribe looks forward to any technical assistance the EPA can provide to aid the Tribe in furthering their endeavors to restore, protect, enhance, and sustain the chemical, physical, and biological integrity of impaired waters within our Ancestral Territory and the native flora and fauna that depends on those waters. Specific areas of focus will be selected during the annual evaluation of the strategy.

X. General Support and Infrastructure

As of 2018, the Indian Environmental General Assistance Program Act in addition to CWA 106 and 319 grant funding provides the IWQP with 2.07 FTE to complete all water quality monitoring and reporting tasks. The current funding level sufficed monitoring needs for the small acreage of approximately 540 acres that the Tribe owned previous to January 8, 2018. On that date, the Western Oregon Tribal Fairness Act was enacted and the Tribe was conveyed 7 tracts of O&C lands spread over 3 counties and totaling 14,742 acres.

Many of the waters within these tracts have been designated critical habitat for Oregon coastal coho salmon (*Oncorhynchus kisutch*) and will require that additional water quality indicators be monitored for to ensure that water quality standards are being met, beneficial uses are being supported, and human health and aquatic health are being protected. Reference **Table 8.** for resources the Tribe currently utilizes for monitoring and those that the Tribe will need in order to meet the new objectives set forth in this strategy.

In order to be able to monitor for the additional water quality indicators set forth in this strategy, the Tribe has been building laboratory capacity to monitor for COCs and COECs. Efforts are still ongoing to build in house capacity to monitor HABs. Additional training will also be required to perform aquatic inventories and wetland inventories and assessments.

Table 8.

Objectives	Staffing	Training	Equipment	Lab Resources
Existing: Provide Water Quality Investigations and Assessments and continuity with past water quality investigation efforts Work with Partners/Water Quality Stakeholders to address NPS issues	2.07 FTE Biologist Water Protection Specialist Air & Water Protection Specialist	Current staff are highly competent in ambient water quality monitoring; bacteria monitoring; nutrient sampling; and macroinvertebrate communities sampling Scuba Certification	1 GSA Leased Vehicle 1 Flat Bottom Boat and Trailer 1- 40 hp Honda Outboard Motor 1- 8 hp Yamaha Outboard Motor 1 YSI EXO 1 Handheld Multi-Parameter Sonde Probe with cable and complete set of probes 6 YSI EXO 2 data loggers with a complete set of probes 1 YSI EXO 3 logger with a complete set of probes 17 HOBO water temperature data loggers and software 1-IDEXX Bacteria Lab Quant-Tray sealer and trays, supplies, and 2 incubators. 1 GCMS with workstation	Marine Chemistry Laboratory at the University of Washington's School of Oceanography for nutrient analyses Aquatic Biological Associates, Inc. for macroinvertebrate analyses Oregon Department of Fisheries and Wildlife's Marine Resources Program for phytoplankton analyses

			computer and software 1 Centrifuge 1 Analytical Balance 2 Microscopes 1 Nutrient AutoAnalyzer 1 Fume Hood 1 Mini Refrigerator 1 Freezer 4 Workstation computers & software	
Future: Reassess monitoring priorities and design NPS Effectiveness Monitoring Wetlands Monitoring Wetlands Monitoring EPA Approved Water Quality Standards Establish Regulatory Framework for	3.50 FTE Biologist Water Protection Specialist Air & Water Protection Specialist Lab Technician	GCMS Training Handheld XRF Analyzer Training FlowCam Training Current Meters/Flow Gauges Installation; Operations; & Data Analyses Training Wetland Functions Assessment Training	1 Field Laptop/Tablet ~10 Dissolved Oxygen Data Loggers 1 Handheld XRF Analyzer 1 FlowCam ~ 10 Current Meters/Flow Gauges WQ statistical software ARC-HYDRO	Southwestern Community College Laboratory HABs analyses Heavy Metals analyses

Developing 303 and 401 Certification Programs Regulatory Framework		Aquatic Inventories Training Habitat Assessment Training Algal Communities Inventories & HABs monitoring Training COCs Training Flow Measurements Training Emergency Monitoring Training STORET Training RStudio Training WQ Statistical Software Training ARC-HYDRO GIS Training		