



# Sampling and Analysis Plan

## Volunteer Water Quality Monitoring

South Fork Burnt River SIA

Submitted to: Oregon DEQ  
May 2025



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# Project approvals

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Date: \_\_\_\_\_

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\_\_\_\_\_ **Nick Haxton-Evans, Volunteer Monitoring Coordinator**

Date: \_\_\_\_\_



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# 1. Project Management

## 1.1. Distribution List

The following personnel will be emailed regarding all aspects of this sampling and analysis plan (SAP). Deviations from this SAP must be communicated in writing (email is acceptable) to all individuals identified in Table 1. Final reports from the DEQ Laboratory will be emailed and mailed to the project manager, regional monitoring coordinator and laboratory monitoring coordinator/data manager.

**Table 1 Distribution List**

Name	Phone	Email
Whitney Rohner, Burnt River SWCD District Manager	541-519-8310	<a href="mailto:swcdwhitney@gmail.com">swcdwhitney@gmail.com</a>
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Rob Hibbs, DOA SIA Coordinator	971-719-1576	<a href="mailto:Rob.HIBBS@oda.oregon.gov">Rob.HIBBS@oda.oregon.gov</a>

## 1.2. Project/task organization

Sampling Organization(s): Burnt River SWCD  
 3990 Midway Drive  
 Baker City, OR 97814  
 541-519-8235

Analytical Organization: US Bureau of Reclamation Soil and Water Laboratory  
 300 E Garrison Road  
 Boise, ID 83702  
 208-334-1540

## 1.3. Problem definition/background

The purpose of Burnt River SWCD’s project is to collect data at five different sites in the South Fork Burnt River area as a Strategic Implementation Area (SIA). This is an agriculturally-influenced area. A Local Monitoring Team developed a monitoring proposal to detect improvements or lack of improvements due to projects being implemented through the SIA process. Our goal is to change agricultural management to benefit water quality as well as the landowner. These activities include but are not limited to; irrigation improvements such as converting from flood to sprinkler or water delivery improvements, livestock grazing management plans, livestock trough installations, riparian and cross fencing, rangeland seeding, and conservation planning for entire farm operation. Other activities that are not directly related to agriculture include: bank stabilization, diversion work including fish screening, and riparian management plans.

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Brief description of the watershed/background: Located near Unity, Oregon this SIA will take place within the South Fork and North Fork of the Burnt River, Job Creek, and Camp Creek drainages, together containing 209,531 acres and an estimated 330 stream miles. The Burnt River is a 98-mile-long tributary of the Snake River. The Snake River plays an important role in providing a corridor for the exchange of the endangered bull trout between populations in its tributaries; historically bull trout utilized the Snake River for foraging, overwintering, and as a migratory corridor. The SIA will allow the Burnt River Soil and Water Conservation District to coordinate technical assistance partnerships, implement landowner outreach, conduct stream monitoring, and help landowners implement projects for the improvement of water quality in these key watersheds.

Burnt River has displayed a pH reading as high as 9.44 in addition to visual impacts to riparian and stream health. Burnt River SWCD's goal is to monitor nutrients, bacteria, sediment, and temperature and will begin prior to SIA project implementation with baseline measurements and will continue for up to five years. With sampling locations, parameters, and frequency dependent on data results over time. The Burnt River SWCD will use nitrate/nitrite, total phosphorus (TP), dissolved oxygen (DO), total suspended solids (TSS), *Escherichia coli*, and pH to prioritize future restoration activities that improve irrigation practices and non-agricultural practices that contribute to water quality degradation. These specific parameters were chosen due to agricultural runoff through inefficient irrigation practices that contribute fertilizers consisting of nitrogen and phosphorus into the watershed. The Burnt River has known impairment related to excess phosphorus and was assigned target phosphorus concentration of .07 mg/L in the Snake River TMDL (2004). Non-agricultural practices contributing to water quality degradation include forest management practices located above the South Fork Burnt River SIA as well as livestock use of perennial and intermittent streams for water sources. Oregon DEQ may use the data to assess whether the Burnt River is meeting water quality criteria to protect beneficial uses.

#### 1.4. Project/Task Description

Annual reports summarizing and interpreting data will be provided to all cooperators including the Burnt River SWCD, OWEB, ODEQ, ODA, interested parties, landowners, and operators. A discussion of findings and interpretation will be presented in Burnt River SWCD meetings, targeted conferences, and during special presentations. It is shown in past experience that monitoring data motivates landowners to install projects to eliminate irrigation return flows, which improves water quality.

The Burnt River SWCD plans to conduct a monitoring program from May through October at five locations for the next five years to document agriculturally-influenced water quality concerns. This data will encourage the implementation of best management practices.

##### **The water quality parameters we will focus on are:**

- Nitrate/Nitrite
- *Escherichia coli*
- Total Phosphorus
- Total Suspended Solids

##### **Other samples will include:**

- pH
- Dissolved Oxygen

Dissolved oxygen, pH, and temperature will be taken and recorded in the field at the same time of the day, monthly. Temperatures change throughout the day and change the chemistry of the water, so to be consistent in our sampling it is important to sample the same time of the day.

We will follow the guidance for collection of water samples from ODEQ for the next five years. These parameters are closely linked to agricultural activities in general, and the Local Monitoring Team wanted to determine if they were issues in this area. The samples will be sent to the BOR lab in Idaho to determine pollutant levels related to agriculture.

Possible constraints that might limit our ability to complete the project as defined, would be financial and site access due to weather.

**Table 2 Project Gantt Chart**

Tasks to be completed	Months for each year 2025-2029											
	1	2	3	4	5	6	7	8	9	10	11	12
Sampling Planning and revision			x	x	x							
Monthly testing of dissolved oxygen, pH, temperature, total phosphorus, total suspended solids and nitrate/nitrite					x	x	x	x	x	x		
Data entry						x	x	x	x	x		
Data analysis and reporting							x			x		

### 1.5. Quality objectives and criteria

- “A” level data quality will be our target for all parameters.
- Data quality levels are defined in the ODEQ VOLUNTEER MONITORING QAPP.
- Achieving optimal data results necessitates sampling across the spring, summer, and fall seasons. Variability in environmental conditions, including surface runoff due to rainfall and snowmelt, along with temperature fluctuations, can significantly impact water quality assessments. Therefore, a comprehensive sampling strategy that accounts for these factors is essential for accurate and reliable data collection.

### 1.6. Training Requirements and Certification

- Burnt River SWCD employees will use YSI pro 1020 multi-field probe for pH and DO sampling. GeoTech will provide training through training videos and phone conferences.

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- BOR lab will train SWCD staff on the correct way to collect samples and transport to the lab in a phone conference.

## 1.7. Documentation and Records

Published copies of this SAP will be maintained by the DEQ QAO and will be distributed to those listed in Table 1.

**Table 3 Controlled Documents**

Document or Record Name and Description	Storage Location	Storage Time
<b>DEQ Quality Assurance Project Plan (QAPP) (v.3)</b> - DEQ04-LAB-0047-QAPP project description and assurance procedures.	DEQ Internet Page	10 years
<b>Sampling Analysis Plan – specific sampling information for each group’s activities.</b>	DEQ Laboratory, Burnt River SWCD office	10 years
<b>DEQ Laboratory Mode of Operations Manual (MOM) (v.4)</b> - Methods manual DEQ03-LAB-0036-SOP V3	DEQ Internet Page, Burnt River SWCD office	10 years
<b>Equipment Notebooks</b> - records of quality control checks, calibrations and maintenance.	Burnt River SWCD office	10 years

## 2. Data Generation and Acquisition

### 2.1. Sampling Process Design

Sampling dates as planned: taking one full day at the end of each month beginning in May ending in October, but subject to change due to the remoteness of the area and weather. Two locations on South Fork, one location on Camp Creek, one location on West Camp creek and one location on East Camp creek. See attached Map for locations. These sites were chosen to provide water quality data before it flows into areas of agricultural practices and to capture the data after it flows through these areas. Sites will be accessed on public lands only.

At each specified location, we will obtain two water samples and one bacteria sample with a sterile bottle. The samples will be put on ice in a cooler and shipped over night to the BOR lab in Boise, Idaho. The different parameter tests will include the measurement of nitrate/nitrite, total phosphorus (TP), total suspended solids (TSS), and E.coli. Temperature, DO, and pH will be measured in the field. We will take duplicate samples, roughly every 5th sample to provide quality assurance.

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**Table 4 Summary of the sampling locations**

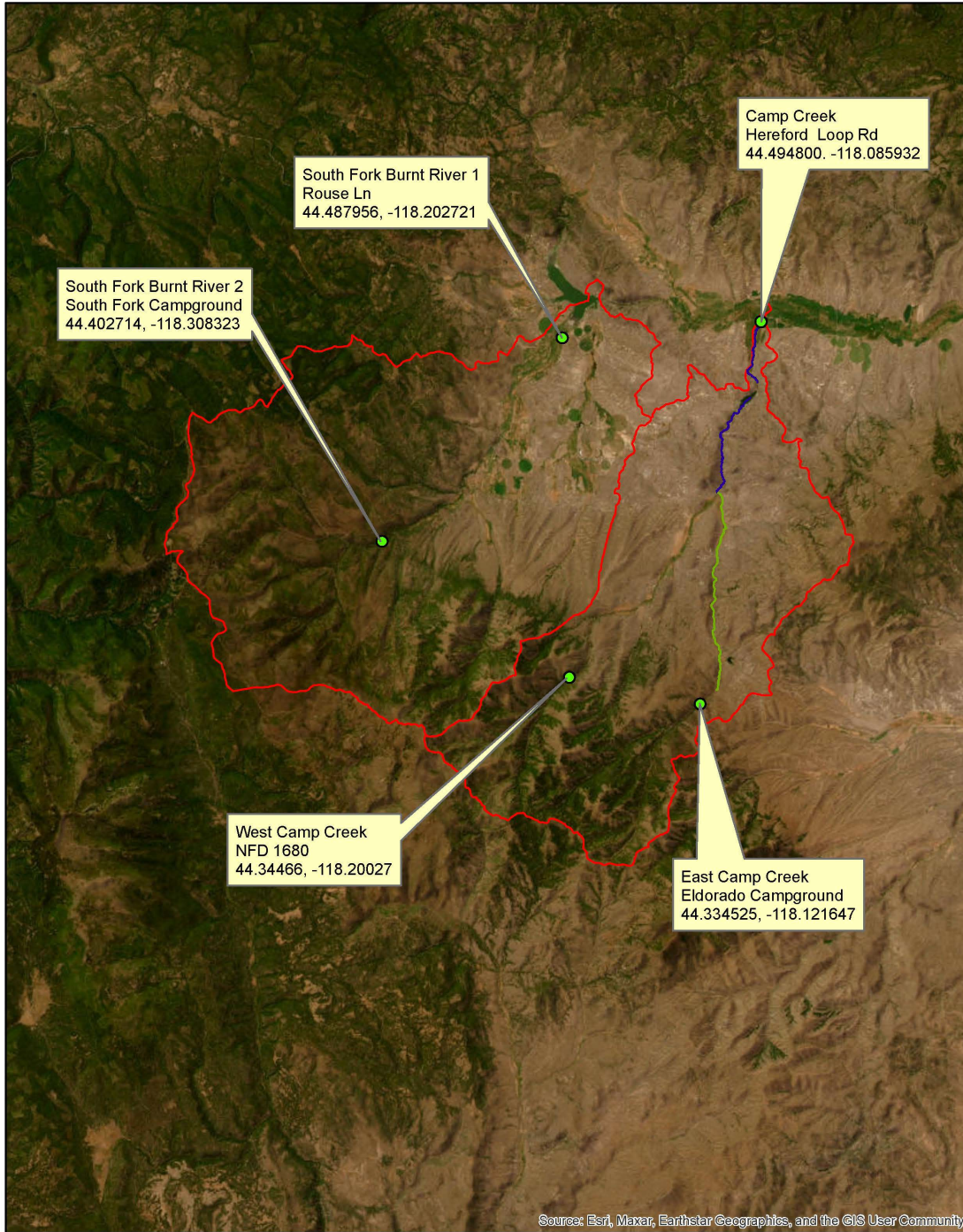
<b>DEQ Station ID *</b>	<b>Organizational Site ID</b>	<b>Latitude/Longitude</b>	<b>Station Description</b>	<b>Parameters</b>
	South Fork Burnt River #1	44.487956, -118.202721	Rouse Ln before the waters enter the Unity Reservoir	DO, pH, Temp, TP, TSS, Nitrite/Nitrate, <i>E. coli</i>
	South Fork Burnt River #2	44.402714, -118.308323	South Fork Campground on forest service property	DO, pH, Temp, TP, TSS, Nitrite/Nitrate, <i>E. coli</i>
	West Camp Creek #3	44.34466, -118.20027	NFD 1680 on forest service property	DO, pH, Temp, TP, TSS, Nitrite/Nitrate, <i>E. coli</i>
	East Camp Creek #4	44.334525, -118.121647	Eldorado Campground on forest service property	DO, pH, Temp, TP, TSS, Nitrite/Nitrate, <i>E. coli</i>
	Camp Creek #5	44.494800, -118.085932	Hereford Lp before waters enter the Burnt River	DO, pH, Temp, TP, TSS, Nitrite/Nitrate, <i>E. coli</i>

\*If a Station ID number is not available during QAPP/SAP development, the DEQ Laboratory will generate the unique identifier prior to data processing.

***Figure 1: Map of sampling sites***

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Burnt River SIA Sample Sites



## 2.2. Sampling Methods

- Water quality samples gathered by Burnt River SWCD's employee will be collected from the bank or wading using an approved sampling container.

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- Burnt River SWCD will follow the ODEQ VOLUNTEER MONITORING QAPP guidelines for sample collection containers, holding times or preservation for our project.

### 2.3. Handling and custody

- All samples will be measured in the simplest manner possible that will still allow trends to be determined over five years to keep costs down and simplify project design. The information will be recorded on a field sheet and samples will be labeled in the field, which will include location, date, time, type of sample, and sampler's name.
- Samples will be packed in coolers with ice packs and shipped via UPS overnight to the BOR laboratory by a Burnt River SWCD staff the same day.
- Each site will have premade labels and attached to each bottle at the time of the sample. The temp, DO and pH will be recorded on a field sheet (Figure 2: Sample Field Sheet).
- Chain of custody form to send to the lab (Figure 3: Sample Chain of Custody).

**Table 5 Summary of sampling parameters**

Parameter	Container	Preservation	Holding Time
<i>Escherichia coli</i>	120 mL carbonate	4 degrees C	24 hours
Nitrate/Nitrite	500 mL poly	4 degrees C	48 hours
Total Phosphate	500 mL poly	HCL 1 mL, 4 degrees C	28 days
Total Suspended Solids	500 mL poly	Cool to 4 degrees C	7 days from collection

### 2.4. Analytical methods

- Burnt River SWCD will be using the standard methods defined in the ODEQ QAPP and using YSI PRO 1020 multi-field probe and we will reference manual.
- Temperature, pH, and Dissolved Oxygen will be measured in the field using the YSI 1020 field probe. *Escherichia coli*, Nitrate/Nitrite, Total Phosphate, and Total Suspended Solids will be processed after returning to the BOR lab. Waste generated from bacteria analysis will be sterilized before disposal.

Analysis	Department	Method	MRL
Dissolved Nitrate + Nitrite (NO <sub>3</sub> +NO <sub>2</sub> )	Nutrients	EPA 353.2	0.01 mg/L as N
Total Phosphorus (TP)	Nutrients	EPA 365.1	0.01 mg/L
Total Suspended Sediment (TSS)	Wet Chemistry	SM I-3765-85	1 mg/L

### 2.5. Quality control

- Burnt River SWCD will be following the protocols listed in the ODEQ VOLUNTEER MONITORING QAPP
- Burnt River SWCD will follow the instructions and reference the guide provided with the YSI PRO 1020 multi-field probe to ensure quality control.
- Duplicate quality control (QC) samples for all water quality measurements will be taken at a minimum of 10% of the total number of monitoring sites (1 duplicate for every 5 sites) during sampling period.
- If quality control results show a sampling problem we will retest, contact the manufacturer and contact the DEQ Vol. Mon. specialist.

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## 2.6. Instrument/equipment testing, inspection, and maintenance requirements

- Burnt River SWCD agrees to follow the procedures in the maintenance and inspection table in the ODEQ VOLUNTEER MONITORING QAPP.

## 2.7. Instrument calibration and frequency

- Burnt River SWCD agrees to follow the procedures in the Instrument Calibration and Frequency table in section B7 of the ODEQ VOLUNTEER MONITORING QAPP.
- The equipment will be kept at the Burnt River SWCD office and Cory Roe will be responsible for keeping the equipment in working order and supplies available.

## 2.8. Non-direct measurements

NA

## 2.9. Data management

Burnt River SWCD will:

- Collect and/or download all data in the field on sheets and electronically.
- Enter data into Excel spreadsheets and provide to ODA.
- Review all data for completeness, reasonableness, transcription errors, and calculation errors.
- Enter all data related to monitoring into the Excel worksheets provided by DEQ for submittal.
- Data will be stored on field sheets and electronically.
- Be responsible for the data of each step going from field to data storage. Review data and consolidate it for submittal to DEQ.
- Maintain information regarding monitoring sites and provide to DEQ as needed. Fields consist of: DEQ Site ID, Local Site ID, Site Description, Elevation (m), Decimal Latitude and Longitude to four decimal places, Datum used for calculating the latitude and longitude, Depth of deployment (m).

DEQ will:

- Review the data in the winter after each sampling season and notify ODA of its data quality level by February 1.
- Notify ODA of any issues related to data management.

ODA will:

- First analyze the data in 2025, for the first five years (2025-2030). Method of analysis will be determined at that time.

# 3. Assessment and Oversight

Assessment and oversight of the project will be carried out by Cory Roe.

## 3.1. Assessment and response actions

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As outlined in section 3.1 of the Volunteer Monitoring Program QAPP, we agree to correct problems identified during the assessments that are conducted by ODEQ Volunteer Monitoring Program Specialist. Staff from the Burnt River SWCD are the first line of quality control. We will attempt to correct any identified issues. If necessary, we will contact ODA for guidance. If necessary, ODA will contact DEQ for guidance.

### **3.2. Reports to management**

Results of all quality control tests will be provided annually to ODA and DEQ in the spreadsheets provided by DEQ for data submittal.

## **4. Data validation and usability**

Data quality levels (DQL) will be assigned in accordance with DEQ guidance document *Data Validation and Qualification* (DEQ09-LAB-0006-QAG). Generally, only targeted DQLs of “A”, or “B” will be acceptable unless the basis for the data acceptability is approved and documented by the project manager and DEQ Volunteer Monitoring Coordinator. All data verification, validation, and assessment activities for project purposes are the responsibility of the project manager.

### **4.1. Data review, validation, and verification**

Section 4.1 of the DEQ QAPP has been reviewed and we agree to follow these procedures for accepting, rejecting, or qualifying data. We understand that the DEQ Volunteer Monitoring Specialist and the DEQ QAO will determine if the data collected meets the objectives of this QAPP and it is at their discretion to accept, qualify, or reject data for AWQMS use.

### **4.2. Validation and verification methods**

- 1) Who will review field data sheets and how and when will they do it? The Burnt River Soil and Water Conservation District (SWCD) will conduct a review of the field data sheets upon their receipt from the Bureau of Reclamation (BOR) laboratory, which occurs at the conclusion of the sampling season. This process ensures the accuracy and integrity of the data collected throughout the season
- 2) Who will review data entered into the database and how and when will they do it? The Burnt River SWCD and ODA will review the data entered in the database after the Burnt River SWCD has compiled the information at the end of the sampling season.
- 3) Where applicable, who will review laboratory results and how and when will they do it? The review of laboratory results will be conducted by the Burnt River SWCD staff at the conclusion of the sampling season. This process ensures a comprehensive evaluation of the data collected during the season, allowing for accurate interpretation and application of findings.
- 4) Who will determine the data quality levels for data? How and when will they do it? The determination of data quality levels will be a collaborative effort, overseen by the Burnt River Soil and Water Conservation District (SWCD) in conjunction with the Department of Environmental Quality (DEQ) and the Oregon Department of Agriculture (ODA). This evaluation will take place at the conclusion of the sampling season, ensuring that all parties engaged work collectively to establish quality standards for the data collected.

### **4.3. Reconciliation with data quality objectives**

As per “Reconciliation with Data Quality Objectives”, section 4.3 of the Volunteer Monitoring Program QAPP:

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Define what you will do with data that falls outside of the target precision and accuracy from your data quality objectives in the context of answering your monitoring question (may include the process/who will decide what to do). In the event that data fails to meet the established precision and accuracy standards outlined in our data quality objectives, we will verify the monitoring equipment's accuracy (YSI Probe) and ensure that appropriate methodologies were employed during sample collection. The YSI Probe is only an ancillary to the root goal of the plan. Additionally, we will confirm with the BOR Lab compliance with holding times and temperature requirements. If the samples were received out of holding time or temperature we would re-sample each site.

How will you compare the completeness, representativeness and comparability of your actual data to those outlined in your data quality objectives? In evaluating the completeness, representativeness, and comparability of our actual data against the established data quality objectives, it is imperative to acknowledge the significance of seasonal sampling. Conducting evaluations across spring, summer, and fall not only enhances the representativeness of our data but also mitigates the inherent variability introduced by environmental factors such as surface runoff and temperature fluctuations. These elements can profoundly influence water quality assessments. Thus, implementing a comprehensive sampling strategy that incorporates these seasonal variations will be crucial for ensuring the accuracy and reliability of our data collection efforts.

Who will decide what type of actions can be taken with the data once it is compared to the data quality objectives? The determination of actionable steps based on data comparison with quality objectives will require collaborative efforts. Engaging with the Oregon Department of Agriculture (ODA) and the District Manager is crucial for identifying necessary enhancements that align with regional needs. This partnership will ensure that decisions are informed and strategically implemented.

How will data quality be communicated to data users? Data quality will be communicated to users through a formal PowerPoint presentation directed at the ODA and monitoring team. This forum will facilitate an engaging discussion, allowing for the exchange of ideas and insights regarding the assessment and improvement of data quality.

## 5. Revision History

Revision History will track revisions that occur after the first approved version of the SAP. There is no need to include any information in this table for the initial version.

**Table 6 Revision History**

Revision	Date	Changes	Editor
1.0	5/16/2025	Initial Document	Cory Roe

