



# Water Quality Monitoring Study Plan

Moyie River Hydroelectric Project  
(FERC No. 1991)

February 25, 2025

Prepared by:



Prepared for:  
City of Bonners Ferry  
Bonners Ferry, Idaho

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## **List of Acronyms and Abbreviations**

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CFR .....	Code of Federal Regulations
City .....	City of Bonners Ferry, Idaho
Commission .....	Federal Energy Regulatory Commission
DEQ .....	Idaho Department of Environmental Quality
DO .....	dissolved oxygen
FERC .....	Federal Energy Regulatory Commission
FLA .....	Final License Application
FPA .....	Federal Power Act
IDAPA .....	Idaho Administrative Procedures Act
NOI .....	Notice of Intent
PAD .....	Pre-Application Document
Project .....	Moyie River Hydroelectric Project
Study .....	Water Quality Study
TDG .....	total dissolved gas
TLP .....	Traditional Licensing Process
U.S.C. ....	United States Code

## **1.0 Introduction and Background**

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### **1.1 General Description of the Project**

The City of Bonners Ferry, Idaho (Bonners Ferry or City) is the licensee, owner, and operator of the Moyie River Hydroelectric Project (FERC No. 1991) (Project or Moyie River Project). The Project is located on the Moyie River in Boundary County, Idaho. The Project was licensed by the Federal Energy Regulatory Commission (FERC or Commission) on June 9, 1999 (with an effective date of June 1, 1999), and the license expires on May 31, 2029.

The Project is currently licensed by FERC under the authority granted by Congress through the Federal Power Act (FPA), 16 United States Code (U.S.C.) § 791(a), et seq., to license and oversee the construction and operation of non-federal hydroelectric projects on jurisdictional waters and/or federal lands. As described in the Pre-Application Document (PAD) and the associated Notice of Intent (NOI), filed with FERC on April 29, 2024, the City is pursuing a new license for the Project using FERC's Traditional Licensing Process (TLP), as defined in 18 Code of Federal Regulations (CFR) Part 5. On June 3, 2024, FERC approved the City's request to use the TLP. In accordance with FERC's regulations at 18 CFR § 16.9(b), the City must file an application for a new license for the Project on or before May 31, 2027.

At this time, the City is not proposing any modifications to the physical plant or dam, new facilities, or operational changes to the Project. While the City does not presently propose any new Project facilities or upgrades, the City will continually evaluate the potential for such improvements over the course of the relicensing. If the City intends to propose any new Project facilities or upgrades in the Final License Application (FLA) that would affect the scope of relicensing studies, the City will inform FERC and licensing stakeholders of this proposal at a time early enough in the pre-filing consultation process to ensure that the effects of any new facilities or upgrades are appropriately considered as part of the relicensing process.

### **1.2 Study Consultation**

The City proposed a Water Quality Study (Study) in the PAD and consulted with the Idaho Department of Environmental Quality (DEQ) and the Kootenai Tribe of Idaho in development of this Study Plan. On October 7, 2024, through a letter submitted to the City by the Idaho Office of Energy and Mineral Resources, DEQ requested this Water Quality Study be conducted as part of the FERC relicensing efforts.

### **1.3 Study Goals and Objectives**

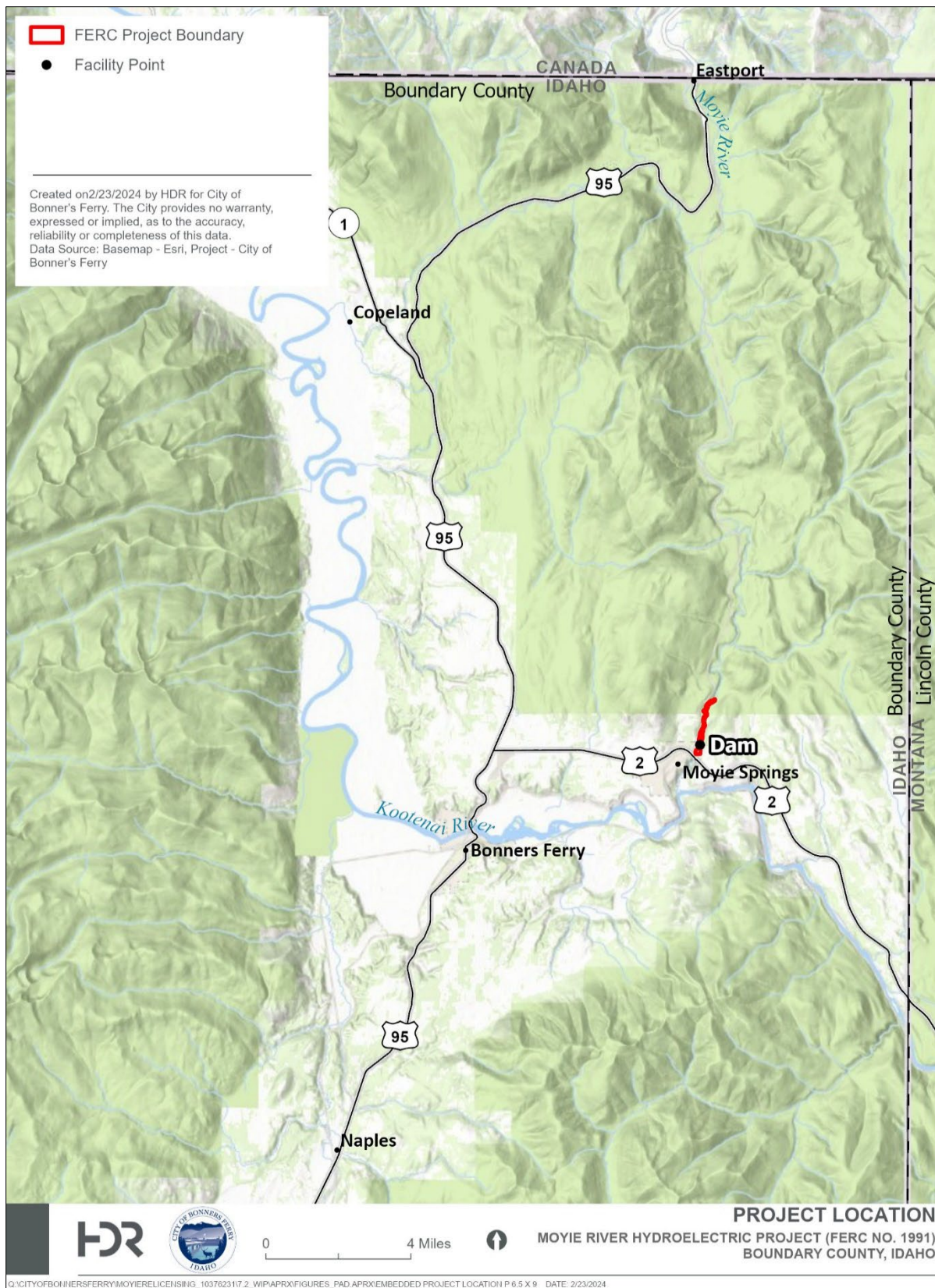
The goal of the Study is to collect water quality information that will be used to (1) characterize water quality in the Moyie River near the Project to inform the Project's FERC license application and (2) provide information to support the DEQ Clean Water Act Section 401 Water Quality Certification process. The objectives of this Study are:

- To better understand the Project's contribution to thermal load to the Moyie River;
- To better understand the Project's contribution to total dissolved gas (TDG) in the Moyie River;
- Determine whether the reservoir thermally stratifies; and
- Determine how dissolved oxygen (DO) changes if the reservoir stratifies.

## **2.0 Study Area**

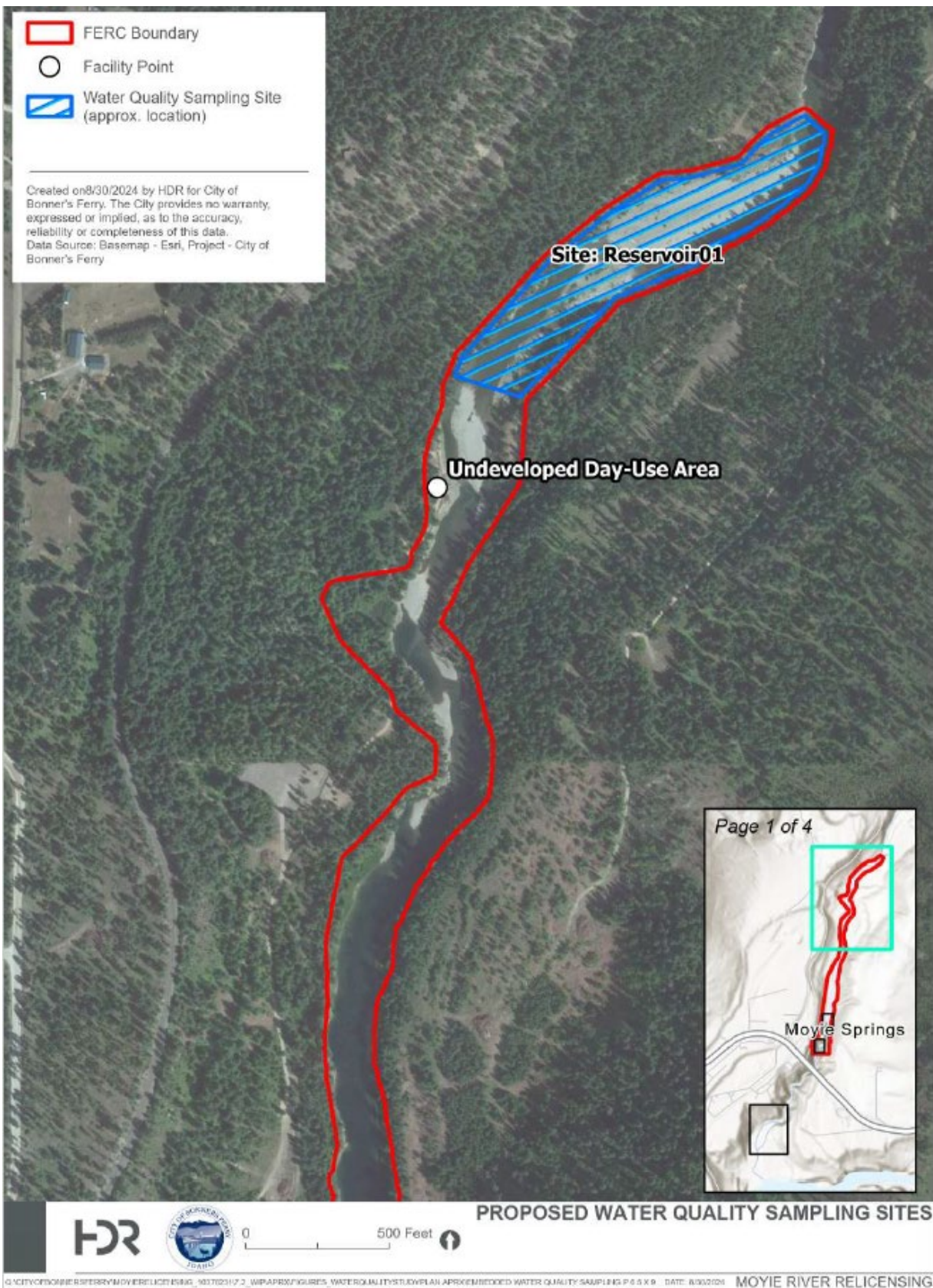
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The Study Area includes the Moyie River above the Project's reservoir, the Project's reservoir, the Project's tailrace, and the Moyie River near the Twin Rivers Sturgeon and Burbot Hatchery. Approximate locations are identified in Figures 2.0-1 through 2.0-5 below and will be finalized in consultation with DEQ and the Kootenai Tribe of Idaho with consideration of safe site access.



**Figure 2.0-1. Project location.**





**Figure 2.0-2. Proposed Upper Reservoir Water Quality Monitoring Site.**





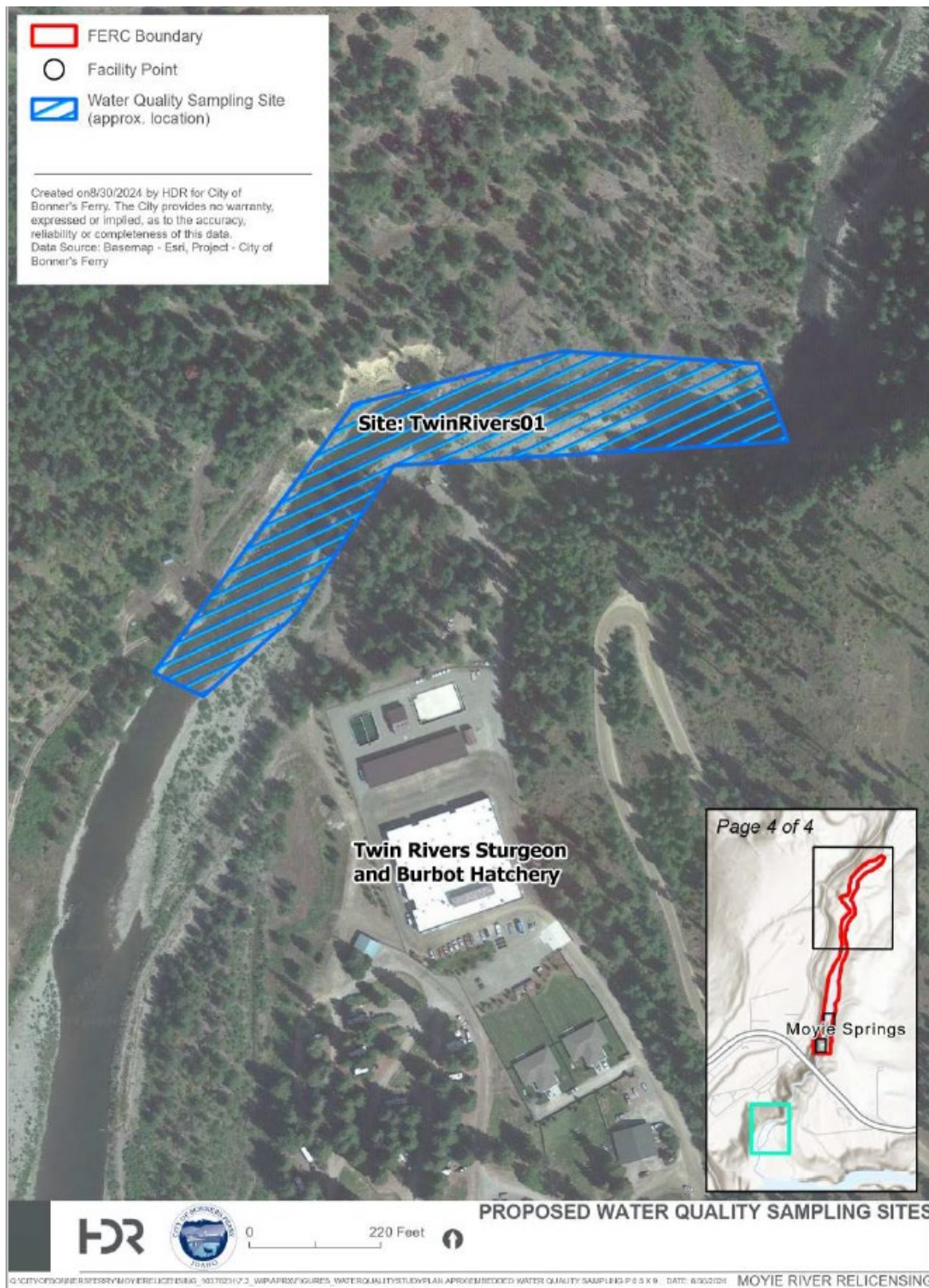
**Figure 2.0-3. Proposed Forebay and Plunge Pool Water Quality Monitoring Sites**





**Figure 2.0-4. Proposed Tailrace Water Quality Monitoring Site.**





**Figure 2.0-5. Proposed Twin Rivers Sturgeon and Burbot Hatchery Water Quality Monitoring Site.**

### 3.0 Methodology and Reporting

The Study will consist of the installation and monitoring of continuous water quality data as well as discrete sampling events, as described in Sections 3.1-3.2 and Table 3.01 below.

**Table 3.0-1. Water Quality Monitoring Study sampling parameters, frequency, and methods.**

Location	Parameter	Frequency	Methods
Reservoir01	Temperature	Continuous (15-min)	On-site logger
	Temperature, DO, pH, Turbidity	Discrete (4-6 weeks)	Grab sample
Forebay01	Temperature	Continuous (15-min)	On-site loggers
	Temperature, DO, pH, Turbidity	Discrete (4-6 weeks)	Grab sample
Forebay02	Vertical Profile (Temperature, DO)	Discrete (twice)	Grab sample
PlungePool01 <sup>1</sup>	TDG	Opportunistically (twice)	Grab sample
Tailrace01	Temperature	Continuous (15-min)	On-site logger
	Temperature, DO, pH, Turbidity	Discrete (4-6 weeks)	Grab sample
TwinRivers01	Temperature, DO, pH, Turbidity	Discrete (4-6 weeks)	Grab sample
	TDG	Opportunistically (twice)	Grab sample

### 3.1 Continuous Temperature Monitoring

Continuous (15-minute intervals) temperature data will be collected from the following areas:

- Moyie River – Upstream of the influence of the Project's reservoir.
- Reservoir Forebay – Within the Project's reservoir near the Project's intake.
- Powerhouse Tailrace – Approximately 25-250 feet downstream of the Powerhouse #2 tailrace.

Water quality monitors will be calibrated according to the manufacturer's instructions prior to deployment. The sampling date, time, location, and general field condition description will be recorded and provided in the Study report.

Continuous water temperature data will be collected at fifteen-minute increments via a water temperature data logger, such as the Onset HOBO® U22-001 loggers (or equivalent), deployed at each of the areas listed above. The sampling intervals will occur every fifteen minutes on the hour (e.g., 7:00 am, 7:15 am). The timing of data downloads will be dependent on the amount of

<sup>1</sup> The City will explore the opportunity to monitor TDG within the PlungePool01 site area. If safe access is not feasible, the City will identify the safest monitoring location downstream of the Moyie Dam.



biofouling observed during the previous download and data collection event. Each meter will be cleaned, and biofouling will be removed prior to redeployment after each download event.

### 3.2 Discrete Water Quality Monitoring

Discrete water quality readings for water temperature, DO, and pH will be collected at each of the continuous monitoring sites (above) and in the Moyie River near the Twin Rivers Sturgeon and Burbot Hatchery using a multi-parameter water quality sonde, such as a Horiba U-50 multimeter, YSI Pro Multimeter, or equivalent, during deployment of the temperature data loggers, during each data download event, and during the demobilization event. Turbidity data will be collected during the same sampling event with a Hach 2100Q or equivalent. Post-deployment data review and calibration will occur to verify accuracy of continuous data loggers.

Vertical measurements of temperature and DO will be collected near the dam forebay at a deep, safely accessible site during two separate sampling events to occur between July and August 2025 using a multiparameter sonde with depth probe collecting measurements every two meters.

TDG will be measured twice opportunistically during each spill event, over the course of two separate spill events, using a Hydrolab® multiparameter sonde or equivalent equipment. TDG will be measured immediately below Moyie Dam (at a safe access site nearest to the Moyie Dam) and near the Twin Rivers Sturgeon and Burbot Hatchery. Sample sites will be positioned outside of the mixing zone of TDG-generating activities where the appropriate compensation depth<sup>2</sup> for monitoring can be achieved with minimal turbulence. Barometric pressure data, necessary for calculating TDG percent saturation, will be downloaded from Boundary County Airport and corrected for elevation at each site.

The water quality monitoring instrument will be field checked and calibrated in accordance with the manufacturer's calibration protocols prior to each sampling event.

Historical and current ambient air temperature data (from existing nearby weather stations or equivalent methods) for the Project area will be obtained to determine if temperatures were above average, below average, or normal for the study period.

### 3.3 Reporting

The Study methodology, QA/QC procedures, data analysis, and results will be documented in a Study report and provided to Study participants on or before January 31, 2026. The Study report will evaluate and summarize the water quality data relative to the applicable Idaho water quality standards (Idaho Administrative Procedures Act [IDAPA] 58.01.02).

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<sup>2</sup> The depth at which the sum of hydrostatic and atmospheric pressure exceeds the gas pressure of TDG-supersaturated water.

## **4.0 Schedule and Consultation**

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### **4.1 Study Schedule**

Continuous water temperature monitoring loggers will be deployed at representative locations for the period from approximately June 15 through November 15, 2025. Downloads of the continuous temperature data will be collected every 4-6 weeks. During these collection periods, the City proposes to collect grab samples of temperature, DO, pH, and turbidity.

TDG will be measured opportunistically during two separate spill events, likely to occur between May and June 2025.

The Study methodology and results will be documented in a Study report and provided to Study participants on or before January 31, 2026.

### **4.2 Consultation**

The City will consult with DEQ, the Kootenai Tribe of Idaho, and other interested parties in implementation of this Study. Consultation summaries will be provided in the Study Report.