



Portland General Electric
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March 25, 2026
ELECTRONICALLY FILED

Ms. Sarah Mattechuck
Sandy, Clackamas, and Molalla Basin Coordinator
Oregon Department of Environmental Quality
Northwest Region Water Quality
700 NE Multnomah St.
Portland, OR 97232

**Re: Project No. 2195 – Clackamas River Hydroelectric Project
Mercury TMDL Implementation Plan, 2025 Annual Report**

Dear Ms. Mattechuck:

The Oregon Department of Environmental Quality (ODEQ) has set Total Maximum Daily Loads (TMDLs) for the Willamette Basin, which includes the Clackamas River. On December 30, 2019, the Environmental Protection Agency (EPA) established the Willamette Basin Mercury TMDL, which replaced ODEQ's 2006 Willamette Basin Mercury TMDL. EPA's 2019 TMDL, as revised on February 4, 2021, is currently in effect, accompanied by ODEQ's 2019 Water Quality Management Plan (WQMP).

The WQMP assigned Portland General Electric (PGE) as a Designated Management Agency (DMA) responsible for evaluating and implementing mercury reduction strategies associated with lands draining into their Clackamas River Hydroelectric Project reservoirs and impacts from reservoir operations, with particular consideration for factors affecting methylation rates. As a DMA, PGE is required under Oregon Administrative Rule (OAR) 340-42-0080 to submit a TMDL Implementation Plan (IP) to ODEQ. The ODEQ approved PGE's IP on November 3, 2023. The IP requires PGE to submit to ODEQ an annual report of its progress in implementing the IP.

Accordingly, enclosed for filing with ODEQ is the *Mercury Total Maximum Daily Load Implementation Plan – 2025 Annual Report* for PGE's Clackamas River Hydroelectric Project. This letter has been filed electronically.

Sincerely,

A handwritten signature in cursive script that reads "Brian Weatherly".

Hydropower FERC License Manager
Portland General Electric

Enclosure:	Mercury Total Maximum Daily Load Implementation Plan – 2025 Annual Report
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Clackamas River Hydroelectric Project
FERC No. 2195

Mercury Total Maximum Daily Load
Implementation Plan

2025 Annual Report

Prepared by:
Portland General Electric
Kate Mott
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March 2026

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Introduction

The Oregon Department of Environmental Quality (ODEQ) has set Total Maximum Daily Loads (TMDLs) for the Willamette Basin, which includes the Clackamas River. On December 30, 2019, the Environmental Protection Agency (EPA) established the Willamette Basin Mercury TMDL, which replaced ODEQ's 2006 Willamette Basin Mercury TMDL. EPA's 2019 TMDL, as revised on February 4, 2021, is currently in effect, accompanied by ODEQ's 2019 Water Quality Management Plan (WQMP).

The WQMP assigned Portland General Electric (PGE) as a Designated Management Agency (DMA) responsible for evaluating and implementing mercury reduction strategies associated with lands draining into their reservoirs and impacts from reservoir operations, with particular consideration for factors affecting methylation rates. As a DMA, PGE is required under Oregon Administrative Rule (OAR) 340-42-0080 to submit a TMDL Implementation Plan (IP) to ODEQ. The ODEQ approved PGE's IP on November 3, 2023. The IP requires PGE to submit to ODEQ an annual report of its progress in implementing the IP. This is PGE's 2025 annual report on progress implementing the IP.

Approach

The IP describes monitoring and analysis that PGE will perform to understand baseline conditions within the Clackamas River Hydroelectric Project (Project) and inform the process for identifying potential mercury reduction strategies and assessing progress towards TMDL goals. PGE will meet these objectives using a phased approach (Table 1):

Phase 1: Data Collection & Sampling

Phase 2: Analysis & Evaluation

Phase 3: Refine Implementation

Adaptive management is a process that acknowledges and incorporates improved technologies and practices over time to refine implementation. PGE will incorporate these principles in later years by evaluating performance and adjusting management practices and monitoring plans to suit.

Table 1. Phased approach to TMDL implementation.

Phase	Objective	Timeline	Deliverables
Pre-phase:	Implementation Plan Development	2019-2023	Mercury TMDL Implementation Plan (Oct 2023)
Phase 1: Data Collection & Sampling	Collect water quality data from strategic locations within the subbasin	2024	Annual Report (April 1) <ul style="list-style-type: none"> • Calendar year 2023 activities
		2025	Annual Report (April 1) <ul style="list-style-type: none"> • Calendar year 2024 monitoring results
		2026	Annual Report (April 1) <ul style="list-style-type: none"> • Calendar year 2025 monitoring results
Phase 2: Analysis & Evaluation	<ul style="list-style-type: none"> • Analyze monitoring results in conjunction with relevant data from other sources • Identify locations where methylation is occurring • Identify best management practices (BMPs) that could be employed to reduce methylation • Identify data gaps and adjust future monitoring to suit 	2027	Annual Report (April 1) <ul style="list-style-type: none"> • Calendar year 2026 monitoring results Evaluation Report (Dec 31) <ul style="list-style-type: none"> • Data summary (2024 - 2026 monitoring results) <ul style="list-style-type: none"> ○ Compiled monitoring data ○ Other relevant data • Data analysis • Basin-wide mercury translator • Recommendations <ul style="list-style-type: none"> ○ BMPs ○ Future monitoring plan
Phase 3: Refine Implementation	<ul style="list-style-type: none"> • Implement plan and timeline for recommended BMPs • Implement additional water quality monitoring if data were gaps identified 	2028+	Annual Report (April 1) <ul style="list-style-type: none"> • Implementation status • Calendar year monitoring results

2025 Monitoring

In 2025, water quality samples were taken as part of Phase 1 of the IP. Samples and vertical water-column chemistry profiles were taken in late summer from the Project’s two major reservoirs - Timothy Lake and North Fork Reservoir (Table 2, Table 3). Samples were collected following the procedures detailed in PGE’s Mercury TMDL Standard Operating Procedure (SOP).

Water samples were analyzed for the following analytes: total mercury (THg), dissolved methylmercury (MeHg), sulfate, total dissolved organic carbon (DOC), and total suspended solids (TSS) (Table 2). THg and MeHg were collected following the trace metal sampling protocols in US EPA Method 1669. The other analytes were collected following standard methods outline in PGE’s SOP. Samples were analyzed by a certified laboratory (i.e. ALS-Kelso, WA). Table 2 lists the laboratory methods used for chemical analysis, the method detection limits, and the laboratory reporting limits. It should be noted that the contracted laboratory used to analyze PGE water samples conducts periodic MDL calibration studies. A study conducted in March 2025 resulted in changes to MDL’s for total mercury and methylmercury (Table 2). In 2024, the MDL for total mercury and methylmercury was 0.06 ng/L and 0.03 ng/L, respectively.

To characterize thermal stratification and chemical gradients in both reservoirs, temperature, dissolved oxygen (DO), pH, and conductivity were measured in vertical water-column profiles using a Hydrolab HL4 Series Sonde. Measurements were taken at 1-m intervals in the Timothy Lake forebay and at 2-m intervals in the North Fork Dam forebay.

Table 2. The method, detection, and reporting limits for the monitored analytes for samples taken in 2025.

Analytical Parameter/Field Measurement	Project Target	Minimum Detection Limit	Minimum Reporting Limit	Method
Total Mercury ¹	0.14 ng/L	0.24 ng/L	0.50 ng/L	US EPA Method 1631
Methylmercury, dissolved ¹	No project target for water column	0.059 ng/L	0.10 ng/L	US EPA Method 1630
Sulfate	No project target	0.02 mg/L	0.2 mg/L	IC 300.0/9056A
Total Dissolved Organic Carbon	No project target	0.1 mg/L	0.5 mg/L	SM5310C (Diss)
Total Suspended Solids	No project target	5.0 mg/L	5.0 mg/L	SM 2540 D-LL

1. Minimum detection limit for total mercury and methylmercury was 0.06 ng/L and 0.03 ng/L in 2024, respectively.

Table 3. Summary of the Phase 1 water quality monitoring proposed for the Mercury TMDL.

Sampling Location	Frequency	Parameters
Timothy Lake - Outlet	1 sample in late summer/early fall Taken in years 2024, 2025, 2026	<ul style="list-style-type: none"> • THg • MeHg, dissolved • Sulfate • DOC • TSS
Timothy Lake - Forebay	Minimum of 1 sample in late summer/early fall Taken in years 2024, 2025, 2026	<ul style="list-style-type: none"> • Temp/DO/pH/conductivity - profiles, 1-m interval
North Fork Reservoir - Outlet	1 sample in late summer/early fall Taken in years 2024, 2025, 2026	<ul style="list-style-type: none"> • THg • MeHg, dissolved • Sulfate • DOC • TSS
North Fork Reservoir - Forebay	Minimum of 1 sample in late summer/early fall Taken in years 2024, 2025, 2026	<ul style="list-style-type: none"> • Temp/DO/pH/conductivity - profiles, 2-m interval

Note: THg = Total Mercury, MeHg = Methylmercury, DOC = Dissolved Organic Carbon, TSS = Total Suspended Solids

Timothy Lake

On August 4, 2025, at 15:20 water samples were taken from the tailrace of the Timothy Lake powerhouse. A field blank for each parameter and a duplicate sample for total mercury and methylmercury were taken from the same location. Results are shown in Table 4.

Vertical profiles for water temperature (°C), DO (mg/L), pH, and conductivity (uS/cm) were collected in one-meter increments from the powerhouse intake tower on July 7, July 21, July 28, and August 4 and 15, 2025 (Figure 1).

- The temperature profiles for Timothy Lake show that the lake was stratified by July 7 and remained stratified through August 15 (Figure 1).
- Across all five sampled dates, there was a metalimnetic spike in DO (mg/L) between 5-15 m, indicating high rates of photosynthetic activity in the metalimnion.
- On July 21 and 28, pH exhibited a similar profile with a spike in pH values in the metalimnion followed by decreasing pH values in the hypolimnion. This indicates high photosynthetic activity in the metalimnion. The profiles produced on July 7 and August 15 indicate consistent pH values from water surface to 12.5 m, or the beginning of the hypolimnion, where pH values begin to decrease. Note, the sonde utilized on July 7

and August 4 failed pH calibration. The other probes, those used on July 21, 28, and August 15, passed pH calibration. This may explain the differing results.

- The conductivity profiles for Timothy Lake remained fairly constant through the summer and ultimately peaked on August 15. These results reflect the combination of evaporative concentration of ions and increasing conductivity of inflowing streams.

Table 4. Results from water quality samples taken from the tailrace of the Timothy Lake Powerhouse on August 4, 2025. NC = Not Collected; ND = Not Detected

Analytical Parameter/Field Measurement	Sample Result	Duplicate Result	Field Blank	Minimum Detection Limit
Total Mercury	0.33 ng/L	0.32 ng/L	ND	0.24 ng/L
Methylmercury	ND	ND	ND	0.059 ng/L
Sulfate	0.27 mg/L	NC	ND	0.02 mg/L
Dissolved Organic Carbon	1.00 mg/L	NC	0.1 mg/L	0.1 mg/L
Total Suspended Solids	ND	NC	ND	5.0 mg/L

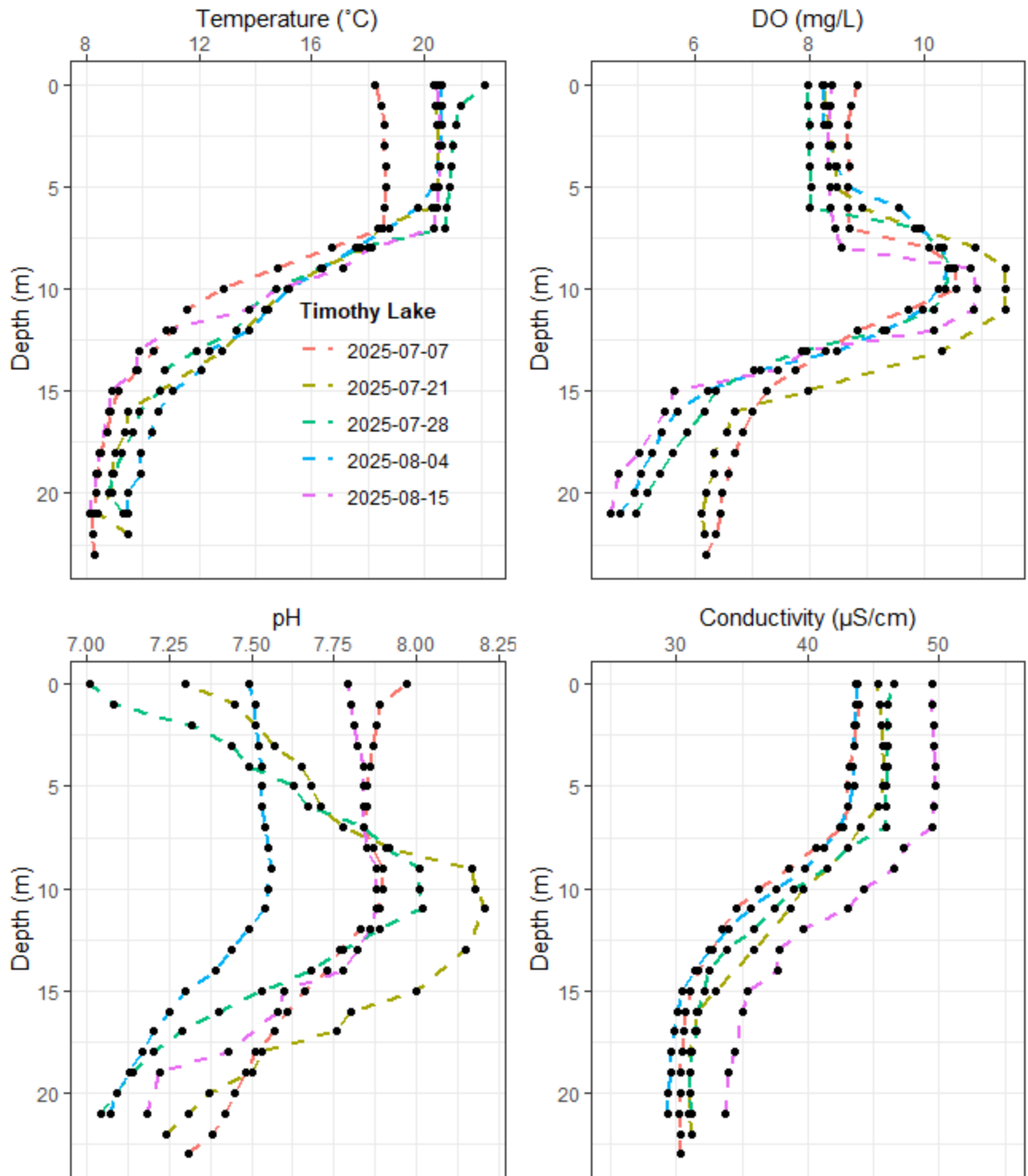


Figure 1. Vertical water-column chemistry profiles for water temperature (°C), DO (mg/L), pH, and conductivity (uS/cm) were collected in one-meter increments from the Timothy Lake Powerhouse intake tower on July 7, July 21, July 28, August 4, and August 15, 2025.

North Fork Reservoir

On August 5, 2025, at 15:00 water quality samples were taken from the North Fork Dam tailrace by boat. A duplicate sample for each parameter and a field blank for total mercury and methylmercury were taken from the same location. Results are shown in Table 5.

Vertical water-column chemistry profiles for water temperature (°C), DO (mg/L), pH, and conductivity (uS/cm) were collected in two-meter increments in front of the powerhouse intakes on August 5 and 15, 2025 (Figure 2).

- Temperature profiles from the two sampling events show slight warming between 2-3°C in the upper 5 m, but no reservoir stratification.
- On August 5, DO increased about 0.5 mg/L between the surface and 10 m. On August 15, DO decreased between the surface and 10 m, which may be a result of increased photosynthetic activity near the surface of the reservoir.
- Values for pH remained relatively unchanged with depth on August 5. However, on August 15, pH decreased from the surface of the reservoir to 15 m which may be a result of increased photosynthetic activity near the surface of the reservoir.
- Conductivity was about 2 uS/cm higher at the surface of the reservoir on both sample dates which indicates a higher concentration of ions (due to evaporation) and increasing conductivity of inflowing streams.

Table 5. Results from water quality samples taken from a penstock release valve of the North Fork Powerhouse on August 5, 2025. NC = Not Collected; ND = Not Detected

Analytical Parameter/Field Measurement	Sample Result	Duplicate Result	Field Blank Result	Minimum Detection Limit
Total Mercury	1.34 ng/L	1.27 ng/L	0.26 ng/L	0.24 ng/L
Methylmercury	ND	ND	ND	0.059 ng/L
Sulfate	1.08 mg/L	1.09 mg/L	NC	0.02 mg/L
Dissolved Organic Carbon	0.6 mg/L	0.5 mg/L	NC	0.1 mg/L
Total Suspended Solids	5.0 mg/L	ND	NC	5.0 mg/L

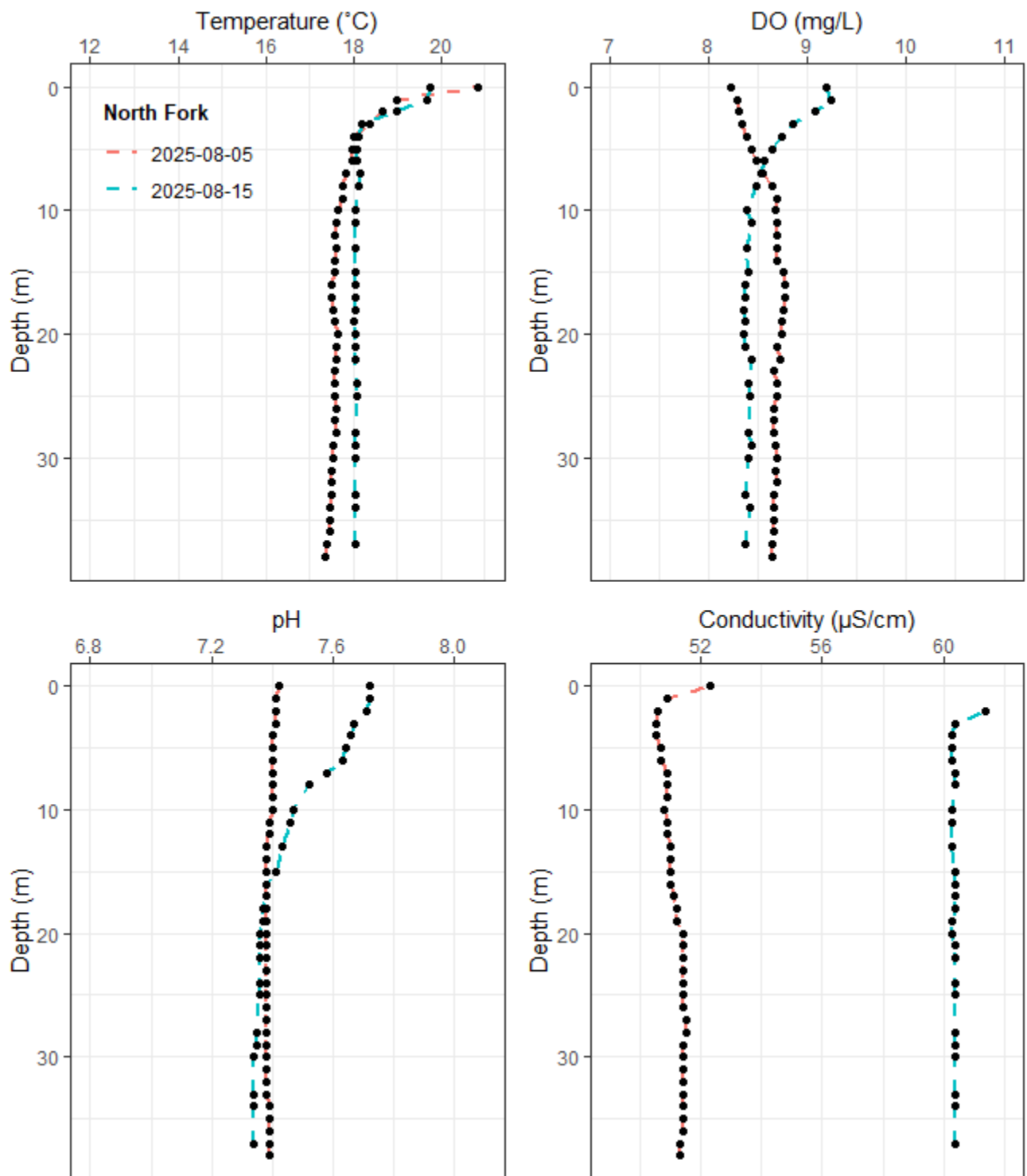


Figure 2. Vertical water-column chemistry profiles for water temperature (°C), DO (mg/L), pH, and conductivity (uS/cm) were collected in two-meter increments in front of the powerhouse intakes on August 5 and September 15, 2025.

Quality Assurance Results

All sampling events in 2025 were conducted in accordance with PGE's Quality Assurance Project Plan (QAPP). Where applicable, data results were checked for data quality indicators in accordance with PGE's QAPP. Data quality indicators for analytical quality assurance/quality control (QA/QC) samples taken by ALS (Kelso, WA), were completed in accordance with their SOP and were reported to PGE. The Hydrolab HL4 Series sondes for DO, and conductivity were calibrated on June 17, September 10. On June 17, pH failed calibration. Two replacement Hydrolab HL4 Series sondes were sent to PGE in July and all parameters were lab calibrated prior to shipment. The depth sonde was calibrated prior to each use. The sondes were calibrated in accordance with manufacturer recommendations. PGE generated quality assurance results are available upon request.