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To: Amber Nealy; efilingacceptance@ferc.gov
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-Filed By: Public Utility District No. 1 of Douglas County, Washington
-Signed By: Amber Nealy
-Filing Type: Environmental and Recreational Compliance Report
-Filing Desc: Public Utility District No. 1 of Douglas County, Washington submits 2023 Annual Total Dissolved Gas Abatement Plan Report for the Wells Hydroelectric Project under P-2149.
-Submission Date/Time: 2/22/2024 2:17:52 PM
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Public Utility District No. 1 of Douglas County

1151 Valley Mall Parkway · East Wenatchee, Washington 98802-4497 · 509/884-7191 · FAX 509/884-0553 · www.douglaspud.org

Via Electronic Filing

Honorable Kimberly D. Bose
Secretary
Federal Energy Regulatory Commission
888 1st Street N.E.
Washington, D.C. 20426

February 22, 2024

Subject: 2023 Annual Report - Total Dissolved Gas Abatement Plan
Wells Hydroelectric Project – FERC License Article 401 (b)

Dear Secretary Bose:

Pursuant to Article 401(b) of the Federal Energy Regulatory Commission (FERC) license for the Wells Hydroelectric Project (Wells Project), the Public Utility District No. 1 of Douglas County (Douglas PUD) hereby submits the final Total Dissolved Gas Abatement Plan Annual Report (TDG Report) for calendar year 2023. Article 401(b) requires Douglas PUD to file an annual TDG Report with the FERC by February 28th during each year of the license.

The final 2023 TDG Report is attached as Appendix A to this letter. A draft version of this 2023 TDG report was distributed on January 9, 2024 to the Washington State Department of Ecology (Ecology) and all of the other parties to the Aquatic Settlement Agreement (ASA) including the United States Fish and Wildlife Service (USFWS), Washington State Department of Fish and Wildlife (WDFW), the Confederated Tribes of the Colville Reservation (CTCR) and the Confederated Tribes and the Bands of the Yakama Nation (Yakama Nation). No comments were received during the 30 day comment period. Following review, all parties present during the February 14, 2024 Aquatic Settlement Work Group (Aquatic SWG) meeting approved the 2023 TDG Report. The CTCR approved the 2023 TDG Report on February 14, 2024 by email, having missed the February 14, 2024 conference call. The pre-filing consultation record supporting the review and approval of the 2023 TDG Report can be found in Appendix B.

The enclosed 2023 TDG Report is consistent with (1) the Water Quality Management Plan that is contained within the ASA, (2) Condition 6.7(2)(c)(iii) of Ecology's Clean Water Act Section 401 Water Quality Certification (401 Certification), and (3) the National Marine Fisheries Service Endangered Species Act Incidental Take Statement (ITS) Reasonable and Prudent Measure No. 2 for the Wells Project.

If you have any questions or require further information regarding the enclosed report, please feel free to contact me at (509) 881-2323, andrewg@dcpud.org or Mariah Mayfield at (509) 881-2326, mariah.mayfield@dcpud.org.

Sincerely,

Andrew Gingerich
Natural Resources Supervisor

Appendix A – 2023 Annual Report - Total Dissolved Gas Abatement Plan - Wells Hydroelectric Project

Appendix B – Pre-filing Consultation Record for the 2023 Annual Report – Total Dissolved Gas Abatement Plan - Wells Hydroelectric Project

Cc: Breean Zimmerman – Ecology, Union Gap
Chad Brown – Ecology, Lacey
Scott Carlon – NMFS, Portland
Wells Aquatic Settlement Work Group
Mariah Mayfield – Douglas PUD
Shane Bickford – Douglas PUD

APPENDIX A

2023 ANNUAL REPORT TOTAL DISSOLVED GAS ABATEMENT PLAN FOR THE WELLS HYDROELECTRIC PROJECT

2023 Annual Report
Total Dissolved Gas Abatement Plan

Wells Hydroelectric Project

Public Utility District No. 1 of Douglas County
1151 Valley Mall Parkway
East Wenatchee, WA 98802-4331

Prepared for:

Washington Department of Ecology
1250 Alder St, Union Gap, WA 98903

And

Aquatic Settlement Work Group

February 2024

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1 INTRODUCTION

The 2023 Wells Hydroelectric Project (Wells Project) Gas Abatement Plan (GAP) was approved by the Washington State Department of Ecology (Ecology) via conference call on February 8, 2023 and subsequently submitted to the Federal Energy Regulatory Commission (FERC) on February 16, 2023. The FERC approved the GAP on May 23, 2023. The GAP and its associated measures represent a long-term strategy to achieve compliance with the Washington State Water Quality Standard (WQS) criteria for total dissolved gas (TDG) downstream of the Wells Project while continuing to provide safe passage for downstream migrating juvenile salmonids. This annual report summarizes the results from the 2023 monitoring season and describes the background, operations, and results of GAP implementation at the Wells Project in 2023. In addition, this report contains TDG performance for the Wells Project during the 2023 fish passage season, and TDG performance outside of the fish passage season. Data summarized in this report includes monitoring from January 1, 2023 to December 31, 2023.

1.1 Project Description

The Wells Project is owned and operated by Public Utility District No. 1 of Douglas County (Douglas PUD) and is located at river mile (RM) 515.6 on the Columbia River in the State of Washington (Figure 1). Wells Dam is located approximately 30 river miles downstream from the Chief Joseph Hydroelectric Project, owned and operated by the United States Army Corps of Engineers (USACE), and 42 miles upstream from the Rocky Reach Hydroelectric Project, owned and operated by Public Utility District No. 1 of Chelan County. The nearest town is Pateros, Washington, which is located approximately 8 miles upstream of Wells Dam.

The Wells Project is the chief generating resource for Douglas PUD. It includes ten generating units with a nameplate rating of 832,320 kW and a peaking capacity of approximately 840,000 kW. The design of the Wells Project is unique in that the generating units, spillways, switchyard, and fish passage facilities were combined into a single structure referred to as the hydrocombine. The hydrocombine is 1,130 feet long, 168 feet wide and has a top-of-dam elevation of 795 feet above mean sea level (msl). Upstream fish passage facilities are located on both sides of the hydrocombine.

The Methow and Okanogan rivers are tributaries to the Columbia River, which drain into the Wells Reservoir. The Wells Project boundary extends 1.5 miles up the Methow River and 15.5 miles up the Okanogan River. The surface area of the reservoir is 9,740 acres with a gross storage capacity of 331,200 acre-feet and usable storage of 97,985 acre-feet at the normal maximum water surface elevation of 781 feet msl.

1.2 Fixed Monitoring Site Locations

Fixed monitoring stations (FMS) for TDG are located above and below Wells Dam (Figure 1). All FMS are Hach® or Hydrotech HYDROLAB MiniSonde (MS5) instruments equipped with TDG and temperature

probes, are deployed approximately 15 feet below normal surface water elevation and are calibrated monthly. The forebay station is located midway across the deck of Wells Dam (47° 56’ 50.28” N, 119° 51’ 54.78” W). The tailrace station is located on the left bank of the Columbia River 2.6 miles downstream of Wells Dam (47° 54’ 46.86” N, 119° 53’ 45.66” W). In the spring of 2014, Douglas PUD installed a third FMS at Washburn Island (WSBW; 48° 5' 17.15" N, 119°40' 33.82" W), located approximately 7 miles downstream of Chief Joseph Dam. Data from the three stations are automatically transmitted by radio to Wells Dam, stored, forwarded to the USACE, and posted to the Douglas PUD’s public webpage (www.douglaspud.org). Weather data are recorded by Global Water, Inc. instrumentation, including an electronic barometer located on the deck of Wells Dam at 810 feet elevation.

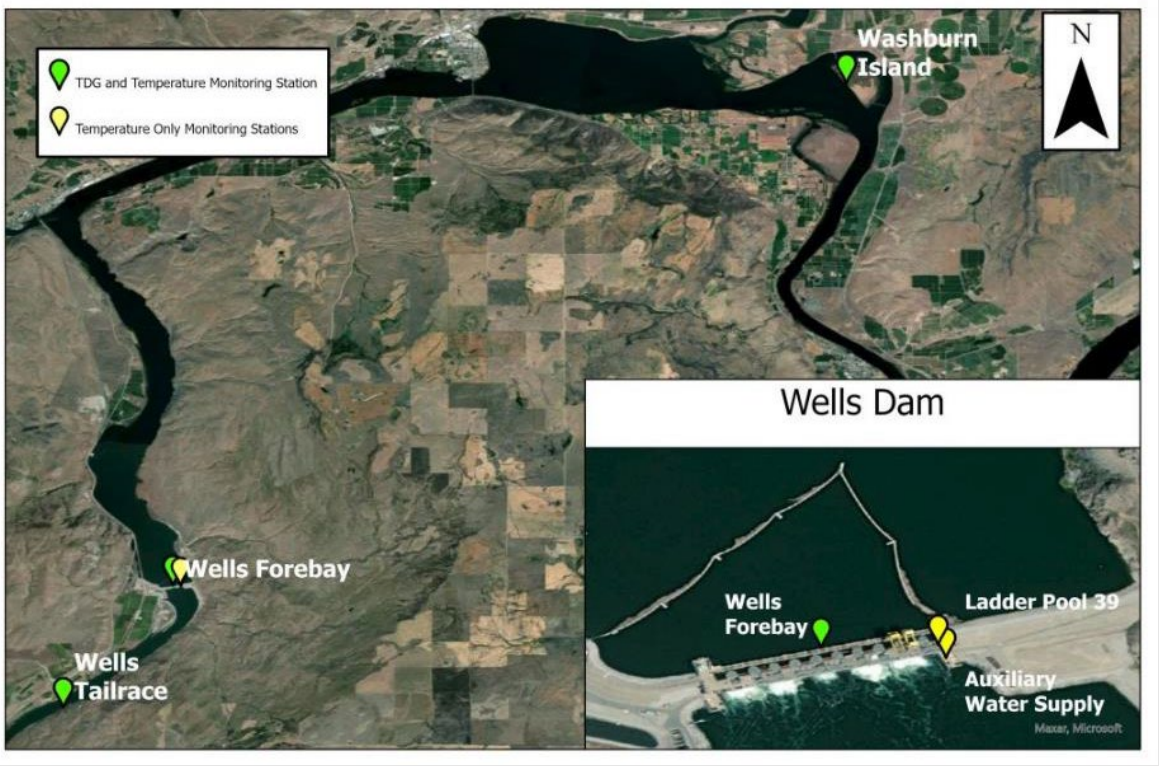

Figure 1. TDG and temperature fixed monitoring stations above and below Wells Dam.

1.3 Regulatory Framework

Washington Administrative Code (WAC) Chapter 173-201A identifies the WQS for surface waters in Washington State. Per the WQS, TDG measurements shall not exceed 110% saturation at any point of measurement in any state water body. The WQS provides for two exceptions to this rule: (1) for spill over dams to increase survival of downstream migrating juvenile salmon; and (2) during natural flood flows. Further, in 2019 the WAC was revised to allow for increased spill during the spring smolt migration period generally recognized by Ecology to be occurring between April and June. The revised WAC is written as follows:

(i) The water quality criteria established in this chapter for TDG shall not apply when the stream flow exceeds the seven-day, ten-year frequency flood (7Q-10 flow). The 7Q-10 flow for the Wells Project is 246,000 cubic feet per second (cfs), based on the hydrologic records from 1930 to 1998 and the USGS Bulletin 17B, "Guidelines for Determining Flood Flow Frequency" (Pickett et al. 2004). When river flow volume exceeds 7Q-10 flows, the WQS established in the WAC do not apply.

(ii) The TDG criteria may be adjusted to aid fish passage over hydroelectric dams that spill for anadromous juvenile fish as of the 2020 spill season. The elevated TDG levels are intended to allow increased fish passage via spill without causing more harm to fish populations than caused by turbine fish passage. The following special fish-passage exemptions for the Snake and Columbia rivers apply when spilling water at dams is necessary to aid fish passage:

(A) TDG must not exceed:

- *An average of 115% as measured in the forebays of the next downstream dams and must not exceed an average of 120% as measured in the tailraces of each dam (these averages are calculated as an average of the twelve highest hourly readings in a calendar day, relative to atmospheric pressure); and*

- *A maximum TDG saturation level of 125% calculated as an average of the two highest hourly TDG measures in a calendar day during spillage for fish passage.*

(B) To further aid fish passage during the spring spill season (generally from April through June), spill may be increased up to the following levels as measured at the tailrace fixed-site monitoring location:

- *A maximum TDG saturation level of 125% calculated as an average of the twelve highest hourly TDG measures in a calendar day; and*

- *A maximum TDG saturation level of 126% calculated as an average of any two consecutive hourly TDG measures.*

These TDG criteria may be applied in place of (A) of this subsection (above; see WAC 173-201A-200) during spring spill operations when applied in accordance with the following conditions:

- *In addition to complying with the requirements of WAC Chapter 173-201A, the tailrace maximum TDG criteria at hydropower dams shall be applied in accordance with Endangered Species Act consultation documents associated with spill operations on the Snake and Columbia rivers, including operations for fish passage. The Endangered Species Act consultation documents are those by which dams may legally operate during the time that the adjusted criteria in (B) of this subsection are in use.*

- *Application of the tailrace maximum TDG criteria must be accompanied by a department approved biological monitoring plan designed to measure impacts of fish exposed to increased TDG conditions throughout the spring spill season. Beginning in the year 2021, plans must include monitoring for nonsalmonid fish species and must continue for a minimum of five years, and thereafter as determined by the department.*

- *TDG must be reduced to allowances specified in (A) of this subsection if the calculated incidence of gas bubble trauma in salmonids (with a minimum sample size of 50 fish required weekly) or nonsalmonids (with a minimum sample size of 50 fish required weekly) exceeds:*

    - *Gas bubble trauma in nonpaired fins of 15%; or*

    - *Gas bubble trauma in nonpaired fins of 5% and gas bubbles occlude more than 25% of the surface area of the fin.*

If gas bubble trauma exceeds these biological thresholds, additional monitoring must demonstrate the incidence of gas bubble trauma below biological thresholds before TDG can be adjusted to allowances specified in this subsection. Gas bubble trauma monitoring data shall be excluded from comparison to biological thresholds when higher than normal river flow contributes to excess spill above the ability to meet (B) above. This monitoring data exclusion shall apply for one full calendar day after reduced river flow allows attainment of (B) above.

1.4 Gas Abatement Plan Approach

1.4.1 Structural

No permanent structural modifications were proposed or conducted in the 2023 monitoring season. Spill Gate 9 was unavailable during the 2023 bypass period but was put back into service on July 31, 2023. Spill Gate 7 returned to service for the 2023 bypass period, while turbine unit 5 was out of service during the bypass period for complete turbine rebuild. As such, Spill Gate 7 was used as the primary gate for concentrated spill when flows exceeded plant capacity.

1.4.2 Consultation

Consistent with prior consultation requirements, Douglas PUD directs all correspondence related to TDG compliance to Ecology's Hydropower Projects Manager located in the Central Region Office (Union Gap, Washington 98903). In addition, Douglas PUD annually consults with the Aquatic Settlement Work Group (Aquatic SWG) and Habitat Conservation Plan Coordinating Committee (HCP CC) for specific TDG and WQS documents pursuant to Douglas PUD's 401 Water Quality Certification (401 Certification). Final documents that have received committee and stakeholder approval are submitted to the FERC for approval and towards complying with the consultation and approval requirements contained within the FERC license for the Wells Project.

2 OPERATIONS

2.1 Description of Fish-Passage Season Flow

The Wells Anadromous Fish Agreement and HCP required Douglas PUD to provide juvenile fish bypass passage opportunities for greater than 95% of the downstream migrating juvenile fish covered by the HCP (Plan Species). The HCP-defined juvenile fish passage season starts April 1st and runs through August 31st of each year. Douglas PUD annually reviews fish passage statistics and uses that information to tune operation during subsequent years toward ensuring that greater than 95% of the juvenile outmigration is afforded a non-turbine passage route through Wells Dam. Based upon prior-year information, the juvenile fish bypass started on April 9 (0:00) and ended on July 24 (24:00). As required, TDG performance was monitored during this period and transmitted to the USACE, Northwest Division on a real-time basis (www.nwd-wc.usace.army.mil) and made available on Douglas PUD's public webpage (https://douglaspud.org/environmental-stewardship/for-regulatory-agencies/total-dissolved-gas-and-temperature-monitoring/). Historical data continues to be available for download at both websites.

Data from 1969 to 2023 show that average monthly flows at Wells Dam range from a September low of 49.3 kcfs to a May high of 171.7 kcfs (Table 1; Figure 2). The ten-year average shows higher flows in May through July compared to the historical means recorded during the same months. Flows at the run-of-river Wells Project are determined by upstream storage releases at the Grand Coulee Hydroelectric Project and Canadian storage projects, with typically less than 10% of the total river flow provided by the two rivers that flow into the Columbia River within the Wells Project (Okanogan and Methow Rivers). Tributary inputs from the Methow and Okanogan River are often referred to as "side-flows," which enter the Columbia River within the Project area.

Table 1. Monthly average river discharge (kcfs) from the Wells Project, 1969-2023. New historic (since 1969) minimum values were set in September and October of 2023 (bolded values).

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Mean
2023	85.7	88.7	66.2	59.7	171.7	97.4	98.2	98.6	49.3	51.1	87.5	76.6	86.3
Average since 1969	109.1	108.5	105.1	115.9	153.2	163.4	133.6	105.8	73.7	73.5	88.2	101.1	110.8
Minimum since 1969	67.4	69.9	56.0	51.9	55.2	73.7	53.4	63.9	**49.3**	**51.0**	63.8	72.6	--
Maximum since 1969	159.2	180.7	193.9	203.8	266.3	348.7	253.8	181.3	123	108.9	110.0	149.0	--
10YR mean (2014-2023)	111.0	111.8	102.3	114.0	167.2	158.0	125.1	105.3	64.5	90.4	90.6	98.1	109.2

After a modest March and April where both months approached half of normal flow averages, observed May flows at Wells Dam in 2023 were above average. Spring run-off occurred slightly earlier than normal (May) and was of a shorter duration (Figure 2) leaving June and July flows that were much lower than average. Despite the high flows in May, stream flows never exceeded the 7Q-10 value of 246 kcfs. Discharge in June and July were significantly lower than the mean and, in September and October, new historic (since 1969) minimum values were observed (Table 1).

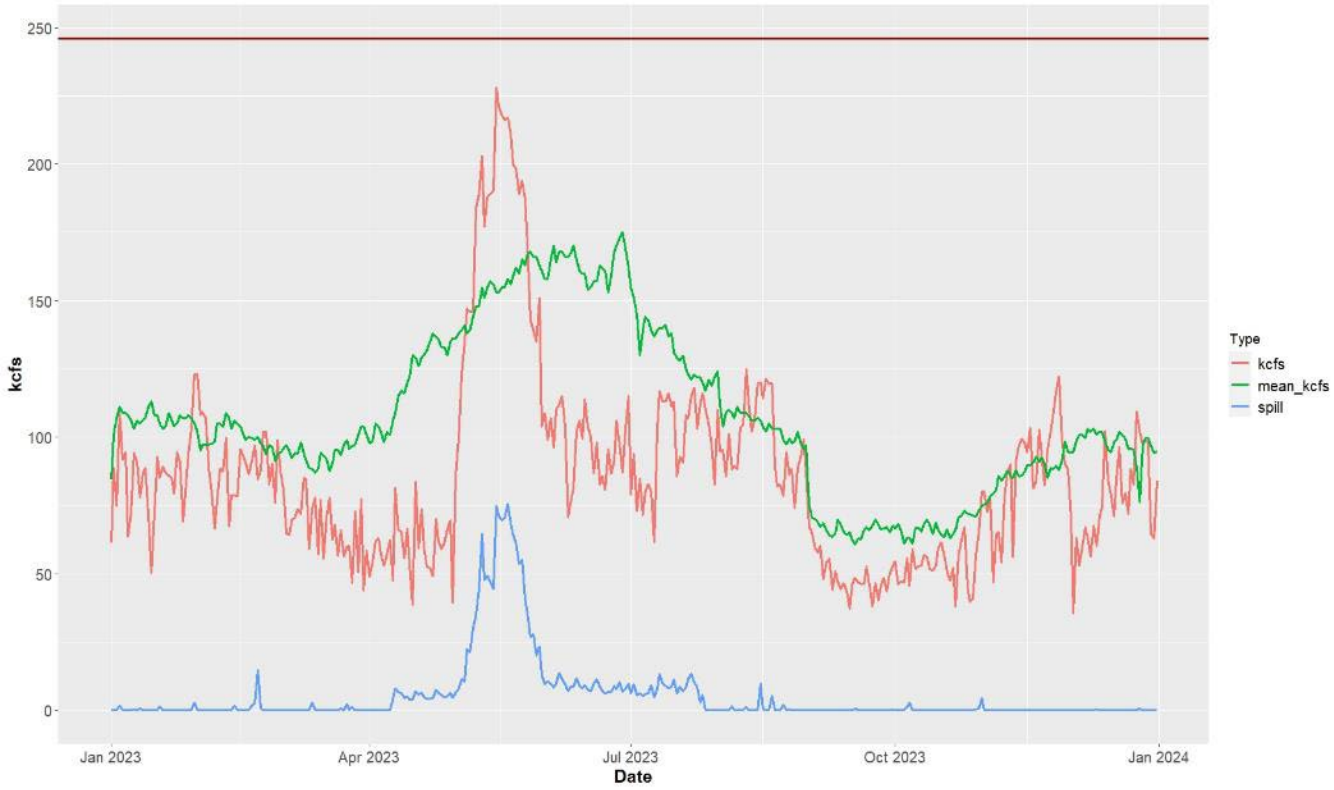

Figure 2. 2023 daily discharge and daily spill, compared to 10-year mean daily discharge. Dark red reference line indicates the 7Q-10 values of 246 kcfs.

Methow River Tributary flows were above average in May due to a generally cool spring followed by a rapid warm-up in May. The shape of this hydrograph provided conditions for Douglas PUD to complete a Methow River flush (Figure 3). Under this scenario, the Wells Pool is brought down to only a couple feet above minimum pool elevation and rock groins in the lower Methow combined with high Methow River flow transport the movement of fine sediments in the lower 1 mile of the Methow out into the Wells Reservoir. When conditions allow this action is necessary to complete to prevent future flooding in the town of Pateros, WA.

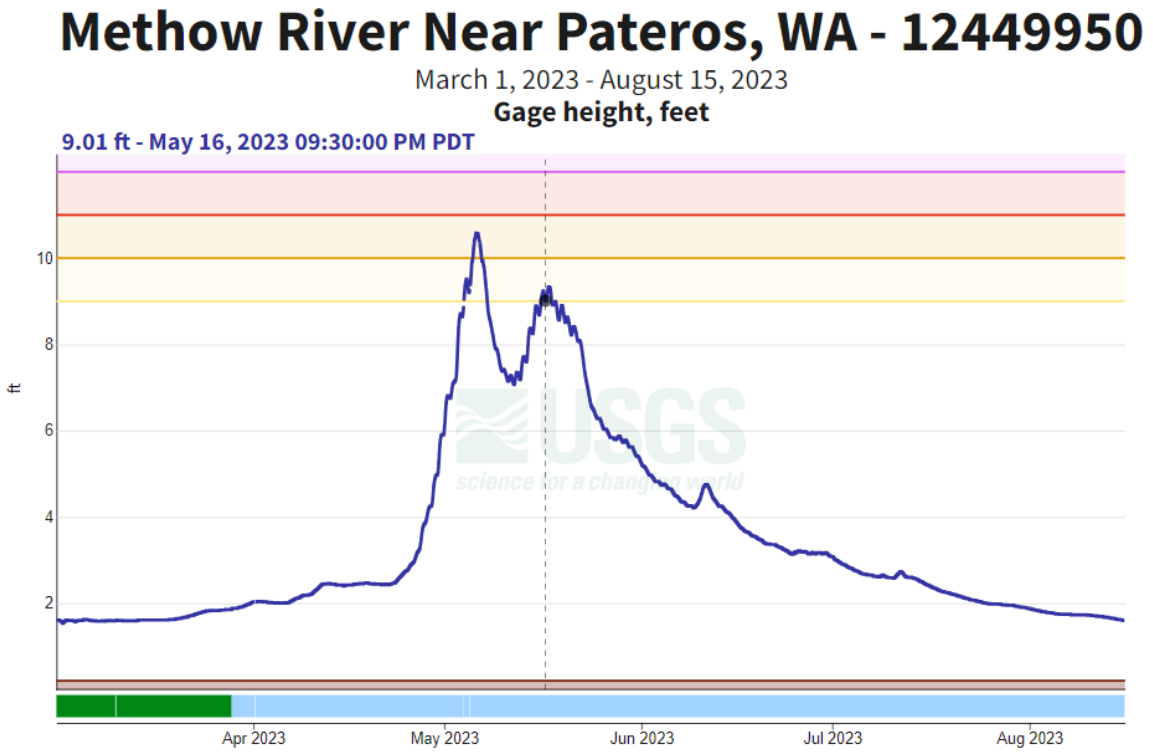

Figure 3. Methow River hydrograph in spring and summer of 2023. The rapid increase in flows above 9 ft in early May facilitated a Methow River flush opportunity (waterdata.us.gov).

2.2 Fish Bypass Program

Wells Dam is a hydrocombine, and the spillbays are located directly above the turbine intakes. Research at Wells Dam in the mid-1980s demonstrated that a modest amount of spill could effectively guide a high proportion of downstream migrating juvenile salmon away from turbines and into a surface-oriented bypass system. A Juvenile Bypass System (JBS) was subsequently developed at Wells in the late 1980s. The Wells Dam JBS was engineered based on biological research and hydraulic modeling and utilizes flow-constricting barriers deployed in five of the eleven spillbays to effectively attract and safely guide fish through the Wells Project. The JBS has since proven to be the most efficient system on the mainstem Columbia River, providing high levels of fish protection and survival that has met approval from various fisheries agencies and tribes (Skalski et al. 1996). The passage and survival performance measures contained within the FERC-approved HCP have been consistently exceeded for spring migrating plan species (Bickford et al. 2001; Gingerich et al. 2020; see Section 3.1.1 below).

2.3 Fish Bypass Spill Quantities and Duration

The Wells Dam JBS uses up to 2.2 kcfs of water for each of the five bypass/spillbays. Under normal conditions, the JBS will use roughly five to eight percent of the total river flow for fish guidance. The bypass spill has a small influence on TDG production (~0-2%) while providing a safe and highly effective,

non-turbine passage route for over 92% of the spring-migrating and 96% of the summer-migrating juvenile salmonids. The HCP-defined juvenile fish migration period runs from April 1st to August 31st of each year. The HCP CC retains annual operating oversight that includes the potential to operate the JBS as early as April 1 and as late as August 31 to ensure that at least 95% of the spring and summer migrations of juvenile salmonids are provided a safe, non-turbine passage route over Wells Dam. Any spill that occurs between April 1st and August 31st is deemed to have a beneficial effect on migrating juvenile salmonids.

From 2003 to 2011, the HCP CC directed the District to operate the JBS on a fixed schedule between April 12 and August 26 in an effort to provide a non-turbine passage route for at least 95% of the spring and summer migrations of juvenile salmonids. In 2012, Douglas PUD evaluated past performance of the Wells Dam JBS operating dates relative to observed annual run timing (at the Rocky Reach Bypass) for both spring and summer migrants. With that data, a request was made to and granted by the HCP CC to revise the bypass operating dates in 2012 to start April 9 and end August 19. These new dates were therefore used in 2012-2020 to operate the JBS for migrating juvenile salmonids. Again in 2020, after nine more years of data collection, Douglas PUD requested that the bypass window end ten days earlier on August 9 in 2021. Given the long history of data collection and analysis, the HCP CC approved the request to have the bypass period operate between April 9 and August 9 in 2021, and JBS operation within those dates readily provided JBS passage for greater than 95% of the spring and summer migrants. In 2022, a retrospective analysis of the Wells Dam smolt passage dates estimated that more than 95% of the spring migrants passing Wells Dam were afforded a bypass opportunity at Wells Dam. However, the same analysis showed that the bypass should have ran two more days to August 11th to provide 95% bypass operations coverage for summer migrant salmonids. Given the limitations of the retrospective analysis and the failure in 2022 to provide a non-turbine passage route to 95% of summer migrating salmonids, the HCP CC will consider the use of RealTime Forecasters for estimating cumulative passage of juvenile salmonids at Wells Dam in the future, and to end the JBS each year once 95% passage has been reached at Rocky Reach Dam[1], rather than on a fixed date. RealTime Forecasters is a publicly available program created by University of Washington School of Aquatic and Fishery Sciences staff associated with the Columbia Basin Research office (Beer 2022) and available online at https://www.cbr.washington.edu/analysis/rt. Juvenile anadromous salmonids that pass Wells Dam before and after the bypass system is shut down for the year benefit from spill at the Wells Project and therefore Douglas PUD annually develops a GAP and conducts biological and physical monitoring in order to obtain an Ecology approved TDG adjustment for the entire juvenile salmonid migration period (April 1st to August 31st).

[1] Using Rocky Reach Dam JBS index counts and program RealTime Forecasters is a conservative approach to ending bypass operations at Wells Dam since it does not correct for the travel date delay between Wells Dam and Rocky Reach Dam. If 95% of the run is completed at Rocky Reach, then some value greater than 95% will have passed Wells Dam given that travel times for summer Chinook between Wells and Rocky Reach dams are more than one day and had a median of 11 days in the most recent analysis (Buchanan and Townsend 2023).

3 IMPLEMENTATION RESULTS

3.1 Fisheries Management

3.1.1 Fish Passage Efficiencies

No new fish passage efficiency studies were conducted at the Wells Project in 2023. However, three years of bypass efficiency studies have shown the Wells Dam JBS to be the most efficient juvenile salmonid collection system in the Columbia River with fish passage efficiencies averaging 92% for spring migrants (steelhead, Sockeye Salmon, and spring Chinook Salmon) and averaging over 96% for summer migrants (summer/fall Chinook Salmon; Skalski et al. 1996).

3.1.1 Survival Studies

No survival studies were conducted in 2023, with the most recent survival confirmation study completed in 2020. The average project survival estimates for all five survival studies completed at Wells Dam using yearling spring migrants is 0.9604 (SE=0.0098). These results indicate that the Wells Project has the highest rate of project survival for spring migrating fish on the Columbia and Snake Rivers.

3.1.2 Run-Timing Evaluation

Based on analysis conducted by Drs. Rebecca Buchanan and Richard Townsend of Columbia Basin Research, in 2023 Douglas PUD surpassed the HCP requirement to provide bypass operations during at least 95% of the juvenile salmon and steelhead migration taking place at Wells Dam for all salmonid groups except subyearling summer Chinook (Buchanan and Townsend 2023). The onset of bypass operations at Wells Dam in 2023 continued with the schedule determined in 2021, starting at 00:00 on April 9. Unlike previous years, the end date of bypass operations in 2023 was informed by the predicted 95% passage date of subyearling Chinook Salmon at Rocky Reach Dam generated by RealTime Forecaster, as described above. In 2023, bypass operations at Wells Dam ceased at 24:00 on July 24. Buchanan and Townsend (2023) summarized the success of the 2023 juvenile bypass season:

> *"The percentage of the migration that passed Wells Dam during the Wells bypass operations in 2023 was at or near 100% for PIT-tagged yearling Chinook Salmon (combined hatchery and wild), PIT-tagged steelhead, Sockeye Salmon, and PIT-tagged Coho Salmon. An estimated 99.4% of the wild yearling Chinook migration occurred during bypass operations at Wells Dam. Additionally, the Program RealTime estimates of the percentage of the subyearling Chinook migration that passed Wells Dam within the period of bypass operations were compared with those estimated by PIT-tag detections. Program RealTime estimated that bypass operations at Wells Dam covered 98.93% of the subyearling Chinook Salmon migration in 2023. The 2023 results for all monitored Plan Species were consistent with historical trends (2012–2022) and exceeded the HCP goals of providing bypass operations for equal to or greater than 95% of the spring outmigration of juvenile Plan Species."*

3.2 Biological Monitoring

The 2023 Wells Project GAP and the biological monitoring requirement of the WAC governing TDG adjustments for juvenile fish passage call for biological monitoring. Pursuant to the 2023 GAP, weekly GBT monitoring occurred at the Rocky Reach JBS and in the Wells Dam tailrace. Further, additional monitoring occurred when observed TDG levels were above 125%, consistent with the National Marine Fisheries Service (NMFS) recommendations (NMFS 2000). GBT monitoring began on April 4 and continued through June 26, 2023 at Rocky Reach Dam consistent with the 2023 GAP. Each week, Douglas PUD endeavored to examine no fewer than 50 resident and 50 anadromous fish for GBT. However, due to low passage rates at the Rocky Reach JBS, more than 50 smolts were examined in only 6 of the 14 sample weeks. In total, 550 smolts were encountered in the Rocky Reach JBS and examined for GBT (Table 2). Within the Wells Tailrace, 956 resident fish were examined for GBT (Table 3). In 2023, no GBT was observed at the Rocky Reach JBS or in the Wells tailrace sampling.

Table 2. Summary of fish sampled at the Rocky Reach Juvenile Bypass System for GBT in 2023. None of the fish examined had signs of GBT.

	4/4	4/13	4/18	4/27	5/2	5/8	5/9	5/17	5/23	6/1	6/7	6/13	6/19	6/26	*SPECIES TOTAL*
CHINOOK YEARLING	3	2	20	34	17	15	24	13	48	27	--	--	3	3	***209***
STEELHEAD	--	--	--	4	10	23	--	--	1	2	--	--	4	5	***49***
CHINOOK SUB-YEARLING	6	4	--	8	31	--	5	--	--	3	51	63	49	1	***221***
SOCKEYE	--	1	--	--	--	1	--	22	7	24	--	--	--	--	***55***
COHO	--	1	8	3	--	1	1	1	--	1	--	--	--	--	***16***
DAILY TOTAL	***9***	***8***	***28***	***49***	***58***	***40***	***30***	***36***	***56***	***57***	***51***	***63***	***56***	***9***	***550***

Table 3. Summary of fish collected for GBT examination via electrofishing in the Wells Tailrace, 2023. None of the fish examined had signs of GBT.

	4/4	4/13	4/18	4/27	5/4	5/10	5/17	5/23	6/1	6/6	6/13	6/20	6/26	*SPECIES TOTAL*
BULLHEAD	--	--	--	--	--	--	--	--	--	--	--	--	1	***1***
BLUEGILL / PUMPKINSEED	1	--	--	--	--	--	--	--	--	--	2	--	--	***3***
BASS SPECIES	--	--	--	--	1	--	1	3	1	1	2	--	1	***10***
LARGESCALE SUCKER	6	7	3	11	6	2	28	23	12	2	11	27	15	***153***
CHISELMOUTH	--	7	2	5	15	2	2	3	--	2	10	1	3	***52***
CARP	--	--	--	--	--	--	1	1	--	1	2	1	--	***6***
CUTTHROAT TROUT	--	--	--	--	--	--	--	--	--	--	--	--	1	***1***
WHITEFISH SPECIES	--	--	--	--	--	1	--	--	1	--	--	--	6	***8***
PEAMOUTH	5	4	--	--	--	2	1	6	1	16	1	--	1	***37***
PACIFIC LAMPREY	--	--	--	--	--	--	--	1	--	--	--	--	--	***1***
REDSIDE SHINER	37	62	76	87	14	68	14	14	35	43	16	12	22	***500***
SCULPIN SPECIES	--	--	--	--	--	--	--	--	1	--	1	--	--	***2***
3 SPINE STICKLEBACK	5	3	1	--	3	3	--	--	--	--	--	--	3	***18***
NORTHERN PIKEMINNOW	2	15	3	1	17	1	2	2	3	6	5	12	14	***83***
BRIDGELIP SUCKER	2	--	--	--	--	--	--	--	1	1	--	--	1	***5***
WALLEYE	--	--	--	--	--	--	1	7	--	--	--	--	--	***8***
OTHER*	--	--	1	--	12	1	2	3	3	35	11	--	--	***68***
DAILY TOTAL	***58***	***98***	***86***	***104***	***68***	***80***	***52***	***63***	***58***	***107***	***61***	***53***	***68***	***956***

*Other species collected were as follows: 1 burbot on 4/18; 12 unknown suckers on 5/4; 1 unknown sucker on 5/10; 1 Rainbow Trout and 1 unknown sucker on 5/17; 3 unknown suckers on 5/23; 3 unknown suckers on 6/1; 35 unknown suckers on 6/6; and 11 unknown suckers on 6/13.

3.3 Water Quality Forums

Douglas PUD has actively participated in regional water quality forums with Ecology, Washington Department of Fish and Wildlife, NMFS, Tribal Agencies, the U.S. Fish and Wildlife Service, the USACE, and other Mid-Columbia PUDs (i.e., Grant and Chelan counties). Notably, in 2023, Douglas PUD participated in monthly water supply webinars provided by NOAA's Northwest River Forecast Center from January-June. Since 2020 and the onset of the Covid-19 pandemic, there has been some reduction in regional coordination of water quality issues and topics. At the end of 2020, the USACE cancelled their regional review of TDG monitoring in the Snake and Columbia Rivers normally held in Portland each year. Douglas PUD looks forward to participating in these forums again in the future.

3.4 Physical Monitoring

3.4.1 Overview

TDG monitoring at the Wells Project currently occurs year-round as required by Douglas PUD's Wells Project 401 Certification. As required by Douglas PUD's Quality Assurance Project Plan for TDG, FMS sensors are serviced and calibrated at least once per month or sooner if calibration issues are observed in the data.

In 2014, an additional reservoir monitoring station was installed at Washburn Island (RM 537.5) to collect TDG data representative of water quality entering the Wells Project from Chief Joseph Dam. The current Chief Joseph Dam tailwater station (CHQW) minisonde TDG sensor is deployed along the right bank of the Columbia River, 0.75 miles downstream from Chief Joseph Dam. The river right location of the USACE TDG sensor precludes it from collecting bulk flow data, and instead the sensor monitors spillbay water disproportionally. Under some conditions, water coming from Chief Joseph Dam spillbays has a lower TDG concentration than the powerhouse. For example, when the Chief Joseph Dam forebay has high concentrations of TDG (e.g. greater than 120%) as a result of high spill volumes from Grand Coulee Dam and limited degassing through Rufus Woods Reservoir, water sent through the spillbays at Chief Joseph Dam may actually be stripped of gas via the spill deflectors. However, powerhouse TDG concentrations are essentially identical to those in the forebay and can be missed by the CHQW sensor since powerhouse flows orient to river left rather than river right where the TDG sensor resides. As a result of the CHQW location and the orientation of spill and powerhouse flows, bulk flows leaving the federal system and entering the Wells Project are not accurately monitored. The Washburn Island location installed and operated by Douglas PUD allows water quality managers and the Aquatic SWG Parties to:

1) Better understand TDG degassing in the Wells Project and expected TDG saturation in the Wells forebay.

2) Assure data quality at the Wells forebay TDG sensor since Washburn Island TDG values should correlate predictably with Wells forebay TDG values. Based on the comparison of the sensors at these two locations, technicians can ensure reliable data collection by scheduling sensor servicing when data appears to be erroneous.

3) More accurately assess TDG production from the federal power system upstream of Wells Dam, which may support improved management towards minimizing TDG production in the Columbia River.

3.4.2 Data Evaluation and Analyses

Hourly TDG monitoring data were retrieved from the USACE, Northwest Division for three monitoring locations: the forebay of Wells Dam, tailrace of Wells Dam, and forebay of Rocky Reach Dam, or from the Douglas PUD dataset, available at https://douglaspud.org. The data were partitioned to include only readings obtained during specific time periods of non-bypass (January – March and September – December), spring bypass (April - June), and summer bypass (July and August). Data were stratified by monitoring site, ascending date, and ascending time. Data quality review included ensuring TDG sensor data was responding to each data request and not simply repeating data from the previous time interval or relaying inaccurate data as the result of a system failure (e.g., a failed membrane on the TDG sensor). Where data was perceived to be frozen or otherwise inaccurate, it was removed and, when feasible, replaced with accurate data collected by the adjacent, redundant sonde.

3.5 TDG Compliance

During the non-fish passage season, the TDG criterion in the Wells Tailrace is 110% (January–March and September–December). During the spring bypass (April–June) season, compliance was calculated using the new regulatory criteria as adopted by Ecology in 2019. Additionally, there are five compliance criteria for the 2023 fish passage adjustment that must be met in association with operation at the Wells Project as described in the 2023 GAP and reviewed in Section 1.3. These five compliance criteria apply differently between spring bypass (April–June) and summer bypass (July–August) seasons but are waived when flows exceed the 7Q-10 value for the Wells Project (246 kcfs). For more information refer to WAC 173-201A-200.

3.5.1 Non-Fish Passage Season Compliance (Wells Tailrace 110%)

Pursuant to Douglas PUD's FERC Operating License and 401 Certification, in August 2013 Douglas PUD started collecting TDG data during the non-fish passage season. Non-spill flows at Wells Dam (through the turbine units and fishways) generate little to no additional dissolved gas, and spill outside the fish passage adjustment period is uncommon. There were four hourly instances over two different days in which TDG values were observed higher than 110% outside of the fish bypass season during 2023 (Figure 4). On September 13, 2023, TDG values were over 110% for three hours in the late morning. This was during a time of very low flows in the Columbia River at Wells Dam and there was no spill occurring. It is unknown what caused this TDG increase but it may have been due to a change in aquatic vegetation

respiration during this low water period immediately adjacent to the TDG sonde. On October 31, 2023, incoming flow to the Wells Project area exceeded BPA estimates, spill occurred, and two hours of TDG values were recorded over 110%.

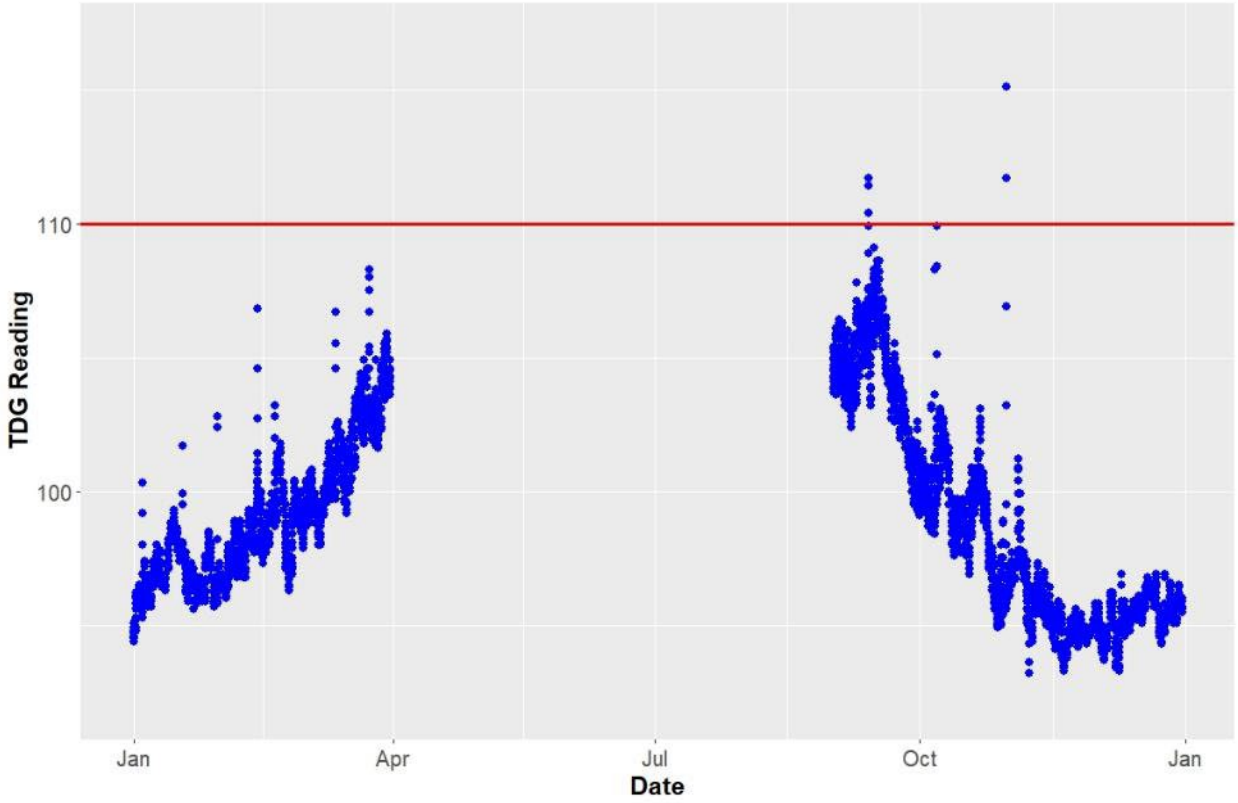

Figure 4. Hourly TDG data for the Wells Tailrace during the non-fish bypass season in 2023. Values colored red and appearing above the reference line represent exceedances of the standard.

3.5.2 Spring Fish Passage Season (April through June) Compliance

Mean of Highest 12-Hour TDG Values (Wells Tailrace: 125%)

In 2023, there were no instances of the mean highest 12-hour TDG values exceeding the 125% criteria from April through June.

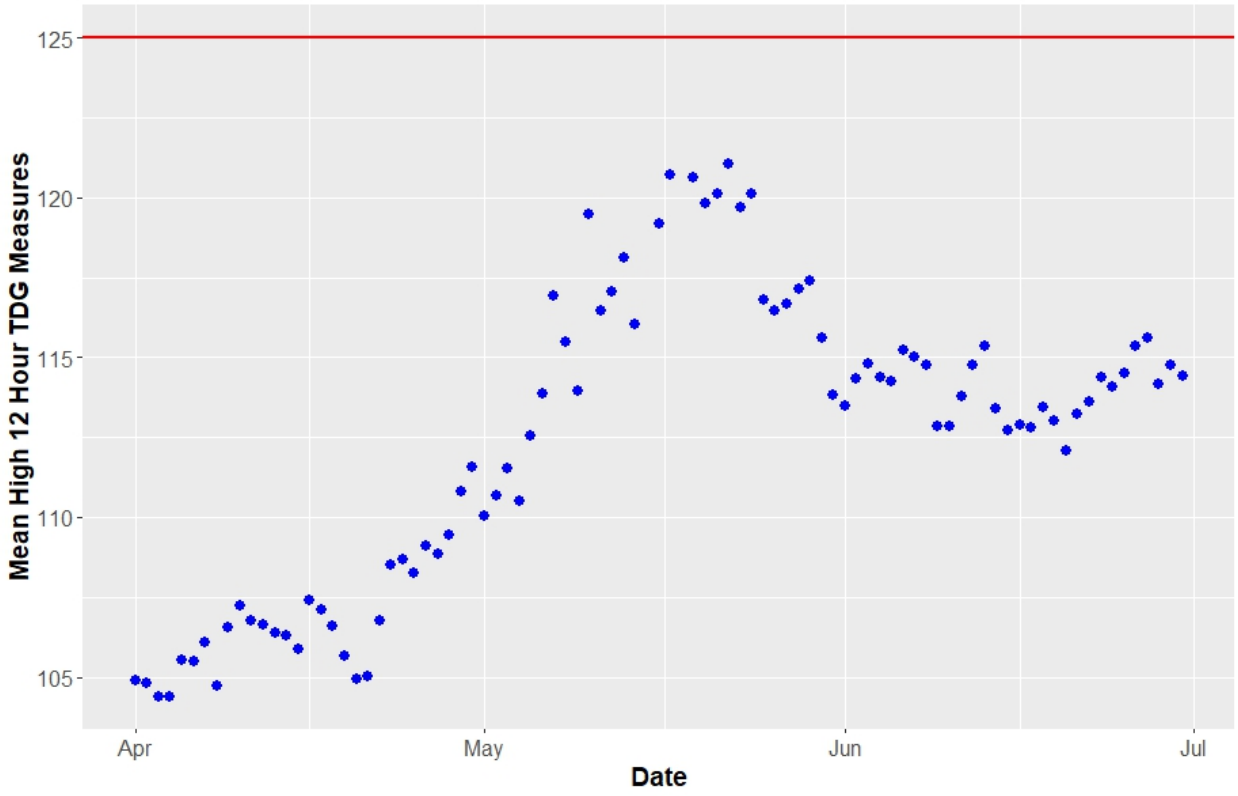

Figure 5. Mean highest 12-hour TDG measures in the Wells Tailrace from April through June 2023. Reference line indicates the compliance standard of 125%.

Mean Consecutive 2-Hour TDG Values (Wells Tailrace: 126%)

In 2023, there were only two exceedances of the 126% 2-hour consecutive mean TDG standard in the Wells Tailrace during the April - June period. On May 7, 2023, the 2-hour consecutive mean was 130.3% and 132.4% both exceedances occurring in the early morning during spring run-off and as a result of high volume of water being spilled at the Wells Project. Post event analysis suggested that the TDG violation may have been preventable, even though it occurred during the early morning (night) hours of May 7, 2023, and when load requests would have been reduced. Similar situations throughout the bypass season did not yield a non-compliant event.

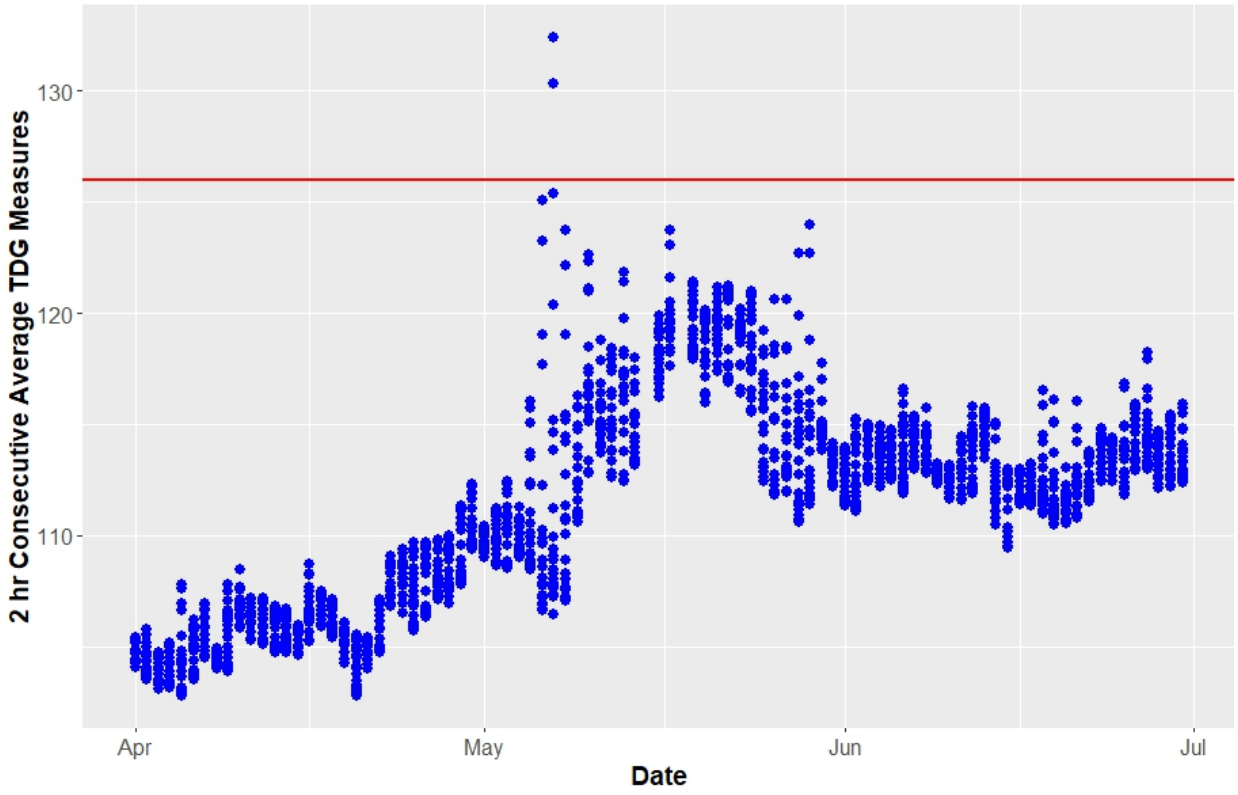

Figure 6. Two-hour consecutive average TDG values for the Wells Tailrace, April through June 2023. Reference line indicates the compliance level of 126%.

3.5.3 Summer Fish Passage Season (July and August) Compliance

Mean of Highest 2-Hour TDG Values (Wells Tailrace: 125%)

In 2023, there were no instances of the mean highest two-hour TDG values in the Wells Tailrace exceeding the 125% criteria between July and August.

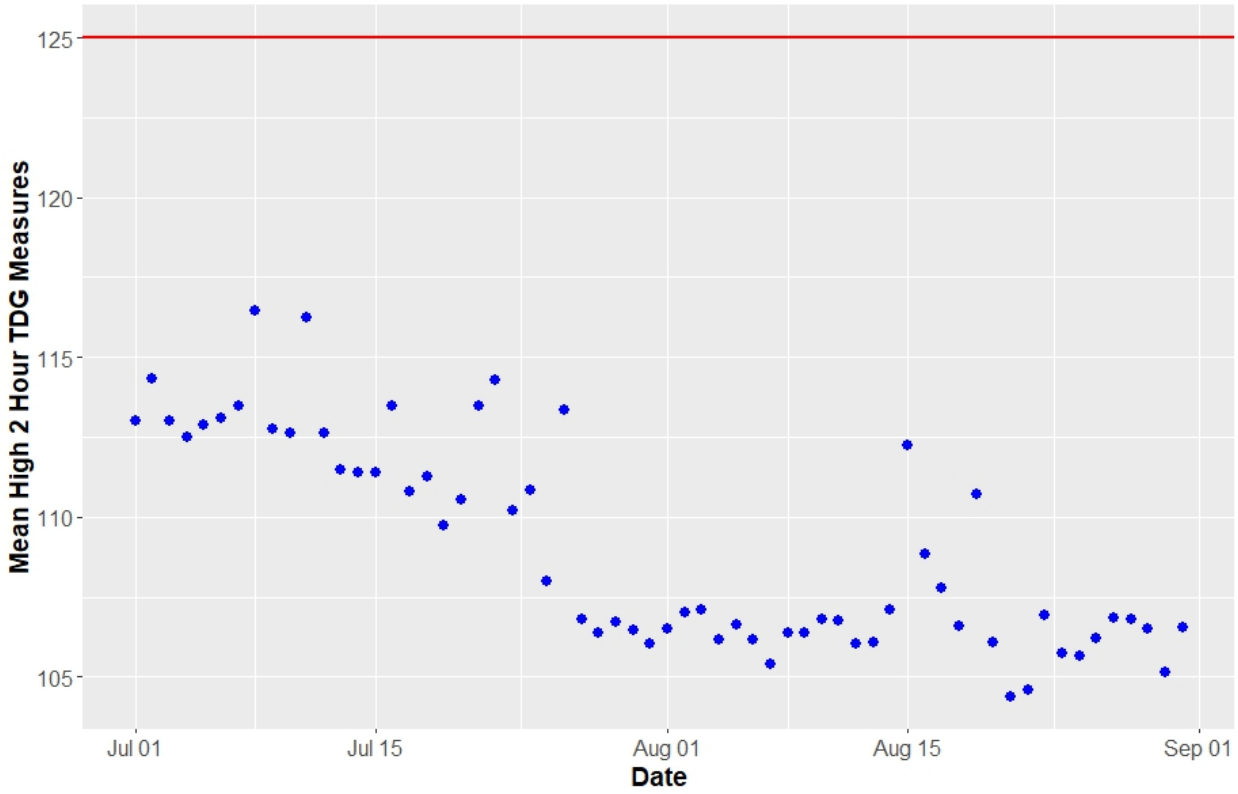

Figure 7. Mean highest 2-hour TDG measures in the Wells tailrace from July to August 2023. Reference line indicates the compliance standard of 125%.

Mean of Highest 12-Hour TDG Values (Wells Tailrace: 120%)

In 2023, there were no instances of the mean highest 12-hour TDG values in the Wells Tailrace exceeding the 120% criteria between July and August.

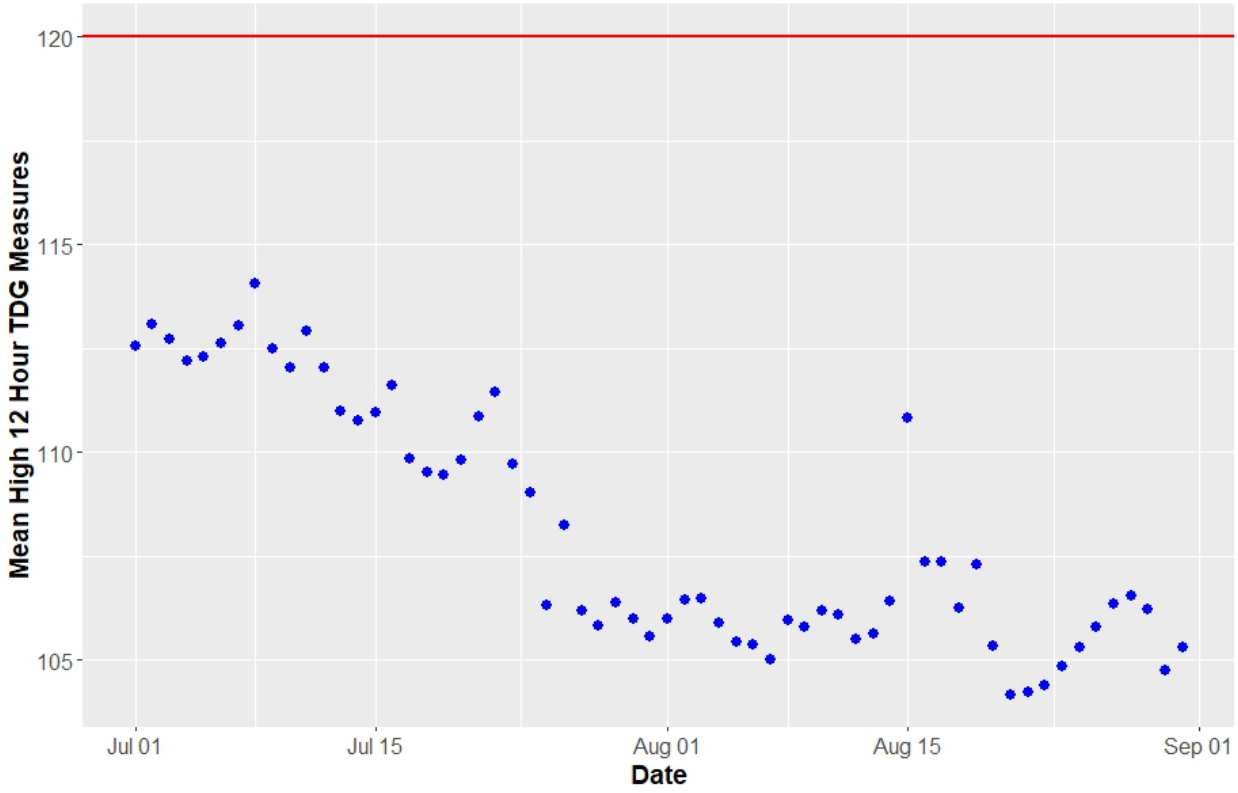

Figure 8. Mean highest 12-hour TDG measures in the Wells Tailrace from July to August 2023. Reference line indicates the compliance standard of 120%.

Mean of Highest 12-Hour TDG Values (Rocky Reach Forebay: 115%)

In 2023, there were no instances of the mean highest 12-hour TDG values in the Rocky Reach Forebay exceeding the 115% criteria between July and August.

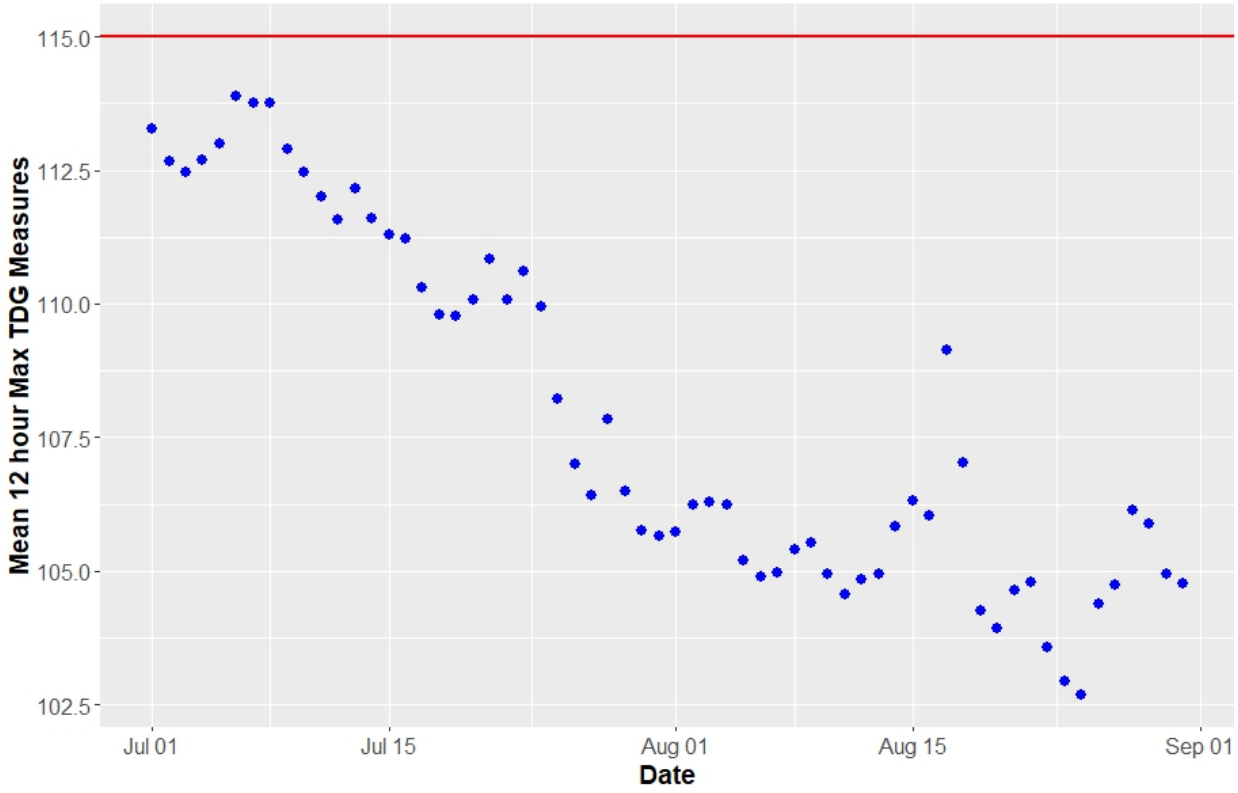

Figure 9. Mean highest 12-hour TDG measures in the Rocky Reach Forebay from July to August 2023. Reference line indicates the compliance standard of 115%.

Wells Forebay TDG Compliance

While the Wells Project's level of TDG compliance in 2023 was near perfect, it is typically difficult to achieve complete WQS compliance due to incoming water entering the Wells Forebay is frequently greater than the Environmental Protection Agency (EPA) and Tribal Water's TDG WQS standard of 110%. For example, between June 1 and July 31, 2023, water entering the Wells Forebay was above 110% TDG over 85% of the time (Figure 10).

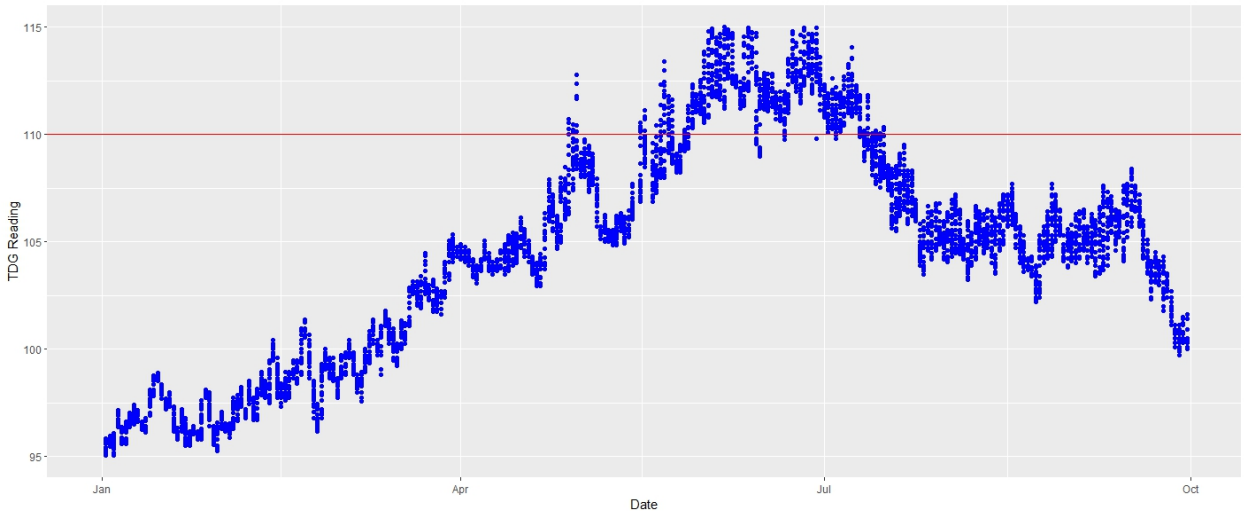

Figure 10. Wells Forebay TDG from January to October 2023. The reference line at 110% represents the EPA and Tribal Waters compliance threshold.

Table 4 TDG compliance at the Wells Project for the entire 2023 season.

April - June	**Mean of Highest 12-Hour TDG Values: Wells Tailrace 125%**	
	Non-compliant measurements	0
	7Q-10 flow measurements	0
	Total measurements	91
	DCPUD compliance	**100.0%**
	Mean Consecutive 2-Hour TDG Values: Wells Tailrace 126%	
	Non-compliant measurements	2
	7Q-10 flow measurements	0
	Total measurements	2093
	DCPUD compliance	**99.9%**
July & August	**Mean of Highest 2-Hour TDG Values: Wells Tailrace 125%**	
	Non-compliant measurements	0
	7Q-10 flow measurements	0
	Total measurements	62
	DCPUD compliance	**100.0%**
	Mean of Highest 12-Hour TDG Values: Wells Tailrace 120%	
	Non-compliant measurements	0
	7Q-10 flow measurements	0
	Total measurements	62
	DCPUD compliance	**100.0%**
	Mean of Highest 12-Hour TDG Values: Rocky Reach Forebay 115%	
	Non-compliant measurements	0
	7Q-10 flow measurements	0
	Total measurements	62
	DCPUD compliance	**100.0%**
Jan - Mar & Sept - Dec	**Wells Tailrace: <110% Standard**	
	Non-compliant measurements	5
	Total measurements	5086
	DCPUD compliance	**99.9%**

4 DISCUSSION OF GAS ABATEMENT MEASURES

4.1 Water Quality Attainment Plan Activities

As required by the Wells Project 401 Certification, Douglas PUD developed a Water Quality Attainment Plan (WQAP) that was approved by Ecology and the FERC in 2013. The WQAP provides a detailed strategy for achieving compliance with the TDG state WQS within a required ten-year timeframe (i.e., compliance schedule). In December 2023, Douglas PUD completed a WQAP 10-Year Review (Douglas PUD 2023) and submitted to the Department of Ecology and the Aquatic SWG for 30-day review. Once approved, the final document is expected to be filed with the FERC in the first quarter of 2024. This report details all actions taken to meet water quality standards and the next steps for water quality attainment. For 2023, the WQAP implementation actions include updating and implementing the Spill Playbook, continuing with biological monitoring for GBT, coordinating river flows with power sales and system operators, implementing the TDG prediction tool (found here: https://www.cbr.washington.edu/shiny/DAM_CONDITIONS/), and assessing the need to update any relevant TDG models.

In 2023, modifications were made to the Spill Playbook to accommodate the unavailability of Spill Gate 9, which was undergoing maintenance activities for a prolonged period. Biological monitoring (i.e., GBT monitoring in biota, as needed) continued in 2023 toward determining the impact on salmonids and resident fish pursuant to the Biological Monitoring Plan portion of the 2022 Wells Dam GAP.

4.2 Operational

River levels were below average for most of the year with a short, high run-off occuring in late-May (Table 1; Figure 2). This lead to a short period of time were mean daily flows were above average before returning to low baseflow levels. September and October had the lowest average monthly flows at Wells Dam since Project commission in in the late 1960's.

Despite having a low-to-average flow year, there were mutliple maintenance and operational actions that took place during May that required short term deviation from the Spill Playbook, while remaining complaint with the opertaional requirements of the juvenile bypass system at Wells Dam. On May 10, 2023, the reservoir level was lowered in order to produce conditions that would help flush fine sediment from the mouth of the Methow River. This required spill to be allowed through Spill Gates 3 and 5 for brief periods, in addition to 7, in order to safely reduce the forebay level. After the reservoir reached the desired level, the flow barrier on Spill Gate 6 was removed and spill was returned to Spill Gates 6 and 7, per the Spill Playbook desired configuration. Additionally, in order to prepare Turbine Unit 6 for maintenance, stop logs needed to be installed in the turbine unit intake. This required spill to be diverted through Spill Gate 3 and 4 rather than using Spill Gates 6, 7, and 8. Given the high incoming flows the flow barrier on Spill Gate 4 was removed on May 15, 2023 to accomadate the stop log work and to safely pass the high incoming flow volume. On May 17, 2023, stop log installation was attempted by diverting spill near Spill Gate 6, but the high flow conditions proved unsafe for

completing this operational effort.The Methow River flush was completed on May 22, 2023 and operators were able to reinstall the bypass barrier to Spill Gate 6 on May 23, 2023, returning the reservoir to normal levels.

The Flow barrier was returned to Spill Gate 4 on May 25, 2023. The stop log installation was attempted again on May 27, 2023, and again, spill was diverted into Spill Gate 3. All stop logs were fully set by May 29, 2023, and spill was returned to Spill Gate 6 by mid-afternoon. While the order of the bypass barrier removal was modified during these maintenance activities, units were shutoff when a bypass bay became unavailable or discharge through a spill gate that had a removed barrier could not be kept at 15 kcfs.

By June 2023, river flows had decreased and all major maintenance that required spill gate manipulation was complete. Spill was managed according to the Spill Playbook for the remainder of the juvenile bypass season.

4.2.1 Structural

No permanent structural modifications were proposed or completed during the 2023 monitoring season. Continued maintenance work on Spill Gate 9 precluded the release of spill through Spillbay 9 for the duration of the fish bypass period. Although influencing the Spill Playbook, the reduced operational flexibility caused by the maintenance activity did not adversely affect compliance with TDG standards.

5 CONCLUSIONS

TDG performance at the Wells Project during the 2023 season was very good overall. Results support the continued implementation of the Spill Playbook to manage TDG production through operational means and suggest future operational performance should return to extremely high rates of compliance with TDG standards under average flow conditions. There were four instances of exceedances of the 110% TDG standard occurring outside the bypass period that may have been avoidable, and these events are expected to continue to decrease as Douglas PUD maintains its emphasis on system operator training, utilization of the Columbia Basin Research's TDG RealTime Forecaster model, EAS accounting, and coordination with control room operators. Douglas PUD will emphasize testing the Spill Playbook in years where ten units are available 95% of the time (expectation of reliability). The ongoing turbine rebuild project currently only provides 9 out of 10 units for operation during the peak hydrograph, thereby reducing the amount of water that can be passed through the turbine units by approximately 15-20 kcfs. Turbine maintenance is expected to be completed in 2028. Lack of unit availability increases the difficulty of maintaining compliance with WQS because when Wells Project inflow exceeds the reduced turbine capacity, the additional water must be spilled creating more opportunity for TDG increases in the Wells Tailrace. Despite this challenge, overall, Douglas PUD has maintained high TDG compliance with WQS. Douglas PUD will continue to work closely with Ecology towards meeting year-round TDG standards in subsequent years.

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APPENDIX B

PRE-FILING CONSULTATION RECORD FOR THE 2023 ANNUAL REPORT TOTAL DISSOLVED GAS ABATEMENT PLAN FOR THE WELLS HYDROELECTRIC PROJECT

NOTICE TO AQUATIC SETTLEMENT WORK GROUP TO REVIEW THE TOTAL DISSOLVED GAS ABATEMENT PLAN 2023 ANNUAL REPORT

From: Kristi Geris <kgeris@anchorqea.com>
Sent: Tuesday, January 9, 2024 4:29 PM
To: Andrew Gingerich <andrew.gingerich@dcpud.org>; Blanchard, Monica R (DFW) <Monica.Blanchard@dfw.wa.gov>; Chad Brown <chbr461@ecy.wa.gov>; Chas Kyger <chas.kyger@dcpud.org>; David Blodgett, III <blod@yakamafish-nsn.gov>; Fety, Stuart B (FWS) <stuart_fety@fws.gov>; Jason McLellan <Jason.McLellan@colvilletribes.com>; John Ferguson <jferguson@anchorqea.com>; John Rohrback <john.rohrback@dcpud.org>; Keely Murdoch (murk@yakamafish-nsn.gov) <murk@yakamafish-nsn.gov>; Kristi Geris <kgeris@anchorqea.com>; Laura.Heironimus@dfw.wa.gov; Mariah Mayfield <mariah.mayfield@dcpud.org>; Verhey, Patrick M (DFW) <patrick.verhey@dfw.wa.gov>; Ralph Lampman (lamr@yakamafish-nsn.gov) <lamr@yakamafish-nsn.gov>; RD Nelle <RD_Nelle@fws.gov>; bzim461 <bzim461@ECY.WA.GOV>
Subject: FW: 2023 TDG Annual Report

Hi ASWG Technical Reps: please see the email below from Mariah and the attached draft 2023 TDG/GAP Annual Report, which is available for a 30-day review with edits and comments due to Mariah by **February 10, 2024**.

The attached draft report is also available for download from the Aquatic SWG Extranet Site, under: Documents > All by Mtg Date > 1/10/2024 (instructions below). Thanks! –Kristi

Instructions:

To gain access to the Aquatic SWG Extranet Homepage, please use the following procedure:

* Visit: https://extranet.dcpud.net/sites/nr/aswg/
* Login using “Forms Authentication” (for non-Douglas PUD employees)

You should now be at the Aquatic SWG homepage.

If you encounter problems, or need a login username and password to access the site: Please feel free to contact me, Andrew Gingerich, or Julene McGregor [jmcgregor@dcpud.org; (509) 881-2236] and we will gladly assist you with questions or issues.

Kristi Geris

ANCHOR QEA, LLC
kgeris@anchorqea.com
O (509) 492-3102
M (360) 220-3988

From: Mariah Mayfield <mariah.mayfield@dcpud.org>
Sent: Tuesday, January 9, 2024 16:17
To: Kristi Geris <kgeris@anchorqea.com>
Subject: 2023 TDG Annual Report

Attached is the 2023 TDG Annual Report for the ASWG 30-day review. We would like all comments emailed to me (mariah.mayfield@dcpud.org) by February 10, 2024 and we will be voting to approve the report at the February 14th ASWG meeting. Thank you and let me know if there are any questions.

Mariah

Mariah Mayfield
Aquatic Resource Biologist
Public Utility District No. 1 of Douglas County
1151 Valley Mall Parkway
East Wenatchee, WA 98802
Direct: (509) 881-2326
mariah.mayfield@dcpud.org

COLVILLE CONFEDERATED TRIBES' EMAIL SHOWING APPROVAL OF TOTAL DISSOLVED GAS ABATEMENT PLAN 2023 ANNUAL REPORT

From: John Ferguson <jferguson@anchorqea.com>
Sent: Wednesday, February 14, 2024 8:36 AM
To: Andrew Gingerich <andrew.gingerich@dcpud.org>; Chas Kyger <chas.kyger@dcpud.org>; Mariah Mayfield <mariah.mayfield@dcpud.org>
Cc: Kristi Geris <kgeris@anchorqea.com>
Subject: FW: Aquatic SWG: 2/14 conf call agenda

FYI, from Jason.
J

From: Jason McLellan <jason.mclellan@colvilletribes.com>
Sent: Wednesday, February 14, 2024 8:23 AM
To: Kristi Geris <kgeris@anchorqea.com>; John Ferguson <jferguson@anchorqea.com>
Subject: Re: Aquatic SWG: 2/14 conf call agenda

Hi John,

I have a conflict and this am unable to make today's call. I vote to approve the meeting notes, BOP and GAP reports, and the Bull Trout report.

Sturgeon update - 157 BY23 wild larvae original juvenile White Sturgeon originally caught in Lake Roosevelt are being transferred to Wells hatchery today to make up for the shortfall in the Chelan PUD program.

SAP screening of the BY23 CPUD program fish at Wells is scheduled to start on March 4.

Thanks,
Jason

> On Feb 2, 2024, at 5:52 PM, Kristi Geris <kgeris@anchorqea.com> wrote:
>
> Hi Aquatic SWG: attached is the agenda for the Aquatic SWG conference call on February 14, 2024.
>
> The attached final agenda is also available for download from the Aquatic SWG Extranet Site, under: Documents > All by Mtg Date > 2/14/2024 (instructions below). Thanks, and have a great weekend! –kristi

Instructions:

To gain access to the Aquatic SWG Extranet Homepage, please use the following procedure:

* Visit: https://extranet.dcpud.net/sites/nr/aswg/
* Login using “Forms Authentication” (for non-Douglas PUD employees)

You should now be at the Aquatic SWG homepage.

If you encounter problems, or need a login username and password to access the site:
Please feel free to contact me, Andrew Gingerich, or Julene McGregor [jmcgregor@dcpud.org; (509) 881-2236] and we will gladly assist you with questions or issues.

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ANCHOR QEA,LLC
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FINAL AQUATIC SETTLEMENT WORK GROUP ACTION ITEMS SHOWING APPROVAL OF TOTAL DISSOLVED GAS ABATEMENT PLAN 2023 ANNUAL REPORT

FINAL

Conference Call Action Items

Aquatic Settlement Work Group

To: Aquatic SWG Parties **Date:** February 15, 2024

From: John Ferguson, Chair, Anchor QEA, LLC

Re: **Final Action Items of the February 14, 2024, Aquatic SWG Conference Call**

Below is a summary of Action Items from the Aquatic Settlement Work Group (SWG) meeting that was held by conference call on Wednesday, February 14, 2024, from 10:00 a.m. to 12:00 p.m. Attendees are listed in Attachment A. These action items include the following:

Summary of Action Items

1. The Yakama Nation (YN) will ask Pacific Northwest National Laboratory (PNNL) about possibly presenting results from their 2023 juvenile Pacific Lamprey passage behavior and survival study during a joint meeting of the Aquatic SWG, Rocky Reach Fish Forum (RRFF), and Priest Rapids Fish Forum (PRFF) this spring, 2024 (Item I-C).
2. Douglas PUD will provide additional information about the operation of the return-to-river pipe at Wells Dam, including photographs of inside the Adult Handling Facility where the pipe connects to the sorting table and approximate dates and hours of when flush water might be running through the pipe (Item I-C).
3. Douglas PUD will contact the Washington Department of Fish and Wildlife (WDFW) genetics laboratory regarding *Bull Trout Movement and Life History Investigation 2022–2023* (2022–2023 Bull Trout Study Report), *Appendix C. Genetic Analysis for Bull Trout Prepared by Washington Department of Fish and Wildlife Dated June 2023*, notably for clarification about methods used and populations considered in the genetic analysis (Item II-C).
4. Douglas PUD will ask Grant PUD for information about lamprey trap operations at Priest Rapids Dam, including photographs of how the orifices are configured when the traps are operated (Item II-E).
5. Douglas PUD will consult the YN about lamprey trap operations for implementation at Wells Dam in 2024, including possibly collecting genetic fin clips and release location for fish collected in the traps, for further discussion with the Aquatic SWG (Item II-E).
6. The Aquatic SWG meeting on March 13, 2024, will be held by conference call (Item III-A).

Summary of Decisions

1. Aquatic SWG representatives present approved the *2024 Total Dissolved Gas Abatement Plan and appended Wells Bypass Operating Plan* (2024 GAP/BOP). The Confederated Tribes of the Colville Reservation (CTCR) approved the plan via email prior to the Aquatic SWG conference call on February 14, 2024 (Item II-A).
2. Aquatic SWG representatives present approved the *2023 Annual Report Total Dissolved Gas Abatement Plan* (2023 TDG Report). The CTCR approved the report via email prior to the Aquatic SWG conference call on February 14, 2024 (Item II-B).
3. Aquatic SWG representatives present approved the 2022–2023 Bull Trout Study Report, as revised, including *Appendix A. FERC Order Granting Variance from Radio Telemetry Study Pursuant to Bull Trout Stranding, Entrapment, and Take Study Plan and Article 402 Issued October 12, 2021*, *Appendix B. 2022–2023 Bull Trout Detection History Plots of Individual Study Fish*, and *Appendix C. Genetic Analysis for Bull Trout Prepared by Washington Department of Fish and Wildlife Dated June 2023*. The CTCR approved the report via email prior to the Aquatic SWG conference call on February 14, 2024 (Item II-C).

Agreements

1. Aquatic SWG representatives present agreed to Douglas PUD's proposal to use new sampling methods, fyke nets and hoop nets, for the 2024 Resident Fish Assemblage Study, so Douglas PUD can move forward with purchasing gear for implementation this spring 2024 (Item II-F).

Review Items

1. The draft *Total Dissolved Gas Water Quality Attainment Plan Year 10 Report* (Water Quality Attainment Plan 10-Year Report) was distributed to the Aquatic SWG by Kristi Geris on November 14, 2023, and is available for review with edits and comments due to Mariah Mayfield.
2. The draft 2024 Resident Fish Assemblage Study Plan was distributed to the Aquatic SWG by Kristi Geris on January 29, 2024, and is available for a 30-day review with edits and comments due to Chas Kyger by February 28, 2024. Douglas PUD will request approval of the draft plan during the Aquatic SWG conference call on March 13, 2024 (Item II-F).
3. The draft *2024 Aquatic Settlement Agreement and Workgroup Action Plan* (2024 ASA Action Plan) was distributed to the Aquatic SWG by Kristi Geris on February 13, 2024, and is available for a 30-day review with edits and comments due to Andrew Gingerich by March 12, 2024. Douglas PUD will request approval of the draft plan during the Aquatic SWG conference call on March 13, 2024 (Item II-H).

Documents Finalized

1. The final 2022–2023 Bull Trout Study Report, as revised, including Appendices A, B, and C, were distributed to the Aquatic SWG by Kristi Geris following the Aquatic SWG conference call on February 14, 2024 (Item II-C).

Attachment A – List of Attendees

Name	Role	Organization
John Ferguson	Aquatic SWG Chairman	Anchor QEA, LLC
Kristi Geris	Administration/Technical Support	Anchor QEA, LLC
Chas Kyger	Aquatic SWG Technical Alternate	Douglas PUD
John Rohrback	Aquatic SWG Technical Support	Douglas PUD
Mariah Mayfield	Aquatic SWG Technical Support	Douglas PUD
RD Nelle	Aquatic SWG Technical Representative	U.S. Fish and Wildlife Service
Stuart Fety	Aquatic SWG Technical Alternate	U.S. Fish and Wildlife Service
Patrick Verhey	Aquatic SWG Technical Representative	Washington Department of Fish and Wildlife
Laura Heironimus	Aquatic SWG Technical Alternate	Washington Department of Fish and Wildlife
Breean Zimmerman	Aquatic SWG Technical Representative	Washington State Department of Ecology
Ralph Lampman	Aquatic SWG Technical Representative	Yakama Nation