  

PUBLIC UTILITY DISTRICT NO. 1 *of* CHELAN COUNTY
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April 30, 2013

VIA ELECTRONIC FILING

Honorable Kimberly D. Bose, Secretary
Nathaniel J. Davis, Sr., Deputy Secretary
FEDERAL ENERGY REGULATORY COMMISSION
888 First Street, NE
Washington, DC 20426

Subject: Rocky Reach Hydroelectric Project, FERC No. 2145
Article 401 and Appendix A, Sections 5.6(1), 5.7(1) and 5.7(2) – Annual Quality Assurance Project Report and QAPP Update

Dear Secretary Bose and Deputy Secretary Davis:

The Federal Energy Regulatory Commission (Commission or FERC) issued the "*Order Modifying and Approving Quality Assurance Project Plan Pursuant to Article 401 and Appendix A*" for the Rocky Reach Hydroelectric Project No. 2145 (Project) on November 3, 2010.[1]

As specified in the Order, the Public Utility District No. 1 of Chelan County (Chelan PUD) is required to file an annual Quality Assurance Project Plan (QAPP) report with the Commission by May 1 of each year for the duration of the license. Chelan PUD is required to file the annual QAPP report to the Washington Department of Ecology (Ecology) by March 1 and provide Ecology a minimum of 30 days to comment on the report. As part of the filing of the annual QAPP report with the Commission, Chelan PUD is required to include documentation of consultation with Ecology and its response to any comments received.

[1] 133 FERC ¶ 62,115

As specified in Paragraph 4 of the Order, Chelan PUD is to conduct water quality monitoring activities at the locations and frequency described below:

Parameter (metric)	**Location(s)**	**Frequency**
Temperature (degrees Celsius)	Rocky Reach forebay and tailrace, Rock Island forebay	Hourly, April-October
Temperature (degrees Celsius)	Juvenile fish bypass, adult fishway	Hourly for one year
Total dissolved gas (TDG) (% saturation)	Rocky Reach forebay and tailrace, Rock Island forebay	Hourly, April-August

TDG monitoring is currently conducted at both the Rocky Reach and Rock Island hydroelectric projects. Therefore, Chelan PUD has collected the required TDG data specified in Paragraph 10 of the Order and has included the annual Gas Abatement Report with this filing (see attachment).

If you have any questions or require additional information, please contact me or Waikele Hampton at (509) 661-4627.

Sincerely,

Michelle Smith
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Enclosure: Annual Quality Assurance Project Report and QAPP Update

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Rocky Reach Fish Forum

ROCKY REACH
ANNUAL QUALITY ASSURANCE PROJECT REPORT AND QAPP UPDATE, 2013

FINAL

ROCKY REACH HYDROELECTRIC PROJECT
FERC Project No. 2145

May 1, 2013

Public Utility District No. 1 of Chelan County
Wenatchee, Washington

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EXECUTIVE SUMMARY

This annual water quality monitoring report (aka Quality Assurance Project Plan or QAPP Report) is being submitted to the Federal Energy Regulatory Commission (FERC) as required by the Order Modifying and Approving the Quality Assurance Project Plan Pursuant to Article 401 and Appendix A issued November 3, 2010.

A draft of this report was provided to the Washington Department of Ecology (Ecology) on February 28, 2013 for review and comment. Ecology provided comments on March 8, 2013. A copy of the consultation record, including Ecology's comments and Chelan PUD responses, is attached as Appendix E.

This report includes:

- the results of all sampling and measurement procedures;
- conclusions regarding compliance with the project's water quality standards;
- recommendations for further action, if necessary; and
- the annual update to the QAPP.

Total dissolved gas (TDG) data was collected throughout the monitoring season at 15-minute intervals January 1 – December 31 in the Rocky Reach forebay and tailrace and the Rock Island forebay (next downstream dam). The hourly averages of these readings were recorded on a computer located at Chelan PUD headquarters for later use in calculating daily high and the 12 highest consecutive hours.

Data analysis of TDG data during the fish spill season (April 1 – August 31) showed that water coming into the Rocky Reach forebay from upstream-exceeded Washington State water quality criteria of 115% on 94 days. TDG exceeded the modified Washington State water quality TDG criteria on 58 days in the Rocky Reach tailrace (120%), and 92 days in the Rock Island forebay (115%). These exceedances of the water quality criteria did not necessarily result in noncompliance, as many occurred during river flows that exceeded 7Q10 or when forebay TDG levels were above the numeric criteria. For instance some exceedances in the Rocky Reach tailrace and Rock Island forebay occurred when flows exceeded 7Q10. Additionally, some exceedances observed in the Rock Island forebay occurred when the upstream dam's forebay exceeded 115%. After eliminating exceedances that occurred when flows exceeded 7Q10 or the upstream forebay exceeded 115%, the percentage of days TDG criterion was met is shown below:

Monitoring Location	Percent of Days Criteria Were Met
Rocky Reach Tailrace (125%)	99.9%
Rocky Reach Tailrace (120%)	76%
Rock Island Forebay (115%)	89%

Between January 1 and March 31, 2012, the non-fish spill criteria of 110% was exceeded 52 and 61 hours in the Rocky Reach tailrace and Rock Island forebay, resulting in 97.6% and 97.2% of the days meeting TDG criteria, respectively.

Between September 1 and December 31, 2012, the non-fish spill criterion of 110% was not exceeded in either the Rocky Reach forebay or tailrace, resulting in 100% of the days meeting TDG criteria.

Temperature data were collected April 1 –October 31 at 15-minute intervals at both the Rocky Reach forebay and tailrace. These 15-minute intervals were averaged into hourly readings for use in compiling

daily averages, daily highs, and 7-DADMax temperature. Temperature data were logged hourly April 1 – October 31 at the juvenile fish bypass entrance, and April 1 – August 31 at the sampling facility. Chelan PUD obtained Wells Dam tailrace hourly temperature data directly from Douglas County PUD. Wells tailrace data was limited to April 9 – May 31 and July 1 – August 19.

A summary showing the percentage of days temperature criterion was met is shown below:

Location	Data Collection Period	# of Exceedances[1]	% of Days that Criterion was Met
Wells Tailrace	4/9 – 5/31 and 7/1--8/19	8	91%
Rocky Reach Forebay	4/9 – 5/31 and 7/1 – 8/19	3	96.6%
Rocky Reach Forebay	4/1-4/8, 6/1-6/30, 8/20 -10/31	48[2]	---
Rocky Reach Tailrace	4/1-10/31	0	100%
Entrance	4/9 – 5/31 and 7/1 – 8/19[3]	14	84.4%
Entrance	4/1-4/8, 6/1-6/30, 8/20 -10/31	24[2]	---
Sampling Facility	4/1-8/31	0	100%

[1]State of Washington's Water Quality Standards designate a temperature criterion for the Project area of 17.5°C, except when a water body's temperature is warmer than 17.5°C and that condition is due to natural conditions, then human actions considered cumulatively may not cause the 7-DADMax temperature of that water body to increase more than 0.3°C. For the purposes of this report, "natural condition" is the background/incoming condition (i.e. Wells tailrace for the Rocky Reach forebay, and the juvenile fish bypass entrance for the sampling facility).

[2]This number is based entirely on the 17.5°C 7-DADMa. It does not take into account "natural condition", as Wells tailrace data was not provided for these dates. Percent days met the criterion was not calculated for these dates because it would be misleading due to the lack of "natural condition" available for these dates.

[3]These are the dates that "natural condition" data from the Wells tailrace was available.

Further water quality monitoring actions include:

- Continue the TDG monitoring program, as conducted in 2012;
- Analyze the data gathered during spill gated testing, with expected completion by fall 2013;
- Continue forebay and tailrace temperature monitoring, as conducted in 2012;
- Install temperature loggers in the upstream fishway during the winter of 2013/2014;
- Develop a study plan for reservoir TDG; and
- Prepare a report on macrophyte beds that summarizes the methods and results by the end of August 2013.

No update to the QAPP is proposed at this time.

SECTION 1: ***INTRODUCTION***

The Rocky Reach Hydroelectric Project (Project), owned and operated by Chelan County Public Utility District (Chelan PUD), is located on the Columbia River in Chelan County, Washington, approximately seven miles upstream of the city of Wenatchee, Washington (Figure 1). The Project utilizes the waters of the Columbia River, whose drainage basin extends over substantial portions of northern Washington, Idaho, Montana and into Canada. The Project reservoir (Lake Entiat) extends 43 miles to Douglas County PUD's Wells Dam. The Project consists primarily of an 8,235-acre reservoir; a 2,847-foot-long by 130-foot-high concrete gravity dam spanning the river, including a powerhouse and spillway; a juvenile fish bypass system, and hatchery facilities.

FERC issued the Order Modifying and Approving Quality Assurance Project Plan (QAPP) for the Rocky Reach Project on November 3, 2010. The QAPP provided the basic framework for all the water quality monitoring and reporting required in the Rocky Reach 401 Certification.

The 401 Certification requires Chelan PUD to:

- Monitor total dissolved gas (TDG) and temperature in the Project forebay and tailrace annually;
- Monitor temperature in the upstream fishway and juvenile fish bypass system (JFBS) for one year, unless Ecology or the Rocky Reach Fish Forum determines additional monitoring is required;
- Conduct a one-time study of pH, dissolved oxygen (DO),
- Monitor water temperature in shallow water areas (macrophyte beds) of the Rocky Reach reservoir, including areas that contain dense growths of aquatic macrophytes;
- Conduct a one-time study of Gas Bubble Trauma (GBT), and
- Compile hourly temperature data from the Wells Dam tailrace.

The 401 Certification requires that Quality Assurance Project Plans (QAPP) for the studies mentioned above (does not include Wells Dam tailrace temperature) be submitted for Ecology review and written approval.

Section 5.7(8) of the 401 Certification requires the submittal of an annual report of water quality monitoring results, along with a summary report by March 1 of each year to WDOE. WDOE will use the monitoring results to track the Project's progress toward meeting and remaining in compliance with the state water quality standards. Additionally, the FERC Order Modifying and Approving the QAPP requires the submittal of the same report to the FERC by May 1 of each year.

Figure 1.1. Location of the Rocky Reach Hydroelectric Project on the Columbia River

SECTION 2: ***MONITORING PROCEDURES***

2.1 Forebay and Tailrace TDG and Temperature

Consistent with the 401 Certification, TDG and temperature were monitored in the Project forebay and tailrace on an hourly basis, 1 April – 31 August and 1 April – 31 October, respectively.

The forebay fixed monitoring station (FMS) is located on the upstream side of the dam (Figure 2), the standpipe affixed to the corner between the powerhouse and spillway, approximately mid-channel. Consistent with the 401 Water Quality Certification (Ecology, April 4, 2006), the tailrace fixed monitoring station is located approximately 0.38 mile downstream of the dam (Figure 2). The standpipe is affixed to the downstream side of a pier nose supporting the juvenile bypass system outfall pipe. This location is east of mid-channel, and is minimally impacted by powerhouse flows when the project is passing water over the spillway (Schneider and Wilhelms, 2005). This location was chosen because it was the most feasible location near the end of the aerated zone, which is the compliance point for the Mid-Columbia TDG TMDL.

Forebay and tailrace TDG and temperature data were collected using instruments that can immediately transmit the data to Chelan PUD headquarters, allowing for real-time data recording. A multi-parameter instrument (Minisonde) developed by Hydrolab, Inc., equipped with TDG and temperature sensors, was lowered down the standpipe at each site and submerged to depth of approximately 15 feet.

TDG and temperature measurements were recorded throughout the monitoring season at 15-minute intervals. These 15-minute intervals were averaged into hourly readings for use in compiling daily and 12-hour averages for TDG and daily averages and daily highs for temperature. All hourly data were forwarded to Chelan PUD headquarters building and then onto the US Army Corps of Engineers Reservoir Control Center (RCC) and posted at their site on the World Wide Web.

2.1.1 Alternative Spillway Operations

In 2011, high flow volumes and high levels of TDG in the Columbia River provided an opportunity for Chelan PUD to implement a test of spillway operations not previously tested under the high-flow conditions. The purpose was to evaluate the effectiveness of alternative operations using gates 2-12, to determine whether TDG levels could be reduced without adverse effects on fish passage. The testing utilized four spill configurations: standard (also referred to as “fish spill”), TDG Spill Pattern, Shallow Arc Spill, and Flattened Spill Pattern. This testing did not require any modifications to the TDG monitoring conducted on an annual basis.

The study was conducted from early June to the end of July while river flows were high. The testing schedule established that each configuration was to be run for 24 hours at a time (midnight to midnight, until the end of June; and 0700 -0700 until the end of the study). Upon the completion of one scenario, another would begin.

The data from this first year of testing showed some promise, but not enough data was collected to make a determination as to which, if any, of the three alternate configurations would be effective at minimizing TDG without adversely affecting fish passage. For this reason, Chelan PUD conducted another round of testing in 2012.

The same three alternate configurations were tested, along with the Standard (“fish spill”) configuration in 2012. However, the testing schedule was revised such that the alternate (not Standard) spill configurations were tested for 12 hrs from 0710 hrs to 1910 hrs Monday – Friday during the course of the

study. The Standard Spill pattern was utilized between 1910 hrs and 0710 hrs Monday-Friday and all day Saturday and Sunday.

Chelan PUD is currently working with a consultant to analyze the two years' of data in hopes of establishing one of the alternate configurations as being effective at minimizing TDG and will provide Ecology a status update on the analysis when it becomes available, expected fall of 2013.

2.2 Fishway and Juvenile Fish Bypass Temperature

As per the QAPP, Chelan PUD is required to install temperature loggers in two locations (entrance and sampling facility) in the JFBS and at two locations in the upstream fishway (exit and near the bottom of the ladder). The 401 Certification and QAPP do not specify a schedule for installation of the temperature loggers. In 2012 two loggers were installed in the juvenile sampling facility. One of these loggers was lost, but the other remained in place during the monitoring season. During construction of the JFBS, a SonTek Acoustic Doppler equipped with a temperature probe was installed in the first entrance of the JFBS. Research into the instrument has confirmed its level of accuracy and resolution meet the QAPP standards; therefore Chelan PUD proposes this instrument be used in lieu of installing another logger in the JFBS entrance. Chelan PUD is expecting to install the loggers in the upstream fishway during winter 2013/2014.

Temperature data were logged hourly 1 April – 31 October at the juvenile fish bypass entrance, and 1 April – 29 August at the sampling facility.

2.3 Wells Dam Tailrace Temperature

Chelan PUD obtained Wells Dam tailrace hourly temperature data directly from Douglas County PUD. Wells tailrace data was limited to 9 April – 31 May and 1 July – 19 August.

2.4 GBT

No GBT study was conducted in 2012. Refer to the schedule of 2013 planned activities in Section 4 of this document.

2.5 Macrophyte Bed DO, pH, and Temperature

Macrophyte bed DO, pH, and temperature data were collected mid-August to late-September 2012. Methods, results, and discussion will be included in a separate report expected to be completed by the end of August 2013.

Figure 2.1. Location of the forebay and tailrace FMSs, and the JFBS SC entrances

2.6 Data Evaluation and Completeness (QA/QC)

2.6.1 Representativeness

TDG and temperature data were collected from locations required by the 401 Certification and the Mid-Columbia River and Lake Roosevelt TDG TML. Data was collected hourly, which is at a frequency sufficient to determine trends and if water quality standards are being met.

2.6.2 Comparability

TDG and temperature were monitored using standard units of measurement at fixed locations, and therefore data is comparable to data collected historically by Chelan PUD.

2.6.3 Completeness

TDG

Data collection, QA/QC, and analyses of TDG followed those described in the QAPP. Table 2.1 shows the number of values that were omitted from the dataset due to QA/QC issues compared to the total number of available hours. Overall data loss in the 2012 monitoring season (April 1 – August 31) was 107 hours of the combined 11,016 available hours, which was well within the 90% data completeness decision quality objective as specified in the QAPP.

Table 2.1 Overview of total dissolved gas data set during 2012 fish spill season.

Location	Available data collection hours	Number of omitted/ lost hourly readings	Percent data completeness (%)
RRFB FMS	3,672	72	98%
RRTR FMS	3,672	3	99.9%
RIFB FMS	3,672	32	99.1%
Total	**11,016**	**107**	**99%**

Temperature at Rocky Reach Facilities

Data collection, QA/QC, and analyses of water temperature followed those described in the QAPP. Table 2-2 shows the number of values that were omitted from the dataset due to QA/QC issues compared to the total number of available hours. Overall data loss in the 2012 monitoring season was 45 hours of the combined 19,080 available hours, which was well within the 90% data completeness decision quality objective as specified in the QAPP.

Table 2.2 Overview of temperature data set during the 2012 monitoring period (April 1–October 31).

Location	Available data collection hours	Number of omitted/ lost hourly readings	Percent data completeness (%)
FB FMS	5,136	5	99.9
TR FMS	5,136	1	99.98
JFBS Entrance	5,136	0	100
JFBS Sampling Facility (April 1 – August 29)	3,672	39	98.9
Total	**19,080**	**45**	**99.76**

2.6.4 Precision

The TDG and temperature monitoring program implemented in 2011 used the same type of equipment to monitor water quality over a small spatial and temporal regime at all sites. Additionally, duplicate sampling occurred during monthly calibrations. See Appendix C for the calibration reports.

2.6.5 Bias

Bias was minimized by following standard protocols for calibration and maintenance.

As discussed in the QAPP, the accuracy/bias of the temperature sensors is ±0.1°C. During 14 instrument maintenance/calibrations, instrument temperature was compared to a standard. Of these 14 comparisons, 11 met the data quality objective of ±0.1°C (Appendix C). The three remaining comparisons (all ±0.2°C) did not meet the measurement data quality objective (MQO) as discussed in the QAPP; however the criteria may be overly strict and may need to be revised. Since completion of the QAPP, Chelan PUD has received input from WDOE that it is not recommended to use the instrument's manufacturer specification for MQOs because expected instrument error alone can cause a failure of meeting the QA criteria. With this recommendation in mind, Chelan PUD has determined that the data from these instruments appears acceptable for use.

2.6.6 Sensitivity

All of the sensors used for the monitoring program have sensitivities that are better than required to determine compliance with water quality standards.

2.6.7 Calibration and Maintenance

Forebay and Tailrace TDG and Temperature

Section 5.7.3 of the 401 Certification requires Chelan PUD to maintain a TDG monitoring program that is at least as stringent as the QA/QC calibration and monitoring procedures and protocols developed by the USGS monitoring methodology for the Columbia River.

Chelan PUD has developed its QA/QC protocols following established protocols by other resource agencies conducting similar monitoring programs, such as the USGS, U.S. Army Corps of Engineers, and other mid-Columbia River Dam operators, as well as HydroLab Corporation's recommendations. These QA/QC protocols are included in Chelan PUD's approved QAPP (Appendix A).

Chelan PUD entered into a Professional Services Agreement with Columbia Basin Environmental to perform monthly calibrations and equipment maintenance on the forebay and tailrace TDG/temperature instruments. Quality Assurance/Quality Control measures were accomplished through training in instrument maintenance, operation, and factory prescribed calibration methods. A detailed log was maintained for all work done on the monitoring equipment, including monthly maintenance, calibration, exchange of instruments, and any other pertinent information. Redundant measurements with a mobile instrument to verify the accuracy of the in-situ instruments were conducted during the monthly calibrations. Calibration reports are included as Appendix C.

JFBS Sampling Facility Temperature

For all field-deployed equipment, a pre-and post-calibrated protocol was conducted in accordance with the manufacturer's recommendations to document instrument bias and performance at representative temperatures. The accuracy of the field thermometers was maintained by a two-point comparison between the field equipment and a certified reference thermometer. This comparison was made prior to and after logger deployment, and at a minimum of annually for real-time equipment.

Upstream Fishway Temperature

Instruments have not yet been installed in the fishway; therefore there is no data to report.

GBT

No studies were conducted during 2012.

DO/pH

Macrophyte bed DO, pH, and temperature data were collected mid-August to late-September 2012. Methods, results, and discussion will be included in a separate report expected to be completed by the end of August 2013.

SECTION 3: ***RESULTS AND DISCUSSION***

3.1 TDG

Refer to the 2012 Gas Abatement Annual Report (Appendix B) for detailed information about TDG during the fish spill season (1 April – 31 August).

Between January 1 and March 31, 2012, the non-fish spill criterion of 110% was exceeded 52 and 61 hours in the Rocky Reach tailrace and Rock Island forebay, resulting in 97.6% and 97.2% of the days meeting TDG criteria, respectively.

Between September 1 and December 31, 2012, the non-fish spill criterion of 110% was exceeded on no hours in either the Rocky Reach forebay or tailrace, resulting in 100% of the days meeting TDG criteria.

3.1.1 Alternative Spillway Operations

Chelan PUD is currently analyzing the data gathered during the spill gate testing conducted in 2011 and 2012. Chelan PUD expects to have results of this analysis by fall 2013.

3.2 Temperature

State of Washington's Water Quality Standards designate a temperature criterion for the Project area of 17.5°C, except when a water body's temperature is warmer than 17.5°C and that condition is due to natural conditions, then human actions considered cumulatively may not cause the 7-DADMax temperature of that water body to increase more than 0.3°C. For the purposes of this report, "natural condition" is the background/incoming condition (i.e. Wells tailrace for the Rocky Reach forebay, and the juvenile fish bypass entrance for the sampling facility). Compliance, for the purpose of this report, was calculated by first determining if the7-DADMax temperature of 17.5°C was exceeded at each monitoring location. If temperatures exceeded 17.5°C, at the Rocky Reach forebay, Rocky Reach tailrace, or sampling facility those temperatures were compared to the "background" temperatures in the Wells tailrace, Rocky Reach forebay, and juvenile fish bypass system entrance, respectively.

3.2.1 Forebay, Tailrace, and Wells Dam tailrace

Daily maximum temperatures from the three sites were used to determine the 7-DADMax. Figures 3-1 and 3-2 present graphical displays of the 1-DMax and 7-DADMax values. In general, water temperatures peaked during the months of July through September. Table 3-1 below summarizes the number of exceedances of the 7-DADMax criteria and percent days criterion were met for each monitoring site.

As per Section 5.5(1)(c) of the 401 Certification, this data will be used to run the CE-QUAL-W2 model in Year 5 of the License to evaluate the Project compliance with numeric temperature criteria.

Table 3.1 Summary of days meeting temperature criterion in the Rocky Reach forebay, Rocky Reach tailrace, and Wells tailrace, 2012.

Location	Data Collection Period	# of Exceedances[1]	% of Days that Criterion was Met
Wells Tailrace	4/9 – 5/31 and 7/1--8/19	8	91%
Rocky Reach Forebay	4/9 – 5/31 and 7/1 – 8/19	3	96.6%
Rocky Reach Forebay	4/1-4/8, 6/1-6/30, 8/20 -10/31	48[2]	---
Rocky Reach Tailrace	4/1-10/31	0	100%

[1]State of Washington's Water Quality Standards designate a temperature criterion for the Project area of 17.5°C, except when a water body's temperature is warmer than 17.5°C and that condition is due to natural conditions, then human actions considered cumulatively may not cause the 7-DADMax temperature of that water body to increase more than 0.3°C. For the purposes of this report, "natural condition" is the background/incoming condition (i.e. Wells tailrace for the Rocky Reach forebay, and the juvenile fish bypass entrance for the sampling facility).

[2]This number is based entirely on the 17.5°C 7-DADMa. It does not take into account "natural condition", as Wells tailrace data was not provided for these dates. Percent days met the criterion was not calculated for these dates because it would be misleading due to the lack of "natural condition" available for these dates.

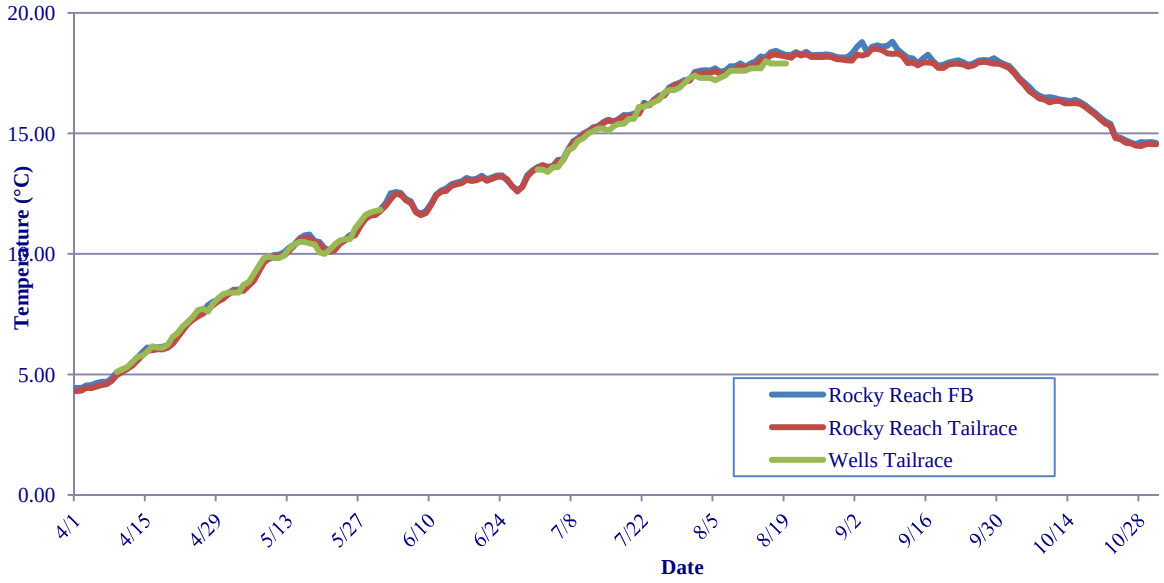

Figure 3.1. Daily maximum water temperature values recorded at each site in 2012

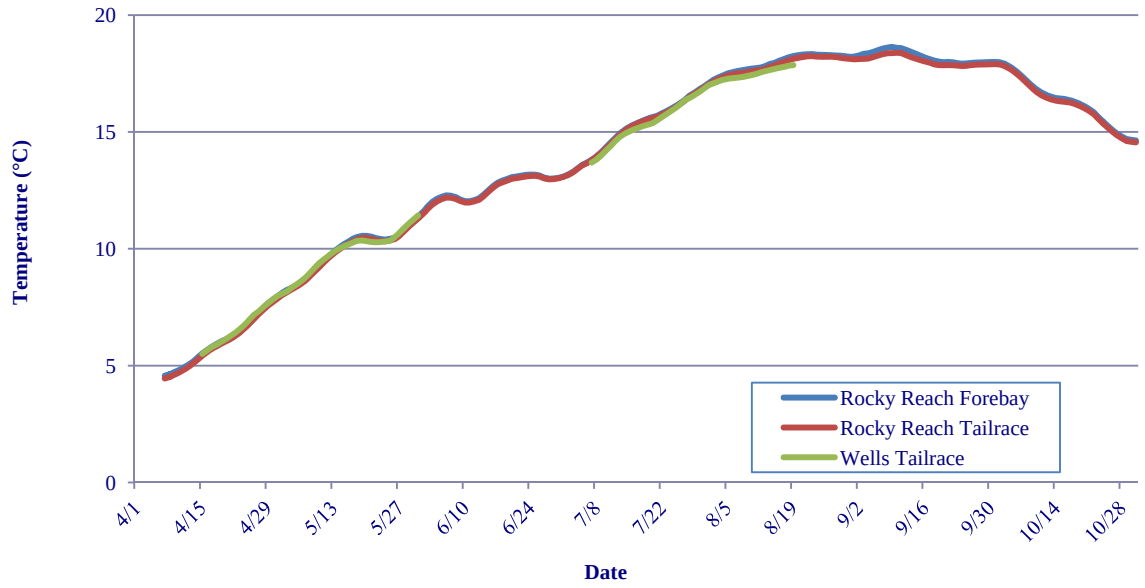

Figure 3.2. Seven-day rolling average of daily maximum temperature values recorded at each site in 2012

3.2.2 Upstream Fishway

At this time, instruments have not been installed in the upstream fishway; therefore, there is no data to report for those locations.

3.2.3 JFBS Entrance and Sampling Facility

Daily maximum temperatures from the two sites were used to determine the 7-DADMax. Figures 3-3 and 3-4 present graphical displays of the 1-DMax and 7-DADMax values. In general, water temperatures peaked during the months of July through September.

Table 3-2 below summarizes the number of exceedances of the 7-DADMax criteria and days meeting temperature criterion.

Table 3.2 Summary of days meeting temperature criterion in the JFBS entrance and sampling facility, 2012.

Location	Data Collection Period	# of Exceedances[1]	% of Days that Criterion was Met
Entrance	4/9 – 5/31 and 7/1 – 8/19[2]	14	84.4%
Entrance	4/1-4/8, 6/1-6/30, 8/20 -10/31	24[2]	---
Sampling Facility	4/1-8/31	0	100%

[1]State of Washington's Water Quality Standards designate a temperature criterion for the Project area of 17.5°C, except when a water body's temperature is warmer than 17.5°C and that condition is due to natural conditions, then human actions considered cumulatively may not cause the 7-DADMax temperature of that water body to increase more than 0.3°C. For the purposes of this report, "natural condition" is the background/incoming condition (i.e. Wells tailrace for the Rocky Reach forebay, and the juvenile fish bypass entrance for the sampling facility).
[2]These are the dates that "natural condition" data from the Wells tailrace was available.
[3]This number is based entirely on the 17.5°C 7-DADMa. It does not take into account "natural conditions", as Wells tailrace data was not provided for these dates. Percent days met the criterion was not calculated for these dates because it would be misleading due to the lack of "natural condition" available for these dates.

3.3 GBT

No studies were conducted in 2012.

3.4 Dissolved Oxygen and pH

Macrophyte bed DO, pH, and temperature data were collected mid-August to late-September 2012. Methods, results, and discussion will be included in a separate report expected to be completed by the end of August 2013.

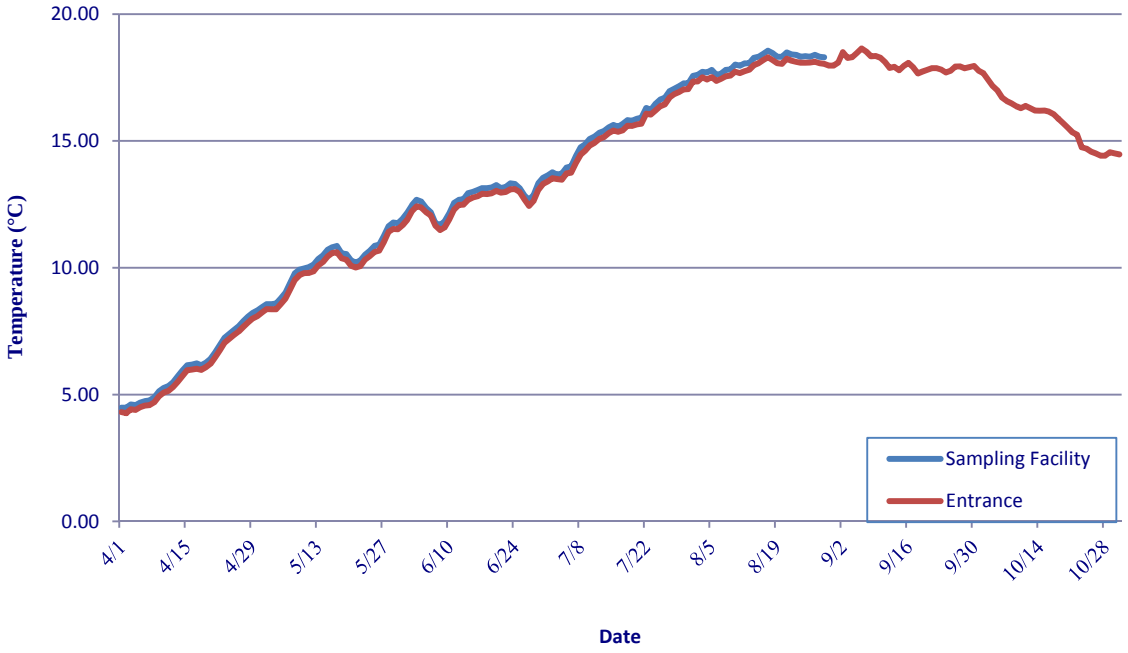

Figure 3.3. Daily maximum water temperature values recorded at JFBS entrance and sampling facility in 2012.

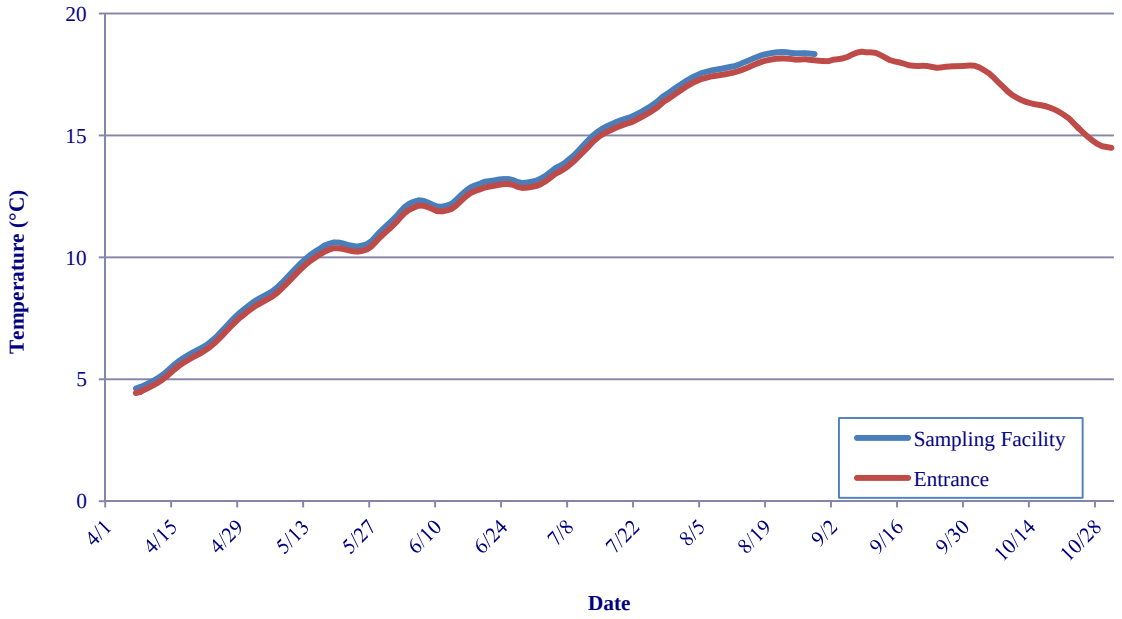

Figure 3.4. Seven day rolling average of daily maximum temperature values recorded at the JFBS entrance and sampling facility in 2012

SECTION 4: ***PROPOSED 2013 ACTION PLAN***

4.1 TDG

Chelan PUD plans to continue the TDG monitoring program conducted in 2012.

Chelan PUD is currently analyzing the data gathered during the spill gate testing conducted in 2011 and 2012. Data analysis is expected to be completed by fall 2013.

4.2 Temperature

4.2.1 Forebay and Tailrace

Chelan PUD plans to continue the forebay and tailrace temperature monitoring program conducted in 2012.

4.2.2 Fishway and juvenile fish bypass system

Chelan PUD expects to install the loggers in the upstream fishway during winter 2013/2014.
Because the one year of required temperature monitoring was conducted in the JFBS in 2013, Chelan does not plan to monitor temperature in the JFBS in 2013.

4.3 GBT

Chelan PUD plans to develop a study plan for reservoir GBT during the spring of 2013. Dependent on appropriate TDG conditions, implementation would begin spring of 2013, subsequent to review and approval by WDOE.

4.4 Dissolved Oxygen/pH

Macrophyte bed DO, pH, and temperature data were collected mid-August to late-September 2012. Chelan PUD will prepare a report summarizing methods, results, and discussion in a report expected to be completed by the end of August 2013.

SECTION 5: ***PROPOSED CHANGES TO QAPP***

Chelan PUD does not propose any changes to the QAPP at this time.

APPENDIX A: FINAL QUALITY ASSURANCE PROJECT PLAN

The final Quality Assurance Project Plan can be found at the following link:

http://www.chelanpud.org/departments/licensingCompliance/rr_implementation/ResourceDocuments/33937.pdf

APPENDIX B: 2012 ANNUAL GAS ABATEMENT REPORT

The 2012 Annual Gas Abatement Report can be found at the following link:

http://www.chelanpud.org/departments/licensingCompliance/rr_implementation/ResourceDocuments/39852.pdf

APPENDIX C: CALIBRATION REPORTS

Site	InstrID	Date	Time	BP mmHg	Temperature (°C)			TDG Pressure (mmHg)				Deviation from STD TDG %Saturation			
				STD	STD	Probe	Diff	100%	113%	126%	139%	100%	113%	126%	139%
RIGW	32546	01/31/12	13:15	747.9	4.0	4.0	0.0	749	849	949	1049	-0.1	-0.1	-0.1	-0.1
RIGW	32546	04/04/12	11:00	744.2	5.2	5.1	0.1	745	845	945	1045	-0.1	-0.1	-0.1	-0.1
RIGW	32546	05/01/12	12:50	743.0	9.6	9.4	0.2	744	844	944	1044	-0.1	-0.1	-0.1	-0.1
RIGW	32546	05/31/12	12:20	747.8	13.0	12.9	0.1	748	848	948	1048	0.0	0.0	0.0	0.0
RIGW	32546	07/02/12	13:30	741.9	15.2	15.1	0.1	743	843	943	1043	-0.1	-0.1	-0.1	-0.1
RIGW	32545	07/24/12	13:15	746.0	17.5	17.4	0.1	747	847	948	1049	-0.1	-0.1	-0.3	-0.4
RIGW	32545	08/15/12	10:05	747.2	19.0	18.7	0.3	747	846	946	1046	0.0	0.2	0.2	0.2
RIGW	32545	10/22/12	11:05	744.8	14.0	13.8	0.2	742	841	941	1041	0.4	0.5	0.5	0.5
RIS	37606	01/31/12	14:15	746.7	3.0	2.9	0.1	746	846	946	1047	0.1	0.1	0.1	0.0
RIS	37606	04/04/12	12:20	742.9	4.9	4.8	0.1	742	842	942	1042	0.1	0.1	0.1	0.1
RIS	37606	05/01/12	14:00	741.8	9.0	8.8	0.2	741	841	941	1041	0.1	0.1	0.1	0.1
RIS	37606	05/31/12	11:30	746.7	12.4	12.6	-0.2	746	846	945	1046	0.1	0.1	0.2	0.1
RIS	37606	07/02/12	12:05	741.7	14.5	14.5	0.0	741	841	941	1042	0.1	0.1	0.1	0.0
RIS	37606	08/15/12	11:00	745.8	19.0	18.9	0.1	745	845	945	1046	0.1	0.1	0.1	0.0
RIS	37606	08/29/12	10:30	747.7	18.0	17.9	0.1	747	847	947	1047	0.1	0.1	0.1	0.1
RIS	37606	10/22/12	12:05	743.4	14.2	14.1	0.1	741	841	940	1041	0.3	0.3	0.5	0.3
RRDW	38865	01/31/12	15:30	745.4	2.8	2.7	0.1	748	847	947	1048	-0.3	-0.2	-0.2	-0.3
RRDW	38865	04/04/12	13:45	741.8	5.2	5.1	0.1	741	841	941	1041	0.1	0.1	0.1	0.1
RRDW	38865	05/01/12	10:40	741.7	8.7	8.5	0.2	741	840	940	1041	0.1	0.2	0.2	0.1
RRDW	38865	05/31/12	10:05	746.1	12.9	12.7	0.2	746	846	946	1046	0.0	0.0	0.0	0.0
RRDW	38865	07/02/12	9:40	742.5	14.0	13.9	0.1	743	842	942	1043	-0.1	0.1	0.1	-0.1
RRDW	38865	08/15/12	12:25	744.5	18.9	18.7	0.2	745	844	944	1044	-0.1	0.1	0.1	0.1
RRDW	38865	10/22/12	13:40	741.8	14.0	13.9	0.1	740	840	940	1040	0.2	0.2	0.2	0.2
RRH	37607	01/31/12	16:15	744.1	2.8	2.8	0.0	746	846	946	1047	-0.3	-0.3	-0.3	-0.4
RRH	37607	04/04/12	14:20	741.1	6.1	6.1	0.0	743	842	942	1043	-0.3	-0.1	-0.1	-0.3
RRH	37607	05/01/12	11:15	740.0	9.2	9.1	0.1	739	839	939	1040	0.1	0.1	0.1	0.0
RRH	37607	05/31/12	9:15	745.3	12.8	12.7	0.1	745	845	946	1046	0.0	0.0	-0.1	-0.1
RRH	37607	07/02/12	10:20	740.3	14.1	14.1	0.0	743	842	942	1043	-0.4	-0.2	-0.2	-0.4
RRH	32607	08/15/12	13:10	742.6	19.7	19.6	0.1	744	844	944	1044	-0.2	-0.2	-0.2	-0.2
RRH	37607	10/22/12	14:20	741.0	14.2	14.1	0.1	735	835	935	1036	0.8	0.8	0.8	0.7

APPENDIX D: DAILY MAXIMUM TEMPERATURE AND 7-DAY ROLLING AVERAGE OF THE DAILY MAXIMUM TEMPERATURES

	Daily Maximum Temperatures						7-Day Average of Daily Maximum Temperatures				
Date	Wells Tailrace	Rocky Reach Forebay	Rocky Reach Tailarace	JFBS Entrance	JFBS Sampling Facility		Wells Tailrace	Rocky Reach Forebay	Rocky Reach Tailarace	JFBS Entrance	JFBS Sampling Facility
1-Apr		4.45	4.30	4.48	4.31						
2-Apr		4.44	4.34	4.48	4.27						
3-Apr		4.54	4.44	4.61	4.42						
4-Apr		4.56	4.43	4.58	4.39						
5-Apr		4.64	4.50	4.69	4.50						
6-Apr		4.69	4.55	4.74	4.57						
7-Apr		4.69	4.60	4.77	4.59			4.57	4.45	4.62	4.44
8-Apr		4.84	4.74	4.90	4.70			4.63	4.51	4.68	4.49
9-Apr	5.10	5.09	4.97	5.13	4.93			4.72	4.60	4.77	4.59
10-Apr	5.20	5.19	5.09	5.26	5.08			4.81	4.70	4.87	4.68
11-Apr	5.30	5.25	5.21	5.33	5.15			4.91	4.81	4.97	4.79
12-Apr	5.50	5.46	5.36	5.49	5.30			5.03	4.93	5.09	4.90
13-Apr	5.72	5.68	5.57	5.72	5.50			5.17	5.08	5.23	5.03
14-Apr	5.78	5.91	5.79	5.95	5.73			5.35	5.25	5.40	5.20
15-Apr	5.94	6.11	5.99	6.15	5.96		5.51	5.53	5.43	5.58	5.38
16-Apr	6.17	6.07	6.00	6.18	5.98		5.66	5.67	5.57	5.73	5.53
17-Apr	6.11	6.12	6.04	6.23	6.02		5.79	5.80	5.71	5.86	5.66
18-Apr	6.11	6.15	6.03	6.15	5.97		5.90	5.93	5.83	5.98	5.78
19-Apr	6.22	6.21	6.10	6.26	6.08		6.01	6.04	5.93	6.09	5.89
20-Apr	6.56	6.32	6.27	6.41	6.21		6.13	6.13	6.03	6.19	5.99
21-Apr	6.72	6.61	6.54	6.66	6.47		6.26	6.23	6.14	6.29	6.10
22-Apr	7.00	6.92	6.82	6.97	6.75		6.41	6.34	6.26	6.41	6.21
23-Apr	7.17	7.18	7.09	7.24	7.04		6.56	6.50	6.41	6.56	6.37
24-Apr	7.39	7.35	7.27	7.39	7.20		6.74	6.68	6.59	6.73	6.53
25-Apr	7.67	7.46	7.41	7.54	7.35		6.96	6.86	6.79	6.92	6.73
26-Apr	7.72	7.64	7.52	7.70	7.49		7.18	7.07	6.99	7.13	6.93
27-Apr	7.61	7.87	7.73	7.90	7.67		7.33	7.29	7.20	7.34	7.14
28-Apr	7.94	8.02	7.88	8.07	7.84		7.50	7.49	7.39	7.54	7.33
29-Apr	8.17	8.10	8.03	8.22	8.00		7.67	7.66	7.56	7.72	7.51
30-Apr	8.33	8.26	8.14	8.32	8.09		7.83	7.82	7.71	7.88	7.66
1-May	8.39	8.38	8.33	8.44	8.24		7.98	7.96	7.86	8.03	7.81
2-May	8.39	8.52	8.45	8.57	8.37		8.08	8.11	8.01	8.17	7.96
3-May	8.39	8.52	8.45	8.57	8.36		8.17	8.24	8.14	8.30	8.08
4-May	8.72	8.54	8.47	8.59	8.36		8.33	8.33	8.25	8.40	8.18
5-May	8.83	8.74	8.68	8.79	8.56		8.46	8.43	8.37	8.50	8.28
6-May	9.17	8.94	8.88	9.02	8.78		8.60	8.55	8.49	8.61	8.40
7-May	9.50	9.32	9.26	9.41	9.15		8.77	8.71	8.65	8.77	8.55
8-May	9.83	9.67	9.64	9.78	9.52		8.98	8.89	8.83	8.96	8.73
9-May	9.89	9.86	9.80	9.93	9.71		9.19	9.08	9.03	9.16	8.92
10-May	9.83	9.96	9.88	9.98	9.79		9.40	9.29	9.23	9.36	9.13
11-May	9.83	9.97	9.91	10.03	9.80		9.55	9.49	9.43	9.56	9.33

	Daily Maximum Temperatures						7-Day Average of Daily Maximum Temperatures				
Date	Wells Tailrace	Rocky Reach Forebay	Rocky Reach Tailarace	JFBS Entrance	JFBS Sampling Facility		Wells Tailrace	Rocky Reach Forebay	Rocky Reach Tailarace	JFBS Entrance	JFBS Sampling Facility
12-May	9.94	10.07	9.93	10.12	9.86		9.71	9.68	9.61	9.75	9.52
13-May	10.22	10.26	10.12	10.35	10.09		9.86	9.87	9.79	9.94	9.70
14-May	10.39	10.40	10.34	10.49	10.22		9.99	10.03	9.95	10.10	9.85
15-May	10.50	10.64	10.59	10.71	10.45		10.09	10.16	10.08	10.23	9.99
16-May	10.50	10.77	10.65	10.81	10.59		10.17	10.30	10.20	10.36	10.11
17-May	10.44	10.80	10.66	10.86	10.61		10.26	10.42	10.32	10.48	10.23
18-May	10.39	10.53	10.48	10.57	10.37		10.34	10.50	10.40	10.56	10.31
19-May	10.06	10.49	10.40	10.54	10.32		10.36	10.56	10.46	10.62	10.38
20-May	10.00	10.23	10.15	10.30	10.08		10.33	10.55	10.47	10.61	10.38
21-May	10.17	10.16	10.10	10.20	10.01		10.29	10.52	10.43	10.57	10.34
22-May	10.39	10.23	10.16	10.30	10.07		10.28	10.46	10.37	10.51	10.29
23-May	10.56	10.48	10.42	10.52	10.32		10.29	10.42	10.34	10.47	10.25
24-May	10.61	10.61	10.55	10.66	10.45		10.31	10.39	10.32	10.44	10.23
25-May	10.61	10.78	10.70	10.86	10.62		10.34	10.43	10.35	10.48	10.27
26-May	11.06	10.83	10.78	10.91	10.67		10.49	10.48	10.41	10.53	10.32
27-May	11.33	11.23	11.15	11.25	11.01		10.68	10.62	10.55	10.67	10.45
28-May	11.61	11.58	11.45	11.64	11.42		10.88	10.82	10.74	10.88	10.65
29-May	11.72	11.70	11.59	11.78	11.53		11.07	11.03	10.95	11.09	10.86
30-May	11.78	11.67	11.61	11.76	11.52		11.25	11.20	11.12	11.27	11.03
31-May	11.83	11.85	11.78	11.93	11.67		11.42	11.38	11.29	11.45	11.21
1-Jun		12.09	11.98	12.17	11.90			11.56	11.48	11.63	11.39
2-Jun		12.51	12.27	12.46	12.23			11.80	11.69	11.86	11.61
3-Jun		12.57	12.51	12.68	12.42			12.00	11.89	12.06	11.81
4-Jun		12.53	12.46	12.61	12.38			12.13	12.03	12.20	11.95
5-Jun		12.28	12.23	12.36	12.19			12.22	12.12	12.28	12.04
6-Jun		12.18	12.11	12.20	12.07			12.29	12.19	12.34	12.12
7-Jun		11.76	11.73	11.76	11.66			12.27	12.18	12.32	12.12
8-Jun		11.67	11.61	11.69	11.49			12.21	12.13	12.25	12.06
9-Jun		11.79	11.70	11.83	11.59			12.11	12.05	12.16	11.97
10-Jun		12.08	12.02	12.15	11.91			12.04	11.98	12.08	11.90
11-Jun		12.46	12.42	12.56	12.29			12.03	11.97	12.08	11.89
12-Jun		12.64	12.59	12.68	12.48			12.08	12.03	12.12	11.93
13-Jun		12.72	12.62	12.70	12.49			12.16	12.10	12.19	11.99
14-Jun		12.89	12.82	12.94	12.68			12.32	12.25	12.36	12.13
15-Jun		12.96	12.89	12.99	12.77			12.51	12.44	12.55	12.32
16-Jun		13.01	12.94	13.06	12.82			12.68	12.61	12.73	12.49
17-Jun		13.15	13.07	13.14	12.92			12.83	12.76	12.87	12.63
18-Jun		13.08	13.02	13.14	12.90			12.92	12.85	12.95	12.72
19-Jun		13.12	13.06	13.16	12.93			12.99	12.92	13.02	12.79
20-Jun		13.24	13.16	13.26	13.03			13.07	13.00	13.10	12.86
21-Jun		13.10	13.03	13.14	12.96			13.09	13.02	13.13	12.90

	Daily Maximum Temperatures						7-Day Average of Daily Maximum Temperatures				
Date	Wells Tailrace	Rocky Reach Forebay	Rocky Reach Tailarace	JFBS Entrance	JFBS Sampling Facility		Wells Tailrace	Rocky Reach Forebay	Rocky Reach Tailarace	JFBS Entrance	JFBS Sampling Facility
22-Jun		13.17	13.11	13.19	12.99			13.12	13.06	13.15	12.94
23-Jun		13.26	13.20	13.33	13.10			13.16	13.09	13.19	12.98
24-Jun		13.26	13.20	13.31	13.10			13.18	13.11	13.22	13.00
25-Jun		13.04	13.08	13.14	12.98			13.17	13.12	13.22	13.01
26-Jun		12.81	12.81	12.85	12.69			13.12	13.09	13.17	12.98
27-Jun		12.64	12.59	12.68	12.44			13.04	13.00	13.09	12.89
28-Jun		12.79	12.79	12.87	12.64			12.99	12.97	13.05	12.85
29-Jun		13.27	13.21	13.33	13.07			13.01	12.98	13.07	12.86
30-Jun		13.46	13.43	13.55	13.31			13.04	13.02	13.10	12.89
1-Jul	13.50	13.61	13.57	13.64	13.41			13.09	13.07	13.15	12.93
2-Jul	13.50	13.68	13.68	13.76	13.53			13.18	13.16	13.24	13.01
3-Jul	13.40	13.61	13.60	13.67	13.49			13.29	13.27	13.36	13.13
4-Jul	13.60	13.65	13.62	13.71	13.47			13.44	13.41	13.50	13.27
5-Jul	13.60	13.90	13.87	13.95	13.72			13.60	13.57	13.66	13.43
6-Jul	13.90	13.92	13.88	14.00	13.75			13.69	13.66	13.76	13.52
7-Jul	14.30	14.34	14.28	14.41	14.13		13.69	13.81	13.78	13.88	13.64
8-Jul	14.40	14.67	14.60	14.75	14.46		13.81	13.97	13.93	14.04	13.79
9-Jul	14.70	14.80	14.75	14.86	14.62		13.99	14.13	14.09	14.19	13.95
10-Jul	14.80	14.99	14.97	15.08	14.82		14.19	14.32	14.28	14.40	14.14
11-Jul	15.00	15.11	15.05	15.18	14.93		14.39	14.53	14.49	14.60	14.35
12-Jul	15.10	15.26	15.23	15.32	15.08		14.60	14.73	14.68	14.80	14.54
13-Jul	15.20	15.31	15.29	15.39	15.15		14.79	14.93	14.88	15.00	14.74
14-Jul	15.20	15.48	15.43	15.53	15.30		14.91	15.09	15.05	15.16	14.91
15-Jul	15.10	15.57	15.55	15.63	15.41		15.01	15.22	15.18	15.28	15.04
16-Jul	15.30	15.50	15.46	15.56	15.36		15.10	15.32	15.28	15.38	15.15
17-Jul	15.40	15.60	15.58	15.68	15.41		15.19	15.40	15.37	15.47	15.23
18-Jul	15.40	15.77	15.70	15.82	15.60		15.24	15.50	15.46	15.56	15.33
19-Jul	15.60	15.76	15.70	15.80	15.59		15.31	15.57	15.53	15.63	15.40
20-Jul	15.60	15.82	15.75	15.87	15.65		15.37	15.64	15.60	15.70	15.48
21-Jul	16.10	15.85	15.82	15.92	15.68		15.50	15.69	15.65	15.75	15.53
22-Jul	16.10	16.27	16.22	16.30	16.07		15.64	15.80	15.75	15.85	15.62
23-Jul	16.20	16.18	16.16	16.23	16.04		15.77	15.89	15.85	15.94	15.72
24-Jul	16.30	16.40	16.37	16.46	16.20		15.90	16.01	15.96	16.05	15.83
25-Jul	16.40	16.57	16.54	16.63	16.37		16.04	16.12	16.08	16.17	15.94
26-Jul	16.70	16.63	16.57	16.70	16.44		16.20	16.25	16.20	16.30	16.06
27-Jul	16.80	16.91	16.85	16.96	16.71		16.37	16.40	16.36	16.46	16.21
28-Jul	16.80	17.02	16.98	17.06	16.84		16.47	16.57	16.53	16.62	16.38
29-Jul	16.90	17.10	17.04	17.15	16.92		16.59	16.69	16.64	16.74	16.50
30-Jul	17.10	17.21	17.15	17.27	17.03		16.71	16.84	16.79	16.89	16.64
31-Jul	17.30	17.22	17.19	17.27	17.04		16.86	16.95	16.90	17.01	16.77
1-Aug	17.40	17.55	17.47	17.56	17.34		17.00	17.09	17.04	17.14	16.90

	Daily Maximum Temperatures						7-Day Average of Daily Maximum Temperatures				
Date	Wells Tailrace	Rocky Reach Forebay	Rocky Reach Tailarace	JFBS Entrance	JFBS Sampling Facility		Wells Tailrace	Rocky Reach Forebay	Rocky Reach Tailarace	JFBS Entrance	JFBS Sampling Facility
2-Aug	17.30	17.60	17.48	17.61	17.35		17.09	17.23	17.17	17.27	17.03
3-Aug	17.30	17.62	17.49	17.72	17.51		17.16	17.33	17.26	17.38	17.15
4-Aug	17.30	17.61	17.51	17.70	17.42		17.23	17.42	17.33	17.47	17.23
5-Aug	17.20	17.70	17.59	17.80	17.51		17.27	17.50	17.41	17.56	17.31
6-Aug	17.30	17.55	17.48	17.61	17.36		17.30	17.55	17.46	17.61	17.36
7-Aug	17.40	17.59	17.50	17.65	17.45		17.31	17.60	17.50	17.66	17.42
8-Aug	17.60	17.79	17.63	17.80	17.55		17.34	17.64	17.53	17.70	17.45
9-Aug	17.60	17.78	17.65	17.82	17.58		17.39	17.66	17.55	17.73	17.48
10-Aug	17.60	17.91	17.79	18.01	17.73		17.43	17.70	17.59	17.77	17.51
11-Aug	17.60	17.78	17.71	17.96	17.67		17.47	17.73	17.62	17.81	17.55
12-Aug	17.70	17.90	17.78	18.06	17.75		17.54	17.76	17.65	17.84	17.58
13-Aug	17.70	17.99	17.86	18.06	17.81		17.60	17.82	17.70	17.91	17.65
14-Aug	17.70	18.19	18.04	18.27	17.99		17.64	17.90	17.78	18.00	17.72
15-Aug	18.00	18.15	18.05	18.32	18.06		17.70	17.96	17.84	18.07	17.80
16-Aug	17.90	18.36	18.25	18.44	18.19		17.74	18.04	17.93	18.16	17.89
17-Aug	17.90	18.43	18.28	18.56	18.30		17.79	18.11	18.00	18.24	17.97
18-Aug	17.90	18.34	18.23	18.46	18.19		17.83	18.19	18.07	18.31	18.04
19-Aug	17.90	18.25	18.19	18.32	18.06		17.86	18.25	18.13	18.35	18.08
20-Aug		18.25	18.14	18.32	18.04			18.28	18.17	18.38	18.12
21-Aug		18.37	18.31	18.49	18.24			18.31	18.21	18.41	18.15
22-Aug		18.28	18.23	18.41	18.16			18.33	18.23	18.43	18.17
23-Aug		18.39	18.29	18.39	18.12			18.33	18.24	18.42	18.16
24-Aug		18.23	18.17	18.32	18.08			18.30	18.22	18.39	18.13
25-Aug		18.26	18.17	18.34	18.08			18.29	18.21	18.37	18.11
26-Aug		18.26	18.17	18.32	18.09			18.29	18.21	18.37	18.12
27-Aug		18.28	18.19	18.39	18.12			18.29	18.22	18.38	18.13
28-Aug		18.24	18.17	18.32	18.07			18.28	18.20	18.36	18.10
29-Aug		18.17	18.08	18.30	18.04			18.26	18.18	18.34	18.09
30-Aug		18.15	18.06		17.97			18.23	18.14		18.06
31-Aug		18.15	18.03		17.97			18.21	18.12		18.05
1-Sep		18.31	18.02		18.09			18.22	18.10		18.05
2-Sep		18.59	18.28		18.50			18.27	18.12		18.11
3-Sep		18.79	18.22		18.27			18.34	18.12		18.13
4-Sep		18.38	18.29		18.31			18.36	18.14		18.16
5-Sep		18.60	18.51		18.47			18.42	18.20		18.22
6-Sep		18.66	18.51		18.65			18.50	18.26		18.32
7-Sep		18.60	18.45		18.52			18.56	18.32		18.40
8-Sep		18.63	18.32		18.34			18.61	18.37		18.43
9-Sep		18.80	18.30		18.35			18.64	18.37		18.41
10-Sep		18.48	18.32		18.28			18.59	18.38		18.41
11-Sep		18.31	18.22		18.11			18.58	18.37		18.39

	Daily Maximum Temperatures						7-Day Average of Daily Maximum Temperatures				
Date	Wells Tailrace	Rocky Reach Forebay	Rocky Reach Tailarace	JFBS Entrance	JFBS Sampling Facility		Wells Tailrace	Rocky Reach Forebay	Rocky Reach Tailarace	JFBS Entrance	JFBS Sampling Facility
12-Sep		18.14	17.92		17.88			18.52	18.29		18.30
13-Sep		18.11	17.95		17.92			18.44	18.21		18.20
14-Sep		17.91	17.83		17.78			18.34	18.12		18.09
15-Sep		18.11	17.95		17.96			18.27	18.07		18.04
16-Sep		18.26	17.94		18.08			18.19	18.02		18.00
17-Sep		18.00	17.93		17.91			18.12	17.96		17.95
18-Sep		17.81	17.72		17.66			18.05	17.89		17.88
19-Sep		17.85	17.72		17.74			18.01	17.86		17.86
20-Sep		17.94	17.86		17.80			17.98	17.85		17.85
21-Sep		17.99	17.89		17.87			17.99	17.86		17.86
22-Sep		18.04	17.89		17.87			17.98	17.85		17.85
23-Sep		17.95	17.86		17.81			17.94	17.84		17.81
24-Sep		17.84	17.77		17.70			17.92	17.81		17.78
25-Sep		17.91	17.82		17.77			17.93	17.83		17.79
26-Sep		18.02	17.94		17.93			17.95	17.86		17.82
27-Sep		18.05	17.98		17.94			17.97	17.88		17.84
28-Sep		18.02	17.94		17.86			17.97	17.89		17.84
29-Sep		18.12	17.89		17.90			17.99	17.89		17.84
30-Sep		17.98	17.89		17.95			17.99	17.89		17.86
1-Oct		17.88	17.81		17.77			18.00	17.90		17.87
2-Oct		17.80	17.72		17.66			17.98	17.88		17.86
3-Oct		17.57	17.51		17.41			17.92	17.82		17.79
4-Oct		17.31	17.24		17.16			17.81	17.71		17.68
5-Oct		17.12	17.02		16.99			17.68	17.58		17.55
6-Oct		16.92	16.75		16.70			17.51	17.42		17.38
7-Oct		16.70	16.60		16.57			17.33	17.24		17.18
8-Oct		16.56	16.45		16.48			17.14	17.04		17.00
9-Oct		16.48	16.41		16.36			16.95	16.85		16.81
10-Oct		16.50	16.29		16.29			16.80	16.68		16.65
11-Oct		16.47	16.35		16.38			16.68	16.55		16.54
12-Oct		16.42	16.35		16.29			16.58	16.46		16.44
13-Oct		16.38	16.25		16.20			16.50	16.38		16.37
14-Oct		16.34	16.24		16.19			16.45	16.33		16.31
15-Oct		16.40	16.25		16.20			16.43	16.30		16.27
16-Oct		16.31	16.23		16.15			16.40	16.28		16.24
17-Oct		16.18	16.10		16.05			16.35	16.25		16.21
18-Oct		16.00	15.94		15.88			16.29	16.19		16.14
19-Oct		15.85	15.77		15.70			16.21	16.11		16.05
20-Oct		15.67	15.59		15.52			16.11	16.02		15.96
21-Oct		15.50	15.41		15.34			15.99	15.90		15.84
22-Oct		15.40	15.31		15.25			15.84	15.76		15.70

	Daily Maximum Temperatures						7-Day Average of Daily Maximum Temperatures				
Date	Wells Tailrace	Rocky Reach Forebay	Rocky Reach Tailarace	JFBS Entrance	JFBS Sampling Facility		Wells Tailrace	Rocky Reach Forebay	Rocky Reach Tailarace	JFBS Entrance	JFBS Sampling Facility
23-Oct		14.88	14.80		14.75			15.64	15.56		15.50
24-Oct		14.82	14.76		14.70			15.45	15.37		15.30
25-Oct		14.72	14.61		14.58			15.26	15.18		15.12
26-Oct		14.63	14.59		14.51			15.09	15.01		14.95
27-Oct		14.55	14.49		14.42			14.93	14.85		14.79
28-Oct		14.64	14.48		14.42			14.81	14.72		14.66
29-Oct		14.63	14.55		14.55			14.70	14.61		14.56
30-Oct		14.64	14.56		14.51			14.66	14.58		14.53
31-Oct		14.61	14.55		14.47			14.63	14.55		14.49

APPENDIX E: CONSULTATION RECORD

From: Frantz, Waikele M.
Sent: Thursday, February 28, 2013 3:50 PM
To: Irle, Pat (ECY); McKinney, Charlie (ECY)
Cc: Sokolowski, Rosana; Bitterman, Deborah
Subject: 2012 Draft Water Quality Annual Report

PUBLIC UTILITY DISTRICT NO. 1 of CHELAN COUNTY
P.O. Box 1231, Wenatchee, WA 98807-1231 • 327 N. Wenatchee Ave., Wenatchee, WA 98801
(509) 663-8121 • Toll free 1-888-663-8121 • www.chelanpud.org

To: Patricia Irle, Washington State Department of Ecology
Charlie McKinney, Washington State Department of Ecology

From: Waikele Frantz, Environmental Permit Coordinato
Public Utility District No. 1 of Chelan County (Chelan PUD)

Re: Rocky Reach Hydroelectric Project No. 2145
License Article 401 – Water Quality Annual Report

Ms. Irle and Mr. McKinney:

As per Section 5.7(8) of the 401 Water Quality Certification for Rocky Reach, Chelan PUD hereby submits the 2012 Water Quality Annual Report for your review.

Please review and submit your comments on or before 5:00 p.m., April 5, 2013 to me via email at waikele.frantz@chelanpud.org or via fax to (509) 661-8203.

Pursuant to the FERC Order Modifying and Approving Quality Assurance Project Plan, Chelan PUD will file the Final Water Quality Report with FERC by May 1, 2012.

All received comments will be appended to the final plan with a description of how each comment or recommendation was incorporated in the report, or, if the licensee does not adopt a recommendation, the filing with the FERC will include the licensee's reasons, based on project-specific information for not adopting such recommendation.

If you have any questions, please do not hesitate to contact me.

Thank you,
Waikele Frantz
509-661-4627

From: Irle, Pat (ECY) [mailto:PIRL461@ECY.WA.GOV]
Sent: Friday, March 08, 2013 11:25 AM
To: Frantz, Waikele M.
Cc: Sokolowski, Rosana; Bitterman, Deborah; McKinney, Charlie (ECY)
Subject: RE: 2012 Draft Water Quality Annual Report

Hi, Waikele –

Thanks for the draft Annual Water Quality Monitoring Report for 2012. It looks like very clear presentation of information. The report is well organized to let us know when to expect what.

Figures 3-2 and 3-4 were helpful for showing compliance; however, it would also be helpful to present have the number of exceedances (i.e., of 0.3^{o}C over 17.5^{o}C of the 7-day average of temperature on a daily basis) in the pool and in the JFBS, and the % of days in compliance. (Using the dates from 4/9 to 8/19 for the pool and 4/1 to 8/31 for the JFBS is fine.)

Minor comments:

Table 3-1 indicates that the maximum hourly temperature from 4/1 to 8/31 decreases from the entrance to the sampling facility, yet Figure 3-3 seems to show that the temperature in the sampling facility is always higher than at the entrance. Could you please explain or correct?

Section 4.2.2, second sentence, first “2013”: Do you mean 2013 or 2012?

Section 4.4: Could you include a date by which the dissolved oxygen/pH report with be submitted?

If you have any questions, please let me know.

Pat Irle
Hydropower Projects Manager
(509) 454-7864

WDOE Comment	Chelan PUD Response
Figures 3-2 and 3-4 were helpful for showing compliance; however, it would also be helpful to have the number of exceedances (i.e., of 0.3°C over 17.5°C of the 7-day average of temperatures on a daily basis) in the pool and in the JFBS, and the % days in compliance. (Using the dates from 4/9 to 8/19 for the pool and 4/1 to 8/31 for the JFBS is fine.)	Chelan PUD has replaced the tables in Section 3 that originally summarized mean, minimum, and maximum temperatures at each site with new tables that summarize the number of days of exceedances of the 7-DADMax and the % compliance at all sites.
Table 3-1 indicates that the maximum hourly temperature from 4/1 to 8/31 decreases from the entrance to the sampling facility, yet Figure 3-3 seems to show that the temperature in the sampling facility is always higher than at the entrance. Could you explain or correct.	Thanks for catching this. During a follow-up telephone conversation with Pat Irle at WDOE, it was agreed that it was not necessary to include the data presented in Table 3-1 (which was incorrectly labeled as 3-1, but should have been Table 3-2). The table has been replaced with a table (Table 3-2) that summarizes the number of days of exceedances of the 7-DADMax and the % compliance.
Section 4.2.2, second sentence, first “2013”: Do you mean 2013 or 2012?	2013 is correct.
Section 4.4: Could you include a date by which the dissolved oxygen/pH report will be submitted?	