March 29, 2011

Ms. Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street N.E.
Washington, DC 20426

**Subject: Spokane River Hydroelectric Project, FERC Project No. 2545**
**Submittal of the Coeur d'Alene Indian Reservation 2010 Water Quality Annual Summary Report**

Dear Secretary Bose:

On June 18, 2009 the Federal Energy Regulatory Commission (FERC) issued a new license for the Spokane River Hydroelectric Project, FERC Project No. 2545-091 (License). Ordering Paragraph G of the License incorporated the U.S. Department of Interior's (Interior's) January 27, 2009 Federal Power Act 4(e) Conditions as Appendix D. Appendix D, Condition No. 5 requires Avista to complete a Coeur d'Alene Indian Reservation Water Quality Monitoring Plan (WQMP), in collaboration with the Coeur d'Alene Tribe (Tribe), within one year of License issuance (June 18, 2010).

During 2010, Avista and the Tribe worked collaboratively to develop and implement the WQMP following Interior's and FERC's approval. The enclosed Water Quality Annual Summary Report (ASR) summarizes the work that was completed in 2010.

In a related matter, the FERC and Interior approved 2010 Annual Implementation Report specified the ASR would be submitted to Interior by March 1st and to FERC by April 1st on an annual basis. Avista submitted the ASR to Interior on March 1, 2011 and revised it to incorporate the correspondence record with Interior, which is included as Appendix B. We will revise the WQMP to accommodate the revisions and file it independently with Interior and FERC.

If you have any questions regarding the ASR, feel free to call me at (509) 495-4998 or Meghan Lunney at (509) 495-4643.

Sincerely,

Speed Fitzhugh

Elvin "Speed" Fitzhugh
Spokane River License Manager

Enclosure:
2010 Water Quality Annual Summary Report

Doc. No. 2011-0089

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Phillip Cernera, Coeur d'Alene Tribe
Scott Fields, Coeur d'Alene Tribe

# AVISTA CORPORATION

## COEUR D'ALENE RESERVATION

## 2010 WATER QUALITY MONITORING

## ANNUAL SUMMARY REPORT

4(E) CONDITION NO. 5

SPOKANE RIVER HYDROELECTRIC PROJECT
FERC PROJECT NO. 2545

Prepared By:
Coeur d'Alene Tribe

In Cooperation With:
Avista Corporation

*March 29, 2011*

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## Tables



## Figures



## Appendices

# 1.0 INTRODUCTION

## 1.1 Background

On June 18, 2009, the Federal Energy Regulatory Commission (FERC) issued Avista Corporation (Avista) a new license for the Spokane River Hydroelectric Project (Spokane River Project), FERC Project No. 2545-091 for a 50-year license term (FERC, 2009). The new FERC license (License) was issued on June 18, 2009 and includes operation of the Post Falls Hydroelectric Development (HED) in Idaho as a component of the Spokane River Project.

The Post Falls HED includes three dams located on the Spokane River approximately nine miles downstream from the outlet of Coeur d'Alene Lake. Coeur d'Alene Lake is a natural lake created by a channel restriction at the outlet, with the outlet serving as the headwaters of the Spokane River. The Post Falls HED's Project boundary encompasses Coeur d'Alene Lake, Spokane River upstream of the Post Falls Dams, and the lower reaches of the St. Joe, Coeur d'Alene and St. Maries rivers to the normal full pool water elevation of 2,128 feet.

## 1.2 License Requirements

Ordering Paragraph G of the License incorporated the U.S. Department of Interior's (Interior's) January 27, 2009 Federal Power Act 4(e) Conditions (Conditions). The Conditions can be found in Appendix D of the License. Condition No. 5 of Appendix D of the License regarding Water Quality Standards and Water Quality Monitoring (Condition 5) requires Avista to complete a Coeur d'Alene Indian Reservation Water Quality Monitoring Plan (WQMP), in collaboration with the Coeur d'Alene Tribe (Tribe), within one year of License issuance (June 18, 2010).

During 2010, Avista and the Tribe worked collaboratively to develop the WQMP and submitted it to Interior on March 26, 2010 for review and approval. After completing Interior's recommended revisions, Interior approved the WQMP on June 17, 2010. On June 18, 2010, the WQMP was submitted to FERC, which FERC approved via Order 2545-091 on October 15, 2010. In accordance with the WQMP the water quality monitoring program includes the following:

- Monitoring water quality at the five sites (C5, C6, RL1, BL1, and SJ1) identified by Interior, or agreed to by the licensee and the Tribe and approved by the Secretary;
- Conduct continuous temperature, specific conductance, pH, and dissolved oxygen (DO), at the specified sites annually from June through November;
- Develop profiles of water column conditions for temperature, specific conductance, pH, and DO at all sites annually at least twice monthly during the monitoring period;
- Collect profiles throughout the water column to characterize physical/chemical conditions in the euphotic zone and lower hypolimnion and to define the depth and magnitude of the thermocline;
- Follow specified methods for collecting water samples at each site;

- Use appropriate quality assurance and quality control measures for specified parameters and corresponding detection limits:
- Collect one phytoplankton subsample per month from the euphotic zone at all sites;
- Maintain data in an electronic database or spreadsheet, and provide reports; and
- Provide data within 30 working days after collection or laboratory analysis and promptly respond to requests for additional information.

## 2.0 DATA COLLECTION

The WQMP indicates water quality monitoring will be conducted at the following five sites (which correspond to the sites identified in Part A(1)(a-e) of Condition 5) located within the Coeur d'Alene Reservation (Reservation) in the southern end of Coeur d'Alene Lake and the St. Joe River. Figure 1 displays the location of the Coeur d'Alene Reservation Boundary and Figure 2 shows the locations of the five monitoring sites within the southern portion of Coeur d'Alene Lake and the St. Joe River.

Upon receiving FERC approval of the WQMP, Avista contracted with the Tribe to implement the WQMP. Water quality monitoring was conducted, in accordance with the WQMP, on November 29$^{th}$ and 30$^{th}$ of 2010 at three out of the five water quality monitoring sites, including sites C5 (Coeur d'Alene Lake), C6 (Chatcolet Lake), and SJ1 (Lower St. Joe River). Sampling at sites BL1 (Benewah Lake) and RL1 (Round Lake) was not conducted during this event as these sites had completely iced over. The field notes collected during the November sampling event are included as Appendix A.

### 2.1 In-Situ Profile Monitoring

In-situ and water quality samples were collected from site C5 on November 30, 2010 and from sites C6 and SJ1 on November 29, 2010. At these three sites, in-situ profiles were collected from the lake surface to the lake bottom using a Hydrolab® DS5 multi-probe which created depth-profiles for the parameters identified in the WQMP. These parameters included water temperature, pH, specific conductance, depth, photosynthetic active radiation, dissolved oxygen (percent saturation and concentration), and relative fluorescence (chlorophyll-a). The Hydrolab DS5 multi-probe sensors were calibrated prior to each day's monitoring and dissolved oxygen was calibrated at the sample sites. The in-situ data collected from sites C5, C6, and SJ2 are summarized in Table 2

The WQMP calls for the in-situ profile monitoring to be conducted twice a month, however due to the timeframe of when the WQMP was approved, only one monitoring event occurred in November.

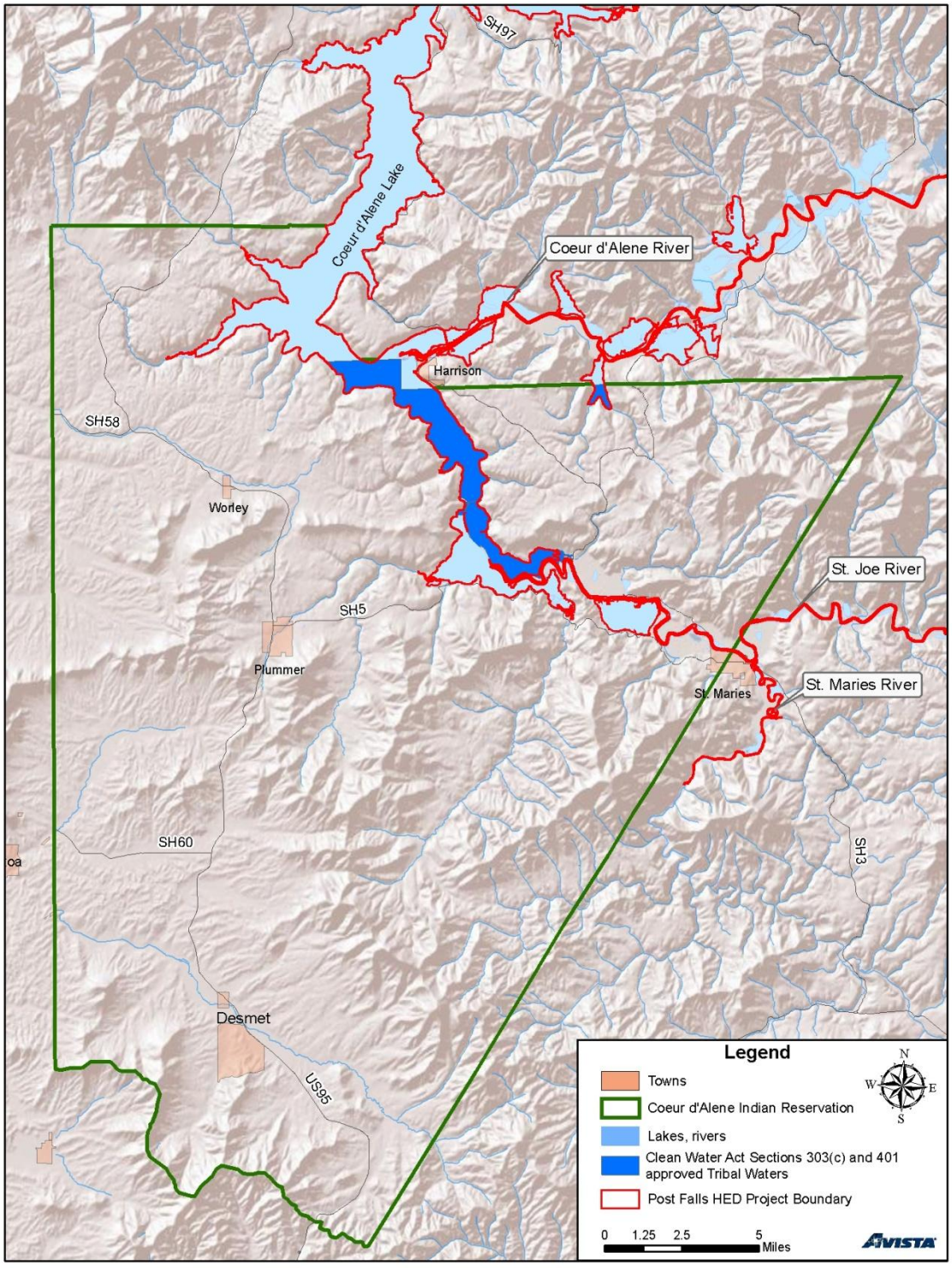


**Figure 1: Current Exterior Boundaries of the Coeur d'Alene Indian Reservation.**

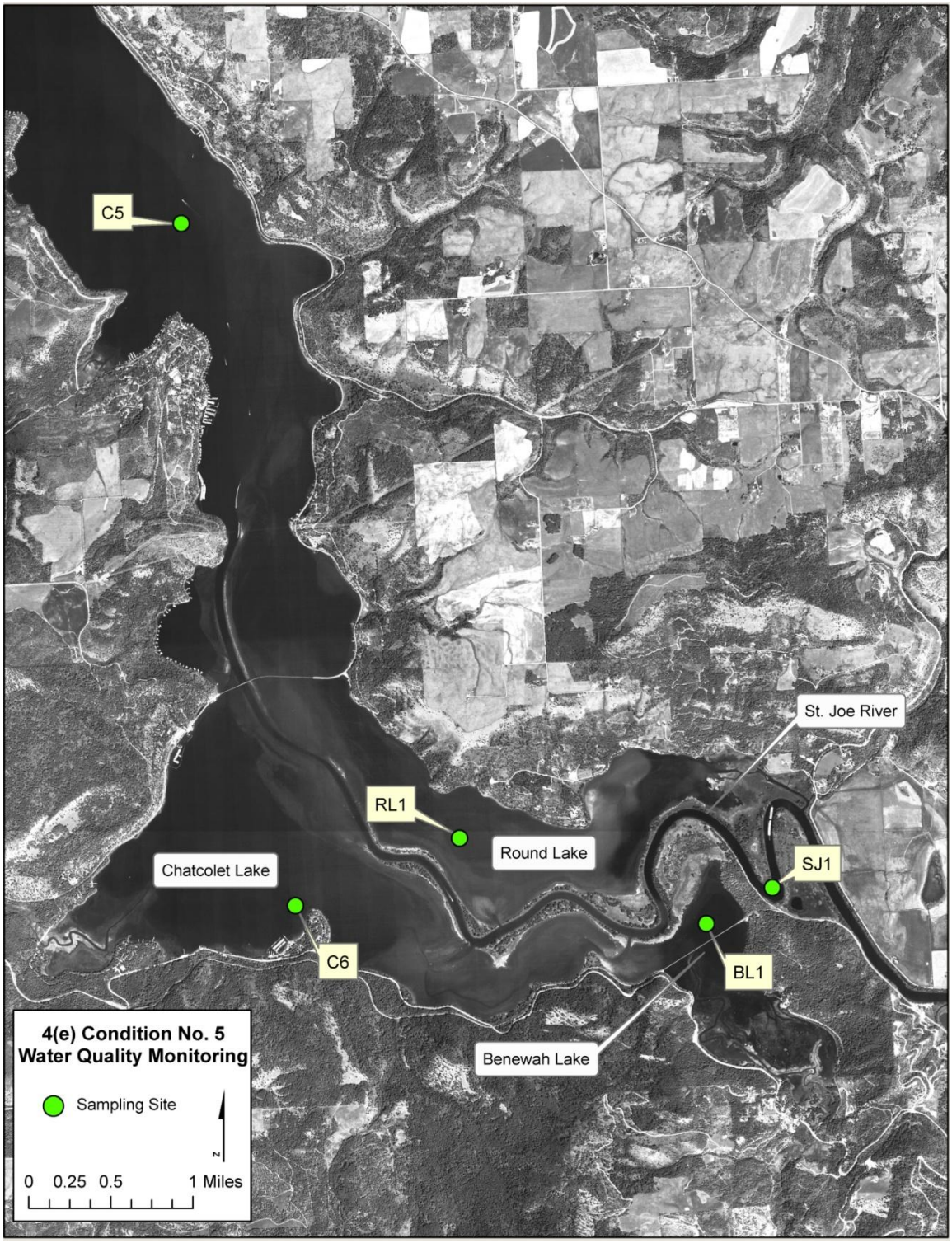


**Figure 2: Map of sampling sites located in Coeur d'Alene Lake and the St. Joe River.**

## 2.2 Continuous Monitoring

The WQMP indicates continuous monitoring of temperature, specific conductance, pH, and dissolved oxygen (percent saturation and concentration) would be collected using a YSI 6600V2-4M buoy (multi-probe system) at each site, June through November, on a revolving five-year cycle. Continuous monitoring was not conducted during the 2010 season as the WQMP was not approved by FERC until October of 2010, and the multi-probe system had not yet been purchased. In accordance with the Interior and FERC-approved 2010 Annual Implementation Report, the multi-probe system will be purchased by April 15, 2011. As such, continuous monitoring will be initiated at site C5, June through November, starting in 2011.

## 2.3 Water Sample Collection

### *2.3.1* Sample Depths

The WQMP indicated water samples would be collected for nutrients at each of the five sites (Table 1 and Figure 2) once per month from June through November on an annual basis, for the term of the License. During monthly sampling, at each of the five sites, water samples will be collected from the following depths as indicated in Part A(5) of Condition 5:

- euphotic zone composite (defined as 3-5 evenly spaced samples taken from 0.5 m below the surface to the depth to which 1% of incident solar radiation at the surface penetrates, composited in a churn splitter, and from which subsamples are withdrawn for laboratory analysis);
- one meter above the lake bottom; and
- at Site C5 only (part of A(1)(a) of Condition 5), in the zone of maximum chlorophyll fluorescence.

### *2.3.2* Nutrient Sampling

The WQMP further indicates the water samples collected at each of the five monitoring locations at the depths previously identified will be analyzed for the following nutrients as defined in Part A(6)(a-g) of Condition 5: total Nitrogen; nitrite ($NO_2$) + nitrate ($NO_3$) Nitrogen; ammonia nitrogen ($NH_3$); total Phosphorus; dissolved Phosphorus; ortho Phosphorus; and chlorophyll *a* (in the euphotic composite and zone of maximum chlorophyll fluorescence samples). In accordance with the WQMP, the Spokane Tribal Laboratory, a certified laboratory, analyzed the water quality samples for the constituents and method detection limits identified in Table 3 of the WQMP.

During the 2010 monitoring program water samples were collected from C5, C6, and SJ1 for the nutrients previously identified. A summary of the in-situ profile and analytical results is included in Section 3.0 and the QA/QC results are presented in Section 4.0.

### *2.3.3* Phytoplankton Sampling

Also, Part A(7) of Condition 5 indicates one phytoplankton sample will be collected per month, June through November, from the euphotic zone composite in accordance with Part A(5)(a) of Condition 5 at each of the five monitoring locations previously identified. Advanced Eco-Solutions analyzed subsamples for taxa present (identified to species level whenever possible), cell counts and biovolume.

During the November 2010 monitoring event, one phytoplankton sample was collected from sites C5, C6, and SJ1. The taxa, cell counts and biovolume are summarized in Table 4.

## 3.0 SUMMARY OF DATA RESULTS

The in-situ data collected with a Hydrolab DS5 from sites C5, C6, and SJ1 are summarized in Table 2. Temperature at C5, C6 and SJ1 all exhibited near isothermal conditions throughout the water column. The lower St. Joe River (SJ1) was the coldest with a mean water column temperature of 0.6 °C with some thin ice at the surface. Site C6 was slightly warmer with a mean water column temperature of 1.4 °C. Site C5 was the warmest of the three sites with a mean water column temperature of 3.6 °C. Site C5 is a pelagic site located in the southern basin of Coeur d'Alene Lake and exhibits the higher temperature due the larger volume of water and higher heat capacity of the main body of the lake.

Dissolved oxygen percent saturation throughout the water column ranged from 88.2-90.7% at SJ1, 86.0-93.4% at C6, and 90.1-92.6% at C5. All three sites met the Tribal Water Quality Standard of at least 8.0 mg/L dissolved oxygen (Coeur d'Alene Tribe 2010), as all three sites were >10.0 mg/L throughout the water column (Table 2).

Total and inorganic dissolved forms of phosphorus and nitrogen were analyzed from a photic zone composite and a discrete grab at one meter above bottom at sites SJ1, C6 and C5. The analytical results are summarized in Table 3. Phosphorus values were similar among the three sites, from both photic zone composite and bottom samples (Table 3). Total Kjeldahl nitrogen values were higher at site C6 compared to C5 and SJ1 (Table 3). At all three sites, total phosphorus values from both photic zone and one meter above bottom were within the range of values from early December sampling done in 2007-2009 as part of the Coeur d'Alene Lake Management Plan monitoring program. For example, total phosphorus from the photic zone composite at site C5 in 2010 was 18 µg/L, compared to the range from 2007-2009 of 11-21 µg/L. Total Kjeldahl nitrogen values at the three sites also exhibited similarity when compared to the range from 2007-2009. This similarity in phosphorus and nitrogen concentrations between years is likely due to the fully mixed water column at each site during the early winter season.

Chlorophyll *a* was highest at site C6 at 6.28 µg/L and lowest at SJ1 at 0.34 µg/L (Table 3). The higher chlorophyll a concentration at C6 in 2010 is also consistent with results from 2007-2009 from early winter sampling.

The phytoplankton community at sites SJ1, C6 and C5 was dominated by diatoms with 62.3, 85.4 and 73.2% of the phytoplankton biovolume respectively. The diatoms *Aulacoseira italica* and *Cyclotella comta* dominated the phytoplankton community on a biovolume basis at sites C6 and C5 (Table 4). The pennate diatoms *Navicula sp.* and *Gomphonema sp.* dominated at SJ1 (Table 4.)

The cyanobacteria (Blue-greens) comprised only a small percentage of the biovolume at sites C6 and C5 at 1.4% and 3.4% respectively. At site SJ1 cyanobacteria comprised 17.5% of the biovolume. The small, unicellular *Synechococcus* sp. and *Chroococcus* sp. dominated the cyanobacteria community at all three sites.

## 4.0 QUALITY CONTROL AND QUALITY ASSURANCE

Since this was the only sample event for the 2010 season, no equipment blanks were taken. A complete pre-season equipment blank will be taken prior to the June 2011 sampling event. A sample replicate was taken at site C6. The results of the laboratory quality assurance and quality control (QA/QC) and sample replicate relative percent difference (% RPD) are summarized in Table 5. The laboratory QA/QC results were all within acceptable limits for percent recovery of matrix spikes. Laboratory blanks using analytical-grade deionized water produced no detections above minimum reporting limits. The replicate sample from the photic zone composite at site C6 had acceptable %RPD values (Table 5).

## 5.0 REFERENCES

Avista and the Coeur d'Alene Tribe. 2010. Coeur d'Alene Reservation Water Quality Monitoring Plan. June 14.

Coeur d'Alene Tribe's Lake Management Department. 2010. Water Quality Standards for Approved Surface Waters of the Coeur d'Alene Tribe. Prepared for: The United State's Environmental Protection Agencey (Region 10).

FERC. 2010. Order Approving Water Quality Monitoring Plan Under Paragraph G. October 15.

FERC. 2009. Order Issuing New License and Approving Annual Charges For Use of Reservation Lands. Project Nos. 2545-091 and 12606-000. June 18.

# TABLES

**TABLE 1**
**Annual Water Quality Sampling Site Locations**
**2010 Annual Summary Report**
**4(e) Condition 5: Water Quality Standards and Water Quality Monitoring**

| Site Code | Site Name | Total Depth | Latitude | Longitude |
|---|---|---|---|---|
| C5 | Coeur d'Alene Lake | 17 m | N 47°25'15.927" | N 116°45'30.509" |
| C6 | Chatcolet Lake | 11 m | N 47°21'30.272" | N 116°44'54.080" |
| BL1 | Benewah Lake | 3 m | N 47°21'17.551" | N 116°41'42.743" |
| SJ1 | Lower St. Joe River | 18 m | N 47°21'27.906" | N 116°41'10.986" |
| RL1 | Round Lake | 3 m | N 47°21'48.925" | N 116°43'35.865" |

# TABLE 2
## Tabulated Summary of In-Situ Monitoring
## 2010 Annual Summary Report
## 4(e) Condition 5: Water Quality Standards and Water Quality Monitoring

| Site Code | Date (mm/dd/yyyy) | Time (military) | Water Temperature (°C) | pH | Specific Conductance (µS/cm) | Depth (meters) | Photosynthetic Active Radiation (PAR) (µE/s/m²) | Dissolved Oxygen (% Saturation) | Dissolved Oxygen (mg/L) | Relative Fluorescence (Chlorophyll a) (Volts) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 10:48:52 | 4.06 | 6.92 | 61 | 0.52 | 188 | 92.6 | 10.39 | 0.0158 |
| | | 10:48:53 | 4.05 | 6.92 | 64 | 0.54 | 195 | 92.6 | 10.39 | 0.0156 |
| | | 10:48:54 | 4.04 | 6.92 | 58 | 0.54 | 195 | 92.6 | 10.39 | 0.0156 |
| | | 10:49:33 | 4.05 | 6.9 | 63 | 1.11 | 69 | 92.6 | 10.39 | 0.0166 |
| | | 10:49:34 | 4.06 | 6.9 | 51 | 1.09 | 69 | 92.6 | 10.38 | 0.0166 |
| | | 10:49:35 | 4.06 | 6.89 | 51 | 1.09 | 69 | 92.6 | 10.38 | 0.0167 |
| | | 10:49:58 | 4.05 | 6.85 | 59 | 2 | 47 | 92.4 | 10.36 | 0.0174 |
| | | 10:49:59 | 4.05 | 6.85 | 59 | 2 | 47 | 92.4 | 10.36 | 0.0174 |
| | | 10:50:00 | 4.04 | 6.85 | 58 | 2.01 | 46 | 92.3 | 10.35 | 0.0173 |
| | | 10:50:46 | 3.95 | 6.84 | 58 | 3.04 | 30 | 92.1 | 10.36 | 0.0168 |
| | | 10:50:47 | 3.94 | 6.84 | 56 | 3.04 | 31 | 92.1 | 10.36 | 0.0169 |
| | | 10:50:48 | 3.94 | 6.84 | 56 | 3.04 | 31 | 92.1 | 10.36 | 0.0169 |
| | | 10:51:16 | 3.9 | 6.83 | 58 | 4.01 | 23 | 92 | 10.36 | 0.0163 |
| | | 10:51:17 | 3.9 | 6.83 | 58 | 4.01 | 23 | 92 | 10.36 | 0.0163 |
| | | 10:51:18 | 3.88 | 6.82 | 58 | 4 | 22 | 91.9 | 10.36 | 0.0163 |
| | | 10:51:45 | 4.01 | 6.78 | 55 | 5.07 | 13 | 91.8 | 10.31 | 0.0171 |
| | | 10:51:46 | 4.01 | 6.78 | 55 | 5.07 | 13 | 91.8 | 10.31 | 0.0171 |
| | | 10:51:47 | 4 | 6.8 | 58 | 5.07 | 13 | 91.7 | 10.3 | 0.0171 |
| | | 10:52:36 | 4.01 | 6.79 | 55 | 6.02 | 7 | 91.6 | 10.29 | 0.017 |
| | | 10:52:37 | 4.01 | 6.79 | 55 | 6.02 | 7 | 91.6 | 10.29 | 0.017 |
| | | 10:52:38 | 4 | 6.79 | 57 | 6.01 | 8 | 91.6 | 10.29 | 0.017 |
| | | 10:52:59 | 3.86 | 6.77 | 57 | 7.02 | 4 | 91.3 | 10.29 | 0.0171 |
| | | 10:53:00 | 3.86 | 6.77 | 57 | 7.02 | 4 | 91.3 | 10.29 | 0.0171 |
| | | 10:53:01 | 3.86 | 6.77 | 56 | 7.02 | 4 | 91.3 | 10.29 | 0.0171 |
| | | 10:53:50 | 3.89 | 6.76 | 58 | 7.97 | 3 | 91.3 | 10.28 | 0.0181 |
| C5 | 11/30/2010 | 10:53:51 | 3.89 | 6.76 | 58 | 7.97 | 3 | 91.3 | 10.28 | 0.018 |
| | | 10:53:52 | 3.9 | 6.77 | 57 | 7.98 | 3 | 91.4 | 10.29 | 0.0179 |
| | | 10:55:09 | 3.87 | 6.74 | 56 | 8.99 | 2 | 91.1 | 10.26 | 0.0176 |
| | | 10:55:10 | 3.86 | 6.74 | 57 | 8.99 | 2 | 91.1 | 10.27 | 0.0218 |
| | | 10:55:11 | 3.86 | 6.74 | 57 | 8.99 | 2 | 91.1 | 10.27 | 0.0218 |
| | | 10:55:58 | 3.9 | 6.74 | 56 | 10.06 | 1 | 91 | 10.25 | 0.0168 |
| | | 10:55:59 | 3.88 | 6.74 | 57 | 10.05 | 1 | 91.1 | 10.26 | 0.0168 |
| | | 10:56:00 | 3.88 | 6.74 | 57 | 10.05 | 1 | 91.1 | 10.26 | 0.0167 |
| | | 10:56:40 | 3.79 | 6.73 | 57 | 11.02 | 0 | 90.8 | 10.26 | 0.0168 |
| | | 10:56:41 | 3.8 | 6.73 | 55 | 11.02 | 1 | 90.8 | 10.26 | 0.0168 |
| | | 10:56:42 | 3.8 | 6.73 | 55 | 11.02 | 1 | 90.8 | 10.26 | 0.0168 |
| | | 10:57:19 | 3.86 | 6.72 | 57 | 12.01 | 1 | 90.7 | 10.22 | 0.0175 |
| | | 10:57:20 | 3.86 | 6.72 | 57 | 12.01 | 1 | 90.7 | 10.22 | 0.0174 |
| | | 10:57:21 | 3.86 | 6.72 | 56 | 12.01 | 0 | 90.7 | 10.23 | 0.0173 |
| | | 10:57:43 | 3.82 | 6.72 | 57 | 12.99 | 0 | 90.6 | 10.22 | 0.0162 |
| | | 10:57:44 | 3.82 | 6.72 | 57 | 12.99 | 0 | 90.6 | 10.22 | 0.0162 |
| | | 10:57:45 | 3.81 | 6.71 | 57 | 12.97 | 1 | 90.6 | 10.22 | 0.0162 |
| | | 10:58:30 | 3.75 | 6.71 | 57 | 14 | 0 | 90.3 | 10.21 | 0.0192 |
| | | 10:58:31 | 3.75 | 6.71 | 57 | 14 | 0 | 90.3 | 10.21 | 0.0199 |
| | | 10:58:32 | 3.74 | 6.71 | 57 | 13.99 | 0 | 90.4 | 10.22 | 0.0201 |
| | | 10:58:54 | 3.71 | 6.7 | 57 | 15.06 | 0 | 90.3 | 10.21 | 0.0162 |
| | | 10:58:55 | 3.71 | 6.7 | 57 | 15.06 | 0 | 90.3 | 10.21 | 0.0162 |
| | | 10:58:56 | 3.71 | 6.71 | 56 | 15.06 | 1 | 90.2 | 10.21 | 0.016 |
| | | 10:59:23 | 3.72 | 6.71 | 56 | 16.01 | 1 | 90.1 | 10.2 | 0.0163 |
| | | 10:59:24 | 3.72 | 6.71 | 56 | 16.01 | 1 | 90.1 | 10.2 | 0.0163 |
| | | 10:59:25 | 3.72 | 6.7 | 56 | 16.02 | 1 | 90.1 | 10.19 | 0.0164 |

# TABLE 2
## Tabulated Summary of In-Situ Monitoring
## 2010 Annual Summary Report
## 4(e) Condition 5: Water Quality Standards and Water Quality Monitoring

| Site Code | Date (mm/dd/yyyy) | Time (military) | Water Temperature (°C) | pH | Specific Conductance (µS/cm) | Depth (meters) | Photosynthetic Active Radiation (PAR) (µE/s/m²) | Dissolved Oxygen (% Saturation) | Dissolved Oxygen (mg/L) | Relative Fluorescence (Chlorophyll a) (Volts) |
|---|---|---|---|---|---|---|---|---|---|---|
| C6 | 11/29/2010 | 14:09:38 | 1.1 | 7.03 | 57 | 0.55 | 173 | 93.4 | 11.44 | 0.027 |
| | | 14:09:39 | 1.09 | 7.03 | 59 | 0.55 | 173 | 93.4 | 11.43 | 0.027 |
| | | 14:09:40 | 1.09 | 7.02 | 59 | 0.54 | 165 | 93.4 | 11.43 | 0.03 |
| | | 14:10:43 | 1.16 | 7.04 | 58 | 0.52 | 193 | 93.4 | 11.41 | 0.0317 |
| | | 14:10:44 | 1.16 | 7.04 | 58 | 0.52 | 193 | 93.4 | 11.41 | 0.0317 |
| | | 14:10:45 | 1.17 | 7.04 | 60 | 0.51 | 196 | 93.4 | 11.41 | 0.0302 |
| | | 14:12:08 | 1.13 | 7.06 | 58 | 0.99 | 76 | 93.3 | 11.41 | 0.0306 |
| | | 14:12:09 | 1.13 | 7.05 | 58 | 0.98 | 81 | 93.4 | 11.42 | 0.0296 |
| | | 14:12:10 | 1.11 | 7.04 | 57 | 0.98 | 81 | 93.3 | 11.42 | 0.0296 |
| | | 14:12:56 | 1.24 | 7.05 | 55 | 2 | 36 | 93.2 | 11.36 | 0.0378 |
| | | 14:12:57 | 1.24 | 7.05 | 55 | 2 | 36 | 93.2 | 11.36 | 0.0378 |
| | | 14:12:58 | 1.24 | 7.02 | 58 | 2.01 | 35 | 93.1 | 11.36 | 0.0376 |
| | | 14:13:32 | 1.37 | 7.02 | 57 | 3 | 17 | 92.6 | 11.25 | 0.0384 |
| | | 14:13:33 | 1.37 | 7.02 | 57 | 3 | 17 | 92.6 | 11.25 | 0.0384 |
| | | 14:13:34 | 1.37 | 7.02 | 57 | 3 | 17 | 92.6 | 11.25 | 0.0388 |
| | | 14:14:35 | 1.39 | 7 | 57 | 4.05 | 9 | 92 | 11.18 | 0.038 |
| | | 14:14:36 | 1.38 | 7 | 57 | 4.04 | 9 | 92 | 11.18 | 0.0383 |
| | | 14:14:37 | 1.38 | 7 | 57 | 4.04 | 9 | 92 | 11.18 | 0.0383 |
| | | 14:15:27 | 1.43 | 6.98 | 57 | 4.93 | 4 | 91.5 | 11.09 | 0.0351 |
| | | 14:15:28 | 1.43 | 7 | 58 | 4.93 | 4 | 91.4 | 11.09 | 0.0352 |
| | | 14:15:29 | 1.43 | 7 | 58 | 4.93 | 4 | 91.4 | 11.09 | 0.0352 |
| | | 14:16:01 | 1.44 | 6.98 | 57 | 6.08 | 2 | 91.2 | 11.06 | 0.0302 |
| | | 14:16:02 | 1.44 | 6.98 | 57 | 6.08 | 2 | 91.2 | 11.06 | 0.0302 |
| | | 14:16:03 | 1.44 | 6.98 | 57 | 6.07 | 2 | 91.2 | 11.06 | 0.0296 |
| | | 14:16:23 | 1.44 | 6.98 | 58 | 6.07 | 1 | 91.1 | 11.05 | 0.0315 |
| | | 14:16:24 | 1.44 | 6.98 | 58 | 6.07 | 1 | 91.1 | 11.05 | 0.0315 |
| | | 14:16:25 | 1.44 | 6.98 | 57 | 6.07 | 1 | 91.2 | 11.06 | 0.0317 |
| | | 14:17:01 | 1.45 | 6.97 | 57 | 6.95 | 1 | 90.9 | 11.02 | 0.0327 |
| | | 14:17:05 | 1.45 | 6.97 | 57 | 6.95 | 1 | 90.9 | 11.02 | 0.0327 |
| | | 14:17:06 | 1.45 | 6.96 | 57 | 6.95 | 1 | 90.9 | 11.02 | 0.0327 |
| | | 14:17:25 | 1.48 | 6.95 | 58 | 7.98 | 0 | 90.8 | 10.99 | 0.0311 |
| | | 14:17:26 | 1.48 | 6.95 | 57 | 7.97 | 0 | 90.7 | 10.99 | 0.0311 |
| | | 14:17:27 | 1.48 | 6.95 | 58 | 7.97 | 0 | 90.6 | 10.98 | 0.0311 |
| | | 14:18:12 | 1.52 | 6.94 | 58 | 8.99 | 0 | 90 | 10.89 | 0.0322 |
| | | 14:18:13 | 1.51 | 6.94 | 58 | 8.97 | 0 | 90 | 10.89 | 0.0324 |
| | | 14:18:14 | 1.51 | 6.94 | 58 | 8.97 | 0 | 90 | 10.89 | 0.0324 |
| | | 14:18:57 | 1.75 | 6.9 | 57 | 9.54 | 1 | 89.1 | 10.71 | 0.0343 |
| | | 14:18:58 | 1.75 | 6.9 | 56 | 9.54 | 0 | 88.9 | 10.69 | 0.0303 |
| | | 14:18:59 | 1.75 | 6.9 | 56 | 9.54 | 0 | 88.9 | 10.69 | 0.0303 |
| | | 14:19:24 | 1.98 | 6.86 | 57 | 10.07 | 1 | 86.2 | 10.3 | 0.0271 |
| | | 14:19:25 | 1.97 | 6.86 | 57 | 10.07 | 1 | 85.9 | 10.27 | 0.0274 |
| | | 14:19:26 | 1.97 | 6.86 | 57 | 10.07 | 1 | 85.9 | 10.27 | 0.0274 |

**TABLE 2**
**Tabulated Summary of In-Situ Monitoring**
**2010 Annual Summary Report**
**4(e) Condition 5: Water Quality Standards and Water Quality Monitoring**

| Site Code | Date (mm/dd/yyyy) | Time (military) | Water Temperature (°C) | pH | Specific Conductance (µS/cm) | Depth (meters) | Photosynthetic Active Radiation (PAR) (µE/s/m²) | Dissolved Oxygen (% Saturation) | Dissolved Oxygen (mg/L) | Relative Fluorescence (Chlorophyll a) (Volts) |
|---|---|---|---|---|---|---|---|---|---|---|
| SJ1 | 11/29/2010 | 11:44:00 | 0.48 | 7.07 | 51 | 0.48 | 307 | 90.6 | 11.29 | 0.007 |
| | | 11:44:01 | 0.48 | 7.07 | 51 | 0.49 | 307 | 90.6 | 11.29 | 0.007 |
| | | 11:44:02 | 0.49 | 7.07 | 51 | 0.49 | 307 | 90.7 | 11.3 | 0.007 |
| | | 11:45:31 | 0.55 | 6.95 | 51 | 0.55 | 283 | 90.8 | 11.29 | 0.007 |
| | | 11:45:32 | 0.55 | 6.95 | 51 | 0.55 | 283 | 90.8 | 11.29 | 0.007 |
| | | 11:45:33 | 0.55 | 6.95 | 51 | 0.55 | 282 | 90.8 | 11.29 | 0.007 |
| | | 11:46:30 | 0.61 | 6.89 | 51 | 0.97 | 131 | 90.8 | 11.27 | 0.0073 |
| | | 11:46:31 | 0.6 | 6.89 | 51 | 0.96 | 134 | 90.8 | 11.27 | 0.0073 |
| | | 11:46:32 | 0.6 | 6.89 | 51 | 0.96 | 134 | 90.8 | 11.27 | 0.0073 |
| | | 11:47:27 | 0.59 | 6.84 | 51 | 2.07 | 64 | 90.6 | 11.26 | 0.0077 |
| | | 11:47:28 | 0.59 | 6.85 | 51 | 2.07 | 64 | 90.6 | 11.26 | 0.0077 |
| | | 11:47:29 | 0.59 | 6.68 | 51 | 2.07 | 64 | 90.6 | 11.26 | 0.0077 |
| | | 11:48:30 | 0.58 | 6.81 | 51 | 2.98 | 36 | 90.3 | 11.22 | 0.0077 |
| | | 11:48:31 | 0.58 | 6.8 | 51 | 2.99 | 35 | 90.3 | 11.22 | 0.0077 |
| | | 11:48:32 | 0.58 | 6.8 | 51 | 2.99 | 35 | 90.3 | 11.22 | 0.0077 |
| | | 11:49:05 | 0.57 | 6.78 | 51 | 4.03 | 20 | 90.3 | 11.23 | 0.0079 |
| | | 11:49:06 | 0.57 | 6.78 | 51 | 4.02 | 20 | 90.3 | 11.22 | 0.0079 |
| | | 11:49:07 | 0.57 | 6.79 | 51 | 4.03 | 20 | 90.3 | 11.22 | 0.0079 |
| | | 11:49:44 | 0.57 | 6.77 | 51 | 5.02 | 11 | 90 | 11.19 | 0.0079 |
| | | 11:49:45 | 0.57 | 6.77 | 51 | 5.03 | 11 | 90.1 | 11.19 | 0.0079 |
| | | 11:49:46 | 0.57 | 6.77 | 51 | 5.03 | 11 | 90.1 | 11.19 | 0.0079 |
| | | 11:50:14 | 0.57 | 6.74 | 51 | 6.07 | 5 | 90 | 11.19 | 0.0079 |
| | | 11:50:15 | 0.57 | 6.74 | 51 | 6.07 | 6 | 90 | 11.19 | 0.0079 |
| | | 11:50:16 | 0.57 | 6.75 | 51 | 6.06 | 6 | 90.1 | 11.19 | 0.0079 |
| | | 11:51:17 | 0.58 | 6.73 | 51 | 6.97 | 3 | 89.9 | 11.17 | 0.0077 |
| | | 11:51:18 | 0.57 | 6.74 | 51 | 6.97 | 4 | 89.9 | 11.17 | 0.0077 |
| | | 11:51:19 | 0.57 | 6.74 | 51 | 6.97 | 4 | 89.9 | 11.17 | 0.0077 |
| | | 11:52:04 | 0.6 | 6.73 | 51 | 7.99 | 2 | 89.8 | 11.14 | 0.0079 |
| | | 11:52:05 | 0.61 | 6.72 | 51 | 7.99 | 2 | 89.8 | 11.14 | 0.0078 |
| | | 11:52:06 | 0.61 | 6.72 | 51 | 7.99 | 2 | 89.8 | 11.14 | 0.0078 |
| | | 11:52:54 | 0.62 | 6.72 | 51 | 8.97 | 1 | 89.6 | 11.11 | 0.0078 |
| | | 11:52:55 | 0.62 | 6.72 | 51 | 8.97 | 1 | 89.6 | 11.11 | 0.0078 |
| | | 11:52:56 | 0.62 | 6.71 | 51 | 8.97 | 1 | 89.6 | 11.12 | 0.0078 |
| | | 11:53:38 | 0.59 | 6.7 | 51 | 10.05 | 0 | 89.5 | 11.11 | 0.0076 |
| | | 11:53:39 | 0.59 | 6.7 | 51 | 10.05 | 1 | 89.5 | 11.11 | 0.0076 |
| | | 11:53:40 | 0.59 | 6.7 | 51 | 10.05 | 1 | 89.5 | 11.11 | 0.0076 |
| | | 11:54:10 | 0.63 | 6.7 | 51 | 11.07 | 0 | 89.2 | 11.06 | 0.0077 |
| | | 11:54:11 | 0.63 | 6.7 | 51 | 11.07 | 0 | 89.2 | 11.07 | 0.0077 |
| | | 11:54:12 | 0.63 | 6.7 | 51 | 11.07 | 0 | 89.2 | 11.07 | 0.0077 |
| | | 11:55:04 | 0.64 | 6.69 | 51 | 12.04 | 0 | 89.1 | 11.05 | 0.0079 |
| | | 11:55:05 | 0.64 | 6.69 | 51 | 12.04 | 0 | 89.1 | 11.05 | 0.0079 |
| | | 11:55:06 | 0.65 | 6.68 | 51 | 12.04 | 0 | 89.1 | 11.05 | 0.0079 |
| | | 11:55:31 | 0.65 | 6.68 | 51 | 12.95 | 0 | 89.1 | 11.05 | 0.0077 |
| | | 11:55:32 | 0.65 | 6.68 | 51 | 12.95 | 0 | 89.1 | 11.05 | 0.0078 |
| | | 11:55:33 | 0.65 | 6.68 | 51 | 12.95 | 0 | 89.2 | 11.06 | 0.0079 |
| | | 11:56:16 | 0.65 | 6.67 | 51 | 13.99 | 0 | 88.9 | 11.02 | 0.008 |
| | | 11:56:17 | 0.65 | 6.68 | 51 | 13.99 | 0 | 88.9 | 11.02 | 0.008 |
| | | 11:56:18 | 0.66 | 6.68 | 51 | 13.99 | 0 | 88.9 | 11.02 | 0.008 |
| | | 11:56:42 | 0.66 | 6.67 | 51 | 15 | 0 | 88.7 | 10.99 | 0.0075 |
| | | 11:56:43 | 0.66 | 6.67 | 51 | 15 | 0 | 88.7 | 10.99 | 0.0075 |
| | | 11:56:44 | 0.66 | 6.67 | 51 | 15 | 0 | 88.7 | 10.99 | 0.0077 |
| | | 11:57:22 | 0.67 | 6.67 | 51 | 16.02 | 0 | 88.7 | 10.99 | 0.0082 |
| | | 11:57:23 | 0.67 | 6.67 | 51 | 16.02 | 0 | 88.7 | 10.99 | 0.0082 |
| | | 11:57:24 | 0.67 | 6.67 | 51 | 16.02 | 0 | 88.7 | 10.99 | 0.0083 |
| | | 11:58:12 | 0.67 | 6.67 | 51 | 17 | 1 | 88.5 | 10.97 | 0.008 |
| | | 11:58:13 | 0.67 | 6.67 | 51 | 17 | 1 | 88.5 | 10.97 | 0.008 |
| | | 11:58:14 | 0.66 | 6.67 | 51 | 17 | 0 | 88.5 | 10.97 | 0.008 |
| | | 11:58:38 | 0.66 | 6.64 | 51 | 17.96 | 0 | 88.5 | 10.97 | 0.0079 |
| | | 11:58:39 | 0.66 | 6.64 | 51 | 17.96 | 0 | 88.5 | 10.97 | 0.0079 |
| | | 11:58:40 | 0.66 | 6.66 | 51 | 17.97 | 0 | 88.5 | 10.97 | 0.0079 |
| | | 11:59:13 | 0.67 | 6.65 | 51 | 18.97 | 0 | 88.3 | 10.94 | 0.0135 |
| | | 11:59:14 | 0.67 | 6.65 | 50 | 18.96 | 0 | 88.3 | 10.94 | 0.0094 |
| | | 11:59:15 | 0.67 | 6.65 | 51 | 18.96 | 0 | 88.3 | 10.94 | 0.0094 |
| | | 11:59:52 | 0.68 | 6.64 | 51 | 19.98 | 0 | 88.2 | 10.92 | 0.0084 |
| | | 11:59:53 | 0.68 | 6.64 | 51 | 19.98 | 0 | 88.2 | 10.92 | 0.0084 |
| | | 11:59:54 | 0.68 | 6.64 | 51 | 19.98 | 0 | 88.2 | 10.92 | 0.0083 |

**TABLE 3**
**Summary of Nutrient Sampling**
**2010 Annual Summary Report**
**4(e) Condition 5: Water Quality Standards and Water Quality Monitoring**

| Site Location | Sample Depth | Sample Date | Sample Time (military) | Analytical Results (µg/L) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Chlorophyll-a | Ammonia as N | Nitrate as N | Nitrite as N | Total Kjeldahl Nitrogen | Total Phosphorus | Total Dissolved Phosphorus | Ortho-phosphate as P |
| C5 | Photic Zone Composite | 11/30/2010 | 11:15 | 1.78[1] | 12 | 22 | nd[2] | 200 | 18 | 6 | nd |
| | 1m Above Bottom | | 12:00 | NA[3] | 10 | 22 | nd | 130 | 10 | nd | 4.9 |
| C6 | Photic Zone Composite | 11/29/2010 | 14:30 | 6.28[4] | nd | 23 | nd | 260 | 20 | nd | 2.8 |
| | Photic Zone Composite - R[5] | 11/30/2011 | 14:35 | 8.13[4] | 10 | 23 | nd | 210 | 18 | nd | 2.5 |
| | 1m Above Bottom | 11/30/2010 | 15:10 | NA | nd | 26 | nd | 190 | 17 | nd | 3.3 |
| SJ1 | Photic Zone Composite | 11/29/2010 | 12:30 | 0.34[1] | 40 | 34 | nd | 140 | 14 | 10 | 3.7 |
| | 1m Above Bottom | | 13:10 | NA | 20 | 44 | nd | 130 | 15 | nd | 3.7 |
| **Minimum Reporting Limit (µg/L)** | | | | 0.1 | 10 | 10 | 10 | 50 | 5 | 5 | 2 |

**Notes:**
(1) 1.78 = Analyzed using the Spokane Tribal Labororatory Method SM10200H (Spectrophotometric).
(2) nd = Analyte not detected above minimum reporting limit.
(3) NA = Not analyzed.
(4) 6.28 = Anyalzed using EPA Manchester Laboratory Method SM10200H (Flourometric).
(5) R = Replicate sample taken from churn splitter.

**TABLE 4**
**Phytoplankton Results**
**2010 Annual Summary Report**
**4(e) Condition 5: Water Quality Standards and Water Quality Monitoring**

| Site Location | Sample Date | Code | Group | Genus/species (type) | Cell Counts (units/ml) | Biovolume (mm3/L) |
|---|---|---|---|---|---|---|
| C5 | 11/30/2010 | ABDI | Blue-greens | Chroococcus sp. (cells) | 48.78 | 0.0061 |
| | | AHNI | Blue-greens | Synechococcus sp. (coccoid) | 1780.57 | 0.0071 |
| | | AHOI | Blue-greens | Synechococcus sp. (rod) | 439.04 | 0.0018 |
| | | AHPI | Blue-greens | Synechocystis | 195.13 | 0.0016 |
| | | AAJI | Greens/Desmids | Ankistrodesmus sp. | 73.17 | 0.0059 |
| | | AFBI | Greens/Desmids | Monomastix sp. | 24.39 | 0.003 |
| | | AFJI | Greens/Desmids | Nephroselmis | 48.78 | 0.0051 |
| | | AABI | Diatoms | Achnanthidium sp. | 24.39 | 0.002 |
| | | AAQI | Diatoms | Aulacoseira italica | 1634.22 | 0.2451 |
| | | ACDI | Diatoms | Cyclotella comta | 219.52 | 0.0768 |
| | | ACII | Diatoms | Cymbella sp. (medium) | 24.39 | 0.0061 |
| | | AFEI | Diatoms | Navicula sp. (medium) | 48.78 | 0.0244 |
| | | AFMI | Diatoms | Nitzschia sp. (small) | 24.39 | 0.002 |
| | | AEBI | Dinoflagellates | Gymnodinium sp. (medium) | 24.39 | 0.0098 |
| | | ABHI | Chryso & Cryptohyte | Chrysococcus | 73.17 | 0.0055 |
| | | ABZI | Chryso & Cryptohyte | Cryptomonas sp. (large) | 48.78 | 0.0171 |
| | | ACAI | Chryso & Cryptohyte | Cryptomonas sp. (medium) | 146.35 | 0.0256 |
| | | ACRI | Chryso & Cryptohyte | Dinobryon sp. (medium) | 146.35 | 0.0176 |
| | | AENI | Chryso & Cryptohyte | Chroomonas acuta | 146.35 | 0.0073 |
| | | AGZI | Chryso & Cryptohyte | Small microflagellates | 1951.3 | 0.0098 |
| | | AIBI | Chryso & Cryptohyte | Trachelomonas sp. | 48.78 | 0.0073 |
| C6 | 11/29/2010 | ABDI | Blue-greens | Chroococcus sp. (cells) | 97.57 | 0.0122 |
| | | AHNI | Blue-greens | Synechococcus sp. (coccoid) | 1926.91 | 0.0077 |
| | | AHOI | Blue-greens | Synechococcus sp. (rod) | 195.13 | 0.0008 |
| | | AHPI | Blue-greens | Synechocystis | 170.74 | 0.0014 |
| | | AAJI | Greens/Desmids | Ankistrodesmus sp. | 48.78 | 0.0039 |
| | | ACVI | Greens/Desmids | Elakatothrix sp. | 24.39 | 0.0037 |
| | | AFBI | Greens/Desmids | Monomastix sp. | 48.78 | 0.0061 |
| | | AFCI | Greens/Desmids | Monoraphidium | 121.96 | 0.0244 |
| | | AFJI | Greens/Desmids | Nephroselmis | 97.57 | 0.0101 |
| | | AAOI | Diatoms | Asterionella formosa | 195.13 | 0.0195 |
| | | AAQI | Diatoms | Aulacoseira italica | 3317.22 | 0.4976 |
| | | ACDI | Diatoms | Cyclotella comta | 2122.04 | 0.7427 |
| | | ADVI | Diatoms | Gomphonema sp. (medium) | 24.39 | 0.0122 |
| | | AFKI | Diatoms | Nitzschia sp. (large) | 24.39 | 0.0098 |
| | | AFLI | Diatoms | Nitzschia sp. (medium) | 170.74 | 0.0341 |
| | | AFMI | Diatoms | Nitzschia sp. (small) | 48.78 | 0.0039 |
| | | AHJI | Diatoms | Stephanodiscus sp. (large) | 48.78 | 0.0488 |
| | | AEBI | Dinoflagellates | Gymnodinium sp. (medium) | 48.78 | 0.0195 |
| | | ABZI | Chryso & Cryptohyte | Cryptomonas sp. (large) | 24.39 | 0.0085 |
| | | ACAI | Chryso & Cryptohyte | Cryptomonas sp. (medium) | 268.3 | 0.047 |
| | | ACBI | Chryso & Cryptohyte | Cryptomonas sp. (small) | 48.78 | 0.0049 |
| | | ACRI | Chryso & Cryptohyte | Dinobryon sp. (medium) | 170.74 | 0.0205 |
| | | AEJI | Chryso & Cryptohyte | Kephyrion sp. | 97.57 | 0.0049 |
| | | AENI | Chryso & Cryptohyte | Chroomonas acuta | 195.13 | 0.0098 |
| | | AEOI | Chryso & Cryptohyte | Komma sp. | 97.57 | 0.0098 |
| | | AFNI | Chryso & Cryptohyte | Ochromonas sp. | 73.17 | 0.011 |
| | | AGZI | Chryso & Cryptohyte | Small microflagellates | 3390.39 | 0.017 |
| | | AIBI | Chryso & Cryptohyte | Trachelomonas sp. | 73.17 | 0.011 |

**TABLE 4**
**Phytoplankton Results**
**2010 Annual Summary Report**
**4(e) Condition 5: Water Quality Standards and Water Quality Monitoring**

| Site Location | Sample Date | Code | Group | Genus/species (type) | Cell Counts (units/ml) | Biovolume (mm3/L) |
|---|---|---|---|---|---|---|
| C6 (DUP) | 11/29/2010 | AAHI | Blue-greens | Anabaena sp. | 439.04 | 0.022 |
| | | ABDI | Blue-greens | Chroococcus sp. (cells) | 243.91 | 0.0305 |
| | | AHNI | Blue-greens | Synechococcus sp. (coccoid) | 2170.83 | 0.0087 |
| | | AHOI | Blue-greens | Synechococcus sp. (rod) | 121.96 | 0.0005 |
| | | AHPI | Blue-greens | Synechocystis | 243.91 | 0.002 |
| | | AAJI | Greens/Desmids | Ankistrodesmus sp. | 243.91 | 0.0195 |
| | | AFBI | Greens/Desmids | Monomastix sp. | 24.39 | 0.003 |
| | | AFCI | Greens/Desmids | Monoraphidium | 121.96 | 0.0244 |
| | | AFJI | Greens/Desmids | Nephroselmis | 48.78 | 0.0051 |
| | | AGXC | Greens/Desmids | Scenedesmus sp. | 24.39 | 0.0015 |
| | | AAPI | Diatoms | Aulacoseira granulata | 48.78 | 0.0098 |
| | | AAQI | Diatoms | Aulacoseira italica | 2463.52 | 0.3695 |
| | | ACDI | Diatoms | Cyclotella comta | 2195.22 | 0.7683 |
| | | ACII | Diatoms | Cymbella sp. (medium) | 24.39 | 0.0061 |
| | | ADHI | Diatoms | Fragilaria crotonensis | 146.35 | 0.0102 |
| | | ADVI | Diatoms | Gomphonema sp. (medium) | 24.39 | 0.0122 |
| | | AFEI | Diatoms | Navicula sp. (medium) | 24.39 | 0.0122 |
| | | AFFI | Diatoms | Navicula sp. (small) | 24.39 | 0.0037 |
| | | AFKI | Diatoms | Nitzschia sp. (large) | 24.39 | 0.0098 |
| | | AFLI | Diatoms | Nitzschia sp. (medium) | 146.35 | 0.0293 |
| | | AFMI | Diatoms | Nitzschia sp. (small) | 24.39 | 0.002 |
| | | AEBI | Dinoflagellates | Gymnodinium (medium) | 48.78 | 0.0195 |
| | | ABHI | Chryso & Cryptohyte | Chrysococcus | 73.17 | 0.0055 |
| | | ABZI | Chryso & Cryptohyte | Cryptomonas sp. (large) | 121.96 | 0.0427 |
| | | ACAI | Chryso & Cryptohyte | Cryptomonas sp. (medium) | 487.83 | 0.0854 |
| | | AEJI | Chryso & Cryptohyte | Kephyrion | 48.78 | 0.0024 |
| | | AENI | Chryso & Cryptohyte | Chroomonas acuta | 170.74 | 0.0085 |
| | | AEOI | Chryso & Cryptohyte | Komma sp. | 48.78 | 0.0049 |
| | | AFNI | Chryso & Cryptohyte | Ochromonas sp. | 97.57 | 0.0146 |
| | | AGZI | Chryso & Cryptohyte | Small microflagellates | 4805.09 | 0.024 |
| | | AIBI | Chryso & Cryptohyte | Trachelomonas sp. | 97.57 | 0.0146 |
| SJ1 | 11/29/2010 | ABDI | Blue-greens | Chroococcus sp. (cells) | 97.57 | 0.0122 |
| | | AGKI | Blue-greens | Planktothrix sp. | 146.35 | 0.0022 |
| | | AHNI | Blue-greens | Synechococcus sp. (coccoid) | 1536.65 | 0.0061 |
| | | AHOI | Blue-greens | Synechococcus sp. (rod) | 219.52 | 0.0009 |
| | | AAJI | Greens/Desmids | Ankistrodesmus sp. | 24.39 | 0.002 |
| | | AABI | Diatoms | Achnanthidium sp. | 73.17 | 0.0059 |
| | | ABSI | Diatoms | Cocconeis sp. | 24.39 | 0.0049 |
| | | ADFI | Diatoms | Fragilaria capucina | 73.17 | 0.0055 |
| | | ADUI | Diatoms | Gomphonema sp. (large) | 24.39 | 0.0183 |
| | | ADVI | Diatoms | Gomphonema sp. (medium) | 24.39 | 0.0122 |
| | | AFEI | Diatoms | Navicula sp. (medium) | 48.78 | 0.0244 |
| | | AFLI | Diatoms | Nitzschia sp. (medium) | 24.39 | 0.0049 |
| | | AENI | Chryso & Cryptohyte | Chroomonas acuta | 73.17 | 0.0037 |
| | | AEOI | Chryso & Cryptohyte | Komma sp. | 24.39 | 0.0024 |
| | | AFNI | Chryso & Cryptohyte | Ochromonas sp. | 48.78 | 0.0073 |
| | | AGZI | Chryso & Cryptohyte | Small microflagellates | 1853.74 | 0.0093 |

**TABLE 5**
**Summary of Laboratory and Sample Replicate QA/QC**
**2010 Annual Summary Report**
**4(e) Condition 5: Water Quality Stadards and Water Quality Monitoring**

| Analyte | Laboratory QA/QC | | | C6 Photic Zone Replicate |
|---|---|---|---|---|
| | Minimum Reporting Limit (µg/L) | Laboratory Blank (µg/L) | Sample Matrix Spike Recovery (%) | Replicate %RPD |
| Total Phosphorus | 5 | <5 | 110% | 0.0% |
| Total Dissolved Phosphorus | 5 | <5 | 105% | NA[2] |
| Ortho-Phosphate as P | 2 | <2 | 105% | NA |
| Total Kjeldahl Nitrogen | 50 | <50 | 106% | 17.2% |
| Nitrate | 10 | <10 | 98% | 8.0% |
| Nitrite | 10 | <10 | 92% | NA |
| Chlorophyll *a* [1] | 1 | <1 | 92% | 25.7% |

Notes:
(1) EPA Manchester Lab
(2) One or both samples were below MRL, unable to calculate % RPD.

# APPENDIX A

## Field Notes

**APPENDIX A**

**Field Notes**

**2010 Annual Summary Report**

**4(e) Condition 5: Water Quality Standards and Water Quality Monitoring**

| Site Code | Sample Date | Hydrolab Start Time (military) | Photic Zone Depth(m) | Photic Zone Composite Sample Depths(m) | | | | | Photic Zone Sample Time (military) | 1 M Above Bottom Depth (m) | 1 M Above Bottom Sample Time (military) | Field or Sample Replicate | Depth of Replicate | Field or Sample Replicate Sample Time (military) | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Depth 1 | Depth 2 | Depth 3 | Depth 4 | Depth 5 | | | | | | | |
| C5 | 11/30/2010 | 1048 | 9.00 | 1.00 | 3.00 | 5.00 | 7.00 | 9.00 | 1115 | 15.0 | 1200 | None | no replicate | na | BP=671, D.O. calibrated, lake bottom= 16.46, weather: air temp 30 degrees F, 10mph SE wind, moderate snow, overcast, falling BP. Deck Cell PAR at 1045 hrs. = 247.8 (µE/s/m²) |
| SJ1 | 11/29/2010 | 1144 | 7.00 | 1.00 | 2.50 | 4.00 | 5.50 | 7.00 | 1230 | 19.0 | 1310 | None | no replicate | na | BP = 690, D.O. calibrated, broken ice at surface, weather: air temp 25 degrees F, overcast SE winds 2 to 5mph. Deck Cell PAR at 1140 hrs. = 377.9 (µE/s/m²) |
| C6 | 11/29/2010 | 1409 | 6.00 | 1.00 | 2.25 | 3.50 | 4.75 | 6.00 | 1430 | 9.0 | 1510 | Sample replicate | Photic zone | 1435 | Weather same as SJ1, no ice near sample site. Deck Cell PAR at 1410 hrs. = 202.3 (µE/s/m²) |
| RL1 | na | na | na | na | na | na | na | na | na | na | na | na | na | na | RL1 was completely ice covered and was not safe to sample on foot, no samples taken. |
| BL1 | na | na | na | na | na | na | na | na | na | na | na | na | na | na | BL1 was completely ice covered and was not safe to sample on foot, no samples taken. |

# APPENDIX B

## Correspondence with Interior

March 1, 2011

Stanley M. Speaks, Regional Director
Bureau of Indian Affairs
911 NE 11th Avenue, Suite 2
Portland, OR 97232

**Subject: Spokane River Hydroelectric Project, FERC Project No. 2545**
**Submittal of the Coeur d'Alene Indian Reservation 2010 Water Quality Annual Summary Report**

Dear Mr. Speaks:

On June 18, 2009 the Federal Energy Regulatory Commission (FERC) issued a new license for the Spokane River Hydroelectric Project, FERC Project No. 2545-091 (License). Ordering Paragraph G of the License incorporated the U.S. Department of Interior's January 27, 2009 Federal Power Act 4(e) Conditions as Appendix D. Appendix D, Condition No. 5 requires Avista to complete a Coeur d'Alene Indian Reservation Water Quality Monitoring Plan (WQMP), in collaboration with the Coeur d'Alene Tribe (Tribe), within one year of License issuance (June 18, 2010).

During 2010, Avista and the Tribe worked collaboratively to develop the WQMP and submitted it to Interior on March 26, 2010 for review and approval. After completing Interior's recommended revisions, Interior approved the WQMP on June 17, 2010. FERC subsequently approved the WQMP on October 15, 2010. Upon FERC's approval, Avista and the Tribe began implementing the WQMP. The enclosed Water Quality Annual Summary Report summarizes the work that was completed in 2010. Avista is required to submit the summary to Interior by March 1st and to FERC by April 1st on an annual basis.

If you have any questions regarding the Water Quality Annual Summary Report, feel free to call me at (509) 495-4998 or Meghan Lunney at (509) 495-4643.

Sincerely,

Speed Fitzhugh

Elvin "Speed" Fitzhugh
Spokane River License Manager

Enclosure

cc: Bob Dach, BIA Portland
Phillip Cernera, Coeur d'Alene Tribe
Scott Fields, Coeur d'Alene Tribe

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## Barbour, Tori (Victoria)

**From:** Fitzhugh, Speed (Elvin)
**Sent:** Monday, March 28, 2011 4:56 PM
**To:** Dach, Robert
**Cc:** Phil Cernera; Scott Fields; Lunney, Meghan; Armes, David; Dave Lamb; Goloborodko, Yelena; Drake, Michele
**Subject:** RE: Coeur d'Alene Reservation 2010 Annual Water Quality and Aquatic Weed Summary Reports

Bob,
Per our telephone conversation we will revise the reporting sections in both the Aquatic Weed Management Plan and the Water Quality Monitoring Plan to include the March 1st and April 1st Annual Summary Report filing dates.
Thanks,
Speed

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**From:** Fitzhugh, Speed (Elvin)
**Sent:** Monday, March 28, 2011 8:24 AM
**To:** 'Dach, Robert'
**Cc:** Phil Cernera; Scott Fields; Lunney, Meghan; Armes, David; Dave Lamb; Goloborodko, Yelena; Drake, Michele
**Subject:** RE: Coeur d'Alene Reservation 2010 Annual Water Quality and Aquatic Weed Summary Reports

Bob,
I hope this is what you are looking for. It is in Section III on page 2 of the AIR, as indicated below.
Thanks,
Speed

**Page 2 of 2010 AIR**
"III. Annual Summary Report
The Water Quality Standards and Water Quality Monitoring Condition (Condition No. 5) and the Coeur d'Alene Reservation Aquatic Weed Management Condition (Condition No. 7) include Annual Summary Reports (ASR) in addition to the AIRs. The ASRs are necessary because the results of the previous year's work and recommendations for the upcoming year are not available when the AIRs are prepared and submitted to Interior and FERC for review and approval. The ASRs will be submitted to Interior by of each year, subsequent to the completion of each field season, and will be referenced in the AIRs as appropriate."

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**From:** Dach, Robert [mailto:Robert.Dach@bia.gov]
**Sent:** Monday, March 28, 2011 8:16 AM
**To:** Fitzhugh, Speed (Elvin)
**Cc:** Phil Cernera; Scott Fields; Lunney, Meghan; Armes, David; Dave Lamb; Goloborodko, Yelena; michelle.arthur@landandwater.net
**Subject:** RE: Coeur d'Alene Reservation 2010 Annual Water Quality and Aquatic Weed Summary Reports

Thanks Speed, that all makes sense. Can you point me to the requirement in the plans that makes this clear? I can't for the life of me find these dates or this process.

Bob Dach
Hydropower Program Manager
Bureau of Indian Affairs
911 NE 11th Ave.
Portland, OR 97232

503-231-6711

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**From:** Fitzhugh, Speed (Elvin) [mailto:Speed.Fitzhugh@avistacorp.com]
**Sent:** Friday, March 25, 2011 9:22 AM
**To:** Dach, Robert
**Cc:** Phil Cernera; Scott Fields; Lunney, Meghan; Armes, David; Dave Lamb; Goloborodko, Yelena; michelle.arthur@landandwater.net
**Subject:** Coeur d'Alene Reservation 2010 Annual Water Quality and Aquatic Weed Summary Reports
**Importance:** High

Bob,

We indicated in both the Water Quality Monitoring Plan and Aquatic Weed Management Plan that an Annual Summary Report (ASR) would be submitted in each year's subsequent Annual Implementation Report (AIR). However, in the second bullet of your response to the October 15, 2010 AIR, you asked if the ASRs could be provided earlier than the subsequent year's AIR submittal. This made complete sense to us, so we revised the AIR, in both the Water Quality and Aquatic Weed sections, to indicate that we would submit an ASR for both resources to Interior by March 1, and to FERC by April 1. That way, you would be able to see the results of the previous year's sampling events well before the next AIR is sent out in October.

All of the proposed activities in the AIRs match those in the ASRs, so it was unnecessary to modify anything that was approved in the AIR.

In regard to your other recommendations, we will incorporate them in the next ASR's when we submit them in March, 2012.

My understanding is the same as yours, in regard to your questions pertaining to aquatic weeds. That is, our goal was to reduce the originally surveyed 1,000 acres by 90% and maintain them at less than 100 acres for the license term. That being said, it could be a challenge to meet the goal, especially if we find more large infestations in the future. The goal with the work that will be completed this year is to determine if there are more efficient ways to control milfoil than the methods employed in the past. While the efficacy's of the herbicide were good last year, we feel they could be even better if we had a more thorough understanding of water movement throughout the system.

I hope this answers your questions, if not please feel free to call me and we can discuss them further.

Thanks a lot,

Speed

Elvin "Speed" Fitzhugh
Spokane River License Manager
Avista Utilities
(509)495-4998

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**From:** Dach, Robert [mailto:Robert.Dach@bia.gov]
**Sent:** Thursday, March 17, 2011 3:39 PM
**To:** Fitzhugh, Speed (Elvin)
**Cc:** Phil Cernera; Lunney, Meghan; Drake, Michele; Barbour, Tori (Victoria); Scott Fields; Dave Lamb
**Subject:** RE: Coeur d'Alene Reservation 2010 Annual Water Quality and Aquatic Weed Summary Reports

HI Speed,

The Aquatic Weed report also looks good and I have no comments warranting a change to the Summary Report. Similar to the Water Quality report, however, I could not find the requirement to provide the summary to us by March 1 clearly articulated in the Plan, so if you can point it out or clear up the issue for me that would be great.

My one comment on the Summary Report has to do with the discovery of an additional 432 acres of milfoil. I believe the way the objectives are structured, the goal is to reduce the total affected acres to 100 within 10 years and then maintain that area at less than 100 acres for the license term. Is that how you read it? Additional acres discovered would seem to be irrelevant with respect to these goals (it's a little confusing because goal (1) says reduce 1,000 acres by 90% within 10 years, but goal (2) says maintain at less than 100 acres for the license term). It is important to note additional acres discovered, I was just wondering how that affected goal (1) and whether the intent was to have less than 100 acres affected by the 10-year mark (regardless of how many additional acres may appear over the next 10 years).

Thanks!

Bob Dach
Hydropower Program Manager
Bureau of Indian Affairs
911 NE 11th Ave.
Portland, OR 97232

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**From:** Fitzhugh, Speed (Elvin) [mailto:Speed.Fitzhugh@avistacorp.com]
**Sent:** Tuesday, March 01, 2011 3:44 PM
**To:** Dach, Robert
**Cc:** Phil Cernera; Lunney, Meghan; Drake, Michele; Barbour, Tori (Victoria); Scott Fields; Dave Lamb
**Subject:** Coeur d'Alene Reservation 2010 Annual Water Quality and Aquatic Weed Summary Reports
**Importance:** High

<<Cover Lttr & 2010 WQ Annual Summary Report_2-28-11.pdf>> <<Cover Lttr & 2010 Aquatic Weed Annual Summary Report_2-28-11.pdf>>

Bob,

I've attached the Coeur d'Alene Reservation 2010 Water Quality Annual Summary Report and the 2010 Aquatic Weed Annual Summary Report for your records. Avista is required to submit both reports to Interior by March 1st and to FERC by April 1st on an annual basis. We have placed paper copies in the mail to Stanley Speaks, BIA's Regional Director, as well.

Please feel free to give me a call if you have any questions or wish to discuss the activities that Avista and the Coeur d'Alene Tribe conducted last year.

Thanks,

Speed

Elvin "Speed" Fitzhugh

Spokane River License Manager

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(509)495-4998

## Barbour, Tori (Victoria)

**From:** Dach, Robert [Robert.Dach@bia.gov]
**Sent:** Thursday, March 17, 2011 12:38 PM
**To:** Fitzhugh, Speed (Elvin)
**Cc:** Phil Cernera; Lunney, Meghan; Drake, Michele; Barbour, Tori (Victoria); Scott Fields; Dave Lamb
**Subject:** RE: Coeur d'Alene Reservation 2010 Annual Water Quality and Aquatic Weed Summary Reports

Hi Speed,

I'm in the process of reviewing both reports, following are comments on the Water Quality report.

In general, I remember the whole discussion of why the summary reports were necessary, but I can't for the life of me find the requirement to submit to BIA by March 1 annually. Under Section 4 of the Plan (Reporting) It just says you'll seek additional approval from the Secretary at least 60 days prior to the next field season "if substantive modifications to any measure approved by the Secretary in the prior year's AIR are necessary…" I didn't see in the report that you were seeking any substantive modifications to what was approved by the Secretary in the last AIR. Can you clarify for me?

Regarding the report itself – it looked pretty good and I don't need any changes for this year. However, in the future, a table similar to Table 2 in the Plan, with two additional columns would be great. The two additional columns would be titled "Sampling Completed as Programmed" or something there about with a simple 'yes' or 'no' indicated for each parameter (you could explain any 'no' entries in text following the table). The second column would be "Within Tribal Water Quality Standards" with the same 'yes' 'no' approach (or 'NA' if there is no particular standard for that measurement).

In Section 3 of the report, it wasn't stated whether temperature was within Tribal standards, and I couldn't tell what the tribal standards were for the other reporting parameters.

There should be a section in the report titled "Proposed Changes from Prior year AIR" if there were none, simply state that. If you were requesting some changes, then it would be clear to me. There should also be a section titled "Tribal Concerns." This would help identify any issues that may have come up that are worth noting to the BIA. Then we can have a track record of issues over the years.

So generally, everything looks OK – assuming that I'm not missing some big change hidden in the fine print! If you can clarify the need/requirement for the report again – that would be great. Just don't want folks writing reports if they don't need to. (Apparently I have a little mad cow disease!)

Bob Dach
Hydropower Program Manager
Bureau of Indian Affairs
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Portland, OR 97232

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**Sent:** Tuesday, March 01, 2011 3:44 PM
**To:** Dach, Robert
**Cc:** Phil Cernera; Lunney, Meghan; Drake, Michele; Barbour, Tori (Victoria); Scott Fields; Dave Lamb

**Subject:** Coeur d'Alene Reservation 2010 Annual Water Quality and Aquatic Weed Summary Reports
**Importance:** High

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Thanks,

Speed

Elvin "Speed" Fitzhugh

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