



Upper Peninsula Power Company

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January 22, 2014

FERC Project No. 10855

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

Dear Secretary Bose:

Dead River Hydroelectric Project – 2013 Water Quality Monitoring Report

Per the Order Modifying and Approving Water Quality Monitoring Plan under Article 408, dated April 17, 2003, and the Order Approving Modification to Approved Water Quality Monitoring Plan under Article 408, dated March 3, 2005, Upper Peninsula Power Company (UPPCO) is pleased to submit water quality monitoring data collected at the Dead River Hydroelectric Project.

During the 2013 monitoring period, water quality monitoring was conducted at the following locations:

- In the Dead River where County Road AAO crosses the Dead River (SE ¼ of the NE ¼, Section 22, T49N, R28W, Township of Champion).
- Downstream of the Hoist Powerhouse in the natural river channel (SE ¼ of the NE ¼, Section 16, T48N, R26W, Township of Negaunee).
- Downstream of the McClure Dam in the Dead River, east of where the LS&I railroad crosses the Dead River (NW ¼ of the SW ¼, Section 13, T48N, R26W, Township of Negaunee).
- In the tailrace of the McClure Powerhouse, upstream of the confluence of the tailrace and the Forestville Basin (SW ¼ of the NE ¼, Section 7, T48N, R25W, Township of Marquette).

Per the water quality monitoring plan, water temperature was monitored at each of the above locations on an hourly basis from May 1st through October 31st, while dissolved oxygen (D.O.) was monitored from June 1st through September 30th. Monitoring data for each location can be found in Appendix A. In addition to the hourly monitoring, D.O. and temperature profiles were taken at the intake structures of the Dead River Storage Basin and the McClure Storage Basin powerhouses

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every two weeks during the months of June through September. Dissolved oxygen and temperature profile data can be found in Appendix B. Equipment quality assurance data can be found in Appendix C.

Please note that the D.O. water quality monitoring equipment has an accuracy of +/- 0.1 mg/l, per the manufacturer. The water quality monitoring equipment was cleaned and calibrated every other week during the monitoring period. Equipment calibration information was used to determine calibration drift that occurred since the previous calibration event. In the event that the meter calibration had drifted by more than 0.1 mg/l between calibration events, the raw monitoring data is corrected assuming a linear degradation of calibration. Therefore, dissolved oxygen concentrations less than 6.9 mg/l are potential deviations from the water quality standard.

AAO Bridge Monitoring Location

At the County Road AAO monitoring location, no deviations from the D.O. or temperature water quality standards were observed during the monitoring season. 2013 was the first season of operational testing of Silver Lake. UPPCO was able to maintain reservoir elevation above start of month target elevations throughout the monitoring season. Minimum flow was being released from Silver Lake between June 15 and August 12th, with higher release flows for the remainder of the monitoring season. Additional flow from Silver Lake was not required to maintain reservoir elevation in the Dead River Storage Basin. In 2012, intermittent D.O. deviations were observed between July 1st and September 6th. In 2013, no deviations were observed. In general, water levels were higher in Silver Lake, while in stream temperatures were lower in 2013 compared to 2012. This likely contributed to attaining the D.O. and temperature water quality standards at this location. For your reference, the following table contains the observed monthly average water temperature at this location during the monitoring season for calendar years 2012 and 2013.

Table 1 – Monthly Average Water Temps @ C.R. AAO monitoring location

	2012	2013
May	57.7 °F	41.2 °F
June	65.2 °F	60.1 °F
July	71.1 °F	65.2 °F
August	66.6 °F	63.9 °F
September	57.1 °F	61.1 °F
October	46.2 °F	49.1 °F

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Hoist Powerhouse Monitoring Location

At the Hoist powerhouse monitoring location, deviations from the D.O. water quality standard were observed in July, August, and September, while temperature deviations were observed in August and September. Dissolved oxygen levels as low as 5.6 mg/l were recorded during the month of July. The low D.O. readings observed were likely due to low DO levels in the hypolimnion of the Dead River Storage Basin. Dissolved oxygen and temperature profiles conducted at the powerhouse intake (Appendix C) showed that the reservoir was stratified in July, with D.O. levels below 4 mg/l at the bottom of the reservoir where water is withdrawn and subsequently released through the powerhouse.

In August, there was an unusual drop in DO levels from August 23rd through August 30th when D.O. levels abruptly increased to concentrations above the water quality standard. The Hoist powerhouse was off-line for maintenance work on the powerhouse intake valve between August 15th and September 6th. While the powerhouse was off-line, water was being released through a bypass valve located approximately 3 to 4 meters below the surface of the reservoir that withdraws water from the epilimnion of the reservoir. Profiles conducted at the powerhouse intake in late August and early September showed D.O. levels in the epilimnion were above the downstream water quality standard. Water quality monitoring conducted in 2007 determined that D.O. levels increase with distance from the powerhouse due to aeration in the Dead River, however; water temperature also increases with distance from the powerhouse due to atmospheric conditions. As D.O. levels in the epilimnion where water was being withdrawn were above the water quality standard and knowing that D.O. levels increase with distance from the powerhouse, the cause of the low D.O. readings is likely due to an equipment malfunction.

Between September 6th and September 17th, low D.O. readings were recorded at the monitoring location. Dissolved oxygen readings during this time period were very erratic, varying from 0 mg/l to greater than 7 mg/l over the span of an hour. The erratic readings are due to malfunction of the D.O. sensor. At the time of the malfunction started, dissolved oxygen levels were above the water quality standard of 7 mg/l. Please note that between September 3rd and September 17th, the reservoir went through the fall turnover and was no longer stratified. A D.O. and temperature profile conducted on September 17th shows that D.O. levels were above the water quality standard at all depths. Therefore it is likely that D.O. levels were above the water quality standard during the period of the equipment malfunction.

Deviations from the License monthly maximum average temperature of 68°F in August and 63°F in September occurred during the monitoring season. The average monthly water temperatures at this location were 68.7°F and 64.4°F, respectively. A significant contributing factor to the high

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average water temperature during these months was that the Hoist powerhouse was off-line from August 15th through September 6th for maintenance work on the powerhouse intake valve. For this twenty three day period, warmer water from the epilimnion was being released rather than colder water from the hypolimnion. Dissolved oxygen and temperature profiles conducted at the powerhouse intake show water temperatures in the epilimnion were over 70°F when the bypass valve was being used. As a result, deviations from the monthly temperature standard occurred.

As stated above, additional flow from Silver Lake was not required to maintain reservoir elevation in the Dead River Storage Basin, yet the facility was able to release more than minimum flow (100 cfs) for much of the summer. Compared to previous monitoring seasons, fewer D.O. deviations were observed. Aside from the low readings observed in August and September that were likely due to equipment issues, D.O. deviations were only observed in July. In general, water temperatures were lower in 2013 than in 2012, which likely contributed to the reduced occurrence of deviations from D.O. and temperature water quality standards at this location. For your reference, the following table contains the observed monthly average water temperature at this location during the monitoring season for calendar years 2012 and 2013:

Table 2 – Monthly Average Water Temps @ the Hoist Powerhouse monitoring location

	2012	2013
May	55.5 °F	41.8 °F
June	65.1 °F	58.0 °F
July	71.9 °F	66.7 °F
August	70.2 °F	68.7 °F
September	62.9 °F	64.4 °F
October	49.4 °F	54.1 °F

Downstream of the McClure Dam

Downstream of the McClure Dam at the LS&I Railroad Bridge monitoring location, there were no deviations from the dissolved oxygen or temperature standards during the monitoring season. Dissolved oxygen levels were above 8.0 mg/l all season. D.O. levels at this location are significantly higher than at the Hoist powerhouse monitoring location, while water temperature is generally lower than the temperature below the Hoist powerhouse. This is expected due to two factors. First, there is significantly more aeration of water in this stretch of river due to the elevation change from the McClure Dam to the monitoring location compared to the elevation change between the Hoist powerhouse and the downstream monitoring location. Second, the McClure Basin is generally cooler than the Dead River Storage Basin. Temperature profiles of the reservoir generally show cooler water in the McClure storage basin compared to the Dead River Storage Basin. Releasing water through a deep-water draw (located approximately 18' below the spillway crest) at the

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McClure Dam, along with groundwater seepage and springs feeding into this section of river, results in lower water temperatures downstream of the McClure Dam compared to downstream of the Hoist Powerhouse. For your reference, the following table contains the observed monthly average water temperature at this location during the monitoring season for calendar years 2012 and 2013:

Table 3: Monthly Average Water Temps Downstream of the McClure Dam

	2012	2013
May	51.6 °F	43.1 °F
June	60.4 °F	60.2 °F
July	65.7 °F	62.8 °F
August	65.4 °F	63.8 °F
September	59.2 °F	62.0 °F
October	48.8 °F	52.6 °F

Downstream of the McClure Powerhouse

Downstream of the McClure Powerhouse, there were no deviations from the dissolved oxygen or temperature standards during the monitoring season. Dissolved oxygen levels were above the water quality standard of 5.0 mg/l all season. The water temperature observed at this location was slightly lower than the temperature observed at the Hoist Powerhouse monitoring location, which is consistent with the temperature profile data. DO levels were slightly higher at this monitoring location compared to the monitoring location downstream of the Hoist Powerhouse. A comparison of D.O. and temperature data collected from the Hoist and McClure developments is included in Appendix A. For your reference, the following table contains the observed monthly average water temperature at this location during the monitoring season for calendar years 2012 and 2013:

Table 4: Monthly Average Water Temps Downstream of the McClure Powerhouse

	2012	2013
May	56.0 °F	43.4 °F
June	65.0 °F	57.8 °F
July	72.5 °F	66.7 °F
August	69.9 °F	66.9 °F
September	61.3 °F	62.7 °F
October	49.5 °F	52.5 °F

Enclosed with this report are the D.O. and temperature monitoring data from the four monitoring locations, profile monitoring data from the Hoist and McClure developments, and equipment quality assurance documentation. UPPCO provided the 2013 water quality monitoring data to the

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Michigan Department of Natural Resources (MDNR), Michigan Department of Environmental Quality (MDEQ), and the U.S. Fish and Wildlife Service (FWS) on November 21, 2013 for review and comment. Documentation of Agency Consultation can be found in Appendix D. Should you have any questions or concerns, please do not hesitate to call Mr. Mark Metcalf at (920) 433-1833.

Sincerely,

A handwritten signature in black ink, appearing to read 'Gil Snyder', with a long horizontal flourish extending to the right.

Gil Snyder
Manager – Regional Generation
for Wisconsin Public Service Corporation

MWM

Enc: 2013 Water quality monitoring report

cc: Mr. Robert Meyers, UPPCO - UISC
Ms. Dianna Klemans - MDEQ
Mr. Mitch Koetje - MDEQ
Mr. Burr Fisher - FWS
Mr. John Myers, IBS - D2
Mr. Keith Moyle, UPPCO - UISC
Mr. Virgil Schlorke, UPPCO- UISC

Mr. Shawn Puzen, IBS - D2
Ms. Joan Johanek, WPSC - D2
Mr. Gary Kohlhepp – MDEQ
Mr. Koren Carpenter – MDEQ
Mr. Kyle Kruger - MDNR
Mr. John Zygaj, FERC - CRO
Ms. Patricia Grant - FERC

Appendix A

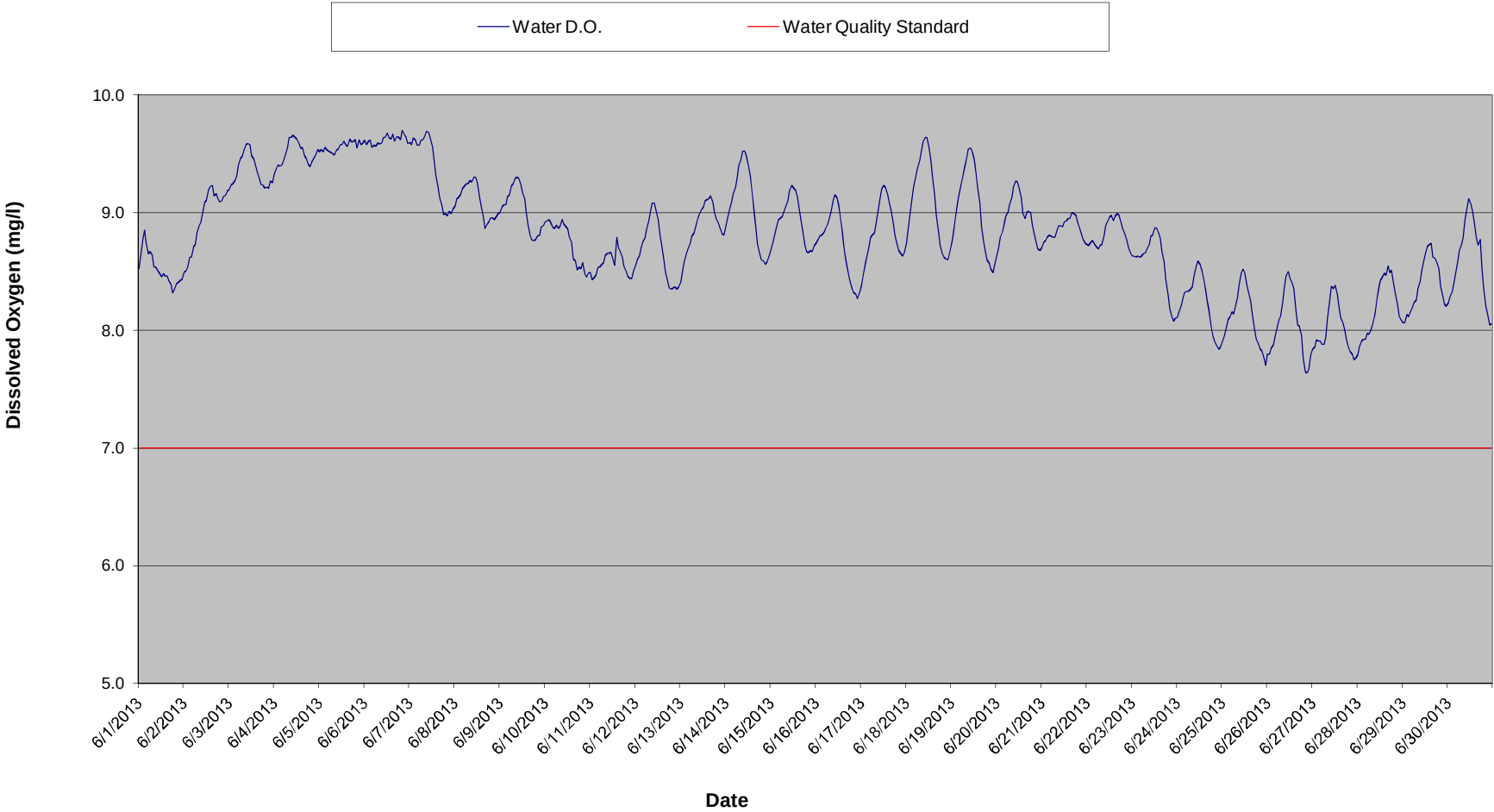
Dead River Hydroelectric Project

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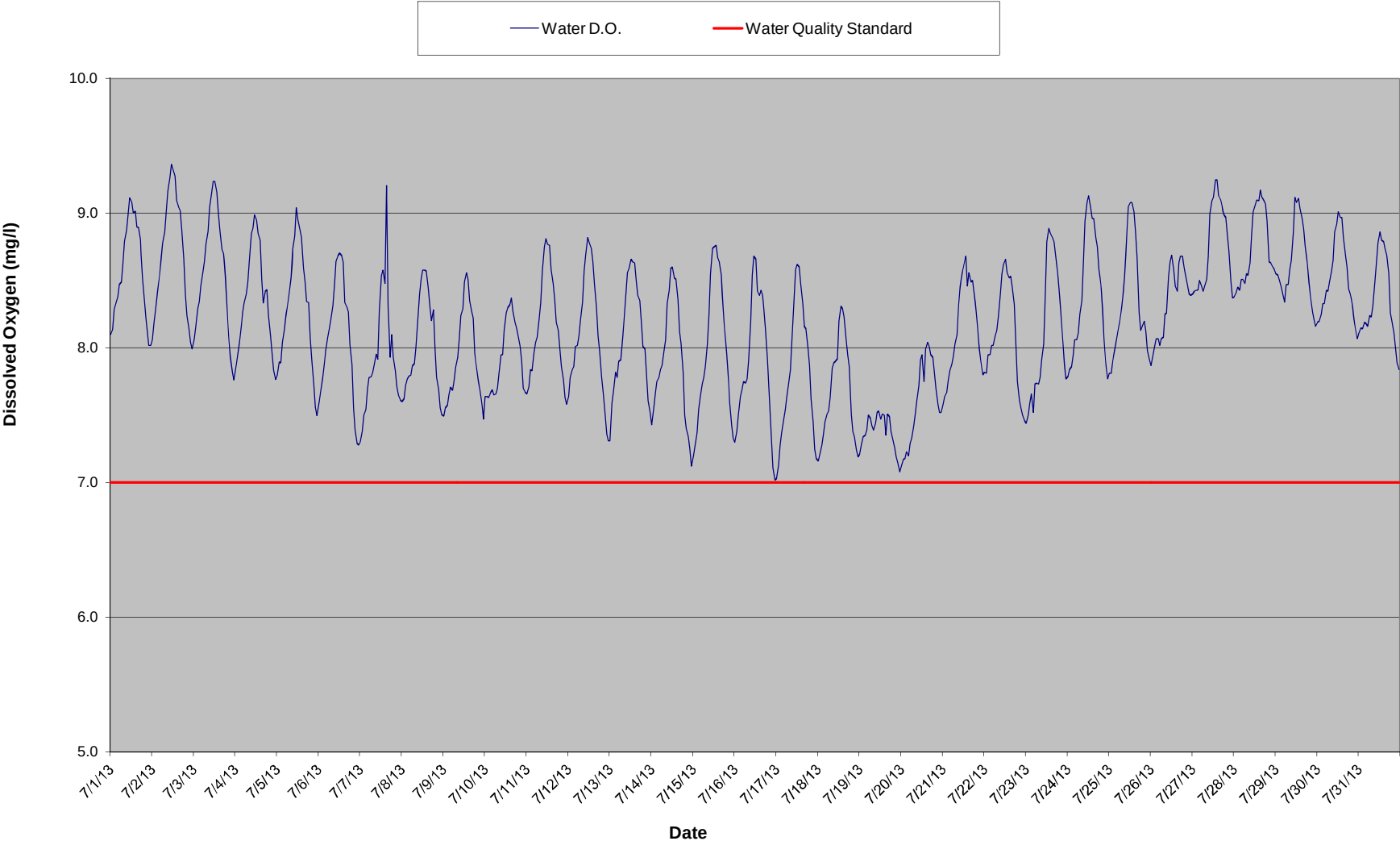
2013 Water Quality Monitoring Data

Dead River Water Quality Monitoring Data
at the
AAO Bridge Below the Silver Lake Storage Basin

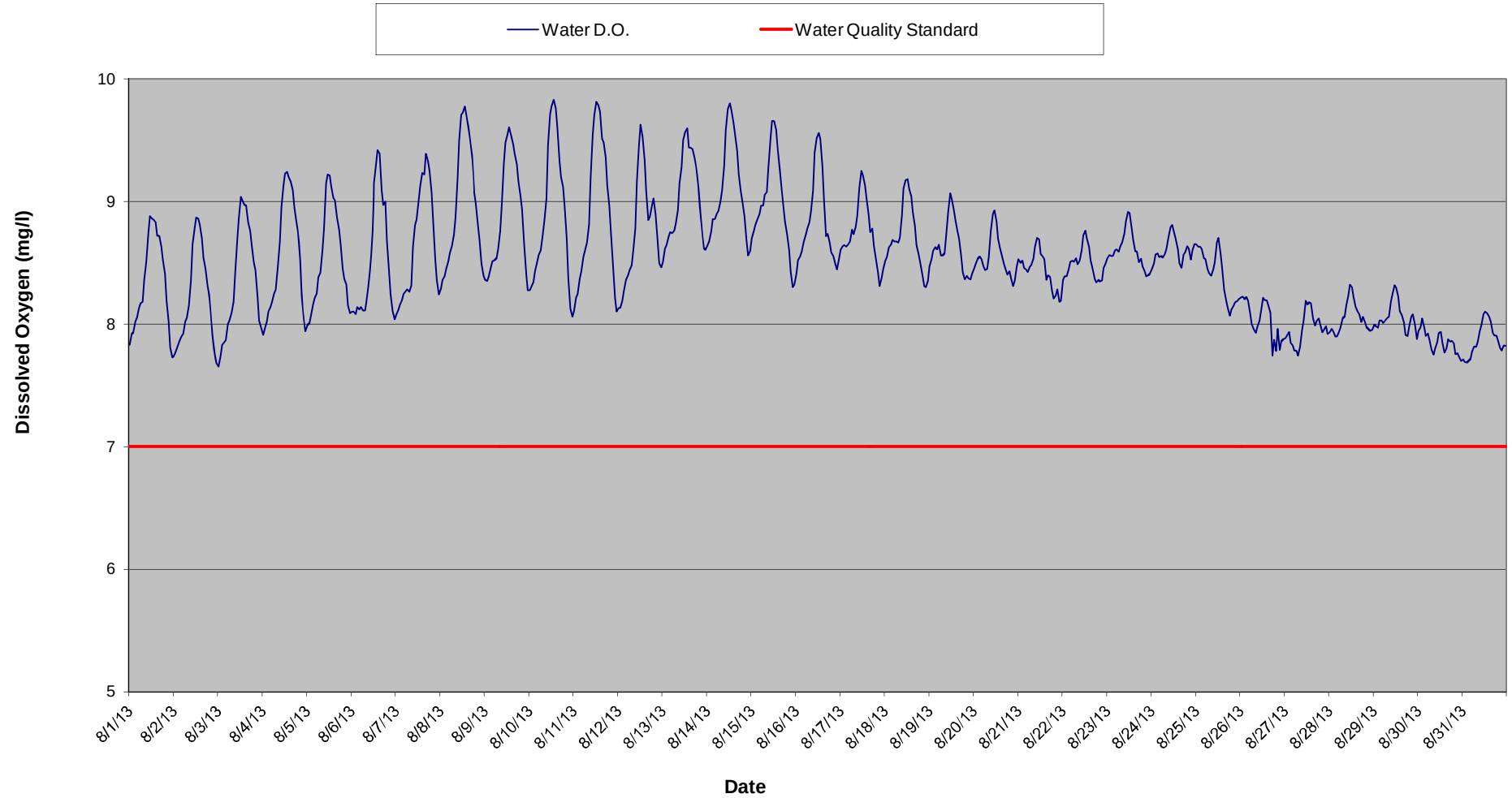
Dead River at CR AAO Bridge Dissolved Oxygen Summary - June 2013



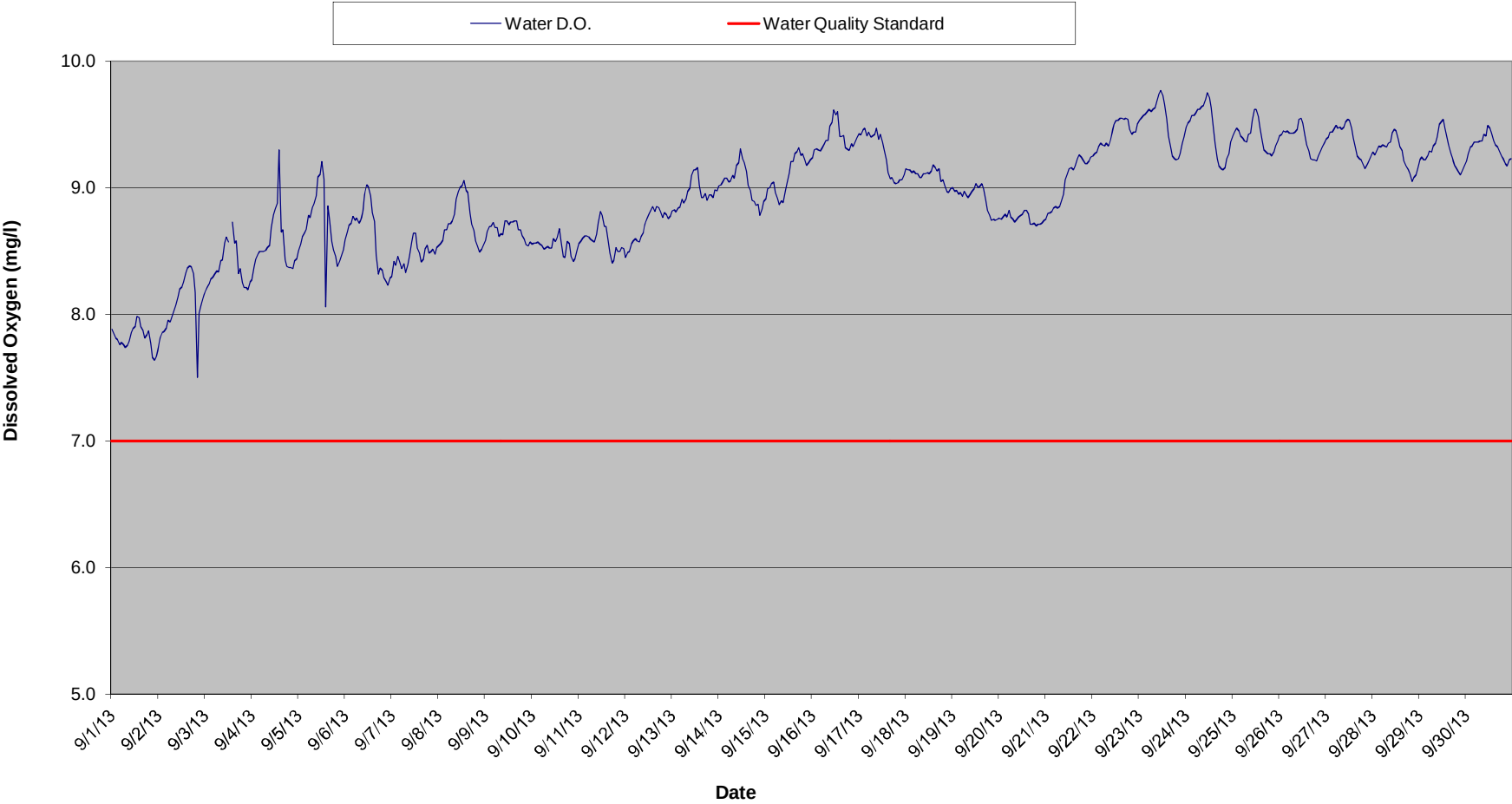
Dead River at CR AAO Bridge Dissolved Oxygen Summary - July 2013



Dead River at CR AAO Bridge Dissolved Oxygen Summary - August 2013



Dead River at CR AAO Bridge Dissolved Oxygen Summary - September 2013



Dead River at County Road AAO Bridge - June 2013 Dissolved Oxygen Summary

Time HHMMSS	06/01/13	06/02/13	06/03/13	06/04/13	06/05/13	06/06/13	06/07/13	06/08/13	06/09/13	06/10/13	06/11/13	06/12/13	06/13/13	06/14/13	06/15/13	06/16/13
0	8.5	8.5	9.2	9.3	9.5	9.6	9.6	9.1	9.0	8.9	8.5	8.6	8.4	9.0	8.8	8.8
10000	8.6	8.5	9.2	9.4	9.5	9.6	9.6	9.1	9.0	8.9	8.4	8.6	8.5	9.0	8.8	8.8
20000	8.8	8.5	9.2	9.4	9.5	9.6	9.6	9.1	9.1	8.9	8.4	8.6	8.6	9.1	8.9	8.8
30000	8.9	8.6	9.3	9.4	9.6	9.6	9.6	9.2	9.1	8.9	8.5	8.7	8.7	9.2	8.9	8.8
40000	8.7	8.6	9.3	9.4	9.5	9.6	9.6	9.2	9.1	8.9	8.5	8.8	8.7	9.2	9.0	8.9
50000	8.6	8.7	9.4	9.4	9.5	9.6	9.6	9.2	9.1	8.9	8.5	8.8	8.7	9.3	9.0	8.9
60000	8.7	8.7	9.5	9.5	9.5	9.6	9.6	9.2	9.2	8.9	8.6	8.9	8.8	9.4	9.0	9.0
70000	8.6	8.8	9.5	9.5	9.5	9.6	9.6	9.2	9.2	8.9	8.6	8.9	8.8	9.5	9.1	9.0
80000	8.5	8.9	9.5	9.6	9.5	9.6	9.7	9.3	9.3	8.9	8.6	9.0	8.9	9.5	9.1	9.1
90000	8.5	8.9	9.6	9.6	9.5	9.6	9.7	9.3	9.3	8.9	8.7	9.1	8.9	9.5	9.2	9.2
100000	8.5	9.0	9.6	9.7	9.5	9.6	9.7	9.3	9.3	8.9	8.7	9.1	9.0	9.5	9.2	9.1
110000	8.5	9.1	9.6	9.6	9.6	9.6	9.6	9.3	9.2	8.9	8.7	9.0	9.0	9.4	9.2	9.1
120000	8.5	9.1	9.5	9.6	9.6	9.7	9.6	9.3	9.2	8.9	8.6	8.9	9.1	9.3	9.2	9.0
130000	8.5	9.2	9.5	9.6	9.6	9.6	9.4	9.1	9.1	8.8	8.6	8.8	9.1	9.2	9.1	8.8
140000	8.5	9.2	9.4	9.5	9.6	9.6	9.3	9.1	9.0	8.7	8.8	8.7	9.1	9.0	9.1	8.7
150000	8.5	9.2	9.3	9.6	9.6	9.7	9.2	9.0	8.9	8.6	8.7	8.6	9.1	8.9	8.9	8.6
160000	8.4	9.1	9.3	9.5	9.6	9.6	9.1	8.9	8.8	8.6	8.7	8.5	9.1	8.7	8.8	8.5
170000	8.4	9.2	9.2	9.5	9.6	9.6	9.1	8.9	8.8	8.5	8.6	8.4	9.0	8.7	8.7	8.4
180000	8.3	9.1	9.2	9.4	9.6	9.6	9.0	8.9	8.8	8.5	8.5	8.4	9.0	8.6	8.7	8.4
190000	8.4	9.1	9.2	9.4	9.6	9.6	9.0	9.0	8.8	8.5	8.5	8.4	8.9	8.6	8.7	8.3
200000	8.4	9.1	9.2	9.4	9.6	9.7	9.0	9.0	8.8	8.6	8.5	8.4	8.9	8.6	8.7	8.3
210000	8.4	9.1	9.2	9.5	9.6	9.7	9.0	8.9	8.8	8.5	8.4	8.4	8.8	8.6	8.7	8.3
220000	8.4	9.1	9.3	9.5	9.6	9.6	9.0	9.0	8.9	8.5	8.4	8.4	8.8	8.6	8.7	8.3
230000	8.4	9.2	9.3	9.5	9.6	9.6	9.0	9.0	8.9	8.5	8.5	8.4	8.9	8.7	8.7	8.4
Daily Max	8.9	9.2	9.6	9.7	9.6	9.7	9.7	9.3	9.3	8.9	8.8	9.1	9.1	9.5	9.2	9.2
Daily Min	8.3	8.5	9.2	9.3	9.5	9.6	9.0	8.9	8.8	8.5	8.4	8.4	8.4	8.6	8.7	8.3
Average	8.5	8.9	9.4	9.5	9.6	9.6	9.4	9.1	9.0	8.7	8.6	8.7	8.9	9.0	8.9	8.7

License Minimum Dissolved Oxygen: 7.0 mg/l

Dead River at County Road AAO Bridge - June 2013 Dissolved Oxygen Summary

Time HHMMSS	06/17/13	06/18/13	06/19/13	06/20/13	06/21/13	06/22/13	06/23/13	06/24/13	06/25/13	06/26/13	06/27/13	06/28/13	06/29/13	06/30/13
0	8.5	8.9	8.8	8.7	8.8	8.7	8.6	8.1	7.9	7.8	7.8	7.8	8.1	8.2
10000	8.6	9.0	8.9	8.8	8.8	8.8	8.6	8.2	8.0	7.8	7.9	7.9	8.1	8.3
20000	8.6	9.1	9.1	8.8	8.8	8.8	8.6	8.2	8.0	7.8	7.9	7.9	8.1	8.3
30000	8.7	9.2	9.2	8.9	8.8	8.7	8.6	8.3	8.1	7.9	7.9	7.9	8.1	8.4
40000	8.8	9.3	9.2	9.0	8.8	8.7	8.6	8.3	8.1	7.9	7.9	7.9	8.2	8.5
50000	8.8	9.4	9.3	9.0	8.8	8.7	8.7	8.3	8.2	8.0	7.9	8.0	8.2	8.6
60000	8.8	9.4	9.4	9.1	8.8	8.7	8.7	8.3	8.1	8.1	7.9	8.0	8.2	8.7
70000	8.9	9.5	9.5	9.1	8.9	8.7	8.7	8.4	8.2	8.1	7.9	8.0	8.3	8.7
80000	9.0	9.6	9.5	9.2	8.9	8.8	8.7	8.4	8.3	8.2	8.1	8.1	8.4	8.8
90000	9.1	9.6	9.6	9.3	8.9	8.9	8.8	8.5	8.4	8.4	8.3	8.1	8.4	8.9
100000	9.2	9.6	9.5	9.3	8.9	8.9	8.8	8.5	8.5	8.5	8.4	8.2	8.5	9.0
110000	9.2	9.6	9.4	9.2	8.9	9.0	8.9	8.6	8.5	8.5	8.4	8.4	8.6	9.1
120000	9.2	9.5	9.3	9.1	8.9	9.0	8.9	8.6	8.5	8.4	8.4	8.4	8.7	9.1
130000	9.2	9.3	9.2	9.0	9.0	8.9	8.8	8.5	8.4	8.4	8.3	8.4	8.7	9.0
140000	9.1	9.2	9.1	9.0	9.0	9.0	8.8	8.5	8.3	8.4	8.2	8.5	8.7	8.9
150000	9.0	9.0	8.9	9.0	9.0	9.0	8.8	8.4	8.2	8.2	8.1	8.5	8.7	8.8
160000	8.9	8.8	8.8	9.0	9.0	9.0	8.7	8.3	8.1	8.0	8.1	8.5	8.6	8.7
170000	8.8	8.7	8.7	9.0	9.0	8.9	8.6	8.1	8.0	8.0	8.0	8.5	8.6	8.8
180000	8.7	8.7	8.6	8.9	8.9	8.9	8.4	8.0	7.9	8.0	7.9	8.5	8.6	8.5
190000	8.7	8.6	8.6	8.8	8.9	8.8	8.3	7.9	7.9	7.8	7.9	8.4	8.5	8.4
200000	8.7	8.6	8.5	8.8	8.8	8.8	8.2	7.9	7.8	7.6	7.8	8.3	8.4	8.2
210000	8.6	8.6	8.5	8.7	8.8	8.7	8.1	7.9	7.8	7.6	7.8	8.2	8.3	8.1
220000	8.7	8.7	8.6	8.7	8.7	8.7	8.1	7.8	7.8	7.7	7.7	8.1	8.2	8.0
230000	8.7	8.7	8.6	8.7	8.7	8.6	8.1	7.9	7.7	7.8	7.8	8.1	8.2	8.1
Daily Max	9.2	9.6	9.6	9.3	9.0	9.0	8.9	8.6	8.5	8.5	8.4	8.5	8.7	9.1
Daily Min	8.5	8.6	8.5	8.7	8.7	8.6	8.1	7.8	7.7	7.6	7.7	7.8	8.1	8.0
Average	8.9	9.1	9.0	9.0	8.9	8.8	8.6	8.2	8.1	8.0	8.0	8.2	8.4	8.6

Dead River at County Road AAO Bridge - July 2013 Dissolved Oxygen Monitoring Data

Time																
HHMMSS	07/01/13	07/02/13	07/03/13	07/04/13	07/05/13	07/06/13	07/07/13	07/08/13	07/09/13	07/10/13	07/11/13	07/12/13	07/13/13	07/14/13	07/15/13	07/16/13
0	8.1	8.1	8.1	7.8	7.8	7.6	7.3	7.6	7.5	7.6	7.7	7.6	7.3	7.4	7.2	7.3
10000	8.1	8.2	8.2	7.9	7.9	7.7	7.4	7.6	7.6	7.6	7.7	7.8	7.6	7.6	7.3	7.4
20000	8.3	8.3	8.3	8.0	7.9	7.8	7.5	7.7	7.6	7.6	7.8	7.8	7.7	7.7	7.4	7.5
30000	8.3	8.4	8.3	8.1	8.0	7.9	7.5	7.8	7.7	7.7	7.8	7.9	7.8	7.8	7.5	7.6
40000	8.4	8.5	8.5	8.3	8.1	8.0	7.7	7.8	7.7	7.7	8.0	8.0	7.8	7.8	7.6	7.7
50000	8.5	8.7	8.6	8.3	8.2	8.1	7.8	7.8	7.7	7.7	8.0	8.0	7.9	7.8	7.7	7.8
60000	8.5	8.8	8.6	8.4	8.3	8.1	7.8	7.9	7.8	7.7	8.1	8.1	7.9	7.9	7.8	7.7
70000	8.6	8.9	8.8	8.5	8.4	8.2	7.8	7.9	7.9	7.7	8.2	8.2	8.0	8.0	7.9	7.8
80000	8.8	9.0	8.9	8.6	8.5	8.3	7.9	8.0	7.9	7.8	8.3	8.3	8.2	8.1	8.0	7.9
90000	8.9	9.2	9.0	8.8	8.7	8.5	8.0	8.2	8.1	8.0	8.6	8.6	8.4	8.3	8.2	8.2
100000	9.0	9.3	9.1	8.9	8.8	8.6	7.9	8.4	8.2	8.0	8.8	8.7	8.6	8.4	8.6	8.5
110000	9.1	9.4	9.2	9.0	9.0	8.7	8.3	8.5	8.3	8.1	8.8	8.8	8.6	8.6	8.7	8.7
120000	9.1	9.3	9.2	8.9	9.0	8.7	8.5	8.6	8.5	8.3	8.8	8.8	8.7	8.6	8.8	8.7
130000	9.0	9.3	9.2	8.9	8.9	8.7	8.6	8.6	8.6	8.3	8.8	8.7	8.6	8.5	8.8	8.4
140000	9.0	9.1	9.0	8.8	8.8	8.6	8.5	8.6	8.5	8.3	8.6	8.6	8.6	8.5	8.7	8.4
150000	8.9	9.0	8.9	8.5	8.6	8.3	9.2	8.4	8.4	8.4	8.5	8.5	8.5	8.4	8.6	8.4
160000	8.9	9.0	8.7	8.3	8.5	8.3	8.3	8.3	8.3	8.3	8.4	8.3	8.4	8.1	8.5	8.4
170000	8.8	8.9	8.7	8.4	8.3	8.3	7.9	8.2	8.2	8.2	8.2	8.1	8.4	8.0	8.3	8.2
180000	8.6	8.7	8.6	8.4	8.3	8.0	8.1	8.3	8.0	8.2	8.1	8.0	8.2	7.8	8.2	8.1
190000	8.4	8.4	8.3	8.2	8.1	7.9	7.9	8.0	7.8	8.1	8.0	7.8	8.0	7.5	8.0	7.9
200000	8.3	8.2	8.1	8.1	7.9	7.6	7.8	7.8	7.8	8.0	7.9	7.7	8.0	7.4	7.8	7.6
210000	8.1	8.1	7.9	8.0	7.7	7.4	7.7	7.7	7.7	7.9	7.8	7.5	7.8	7.3	7.6	7.3
220000	8.0	8.0	7.8	7.8	7.6	7.3	7.7	7.6	7.6	7.7	7.6	7.4	7.6	7.3	7.4	7.1
230000	8.0	8.0	7.8	7.8	7.5	7.3	7.6	7.5	7.5	7.7	7.6	7.3	7.5	7.1	7.3	7.0
Daily Max	9.1	9.4	9.2	9.0	9.0	8.7	9.2	8.6	8.6	8.4	8.8	8.8	8.7	8.6	8.8	8.7
Daily Min	8.0	8.0	7.8	7.8	7.5	7.3	7.3	7.5	7.5	7.6	7.6	7.3	7.3	7.1	7.2	7.0
Average	8.6	8.7	8.6	8.4	8.3	8.1	7.9	8.0	7.9	7.9	8.2	8.1	8.1	7.9	8.0	7.9

License Minimum Dissolved Oxygen: 7.0 mg/l

Dead River at County Road AAO Bridge - July 2013 Dissolved Oxygen Monitoring Data

Time HHMMSS	07/17/13	07/18/13	07/19/13	07/20/13	07/21/13	07/22/13	07/23/13	07/24/13	07/25/13	07/26/13	07/27/13	07/28/13	07/29/13	07/30/13	07/31/13
0	7.0	7.2	7.2	7.1	7.6	7.8	7.4	7.8	7.8	7.9	8.4	8.4	8.6	8.2	8.1
10000	7.1	7.2	7.3	7.2	7.6	7.8	7.5	7.8	7.8	8.0	8.4	8.4	8.5	8.2	8.2
20000	7.3	7.3	7.3	7.2	7.7	8.0	7.6	7.9	7.9	8.0	8.4	8.5	8.5	8.3	8.1
30000	7.4	7.4	7.4	7.2	7.8	8.0	7.7	7.9	8.0	8.1	8.4	8.4	8.5	8.3	8.2
40000	7.5	7.5	7.4	7.2	7.8	8.0	7.5	8.1	8.1	8.1	8.5	8.5	8.4	8.3	8.2
50000	7.5	7.5	7.5	7.3	7.9	8.0	7.7	8.1	8.1	8.0	8.5	8.5	8.3	8.4	8.2
60000	7.6	7.5	7.5	7.3	7.9	8.1	7.7	8.1	8.2	8.1	8.4	8.5	8.5	8.4	8.2
70000	7.8	7.6	7.4	7.4	8.0	8.1	7.7	8.3	8.3	8.1	8.5	8.6	8.5	8.5	8.2
80000	7.8	7.9	7.4	7.5	8.1	8.2	7.8	8.4	8.4	8.3	8.5	8.5	8.6	8.6	8.3
90000	8.1	7.9	7.4	7.6	8.3	8.4	7.9	8.6	8.6	8.3	8.7	8.6	8.7	8.7	8.5
100000	8.4	7.9	7.5	7.7	8.5	8.6	8.0	8.9	8.8	8.5	9.0	8.8	8.9	8.9	8.6
110000	8.6	7.9	7.5	7.9	8.6	8.6	8.4	9.1	9.1	8.6	9.1	9.0	9.1	8.9	8.8
120000	8.6	8.2	7.5	8.0	8.6	8.7	8.8	9.1	9.1	8.7	9.1	9.1	9.1	9.0	8.9
130000	8.6	8.3	7.5	7.8	8.7	8.6	8.9	9.0	9.1	8.6	9.3	9.1	9.1	9.0	8.8
140000	8.5	8.3	7.5	8.0	8.5	8.5	8.9	9.0	9.0	8.5	9.3	9.1	9.0	9.0	8.8
150000	8.3	8.2	7.4	8.0	8.6	8.5	8.8	9.0	8.9	8.4	9.1	9.2	9.0	8.8	8.7
160000	8.2	8.1	7.5	8.0	8.5	8.5	8.8	8.8	8.7	8.6	9.1	9.1	8.9	8.7	8.7
170000	8.1	8.0	7.5	8.0	8.5	8.3	8.7	8.8	8.3	8.7	9.1	9.1	8.8	8.6	8.6
180000	8.0	7.9	7.4	7.9	8.4	8.0	8.6	8.6	8.1	8.7	9.0	9.1	8.6	8.4	8.3
190000	7.9	7.5	7.3	7.8	8.3	7.8	8.4	8.5	8.2	8.6	9.0	8.9	8.5	8.4	8.2
200000	7.6	7.4	7.3	7.7	8.2	7.6	8.3	8.3	8.2	8.5	8.8	8.6	8.4	8.3	8.1
210000	7.5	7.3	7.2	7.6	8.0	7.6	8.1	8.1	8.1	8.5	8.7	8.6	8.3	8.2	8.0
220000	7.3	7.2	7.2	7.5	7.9	7.5	7.9	7.9	8.0	8.4	8.5	8.6	8.2	8.1	7.9
230000	7.2	7.2	7.1	7.5	7.8	7.5	7.8	7.8	7.9	8.4	8.4	8.6	8.2	8.1	7.8
Daily Max	8.6	8.3	7.5	8.0	8.7	8.7	8.9	9.1	9.1	8.7	9.3	9.2	9.1	9.0	8.9
Daily Min	7.0	7.2	7.1	7.1	7.6	7.5	7.4	7.8	7.8	7.9	8.4	8.4	8.2	8.1	7.8
Average	7.8	7.7	7.4	7.6	8.1	8.1	8.1	8.4	8.4	8.3	8.8	8.7	8.6	8.5	8.3

Dead River at County Road AAO Bridge - August 2013 Dissolved Oxygen Monitoring Data

Time HHMMSS	8/1/2013	8/2/2013	8/3/2013	8/4/2013	8/5/2013	8/6/2013	8/7/2013	8/8/2013	8/9/2013	8/10/2013	8/11/2013	8/12/2013	8/13/2013	8/14/2013	8/15/2013	8/16/2013	8/17/2013
0	7.8	7.7	7.7	7.9	8.0	8.1	8.1	8.3	8.4	8.3	8.1	8.1	8.5	8.6	8.7	8.4	8.6
10000	7.9	7.8	7.7	8.0	8.0	8.1	8.1	8.4	8.4	8.3	8.2	8.1	8.6	8.7	8.8	8.5	8.6
20000	7.9	7.8	7.8	8.0	8.1	8.1	8.2	8.4	8.4	8.3	8.2	8.2	8.6	8.8	8.8	8.6	8.6
30000	8.0	7.9	7.9	8.1	8.2	8.1	8.2	8.4	8.5	8.4	8.4	8.3	8.7	8.9	8.9	8.6	8.6
40000	8.1	7.9	7.9	8.1	8.2	8.1	8.2	8.5	8.5	8.5	8.4	8.4	8.8	8.9	8.9	8.7	8.7
50000	8.1	7.9	8.0	8.2	8.3	8.1	8.3	8.6	8.5	8.6	8.5	8.4	8.7	8.9	9.0	8.7	8.7
60000	8.2	8.0	8.0	8.3	8.4	8.1	8.3	8.6	8.5	8.6	8.6	8.4	8.8	8.9	9.0	8.8	8.8
70000	8.2	8.1	8.1	8.3	8.4	8.1	8.3	8.7	8.6	8.7	8.7	8.5	8.8	9.0	9.1	8.8	8.7
80000	8.4	8.2	8.2	8.5	8.6	8.2	8.3	8.9	8.8	8.8	8.8	8.6	8.9	9.1	9.1	8.9	8.8
90000	8.5	8.4	8.4	8.7	8.8	8.3	8.6	9.2	9.0	9.0	9.2	8.8	9.2	9.3	9.3	9.1	8.9
100000	8.7	8.7	8.7	9.0	9.2	8.5	8.8	9.5	9.3	9.5	9.5	9.2	9.3	9.6	9.5	9.4	9.1
110000	8.9	8.8	8.9	9.1	9.2	8.7	8.9	9.7	9.5	9.7	9.7	9.5	9.5	9.8	9.7	9.5	9.3
120000	8.9	8.9	9.0	9.2	9.2	9.1	9.0	9.7	9.5	9.8	9.8	9.6	9.6	9.8	9.7	9.6	9.2
130000	8.9	8.9	9.0	9.2	9.1	9.3	9.1	9.8	9.6	9.8	9.8	9.5	9.6	9.7	9.6	9.5	9.1
140000	8.8	8.8	9.0	9.2	9.0	9.4	9.2	9.7	9.5	9.8	9.7	9.3	9.4	9.6	9.4	9.3	9.0
150000	8.7	8.7	9.0	9.2	9.0	9.4	9.2	9.6	9.5	9.6	9.5	9.1	9.4	9.5	9.3	9.0	8.9
160000	8.7	8.5	8.8	9.1	8.9	9.1	9.4	9.5	9.4	9.3	9.5	8.8	9.4	9.4	9.1	8.7	8.7
170000	8.6	8.5	8.8	9.0	8.8	9.0	9.3	9.4	9.3	9.2	9.4	8.9	9.4	9.2	9.0	8.7	8.8
180000	8.5	8.3	8.6	8.8	8.7	9.0	9.3	9.1	9.2	9.1	9.1	9.0	9.3	9.1	8.8	8.7	8.6
190000	8.4	8.2	8.5	8.8	8.5	8.7	9.1	9.0	9.0	9.0	9.0	9.0	9.1	9.0	8.7	8.6	8.5
200000	8.2	8.0	8.4	8.5	8.4	8.4	8.8	8.8	8.9	8.7	8.8	8.9	9.0	8.9	8.6	8.6	8.4
210000	8.0	7.9	8.2	8.2	8.3	8.2	8.5	8.7	8.7	8.4	8.5	8.7	8.8	8.7	8.4	8.5	8.3
220000	7.8	7.8	8.0	8.1	8.2	8.1	8.4	8.5	8.4	8.1	8.2	8.5	8.6	8.6	8.3	8.4	8.4
230000	7.7	7.7	8.0	7.9	8.1	8.0	8.2	8.4	8.3	8.1	8.1	8.5	8.6	8.6	8.3	8.5	8.4
Daily Max	8.9	8.9	9.0	9.2	9.2	9.4	9.4	9.8	9.6	9.8	9.8	9.6	9.6	9.8	9.7	9.6	9.3
Daily Min	7.7	7.7	7.7	7.9	8.0	8.0	8.1	8.3	8.3	8.1	8.1	8.1	8.5	8.6	8.3	8.4	8.3
Average	8.3	8.2	8.4	8.6	8.6	8.5	8.7	9.0	8.9	8.9	8.9	8.8	9.0	9.1	9.0	8.8	8.7

License Minimum Dissolved Oxygen: 7.0 mg/l

Dead River at County Road AAO Bridge - August 2013 Dissolved Oxygen Monitoring Data

Time														
HHMMSS	8/18/2013	8/19/2013	8/20/2013	8/21/2013	8/22/2013	8/23/2013	8/24/2013	8/25/2013	8/26/2013	8/27/2013	8/28/2013	8/29/2013	8/30/2013	8/31/2013
0	8.5	8.5	8.5	8.5	8.4	8.5	8.4	8.7	8.2	7.9	7.9	8.0	7.9	7.7
10000	8.5	8.5	8.5	8.5	8.4	8.6	8.5	8.6	8.2	7.9	8.0	8.0	8.0	7.7
20000	8.6	8.6	8.5	8.5	8.4	8.6	8.6	8.6	8.2	7.9	7.9	8.0	8.0	7.7
30000	8.6	8.6	8.6	8.5	8.4	8.6	8.6	8.6	8.2	7.8	7.9	8.0	8.0	7.7
40000	8.7	8.6	8.5	8.4	8.5	8.6	8.5	8.5	8.2	7.8	7.9	8.0	7.9	7.7
50000	8.7	8.6	8.5	8.4	8.5	8.6	8.6	8.5	8.1	7.8	7.9	8.0	7.9	7.8
60000	8.7	8.6	8.4	8.5	8.5	8.6	8.5	8.4	8.0	7.8	8.0	8.0	7.9	7.8
70000	8.7	8.6	8.5	8.5	8.5	8.6	8.6	8.4	8.0	7.7	8.0	8.0	7.8	7.8
80000	8.7	8.6	8.5	8.5	8.5	8.7	8.6	8.4	7.9	7.8	8.1	8.1	7.8	7.9
90000	8.9	8.7	8.8	8.6	8.5	8.7	8.7	8.4	8.0	8.0	8.2	8.2	7.8	7.9
100000	9.1	8.9	8.9	8.7	8.6	8.8	8.8	8.5	8.0	8.0	8.2	8.2	7.8	8.0
110000	9.2	9.1	8.9	8.7	8.7	8.9	8.8	8.7	8.1	8.2	8.3	8.3	7.9	8.1
120000	9.2	9.0	8.8	8.6	8.8	8.9	8.7	8.7	8.2	8.2	8.3	8.3	7.9	8.1
130000	9.1	8.9	8.7	8.5	8.7	8.8	8.7	8.6	8.2	8.2	8.2	8.2	7.8	8.1
140000	9.0	8.8	8.6	8.5	8.6	8.7	8.6	8.5	8.2	8.2	8.1	8.1	7.8	8.1
150000	8.9	8.8	8.6	8.4	8.5	8.6	8.5	8.3	8.2	8.0	8.1	8.1	7.8	8.0
160000	8.8	8.7	8.5	8.4	8.5	8.6	8.5	8.2	8.1	8.0	8.1	8.0	7.9	7.9
170000	8.6	8.6	8.5	8.4	8.4	8.5	8.6	8.1	7.7	8.0	8.0	7.9	7.9	7.9
180000	8.6	8.4	8.4	8.3	8.3	8.5	8.6	8.1	7.9	8.0	8.1	7.9	7.9	7.9
190000	8.5	8.4	8.4	8.2	8.4	8.5	8.6	8.1	7.8	8.0	8.0	8.0	7.8	7.9
200000	8.4	8.4	8.4	8.2	8.3	8.4	8.6	8.1	8.0	7.9	8.0	8.1	7.8	7.8
210000	8.3	8.4	8.3	8.3	8.4	8.4	8.5	8.2	7.8	8.0	8.0	8.1	7.8	7.8
220000	8.3	8.4	8.4	8.2	8.5	8.4	8.6	8.2	7.9	8.0	7.9	8.0	7.7	7.8
230000	8.3	8.4	8.5	8.2	8.5	8.4	8.7	8.2	7.9	7.9	8.0	7.9	7.7	7.8
Daily Max	9.2	9.1	8.9	8.7	8.8	8.9	8.8	8.7	8.2	8.2	8.3	8.3	8.0	8.1
Daily Min	8.3	8.4	8.3	8.2	8.3	8.4	8.4	8.1	7.7	7.7	7.9	7.9	7.7	7.7
Average	8.7	8.6	8.5	8.4	8.5	8.6	8.6	8.4	8.0	8.0	8.0	8.1	7.9	7.9

Dead River at County Road AAO Bridge - September 2013 Dissolved Oxygen Data

Time HHMMSS	9/1/2013	9/2/2013	9/3/2013	9/4/2013	9/5/2013	9/6/2013	9/7/2013	9/8/2013	9/9/2013	9/10/2013	9/11/2013	9/12/2013	9/13/2013	9/14/2013	9/15/2013	9/16/2013
0	7.9	7.7	8.2	8.3	8.5	8.6	8.3	8.5	8.6	8.6	8.6	8.4	8.8	9.0	8.9	9.2
10000	7.9	7.8	8.2	8.4	8.6	8.6	8.4	8.6	8.7	8.6	8.6	8.5	8.8	9.0	9.0	9.3
20000	7.8	7.9	8.2	8.4	8.6	8.7	8.4	8.6	8.7	8.6	8.6	8.5	8.8	9.0	9.0	9.3
30000	7.8	7.9	8.3	8.5	8.6	8.7	8.5	8.7	8.7	8.6	8.6	8.6	8.8	9.1	9.0	9.3
40000	7.8	7.9	8.3	8.5	8.7	8.8	8.4	8.7	8.7	8.6	8.6	8.6	8.8	9.1	9.0	9.3
50000	7.8	8.0	8.3	8.5	8.8	8.7	8.4	8.7	8.7	8.5	8.6	8.6	8.9	9.0	9.0	9.3
60000	7.8	7.9	8.3	8.5	8.8	8.8	8.4	8.7	8.7	8.5	8.6	8.6	8.9	9.1	8.9	9.3
70000	7.7	8.0	8.3	8.5	8.8	8.7	8.3	8.7	8.6	8.5	8.6	8.6	8.9	9.1	8.9	9.4
80000	7.8	8.0	8.4	8.5	8.9	8.7	8.4	8.8	8.6	8.5	8.6	8.6	9.0	9.1	8.9	9.4
90000	7.8	8.1	8.4	8.5	8.9	8.8	8.5	8.9	8.6	8.5	8.6	8.6	9.0	9.2	8.9	9.5
100000	7.9	8.1	8.6	8.7	9.1	8.9	8.6	9.0	8.7	8.5	8.7	8.7	9.1	9.2	9.0	9.5
110000	7.9	8.2	8.6	8.8	9.1	9.0	8.6	9.0	8.7	8.6	8.8	8.8	9.1	9.3	9.0	9.6
120000	7.9	8.2	8.6	8.8	9.2	9.0	8.6	9.0	8.7	8.6	8.8	8.8	9.1	9.2	9.1	9.6
130000	8.0	8.3		8.9	9.1	8.9	8.5	9.1	8.7	8.6	8.7	8.8	9.2	9.2	9.2	9.6
140000	8.0	8.3	8.7	9.3	8.1	8.8	8.5	9.0	8.7	8.7	8.7	8.9	9.0	9.1	9.2	9.4
150000	7.9	8.4	8.6	8.6	8.9	8.7	8.4	9.0	8.7	8.6	8.6	8.8	8.9	9.0	9.3	9.4
160000	7.9	8.4	8.6	8.7	8.7	8.5	8.4	8.8	8.7	8.5	8.5	8.9	8.9	9.0	9.3	9.4
170000	7.8	8.4	8.3	8.4	8.6	8.3	8.5	8.7	8.7	8.4	8.4	8.8	9.0	8.9	9.3	9.3
180000	7.8	8.3	8.4	8.4	8.5	8.4	8.5	8.7	8.7	8.6	8.4	8.8	8.9	8.9	9.3	9.3
190000	7.9	8.2	8.3	8.4	8.5	8.3	8.5	8.6	8.6	8.6	8.5	8.8	8.9	8.9	9.3	9.3
200000	7.8	7.5	8.2	8.4	8.4	8.3	8.5	8.5	8.6	8.5	8.5	8.8	8.9	8.9	9.2	9.3
210000	7.7	8.0	8.2	8.4	8.4	8.3	8.5	8.5	8.6	8.4	8.5	8.8	8.9	8.8	9.2	9.3
220000	7.6	8.1	8.2	8.4	8.5	8.2	8.5	8.5	8.5	8.4	8.5	8.8	9.0	8.8	9.2	9.4
230000	7.7	8.1	8.3	8.4	8.5	8.3	8.5	8.5	8.6	8.5	8.5	8.8	9.0	8.9	9.2	9.4
Daily Max	8.0	8.4	8.7	9.3	9.2	9.0	8.6	9.1	8.7	8.7	8.8	8.9	9.2	9.3	9.3	9.6
Daily Min	7.6	7.5	8.2	8.3	8.1	8.2	8.3	8.5	8.5	8.4	8.4	8.4	8.8	8.8	8.9	9.2
Average	7.8	8.1	8.4	8.5	8.7	8.6	8.5	8.7	8.7	8.5	8.6	8.7	8.9	9.0	9.1	9.4

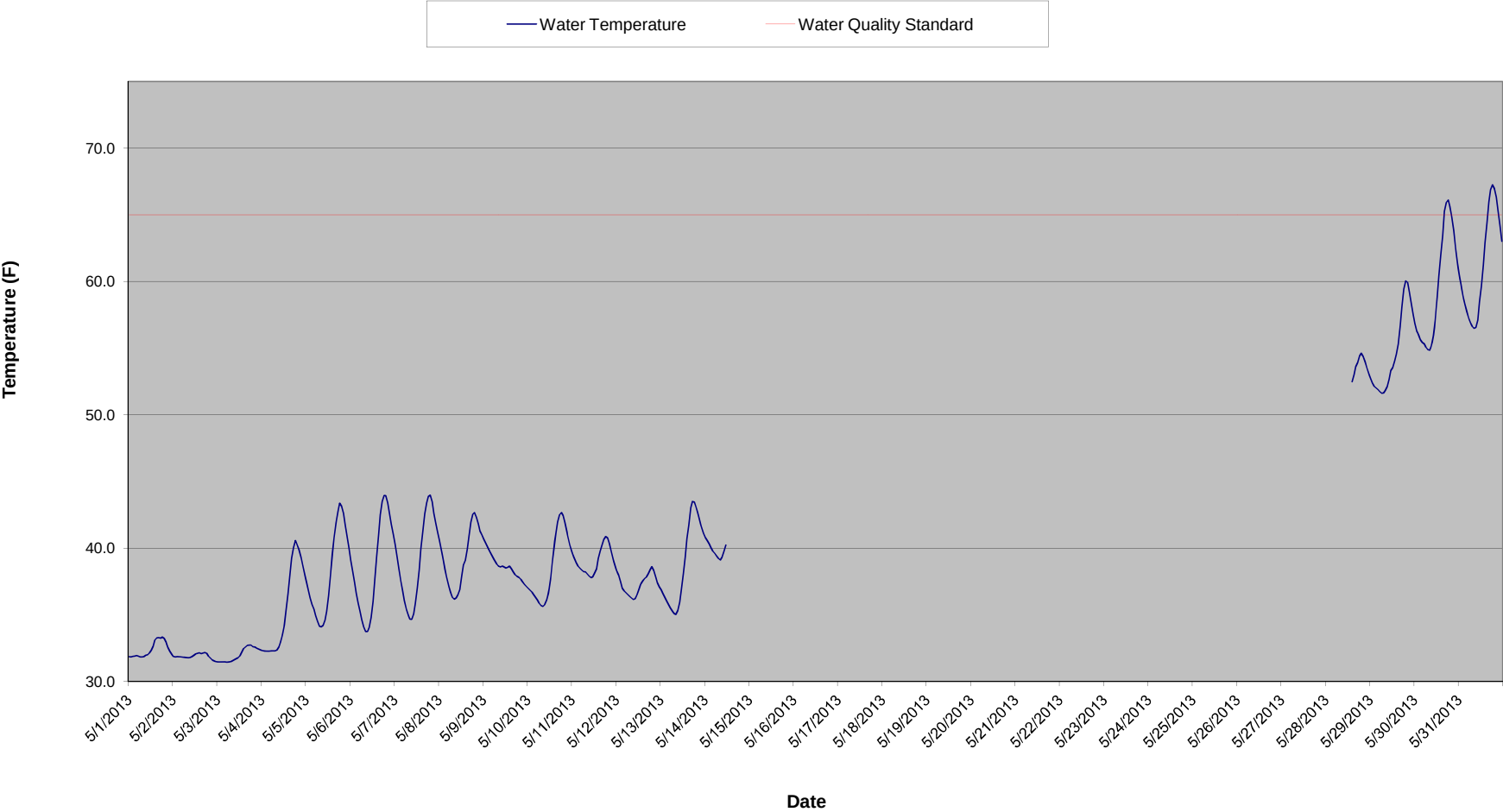
License Minimum Dissolved Oxygen: 7.0 mg/l

Missing data due to equipment maintenance.

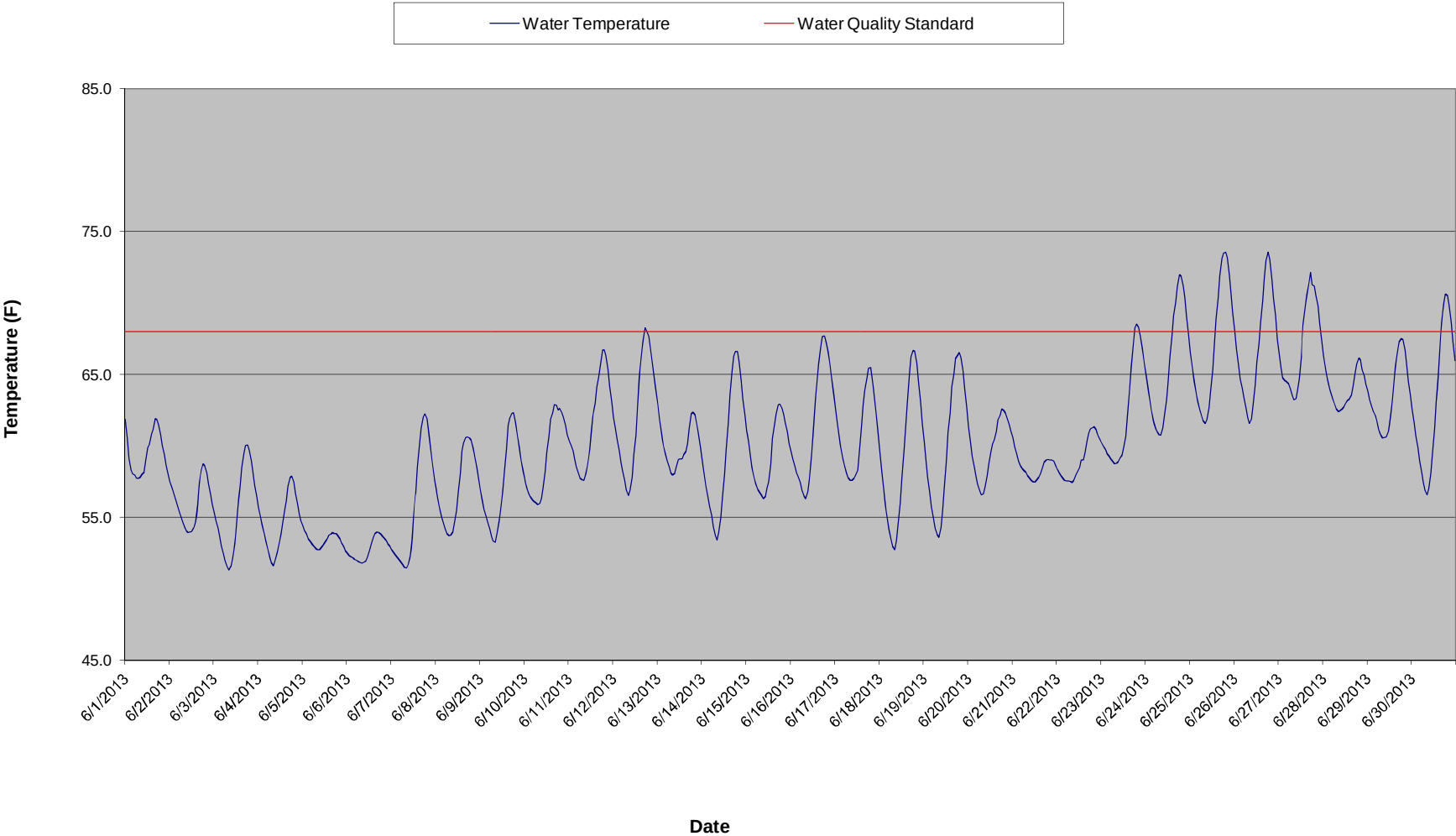
Dead River at County Road AAO Bridge - September 2013 Dissolved Oxygen Data

Time														
HHMMSS	9/17/2013	9/18/2013	9/19/2013	9/20/2013	9/21/2013	9/22/2013	9/23/2013	9/24/2013	9/25/2013	9/26/2013	9/27/2013	9/28/2013	9/29/2013	9/30/2013
0	9.4	9.2	9.0	8.8	8.8	9.3	9.5	9.5	9.4	9.4	9.4	9.3	9.2	9.2
10000	9.4	9.1	9.0	8.8	8.8	9.3	9.6	9.5	9.4	9.4	9.4	9.3	9.2	9.3
20000	9.5	9.1	9.0	8.8	8.8	9.3	9.6	9.5	9.5	9.5	9.4	9.3	9.2	9.3
30000	9.5	9.1	9.0	8.8	8.8	9.3	9.6	9.6	9.5	9.4	9.4	9.3	9.2	9.3
40000	9.4	9.1	9.0	8.8	8.8	9.4	9.6	9.6	9.4	9.5	9.5	9.3	9.3	9.4
50000	9.4	9.1	8.9	8.8	8.9	9.3	9.6	9.6	9.4	9.4	9.5	9.3	9.3	9.4
60000	9.4	9.1	9.0	8.8	8.8	9.3	9.6	9.6	9.4	9.4	9.5	9.3	9.3	9.4
70000	9.4	9.1	8.9	8.8	8.9	9.4	9.6	9.6	9.4	9.4	9.5	9.3	9.3	9.4
80000	9.4	9.1	8.9	8.7	8.9	9.3	9.6	9.6	9.4	9.4	9.5	9.4	9.4	9.4
90000	9.5	9.1	9.0	8.8	9.0	9.4	9.7	9.7	9.4	9.5	9.5	9.4	9.4	9.4
100000	9.4	9.1	9.0	8.8	9.1	9.4	9.7	9.7	9.5	9.5	9.5	9.4	9.5	9.4
110000	9.4	9.1	9.0	8.8	9.1	9.5	9.8	9.8	9.6	9.6	9.5	9.5	9.5	9.5
120000	9.4	9.1	9.0	8.8	9.2	9.5	9.7	9.7	9.6	9.5	9.5	9.5	9.5	9.5
130000	9.3	9.1	9.0	8.8	9.2	9.5	9.7	9.6	9.6	9.4	9.5	9.4	9.5	9.4
140000	9.2	9.2	9.0	8.8	9.1	9.6	9.5	9.5	9.5	9.3	9.4	9.3	9.4	9.4
150000	9.1	9.2	9.0	8.8	9.2	9.6	9.4	9.4	9.4	9.3	9.3	9.3	9.3	9.3
160000	9.1	9.1	9.0	8.7	9.2	9.5	9.3	9.2	9.3	9.2	9.3	9.2	9.3	9.3
170000	9.1	9.2	8.9	8.7	9.3	9.6	9.3	9.2	9.3	9.2	9.2	9.2	9.2	9.3
180000	9.0	9.1	8.8	8.7	9.2	9.5	9.2	9.2	9.3	9.2	9.2	9.1	9.2	9.3
190000	9.0	9.1	8.8	8.7	9.2	9.5	9.2	9.1	9.3	9.2	9.2	9.1	9.2	9.2
200000	9.0	9.0	8.7	8.7	9.2	9.4	9.2	9.2	9.3	9.3	9.2	9.1	9.1	9.2
210000	9.1	9.0	8.8	8.7	9.2	9.4	9.3	9.2	9.3	9.3	9.2	9.1	9.1	9.2
220000	9.1	9.0	8.7	8.7	9.2	9.4	9.4	9.3	9.3	9.3	9.2	9.1	9.1	9.2
230000	9.1	9.0	8.8	8.7	9.2	9.5	9.4	9.4	9.4	9.4	9.3	9.2	9.2	9.2
Daily Max	9.5	9.2	9.0	8.8	9.3	9.6	9.8	9.8	9.6	9.6	9.5	9.5	9.5	9.5
Daily Min	9.0	9.0	8.7	8.7	8.8	9.3	9.2	9.1	9.3	9.2	9.2	9.1	9.1	9.2
Average	9.3	9.1	8.9	8.8	9.0	9.4	9.5	9.5	9.4	9.4	9.4	9.3	9.3	9.3

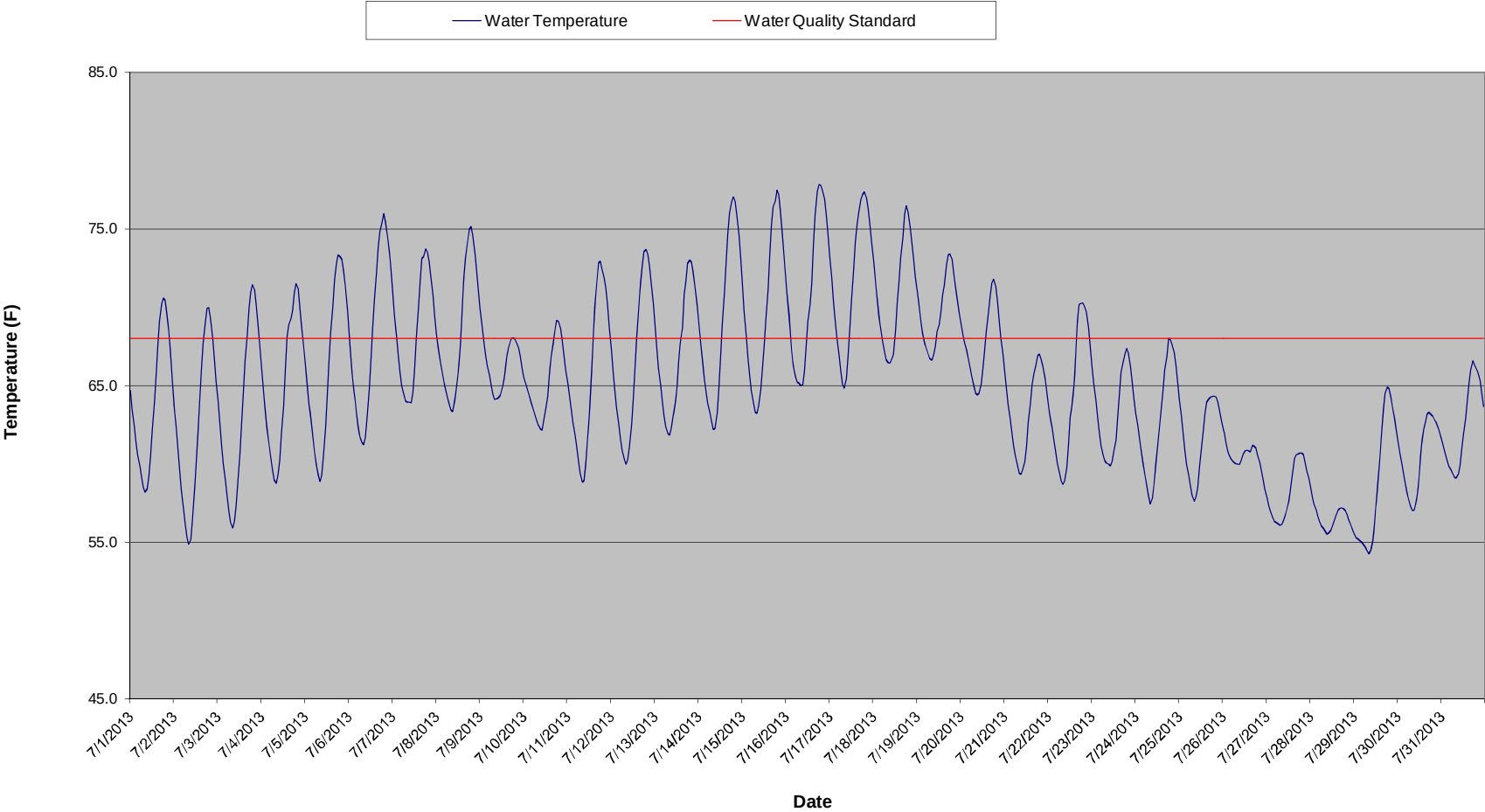
Dead River at CR AAO Bridge Temperature Summary - May 2013



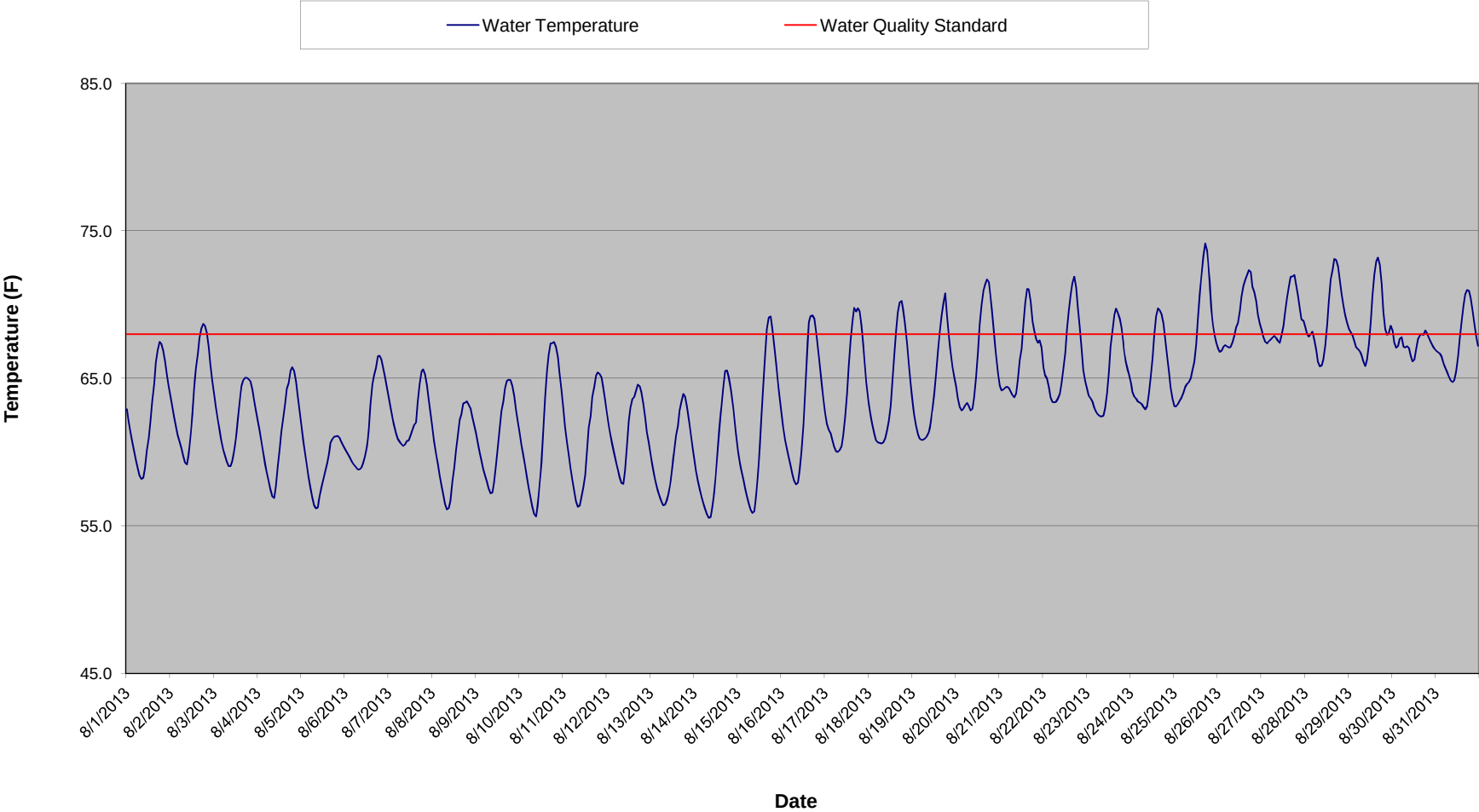
Dead River at CR AAO Bridge Temperature Summary - June 2013



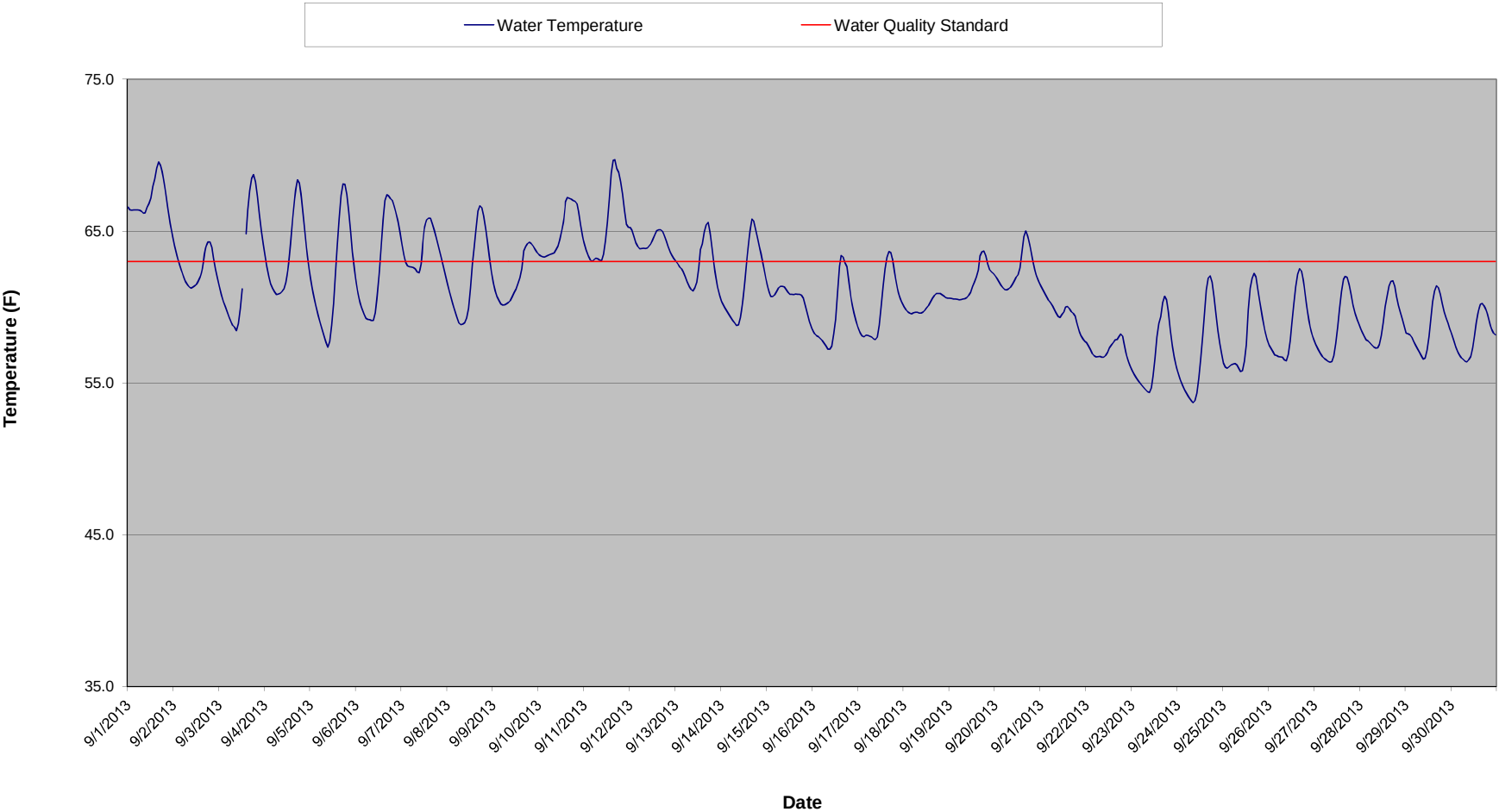
Dead River at CR AAO Bridge Temperature - July 2013



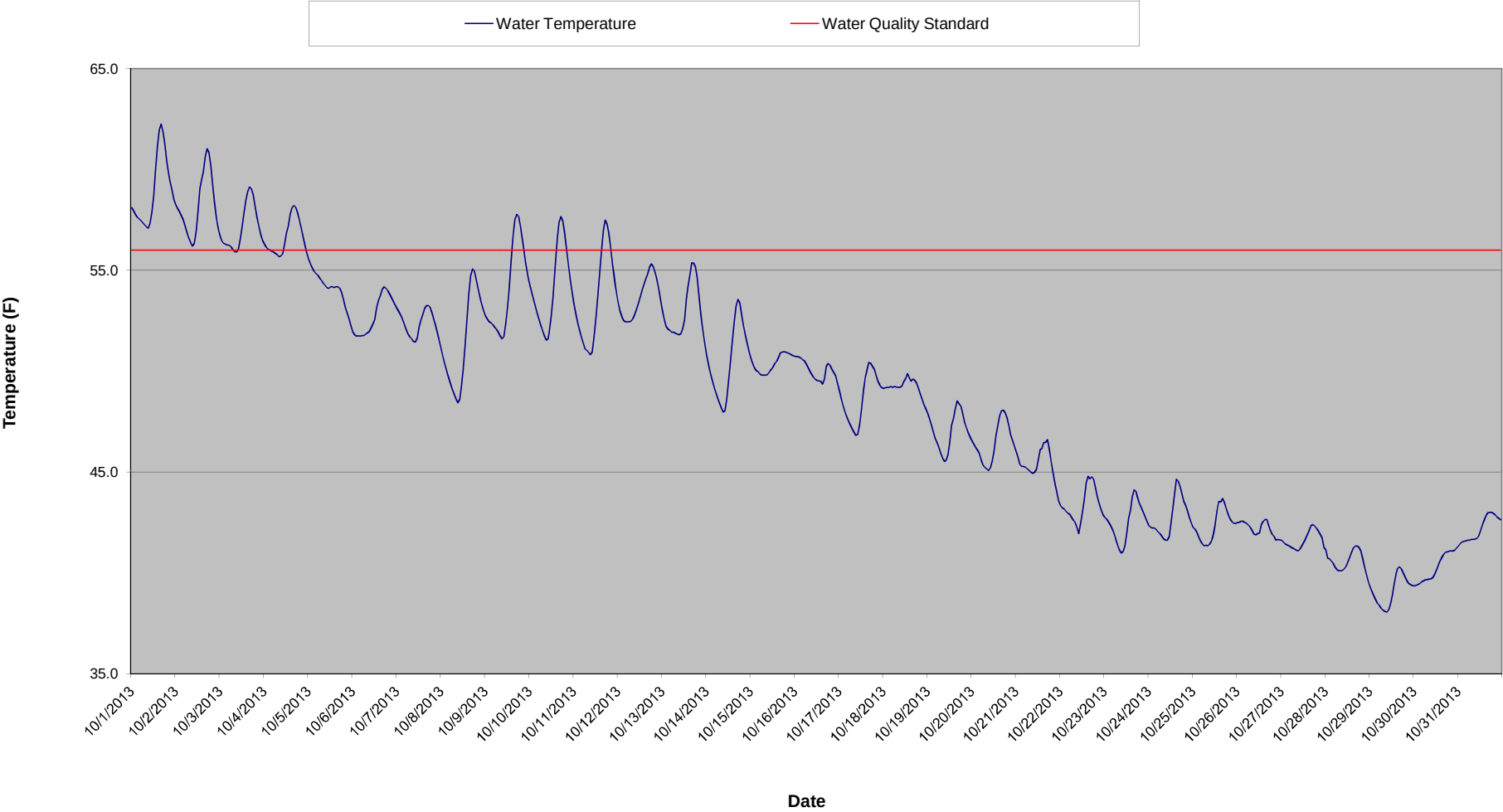
Dead River at CR AAO Bridge Temperature - August 2013



Dead River at CR AAO Bridge Temperature - September 2013



Dead River at CR AAO Bridge Temperature - October 2013



Dead River at County Road AAO Bridge - May 2013 Temperature Monitoring Data

Time HHMMSS	5/1/13	5/2/13	5/3/13	5/4/13	5/5/13	5/6/13	5/7/13	5/8/13	5/9/13	5/10/13	5/11/13	5/12/13	5/13/13	5/14/13	5/15/13	5/16/13		
0	31.9	31.9	31.5	32.3	37.5	39.1	40.3	40.6	40.6	37.0	39.6	38.3	36.9	40.8				
10000	31.8	31.8	31.5	32.3	36.8	38.3	39.3	39.9	40.4	36.8	39.3	38.0	36.6	40.6				
20000	31.9	31.9	31.5	32.3	36.3	37.4	38.5	39.1	40.1	36.7	38.9	37.5	36.3	40.3				
30000	31.9	31.9	31.5	32.3	35.8	36.6	37.6	38.4	39.8	36.5	38.7	37.0	36.0	40.0				
40000	31.9	31.8	31.5	32.3	35.4	35.9	36.8	37.8	39.5	36.3	38.5	36.8	35.7	39.8				
50000	31.9	31.8	31.4	32.3	35.0	35.2	36.1	37.2	39.3	36.1	38.4	36.6	35.5	39.6				
60000	31.8	31.8	31.5	32.3	34.5	34.6	35.4	36.7	39.1	35.9	38.2	36.5	35.3	39.4				
70000	31.8	31.8	31.5	32.3	34.1	34.1	35.0	36.3	38.8	35.7	38.2	36.4	35.1	39.2				
80000	31.9	31.8	31.6	32.4	34.1	33.7	34.7	36.2	38.6	35.6	38.1	36.2	35.0	39.1				
90000	32.0	31.8	31.6	32.6	34.2	33.7	34.7	36.3	38.6	35.7	37.9	36.1	35.3	39.3				
100000	32.0	31.9	31.7	33.0	34.6	34.1	35.1	36.5	38.6	36.1	37.8	36.2	35.9	39.7				
110000	32.1	32.0	31.8	33.5	35.3	34.8	35.9	36.9	38.6	36.6	37.9	36.5	36.9	40.2				
120000	32.3	32.1	31.9	34.3	36.4	36.0	37.0	37.9	38.5	37.6	38.1	36.9	38.0					
130000	32.6	32.1	32.2	35.3	38.0	37.6	38.4	38.7	38.6	38.9	38.4	37.3	39.3					
140000	33.1	32.1	32.5	36.6	39.5	39.4	40.0	39.1	38.6	40.0	39.2	37.5	40.7					
150000	33.3	32.1	32.6	38.0	40.8	41.0	41.2	39.9	38.4	41.1	39.8	37.7	41.7					
160000	33.3	32.1	32.7	39.2	41.9	42.5	42.6	40.9	38.2	42.0	40.2	37.8	43.0					
170000	33.2	32.2	32.7	40.0	42.7	43.5	43.4	41.9	38.0	42.5	40.6	38.1	43.5					
180000	33.3	32.1	32.7	40.6	43.4	44.0	43.9	42.5	37.9	42.7	40.9	38.4	43.4					
190000	33.2	31.9	32.6	40.2	43.1	43.9	44.0	42.7	37.8	42.4	40.8	38.6	43.0					
200000	32.9	31.7	32.6	39.9	42.6	43.4	43.5	42.3	37.7	41.9	40.3	38.3	42.5					
210000	32.6	31.6	32.5	39.3	41.8	42.5	42.6	41.8	37.5	41.2	39.8	37.9	42.0					
220000	32.3	31.6	32.4	38.7	40.9	41.8	41.9	41.3	37.3	40.5	39.2	37.4	41.5					
230000	32.0	31.5	32.4	38.1	40.0	41.1	41.2	41.0	37.1	40.0	38.7	37.1	41.1					
Daily Max	33.3	32.2	32.7	40.6	43.4	44.0	44.0	42.7	40.6	42.7	40.9	38.6	43.5	40.8	0.0	0.0		
Daily Min	31.8	31.5	31.4	32.3	34.1	33.7	34.7	36.2	37.1	35.6	37.8	36.1	35.0	39.1	0.0	0.0		
Average	32.4	31.9	32.0	35.4	38.1	38.5	39.1	39.2	38.7	38.6	39.1	37.3	38.8	39.8	#DIV/0!	#DIV/0!		

Monthly average temp (F): 41.2
License Maximum Monthly Average: 65°F

No data - Equipment Malfunction

Dead River at County Road AAO Bridge - May 2013 Temperature Monitoring Data

Time HHMMSS	5/17/13	5/18/13	5/19/13	5/20/13	5/21/13	5/22/13	5/23/13	5/24/13	5/25/13	5/26/13	5/27/13	5/28/13	5/29/13	5/30/13	5/31/13
0													52.7	56.9	60.5
10000													52.4	56.3	59.8
20000													52.1	56.0	58.9
30000													52.0	55.6	58.3
40000													51.9	55.4	57.8
50000													51.7	55.3	57.3
60000													51.6	55.1	56.9
70000													51.6	54.9	56.6
80000													51.8	54.8	56.5
90000													52.1	55.2	56.5
100000													52.7	55.9	57.1
110000													53.3	57.1	58.5
120000													53.5	58.8	59.6
130000													54.0	60.4	61.2
140000												52.5	54.5	62.0	62.9
150000												53.0	55.3	63.5	64.3
160000												53.6	56.6	65.3	66.0
170000												53.9	58.0	65.9	66.9
180000												54.4	59.4	66.1	67.2
190000												54.6	60.0	65.6	67.0
200000												54.4	59.9	64.8	66.3
210000												54.0	59.2	63.8	65.3
220000												53.5	58.4	62.5	64.2
230000												53.1	57.5	61.4	63.0
Daily Max	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	54.6	60.0	66.1	67.2
Daily Min	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	52.5	51.6	54.8	56.5
Average	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	53.7	54.7	59.5	61.2

No data - Equipment Malfunction

Dead River at County Road AAO Bridge - June 2013 Temperature Monitoring Data

Time HHMMSS	06/01/13	06/02/13	06/03/13	06/04/13	06/05/13	06/06/13	06/07/13	06/08/13	06/09/13	06/10/13	06/11/13	06/12/13	06/13/13	06/14/13	06/15/13	06/16/13
0	61.9	57.5	55.3	55.7	54.4	52.5	52.7	57.0	56.9	57.7	60.3	62.0	62.9	59.0	61.1	59.6
10000	60.5	57.1	54.8	55.0	54.1	52.3	52.5	56.3	56.2	57.1	60.1	61.2	61.8	58.1	60.2	59.1
20000	59.1	56.7	54.2	54.4	53.8	52.3	52.4	55.6	55.6	56.7	59.6	60.4	60.8	57.2	59.3	58.6
30000	58.3	56.3	53.6	53.9	53.5	52.2	52.2	55.0	55.1	56.5	59.1	59.6	60.0	56.4	58.4	58.1
40000	58.0	55.9	53.0	53.3	53.3	52.1	52.1	54.5	54.6	56.2	58.5	58.9	59.4	55.8	57.8	57.9
50000	58.0	55.5	52.4	52.8	53.1	52.0	51.9	54.2	54.2	56.1	58.1	58.3	59.0	55.1	57.3	57.5
60000	57.7	55.0	52.0	52.2	53.0	51.9	51.7	53.9	53.7	56.0	57.8	57.6	58.5	54.4	56.9	56.9
70000	57.8	54.7	51.5	51.8	52.8	51.9	51.5	53.7	53.3	55.9	57.6	56.9	58.1	53.7	56.8	56.5
80000	57.8	54.3	51.3	51.6	52.8	51.8	51.5	53.7	53.3	56.0	57.6	56.6	58.0	53.4	56.5	56.3
90000	58.0	54.1	51.6	52.0	52.8	51.9	51.7	54.0	53.8	56.3	58.1	56.9	58.1	53.9	56.3	56.8
100000	58.2	53.9	52.1	52.5	52.9	52.0	52.4	54.6	54.6	57.1	58.8	57.8	58.5	55.0	56.5	57.8
110000	58.9	54.0	53.1	53.1	53.1	52.2	53.4	55.5	55.5	58.2	59.8	59.4	59.1	56.4	57.1	59.3
120000	59.9	54.0	54.4	53.8	53.3	52.7	55.1	56.7	56.8	59.6	61.0	60.7	59.1	58.0	57.5	61.0
130000	60.1	54.3	55.8	54.5	53.5	53.1	56.7	58.0	58.2	60.7	62.2	62.7	59.1	59.8	58.7	62.7
140000	60.8	54.7	57.2	55.5	53.8	53.6	58.6	59.6	59.8	61.9	63.0	64.8	59.4	61.7	60.5	64.4
150000	61.2	55.9	58.5	56.2	53.8	53.9	60.1	60.2	61.4	62.3	64.1	66.3	59.6	63.6	61.5	65.8
160000	61.9	57.4	59.5	57.2	53.9	54.0	61.2	60.6	62.0	62.9	64.9	67.3	60.2	65.3	62.3	66.9
170000	61.8	58.3	60.0	57.8	53.9	53.9	62.0	60.6	62.3	62.9	65.7	68.3	61.2	66.3	62.9	67.7
180000	61.5	58.8	60.1	57.9	53.9	53.8	62.3	60.6	62.3	62.5	66.7	68.0	62.2	66.6	62.9	67.7
190000	60.8	58.6	59.7	57.5	53.7	53.7	61.9	60.4	61.6	62.6	66.7	67.7	62.4	66.6	62.6	67.3
200000	60.0	58.1	58.9	56.7	53.5	53.6	61.1	59.9	60.8	62.3	66.3	66.7	62.2	65.9	62.2	66.6
210000	59.4	57.4	58.1	55.9	53.2	53.4	60.0	59.2	59.9	62.0	65.3	65.8	61.6	64.5	61.6	65.7
220000	58.7	56.6	57.3	55.3	52.9	53.2	58.7	58.5	59.0	61.4	64.2	64.8	60.8	63.3	61.0	64.8
230000	58.0	55.9	56.5	54.8	52.7	53.0	57.9	57.7	58.2	60.8	63.1	63.8	59.9	62.1	60.2	63.8
Daily Max	61.9	58.8	60.1	57.9	54.4	54.0	62.3	60.6	62.3	62.9	66.7	68.3	62.9	66.6	62.9	67.7
Daily Min	57.7	53.9	51.3	51.6	52.7	51.8	51.5	53.7	53.3	55.9	57.6	56.6	58.0	53.4	56.3	56.3
Average	59.5	56.0	55.5	54.6	53.4	52.8	55.9	57.1	57.5	59.2	61.6	62.2	60.1	59.7	59.5	61.6

Monthly average temp (F): 60.1
License Maximum Monthly Average: 68°F

Dead River at County Road AAO Bridge - June 2013 Temperature Monitoring Data

Time HHMMSS	06/17/13	06/18/13	06/19/13	06/20/13	06/21/13	06/22/13	06/23/13	06/24/13	06/25/13	06/26/13	06/27/13	06/28/13	06/29/13	06/30/13
0	62.8	59.6	60.2	61.4	60.5	58.4	60.2	65.0	66.6	68.0	66.3	66.3	63.8	62.6
10000	61.6	58.4	59.0	60.2	60.0	58.1	60.0	64.1	65.5	66.8	65.5	65.4	63.2	61.6
20000	60.6	57.1	57.8	59.3	59.5	57.9	59.8	63.2	64.6	65.6	64.8	64.8	62.7	60.7
30000	59.8	55.9	56.7	58.5	59.0	57.8	59.5	62.4	63.8	64.7	64.6	64.2	62.4	59.9
40000	59.1	54.9	55.7	57.9	58.6	57.6	59.3	61.8	63.1	64.0	64.5	63.7	62.1	59.0
50000	58.5	54.1	54.9	57.3	58.4	57.5	59.1	61.3	62.5	63.4	64.4	63.3	61.6	58.2
60000	58.1	53.5	54.2	56.9	58.3	57.5	58.9	61.0	62.1	62.6	64.1	62.9	61.1	57.5
70000	57.8	53.0	53.8	56.6	58.2	57.5	58.8	60.8	61.8	62.0	63.5	62.6	60.7	56.9
80000	57.6	52.8	53.6	56.7	57.9	57.5	58.8	60.7	61.6	61.6	63.2	62.4	60.5	56.6
90000	57.6	53.4	54.3	57.1	57.7	57.6	58.9	61.3	61.8	61.9	63.3	62.5	60.6	57.0
100000	57.7	54.5	55.5	57.9	57.6	58.0	59.1	62.1	62.7	62.9	63.9	62.6	60.6	58.1
110000	58.0	56.0	57.1	58.7	57.5	58.2	59.4	63.2	63.9	64.3	64.7	62.7	61.0	59.5
120000	58.3	57.7	59.0	59.6	57.5	58.5	59.9	64.6	65.4	65.9	66.2	63.0	61.8	61.2
130000	59.6	59.6	61.0	60.1	57.7	59.0	60.7	66.2	67.2	67.2	68.5	63.2	63.0	63.1
140000	61.4	61.4	62.3	60.4	57.8	59.0	62.1	67.7	68.9	68.6	69.7	63.3	64.3	65.1
150000	62.9	63.3	64.1	61.0	58.0	59.5	63.9	69.1	70.3	70.2	70.6	63.5	65.6	66.9
160000	63.9	64.9	65.0	61.8	58.5	60.4	65.5	70.1	71.9	71.8	71.4	64.1	66.6	68.6
170000	64.7	66.3	66.1	62.2	58.9	60.9	67.1	71.2	73.1	73.0	72.1	65.1	67.3	70.0
180000	65.5	66.7	66.4	62.6	59.0	61.2	68.3	72.0	73.5	73.6	71.3	65.8	67.5	70.6
190000	65.5	66.6	66.5	62.5	59.1	61.3	68.5	71.9	73.6	73.1	71.2	66.2	67.4	70.5
200000	64.7	65.8	66.2	62.3	59.0	61.4	68.3	71.2	73.2	71.7	70.5	66.0	66.7	69.8
210000	63.4	64.5	65.3	62.0	59.0	61.1	67.7	70.4	71.9	70.3	69.8	65.4	65.7	68.6
220000	62.2	63.1	64.0	61.5	58.9	60.8	66.8	69.1	70.6	69.1	68.6	64.9	64.5	67.3
230000	60.9	61.6	62.7	61.1	58.7	60.5	65.9	67.7	69.3	67.5	67.3	64.3	63.5	66.0
Daily Max	65.5	66.7	66.5	62.6	60.5	61.4	68.5	72.0	73.6	73.6	72.1	66.3	67.5	70.6
Daily Min	57.6	52.8	53.6	56.6	57.5	57.5	58.8	60.7	61.6	61.6	63.2	62.4	60.5	56.6
Average	60.9	59.4	60.1	59.8	58.6	59.0	62.3	65.8	67.0	67.1	67.1	64.1	63.5	63.1

Dead River at County Road AAO Bridge - July 2013 Temperature Monitoring Data

Time HHMMSS	07/01/13	07/02/13	07/03/13	07/04/13	07/05/13	07/06/13	07/07/13	07/08/13	07/09/13	07/10/13	07/11/13	07/12/13	07/13/13	07/14/13	07/15/13	07/16/13
0	64.7	63.8	63.9	66.1	66.3	68.4	70.9	68.3	69.9	65.5	65.2	67.3	68.8	69.0	71.5	71.5
10000	63.5	62.3	62.5	64.6	65.0	66.9	69.5	67.4	68.7	65.1	64.3	65.9	67.4	67.9	69.8	70.1
20000	62.4	60.9	61.2	63.3	63.9	65.5	68.1	66.6	67.8	64.7	63.5	64.7	66.1	66.6	68.2	68.7
30000	61.4	59.6	60.0	62.2	62.8	64.3	66.9	65.9	66.9	64.4	62.6	63.6	65.0	65.4	66.8	67.3
40000	60.5	58.3	58.9	61.3	61.8	63.2	65.8	65.3	66.3	63.9	61.8	62.5	64.0	64.6	65.6	66.3
50000	59.9	57.1	57.9	60.4	60.9	62.4	65.0	64.8	65.6	63.5	61.0	61.6	63.0	63.9	64.7	65.6
60000	59.1	56.2	57.0	59.6	60.0	61.8	64.4	64.2	65.0	63.1	60.2	60.9	62.4	63.2	63.9	65.2
70000	58.5	55.3	56.2	59.0	59.2	61.4	64.0	63.8	64.4	62.8	59.4	60.3	62.0	62.7	63.3	65.1
80000	58.2	54.9	55.9	58.7	58.9	61.2	63.9	63.4	64.1	62.5	58.8	60.0	61.8	62.2	63.2	65.0
90000	58.4	55.2	56.3	59.3	59.3	61.7	64.0	63.3	64.2	62.2	58.9	60.2	62.3	62.3	63.7	65.0
100000	59.2	56.3	57.3	60.2	60.5	62.9	63.9	64.1	64.2	62.2	59.9	61.1	63.0	63.2	64.7	65.9
110000	60.5	58.0	58.8	62.0	62.3	64.7	64.5	64.9	64.4	62.8	61.5	62.5	63.9	64.8	66.2	67.5
120000	62.1	59.8	60.7	63.7	64.4	66.6	66.0	65.9	64.8	63.6	63.4	64.1	64.8	66.8	67.6	69.1
130000	63.9	61.9	62.7	66.0	66.5	68.6	68.0	67.6	65.4	64.3	65.5	66.1	66.5	68.9	69.2	70.1
140000	65.6	64.1	64.6	68.1	68.4	70.4	70.0	69.8	66.3	65.7	67.8	68.1	67.7	70.9	71.1	71.5
150000	67.6	66.0	66.6	68.9	70.1	72.2	71.7	71.9	67.1	66.8	70.0	70.0	68.7	72.9	73.4	74.0
160000	69.1	67.7	68.3	69.2	71.7	73.8	73.1	73.2	67.5	67.7	71.6	71.6	70.8	74.7	75.3	75.8
170000	70.2	69.0	69.9	69.8	72.7	74.8	73.2	74.2	68.0	68.6	72.8	72.7	71.6	76.0	76.4	77.4
180000	70.6	69.9	70.9	70.9	73.3	75.4	73.7	75.0	68.1	69.2	72.9	73.5	72.8	76.7	76.8	77.8
190000	70.4	70.0	71.4	71.5	73.2	76.0	73.5	75.2	68.0	69.1	72.4	73.7	73.0	77.1	77.5	77.8
200000	69.6	69.3	71.1	71.2	73.1	75.5	73.0	74.6	67.8	68.6	71.9	73.4	72.9	76.8	77.2	77.5
210000	68.4	68.1	70.1	69.9	72.4	74.6	72.0	73.5	67.4	67.9	71.2	72.6	72.2	75.9	76.0	76.9
220000	66.9	66.8	69.0	68.8	71.4	73.5	70.8	72.3	66.8	66.9	70.1	71.5	71.3	74.6	74.5	75.9
230000	65.3	65.3	67.5	67.4	69.9	72.3	69.4	71.1	66.1	66.0	68.7	70.2	70.2	73.1	73.0	74.7
Daily Max	70.6	70.0	71.4	71.5	73.3	76.0	73.7	75.2	69.9	69.2	72.9	73.7	73.0	77.1	77.5	77.8
Daily Min	58.2	54.9	55.9	58.7	58.9	61.2	63.9	63.3	64.1	62.2	58.8	60.0	61.8	62.2	63.2	65.0
Average	64.0	62.3	63.3	65.1	66.2	68.3	68.5	68.6	66.5	65.3	65.7	66.6	67.2	69.2	70.0	70.9

Monthly average temp (F): 65.2

License Maximum Monthly Average: 68°F

Dead River at County Road AAO Bridge - July 2013 Temperature Monitoring Data

Time															
HHMMSS	07/17/13	07/18/13	07/19/13	07/20/13	07/21/13	07/22/13	07/23/13	07/24/13	07/25/13	07/26/13	07/27/13	07/28/13	07/29/13	07/30/13	07/31/13
0	73.3	72.9	71.0	68.9	65.9	63.8	66.2	63.3	64.2	62.2	57.8	58.5	55.5	61.4	61.5
10000	71.8	71.7	70.1	68.3	64.8	63.0	65.1	62.4	63.0	61.6	57.3	57.9	55.3	60.7	61.1
20000	70.3	70.5	69.1	67.7	63.8	62.3	64.1	61.6	61.9	61.1	57.0	57.4	55.2	60.0	60.6
30000	69.1	69.4	68.3	67.2	62.8	61.5	63.0	60.8	60.9	60.7	56.6	57.1	55.1	59.4	60.2
40000	68.0	68.5	67.6	66.7	61.9	60.8	62.0	60.0	60.0	60.4	56.3	56.6	55.0	58.8	59.8
50000	66.9	67.8	67.4	66.2	61.1	60.0	61.2	59.3	59.3	60.2	56.2	56.3	54.9	58.2	59.6
60000	65.9	67.2	67.0	65.6	60.5	59.4	60.5	58.6	58.6	60.1	56.2	56.0	54.7	57.6	59.4
70000	65.1	66.7	66.7	65.0	59.9	58.9	60.2	57.9	58.0	60.0	56.1	55.9	54.4	57.2	59.2
80000	64.8	66.5	66.6	64.5	59.4	58.7	60.0	57.4	57.6	60.0	56.1	55.7	54.3	57.0	59.1
90000	65.4	66.5	67.0	64.4	59.3	58.9	60.0	57.8	57.9	60.0	56.3	55.5	54.4	57.1	59.3
100000	66.9	66.7	67.5	64.5	59.6	59.8	59.9	58.6	58.5	60.2	56.7	55.6	55.1	57.7	59.9
110000	68.6	67.0	68.5	65.1	60.2	61.2	60.1	60.0	59.7	60.6	57.2	55.7	56.1	58.4	60.9
120000	70.4	68.6	68.9	66.1	61.1	63.0	60.8	61.0	61.1	60.8	57.6	56.0	57.5	59.8	61.9
130000	72.4	70.4	69.7	67.2	62.6	63.7	61.5	62.4	62.1	60.9	58.4	56.4	58.8	61.2	62.9
140000	74.2	71.6	70.8	68.4	63.9	65.1	63.0	63.6	63.2	60.8	59.3	56.7	60.5	62.2	64.1
150000	75.3	73.2	71.4	69.7	65.1	67.0	64.5	64.7	63.9	60.7	60.3	57.1	62.1	62.6	65.1
160000	76.0	74.4	72.7	70.7	65.7	69.1	65.9	66.0	64.2	61.2	60.6	57.2	63.5	63.1	66.0
170000	76.9	75.9	73.3	71.5	66.2	70.2	66.5	66.8	64.3	61.1	60.6	57.2	64.5	63.3	66.6
180000	77.2	76.5	73.4	71.8	66.9	70.3	67.0	68.0	64.3	61.0	60.7	57.1	64.9	63.2	66.3
190000	77.4	76.1	73.0	71.3	67.0	70.3	67.4	67.9	64.3	60.5	60.7	57.0	64.8	63.0	66.1
200000	77.0	75.1	72.2	70.4	66.7	70.0	67.1	67.6	64.3	60.1	60.6	56.8	64.3	62.8	65.8
210000	76.3	74.1	71.2	69.2	66.3	69.7	66.2	67.1	64.0	59.5	60.1	56.4	63.6	62.6	65.3
220000	75.3	73.1	70.4	68.0	65.5	68.6	65.2	66.3	63.4	59.0	59.6	56.1	62.9	62.3	64.5
230000	74.1	72.0	69.7	67.0	64.6	67.4	64.2	65.3	62.8	58.4	59.1	55.8	62.2	61.9	63.7
Daily Max	77.4	76.5	73.4	71.8	67.0	70.3	67.4	68.0	64.3	62.2	60.7	58.5	64.9	63.3	66.6
Daily Min	64.8	66.5	66.6	64.4	59.3	58.7	59.9	57.4	57.6	58.4	56.1	55.5	54.3	57.0	59.1
Average	71.6	70.9	69.7	67.7	63.4	64.3	63.4	62.7	61.7	60.5	58.2	56.6	58.7	60.5	62.4

Dead River at County Road AAO Bridge - August 2013 Temperature Monitoring Data

Time HHMMSS	8/1/2013	8/2/2013	8/3/2013	8/4/2013	8/5/2013	8/6/2013	8/7/2013	8/8/2013	8/9/2013	8/10/2013	8/11/2013	8/12/2013	8/13/2013	8/14/2013	8/15/2013	8/16/2013
0	62.9	63.8	63.9	62.1	61.8	60.2	63.7	61.6	61.3	61.3	62.9	62.6	59.8	59.5	60.2	62.6
10000	62.1	63.1	63.1	61.5	60.8	60.0	63.0	60.7	60.7	60.5	61.7	61.8	59.1	58.7	59.4	61.6
20000	61.3	62.4	62.2	60.7	59.9	59.8	62.4	59.9	60.0	59.8	60.7	61.1	58.4	58.0	58.7	60.8
30000	60.7	61.7	61.5	59.9	59.1	59.5	61.8	59.2	59.4	59.1	59.8	60.5	57.8	57.5	58.1	60.2
40000	60.1	61.2	60.8	59.2	58.3	59.3	61.3	58.5	58.9	58.3	58.9	59.9	57.4	57.0	57.6	59.6
50000	59.5	60.7	60.2	58.6	57.5	59.1	60.9	57.8	58.4	57.6	58.1	59.3	57.0	56.5	57.0	59.1
60000	58.9	60.2	59.7	58.0	56.9	59.0	60.7	57.1	58.0	56.9	57.3	58.8	56.6	56.1	56.5	58.5
70000	58.4	59.8	59.4	57.5	56.4	58.8	60.5	56.5	57.5	56.3	56.7	58.3	56.4	55.8	56.1	58.0
80000	58.2	59.3	59.0	57.0	56.2	58.8	60.4	56.1	57.2	55.8	56.3	57.9	56.4	55.5	55.9	57.8
90000	58.2	59.2	59.0	56.9	56.2	58.9	60.5	56.2	57.3	55.6	56.4	57.8	56.8	55.6	56.0	57.9
100000	58.9	59.8	59.4	57.7	57.0	59.3	60.7	56.7	58.0	56.4	56.9	58.7	57.2	56.2	56.9	58.7
110000	60.1	61.1	60.1	59.0	57.6	59.8	60.8	58.0	59.1	57.9	57.6	60.4	58.0	57.3	58.4	60.1
120000	60.9	62.5	61.0	60.2	58.1	60.4	61.1	58.9	60.4	59.3	58.4	62.2	59.1	58.7	60.3	61.8
130000	62.0	64.2	62.1	61.4	58.6	61.4	61.5	60.0	61.5	61.3	59.9	63.0	60.0	60.3	62.4	64.0
140000	63.5	65.7	63.3	62.3	59.2	63.3	61.8	61.1	62.8	63.7	61.7	63.6	61.1	61.8	64.6	66.4
150000	64.6	66.7	64.5	63.3	59.8	64.6	62.0	62.2	63.4	65.5	62.4	63.7	61.8	63.1	66.7	68.8
160000	66.1	67.7	64.9	64.3	60.6	65.2	63.4	62.5	64.3	66.6	63.7	64.1	62.8	64.3	68.4	69.2
170000	66.9	68.4	65.0	64.7	60.9	65.7	64.6	63.3	64.8	67.4	64.4	64.6	63.4	65.5	69.1	69.3
180000	67.5	68.7	65.0	65.5	61.0	66.5	65.4	63.4	64.9	67.4	65.2	64.5	64.0	65.5	69.2	69.0
190000	67.4	68.6	64.9	65.8	61.1	66.5	65.6	63.4	64.9	67.5	65.4	64.1	63.8	65.1	68.4	68.2
200000	66.9	68.1	64.8	65.5	61.1	66.3	65.3	63.2	64.5	67.1	65.3	63.3	63.1	64.4	67.2	67.0
210000	66.1	67.1	64.2	64.8	60.9	65.6	64.5	62.9	63.8	66.4	65.0	62.3	62.2	63.4	66.0	66.0
220000	65.3	65.9	63.5	63.8	60.7	65.1	63.6	62.4	62.9	65.3	64.4	61.4	61.4	62.3	64.8	64.8
230000	64.5	64.8	62.8	62.8	60.4	64.4	62.6	61.8	62.1	64.2	63.5	60.7	60.4	61.2	63.7	63.6
Daily Max	67.5	68.7	65.0	65.8	61.8	66.5	65.6	63.4	64.9	67.5	65.4	64.6	64.0	65.5	69.2	69.3
Daily Min	58.2	59.2	59.0	56.9	56.2	58.8	60.4	56.1	57.2	55.6	56.3	57.8	56.4	55.5	55.9	57.8
Average	62.5	63.8	62.3	61.3	59.2	62.0	62.4	60.1	61.1	61.5	60.9	61.4	59.8	60.0	61.7	63.0

Monthly average temp (F): 63.9
License Maximum Monthly Average: 68°F

Dead River at County Road AAO Bridge - August 2013 Temperature Monitoring Data

Time	8/17/2013	8/18/2013	8/19/2013	8/20/2013	8/21/2013	8/22/2013	8/23/2013	8/24/2013	8/25/2013	8/26/2013	8/27/2013	8/28/2013	8/29/2013	8/30/2013	8/31/2013
HHMMSS															
0	62.6	63.3	63.5	64.4	64.5	65.7	64.3	64.8	63.1	67.0	68.3	68.5	68.3	68.2	66.9
10000	61.9	62.5	62.5	63.6	64.2	65.2	63.8	64.1	63.1	66.8	67.8	68.0	68.1	67.4	66.8
20000	61.5	61.8	61.8	63.1	64.2	65.0	63.6	63.8	63.3	66.9	67.5	67.8	67.9	67.1	66.7
30000	61.3	61.2	61.2	62.8	64.4	64.4	63.4	63.6	63.5	67.1	67.4	68.0	67.5	67.2	66.5
40000	60.8	60.8	60.9	62.9	64.4	63.7	63.0	63.4	63.7	67.2	67.5	68.2	67.1	67.7	66.0
50000	60.3	60.7	60.8	63.2	64.3	63.4	62.7	63.4	64.0	67.2	67.6	67.6	67.0	67.8	65.7
60000	60.0	60.6	60.8	63.3	64.1	63.4	62.5	63.3	64.4	67.1	67.8	66.9	66.8	67.1	65.4
70000	60.0	60.6	60.9	63.1	63.9	63.4	62.4	63.1	64.6	67.1	67.9	66.1	66.6	67.1	65.1
80000	60.1	60.7	61.1	62.8	63.7	63.6	62.4	62.9	64.7	67.4	67.7	65.8	66.1	67.2	64.9
90000	60.4	60.9	61.4	62.9	64.0	64.0	62.5	63.1	65.0	67.9	67.5	65.9	65.8	67.0	64.7
100000	61.1	61.4	61.9	63.7	64.9	64.6	63.0	63.9	65.5	68.4	67.4	66.3	66.3	66.5	64.9
110000	62.4	62.1	62.9	65.1	66.2	65.6	64.0	65.0	66.1	68.8	67.9	67.2	67.3	66.1	65.5
120000	64.0	63.1	64.1	66.8	67.0	66.7	65.4	66.4	67.3	69.6	68.6	68.6	68.9	66.3	66.5
130000	65.8	64.7	65.2	68.6	68.5	68.3	67.2	67.9	69.0	70.5	69.5	70.2	70.6	66.9	67.7
140000	67.6	66.5	66.8	69.9	70.1	69.6	68.2	69.2	70.8	71.3	70.5	71.7	72.0	67.7	68.9
150000	68.9	68.3	68.1	70.9	71.1	70.7	69.3	69.7	72.1	71.7	71.2	72.4	72.9	67.9	69.9
160000	69.8	69.5	69.2	71.4	71.0	71.5	69.7	69.6	73.3	72.0	71.9	73.1	73.2	68.0	70.7
170000	69.5	70.2	70.1	71.7	70.2	71.9	69.4	69.4	74.2	72.3	71.9	73.0	72.7	67.9	71.0
180000	69.7	70.3	70.8	71.5	68.9	71.1	69.0	68.7	73.7	72.2	72.0	72.6	71.4	68.3	70.9
190000	69.5	69.6	69.3	70.5	68.3	69.8	68.4	67.7	72.2	71.2	71.3	71.7	69.5	68.1	70.4
200000	68.6	68.6	67.9	69.2	67.7	68.5	67.4	66.5	70.5	70.8	70.6	70.7	68.3	67.7	69.6
210000	67.2	67.4	66.7	67.9	67.4	67.0	66.3	65.5	68.8	70.2	69.7	69.9	67.9	67.5	68.7
220000	65.6	66.0	65.8	66.6	67.6	65.6	65.8	64.4	68.0	69.3	69.0	69.3	68.1	67.2	67.9
230000	64.3	64.7	65.1	65.3	67.1	64.8	65.3	63.6	67.5	68.7	68.9	68.8	68.6	67.0	67.2
Daily Max	69.8	70.3	70.8	71.7	71.1	71.9	69.7	69.7	74.2	72.3	72.0	73.1	73.2	68.3	71.0
Daily Min	60.0	60.6	60.8	62.8	63.7	63.4	62.4	62.9	63.1	66.8	67.4	65.8	65.8	66.1	64.7
Average	64.3	64.4	64.5	66.3	66.6	66.6	65.4	65.5	67.4	69.1	69.1	69.1	68.7	67.4	67.4

Dead River at County Road AAO Bridge - September 2013 Temperature Monitoring Data

Time		9/1/2013	9/2/2013	9/3/2013	9/4/2013	9/5/2013	9/6/2013	9/7/2013	9/8/2013	9/9/2013	9/10/2013	9/11/2013	9/12/2013	9/13/2013	9/14/2013	9/15/2013	9/16/2013
HHMMSS																	
0		66.6	64.3	61.4	63.3	61.8	61.6	64.1	61.5	61.6	63.4	64.1	65.2	63.0	60.4	61.5	58.5
10000		66.4	63.7	60.8	62.7	61.1	60.9	63.4	61.0	61.1	63.4	63.7	65.0	62.9	60.1	61.0	58.2
20000		66.4	63.2	60.4	62.0	60.5	60.3	62.9	60.5	60.7	63.3	63.4	64.7	62.6	59.9	60.7	58.1
30000		66.4	62.8	60.0	61.5	59.9	59.9	62.7	60.0	60.4	63.3	63.1	64.2	62.5	59.7	60.7	58.0
40000		66.4	62.4	59.7	61.2	59.4	59.5	62.7	59.7	60.2	63.3	63.0	64.0	62.3	59.5	60.8	57.9
50000		66.4	62.1	59.4	61.0	59.0	59.3	62.6	59.3	60.1	63.4	63.1	63.8	62.0	59.3	61.0	57.8
60000		66.4	61.7	59.1	60.8	58.6	59.2	62.6	58.9	60.2	63.5	63.2	63.8	61.6	59.1	61.3	57.6
70000		66.3	61.5	58.8	60.9	58.1	59.2	62.5	58.8	60.2	63.5	63.2	63.9	61.4	58.9	61.4	57.4
80000		66.2	61.3	58.7	60.9	57.7	59.1	62.3	58.9	60.3	63.6	63.1	63.8	61.2	58.8	61.4	57.2
90000		66.2	61.2	58.4	61.0	57.3	59.1	62.3	59.0	60.4	63.8	63.1	63.9	61.1	58.8	61.3	57.2
100000		66.6	61.3	58.9	61.2	57.7	59.6	62.8	59.3	60.7	64.0	63.5	64.0	61.3	59.3	61.1	57.4
110000		66.8	61.4	59.9	61.6	58.8	60.8	64.1	59.9	60.9	64.5	64.4	64.2	61.6	60.2	61.0	58.2
120000		67.2	61.5	61.2	62.4	60.2	62.1	65.3	61.3	61.2	65.0	65.6	64.5	62.6	61.3	60.8	59.2
130000		67.9	61.7		63.6	62.0	63.8	65.7	62.9	61.5	65.6	67.1	64.7	63.8	62.7	60.8	61.0
140000		68.4	62.0	64.8	65.0	64.0	65.7	65.8	63.9	61.9	66.9	68.8	65.0	64.2	63.9	60.8	62.7
150000		69.1	62.5	66.4	66.4	65.8	67.0	65.8	65.1	62.5	67.2	69.7	65.1	64.9	65.1	60.9	63.4
160000		69.5	63.3	67.7	67.7	67.3	67.4	65.5	66.3	63.7	67.2	69.7	65.1	65.4	65.8	60.8	63.3
170000		69.3	64.0	68.5	68.4	68.1	67.3	65.1	66.7	64.0	67.1	69.1	65.0	65.6	65.7	60.8	62.9
180000		68.9	64.3	68.7	68.2	68.1	67.1	64.6	66.5	64.2	67.0	68.9	64.7	64.9	65.1	60.8	62.7
190000		68.2	64.3	68.3	67.5	67.4	67.0	64.1	66.0	64.3	67.0	68.3	64.4	63.9	64.5	60.6	61.7
200000		67.3	63.9	67.3	66.2	66.3	66.6	63.6	65.2	64.2	66.8	67.4	64.0	62.8	63.9	60.1	60.6
210000		66.4	63.2	66.1	64.9	64.9	66.1	63.1	64.2	64.0	66.3	66.4	63.6	62.0	63.4	59.7	60.0
220000		65.6	62.5	65.0	63.7	63.6	65.6	62.5	63.2	63.8	65.4	65.4	63.4	61.3	62.8	59.2	59.4
230000		64.9	61.9	64.1	62.6	62.5	64.9	62.0	62.3	63.6	64.6	65.2	63.2	60.8	62.0	58.8	58.9
Daily Max		69.5	64.3	68.7	68.4	68.1	67.4	65.8	66.7	64.3	67.2	69.7	65.2	65.6	65.8	61.5	63.4
Daily Min		64.9	61.2	58.4	60.8	57.3	59.1	62.0	58.8	60.1	63.3	63.0	63.2	60.8	58.8	58.8	57.2
Average		67.1	62.6	62.8	63.5	62.1	62.9	63.7	62.1	61.9	65.0	65.5	64.3	62.7	61.7	60.7	59.6

Monthly average temp (F): 61.1

License Maximum Monthly Average: 63°F

Missing data due to equipment maintenance

Dead River at County Road AAO Bridge - September 2013 Temperature Monitoring Data

Time														
HHMMSS	9/17/2013	9/18/2013	9/19/2013	9/20/2013	9/21/2013	9/22/2013	9/23/2013	9/24/2013	9/25/2013	9/26/2013	9/27/2013	9/28/2013	9/29/2013	9/30/2013
0	58.6	60.0	60.6	62.0	61.4	57.7	55.8	55.7	56.3	57.5	57.7	58.6	58.3	58.2
10000	58.3	59.8	60.6	61.9	61.1	57.4	55.5	55.3	56.0	57.3	57.4	58.3	58.2	57.8
20000	58.1	59.7	60.5	61.6	60.9	57.2	55.4	55.0	56.0	57.0	57.2	58.1	58.2	57.4
30000	58.0	59.6	60.5	61.4	60.7	56.9	55.2	54.7	56.1	56.8	56.9	57.8	58.0	57.1
40000	58.2	59.5	60.5	61.3	60.5	56.8	55.0	54.4	56.2	56.8	56.7	57.8	57.7	56.8
50000	58.1	59.6	60.5	61.1	60.3	56.7	54.9	54.2	56.2	56.7	56.6	57.6	57.5	56.7
60000	58.1	59.6	60.5	61.1	60.1	56.7	54.7	54.0	56.3	56.7	56.5	57.5	57.3	56.6
70000	58.0	59.6	60.5	61.2	59.8	56.8	54.6	53.8	56.2	56.7	56.4	57.4	57.0	56.4
80000	57.9	59.6	60.5	61.3	59.6	56.7	54.4	53.7	55.9	56.5	56.4	57.3	56.8	56.4
90000	57.8	59.6	60.6	61.5	59.4	56.7	54.4	53.8	55.7	56.5	56.4	57.3	56.6	56.5
100000	58.0	59.7	60.8	61.7	59.3	56.8	54.7	54.3	55.8	56.9	56.8	57.5	56.6	56.7
110000	58.8	59.8	61.0	62.0	59.5	57.0	55.4	55.3	56.4	57.8	57.6	58.1	57.2	57.3
120000	60.0	59.9	61.3	62.1	59.7	57.3	56.6	56.6	57.5	58.9	58.7	59.0	58.1	58.2
130000	61.4	60.1	61.6	62.6	60.0	57.5	58.0	58.1	59.8	60.2	59.9	60.0	59.3	59.1
140000	62.5	60.4	62.0	63.6	60.0	57.7	58.9	59.7	61.2	61.3	61.0	60.7	60.4	59.7
150000	63.3	60.6	62.4	64.6	59.9	57.8	59.4	61.1	61.9	62.2	61.8	61.4	61.1	60.2
160000	63.6	60.8	63.4	65.0	59.7	57.8	60.3	61.9	62.2	62.5	62.0	61.7	61.4	60.2
170000	63.6	60.9	63.6	64.7	59.6	58.0	60.7	62.1	62.0	62.4	62.0	61.7	61.3	60.1
180000	63.1	60.9	63.7	64.1	59.4	58.2	60.5	61.6	61.2	61.7	61.5	61.4	60.8	59.8
190000	62.3	60.9	63.4	63.6	58.9	58.1	59.6	60.7	60.4	60.7	60.9	60.7	60.2	59.4
200000	61.6	60.8	62.8	62.9	58.4	57.4	58.6	59.5	59.6	59.8	60.2	60.1	59.7	58.9
210000	61.0	60.7	62.5	62.3	58.1	56.8	57.6	58.4	59.0	59.0	59.6	59.6	59.3	58.5
220000	60.5	60.6	62.3	61.9	57.9	56.4	56.8	57.6	58.3	58.5	59.3	59.2	58.9	58.3
230000	60.3	60.6	62.2	61.6	57.7	56.1	56.2	56.9	57.8	58.0	58.9	58.7	58.6	58.2
Daily Max	63.6	60.9	63.7	65.0	61.4	58.2	60.7	62.1	62.2	62.5	62.0	61.7	61.4	60.2
Daily Min	57.8	59.5	60.5	61.1	57.7	56.1	54.4	53.7	55.7	56.5	56.4	57.3	56.6	56.4
Average	60.0	60.1	61.6	62.4	59.7	57.2	56.8	57.0	58.1	58.7	58.7	59.1	58.7	58.1

Dead River at County Road AAO Bridge - October 2013 Temperature Monitoring Data

Time																	
HHMMSS	10/1/2013	10/2/2013	10/3/2013	10/4/2013	10/5/2013	10/6/2013	10/7/2013	10/8/2013	10/9/2013	10/10/2013	10/11/2013	10/12/2013	10/13/2013	10/14/2013	10/15/2013	10/16/2013	10/17/2013
0	58.1	58.2	56.7	56.3	55.6	51.9	53.1	51.1	52.7	54.3	53.4	53.4	53.0	50.8	50.6	50.7	49.1
10000	58.0	58.1	56.4	56.1	55.3	51.8	53.0	50.7	52.6	54.0	52.8	53.0	52.6	50.3	50.4	50.7	48.7
20000	57.8	57.9	56.3	56.0	55.1	51.7	52.8	50.3	52.4	53.6	52.4	52.7	52.2	49.9	50.2	50.7	48.3
30000	57.6	57.7	56.3	56.0	55.0	51.7	52.6	50.0	52.4	53.2	52.0	52.5	52.1	49.6	50.0	50.6	48.0
40000	57.6	57.5	56.2	55.9	54.8	51.7	52.3	49.7	52.3	52.9	51.7	52.4	52.0	49.2	50.0	50.6	47.8
50000	57.5	57.2	56.2	55.9	54.8	51.8	52.1	49.4	52.2	52.6	51.4	52.4	51.9	48.9	49.9	50.5	47.5
60000	57.4	56.9	56.2	55.8	54.6	51.8	51.8	49.1	52.1	52.3	51.1	52.4	51.9	48.7	49.8	50.4	47.3
70000	57.3	56.6	56.0	55.8	54.5	51.8	51.7	48.8	51.9	52.0	51.0	52.5	51.9	48.4	49.8	50.2	47.2
80000	57.2	56.4	55.9	55.7	54.4	51.9	51.6	48.6	51.7	51.7	50.9	52.6	51.8	48.2	49.8	50.0	47.0
90000	57.1	56.2	55.9	55.7	54.2	52.0	51.5	48.4	51.6	51.5	50.8	52.8	51.8	48.0	49.8	49.9	46.8
100000	57.3	56.3	56.0	55.8	54.1	52.1	51.4	48.6	51.7	51.6	50.9	53.1	51.9	48.0	49.9	49.7	46.9
110000	57.9	56.9	56.5	56.3	54.1	52.3	51.6	49.2	52.3	52.2	51.7	53.4	52.1	48.6	50.1	49.6	47.3
120000	58.7	57.9	57.1	56.8	54.2	52.6	52.2	50.1	53.2	53.0	52.6	53.7	52.5	49.6	50.2	49.5	48.1
130000	60.0	59.1	57.8	57.2	54.2	53.2	52.5	51.2	54.2	54.2	53.7	54.0	53.6	50.5	50.4	49.5	48.9
140000	61.1	59.5	58.5	57.8	54.1	53.5	52.8	52.5	55.5	55.4	54.8	54.3	54.2	51.5	50.5	49.5	49.6
150000	62.0	59.9	58.9	58.1	54.2	53.7	53.1	53.8	56.8	56.6	56.0	54.6	54.8	52.4	50.7	49.4	50.0
160000	62.2	60.6	59.1	58.2	54.2	54.1	53.2	54.7	57.5	57.4	57.0	54.8	55.4	53.2	50.9	49.6	50.4
170000	61.9	61.0	59.0	58.1	54.1	54.2	53.2	55.1	57.8	57.7	57.5	55.1	55.3	53.5	50.9	50.2	50.4
180000	61.3	60.8	58.7	57.9	53.9	54.1	53.2	55.0	57.7	57.5	57.3	55.3	55.2	53.4	51.0	50.4	50.2
190000	60.4	60.2	58.2	57.5	53.5	54.0	52.9	54.5	57.1	56.9	56.8	55.2	54.6	52.8	50.9	50.3	50.1
200000	59.8	59.3	57.6	57.1	53.2	53.8	52.6	54.1	56.5	56.1	56.0	54.9	53.6	52.2	50.9	50.1	49.8
210000	59.4	58.3	57.2	56.7	52.9	53.6	52.3	53.7	55.9	55.3	55.2	54.6	52.7	51.8	50.9	49.9	49.5
220000	59.0	57.6	56.8	56.3	52.6	53.4	51.9	53.3	55.3	54.6	54.5	54.1	52.0	51.4	50.8	49.8	49.3
230000	58.5	57.1	56.5	55.9	52.3	53.3	51.5	53.0	54.8	54.0	53.9	53.5	51.4	51.0	50.8	49.4	49.2
Daily Max	62.2	61.0	59.1	58.2	55.6	54.2	53.2	55.1	57.8	57.7	57.5	55.3	55.4	53.5	51.0	50.7	50.4
Daily Min	57.1	56.2	55.9	55.7	52.3	51.7	51.4	48.4	51.6	51.5	50.8	52.4	51.4	48.0	49.8	49.4	46.8
Average	58.9	58.2	57.1	56.6	54.2	52.8	52.4	51.5	54.1	54.2	53.6	53.6	52.9	50.5	50.4	50.0	48.6

Monthly average temp (F): 49.1
License Maximum Monthly Average: 56°F

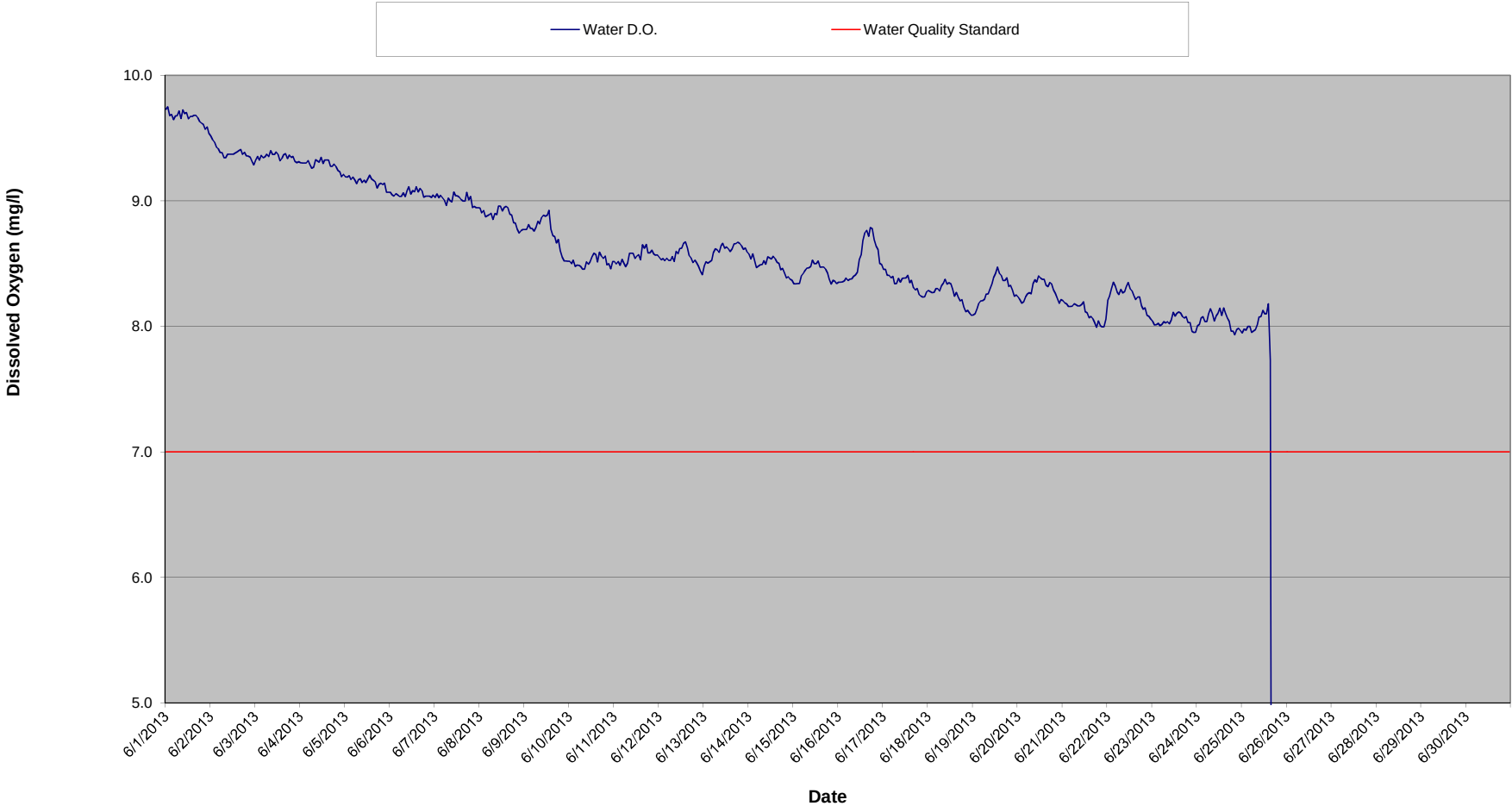
Dead River at County Road AAO Bridge - October 2013 Temperature Monitoring Data

Time														
HHMMSS	10/18/2013	10/19/2013	10/20/2013	10/21/2013	10/22/2013	10/23/2013	10/24/2013	10/25/2013	10/26/2013	10/27/2013	10/28/2013	10/29/2013	10/30/2013	10/31/2013
0	49.1	47.9	46.6	46.0	43.3	42.7	42.3	42.2	42.5	41.6	41.1	39.3	39.3	41.3
10000	49.2	47.6	46.4	45.7	43.2	42.7	42.3	42.2	42.5	41.5	40.7	39.1	39.4	41.5
20000	49.2	47.3	46.2	45.4	43.2	42.5	42.2	42.0	42.5	41.4	40.7	38.9	39.4	41.5
30000	49.2	47.0	46.1	45.3	43.1	42.4	42.2	41.8	42.6	41.4	40.6	38.7	39.5	41.6
40000	49.2	46.7	45.9	45.3	43.0	42.2	42.1	41.6	42.5	41.3	40.5	38.5	39.5	41.6
50000	49.2	46.5	45.6	45.2	42.9	42.0	42.0	41.4	42.5	41.3	40.3	38.4	39.6	41.6
60000	49.2	46.2	45.4	45.2	42.7	41.7	41.9	41.3	42.4	41.2	40.2	38.2	39.7	41.6
70000	49.2	45.9	45.2	45.1	42.6	41.4	41.8	41.4	42.3	41.2	40.1	38.2	39.7	41.6
80000	49.2	45.7	45.2	45.0	42.5	41.1	41.7	41.3	42.1	41.1	40.1	38.1	39.7	41.6
90000	49.2	45.5	45.1	44.9	42.3	41.0	41.6	41.4	41.9	41.1	40.1	38.0	39.7	41.7
100000	49.3	45.6	45.2	45.0	41.9	41.1	41.6	41.6	41.9	41.2	40.2	38.1	39.7	41.7
110000	49.5	45.8	45.5	45.1	42.4	41.3	41.8	41.9	41.9	41.3	40.3	38.4	39.9	41.8
120000	49.6	46.5	46.0	45.6	43.0	42.0	42.4	42.4	42.0	41.5	40.5	38.9	40.1	42.1
130000	49.9	47.3	46.8	46.1	43.6	42.7	43.1	43.1	42.4	41.7	40.8	39.4	40.4	42.4
140000	49.7	47.6	47.3	46.1	44.4	43.1	43.9	43.5	42.5	41.9	41.0	39.9	40.6	42.6
150000	49.5	48.1	47.8	46.5	44.8	43.8	44.6	43.5	42.6	42.1	41.2	40.2	40.7	42.9
160000	49.6	48.5	48.0	46.5	44.7	44.1	44.5	43.7	42.6	42.3	41.3	40.3	40.9	43.0
170000	49.6	48.4	48.1	46.6	44.8	44.0	44.3	43.5	42.4	42.4	41.3	40.2	41.0	43.0
180000	49.4	48.3	47.9	46.2	44.6	43.7	43.9	43.2	42.1	42.3	41.3	40.0	41.0	43.0
190000	49.2	47.9	47.7	45.5	44.2	43.4	43.5	42.9	41.9	42.2	41.1	39.8	41.1	42.9
200000	48.9	47.5	47.3	45.0	43.8	43.2	43.3	42.7	41.8	42.1	40.7	39.6	41.1	42.9
210000	48.6	47.2	46.9	44.5	43.4	43.0	43.1	42.5	41.6	41.9	40.3	39.5	41.1	42.8
220000	48.3	46.9	46.6	44.0	43.1	42.8	42.7	42.5	41.6	41.7	40.0	39.4	41.1	42.7
230000	48.1	46.7	46.3	43.6	42.9	42.5	42.5	42.4	41.6	41.3	39.6	39.4	41.2	42.6
Daily Max	49.9	48.5	48.1	46.6	44.8	44.1	44.6	43.7	42.6	42.4	41.3	40.3	41.2	43.0
Daily Min	48.1	45.5	45.1	43.6	41.9	41.0	41.6	41.3	41.6	41.1	39.6	38.0	39.3	41.3
Average	49.2	47.0	46.5	45.4	43.4	42.5	42.7	42.3	42.2	41.6	40.6	39.1	40.2	42.2

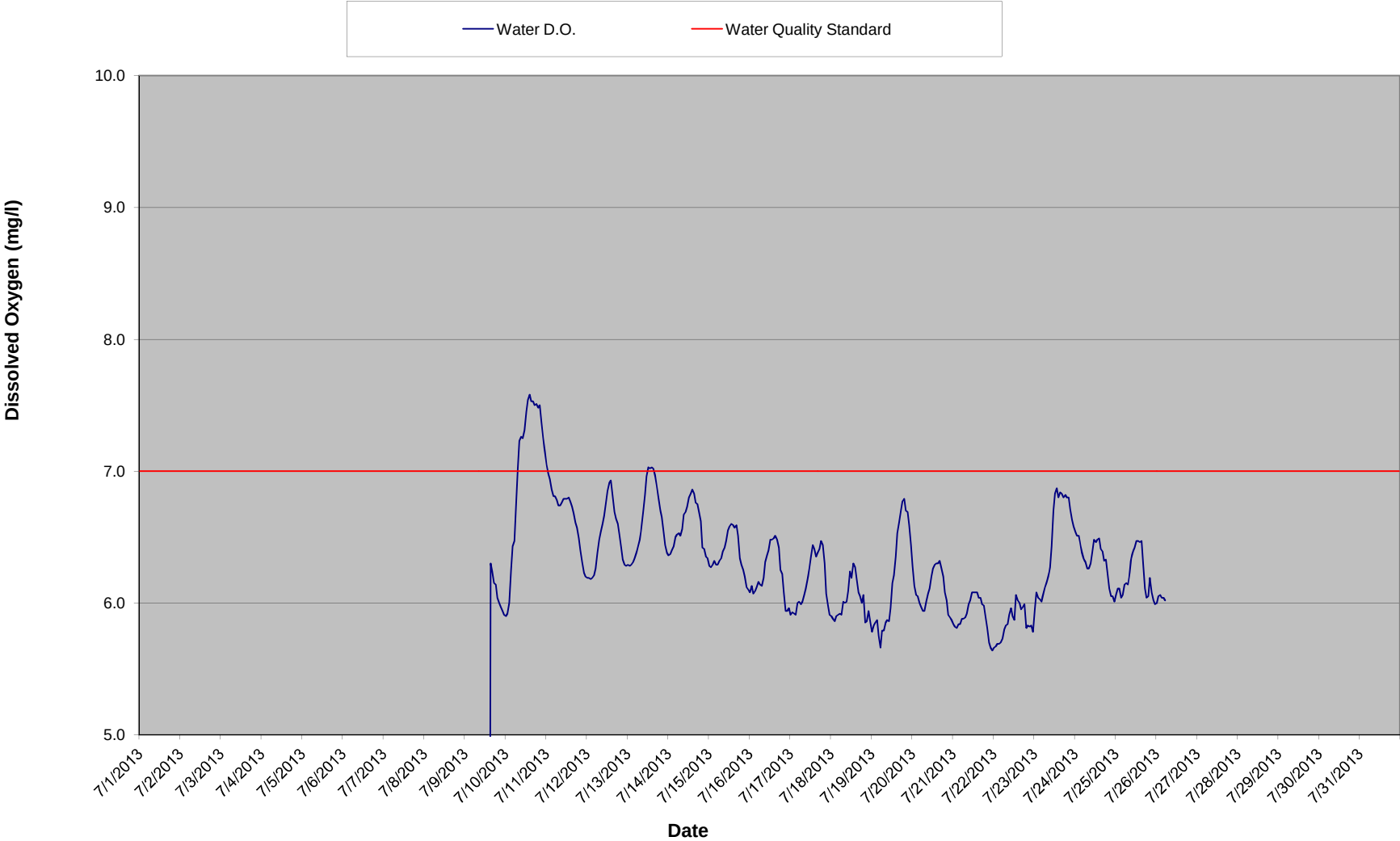
Dead River Water Quality Monitoring Data

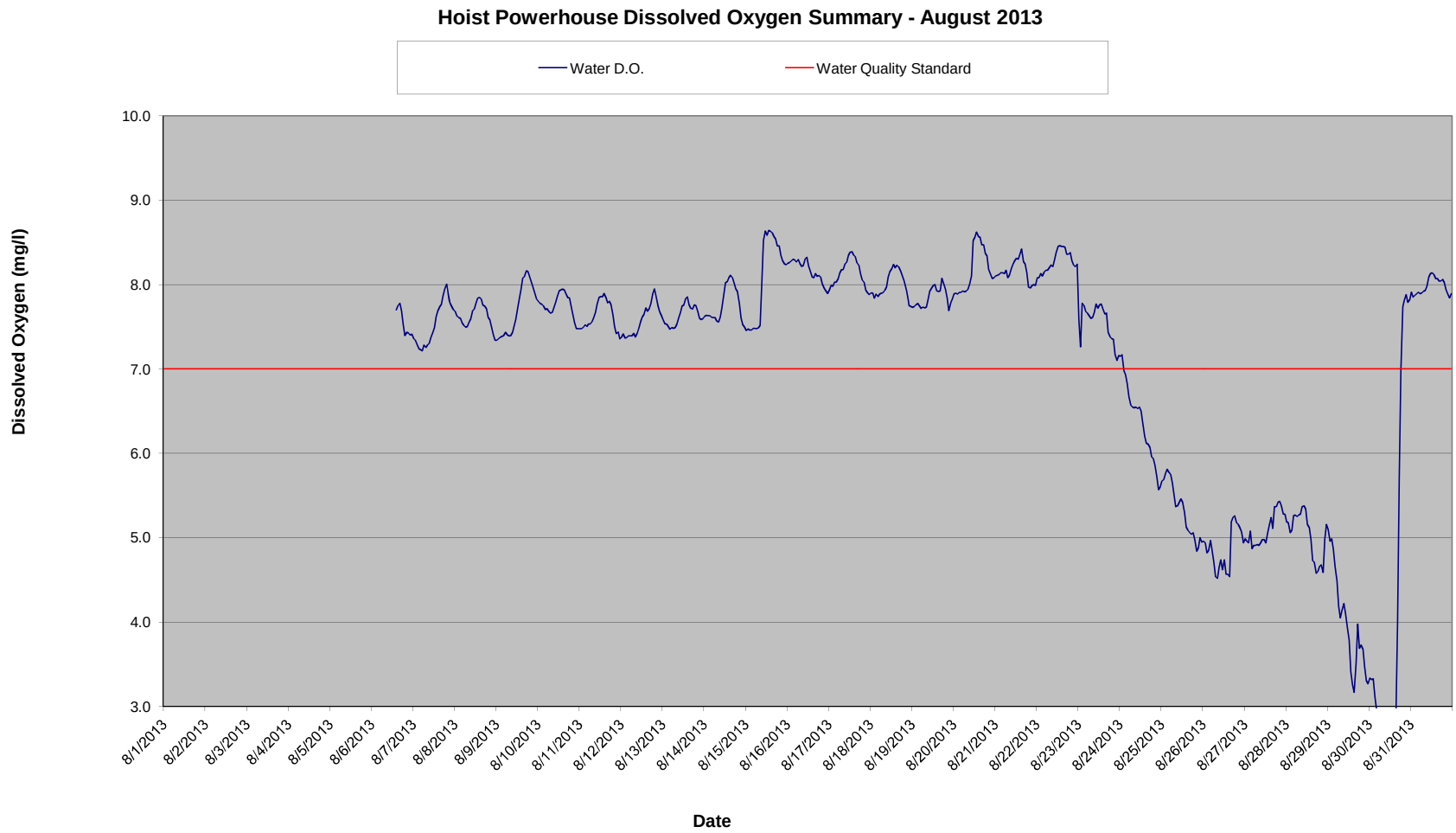
Downstream of the Hoist Powerhouse

Hoist Powerhouse Dissolved Oxygen Summary - June 2013

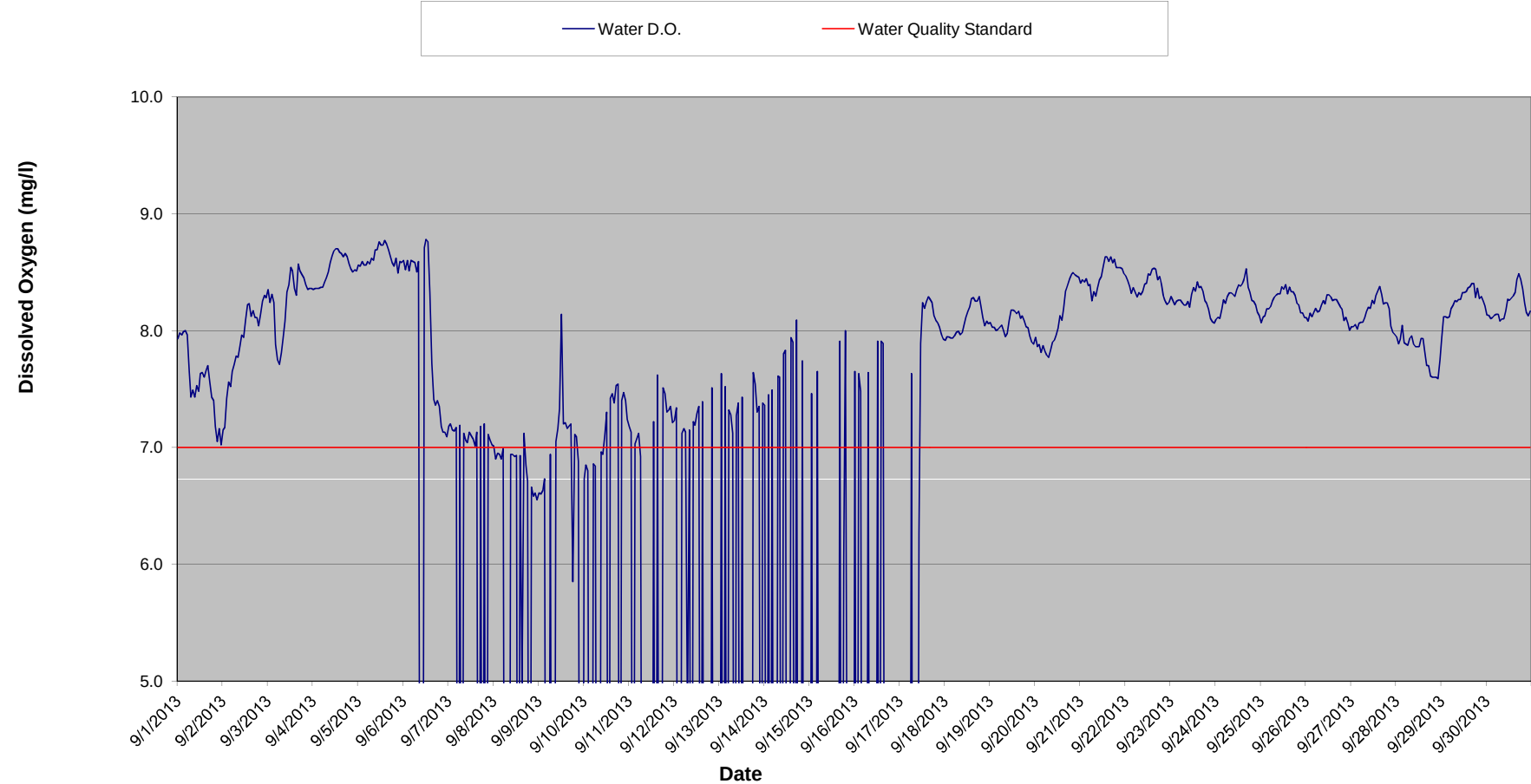


Hoist Powerhouse Dissolved Oxygen Summary - July 2013





Hoist Powerhouse Dissolved Oxygen Summary - September 2013



Dead River Below Hoist Powerhouse - June 2013 Dissolved Oxygen Monitoring Data

Time																
HHMMSS	06/01/13	06/02/13	06/03/13	06/04/13	06/05/13	06/06/13	06/07/13	06/08/13	06/09/13	06/10/13	06/11/13	06/12/13	06/13/13	06/14/13	06/15/13	06/16/13
0	9.7	9.5	9.3	9.3	9.2	9.1	9.0	8.9	8.8	8.5	8.5	8.5	8.5	8.6	8.3	8.4
10000	9.7	9.5	9.4	9.3	9.2	9.0	9.1	8.9	8.8	8.5	8.5	8.5	8.5	8.5	8.3	8.4
20000	9.7	9.5	9.3	9.3	9.2	9.0	9.0	8.9	8.8	8.5	8.5	8.5	8.5	8.6	8.3	8.4
30000	9.7	9.4	9.4	9.3	9.2	9.1	9.0	8.9	8.8	8.5	8.5	8.5	8.5	8.5	8.3	8.4
40000	9.6	9.4	9.3	9.3	9.2	9.0	9.0	8.9	8.8	8.5	8.5	8.5	8.5	8.5	8.4	8.4
50000	9.7	9.4	9.4	9.3	9.2	9.0	9.0	8.9	8.8	8.5	8.5	8.5	8.6	8.5	8.4	8.4
60000	9.7	9.4	9.4	9.3	9.1	9.0	9.0	8.9	8.8	8.5	8.5	8.5	8.6	8.5	8.4	8.4
70000	9.7	9.3	9.4	9.3	9.2	9.1	9.0	8.9	8.8	8.5	8.5	8.6	8.6	8.5	8.5	8.4
80000	9.7	9.3	9.4	9.3	9.2	9.0	9.0	8.9	8.8	8.5	8.6	8.5	8.6	8.5	8.5	8.4
90000	9.7	9.4	9.4	9.3	9.1	9.1	9.0	8.9	8.9	8.5	8.6	8.6	8.6	8.5	8.5	8.4
100000	9.7	9.4	9.4	9.3	9.2	9.1	9.1	9.0	8.9	8.5	8.6	8.6	8.7	8.6	8.5	8.4
110000	9.7	9.4	9.4	9.3	9.1	9.1	9.0	9.0	8.9	8.5	8.5	8.6	8.6	8.5	8.5	8.5
120000	9.7	9.4	9.4	9.3	9.2	9.1	9.0	8.9	8.9	8.6	8.6	8.6	8.6	8.5	8.5	8.6
130000	9.7	9.4	9.3	9.3	9.2	9.1	9.0	8.9	8.9	8.6	8.6	8.7	8.6	8.6	8.5	8.7
140000	9.7	9.4	9.3	9.3	9.2	9.1	9.0	9.0	8.8	8.6	8.5	8.7	8.6	8.5	8.5	8.7
150000	9.7	9.4	9.4	9.3	9.2	9.1	9.0	8.9	8.7	8.5	8.7	8.6	8.6	8.5	8.5	8.8
160000	9.7	9.4	9.4	9.3	9.2	9.1	9.0	8.9	8.7	8.6	8.6	8.6	8.7	8.5	8.5	8.7
170000	9.7	9.4	9.3	9.3	9.1	9.1	9.1	8.9	8.7	8.6	8.7	8.5	8.7	8.5	8.5	8.8
180000	9.6	9.4	9.4	9.3	9.1	9.0	9.0	8.8	8.7	8.5	8.6	8.5	8.7	8.5	8.4	8.8
190000	9.6	9.4	9.3	9.3	9.1	9.0	9.0	8.8	8.6	8.6	8.6	8.5	8.7	8.4	8.4	8.7
200000	9.6	9.4	9.4	9.2	9.1	9.0	8.9	8.8	8.6	8.5	8.6	8.5	8.6	8.4	8.3	8.6
210000	9.6	9.3	9.3	9.2	9.1	9.0	9.0	8.7	8.5	8.5	8.6	8.5	8.6	8.4	8.4	8.6
220000	9.6	9.3	9.3	9.2	9.1	9.0	8.9	8.8	8.5	8.5	8.6	8.4	8.6	8.4	8.4	8.5
230000	9.5	9.3	9.3	9.2	9.1	9.0	8.9	8.8	8.5	8.5	8.6	8.4	8.6	8.4	8.3	8.5
Daily Max	9.7	9.5	9.4	9.3	9.2	9.1	9.1	9.0	8.9	8.6	8.7	8.7	8.7	8.6	8.5	8.8
Daily Min	9.5	9.3	9.3	9.2	9.1	9.0	8.9	8.7	8.5	8.5	8.5	8.4	8.5	8.4	8.3	8.4
Average	9.7	9.4	9.4	9.3	9.2	9.1	9.0	8.9	8.7	8.5	8.6	8.5	8.6	8.5	8.4	8.5

Water Quality Standard: 7 mg/l Dissolved Oxygen

Dead River Below Hoist Powerhouse - June 2013 Dissolved Oxygen Monitoring Data

Time HHMMSS	06/17/13	06/18/13	06/19/13	06/20/13	06/21/13	06/22/13	06/23/13	06/24/13	06/25/13	06/26/13	06/27/13	06/28/13	06/29/13	06/30/13
0	8.5	8.3	8.1	8.2	8.2	8.2	8.0	8.0	7.9	0.1	0.1	0.1	0.1	0.1
10000	8.5	8.3	8.1	8.2	8.2	8.2	8.0	8.0	8.0	0.1	0.1	0.1	0.1	0.1
20000	8.4	8.3	8.1	8.2	8.2	8.3	8.0	8.1	8.0	0.1	0.1	0.1	0.1	0.1
30000	8.4	8.3	8.2	8.2	8.2	8.4	8.0	8.1	8.0	0.1	0.1	0.1	0.1	0.1
40000	8.4	8.3	8.2	8.2	8.2	8.3	8.0	8.0	8.0	0.1	0.1	0.1	0.1	0.1
50000	8.4	8.3	8.2	8.3	8.2	8.3	8.0	8.0	8.0	0.1	0.1	0.1	0.1	0.1
60000	8.3	8.3	8.2	8.3	8.2	8.3	8.0	8.1	8.0	0.1	0.1	0.1	0.1	0.1
70000	8.3	8.3	8.3	8.3	8.2	8.3	8.0	8.1	8.0	0.1	0.1	0.1	0.1	0.1
80000	8.4	8.3	8.3	8.3	8.2	8.3	8.0	8.1	8.0	0.1	0.1	0.1	0.1	0.1
90000	8.4	8.4	8.3	8.4	8.2	8.3	8.0	8.0	8.1	0.1	0.1	0.1	0.1	0.1
100000	8.4	8.3	8.3	8.4	8.2	8.3	8.1	8.1	8.1	0.1	0.1	0.1	0.1	0.1
110000	8.4	8.3	8.4	8.4	8.2	8.3	8.1	8.1	8.1	0.1	0.1	0.1	0.1	0.1
120000	8.4	8.3	8.4	8.4	8.1	8.3	8.1	8.1	8.1	0.1	0.1	0.1	0.1	0.1
130000	8.4	8.3	8.5	8.4	8.1	8.3	8.1	8.1	8.1	0.1	0.1	0.1	0.1	0.1
140000	8.3	8.2	8.4	8.4	8.1	8.2	8.1	8.1	8.2	0.1	0.1	0.1	0.1	0.1
150000	8.4	8.3	8.4	8.3	8.1	8.2	8.1	8.1	7.7	0.1	0.1	0.1	0.1	0.1
160000	8.3	8.2	8.4	8.3	8.1	8.2	8.1	8.1	0.1	0.1	0.1	0.1	0.1	0.1
170000	8.3	8.2	8.4	8.3	8.0	8.2	8.1	8.0	0.1	0.1	0.1	0.1	0.1	0.1
180000	8.3	8.2	8.4	8.3	8.0	8.2	8.1	8.0	0.1	0.1	0.1	0.1	0.1	0.1
190000	8.3	8.2	8.3	8.3	8.0	8.1	8.0	8.0	0.1	0.1	0.1	0.1	0.1	0.1
200000	8.2	8.1	8.3	8.3	8.0	8.1	8.0	7.9	0.1	0.1	0.1	0.1	0.1	0.1
210000	8.2	8.1	8.3	8.2	8.0	8.1	8.0	8.0	0.1	0.1	0.1	0.1	0.1	0.1
220000	8.2	8.1	8.2	8.2	8.0	8.1	8.0	8.0	0.1	0.1	0.1	0.1	0.1	0.1
230000	8.3	8.1	8.3	8.2	8.1	8.1	8.0	8.0	0.1	0.1	0.1	0.1	0.1	0.1
Daily Max	8.5	8.4	8.5	8.4	8.2	8.4	8.1	8.1	8.2	0.1	0.1	0.1	0.1	0.1
Daily Min	8.2	8.1	8.1	8.2	8.0	8.1	8.0	7.9	0.1	0.1	0.1	0.1	0.1	0.1
Average	8.3	8.3	8.3	8.3	8.1	8.2	8.0	8.0	5.4	0.1	0.1	0.1	0.1	0.1

No data - Equipment Malfunction

Dead River Below Hoist Powerhouse - July 2013 Dissolved Oxygen Monitoring Data

Time HHMMSS	07/01/13	07/02/13	07/03/13	07/04/13	07/05/13	07/06/13	07/07/13	07/08/13	07/09/13	07/10/13	07/11/13	07/12/13	07/13/13	07/14/13	07/15/13	07/16/13
0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	5.9	7.2	6.2	6.3	6.4	6.3	6.1
10000	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	5.9	7.1	6.2	6.3	6.4	6.3	6.1
20000	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	5.9	7.0	6.2	6.3	6.4	6.3	6.1
30000	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	6.0	6.9	6.2	6.3	6.4	6.3	6.1
40000	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	6.3	6.9	6.2	6.3	6.4	6.3	6.1
50000	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	6.4	6.8	6.2	6.3	6.5	6.3	6.1
60000	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	6.5	6.8	6.3	6.4	6.5	6.3	6.2
70000	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	6.7	6.8	6.4	6.4	6.5	6.3	6.1
80000	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	7.0	6.7	6.5	6.5	6.5	6.3	6.1
90000	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	7.2	6.7	6.5	6.6	6.6	6.4	6.2
100000	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	7.3	6.8	6.6	6.7	6.7	6.4	6.3
110000	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	7.3	6.8	6.7	6.8	6.7	6.5	6.4
120000	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	7.3	6.8	6.8	7.0	6.7	6.6	6.4
130000	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	7.5	6.8	6.9	7.0	6.8	6.6	6.5
140000	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	7.5	6.8	6.9	7.0	6.8	6.6	6.5
150000	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	6.3	7.6	6.8	6.9	7.0	6.9	6.6	6.5
160000	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	6.3	7.5	6.7	6.8	7.0	6.8	6.6	6.5
170000	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	6.2	7.5	6.7	6.7	7.0	6.8	6.6	6.5
180000	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	6.2	7.5	6.6	6.6	6.9	6.8	6.5	6.4
190000	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	6.1	7.5	6.6	6.6	6.8	6.7	6.3	6.3
200000	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	6.0	7.5	6.5	6.5	6.7	6.6	6.3	6.2
210000	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	6.0	7.5	6.4	6.4	6.7	6.4	6.3	6.1
220000	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	6.0	7.4	6.3	6.3	6.5	6.4	6.2	5.9
230000	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	5.9	7.3	6.2	6.3	6.4	6.4	6.1	5.9
Daily Max	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	6.3	7.6	7.2	6.9	7.0	6.9	6.6	6.5
Daily Min	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	5.9	6.2	6.2	6.3	6.4	6.1	5.9
Average	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	2.4	7.0	6.7	6.5	6.6	6.6	6.4	6.2

Water Quality Standard: 7 mg/l Dissolved Oxygen

	Below water quality standard
	No data - Equipment Malfunction

Dead River Below Hoist Powerhouse - July 2013 Dissolved Oxygen Monitoring Data

Time HHMMSS	07/17/13	07/18/13	07/19/13	07/20/13	07/21/13	07/22/13	07/23/13	07/24/13	07/25/13	07/26/13	07/27/13	07/28/13	07/29/13	07/30/13	07/31/13
0	6.0	5.9	5.9	6.4	5.9	5.6	5.8	6.5	6.1	6.0	0.0	0.0	0.0	0.0	0.0
10000	5.9	5.9	5.8	6.3	5.8	5.7	6.0	6.5	6.1	6.1	0.0	0.0	0.0	0.0	0.0
20000	5.9	5.9	5.8	6.1	5.8	5.7	6.1	6.5	6.1	6.1	0.0	0.0	0.0	0.0	0.0
30000	5.9	5.9	5.9	6.1	5.8	5.7	6.0	6.4	6.0	6.0	0.0	0.0	0.0	0.0	0.0
40000	5.9	5.9	5.9	6.1	5.8	5.7	6.0	6.4	6.1	6.0	0.0	0.0	0.0	0.0	0.0
50000	6.0	5.9	5.8	6.0	5.8	5.7	6.0	6.3	6.1	6.0	0.0	0.0	0.0	0.0	0.0
60000	6.0	5.9	5.7	6.0	5.9	5.7	6.1	6.3	6.2	0.0	0.0	0.0	0.0	0.0	0.0
70000	6.0	5.9	5.8	5.9	5.9	5.8	6.1	6.3	6.1	0.0	0.0	0.0	0.0	0.0	0.0
80000	6.0	6.0	5.8	5.9	5.9	5.8	6.2	6.3	6.2	0.0	0.0	0.0	0.0	0.0	0.0
90000	6.1	6.0	5.9	6.0	5.9	5.8	6.2	6.3	6.3	0.0	0.0	0.0	0.0	0.0	0.0
100000	6.1	6.0	5.9	6.1	6.0	5.9	6.3	6.4	6.4	0.0	0.0	0.0	0.0	0.0	0.0
110000	6.2	6.1	5.9	6.1	6.0	6.0	6.4	6.5	6.4	0.0	0.0	0.0	0.0	0.0	0.0
120000	6.3	6.2	6.0	6.2	6.1	5.9	6.7	6.5	6.5	0.0	0.0	0.0	0.0	0.0	0.0
130000	6.4	6.2	6.2	6.3	6.1	5.9	6.8	6.5	6.5	0.0	0.0	0.0	0.0	0.0	0.0
140000	6.4	6.3	6.2	6.3	6.1	6.1	6.9	6.5	6.5	0.0	0.0	0.0	0.0	0.0	0.0
150000	6.4	6.3	6.4	6.3	6.1	6.0	6.8	6.4	6.5	0.0	0.0	0.0	0.0	0.0	0.0
160000	6.4	6.2	6.5	6.3	6.0	6.0	6.8	6.4	6.3	0.0	0.0	0.0	0.0	0.0	0.0
170000	6.4	6.1	6.6	6.3	6.0	6.0	6.8	6.3	6.1	0.0	0.0	0.0	0.0	0.0	0.0
180000	6.4	6.1	6.7	6.3	6.0	6.0	6.8	6.3	6.0	0.0	0.0	0.0	0.0	0.0	0.0
190000	6.5	6.0	6.8	6.2	6.0	6.0	6.8	6.2	6.1	0.0	0.0	0.0	0.0	0.0	0.0
200000	6.4	6.1	6.8	6.1	5.9	5.8	6.8	6.1	6.2	0.0	0.0	0.0	0.0	0.0	0.0
210000	6.3	5.9	6.7	6.0	5.8	5.8	6.7	6.1	6.1	0.0	0.0	0.0	0.0	0.0	0.0
220000	6.1	5.9	6.7	5.9	5.7	5.8	6.6	6.1	6.0	0.0	0.0	0.0	0.0	0.0	0.0
230000	6.0	5.9	6.6	5.9	5.7	5.8	6.6	6.0	6.0	0.0	0.0	0.0	0.0	0.0	0.0
Daily Max	6.5	6.3	6.8	6.4	6.1	6.1	6.9	6.5	6.5	6.1	0.0	0.0	0.0	0.0	0.0
Daily Min	5.9	5.9	5.7	5.9	5.7	5.6	5.8	6.0	6.0	0.0	0.0	0.0	0.0	0.0	0.0
Average	6.2	6.0	6.2	6.1	5.9	5.8	6.4	6.3	6.2	1.5	0.0	0.0	0.0	0.0	0.0

Below water quality standard
No data - Equipment Malfunction

Dead River Below Hoist Powerhouse - August 2013 Dissolved Oxygen Monitoring Data

Time HHMMSS	8/1/2013	8/2/2013	8/3/2013	8/4/2013	8/5/2013	8/6/2013	8/7/2013	8/8/2013	8/9/2013	8/10/2013	8/11/2013	8/12/2013	8/13/2013	8/14/2013	8/15/2013	8/16/2013	8/17/2013
0	0.0	0.0	0.0	0.0	0.0	0.0	7.4	7.7	7.3	7.8	7.5	7.4	7.6	7.6	7.5	8.3	7.9
10000	0.0	0.0	0.0	0.0	0.0	0.0	7.3	7.6	7.4	7.8	7.5	7.4	7.5	7.6	7.5	8.3	8.0
20000	0.0	0.0	0.0	0.0	0.0	0.0	7.3	7.6	7.4	7.8	7.5	7.4	7.5	7.6	7.5	8.3	8.0
30000	0.0	0.0	0.0	0.0	0.0	0.0	7.2	7.6	7.4	7.7	7.5	7.4	7.5	7.6	7.5	8.3	8.0
40000	0.0	0.0	0.0	0.0	0.0	0.0	7.2	7.5	7.4	7.7	7.5	7.4	7.5	7.6	7.5	8.3	8.0
50000	0.0	0.0	0.0	0.0	0.0	0.0	7.2	7.5	7.4	7.7	7.5	7.4	7.5	7.6	7.5	8.3	8.1
60000	0.0	0.0	0.0	0.0	0.0	0.0	7.3	7.5	7.4	7.7	7.5	7.4	7.5	7.6	7.5	8.3	8.1
70000	0.0	0.0	0.0	0.0	0.0	0.0	7.3	7.5	7.4	7.7	7.6	7.4	7.5	7.6	7.5	8.2	8.2
80000	0.0	0.0	0.0	0.0	0.0	0.0	7.3	7.6	7.4	7.7	7.6	7.4	7.5	7.6	7.5	8.2	8.2
90000	0.0	0.0	0.0	0.0	0.0	0.0	7.3	7.6	7.4	7.7	7.7	7.4	7.6	7.6	8.0	8.2	8.2
100000	0.0	0.0	0.0	0.0	0.0	0.0	7.4	7.7	7.5	7.8	7.8	7.5	7.7	7.7	8.5	8.3	8.3
110000	0.0	0.0	0.0	0.0	0.0	0.0	7.4	7.7	7.6	7.9	7.8	7.6	7.7	7.9	8.6	8.3	8.3
120000	0.0	0.0	0.0	0.0	0.0	0.0	7.5	7.8	7.7	7.9	7.9	7.6	7.8	8.0	8.6	8.2	8.4
130000	0.0	0.0	0.0	0.0	0.0	0.0	7.6	7.8	7.8	7.9	7.9	7.6	7.8	8.0	8.6	8.2	8.4
140000	0.0	0.0	0.0	0.0	0.0	7.7	7.7	7.8	7.9	7.9	7.9	7.7	7.9	8.1	8.6	8.1	8.3
150000	0.0	0.0	0.0	0.0	0.0	7.7	7.7	7.8	8.1	7.9	7.8	7.7	7.8	8.1	8.6	8.1	8.3
160000	0.0	0.0	0.0	0.0	0.0	7.8	7.8	7.8	8.1	7.9	7.8	7.7	7.7	8.1	8.6	8.1	8.3
170000	0.0	0.0	0.0	0.0	0.0	7.7	7.9	7.7	8.2	7.8	7.8	7.8	7.7	8.0	8.5	8.1	8.2
180000	0.0	0.0	0.0	0.0	0.0	7.5	7.9	7.7	8.2	7.8	7.8	7.9	7.8	7.9	8.5	8.1	8.1
190000	0.0	0.0	0.0	0.0	0.0	7.4	8.0	7.6	8.1	7.7	7.6	7.9	7.7	7.9	8.5	8.1	8.1
200000	0.0	0.0	0.0	0.0	0.0	7.4	7.9	7.6	8.0	7.6	7.5	7.9	7.7	7.8	8.3	8.0	8.0
210000	0.0	0.0	0.0	0.0	0.0	7.4	7.8	7.5	8.0	7.5	7.4	7.7	7.6	7.6	8.3	8.0	7.9
220000	0.0	0.0	0.0	0.0	0.0	7.4	7.7	7.4	7.9	7.5	7.4	7.7	7.6	7.5	8.2	7.9	7.9
230000	0.0	0.0	0.0	0.0	0.0	7.4	7.7	7.3	7.8	7.5	7.4	7.6	7.6	7.5	8.2	7.9	7.9
Daily Max	0.0	0.0	0.0	0.0	0.0	7.8	8.0	7.8	8.2	7.9	7.9	7.9	7.9	8.1	8.6	8.3	8.4
Daily Min	0.0	0.0	0.0	0.0	0.0	0.0	7.2	7.3	7.3	7.5	7.4	7.4	7.5	7.5	7.5	7.9	7.9
Average	0.0	0.0	0.0	0.0	0.0	3.1	7.5	7.6	7.7	7.8	7.6	7.6	7.6	7.8	8.1	8.2	8.1

Water Quality Standard: 7.0 mg/l Dissolved Oxygen

No data - Equipment Malfunction

Dead River Below Hoist Powerhouse - August 2013 Dissolved Oxygen Monitoring Data

Time HHMMSS	8/18/2013	8/19/2013	8/20/2013	8/21/2013	8/22/2013	8/23/2013	8/24/2013	8/25/2013	8/26/2013	8/27/2013	8/28/2013	8/29/2013	8/30/2013	8/31/2013
0	7.9	7.7	7.9	8.1	8.1	7.6	7.2	5.7	5.0	5.0	5.2	5.1	3.3	7.9
10000	7.9	7.7	7.9	8.1	8.1	7.3	7.2	5.7	4.9	5.0	5.2	5.0	3.3	7.9
20000	7.8	7.8	7.9	8.1	8.1	7.8	7.0	5.8	4.8	4.9	5.1	5.0	3.3	7.9
30000	7.9	7.8	7.9	8.1	8.1	7.8	6.9	5.8	4.9	5.1	5.1	4.9	3.1	7.9
40000	7.9	7.7	7.9	8.1	8.2	7.7	6.8	5.8	5.0	4.9	5.3	4.7	2.9	7.9
50000	7.9	7.7	7.9	8.1	8.2	7.7	6.7	5.8	4.8	4.9	5.3	4.5	2.7	7.9
60000	7.9	7.7	7.9	8.2	8.2	7.6	6.6	5.7	4.7	4.9	5.3	4.2	2.6	7.9
70000	7.9	7.7	7.9	8.1	8.2	7.6	6.6	5.5	4.5	4.9	5.3	4.1	2.9	7.9
80000	7.9	7.7	7.9	8.1	8.2	7.6	6.5	5.4	4.5	4.9	5.3	4.1	2.7	7.9
90000	8.0	7.8	8.0	8.2	8.2	7.7	6.6	5.4	4.7	4.9	5.4	4.2	2.5	8.0
100000	8.1	7.9	8.1	8.2	8.3	7.8	6.5	5.4	4.7	5.0	5.4	4.1	2.6	8.1
110000	8.2	8.0	8.5	8.3	8.4	7.7	6.6	5.5	4.6	5.0	5.3	4.0	2.5	8.1
120000	8.2	8.0	8.6	8.3	8.5	7.8	6.5	5.4	4.7	4.9	5.2	3.8	2.4	8.1
130000	8.2	8.0	8.6	8.3	8.5	7.8	6.4	5.3	4.6	5.1	5.1	3.4	2.5	8.1
140000	8.2	7.9	8.6	8.4	8.5	7.7	6.2	5.1	4.6	5.2	5.0	3.3	2.6	8.1
150000	8.2	7.9	8.6	8.4	8.5	7.7	6.1	5.1	4.5	5.2	4.7	3.2	2.9	8.1
160000	8.2	7.9	8.5	8.3	8.4	7.7	6.1	5.1	5.2	5.1	4.7	3.5	4.0	8.0
170000	8.2	8.1	8.5	8.2	8.4	7.4	6.1	5.0	5.2	5.4	4.6	4.0	5.7	8.0
180000	8.1	8.0	8.4	8.1	8.4	7.4	6.0	5.1	5.3	5.4	4.6	3.7	7.0	8.1
190000	8.0	7.9	8.3	8.0	8.4	7.4	5.9	5.0	5.2	5.4	4.7	3.7	7.7	8.0
200000	8.0	7.8	8.2	8.0	8.3	7.4	5.9	4.8	5.2	5.4	4.7	3.7	7.8	7.9
210000	7.9	7.7	8.1	8.0	8.2	7.2	5.7	4.9	5.1	5.4	4.6	3.5	7.9	7.9
220000	7.8	7.8	8.1	8.0	8.2	7.1	5.6	5.0	5.1	5.3	5.0	3.3	7.8	7.8
230000	7.7	7.8	8.1	8.0	8.2	7.2	5.6	5.0	4.9	5.3	5.2	3.3	7.8	7.9
Daily Max	8.2	8.1	8.6	8.4	8.5	7.8	7.2	5.8	5.3	5.4	5.4	5.1	7.9	8.1
Daily Min	7.7	7.7	7.9	8.0	8.1	7.1	5.6	4.8	4.5	4.9	4.6	3.2	2.4	7.8
Average	8.0	7.8	8.2	8.2	8.3	7.6	6.4	5.3	4.9	5.1	5.0	4.0	4.2	8.0

Suspect data. Potential equipment malfunction

Dead River Below Hoist Powerhouse - September 2013 Dissolved Oxygen Monitoring Data

Time	9/1/2013	9/2/2013	9/3/2013	9/4/2013	9/5/2013	9/6/2013	9/7/2013	9/8/2013	9/9/2013	9/10/2013	9/11/2013	9/12/2013	9/13/2013	9/14/2013	9/15/2013	9/16/2013
HHMMSS																
0	7.9	7.2	8.4	8.4	8.6	8.6	7.2	7.0	6.6	6.7	7.2	7.2	0.1	7.4	0.1	7.7
10000	8.0	7.2	8.2	8.4	8.6	8.5	7.2	6.9	6.6	6.9	7.1	7.3	7.6	0.1	7.5	0.1
20000	8.0	7.4	8.3	8.4	8.6	8.6	7.2	7.0	6.6	6.8	0.2	0.2	0.1	7.5	0.1	7.6
30000	8.0	7.6	8.2	8.4	8.6	8.5	7.1	6.9	6.7	0.1	7.0	0.2	7.5	0.1	0.1	7.5
40000	8.0	7.5	7.9	8.4	8.6	8.6	7.2	6.9	0.1	0.1	7.1	7.1	0.1	7.5	7.7	0.1
50000	8.0	7.7	7.8	8.4	8.6	8.6	0.2	7.0	0.1	6.9	7.1	7.2	7.3	0.1	0.1	0.1
60000	7.7	7.7	7.7	8.4	8.6	8.6	7.2	0.1	6.9	6.8	6.9	7.1	7.3	0.1	0.1	0.1
70000	7.4	7.8	7.8	8.5	8.6	8.5	0.2	0.1	0.1	0.1	0.2	4.6	7.1	7.6	0.1	7.6
80000	7.5	7.8	7.9	8.5	8.6	8.6	7.1	0.2	0.1	0.1	0.2	7.2	0.1	7.6	0.1	0.1
90000	7.4	7.9	8.1	8.6	8.7	0.2	7.1	6.9	7.1	7.0	0.2	0.2	7.3	0.1	0.1	0.1
100000	7.5	8.0	8.3	8.6	8.7	0.2	7.0	6.9	7.2	6.9	0.2	7.2	7.4	7.8	0.1	0.1
110000	7.5	7.9	8.4	8.7	8.8	8.7	7.1	6.9	7.3	7.1	0.2	7.2	0.1	7.8	0.1	0.1
120000	7.6	8.1	8.5	8.7	8.7	8.8	7.1	6.9	8.1	7.3	0.2	7.3	7.4	0.1	0.1	7.9
130000	7.6	8.2	8.5	8.7	8.7	8.8	7.1	0.2	7.2	0.2	7.2	7.4	0.1	0.1	0.1	0.1
140000	7.6	8.2	8.4	8.7	8.8	8.3	7.0	6.9	7.2	7.4	0.2	0.2	0.1	7.9	0.1	7.9
150000	7.7	8.1	8.3	8.7	8.7	7.7	7.1	4.9	7.2	7.5	7.6	7.4	0.1	7.9	0.1	7.9
160000	7.7	8.2	8.6	8.6	8.7	7.4	0.2	7.1	7.2	7.4	0.2	0.2	0.1	0.1	7.9	0.1
170000	7.6	8.1	8.5	8.7	8.6	7.4	7.2	6.9	7.2	7.5	0.2	0.2	0.1	8.1	0.1	0.1
180000	7.4	8.1	8.5	8.6	8.6	7.4	0.2	6.7	5.9	7.5	7.5	0.2	7.6	0.1	6.1	0.1
190000	7.4	8.0	8.5	8.6	8.6	7.4	7.2	0.1	7.1	0.2	7.5	0.2	7.5	0.1	8.0	0.1
200000	7.2	8.1	8.4	8.5	8.6	7.2	0.2	6.7	7.1	7.4	7.3	7.5	7.3	7.7	3.2	0.1
210000	7.1	8.3	8.4	8.5	8.5	7.1	7.1	6.6	6.9	7.5	7.3	0.1	7.4	0.1	0.1	0.1
220000	7.2	8.3	8.4	8.5	8.6	7.1	7.1	6.6	0.2	7.4	7.4	0.1	0.1	0.1	0.1	0.1
230000	7.0	8.3	8.4	8.5	8.6	7.1	7.0	6.6	0.2	7.2	7.2	0.1	7.4	0.0	0.1	4.4
Daily Max	8.0	8.3	8.6	8.7	8.8	8.8	7.2	7.1	8.1	7.5	7.6	7.5	7.6	8.1	8.0	7.9
Daily Min	7.0	7.2	7.7	8.4	8.5	0.2	0.2	0.1	0.1	0.1	0.2	0.1	0.1	0.0	0.1	0.1
Average	7.6	7.9	8.3	8.5	8.6	7.4	5.7	5.4	5.3	5.4	4.3	3.9	4.1	3.6	1.8	2.5

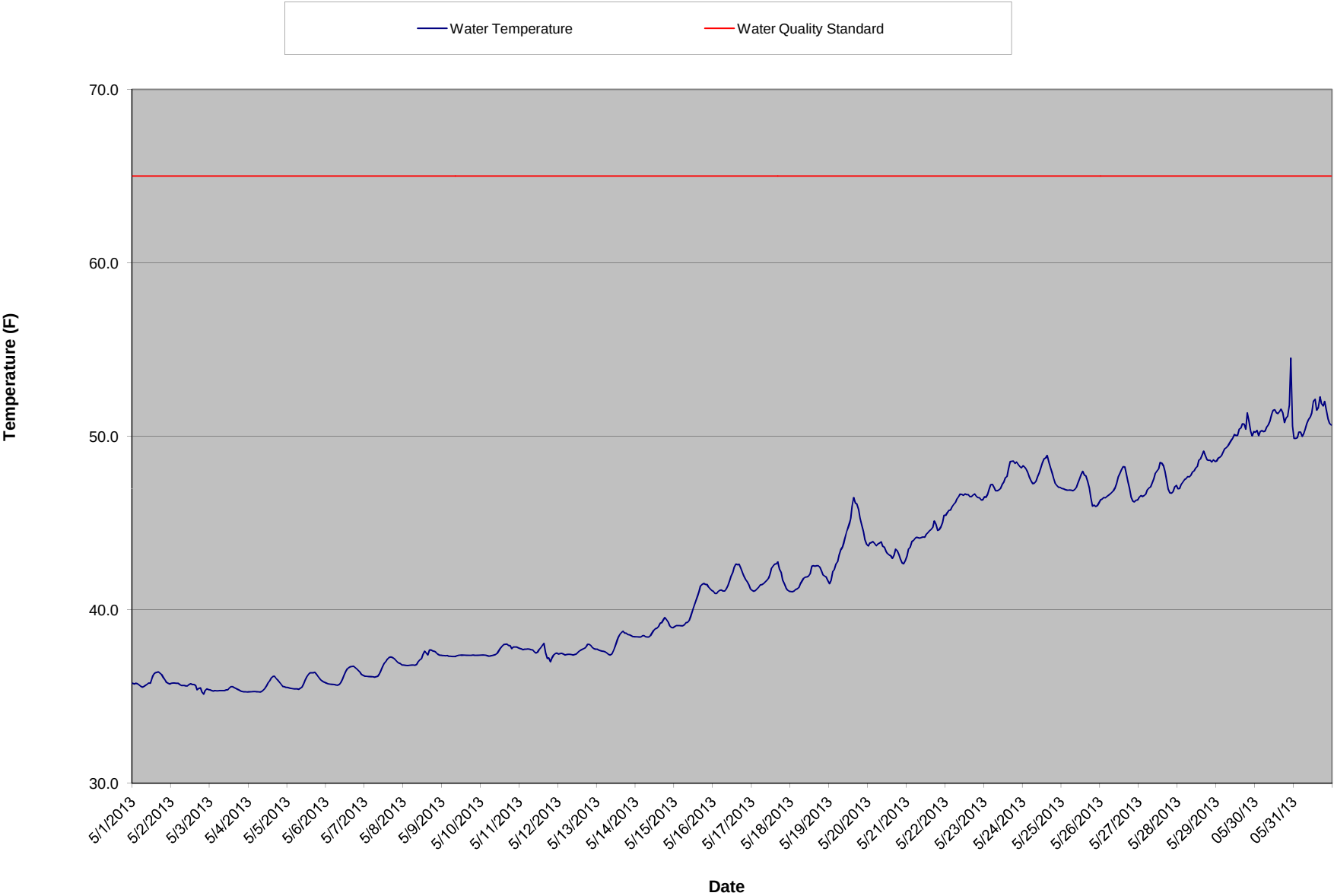
Water Quality Standard: 7 mg/l Dissolved Oxygen

Suspect data. May not be representative of actual conditions due to equipment malfunction

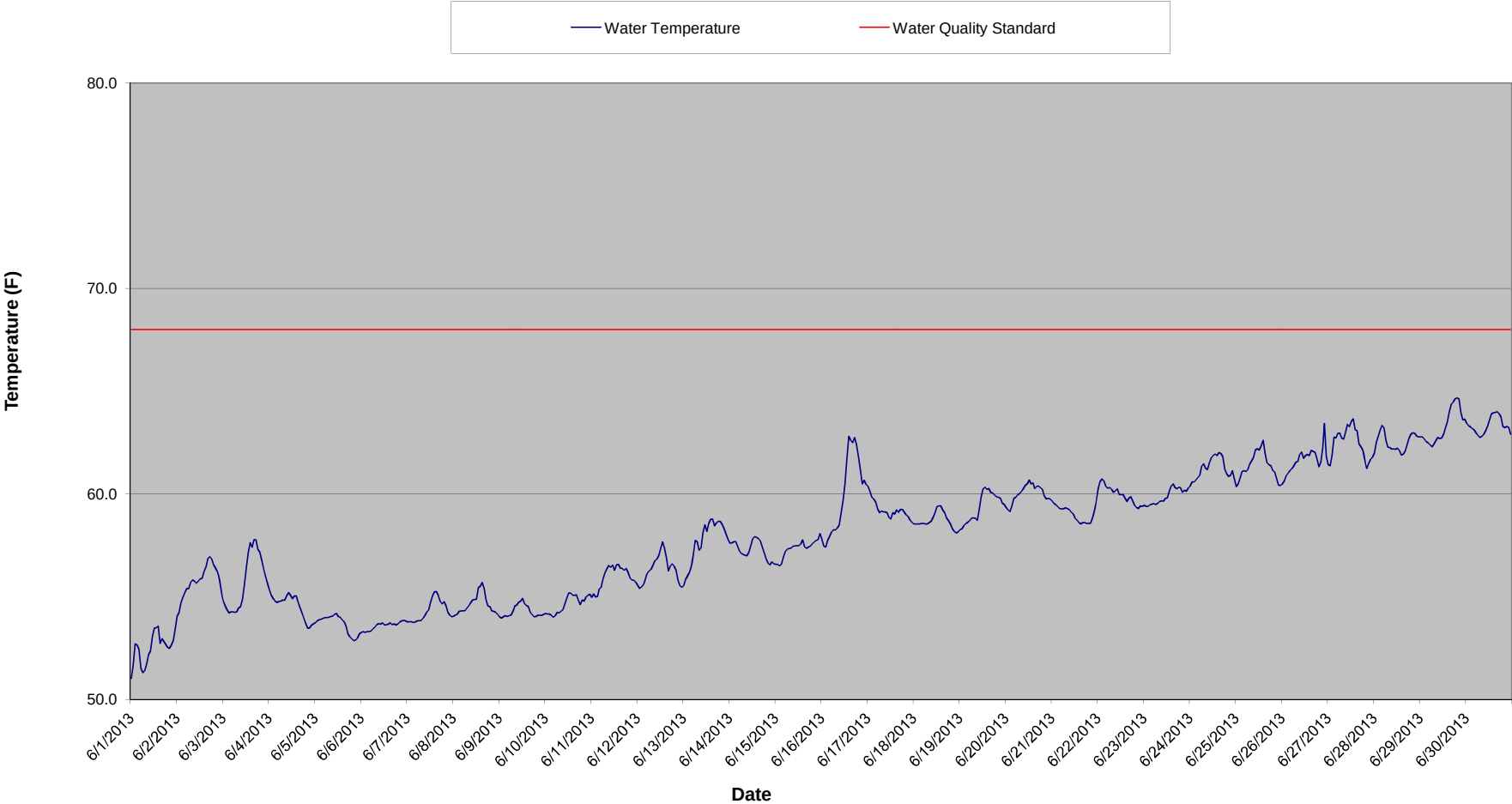
Dead River Below Hoist Powerhouse - September 2013 Dissolved Oxygen Monitoring Data

Time														
HHMMSS	9/17/2013	9/18/2013	9/19/2013	9/20/2013	9/21/2013	9/22/2013	9/23/2013	9/24/2013	9/25/2013	9/26/2013	9/27/2013	9/28/2013	9/29/2013	9/30/2013
0	0.1	7.9	8.1	7.9	8.4	8.5	8.3	8.1	8.1	8.1	8.0	7.9	7.9	8.1
10000	0.1	7.9	8.0	7.9	8.4	8.4	8.3	8.1	8.1	8.1	8.0	7.9	8.1	8.1
20000	0.1	7.9	8.0	7.9	8.4	8.4	8.2	8.1	8.1	8.1	8.1	7.9	8.1	8.1
30000	0.1	7.9	8.0	7.8	8.4	8.3	8.2	8.2	8.2	8.1	8.0	8.0	8.1	8.1
40000	0.1	7.9	8.0	7.9	8.4	8.4	8.3	8.3	8.2	8.2	8.1	7.9	8.1	8.1
50000	0.1	8.0	8.0	7.8	8.4	8.3	8.3	8.2	8.2	8.2	8.1	7.9	8.2	8.1
60000	7.6	8.0	8.0	7.8	8.3	8.3	8.2	8.3	8.3	8.2	8.1	7.9	8.2	8.1
70000	0.1	8.0	8.0	7.8	8.3	8.3	8.2	8.3	8.3	8.2	8.1	7.9	8.3	8.1
80000	0.1	8.0	7.9	7.8	8.3	8.3	8.2	8.3	8.3	8.2	8.2	8.0	8.2	8.1
90000	0.1	8.0	8.0	7.9	8.4	8.3	8.2	8.3	8.3	8.3	8.2	7.9	8.3	8.1
100000	6.3	8.0	8.1	7.9	8.4	8.4	8.2	8.3	8.3	8.2	8.2	7.9	8.3	8.2
110000	7.9	8.1	8.2	8.0	8.5	8.4	8.3	8.4	8.4	8.3	8.3	7.9	8.3	8.3
120000	8.2	8.2	8.2	8.0	8.6	8.5	8.4	8.4	8.4	8.3	8.2	7.9	8.3	8.3
130000	8.2	8.2	8.2	8.1	8.6	8.5	8.3	8.4	8.4	8.3	8.3	7.9	8.3	8.3
140000	8.2	8.3	8.1	8.1	8.6	8.5	8.4	8.4	8.3	8.3	8.3	7.9	8.4	8.3
150000	8.3	8.3	8.2	8.2	8.6	8.5	8.4	8.4	8.4	8.3	8.4	7.8	8.4	8.3
160000	8.3	8.3	8.1	8.3	8.6	8.5	8.4	8.5	8.3	8.3	8.3	7.7	8.4	8.4
170000	8.2	8.3	8.1	8.4	8.6	8.4	8.3	8.4	8.3	8.2	8.2	7.7	8.4	8.5
180000	8.1	8.3	8.1	8.4	8.6	8.5	8.3	8.3	8.3	8.2	8.2	7.6	8.3	8.4
190000	8.1	8.2	8.0	8.5	8.5	8.4	8.2	8.3	8.2	8.2	8.2	7.6	8.4	8.4
200000	8.1	8.1	8.0	8.5	8.5	8.3	8.2	8.2	8.2	8.1	8.2	7.6	8.3	8.2
210000	8.0	8.0	8.0	8.5	8.5	8.3	8.1	8.2	8.2	8.1	8.0	7.6	8.3	8.2
220000	8.0	8.1	7.9	8.5	8.5	8.2	8.1	8.2	8.2	8.1	8.0	7.6	8.3	8.1
230000	7.9	8.1	7.9	8.5	8.5	8.2	8.1	8.1	8.1	8.0	8.0	7.7	8.2	8.2
Daily Max	8.3	8.3	8.2	8.5	8.6	8.5	8.4	8.5	8.4	8.3	8.4	8.0	8.4	8.5
Daily Min	0.1	7.9	7.9	7.8	8.3	8.2	8.1	8.1	8.1	8.0	8.0	7.6	7.9	8.1
Average	5.0	8.1	8.0	8.1	8.5	8.4	8.3	8.3	8.2	8.2	8.2	7.8	8.3	8.2

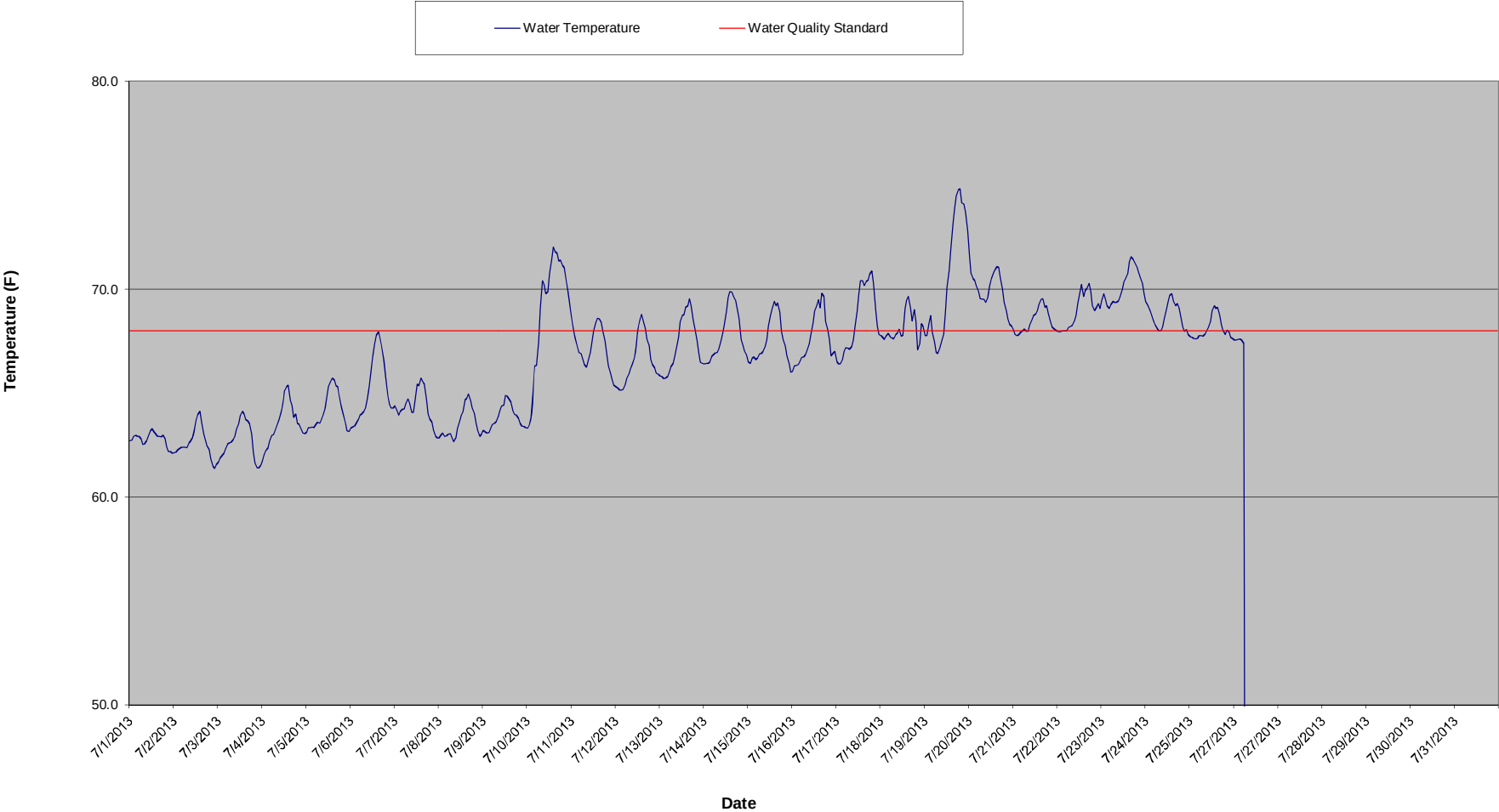
Hoist Powerhouse Temperature Summary - May 2013



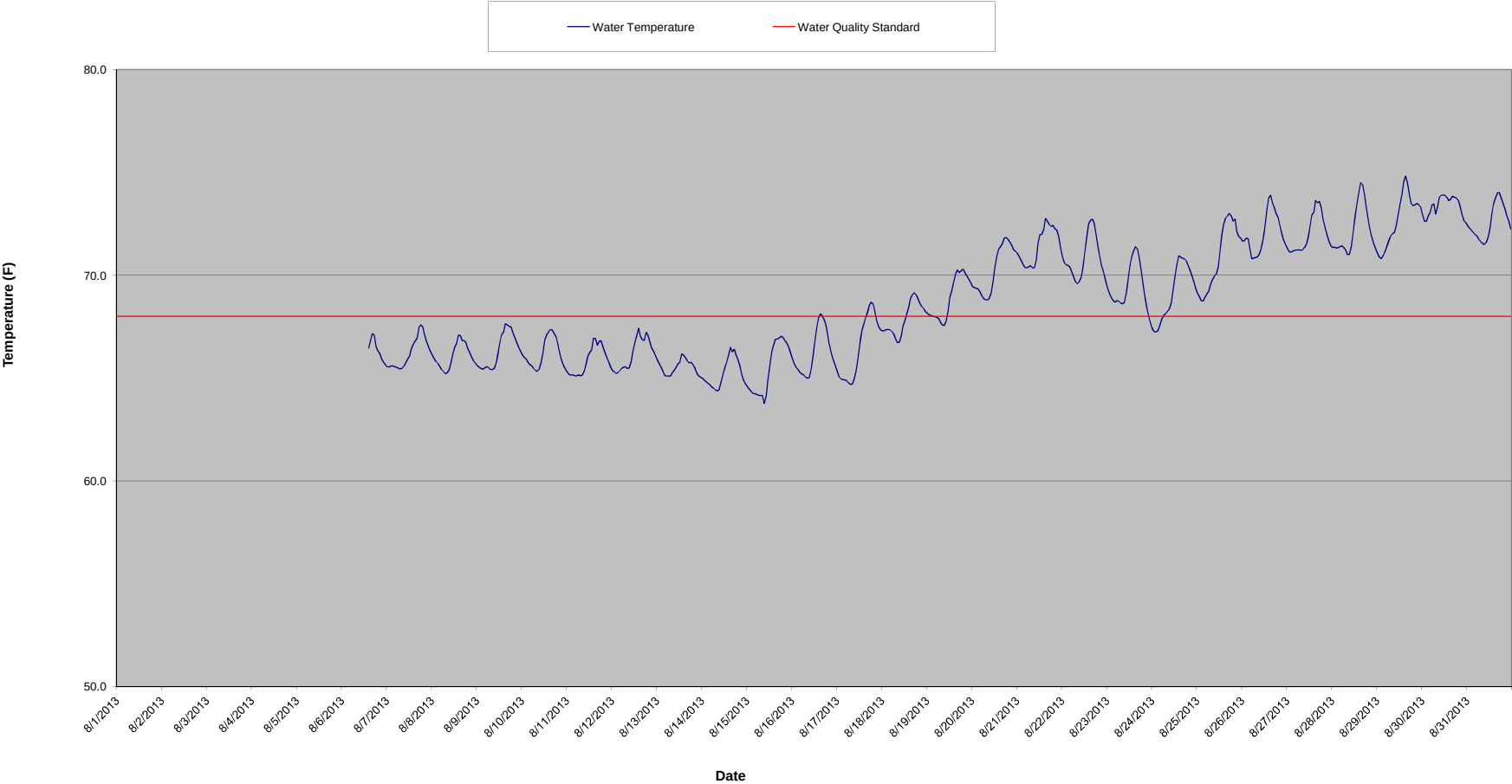
Hoist Powerhouse Temperature Summary - June 2013



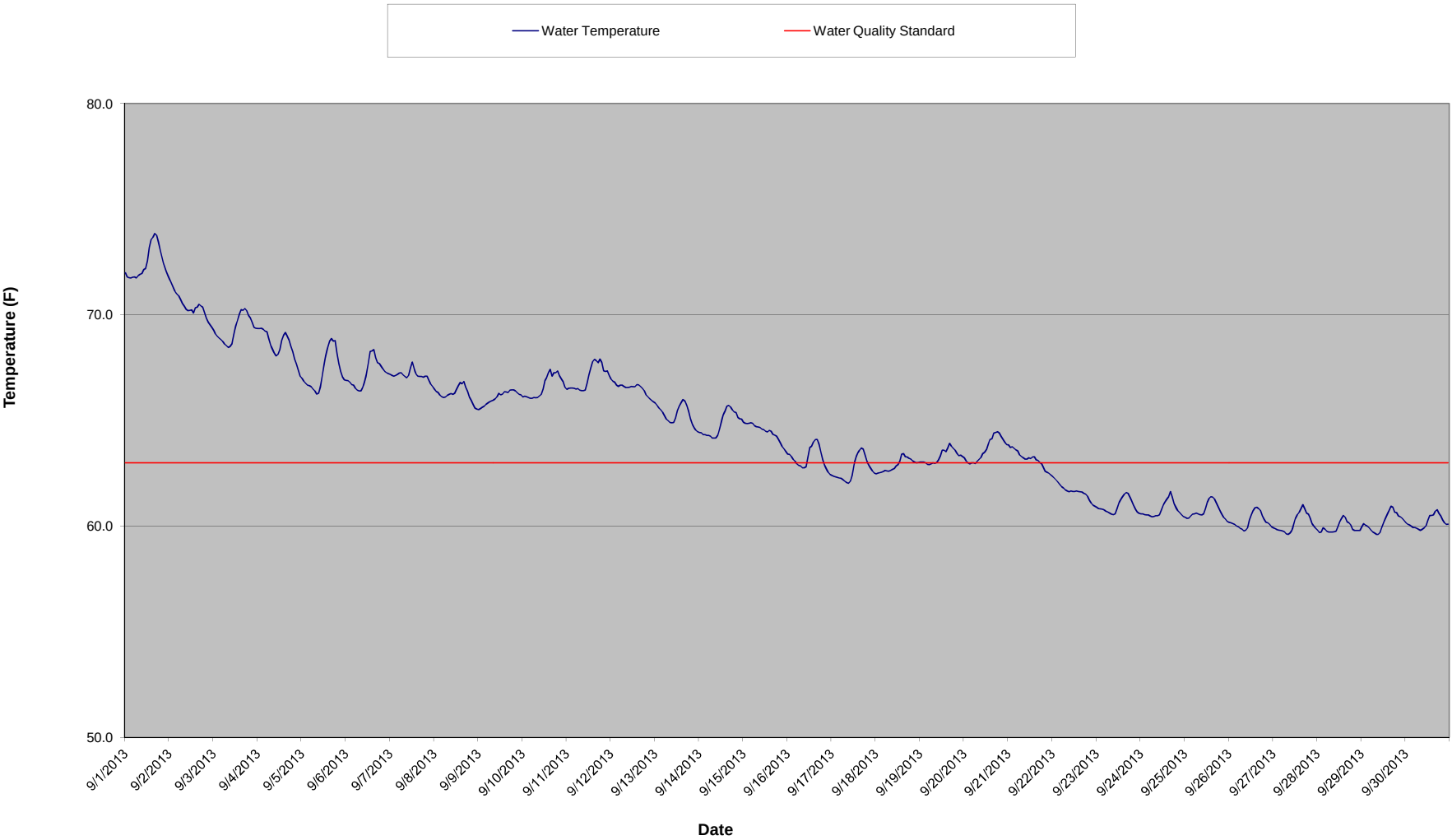
Hoist Powerhouse Temperature Summary - July 2013



Hoist Powerhouse Temperature Summary - August 2013



Hoist Powerhouse Temperature Summary - September 2013



Hoist Powerhouse Temperature Summary - October 2013



Dead River Below Hoist Powerhouse - May 2013 Temperature Monitoring Data

Time HHMMSS	5/1/2013	5/2/2013	5/3/2013	5/4/2013	5/5/2013	5/6/2013	5/7/2013	5/8/2013	5/9/2013	5/10/2013	5/11/2013	5/12/2013	5/13/2013	5/14/2013	5/15/2013	5/16/2013
0	35.8	35.8	35.4	35.3	35.5	35.8	36.2	36.8	37.4	37.4	37.8	37.5	37.7	38.4	39.0	41.1
10000	35.7	35.8	35.3	35.3	35.5	35.7	36.2	36.8	37.4	37.4	37.7	37.5	37.7	38.4	39.1	40.9
20000	35.8	35.8	35.3	35.3	35.5	35.7	36.2	36.8	37.3	37.4	37.7	37.5	37.7	38.4	39.1	40.9
30000	35.7	35.8	35.3	35.3	35.5	35.7	36.1	36.8	37.4	37.4	37.7	37.5	37.6	38.4	39.1	41.1
40000	35.7	35.8	35.3	35.3	35.4	35.7	36.1	36.8	37.3	37.3	37.7	37.4	37.6	38.5	39.1	41.1
50000	35.6	35.7	35.3	35.3	35.4	35.7	36.1	36.8	37.3	37.3	37.7	37.4	37.6	38.5	39.1	41.1
60000	35.5	35.6	35.3	35.3	35.4	35.7	36.1	36.8	37.3	37.3	37.7	37.4	37.5	38.4	39.1	41.1
70000	35.6	35.6	35.3	35.3	35.4	35.7	36.1	36.8	37.3	37.4	37.7	37.4	37.4	38.4	39.3	41.1
80000	35.6	35.6	35.3	35.3	35.5	35.7	36.2	36.8	37.3	37.4	37.7	37.4	37.4	38.4	39.3	41.2
90000	35.7	35.6	35.3	35.4	35.5	35.8	36.3	37.0	37.3	37.4	37.6	37.4	37.5	38.5	39.4	41.4
100000	35.8	35.6	35.4	35.5	35.7	36.0	36.5	37.1	37.4	37.5	37.5	37.4	37.6	38.7	39.6	41.7
110000	35.8	35.7	35.4	35.6	35.9	36.2	36.7	37.2	37.4	37.7	37.6	37.5	37.9	38.8	39.9	41.9
120000	36.1	35.7	35.5	35.8	36.1	36.4	36.9	37.4	37.4	37.8	37.7	37.5	38.1	38.9	40.2	42.2
130000	36.3	35.7	35.6	35.9	36.3	36.6	37.0	37.6	37.4	37.9	37.8	37.6	38.4	38.9	40.5	42.5
140000	36.4	35.7	35.6	36.1	36.4	36.7	37.1	37.5	37.4	38.0	38.0	37.7	38.6	39.0	40.7	42.6
150000	36.4	35.6	35.5	36.2	36.4	36.7	37.3	37.4	37.4	38.0	38.1	37.7	38.7	39.2	41.0	42.6
160000	36.4	35.4	35.5	36.2	36.4	36.7	37.3	37.7	37.4	38.0	37.5	37.8	38.8	39.3	41.4	42.6
170000	36.3	35.5	35.4	36.0	36.4	36.8	37.3	37.7	37.4	37.9	37.2	37.9	38.7	39.4	41.5	42.4
180000	36.3	35.5	35.4	35.9	36.3	36.7	37.2	37.6	37.4	37.9	37.2	38.0	38.7	39.6	41.5	42.1
190000	36.1	35.3	35.3	35.8	36.2	36.6	37.1	37.6	37.4	37.8	37.0	38.0	38.6	39.4	41.5	41.9
200000	36.0	35.1	35.3	35.7	36.0	36.5	37.0	37.5	37.4	37.9	37.2	37.9	38.6	39.3	41.5	41.7
210000	35.8	35.3	35.3	35.6	35.9	36.4	36.9	37.5	37.4	37.9	37.4	37.8	38.5	39.1	41.3	41.6
220000	35.8	35.4	35.3	35.6	35.9	36.3	36.9	37.4	37.4	37.9	37.5	37.8	38.5	39.0	41.2	41.5
230000	35.7	35.4	35.3	35.5	35.8	36.2	36.8	37.4	37.4	37.8	37.5	37.7	38.4	39.0	41.1	41.2
Daily Max	36.4	35.8	35.6	36.2	36.4	36.8	37.3	37.7	37.4	38.0	38.1	38.0	38.8	39.6	41.5	42.6
Daily Min	35.5	35.1	35.3	35.3	35.4	35.7	36.1	36.8	37.3	37.3	37.0	37.4	37.4	38.4	39.0	40.9
Average	35.9	35.6	35.4	35.6	35.9	36.2	36.7	37.2	37.4	37.7	37.6	37.6	38.1	38.8	40.2	41.7

Monthly average temp (F): 41.8
License Max. Average Temperature: 65°F

Dead River Below Hoist Powerhouse - May 2013 Temperature Monitoring Data

Time															
HHMMSS	5/17/2013	5/18/2013	5/19/2013	5/20/2013	5/21/2013	5/22/2013	5/23/2013	5/24/2013	5/25/2013	5/26/2013	5/27/2013	5/28/2013	5/29/2013	5/30/2013	5/31/2013
0	41.1	41.1	41.5	43.7	43.1	45.4	46.5	48.3	47.0	46.3	46.5	47.0	48.6	50.2	49.9
10000	41.1	41.0	41.7	43.8	43.5	45.6	46.5	48.2	47.0	46.4	46.6	47.0	48.7	50.3	49.9
20000	41.1	41.1	42.2	43.9	43.6	45.7	46.7	48.1	46.9	46.5	46.5	47.2	48.8	50.0	49.9
30000	41.2	41.2	42.3	43.9	43.9	45.8	47.0	47.9	46.9	46.5	46.6	47.4	48.9	50.3	50.3
40000	41.3	41.2	42.6	43.8	44.0	45.9	47.2	47.6	46.9	46.5	46.7	47.5	49.1	50.3	50.3
50000	41.4	41.3	42.8	43.7	44.1	46.1	47.2	47.4	46.9	46.6	46.9	47.6	49.3	50.3	50.0
60000	41.5	41.5	43.2	43.8	44.2	46.2	47.0	47.3	46.9	46.7	47.0	47.7	49.4	50.3	50.2
70000	41.5	41.7	43.5	43.8	44.2	46.4	46.9	47.3	46.9	46.8	47.1	47.7	49.5	50.5	50.5
80000	41.6	41.8	43.6	43.9	44.1	46.5	46.9	47.4	46.9	46.9	47.3	47.8	49.6	50.6	50.8
90000	41.7	41.9	43.9	43.7	44.2	46.7	46.9	47.7	47.1	47.0	47.6	47.9	49.8	50.9	51.0
100000	41.8	41.9	44.3	43.6	44.2	46.7	47.0	47.9	47.3	47.3	47.9	48.0	49.9	51.3	51.1
110000	42.0	41.9	44.6	43.4	44.2	46.6	47.2	48.2	47.6	47.7	48.0	48.2	50.1	51.5	51.4
120000	42.4	42.1	44.9	43.3	44.3	46.7	47.3	48.5	47.8	47.9	48.1	48.3	50.1	51.5	52.0
130000	42.5	42.5	45.2	43.2	44.5	46.6	47.6	48.7	48.0	48.1	48.5	48.6	50.1	51.4	52.1
140000	42.6	42.5	46.0	43.1	44.5	46.6	47.7	48.8	47.8	48.3	48.5	48.7	50.4	51.3	51.5
150000	42.7	42.5	46.5	43.0	44.6	46.5	48.1	48.9	47.7	48.2	48.3	48.9	50.5	51.4	51.7
160000	42.7	42.5	46.1	43.2	44.8	46.5	48.5	48.5	47.4	47.8	48.0	49.2	50.7	51.6	52.3
170000	42.4	42.5	46.1	43.5	45.1	46.6	48.6	48.2	47.0	47.4	47.4	48.9	50.7	51.4	51.9
180000	42.2	42.5	45.8	43.4	44.9	46.7	48.6	47.9	46.5	47.0	47.0	48.7	50.4	50.8	51.7
190000	41.7	42.3	45.3	43.2	44.6	46.5	48.4	47.5	46.0	46.5	46.7	48.6	51.4	51.0	52.0
200000	41.5	42.0	44.9	42.9	44.6	46.5	48.5	47.3	46.0	46.3	46.7	48.6	50.9	51.2	51.5
210000	41.3	41.9	44.5	42.7	44.8	46.5	48.4	47.2	46.0	46.2	46.8	48.5	50.3	51.8	51.0
220000	41.1	41.9	44.0	42.7	45.0	46.3	48.3	47.1	46.0	46.3	47.1	48.7	50.0	54.5	50.8
230000	41.1	41.7	43.8	42.8	45.4	46.3	48.2	47.1	46.1	46.3	47.2	48.5	50.3	50.6	50.6
Daily Max	42.7	42.5	46.5	43.9	45.4	46.7	48.6	48.9	48.0	48.3	48.5	49.2	51.4	54.5	52.3
Daily Min	41.1	41.0	41.5	42.7	43.1	45.4	46.5	47.1	46.0	46.2	46.5	47.0	48.6	50.0	49.9
Average	41.7	41.9	44.1	43.4	44.4	46.3	47.5	47.9	46.9	47.0	47.3	48.1	49.9	51.0	51.0

Dead River Below Hoist Powerhouse - June 2013 Temperature Monitoring Data

Time	6/1/2013	6/2/2013	6/3/2013	6/4/2013	6/5/2013	6/6/2013	6/7/2013	6/8/2013	6/9/2013	6/10/2013	6/11/2013	6/12/2013	6/13/2013	6/14/2013	6/15/2013	6/16/2013
HHMMSS																
0	51.0	54.1	54.8	55.3	53.7	53.3	53.8	54.1	54.0	54.2	55.0	55.6	55.5	57.6	56.6	57.8
10000	51.7	54.2	54.6	55.1	53.8	53.3	53.8	54.1	54.0	54.2	55.1	55.4	55.9	57.6	56.6	57.5
20000	52.7	54.7	54.4	54.9	53.9	53.3	53.8	54.1	54.0	54.2	55.0	55.5	56.0	57.7	56.5	57.4
30000	52.6	55.0	54.2	54.8	53.9	53.3	53.7	54.3	54.1	54.1	55.0	55.6	56.2	57.7	56.6	57.7
40000	52.4	55.2	54.3	54.7	53.9	53.3	53.8	54.3	54.0	54.0	55.4	55.9	56.5	57.5	56.9	57.9
50000	51.5	55.4	54.3	54.8	54.0	53.3	53.8	54.3	54.1	54.1	55.5	56.1	57.1	57.2	57.2	58.1
60000	51.3	55.4	54.2	54.8	54.0	53.4	53.8	54.3	54.1	54.2	55.9	56.2	57.7	57.1	57.3	58.3
70000	51.4	55.7	54.3	54.8	54.0	53.5	53.8	54.4	54.3	54.2	56.2	56.3	57.7	57.1	57.3	58.2
80000	51.7	55.8	54.4	54.8	54.0	53.6	53.9	54.6	54.5	54.3	56.4	56.5	57.3	57.0	57.4	58.3
90000	52.2	55.8	54.5	55.0	54.1	53.7	54.1	54.7	54.6	54.4	56.5	56.8	57.4	57.0	57.5	58.5
100000	52.4	55.7	54.9	55.2	54.1	53.7	54.2	54.8	54.7	54.6	56.4	56.8	58.1	57.2	57.5	59.1
110000	53.1	55.8	55.6	55.1	54.2	53.7	54.4	54.9	54.8	54.9	56.5	57.0	58.5	57.5	57.5	59.7
120000	53.5	55.9	56.4	54.9	54.0	53.6	54.7	54.9	54.9	55.2	56.3	57.3	58.2	57.8	57.5	60.5
130000	53.5	55.9	57.1	55.0	54.0	53.6	55.0	55.4	54.7	55.2	56.6	57.7	58.6	57.9	57.6	61.7
140000	53.6	56.2	57.6	55.0	53.9	53.7	55.2	55.5	54.6	55.1	56.6	57.3	58.8	57.9	57.8	62.8
150000	52.7	56.4	57.4	54.7	53.8	53.7	55.3	55.7	54.5	55.1	56.4	56.9	58.8	57.8	57.4	62.6
160000	53.0	56.9	57.8	54.4	53.6	53.6	55.1	55.4	54.2	55.1	56.4	56.2	58.4	57.7	57.3	62.5
170000	52.8	56.9	57.8	54.2	53.2	53.7	54.8	54.8	54.1	54.8	56.3	56.5	58.6	57.4	57.4	62.7
180000	52.7	56.8	57.3	53.9	53.0	53.6	54.6	54.5	54.0	54.6	56.4	56.6	58.7	57.1	57.5	62.4
190000	52.5	56.6	57.2	53.7	53.0	53.7	54.8	54.5	54.0	54.8	56.2	56.5	58.7	56.8	57.6	61.8
200000	52.5	56.4	56.8	53.5	52.9	53.8	54.6	54.3	54.1	54.8	55.9	56.3	58.5	56.6	57.7	61.2
210000	52.6	56.2	56.3	53.5	52.9	53.8	54.2	54.3	54.1	55.0	55.8	55.8	58.3	56.6	57.7	60.5
220000	52.9	55.8	56.0	53.6	53.0	53.9	54.1	54.2	54.1	55.1	55.8	55.5	58.0	56.7	57.8	60.7
230000	53.4	55.3	55.7	53.7	53.2	53.8	54.0	54.1	54.1	55.1	55.7	55.5	57.8	56.6	58.1	60.5
Daily Max	53.6	56.9	57.8	55.3	54.2	53.9	55.3	55.7	54.9	55.2	56.6	57.7	58.8	57.9	58.1	62.8
Daily Min	51.0	54.1	54.2	53.5	52.9	53.3	53.7	54.1	54.0	54.0	55.0	55.4	55.5	56.6	56.5	57.4
Average	52.5	55.7	55.7	54.6	53.7	53.6	54.3	54.6	54.3	54.6	56.0	56.3	57.7	57.3	57.3	59.9

Monthly average temp (F): 58.0

License Max. Average Temperature: 68 F

Dead River Below Hoist Powerhouse - June 2013 Temperature Monitoring Data

Time														
HHMMSS	6/17/2013	6/18/2013	6/19/2013	6/20/2013	6/21/2013	6/22/2013	6/23/2013	6/24/2013	6/25/2013	6/26/2013	6/27/2013	6/28/2013	6/29/2013	6/30/2013
0	60.4	58.5	58.3	59.3	59.7	60.3	59.5	60.4	60.4	60.5	61.4	62.0	62.8	63.4
10000	60.1	58.5	58.3	59.2	59.5	60.6	59.4	60.6	60.5	60.6	61.4	62.5	62.8	63.3
20000	59.8	58.5	58.5	59.1	59.5	60.7	59.4	60.6	60.8	60.9	61.9	62.8	62.7	63.3
30000	59.8	58.5	58.6	59.4	59.4	60.6	59.5	60.7	61.1	61.0	62.8	63.1	62.5	63.2
40000	59.6	58.6	58.6	59.8	59.3	60.4	59.5	60.8	61.1	61.1	62.7	63.3	62.5	63.1
50000	59.3	58.6	58.7	59.8	59.3	60.3	59.5	60.9	61.1	61.2	62.9	63.2	62.4	63.0
60000	59.1	58.5	58.8	60.0	59.3	60.3	59.5	61.3	61.2	61.4	63.0	62.6	62.3	62.9
70000	59.2	58.5	58.8	60.0	59.3	60.2	59.5	61.5	61.4	61.5	62.7	62.3	62.4	62.7
80000	59.1	58.6	58.8	60.1	59.3	60.1	59.6	61.3	61.6	61.6	62.7	62.3	62.6	62.8
90000	59.1	58.7	58.7	60.3	59.2	60.2	59.7	61.2	61.8	61.9	63.0	62.2	62.7	62.9
100000	59.1	58.9	59.3	60.4	59.1	60.2	59.6	61.5	62.2	62.0	63.4	62.2	62.7	63.1
110000	58.9	59.1	59.9	60.5	59.0	60.0	59.8	61.8	62.2	61.7	63.3	62.2	62.7	63.3
120000	58.8	59.4	60.2	60.7	58.8	60.0	59.8	61.9	62.1	61.9	63.5	62.2	62.9	63.6
130000	59.1	59.4	60.3	60.5	58.7	60.0	60.1	62.0	62.3	61.9	63.7	62.1	63.2	63.9
140000	59.0	59.4	60.2	60.5	58.6	59.8	60.4	61.9	62.6	61.9	63.1	61.9	63.5	64.0
150000	59.2	59.2	60.3	60.3	58.5	59.6	60.5	62.0	62.0	62.1	63.1	61.9	64.0	64.0
160000	59.1	59.1	60.1	60.4	58.6	59.8	60.3	62.0	61.5	62.1	62.4	62.1	64.4	64.0
170000	59.3	58.8	60.0	60.4	58.6	59.9	60.2	61.8	61.4	62.0	62.3	62.4	64.5	63.9
180000	59.3	58.7	59.9	60.3	58.6	59.6	60.3	61.2	61.4	61.7	62.1	62.7	64.6	63.8
190000	59.1	58.5	59.9	60.2	58.6	59.4	60.3	61.0	61.1	61.3	61.6	62.9	64.7	63.3
200000	59.0	58.3	59.8	59.9	58.6	59.3	60.1	60.9	61.1	61.5	61.2	63.0	64.6	63.2
210000	58.9	58.2	59.8	59.8	58.8	59.3	60.2	60.9	60.7	62.3	61.5	62.9	64.0	63.3
220000	58.7	58.1	59.6	59.8	59.2	59.4	60.1	61.1	60.4	63.4	61.7	62.8	63.6	63.2
230000	58.6	58.2	59.5	59.8	59.6	59.4	60.3	60.7	60.4	61.8	61.8	62.8	63.6	62.9
Daily Max	60.4	59.4	60.3	60.7	59.7	60.7	60.5	62.0	62.6	63.4	63.7	63.3	64.7	64.0
Daily Min	58.6	58.1	58.3	59.1	58.5	59.3	59.4	60.4	60.4	60.5	61.2	61.9	62.3	62.7
Average	59.2	58.7	59.4	60.0	59.0	60.0	59.9	61.2	61.4	61.6	62.5	62.5	63.3	63.3

Dead River Below Hoist Powerhouse - July 2013 Temperature Monitoring Data

Time HHMMSS	7/1/13	7/2/13	7/3/13	7/4/13	7/5/13	7/6/13	7/7/13	7/8/13	7/9/13	7/10/13	7/11/13	7/12/13	7/13/13	7/14/13	7/15/13	7/16/13
0	62.7	62.1	61.7	61.8	63.1	63.3	64.4	62.9	63.2	63.3	68.5	65.3	65.8	66.4	66.5	66.0
10000	62.7	62.2	61.9	62.1	63.3	63.4	64.1	63.0	63.1	63.5	68.1	65.2	65.8	66.4	66.4	66.3
20000	62.9	62.3	62.0	62.3	63.3	63.4	64.0	63.1	63.1	63.8	67.6	65.2	65.7	66.4	66.7	66.3
30000	63.0	62.3	62.1	62.4	63.4	63.5	64.1	62.9	63.1	65.1	67.3	65.1	65.7	66.5	66.7	66.4
40000	62.9	62.4	62.3	62.7	63.3	63.7	64.2	62.9	63.3	66.3	67.0	65.2	65.8	66.8	66.6	66.5
50000	62.9	62.4	62.6	63.0	63.5	64.0	64.2	63.0	63.5	66.3	66.9	65.4	66.0	66.8	66.7	66.7
60000	62.8	62.4	62.6	63.0	63.6	64.0	64.5	63.1	63.6	67.4	66.6	65.7	66.3	66.9	66.9	66.7
70000	62.5	62.4	62.6	63.2	63.6	64.1	64.7	62.9	63.6	69.1	66.4	65.9	66.4	66.9	66.9	66.8
80000	62.6	62.6	62.8	63.5	63.7	64.3	64.5	62.7	63.9	70.4	66.3	66.2	66.8	67.1	67.0	67.0
90000	62.7	62.7	62.9	63.7	64.0	64.7	64.1	62.8	64.2	70.2	66.6	66.4	67.2	67.5	67.2	67.4
100000	62.9	62.9	63.3	64.1	64.3	65.4	64.1	63.3	64.4	69.8	66.9	66.7	67.7	67.9	67.6	67.8
110000	63.2	63.3	63.5	64.5	64.8	66.0	64.7	63.7	64.4	69.9	67.5	67.2	68.4	68.3	68.2	68.4
120000	63.3	63.7	63.9	65.1	65.3	66.9	65.4	63.9	64.9	70.7	68.0	68.0	68.7	68.9	68.8	69.0
130000	63.2	64.0	64.1	65.3	65.6	67.4	65.4	64.1	64.9	71.4	68.4	68.5	68.8	69.6	69.1	69.2
140000	63.0	64.1	64.0	65.4	65.7	67.8	65.7	64.7	64.7	72.0	68.6	68.8	69.1	69.9	69.4	69.5
150000	62.9	63.6	63.7	64.6	65.6	67.9	65.6	64.8	64.6	71.8	68.6	68.4	69.2	69.9	69.2	69.1
160000	62.9	63.0	63.7	64.4	65.4	67.6	65.4	65.0	64.1	71.7	68.4	68.1	69.5	69.6	69.3	69.8
170000	62.9	62.7	63.5	63.8	65.3	67.0	64.7	64.7	64.0	71.3	68.0	67.6	69.2	69.4	68.9	69.7
180000	63.0	62.5	63.0	64.0	64.7	66.6	64.0	64.3	64.0	71.4	67.5	67.3	68.5	69.0	68.0	68.5
190000	62.8	62.3	62.2	63.6	64.3	65.8	63.8	64.0	63.8	71.1	66.9	66.6	68.1	68.6	67.6	68.0
200000	62.4	61.8	61.6	63.5	63.9	64.9	63.6	63.6	63.6	71.0	66.3	66.4	67.5	67.6	67.3	67.6
210000	62.2	61.5	61.4	63.3	63.6	64.5	63.2	63.2	63.4	70.3	66.0	66.2	66.9	67.3	66.8	66.8
220000	62.2	61.4	61.4	63.1	63.2	64.3	62.9	62.9	63.4	69.9	65.6	66.0	66.5	67.0	66.4	66.9
230000	62.1	61.6	61.5	63.1	63.2	64.3	62.8	63.0	63.3	69.3	65.4	65.9	66.4	66.8	66.0	67.0
Daily Max	63.3	64.1	64.1	65.4	65.7	67.9	65.7	65.0	64.9	72.0	68.6	68.8	69.5	69.9	69.4	69.8
Daily Min	62.1	61.4	61.4	61.8	63.1	63.3	62.8	62.7	63.1	63.3	65.4	65.1	65.7	66.4	66.0	66.0
Average	62.8	62.6	62.7	63.5	64.1	65.2	64.3	63.5	63.8	69.1	67.2	66.6	67.3	67.8	67.5	67.6

Monthly average temp (F): 66.7
License Max. Average Temperature: 68 F

Dead River Below Hoist Powerhouse - July 2013 Temperature Monitoring Data

Time HHMMSS	7/17/13	7/18/13	7/19/13	7/20/13	7/21/13	7/22/13	7/23/13	7/24/13	7/25/13	7/26/13	7/27/13	7/28/13	7/29/13	7/30/13	7/31/13
0	66.5	67.8	67.7	71.7	68.1	68.0	69.4	69.4	67.7	67.6					
10000	66.4	67.7	67.8	70.8	67.8	67.9	69.8	69.2	67.7	67.6					
20000	66.4	67.6	68.4	70.5	67.7	68.0	69.5	69.0	67.6	67.6					
30000	66.6	67.7	68.7	70.4	67.8	68.0	69.2	68.8	67.6	67.6					
40000	67.0	67.9	67.9	70.1	67.9	68.0	69.1	68.5	67.6	67.6					
50000	67.2	67.7	67.5	69.9	68.0	68.0	69.2	68.3	67.7	67.4					
60000	67.2	67.7	67.0	69.5	68.1	68.2	69.4	68.1	67.7						
70000	67.1	67.6	66.9	69.5	68.0	68.2	69.4	68.0	67.7						
80000	67.2	67.8	67.2	69.5	68.0	68.3	69.4	68.0	67.8						
90000	67.6	67.9	67.5	69.4	68.3	68.5	69.4	68.2	68.0						
100000	68.2	68.1	67.8	69.6	68.5	68.7	69.6	68.6	68.2						
110000	68.9	67.7	68.9	70.1	68.7	69.3	70.0	69.0	68.4						
120000	69.7	67.8	70.1	70.5	68.8	69.8	70.4	69.4	69.0						
130000	70.4	69.1	70.9	70.7	69.0	70.2	70.5	69.7	69.2						
140000	70.4	69.5	71.9	70.9	69.3	69.6	70.8	69.8	69.1						
150000	70.2	69.6	73.1	71.1	69.5	69.9	71.3	69.4	69.1						
160000	70.4	69.1	73.9	71.0	69.5	70.0	71.6	69.2	68.7						
170000	70.4	68.5	74.5	70.5	69.1	70.3	71.4	69.3	68.3						
180000	70.7	69.0	74.8	70.0	69.2	69.9	71.3	69.1	68.0						
190000	70.9	68.5	74.8	69.4	68.8	69.2	71.1	68.6	67.8						
200000	70.3	67.1	74.1	69.0	68.4	69.0	70.8	68.2	68.0						
210000	69.0	67.4	74.1	68.6	68.2	69.1	70.6	68.0	67.9						
220000	68.2	68.3	73.7	68.3	68.1	69.3	70.3	68.1	67.7						
230000	67.8	68.2	72.8	68.2	68.0	69.1	69.8	67.8	67.6						
Daily Max	70.9	69.6	74.8	71.7	69.5	70.3	71.6	69.8	69.2	67.6	0.0	0.0	0.0	0.0	0.0
Daily Min	66.4	67.1	66.9	68.2	67.7	67.9	69.1	67.8	67.6	67.4	0.0	0.0	0.0	0.0	0.0
Average	68.5	68.1	70.5	70.0	68.5	68.9	70.1	68.7	68.1	67.5	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

 No data - equipment malfunction

Dead River Below Hoist Powerhouse - August 2013 Temperature Monitoring Data

Time	Time																
HHMMSS	8/1/2013	8/2/2013	8/3/2013	8/4/2013	8/5/2013	8/6/2013	8/7/2013	8/8/2013	8/9/2013	8/10/2013	8/11/2013	8/12/2013	8/13/2013	8/14/2013	8/15/2013	8/16/2013	
0							65.6	66.1	65.6	66.1	65.3	65.4	65.9	65.0	64.6	66.0	
10000							65.5	65.9	65.5	65.5	66.0	65.2	65.3	65.7	64.9	64.5	65.7
20000							65.6	65.8	65.5	65.9	65.1	65.2	65.5	64.8	64.4	65.5	
30000							65.6	65.7	65.4	65.8	65.2	65.3	65.3	64.7	64.3	65.4	
40000							65.6	65.6	65.5	65.7	65.1	65.4	65.1	64.7	64.2	65.3	
50000							65.5	65.4	65.6	65.6	65.1	65.5	65.1	64.6	64.2	65.2	
60000							65.5	65.3	65.5	65.5	65.2	65.5	65.1	64.5	64.2	65.2	
70000							65.4	65.2	65.4	65.4	65.1	65.6	65.1	64.4	64.1	65.0	
80000							65.5	65.3	65.4	65.3	65.2	65.5	65.2	64.4	64.2	65.0	
90000							65.6	65.4	65.5	65.4	65.3	65.5	65.4	64.4	63.8	65.0	
100000	65.8	65.7	65.7	65.8	65.7	65.8	65.7	65.8	65.5	64.8	64.1	65.4					
110000	65.9	66.2	66.2	66.3	66.1	66.3	66.3	65.7	65.2	64.9	66.1						
120000	66.1	66.5	66.7	66.8	66.3	66.7	65.8	65.5	65.6	66.7							
130000	66.5	66.7	67.1	67.1	66.4	67.1	66.2	65.7	66.3	67.4							
140000	66.5	66.7	67.1	67.2	67.2	66.9	67.4	66.1	66.1	66.6	67.9						
150000	66.8	66.8	67.1	67.6	67.4	66.9	67.0	66.0	66.5	66.9	68.1						
160000	67.2	66.9	66.8	67.6	67.3	66.6	66.9	65.8	66.3	66.9	68.0						
170000	67.1	67.5	66.8	67.5	67.2	66.8	66.8	65.7	66.4	67.0	67.8						
180000	66.5	67.6	66.7	67.5	67.0	66.8	67.2	65.8	66.1	67.0	67.5						
190000	66.3	67.5	66.4	67.2	66.6	66.5	67.1	65.6	65.9	67.0	67.0						
200000	66.2	67.1	66.2	67.0	66.2	66.3	66.8	65.5	65.6	66.8	66.5						
210000	65.9	66.8	66.0	66.7	65.9	66.0	66.5	65.2	65.2	66.7	66.1						
220000	65.8	66.5	65.8	66.5	65.6	65.8	66.3	65.1	64.9	66.5	65.8						
230000	65.7	66.3	65.7	66.3	65.4	65.6	66.1	65.0	64.7	66.2	65.6						
Daily Max	0.0	0.0	0.0	0.0	0.0	67.2	67.6	67.1	67.6	67.4	66.9	67.4	66.2	66.5	67.0	68.1	
Daily Min	0.0	0.0	0.0	0.0	0.0	65.7	65.4	65.2	65.4	65.3	65.1	65.2	65.0	64.4	63.8	65.0	
Average	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	66.4	66.2	66.1	66.3	66.2	65.8	66.2	65.5	65.2	65.5	66.2	

Monthly average temp (F): 68.7
License Max. Average Temperature: 68 F

No data - equipment malfunction

Dead River Below Hoist Powerhouse - August 2013 Temperature Monitoring Data

Time	8/17/2013	8/18/2013	8/19/2013	8/20/2013	8/21/2013	8/22/2013	8/23/2013	8/24/2013	8/25/2013	8/26/2013	8/27/2013	8/28/2013	8/29/2013	8/30/2013	8/31/2013
HHMMSS															
0	65.3	67.3	68.1	69.4	71.1	70.9	69.4	67.4	69.1	71.7	71.3	71.3	71.0	72.9	72.4
10000	65.0	67.3	68.1	69.4	70.9	70.6	69.2	67.2	69.0	71.7	71.1	71.4	70.9	72.6	72.3
20000	65.0	67.4	68.0	69.4	70.7	70.5	68.9	67.2	68.8	71.8	71.1	71.3	70.8	72.6	72.2
30000	64.9	67.4	68.0	69.3	70.5	70.5	68.8	67.3	68.7	71.8	71.2	71.3	71.0	72.9	72.1
40000	64.9	67.4	68.0	69.2	70.4	70.4	68.7	67.6	68.9	71.2	71.2	71.4	71.2	73.0	72.0
50000	64.9	67.3	67.9	69.0	70.4	70.2	68.8	67.9	69.1	70.8	71.2	71.4	71.4	73.4	71.9
60000	64.8	67.1	67.9	68.9	70.4	69.9	68.7	68.1	69.2	70.8	71.2	71.3	71.6	73.5	71.7
70000	64.7	66.9	67.7	68.8	70.5	69.7	68.6	68.1	69.6	70.9	71.2	71.2	71.9	73.0	71.6
80000	64.7	66.7	67.6	68.8	70.4	69.6	68.6	68.2	69.8	70.9	71.2	71.0	72.0	73.3	71.5
90000	64.9	66.7	67.6	68.9	70.4	69.7	68.7	68.4	69.9	71.0	71.3	71.0	72.1	73.8	71.5
100000	65.3	67.0	67.8	69.1	70.7	69.9	69.1	68.7	70.1	71.3	71.5	71.4	72.4	73.9	71.6
110000	66.0	67.5	68.3	69.7	71.5	70.4	69.8	69.2	70.4	71.8	71.8	72.1	72.9	73.9	71.9
120000	66.7	67.8	68.9	70.4	72.0	71.2	70.5	69.9	71.1	72.4	72.3	72.8	73.5	73.9	72.4
130000	67.3	68.1	69.2	70.9	72.0	71.8	70.9	70.5	71.9	73.2	72.9	73.4	73.9	73.8	73.0
140000	67.6	68.5	69.7	71.3	72.2	72.5	71.2	70.9	72.5	73.7	73.1	74.0	74.5	73.6	73.5
150000	67.9	68.9	70.1	71.4	72.8	72.7	71.4	70.9	72.8	73.9	73.6	74.5	74.8	73.7	73.8
160000	68.2	69.0	70.3	71.5	72.6	72.7	71.3	70.8	72.9	73.5	73.5	74.4	74.5	73.8	74.0
170000	68.5	69.2	70.1	71.8	72.5	72.5	70.8	70.8	73.0	73.3	73.6	74.0	73.9	73.8	74.0
180000	68.7	69.0	70.2	71.8	72.4	71.9	70.3	70.7	72.9	73.0	73.3	73.3	73.5	73.8	73.7
190000	68.6	68.9	70.3	71.7	72.4	71.3	69.6	70.5	72.6	72.8	72.7	72.7	73.4	73.7	73.5
200000	68.2	68.6	70.1	71.6	72.3	70.8	68.9	70.3	72.7	72.4	72.3	72.2	73.4	73.4	73.2
210000	67.8	68.5	70.0	71.4	72.2	70.4	68.4	70.0	72.1	72.0	72.0	71.8	73.5	73.0	72.9
220000	67.5	68.4	69.8	71.2	71.9	70.1	68.0	69.7	71.9	71.7	71.7	71.5	73.4	72.7	72.6
230000	67.4	68.2	69.6	71.2	71.3	69.7	67.7	69.4	71.8	71.5	71.4	71.3	73.3	72.6	72.2
Daily Max	68.7	69.2	70.3	71.8	72.8	72.7	71.4	70.9	73.0	73.9	73.6	74.5	74.8	73.9	74.0
Daily Min	64.7	66.7	67.6	68.8	70.4	69.6	67.7	67.2	68.7	70.8	71.1	71.0	70.8	72.6	71.5
Average	66.4	67.9	68.9	70.3	71.4	70.8	69.4	69.2	70.9	72.0	72.0	72.2	72.7	73.3	72.6

** Bypass opened on 8/15 between 7 & 8 EST to support work on intake structure.
All water being released through low head outlet.

Dead River Below Hoist Powerhouse - September 2013 Temperature Monitoring Data

Time HHMMSS	9/1/2013	9/2/2013	9/3/2013	9/4/2013	9/5/2013	9/6/2013	9/7/2013	9/8/2013	9/9/2013	9/10/2013	9/11/2013	9/12/2013	9/13/2013	9/14/2013	9/15/2013	9/16/2013
0	72.0	71.7	69.3	69.4	67.0	66.9	67.2	66.5	65.5	66.1	66.5	67.0	65.8	64.4	64.9	63.4
10000	71.8	71.5	69.1	69.4	66.9	66.9	67.1	66.4	65.6	66.1	66.5	66.9	65.7	64.4	64.9	63.4
20000	71.8	71.3	69.0	69.4	66.8	66.8	67.1	66.3	65.6	66.1	66.5	66.8	65.6	64.3	64.9	63.3
30000	71.7	71.1	68.9	69.3	66.7	66.7	67.1	66.2	65.7	66.1	66.5	66.7	65.5	64.3	64.9	63.2
40000	71.8	71.0	68.8	69.2	66.7	66.7	67.2	66.1	65.8	66.1	66.5	66.6	65.4	64.3	64.9	63.1
50000	71.8	70.9	68.7	69.2	66.6	66.5	67.2	66.1	65.8	66.1	66.5	66.7	65.2	64.3	64.9	62.9
60000	71.7	70.7	68.6	68.9	66.5	66.4	67.3	66.1	65.9	66.1	66.5	66.7	65.1	64.3	64.8	62.9
70000	71.9	70.5	68.5	68.6	66.4	66.4	67.2	66.2	65.9	66.1	66.4	66.6	65.0	64.2	64.7	62.9
80000	71.9	70.4	68.5	68.4	66.3	66.4	67.1	66.2	66.0	66.1	66.4	66.6	64.9	64.2	64.7	62.8
90000	72.0	70.3	68.5	68.2	66.3	66.6	67.0	66.3	66.0	66.2	66.4	66.6	64.9	64.2	64.7	62.8
100000	72.1	70.2	68.6	68.1	66.6	66.9	67.1	66.2	66.1	66.2	66.4	66.6	64.9	64.3	64.6	62.8
110000	72.2	70.2	69.1	68.1	67.1	67.2	67.5	66.3	66.3	66.5	66.8	66.6	65.1	64.6	64.6	63.3
120000	72.6	70.2	69.5	68.4	67.7	67.7	67.8	66.5	66.2	66.9	67.2	66.6	65.5	64.9	64.5	63.7
130000	73.2	70.1	69.7	68.8	68.1	68.3	67.5	66.7	66.3	67.0	67.5	66.6	65.7	65.3	64.5	63.8
140000	73.6	70.3	70.0	69.0	68.5	68.3	67.2	66.8	66.4	67.3	67.8	66.7	65.8	65.4	64.5	64.0
150000	73.7	70.4	70.3	69.2	68.8	68.4	67.1	66.7	66.3	67.4	67.9	66.7	66.0	65.7	64.5	64.1
160000	73.9	70.5	70.2	69.0	68.9	68.0	67.1	66.8	66.3	67.1	67.8	66.6	65.9	65.7	64.3	64.1
170000	73.8	70.4	70.3	68.8	68.8	67.7	67.1	66.6	66.4	67.3	67.7	66.5	65.7	65.6	64.3	63.9
180000	73.5	70.4	70.2	68.5	68.8	67.7	67.0	66.4	66.5	67.3	67.9	66.4	65.5	65.5	64.3	63.5
190000	73.0	70.1	70.0	68.3	68.2	67.6	67.1	66.1	66.5	67.4	67.7	66.2	65.1	65.4	64.1	63.2
200000	72.7	69.8	69.9	67.9	67.7	67.4	67.1	65.9	66.4	67.1	67.4	66.1	64.9	65.4	64.0	62.9
210000	72.4	69.7	69.6	67.7	67.3	67.3	66.9	65.8	66.3	67.0	67.3	66.0	64.7	65.1	63.8	62.7
220000	72.1	69.5	69.4	67.4	67.1	67.3	66.7	65.6	66.2	66.8	67.4	65.9	64.5	65.1	63.7	62.5
230000	71.9	69.4	69.4	67.1	66.9	67.2	66.6	65.5	66.2	66.6	67.1	65.9	64.5	65.1	63.5	62.5
Daily Max	73.9	71.7	70.3	69.4	68.9	68.4	67.8	66.8	66.5	67.4	67.9	67.0	66.0	65.7	64.9	64.1
Daily Min	71.7	69.4	68.5	67.1	66.3	66.4	66.6	65.5	65.5	66.1	66.4	65.9	64.5	64.2	63.5	62.5
Average	72.4	70.4	69.3	68.6	67.3	67.2	67.1	66.3	66.1	66.6	67.0	66.5	65.3	64.8	64.5	63.2

Monthly average temp (F): 64.4
License Max. Average Temperature: 63 F

** Bypass closed on 9/6 between 1200 & 1300 EST.
Prior to closure, all water being released through low head outlet.

Dead River Below Hoist Powerhouse - September 2013 Temperature Monitoring Data

Time														
HHMMSS	9/17/2013	9/18/2013	9/19/2013	9/20/2013	9/21/2013	9/22/2013	9/23/2013	9/24/2013	9/25/2013	9/26/2013	9/27/2013	9/28/2013	9/29/2013	9/30/2013
0	62.4	62.5	63.0	63.2	63.8	62.3	60.9	60.6	60.4	60.2	59.9	59.8	60.0	60.2
10000	62.4	62.5	63.0	63.1	63.7	62.3	60.8	60.6	60.4	60.2	59.9	59.7	60.1	60.1
20000	62.3	62.5	63.0	63.0	63.8	62.2	60.8	60.5	60.4	60.1	59.8	59.7	60.0	60.1
30000	62.3	62.5	63.0	62.9	63.7	62.1	60.8	60.5	60.5	60.1	59.8	59.9	60.0	60.0
40000	62.3	62.6	62.9	63.0	63.6	62.0	60.8	60.5	60.6	60.0	59.8	59.9	59.9	59.9
50000	62.3	62.6	62.9	63.0	63.6	61.9	60.7	60.5	60.6	60.0	59.8	59.8	59.8	59.9
60000	62.2	62.6	62.9	63.0	63.4	61.8	60.7	60.4	60.6	59.9	59.7	59.7	59.7	59.9
70000	62.1	62.6	63.0	63.1	63.3	61.7	60.6	60.5	60.6	59.9	59.6	59.7	59.7	59.8
80000	62.1	62.6	63.0	63.2	63.2	61.7	60.6	60.5	60.5	59.8	59.6	59.7	59.6	59.8
90000	62.0	62.7	63.0	63.2	63.2	61.6	60.5	60.5	60.5	59.8	59.7	59.7	59.6	59.9
100000	62.1	62.7	63.1	63.4	63.2	61.7	60.6	60.5	60.6	59.9	59.8	59.8	59.7	59.9
110000	62.4	62.9	63.3	63.5	63.2	61.6	60.8	60.7	60.8	60.3	60.1	60.0	59.9	60.0
120000	62.9	62.9	63.6	63.6	63.2	61.6	61.1	61.0	61.1	60.5	60.4	60.2	60.2	60.3
130000	63.2	63.1	63.6	63.9	63.3	61.7	61.3	61.1	61.3	60.7	60.5	60.4	60.4	60.5
140000	63.5	63.4	63.5	64.1	63.3	61.6	61.4	61.3	61.4	60.9	60.7	60.5	60.6	60.5
150000	63.6	63.4	63.7	64.1	63.1	61.6	61.5	61.4	61.4	60.9	60.8	60.4	60.7	60.5
160000	63.7	63.3	63.9	64.4	63.1	61.6	61.6	61.6	61.3	60.8	61.0	60.2	60.9	60.7
170000	63.6	63.3	63.8	64.4	63.0	61.6	61.6	61.4	61.1	60.7	60.8	60.2	60.9	60.8
180000	63.4	63.2	63.7	64.5	62.9	61.5	61.4	61.1	60.9	60.5	60.6	60.1	60.7	60.6
190000	63.1	63.2	63.6	64.4	62.8	61.4	61.2	60.9	60.7	60.3	60.6	59.8	60.6	60.5
200000	62.9	63.1	63.4	64.2	62.6	61.2	61.0	60.7	60.6	60.2	60.4	59.8	60.5	60.3
210000	62.7	63.0	63.3	64.1	62.5	61.1	60.8	60.6	60.4	60.2	60.1	59.8	60.4	60.2
220000	62.6	63.0	63.4	64.0	62.5	61.0	60.7	60.5	60.3	60.1	60.0	59.8	60.4	60.1
230000	62.5	63.0	63.3	63.9	62.4	60.9	60.6	60.5	60.2	60.0	59.9	59.8	60.3	60.1
Daily Max	63.7	63.4	63.9	64.5	63.8	62.3	61.6	61.6	61.4	60.9	61.0	60.5	60.9	60.8
Daily Min	62.0	62.5	62.9	62.9	62.4	60.9	60.5	60.4	60.2	59.8	59.6	59.7	59.6	59.8
Average	62.7	62.9	63.3	63.6	63.2	61.7	60.9	60.8	60.7	60.2	60.1	59.9	60.2	60.2

Dead River Below Hoist Powerhouse - October 2013 Temperature Monitoring Data

Time	10/1/2013	10/2/2013	10/3/2013	10/4/2013	10/5/2013	10/6/2013	10/7/2013	10/8/2013	10/9/2013	10/10/2013	10/11/2013	10/12/2013	10/13/2013	10/14/2013	10/15/2013	10/16/2013
HHMMSS																
0	60.1	60.2	60.1	59.7	59.4	57.9	58.8	57.7	57.8	57.8	57.6	57.3	57.2	56.7	56.3	56.0
10000	60.1	60.2	60.2	59.7	59.4	58.2	58.7	57.7	57.7	57.8	57.5	57.3	57.2	56.6	56.3	56.0
20000	60.1	60.2	60.2	59.7	59.4	58.3	58.7	57.6	57.7	57.8	57.5	57.3	57.1	56.5	56.2	55.9
30000	60.1	60.1	60.2	59.6	59.4	58.4	58.6	57.6	57.7	57.8	57.5	57.3	57.1	56.5	56.2	55.9
40000	60.1	60.0	60.2	59.6	59.3	58.4	58.4	57.5	57.7	57.8	57.6	57.3	57.1	56.4	56.2	55.9
50000	60.1	60.0	60.1	59.6	59.3	58.5	58.3	57.5	57.7	57.8	57.5	57.3	57.1	56.4	56.2	55.8
60000	60.0	59.9	60.1	59.6	59.2	58.5	58.3	57.5	57.7	57.8	57.5	57.3	57.0	56.4	56.1	55.7
70000	60.0	59.8	60.0	59.5	59.1	58.5	58.2	57.4	57.7	57.7	57.6	57.3	57.0	56.3	56.1	55.7
80000	60.0	59.7	60.0	59.5	59.0	58.5	58.1	57.4	57.6	57.7	57.6	57.3	56.9	56.3	56.1	55.7
90000	59.9	59.7	59.9	59.5	58.9	58.6	58.2	57.4	57.6	57.7	57.6	57.3	56.9	56.2	56.1	55.6
100000	60.0	59.8	60.0	59.6	58.8	58.6	58.3	57.5	57.6	57.8	57.6	57.4	56.9	56.2	56.1	55.6
110000	60.2	60.0	60.1	59.8	58.8	58.7	58.4	57.7	57.8	58.0	57.8	57.5	57.0	56.5	56.1	55.6
120000	60.5	60.3	60.3	59.9	58.9	58.8	58.5	57.9	58.0	58.2	58.0	57.5	57.1	56.8	56.1	55.6
130000	60.7	60.6	60.5	60.0	58.9	59.1	58.7	58.0	58.2	58.4	58.0	57.4	57.2	56.9	56.2	55.6
140000	60.9	60.8	60.5	60.0	58.9	59.4	58.7	58.1	58.3	58.4	58.1	57.5	57.4	56.9	56.1	55.6
150000	61.2	60.9	60.5	60.0	58.9	59.3	58.7	58.2	58.4	58.4	58.2	57.5	57.4	56.9	56.1	55.6
160000	61.2	60.9	60.4	59.9	58.9	59.1	58.6	58.3	58.5	58.3	58.2	57.5	57.4	56.9	56.1	55.6
170000	61.2	60.9	60.2	59.9	58.9	59.4	58.4	58.2	58.4	58.1	58.1	57.6	57.3	56.8	56.1	55.5
180000	61.1	60.7	60.1	59.8	58.7	59.4	58.3	58.1	58.4	58.1	57.9	57.7	57.2	56.7	56.0	55.5
190000	60.8	60.5	60.0	59.6	58.5	59.2	58.2	58.0	58.3	57.9	57.7	57.6	57.1	56.6	56.0	55.5
200000	60.6	60.4	59.8	59.5	58.2	59.1	58.0	57.9	58.2	57.8	57.6	57.5	56.9	56.5	56.0	55.4
210000	60.5	60.2	59.8	59.5	57.8	59.0	57.9	57.8	58.1	57.8	57.5	57.4	56.9	56.5	56.0	55.3
220000	60.4	60.1	59.7	59.5	57.5	58.9	57.9	57.8	58.0	57.7	57.4	57.4	56.8	56.4	56.0	55.3
230000	60.3	60.1	59.7	59.5	57.7	58.9	57.8	57.7	57.9	57.6	57.4	57.3	56.7	56.4	56.0	55.2
Daily Max	61.2	60.9	60.5	60.0	59.4	59.4	58.8	58.3	58.5	58.4	58.2	57.7	57.4	56.9	56.3	56.0
Daily Min	59.9	59.7	59.7	59.5	57.5	57.9	57.8	57.4	57.6	57.6	57.4	57.3	56.7	56.2	56.0	55.2
Average	60.4	60.2	60.1	59.7	58.8	58.8	58.4	57.8	58.0	57.9	57.7	57.4	57.1	56.6	56.1	55.6

Monthly average temp (F): 54.1
License Max. Average Temperature: 56 F

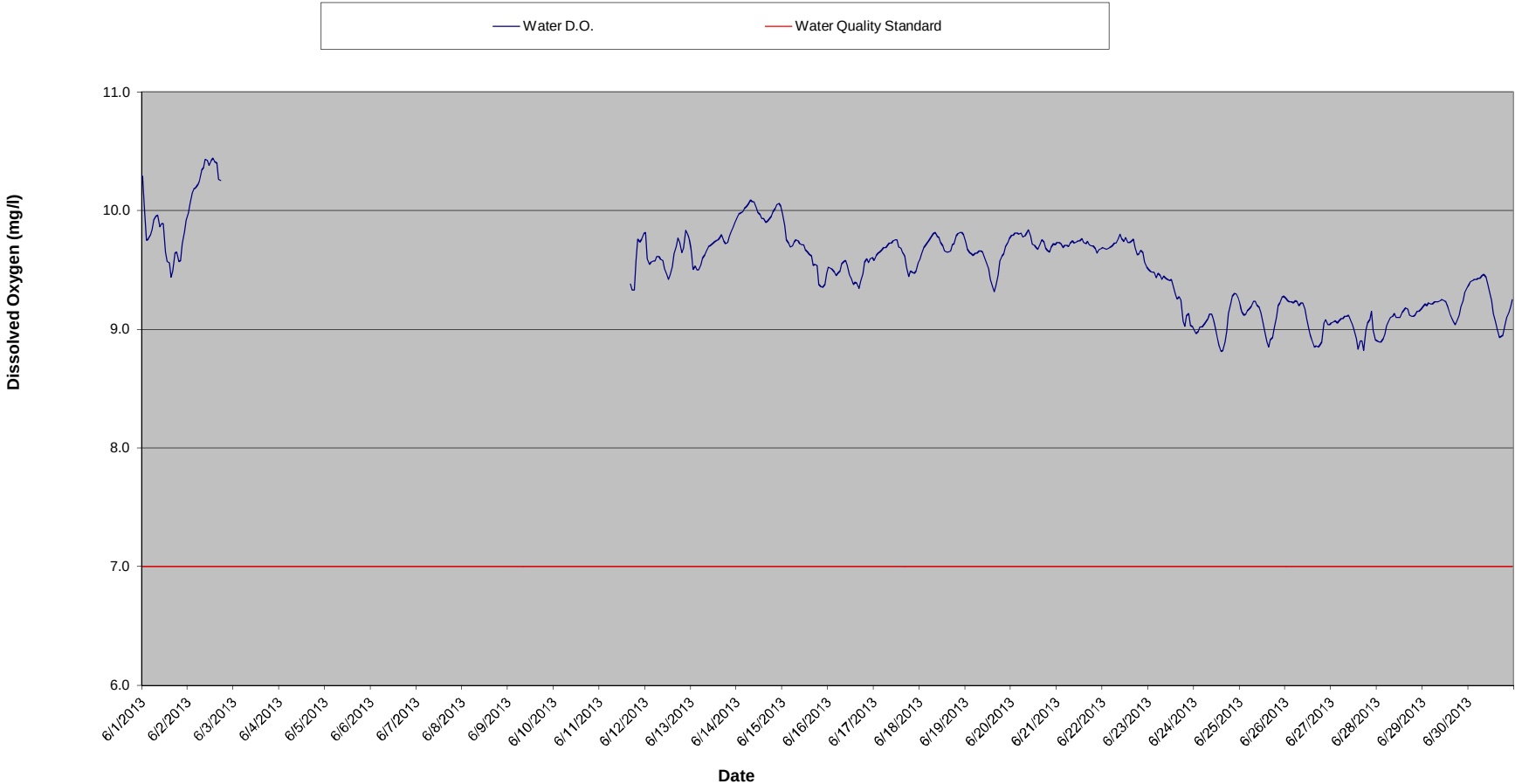
Dead River Below Hoist Powerhouse - October 2013 Temperature Monitoring Data

Time															
HHMMSS	10/17/2013	10/18/2013	10/19/2013	10/20/2013	10/21/2013	10/22/2013	10/23/2013	10/24/2013	10/25/2013	10/26/2013	10/27/2013	10/28/2013	10/29/2013	10/30/2013	10/31/2013
0	55.0	54.7	54.3	53.7	53.1	51.5	50.7	49.5	48.8	48.3	47.5	46.7	46.0	45.8	45.9
10000	55.0	54.7	54.2	53.7	53.1	51.5	50.7	49.4	48.8	48.3	47.5	46.7	46.0	45.8	45.9
20000	54.9	54.7	54.1	53.5	53.0	51.5	50.6	49.4	48.8	48.2	47.4	46.6	45.9	45.8	45.9
30000	54.8	54.7	54.1	53.4	53.0	51.5	50.6	49.3	48.7	48.2	47.4	46.6	45.9	45.8	46.0
40000	54.8	54.7	54.0	53.3	53.0	51.3	50.5	49.4	48.6	48.0	47.4	46.5	45.8	45.7	46.0
50000	54.7	54.7	53.9	53.3	52.9	51.3	50.4	49.3	48.5	47.8	47.4	46.4	45.8	45.7	46.0
60000	54.7	54.7	53.9	53.3	52.9	51.2	50.3	49.3	48.5	47.8	47.3	46.4	45.8	45.7	46.0
70000	54.6	54.7	53.8	53.3	52.7	51.0	50.2	49.2	48.4	47.8	47.3	46.3	45.8	45.7	46.0
80000	54.6	54.7	53.7	53.3	52.6	50.9	50.1	49.2	48.3	47.8	47.3	46.3	45.7	45.7	46.0
90000	54.5	54.6	53.7	53.2	52.5	50.9	50.0	49.1	48.3	47.8	47.3	46.3	45.7	45.6	46.0
100000	54.6	54.7	53.7	53.3	52.5	51.0	50.1	49.2	48.3	47.8	47.3	46.3	45.7	45.6	46.0
110000	54.7	54.8	53.9	53.4	52.5	51.1	50.1	49.3	48.3	47.9	47.3	46.4	45.8	45.7	46.1
120000	55.1	54.8	54.1	53.5	52.5	51.3	50.3	49.4	48.5	47.8	47.3	46.6	46.0	45.8	46.1
130000	55.1	54.8	54.1	53.6	52.3	51.3	50.4	49.5	48.6	48.0	47.3	46.6	46.0	45.9	46.2
140000	55.1	54.8	54.3	53.6	52.4	50.8	50.3	49.5	48.8	47.9	47.3	46.8	46.2	45.9	46.2
150000	55.2	54.8	54.2	53.6	52.4	50.9	50.3	49.6	48.6	47.9	47.3	46.8	46.1	45.9	46.2
160000	55.1	54.8	54.1	53.6	52.3	51.0	50.3	49.5	48.6	47.9	47.4	46.8	46.1	45.9	46.2
170000	55.2	54.7	54.0	53.5	52.2	51.1	50.1	49.5	48.6	47.8	47.3	46.8	46.0	46.0	46.2
180000	55.2	54.6	54.0	53.5	52.0	51.0	50.0	49.3	48.6	47.6	47.3	46.7	45.9	45.9	46.1
190000	55.0	54.5	53.9	53.4	51.8	50.9	49.9	49.2	48.5	47.6	47.2	46.5	45.9	45.8	46.1
200000	54.9	54.4	53.8	53.3	51.6	50.8	49.8	49.1	48.4	47.6	47.2	46.4	45.8	45.8	46.0
210000	54.8	54.4	53.8	53.2	51.5	50.8	49.7	49.1	48.4	47.6	47.1	46.3	45.8	45.8	46.0
220000	54.8	54.4	53.7	53.2	51.5	50.8	49.6	49.0	48.3	47.5	47.0	46.2	45.8	45.9	46.0
230000	54.8	54.3	53.7	53.2	51.5	50.7	49.6	48.9	48.3	47.5	46.9	46.1	45.8	45.9	46.0
Daily Max	55.2	54.8	54.3	53.7	53.1	51.5	50.7	49.6	48.8	48.3	47.5	46.8	46.2	46.0	46.2
Daily Min	54.5	54.3	53.7	53.2	51.5	50.7	49.6	48.9	48.3	47.5	46.9	46.1	45.7	45.6	45.9
Average	54.9	54.7	53.9	53.4	52.4	51.1	50.2	49.3	48.5	47.9	47.3	46.5	45.9	45.8	46.0

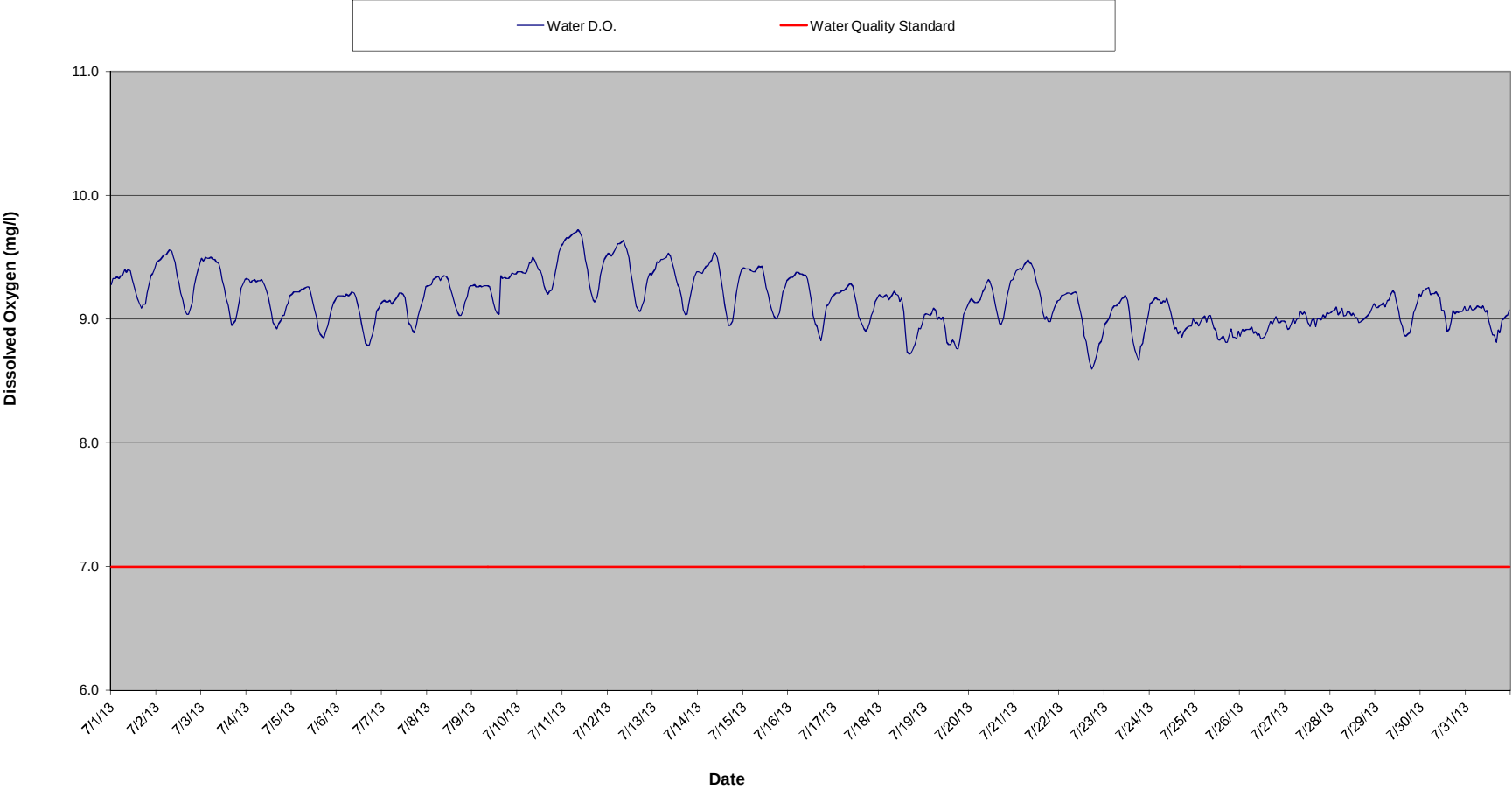
Dead River Water Quality Monitoring Data

**Downstream of the McClure Dam in the Dead River
at the LS&I Railroad Bridge**

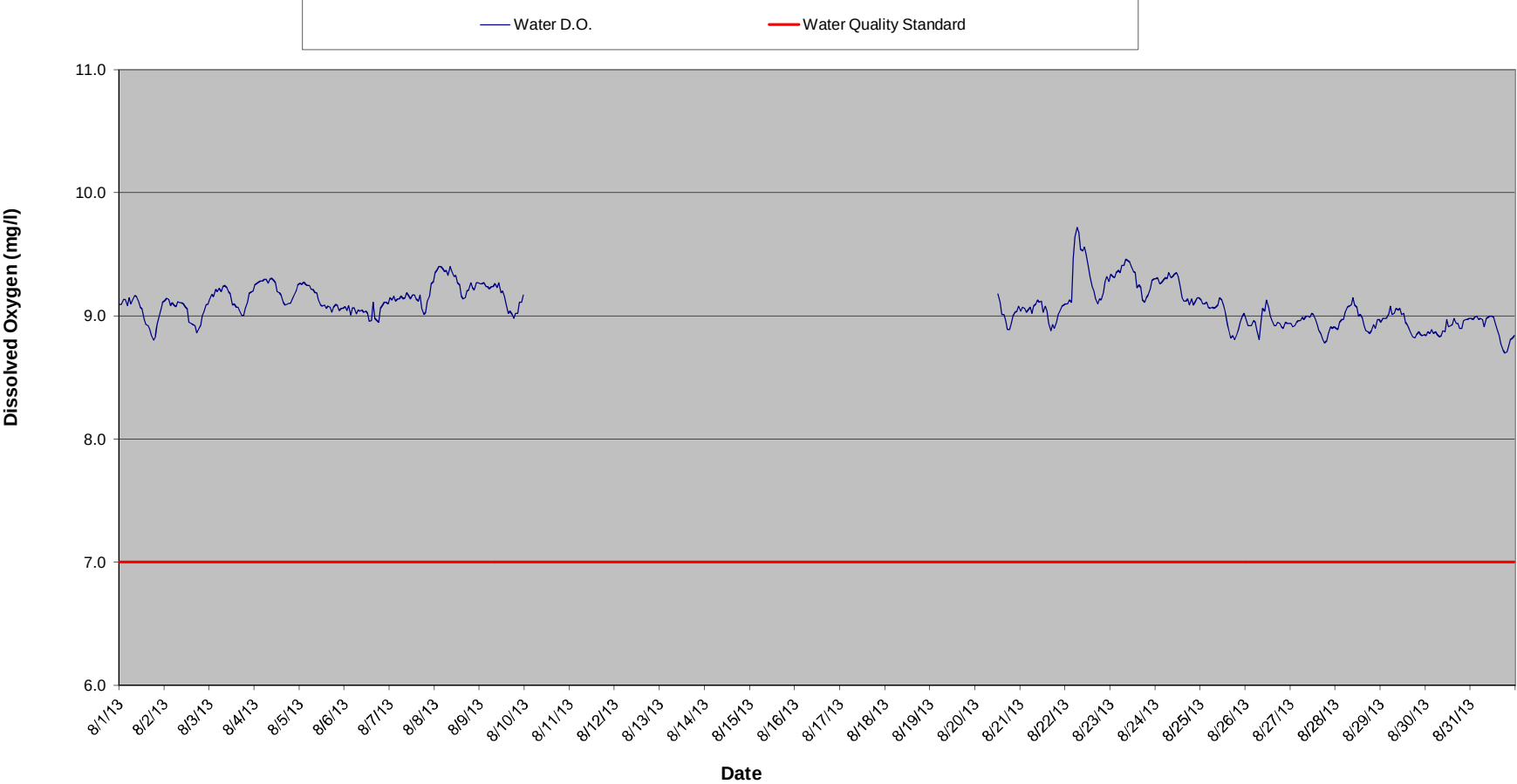
Dead River Below McClure Dam Dissolved Oxygen Summary - June 2013



Dead River Below McClure Dam Dissolved Oxygen Summary - July 2013



Dead River Below McClure Dam Dissolved Oxygen Summary - August 2013



Dead River Below McClure Dam Dissolved Oxygen Summary - September 2013



Dead River Below McClure Dam - June 2013 Dissolved Oxygen Summary

Time HHMMSS	06/01/13	06/02/13	06/03/13	06/04/13	06/05/13	06/06/13	06/07/13	06/08/13	06/09/13	06/10/13	06/11/13	06/12/13	06/13/13	06/14/13	06/15/13	06/16/13	
0	10.3	10.0											9.8	9.7	9.9	10.0	9.5
10000	10.0	10.1											9.6	9.5	10.0	9.9	9.5
20000	9.8	10.2											9.5	9.5	10.0	9.8	9.5
30000	9.8	10.2											9.6	9.5	10.0	9.7	9.5
40000	9.8	10.2											9.6	9.5	10.0	9.7	9.5
50000	9.8	10.2											9.6	9.5	10.0	9.7	9.5
60000	9.9	10.3											9.6	9.6	10.1	9.7	9.5
70000	10.0	10.3											9.6	9.6	10.1	9.8	9.6
80000	10.0	10.4											9.6	9.7	10.1	9.7	9.6
90000	9.9	10.4											9.6	9.7	10.1	9.7	9.6
100000	9.9	10.4											9.5	9.7	10.0	9.7	9.5
110000	9.9	10.4											9.5	9.7	10.0	9.7	9.5
120000	9.7	10.4											9.4	9.7	10.0	9.7	9.4
130000	9.6	10.4											9.5	9.7	9.9	9.6	9.4
140000	9.6	10.4											9.5	9.8	9.9	9.6	9.4
150000	9.4	10.4											9.6	9.8	9.9	9.6	9.4
160000	9.5	10.3	9.4	9.7	9.8	9.9	9.5	9.3									
170000	9.6	10.3	9.3	9.8	9.7	9.9	9.5	9.4									
180000	9.7											9.3	9.7	9.7	9.9	9.5	9.5
190000	9.6											9.6	9.6	9.7	10.0	9.4	9.6
200000	9.6											9.8	9.7	9.8	10.0	9.4	9.6
210000	9.7											9.7	9.8	9.8	10.0	9.4	9.6
220000	9.8											9.8	9.8	9.9	10.1	9.4	9.6
230000	9.9											9.8	9.8	9.9	10.0	9.5	9.6
Daily Max	10.3	10.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.8	9.8	9.9	10.1	10.0	9.6	
Daily Min	9.4	10.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.3	9.4	9.5	9.9	9.4	9.3	
Average	9.8	10.3	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	9.6	9.6	9.7	10.0	9.6	9.5	

License Minimum Dissolved Oxygen: 7.0 mg/l

 Missing Data - Equipment Malfunction

Dead River Below McClure Dam - June 2013 Dissolved Oxygen Summary

Time														
HHMMSS	06/17/13	06/18/13	06/19/13	06/20/13	06/21/13	06/22/13	06/23/13	06/24/13	06/25/13	06/26/13	06/27/13	06/28/13	06/29/13	06/30/13
0	9.6	9.6	9.7	9.8	9.7	9.7	9.5	9.0	9.2	9.3	9.1	8.9	9.2	9.4
10000	9.6	9.6	9.7	9.8	9.7	9.7	9.5	9.0	9.1	9.2	9.1	8.9	9.2	9.4
20000	9.6	9.7	9.6	9.8	9.7	9.7	9.5	9.0	9.1	9.2	9.1	8.9	9.2	9.4
30000	9.6	9.7	9.6	9.8	9.7	9.7	9.5	9.0	9.1	9.2	9.1	8.9	9.2	9.4
40000	9.7	9.7	9.6	9.8	9.7	9.7	9.4	9.0	9.2	9.2	9.1	9.0	9.2	9.4
50000	9.7	9.8	9.6	9.8	9.7	9.7	9.5	9.0	9.2	9.2	9.1	9.0	9.2	9.4
60000	9.7	9.8	9.6	9.8	9.7	9.7	9.5	9.1	9.2	9.2	9.1	9.1	9.2	9.4
70000	9.7	9.8	9.7	9.8	9.7	9.7	9.4	9.1	9.2	9.2	9.1	9.1	9.2	9.5
80000	9.7	9.8	9.7	9.8	9.7	9.8	9.4	9.1	9.2	9.2	9.1	9.1	9.2	9.5
90000	9.7	9.8	9.7	9.8	9.7	9.8	9.4	9.1	9.2	9.2	9.1	9.1	9.2	9.4
100000	9.7	9.8	9.6	9.8	9.7	9.8	9.4	9.1	9.2	9.2	9.1	9.1	9.3	9.4
110000	9.8	9.7	9.6	9.7	9.7	9.7	9.4	9.0	9.1	9.1	9.0	9.1	9.2	9.3
120000	9.8	9.7	9.5	9.7	9.7	9.8	9.4	8.9	9.1	9.0	9.0	9.1	9.2	9.2
130000	9.7	9.7	9.4	9.7	9.8	9.7	9.4	8.9	9.0	8.9	8.9	9.1	9.2	9.1
140000	9.7	9.7	9.4	9.7	9.7	9.7	9.3	8.8	8.9	8.9	8.8	9.2	9.1	9.1
150000	9.6	9.7	9.3	9.7	9.7	9.7	9.3	8.8	8.9	8.9	8.9	9.2	9.1	9.0
160000	9.6	9.7	9.4	9.8	9.7	9.8	9.3	8.9	8.9	8.9	8.9	9.2	9.1	8.9
170000	9.5	9.7	9.5	9.7	9.7	9.7	9.2	9.0	8.9	8.9	8.8	9.1	9.0	8.9
180000	9.4	9.7	9.6	9.7	9.7	9.6	9.1	9.1	9.0	8.9	9.0	9.1	9.1	9.0
190000	9.5	9.8	9.6	9.7	9.7	9.6	9.0	9.2	9.1	8.9	9.1	9.1	9.1	9.0
200000	9.5	9.8	9.6	9.7	9.7	9.7	9.1	9.3	9.2	9.1	9.1	9.1	9.2	9.1
210000	9.5	9.8	9.7	9.7	9.6	9.6	9.1	9.3	9.2	9.1	9.2	9.2	9.2	9.1
220000	9.5	9.8	9.7	9.7	9.7	9.6	9.0	9.3	9.3	9.0	9.0	9.2	9.3	9.2
230000	9.6	9.8	9.8	9.7	9.7	9.5	9.0	9.3	9.3	9.0	8.9	9.2	9.4	9.3
Daily Max	9.8	9.8	9.8	9.8	9.8	9.8	9.5	9.3	9.3	9.3	9.2	9.2	9.4	9.5
Daily Min	9.4	9.6	9.3	9.7	9.6	9.5	9.0	8.8	8.9	8.9	8.8	8.9	9.0	8.9
Average	9.6	9.7	9.6	9.7	9.7	9.7	9.3	9.1	9.1	9.1	9.0	9.1	9.2	9.2

Dead River Below McClure Dam - July 2013 Dissolved Oxygen Monitoring Data

Time																
HHMMSS	07/01/13	07/02/13	07/03/13	07/04/13	07/05/13	07/06/13	07/07/13	07/08/13	07/09/13	07/10/13	07/11/13	07/12/13	07/13/13	07/14/13	07/15/13	07/16/13
0	9.3	9.5	9.5	9.3	9.2	9.2	9.1	9.3	9.3	9.4	9.6	9.5	9.4	9.4	9.4	9.3
10000	9.3	9.5	9.5	9.3	9.2	9.2	9.2	9.3	9.3	9.4	9.6	9.5	9.4	9.4	9.4	9.3
20000	9.3	9.5	9.5	9.3	9.2	9.2	9.1	9.3	9.3	9.4	9.7	9.5	9.5	9.4	9.4	9.3
30000	9.3	9.5	9.5	9.3	9.2	9.2	9.1	9.3	9.3	9.4	9.7	9.5	9.5	9.4	9.4	9.4
40000	9.3	9.5	9.5	9.3	9.2	9.2	9.2	9.3	9.3	9.4	9.7	9.6	9.5	9.4	9.4	9.4
50000	9.4	9.5	9.5	9.3	9.2	9.2	9.1	9.3	9.3	9.4	9.7	9.6	9.5	9.4	9.4	9.4
60000	9.4	9.5	9.5	9.3	9.2	9.2	9.1	9.3	9.3	9.4	9.7	9.6	9.5	9.5	9.4	9.4
70000	9.4	9.6	9.5	9.3	9.3	9.2	9.2	9.3	9.3	9.5	9.7	9.6	9.5	9.5	9.4	9.4
80000	9.4	9.6	9.5	9.3	9.3	9.2	9.2	9.3	9.3	9.5	9.7	9.6	9.5	9.5	9.4	9.4
90000	9.4	9.5	9.5	9.3	9.3	9.2	9.2	9.4	9.3	9.5	9.7	9.6	9.5	9.5	9.4	9.4
100000	9.4	9.5	9.4	9.3	9.2	9.2	9.2	9.3	9.2	9.4	9.7	9.6	9.5	9.5	9.4	9.3
110000	9.3	9.3	9.3	9.2	9.1	9.1	9.2	9.3	9.1	9.4	9.6	9.5	9.4	9.4	9.3	9.3
120000	9.3	9.3	9.3	9.1	9.1	9.1	9.2	9.3	9.1	9.4	9.5	9.4	9.3	9.3	9.3	9.1
130000	9.2	9.2	9.2	9.1	9.0	9.0	9.1	9.2	9.1	9.3	9.4	9.3	9.3	9.2	9.2	9.0
140000	9.2	9.2	9.1	9.0	8.9	8.9	9.0	9.2	9.0	9.3	9.3	9.2	9.3	9.1	9.1	9.0
150000	9.1	9.1	9.0	8.9	8.9	8.8	9.0	9.1	9.3	9.2	9.2	9.1	9.2	9.0	9.1	8.9
160000	9.1	9.0	9.0	8.9	8.9	8.8	8.9	9.1	9.3	9.2	9.2	9.1	9.1	9.0	9.0	8.9
170000	9.1	9.0	9.0	9.0	8.9	8.8	8.9	9.0	9.3	9.2	9.1	9.1	9.0	8.9	9.0	8.8
180000	9.1	9.1	9.0	9.0	8.9	8.8	9.0	9.0	9.3	9.2	9.2	9.1	9.0	9.0	9.0	8.9
190000	9.2	9.1	9.1	9.0	9.0	8.9	9.0	9.1	9.3	9.3	9.2	9.1	9.1	9.1	9.1	9.0
200000	9.3	9.3	9.2	9.0	9.0	9.0	9.1	9.1	9.3	9.4	9.4	9.2	9.2	9.2	9.1	9.1
210000	9.4	9.3	9.3	9.1	9.1	9.1	9.1	9.2	9.4	9.5	9.4	9.3	9.3	9.3	9.2	9.1
220000	9.4	9.4	9.3	9.1	9.1	9.1	9.2	9.3	9.4	9.5	9.5	9.4	9.3	9.4	9.3	9.1
230000	9.4	9.4	9.3	9.2	9.2	9.1	9.3	9.3	9.4	9.6	9.5	9.4	9.4	9.4	9.3	9.2
Daily Max	9.4	9.6	9.5	9.3	9.3	9.2	9.3	9.4	9.4	9.6	9.7	9.6	9.5	9.5	9.4	9.4
Daily Min	9.1	9.0	9.0	8.9	8.9	8.8	8.9	9.0	9.0	9.2	9.1	9.1	9.0	8.9	9.0	8.8
Average	9.3	9.3	9.3	9.2	9.1	9.1	9.1	9.2	9.3	9.4	9.5	9.4	9.3	9.3	9.3	9.2

License Minimum Dissolved Oxygen: 7.0 mg/l

Dead River Below McClure Dam - July 2013 Dissolved Oxygen Monitoring Data

Time HHMMSS	07/17/13	07/18/13	07/19/13	07/20/13	07/21/13	07/22/13	07/23/13	07/24/13	07/25/13	07/26/13	07/27/13	07/28/13	07/29/13	07/30/13	07/31/13
0	9.2	9.2	9.0	9.1	9.4	9.2	9.0	9.1	9.0	8.9	9.0	9.1	9.1	9.2	9.1
10000	9.2	9.2	9.0	9.2	9.4	9.2	9.0	9.1	9.0	8.9	8.9	9.1	9.1	9.2	9.1
20000	9.2	9.2	9.0	9.1	9.4	9.2	9.0	9.2	8.9	8.9	8.9	9.1	9.1	9.2	9.1
30000	9.2	9.2	9.0	9.1	9.4	9.2	9.0	9.2	9.0	8.9	9.0	9.1	9.1	9.2	9.1
40000	9.2	9.2	9.0	9.1	9.4	9.2	9.1	9.2	9.0	8.9	9.0	9.0	9.1	9.3	9.1
50000	9.2	9.2	9.1	9.1	9.4	9.2	9.1	9.2	9.0	8.9	9.0	9.1	9.1	9.2	9.1
60000	9.2	9.2	9.1	9.2	9.5	9.2	9.1	9.1	9.0	8.9	9.0	9.1	9.1	9.2	9.1
70000	9.3	9.2	9.0	9.2	9.5	9.2	9.1	9.1	9.0	8.9	9.0	9.0	9.2	9.2	9.1
80000	9.3	9.2	9.0	9.2	9.5	9.2	9.1	9.1	9.0	8.9	9.1	9.0	9.2	9.2	9.1
90000	9.3	9.2	9.0	9.3	9.4	9.2	9.2	9.2	9.0	8.9	9.0	9.1	9.2	9.2	9.1
100000	9.3	9.2	9.0	9.3	9.4	9.1	9.2	9.1	8.9	8.9	9.1	9.1	9.2	9.2	9.1
110000	9.2	9.1	8.9	9.3	9.3	9.1	9.2	9.1	8.9	8.8	9.0	9.0	9.1	9.1	9.1
120000	9.1	9.2	8.8	9.2	9.3	9.0	9.2	9.0	8.8	8.8	9.0	9.0	9.1	9.1	9.0
130000	9.0	9.1	8.8	9.2	9.2	8.9	9.1	8.9	8.8	8.9	8.9	9.0	9.0	9.0	8.9
140000	9.0	8.9	8.8	9.1	9.2	8.8	8.9	8.9	8.9	8.9	9.0	9.0	8.9	8.9	8.9
150000	9.0	8.7	8.8	9.0	9.1	8.7	8.8	8.9	8.9	8.9	9.0	9.0	8.9	8.9	8.9
160000	8.9	8.7	8.8	9.0	9.0	8.7	8.8	8.9	8.8	9.0	8.9	9.0	8.9	9.0	8.8
170000	8.9	8.7	8.8	9.0	9.0	8.6	8.7	8.9	8.8	9.0	9.0	9.0	8.9	9.1	8.9
180000	8.9	8.8	8.8	9.0	9.0	8.6	8.7	8.9	8.9	9.0	9.0	9.0	8.9	9.0	8.9
190000	9.0	8.8	8.8	9.1	9.0	8.7	8.8	8.9	8.9	9.0	9.0	9.0	8.9	9.1	9.0
200000	9.0	8.8	8.9	9.2	9.0	8.7	8.8	8.9	8.9	9.0	9.0	9.0	9.1	9.1	9.0
210000	9.1	8.9	9.0	9.3	9.1	8.8	8.9	8.9	8.9	9.0	9.0	9.1	9.1	9.1	9.0
220000	9.1	8.9	9.1	9.3	9.1	8.8	9.0	8.9	8.8	9.0	9.1	9.1	9.1	9.1	9.0
230000	9.2	9.0	9.1	9.3	9.1	8.9	9.0	9.0	8.9	9.0	9.0	9.1	9.2	9.1	9.1
Daily Max	9.3	9.2	9.1	9.3	9.5	9.2	9.2	9.2	9.0	9.0	9.1	9.1	9.2	9.3	9.1
Daily Min	8.9	8.7	8.8	9.0	9.0	8.6	8.7	8.9	8.8	8.8	8.9	9.0	8.9	8.9	8.8
Average	9.1	9.0	9.0	9.2	9.3	9.0	9.0	9.0	8.9	8.9	9.0	9.0	9.1	9.1	9.0

Dead River Below McClure Dam - August 2013 Dissolved Oxygen Monitoring Data

Time HHMMSS	8/1/2013	8/2/2013	8/3/2013	8/4/2013	8/5/2013	8/6/2013	8/7/2013	8/8/2013	8/9/2013	8/10/2013	8/11/2013	8/12/2013	8/13/2013	8/14/2013	8/15/2013	8/16/2013
0	9.1	9.1	9.1	9.3	9.3	9.1	9.2	9.4	9.3	No data. Equipment malfunction.						
10000	9.1	9.1	9.2	9.3	9.3	9.0	9.1	9.4	9.3							
20000	9.1	9.1	9.2	9.3	9.3	9.1	9.2	9.4	9.3							
30000	9.1	9.1	9.2	9.3	9.3	9.0	9.1	9.4	9.2							
40000	9.1	9.1	9.2	9.3	9.2	9.1	9.1	9.4	9.2							
50000	9.1	9.1	9.2	9.3	9.2	9.1	9.1	9.4	9.2							
60000	9.1	9.1	9.2	9.3	9.2	9.0	9.2	9.4	9.2							
70000	9.1	9.1	9.2	9.3	9.2	9.0	9.1	9.3	9.2							
80000	9.2	9.1	9.2	9.3	9.2	9.0	9.2	9.4	9.3							
90000	9.2	9.1	9.2	9.3	9.2	9.0	9.2	9.4	9.2							
100000	9.1	9.1	9.2	9.3	9.1	9.0	9.2	9.3	9.3							
110000	9.1	9.1	9.2	9.3	9.1	9.0	9.1	9.3	9.2							
120000	9.1	9.1	9.1	9.2	9.1	9.0	9.2	9.3	9.2							
130000	9.0	8.9	9.1	9.2	9.1	9.0	9.2	9.3	9.2							
140000	8.9	8.9	9.1	9.2	9.1	9.0	9.1	9.2	9.1							
150000	8.9	8.9	9.1	9.1	9.1	9.1	9.1	9.1	9.0							
160000	8.9	8.9	9.0	9.1	9.1	9.0	9.2	9.2	9.0							
170000	8.8	8.9	9.0	9.1	9.0	9.0	9.1	9.2	9.0							
180000	8.8	8.9	9.0	9.1	9.1	9.0	9.0	9.2	9.0							
190000	8.8	8.9	9.1	9.1	9.1	9.1	9.0	9.3	9.0							
200000	8.9	9.0	9.1	9.1	9.1	9.1	9.1	9.2	9.0							
210000	9.0	9.0	9.2	9.2	9.0	9.1	9.2	9.2	9.1							
220000	9.1	9.1	9.2	9.2	9.1	9.1	9.3	9.3	9.1							
230000	9.1	9.1	9.2	9.3	9.1	9.1	9.3	9.3	9.2							
Daily Max	9.2	9.1	9.2	9.3	9.3	9.1	9.3	9.4	9.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Daily Min	8.8	8.9	9.0	9.1	9.0	9.0	9.0	9.1	9.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Average	9.0	9.0	9.1	9.2	9.1	9.0	9.1	9.3	9.2	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

License Minimum Dissolved Oxygen: 7.0 mg/l

No data. Equipment malfunction.

Dead River Below McClure Dam - August 2013 Dissolved Oxygen Monitoring Data

Time	8/17/2013	8/18/2013	8/19/2013	8/20/2013	8/21/2013	8/22/2013	8/23/2013	8/24/2013	8/25/2013	8/26/2013	8/27/2013	8/28/2013	8/29/2013	8/30/2013	8/31/2013
HHMMSS															
0					9.0	9.1	9.3	9.3	9.1	9.0	8.9	8.9	9.0	8.8	9.0
10000					9.1	9.1	9.3	9.3	9.1	8.9	8.9	8.9	9.0	8.9	9.0
20000					9.1	9.1	9.3	9.3	9.1	8.9	8.9	9.0	9.0	8.9	9.0
30000					9.0	9.1	9.4	9.3	9.1	8.9	9.0	9.0	9.0	8.9	9.0
40000					9.1	9.5	9.4	9.3	9.1	9.0	9.0	9.0	9.0	8.9	9.0
50000					9.1	9.6	9.4	9.3	9.1	9.0	9.0	9.0	9.1	8.9	9.0
60000					9.0	9.7	9.4	9.3	9.1	8.9	9.0	9.1	9.0	8.9	9.0
70000					9.1	9.7	9.4	9.4	9.1	8.8	9.0	9.1	9.0	8.8	8.9
80000					9.1	9.5	9.5	9.3	9.1	8.9	9.0	9.1	9.1	8.8	9.0
90000					9.1	9.5	9.5	9.3	9.1	9.1	9.0	9.2	9.1	8.9	9.0
100000					9.1	9.6	9.4	9.3	9.2	9.0	9.0	9.1	9.1	8.9	9.0
110000					9.1	9.5	9.4	9.4	9.1	9.1	9.0	9.1	9.0	9.0	9.0
120000				9.2	9.0	9.4	9.4	9.3	9.1	9.1	9.0	9.0	9.0	8.9	9.0
130000				9.1	9.1	9.3	9.4	9.2	9.0	9.0	9.0	9.0	9.0	8.9	8.9
140000				9.0	9.0	9.2	9.2	9.2	8.9	9.0	8.9	9.0	8.9	8.9	8.9
150000				9.0	8.9	9.2	9.3	9.1	8.9	8.9	8.9	8.9	8.9	9.0	8.8
160000				9.0	8.9	9.1	9.2	9.1	8.8	8.9	8.9	8.9	8.9	8.9	8.8
170000				8.9	8.9	9.1	9.1	9.1	8.8	9.0	8.8	8.9	8.8	8.9	8.7
180000				8.9	8.9	9.1	9.1	9.1	8.8	8.9	8.8	8.9	8.8	8.9	8.7
190000				8.9	9.0	9.1	9.2	9.1	8.8	8.9	8.8	8.9	8.9	8.9	8.7
200000				9.0	9.0	9.2	9.2	9.1	8.9	8.9	8.9	8.9	8.9	9.0	8.8
210000				9.0	9.0	9.3	9.2	9.1	9.0	9.0	8.9	8.9	8.9	9.0	8.8
220000				9.0	9.1	9.3	9.3	9.2	9.0	8.9	8.9	9.0	8.8	9.0	8.8
230000				9.1	9.1	9.3	9.3	9.2	9.0	8.9	8.9	9.0	8.9	9.0	8.8
Daily Max	0.0	0.0	0.0	9.2	9.1	9.7	9.5	9.4	9.2	9.1	9.0	9.2	9.1	9.0	9.0
Daily Min	0.0	0.0	0.0	8.9	8.9	9.1	9.1	9.1	8.8	8.8	8.8	8.9	8.8	8.8	8.7
Average	#DIV/0!	#DIV/0!	#DIV/0!	9.0	9.0	9.3	9.3	9.2	9.0	9.0	8.9	9.0	8.9	8.9	8.9

Dead River Below McClure Dam - September 2013 Dissolved Oxygen Data

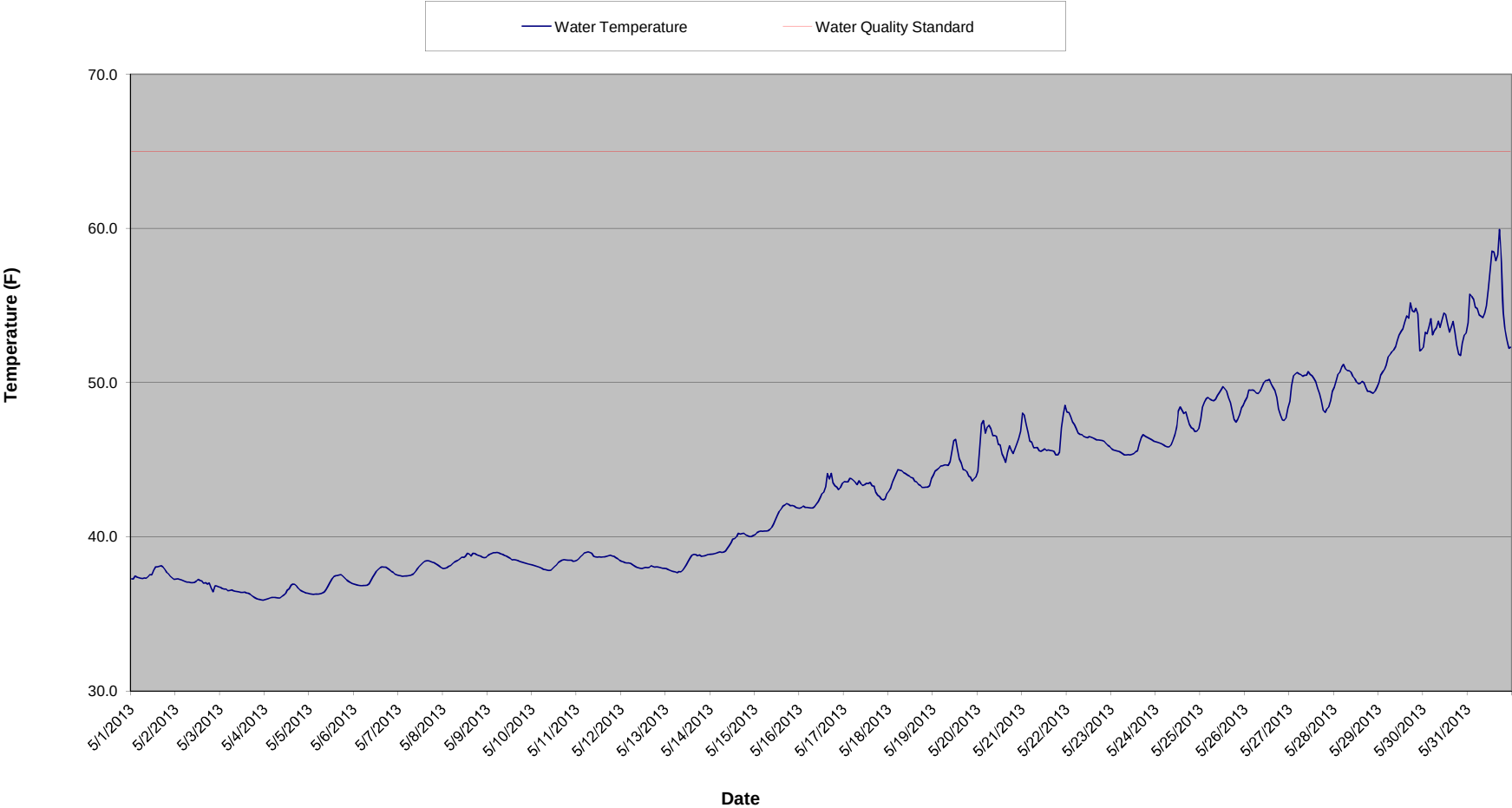
Time																
HHMMSS	9/1/2013	9/2/2013	9/3/2013	9/4/2013	9/5/2013	9/6/2013	9/7/2013	9/8/2013	9/9/2013	9/10/2013	9/11/2013	9/12/2013	9/13/2013	9/14/2013	9/15/2013	9/16/2013
0	8.8	9.0	9.0	9.0	9.3	9.2	8.9	9.2	9.2	9.0	9.1	9.1	9.3	9.5	9.3	9.6
10000	8.8	9.0	9.0	9.0	9.2	9.1	8.9	9.2	9.2	8.9	9.0	9.2	9.3	9.5	9.3	9.6
20000	8.8	9.0	9.0	8.9	9.2	9.2	9.0	9.2	9.2	8.9	9.1	9.2	9.4	9.5	9.3	9.7
30000	8.8	9.0	9.0	8.9	9.2	9.2	8.9	9.2	9.2	8.9	9.0	9.2	9.3	9.5	9.3	9.6
40000	8.8	9.0	9.0	8.9	9.3	9.1	8.9	9.2	9.1	9.0	9.1	9.2	9.4	9.5	9.3	9.7
50000	8.8	9.0	9.1	8.9	9.2	9.1	8.9	9.3	9.1	9.0	9.1	9.2	9.4	9.5	9.3	9.7
60000	8.8	8.9	9.1	8.9	9.2	9.1	8.9	9.2	9.1	9.0	9.1	9.2	9.4	9.5	9.3	9.7
70000	8.8	8.9	9.1	9.0	9.2	9.1	8.9	9.2	9.1	9.0	9.1	9.2	9.4	9.5	9.3	9.7
80000	8.8	9.0	9.1	9.0	9.3	9.2	8.9	9.2	9.1	9.0	9.1	9.2	9.5	9.5	9.3	9.7
90000	8.8	9.0	9.1	9.1	9.2	9.1	8.9	9.2	9.1	9.0	9.1	9.3	9.5	9.5	9.3	9.7
100000	8.8	9.0	9.1	9.1	9.2	9.2	9.0	9.2	9.1	9.0	9.1	9.2	9.5	9.5	9.4	9.8
110000	8.8	9.1	9.1	9.2	9.2	9.1	9.0	9.2	9.1	9.1	9.1	9.3	9.5	9.5	9.4	9.8
120000	8.9	9.1	9.1	9.2	9.2	9.1	9.0	9.3	9.1	9.0	9.1	9.3	9.5	9.4	9.4	9.7
130000	8.9	9.0	9.0	9.2	9.2	8.9	8.9	9.2	9.1	8.9	9.1	9.3	9.5	9.4	9.5	9.7
140000	8.8	9.0	9.0	9.1	9.1	8.9	9.0	9.2	9.1	8.9	9.0	9.3	9.4	9.4	9.5	9.7
150000	8.8	9.0	8.9	9.1	9.1	8.9	9.0	9.2	9.0	8.9	9.0	9.3	9.4	9.3	9.5	9.6
160000	8.8	8.9	8.5	9.1	9.1	8.8	9.0	9.1	9.1	8.9	9.0	9.3	9.3	9.2	9.5	9.7
170000	8.7	8.8	8.8	9.1	9.0	8.9	9.1	9.1	9.0	9.0	9.0	9.3	9.3	9.2	9.5	9.6
180000	8.7	8.8	8.8	9.0	9.0	8.9	9.0	9.1	8.9	9.0	9.0	9.3	9.3	9.2	9.6	9.6
190000	8.8	8.9	8.8	9.0	9.0	8.9	9.1	9.1	8.9	8.9	9.0	9.2	9.3	9.2	9.5	9.7
200000	8.8	8.9	8.9	9.1	9.1	8.9	9.1	9.1	8.9	8.9	9.0	9.2	9.4	9.2	9.5	9.7
210000	8.9	8.9	8.9	9.1	9.2	8.9	9.1	9.1	8.9	9.0	9.0	9.3	9.4	9.2	9.6	9.7
220000	9.0	8.9	9.0	9.2	9.2	8.9	9.1	9.1	8.9	9.0	9.1	9.3	9.4	9.3	9.5	9.7
230000	9.0	9.0	9.0	9.2	9.2	9.0	9.1	9.2	9.0	9.1	9.1	9.3	9.5	9.3	9.6	9.7
Daily Max	9.0	9.1	9.1	9.2	9.3	9.2	9.1	9.3	9.2	9.1	9.1	9.3	9.5	9.5	9.6	9.8
Daily Min	8.7	8.8	8.5	8.9	9.0	8.8	8.9	9.1	8.9	8.9	9.0	9.1	9.3	9.2	9.3	9.6
Average	8.8	9.0	9.0	9.0	9.2	9.0	9.0	9.2	9.1	9.0	9.1	9.2	9.4	9.4	9.4	9.7

License Minimum Dissolved Oxygen: 7.0 mg/l

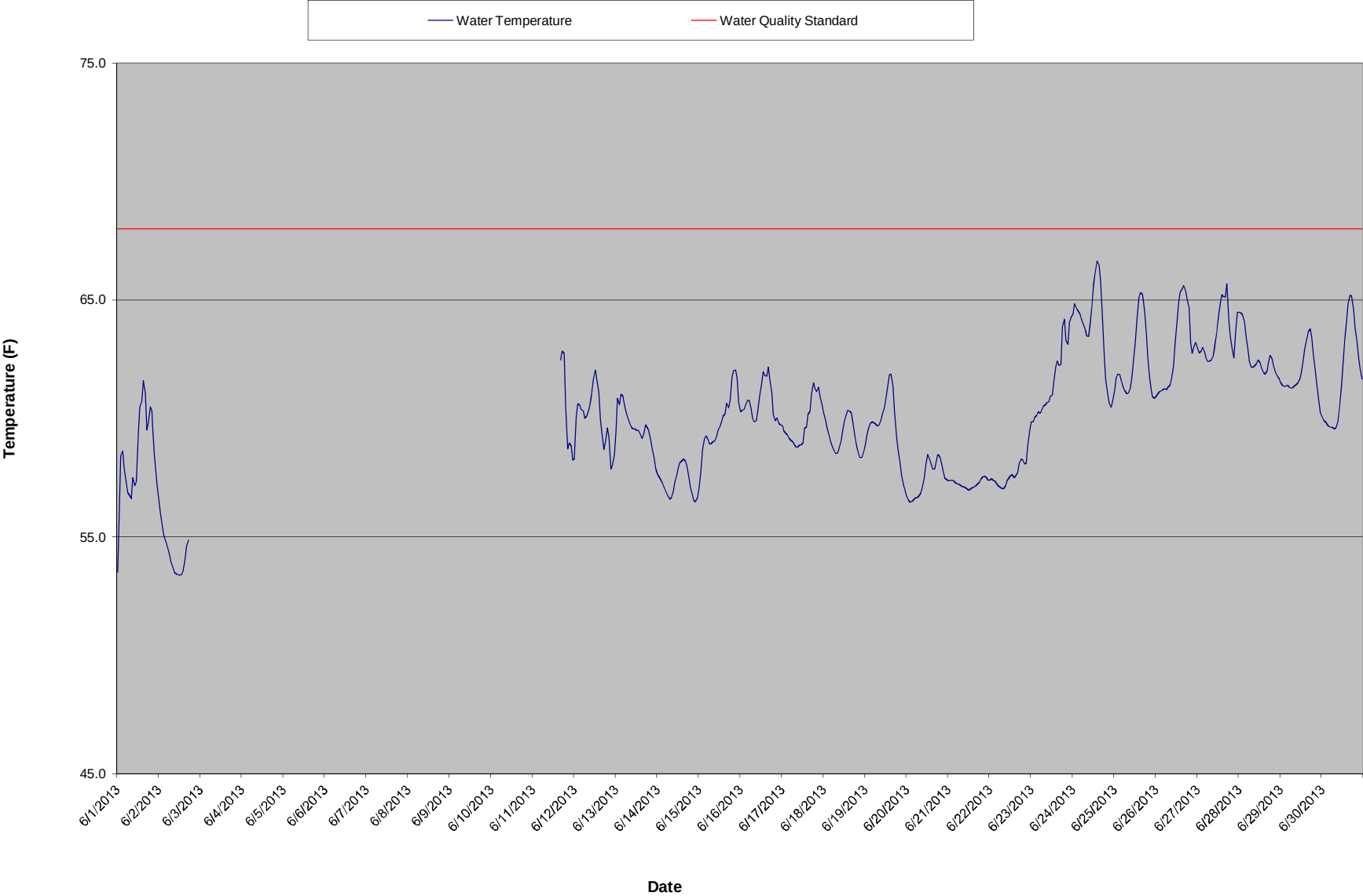
Dead River Below McClure Dam - September 2013 Dissolved Oxygen Data

Time														
HHMMSS	9/17/2013	9/18/2013	9/19/2013	9/20/2013	9/21/2013	9/22/2013	9/23/2013	9/24/2013	9/25/2013	9/26/2013	9/27/2013	9/28/2013	9/29/2013	9/30/2013
0	9.8	9.2	9.0	9.0	9.1	9.4	9.6	9.6	9.6	9.7	9.6	9.6	9.5	9.7
10000	9.8	9.3	9.1	9.0	9.2	9.4	9.7	9.6	9.6	9.6	9.7	9.6	9.6	9.7
20000	9.7	9.2	9.1	9.0	9.2	9.4	9.6	9.6	9.6	9.6	9.7	9.6	9.6	9.7
30000	9.7	9.2	9.0	9.0	9.2	9.4	9.6	9.6	9.6	9.7	9.6	9.7	9.6	9.7
40000	9.8	9.2	9.0	9.0	9.2	9.4	9.7	9.6	9.6	9.7	9.7	9.6	9.6	9.7
50000	9.7	9.2	9.1	9.0	9.3	9.4	9.6	9.7	9.6	9.7	9.7	9.6	9.6	9.7
60000	9.7	9.2	9.1	9.0	9.3	9.4	9.7	9.6	9.6	9.7	9.7	9.6	9.7	9.7
70000	9.8	9.2	9.1	9.0	9.2	9.5	9.7	9.7	9.6	9.7	9.6	9.7	9.7	9.7
80000	9.8	9.2	9.1	9.0	9.3	9.5	9.7	9.7	9.7	9.7	9.7	9.7	9.7	9.7
90000	9.8	9.2	9.1	9.0	9.3	9.5	9.7	9.7	9.7	9.8	9.7	9.7	9.7	9.8
100000	9.8	9.2	9.1	9.0	9.4	9.5	9.7	9.7	9.6	9.8	9.7	9.6	9.7	9.7
110000	9.8	9.2	9.1	9.0	9.4	9.5	9.7	9.6	9.6	9.8	9.6	9.6	9.7	9.7
120000	9.8	9.2	9.1	9.1	9.4	9.5	9.6	9.6	9.6	9.7	9.6	9.6	9.7	9.7
130000	9.4	9.2	9.0	9.0	9.4	9.5	9.6	9.7	9.6	9.6	9.6	9.6	9.7	9.7
140000	9.3	9.1	9.0	9.0	9.3	9.5	9.6	9.6	9.5	9.6	9.6	9.5	9.6	9.7
150000	9.2	9.1	9.0	9.0	9.3	9.5	9.5	9.5	9.5	9.6	9.5	9.5	9.6	9.6
160000	9.2	9.1	9.0	9.1	9.3	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.6	9.6
170000	9.1	9.1	8.9	9.0	9.3	9.5	9.5	9.5	9.4	9.5	9.5	9.4	9.5	9.5
180000	9.1	9.1	9.0	9.0	9.3	9.5	9.5	9.5	9.4	9.5	9.5	9.4	9.5	9.5
190000	9.1	9.1	8.9	9.1	9.3	9.5	9.5	9.5	9.5	9.5	9.5	9.4	9.6	9.5
200000	9.2	9.1	9.0	9.1	9.3	9.5	9.5	9.5	9.6	9.6	9.5	9.4	9.6	9.5
210000	9.2	9.1	8.9	9.1	9.4	9.5	9.5	9.5	9.5	9.6	9.5	9.5	9.6	9.6
220000	9.2	9.1	8.9	9.1	9.4	9.6	9.5	9.6	9.6	9.6	9.6	9.5	9.7	9.6
230000	9.2	9.1	9.0	9.2	9.4	9.6	9.6	9.6	9.6	9.6	9.6	9.5	9.7	9.6
Daily Max	9.8	9.3	9.1	9.2	9.4	9.6	9.7	9.7	9.7	9.8	9.7	9.7	9.7	9.8
Daily Min	9.1	9.1	8.9	9.0	9.1	9.4	9.5	9.5	9.4	9.5	9.5	9.4	9.5	9.5
Average	9.5	9.2	9.0	9.0	9.3	9.5	9.6	9.6	9.6	9.6	9.6	9.6	9.6	9.7

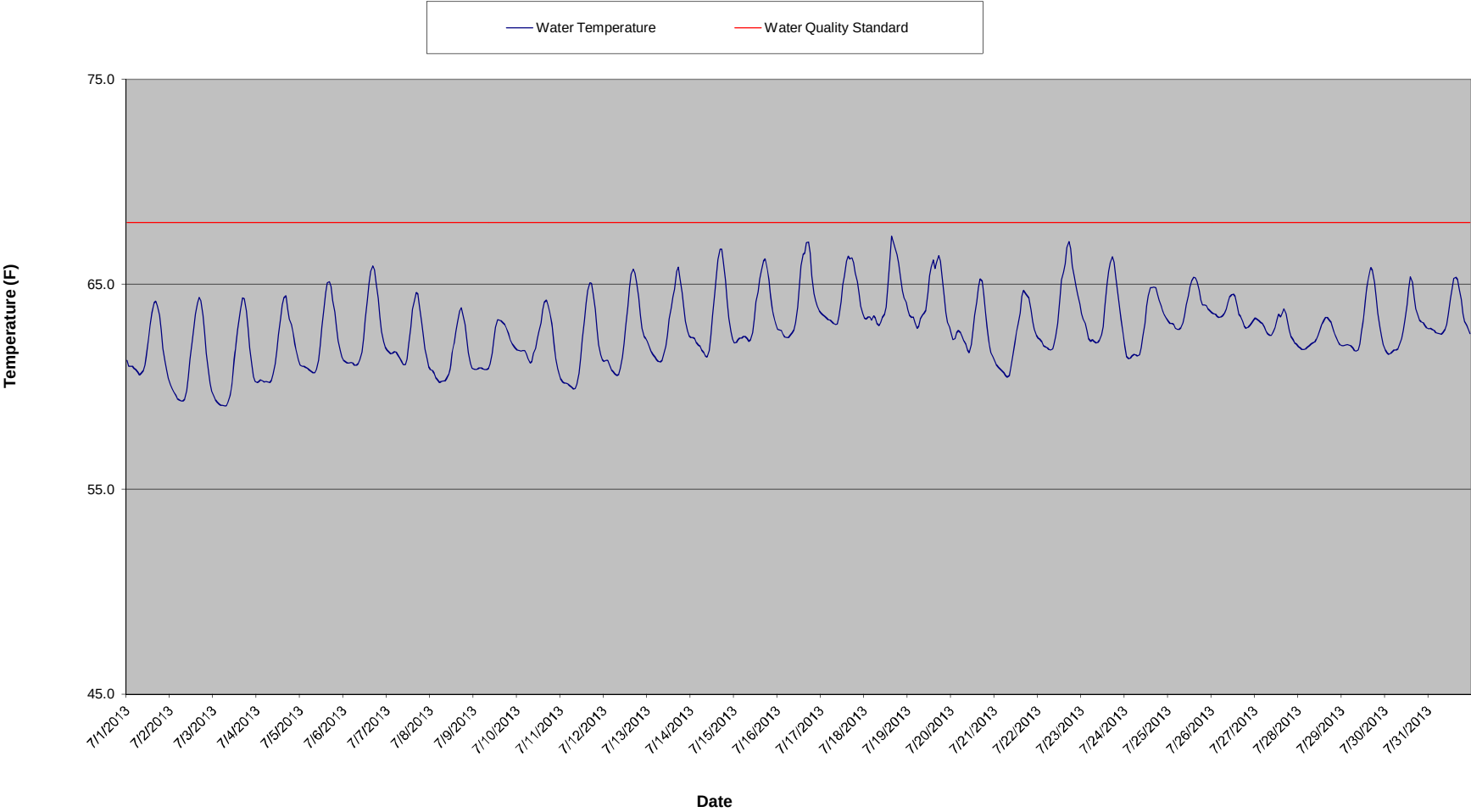
Dead River Below McClure Dam Temperature Summary - May 2013



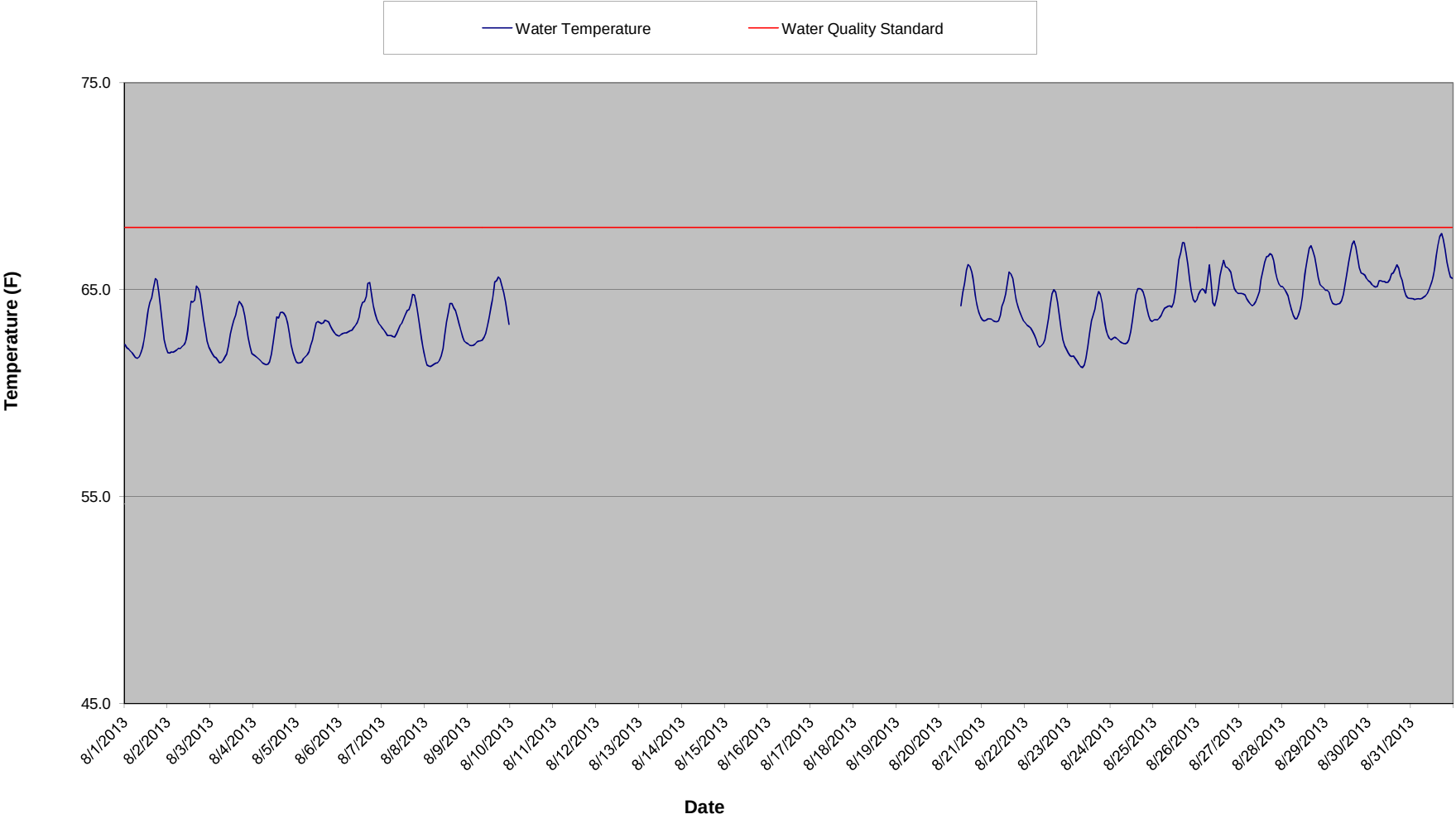
Dead River Below McClure Dam Temperature - June 2013

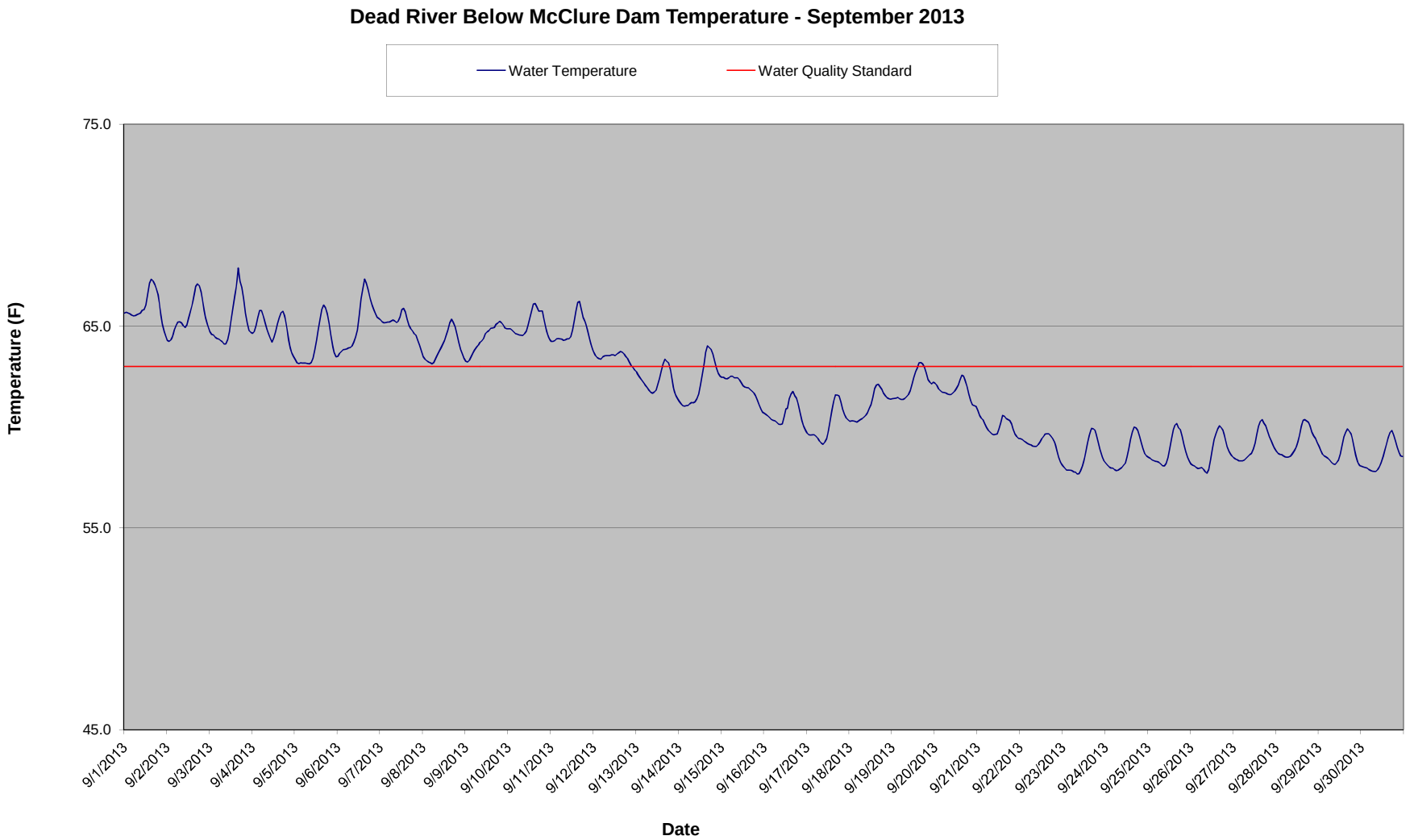


Dead River Below McClure Dam Temperature - July 2013

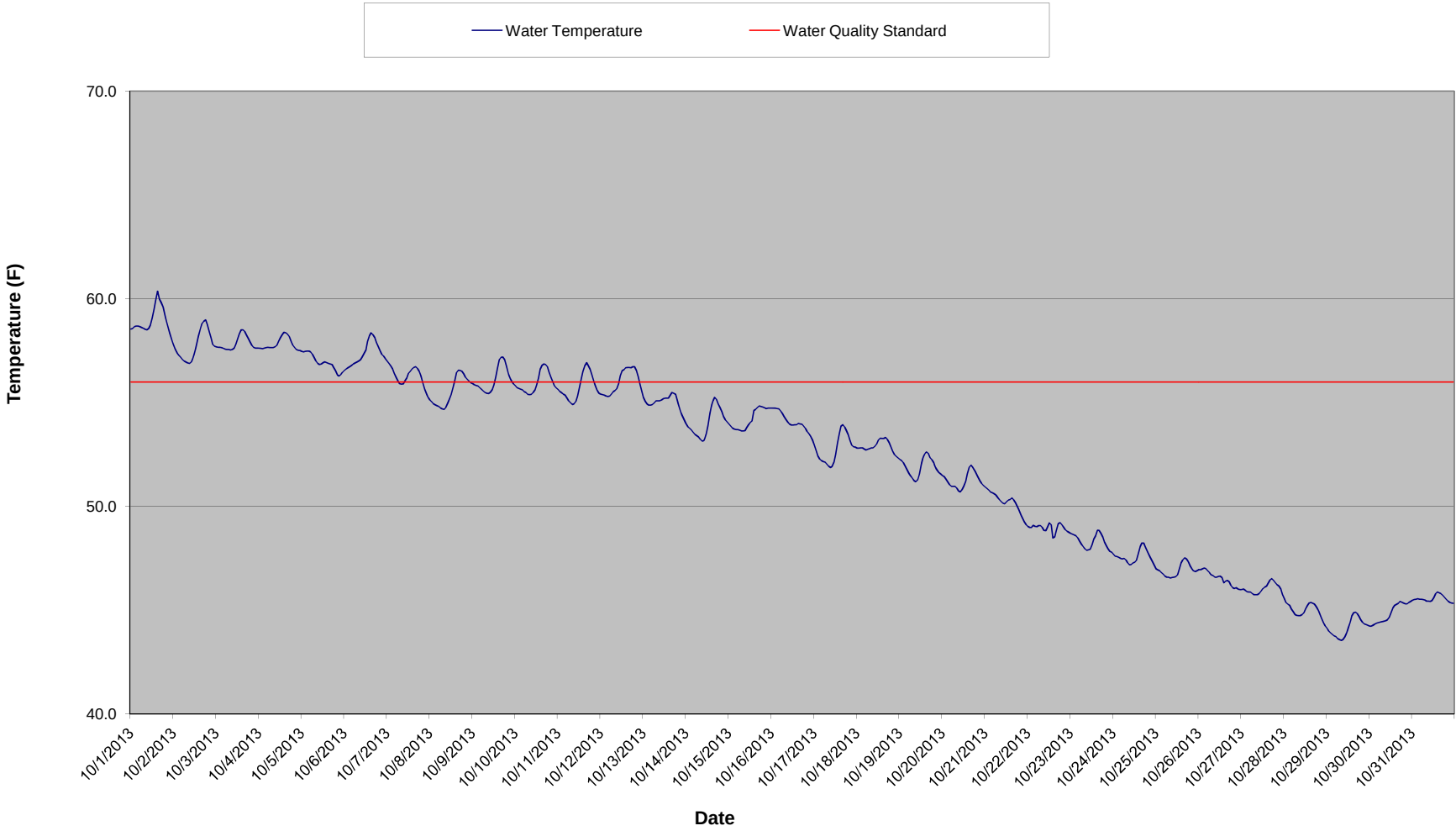


Dead River Below McClure Dam Temperature - August 2013





Dead River Below McClure Dam Temperature - October 2013



Dead River Below McClure Dam - May 2013 Temperature Monitoring Data

Time HHMMSS	5/1/13	5/2/13	5/3/13	5/4/13	5/5/13	5/6/13	5/7/13	5/8/13	5/9/13	5/10/13	5/11/13	5/12/13	5/13/13	5/14/13	5/15/13	5/16/13
0	37.3	37.3	36.7	35.9	36.3	36.9	37.5	37.9	38.8	38.2	38.5	38.4	37.9	38.9	40.1	41.8
10000	37.3	37.3	36.6	36.0	36.3	36.9	37.5	38.0	38.9	38.1	38.6	38.4	37.9	38.9	40.3	41.9
20000	37.5	37.2	36.6	36.0	36.3	36.9	37.4	38.0	38.9	38.1	38.7	38.3	37.8	38.9	40.3	42.0
30000	37.4	37.2	36.6	36.1	36.3	36.8	37.5	38.1	39.0	38.0	38.8	38.3	37.8	38.9	40.4	41.9
40000	37.3	37.1	36.5	36.1	36.3	36.8	37.5	38.1	39.0	38.0	38.9	38.3	37.7	39.0	40.4	41.9
50000	37.3	37.1	36.5	36.1	36.3	36.8	37.5	38.3	39.0	38.0	39.0	38.3	37.7	39.0	40.4	41.9
60000	37.3	37.1	36.6	36.1	36.3	36.8	37.5	38.4	38.9	37.9	39.0	38.2	37.7	39.0	40.4	41.9
70000	37.3	37.1	36.5	36.0	36.4	36.9	37.5	38.4	38.9	37.9	39.0	38.1	37.7	39.0	40.4	41.9
80000	37.3	37.0	36.5	36.0	36.4	37.0	37.6	38.5	38.9	37.8	38.9	38.0	37.7	39.1	40.5	42.0
90000	37.4	37.0	36.4	36.1	36.6	37.1	37.7	38.6	38.8	37.8	38.7	38.0	37.8	39.2	40.6	42.1
100000	37.5	37.0	36.4	36.2	36.8	37.4	37.9	38.7	38.8	37.8	38.7	38.0	38.0	39.4	40.8	42.3
110000	37.5	37.1	36.4	36.3	37.0	37.6	38.1	38.7	38.7	38.0	38.7	37.9	38.2	39.6	41.1	42.5
120000	37.8	37.2	36.4	36.5	37.3	37.8	38.2	38.7	38.6	38.1	38.7	38.0	38.4	39.8	41.4	42.8
130000	38.0	37.2	36.4	36.6	37.4	37.9	38.3	38.9	38.5	38.2	38.7	38.0	38.6	39.9	41.6	42.9
140000	38.0	37.1	36.4	36.9	37.5	38.0	38.4	38.9	38.5	38.3	38.7	38.0	38.8	40.0	41.8	43.3
150000	38.1	37.0	36.3	36.9	37.5	38.0	38.4	38.8	38.5	38.4	38.7	38.0	38.9	40.2	42.0	44.1
160000	38.1	37.0	36.3	36.9	37.5	38.0	38.4	38.9	38.5	38.5	38.7	38.1	38.8	40.2	42.1	43.7
170000	38.0	36.9	36.2	36.8	37.5	38.0	38.4	38.9	38.4	38.5	38.8	38.1	38.8	40.2	42.2	44.1
180000	37.9	37.0	36.1	36.7	37.4	38.0	38.4	38.8	38.4	38.5	38.8	38.0	38.8	40.2	42.1	43.5
190000	37.7	36.7	36.0	36.5	37.3	37.9	38.3	38.8	38.3	38.5	38.8	38.0	38.7	40.1	42.0	43.3
200000	37.6	36.4	36.0	36.5	37.2	37.8	38.2	38.8	38.3	38.5	38.7	38.0	38.8	40.1	42.0	43.2
210000	37.4	36.8	35.9	36.4	37.1	37.7	38.2	38.7	38.2	38.5	38.6	38.0	38.8	40.0	42.0	43.1
220000	37.3	36.8	35.9	36.4	37.0	37.6	38.1	38.6	38.2	38.4	38.6	38.0	38.8	40.0	41.9	43.2
230000	37.2	36.8	35.9	36.3	37.0	37.5	38.0	38.7	38.2	38.4	38.5	38.0	38.9	40.1	41.9	43.5
Daily Max	38.1	37.3	36.7	36.9	37.5	38.0	38.4	38.9	39.0	38.5	39.0	38.4	38.9	40.2	42.2	44.1
Daily Min	37.2	36.4	35.9	35.9	36.3	36.8	37.4	37.9	38.2	37.8	38.5	37.9	37.7	38.9	40.1	41.8
Average	37.6	37.0	36.3	36.3	36.9	37.4	37.9	38.5	38.6	38.2	38.7	38.1	38.3	39.6	41.2	42.7

Monthly average temp (F): 43.1
License Maximum Monthly Average: 65°F

Dead River Below McClure Dam - May 2013 Temperature Monitoring Data

Time															
HHMMSS	5/17/13	5/18/13	5/19/13	5/20/13	5/21/13	5/22/13	5/23/13	5/24/13	5/25/13	5/26/13	5/27/13	5/28/13	5/29/13	5/30/13	5/31/13
0	43.6	42.9	44.0	44.2	48.0	48.1	45.7	46.1	47.6	48.8	48.8	49.7	50.0	52.3	53.9
10000	43.6	43.2	44.3	45.8	47.9	48.1	45.6	46.1	48.4	49.0	49.8	50.1	50.5	53.3	55.7
20000	43.6	43.5	44.3	47.3	47.3	47.8	45.6	46.1	48.7	49.5	50.4	50.5	50.7	53.2	55.6
30000	43.8	43.8	44.5	47.5	46.7	47.4	45.6	46.0	49.0	49.5	50.6	50.7	50.8	53.6	55.4
40000	43.8	44.1	44.6	46.7	46.2	47.3	45.5	46.0	49.0	49.5	50.6	51.0	51.1	54.2	54.9
50000	43.6	44.3	44.6	47.1	46.1	47.0	45.5	45.9	48.9	49.5	50.6	51.2	51.7	53.1	54.8
60000	43.5	44.3	44.7	47.2	45.8	46.7	45.4	45.8	48.8	49.3	50.5	50.9	51.8	53.4	54.4
70000	43.4	44.3	44.7	47.0	45.8	46.6	45.3	45.8	48.8	49.3	50.4	50.8	52.0	53.6	54.3
80000	43.6	44.2	44.6	46.5	45.8	46.6	45.3	46.0	48.9	49.4	50.5	50.8	52.1	54.0	54.2
90000	43.4	44.1	44.9	46.6	45.6	46.5	45.3	46.2	49.2	49.7	50.5	50.7	52.3	53.6	54.5
100000	43.3	44.0	45.5	46.5	45.5	46.5	45.3	46.6	49.3	50.0	50.7	50.4	52.7	54.1	55.0
110000	43.4	43.9	46.2	46.0	45.6	46.4	45.3	47.1	49.5	50.1	50.5	50.2	53.1	54.5	56.1
120000	43.5	43.8	46.3	46.0	45.7	46.5	45.4	48.1	49.7	50.1	50.4	50.0	53.3	54.4	57.4
130000	43.4	43.8	45.7	45.4	45.6	46.5	45.5	48.4	49.6	50.2	50.3	49.9	53.5	53.8	58.5
140000	43.5	43.6	45.1	45.1	45.6	46.4	45.6	48.2	49.4	49.9	50.1	49.9	53.9	53.3	58.5
150000	43.3	43.6	44.8	44.8	45.6	46.3	46.1	48.0	49.0	49.7	49.6	50.1	54.3	53.6	57.9
160000	43.3	43.4	44.3	45.5	45.6	46.3	46.4	48.1	48.7	49.5	49.3	50.0	54.2	54.0	58.3
170000	42.9	43.3	44.3	45.9	45.5	46.3	46.6	47.6	48.2	49.0	48.8	49.7	55.2	53.2	59.9
180000	42.7	43.2	44.2	45.6	45.3	46.3	46.5	47.3	47.6	48.3	48.2	49.4	54.7	52.4	57.8
190000	42.6	43.2	43.9	45.4	45.3	46.2	46.5	47.1	47.4	47.9	48.1	49.4	54.6	51.8	54.5
200000	42.4	43.2	43.9	45.7	45.5	46.2	46.4	47.0	47.6	47.6	48.3	49.4	54.8	51.7	53.4
210000	42.4	43.2	43.6	46.0	47.1	46.1	46.3	46.8	47.9	47.5	48.4	49.3	54.4	52.5	52.7
220000	42.5	43.3	43.8	46.4	47.9	45.9	46.3	46.9	48.4	47.7	48.8	49.4	52.1	53.1	52.2
230000	42.8	43.8	43.9	46.8	48.5	45.8	46.2	47.0	48.5	48.3	49.4	49.7	52.1	53.2	52.3
Daily Max	43.8	44.3	46.3	47.5	48.5	48.1	46.6	48.4	49.7	50.2	50.7	51.2	55.2	54.5	59.9
Daily Min	42.4	42.9	43.6	44.2	45.3	45.8	45.3	45.8	47.4	47.5	48.1	49.3	50.0	51.7	52.2
Average	43.2	43.7	44.6	46.1	46.2	46.7	45.8	46.8	48.7	49.1	49.7	50.1	52.7	53.3	55.5

Dead River Below McClure Dam - June 2013 Temperature Monitoring Data

Time HHMMSS	06/01/13	06/02/13	06/03/13	06/04/13	06/05/13	06/06/13	06/07/13	06/08/13	06/09/13	06/10/13	06/11/13	06/12/13	06/13/13	06/14/13	06/15/13	06/16/13
0	53.5	56.5										58.3	59.4	57.6	57.0	60.3
10000	55.9	55.9										60.1	60.9	57.5	57.8	60.4
20000	58.4	55.4										60.6	60.6	57.4	58.6	60.4
30000	58.6	55.0										60.5	61.0	57.2	59.1	60.6
40000	57.9	54.8										60.4	60.9	57.1	59.3	60.8
50000	57.3	54.6										60.3	60.6	56.9	59.1	60.8
60000	56.9	54.2										60.0	60.2	56.7	58.9	60.4
70000	56.7	53.9										60.1	60.0	56.6	58.9	60.0
80000	56.6	53.7										60.3	59.8	56.6	59.0	59.9
90000	57.5	53.5										60.5	59.6	56.9	59.0	59.9
100000	57.2	53.4										61.1	59.6	57.3	59.2	60.3
110000	57.3	53.4										61.6	59.6	57.6	59.5	61.0
120000	59.3	53.4										62.0	59.5	57.9	59.7	61.4
130000	60.5	53.4										61.6	59.5	58.1	59.8	62.0
140000	60.7	53.5										61.1	59.3	58.2	60.1	61.8
150000	61.6	54.1										60.0	59.2	58.3	60.2	61.8
160000	61.1	54.6									62.5	59.4	59.3	58.2	60.6	62.2
170000	59.5	54.9									62.9	58.7	59.7	58.0	60.4	61.7
180000	59.8										62.7	59.0	59.6	57.5	60.7	61.1
190000	60.5										60.5	59.6	59.5	57.1	61.8	60.2
200000	60.3										58.7	59.2	59.1	56.8	62.0	59.9
210000	58.8										59.0	57.9	58.7	56.5	62.0	60.0
220000	57.9										58.8	58.0	58.3	56.5	61.7	59.8
230000	57.1										58.2	58.5	57.9	56.6	60.7	59.7
Daily Max	61.6		56.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	62.9	62.0	61.0	58.3	62.0
Daily Min	53.5	53.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	58.2	57.9	57.9	56.5	57.0	59.7
Average	58.4	54.3	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	60.4	60.0	59.7	57.3	59.8	60.7

Monthly average temp (F): 60.2

License Maximum Monthly Average: 68°F

Missing Data - Equipment malfunction

Dead River Below McClure Dam - June 2013 Temperature Monitoring Data

Time HHMMSS	06/17/13	06/18/13	06/19/13	06/20/13	06/21/13	06/22/13	06/23/13	06/24/13	06/25/13	06/26/13	06/27/13	06/28/13	06/29/13	06/30/13
0	59.7	60.2	58.9	56.7	57.4	57.4	59.9	64.4	61.2	60.9	63.0	64.5	61.5	60.0
10000	59.5	59.9	59.3	56.6	57.4	57.5	59.9	64.8	61.7	61.0	62.8	64.5	61.4	59.9
20000	59.4	59.6	59.6	56.5	57.4	57.4	60.0	64.7	61.9	61.1	62.9	64.4	61.4	59.8
30000	59.3	59.3	59.8	56.5	57.4	57.3	60.1	64.5	61.8	61.2	63.0	64.1	61.4	59.7
40000	59.2	59.0	59.8	56.6	57.3	57.2	60.3	64.4	61.6	61.2	62.8	63.5	61.4	59.7
50000	59.1	58.8	59.8	56.6	57.3	57.1	60.2	64.2	61.3	61.3	62.5	62.9	61.3	59.6
60000	59.0	58.6	59.8	56.7	57.2	57.1	60.4	64.0	61.2	61.2	62.4	62.4	61.3	59.6
70000	58.9	58.5	59.7	56.7	57.2	57.0	60.5	63.8	61.1	61.3	62.4	62.2	61.3	59.6
80000	58.8	58.5	59.7	56.8	57.1	57.0	60.6	63.5	61.1	61.4	62.5	62.2	61.4	59.6
90000	58.8	58.7	59.9	57.1	57.1	57.2	60.7	63.5	61.3	61.7	62.6	62.2	61.4	59.9
100000	58.9	59.1	60.2	57.5	57.1	57.4	60.7	64.0	61.7	62.2	63.1	62.3	61.5	60.5
110000	58.9	59.5	60.5	58.0	57.0	57.5	60.9	64.8	62.3	63.1	63.6	62.5	61.6	61.3
120000	59.0	59.9	60.9	58.5	57.0	57.6	61.0	65.7	63.2	64.1	64.2	62.4	61.9	62.3
130000	59.6	60.2	61.4	58.3	57.0	57.6	61.6	66.2	64.1	64.9	64.9	62.1	62.5	63.2
140000	59.6	60.4	61.8	58.1	57.1	57.5	62.2	66.7	65.1	65.3	65.2	61.9	62.9	64.1
150000	60.2	60.3	61.9	57.9	57.1	57.6	62.4	66.5	65.3	65.5	65.1	61.9	63.4	64.8
160000	60.3	60.2	61.4	57.9	57.2	57.7	62.2	65.8	65.2	65.6	65.1	62.0	63.7	65.2
170000	61.1	59.7	60.3	58.2	57.2	58.1	62.3	64.5	64.8	65.4	65.7	62.4	63.8	65.2
180000	61.5	59.3	59.3	58.5	57.3	58.3	63.9	62.7	63.9	65.0	64.1	62.7	63.4	64.6
190000	61.3	58.8	58.7	58.4	57.4	58.2	64.2	61.6	62.9	64.7	63.4	62.5	62.7	63.8
200000	61.1	58.6	58.1	58.2	57.5	58.1	63.3	61.0	62.0	63.2	62.9	62.2	62.0	63.2
210000	61.3	58.4	57.6	57.8	57.6	58.1	63.1	60.6	61.4	62.7	62.5	61.9	61.4	62.6
220000	60.9	58.4	57.2	57.5	57.5	58.9	64.1	60.5	60.9	63.1	63.8	61.8	60.7	62.1
230000	60.6	58.5	57.0	57.4	57.4	59.5	64.2	60.7	60.9	63.2	64.5	61.7	60.2	61.7
Daily Max	61.5	60.4	61.9	58.5	57.6	59.5	64.2	66.7	65.3	65.6	65.7	64.5	63.8	65.2
Daily Min	58.8	58.4	57.0	56.5	57.0	57.0	59.9	60.5	60.9	60.9	62.4	61.7	60.2	59.6
Average	59.8	59.3	59.7	57.4	57.3	57.7	61.6	63.9	62.4	62.9	63.5	62.6	61.9	61.8

Dead River Below McClure Dam - July 2013 Temperature Monitoring Data

Time HHMMSS	07/01/13	07/02/13	07/03/13	07/04/13	07/05/13	07/06/13	07/07/13	07/08/13	07/09/13	07/10/13	07/11/13	07/12/13	07/13/13	07/14/13	07/15/13	07/16/13
0	61.3	60.1	59.5	60.2	61.1	61.3	61.8	60.8	60.9	61.8	60.4	61.2	62.2	62.4	62.1	62.8
10000	61.0	59.9	59.4	60.2	61.0	61.2	61.7	60.8	60.8	61.8	60.2	61.3	61.9	62.4	62.2	62.8
20000	61.0	59.7	59.3	60.3	61.0	61.2	61.6	60.7	60.9	61.7	60.2	61.3	61.7	62.3	62.3	62.7
30000	61.0	59.6	59.1	60.3	60.9	61.2	61.6	60.4	60.9	61.8	60.2	61.1	61.6	62.2	62.4	62.5
40000	60.9	59.4	59.1	60.2	60.9	61.2	61.7	60.3	60.9	61.8	60.1	60.8	61.4	62.0	62.4	62.4
50000	60.8	59.3	59.1	60.2	60.8	61.1	61.7	60.2	60.9	61.6	60.0	60.7	61.3	62.0	62.4	62.4
60000	60.7	59.3	59.1	60.2	60.7	61.1	61.6	60.3	60.8	61.4	60.0	60.6	61.2	61.8	62.4	62.4
70000	60.6	59.3	59.1	60.2	60.7	61.0	61.4	60.3	60.8	61.1	59.9	60.5	61.2	61.6	62.3	62.5
80000	60.6	59.4	59.2	60.3	60.7	61.1	61.2	60.3	60.9	61.2	59.9	60.6	61.3	61.5	62.2	62.6
90000	60.8	59.8	59.6	60.6	60.8	61.3	61.1	60.4	61.1	61.6	60.1	60.9	61.6	61.4	62.3	62.8
100000	61.0	60.5	60.1	61.1	61.3	61.7	61.1	60.6	61.6	61.9	60.6	61.4	62.0	61.8	62.6	63.1
110000	61.6	61.3	60.9	61.7	62.0	62.3	61.3	60.9	62.3	62.3	61.4	62.1	62.5	62.5	63.3	63.9
120000	62.4	62.2	61.8	62.5	62.9	63.3	62.0	61.6	62.9	62.7	62.3	62.9	63.3	63.4	64.1	64.9
130000	63.1	62.9	62.6	63.3	63.8	64.3	62.9	62.1	63.3	63.1	63.2	63.9	63.8	64.5	64.6	65.9
140000	63.6	63.5	63.2	64.0	64.6	65.0	63.8	62.7	63.2	63.8	64.1	64.8	64.4	65.4	65.2	66.5
150000	64.1	64.1	63.9	64.3	65.1	65.6	64.1	63.1	63.2	64.1	64.7	65.5	64.7	66.2	65.6	66.5
160000	64.2	64.3	64.3	64.4	65.1	65.9	64.6	63.7	63.1	64.2	65.1	65.7	65.6	66.7	66.1	67.0
170000	63.9	64.2	64.3	63.8	64.9	65.7	64.5	63.8	63.0	64.0	65.0	65.5	65.8	66.7	66.2	67.0
180000	63.5	63.5	63.7	63.3	64.2	65.1	63.9	63.5	62.8	63.6	64.5	65.1	65.3	66.1	65.8	66.5
190000	62.8	62.6	62.9	63.0	63.6	64.3	63.1	63.0	62.6	63.1	63.8	64.3	64.6	65.2	65.2	65.4
200000	61.9	61.6	61.9	62.7	62.9	63.4	62.5	62.3	62.3	62.3	62.8	63.5	63.9	64.2	64.5	64.5
210000	61.2	60.8	61.1	62.1	62.2	62.7	61.8	61.6	62.1	61.6	62.1	62.8	63.2	63.4	63.7	64.2
220000	60.8	60.2	60.5	61.6	61.8	62.2	61.4	61.1	62.0	61.0	61.5	62.5	62.7	62.7	63.3	63.9
230000	60.4	59.8	60.3	61.3	61.4	61.9	61.0	60.9	61.9	60.6	61.3	62.3	62.5	62.3	63.0	63.7
Daily Max	64.2	64.3	64.3	64.4	65.1	65.9	64.6	63.8	63.3	64.2	65.1	65.7	65.8	66.7	66.2	67.0
Daily Min	60.4	59.3	59.1	60.2	60.7	61.0	61.0	60.2	60.8	60.6	59.9	60.5	61.2	61.4	62.1	62.4
Average	61.8	61.1	61.0	61.7	62.3	62.7	62.2	61.5	61.9	62.2	61.8	62.6	62.9	63.4	63.6	64.1

Monthly average temp (F): 62.8

License Maximum Monthly Average: 68°F

Dead River Below McClure Dam - July 2013 Temperature Monitoring Data

Time HHMMSS	07/17/13	07/18/13	07/19/13	07/20/13	07/21/13	07/22/13	07/23/13	07/24/13	07/25/13	07/26/13	07/27/13	07/28/13	07/29/13	07/30/13	07/31/13
0	63.6	63.4	63.8	62.6	61.3	62.4	63.6	61.9	63.2	63.6	63.3	61.9	62.0	61.8	62.8
10000	63.5	63.3	63.5	62.3	61.1	62.3	63.3	61.5	63.1	63.6	63.3	61.9	62.0	61.6	62.8
20000	63.4	63.4	63.4	62.3	60.9	62.2	63.1	61.4	63.1	63.5	63.2	61.8	62.0	61.6	62.8
30000	63.3	63.4	63.4	62.6	60.9	62.0	62.7	61.4	63.0	63.4	63.1	61.8	62.0	61.6	62.7
40000	63.3	63.2	63.1	62.7	60.8	61.9	62.3	61.5	62.9	63.4	63.1	61.8	62.0	61.7	62.6
50000	63.2	63.4	62.8	62.6	60.7	61.9	62.2	61.6	62.8	63.4	62.9	61.9	62.0	61.8	62.6
60000	63.2	63.4	63.0	62.4	60.5	61.8	62.3	61.6	62.8	63.4	62.7	62.0	61.9	61.8	62.6
70000	63.1	63.1	63.3	62.2	60.5	61.8	62.2	61.5	62.9	63.6	62.6	62.1	61.8	61.8	62.5
80000	63.0	63.0	63.5	62.1	60.5	61.8	62.1	61.6	63.1	63.8	62.5	62.1	61.7	62.0	62.6
90000	63.1	63.1	63.6	61.8	60.9	62.1	62.2	61.9	63.5	64.1	62.5	62.2	61.8	62.3	62.8
100000	63.4	63.4	63.7	61.6	61.5	62.6	62.3	62.4	64.0	64.4	62.7	62.3	62.1	62.7	63.0
110000	64.1	63.5	64.6	62.0	62.1	63.3	62.5	63.1	64.4	64.5	62.9	62.5	62.7	63.2	63.5
120000	65.0	63.9	65.4	62.7	62.7	64.2	62.9	63.9	64.9	64.5	63.2	62.8	63.4	64.0	64.3
130000	65.4	64.9	65.8	63.5	63.0	65.2	63.9	64.4	65.1	64.4	63.5	63.1	64.2	64.8	64.8
140000	66.1	66.2	66.2	64.1	63.6	65.6	65.0	64.8	65.3	63.9	63.4	63.2	64.9	65.4	65.3
150000	66.4	67.3	65.8	64.8	64.4	66.0	65.6	64.8	65.3	63.5	63.6	63.4	65.4	65.1	65.3
160000	66.2	67.1	66.1	65.2	64.7	66.8	66.1	64.9	65.1	63.4	63.8	63.4	65.8	64.4	65.2
170000	66.3	66.7	66.4	65.1	64.5	67.1	66.3	64.8	64.7	63.2	63.6	63.3	65.7	63.8	64.8
180000	66.0	66.4	66.1	64.5	64.4	66.7	66.1	64.5	64.2	63.0	63.1	63.1	65.1	63.5	64.3
190000	65.6	66.0	65.4	63.6	64.3	65.9	65.4	64.2	64.0	62.8	62.7	62.9	64.4	63.2	63.6
200000	65.1	65.2	64.4	62.7	63.8	65.3	64.5	63.9	64.0	62.9	62.4	62.6	63.6	63.2	63.2
210000	64.6	64.7	63.6	62.1	63.2	64.9	63.9	63.7	64.0	63.0	62.3	62.4	62.9	63.1	63.0
220000	63.9	64.3	63.1	61.6	62.8	64.5	63.2	63.5	63.8	63.1	62.1	62.2	62.4	63.0	62.8
230000	63.6	64.1	62.9	61.4	62.5	64.0	62.5	63.3	63.7	63.2	62.1	62.0	62.1	62.9	62.6
Daily Max	66.4	67.3	66.4	65.2	64.7	67.1	66.3	64.9	65.3	64.5	63.8	63.4	65.8	65.4	65.3
Daily Min	63.0	63.0	62.8	61.4	60.5	61.8	62.1	61.4	62.8	62.8	62.1	61.8	61.7	61.6	62.5
Average	64.3	64.4	64.3	62.9	62.3	63.8	63.6	63.0	63.9	63.6	62.9	62.4	63.1	62.9	63.4

Dead River Below McClure Dam - August 2013 Temperature Monitoring Data

Time	8/1/2013	8/2/2013	8/3/2013	8/4/2013	8/5/2013	8/6/2013	8/7/2013	8/8/2013	8/9/2013	8/10/2013	8/11/2013	8/12/2013	8/13/2013	8/14/2013	8/15/2013	8/16/2013
HHMMSS																
0	62.3	62.0	62.0	61.8	61.5	62.8	63.2	61.7	62.4							
10000	62.2	61.9	61.9	61.8	61.4	62.8	63.0	61.4	62.3							
20000	62.1	62.0	61.8	61.7	61.5	62.9	62.9	61.3	62.3							
30000	62.0	62.0	61.7	61.6	61.5	62.9	62.8	61.3	62.3							
40000	62.0	62.0	61.6	61.6	61.7	62.9	62.8	61.3	62.4							
50000	61.8	62.1	61.5	61.5	61.8	63.0	62.8	61.4	62.5							
60000	61.7	62.2	61.5	61.4	61.8	63.0	62.7	61.4	62.5							
70000	61.7	62.2	61.6	61.4	62.0	63.0	62.7	61.5	62.5							
80000	61.8	62.3	61.8	61.4	62.3	63.2	62.9	61.6	62.6							
90000	62.0	62.3	61.9	61.5	62.6	63.3	63.1	61.8	62.7							
100000	62.2	62.5	62.3	61.9	63.0	63.4	63.3	62.2	62.9							
110000	62.7	63.0	62.9	62.5	63.4	63.7	63.4	62.8	63.3							
120000	63.4	63.7	63.2	63.1	63.5	64.1	63.6	63.4	63.7							
130000	64.0	64.4	63.5	63.7	63.4	64.4	63.8	63.9	64.3							
140000	64.4	64.4	63.8	63.6	63.4	64.4	64.0	64.3	64.6							
150000	64.6	64.5	64.2	63.9	63.4	64.7	64.0	64.3	65.4							
160000	65.1	65.2	64.4	63.9	63.5	65.3	64.3	64.1	65.4							
170000	65.5	65.1	64.3	63.9	63.5	65.3	64.8	64.0	65.6							
180000	65.5	64.8	64.1	63.7	63.4	64.8	64.7	63.7	65.5							
190000	64.9	64.2	63.8	63.4	63.2	64.3	64.4	63.4	65.2							
200000	64.1	63.6	63.2	62.9	63.1	63.9	63.8	63.1	64.9							
210000	63.3	63.0	62.7	62.3	62.9	63.6	63.2	62.7	64.4							
220000	62.6	62.5	62.3	62.0	62.8	63.4	62.6	62.5	63.9							
230000	62.2	62.2	61.9	61.7	62.8	63.3	62.2	62.4	63.3							
Daily Max	65.5	65.2	64.4	63.9	63.5	65.3	64.8	64.3	65.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Daily Min	61.7	61.9	61.5	61.4	61.4	62.8	62.2	61.3	62.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Average	63.1	63.1	62.7	62.4	62.6	63.7	63.4	62.6	63.6	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

Monthly average temp (F): 63.8
License Maximum Monthly Average: 68°F

No data. Equipment malfunction.

Dead River Below McClure Dam - August 2013 Temperature Monitoring Data

Time	8/17/2013	8/18/2013	8/19/2013	8/20/2013	8/21/2013	8/22/2013	8/23/2013	8/24/2013	8/25/2013	8/26/2013	8/27/2013	8/28/2013	8/29/2013	8/30/2013	8/31/2013
HHMMSS															
0					63.5	63.4	62.0	62.6	63.5	64.5	64.8	65.2	65.0	65.4	64.6
10000					63.5	63.3	61.8	62.6	63.6	64.8	64.8	65.0	65.0	65.4	64.6
20000					63.5	63.2	61.8	62.7	63.5	64.9	64.8	64.9	64.9	65.2	64.5
30000					63.6	63.2	61.8	62.7	63.6	65.0	64.7	64.7	64.6	65.2	64.5
40000					63.6	63.0	61.7	62.6	63.8	65.0	64.6	64.4	64.3	65.1	64.6
50000					63.6	62.8	61.5	62.5	63.9	64.8	64.4	64.0	64.3	65.2	64.5
60000					63.5	62.6	61.4	62.4	64.1	65.5	64.3	63.8	64.3	65.4	64.6
70000					63.5	62.3	61.3	62.4	64.1	66.2	64.2	63.6	64.3	65.4	64.6
80000					63.4	62.2	61.2	62.4	64.2	65.3	64.3	63.6	64.3	65.4	64.7
90000					63.5	62.3	61.4	62.4	64.2	64.4	64.4	63.8	64.5	65.4	64.8
100000					63.8	62.4	61.7	62.6	64.1	64.2	64.7	64.1	64.8	65.3	65.0
110000					64.2	62.6	62.2	63.0	64.4	64.5	64.9	64.6	65.2	65.4	65.2
120000				64.2	64.4	63.1	62.9	63.6	64.9	65.0	65.5	65.3	65.8	65.5	65.5
130000				64.9	64.8	63.6	63.5	64.3	65.7	65.7	65.9	66.0	66.3	65.8	66.0
140000				65.3	65.4	64.3	63.8	64.8	66.5	66.1	66.3	66.6	66.8	65.8	66.6
150000				65.9	65.9	64.8	64.1	65.0	66.8	66.4	66.6	67.0	67.2	66.0	67.1
160000				66.2	65.8	65.0	64.6	65.0	67.3	66.1	66.6	67.1	67.4	66.2	67.6
170000				66.1	65.5	64.9	64.9	65.0	67.3	66.1	66.7	66.9	67.1	66.0	67.7
180000				65.9	65.0	64.4	64.8	64.9	66.8	66.0	66.7	66.6	66.5	65.7	67.4
190000				65.4	64.5	63.8	64.4	64.6	66.2	65.8	66.4	66.1	66.1	65.4	66.9
200000				64.7	64.1	63.1	63.7	64.1	65.4	65.4	65.9	65.6	65.8	65.0	66.3
210000				64.2	63.9	62.6	63.2	63.7	64.9	65.1	65.5	65.2	65.8	64.7	65.9
220000				63.9	63.7	62.3	62.8	63.5	64.5	64.9	65.3	65.2	65.7	64.6	65.6
230000				63.7	63.5	62.1	62.7	63.5	64.4	64.8	65.2	65.1	65.6	64.6	65.6
Daily Max	0.0	0.0	0.0	66.2	65.9	65.0	64.9	65.0	67.3	66.4	66.7	67.1	67.4	66.2	67.7
Daily Min	0.0	0.0	0.0	63.7	63.4	62.1	61.2	62.4	63.5	64.2	64.2	63.6	64.3	64.6	64.5
Average	#DIV/0!	#DIV/0!	#DIV/0!	65.0	64.1	63.2	62.7	63.5	64.9	65.3	65.3	65.2	65.5	65.4	65.6

Dead River Below McClure Dam - September 2013 Temperature Monitoring Data

Time HHMMSS	9/1/2013	9/2/2013	9/3/2013	9/4/2013	9/5/2013	9/6/2013	9/7/2013	9/8/2013	9/9/2013	9/10/2013	9/11/2013	9/12/2013	9/13/2013	9/14/2013	9/15/2013	9/16/2013
0	65.6	64.3	64.7	64.6	63.3	63.5	65.3	63.5	63.2	64.9	64.2	63.7	62.7	61.3	62.5	60.7
10000	65.7	64.2	64.6	64.7	63.2	63.6	65.2	63.4	63.2	64.9	64.2	63.5	62.5	61.2	62.5	60.6
20000	65.6	64.3	64.6	65.0	63.1	63.7	65.2	63.3	63.3	64.8	64.3	63.4	62.4	61.1	62.4	60.5
30000	65.6	64.5	64.4	65.4	63.2	63.8	65.2	63.2	63.5	64.7	64.4	63.4	62.3	61.0	62.4	60.5
40000	65.5	64.8	64.4	65.8	63.2	63.8	65.2	63.2	63.7	64.6	64.4	63.4	62.2	61.1	62.4	60.4
50000	65.5	65.0	64.3	65.8	63.2	63.9	65.2	63.1	63.8	64.6	64.4	63.5	62.1	61.1	62.5	60.3
60000	65.5	65.2	64.3	65.5	63.2	63.9	65.2	63.2	64.0	64.6	64.3	63.5	62.0	61.1	62.5	60.3
70000	65.6	65.2	64.2	65.2	63.1	63.9	65.3	63.4	64.1	64.5	64.3	63.5	61.8	61.2	62.4	60.2
80000	65.6	65.2	64.1	64.9	63.1	64.0	65.2	63.6	64.2	64.5	64.3	63.5	61.7	61.2	62.4	60.1
90000	65.6	65.0	64.1	64.6	63.2	64.2	65.2	63.8	64.3	64.6	64.4	63.5	61.7	61.3	62.4	60.1
100000	65.8	64.9	64.3	64.4	63.4	64.5	65.2	63.9	64.4	64.7	64.4	63.6	61.7	61.4	62.3	60.2
110000	65.8	65.0	64.7	64.2	63.8	64.8	65.4	64.1	64.6	65.0	64.5	63.6	61.8	61.6	62.2	60.5
120000	66.0	65.4	65.3	64.4	64.3	65.5	65.8	64.3	64.7	65.4	64.8	63.5	62.1	62.1	62.0	60.9
130000	66.6	65.7	65.9	64.7	64.8	66.3	65.9	64.6	64.8	65.7	65.3	63.6	62.4	62.6	62.0	60.9
140000	67.1	66.0	66.5	65.1	65.3	66.8	65.7	64.8	64.9	66.1	65.7	63.7	62.8	63.1	62.0	61.4
150000	67.3	66.5	67.0	65.4	65.8	67.3	65.3	65.2	64.9	66.1	66.2	63.7	63.1	63.7	61.9	61.6
160000	67.2	67.0	67.9	65.7	66.0	67.2	65.0	65.3	64.9	65.9	66.2	63.7	63.4	64.0	61.8	61.8
170000	67.0	67.1	67.2	65.7	65.9	66.8	64.9	65.2	65.1	65.7	65.8	63.6	63.2	63.9	61.8	61.6
180000	66.8	67.0	66.9	65.5	65.6	66.4	64.7	65.0	65.1	65.8	65.4	63.5	63.2	63.8	61.7	61.4
190000	66.5	66.7	66.3	65.1	65.1	66.1	64.6	64.6	65.2	65.8	65.2	63.4	62.9	63.6	61.6	61.1
200000	65.8	66.2	65.6	64.5	64.5	65.9	64.5	64.2	65.2	65.3	64.9	63.2	62.3	63.2	61.3	60.7
210000	65.2	65.6	65.1	64.0	64.0	65.6	64.3	63.8	65.0	64.9	64.6	63.1	61.9	62.9	61.1	60.3
220000	64.9	65.3	64.8	63.7	63.7	65.4	64.0	63.6	64.9	64.6	64.2	62.9	61.6	62.7	60.9	60.1
230000	64.5	65.0	64.7	63.5	63.5	65.4	63.8	63.4	64.9	64.4	63.9	62.8	61.4	62.5	60.7	59.9
Daily Max	67.3	67.1	67.9	65.8	66.0	67.3	65.9	65.3	65.2	66.1	66.2	63.7	63.4	64.0	62.5	61.8
Daily Min	64.5	64.2	64.1	63.5	63.1	63.5	63.8	63.1	63.2	64.4	63.9	62.8	61.4	61.0	60.7	59.9
Average	65.9	65.5	65.3	64.9	64.1	65.1	65.1	64.0	64.4	65.1	64.8	63.5	62.3	62.2	62.0	60.7

Monthly average temp (F): 62.0

License Maximum Monthly Average: 63°F

Dead River Below McClure Dam - September 2013 Temperature Monitoring Data

Time														
HHMMSS	9/17/2013	9/18/2013	9/19/2013	9/20/2013	9/21/2013	9/22/2013	9/23/2013	9/24/2013	9/25/2013	9/26/2013	9/27/2013	9/28/2013	9/29/2013	9/30/2013
0	59.7	60.3	61.4	62.2	60.8	59.4	58.1	58.2	58.5	58.2	58.5	58.8	59.0	58.0
10000	59.6	60.3	61.4	62.1	60.6	59.4	58.0	58.1	58.4	58.1	58.4	58.7	58.8	58.0
20000	59.6	60.3	61.4	61.9	60.4	59.3	57.9	58.0	58.4	58.1	58.4	58.6	58.7	58.0
30000	59.6	60.3	61.5	61.8	60.4	59.2	57.9	58.0	58.3	58.0	58.3	58.6	58.6	58.0
40000	59.6	60.2	61.4	61.7	60.2	59.2	57.9	58.0	58.3	57.9	58.3	58.6	58.5	57.9
50000	59.5	60.3	61.4	61.7	60.0	59.1	57.8	57.9	58.3	58.0	58.3	58.5	58.4	57.8
60000	59.4	60.4	61.4	61.7	59.8	59.1	57.8	57.8	58.2	58.0	58.4	58.5	58.4	57.8
70000	59.3	60.4	61.4	61.6	59.7	59.1	57.8	57.9	58.2	57.9	58.4	58.5	58.2	57.8
80000	59.2	60.5	61.5	61.6	59.6	59.0	57.7	57.9	58.1	57.8	58.5	58.6	58.2	57.8
90000	59.1	60.6	61.6	61.6	59.6	59.0	57.7	58.0	58.1	57.7	58.6	58.7	58.1	57.9
100000	59.3	60.7	61.8	61.7	59.6	59.1	57.8	58.1	58.2	57.9	58.7	58.8	58.2	58.0
110000	59.4	60.9	62.1	61.8	59.6	59.3	58.1	58.2	58.5	58.4	58.9	59.0	58.4	58.3
120000	59.8	61.1	62.5	61.9	59.9	59.4	58.4	58.5	58.9	58.9	59.2	59.2	58.7	58.5
130000	60.4	61.5	62.7	62.1	60.2	59.5	58.8	58.9	59.4	59.4	59.6	59.6	59.1	58.8
140000	60.9	61.9	62.9	62.3	60.6	59.6	59.3	59.4	59.9	59.7	60.0	60.0	59.5	59.1
150000	61.3	62.1	63.2	62.6	60.5	59.7	59.7	59.8	60.1	59.9	60.3	60.3	59.7	59.5
160000	61.6	62.1	63.2	62.5	60.4	59.7	59.9	60.0	60.2	60.1	60.4	60.4	59.9	59.7
170000	61.6	62.0	63.1	62.3	60.4	59.6	59.9	60.0	60.0	60.0	60.2	60.3	59.8	59.8
180000	61.5	61.9	63.0	62.0	60.3	59.5	59.8	59.8	59.9	59.8	60.1	60.2	59.6	59.6
190000	61.3	61.7	62.7	61.6	60.2	59.3	59.5	59.5	59.5	59.5	59.8	60.0	59.3	59.3
200000	60.9	61.6	62.3	61.3	59.9	59.0	59.2	59.2	59.1	59.1	59.5	59.7	58.9	59.0
210000	60.6	61.4	62.2	61.1	59.6	58.7	58.8	58.9	58.8	58.9	59.3	59.6	58.5	58.7
220000	60.4	61.4	62.1	61.1	59.5	58.4	58.5	58.7	58.5	58.7	59.1	59.4	58.2	58.6
230000	60.4	61.4	62.2	61.0	59.4	58.2	58.3	58.6	58.3	58.6	58.9	59.2	58.1	58.5
Daily Max	61.6	62.1	63.2	62.6	60.8	59.7	59.9	60.0	60.2	60.1	60.4	60.4	59.9	59.8
Daily Min	59.1	60.2	61.4	61.0	59.4	58.2	57.7	57.8	58.1	57.7	58.3	58.5	58.1	57.8
Average	60.2	61.0	62.1	61.8	60.1	59.2	58.5	58.6	58.8	58.7	59.1	59.2	58.8	58.5

Dead River Below McClure Dam - October 2013 Temperature Monitoring Data

Time HHMMSS	10/1/2013	10/2/2013	10/3/2013	10/4/2013	10/5/2013	10/6/2013	10/7/2013	10/8/2013	10/9/2013	10/10/2013	10/11/2013	10/12/2013	10/13/2013	10/14/2013	10/15/2013	10/16/2013	10/17/2013
0	58.6	57.8	57.7	57.6	57.5	56.6	57.0	55.1	55.9	55.8	55.6	55.4	55.3	54.0	54.0	54.7	53.0
10000	58.6	57.6	57.7	57.6	57.5	56.6	56.9	55.0	55.9	55.7	55.5	55.4	55.1	53.8	53.9	54.7	52.7
20000	58.7	57.4	57.7	57.6	57.5	56.7	56.8	55.0	55.8	55.7	55.5	55.4	54.9	53.8	53.8	54.7	52.4
30000	58.7	57.3	57.7	57.6	57.5	56.7	56.6	54.9	55.8	55.7	55.4	55.3	54.9	53.7	53.7	54.7	52.3
40000	58.7	57.2	57.6	57.7	57.5	56.8	56.4	54.9	55.7	55.6	55.4	55.3	54.9	53.6	53.7	54.7	52.2
50000	58.7	57.1	57.6	57.7	57.5	56.9	56.2	54.8	55.7	55.5	55.2	55.3	54.9	53.5	53.7	54.6	52.2
60000	58.6	57.0	57.6	57.7	57.3	56.9	56.0	54.7	55.6	55.5	55.1	55.4	55.0	53.4	53.7	54.5	52.1
70000	58.6	56.9	57.6	57.7	57.2	56.9	55.9	54.7	55.5	55.4	55.0	55.5	55.1	53.3	53.6	54.3	52.1
80000	58.5	56.9	57.5	57.7	57.0	57.0	55.9	54.7	55.5	55.4	54.9	55.6	55.1	53.2	53.6	54.2	51.9
90000	58.5	56.9	57.6	57.7	56.9	57.1	55.9	54.8	55.4	55.4	55.0	55.7	55.1	53.2	53.7	54.1	51.9
100000	58.6	57.0	57.6	57.8	56.8	57.2	56.0	55.0	55.5	55.5	55.1	55.9	55.1	53.2	53.8	54.0	51.9
110000	58.7	57.2	57.8	58.0	56.9	57.4	56.2	55.2	55.6	55.6	55.3	56.3	55.2	53.4	53.9	53.9	52.1
120000	59.1	57.5	58.1	58.1	56.9	57.5	56.4	55.4	55.9	55.9	55.7	56.5	55.2	53.8	54.1	53.9	52.5
130000	59.5	57.9	58.3	58.3	57.0	58.0	56.5	55.7	56.2	56.2	56.2	56.6	55.2	54.3	54.1	53.9	53.1
140000	59.9	58.2	58.5	58.4	56.9	58.2	56.6	56.1	56.6	56.6	56.5	56.7	55.2	54.8	54.6	53.9	53.5
150000	60.4	58.5	58.5	58.4	56.9	58.4	56.7	56.4	57.1	56.8	56.8	56.7	55.4	55.1	54.7	54.0	53.9
160000	60.0	58.8	58.4	58.3	56.9	58.3	56.7	56.6	57.2	56.9	56.9	56.7	55.5	55.3	54.8	54.0	53.9
170000	59.8	58.9	58.2	58.2	56.8	58.1	56.6	56.6	57.2	56.8	56.8	56.7	55.5	55.1	54.8	54.0	53.8
180000	59.6	59.0	58.1	58.0	56.7	57.9	56.5	56.5	57.1	56.7	56.6	56.7	55.4	55.0	54.8	53.9	53.7
190000	59.3	58.8	57.9	57.8	56.5	57.7	56.3	56.4	56.8	56.5	56.4	56.7	55.1	54.8	54.8	53.8	53.5
200000	58.9	58.4	57.8	57.7	56.3	57.5	56.0	56.2	56.4	56.2	56.0	56.6	54.8	54.6	54.8	53.6	53.2
210000	58.6	58.1	57.7	57.6	56.3	57.3	55.7	56.1	56.2	56.0	55.8	56.2	54.5	54.3	54.7	53.5	53.0
220000	58.3	57.8	57.6	57.5	56.4	57.2	55.5	56.0	56.0	55.8	55.6	55.9	54.3	54.2	54.7	53.4	52.9
230000	58.0	57.7	57.6	57.5	56.5	57.1	55.3	56.0	55.9	55.7	55.5	55.6	54.1	54.1	54.7	53.2	52.9
Daily Max	60.4	59.0	58.5	58.4	57.5	58.4	57.0	56.6	57.2	56.9	56.9	56.7	55.5	55.3	54.8	54.7	53.9
Daily Min	58.0	56.9	57.5	57.5	56.3	56.6	55.3	54.7	55.4	55.4	54.9	55.3	54.1	53.2	53.6	53.2	51.9
Average	59.0	57.7	57.8	57.8	57.0	57.3	56.3	55.5	56.1	56.0	55.7	56.0	55.0	54.1	54.2	54.1	52.8

Monthly average temp (F): 52.6
License Maximum Monthly Average: 56°F

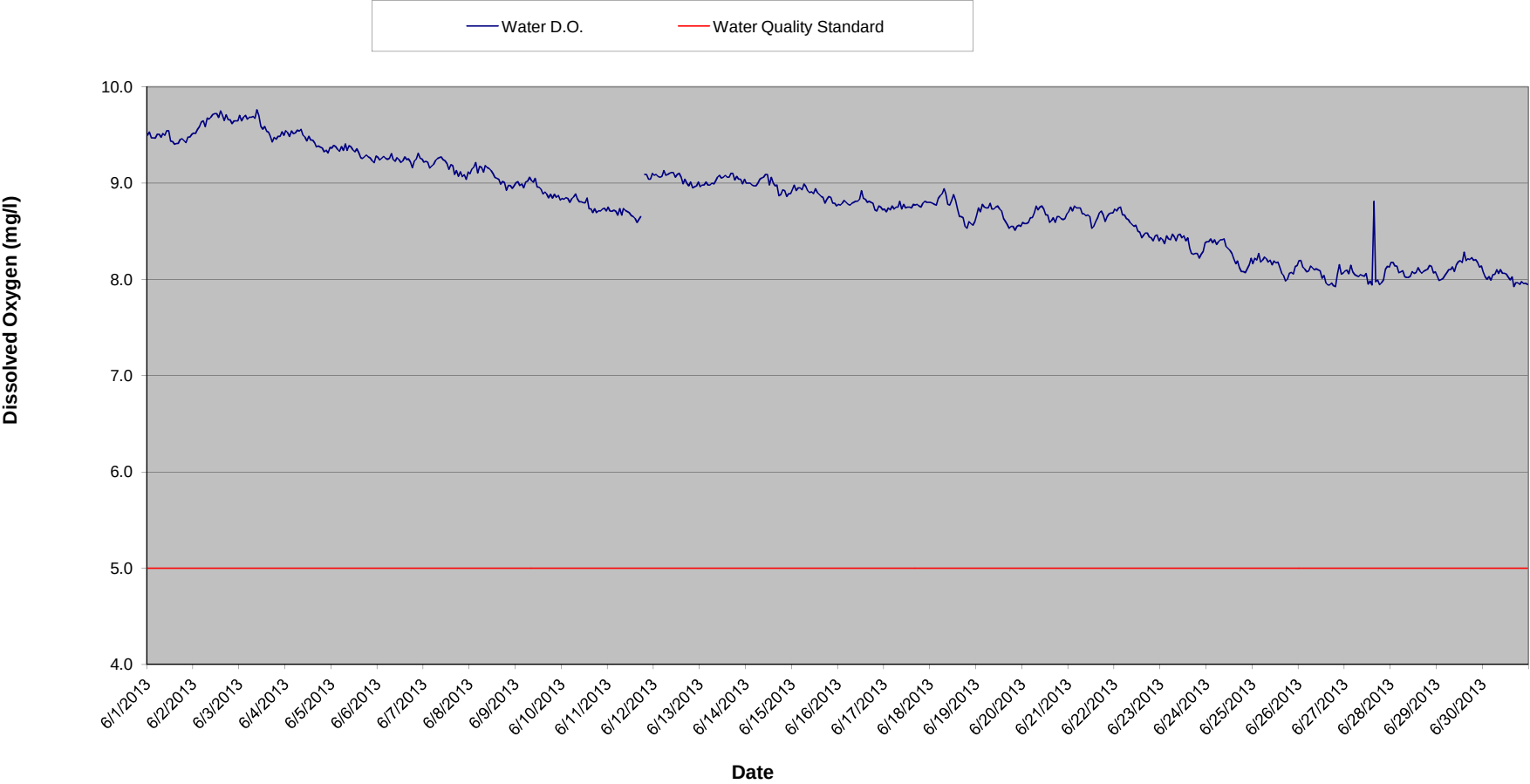
Dead River Below McClure Dam - October 2013 Temperature Monitoring Data

Time HHMMSS	10/18/2013	10/19/2013	10/20/2013	10/21/2013	10/22/2013	10/23/2013	10/24/2013	10/25/2013	10/26/2013	10/27/2013	10/28/2013	10/29/2013	10/30/2013	10/31/2013
0	52.8	52.3	51.5	50.9	49.0	48.7	47.7	47.0	47.0	46.0	45.6	44.1	44.2	45.5
10000	52.8	52.2	51.4	50.9	49.0	48.7	47.6	46.9	47.0	46.0	45.4	44.0	44.2	45.5
20000	52.8	52.1	51.3	50.8	49.0	48.6	47.6	46.9	47.0	46.0	45.3	43.9	44.3	45.5
30000	52.8	51.9	51.2	50.7	49.1	48.6	47.6	46.8	47.0	45.9	45.2	43.8	44.3	45.6
40000	52.8	51.8	51.0	50.7	49.0	48.5	47.5	46.7	47.0	45.9	45.1	43.8	44.4	45.5
50000	52.7	51.6	51.0	50.6	49.0	48.3	47.5	46.7	46.9	45.9	44.9	43.7	44.4	45.5
60000	52.8	51.5	51.0	50.6	49.1	48.2	47.5	46.6	46.8	45.8	44.8	43.6	44.4	45.5
70000	52.8	51.4	51.0	50.4	49.1	48.1	47.4	46.6	46.7	45.8	44.8	43.6	44.5	45.5
80000	52.8	51.2	50.9	50.3	49.0	48.0	47.3	46.6	46.7	45.8	44.7	43.6	44.5	45.4
90000	52.8	51.2	50.8	50.2	48.8	47.9	47.2	46.6	46.6	45.8	44.7	43.6	44.5	45.4
100000	52.9	51.3	50.7	50.2	48.8	47.9	47.2	46.6	46.6	45.8	44.8	43.7	44.5	45.4
110000	53.0	51.6	50.8	50.1	49.0	47.9	47.3	46.6	46.6	45.9	44.9	43.9	44.7	45.5
120000	53.2	52.0	51.0	50.2	49.2	48.2	47.3	46.7	46.7	46.0	45.1	44.2	44.9	45.6
130000	53.3	52.3	51.2	50.3	49.1	48.4	47.4	47.0	46.6	46.1	45.2	44.4	45.1	45.8
140000	53.3	52.5	51.6	50.3	48.5	48.6	47.7	47.3	46.3	46.2	45.4	44.7	45.2	45.9
150000	53.3	52.6	51.9	50.4	48.5	48.9	48.1	47.4	46.4	46.3	45.4	44.9	45.3	45.8
160000	53.3	52.6	52.0	50.3	48.8	48.8	48.2	47.5	46.4	46.5	45.3	44.9	45.3	45.8
170000	53.2	52.4	51.9	50.2	49.2	48.7	48.2	47.5	46.4	46.5	45.3	44.9	45.4	45.7
180000	53.1	52.3	51.7	50.0	49.2	48.5	48.1	47.4	46.2	46.4	45.2	44.7	45.4	45.6
190000	52.9	52.1	51.6	49.8	49.1	48.3	47.8	47.2	46.1	46.3	45.0	44.5	45.4	45.5
200000	52.7	51.9	51.4	49.6	49.0	48.1	47.7	47.0	46.1	46.2	44.8	44.4	45.3	45.4
210000	52.5	51.7	51.2	49.4	48.9	48.0	47.5	46.9	46.1	46.2	44.6	44.3	45.3	45.4
220000	52.4	51.6	51.1	49.3	48.8	47.8	47.3	46.9	46.0	46.0	44.4	44.3	45.4	45.4
230000	52.3	51.6	51.0	49.1	48.8	47.8	47.2	46.9	46.0	45.8	44.3	44.3	45.4	45.3
Daily Max	53.3	52.6	52.0	50.9	49.2	48.9	48.2	47.5	47.0	46.5	45.6	44.9	45.4	45.9
Daily Min	52.3	51.2	50.7	49.1	48.5	47.8	47.2	46.6	46.0	45.8	44.3	43.6	44.2	45.3
Average	52.9	51.9	51.3	50.2	49.0	48.3	47.6	46.9	46.5	46.0	45.0	44.2	44.9	45.6

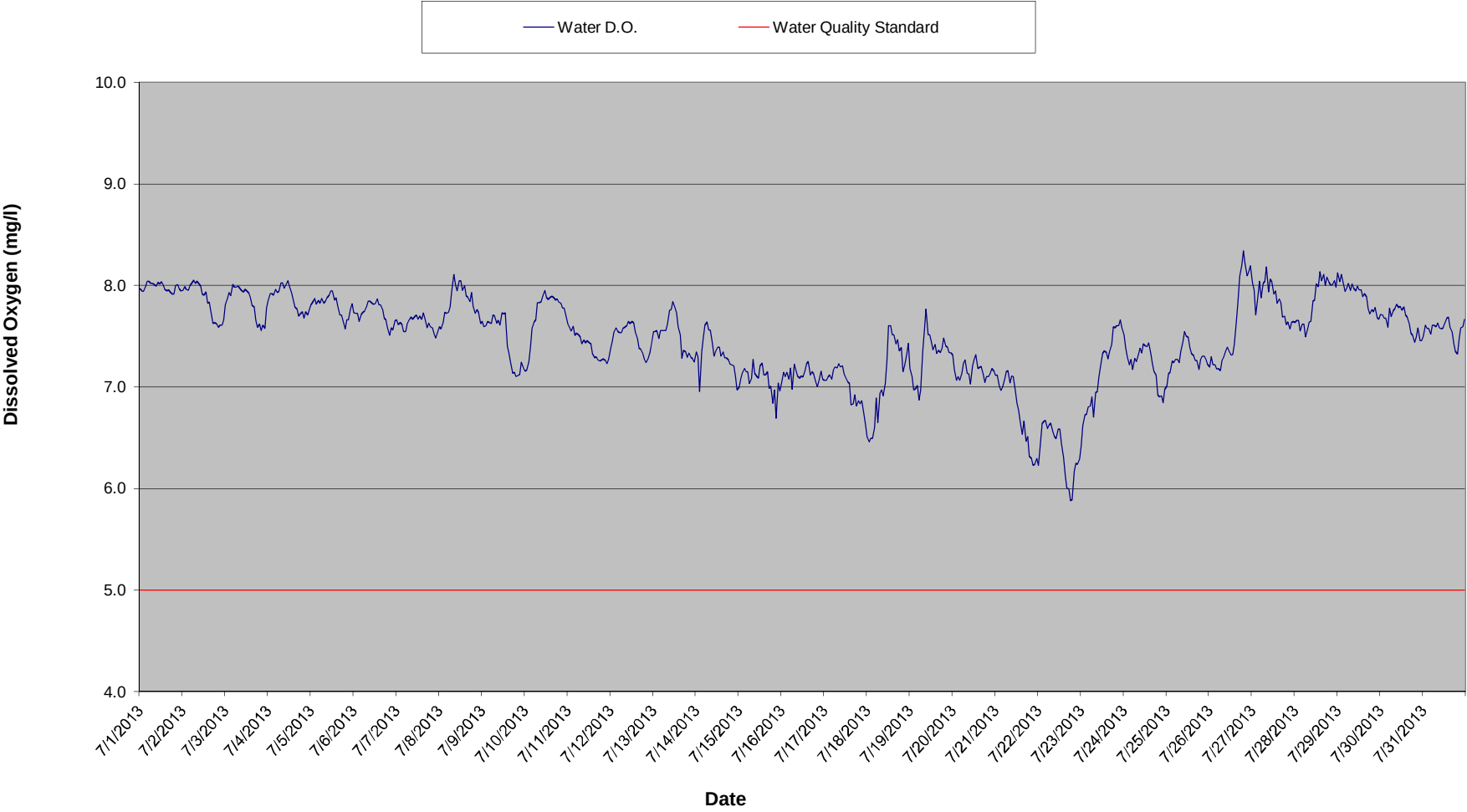
Dead River Water Quality Monitoring Data

Downstream of the McClure Powerhouse

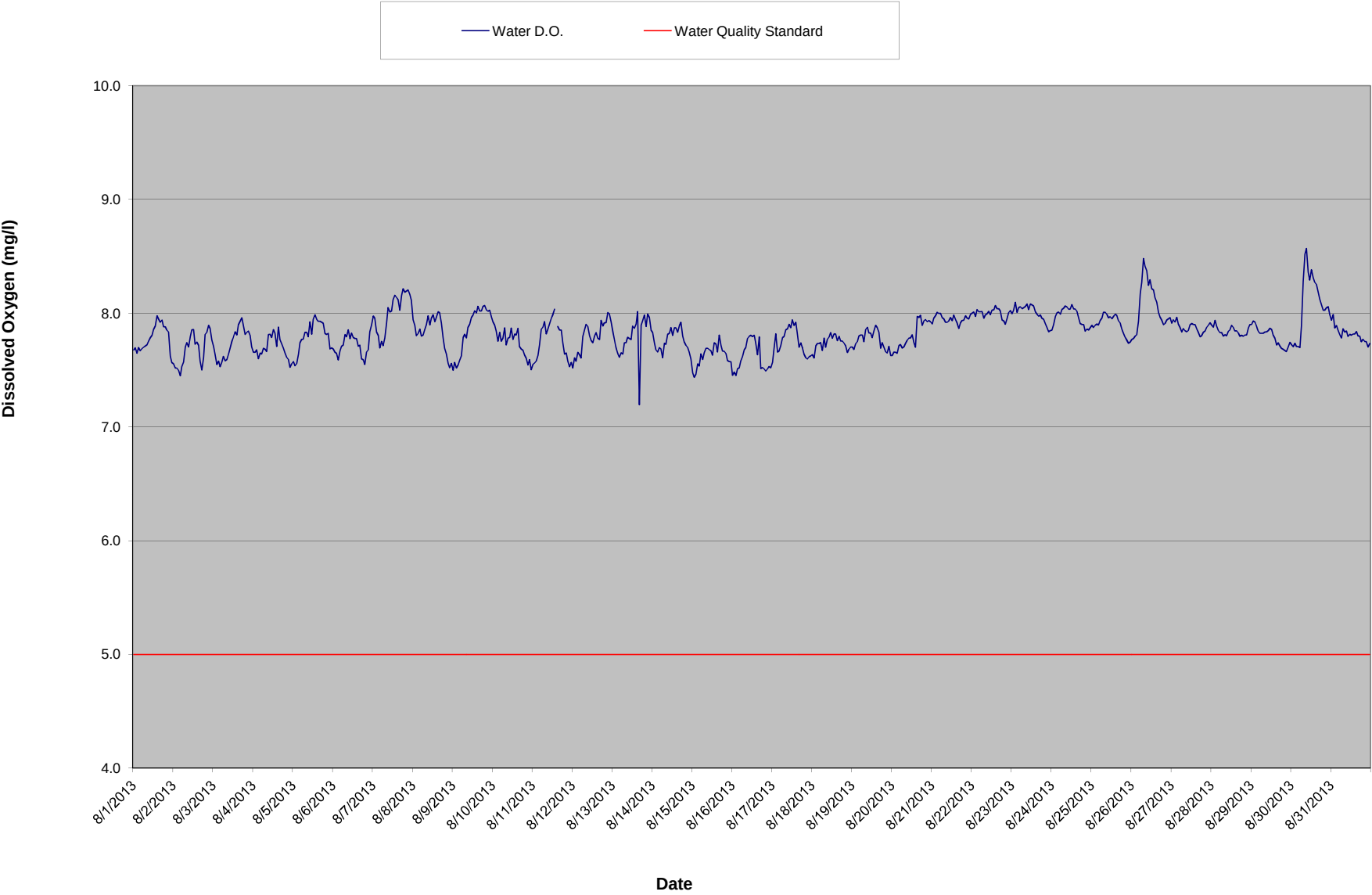
McClure Powerhouse Tailrace DO Summary - June 2013



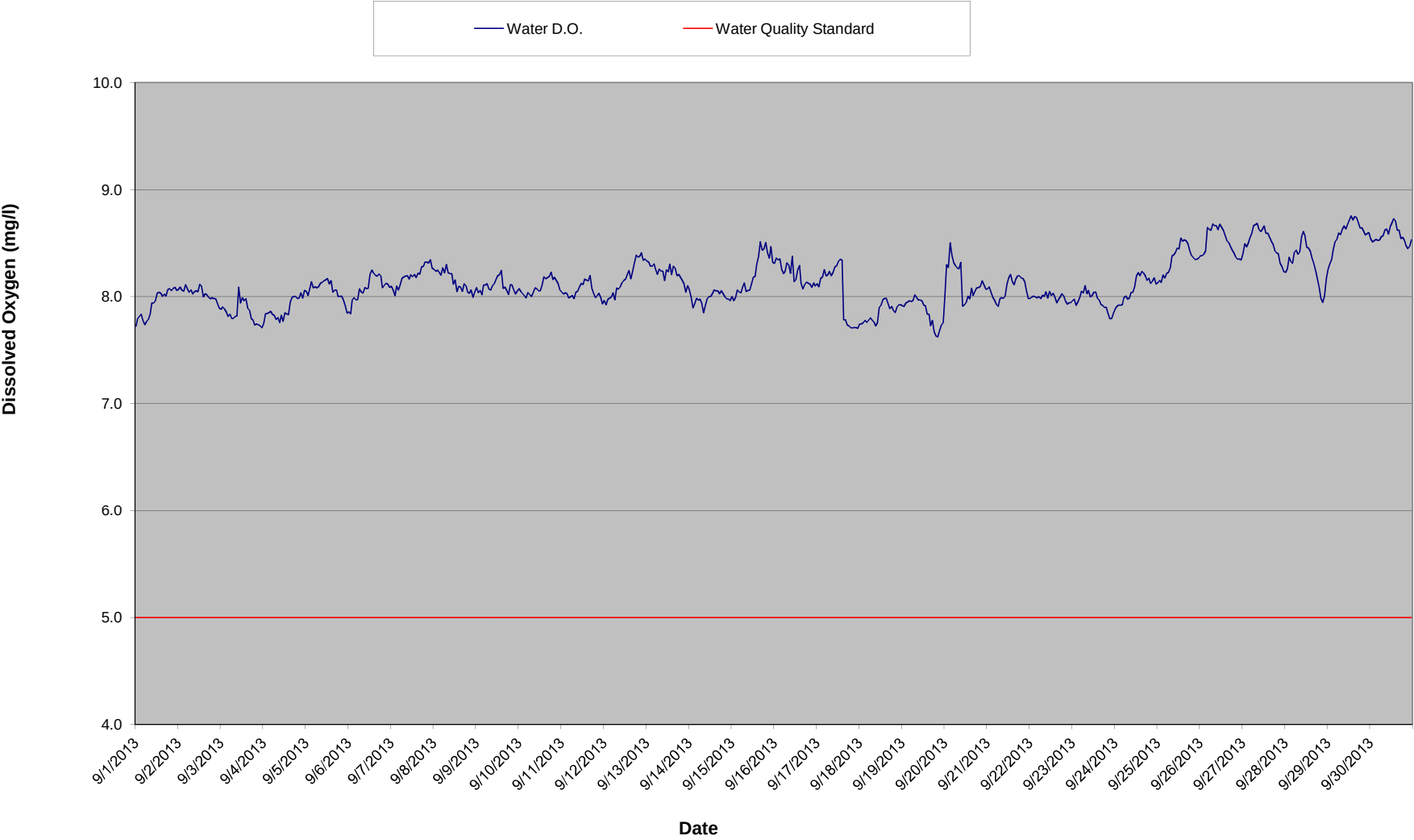
McClure Powerhouse Tailrace DO Summary - July 2013



McClure Powerhouse Tailrace DO Summary - August 2013



McClure Powerhouse Tailrace DO Summary - September 2013



McClure Powerhouse Tailrace - June 2013 Dissolved Oxygen Monitoring Data

Time HHMMSS	06/01/13	06/02/13	06/03/13	06/04/13	06/05/13	06/06/13	06/07/13	06/08/13	06/09/13	06/10/13	06/11/13	06/12/13	06/13/13	06/14/13	06/15/13	06/16/13
0	9.5	9.5	9.7	9.5	9.4	9.3	9.2	9.1	9.0	8.8	8.7	9.1	9.0	9.0	8.9	8.8
10000	9.5	9.5	9.6	9.5	9.4	9.2	9.2	9.1	9.0	8.8	8.7	9.1	9.0	9.0	9.0	8.8
20000	9.5	9.6	9.7	9.5	9.4	9.3	9.2	9.2	9.0	8.8	8.7	9.1	9.0	9.0	8.9	8.8
30000	9.5	9.6	9.7	9.5	9.3	9.3	9.2	9.2	9.0	8.8	8.7	9.1	9.0	9.0	9.0	8.8
40000	9.5	9.6	9.7	9.5	9.3	9.3	9.2	9.1	9.0	8.8	8.7	9.1	9.0	9.0	9.0	8.8
50000	9.5	9.6	9.7	9.5	9.4	9.2	9.2	9.2	9.0	8.8	8.7	9.1	9.0	9.0	8.9	8.8
60000	9.5	9.6	9.7	9.5	9.3	9.3	9.2	9.2	9.0	8.9	8.7	9.1	9.0	9.0	9.0	8.8
70000	9.5	9.7	9.7	9.5	9.4	9.3	9.3	9.1	9.1	8.9	8.7	9.1	9.0	9.0	9.0	8.8
80000	9.5	9.7	9.7	9.6	9.3	9.2	9.3	9.2	9.0	8.8	8.7	9.1	9.0	9.1	8.9	8.8
90000	9.5	9.7	9.8	9.5	9.4	9.2	9.3	9.2	9.0	8.8	8.7	9.1	9.1	9.1	8.9	8.8
100000	9.5	9.7	9.7	9.5	9.4	9.3	9.2	9.1	9.0	8.8	8.7	9.1	9.1	9.1	8.9	8.8
110000	9.5	9.7	9.6	9.4	9.3	9.2	9.2	9.1	9.0	8.8	8.7	9.1	9.1	9.1	8.9	8.8
120000	9.4	9.7	9.6	9.5	9.3	9.2	9.2	9.1	9.0	8.8	8.7	9.1	9.1	9.0	8.9	8.9
130000	9.4	9.7	9.6	9.4	9.4	9.2	9.1	9.1	8.9	8.8	8.7	9.1	9.1	9.1	8.9	8.8
140000	9.4	9.7	9.5	9.4	9.3	9.3	9.2	9.0	8.9	8.7	8.6	9.1	9.1	9.0	8.9	8.8
150000	9.4	9.7	9.5	9.4	9.3	9.2	9.2	9.0	8.9	8.7	8.6	9.0	9.1	9.0	8.9	8.8
160000	9.4	9.6	9.5	9.4	9.3	9.3	9.1	9.0	8.9	8.7	8.6	9.0	9.1	9.0	8.9	8.8
170000	9.5	9.7	9.4	9.4	9.3	9.2	9.1	9.0	8.8	8.7	8.7	9.0	9.1	8.9	8.8	8.8
180000	9.5	9.7	9.5	9.4	9.3	9.2	9.1	9.0	8.9	8.7		9.0	9.0	8.9	8.8	8.8
190000	9.4	9.7	9.5	9.4	9.3	9.2	9.1	8.9	8.8	8.7	9.1	9.0	9.1	8.9	8.9	8.7
200000	9.4	9.6	9.5	9.3	9.3	9.2	9.1	9.0	8.9	8.7	9.1	9.0	9.0	8.9	8.9	8.7
210000	9.5	9.6	9.5	9.3	9.2	9.3	9.1	9.0	8.9	8.7	9.0	9.0	9.0	8.9	8.8	8.8
220000	9.5	9.6	9.5	9.3	9.2	9.3	9.0	8.9	8.9	8.7	9.0	9.0	9.0	8.9	8.8	8.8
230000	9.5	9.6	9.5	9.4	9.3	9.2	9.1	9.0	8.8	8.7	9.1	9.0	9.0	8.9	8.8	8.7
Daily Max	9.5	9.7	9.8	9.6	9.4	9.3	9.3	9.2	9.1	8.9	9.1	9.1	9.1	9.1	9.0	8.9
Daily Min	9.4	9.5	9.4	9.3	9.2	9.2	9.0	8.9	8.8	8.7	8.6	9.0	9.0	8.9	8.8	8.7
Average	9.5	9.6	9.6	9.5	9.3	9.2	9.2	9.1	8.9	8.8	8.8	9.1	9.0	9.0	8.9	8.8

License Minimum Dissolved Oxygen: 5.0 mg/l

Missing data - equipment maintenance

McClure Powerhouse Tailrace - June 2013 Dissolved Oxygen Monitoring Data

Time														
HHMMSS	06/17/13	06/18/13	06/19/13	06/20/13	06/21/13	06/22/13	06/23/13	06/24/13	06/25/13	06/26/13	06/27/13	06/28/13	06/29/13	06/30/13
0	8.7	8.8	8.7	8.6	8.7	8.7	8.4	8.4	8.2	8.2	8.1	8.2	8.0	8.1
10000	8.7	8.8	8.7	8.6	8.8	8.7	8.4	8.4	8.2	8.2	8.1	8.2	8.0	8.0
20000	8.7	8.8	8.7	8.6	8.7	8.7	8.4	8.4	8.2	8.1	8.1	8.1	8.0	8.0
30000	8.7	8.8	8.8	8.6	8.8	8.8	8.5	8.4	8.3	8.1	8.1	8.1	8.0	8.0
40000	8.8	8.8	8.8	8.6	8.7	8.7	8.4	8.4	8.2	8.1	8.1	8.1	8.0	8.0
50000	8.7	8.9	8.7	8.6	8.7	8.7	8.4	8.4	8.2	8.1	8.0	8.1	8.1	8.0
60000	8.8	8.9	8.7	8.7	8.7	8.6	8.5	8.4	8.2	8.1	8.0	8.1	8.1	8.1
70000	8.8	8.9	8.8	8.8	8.7	8.6	8.4	8.4	8.2	8.1	8.0	8.0	8.1	8.1
80000	8.8	8.9	8.7	8.7	8.7	8.6	8.4	8.4	8.2	8.1	8.0	8.0	8.1	8.1
90000	8.7	8.8	8.7	8.8	8.7	8.6	8.5	8.4	8.2	8.1	8.0	8.0	8.1	8.1
100000	8.8	8.8	8.8	8.8	8.7	8.6	8.5	8.3	8.2	8.1	8.0	8.0	8.2	8.1
110000	8.7	8.8	8.8	8.7	8.7	8.6	8.4	8.3	8.2	8.1	8.1	8.1	8.2	8.1
120000	8.8	8.9	8.7	8.7	8.5	8.5	8.5	8.3	8.2	8.0	8.0	8.1	8.2	8.1
130000	8.8	8.8	8.7	8.7	8.6	8.5	8.4	8.3	8.2	8.0	8.0	8.1	8.2	8.0
140000	8.7	8.7	8.6	8.6	8.6	8.4	8.4	8.2	8.1	8.0	7.9	8.1	8.3	8.0
150000	8.8	8.7	8.6	8.6	8.6	8.5	8.3	8.2	8.1	7.9	8.8	8.1	8.2	8.0
160000	8.8	8.7	8.6	8.6	8.7	8.5	8.3	8.2	8.0	7.9	8.0	8.1	8.2	7.9
170000	8.8	8.6	8.5	8.6	8.7	8.5	8.3	8.1	8.0	8.0	8.0	8.1	8.2	8.0
180000	8.8	8.6	8.6	8.7	8.7	8.4	8.3	8.1	8.0	7.9	7.9	8.1	8.2	8.0
190000	8.8	8.5	8.6	8.7	8.6	8.4	8.3	8.1	8.1	7.9	8.0	8.1	8.2	7.9
200000	8.8	8.6	8.5	8.6	8.7	8.4	8.2	8.1	8.1	8.1	8.0	8.1	8.2	8.0
210000	8.8	8.6	8.6	8.6	8.7	8.5	8.3	8.1	8.1	8.2	8.1	8.1	8.2	8.0
220000	8.8	8.6	8.6	8.6	8.7	8.5	8.3	8.2	8.1	8.1	8.1	8.1	8.1	8.0
230000	8.8	8.6	8.6	8.7	8.7	8.4	8.4	8.2	8.1	8.1	8.1	8.1	8.1	7.9
Daily Max	8.8	8.9	8.8	8.8	8.8	8.8	8.5	8.4	8.3	8.2	8.8	8.2	8.3	8.1
Daily Min	8.7	8.5	8.5	8.6	8.5	8.4	8.2	8.1	8.0	7.9	7.9	8.0	8.0	7.9
Average	8.8	8.7	8.7	8.7	8.7	8.6	8.4	8.3	8.1	8.1	8.1	8.1	8.1	8.0

McClure Powerhouse Tailrace - July 2013 Dissolved Oxygen Monitoring Data

Time																
HHMMSS	07/01/13	07/02/13	07/03/13	07/04/13	07/05/13	07/06/13	07/07/13	07/08/13	07/09/13	07/10/13	07/11/13	07/12/13	07/13/13	07/14/13	07/15/13	07/16/13
0	8.0	7.9	7.8	7.9	7.8	7.7	7.7	7.6	7.6	7.2	7.6	7.4	7.5	7.3	7.0	7.0
10000	7.9	8.0	7.9	7.9	7.8	7.7	7.6	7.6	7.6	7.2	7.6	7.5	7.5	7.3	7.1	7.1
20000	7.9	8.0	7.9	7.9	7.9	7.7	7.6	7.6	7.6	7.2	7.5	7.5	7.6	7.0	7.1	7.1
30000	8.0	8.0	7.9	7.9	7.8	7.6	7.6	7.7	7.6	7.4	7.6	7.6	7.5	7.3	7.2	7.1
40000	8.0	8.0	8.0	8.0	7.9	7.7	7.5	7.7	7.6	7.6	7.5	7.6	7.6	7.5	7.2	7.1
50000	8.0	8.0	8.0	7.9	7.8	7.7	7.5	7.7	7.6	7.6	7.5	7.5	7.6	7.6	7.2	7.2
60000	8.0	8.1	8.0	7.9	7.9	7.7	7.6	7.8	7.7	7.7	7.5	7.5	7.6	7.6	7.0	7.0
70000	8.0	8.0	8.0	8.0	7.8	7.8	7.7	7.9	7.7	7.8	7.5	7.6	7.6	7.6	7.1	7.2
80000	8.0	8.0	8.0	8.0	7.8	7.8	7.7	8.1	7.6	7.8	7.4	7.6	7.6	7.6	7.3	7.2
90000	8.0	8.0	8.0	8.0	7.9	7.8	7.7	8.0	7.7	7.8	7.5	7.6	7.8	7.4	7.1	7.1
100000	8.0	8.0	7.9	8.0	7.9	7.8	7.7	7.9	7.6	7.9	7.4	7.6	7.8	7.3	7.1	7.1
110000	8.0	7.9	8.0	8.0	7.9	7.8	7.7	8.0	7.7	8.0	7.5	7.6	7.8	7.4	7.1	7.1
120000	8.0	7.9	7.9	8.0	7.9	7.8	7.7	8.0	7.7	7.9	7.4	7.6	7.8	7.4	7.2	7.1
130000	8.0	7.9	7.9	7.9	7.9	7.9	7.7	7.9	7.7	7.9	7.4	7.6	7.7	7.4	7.2	7.2
140000	8.0	7.8	7.9	7.9	7.9	7.8	7.7	8.0	7.4	7.9	7.3	7.5	7.6	7.3	7.1	7.2
150000	7.9	7.8	7.8	7.8	7.8	7.8	7.7	7.9	7.3	7.9	7.3	7.5	7.5	7.3	7.1	7.3
160000	8.0	7.7	7.8	7.8	7.7	7.8	7.7	7.9	7.2	7.9	7.3	7.4	7.3	7.3	7.1	7.1
170000	7.9	7.6	7.7	7.7	7.7	7.7	7.6	7.8	7.1	7.9	7.3	7.4	7.4	7.3	7.0	7.2
180000	7.9	7.6	7.6	7.7	7.6	7.7	7.6	7.9	7.1	7.9	7.3	7.3	7.3	7.3	7.0	7.1
190000	7.9	7.6	7.6	7.7	7.6	7.6	7.6	7.8	7.1	7.8	7.3	7.3	7.3	7.2	6.8	7.1
200000	8.0	7.6	7.6	7.7	7.7	7.5	7.6	7.7	7.1	7.8	7.3	7.2	7.3	7.2	7.0	7.0
210000	8.0	7.6	7.6	7.7	7.7	7.6	7.5	7.8	7.1	7.8	7.3	7.3	7.3	7.2	6.7	7.1
220000	8.0	7.6	7.6	7.7	7.8	7.6	7.5	7.7	7.2	7.8	7.2	7.3	7.3	7.1	7.0	7.2
230000	7.9	7.7	7.8	7.8	7.8	7.7	7.5	7.6	7.2	7.7	7.3	7.4	7.2	7.0	7.0	7.1
Daily Max	8.0	8.1	8.0	8.0	7.9	7.9	7.7	8.1	7.7	8.0	7.6	7.6	7.8	7.6	7.3	7.3
Daily Min	7.9	7.6	7.6	7.7	7.6	7.5	7.5	7.6	7.1	7.2	7.2	7.2	7.2	7.0	6.7	7.0
Average	8.0	7.9	7.8	7.9	7.8	7.7	7.6	7.8	7.5	7.7	7.4	7.5	7.5	7.3	7.1	7.1

License Minimum Dissolved Oxygen: 5.0 mg/l

McClure Powerhouse Tailrace - July 2013 Dissolved Oxygen Monitoring Data

Time															
HHMMSS	07/17/13	07/18/13	07/19/13	07/20/13	07/21/13	07/22/13	07/23/13	07/24/13	07/25/13	07/26/13	07/27/13	07/28/13	07/29/13	07/30/13	07/31/13
0	7.1	6.5	7.2	7.3	7.1	6.2	6.4	7.5	7.0	7.2	8.0	7.6	8.1	7.7	7.5
10000	7.1	6.5	7.1	7.2	7.1	6.4	6.6	7.4	7.1	7.3	8.0	7.7	8.0	7.7	7.5
20000	7.1	6.5	7.0	7.1	7.0	6.6	6.7	7.3	7.1	7.2	7.7	7.7	8.1	7.7	7.6
30000	7.1	6.5	7.0	7.1	7.0	6.7	6.7	7.2	7.3	7.2	7.9	7.5	8.0	7.7	7.6
40000	7.1	6.6	7.0	7.1	7.0	6.7	6.8	7.3	7.2	7.2	8.0	7.6	7.9	7.6	7.6
50000	7.2	6.9	6.9	7.1	7.1	6.6	6.8	7.2	7.3	7.2	7.9	7.6	8.0	7.8	7.5
60000	7.2	6.7	7.0	7.2	7.1	6.6	6.9	7.3	7.3	7.2	8.0	7.5	8.0	7.7	7.6
70000	7.2	6.9	7.4	7.3	7.2	6.6	6.7	7.3	7.2	7.3	8.0	7.6	8.0	7.8	7.6
80000	7.2	7.0	7.6	7.1	7.0	6.6	6.9	7.3	7.4	7.3	8.2	7.6	8.0	7.8	7.6
90000	7.2	6.9	7.8	7.1	7.1	6.5	7.0	7.4	7.4	7.4	7.9	7.6	8.0	7.8	7.6
100000	7.2	7.0	7.5	7.0	7.1	6.5	7.1	7.3	7.5	7.4	8.1	7.8	7.9	7.8	7.6
110000	7.1	7.3	7.5	7.2	7.0	6.6	7.2	7.4	7.5	7.4	8.0	7.9	8.0	7.8	7.6
120000	7.1	7.6	7.4	7.3	6.8	6.6	7.3	7.4	7.5	7.3	7.9	8.0	8.0	7.8	7.6
130000	7.1	7.6	7.4	7.3	6.8	6.4	7.4	7.4	7.4	7.3	7.9	8.0	8.0	7.8	7.6
140000	7.0	7.5	7.4	7.2	6.6	6.3	7.3	7.4	7.3	7.4	7.8	8.1	7.9	7.7	7.7
150000	6.8	7.5	7.3	7.2	6.5	6.1	7.3	7.3	7.3	7.7	7.9	8.0	7.9	7.7	7.7
160000	6.8	7.4	7.4	7.2	6.7	6.0	7.3	7.2	7.3	7.8	7.8	8.1	7.9	7.6	7.6
170000	6.9	7.5	7.3	7.1	6.5	6.0	7.4	7.2	7.3	8.1	7.7	8.0	7.8	7.5	7.5
180000	6.8	7.4	7.4	7.0	6.5	5.9	7.6	7.1	7.2	8.2	7.7	8.1	7.7	7.5	7.4
190000	6.9	7.4	7.5	7.1	6.3	5.9	7.6	6.9	7.3	8.3	7.6	8.0	7.8	7.4	7.4
200000	6.8	7.1	7.4	7.1	6.3	6.2	7.6	6.9	7.3	8.2	7.6	8.0	7.7	7.5	7.3
210000	6.9	7.2	7.4	7.1	6.2	6.2	7.6	6.9	7.3	8.1	7.6	8.0	7.8	7.6	7.5
220000	6.7	7.3	7.3	7.2	6.2	6.2	7.7	6.8	7.3	8.1	7.6	8.0	7.7	7.5	7.6
230000	6.6	7.4	7.3	7.2	6.3	6.3	7.6	7.0	7.2	8.2	7.6	8.0	7.7	7.5	7.6
Daily Max	7.2	7.6	7.8	7.3	7.2	6.7	7.7	7.5	7.5	8.3	8.2	8.1	8.1	7.8	7.7
Daily Min	6.6	6.5	6.9	7.0	6.2	5.9	6.4	6.8	7.0	7.2	7.6	7.5	7.7	7.4	7.3
Average	7.0	7.1	7.3	7.2	6.8	6.4	7.2	7.2	7.3	7.6	7.9	7.8	7.9	7.7	7.6

McClure Powerhouse Tailrace - August 2013 Dissolved Oxygen Monitoring Data

Time HHMMSS	8/1/2013	8/2/2013	8/3/2013	8/4/2013	8/5/2013	8/6/2013	8/7/2013	8/8/2013	8/9/2013	8/10/2013	8/11/2013	8/12/2013	8/13/2013	8/14/2013	8/15/2013	8/16/2013
0	7.7	7.6	7.7	7.7	7.6	7.7	8.0	7.9	7.5	7.9	7.6	7.5	7.8	7.8	7.5	7.5
10000	7.7	7.5	7.6	7.7	7.5	7.7	8.0	7.9	7.6	7.9	7.6	7.6	7.8	7.7	7.4	7.5
20000	7.6	7.5	7.5	7.7	7.6	7.6	7.8	7.8	7.5	7.8	7.6	7.6	7.7	7.7	7.5	7.5
30000	7.7	7.5	7.6	7.6	7.6	7.6	7.8	7.8	7.5	7.8	7.6	7.7	7.6	7.7	7.6	7.5
40000	7.7	7.4	7.5	7.6	7.7	7.7	7.7	7.9	7.6	7.8	7.7	7.6	7.6	7.7	7.5	7.5
50000	7.7	7.5	7.6	7.6	7.8	7.7	7.8	7.8	7.6	7.8	7.9	7.6	7.7	7.7	7.6	7.6
60000	7.7	7.6	7.6	7.7	7.8	7.7	7.7	7.8	7.8	7.8	7.9	7.8	7.6	7.6	7.6	7.6
70000	7.7	7.7	7.6	7.7	7.8	7.8	7.8	7.9	7.8	7.9	7.9	7.9	7.7	7.7	7.7	7.7
80000	7.7	7.7	7.6	7.7	7.8	7.8	7.9	7.9	7.8	7.7	7.8	7.9	7.7	7.7	7.7	7.7
90000	7.8	7.7	7.6	7.8	7.8	7.9	8.1	8.0	7.9	7.8	7.9	7.9	7.8	7.8	7.7	7.8
100000	7.8	7.8	7.7	7.8	7.9	7.8	8.0	7.9	7.9	7.8	7.9	7.8	7.8	7.8	7.7	7.8
110000	7.8	7.9	7.8	7.8	7.8	7.8	8.0	8.0	8.0	7.9	8.0	7.8	7.8	7.9	7.7	7.8
120000	7.9	7.9	7.8	7.9	7.9	7.8	8.1	8.0	8.0	7.8	8.0	7.7	7.9	7.8	7.6	7.8
130000	7.9	7.7	7.8	7.8	8.0	7.8	8.2	7.9	8.0	7.8	8.0	7.8	7.9	7.9	7.7	7.8
140000	8.0	7.7	7.8	7.7	7.9	7.8	8.1	8.0	8.0	7.8		7.8	7.9	7.9	7.7	7.7
150000	7.9	7.7	7.9	7.9	7.9	7.7	8.1	8.0	8.1	7.9	7.9	7.8	8.0	7.8	7.7	7.6
160000	7.9	7.6	7.9	7.8	7.9	7.7	8.0	8.0	8.0	7.7	7.9	7.8	7.2	7.9	7.8	7.8
170000	7.9	7.5	8.0	7.7	7.9	7.6	8.2	7.9	8.0	7.7	7.9	7.9	7.9	7.9	7.7	7.5
180000	7.9	7.6	7.9	7.7	7.9	7.6	8.2	7.8	8.1	7.7	7.7	7.9	7.9	7.8	7.7	7.5
190000	7.9	7.8	7.8	7.7	7.8	7.5	8.2	7.7	8.1	7.6	7.6	7.9	8.0	7.7	7.7	7.5
200000	7.9	7.8	7.8	7.6	7.8	7.7	8.2	7.6	8.0	7.6	7.6	7.9	7.9	7.7	7.6	7.5
210000	7.8	7.9	7.8	7.6	7.8	7.7	8.2	7.6	8.0	7.5	7.6	8.0	8.0	7.7	7.6	7.5
220000	7.6	7.9	7.8	7.5	7.7	7.8	8.2	7.5	8.0	7.6	7.5	8.0	8.0	7.7	7.6	7.5
230000	7.6	7.8	7.7	7.6	7.7	7.9	8.1	7.6	8.0	7.5	7.6	7.9	7.9	7.6	7.6	7.5
Daily Max	8.0	7.9	8.0	7.9	8.0	7.9	8.2	8.0	8.1	7.9	8.0	8.0	8.0	7.9	7.8	7.8
Daily Min	7.6	7.4	7.5	7.5	7.5	7.5	7.7	7.5	7.5	7.5	7.5	7.5	7.2	7.6	7.4	7.5
Average	7.8	7.7	7.7	7.7	7.8	7.7	8.0	7.8	7.9	7.8	7.8	7.8	7.8	7.8	7.6	7.6

License Minimum Dissolved Oxygen: 5.0 mg/l

No data. Equipment malfunction.

McClure Powerhouse Tailrace - August 2013 Dissolved Oxygen Monitoring Data

Time															
HHMMSS	8/17/2013	8/18/2013	8/19/2013	8/20/2013	8/21/2013	8/22/2013	8/23/2013	8/24/2013	8/25/2013	8/26/2013	8/27/2013	8/28/2013	8/29/2013	8/30/2013	8/31/2013
0	7.6	7.6	7.7	7.6	7.9	8.0	8.0	7.8	7.9	7.8	7.9	7.9	7.9	7.7	7.9
10000	7.7	7.6	7.7	7.7	8.0	8.0	8.0	7.9	7.9	7.8	7.9	7.9	7.9	7.7	8.0
20000	7.8	7.7	7.7	7.7	8.0	8.0	8.1	8.0	7.9	7.8	7.9	7.9	7.9	7.7	7.9
30000	7.7	7.7	7.7	7.6	8.0	8.0	8.0	8.0	7.9	7.8	8.0	7.9	7.9	7.7	7.9
40000	7.7	7.7	7.8	7.7	8.0	8.0	8.0	8.0	7.9	7.9	7.9	7.8	7.8	7.7	7.9
50000	7.7	7.7	7.8	7.7	8.0	8.0	8.1	8.0	7.9	8.2	7.9	7.8	7.8	7.7	7.8
60000	7.8	7.7	7.8	7.7	8.0	8.0	8.0	8.0	8.0	8.3	7.8	7.8	7.8	7.9	7.8
70000	7.8	7.8	7.7	7.7	8.0	8.0	8.0	8.0	8.0	8.5	7.9	7.8	7.8	8.3	7.9
80000	7.9	7.7	7.9	7.7	7.9	8.0	8.1	8.1	8.0	8.4	7.8	7.8	7.8	8.5	7.8
90000	7.9	7.8	7.9	7.8	7.9	8.0	8.1	8.1	8.0	8.4	7.8	7.8	7.8	8.6	7.8
100000	7.9	7.8	7.8	7.8	7.9	8.0	8.0	8.0	8.0	8.2	7.8	7.8	7.8	8.4	7.8
110000	7.9	7.8	7.8	7.8	8.0	8.0	8.1	8.0	8.0	8.3	7.9	7.9	7.9	8.3	7.8
120000	7.9	7.8	7.8	7.8	7.9	8.0	8.1	8.1	8.0	8.2	7.9	7.9	7.9	8.4	7.8
130000	7.9	7.8	7.8	7.7	8.0	8.0	8.1	8.0	8.0	8.2	7.9	7.9	7.8	8.3	7.8
140000	7.9	7.8	7.9	7.7	7.9	8.1	8.0	8.0	8.0	8.1	7.9	7.8	7.8	8.3	7.8
150000	7.8	7.8	7.9	8.0	7.9	8.0	8.0	8.0	8.0	8.1	7.9	7.8	7.7	8.3	7.8
160000	7.7	7.8	7.8	8.0	7.9	8.0	8.0	8.0	7.9	8.0	7.8	7.8	7.7	8.2	7.8
170000	7.7	7.8	7.7	8.0	7.9	8.0	8.0	7.9	7.9	8.0	7.8	7.8	7.7	8.1	7.8
180000	7.7	7.8	7.7	7.9	7.9	7.9	8.0	7.9	7.9	7.9	7.8	7.8	7.7	8.1	7.7
190000	7.6	7.7	7.7	7.9	7.9	7.9	7.9	7.9	7.8	7.9	7.8	7.8	7.7	8.0	7.8
200000	7.6	7.7	7.7	7.9	8.0	7.9	7.9	7.8	7.8	7.9	7.8	7.8	7.7	8.0	7.8
210000	7.6	7.7	7.6	7.9	8.0	8.0	7.9	7.9	7.8	7.9	7.9	7.8	7.7	8.0	7.8
220000	7.6	7.7	7.7	7.9	7.9	8.0	7.8	7.9	7.7	8.0	7.9	7.9	7.7	8.1	7.7
230000	7.6	7.7	7.6	7.9	8.0	8.0	7.8	7.9	7.7	8.0	7.9	7.9	7.7	8.0	7.7
Daily Max	7.9	7.8	7.9	8.0	8.0	8.1	8.1	8.1	8.0	8.5	8.0	7.9	7.9	8.6	8.0
Daily Min	7.6	7.6	7.6	7.6	7.9	7.9	7.8	7.8	7.7	7.8	7.8	7.8	7.7	7.7	7.7
Average	7.7	7.7	7.8	7.8	7.9	8.0	8.0	8.0	7.9	8.1	7.9	7.8	7.8	8.1	7.8

McClure Powerhouse Tailrace - September 2013 Dissolved Oxygen Monitoring Data

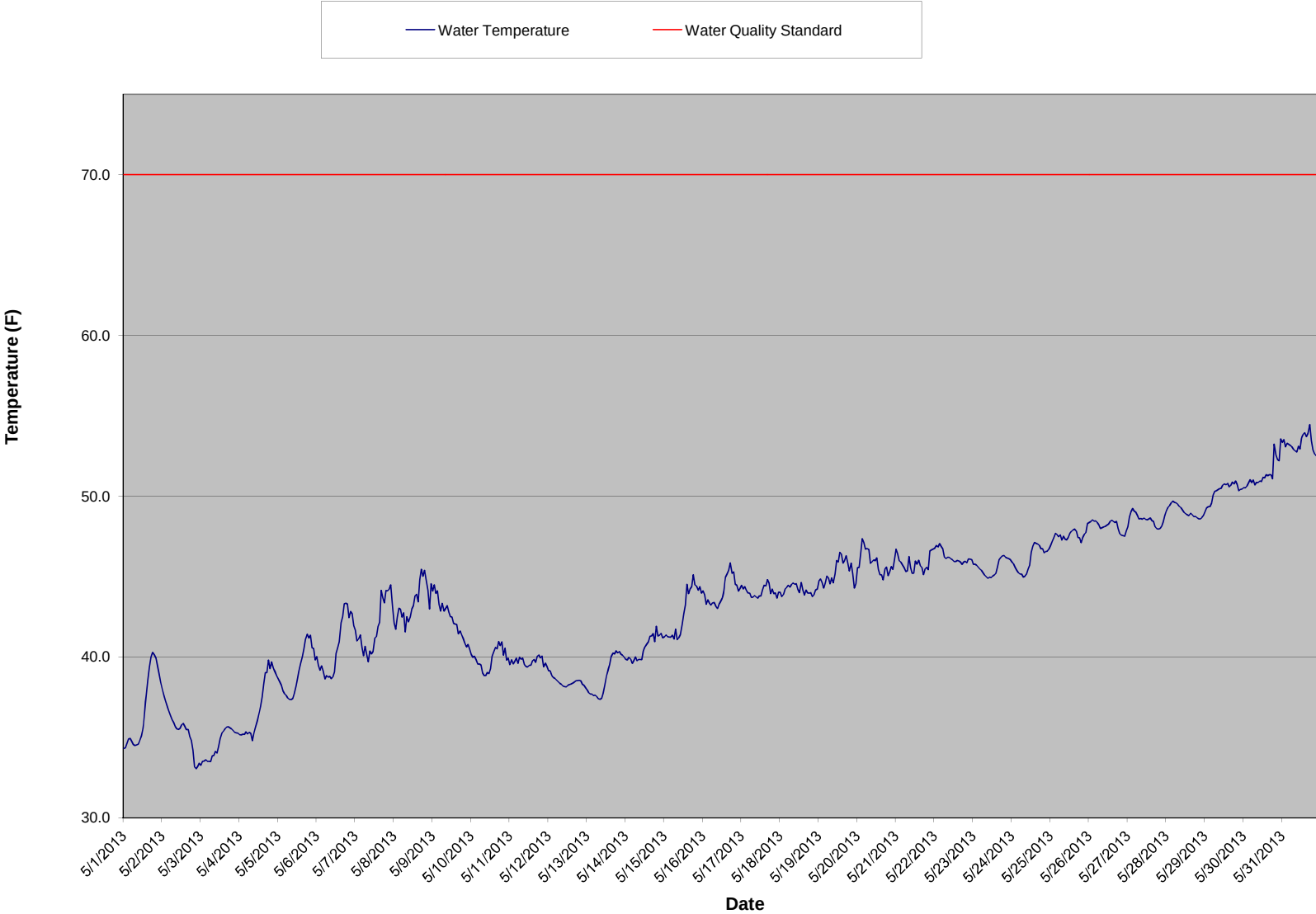
Time HHMMSS	9/1/2013	9/2/2013	9/3/2013	9/4/2013	9/5/2013	9/6/2013	9/7/2013	9/8/2013	9/9/2013	9/10/2013	9/11/2013	9/12/2013	9/13/2013	9/14/2013	9/15/2013	9/16/2013
0	7.7	8.1	7.9	7.7	8.0	7.9	8.1	8.3	8.1	8.1	8.0	8.0	8.3	8.1	8.0	8.3
10000	7.8	8.1	7.9	7.8	8.0	7.8	8.1	8.2	8.0	8.0	8.0	7.9	8.3	8.0	8.0	8.4
20000	7.8	8.1	7.9	7.8	8.1	8.0	8.0	8.2	8.1	8.0	8.0	8.0	8.3	7.9	8.0	8.3
30000	7.8	8.0	7.9	7.9	8.1	8.0	8.1	8.2	8.0	8.0	8.0	8.0	8.3	7.9	8.1	8.4
40000	7.8	8.1	7.8	7.9	8.1	8.0	8.1	8.2	8.1	8.0	8.0	8.0	8.3	8.0	8.0	8.3
50000	7.7	8.1	7.8	7.8	8.1	8.0	8.1	8.3	8.1	8.0	8.0	8.0	8.3	8.0	8.0	8.2
60000	7.8	8.0	7.8	7.8	8.1	8.1	8.2	8.2	8.1	8.0	8.0	8.0	8.2	8.0	8.1	8.2
70000	7.8	8.1	7.8	7.8	8.1	8.0	8.2	8.3	8.1	8.0	8.0	8.1	8.3	7.9	8.1	8.3
80000	7.8	8.0	7.8	7.8	8.1	8.0	8.2	8.2	8.1	8.0	8.0	8.1	8.2	7.8	8.0	8.3
90000	7.9	8.0	7.8	7.8	8.1	8.1	8.2	8.2	8.1	8.1	8.1	8.1	8.2	7.9	8.1	8.2
100000	7.9	8.1	8.1	7.8	8.1	8.1	8.2	8.2	8.1	8.1	8.1	8.1	8.1	8.0	8.1	8.4
110000	8.0	8.0	7.9	7.8	8.2	8.1	8.2	8.1	8.2	8.1	8.1	8.2	8.3	8.0	8.1	8.1
120000	8.0	8.1	8.0	7.8	8.2	8.2	8.2	8.2	8.2	8.1	8.1	8.2	8.2	8.0	8.2	8.2
130000	8.0	8.1	8.0	7.8	8.1	8.2	8.2	8.0	8.2	8.1	8.2	8.2	8.3	8.0	8.2	8.2
140000	8.0	8.0	8.0	7.8	8.1	8.2	8.2	8.1	8.2	8.2	8.2	8.2	8.2	8.1	8.3	8.3
150000	8.0	8.0	7.9	8.0	8.0	8.2	8.2	8.1	8.1	8.2	8.1	8.2	8.3	8.1	8.4	8.1
160000	8.0	8.0	7.9	8.0	8.1	8.2	8.2	8.0	8.1	8.2	8.2	8.2	8.3	8.1	8.5	8.1
170000	8.0	8.0	7.8	8.0	8.1	8.2	8.3	8.1	8.1	8.2	8.1	8.3	8.2	8.0	8.4	8.1
180000	8.1	8.0	7.8	8.0	8.0	8.2	8.3	8.1	8.0	8.2	8.0	8.4	8.2	8.1	8.4	8.1
190000	8.1	8.0	7.7	8.0	8.0	8.1	8.3	8.0	8.1	8.2	8.0	8.4	8.2	8.0	8.5	8.1
200000	8.1	8.0	7.7	8.0	8.0	8.1	8.3	8.0	8.1	8.2	8.0	8.4	8.1	8.0	8.4	8.1
210000	8.1	8.0	7.7	8.0	8.0	8.1	8.3	8.1	8.1	8.2	8.0	8.4	8.1	8.0	8.4	8.1
220000	8.1	7.9	7.7	8.0	7.9	8.1	8.3	8.0	8.0	8.1	8.0	8.3	8.0	8.0	8.5	8.1
230000	8.1	7.9	7.7	8.1	7.8	8.1	8.3	8.0	8.1	8.1	7.9	8.4	8.1	8.0	8.3	8.1
Daily Max	8.1	8.1	8.1	8.1	8.2	8.2	8.3	8.3	8.2	8.2	8.2	8.4	8.3	8.1	8.5	8.4
Daily Min	7.7	7.9	7.7	7.7	7.8	7.8	8.0	8.0	8.0	8.0	7.9	7.9	8.0	7.8	8.0	8.1
Average	7.9	8.0	7.8	7.9	8.1	8.1	8.2	8.1	8.1	8.1	8.1	8.2	8.2	8.0	8.2	8.2

License Minimum Dissolved Oxygen: 5.0 mg/l

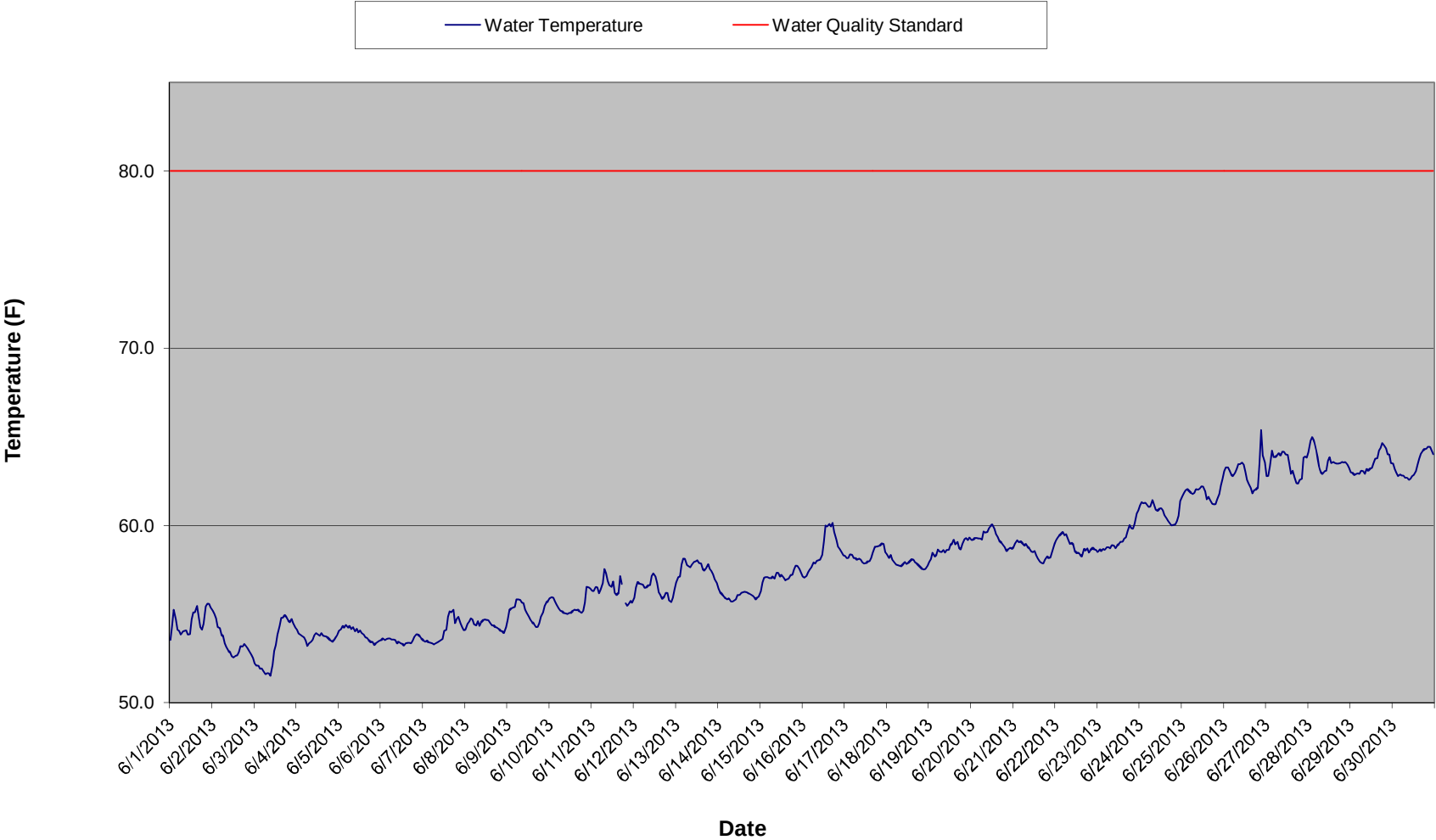
McClure Powerhouse Tailrace - September 2013 Dissolved Oxygen Monitoring Data

Time														
HHMMSS	9/17/2013	9/18/2013	9/19/2013	9/20/2013	9/21/2013	9/22/2013	9/23/2013	9/24/2013	9/25/2013	9/26/2013	9/27/2013	9/28/2013	9/29/2013	9/30/2013
0	8.1	7.7	7.9	8.0	8.1	8.0	8.0	7.9	8.1	8.4	8.4	8.2	8.3	8.5
10000	8.1	7.7	7.9	8.3	8.1	8.0	8.0	7.9	8.1	8.4	8.5	8.3	8.3	8.5
20000	8.2	7.8	7.9	8.3	8.0	8.0	7.9	7.9	8.1	8.4	8.5	8.4	8.3	8.5
30000	8.2	7.8	7.9	8.5	8.0	8.0	7.9	7.9	8.2	8.4	8.5	8.3	8.4	8.5
40000	8.3	7.8	8.0	8.4	8.0	8.0	8.0	7.9	8.2	8.6	8.5	8.3	8.5	8.5
50000	8.2	7.8	8.0	8.3	7.9	8.0	8.1	8.0	8.2	8.6	8.6	8.4	8.5	8.5
60000	8.2	7.8	8.0	8.3	7.9	8.0	8.0	8.0	8.2	8.6	8.7	8.4	8.6	8.6
70000	8.2	7.8	8.0	8.3	8.0	8.0	8.1	8.0	8.3	8.7	8.7	8.4	8.6	8.6
80000	8.2	7.8	8.0	8.3	8.0	8.0	8.0	8.0	8.4	8.7	8.7	8.4	8.6	8.6
90000	8.2	7.7	8.0	8.3	8.0	8.0	8.1	8.0	8.4	8.7	8.6	8.6	8.7	8.6
100000	8.3	7.8	8.0	7.9	8.0	8.0	8.0	8.0	8.4	8.6	8.6	8.6	8.6	8.6
110000	8.3	7.9	8.0	7.9	8.1	8.0	8.0	8.1	8.5	8.7	8.6	8.6	8.7	8.7
120000	8.3	7.9	7.9	7.9	8.2	8.0	8.0	8.2	8.4	8.6	8.7	8.5	8.7	8.7
130000	8.3	8.0	7.9	8.0	8.2	8.0	8.0	8.2	8.5	8.6	8.6	8.5	8.8	8.7
140000	8.3	8.0	7.8	8.0	8.1	8.0	8.0	8.2	8.5	8.6	8.6	8.4	8.7	8.7
150000	7.8	8.0	7.8	8.1	8.1	7.9	8.0	8.2	8.5	8.5	8.6	8.4	8.7	8.6
160000	7.8	7.9	7.7	8.0	8.2	8.0	7.9	8.2	8.5	8.5	8.5	8.3	8.7	8.6
170000	7.7	7.9	7.8	8.1	8.2	8.0	7.9	8.2	8.5	8.5	8.5	8.2	8.7	8.5
180000	7.7	7.9	7.7	8.1	8.2	8.0	7.9	8.2	8.4	8.4	8.4	8.2	8.6	8.6
190000	7.7	7.9	7.6	8.1	8.2	8.0	7.9	8.2	8.4	8.4	8.4	8.1	8.6	8.5
200000	7.7	7.9	7.6	8.1	8.2	8.0	7.8	8.1	8.4	8.4	8.4	8.0	8.6	8.5
210000	7.7	7.9	7.7	8.1	8.1	7.9	7.8	8.1	8.3	8.3	8.3	7.9	8.6	8.4
220000	7.7	7.9	7.7	8.1	8.0	7.9	7.8	8.2	8.3	8.4	8.3	8.0	8.6	8.5
230000	7.7	7.9	7.8	8.1	8.0	7.9	7.8	8.1	8.4	8.3	8.2	8.2	8.6	8.5
Daily Max	8.3	8.0	8.0	8.5	8.2	8.0	8.1	8.2	8.5	8.7	8.7	8.6	8.8	8.7
Daily Min	7.7	7.7	7.6	7.9	7.9	7.9	7.8	7.9	8.1	8.3	8.2	7.9	8.3	8.4
Average	8.0	7.8	7.9	8.1	8.1	8.0	8.0	8.1	8.4	8.5	8.5	8.3	8.6	8.6

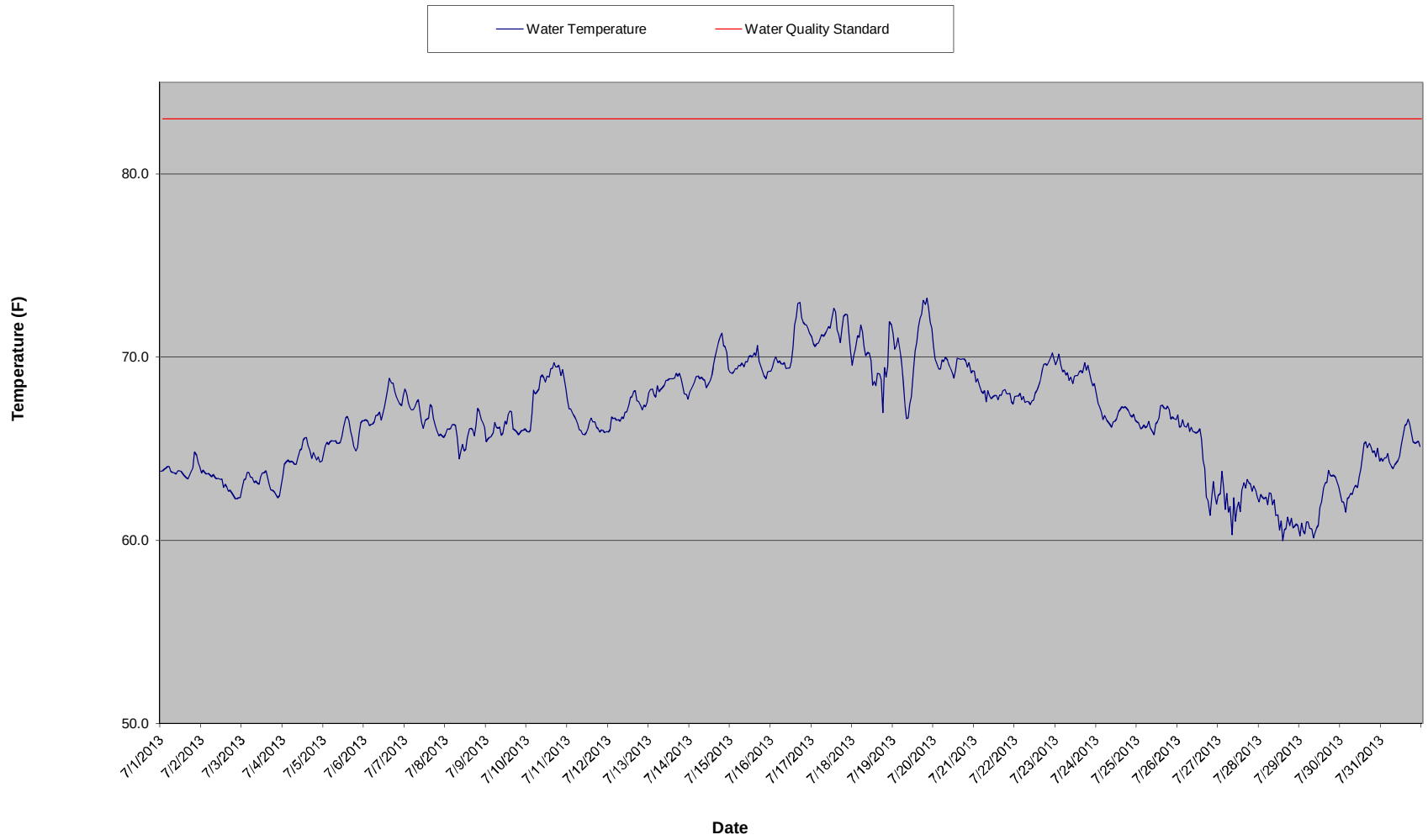
McClure Powerhouse Tailrace Temperature Summary - May 2013



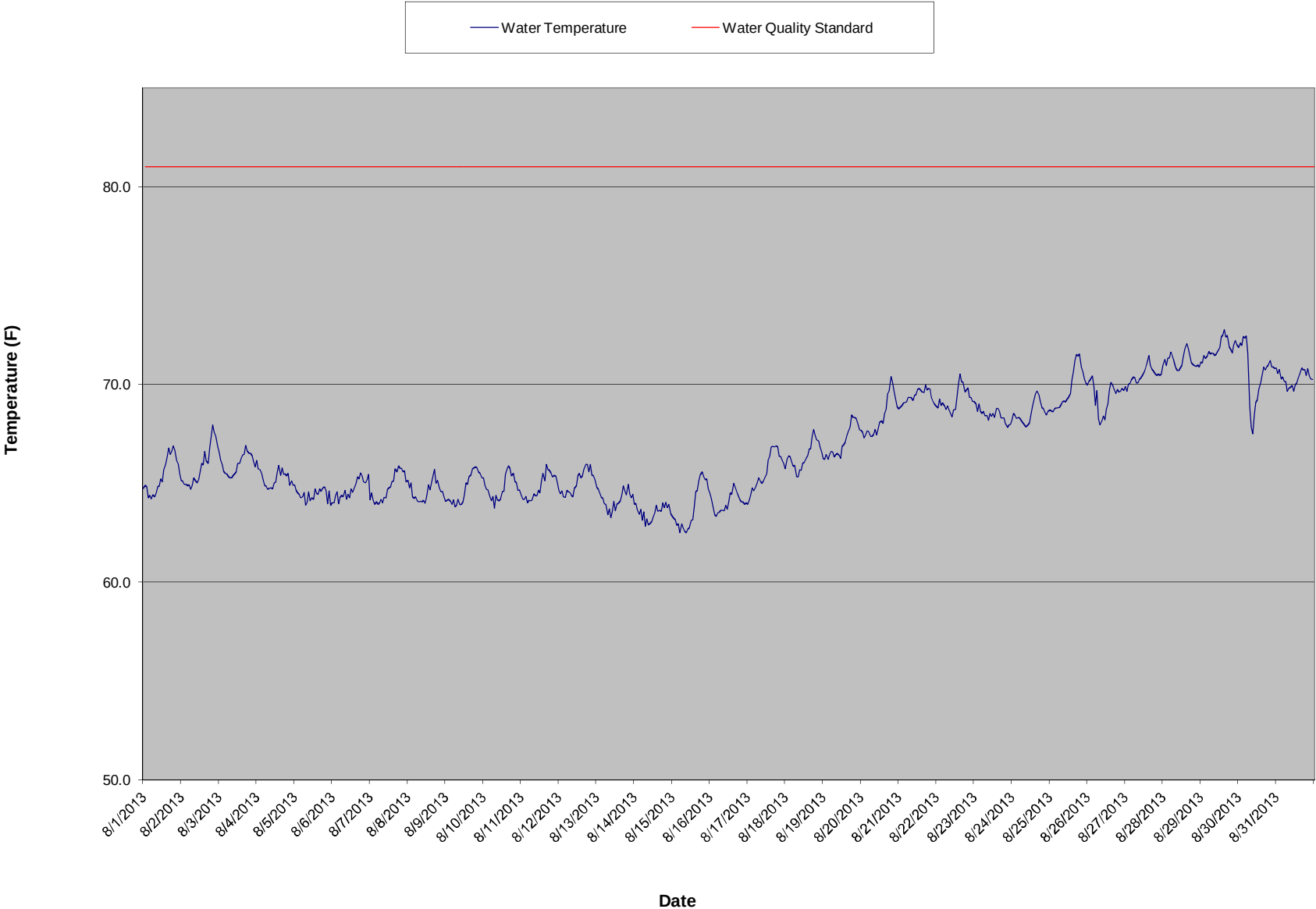
McClure Powerhouse Tailrace Temperature Summary - June 2013



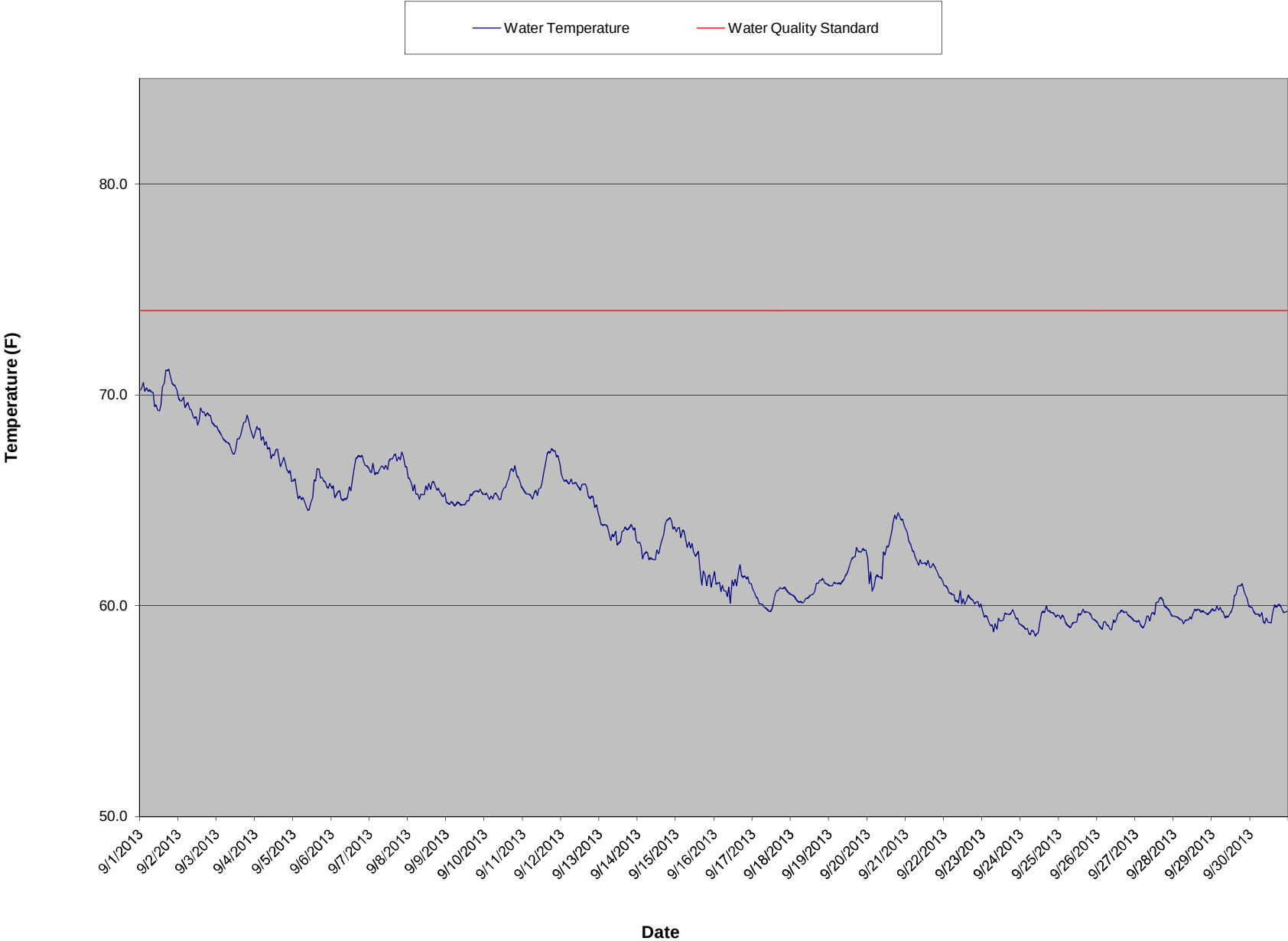
McClure Powerhouse Tailrace Temperature Summary - July 2013



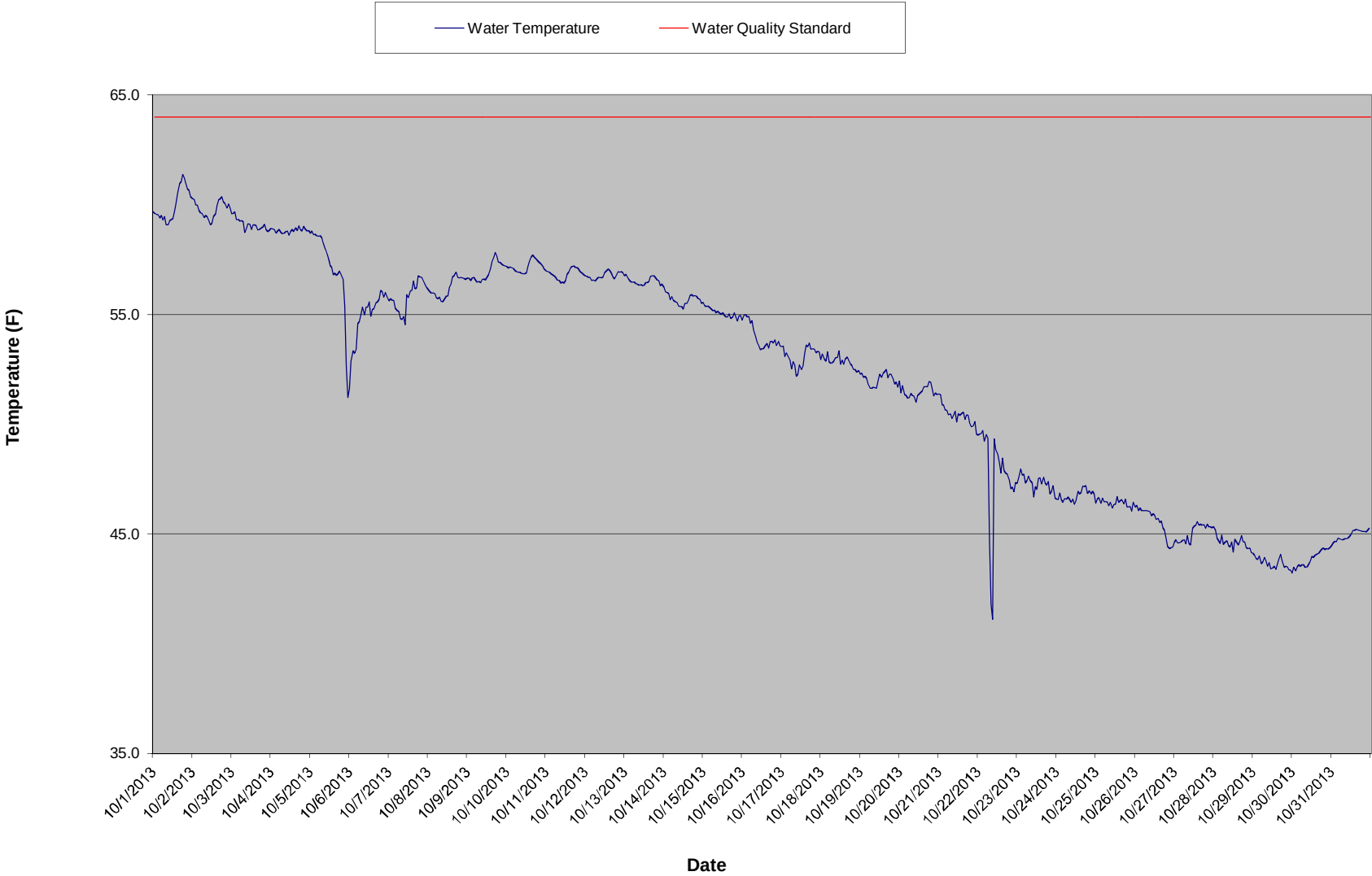
McClure Powerhouse Tailrace Temperature Summary - August 2013



McClure Powerhouse Tailrace Temperature Summary - September 2013



McClure Powerhouse Tailrace Temperature Summary - October 2013



McClure Powerhouse Tailrace - May 2013 Temperature Monitoring Data

Time	5/1/2013	5/2/2013	5/3/2013	5/4/2013	5/5/2013	5/6/2013	5/7/2013	5/8/2013	5/9/2013	5/10/2013	5/11/2013	5/12/2013	5/13/2013	5/14/2013	5/15/2013	5/16/2013
HHMMSS																
0	34.3	38.0	33.3	35.2	38.6	40.0	41.7	42.1	44.1	40.2	39.5	39.1	38.0	39.9	41.3	44.1
10000	34.3	37.6	33.5	35.2	38.4	39.5	41.0	41.7	44.1	40.0	39.8	39.1	37.8	39.8	41.4	43.9
20000	34.6	37.3	33.5	35.2	38.2	39.2	41.1	42.5	44.5	40.0	39.6	38.9	37.7	40.0	41.3	43.3
30000	34.9	37.0	33.6	35.2	37.9	39.5	41.4	43.0	44.0	39.8	39.7	38.7	37.7	39.9	41.2	43.6
40000	34.9	36.7	33.5	35.3	37.7	39.1	40.6	43.0	44.1	39.5	39.9	38.7	37.6	39.6	41.2	43.4
50000	34.8	36.4	33.5	35.2	37.6	38.6	40.1	42.5	43.3	39.6	39.6	38.6	37.6	39.8	41.4	43.2
60000	34.6	36.1	33.5	35.3	37.5	38.8	40.7	42.7	42.9	39.5	40.0	38.5	37.5	40.0	41.1	43.4
70000	34.5	35.9	33.9	35.2	37.4	38.8	40.2	41.6	43.3	39.0	39.9	38.4	37.4	39.8	41.7	43.4
80000	34.5	35.7	33.9	34.8	37.3	38.8	39.7	42.5	42.9	38.8	39.9	38.3	37.4	39.8	41.1	43.1
90000	34.6	35.5	34.1	35.3	37.4	38.6	40.4	42.2	43.0	38.8	39.5	38.2	37.4	39.8	41.2	43.0
100000	34.8	35.5	34.0	35.6	37.7	38.8	40.2	42.5	43.2	39.0	39.4	38.2	37.8	39.8	41.4	43.3
110000	35.1	35.6	34.4	36.0	38.2	39.1	40.3	43.0	42.8	39.0	39.4	38.1	38.3	40.4	42.0	43.5
120000	35.6	35.8	34.9	36.5	38.6	40.2	41.2	43.2	42.5	39.3	39.5	38.2	38.8	40.6	42.7	43.7
130000	36.6	35.9	35.3	36.9	39.2	40.6	41.3	43.8	42.5	40.0	39.5	38.3	39.1	40.8	43.2	44.1
140000	37.6	35.7	35.4	37.5	39.6	40.9	41.9	43.9	42.1	40.4	39.8	38.3	39.5	40.9	44.5	45.0
150000	38.6	35.5	35.5	38.3	40.0	42.1	42.2	43.4	42.0	40.6	39.8	38.4	40.0	41.3	43.9	45.2
160000	39.4	35.5	35.6	39.0	40.5	42.5	44.2	44.8	42.0	40.5	39.7	38.4	40.2	41.3	44.2	45.4
170000	40.0	35.0	35.7	39.0	41.1	43.3	43.7	45.5	41.4	41.0	40.0	38.5	40.2	41.5	44.4	45.9
180000	40.3	34.8	35.6	39.8	41.4	43.3	43.4	45.0	41.6	40.7	40.1	38.5	40.4	40.9	45.1	45.2
190000	40.1	34.2	35.5	39.3	41.2	43.3	44.1	45.4	41.4	40.9	39.9	38.6	40.3	41.9	44.5	45.3
200000	39.9	33.2	35.4	39.7	41.4	42.4	44.1	44.7	41.1	40.1	40.1	38.5	40.3	41.3	44.4	44.5
210000	39.5	33.0	35.3	39.3	40.6	42.8	44.2	44.2	40.8	40.6	39.4	38.3	40.2	41.4	44.2	44.5
220000	38.9	33.2	35.3	39.1	40.5	42.7	44.5	43.0	40.6	39.8	39.6	38.2	40.1	41.5	44.4	44.1
230000	38.4	33.4	35.3	38.8	39.8	42.0	43.1	44.6	40.8	39.9	39.4	38.1	40.0	41.2	44.0	44.3
Daily Max	40.3	38.0	35.7	39.8	41.4	43.3	44.5	45.5	44.5	41.0	40.1	39.1	40.4	41.9	45.1	45.9
Daily Min	34.3	33.0	33.3	34.8	37.3	38.6	39.7	41.6	40.6	38.8	39.4	38.1	37.4	39.6	41.1	43.0
Average	36.7	35.5	34.6	37.0	39.1	40.6	41.9	43.4	42.5	39.9	39.7	38.5	38.8	40.6	42.7	44.1

Monthly average temp (F): 43.4

License Maximum Monthly Average: 70°F

McClure Powerhouse Tailrace - May 2013 Temperature Monitoring Data

Time	5/17/2013	5/18/2013	5/19/2013	5/20/2013	5/21/2013	5/22/2013	5/23/2013	5/24/2013	5/25/2013	5/26/2013	5/27/2013	5/28/2013	5/29/2013	5/30/2013	5/31/2013
HHMMSS															
0	44.5	44.0	44.7	45.6	46.7	46.8	45.8	45.9	46.9	48.4	48.1	49.1	49.0	50.5	53.3
10000	44.2	43.8	44.9	45.6	46.4	46.9	45.8	45.8	47.2	48.4	48.7	49.3	49.3	50.5	53.5
20000	44.4	43.9	44.6	46.4	46.0	46.8	45.7	45.6	47.4	48.5	49.0	49.4	49.4	50.6	53.1
30000	44.2	44.2	44.3	47.4	45.9	47.0	45.6	45.4	47.7	48.5	49.2	49.6	49.4	50.8	53.3
40000	44.0	44.3	44.6	47.1	45.7	46.9	45.5	45.2	47.6	48.5	49.1	49.7	49.6	51.0	53.2
50000	44.0	44.5	45.0	46.7	45.5	46.7	45.4	45.2	47.5	48.4	49.0	49.6	50.1	50.8	53.2
60000	43.7	44.3	44.9	46.7	45.3	46.2	45.2	45.1	47.6	48.2	48.8	49.6	50.3	51.0	53.1
70000	43.7	44.5	44.5	46.7	45.4	46.1	45.1	45.0	47.3	48.0	48.6	49.5	50.3	50.7	52.9
80000	43.8	44.6	44.9	45.8	46.3	46.2	45.0	45.0	47.5	48.0	48.6	49.4	50.4	50.9	52.8
90000	43.7	44.5	44.6	45.9	45.6	46.2	44.9	45.1	47.3	48.1	48.6	49.3	50.5	50.8	52.8
100000	43.6	44.6	45.2	46.0	45.2	46.1	45.0	45.5	47.3	48.1	48.7	49.1	50.5	50.9	53.1
110000	43.8	44.2	46.0	46.0	45.2	46.1	44.9	45.7	47.4	48.2	48.6	49.0	50.7	50.9	52.9
120000	43.8	44.0	45.9	46.2	46.0	45.9	45.0	46.5	47.7	48.3	48.5	48.9	50.8	51.2	53.6
130000	44.2	44.6	46.5	45.4	45.8	45.9	45.1	46.9	47.8	48.4	48.6	48.8	50.7	51.1	53.9
140000	44.5	44.2	46.4	45.1	46.0	46.0	45.2	47.1	47.9	48.5	48.7	48.8	50.8	51.3	53.9
150000	44.4	43.8	45.8	45.1	45.7	46.0	45.6	47.1	47.9	48.4	48.5	48.9	50.6	51.3	53.7
160000	44.8	44.2	46.0	44.8	45.6	45.9	46.0	47.0	47.8	48.4	48.4	48.8	50.7	51.3	53.9
170000	44.6	44.0	46.3	45.5	45.1	45.8	46.2	46.9	47.4	48.4	48.1	48.7	50.9	51.3	54.5
180000	43.9	44.0	45.9	45.6	45.5	45.9	46.3	46.7	47.4	48.0	48.0	48.7	50.8	51.1	53.5
190000	44.2	44.0	45.3	45.1	45.6	46.0	46.3	46.7	47.1	47.7	47.9	48.7	50.9	53.2	52.9
200000	43.9	43.8	45.8	45.3	45.4	45.9	46.2	46.5	47.4	47.6	48.0	48.6	50.7	52.6	52.6
210000	44.0	43.9	45.2	45.6	46.6	46.1	46.1	46.6	47.6	47.6	48.1	48.6	50.3	52.3	52.5
220000	43.6	44.2	44.3	45.4	46.7	46.1	46.1	46.6	47.8	47.5	48.4	48.7	50.4	52.2	52.2
230000	44.0	44.2	44.6	46.1	46.7	46.1	46.1	46.7	48.3	47.8	48.8	48.8	50.5	53.6	52.2
Daily Max	44.8	44.6	46.5	47.4	46.7	47.0	46.3	47.1	48.3	48.5	49.2	49.7	50.9	53.6	54.5
Daily Min	43.6	43.8	44.3	44.8	45.1	45.8	44.9	45.0	46.9	47.5	47.9	48.6	49.0	50.5	52.2
Average	44.1	44.2	45.3	45.9	45.8	46.2	45.6	46.1	47.5	48.2	48.5	49.1	50.3	51.3	53.2

McClure Powerhouse Tailrace - June 2013 Temperature Monitoring Data

Time HHMMSS	06/01/13	06/02/13	06/03/13	06/04/13	06/05/13	06/06/13	06/07/13	06/08/13	06/09/13	06/10/13	06/11/13	06/12/13	06/13/13	06/14/13	06/15/13	06/16/13
0	53.5	55.2	52.2	54.1	54.1	53.5	53.5	54.1	54.7	55.9	56.3	55.9	56.8	56.4	56.3	57.1
10000	54.3	55.0	52.1	53.9	54.1	53.6	53.4	54.4	55.2	56.0	56.3	56.5	57.1	56.2	56.8	57.1
20000	55.3	54.8	52.1	53.8	54.3	53.5	53.5	54.6	55.3	55.9	56.6	56.8	57.1	56.2	57.1	57.2
30000	54.7	54.3	51.9	53.7	54.2	53.6	53.4	54.8	55.4	55.7	56.5	56.7	57.8	56.0	57.1	57.4
40000	54.1	54.2	51.9	53.7	54.4	53.6	53.4	54.7	55.4	55.5	56.2	56.7	58.1	55.9	57.1	57.5
50000	54.1	53.9	51.8	53.5	54.2	53.6	53.3	54.4	55.8	55.3	56.4	56.7	58.1	55.9	57.0	57.6
60000	53.8	53.8	51.6	53.2	54.3	53.6	53.3	54.4	55.9	55.2	56.8	56.5	57.8	55.9	57.0	57.9
70000	54.0	53.3	51.7	53.4	54.2	53.6	53.4	54.6	55.8	55.1	57.6	56.5	57.7	55.7	57.1	57.8
80000	54.1	53.1	51.7	53.4	54.3	53.5	53.4	54.3	55.7	55.1	57.3	56.6	57.7	55.7	57.0	58.0
90000	54.1	52.9	51.5	53.6	54.0	53.4	53.5	54.5	55.6	55.0	56.9	56.6	57.8	55.8	57.3	58.0
100000	53.8	52.8	52.1	53.8	54.2	53.4	53.5	54.7	55.3	55.0	56.6	57.2	57.9	55.9	57.3	58.1
110000	53.9	52.6	52.9	53.9	54.0	53.4	53.6	54.7	55.1	55.1	56.5	57.3	58.0	56.1	57.1	58.3
120000	54.7	52.6	53.3	53.9	54.1	53.3	54.1	54.7	54.9	55.1	56.8	57.1	58.0	56.1	57.2	59.1
130000	55.1	52.6	53.8	53.8	53.9	53.2	54.1	54.7	54.7	55.2	56.2	56.8	57.9	56.2	57.1	60.0
140000	55.1	52.7	54.3	53.9	53.8	53.4	54.8	54.5	54.6	55.2	56.1	56.2	57.9	56.2	56.9	59.9
150000	55.5	52.9	54.8	53.8	53.7	53.4	55.1	54.4	54.4	55.2	56.2	56.1	57.6	56.3	57.0	60.1
160000	54.9	53.2	54.8	53.7	53.7	53.4	55.1	54.4	54.3	55.3	57.2	55.9	57.5	56.2	57.0	60.0
170000	54.3	53.2	55.0	53.7	53.5	53.3	55.3	54.3	54.3	55.2	56.7	56.0	57.6	56.2	57.2	60.2
180000	54.1	53.3	54.9	53.6	53.4	53.5	54.5	54.2	54.5	55.1		56.2	57.8	56.1	57.2	59.6
190000	54.5	53.2	54.6	53.5	53.5	53.7	54.7	54.1	54.9	55.2	55.6	56.2	57.5	56.1	57.5	59.2
200000	55.4	53.1	54.6	53.4	53.3	53.9	54.8	54.1	55.1	55.7	55.5	55.8	57.4	56.0	57.7	58.8
210000	55.6	52.9	54.7	53.5	53.4	53.9	54.5	54.0	55.5	56.5	55.6	55.7	57.2	55.9	57.7	58.7
220000	55.6	52.7	54.5	53.7	53.4	53.7	54.3	53.9	55.7	56.5	55.7	55.9	57.0	55.9	57.5	58.5
230000	55.4	52.5	54.2	53.8	53.5	53.6	54.1	54.3	55.7	56.4	55.7	56.4	56.8	56.0	57.3	58.3
Daily Max	55.6	55.2	55.0	54.1	54.4	53.9	55.3	54.8	55.9	56.5	57.6	57.3	58.1	56.4	57.7	60.2
Daily Min	53.5	52.5	51.5	53.2	53.3	53.2	53.3	53.9	54.3	55.0	55.5	55.7	56.8	55.7	56.3	57.1
Average	54.6	53.4	53.2	53.7	53.9	53.5	54.0	54.4	55.1	55.5	56.4	56.4	57.6	56.0	57.2	58.5

Monthly average temp (F): 57.8
License Maximum Monthly Average: 80 F

Missing data - equipment maintenance

McClure Powerhouse Tailrace - June 2013 Temperature Monitoring Data

Time														
HHMMSS	06/17/13	06/18/13	06/19/13	06/20/13	06/21/13	06/22/13	06/23/13	06/24/13	06/25/13	06/26/13	06/27/13	06/28/13	06/29/13	06/30/13
0	58.3	58.4	57.9	59.2	58.8	59.1	58.5	61.1	61.6	63.1	62.8	64.1	63.0	63.5
10000	58.2	58.2	58.1	59.2	59.0	59.3	58.6	61.3	61.8	63.3	62.8	64.8	63.0	63.2
20000	58.2	58.4	58.5	59.3	59.2	59.4	58.6	61.3	62.0	63.3	63.3	65.0	62.9	63.0
30000	58.4	58.1	58.3	59.3	59.1	59.5	58.7	61.3	62.0	63.1	64.2	64.8	62.9	62.8
40000	58.3	58.0	58.3	59.3	59.1	59.6	58.6	61.2	61.9	62.9	63.9	64.4	62.9	62.9
50000	58.2	57.8	58.7	59.3	59.0	59.5	58.8	61.0	61.8	62.8	63.9	63.9	62.9	62.8
60000	58.2	57.8	58.5	59.2	58.9	59.5	58.8	61.1	61.8	63.0	64.0	63.2	63.1	62.8
70000	58.1	57.7	58.5	59.7	58.9	59.3	58.7	61.4	61.8	63.2	64.1	63.0	63.1	62.7
80000	58.1	57.7	58.6	59.6	58.8	59.0	58.9	61.2	62.0	63.5	64.0	62.9	62.9	62.7
90000	58.1	57.8	58.5	59.6	58.7	59.0	58.9	60.9	62.0	63.5	64.2	63.1	63.2	62.6
100000	57.9	58.0	58.6	59.9	58.5	58.9	58.7	60.8	62.1	63.6	64.2	63.1	63.1	62.6
110000	57.8	57.8	58.6	60.0	58.5	58.6	58.9	61.0	62.2	63.4	64.0	63.6	63.2	62.8
120000	57.9	57.9	58.9	60.1	58.6	58.4	58.9	61.0	62.2	63.0	64.0	63.9	63.2	62.9
130000	58.0	58.0	59.0	59.8	58.3	58.5	59.1	60.9	61.9	62.6	63.5	63.5	63.5	63.1
140000	58.0	58.1	59.2	59.5	58.1	58.3	59.1	60.6	61.5	62.3	62.9	63.6	63.8	63.4
150000	58.2	58.1	58.9	59.4	57.9	58.3	59.3	60.4	61.6	62.1	63.1	63.5	63.8	63.8
160000	58.5	57.9	59.1	59.1	57.9	58.7	59.3	60.3	61.4	61.8	62.7	63.5	64.2	64.0
170000	58.8	57.8	58.7	59.0	57.9	58.6	59.7	60.1	61.2	62.0	62.4	63.5	64.4	64.2
180000	58.8	57.7	58.7	58.9	58.1	58.7	60.0	60.0	61.2	62.0	62.3	63.5	64.7	64.3
190000	58.8	57.6	58.9	58.8	58.3	58.5	59.9	60.0	61.2	62.1	62.6	63.6	64.5	64.3
200000	58.9	57.5	59.2	58.6	58.2	58.6	59.8	60.1	61.5	63.5	62.6	63.6	64.3	64.5
210000	59.0	57.5	59.3	58.6	58.2	58.7	60.1	60.3	61.8	65.4	63.8	63.6	64.0	64.5
220000	58.9	57.6	59.2	58.7	58.5	58.7	60.7	60.5	62.3	64.0	63.9	63.4	64.0	64.2
230000	58.5	57.7	59.3	58.7	58.9	58.6	60.9	61.4	62.6	63.6	63.8	63.2	63.5	64.0
Daily Max	59.0	58.4	59.3	60.1	59.2	59.6	60.9	61.4	62.6	65.4	64.2	65.0	64.7	64.5
Daily Min	57.8	57.5	57.9	58.6	57.9	58.3	58.5	60.0	61.2	61.8	62.3	62.9	62.9	62.6
Average	58.3	57.9	58.7	59.3	58.6	58.9	59.2	60.8	61.8	63.0	63.4	63.7	63.5	63.4

McClure Powerhouse Tailrace - July 2013 Temperature Monitoring Data

Time HHMMSS	07/01/13	07/02/13	07/03/13	07/04/13	07/05/13	07/06/13	07/07/13	07/08/13	07/09/13	07/10/13	07/11/13	07/12/13	07/13/13	07/14/13	07/15/13	07/16/13
0	63.8	63.7	62.9	63.5	64.7	66.5	68.3	65.8	65.4	65.9	67.6	65.9	68.1	68.1	69.2	69.2
10000	63.8	63.8	63.3	64.1	65.2	66.6	68.0	66.1	65.5	65.9	67.2	66.0	68.2	68.3	69.1	69.5
20000	63.9	63.7	63.3	64.3	65.4	66.5	67.6	66.1	65.6	66.0	67.2	66.7	68.3	68.5	69.2	69.8
30000	64.0	63.6	63.7	64.4	65.2	66.3	67.3	66.1	65.6	66.9	66.9	66.6	67.9	68.6	69.4	70.0
40000	64.0	63.6	63.7	64.3	65.4	66.3	67.1	66.3	65.8	68.2	66.8	66.7	67.8	68.9	69.4	69.7
50000	64.0	63.6	63.4	64.3	65.4	66.4	67.1	66.3	66.4	68.0	66.6	66.5	68.4	69.0	69.6	69.8
60000	63.8	63.5	63.4	64.3	65.4	66.5	67.3	66.3	66.2	68.1	66.3	66.6	68.1	68.8	69.5	69.6
70000	63.7	63.6	63.2	64.1	65.4	66.8	67.6	65.7	66.1	68.3	66.0	66.5	68.2	68.9	69.7	69.6
80000	63.7	63.4	63.2	64.1	65.3	66.8	67.7	64.4	66.2	68.9	66.0	66.7	68.3	68.8	69.5	69.7
90000	63.6	63.4	63.1	64.5	65.3	67.0	67.0	64.9	65.7	69.0	65.8	66.6	68.5	68.7	69.7	69.4
100000	63.8	63.4	63.1	64.9	65.4	66.6	66.4	65.2	65.8	68.9	65.8	67.0	68.7	68.3	69.7	69.4
110000	63.8	63.3	63.5	65.0	65.7	66.9	66.1	64.9	66.5	68.6	65.9	67.0	68.7	68.5	70.0	69.4
120000	63.8	63.3	63.7	65.5	66.2	67.3	66.5	65.0	66.4	69.0	66.1	67.4	68.8	68.7	70.1	69.7
130000	63.6	62.9	63.7	65.6	66.7	67.8	66.6	65.6	66.9	68.9	66.5	67.8	68.8	69.0	70.0	70.5
140000	63.5	63.1	63.8	65.6	66.8	68.3	66.7	66.1	67.0	69.4	66.7	67.8	68.8	69.5	70.2	71.8
150000	63.4	62.9	63.4	65.2	66.5	68.8	67.4	66.1	67.0	69.4	66.5	68.1	68.8	70.0	70.1	72.2
160000	63.4	62.7	63.0	64.9	66.0	68.6	67.3	66.0	66.1	69.7	66.5	68.2	69.1	70.4	70.6	72.9
170000	63.6	62.7	62.7	64.5	65.6	68.6	66.7	65.7	66.0	69.5	66.2	67.6	69.0	70.7	69.8	73.0
180000	63.8	62.5	62.7	64.8	65.1	68.1	66.2	66.3	65.9	69.5	66.1	67.6	69.1	71.2	69.5	72.2
190000	63.9	62.4	62.6	64.6	64.9	67.9	65.9	67.2	65.8	69.6	65.9	67.3	68.8	71.3	69.3	71.9
200000	64.8	62.3	62.4	64.4	65.0	67.6	65.7	67.0	65.9	69.0	66.0	67.1	68.4	70.6	69.0	71.8
210000	64.6	62.3	62.3	64.6	65.9	67.5	65.8	66.6	66.0	69.3	66.0	67.4	68.0	70.6	68.8	71.8
220000	64.2	62.3	62.4	64.3	66.4	67.3	65.7	66.4	66.0	68.8	65.9	67.3	68.0	70.3	69.2	71.6
230000	64.0	62.3	63.0	64.3	66.5	67.9	65.6	66.2	66.1	68.3	65.9	67.5	67.7	69.3	69.2	71.3
Daily Max	64.8	63.8	63.8	65.6	66.8	68.8	68.3	67.2	67.0	69.7	67.6	68.2	69.1	71.3	70.6	73.0
Daily Min	63.4	62.3	62.3	63.5	64.7	66.3	65.6	64.4	65.4	65.9	65.8	65.9	67.7	68.1	68.8	69.2
Average	63.8	63.1	63.2	64.6	65.6	67.3	66.8	65.9	66.1	68.5	66.3	67.1	68.4	69.4	69.6	70.7

Monthly average temp (F): 66.7
License Maximum Monthly Average: 83°F

McClure Powerhouse Tailrace - July 2013 Temperature Monitoring Data

Time HHMMSS	07/17/13	07/18/13	07/19/13	07/20/13	07/21/13	07/22/13	07/23/13	07/24/13	07/25/13	07/26/13	07/27/13	07/28/13	07/29/13	07/30/13	07/31/13
0	71.1	69.6	71.3	70.6	69.2	67.9	69.6	67.9	66.5	66.8	62.4	62.1	60.2	62.5	64.5
10000	70.7	70.1	70.4	69.9	68.6	67.9	69.8	67.5	66.4	66.2	62.6	62.5	60.9	62.1	64.3
20000	70.6	70.5	70.6	69.6	68.8	67.9	70.2	67.3	66.1	66.2	63.8	62.3	60.5	62.1	64.5
30000	70.7	71.2	71.0	69.4	68.5	68.0	69.5	67.0	66.1	66.6	62.9	62.3	60.4	61.5	64.5
40000	70.8	71.1	70.5	69.4	68.1	67.7	69.2	66.6	66.3	66.2	61.7	62.3	61.0	62.3	64.7
50000	71.0	71.8	69.9	69.8	68.0	67.9	69.3	66.8	66.1	66.2	62.6	62.0	61.0	62.3	64.3
60000	71.2	71.4	68.7	69.8	68.2	67.5	69.0	66.6	66.2	66.4	61.5	62.6	60.7	62.6	64.0
70000	71.2	70.6	67.4	70.0	67.6	67.6	69.2	66.4	66.5	65.9	61.9	62.5	60.6	62.5	63.9
80000	71.3	70.1	66.6	69.8	68.2	67.6	68.7	66.3	66.1	66.2	60.3	61.9	60.1	62.8	64.1
90000	71.5	70.3	66.7	69.5	67.9	67.4	68.9	66.2	65.9	65.9	62.3	62.2	60.4	63.0	64.2
100000	71.7	70.2	67.4	69.4	67.7	67.6	68.5	66.5	65.8	65.9	61.0	61.4	60.7	62.9	64.3
110000	71.6	69.8	67.9	69.2	67.8	67.6	69.0	66.5	66.3	65.8	61.8	61.4	60.8	63.5	64.6
120000	72.1	68.5	69.3	68.8	67.9	68.0	69.0	66.6	66.5	65.9	62.1	60.5	61.8	63.9	65.2
130000	72.7	68.7	70.3	69.3	67.9	68.2	69.0	67.0	66.7	66.1	61.6	61.1	62.1	64.5	65.8
140000	72.5	68.4	70.8	69.9	67.7	68.5	69.2	67.2	67.4	65.5	62.7	60.0	62.9	65.3	66.3
150000	71.5	69.1	71.6	69.9	67.9	68.8	69.3	67.3	67.4	64.3	63.2	60.5	63.1	65.4	66.4
160000	71.2	69.1	72.1	69.9	67.9	69.3	69.1	67.2	67.2	64.0	62.9	60.6	63.2	65.0	66.6
170000	70.8	68.8	72.3	69.9	68.2	69.6	69.7	67.3	67.2	62.3	63.3	61.3	63.8	65.3	66.3
180000	71.6	67.0	73.1	69.9	68.2	69.6	69.3	67.2	67.3	62.2	63.1	60.8	63.6	65.1	65.9
190000	72.2	69.4	72.9	69.8	68.0	69.6	69.6	67.1	67.1	61.3	63.1	61.2	63.5	64.8	65.4
200000	72.3	68.9	73.2	69.5	68.0	69.7	69.2	66.8	66.6	62.3	62.7	60.7	63.6	64.9	65.3
210000	72.3	69.5	72.7	69.7	68.0	70.0	68.7	66.7	66.7	63.2	63.0	60.8	63.4	64.6	65.4
220000	71.3	71.9	71.9	69.2	67.6	70.2	68.5	66.9	66.6	62.4	62.7	60.9	63.2	65.0	65.4
230000	70.3	71.7	71.6	69.3	67.4	69.9	68.6	66.5	66.6	62.0	62.3	60.8	62.9	64.3	65.1
Daily Max	72.7	71.9	73.2	70.6	69.2	70.2	70.2	67.9	67.4	66.8	63.8	62.6	63.8	65.4	66.6
Daily Min	70.3	67.0	66.6	68.8	67.4	67.4	68.5	66.2	65.8	61.3	60.3	60.0	60.1	61.5	63.9
Average	71.4	69.9	70.4	69.6	68.1	68.5	69.2	66.9	66.6	64.8	62.4	61.4	61.9	63.7	65.0

McClure Powerhouse Tailrace - August 2013 Temperature Monitoring Data

Time	8/1/2013	8/2/2013	8/3/2013	8/4/2013	8/5/2013	8/6/2013	8/7/2013	8/8/2013	8/9/2013	8/10/2013	8/11/2013	8/12/2013	8/13/2013	8/14/2013	8/15/2013	8/16/2013	8/17/2013
HHMMSS																	
0	64.7	65.2	66.6	66.2	64.9	64.0	64.2	65.2	64.1	65.3	64.4	64.7	64.8	64.0	63.3	64.5	63.9
10000	64.9	65.1	66.2	65.7	64.7	64.0	64.5	64.8	64.1	64.9	64.2	64.5	64.7	64.0	63.2	64.2	64.1
20000	64.8	64.9	66.0	65.7	64.5	64.4	64.2	65.0	64.2	64.7	64.2	64.6	64.5	63.7	63.2	63.8	64.4
30000	64.3	65.0	65.6	65.5	64.4	64.6	64.0	64.3	64.1	64.7	64.3	64.3	64.3	63.4	62.9	63.4	64.8
40000	64.4	64.9	65.5	65.2	64.3	64.0	64.1	64.2	64.0	64.4	64.0	64.3	64.2	63.7	62.9	63.3	64.6
50000	64.2	64.9	65.5	64.9	64.3	64.3	64.0	64.3	64.2	64.1	64.1	64.6	64.0	63.1	62.5	63.5	64.8
60000	64.4	64.7	65.3	64.9	64.5	64.4	64.0	64.1	63.8	64.3	64.1	64.6	63.9	63.6	62.9	63.5	65.0
70000	64.3	64.9	65.3	64.7	63.9	64.3	64.2	64.1	63.9	63.7	64.1	64.5	63.4	62.8	62.7	63.6	65.3
80000	64.5	65.3	65.3	64.7	64.0	64.7	64.0	64.1	64.2	64.4	64.5	64.4	63.7	63.2	62.6	63.6	65.1
90000	64.8	65.2	65.4	64.8	64.6	64.2	64.3	64.1	63.9	64.2	64.4	64.3	63.3	62.9	62.5	63.6	65.0
100000	64.9	65.0	65.5	64.7	64.1	64.5	64.3	64.1	64.0	64.1	64.4	64.7	63.6	63.0	62.7	63.9	65.1
110000	65.2	65.2	65.6	65.0	64.3	64.3	64.7	64.0	64.1	64.2	64.6	64.9	64.1	63.1	62.8	63.7	65.3
120000	65.1	65.6	66.0	65.0	64.2	64.7	64.8	64.3	64.5	64.6	64.5	65.4	63.6	63.3	63.1	64.1	65.5
130000	65.7	66.0	66.0	65.5	64.7	64.5	64.8	64.9	65.0	64.6	65.1	65.5	63.9	63.5	63.2	64.5	66.2
140000	66.0	65.9	66.3	65.9	64.5	64.8	65.1	64.7	64.9	65.5	65.5	65.3	64.0	63.9	63.8	64.5	66.4
150000	66.4	66.6	66.4	65.4	64.5	65.0	65.1	65.0	65.3	65.7	65.1	65.4	64.1	63.6	64.6	65.0	66.8
160000	66.8	66.1	66.5	65.8	64.7	65.3	65.7	65.4	65.4	65.9	66.0	65.7	64.4	63.6	64.7	64.8	66.9
170000	66.5	66.0	66.9	65.5	64.6	65.2	65.6	65.7	65.7	65.8	65.7	65.9	64.9	63.6	65.1	64.6	66.8
180000	66.6	66.8	66.7	65.5	64.8	65.5	65.9	65.0	65.8	65.4	65.7	66.0	64.6	64.0	65.4	64.4	66.9
190000	66.9	67.4	66.5	65.4	64.8	65.4	65.8	65.1	65.8	65.5	65.5	65.6	64.4	63.8	65.6	64.2	66.8
200000	66.7	68.0	66.5	65.5	64.6	65.1	65.8	64.7	65.8	65.1	65.3	65.9	65.0	64.0	65.3	64.1	66.4
210000	66.1	67.6	66.4	64.9	64.0	65.0	65.6	64.6	65.6	65.0	65.4	65.4	64.4	63.8	65.2	64.1	66.4
220000	66.0	67.4	66.1	65.1	64.6	65.2	65.6	64.6	65.5	64.7	65.4	65.4	64.3	63.9	65.2	63.9	66.2
230000	65.5	66.9	65.8	64.9	63.9	65.5	65.1	64.3	65.3	64.7	65.0	65.2	64.4	63.5	64.7	64.0	66.0
Daily Max	66.9	68.0	66.9	66.2	64.9	65.5	65.9	65.7	65.8	65.9	66.0	66.0	65.0	64.0	65.6	65.0	66.9
Daily Min	64.2	64.7	65.3	64.7	63.9	64.0	64.0	64.0	63.8	63.7	64.0	64.3	63.3	62.8	62.5	63.3	63.9
Average	65.4	65.9	66.0	65.3	64.4	64.7	64.8	64.6	64.7	64.8	64.8	65.0	64.2	63.5	63.8	64.0	65.6

Monthly average temp (F): 66.9
License Monthly Maximum Average: 81F

McClure Powerhouse Tailrace - August 2013 Temperature Monitoring Data

Time														
HHMMSS	8/18/2013	8/19/2013	8/20/2013	8/21/2013	8/22/2013	8/23/2013	8/24/2013	8/25/2013	8/26/2013	8/27/2013	8/28/2013	8/29/2013	8/30/2013	8/31/2013
0	65.7	66.3	67.7	68.8	68.9	69.1	68.2	68.7	70.0	69.9	71.0	71.1	71.9	70.8
10000	66.2	66.2	67.6	68.8	68.8	69.0	68.5	68.7	70.1	69.6	71.3	71.1	72.1	70.6
20000	66.4	66.5	67.3	68.9	69.3	68.6	68.4	68.6	70.3	70.0	71.0	71.5	72.0	70.8
30000	66.3	66.2	67.5	69.1	68.9	69.0	68.3	68.8	70.4	70.1	71.3	71.3	72.4	70.3
40000	66.1	66.5	67.7	69.1	69.1	68.6	68.3	68.8	69.9	70.2	71.3	71.4	72.4	70.4
50000	65.9	66.6	67.6	69.1	68.9	68.5	68.3	68.8	68.9	70.4	71.6	71.7	72.4	70.2
60000	65.9	66.6	67.4	69.3	68.7	68.6	68.2	68.8	69.7	70.3	71.4	71.5	71.6	70.1
70000	65.3	66.3	67.4	69.3	68.9	68.4	68.1	69.0	68.3	70.1	71.2	71.6	68.9	69.7
80000	65.3	66.4	67.5	69.3	68.7	68.4	68.0	69.1	68.0	70.1	70.8	71.6	67.8	69.8
90000	65.7	66.5	67.7	69.2	68.5	68.2	67.9	69.2	68.2	70.3	70.7	71.5	67.5	69.8
100000	65.7	66.4	67.4	69.4	68.4	68.5	68.0	69.1	68.4	70.3	70.7	71.5	68.4	69.9
110000	66.0	66.3	67.7	69.5	68.7	68.4	68.1	69.2	68.2	70.5	70.8	71.7	69.1	69.6
120000	66.1	66.9	68.1	69.7	68.7	68.5	68.5	69.3	68.8	70.6	71.0	71.9	69.2	70.0
130000	66.2	66.9	68.2	69.8	69.4	68.3	68.9	69.5	69.0	70.9	71.4	72.4	69.7	70.1
140000	66.4	67.1	68.0	69.7	70.1	68.8	69.2	70.2	69.7	71.2	71.8	72.5	70.1	70.3
150000	66.7	67.4	68.5	69.6	70.5	68.8	69.5	70.6	70.1	71.5	72.1	72.8	70.5	70.5
160000	66.8	67.6	68.7	69.6	70.1	68.6	69.7	71.2	69.9	71.0	71.8	72.4	70.9	70.8
170000	67.4	67.9	69.5	70.0	70.1	68.3	69.5	71.5	69.7	70.8	71.5	72.5	70.7	70.7
180000	67.7	68.5	69.7	69.7	69.6	68.3	69.1	71.4	69.5	70.7	71.1	71.9	70.9	70.8
190000	67.4	68.3	70.4	69.8	69.7	68.3	68.8	71.5	69.7	70.5	71.0	71.8	71.0	70.5
200000	67.2	68.3	70.1	69.8	69.8	68.0	68.8	70.9	69.6	70.5	71.0	71.6	71.2	70.8
210000	67.2	68.3	69.6	69.3	69.3	67.8	68.6	70.6	69.7	70.5	70.9	72.0	70.9	70.5
220000	66.8	68.1	69.3	69.1	69.3	68.0	68.5	70.3	69.8	70.5	71.0	72.2	70.9	70.3
230000	66.6	67.7	68.9	69.0	69.2	68.0	68.6	70.1	69.7	70.5	70.9	72.0	70.8	70.3
Daily Max	67.7	68.5	70.4	70.0	70.5	69.1	69.7	71.5	70.4	71.5	72.1	72.8	72.4	70.8
Daily Min	65.3	66.2	67.3	68.8	68.4	67.8	67.9	68.6	68.0	69.6	70.7	71.1	67.5	69.6
Average	66.4	67.1	68.3	69.4	69.2	68.5	68.6	69.8	69.4	70.4	71.2	71.8	70.6	70.3

McClure Powerhouse Tailrace - September 2013 Temperature Monitoring Data

Time HHMMSS	9/1/2013	9/2/2013	9/3/2013	9/4/2013	9/5/2013	9/6/2013	9/7/2013	9/8/2013	9/9/2013	9/10/2013	9/11/2013	9/12/2013	9/13/2013	9/14/2013	9/15/2013	9/16/2013
0	70.2	69.9	68.5	68.2	65.9	65.6	66.4	66.1	64.9	65.3	65.5	66.3	64.2	63.0	63.5	61.6
10000	70.4	69.7	68.3	68.5	66.0	65.7	66.3	66.0	64.9	65.3	65.4	66.0	63.9	63.0	63.7	61.0
20000	70.6	69.7	68.2	68.4	65.5	65.1	66.8	65.8	64.8	65.2	65.3	65.9	63.8	62.8	63.7	61.1
30000	70.2	69.9	68.1	68.4	65.1	65.2	66.2	65.4	64.9	65.0	65.3	66.0	63.9	62.2	63.2	61.1
40000	70.3	69.4	67.9	67.8	65.2	65.4	66.3	65.7	64.9	65.2	65.3	65.8	63.8	62.4	63.6	60.7
50000	70.2	69.5	67.9	68.0	65.0	65.4	66.3	65.3	64.7	65.1	65.2	65.8	63.8	62.5	63.5	61.0
60000	70.3	69.6	67.7	67.6	65.1	65.1	66.4	65.3	64.8	65.3	65.1	66.0	63.4	62.5	63.1	60.7
70000	70.1	69.3	67.7	67.8	65.0	65.0	66.6	65.0	64.9	65.3	65.4	65.8	63.1	62.2	62.8	60.7
80000	70.1	69.3	67.7	67.4	64.7	65.1	66.6	65.3	64.9	65.2	65.5	65.8	63.4	62.3	63.0	60.4
90000	69.5	69.0	67.5	67.5	64.5	65.0	66.5	65.3	64.8	65.0	65.2	65.8	63.3	62.2	62.7	60.9
100000	69.5	68.9	67.2	67.0	64.6	65.2	66.7	65.3	64.8	65.0	65.6	65.7	63.5	62.2	62.9	60.1
110000	69.3	69.0	67.2	67.2	64.9	65.6	66.5	65.7	64.8	65.4	65.6	65.6	62.9	62.2	62.5	61.2
120000	69.2	68.6	67.4	67.1	65.1	65.5	66.9	65.5	64.8	65.6	65.9	65.5	63.0	62.6	62.3	60.9
130000	69.5	68.8	67.9	67.4	66.0	65.9	67.0	65.8	65.0	65.6	66.3	65.8	63.1	62.5	62.5	61.3
140000	70.4	69.4	67.9	67.4	65.9	66.4	67.0	65.5	65.0	65.9	66.7	65.8	63.5	62.8	62.6	60.9
150000	70.6	69.2	68.1	67.0	66.5	67.0	67.1	65.8	65.3	66.0	67.2	65.8	63.6	63.1	61.8	61.6
160000	71.2	69.2	68.4	66.6	66.5	67.0	67.2	65.9	65.2	66.4	67.3	65.6	63.7	63.4	61.0	62.0
170000	71.2	69.0	68.7	66.8	66.1	67.1	66.9	65.6	65.4	66.5	67.2	65.2	63.6	63.9	61.6	61.4
180000	71.2	69.2	68.7	67.0	66.1	67.1	67.0	65.5	65.4	66.4	67.4	65.1	63.6	64.0	61.5	61.3
190000	70.8	69.0	69.0	66.8	65.9	67.1	66.9	65.6	65.5	66.6	67.3	65.2	63.7	64.1	61.0	61.4
200000	70.5	69.0	68.8	66.5	65.9	66.8	67.3	65.4	65.4	66.2	67.4	65.2	63.9	64.2	61.4	61.3
210000	70.5	68.7	68.5	66.3	65.6	66.7	67.1	65.2	65.5	66.1	67.1	64.7	63.6	64.0	61.5	61.4
220000	70.4	68.6	68.1	66.4	65.6	66.7	66.6	65.2	65.4	65.9	67.1	64.8	63.7	63.6	60.9	61.1
230000	70.2	68.5	67.9	65.9	65.8	66.5	66.6	65.3	65.3	65.7	66.7	64.4	63.1	63.7	61.3	61.1
Daily Max	71.2	69.9	69.0	68.5	66.5	67.1	67.3	66.1	65.5	66.6	67.4	66.3	64.2	64.2	63.7	62.0
Daily Min	69.2	68.5	67.2	65.9	64.5	65.0	66.2	65.0	64.7	65.0	65.1	64.4	62.9	62.2	60.9	60.1
Average	70.3	69.2	68.1	67.3	65.5	66.0	66.7	65.5	65.1	65.6	66.2	65.6	63.5	63.0	62.4	61.1

Monthly average temp (F): 62.7

License Monthly Maximum Average: 74 F

McClure Powerhouse Tailrace - September 2013 Temperature Monitoring Data

Time														
HHMMSS	9/17/2013	9/18/2013	9/19/2013	9/20/2013	9/21/2013	9/22/2013	9/23/2013	9/24/2013	9/25/2013	9/26/2013	9/27/2013	9/28/2013	9/29/2013	9/30/2013
0	60.8	60.5	60.9	62.2	63.6	60.9	59.8	59.1	59.5	59.2	59.3	59.5	59.9	59.9
10000	60.7	60.5	61.0	61.1	63.4	60.9	59.5	59.1	59.4	59.1	59.2	59.5	59.8	59.9
20000	60.4	60.4	60.9	61.6	63.1	60.8	59.5	59.0	59.6	59.0	59.3	59.5	59.8	59.7
30000	60.4	60.3	61.1	60.7	62.9	60.6	59.5	58.9	59.5	58.9	59.1	59.4	60.0	59.6
40000	60.1	60.2	61.1	60.9	62.6	60.6	59.2	58.9	59.2	59.2	59.0	59.3	59.8	59.6
50000	60.1	60.2	61.0	61.3	62.5	60.5	59.1	58.7	59.1	59.3	58.9	59.3	59.9	59.6
60000	60.1	60.2	61.1	61.5	62.3	60.5	59.1	58.6	59.1	59.1	59.2	59.1	59.7	59.5
70000	59.9	60.1	61.0	61.4	62.1	60.2	58.8	58.8	59.0	59.0	59.5	59.3	59.7	59.7
80000	59.9	60.2	61.2	61.4	61.9	60.3	59.1	58.8	59.1	58.9	59.5	59.3	59.4	59.3
90000	59.8	60.4	61.2	61.3	62.2	60.1	58.9	58.6	59.2	58.9	59.3	59.3	59.5	59.2
100000	59.7	60.4	61.4	62.6	62.0	60.7	59.4	58.7	59.2	59.3	59.6	59.5	59.5	59.4
110000	59.7	60.4	61.5	62.4	62.0	60.1	59.3	58.7	59.2	59.2	59.7	59.4	59.6	59.2
120000	59.8	60.5	61.8	62.8	62.0	60.3	59.3	59.3	59.6	59.3	59.6	59.6	59.7	59.2
130000	60.1	60.5	62.0	62.8	61.9	60.1	59.3	59.6	59.6	59.6	60.2	59.8	60.0	59.2
140000	60.6	60.5	62.2	63.1	62.2	60.3	59.6	59.7	59.6	59.7	60.2	59.8	60.5	59.6
150000	60.7	60.7	62.3	63.5	61.8	60.5	59.6	59.7	59.8	59.8	60.4	59.8	60.5	60.0
160000	60.7	61.1	62.3	64.0	61.8	60.4	59.6	60.0	59.7	59.7	60.4	59.8	60.9	59.9
170000	60.9	61.1	62.8	64.3	62.0	60.3	59.6	59.7	59.7	59.7	60.3	59.7	61.0	60.0
180000	60.8	61.2	62.6	64.1	61.8	60.3	59.7	59.8	59.7	59.7	60.0	59.8	61.0	60.1
190000	60.8	61.2	62.5	64.4	61.7	60.1	59.8	59.7	59.6	59.6	59.9	59.7	61.0	60.0
200000	60.9	61.3	62.6	64.2	61.6	60.2	59.6	59.7	59.6	59.5	59.9	59.6	60.7	59.8
210000	60.8	61.1	62.7	64.1	61.4	60.2	59.4	59.6	59.4	59.5	59.8	59.6	60.5	59.7
220000	60.7	61.0	62.6	64.1	61.3	59.9	59.4	59.5	59.3	59.4	59.6	59.6	60.4	59.7
230000	60.6	61.0	62.6	63.8	61.2	60.1	59.1	59.6	59.3	59.3	59.5	59.7	60.0	59.7
Daily Max	60.9	61.3	62.8	64.4	63.6	60.9	59.8	60.0	59.8	59.8	60.4	59.8	61.0	60.1
Daily Min	59.7	60.1	60.9	60.7	61.2	59.9	58.8	58.6	59.0	58.9	58.9	59.1	59.4	59.2
Average	60.4	60.6	61.8	62.6	62.1	60.4	59.4	59.2	59.4	59.3	59.6	59.5	60.1	59.6

McClure Powerhouse Tailrace - October 2013 Temperature Monitoring Data

Time	10/1/2013	10/2/2013	10/3/2013	10/4/2013	10/5/2013	10/6/2013	10/7/2013	10/8/2013	10/9/2013	10/10/2013	10/11/2013	10/12/2013	10/13/2013	10/14/2013	10/15/2013	10/16/2013	10/17/2013
HHMMSS																	
0	59.7	60.3	59.6	58.9	58.7	51.6	55.6	56.1	56.7	57.2	57.0	56.8	56.8	56.2	55.5	54.7	53.5
10000	59.6	60.2	59.6	58.9	58.8	52.9	55.7	56.0	56.6	57.1	56.9	56.7	56.8	56.0	55.4	55.0	53.5
20000	59.6	60.0	59.7	58.9	58.6	53.3	55.7	56.0	56.6	57.2	56.9	56.7	56.7	56.0	55.4	55.0	53.1
30000	59.5	60.0	59.3	58.7	58.7	53.2	55.6	56.0	56.7	57.1	56.9	56.7	56.5	55.9	55.4	54.9	53.2
40000	59.4	59.7	59.3	58.8	58.6	53.4	55.3	56.0	56.7	57.1	56.8	56.6	56.5	55.7	55.3	54.9	53.1
50000	59.5	59.6	59.3	58.9	58.6	54.6	55.2	55.8	56.6	57.0	56.8	56.6	56.5	55.8	55.2	54.6	52.9
60000	59.3	59.6	59.3	58.7	58.6	54.7	55.1	55.7	56.5	56.9	56.7	56.5	56.5	55.7	55.2	54.7	52.5
70000	59.5	59.4	59.2	58.7	58.5	55.0	54.8	55.8	56.5	56.9	56.6	56.6	56.4	55.6	55.2	54.3	52.8
80000	59.1	59.5	58.7	58.7	58.2	55.3	54.8	55.6	56.4	56.9	56.5	56.7	56.4	55.5	55.1	54.0	52.7
90000	59.1	59.4	58.9	58.8	58.0	55.0	54.9	55.6	56.6	56.9	56.4	56.7	56.3	55.4	55.1	53.7	52.2
100000	59.3	59.3	59.1	58.8	57.8	55.3	54.5	55.7	56.6	56.9	56.5	56.7	56.4	55.4	55.1	53.6	52.3
110000	59.3	59.1	59.1	58.6	57.6	55.3	55.9	55.8	56.6	56.9	56.4	56.7	56.3	55.4	55.0	53.4	52.7
120000	59.4	59.2	58.9	58.8	57.2	55.6	55.8	55.8	56.7	56.9	56.5	56.9	56.3	55.2	55.1	53.4	52.5
130000	59.7	59.5	59.1	58.9	57.1	54.9	56.1	56.2	56.8	57.2	56.8	57.0	56.4	55.5	55.0	53.4	52.7
140000	60.1	59.6	59.1	58.8	56.8	55.2	56.1	56.4	57.1	57.5	56.9	57.1	56.4	55.5	54.9	53.5	53.2
150000	60.5	60.0	59.0	58.9	56.9	55.3	56.5	56.7	57.4	57.6	57.1	57.0	56.5	55.6	54.9	53.7	53.6
160000	60.9	60.2	58.8	58.8	56.8	55.5	56.2	56.8	57.6	57.7	57.2	56.9	56.7	55.9	55.0	53.5	53.5
170000	61.1	60.3	58.9	59.0	56.9	55.6	56.2	56.9	57.8	57.6	57.2	56.7	56.8	55.9	54.8	53.8	53.7
180000	61.4	60.4	58.9	58.9	57.0	55.7	56.8	56.7	57.7	57.5	57.1	56.6	56.8	55.8	54.9	53.8	53.4
190000	61.2	60.1	59.0	58.8	56.8	56.1	56.7	56.7	57.4	57.4	57.1	56.8	56.7	55.9	55.1	53.7	53.4
200000	61.0	60.0	59.1	59.0	56.6	56.0	56.7	56.7	57.4	57.4	57.1	56.9	56.6	55.8	54.9	53.9	53.4
210000	60.7	59.8	58.9	58.9	55.4	55.8	56.5	56.7	57.3	57.3	56.9	56.9	56.5	55.7	54.7	53.6	53.3
220000	60.7	60.0	58.8	58.8	52.6	56.0	56.4	56.6	57.2	57.2	56.9	56.9	56.3	55.7	54.9	53.8	53.3
230000	60.4	59.8	58.8	58.8	51.2	55.8	56.2	56.6	57.2	57.1	56.8	56.9	56.4	55.5	55.0	53.5	53.3
Daily Max	61.4	60.4	59.7	59.0	58.8	56.1	56.8	56.9	57.8	57.7	57.2	57.1	56.8	56.2	55.5	55.0	53.7
Daily Min	59.1	59.1	58.7	58.6	51.2	51.6	54.5	55.6	56.4	56.9	56.4	56.5	56.3	55.2	54.7	53.4	52.2
Average	60.0	59.8	59.1	58.8	57.2	54.9	55.8	56.2	56.9	57.2	56.8	56.8	56.5	55.7	55.1	54.0	53.1

Monthly average temp (F): 52.5
License Maximum Monthly Average: 64 F

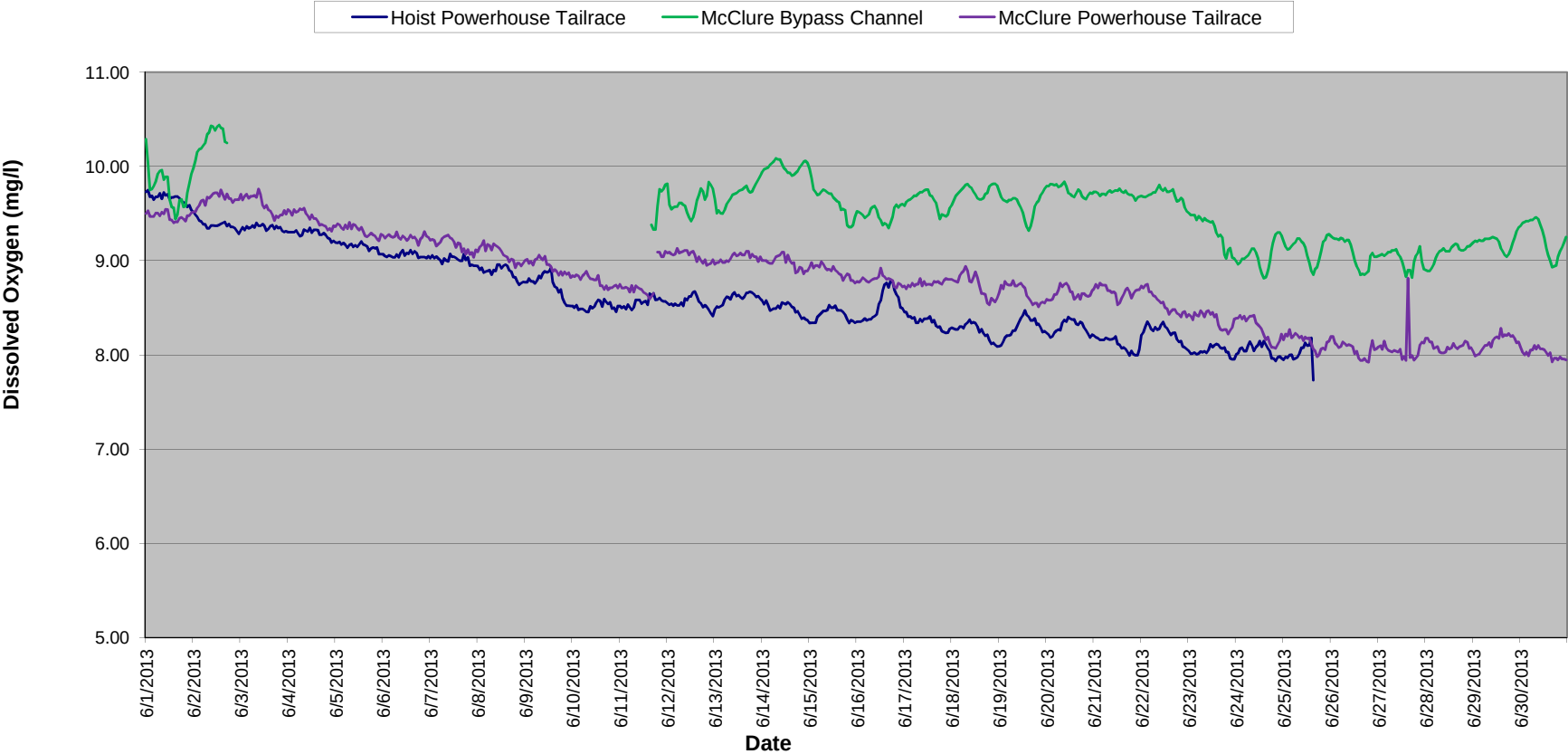
McClure Powerhouse Tailrace - October 2013 Temperature Monitoring Data

Time														
HHMMSS	10/18/2013	10/19/2013	10/20/2013	10/21/2013	10/22/2013	10/23/2013	10/24/2013	10/25/2013	10/26/2013	10/27/2013	10/28/2013	10/29/2013	10/30/2013	10/31/2013
0	53.0	52.3	52.0	51.4	49.5	47.3	46.6	46.4	46.2	44.6	45.3	44.1	43.2	44.5
10000	53.2	52.3	51.4	51.4	49.6	47.6	46.6	46.6	46.3	44.7	45.2	44.0	43.5	44.6
20000	53.0	52.1	51.8	50.9	49.6	48.0	46.9	46.7	46.1	44.6	44.8	43.9	43.3	44.7
30000	52.9	52.2	51.4	50.9	49.7	47.7	46.6	46.4	46.2	44.6	44.7	43.8	43.5	44.6
40000	53.3	52.1	51.3	50.6	49.2	47.7	46.4	46.6	46.1	44.7	44.6	44.0	43.6	44.8
50000	52.8	51.8	51.2	50.6	49.5	47.3	46.6	46.5	46.1	44.7	44.9	43.6	43.5	44.8
60000	52.8	51.6	51.2	50.4	49.4	47.4	46.6	46.5	46.1	44.7	44.5	43.7	43.6	44.7
70000	52.8	51.6	51.4	50.5	44.7	47.6	46.7	46.5	46.1	44.5	44.6	43.9	43.6	44.7
80000	52.9	51.7	51.3	50.3	41.8	47.4	46.6	46.3	46.0	44.9	44.7	43.8	43.5	44.8
90000	53.0	51.7	51.3	50.4	41.1	47.3	46.5	46.4	46.0	44.6	44.5	43.5	43.5	44.8
100000	53.0	51.6	51.0	50.6	49.3	46.7	46.6	46.2	45.8	44.5	44.4	43.7	43.6	44.8
110000	53.3	52.0	51.3	50.1	48.8	47.2	46.3	46.3	45.9	45.3	44.7	43.4	43.8	44.9
120000	52.7	52.3	51.4	50.5	48.6	47.0	46.5	46.3	45.8	45.4	44.2	43.4	44.0	45.0
130000	52.9	52.1	51.4	50.4	48.3	47.5	46.9	46.7	45.7	45.4	44.8	43.5	43.9	45.2
140000	52.7	52.3	51.5	50.5	47.8	47.6	46.8	46.4	45.7	45.6	44.6	43.4	44.0	45.2
150000	53.0	52.4	51.7	50.5	48.5	47.3	46.9	46.5	45.5	45.4	44.5	43.6	44.1	45.2
160000	53.1	52.5	51.7	50.2	47.9	47.6	47.2	46.6	45.6	45.4	44.7	43.9	44.1	45.2
170000	52.9	52.1	51.7	50.4	47.8	47.3	47.2	46.4	45.3	45.4	44.9	44.1	44.2	45.2
180000	52.8	52.3	51.9	50.4	47.7	47.2	47.2	46.6	45.2	45.4	44.7	43.8	44.3	45.1
190000	52.7	52.3	51.9	50.1	47.5	47.4	46.9	46.2	44.8	45.2	44.7	43.5	44.3	45.1
200000	52.5	52.1	51.6	49.9	47.1	46.8	47.0	46.2	44.4	45.4	44.4	43.5	44.3	45.1
210000	52.5	51.8	51.3	49.9	47.1	46.9	46.8	46.3	44.3	45.3	44.3	43.5	44.3	45.1
220000	52.4	51.9	51.4	50.1	46.9	47.2	46.9	46.0	44.4	45.3	44.4	43.4	44.3	45.2
230000	52.4	51.7	51.4	49.6	47.3	46.6	46.8	46.5	44.4	45.3	44.2	43.4	44.4	45.3
Daily Max	53.3	52.5	52.0	51.4	49.7	48.0	47.2	46.7	46.3	45.6	45.3	44.1	44.4	45.3
Daily Min	52.4	51.6	51.0	49.6	41.1	46.6	46.3	46.0	44.3	44.5	44.2	43.4	43.2	44.5
Average	52.9	52.0	51.5	50.4	47.7	47.3	46.8	46.4	45.6	45.0	44.6	43.7	43.9	44.9

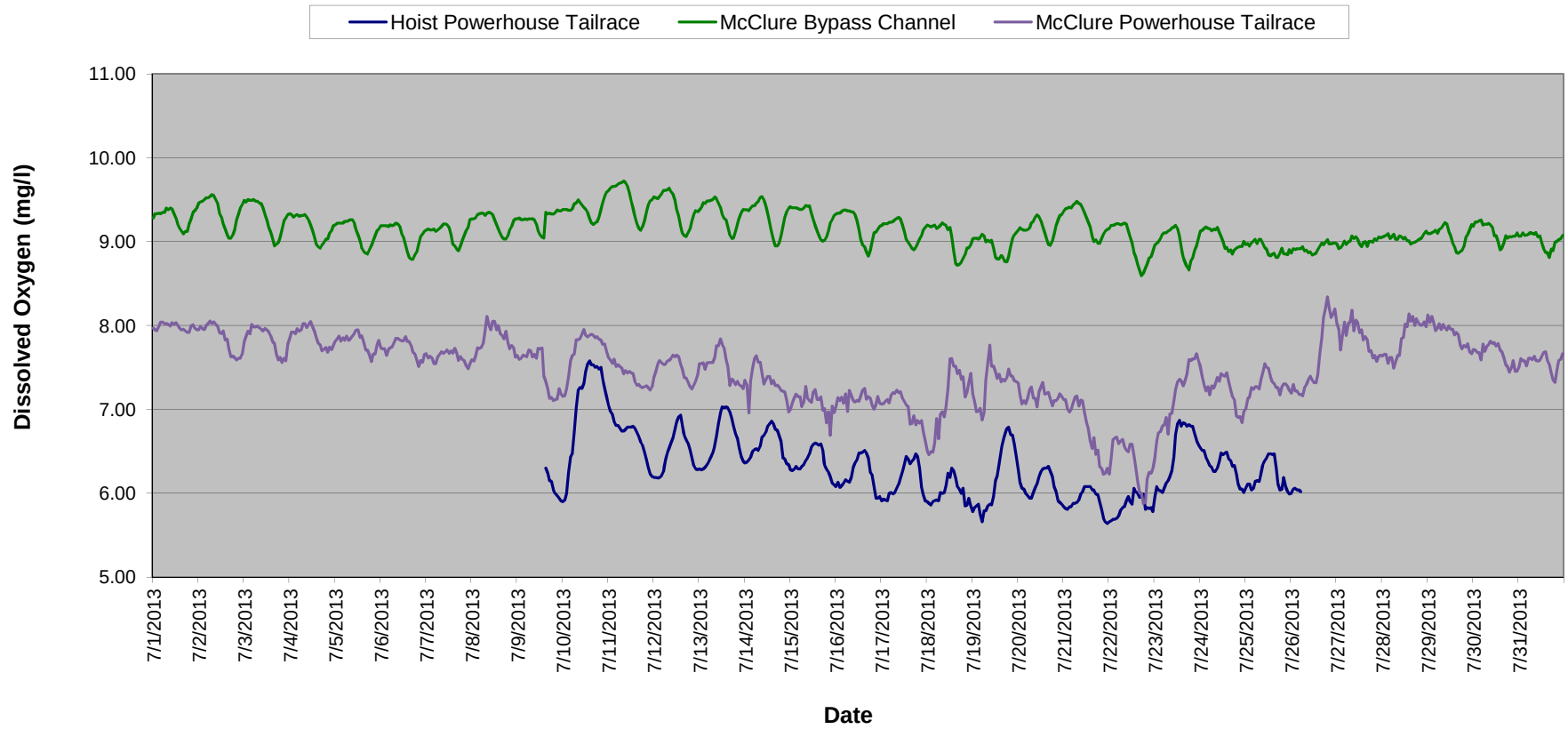
Dead River Water Quality Monitoring Data

Comparison of Hoist and McClure Developments

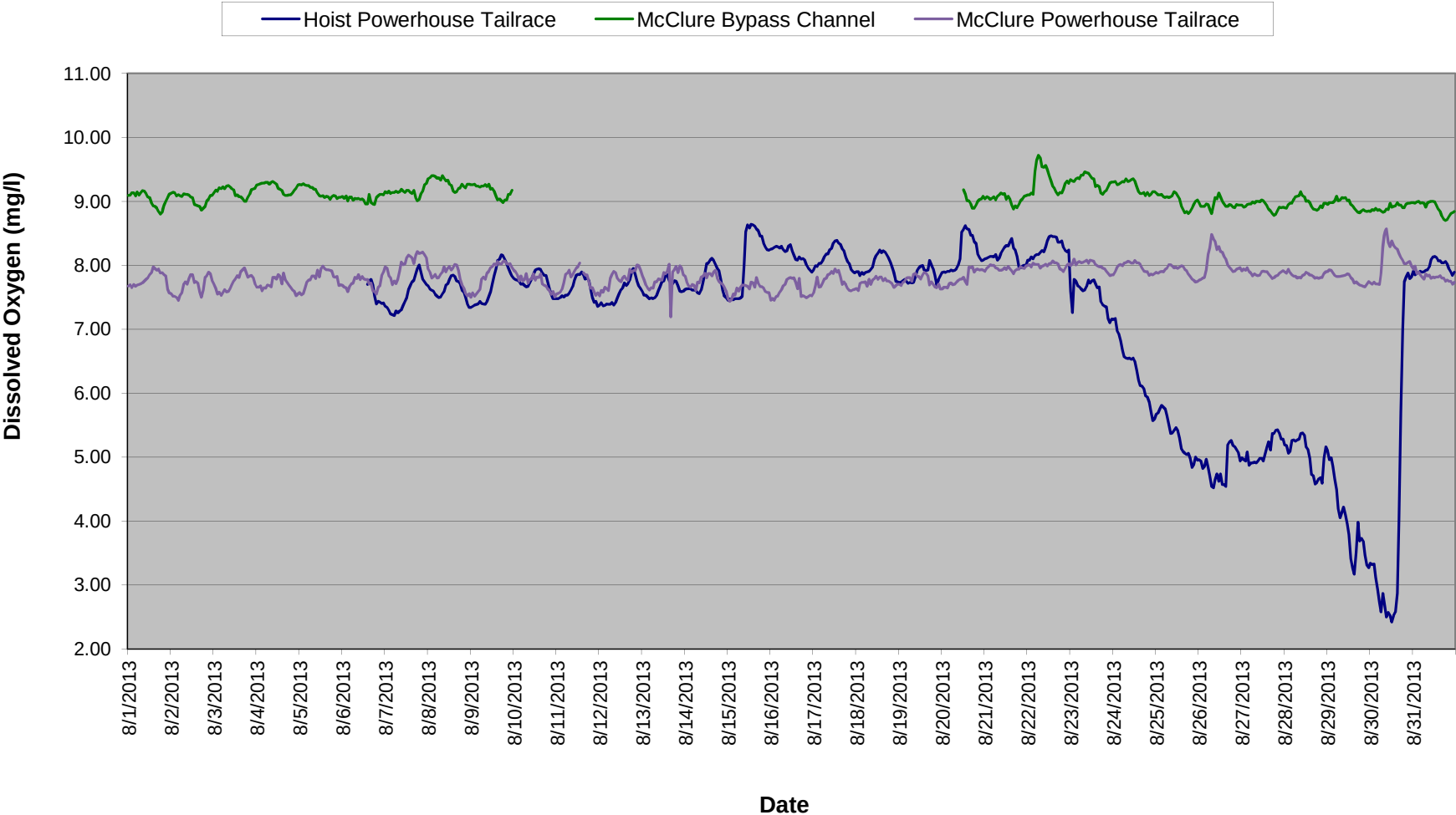
Dissolved Oxygen Comparison - Hoist Powerhouse Tailrace / McClure Bypass Channel
/ McClure Powerhouse Tailrace - June 2013



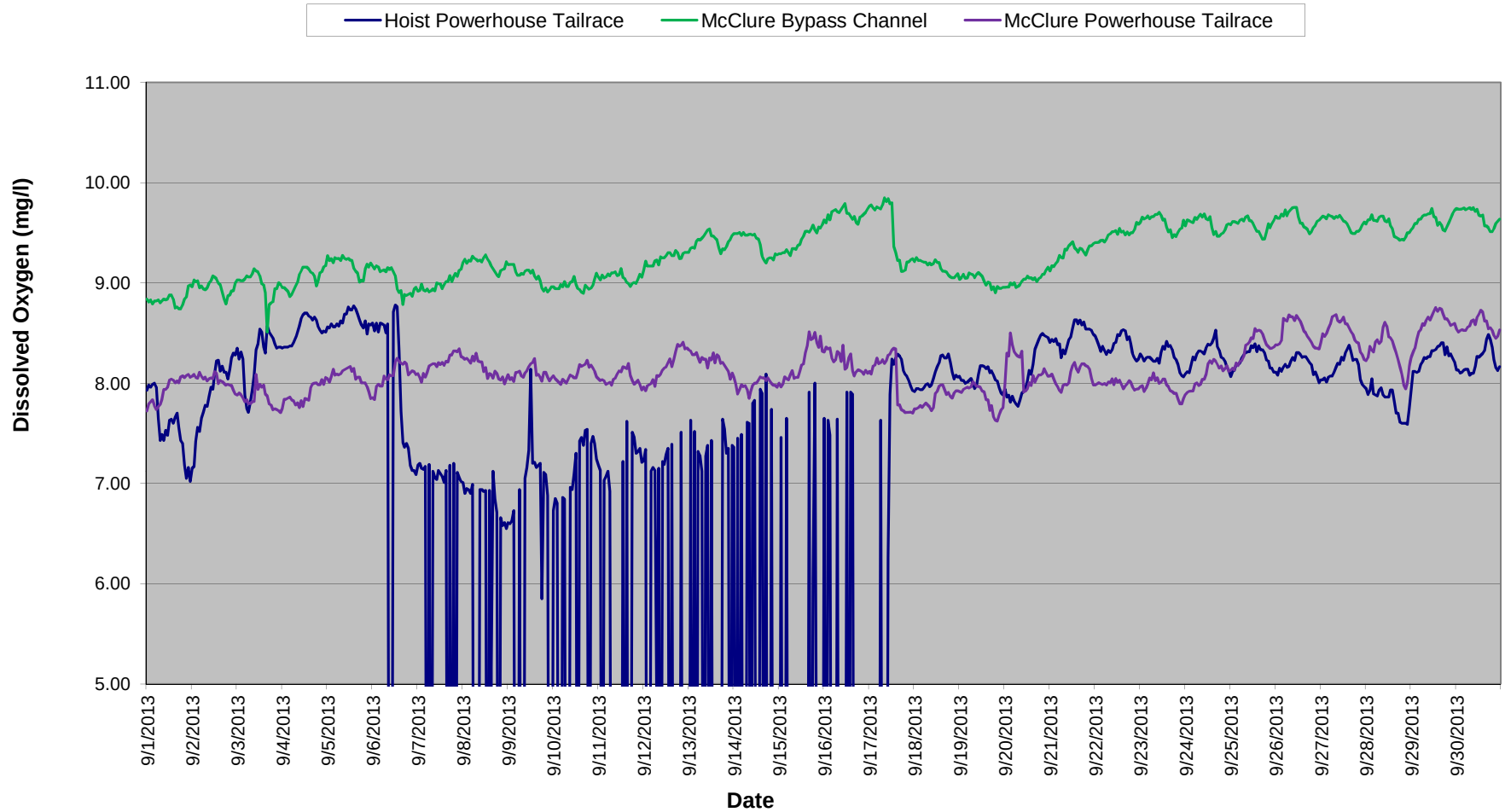
Dissolved Oxygen Comparison - Hoist Powerhouse Tailrace / McClure Bypass Channel
/ McClure Powerhouse Tailrace - July 2013



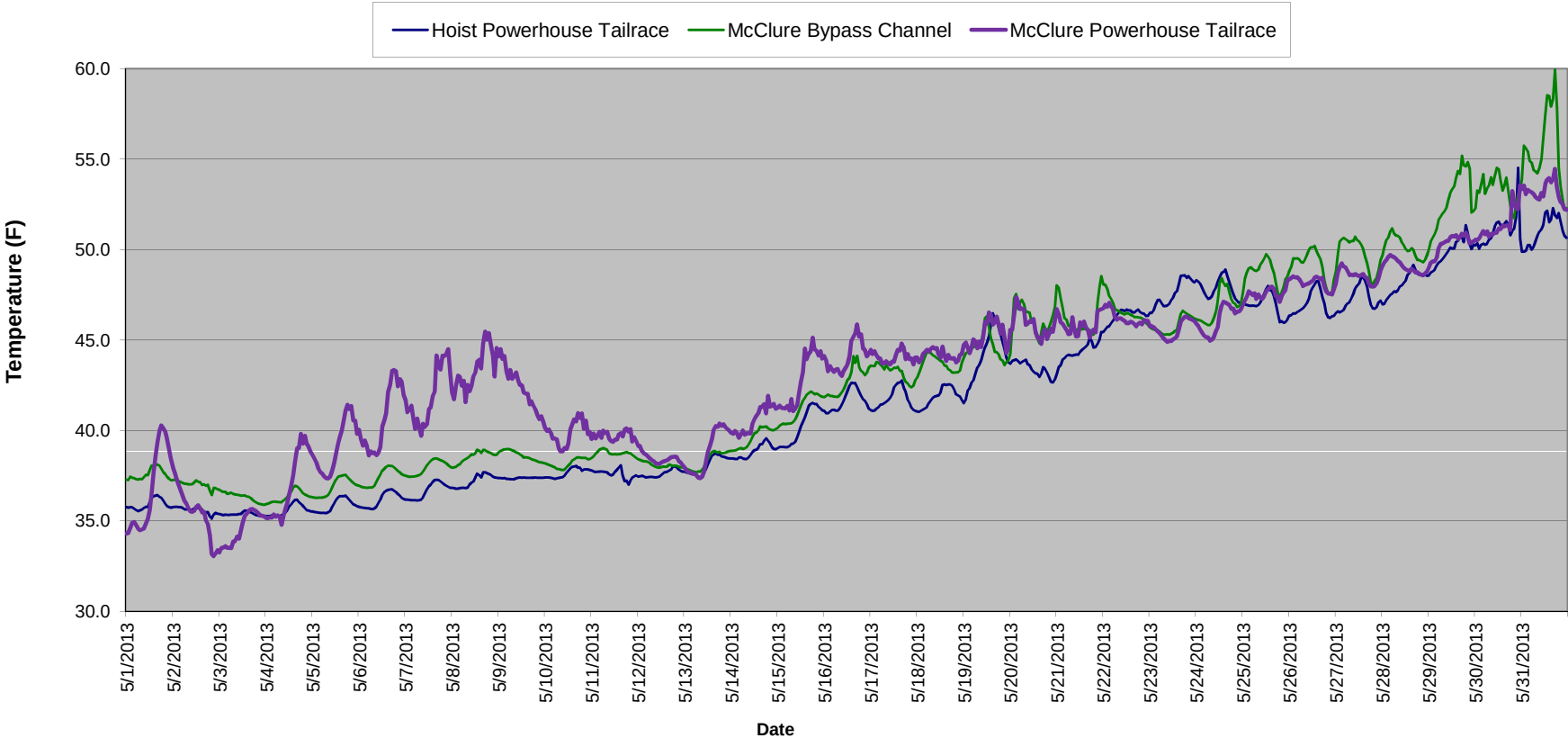
Dissolved Oxygen Comparison - Hoist Powerhouse Tailrace / McClure Bypass Channel
/ McClure Powerhouse Tailrace - August 2013



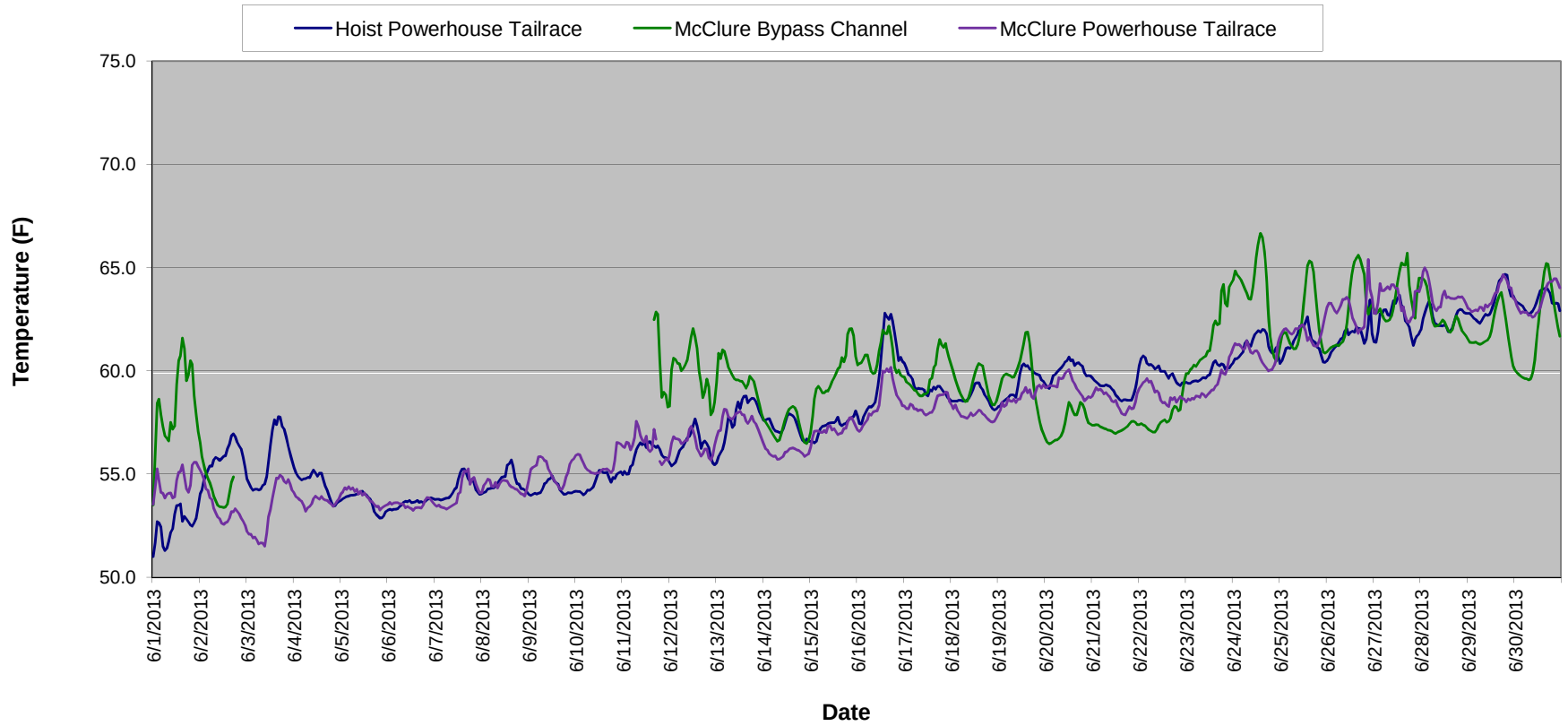
Dissolved Oxygen Comparison - Hoist Powerhouse Tailrace / McClure Bypass Channel
/ McClure Powerhouse Tailrace - September 2013



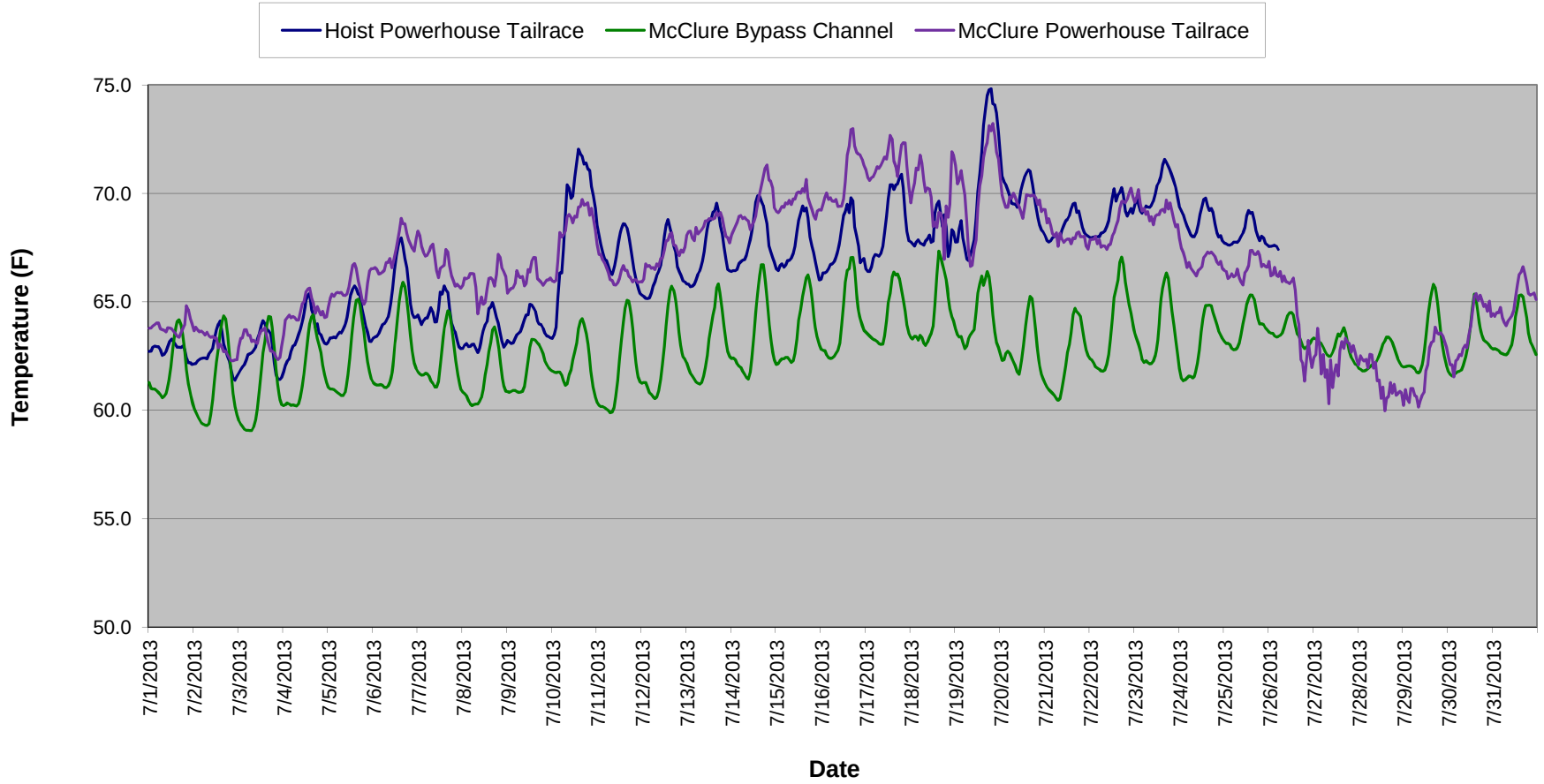
TemperatureComparison - Hoist Powerhouse Tailrace / McClure Bypass Channel
/ McClure Powerhouse Tailrace - May 2013

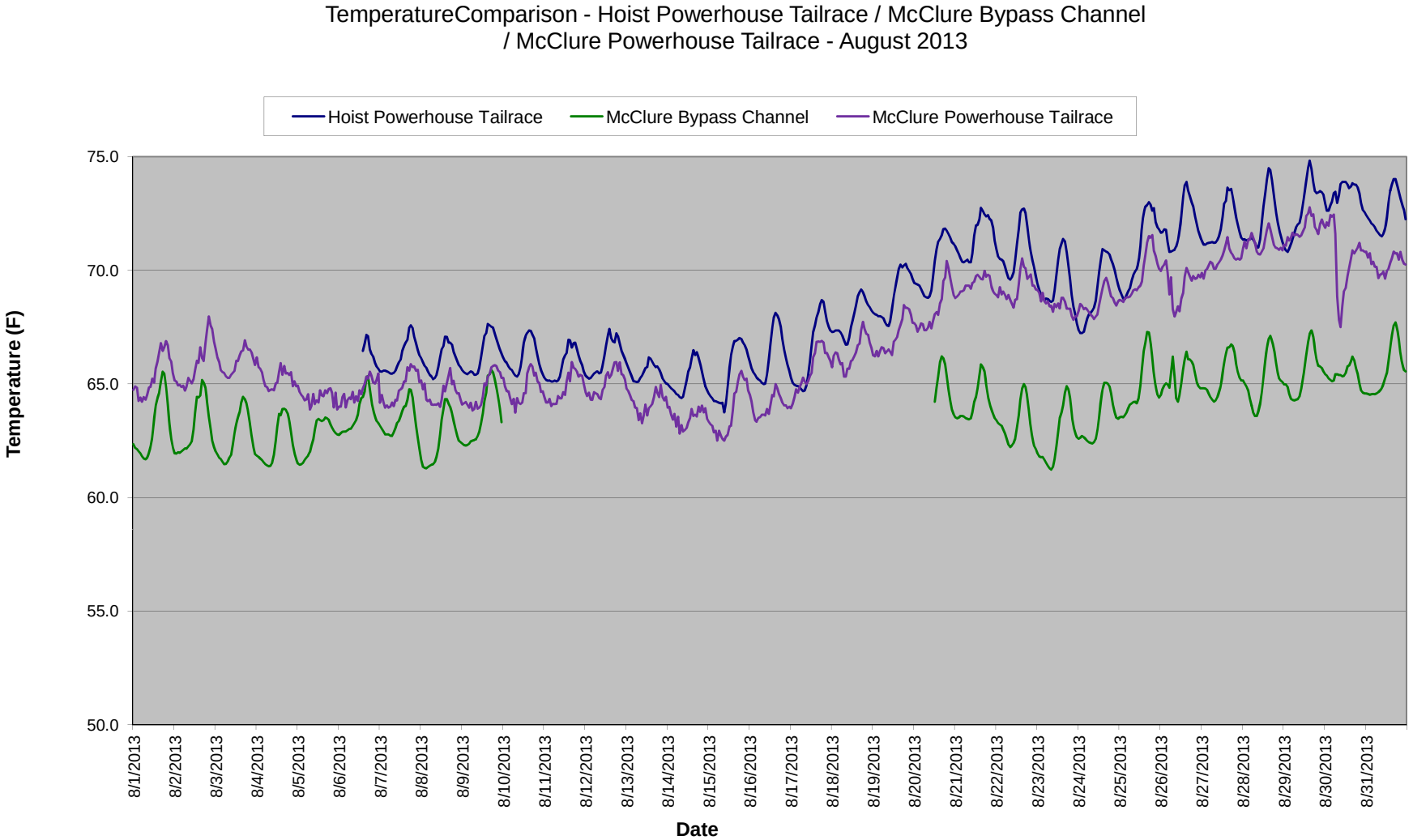


TemperatureComparison - Hoist Powerhouse Tailrace / McClure Bypass Channel
/ McClure Powerhouse Tailrace - June 2013

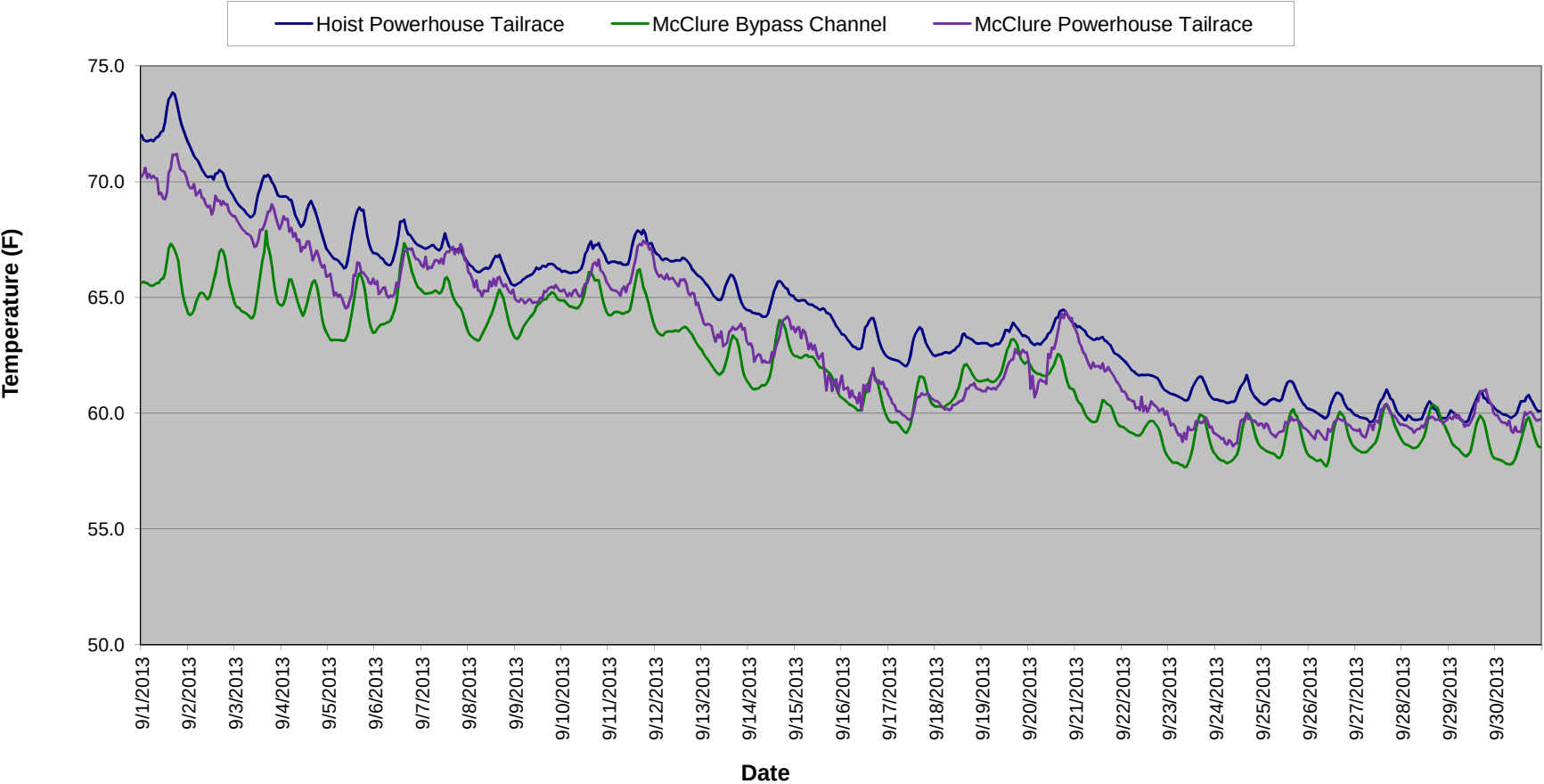


TemperatureComparison - Hoist Powerhouse Tailrace / McClure Bypass Channel
/ McClure Powerhouse Tailrace - July 2013

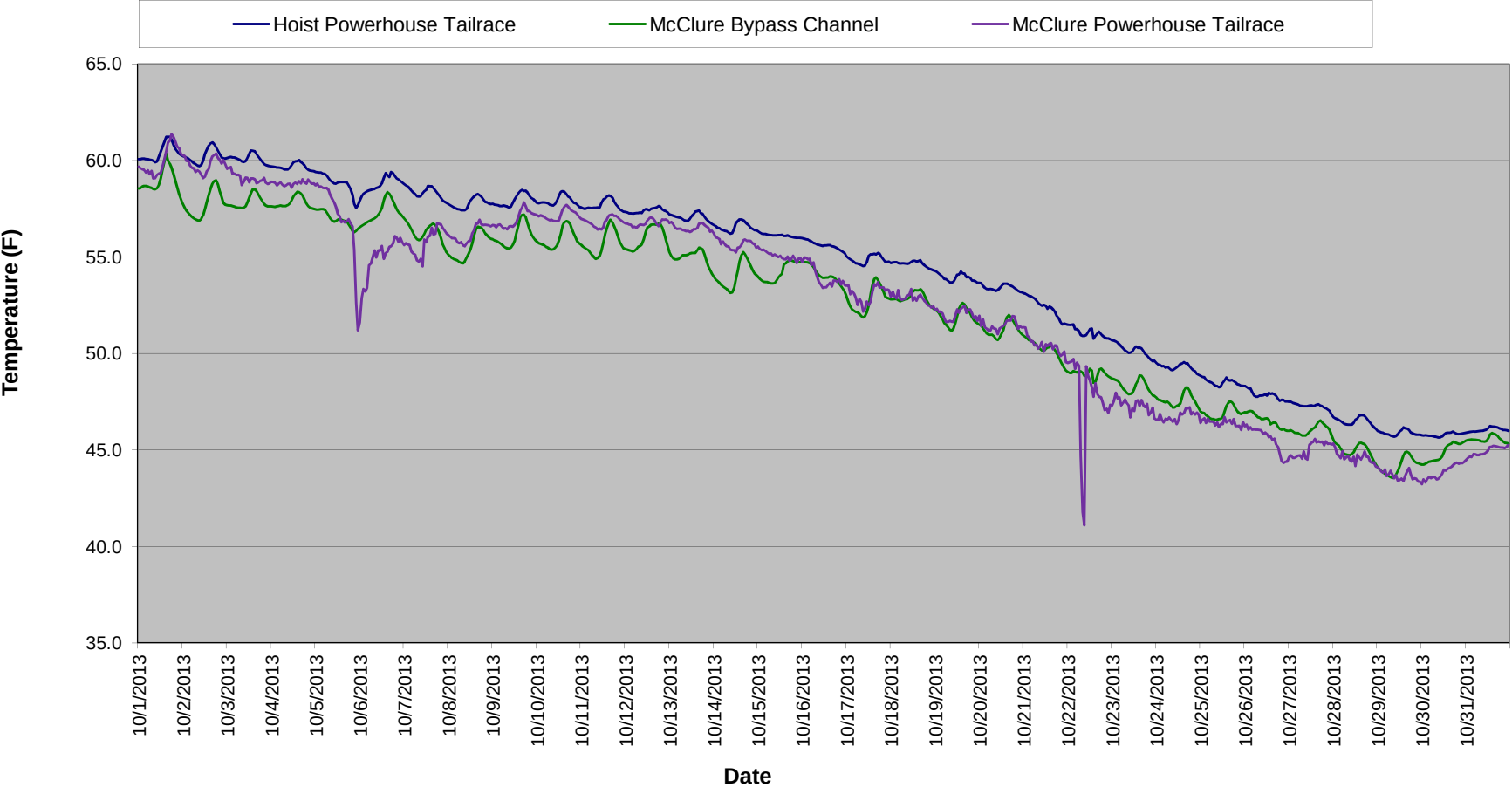




TemperatureComparison - Hoist Powerhouse Tailrace / McClure Bypass Channel
/ McClure Powerhouse Tailrace - September 2013



TemperatureComparison - Hoist Powerhouse Tailrace / McClure Bypass Channel
/ McClure Powerhouse Tailrace - October 2013



Appendix B

Dead River Hydroelectric Project

FERC Project No. 10855

2013 Dissolved Oxygen and Temperature Profile Data

Dead River (Hoist) Storage Basin
2013 Dissolved Oxygen and Temperature Profile Data

6/11/2013

Time: 16:15 EDT

Weather: Sunny, 73F, 5-10 mph wind

Secchi Disk - 6' 10"

Depth (meters)	DO mg/l	Temp °C	Temp °F
0.5	8.73	20.4	68.7
1.0	8.73	18.7	65.7
1.5	8.71	17.4	63.3
2.0	8.7	17.1	62.8
2.5	8.63	16.8	62.2
3.0	8.6	16.7	62.1
3.5	8.55	16.5	61.7
4.0	8.51	16.2	61.2
4.5	8.12	15	59.0
5.0	7.75	14.5	58.1
5.5	7.79	14.3	57.7
6.0	7.76	14.2	57.6
6.5	7.62	13.4	56.1
7.0	7.6	13.4	56.1
7.5	7.58	13.1	55.6
8.0	7.56	13.1	55.6
8.5	7.57	12.2	54.0
9.0	7.66	11.8	53.2
9.5	7.7	11.8	53.2
10.0	7.8	10.7	51.3
10.5	7.8	10.4	50.7
11.0	7.8	9.1	48.4
11.5	7.84	8.9	48.0
12.0	7.52	8.6	47.5
12.5	7.45	8	46.4
13.0	7.52	7.4	45.3

Comparison Readings - 2nd meter

0.5 m	8.83	19.9	102.3
13.0 m	7.21	65.3	8.8

6/25/2013

Time: 14:50 EST

Weather: Cloudy, 75°F, light winds

Secchi Disk - 7' 4"

Depth (m)	DO mg/l	Temp °C	Temp °F
0.5	8.83	22.7	72.9
1.0	8.81	21.7	71.1
1.5	7.91	20.0	68.0
2.0	7.67	19.2	66.6
2.5	7.63	18.9	66.0
3.0	7.57	18.4	65.1
3.5	7.02	17.7	63.9
4.0	6.97	17.2	63.0
4.5	6.45	16.4	61.5
5.0	6.31	16.1	61.0
5.5	6.12	15.5	59.9
6.0	5.93	15.2	59.4
6.5	5.92	15.1	59.2
7.0	5.93	15	59.0

Debris around intake prevented deeper readings

Comparison Readings - 2nd meter

0.5 m	8.07	23.1	73.6
7.0 m	5.28	15.7	60.3

7/9/2013

Time: 16:45 EDT

Weather: Overcast, breezy

Secchi Disk - 8'

Depth (m)	DO mg/l	Temp °C	Temp °F
0.5	7.96	23.6	74.5
1.0	7.84	23.8	74.8
1.5	7.83	23.8	74.8
2.0	7.79	23.8	74.8
2.5	7.77	23.9	75.0
3.0	7.76	23.9	75.0
3.5	7.73	23.8	74.8
4.0	6.28	21.7	71.1
4.5	4.88	20.1	68.2
5.0	4.76	19.6	67.3
5.5	4.49	19.1	66.4
6.0	4.43	18.3	64.9
6.5	4.42	18	64.4
7.0	4.44	17.9	64.2
7.5	4.43	17.5	63.5
8.0	4.04	16.9	62.4
8.5	3.75	16	60.8
9.0	3.71	15.8	60.4
9.5	3.58	15.3	59.5
10.0	3.54	14.9	58.8
10.5	3.52	14.8	58.6
11.0	3.53	14.8	58.6
11.5	3.53	14.8	58.6
12.0	3.53	14.8	58.6

Comparison Readings - 2nd meter

0.5 m	7.93	23.6	74.5
9.5 m	3.58	14.6	58.3

Dead River (Hoist) Storage Basin
2013 Dissolved Oxygen and Temperature Profile Data

7/23/2013

Time: 16:35 EDT

Weather: Sunny, 10-20 mph winds

Secchi Disk - 5' 10"

Depth (m)	DO mg/l	Temp °C	Temp °F
0.5	7.69	22.8	73.0
1.0	7.61	23.0	73.4
1.5	7.57	23.1	73.6
2.0	7.54	23.1	73.6
2.5	7.51	23.2	73.8
3.0	7.51	23.2	73.8
3.5	7.49	23.2	73.8
4.0	7.48	23.3	73.9
4.5	7.46	23.3	73.9
5.0	7.44	23.3	73.9
5.5	7.44	23.3	73.9
6.0	7.39	23.3	73.9
6.5	7.10	23.0	73.4
7.0	6.97	22.8	73.0
7.5	6.89	22.6	72.7
8.0	6.81	22.5	72.5
8.5	2.82	19.1	66.4
9.0	1.99	17.6	63.7
9.5	1.74	17.2	63.0
10.0	1.58	16.1	61.0
10.5	1.92	14.5	58.1
11.0	2.31	12.9	55.2

Comparison Readings - 2nd meter

0.5 m	7.68	22.9	73.2
11 m	2.27	13.2	55.8

8/6/2013

Time: 16:15

Weather: Cloudy, 5-10 mph winds

Secchi Disk - 7' 6"

Depth (m)	DO mg/l	Temp °C	Temp °F
0.5	7.87	20.2	68.4
1.0	7.88	20.1	68.2
1.5	7.88	20.1	68.2
2.0	7.87	20	68.0
2.5	7.85	20	68.0
3.0	7.82	20	68.0
3.5	7.82	20	68.0
4.0	7.81	19.9	67.8
4.5	7.8	19.9	67.8
5.0	7.78	19.9	67.8
5.5	7.76	19.9	67.8
6.0	7.75	19.9	67.8
6.5	7.76	19.9	67.8
7.0	7.75	19.9	67.8
7.5	7.69	19.8	67.6
8.0	4.04	18.2	64.8
8.5	4	18.1	64.6
9.0	3.61	17.6	63.7
9.5	2.87	17.3	63.1
10.0	1.03	16.2	61.2
10.5	0.63	14.9	58.8
11.0	0.69	13.9	57.0

Comparison Readings - 2nd meter

0.5 m	7.85	20.4	68.7
11 m	0.7	14.2	57.6

8/20/2013

Time: 13:00

Weather: Mostly sunny, 75F, 10-15 mph winds

Secchi Disk - 8' 7"

Depth (m)	DO mg/l	Temp °C	Temp °F
0.5	8.14	22.1	71.8
1.0	8.20	21.9	71.4
1.5	8.27	21.9	71.4
2.0	8.30	21.8	71.2
2.5	8.34	21.8	71.2
3.0	8.31	21.8	71.2
3.5	8.24	21.7	71.1
4.0	8.16	21.4	70.5
4.5	8.16	21.3	70.3
5.0	7.73	20.5	68.9
5.5	7.39	20.1	68.2
6.0	7.03	19.3	66.7
6.5	6.75	19.0	66.2
7.0	6.60	18.8	65.8
7.5	6.40	18.7	65.7
8.0	6.06	18.5	65.3
8.5	5.10	18.1	64.6
9.0	4.85	18.0	64.4
9.5	4.44	17.8	64.0
10.0	2.42	17.0	62.6
10.5	0.33	15.8	60.4

Comparison Readings - 2nd meter

0.5 m	8.19	22.3	72.1
10.5 m	0.34	15.9	60.6

Dead River (Hoist) Storage Basin
2013 Dissolved Oxygen and Temperature Profile Data

9/3/2013

Time: 17:15 EDT

Weather: Partly Cloudy, 66F

Secchi Disk - 7' 6"

Depth (m)	DO mg/l	Temp °C	Temp °F
0.5	8.22	21.9	71.4
1.0	8.22	22.0	71.6
1.5	8.2	22.0	71.6
2.0	8.18	22.0	71.6
2.5	8.17	22.0	71.6
3.0	8.11	21.9	71.4
3.5	8.09	21.9	71.4
4.0	8.05	21.9	71.4
4.5	8.06	21.8	71.2
5.0	8.02	21.8	71.2
5.5	8	21.8	71.2
6.0	7.97	21.8	71.2
6.5	7.92	21.7	71.1
7.0	7.93	21.7	71.1
7.5	7.93	21.7	71.1
8.0	7.63	21.5	70.7
8.5	7.12	21.2	70.2
9.0	6.87	20.9	69.6
9.5	3.57	18.8	65.8
10.0	3.35	18.4	65.1
10.5	3.22	18.3	64.9
11.0	3.25	18.3	64.9

Comparison Readings - 2nd meter

0.5 m	8.17	21.7	71.1
11 m	3.17	17.9	64.2

9/17/2013

Time: 13:40 EDT

Weather: Sunny, 60-65F, 5-10 mph wind

Secchi Disk - 6'

Depth (m)	DO mg/l	Temp °C	Temp °F
0.5	7.90	17.7	63.9
1.0	7.88	17.7	63.9
1.5	7.85	17.6	63.7
2.0	7.82	17.6	63.7
2.5	7.81	17.6	63.7
3.0	7.79	17.6	63.7
3.5	7.79	17.6	63.7
4.0	7.78	17.5	63.5
4.5	7.78	17.5	63.5
5.0	7.76	17.5	63.5
5.5	7.73	17.5	63.5
6.0	7.72	17.5	63.5
6.5	7.71	17.5	63.5
7.0	7.70	17.5	63.5
7.5	7.71	17.5	63.5
8.0	7.71	17.5	63.5
8.5	7.71	17.5	63.5
9.0	7.70	17.5	63.5
9.5	7.69	17.5	63.5
10.0	7.68	17.5	63.5
10.5	7.65	17.5	63.5

Comparison Readings - 2nd meter

0.5 m	7.85	17.9	64.2
9.5 m	7.59	17.7	63.9

McClure Storage Basin
2013 Dissolved Oxygen and Temperature Profile Data

6/11/2013

Time: 15:17 EDT

Weather: Sunny, 73°F, light wind

Secchi Disk - 6' 4"

Depth (meters)	DO mg/l	Temp °C	Temp °F
0.5	9.34	16.3	61.3
1.0	9.16	15.9	60.6
1.5	8.64	14.4	57.9
2.0	8.5	13.8	56.8
2.5	8.47	13.6	56.5
3.0	8.42	13.3	55.9
3.5	8.43	13.1	55.6
4.0	8.43	13	55.4
4.5	8.45	13	55.4
5.0	8.44	12.9	55.2
5.5	8.42	12.7	54.9
6.0	8.42	12.6	54.7
6.5	8.46	12.5	54.5
7.0	8.35	12.2	54.0
7.5	8.24	12	53.6
8.0	7.93	11.6	52.9
8.5	7.95	9.9	49.8

6/25/2013

Time: 17:15 EDT

Weather: Clear, light wind

Secchi Disk - 6.5 ft

Depth (meters)	DO mg/l	Temp °C	Temp °F
0.5	7.27	18.9	66.0
1.0	7.32	17.7	63.9
1.5	7.31	17.5	63.5
2.0	7.31	17.1	62.8
2.5	7.31	16.8	62.2
3.0	7.28	16.5	61.7
3.5	7.28	16.3	61.3
4.0	7.27	16.2	61.2
4.5	7.23	16.0	60.8
5.0	7.22	15.9	60.6
5.5	7.19	15.7	60.3
6.0	7.10	15.5	59.9
6.5	7.05	15.4	59.7
7.0	6.87	15.1	59.2
7.5	5.78	13.6	56.5
8.0	6.38	11.0	51.8
8.5	6.19	10.3	50.5

7/9/2013

Time: 16:05 EDT

Weather: Overcast, Breezy

Secchi Disk - 7' 6"

Depth (meters)	DO mg/l	Temp °C	Temp °F
0.5	7.10	22.4	72.3
1.0	6.29	20.5	68.9
1.5	6.22	20.1	68.2
2.0	6.14	19.6	67.3
2.5	5.99	19.2	66.6
3.0	5.95	18.9	66.0
3.5	5.89	18.5	65.3
4.0	5.90	18.5	65.3
4.5	5.90	18.3	64.9
5.0	5.88	18.1	64.6
5.5	5.85	17.9	64.2
6.0	5.79	17.5	63.5
6.5	5.60	17.2	63.0
7.0	5.21	16.9	62.4
7.5	4.43	16.0	60.8
8.0	4.15	15.0	59.0
8.5	4.11	12.5	54.5

Comparison Readings - 2nd meter

0.5 m	9.36	16.4	61.5
8.5 m	7.88	10.3	50.5

Comparison Readings - 2nd meter

0.5 m	7.12	32.0
8.5 m	5.91	32.0

Comparison Readings - 2nd meter

0.5 m	7.11	22.4	72.3
8.5 m	4.56	10.9	51.6

McClure Storage Basin
2013 Dissolved Oxygen and Temperature Profile Data

7/23/2013

Time: 15:45 EDT

Weather: Sunny, 10-20 mph winds

Secchi Disk - 5' 10"

Depth (meters)	DO mg/l	Temp °C	Temp °F
0.5	8.38	21.8	71.2
1.0	8.33	22.1	71.8
1.5	8.31	22.1	71.8
2.0	8.28	22.2	72.0
2.5	8.26	22.2	72.0
3.0	8.24	22.2	72.0
3.5	8.21	22.3	72.1
4.0	7.27	21.5	70.7
4.5	7.20	21.4	70.5
5.0	7.15	21.4	70.5
5.5	5.83	21.0	69.8
6.0	4.83	20.0	68.0
6.5	3.55	18.4	65.1
7.0	2.75	17.3	63.1
7.5	2.25	16.0	60.8
8.0	2.67	14.1	57.4

8/6/2013

Time: 15:10 EDT

Weather: Cloudy, 5-10 mph wind, 72F

Secchi Disk - 6' 7"

Depth (meters)	DO mg/l	Temp °C	Temp °F
0.5	8.20	20.4	68.7
1.0	8.13	20.1	68.2
1.5	7.97	19.9	67.8
2.0	7.79	19.6	67.3
2.5	7.74	19.4	66.9
3.0	7.70	19.4	66.9
3.5	7.69	19.3	66.7
4.0	6.89	19.2	66.6
4.5	6.32	18.9	66.0
5.0	5.89	18.7	65.7
5.5	5.65	18.5	65.3
6.0	5.55	18.4	65.1
6.5	5.26	18.3	64.9
7.0	4.63	17.9	64.2
7.5	2.72	17.0	62.6
8.0	1.13	15.4	59.7
8.5	1.90	13.5	56.3

8/20/2013

Time: 12:10 EDT

Weather: Sunny, 75F, winds 5-10 mph

Secchi Disk - 7' 4"

Depth (meters)	DO mg/l	Temp °C	Temp °F
0.5	8.78	22.6	72.7
1.0	8.78	22.5	72.5
1.5	8.58	21.8	71.2
2.0	8.55	21.5	70.7
2.5	8.47	21.4	70.5
3.0	7.84	19.9	67.8
3.5	7.53	19.4	66.9
4.0	7.26	19	66.2
4.5	7.1	18.6	65.5
5.0	6.94	18.5	65.3
5.5	6.73	18.3	64.9
6.0	6.57	18.1	64.6
6.5	6.38	17.9	64.2
7.0	6.06	17.7	63.9
7.5	1.98	16.5	61.7
8.0	0.79	14.8	58.6
8.5	1.69	13.2	55.8

Comparison Readings - 2nd meter

0.5 m	8.39	21.9	71.4
8.0 m	2.59	14.2	57.6

Comparison Readings - 2nd meter

0.5 m	8.2	20.5	68.9
8.5 m	1.96	13.6	56.5

Comparison Readings - 2nd meter

0.5 m	8.82	22.8	73.0
8.5 m	1.68	13.5	56.3

McClure Storage Basin
2013 Dissolved Oxygen and Temperature Profile Data

9/3/2013

Time: 18:00 EDT

Weather: Partly cloudy, 66F

Secchi Disk - 8' 6"

Depth (m)	DO mg/l	Temp °C	Temp °F
0.5	7.88	22.4	72
1.0	7.83	22.5	73
1.5	7.80	22.5	73
2.0	7.63	22.2	72
2.5	7.61	22.0	72
3.0	7.59	22.0	72
3.5	7.49	21.9	71
4.0	7.42	21.5	71
4.5	7.41	21.3	70
5.0	7.32	21.2	70
5.5	7.29	21.1	70
6.0	7.29	21.0	70
6.5	7.25	21.0	70
7.0	4.20	19.5	67
7.5	3.00	18.2	65
8.0	0.66	16.0	61
8.5	0.91	14.4	58

Comparison Readings - 2nd meter

0.5 m	7.83	22.2	72.0
8.5 m	1.25	13.8	56.8

9/17/2013

Time: 12:45 EDT

Weather: Sunny, 60F, 5-10 mph winds

Secchi Disk - 6'

Depth (m)	DO mg/l	Temp °C	Temp °F
0.5	7.38	17.1	63
1.0	7.29	17.1	63
1.5	7.25	17.1	63
2.0	7.24	17.1	63
2.5	7.23	17.1	63
3.0	7.20	17.1	63
3.5	7.18	17.1	63
4.0	7.16	17.1	63
4.5	7.14	17.1	63
5.0	7.13	17.1	63
5.5	7.09	17.1	63
6.0	7.07	17.1	63
6.5	7.06	17.1	63
7.0	6.89	17.0	63
7.5	6.89	17.0	63
8.0	6.87	17.0	63
8.5	0.74	14.8	59

Comparison Readings - 2nd meter

0.5 m	7.36	17.1	63
8.5 m	0.75	15.1	59

Appendix C

Dead River Hydroelectric Project

FERC Project No. 10855

2013 Water Quality Monitoring Quality Assurance Data

Field Notes for Datasonde Deployment

Date/Time: 4/24/13 12:15 Analyst: mcuLocation: AAO Bridge Datasonde Serial #: 43730**Calibration Information**Datasonde Battery [volts]: 12.0

pH (s.u.)	Before Cal.	After Cal.
7.00 Std	_____	_____
10.00 Std	_____	_____

Conductivity (mS/cm)	Before Cal.	After Cal.	Zero Conductivity Calibration
_____ Std	_____	_____	Before _____ After _____

Barometric Pressure (mm Hg) _____

Dissolved Oxygen	Before Calibration	After Calibration
% Saturation	_____	_____
mg/L D.O.	_____	_____
Temp - °C	_____	_____

DO Handheld Meter Calibration - DO Meter Model _____

	Before Calibration	After Calibration	
% Saturation	_____	_____	Post Calibration Slope = _____
mg/L D.O.	_____	_____	
Temp - °C	_____	_____	

Create File for Test Program _____

Test Program Readings

	Datasonde	YSI Meter	(Must be within 0.5 mg/L D.O.)
% Saturation	_____	_____	
mg/L D.O.	_____	_____	
Temp - °C	_____	_____	

Create File for Datasonde _____ Remove calibration cup, Replace with weight _____

Re-calibration required if outside 0.5 mg/l limit

	Before Cal.	After Cal.	Datasonde	YSI
% Saturation	_____	_____	_____	_____
mg/L D.O.	_____	_____	_____	_____
Temp - °C	_____	_____	_____	_____

Check File StatusFile Start 4/24/13 13:00 File End 5/14/13Battery Life % @ Start: ✓ Battery Life % @ End: ~Notes: Temperature only. Deploying for 2013 monitoring season

Field Notes for Datasonde Deployment

Date/Time: 4/29/13 12:18 Analyst: MW4Location: Hois Datasonde Serial #: 4768**Calibration Information**Datasonde Battery [volts]: 12.2

pH (s.u.)	Before Cal.	After Cal.
7.00 Std	_____	_____
10.00 Std	_____	_____

Conductivity (mS/cm)	Before Cal.	After Cal.	Zero Conductivity Calibration
_____ Std	_____	_____	Before _____ After _____

Barometric Pressure (mm Hg) _____

Dissolved Oxygen	Before Calibration	After Calibration
% Saturation	_____	_____
mg/L D.O.	_____	_____
Temp - °C	_____	_____

DO Handheld Meter Calibration - DO Meter Model _____

	Before Calibration	After Calibration	
% Saturation	_____	_____	Post Calibration Slope = _____
mg/L D.O.	_____	_____	
Temp - °C	_____	_____	

Create File for Test Program _____

Test Program Readings

	Datasonde	YSI Meter	(Must be within 0.5 mg/L D.O.)
% Saturation	_____	_____	
mg/L D.O.	_____	_____	
Temp - °C	_____	_____	

Create File for Datasonde _____ Remove calibration cup, Replace with weight _____

Re-calibration required if outside 0.5 mg/l limit

	Before Cal.	After Cal.	Datasonde	YSI
% Saturation	_____	_____	_____	_____
mg/L D.O.	_____	_____	_____	_____
Temp - °C	_____	_____	_____	_____

Check File StatusFile Start 4/29/13 @ 15:00 File End 5/14/13Battery Life % @ Start: 98 Battery Life % @ End: 61Notes: Temp only. Deploying for 2013 Monitoring Season

Field Notes for Datasonde Deployment

Date/Time: 4/29/13 Analyst: WGMLocation: LS+I Datasonde Serial #: 47163**Calibration Information**Datasonde Battery [volts]: 12.2

pH (s.u.)	Before Cal.	After Cal.
7.00 Std	_____	_____
10.00 Std	_____	_____

Conductivity (mS/cm)	Before Cal.	After Cal.	Zero Conductivity Calibration
_____ Std	_____	_____	Before _____ After _____

Barometric Pressure (mm Hg) _____

Dissolved Oxygen Before Calibration After Calibration

% Saturation _____

mg/L D.O. _____

Temp - °C _____

DO Handheld Meter Calibration - DO Meter Model _____

	<u>Before Calibration</u>	<u>After Calibration</u>
% Saturation	_____	_____
mg/L D.O.	_____	_____
Temp - °C	_____	_____

Post Calibration Slope = _____

Create File for Test Program _____

Test Program Readings

	Datasonde	YSI Meter	(Must be within 0.5 mg/L D.O.)
% Saturation	_____	_____	
mg/L D.O.	_____	_____	
Temp - °C	_____	_____	

Create File for Datasonde _____ Remove calibration cup, Replace with weight _____

Re-calibration required if outside 0.5 mg/l limit

	Before Cal.	After Cal.	Datasonde	YSI
% Saturation	_____	_____	_____	_____
mg/L D.O.	_____	_____	_____	_____
Temp - °C	_____	_____	_____	_____

Check File StatusFile Start 4/29 @ 15:00 File End 5/14/13 @ 23:59Battery Life % @ Start: 100 Battery Life % @ End: 64Notes: Temp only. Deploying for 2013 monitoring season

Field Notes for Datasonde Deployment

Date/Time: 4/29/13 12:30 Analyst: MW4Location: McCure Datasonde Serial #: 60582**Calibration Information**Datasonde Battery [volts]: 12.2

pH (s.u.)	Before Cal.	After Cal.
7.00 Std	<u> </u>	<u> </u>
10.00 Std	<u> </u>	<u> </u>

Conductivity (mS/cm)	Before Cal.	After Cal.	Zero Conductivity Calibration
<u> </u> Std	<u> </u>	<u> </u>	Before <u> </u> After <u> </u>

Barometric Pressure (mm Hg)

Dissolved Oxygen	Before Calibration	After Calibration
% Saturation	<u> </u>	<u> </u>
mg/L D.O.	<u> </u>	<u> </u>
Temp - °C	<u> </u>	<u> </u>

DO Handheld Meter Calibration - DO Meter Model

	Before Calibration	After Calibration	
% Saturation	<u> </u>	<u> </u>	Post Calibration Slope = <u> </u>
mg/L D.O.	<u> </u>	<u> </u>	
Temp - °C	<u> </u>	<u> </u>	

Create File for Test Program **Test Program Readings**

	Datasonde	YSI Meter	(Must be within 0.5 mg/L D.O.)
% Saturation	<u> </u>	<u> </u>	
mg/L D.O.	<u> </u>	<u> </u>	
Temp - °C	<u> </u>	<u> </u>	

Create File for Datasonde Remove calibration cup, Replace with weight **Re-calibration required if outside 0.5 mg/l limit**

	Before Cal.	After Cal.	Datasonde	YSI
% Saturation	<u> </u>	<u> </u>	<u> </u>	<u> </u>
mg/L D.O.	<u> </u>	<u> </u>	<u> </u>	<u> </u>
Temp - °C	<u> </u>	<u> </u>	<u> </u>	<u> </u>

Check File StatusFile Start 4/29 @ 15:00 File End 5/14/13 22:59Battery Life % @ Start: 100 Battery Life % @ End: 64Notes: Temp only. Deploying for 2013 monitoring season.

Field Notes for Datasonde Deployment

Date/Time: 5/14/13 Analyst: MW4Location: AAO Bridge Datasonde Serial #: 43705**Calibration Information**Datasonde Battery [volts]: 12.3

pH (s.u.)	Before Cal.	After Cal.
7.00 Std	_____	_____
10.00 Std	_____	_____

Conductivity (mS/cm)	Before Cal.	After Cal.	Zero Conductivity Calibration
_____ Std	_____	_____	Before _____ After _____

Barometric Pressure (mm Hg) _____

Dissolved Oxygen	<u>Before Calibration</u>	<u>After Calibration</u>
% Saturation	_____	_____
mg/L D.O.	_____	_____
Temp – °C	_____	_____

Temp only

DO Handheld Meter Calibration - DO Meter Model _____

	<u>Before Calibration</u>	<u>After Calibration</u>	
% Saturation	_____	_____	Post Calibration Slope = _____
mg/L D.O.	_____	_____	
Temp – °C	_____	_____	

Create File for Test Program _____

Test Program Readings

	Datasonde	YSI Meter	(Must be within 0.5 mg/L D.O.)
% Saturation	_____	_____	
mg/L D.O.	_____	_____	
Temp – °C	_____	_____	

Create File for Datasonde _____ Remove calibration cup, Replace with weight _____

Re-calibration required if outside 0.5 mg/l limit

	Before Cal.	After Cal.	Datasonde	YSI
% Saturation	_____	_____	_____	_____
mg/L D.O.	_____	_____	_____	_____
Temp – °C	_____	_____	_____	_____

Check File StatusFile Start 5/14/13 @ 12:00File End 5/28/13 23:59Battery Life % @ Start: 100Battery Life % @ End: 66

Notes: _____

Temps range from 1.8 to 3.8°C

Temp only. Data OK

Temp. only

Data OK. Temps b/w $1 + 6^{\circ}\text{C}$

Field Notes for Datasonde Deployment

Date/Time: May 28, 2013 11:45 EDT Analyst: JDLocation: AAC Bridge Datasonde Serial #: 47168

Calibration Information

Datasonde Battery [volts]: 12.1v

pH (s.u.)	Before Cal.	After Cal.
7.00 Std	<u>6.99</u>	<u>7.03</u>
10.00 Std	<u>10.11</u>	<u>10.08</u>

@ 17.54°C

Conductivity (mS/cm)	Before Cal.	After Cal.	Zero Conductivity Calibration
<u>0.305</u> Std	<u>0.298</u>	<u>0.305</u>	Before <u>0.0000</u> After <u>0.0000</u>

Barometric Pressure (mm Hg) 718 mm Hg

Dissolved Oxygen	Before Calibration	After Calibration
% Saturation	<u>110.4%</u>	<u>100.4%</u>
mg/L D.O.	<u>9.17 mg/L</u>	<u>9.38 mg/L</u>
Temp - °C	<u>15.91°C</u>	<u>15.89°C</u>

DO Handheld Meter Calibration - DO Meter Model HQ300 #1

	Before Calibration	After Calibration
% Saturation	<u>94.7%</u>	<u>100.0%</u>
mg/L D.O.	<u>8.70 mg/L</u>	<u>9.20 mg/L</u>
Temp - °C	<u>16.6°C</u>	<u>16.6°C</u>

New D.O. probe Cap 8/27/13

Post Calibration Slope = 100.8%Create File for Test Program ☒

6:12:10 E: 12:22

Test Program Readings

	Datasonde
% Saturation	<u>94.6%</u>
mg/L D.O.	<u>9.82 mg/L</u>
Temp - °C	<u>11.14°C</u>

	YSI Meter	(Must be within 0.5 mg/L D.O.)
% Saturation	<u>93.8%</u>	
mg/L D.O.	<u>9.71 mg/L</u>	
Temp - °C	<u>11.2°C</u>	

Create File for Datasonde ☒Remove calibration cup, Replace with weight ☒

Re-calibration required if outside 0.5 mg/l limit

	Before Cal.	After Cal.	Datasonde	YSI
% Saturation	<u>Deploy</u>			
mg/L D.O.				
Temp - °C				

Check File Status

File Start 5/28/13File End 6/11/13Battery Life % @ Start: 94%Battery Life % @ End: 27%

Notes: _____

Field Notes for Datasonde Deployment

Date/Time: May 28, 2013 12:10 Analyst: TRLocation: McClure Tailwater Datasonde Serial #: 60582

Calibration Information

Datasonde Battery [volts]: 12.2x

pH (s.u.) Before Cal. After Cal. New pH ref. solution 5/25/13
 7.00 Std 5.37 7.03
 10.00 Std 10.13 10.08 @ 17.34°C

Conductivity (mS/cm) Before Cal. After Cal. Zero Conductivity Calibration
0.305 Std 0.234 0.305 Before 0.0000 After 0.0000

Barometric Pressure (mm Hg) 718 mm Hg

Dissolved Oxygen Before Calibration After Calibration
 % Saturation _____
 mg/L D.O. 0 ppm _____
 Temp - °C _____

DO Handheld Meter Calibration - DO Meter Model Hg302 #1 - New D.O. Probe Cap on 5/28/13

Before Calibration After Calibration
 % Saturation 94.7% 100.0%
 mg/L D.O. 8.70 mg/L 9.20 mg/L Post Calibration Slope = 100.8%
 Temp - °C 16.6°C 16.6

Create File for Test Program ☒

S: 12:26 E: 12:48

Test Program Readings

Datasonde YSI Meter (Must be within 0.5 mg/L D.O.)
 % Saturation 103.7% 93.9%
 mg/L D.O. 9.56 mg/L 9.71 mg/L
 Temp - °C 11.24°C 11.3°C

Create File for Datasonde ☒Remove calibration cup, Replace with weight ☒

Re-calibration required if outside 0.5 mg/l limit

Before Cal. After Cal. Datasonde YSI
 % Saturation _____
 mg/L D.O. Deploy _____
 Temp - °C _____

Check File Status

File Start 5/28/13 @ 15:00File End 6/11/13 @ 17:00Battery Life % @ Start: 96%Battery Life % @ End: 29%

Notes: _____

Field Notes for Datasonde Deployment

Date/Time: May 28, 2013 12:35 Analyst: TALocation: Hoist Tailwater Datasonde Serial #: 47167

Calibration Information

Datasonde Battery [volts]: 12.1v

pH (s.u.)	Before Cal.	After Cal.	
7.00 Std	<u>6.89</u>	<u>7.03</u>	
10.00 Std	<u>9.97</u>	<u>10.08</u>	@ <u>17.19°C</u>

Conductivity (mS/cm)	Before Cal.	After Cal.	Zero Conductivity Calibration
<u>0.305</u> Std	<u>0.285</u>	<u>0.305</u>	Before <u>0.0000</u> After <u>0.0000</u>

Barometric Pressure (mm Hg) 718 mm Hg

Dissolved Oxygen	Before Calibration	After Calibration
% Saturation	<u>114.2%</u>	<u>100.0%</u>
mg/L D.O.	<u>9.30 mg/L</u>	<u>9.14 mg/L</u>
Temp - °C	<u>16.96°C</u>	<u>16.94°C</u>

DO Handheld Meter Calibration - DO Meter Model HQ 300 #1 - New D.O. Probe Cap on 5/28/13

	Before Calibration	After Calibration	
% Saturation	<u>94.7%</u>	<u>100.0%</u>	
mg/L D.O.	<u>8.70 mg/L</u>	<u>9.20 mg/L</u>	
Temp - °C	<u>16.6°C</u>	<u>16.6°C</u>	

Post Calibration Slope = 100.8%

Create File for Test Program ✓ 5:12:47 E:13:02

Test Program Readings

	Datasonde	YSI Meter	(Must be within 0.5 mg/L D.O.)
% Saturation	<u>94.8%</u>	<u>93.8%</u>	
mg/L D.O.	<u>9.81 mg/L</u>	<u>9.69 mg/L</u>	
Temp - °C	<u>11.26°C</u>	<u>11.3°C</u>	

Create File for Datasonde ✓ Remove calibration cup, Replace with weight ✓

Re-calibration required if outside 0.5 mg/l limit

	Before Cal.	After Cal.	Datasonde	YSI
% Saturation	<u>Dep to Y</u>	<u>Dep to Y</u>	<u>Dep to Y</u>	<u>Dep to Y</u>
mg/L D.O.	<u>Dep to Y</u>	<u>Dep to Y</u>	<u>Dep to Y</u>	<u>Dep to Y</u>
Temp - °C	<u>Dep to Y</u>	<u>Dep to Y</u>	<u>Dep to Y</u>	<u>Dep to Y</u>

Check File Status

File Start 5/28/13 @ 15:00 File End 6/11/13 @ 17:00Battery Life % @ Start: 96% Battery Life % @ End: 29%

Notes: _____

Field Notes for Datasonde Deployment

Date/Time: May 28, 2013 12:55 Analyst: HALocation: L5 + I Trestle Datasonde Serial #: 60591

Calibration Information

Datasonde Battery [volts]: 12.4v

pH (s.u.)	Before Cal.	After Cal.
7.00 Std	<u>6.34</u>	<u>7.03</u>
10.00 Std	<u>10.51</u>	<u>10.08</u>

@ 17.06°C

Conductivity (mS/cm)	Before Cal.	After Cal.	Zero Conductivity Calibration
<u>0.305</u> Std	<u>0.297</u>	<u>0.305</u>	Before <u>0.0000</u> After <u>0.0000</u>

Barometric Pressure (mm Hg) 718 mm Hg

Dissolved Oxygen	Before Calibration	After Calibration
% Saturation	<u>113.6%</u>	<u>100.0%</u>
mg/L D.O.	<u>10.58 mg/L</u>	<u>9.19 mg/L</u>
Temp - °C	<u>16.57°C</u>	<u>16.66°C</u>

DO Handheld Meter Calibration - DO Meter Model HQ30D #1 - New D.O. Probe cap on 5/28/13

	Before Calibration	After Calibration
% Saturation	<u>94.7%</u>	<u>100.0%</u>
mg/L D.O.	<u>8.70 mg/L</u>	<u>9.20 mg/L</u>
Temp - °C	<u>16.6°C</u>	<u>16.6°C</u>

Post Calibration Slope = 100.8%Create File for Test Program ☒

S: 13:05

E: 13:17

Test Program Readings

	Datasonde	YSI Meter	(Must be within 0.5 mg/L D.O.)
% Saturation	<u>92.4%</u>	<u>93.6%</u>	
mg/L D.O.	<u>9.55 mg/L</u>	<u>9.70 mg/L</u>	
Temp - °C	<u>11.35°C</u>	<u>11.4°C</u>	

Create File for Datasonde ☒Remove calibration cup, Replace with weight ☒

Re-calibration required if outside 0.5 mg/l limit

	Before Cal.	After Cal.	Datasonde	YSI
% Saturation	<u>Deploy</u>			
mg/L D.O.				
Temp - °C				

Check File Status

File Start 5/28/13 15:00File End 6/11/13 17:00Battery Life % @ Start: 100%Battery Life % @ End: 33%Notes: _____

Field Notes for Datasonde Deployment

Date/Time: 6/11/13 12:30 EST Analyst: MMHLocation: AAO Bridge Datasonde Serial #: 47162**Calibration Information**Datasonde Battery [volts]: 12.2

pH (s.u.)	Before Cal.	After Cal.
7.00 Std	<u>~</u>	<u>~</u>
10.00 Std	<u>~</u>	<u>~</u>

Conductivity (mS/cm)	Before Cal.	After Cal.	Zero Conductivity Calibration
<u>0.299</u> Std	<u>0.294</u>	<u>0.299</u>	Before <u>0.0000</u> After <u>0.0001</u>

Barometric Pressure (mm Hg) 742 719.5

Dissolved Oxygen	Before Calibration	After Calibration
% Saturation	<u>92.9</u>	<u>100.1</u>
mg/L D.O.	<u>7.78</u>	<u>8.16</u>
Temp - °C	<u>22.2260</u>	<u>22.71</u>

DO Handheld Meter Calibration - DO Meter Model HQ30d - 15m cable

	Before Calibration	After Calibration	
% Saturation	<u>94.8</u>	<u>100.0</u>	
mg/L D.O.	<u>8.03</u>	<u>8.46</u>	Post Calibration Slope = <u>99.9</u>
Temp - °C	<u>22.4</u>	<u>22.4</u>	

Create File for Test Program ✓ 12:40 - 12:50**Test Program Readings**

	Datasonde	YSI Meter	(Must be within 0.5 mg/L D.O.)
% Saturation	<u>96.5</u>	<u>94.9</u>	
mg/L D.O.	<u>8.86</u>	<u>8.71</u>	OK - Deploy
Temp - °C	<u>16.79</u>	<u>16.9</u>	

Create File for Datasonde ✓ Remove calibration cup, Replace with weight ✓**Re-calibration required if outside 0.5 mg/l limit**

	Before Cal.	After Cal.	Datasonde	YSI
% Saturation	<u> </u>	<u> </u>	<u> </u>	<u> </u>
mg/L D.O.	<u> </u>	<u> </u>	<u> </u>	<u> </u>
Temp - °C	<u> </u>	<u> </u>	<u> </u>	<u> </u>

Check File StatusFile Start 6/11/13 14:00 File End 6/25/13Battery Life % @ Start: 100 Battery Life % @ End: 48

Notes: _____

Field Notes for Datasonde Deployment

Date/Time: 6/11/13 12:40 EST Analyst: MWMLocation: Harst Datasonde Serial #: 42485**Calibration Information**Datasonde Battery [volts]: 12.4

pH (s.u.)	Before Cal.	After Cal.
7.00 Std	<u> </u>	<u> </u>
10.00 Std	<u> </u>	<u> </u>

Conductivity (mS/cm)	Before Cal.	After Cal.	Zero Conductivity Calibration
<u>0.299</u> Std	<u>0.293</u>	<u> </u>	Before <u>0.0018</u> After <u>0.0000</u>

Barometric Pressure (mm Hg) 720

Dissolved Oxygen	Before Calibration	After Calibration
% Saturation	<u>96.9</u>	<u>100.2</u>
mg/L D.O.	<u>8.31</u>	<u>8.13</u>
Temp - °C	<u>23.02</u>	<u>23.06</u>

DO Handheld Meter Calibration - DO Meter Model

	Before Calibration	After Calibration	
% Saturation	<u> </u>	<u> </u>	
mg/L D.O.	<u> </u>	<u> </u>	Post Calibration Slope = <u> </u>
Temp - °C	<u> </u>	<u> </u>	

Create File for Test Program ☒ 12:48 - 12:58**Test Program Readings**

	Datasonde	YSI Meter	(Must be within 0.5 mg/L D.O.)
% Saturation	<u>95.8</u>	<u>95.0</u>	
mg/L D.O.	<u>8.78</u>	<u>8.71</u>	<u>OK - Deploy</u>
Temp - °C	<u>16.88</u>	<u>17.0</u>	

Create File for Datasonde Remove calibration cup, Replace with weight ☒**Re-calibration required if outside 0.5 mg/l limit**

	Before Cal.	After Cal.	Datasonde	YSI
% Saturation	<u> </u>	<u> </u>	<u> </u>	<u> </u>
mg/L D.O.	<u> </u>	<u> </u>	<u> </u>	<u> </u>
Temp - °C	<u> </u>	<u> </u>	<u> </u>	<u> </u>

Check File StatusFile Start 6/11/13 14:00 File End 6/25 23:59Battery Life % @ Start: 100 Battery Life % @ End: 49Notes: Cal'd @ AAG Deployed @ 14:55 EST

Field Notes for Datasonde Deployment

Date/Time: 6/11/13 12:50 Analyst: MGMLocation: LS47 Datasonde Serial #: 47171**Calibration Information**Datasonde Battery [volts]: 12.5

pH (s.u.)	Before Cal.	After Cal.
7.00 Std	<u> </u>	<u> </u>
10.00 Std	<u> </u>	<u> </u>

Conductivity (mS/cm)	Before Cal.	After Cal.	Zero Conductivity Calibration
<u>0.299</u> Std	<u>0.297</u>	<u> </u>	Before <u>0.0019</u> After <u>0.0000</u>

Barometric Pressure (mm Hg) 720

Dissolved Oxygen	Before Calibration	After Calibration
% Saturation	<u>93.5</u>	<u>99.9</u>
mg/L D.O.	<u>7.80</u>	<u>8.02</u>
Temp - °C	<u>23.48</u>	<u>23.55</u>

DO Handheld Meter Calibration - DO Meter Model

	Before Calibration	After Calibration	
% Saturation	<u> </u>	<u> </u>	
mg/L D.O.	<u> </u>	<u> </u>	Post Calibration Slope = <u> </u>
Temp - °C	<u> </u>	<u> </u>	

Create File for Test Program ✓13:00 - 13:10**Test Program Readings**

	Datasonde	YSI Meter	(Must be within 0.5 mg/L D.O.)
% Saturation	<u>95.2</u>	<u>94.7</u>	
mg/L D.O.	<u>8.73</u>	<u>8.68</u>	OK - Deploy
Temp - °C	<u>16.88</u>	<u>17.0</u>	

Create File for Datasonde ✓Remove calibration cup, Replace with weight **Re-calibration required if outside 0.5 mg/l limit**

	Before Cal.	After Cal.	Datasonde	YSI
% Saturation	<u> </u>	<u> </u>	<u> </u>	<u> </u>
mg/L D.O.	<u> </u>	<u> </u>	<u> </u>	<u> </u>
Temp - °C	<u> </u>	<u> </u>	<u> </u>	<u> </u>

Check File StatusFile Start 6/11/13 14:00File End 6/25 23:59Battery Life % @ Start: 100Battery Life % @ End: 49Notes: Cal'd @ AA0 Deployed @ 15:25 EST

Field Notes for Datasonde Deployment

Date/Time: 6/11/13 13:20 Analyst: AWMLocation: McClure Datasonde Serial #: 43731**Calibration Information**Datasonde Battery [volts]: 12.1

pH (s.u.)	Before Cal.	After Cal.
7.00 Std	<u> </u>	<u> </u>
10.00 Std	<u> </u>	<u> </u>

Conductivity (mS/cm)	Before Cal.	After Cal.	Zero Conductivity Calibration

<u>0.299</u> Std	<u>0.293</u>	<u> </u>	Before <u>10025</u> After <u> </u>

Barometric Pressure (mm Hg) 720

Dissolved Oxygen	Before Calibration	After Calibration
% Saturation	<u>98.2</u>	<u>100.4</u>
mg/L D.O.	<u>8.40</u>	<u>8.30</u>
Temp - °C	<u>22.04</u>	<u>22.01</u>

DO Handheld Meter Calibration - DO Meter Model

	Before Calibration	After Calibration	
% Saturation	<u>98.2</u>	<u> </u>	Post Calibration Slope = <u> </u>
mg/L D.O.	<u>8.4</u>	<u> </u>	
Temp - °C	<u> </u>	<u> </u>	

Create File for Test Program ☒

13:30 - 13:40

Test Program Readings

	Datasonde	YSI Meter	(Must be within 0.5 mg/L D.O.)
% Saturation	<u>95.3</u>	<u>17.7</u>	<u>94.8</u>
mg/L D.O.	<u>8.35</u>	<u>8.61</u>	<u> </u>
Temp - °C	<u>16.77</u>	<u>17.1</u>	<u> </u>

OK - Deploy

Create File for Datasonde ☒Remove calibration cup, Replace with weight **Re-calibration required if outside 0.5 mg/l limit**

	Before Cal.	After Cal.	Datasonde	YSI
% Saturation	<u> </u>	<u> </u>	<u> </u>	<u> </u>
mg/L D.O.	<u> </u>	<u> </u>	<u> </u>	<u> </u>
Temp - °C	<u> </u>	<u> </u>	<u> </u>	<u> </u>

Check File StatusFile Start 6/11/13 15:00File End 6/25/13 23:59Battery Life % @ Start: 100Battery Life % @ End: 49Notes: Calibrated @ AAO

Field Notes for Datasonde Post Calibration

Date/Time: Aug 6/11/13 13:10 EST Analyst: new

Location: _____ Datasonde Serial #: 47168

Ending Datasonde Battery [volts]: 10.4

Calibration Information

pH (s.u.):	<u>Observed</u>
7.00 Std.	<u>-</u>
10.00 Std.	<u>-</u>

Conductivity (mS/cm): 0.299 Std. Conc. 0.321 Observed
0.0030 Zero Observed, In Air

Barometric Pressure (mm Hg) 720

<u>Dissolved Oxygen</u>	<u>Before Calibrate</u>	<u>After Calibrate</u>
% Saturation	<u>103.5</u>	<u>79.7</u>
mg/L D.O.	<u>8.90</u>	<u>8.63</u>
Temp - °C	<u>19.71</u>	<u>19.70</u>

Notes:

Date OK. All D.O. > 8 mg/L

Field Notes for Datasonde Post Calibration

Date/Time: 6/11/13 Analyst: MWM

Location: Hoist Tail Datasonde Serial #: 47167

Ending Datasonde Battery [volts]: 18.4

Calibration Information

pH (s.u.):	<u>Observed</u>
7.00 Std.	<u>-</u>
10.00 Std.	<u>-</u>

Conductivity (mS/cm): 0.299 Std. Conc. 0.303 Observed
- Zero Observed, In Air

Barometric Pressure (mm Hg) 724

<u>Dissolved Oxygen</u>	<u>Before Calibrate</u>	<u>After Calibrate</u>
% Saturation	<u>102.7</u>	<u>99.9</u>
mg/L D.O.	<u>8.39</u>	<u>8.22</u>
Temp - °C	<u>22.54</u>	<u>22.58</u>

Notes:

Data OK - all above 9 ug/L

Field Notes for Datasonde Post Calibration

Date/Time: 6/11/13 15:50 EST Analyst: MMW

Location: LS4D Datasonde Serial #: 60591

Ending Datasonde Battery [volts]: _____

Calibration Information

pH (s.u.):	<u>Observed</u>
7.00 Std.	_____
10.00 Std.	_____

Conductivity (mS/cm): _____ Std. Conc. _____ Observed
 _____ Zero Observed, In Air

Barometric Pressure (mm Hg) _____

<u>Dissolved Oxygen</u>	<u>Before Calibrate</u>	<u>After Calibrate</u>
% Saturation	_____	_____
mg/L D.O.	_____	_____
Temp - °C	_____	_____

Notes:

would not connect in field

replaced batteries, No connection.

6/12/13 - was able to get probe to communicate. Equipment failed

on 6/2/13. Missing data between 6/2 @ 17:00 + 6/11 @ 16:00

when a replacement sonde was deployed.

Field Notes for Datasonde Post CalibrationDate/Time: 6/11/13 18:45 Analyst: MWALocation: McClure Datasonde Serial #: 60582Ending Datasonde Battery [volts]: 10.4**Calibration Information**

pH (s.u.):	<u>Observed</u>
7.00 Std.	<u>—</u>
10.00 Std.	<u>—</u>

Conductivity (mS/cm): 0.299 Std. Conc. 0.309 Observed
— Zero Observed, In Air

Barometric Pressure (mm Hg) 735.5

<u>Dissolved Oxygen</u>	<u>Before Calibrate</u>	<u>After Calibrate</u>
% Saturation	<u>117.2</u>	<u>100.2</u>
mg/L D.O.	<u>9.69</u>	<u>9.52</u>
Temp - °C	<u>16.14</u>	<u>16.24</u>

Notes:

Data OK - All above 8

Field Notes for Datasonde Deployment

Date/Time: 6/25/13 11:45 EDT Analyst: TDLocation: AAZ Bridge Datasonde Serial #: 47169

Calibration Information

Datasonde Battery [volts]: 12.2

pH (s.u.)	Before Cal.	After Cal.	@ 24.3°C
7.00 Std	<u>7.03</u>	<u>7.00</u>	
10.00 Std	<u>9.76</u>	<u>10.00</u>	

Conductivity (mS/cm)	Before Cal.	After Cal.	Zero Conductivity Calibration
<u>0.2899</u> Std	<u>0.286</u>	<u>0.299</u>	Before <u>0.000</u> After <u>0.000</u>

Barometric Pressure (mm Hg) 719 mm Hg

Dissolved Oxygen	Before Calibration	After Calibration
% Saturation	<u>105.0%</u>	<u>100.0%</u>
mg/L D.O.	<u>8.72 mg/L</u>	<u>7.97 mg/L</u>
Temp - °C	<u>23.26°C</u>	<u>23.85°C</u>

DO Handheld Meter Calibration - DO Meter Model 140302 #2

	Before Calibration	After Calibration	Post Calibration Slope = <u>100.3%</u>
% Saturation	<u>99.0%</u>	<u>100.0%</u>	
mg/L D.O.	<u>7.44 mg/L</u>	<u>7.56 mg/L</u>	
Temp - °C	<u>26.9°C</u>	<u>26.7°C</u>	

Create File for Test Program ☒

Test Program Readings

	Datasonde	YSI Meter (Must be within 0.5 mg/L D.O.)
% Saturation	<u>96.5%</u>	<u>97.2%</u>
mg/L D.O.	<u>8.47 mg/L</u>	<u>8.48 mg/L</u>
Temp - °C	<u>18.94°C</u>	<u>19.2°C</u>

Create File for Datasonde ☒Remove calibration cup, Replace with weight ☒

Re-calibration required if outside 0.5 mg/l limit

	Before Cal.	After Cal.	Datasonde	YSI
% Saturation	<u>Deploy</u>	<u>4</u>	<u> </u>	<u> </u>
mg/L D.O.				
Temp - °C				

Check File Status

File Start 6/25/13 13:00File End 7/9/13 17:00Battery Life % @ Start: 98%Battery Life % @ End: 31%

Notes: _____

Field Notes for Datasonde Deployment

Date/Time: 6/25/13 Analyst: TH
 Location: McClure Tailwater Datasonde Serial #: 47163

Calibration Information

Datasonde Battery [volts]: 12.54

pH (s.u.)	Before Cal.	After Cal.	
7.00 Std	<u>7.15</u>	<u>7.00</u>	Ⓢ 24.76°C
10.00 Std	<u>10.04</u>	<u>10.00</u>	

Conductivity (mS/cm)	Before Cal.	After Cal.	Zero Conductivity Calibration
<u>0.299</u> Std	<u>0.259</u>	<u>0.299</u>	Before <u>0.000</u> After <u>0.000</u>

Barometric Pressure (mm Hg) 719.0 mm Hg

Dissolved Oxygen	Before Calibration	After Calibration
% Saturation	<u>96.0%</u>	<u>100.0%</u>
mg/L D.O.	<u>7.68 mg/L</u>	<u>7.80 mg/L</u>
Temp - °C	<u>25.02°C</u>	<u>25.07°C</u>

DO Handheld Meter Calibration - DO Meter Model HQ300 #2

	Before Calibration	After Calibration	
% Saturation	<u>99.0%</u>	<u>100.0%</u>	Post Calibration Slope = <u>100.3%</u>
mg/L D.O.	<u>7.44 mg/L</u>	<u>7.56 mg/L</u>	
Temp - °C	<u>26.9°C</u>	<u>26.7°C</u>	

Create File for Test Program ✓

S: 12:30

E: 12:42

Test Program Readings

	Datasonde	YSI Meter	(Must be within 0.5 mg/L D.O.)
% Saturation	<u>97.4%</u>	<u>97.5%</u>	
mg/L D.O.	<u>8.46 mg/L</u>	<u>8.46 mg/L</u>	
Temp - °C	<u>19.43°C</u>	<u>19.5°C</u>	

Create File for Datasonde ✓

Remove calibration cup, Replace with weight ✓

Re-calibration required if outside 0.5 mg/l limit

	Before Cal.	After Cal.	Datasonde	YSI
% Saturation	<u>Depto</u>			
mg/L D.O.				
Temp - °C				

Check File Status

File Start 6/25/13 15:00

File End 7/9/13 17:00

Battery Life % @ Start: 100%

Battery Life % @ End: 33%

Notes: _____

Field Notes for Datasonde Deployment

Date/Time: 6/25/13 12:35 EDT Analyst: TRLocation: Hoist Tailwater Datasonde Serial #: 43727

Calibration Information

Datasonde Battery [volts]: 12.4 V

pH (s.u.)	Before Cal.	After Cal.
7.00 Std	<u>7.00</u>	<u>7.00</u>
10.00 Std	<u>9.95</u>	<u>10.00</u>

pH Cal. Temp.: 25.14°C

Conductivity (mS/cm)	Before Cal.	After Cal.	Zero Conductivity Calibration
<u>0.299</u> Std	<u>0.295</u>	<u>0.299</u>	Before <u>0.0000</u> After <u>0.0000</u>

Barometric Pressure (mm Hg) 719.0 mm Hg

Datasonde Dissolved Oxygen	Before Calibration	After Calibration
% Saturation	<u>97.0%</u>	<u>100.0%</u>
mg/L D.O.	<u>7.91 mg/L</u>	<u>7.74 mg/L</u>
Temp - °C	<u>25.38°C</u>	<u>25.46°C</u>

DO Handheld Meter Calibration - DO Meter Model HQ30d #2

	Before Calibration	After Calibration	
% Saturation	<u>99.0%</u>	<u>100.0%</u>	Post Calibration Slope = <u>100.3%</u>
mg/L D.O.	<u>7.44 mg/L</u>	<u>7.56 mg/L</u>	
Temp - °C	<u>26.9°C</u>	<u>26.7°C</u>	

Create File for Test Program ☒Start Test: 12:47End Test: 12:59

Test Program Readings

	Datasonde	Hach HQ30d Meter	(Must be within 0.5 mg/L D.O.)
% Saturation	<u>96.6%</u>	<u>97.5%</u>	
mg/L D.O.	<u>8.38 mg/L</u>	<u>8.43 mg/L</u>	
Temp - °C	<u>19.50°C</u>	<u>19.7°C</u>	

Create File for Datasonde ☒Remove calibration cup, Replace with weight ☒

Re-calibration required if outside 0.5 mg/l limit

	Before Cal.	After Cal.	Datasonde	Hach HQ30d Meter
% Saturation				
mg/L D.O.				
Temp - °C				

Deploy

Check File Status

File Start 6/25/13 15:00File End 7/9/13 17:00Battery Life % @ Start: 100%Battery Life % @ End: 33%

Notes: _____

Field Notes for Datasonde Deployment

Date/Time: 6/25/13 12:55 EDT Analyst: TALocation: L5+I Trestle Datasonde Serial #: 47166

Calibration Information

Datasonde Battery [volts]: 12.34

pH (s.u.)	Before Cal.	After Cal.	pH Cal. Temp.: <u>25.84°C</u>
7.00 Std	<u>7.00</u>	<u>7.00</u>	
10.00 Std	<u>9.99</u>	<u>10.00</u>	

Conductivity (mS/cm)	Before Cal.	After Cal.	Zero Conductivity Calibration
~~0.229~~ Std	<u>0.229</u>	<u>0.299</u>	Before <u>0.000</u> After <u>0.0000</u>

Barometric Pressure (mm Hg) 719 mm Hg

Datasonde Dissolved Oxygen	Before Calibration	After Calibration
% Saturation	<u>98.7%</u>	<u>100.0%</u>
mg/L D.O.	<u>7.76 mg/L</u>	<u>7.67 mg/L</u>
Temp - °C	<u>25.9°C</u>	<u>25.99°C</u>

DO Handheld Meter Calibration - DO Meter Model HQ30d #2

	Before Calibration	After Calibration	Post Calibration Slope = <u>100.3%</u>
% Saturation	<u>99.0%</u>	<u>100.0%</u>	
mg/L D.O.	<u>7.44 mg/L</u>	<u>7.56 mg/L</u>	
Temp - °C	<u>26.9°C</u>	<u>26.7°C</u>	

Create File for Test Program ☒Start Test: 13:05End Test: 13:17

Test Program Readings

	Datasonde	Hach HQ30d Meter	(Must be within 0.5 mg/L D.O.)
% Saturation	<u>98.7%</u>	<u>97.6%</u>	
mg/L D.O.	<u>8.54 mg/L</u>	<u>8.41 mg/L</u>	
Temp - °C	<u>19.7°C</u>	<u>19.8°C</u>	

Create File for Datasonde ☒Remove calibration cup, Replace with weight ☒

Re-calibration required if outside 0.5 mg/l limit

	Before Cal.	After Cal.	Datasonde	Hach HQ30d Meter
% Saturation	<u>Deploy</u>	<u>Deploy</u>	<u> </u>	<u> </u>
mg/L D.O.			<u> </u>	<u> </u>
Temp - °C			<u> </u>	<u> </u>

Check File Status

File Start 6/25/13 15:00File End 6/25/13 17:00Battery Life % @ Start: 100%Battery Life % @ End: 33%

Notes: _____

Field Notes for Datasonde Post Calibration

Date/Time: 6/25/13 12:08 EDT Analyst: CR

Location: AAO Bridge Datasonde Serial #: 47162

Ending Datasonde Battery [volts]: 10.64

Calibration Information

pH (s.u.):	<u>Observed</u>
7.00 Std.	<u>6.53</u> @ 24.5°C
10.00 Std.	<u>9.49</u>

Conductivity (mS/cm): 0.299 Std. Conc. 0.297 Observed
~~0.0000~~ Zero Observed, In Air

Barometric Pressure (mm Hg) 719 mm Hg

<u>Dissolved Oxygen</u>	<u>Before Calibrate</u>	<u>After Calibrate</u>
% Saturation	<u>100.6%</u>	<u>100.0%</u>
mg/L D.O.	<u>8.21 mg/L</u>	<u>8.13 mg/L</u>
Temp - °C	<u>22.73°C</u>	<u>22.83°C</u>

Notes:

all 7, 8 and 9's for D.O.

Field Notes for Datasonde Post CalibrationDate/Time: 6/25/13 16:10 Analyst: CALocation: Hoist Tailwater Datasonde Serial #: 42485Ending Datasonde Battery [volts]: 10.84**Calibration Information**

pH (s.u.):	<u>Observed</u>	
7.00 Std.	<u>7.00</u>	@ 26.87°C
10.00 Std.	<u>16.03</u>	

Conductivity (mS/cm): 0.299 Std. Conc. 0.294 Observed
0.0000 Zero Observed, In Air

Barometric Pressure (mm Hg) 728.0 mm Hg

<u>Dissolved Oxygen</u>	<u>Before Calibrate</u>	<u>After Calibrate</u>
% Saturation	<u>96.9%</u>	<u>100.0%</u>
mg/L D.O.	<u>7.29 mg/L</u>	<u>7.61 mg/L</u>
Temp - °C	<u>27.06°C</u>	<u>27.08°C</u>

Notes:

LDO readings in 7's and 8's

Field Notes for Datasonde Post Calibration

Date/Time: 6/25/13 15:50 Analyst: HALocation: L5+I Treble Datasonde Serial #: 47171Ending Datasonde Battery [volts]: 10.9xCalibration Information

pH (s.u.):	Observed
7.00 Std.	<u>6.76</u>
10.00 Std.	<u>9.55</u>

@ 26.49°C

Conductivity (mS/cm): 0.299 Std. Conc. 0.291 Observed
~~0.0000~~ Zero Observed, In Air

Barometric Pressure (mm Hg) 728.0 mmHg

<u>Dissolved Oxygen</u>	<u>Before Calibrate</u>	<u>After Calibrate</u>
% Saturation	<u>103.1%</u>	<u>100.0%</u>
mg/L D.O.	<u>7.97 mg/L</u>	<u>7.79 mg/L</u>
Temp - °C	<u>25.70°C</u>	<u>25.78°C</u>

Notes:

100 readings in 8's + 9's

Field Notes for Datasonde Post Calibration

Date/Time: 6/25/13 16:00 Analyst: CA

Location: McClure Tailwater Datasonde Serial #: 43731

Ending Datasonde Battery [volts]: 10.8 v

Calibration Information

pH (s.u.):	<u>Observed</u>	
7.00 Std.	<u>7.05</u>	@ 26.53 °C
10.00 Std.	<u>10.12</u>	

Conductivity (mS/cm): 0.299 Std. Conc. 0.293 Observed
0.0000 Zero Observed, In Air

Barometric Pressure (mm Hg) 728 mm Hg

<u>Dissolved Oxygen</u>	<u>Before Calibrate</u>	<u>After Calibrate</u>
% Saturation	<u>99.8%</u>	<u>100.0%</u>
mg/L D.O.	<u>7.62 mg/L</u>	<u>7.73 mg/L</u>
Temp - °C	<u>26.33 °C</u>	<u>26.28 °C</u>

Notes:

LDO reading in 8's + 9's

Field Notes for Datasonde Deployment

Date/Time: July 9, 2013 11:10 EDT Analyst: HA

Location: AAO Bridge Datasonde Serial #: 60593

Calibration Information

Datasonde Battery [volts]: 12.3v

pH (s.u.)	Before Cal.	After Cal.
7.00 Std	<u>7.22</u>	<u>7.00</u>
10.00 Std	<u>10.00</u>	<u>10.00</u>

pH Cal. Temp.: 24.05°C

Conductivity (mS/cm)	Before Cal.	After Cal.	Zero Conductivity Calibration
<u>0.303</u> Std	<u>0.298</u>	<u>0.303</u>	Before <u>0.0000</u> After <u>0.0000</u>

Barometric Pressure (mm Hg) 722.1 mm Hg

Datasonde Dissolved Oxygen	Before Calibration	After Calibration
% Saturation	<u>97.0%</u>	<u>100.0%</u>
mg/L D.O.	<u>7.92 mg/L</u>	<u>8.08 mg/L</u>
Temp - °C	<u>23.30</u>	<u>23.38°C</u>

DO Handheld Meter Calibration - DO Meter Model # 2

	Before Calibration	After Calibration
% Saturation	<u>96.0%</u>	<u>100.0%</u>
mg/L D.O.	<u>7.44</u>	<u>7.78 mg/L</u>
Temp - °C	<u>25.3°C</u>	<u>25.3°C</u>

Post Calibration Slope = 101.9%

Create File for Test Program ☒

Start Test: 11:25

End Test: 11:40

Test Program Readings

	Datasonde	Hach HQ30d Meter	(Must be within 0.5 mg/L D.O.)
% Saturation	<u>95.3%</u>	<u>96.5%</u>	
mg/L D.O.	<u>8.53 mg/L</u>	<u>8.61 mg/L</u>	
Temp - °C	<u>18.22°C</u>	<u>18.3°C</u>	

Create File for Datasonde ☒

Remove calibration cup, Replace with weight 2

Re-calibration required if outside 0.5 mg/l limit

	Before Cal.	After Cal.	Datasonde	Hach HQ30d Meter
% Saturation	_____	_____	_____	_____
mg/L D.O.	_____	_____	_____	_____
Temp - °C	_____	_____	_____	_____

Check File Status

File Start 7/9/13 12:00

File End 7/23/13 17:00

Battery Life % @ Start: 100%

Battery Life % @ End: 51%

Notes: _____

Field Notes for Datasonde Deployment

Date/Time: July 9, 2013 11:56 EDT Analyst: JALocation: Hoist Tailwater Datasonde Serial #: 47171

Calibration Information

Datasonde Battery [volts]: 12.1v

pH (s.u.)	Before Cal.	After Cal.
7.00 Std	<u>7.03</u>	<u>7.00</u>
10.00 Std	<u>10.16</u>	<u>10.00</u>

pH Cal. Temp.: 23.98°C

Conductivity (mS/cm)	Before Cal.	After Cal.	Zero Conductivity Calibration
<u>0.303</u> Std	<u>0.301</u>	<u>0.303</u>	Before <u>0.0000</u> After <u>0.0000</u>

Barometric Pressure (mm Hg) 722.1 mm Hg

Datasonde Dissolved Oxygen	Before Calibration	After Calibration
% Saturation	<u>98.8%</u>	<u>100.0%</u>
mg/L D.O.	<u>8.03 mg/L</u>	<u>8.10 mg/L</u>
Temp - °C	<u>23.31°C</u>	<u>23.32°C</u>

DO Handheld Meter Calibration - DO Meter Model #2

	Before Calibration	After Calibration	
% Saturation	<u>96.0%</u>	<u>100.0%</u>	Post Calibration Slope = <u>101.9%</u>
mg/L D.O.	<u>7.44 mg/L</u>	<u>7.78 mg/L</u>	
Temp - °C	<u>25.3°C</u>	<u>25.3°C</u>	

Create File for Test Program ☒Start Test: 12:06End Test: 12:18

Test Program Readings

	Datasonde	Hach HQ30d Meter	(Must be within 0.5 mg/L D.O.)
% Saturation	<u>94.8%</u>	<u>97.5%</u>	
mg/L D.O.	<u>8.46 mg/L</u>	<u>8.67 mg/L</u>	
Temp - °C	<u>18.34°C</u>	<u>18.5°C</u>	

Create File for Datasonde ☒

Remove calibration cup, Replace with weight _____

Re-calibration required if outside 0.5 mg/l limit

	Before Cal.	After Cal.	Datasonde	Hach HQ30d Meter
% Saturation				
mg/L D.O.				
Temp - °C				

Check File Status

File Start 7/9/13 15:00File End 7/23/13 17:00Battery Life % @ Start: 98%Battery Life % @ End: 48%

Notes: _____

Field Notes for Datasonde Deployment

Date/Time: July 9, 2013 12:20 EST Analyst: THLocation: LS + I Trestle Datasonde Serial #: 47162

Calibration Information

Datasonde Battery [volts]: 12.24

pH (s.u.)	Before Cal.	After Cal.
7.00 Std	<u>6.60</u>	<u>7.00</u>
10.00 Std	<u>9.95</u>	<u>10.00</u>

pH Cal. Temp.: 24.12°C

Conductivity (mS/cm)	Before Cal.	After Cal.
<u>0.303</u>	<u>0.308</u>	<u>0.303</u>
<u>0.308</u> Std	<u>0.308</u>	<u>0.303</u>

Zero Conductivity Calibration

Before 0.0000 After 0.0000Barometric Pressure (mm Hg) 722.1 mm Hg

Datasonde Dissolved Oxygen	Before Calibration	After Calibration
% Saturation	<u>99.0%</u>	<u>100.0%</u>
mg/L D.O.	<u>7.89 mg/L</u>	<u>7.96 mg/L</u>
Temp - °C	<u>24.15°C</u>	<u>24.15°C</u>

DO Handheld Meter Calibration - DO Meter Model #2

	Before Calibration	After Calibration
% Saturation	<u>96.0%</u>	<u>100.0%</u>
mg/L D.O.	<u>7.44 mg/L</u>	<u>7.78 mg/L</u>
Temp - °C	<u>25.3°C</u>	<u>25.3°C</u>

Post Calibration Slope = 101.9%Create File for Test Program ✓Start Test: 12:29End Test: 12:41

Test Program Readings

	Datasonde	Hach HQ30d Meter	(Must be within 0.5 mg/L D.O.)
% Saturation	<u>97.6%</u>	<u>97.7%</u>	
mg/L D.O.	<u>8.69 mg/L</u>	<u>8.67 mg/L</u>	
Temp - °C	<u>18.48°C</u>	<u>18.6°C</u>	

Create File for Datasonde ✓

Remove calibration cup, Replace with weight _____

Re-calibration required if outside 0.5 mg/l limit

	Before Cal.	After Cal.	Datasonde	Hach HQ30d Meter
% Saturation				
mg/L D.O.				
Temp - °C				

Check File Status

File Start 7/9/13 15:00File End 7/23/13 17:00Battery Life % @ Start: 100%Battery Life % @ End: 33%

Notes: _____

Field Notes for Datasonde Deployment

Date/Time: July 9, 2013 11:40 Analyst: TA

Location: McClure Tailwater Datasonde Serial #: 47167

Calibration Information

Datasonde Battery [volts]: 11.8 v

pH (s.u.)	Before Cal.	After Cal.
7.00 Std	<u>7.03</u>	<u>7.00</u>
10.00 Std	<u>10.15</u>	<u>10.00</u>

pH Cal. Temp.: 23.24°C

Conductivity (mS/cm)	Before Cal.	After Cal.	Zero Conductivity Calibration
<u>0.303</u> Std	<u>0.304</u>	<u>0.303</u>	Before <u>0.0000</u> After <u>0.0000</u>

Barometric Pressure (mm Hg) 722.1 mm Hg

Datasonde Dissolved Oxygen	Before Calibration	After Calibration
% Saturation	<u>98.7%</u>	<u>100.0%</u>
mg/L D.O.	<u>7.93 mg/L</u>	<u>8.00 mg/L</u>
Temp - °C	<u>23.85°C</u>	<u>23.88°C</u>

DO Handheld Meter Calibration - DO Meter Model #2

	Before Calibration	After Calibration
% Saturation	<u>96.0%</u>	<u>100.0%</u>
mg/L D.O.	<u>7.44 mg/L</u>	<u>7.78 mg/L</u>
Temp - °C	<u>25.3°C</u>	<u>25.3°C</u>

Post Calibration Slope = 101.9%

Create File for Test Program ☒

Start Test: 11:48

End Test: 12:00

Test Program Readings

	Datasonde
% Saturation	<u>95.8%</u>
mg/L D.O.	<u>8.57 mg/L</u>
Temp - °C	<u>18.25°C</u>

	Hach HQ30d Meter
% Saturation	<u>96.8%</u>
mg/L D.O.	<u>8.63 mg/L</u>
Temp - °C	<u>18.4°C</u>

(Must be within 0.5 mg/L D.O.)

Create File for Datasonde ☒

Remove calibration cup, Replace with weight _____

Re-calibration required if outside 0.5 mg/l limit

	Before Cal.	After Cal.	Datasonde	Hach HQ30d Meter
% Saturation	<u>Depto</u>			
mg/L D.O.	<u>_____</u>			
Temp - °C	<u>_____</u>			

Check File Status

File Start 7/9/13 14:00

File End 7/9/13 17:00

Battery Life % @ Start: 86%

Battery Life % @ End: 35%

Notes: _____

Field Notes for Datasonde Post Calibration

Date/Time: July 9, 2013 11:30 EDT Analyst: TA

Location: AAO Bridge Datasonde Serial #: 47169

Ending Datasonde Battery [volts]: 10.2v

Calibration Information

pH (s.u.):	<u>Observed</u>	
7.00 Std.	<u>7.12</u>	@ 23.99°C
10.00 Std.	<u>10.20</u>	

Conductivity (mS/cm): 0.303 Std. Conc. 0.305 Observed
0.0000 Zero Observed, In Air

Barometric Pressure (mm Hg) 722.1 mmHg

<u>Dissolved Oxygen</u>	<u>Before Calibrate</u>	<u>After Calibrate</u>
% Saturation	<u>98.6%</u>	<u>100.1%</u>
mg/L D.O.	<u>8.23 mg/L</u>	<u>8.40 mg/L</u>
Temp - °C	<u>21.44°C</u>	<u>21.43°C</u>

Notes:

D.O. readings: 7/8/9's

Field Notes for Datasonde Post Calibration

Date/Time: July 9, 2013 15:20 Analyst: TP
 Location: Hoist tailwater Datasonde Serial #: 43727 ^{Hydra} ^{Sonde} (43721)

Ending Datasonde Battery [volts]: 10.1x

Calibration Information

pH (s.u.):	<u>Observed</u>	
7.00 Std.	<u>7.09</u>	@ 23.52 °C
10.00 Std.	<u>10.12</u>	

Conductivity (mS/cm) : 0.303 Std. Conc. 0.300 Observed

Barometric Pressure (mm Hg) 728.5 mm Hg

<u>Dissolved Oxygen</u>	<u>Before Calibrate</u>	<u>After Calibrate</u>
% Saturation	<u>101.6 %</u>	<u>100.0 %</u>
mg/L D.O.	<u>8.21 mg/L</u>	<u>8.18 mg/L</u>
Temp - °C	<u>23.14</u>	<u>23.17 °C</u>

Notes:

D.O. offline entire file.
D.O. probe post calibrate fine

Field Notes for Datasonde Post CalibrationDate/Time: July 9, 2013 15:10 Analyst: THLocation: LS+I Trestle Datasonde Serial #: 47166Ending Datasonde Battery [volts]: 10.3x**Calibration Information**

pH (s.u.):	<u>Observed</u>
7.00 Std.	<u>7.10</u>
10.00 Std.	<u>10.11</u>

pH Temp Reading.: 23.41°CConductivity (mS/cm) : 0.303 Std. Conc. 0.299 ObservedBarometric Pressure (mm Hg) 728.5 mm Hg

<u>Dissolved Oxygen</u>	<u>Before Calibrate</u>	<u>After Calibrate</u>
% Saturation	<u>101.3%</u>	<u>100.0%</u>
mg/L D.O.	<u>8.18 mg/L</u>	<u>8.19 mg/L</u>
Temp – °C	<u>23.21°C</u>	<u>23.24°C</u>

Notes:

D.O. readings: 8 and 9's

Field Notes for Datasonde Post Calibration

Date/Time: July 9, 2013 15:35 Analyst: FA

Location: McClure Tailwater Datasonde Serial #: 47163

Ending Datasonde Battery [volts]: 10.34

Calibration Information

pH (s.u.):	<u>Observed</u>	
7.00 Std.	<u>7.19</u>	@ 23.6700
10.00 Std.	<u>10.16</u>	

Conductivity (mS/cm) : 0.303 Std. Conc. 0.293 Observed

Barometric Pressure (mm Hg) 728.5 mmHg

<u>Dissolved Oxygen</u>	<u>Before Calibrate</u>	<u>After Calibrate</u>
% Saturation	<u>99.7%</u>	<u>100.1%</u>
mg/L D.O.	<u>7.86 mg/L</u>	<u>8.01 mg/L</u>
Temp - °C	<u>24.42°C</u>	<u>24.38°C</u>

Notes:

D.O. readings: 7 and 8's

Field Notes for Datasonde Deployment

Date/Time: 11:00 7/23/13 Analyst: MWMLocation: AAO Bridge Datasonde Serial #: 47163**Calibration Information**Datasonde Battery [volts]: 12.2

pH (s.u.)	Before Cal.	After Cal.	
7.00 Std	<u>—</u>	<u>—</u>	pH Cal. Temp.: <u>—</u>
10.00 Std	<u>—</u>	<u>—</u>	

Conductivity (mS/cm)	Before Cal.	After Cal.	Zero Conductivity Calibration
<u>0.296</u> Std	<u>0.300</u>	<u>0.296</u>	Before <u>0.0011</u> After <u>0.0000</u>

Barometric Pressure (mm Hg) 723

Datasonde Dissolved Oxygen	Before Calibration	After Calibration
% Saturation	<u>101.2</u>	<u>100.1</u>
mg/L D.O.	<u>9.38</u>	<u>9.22</u>
Temp - °C	<u>16.93</u>	<u>16.89</u>

DO Handheld Meter Calibration - DO Meter Model HQ30d #2 - 15m cable

	Before Calibration	After Calibration	
% Saturation	<u>96.3</u>	<u>100.0</u>	
mg/L D.O.	<u>8.36</u>	<u>8.90</u>	Post Calibration Slope = <u>100.1</u>
Temp - °C	<u>19.7</u>	<u>18.5</u>	

Create File for Test Program ☒ Start Test: 11:08 End Test: 11:18**Test Program Readings**

	Datasonde	Hach HQ30d Meter	(Must be within 0.5 mg/L D.O.)
% Saturation	<u>91.5</u>	<u>93.6</u>	
mg/L D.O.	<u>8.63</u>	<u>8.79</u>	OK - Deploy
Temp - °C	<u>15.72</u>	<u>16.0</u>	

Create File for Datasonde ☒ Remove calibration cup, Replace with weight ☒**Re-calibration required if outside 0.5 mg/l limit**

	Before Cal.	After Cal.	Datasonde	Hach HQ30d Meter
% Saturation	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
mg/L D.O.	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
Temp - °C	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>

Check File Status

File Start 07/23 @ 12 File End 08/06/13 23:59Battery Life % @ Start: 100 Battery Life % @ End: 31Notes: _____

Field Notes for Datasonde Deployment

Date/Time: 7/23/13 11:12 EST Analyst: MMWLocation: A01st Datasonde Serial #: 47168**Calibration Information**Datasonde Battery [volts]: 12.1

pH (s.u.)	<u>Before Cal.</u>	<u>After Cal.</u>	pH Cal. Temp.: <u>-</u>
7.00 Std	<u>-</u>	<u>-</u>	
10.00 Std	<u>-</u>	<u>-</u>	

Conductivity (mS/cm)	<u>Before Cal.</u>	<u>After Cal.</u>	<u>Zero Conductivity Calibration</u>
<u>0.296</u> Std	<u>0.303</u>	<u>0.296</u>	Before <u>0.0007</u> After <u>-</u>

Barometric Pressure (mm Hg) 723

Datasonde Dissolved Oxygen	<u>Before Calibration</u>	<u>After Calibration</u>
% Saturation	<u>100.5</u>	<u>100.0</u>
mg/L D.O.	<u>9.45</u>	<u>9.43</u>
Temp - °C	<u>15.73</u>	<u>15.79</u>

DO Handheld Meter Calibration - DO Meter Model -

	<u>Before Calibration</u>	<u>After Calibration</u>	Post Calibration Slope = <u>-</u>
% Saturation	<u>-</u>	<u>-</u>	
mg/L D.O.	<u>-</u>	<u>-</u>	
Temp - °C	<u>-</u>	<u>-</u>	

Create File for Test Program ☒ Start Test: 11:25 End Test: 11:35**Test Program Readings**

	<u>Datasonde</u>	<u>Hach HQ30d Meter</u>	(Must be within 0.5 mg/L D.O.)
% Saturation	<u>91.5</u>	<u>94.9</u>	
mg/L D.O.	<u>8.60</u>	<u>8.87</u>	
Temp - °C	<u>15.91</u>	<u>16.2</u>	

OK - Deploy

Create File for Datasonde - Remove calibration cup, Replace with weight -**Re-calibration required if outside 0.5 mg/l limit**

	<u>Before Cal.</u>	<u>After Cal.</u>	<u>Datasonde</u>	<u>Hach HQ30d Meter</u>
% Saturation	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
mg/L D.O.	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
Temp - °C	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>

Check File Status

File Start 7/23/13 12:00 File End 8/6/13 23:59Battery Life % @ Start: 96 Battery Life % @ End: 45Notes: Cal'd @ AAO Deployed @ 13:48 EST

Field Notes for Datasonde Deployment

Date/Time: 7/23/13 11:48 Analyst: MW4Location: LS+I Datasonde Serial #: 60582**Calibration Information**Datasonde Battery [volts]: 12.2

pH (s.u.)	<u>Before Cal.</u>	<u>After Cal.</u>	pH Cal. Temp.: <u>—</u>
7.00 Std	<u>—</u>	<u>—</u>	
10.00 Std	<u>—</u>	<u>—</u>	

Conductivity (mS/cm)	<u>Before Cal.</u>	<u>After Cal.</u>	<u>Zero Conductivity Calibration</u>
<u>0.296</u> Std	<u>0.294</u>	<u>0.296</u>	Before <u>0.0004</u> After <u>0.0000</u>

Barometric Pressure (mm Hg) 724

Datasonde Dissolved Oxygen	<u>Before Calibration</u>	<u>After Calibration</u>
% Saturation	<u>101.6</u>	<u>99.9</u>
mg/L D.O.	<u>9.55</u>	<u>9.28</u>
Temp - °C	<u>16.59</u>	<u>16.57</u>

DO Handheld Meter Calibration - DO Meter Model _____

	<u>Before Calibration</u>	<u>After Calibration</u>	Post Calibration Slope = _____
% Saturation	_____	_____	
mg/L D.O.	_____	_____	
Temp - °C	_____	_____	

Create File for Test Program ☒ Start Test: 11:57 End Test: 12:07**Test Program Readings**

	<u>Datasonde</u>	<u>Hach HQ30d Meter</u>	(Must be within 0.5 mg/L D.O.)
% Saturation	<u>93.3</u>	<u>95.6</u>	
mg/L D.O.	<u>8.76</u>	<u>8.93</u>	
Temp - °C	<u>16.04</u>	<u>16.1</u>	

OK - Deploy

Create File for Datasonde _____ Remove calibration cup, Replace with weight _____

Re-calibration required if outside 0.5 mg/l limit

	<u>Before Cal.</u>	<u>After Cal.</u>	<u>Datasonde</u>	<u>Hach HQ30d Meter</u>
% Saturation	_____	_____	_____	_____
mg/L D.O.	_____	_____	_____	_____
Temp - °C	_____	_____	_____	_____

Check File Status

File Start 7/23/13 13:00 File End 8/6/13 23:59Battery Life % @ Start: 98 Battery Life % @ End: 47Notes: Cal'd @ AAS Deployed @ 14:52 EST

Field Notes for Datasonde Deployment

Date/Time: 7/23/13 12:00 Analyst: MWMLocation: McClure Datasonde Serial #: 42485**Calibration Information**Datasonde Battery [volts]: 12.2

pH (s.u.)	<u>Before Cal.</u>	<u>After Cal.</u>	pH Cal. Temp.: <u>-</u>
7.00 Std	<u>-</u>	<u>-</u>	
10.00 Std	<u>-</u>	<u>-</u>	

Conductivity (mS/cm)	<u>Before Cal.</u>	<u>After Cal.</u>	<u>Zero Conductivity Calibration</u>
<u>0.296</u> Std	<u>0.299</u>		Before <u>0.000</u> After <u>1.000</u>

Barometric Pressure (mm Hg) 724

Datasonde Dissolved Oxygen	<u>Before Calibration</u>	<u>After Calibration</u>
% Saturation	<u>108.5</u>	<u>101.0</u>
mg/L D.O.	<u>10.25</u>	<u>9.48</u>
Temp - °C	<u>16.03</u>	<u>16.07</u>

DO Handheld Meter Calibration - DO Meter Model _____

	<u>Before Calibration</u>	<u>After Calibration</u>	
% Saturation	_____	_____	Post Calibration Slope = _____
mg/L D.O.	_____	_____	
Temp - °C	_____	_____	

Create File for Test Program ☒ Start Test: 12:00 End Test: 12:20**Test Program Readings**

	<u>Datasonde</u>	<u>Hach HQ30d Meter</u>	(Must be within 0.5 mg/L D.O.)
% Saturation	<u>91.7</u>	<u>95.8</u>	OK - Deploy
mg/L D.O.	<u>8.61</u>	<u>8.95</u>	
Temp - °C	<u>16.05</u>	<u>16.3</u>	

Create File for Datasonde _____ Remove calibration cup, Replace with weight _____

Re-calibration required if outside 0.5 mg/l limit

	<u>Before Cal.</u>	<u>After Cal.</u>	<u>Datasonde</u>	<u>Hach HQ30d Meter</u>
% Saturation	_____	_____	_____	_____
mg/L D.O.	_____	_____	_____	_____
Temp - °C	_____	_____	_____	_____

Check File Status

File Start 7/23/13 13:00 File End 8/6/13 23:59Battery Life % @ Start: 98 98 Battery Life % @ End: 47 47Notes: Cold @ AAs Deployed @ 17:45

Field Notes for Datasonde Post Calibration

Date/Time: 7/23/13 11:33 Analyst: MWM

Location: AAO Bridge Datasonde Serial #: 60593

Ending Datasonde Battery [volts]: 11.0

Calibration Information

pH (s.u.):	<u>Observed</u>	
7.00 Std.	<u>—</u>	pH Temp Reading.: <u>—</u>
10.00 Std.	<u>—</u>	

Conductivity (mS/cm) : 0.296 Std. Conc. 0.287 Observed

Barometric Pressure (mm Hg) 723

<u>Dissolved Oxygen</u>	<u>Before Calibrate</u>	<u>After Calibrate</u>
% Saturation	<u>99.9</u>	<u>99.4</u>
mg/L D.O.	<u>9.67</u>	<u>9.63</u>
Temp – °C	<u>14.48</u>	<u>14.52</u>

Notes:

All D.O. ↑ 7 mg/L

Field Notes for Datasonde Post Calibration

Date/Time: 7/23/13 14:00 Est Analyst: KWM

Location: Hgist Air Race Datasonde Serial #: 47171

Ending Datasonde Battery [volts]: 11.1

Calibration Information

pH (s.u.):	<u>Observed</u>	pH Temp Reading.: <u>-</u>
7.00 Std.	<u>-</u>	
10.00 Std.	<u>-</u>	

Conductivity (mS/cm) : 0.296 Std. Conc. 0.295 Observed

Barometric Pressure (mm Hg) 726

<u>Dissolved Oxygen</u>	<u>Before Calibrate</u>	<u>After Calibrate</u>
% Saturation	<u>100.0</u>	<u>100.0</u>
mg/L D.O.	<u>9.32</u>	<u>9.33</u>
Temp - °C	<u>16.26</u>	<u>16.45</u>

Notes:

D.O. readings ↓ was of 7 mg/L. All readings ↑ 5 mg/L

7/23/13 - readings @ 13:00 6.87 mg/L, 21.4°C, 81.8% sat.

- went to powerhouse. readings @ fishing pier @ 14:15:

6.54 mg/L, 78.0% sat, 21.9°C

Field Notes for Datasonde Post Calibration

Date/Time: 7/23/13 15:15 Analyst: RWM

Location: L5+I Datasonde Serial #: 47162

Ending Datasonde Battery [volts]: _____

Calibration Information

pH (s.u.):	<u>Observed</u>	
7.00 Std.	<u>-</u>	pH Temp Reading.: <u>-</u>
10.00 Std.	<u>-</u>	

Conductivity (mS/cm) : 0.296 Std. Conc. 0.301 Observed

Barometric Pressure (mm Hg) 731

<u>Dissolved Oxygen</u>	<u>Before Calibrate</u>	<u>After Calibrate</u>
% Saturation	<u>103.4</u>	<u>100.0</u>
mg/L D.O.	<u>~~9.67~~ 9.67</u>	<u>9.45</u>
Temp - °C	<u>16.21</u>	<u>16.20</u>

Notes:

All D.O. ↑ 9 µg/L

Field Notes for Datasonde Post Calibration

Date/Time: 7/23/13 Analyst: KWY

Location: McClure Datasonde Serial #: 47167

Ending Datasonde Battery [volts]: _____

Calibration Information

pH (s.u.):	<u>Observed</u>	
7.00 Std.	<u>—</u>	pH Temp Reading.: _____
10.00 Std.	<u>—</u>	

Conductivity (mS/cm) : 0.296 Std. Conc. 0.292 Observed

Barometric Pressure (mm Hg) 740

<u>Dissolved Oxygen</u>	<u>Before Calibrate</u>	<u>After Calibrate</u>
% Saturation	<u>100.5</u>	<u>99.9</u>
mg/L D.O.	<u>8.98</u>	<u>9.16</u>
Temp – °C	<u>18.26</u>	<u>18.27</u>

Notes:

All D.O. ↑ 6 mg/L

lots of bio growth on sensors - Macroinvertebrates

Field Notes for Datasonde Deployment

Date/Time: 8/6/13 11:15 EST Analyst: MWMLocation: AAO Bridge Datasonde Serial #: 60593**Calibration Information**Datasonde Battery [volts]: 12.4

pH (s.u.)	Before Cal.	After Cal.	pH Cal. Temp.: <u> </u>
7.00 Std	<u> </u>	<u> </u>	
10.00 Std	<u> </u>	<u> </u>	

Conductivity (mS/cm)	Before Cal.	After Cal.	Zero Conductivity Calibration
<u>0.296</u> Std	<u>0.296</u>	<u>0.296</u>	Before <u>0.0008</u> After <u>0.0000</u>

Barometric Pressure (mm Hg) 721

Datasonde Dissolved Oxygen	Before Calibration	After Calibration
% Saturation	<u>96.0</u>	<u>100.0</u>
mg/L D.O.	<u>8.32</u>	<u>8.65</u>
Temp - °C	<u>19.79</u>	<u>19.79</u>

DO Handheld Meter Calibration - DO Meter Model HQ30d

	Before Calibration	After Calibration	Post Calibration Slope = <u> </u>
% Saturation	<u> </u>	<u> </u>	
mg/L D.O.	<u> </u>	<u> </u>	
Temp - °C	<u> </u>	<u> </u>	

Create File for Test Program ☒Start Test: 11:25End Test: 11:35**Test Program Readings**

	Datasonde	Hach HQ30d Meter	(Must be within 0.5 mg/L D.O.)
% Saturation	<u>96.1</u>	<u>95.4</u>	OK. Deploy
mg/L D.O.	<u>9.07</u>	<u>8.96</u>	
Temp - °C	<u>15.59</u>	<u>15.8</u>	

Create File for Datasonde ☒Remove calibration cup, Replace with weight ☒**Re-calibration required if outside 0.5 mg/l limit**

	Before Cal.	After Cal.	Datasonde	Hach HQ30d Meter
% Saturation	<u> </u>	<u> </u>	<u> </u>	<u> </u>
mg/L D.O.	<u> </u>	<u> </u>	<u> </u>	<u> </u>
Temp - °C	<u> </u>	<u> </u>	<u> </u>	<u> </u>

Check File StatusFile Start 08/06/13 12:00File End 8/20/13 23:59Battery Life % @ Start: 100Battery Life % @ End: 34Notes:

Field Notes for Datasonde Deployment

Date/Time: 8/6/13 11:25 Analyst: MWMLocation: Hoist Datasonde Serial #: 47171**Calibration Information**Datasonde Battery [volts]: 12.3

pH (s.u.)	<u>Before Cal.</u>	<u>After Cal.</u>	pH Cal. Temp.: <u>-</u>
7.00 Std	<u>-</u>	<u>-</u>	
10.00 Std	<u>-</u>	<u>-</u>	

Conductivity (mS/cm)	<u>Before Cal.</u>	<u>After Cal.</u>	<u>Zero Conductivity Calibration</u>
<u>0.296</u> Std	<u>0.288</u>	<u>0.296</u>	Before <u>0.0000</u> After <u>0.0000</u>

Barometric Pressure (mm Hg) 8.296 721

Datasonde Dissolved Oxygen	<u>Before Calibration</u>	<u>After Calibration</u>
% Saturation	<u>98.8</u>	<u>100.2</u>
mg/L D.O.	<u>8.63</u>	<u>8.69</u>
Temp - °C	<u>19.65</u>	<u>19.65</u>

DO Handheld Meter Calibration - DO Meter Model _____

	<u>Before Calibration</u>	<u>After Calibration</u>	Post Calibration Slope = _____
% Saturation	_____	_____	
mg/L D.O.	_____	_____	
Temp - °C	_____	_____	

Create File for Test Program ☒ Start Test: 11:35 End Test: 11:45**Test Program Readings**

	<u>Datasonde</u>	<u>Hach HQ30d Meter</u>	(Must be within 0.5 mg/L D.O.)
% Saturation	<u>94.8</u>	<u>95.5</u>	
mg/L D.O.	<u>8.95</u>	<u>8.94</u>	
Temp - °C	<u>15.55</u>	<u>15.8</u>	

OK - Deploy

Create File for Datasonde ☒ Remove calibration cup, Replace with weight ☒**Re-calibration required if outside 0.5 mg/l limit**

	<u>Before Cal.</u>	<u>After Cal.</u>	<u>Datasonde</u>	<u>Hach HQ30d Meter</u>
% Saturation	_____	_____	_____	_____
mg/L D.O.	_____	_____	_____	_____
Temp - °C	_____	_____	_____	_____

Check File StatusFile Start 8/6 14:00 File End 8/20 23:59Battery Life % @ Start: 100 Battery Life % @ End: 32

Notes: _____

Field Notes for Datasonde Deployment

Date/Time: 8/6/13 11:56 Analyst: MMYLocation: LS+I Datasonde Serial #: 47167**Calibration Information**Datasonde Battery [volts]: 12.4

pH (s.u.)	<u>Before Cal.</u>	<u>After Cal.</u>	
7.00 Std	<u>—</u>	<u>—</u>	pH Cal. Temp.: <u>—</u>
10.00 Std	<u>—</u>	<u>—</u>	

Conductivity (mS/cm)	<u>Before Cal.</u>	<u>After Cal.</u>	<u>Zero Conductivity Calibration</u>
<u>0.296</u> Std	<u>0.294</u>	<u>0.296</u>	Before <u>0.0016</u> After <u>0.0000</u>

Barometric Pressure (mm Hg) 720

Datasonde Dissolved Oxygen	<u>Before Calibration</u>	<u>After Calibration</u>
% Saturation	<u>97.7</u>	<u>100.1</u>
mg/L D.O.	<u>8.64</u>	<u>8.61</u>
Temp - °C	<u>20.00</u>	<u>20.02</u>

DO Handheld Meter Calibration - DO Meter Model _____

	<u>Before Calibration</u>	<u>After Calibration</u>	
% Saturation	_____	_____	Post Calibration Slope = _____
mg/L D.O.	_____	_____	
Temp - °C	_____	_____	

Create File for Test Program ☒Start Test: 12:06End Test: 12:16**Test Program Readings**

	<u>Datasonde</u>	<u>Hach HQ30d Meter</u>	(Must be within 0.5 mg/L D.O.)
% Saturation	<u>97.6</u>	<u>98.0</u>	
mg/L D.O.	<u>9.12</u>	<u>9.12</u>	
Temp - °C	<u>15.97</u>	<u>16.2</u>	

Create File for Datasonde ☒Remove calibration cup, Replace with weight ☒**Re-calibration required if outside 0.5 mg/l limit**

	<u>Before Cal.</u>	<u>After Cal.</u>	<u>Datasonde</u>	<u>Hach HQ30d Meter</u>
% Saturation	_____	_____	_____	_____
mg/L D.O.	_____	_____	_____	_____
Temp - °C	_____	_____	_____	_____

Check File StatusFile Start 8/6 @ 15:00File End 8/20 23:59Battery Life % @ Start: 100Battery Life % @ End: 49

Notes: _____

Field Notes for Datasonde Deployment

Date/Time: 8/6/13 Analyst: AWMLocation: McClure tail race Datasonde Serial #: 47169**Calibration Information**Datasonde Battery [volts]: 12.5

pH (s.u.)	<u>Before Cal.</u>	<u>After Cal.</u>	pH Cal. Temp.: <u>—</u>
7.00 Std	<u>—</u>	<u>—</u>	
10.00 Std	<u>—</u>	<u>—</u>	

Conductivity (mS/cm)	<u>Before Cal.</u>	<u>After Cal.</u>	<u>Zero Conductivity Calibration</u>
<u>0.296</u> Std	<u>0.297</u>	<u>0.296</u>	Before <u>0.0012</u> After <u>0.0001</u>

Barometric Pressure (mm Hg) 718

Datasonde Dissolved Oxygen	<u>Before Calibration</u>	<u>After Calibration</u>
% Saturation	<u>99.6</u>	<u>99.9</u>
mg/L D.O.	<u>8.74</u>	<u>8.54</u>
Temp – °C	<u>20.17</u>	<u>20.19</u>

DO Handheld Meter Calibration - DO Meter Model _____

	<u>Before Calibration</u>	<u>After Calibration</u>	Post Calibration Slope = _____
% Saturation	_____	_____	
mg/L D.O.	_____	_____	
Temp – °C	_____	_____	

Create File for Test Program ☒Start Test: 12:16End Test: 12:26**Test Program Readings**

	<u>Datasonde</u>	<u>Hach HQ30d Meter</u>	(Must be within 0.5 mg/L D.O.)
% Saturation	<u>96.9</u>	<u>98.1</u>	<u>OK - Deploy</u>
mg/L D.O.	<u>9.03</u>	<u>9.12</u>	
Temp – °C	<u>15.97</u>	<u>16.3</u>	

Create File for Datasonde ☒Remove calibration cup, Replace with weight ☒**Re-calibration required if outside 0.5 mg/l limit**

	<u>Before Cal.</u>	<u>After Cal.</u>	<u>Datasonde</u>	<u>Hach HQ30d Meter</u>
% Saturation	_____	_____	_____	_____
mg/L D.O.	_____	_____	_____	_____
Temp – °C	_____	_____	_____	_____

Check File StatusFile Start 8/6/13 18:00File End 8/20/13 23:59Battery Life % @ Start: 100Battery Life % @ End: 49Notes: _____

Field Notes for Datasonde Post Calibration

Date/Time: ~~8/6~~ 8/6/13 11:45 Analyst: MM

Location: AAS Bridge Datasonde Serial #: 47163

Ending Datasonde Battery [volts]: 10.56

Calibration Information

pH (s.u.): Observed

7.00 Std. —

10.00 Std. —

pH Temp Reading.: —

Conductivity (mS/cm) : 0.296 Std. Conc. 0.297 Observed

Barometric Pressure (mm Hg) 719

Dissolved Oxygen

Before Calibrate

After Calibrate

% Saturation

97.8

99.6

mg/L D.O.

8.88

8.98

Temp – °C

17.57

17.64

Notes:

All D.O. ↑ 7 mg/L

Field Notes for Datasonde Post Calibration

Date/Time: 8/6/13 14:00 Analyst: AWM

Location: Hoist Datasonde Serial #: 4768

Ending Datasonde Battery [volts]: _____

Calibration Information

pH (s.u.): Observed

7.00 Std. _____

10.00 Std. _____

pH Temp Reading.: _____

Conductivity (mS/cm) : _____ Std. Conc. _____ Observed

Barometric Pressure (mm Hg) _____

Dissolved Oxygen

Before Calibrate

After Calibrate

% Saturation

mg/L D.O.

Temp – °C

Notes:

Will not connect to download file + post cal.

Replaced batteries - still does not connect

8/7/13 - Monitor failed on 7/24 between 5+6 A.M. EST.

No data from 7/24 @ 6 thru 8/6 @ 13:00 when monitor

was retrieved.

Field Notes for Datasonde Post Calibration

Date/Time: 8/6/13 14:46 Analyst: mw

Location: LS+I Datasonde Serial #: 60582

Ending Datasonde Battery [volts]: 10.8

Calibration Information

pH (s.u.): Observed

7.00 Std. -

10.00 Std. -

pH Temp Reading.: -

Conductivity (mS/cm) : 0.296 Std. Conc. 0.300 Observed

Barometric Pressure (mm Hg) 726

Dissolved Oxygen

Before Calibrate

After Calibrate

% Saturation

98.6

100.1

mg/L D.O.

8.48

8.62

Temp – °C

20.30

20.35

Notes:

All D.O. ↑ 8 mg/L

Field Notes for Datasonde Post Calibration

Date/Time: 8/6/13 17:30 Analyst: MWM

Location: McClure Datasonde Serial #: 42485

Ending Datasonde Battery [volts]: 10.9

Calibration Information

pH (s.u.):	<u>Observed</u>	
7.00 Std.	<u>—</u>	pH Temp Reading.: <u>—</u>
10.00 Std.	<u>—</u>	

Conductivity (mS/cm) : 0.296 Std. Conc. 0.281 Observed

Barometric Pressure (mm Hg) 732

<u>Dissolved Oxygen</u>	<u>Before Calibrate</u>	<u>After Calibrate</u>
% Saturation	<u>98.2</u>	<u>100.3</u>
mg/L D.O.	<u>8.59</u>	<u>8.87</u>
Temp – °C	<u>19.43</u>	<u>19.46</u>

Notes:

All D.O. ↑ 6 mg/L

Field Notes for Datasonde Deployment

Date/Time: 8/20/13 8:00 est Analyst: MWMLocation: AAO Bridge Datasonde Serial #: 60592**Calibration Information**Datasonde Battery [volts]: 12.5

pH (s.u.)	<u>Before Cal.</u>	<u>After Cal.</u>	pH Cal. Temp.: <u> </u>
7.00 Std	<u> </u>	<u> </u>	
10.00 Std	<u> </u>	<u> </u>	
Conductivity (mS/cm)	<u>Before Cal.</u>	<u>After Cal.</u>	
<u>0.301</u> Std	<u>0.293</u>	<u> </u>	Zero Conductivity Calibration
			Before <u>0.000</u> After <u>0.000</u>

Barometric Pressure (mm Hg) 725

Datasonde Dissolved Oxygen	<u>Before Calibration</u>	<u>After Calibration</u>
% Saturation	<u>97.6</u>	<u>99.7</u>
mg/L D.O.	<u>9.01</u>	<u>9.05</u>
Temp - °C	<u>17.72</u>	<u>17.68</u>

DO Handheld Meter Calibration - DO Meter Model HQ30d #1

	<u>Before Calibration</u>	<u>After Calibration</u>	Post Calibration Slope = <u>102.5</u>
% Saturation	<u>99.9</u>	<u>3.62 100.0</u>	
mg/L D.O.	<u>8.61</u>	<u>8.61</u>	
Temp - °C	<u>20.0</u>	<u>20.1</u>	

Create File for Test Program ☒Start Test: 8:12End Test: 8:22**Test Program Readings**

	<u>Datasonde</u>
% Saturation	<u>94.2</u>
mg/L D.O.	<u>8.66</u>
Temp - °C	<u>17.09</u>

Hach HQ30d Meter

(Must be within 0.5 mg/L D.O.)

<u>94.1</u>
<u>8.62</u>
<u>17.2</u>

OK - Deploy

Create File for Datasonde ☒Remove calibration cup, Replace with weight ☒**Re-calibration required if outside 0.5 mg/l limit**

	<u>Before Cal.</u>	<u>After Cal.</u>	<u>Datasonde</u>	<u>Hach HQ30d Meter</u>
% Saturation	<u> </u>	<u> </u>	<u> </u>	<u> </u>
mg/L D.O.	<u> </u>	<u> </u>	<u> </u>	<u> </u>
Temp - °C	<u> </u>	<u> </u>	<u> </u>	<u> </u>

Check File StatusFile Start 8/20/13 09:00File End 09/03/13 23:59Battery Life % @ Start: 100Battery Life % @ End: 31Notes: _____

Field Notes for Datasonde Deployment

Date/Time: 8/20/13 8:15 est Analyst: MWMLocation: Hoist Datasonde Serial #: 47163**Calibration Information**Datasonde Battery [volts]: 12.4

pH (s.u.)	Before Cal.	After Cal.	
7.00 Std	<u>-</u>	<u>-</u>	pH Cal. Temp.: <u>-</u>
10.00 Std	<u>-</u>	<u>-</u>	

Conductivity (mS/cm)	Before Cal.	After Cal.	Zero Conductivity Calibration
<u>0.301</u> Std	<u>0.296</u>	<u>0.301</u>	Before <u>0.0004</u> After <u>0.0000</u>

Barometric Pressure (mm Hg) 725

Datasonde Dissolved Oxygen	Before Calibration	After Calibration
% Saturation	<u>98.0</u>	<u>99.7</u>
mg/L D.O.	<u>8.96</u>	<u>9.19</u>
Temp - °C	<u>16.98</u>	<u>16.96</u>

DO Handheld Meter Calibration - DO Meter Model HQ30d #1 - See AAO sheet

	Before Calibration	After Calibration	
% Saturation	<u> </u>	<u> </u>	
mg/L D.O.	<u> </u>	<u> </u>	Post Calibration Slope = <u> </u>
Temp - °C	<u> </u>	<u> </u>	

Create File for Test Program ☒ Start Test: 8:30 End Test: 8:40**Test Program Readings**

	Datasonde	Hach HQ30d Meter	(Must be within 0.5 mg/L D.O.)
% Saturation	<u>95.1</u>	<u>94.4</u>	
mg/L D.O.	<u>8.74</u>	<u>8.65</u>	OK - Deploy
Temp - °C	<u>17.09</u>	<u>17.2</u>	

Create File for Datasonde Remove calibration cup, Replace with weight **Re-calibration required if outside 0.5 mg/l limit**

	Before Cal.	After Cal.	Datasonde	Hach HQ30d Meter
% Saturation	<u> </u>	<u> </u>	<u> </u>	<u> </u>
mg/L D.O.	<u> </u>	<u> </u>	<u> </u>	<u> </u>
Temp - °C	<u> </u>	<u> </u>	<u> </u>	<u> </u>

Check File StatusFile Start 8/20/13 11:00 File End 9/3/13 23:59Battery Life % @ Start: 100 Battery Life % @ End: 31Notes: Calibrated @ AAO bridge

Field Notes for Datasonde Deployment

Date/Time: 8/20/13 8:51 Est Analyst: MMLocation: LS + I Datasonde Serial #: 47160**Calibration Information**Datasonde Battery [volts]: 12.3

pH (s.u.)	<u>Before Cal.</u>	<u>After Cal.</u>	pH Cal. Temp.: <u>-</u>
7.00 Std	<u>-</u>	<u>-</u>	
10.00 Std	<u>-</u>	<u>-</u>	

Conductivity (mS/cm)	<u>Before Cal.</u>	<u>After Cal.</u>	<u>Zero Conductivity Calibration</u>
<u>0.301</u> Std	<u>0.306</u>	<u>0.301</u>	Before <u>0.0019</u> After <u>0.0000</u>

Barometric Pressure (mm Hg) 725

Datasonde Dissolved Oxygen	<u>Before Calibration</u>	<u>After Calibration</u>
% Saturation	<u>99.2</u>	<u>99.9</u>
mg/L D.O.	<u>8.99</u>	<u>9.02</u>
Temp - °C	<u>17.94</u>	<u>17.94</u>

DO Handheld Meter Calibration - DO Meter Model HQ30d #1 - See AAO

	<u>Before Calibration</u>	<u>After Calibration</u>	Post Calibration Slope = <u>-</u>
% Saturation	<u>-</u>	<u>-</u>	
mg/L D.O.	<u>-</u>	<u>-</u>	
Temp - °C	<u>-</u>	<u>-</u>	

Create File for Test Program ✓ Start Test: 09:05 End Test: 09:15**Test Program Readings**

	<u>Datasonde</u>	<u>Hach HQ30d Meter</u>	(Must be within 0.5 mg/L D.O.)
% Saturation	<u>94.3</u>	<u>95.7</u>	OK - Deploy
mg/L D.O.	<u>8.64</u>	<u>8.74</u>	
Temp - °C	<u>17.24</u>	<u>17.3</u>	

Create File for Datasonde - Remove calibration cup, Replace with weight -**Re-calibration required if outside 0.5 mg/l limit**

	<u>Before Cal.</u>	<u>After Cal.</u>	<u>Datasonde</u>	<u>Hach HQ30d Meter</u>
% Saturation	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
mg/L D.O.	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
Temp - °C	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>

Check File StatusFile Start 8/20/13 @ 12:00 File End 9/3/13 @ 23:59Battery Life % @ Start: 100 Battery Life % @ End: 40Notes: Calibrated @ AAO bridge

Field Notes for Datasonde Deployment

Date/Time: 8/20/13 9:05 EDT Analyst: MWMLocation: McClure Datasonde Serial #: 47162**Calibration Information**Datasonde Battery [volts]: 11.8

pH (s.u.)	<u>Before Cal.</u>	<u>After Cal.</u>	pH Cal. Temp.: <u>—</u>
7.00 Std	<u>—</u>	<u>—</u>	
10.00 Std	<u>—</u>	<u>—</u>	

Conductivity (mS/cm)	<u>Before Cal.</u>	<u>After Cal.</u>	<u>Zero Conductivity Calibration</u>
<u>0.301</u> Std	<u>0.301</u>	<u>0.301</u>	Before <u>0.0014</u> After <u>0.0000</u>

Barometric Pressure (mm Hg) 725

Datasonde Dissolved Oxygen	<u>Before Calibration</u>	<u>After Calibration</u>
% Saturation	<u>98.5</u>	<u>99.9</u>
mg/L D.O.	<u>8.90</u>	<u>8.95</u>
Temp - °C	<u>18.31</u>	<u>18.32</u>

DO Handheld Meter Calibration - DO Meter Model _____

	<u>Before Calibration</u>	<u>After Calibration</u>	Post Calibration Slope = _____
% Saturation	_____	_____	
mg/L D.O.	_____	_____	
Temp - °C	_____	_____	

Create File for Test Program ☒ Start Test: 09:15 End Test: 09:25**Test Program Readings**

	<u>Datasonde</u>	<u>Hach HQ30d Meter</u>	(Must be within 0.5 mg/L D.O.)
% Saturation	<u>95.5</u>	<u>96.0</u>	<u>OK - Deploy</u>
mg/L D.O.	<u>8.73</u>	<u>8.76</u>	
Temp - °C	<u>17.33</u>	<u>17.4</u>	

Create File for Datasonde _____ Remove calibration cup, Replace with weight _____

Re-calibration required if outside 0.5 mg/l limit

	<u>Before Cal.</u>	<u>After Cal.</u>	<u>Datasonde</u>	<u>Hach HQ30d Meter</u>
% Saturation	_____	_____	_____	_____
mg/L D.O.	_____	_____	_____	_____
Temp - °C	_____	_____	_____	_____

Check File Status

File Start 8/20/13 @ 15:00 File End 8/20/13 @ 23:59Battery Life % @ Start: 94 Battery Life % @ End: 43Notes: Calibrated @ APO bridge

Field Notes for Datasonde Post Calibration

Date/Time: 8/20/13 8:37 EST Analyst: MM

Location: AAO Bridge Datasonde Serial #: 60593

Ending Datasonde Battery [volts]: 10.8

Calibration Information

pH (s.u.): Observed

7.00 Std. -

10.00 Std. -

pH Temp Reading.: 0

Conductivity (mS/cm) : 0.301 Std. Conc. 0.299 Observed

Barometric Pressure (mm Hg) 724

<u>Dissolved Oxygen</u>	<u>Before Calibrate</u>	<u>After Calibrate</u>
% Saturation	<u>101.7</u>	<u>100.3</u>
mg/L D.O.	<u>7.38</u>	<u>7.28</u>
Temp - °C	<u>16.68</u>	<u>16.70</u>

Notes:

All D.O. ↑ 8 mg/L

Field Notes for Datasonde Post Calibration

Date/Time: 8/20/2013 10:46 EST Analyst: new

Location: Haist Datasonde Serial #: 47171

Ending Datasonde Battery [volts]: 10.8

Calibration Information

pH (s.u.):	<u>Observed</u>	
7.00 Std.	<u>—</u>	pH Temp Reading.: <u>—</u>
10.00 Std.	<u>—</u>	

Conductivity (mS/cm) : 0.301 Std. Conc. ^{0.303}
~~0.327~~ Observed

Barometric Pressure (mm Hg) 726

<u>Dissolved Oxygen</u>	<u>Before Calibrate</u>	<u>After Calibrate</u>
% Saturation	<u>104.1</u>	<u>99.9</u>
mg/L D.O.	<u>8.58</u>	<u>8.29</u>
Temp – °C	<u>22.21</u>	<u>22.26</u>

Notes:

All D.O. ↑ 7 ug/l

② Time of monitor failure, D.O. 9.17, Temp 17.4°C , battery: 11.2 V.

Field Notes for Datasonde Post Calibration

Date/Time: 8/20/13 14:10 Analyst: RWM

Location: McClure Datasonde Serial #: 47169

Ending Datasonde Battery [volts]: _____

Calibration Information

pH (s.u.):	<u>Observed</u>	
7.00 Std.	<u>—</u>	pH Temp Reading.: <u>—</u>
10.00 Std.	<u>—</u>	

Conductivity (mS/cm) : 0.301 Std. Conc. 0.306 Observed

Barometric Pressure (mm Hg) 737

<u>Dissolved Oxygen</u>	<u>Before Calibrate</u>	<u>After Calibrate</u>
% Saturation	<u>104.3</u>	<u>99.5</u>
mg/L D.O.	<u>8.30</u>	<u>8.11</u>
Temp – °C	<u>23.90</u>	<u>24.04</u>

Notes:

All D.O. ↑ 7 mg/L

x 1 hourly reading of -0.1 mg/L D.O. → Equip. Malfunction

Field Notes for Datasonde Deployment

Date/Time: Sept. 3, 2013 12:15 Analyst: TR
 Location: AAO Bridge Datasonde Serial #: 60593

Calibration Information

Datasonde Battery [volts]: 12.3 v

pH (s.u.)	Before Cal.	After Cal.
7.00 Std	<u>7.29</u>	<u>7.02</u>
10.00 Std	<u>9.98</u>	<u>10.00</u>

pH Cal. Temp.: 21.06°C

Conductivity (mS/cm)	Before Cal.	After Cal.	Zero Conductivity Calibration
<u>0.296</u> Std	<u>0.303</u>	<u>0.296</u>	Before <u>0.000</u> After <u>0.000</u>

Barometric Pressure (mm Hg) 724 mm Hg

Datasonde Dissolved Oxygen	Before Calibration	After Calibration
% Saturation	<u>99.0%</u>	<u>100.0%</u>
mg/L D.O.	<u>8.51 mg/L</u>	<u>8.60 mg/L</u>
Temp - °C	<u>20.33°C</u>	<u>20.29°C</u>

DO Handheld Meter Calibration - DO Meter Model HQ300 #1

	Before Calibration	After Calibration
% Saturation	<u>101.2%</u>	<u>100.0%</u>
mg/L D.O.	<u>8.70 mg/L</u>	<u>8.49 mg/L</u>
Temp - °C	<u>20.8°C</u>	<u>20.9°C</u>

Post Calibration Slope = 96.8%

Create File for Test Program ☒

Start Test: 12:38

End Test: 12:53

Test Program Readings

	Datasonde
% Saturation	<u>97.1%</u>
mg/L D.O.	<u>8.90 mg/L</u>
Temp - °C	<u>17.20°C</u>

Hach HQ30d Meter

% Saturation	<u>95.9%</u>
mg/L D.O.	<u>8.71 mg/L</u>
Temp - °C	<u>17.5°C</u>

(Must be within 0.5 mg/L D.O.)

Create File for Datasonde ☒

Remove calibration cup, Replace with weight ☒

Re-calibration required if outside 0.5 mg/l limit

	Before Cal.	After Cal.	Datasonde	Hach HQ30d Meter
% Saturation	<u>Deploy</u>			
mg/L D.O.				
Temp - °C				

Check File Status

File Start 9/3/13 15:00

File End 9/17/13 17:00

Battery Life % @ Start: 96%

Battery Life % @ End: 32%

Notes: _____

Field Notes for Datasonde Deployment

Date/Time: Sept. 3, 2013 13:10 EDT Analyst: LA

Location: Hoist Tailwater Datasonde Serial #: 47166

Calibration Information

Datasonde Battery [volts]: 12.3v

pH (s.u.)	Before Cal.	After Cal.
7.00 Std	<u>7.05</u>	<u>7.02</u>
10.00 Std	<u>10.08</u>	<u>10.06</u>

pH Cal. Temp.: 21.63°C

Conductivity (mS/cm)	Before Cal.	After Cal.	Zero Conductivity Calibration
<u>0.296</u> Std	<u>0.302</u>	<u>0.296</u>	Before <u>0.000</u> After <u>0.000</u>

Barometric Pressure (mm Hg) 724 mm Hg

Datasonde Dissolved Oxygen	Before Calibration	After Calibration
% Saturation	<u>98.1%</u>	<u>100.0%</u>
mg/L D.O.	<u>8.54 mg/L</u>	<u>8.68 mg/L</u>
Temp - °C	<u>19.96°C</u>	<u>19.92°C</u>

DO Handheld Meter Calibration - DO Meter Model HQ300 #1

	Before Calibration	After Calibration
% Saturation	<u>101.2%</u>	<u>100.0%</u>
mg/L D.O.	<u>8.70 mg/L</u>	<u>8.49 mg/L</u>
Temp - °C	<u>20.8°C</u>	<u>20.9°C</u>

Post Calibration Slope = 96.8%

Create File for Test Program ☒

Start Test: 13:23

End Test: 13:35

Test Program Readings

	Datasonde
% Saturation	<u>97.7%</u>
mg/L D.O.	<u>8.81</u>
Temp - °C	<u>17.98°C</u>

	Hach HQ30d Meter
% Saturation	<u>97.1%</u>
mg/L D.O.	<u>8.806 mg/L</u>
Temp - °C	<u>18.3°C</u>

(Must be within 0.5 mg/L D.O.)

only one reading
my mistake

Create File for Datasonde ☒

Remove calibration cup, Replace with weight ☒

Re-calibration required if outside 0.5 mg/l limit

	Before Cal.	After Cal.	Datasonde	Hach HQ30d Meter
% Saturation	<u>97.7%</u>	<u>97.1%</u>		
mg/L D.O.	<u>8.81</u>	<u>8.806</u>		
Temp - °C	<u>17.98°C</u>	<u>18.3°C</u>		

Check File Status

File Start 9/3/13 16:00

File End 9/17/13 17:00

Battery Life % @ Start: 98%

Battery Life % @ End: 98%

Notes: _____

Field Notes for Datasonde Deployment

Date/Time: Sept. 3, 2013 13:30 EDT Analyst: TA

Location: LBI Trestle Datasonde Serial #: 60582

Calibration Information

Datasonde Battery [volts]: 12.1v

pH (s.u.)	Before Cal.	After Cal.
7.00 Std	<u>6.97</u>	<u>7.02</u>
10.00 Std	<u>10.03</u>	<u>10.06</u>

pH Cal. Temp.: 20.76°C

Conductivity (mS/cm)	Before Cal.	After Cal.	Zero Conductivity Calibration
<u>0.296</u> Std	<u>0.294</u>	<u>0.296</u>	Before <u>0.000</u> After <u>0.000</u>

Barometric Pressure (mm Hg) 724 mm Hg

Datasonde Dissolved Oxygen	Before Calibration	After Calibration
% Saturation	<u>99.6%</u>	<u>100.1%</u>
mg/L D.O.	<u>8.69 mg/L</u>	<u>8.69 mg/L</u>
Temp - °C	<u>19.83°C</u>	<u>19.86°C</u>

DO Handheld Meter Calibration - DO Meter Model HQ300 #1

	Before Calibration	After Calibration
% Saturation	<u>101.2%</u>	<u>100.0%</u>
mg/L D.O.	<u>8.70 mg/L</u>	<u>8.49 mg/L</u>
Temp - °C	<u>20.8°C</u>	<u>20.9°C</u>

Post Calibration Slope = 96.8%

Create File for Test Program ☒ Start Test: 13:37 End Test: 13:49

Test Program Readings

	Datasonde
% Saturation	<u>97.5%</u>
mg/L D.O.	<u>8.81 mg/L</u>
Temp - °C	<u>17.87°C</u>

	Hach HQ30d Meter
% Saturation	<u>96.1%</u>
mg/L D.O.	<u>8.61 mg/L</u>
Temp - °C	<u>18.2°C</u>

(Must be within 0.5 mg/L D.O.)

Create File for Datasonde ☒ Remove calibration cup, Replace with weight ☒

Re-calibration required if outside 0.5 mg/l limit

	Before Cal.	After Cal.	Datasonde	Hach HQ30d Meter
% Saturation	<u>Deploy</u>			
mg/L D.O.				
Temp - °C				

Check File Status

File Start 9/3/13 16:00 EDT File End 9/17/13 17:00

Battery Life % @ Start: 100% Battery Life % @ End: 50%

Notes: _____

Field Notes for Datasonde Deployment

Date/Time: Sept. 3, 2013 12:55 EDT Analyst: THLocation: McClure Tailwater Datasonde Serial #: 60580**Calibration Information**Datasonde Battery [volts]: 12.3v

pH (s.u.)	Before Cal.	After Cal.
7.00 Std	<u>7.09</u>	<u>7.02</u>
10.00 Std	<u>9.99</u>	<u>10.00</u>

pH Cal. Temp.: 21.26°C

Conductivity (mS/cm)	Before Cal.	After Cal.	Zero Conductivity Calibration

<u>0.296</u> Std	<u>0.295</u>	<u>0.296</u>	Before <u>0.000</u> After <u>0.000</u>

Barometric Pressure (mm Hg) 724 mm Hg

Datasonde Dissolved Oxygen	Before Calibration	After Calibration
% Saturation	<u>98.3%</u>	<u>100.0%</u>
mg/L D.O.	<u>8.37 mg/L</u>	<u>8.61 mg/L</u>
Temp - °C	<u>20.85°C</u>	<u>20.81°C</u>

DO Handheld Meter Calibration - DO Meter Model HQ30D #1

	Before Calibration	After Calibration
% Saturation	<u>101.2%</u>	<u>100.0%</u>
mg/L D.O.	<u>8.70 mg/L</u>	<u>8.49 mg/L</u>
Temp - °C	<u>20.8°C</u>	<u>20.9°C</u>

Post Calibration Slope = 96.8%Create File for Test Program ☒Start Test: 13:03End Test: 13:15**Test Program Readings**

	Datasonde
% Saturation	<u>98.0%</u>
mg/L D.O.	<u>8.90 mg/L</u>
Temp - °C	<u>17.64°C</u>

Hach HQ30d Meter
<u>96.2%</u>
<u>8.67 mg/L</u>
<u>17.8°C</u>

(Must be within 0.5 mg/L D.O.)

Create File for Datasonde ☒Remove calibration cup, Replace with weight ☒**Re-calibration required if outside 0.5 mg/l limit**

	Before Cal.	After Cal.	Datasonde	Hach HQ30d Meter
% Saturation	<u>Deploy</u>	<u>Deploy</u>	<u>Deploy</u>	<u>Deploy</u>
mg/L D.O.	<u>Deploy</u>	<u>Deploy</u>	<u>Deploy</u>	<u>Deploy</u>
Temp - °C	<u>Deploy</u>	<u>Deploy</u>	<u>Deploy</u>	<u>Deploy</u>

Check File Status

File Start _____

File End _____

Battery Life % @ Start: _____

Battery Life % @ End: _____

Notes: _____

Field Notes for Datasonde Post CalibrationDate/Time: Sept. 3, 2013 12:45^{EST} Analyst: JALocation: AAO Bridge Datasonde Serial #: 60592Ending Datasonde Battery [volts]: 10.8 v**Calibration Information**

pH (s.u.):	Observed
7.00 Std.	<u>7.16</u>
10.00 Std.	<u>9.99</u>

pH Temp Reading.: 22.09°CConductivity (mS/cm) : 0.296 Std. Conc. 0.293 ObservedBarometric Pressure (mm Hg) 724 mm Hg

	cal fail Before Calibrate	clean/wipe LDO	After Calibrate
Dissolved Oxygen			
% Saturation	<u>79.7%</u>	<u>101.5%</u>	<u>100.0%</u>
mg/L D.O.	<u>7.00 mg/L</u>	<u>9.14 mg/L</u>	<u>8.91 mg/L</u>
Temp - °C	<u>19.30°C</u>	<u>18.32°C</u>	<u>18.64°C</u>

Notes:

High degree of bio-accumulation
on all probes.

D.O. readings in high 7's and 8's

Field Notes for Datasonde Post Calibration

Date/Time: Sept. 3, 2013 16:45 Analyst: HR

Location: Hoist Tailwater Datasonde Serial #: 47163

Ending Datasonde Battery [volts]: 10.7x

Calibration Information

pH (s.u.):	<u>Observed</u>	pH Temp Reading.: <u>22.21°C</u>
7.00 Std.	<u>7.25</u>	
10.00 Std.	<u>10.21</u>	

Conductivity (mS/cm) : 0.296 Std. Conc. 0.293 Observed

Barometric Pressure (mm Hg) 730 mm Hg

<u>Dissolved Oxygen</u>	<u>Before Calibrate</u>	<u>After Calibrate</u>
% Saturation	<u>100.2%</u>	<u>100.0%</u>
mg/L D.O.	<u>8.62 mg/L</u>	<u>8.68 mg/L</u>
Temp - °C	<u>20.25°C</u>	<u>20.22°C</u>

Notes:

Field Notes for Datasonde Post Calibration

Date/Time: Sept. 3, 2013 16:25 Analyst: HA

Location: L5+I Trestle Datasonde Serial #: 47160

Ending Datasonde Battery [volts]: 9.74

Calibration Information

pH (s.u.):	<u>Observed</u>
7.00 Std.	<u>6.89</u>
10.00 Std.	<u>9.90</u>

pH Temp Reading.: 22.32°C

Conductivity (mS/cm) : 6.296 Std. Conc. 0.289 Observed

Barometric Pressure (mm Hg) 730 mmHg

<u>Dissolved Oxygen</u>	<u>Before Calibrate</u>	<u>After Calibrate</u>
% Saturation	<u>100.7%</u>	<u>100.0%</u>
mg/L D.O.	<u>8.51 mg/L</u>	<u>8.54 mg/L</u>
Temp - °C	<u>21.12°C</u>	<u>21.07°C</u>

Notes:

D.O. readings in 8's and 9's

Field Notes for Datasonde Post Calibration

Date/Time: Sept. 3, 2013 16:35 Analyst: TH

Location: McClure Tail Datasonde Serial #: 47162

Ending Datasonde Battery [volts]: 10.5 v

Calibration Information

pH (s.u.):	<u>Observed</u>
7.00 Std.	<u>6.99</u>
10.00 Std.	<u>10.03</u>

pH Temp Reading.: 72.34°C

Conductivity (mS/cm) : 0.296 Std. Conc. 0.273 Observed

Barometric Pressure (mm Hg) 730 mm Hg

<u>Dissolved Oxygen</u>	<u>Before Calibrate</u>	<u>After Calibrate</u>
% Saturation	<u>98.4%</u>	<u>100.0%</u>
mg/L D.O.	<u>8.23 mg/L</u>	<u>8.43 mg/L</u>
Temp - °C	<u>21.75°C</u>	<u>21.73°C</u>

Notes:

D.O. readings in 7's and 8's

Field Notes for Datasonde Deployment

Date/Time: 9/12/13 8:40 EST Analyst: MWMLocation: AAO Datasonde Serial #: 42482**Calibration Information**Datasonde Battery [volts]: 12.3

pH (s.u.)	Before Cal.	After Cal.
7.00 Std	<u>-</u>	<u>-</u>
10.00 Std	<u>-</u>	<u>-</u>

pH Cal. Temp.: -

Conductivity (mS/cm)	Before Cal.	After Cal.	Zero Conductivity Calibration

<u>0.301</u> Std	<u>0.307</u>	<u>0.301</u>	Before <u>0.0017</u> After <u>0.0009</u>

Barometric Pressure (mm Hg) 738

Datasonde Dissolved Oxygen	Before Calibration	After Calibration
% Saturation	<u>101.4</u>	<u>99.8</u>
mg/L D.O.	<u>12.34</u>	<u>12.34</u>
Temp - °C	<u>5.23</u>	<u>5.11</u>

DO Handheld Meter Calibration - DO Meter Model HQ30d H1

	Before Calibration	After Calibration
% Saturation	<u>98.0</u>	<u>100.0</u>
mg/L D.O.	<u>8.27</u>	<u>8.43</u>
Temp - °C	<u>21.7</u>	<u>21.8</u>

Post Calibration Slope = 102.8Create File for Test Program ☒Start Test: 0855End Test: 0905**Test Program Readings**

	Datasonde
% Saturation	<u>93.8</u>
mg/L D.O.	<u>9.33</u>
Temp - °C	<u>14.24</u>

Hach HQ30d Meter (Must be within 0.5 mg/L D.O.)

<u>94.0</u>
<u>9.25</u>
<u>14.5</u>

OK - Deploy

Create File for Datasonde ☒Remove calibration cup, Replace with weight ☒**Re-calibration required if outside 0.5 mg/l limit**

	Before Cal.	After Cal.	Datasonde	Hach HQ30d Meter
% Saturation	<u> </u>	<u> </u>	<u> </u>	<u> </u>
mg/L D.O.	<u> </u>	<u> </u>	<u> </u>	<u> </u>
Temp - °C	<u> </u>	<u> </u>	<u> </u>	<u> </u>

Check File StatusFile Start 9/12/13 10:00File End 10/01/13 23:59Battery Life % @ Start: Battery Life % @ End:

Notes: _____

Field Notes for Datasonde Deployment

Date/Time: 9/17/13 9:00 Analyst: MW4Location: Hoist Datasonde Serial #: 47160**Calibration Information**Datasonde Battery [volts]: 12.2

pH (s.u.)	Before Cal.	After Cal.
7.00 Std	<u>-</u>	<u>-</u>
10.00 Std	<u>-</u>	<u>-</u>

pH Cal. Temp.: -

Conductivity (mS/cm)	Before Cal.	After Cal.	Zero Conductivity Calibration

<u>0.301</u> Std	<u>0.298</u>	<u>0.301</u>	Before <u>10000</u> After <u>10000</u>

Barometric Pressure (mm Hg) 737

Datasonde Dissolved Oxygen	Before Calibration	After Calibration
% Saturation	<u>93.0</u>	<u>100.0</u>
mg/L D.O.	<u>11.13</u>	<u>12.11</u>
Temp - °C	<u>5.95</u>	<u>5.90</u>

DO Handheld Meter Calibration - DO Meter Model _____

	Before Calibration	After Calibration	
% Saturation	<u> </u>	<u> </u>	Post Calibration Slope = <u> </u>
mg/L D.O.	<u> </u>	<u> </u>	
Temp - °C	<u> </u>	<u> </u>	

Create File for Test Program _____ Start Test: 9:15 End Test: 9:25**Test Program Readings**

	Datasonde	Hach HQ30d Meter	(Must be within 0.5 mg/L D.O.)
% Saturation	<u>95.3</u>	<u>94.3</u>	OK - Deploy
mg/L D.O.	<u>9.46</u>	<u>9.27</u>	
Temp - °C	<u>14.34</u>	<u>14.6</u>	

Create File for Datasonde _____ Remove calibration cup, Replace with weight _____

Re-calibration required if outside 0.5 mg/l limit

	Before Cal.	After Cal.	Datasonde	Hach HQ30d Meter
% Saturation	<u> </u>	<u> </u>	<u> </u>	<u> </u>
mg/L D.O.	<u> </u>	<u> </u>	<u> </u>	<u> </u>
Temp - °C	<u> </u>	<u> </u>	<u> </u>	<u> </u>

Check File Status

File Start 9/17/13 12:00File End 10/1/13 23:59Battery Life % @ Start: 98Battery Life % @ End: 29Notes: _____

Field Notes for Datasonde Deployment

Date/Time: 9/17/13 9:35 Analyst: MWHLocation: LS+I Datasonde Serial #: 60592**Calibration Information**Datasonde Battery [volts]: 12.4

pH (s.u.)	Before Cal.	After Cal.
7.00 Std	<u>-</u>	<u>-</u>
10.00 Std	<u>-</u>	<u>-</u>

pH Cal. Temp.: -

Conductivity (mS/cm)	Before Cal.	After Cal.	Zero Conductivity Calibration

<u>0.301</u> Std	<u>0.302</u>	<u>0.301</u>	Before <u>0.0020</u> After <u>0.0000</u>

Barometric Pressure (mm Hg) 737

Datasonde Dissolved Oxygen	Before Calibration	After Calibration
% Saturation	<u>103.1</u>	<u>100.0</u>
mg/L D.O.	<u>12.84</u>	<u>13.49</u>
Temp - °C	<u>4.10</u>	<u>4.04</u>

DO Handheld Meter Calibration - DO Meter Model _____

	Before Calibration	After Calibration	
% Saturation	_____	_____	Post Calibration Slope = _____
mg/L D.O.	_____	_____	
Temp - °C	_____	_____	

Create File for Test Program ✓ Start Test: 09:45 End Test: 09:55**Test Program Readings**

	Datasonde	Hach HQ30d Meter	(Must be within 0.5 mg/L D.O.)
% Saturation	<u>91.6</u>	<u>95.3</u>	OK - Deploy
mg/L D.O.	<u>9.06</u>	<u>9.36</u>	
Temp - °C	<u>14.47</u>	<u>14.6</u>	

Create File for Datasonde _____ Remove calibration cup, Replace with weight _____

Re-calibration required if outside 0.5 mg/l limit

	Before Cal.	After Cal.	Datasonde	Hach HQ30d Meter
% Saturation	_____	_____	_____	_____
mg/L D.O.	_____	_____	_____	_____
Temp - °C	_____	_____	_____	_____

Check File Status

File Start 9/17/13 13:00 File End 10/1/13 23:59Battery Life % @ Start: 100 Battery Life % @ End: 49Notes: _____

Field Notes for Datasonde Deployment

Date/Time: 9/12/13 9:45 Analyst: MMLocation: McClure Datasonde Serial #: 47162**Calibration Information**Datasonde Battery [volts]: 12.1

pH (s.u.)	Before Cal.	After Cal.	pH Cal. Temp.: <u>-</u>
7.00 Std	<u>-</u>	<u>-</u>	
10.00 Std	<u>-</u>	<u>-</u>	

Conductivity (mS/cm)	Before Cal.	After Cal.	Zero Conductivity Calibration
<u>0.301</u> Std	<u>0.301</u>	<u>0.301</u>	Before <u>0.0008</u> After <u>10000</u>

Barometric Pressure (mm Hg) 737

Datasonde Dissolved Oxygen	Before Calibration	After Calibration
% Saturation	<u>13.43</u> <u>106.2</u>	<u>100.2</u>
mg/L D.O.	<u>13.43</u>	<u>12.99</u>
Temp - °C	<u>3.83</u>	<u>3.83</u>

DO Handheld Meter Calibration - DO Meter Model _____

	Before Calibration	After Calibration	Post Calibration Slope = _____
% Saturation	_____	_____	
mg/L D.O.	_____	_____	
Temp - °C	_____	_____	

Create File for Test Program ☒Start Test: 9:55End Test: 10:05**Test Program Readings**

	Datasonde	Hach HQ30d Meter	(Must be within 0.5 mg/L D.O.)
% Saturation	<u>91.6</u>	<u>95.3</u>	OK - Deploy
mg/L D.O.	<u>9.04</u>	<u>9.31</u>	
Temp - °C	<u>14.56</u>	<u>14.7</u>	

Create File for Datasonde _____

Remove calibration cup, Replace with weight _____

Re-calibration required if outside 0.5 mg/l limit

	Before Cal.	After Cal.	Datasonde	Hach HQ30d Meter
% Saturation	_____	_____	_____	_____
mg/L D.O.	_____	_____	_____	_____
Temp - °C	_____	_____	_____	_____

Check File Status

File Start 9/12/13 15:00File End 10/1/13 23:59Battery Life % @ Start: 100Battery Life % @ End: 40Notes: _____

Field Notes for Datasonde Post Calibration

Date/Time: 9/17/13 9:20 Analyst: MWY

Location: AA5 Datasonde Serial #: 60593

Ending Datasonde Battery [volts]: 10.9

Calibration Information

pH (s.u.): Observed

7.00 Std. —

10.00 Std. —

pH Temp Reading.: —

Conductivity (mS/cm) : 0.301 Std. Conc. 0.288 Observed

Barometric Pressure (mm Hg) 736

Dissolved Oxygen

Before Calibrate

After Calibrate

% Saturation

101.0

99.9

mg/L D.O.

11.47

11.58

Temp – °C

7.70

7.55

Notes:

All D.O. ↑ 8 mg/L

Field Notes for Datasonde Post Calibration

Date/Time: 9/17/13 11:30 Analyst: UWM

Location: Hoist Datasonde Serial #: 47166

Ending Datasonde Battery [volts]: 11.1

Calibration Information

pH (s.u.):	<u>Observed</u>	
7.00 Std.	<u>—</u>	pH Temp Reading.: <u>—</u>
10.00 Std.	<u>—</u>	

Conductivity (mS/cm) : Std. Conc. Observed

Barometric Pressure (mm Hg) 737

<u>Dissolved Oxygen</u>	<u>Before Calibrate</u>	<u>After Calibrate</u>
% Saturation	<u> </u>	<u> </u>
mg/L D.O.	<u> </u>	<u> </u>
Temp – °C	<u> </u>	<u> </u>

Notes:

LDO sensor failure - No post cal

Field Notes for Datasonde Post Calibration

Date/Time: 9/17/13 12:23 Analyst: WJM

Location: LS+I Datasonde Serial #: 60582

Ending Datasonde Battery [volts]: 10.7

Calibration Information

pH (s.u.): Observed

7.00 Std.

10.00 Std.

pH Temp Reading.:

Conductivity (mS/cm) : 0.301 Std. Conc. 0.296 Observed

Barometric Pressure (mm Hg) 740

Dissolved Oxygen

Before Calibrate

After Calibrate

% Saturation

100.6

99.8

mg/L D.O.

9.49

9.60

Temp – °C

15.83

15.93

Notes:

All D.O. ↑ 8

Field Notes for Datasonde Post Calibration

Date/Time: 9/12/13 14:35 Analyst: MM

Location: McClure Datasonde Serial #: 60580

Ending Datasonde Battery [volts]: 11.0

Calibration Information

pH (s.u.):	<u>Observed</u>	
7.00 Std.	<u> </u>	pH Temp Reading.: <u> </u>
10.00 Std.	<u> </u>	

Conductivity (mS/cm) : 0.301 Std. Conc. 0.303 Observed

Barometric Pressure (mm Hg) 745

<u>Dissolved Oxygen</u>	<u>Before Calibrate</u>	<u>After Calibrate</u>
% Saturation	<u>100.0</u>	<u>100.3</u>
mg/L D.O.	<u>9.22</u>	<u>9.49</u>
Temp – °C	<u>16.90</u>	<u>17.05</u>

Notes:

All D.O. ↑ 7

Field Notes for Datasonde Deployment

Date/Time: Oct. 1, 2013 12:45 EDT Analyst: TA
 Location: AAO Bridge Datasonde Serial #: 60593

Calibration Information

Datasonde Battery [volts]: 12.3V

pH (s.u.)	<u>Before Cal.</u>	<u>After Cal.</u>	pH Cal. Temp.: _____
7.00 Std	_____	_____	
10.00 Std	_____	_____	

Conductivity (mS/cm)	<u>Before Cal.</u>	<u>After Cal.</u>	<u>Zero Conductivity Calibration</u>
_____ Std	_____	_____	Before _____ After _____

Barometric Pressure (mm Hg) _____

Datasonde Dissolved Oxygen	<u>Before Calibration</u>	<u>After Calibration</u>
% Saturation	_____	_____
mg/L D.O.	_____	_____
Temp - °C	_____	_____

TEMP
only

DO Handheld Meter Calibration - DO Meter Model _____

	<u>Before Calibration</u>	<u>After Calibration</u>	Post Calibration Slope = _____
% Saturation	_____	_____	
mg/L D.O.	_____	_____	
Temp - °C	_____	_____	

Create File for Test Program _____ Start Test: _____ End Test: _____

Test Program Readings

	<u>Datasonde</u>	<u>Hach HQ30d Meter</u>	(Must be within 0.5 mg/L D.O.)
% Saturation	_____	_____	
mg/L D.O.	_____	_____	
Temp - °C	_____	_____	

Create File for Datasonde _____ Remove calibration cup, Replace with weight _____

Re-calibration required if outside 0.5 mg/l limit

	<u>Before Cal.</u>	<u>After Cal.</u>	<u>Datasonde</u>	<u>Hach HQ30d Meter</u>
% Saturation	_____	_____	_____	_____
mg/L D.O.	_____	_____	_____	_____
Temp - °C	_____	_____	_____	_____

Check File Status

File Start 10/1/13 13:00

File End 10/15/13 17:00

Battery Life % @ Start: 100%

Battery Life % @ End: 51%

Notes: _____

Field Notes for Datasonde Deployment

Date/Time: Oct. 1, 2013 13:10 EDT Analyst: HA

Location: Hoise Tailwater Datasonde Serial #: 42485

Calibration Information

Datasonde Battery [volts]: 12.14

pH (s.u.) Before Cal. After Cal.
7.00 Std _____ _____
10.00 Std _____ _____

pH Cal. Temp.: _____

Conductivity (mS/cm) Before Cal. After Cal. Zero Conductivity Calibration

_____ Std _____ _____ Before _____ After _____

Barometric Pressure (mm Hg) _____

Datasonde Dissolved Oxygen Before Calibration After Calibration

% Saturation _____ _____

mg/L D.O. _____ _____

Temp - °C _____ _____

DO Handheld Meter Calibration - DO Meter Model _____

Before Calibration After Calibration

% Saturation _____ _____

mg/L D.O. _____ _____

Temp - °C _____ _____

Post Calibration Slope = _____

Create File for Test Program _____

Start Test: _____

End Test: _____

Test Program Readings

Datasonde

Hach HQ30d Meter

(Must be within 0.5 mg/L D.O.)

% Saturation _____

mg/L D.O. _____

Temp - °C _____

Create File for Datasonde _____

Remove calibration cup, Replace with weight _____

Re-calibration required if outside 0.5 mg/l limit

Before Cal.

After Cal.

Datasonde

Hach HQ30d Meter

% Saturation _____

mg/L D.O. _____

Temp - °C _____

Check File Status

File Start 10/1/13 15:00

File End 10/15/13 17:00

Battery Life % @ Start: 100%

Battery Life % @ End: 50%

Notes: LDO showing intermittent "0.00"

Field Notes for Datasonde Deployment

Date/Time: Oct. 1, 2013 13:20 EDT Analyst: TH
 Location: L5+I Treble Datasonde Serial #: 43731

Calibration Information

Datasonde Battery [volts]: 12.3v

pH (s.u.) Before Cal. After Cal.
 7.00 Std _____ _____
 10.00 Std _____ _____

pH Cal. Temp.: _____

Conductivity (mS/cm) Before Cal. After Cal. Zero Conductivity Calibration
 _____ Std _____ _____ Before _____ After _____

Barometric Pressure (mm Hg) _____

Datasonde Dissolved Oxygen Before Calibration After Calibration
 % Saturation _____ _____
 mg/L D.O. _____ _____
 Temp - °C _____ _____

DO Handheld Meter Calibration - DO Meter Model _____

Before Calibration After Calibration
 % Saturation _____ _____
 mg/L D.O. _____ _____
 Temp - °C _____ _____

Post Calibration Slope = _____

Create File for Test Program _____ Start Test: _____ End Test: _____

Test Program Readings

	Datasonde	Hach HQ30d Meter	(Must be within 0.5 mg/L D.O.)
% Saturation	_____	_____	
mg/L D.O.	_____	_____	
Temp - °C	_____	_____	

Create File for Datasonde _____ Remove calibration cup, Replace with weight _____

Re-calibration required if outside 0.5 mg/l limit

	Before Cal.	After Cal.	Datasonde	Hach HQ30d Meter
% Saturation	_____	_____	_____	_____
mg/L D.O.	_____	_____	_____	_____
Temp - °C	_____	_____	_____	_____

Check File Status

File Start 10/1/13 15:00

File End 10/15/13 17:00

Battery Life % @ Start: 100%

Battery Life % @ End: 50%

Notes: LDO showing intermittent "0.00"

Field Notes for Datasonde Deployment

Date/Time: Oct. 1, 2013 1305 EDT Analyst: TH

Location: McClure Tailwater Datasonde Serial #: 60582

Calibration Information

Datasonde Battery [volts]: 12.24

pH (s.u.)	<u>Before Cal.</u>	<u>After Cal.</u>	pH Cal. Temp.: _____
7.00 Std	_____	_____	
10.00 Std	_____	_____	

Conductivity (mS/cm)	<u>Before Cal.</u>	<u>After Cal.</u>	<u>Zero Conductivity Calibration</u>
_____ Std	_____	_____	Before _____ After _____

Barometric Pressure (mm Hg) _____

Datasonde Dissolved Oxygen	<u>Before Calibration</u>	<u>After Calibration</u>
% Saturation	_____	_____
mg/L D.O.	_____	_____
Temp - °C	_____	_____

DO Handheld Meter Calibration - DO Meter Model _____

	<u>Before Calibration</u>	<u>After Calibration</u>	Temp Only
% Saturation	_____	_____	
mg/L D.O.	_____	_____	
Temp - °C	_____	_____	

Post Calibration Slope = _____

Create File for Test Program _____ Start Test: _____ End Test: _____

Test Program Readings

	<u>Datasonde</u>	<u>Hach HQ30d Meter</u>	(Must be within 0.5 mg/L D.O.)
% Saturation	_____	_____	
mg/L D.O.	_____	_____	
Temp - °C	_____	_____	

Create File for Datasonde _____ Remove calibration cup, Replace with weight _____

Re-calibration required if outside 0.5 mg/l limit

	<u>Before Cal.</u>	<u>After Cal.</u>	<u>Datasonde</u>	<u>Hach HQ30d Meter</u>
% Saturation	_____	_____	_____	_____
mg/L D.O.	_____	_____	_____	_____
Temp - °C	_____	_____	_____	_____

Check File Status

File Start 10/1/13 14:00

File End 10/15/13 17:00

Battery Life % @ Start: 100%

Battery Life % @ End: 50%

Notes: _____

Field Notes for Datasonde Post Calibration

Date/Time: Oct. 1, 2013 12:55 EST Analyst: HA

Location: AAO Bridge Datasonde Serial #: 42482

Ending Datasonde Battery [volts]: 11.0 V

Calibration Information

pH (s.u.):	<u>Observed</u>
7.00 Std.	<u>7.28</u>
10.00 Std.	<u>10.37</u>

pH Temp Reading.: 21.83°C

Conductivity (mS/cm) : 0.301 Std. Conc. 0.295 Observed

Barometric Pressure (mm Hg) 716.2 mm Hg

<u>Dissolved Oxygen</u>	<u>Before Calibrate</u>	<u>After Calibrate</u>
% Saturation	<u>96.8%</u>	<u>99.9%</u>
mg/L D.O.	<u>8.63 mg/L</u>	<u>8.65 mg/L</u>
Temp - °C	<u>19.45°C</u>	<u>19.40°C</u>

Notes:

LDO readings in 8's and 9's

Field Notes for Datasonde Post CalibrationDate/Time: Oct. 1, 2013 15:51 EDT Analyst: HALocation: Hoibt Tailwater Datasonde Serial #: 47160Ending Datasonde Battery [volts]: 10.5 V**Calibration Information**

pH (s.u.):	<u>Observed</u>
7.00 Std.	<u>6.96</u>
10.00 Std.	<u>10.08</u>

pH Temp Reading.: 23.16 °CConductivity (mS/cm) : 0.301 Std. Conc. 0.297 ObservedBarometric Pressure (mm Hg) 722.6 mm Hg

<u>Dissolved Oxygen</u>	<u>Before Calibrate</u>	<u>After Calibrate</u>
% Saturation	<u>99.1%</u>	<u>100.0%</u>
mg/L D.O.	<u>8.32 mg/L</u>	<u>8.22 mg/L</u>
Temp - °C	<u>22.51 °C</u>	<u>22.48 °C</u>

Notes:

LDO readings in upper 7's and 8's

Field Notes for Datasonde Post CalibrationDate/Time: Oct. 1, 2013 15:30 EDT Analyst: HALocation: L5+I Treble Datasonde Serial #: 60592Ending Datasonde Battery [volts]: 11.1x**Calibration Information**

pH (s.u.):	<u>Observed</u>
7.00 Std.	<u>7.19</u>
10.00 Std.	<u>10.17</u>

pH Temp Reading.: 23.15Conductivity (mS/cm) : 0.301 Std. Conc. 0.303 ObservedBarometric Pressure (mm Hg) 722.5 mm Hg

<u>Dissolved Oxygen</u>	<u>Before Calibrate</u>	<u>After Calibrate</u>
% Saturation	<u>94.3%</u>	<u>100.0%</u>
mg/L D.O.	<u>8.06 mg/L</u>	<u>8.38 mg/L</u>
Temp - °C	<u>21.54°C</u>	<u>21.51°C</u>

Notes:

LDO readings in 8's and 9's

Field Notes for Datasonde Post Calibration

Date/Time: Oct. 1, 2013 16:00 EDT Analyst: IA

Location: McClure Tailwater Datasonde Serial #: 47162

Ending Datasonde Battery [volts]: 10.6v

Calibration Information

pH (s.u.):	<u>Observed</u>
7.00 Std.	<u>7.01</u>
10.00 Std.	<u>10.05</u>

pH Temp Reading.: 23.20°C

Conductivity (mS/cm) : 0.301 Std. Conc. 0.297 Observed

Barometric Pressure (mm Hg) 722.6 mm Hg

<u>Dissolved Oxygen</u>	<u>Before Calibrate</u>	<u>After Calibrate</u>
% Saturation	<u>92.8%</u>	<u>100.0%</u>
mg/L D.O.	<u>7.74 mg/L</u>	<u>8.19 mg/L</u>
Temp - °C	<u>22.75°C</u>	<u>22.71°C</u>

Notes:

LDO readings in 7's and 8's

Data OK

Temp only Data OK

Data OK - Temp only

Ending Datasonde Battery [volts]: 10.7

Calibration Information

Conductivity (mS/cm) : _____ Std. Conc. _____ Observed _____

Barometric Pressure (mm Hg) _____

<u>Dissolved Oxygen</u>	<u>Before Calibrate</u>	<u>After Calibrate</u>
% Saturation	_____	_____
mg/L D.O.	_____	_____
Temp – °C	_____	_____

Temp only - Data OK

Field Notes for Datasonde Deployment

Date/Time: 10/15/13 14:48 Analyst: MM

Location: AAO Datasonde Serial #: 47603

Calibration Information

Datasonde Battery [volts]: 12.1

pH (s.u.)	<u>Before Cal.</u>	<u>After Cal.</u>	pH Cal. Temp.: _____
7.00 Std	_____	_____	
10.00 Std	_____	_____	

Conductivity (mS/cm)	<u>Before Cal.</u>	<u>After Cal.</u>	<u>Zero Conductivity Calibration</u>
_____ Std	_____	_____	Before _____ After _____

Barometric Pressure (mm Hg) _____

Datasonde Dissolved Oxygen	<u>Before Calibration</u>	<u>After Calibration</u>
% Saturation	_____	_____
mg/L D.O.	_____	_____
Temp - °C	_____	_____

Temp only

DO Handheld Meter Calibration - DO Meter Model _____

	<u>Before Calibration</u>	<u>After Calibration</u>	Post Calibration Slope = _____
% Saturation	_____	_____	
mg/L D.O.	_____	_____	
Temp - °C	_____	_____	

Create File for Test Program _____ Start Test: _____ End Test: _____

Test Program Readings

	<u>Datasonde</u>	<u>Hach HQ30d Meter</u>	(Must be within 0.5 mg/L D.O.)
% Saturation	_____	_____	
mg/L D.O.	_____	_____	
Temp - °C	_____	_____	

Create File for Datasonde _____ Remove calibration cup, Replace with weight _____

Re-calibration required if outside 0.5 mg/l limit

	<u>Before Cal.</u>	<u>After Cal.</u>	<u>Datasonde</u>	<u>Hach HQ30d Meter</u>
% Saturation	_____	_____	_____	_____
mg/L D.O.	_____	_____	_____	_____
Temp - °C	_____	_____	_____	_____

Check File Status

File Start 10/15/13 1500 File End 11/1/13 0200

Battery Life % @ Start: 100 Battery Life % @ End: 41

Notes: _____

Field Notes for Datasonde Deployment

Date/Time: 10/15/13 13:40 Analyst: MW4Location: Hurst Datasonde Serial #: 47600**Calibration Information**Datasonde Battery [volts]: 12.2

pH (s.u.)	<u>Before Cal.</u>	<u>After Cal.</u>	pH Cal. Temp.: _____
7.00 Std	_____	_____	
10.00 Std	_____	_____	

Conductivity (mS/cm)	<u>Before Cal.</u>	<u>After Cal.</u>	<u>Zero Conductivity Calibration</u>
_____ Std	_____	_____	Before _____ After _____

Barometric Pressure (mm Hg) _____

Datasonde Dissolved Oxygen	<u>Before Calibration</u>	<u>After Calibration</u>
% Saturation	_____	_____
mg/L D.O.	_____	_____
Temp - °C	_____	_____

Temp
only

DO Handheld Meter Calibration - DO Meter Model _____

	<u>Before Calibration</u>	<u>After Calibration</u>	
% Saturation	_____	_____	
mg/L D.O.	_____	_____	
Temp - °C	_____	_____	Post Calibration Slope = _____

Create File for Test Program _____ Start Test: _____ End Test: _____

Test Program Readings

	<u>Datasonde</u>	<u>Hach HQ30d Meter</u>	(Must be within 0.5 mg/L D.O.)
% Saturation	_____	_____	
mg/L D.O.	_____	_____	
Temp - °C	_____	_____	

Create File for Datasonde _____ Remove calibration cup, Replace with weight _____

Re-calibration required if outside 0.5 mg/l limit

	<u>Before Cal.</u>	<u>After Cal.</u>	<u>Datasonde</u>	<u>Hach HQ30d Meter</u>
% Saturation	_____	_____	_____	_____
mg/L D.O.	_____	_____	_____	_____
Temp - °C	_____	_____	_____	_____

Check File StatusFile Start 10/15/13 14:00 File End 11/1/13 0300Battery Life % @ Start: 100 Battery Life % @ End: 50Notes: _____

Field Notes for Datasonde Deployment

Date/Time: 10/15/13 12:46 Analyst: MWH

Location: LSI Datasonde Serial #: 42482

Calibration Information

Datasonde Battery [volts]: 12.5

pH (s.u.)	<u>Before Cal.</u>	<u>After Cal.</u>	pH Cal. Temp.: _____
7.00 Std	_____	_____	
10.00 Std	_____	_____	

Conductivity (mS/cm)	<u>Before Cal.</u>	<u>After Cal.</u>	<u>Zero Conductivity Calibration</u>
_____ Std	_____	_____	Before _____ After _____

Barometric Pressure (mm Hg) _____

Datasonde Dissolved Oxygen	<u>Before Calibration</u>	<u>After Calibration</u>
% Saturation	_____	_____
mg/L D.O.	_____	_____
Temp - °C	_____	_____

Temp only

DO Handheld Meter Calibration - DO Meter Model _____

	<u>Before Calibration</u>	<u>After Calibration</u>	Post Calibration Slope = _____
% Saturation	_____	_____	
mg/L D.O.	_____	_____	
Temp - °C	_____	_____	

Create File for Test Program _____ Start Test: _____ End Test: _____

Test Program Readings

	<u>Datasonde</u>	<u>Hach HQ30d Meter</u>	(Must be within 0.5 mg/L D.O.)
% Saturation	_____	_____	
mg/L D.O.	_____	_____	
Temp - °C	_____	_____	

Create File for Datasonde _____ Remove calibration cup, Replace with weight _____

Re-calibration required if outside 0.5 mg/l limit

	<u>Before Cal.</u>	<u>After Cal.</u>	<u>Datasonde</u>	<u>Hach HQ30d Meter</u>
% Saturation	_____	_____	_____	_____
mg/L D.O.	_____	_____	_____	_____
Temp - °C	_____	_____	_____	_____

Check File Status

File Start 10/15/13 14:00 File End 11/1/13 02:00

Battery Life % @ Start: 100 Battery Life % @ End: _____

Notes: _____

Field Notes for Datasonde Deployment

Date/Time: 10/15/13 12:10 EST Analyst: MWYLocation: McClure Datasonde Serial #: 60592**Calibration Information**Datasonde Battery [volts]: 12.5

pH (s.u.)	Before Cal.	After Cal.
7.00 Std	_____	_____
10.00 Std	_____	_____

pH Cal. Temp.: _____

Conductivity (mS/cm)	Before Cal.	After Cal.	Zero Conductivity Calibration
_____ Std	_____	_____	Before _____ After _____

Barometric Pressure (mm Hg) _____

Datasonde Dissolved Oxygen	Before Calibration	After Calibration
% Saturation	_____	_____
mg/L D.O.	_____	_____
Temp - °C	_____	_____

Temp only

DO Handheld Meter Calibration - DO Meter Model _____

	Before Calibration	After Calibration
% Saturation	_____	_____
mg/L D.O.	_____	_____
Temp - °C	_____	_____

Post Calibration Slope = _____

Create File for Test Program _____

Start Test: _____

End Test: _____

Test Program Readings

	Datasonde	Hach HQ30d Meter	(Must be within 0.5 mg/L D.O.)
% Saturation	_____	_____	
mg/L D.O.	_____	_____	
Temp - °C	_____	_____	

Create File for Datasonde ☒Remove calibration cup, Replace with weight ☒**Re-calibration required if outside 0.5 mg/l limit**

	Before Cal.	After Cal.	Datasonde	Hach HQ30d Meter
% Saturation	_____	_____	_____	_____
mg/L D.O.	_____	_____	_____	_____
Temp - °C	_____	_____	_____	_____

Check File StatusFile Start 10/15/13 13:00File End 10/15/13 02:00Battery Life % @ Start: 100Battery Life % @ End: 41

Notes: _____

Temperature only.

Data OK

Appendix D

Dead River Hydroelectric Project

FERC Project No. 10855

Documentation of Agency Consultation

Upper Peninsula Power Corporation – Dead River Hydroelectric Projects

The following table is a list of the dates of letters or correspondence regarding potential deviations from water quality standards:

Date of Notice to MDEQ, MDNR and US Fish and Wildlife	Date of Notice to FERC	Re:
May 29, 2013	June 4, 2013	Missing Data – AAO
June 12, 2013	June 19, 2013	Missing Data – LSI
July 11, 2013	July 17, 2013	Missing Data – Hoist
July 24, 2013	July 31, 2013	DO deviations - Hoist
August 7, 2013	August 16, 2013	DO deviations - Hoist
August 21, 2013	August 27, 2013	Missing Data – LSI
September 5, 2013	September 11, 2013	DO & temp deviations - Hoist
September 18, 2013	September 25, 2013	Equipment failure – Hoist
October 3, 2013	October 8, 2013	Temperature dev. - Hoist

The 2013 annual water quality monitoring report was submitted to the resource agencies for review and comment on November 21, 2013.

Metcalfe, Mark W

From: Metcalf, Mark W
Sent: Wednesday, May 29, 2013 2:15 PM
To: 'Burr Fisher'; 'Taft, Bill (DEQ)'; 'Kruger, Kyle'; Koetje, Mitch (DEQ)
Cc: Meyers, Robert J; Schlörke, Virgil E; Puzen, Shawn C
Subject: Dead River water quality monitoring - missing data

Good afternoon:

Pursuant to Article 408 of the Project License and the water quality monitoring plan for the Dead River Hydroelectric Project, UPPCO is monitoring water quality (dissolved oxygen and temperature) at 4 locations within the project. Per the monitoring plan, temperature data is collected on an hourly basis from May 1st through October 31st. Dissolved oxygen data is collected hourly from June 1st through September 30th.

On May 14th, a water quality monitor was deployed in the Dead River where County Road AAO crosses the Dead River (SE 1/4 of NE 1/4, section 22, T49N, R28W, Township of Champion), downstream of the Silver Lake Storage basin. Shortly after deployment, the monitor experienced a malfunction of the circuit board controlling the monitor sensors. As a result of the malfunction, temperature data was not collected between 12:00 on May 14th through 13:00 on May 28th.

The water quality standard for temperature at this location is 65F. When the monitor was deployed on May 14th, water temperatures were ranging between 35F and 45F. When the monitor was retrieved on the 28th at approximately 12:00 EST, the water temperature at the AAO bridge was 52F. Given that weather conditions have been normal to slightly below normal for this time of year, it is unlikely high water temperatures occurred during the period of missing data.

If you have any questions, feel free to contact me.

Thanks,
Mark

Mark Metcalf

Environmental Consultant - Air & Water | Integrys Business Support, LLC

920-433-1833 (Green Bay)

920-617-6046 (De Pere)

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Providing support for Integrys Energy Group, Integrys Energy Services, Michigan Gas Utilities, Minnesota Energy Resources, North Shore Gas, Peoples Gas, Trillium CNG, Upper Peninsula Power Company and Wisconsin Public Service.

Metcalfe, Mark W

From: Metcalf, Mark W
Sent: Wednesday, June 12, 2013 9:45 PM
To: 'Taft, Bill (DEQ)'; 'Burr Fisher '; 'Kruger, Kyle'; Koetje, Mitch (DEQ)
Cc: Puzen, Shawn C; Schlorke, Virgil E; Meyers, Robert J
Subject: Water Quality Monitoring - Dead River Hydroelectric Project

Good evening:

Pursuant to Article 408 of the Project License and the water quality monitoring plan for the Dead River Hydroelectric Project, UPPCO is monitoring water quality (dissolved oxygen and temperature) at 4 locations within the project. Per the monitoring plan, temperature data is collected on an hourly basis from May 1st through October 31st. Dissolved oxygen data is collected hourly from June 1st through September 30th.

On May 28th, a water quality monitor was deployed downstream of the McClure Dam in the Dead River, east of where the LS&I railroad crosses the Dead River (SW ¼ of the NE ¼, Section 16, T48N, R26W, Township of Negaunee). On June 2nd, the monitor experienced a malfunction causing it to stop operating. As a result of the malfunction, temperature and dissolved oxygen data was not collected from June 2nd at 17:00 through 16:00 on June 11th when a replacement monitor was deployed.

The dissolved oxygen water quality standard is 7.0 mg/l. As you are aware, UPPCO is releasing a minimum of 20 cfs of flow from a low level siphon at the McClure Dam. A dissolved oxygen profile conducted at the McClure Dam on 6/11 indicated that DO levels are above 7.0 mg/l at all depths. In addition to this flow, UPPCO is currently spilling water into the bypass channel of the river. Consequently, dissolved oxygen levels downstream of the dam were likely above the dissolved oxygen water quality standard during the period of missing data.

The water quality standard for temperature at this location is 68F during the month of June. Prior to the equipment malfunction, water temperatures were in the mid 50's to low 60 degree F range. Water temperatures observed as part of the DO profile at the McClure Dam showed temperatures between 61F and 50F. Therefore, it is unlikely that water temperatures exceeded the standard during the period of missing data.

If you have any questions, feel free to contact me.

Thanks,
Mark

Mark Metcalf

Environmental Consultant - Air & Water | Integrys Business Support, LLC

920-433-1833 (Green Bay)

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Metcalf, Mark W

Subject: FW: Dead River water quality monitoring - missing data
Attachments: Hoist data thru 0709.pdf
Expires: Friday, July 17, 2015 12:00 AM

From: Metcalf, Mark W
Sent: Thursday, July 11, 2013 3:56 PM
To: 'Burr Fisher '; 'Kruger, Kyle'; 'Koetje, Mitch (DEQ)'; Kohlhepp, Gary (DEQ); Klemans, Diana (DEQ); Carpenter, Koren
Cc: Meyers, Robert J; Schlorke, Virgil E; Puzen, Shawn C
Subject: RE: Dead River water quality monitoring - missing data

Good afternoon:

Pursuant to Article 408 of the Project License and the water quality monitoring plan for the Dead River Hydroelectric Project, UPPCO is monitoring water quality (dissolved oxygen and temperature) at 4 locations within the project. Per the monitoring plan, temperature data is collected on an hourly basis from May 1st through October 31st. Dissolved oxygen data is collected hourly from June 1st through September 30th.

On June 25th, a water quality monitor was deployed in the Dead River downstream of the Hoist Powerhouse (SE ¼, of the NE ¼ of Section 16, T48N, R26W (Township of Negaunee)). Shortly after deployment, the monitor experienced a malfunction of the dissolved oxygen sensor. An initial evaluation of the monitor indicates there was an electrical short in the DO sensor which caused the monitor to stop measuring dissolved levels. As a result of the malfunction, dissolved oxygen data was not collected between 16:00 on June 26th through 15:00 on July 9th. Temperature monitoring data was not affected by the malfunction. Attached for your information are graphs of the dissolved oxygen and temperature data collected through July 9th.

In light of the recent equipment reliability issues observed this year, UPPCO is evaluating other equipment manufacturers to determine if switching equipment would result in improved data reliability. Should you have any questions, please feel free to contact me.

Mark

Mark Metcalf

Environmental Consultant - Air & Water | Integrys Business Support, LLC

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920-617-6046 (De Pere)

920-606-8432 *cell*

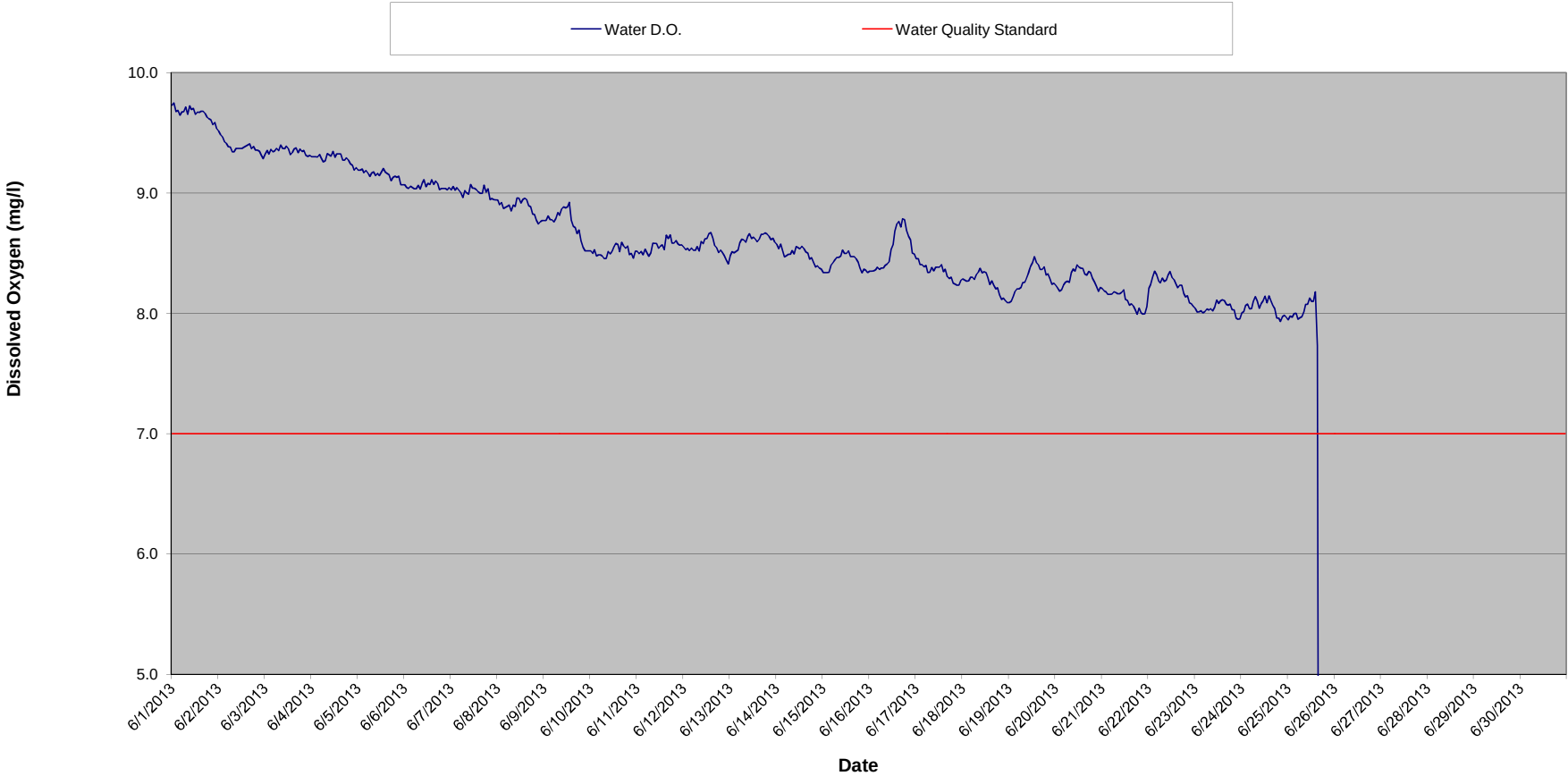
920-433-4916 *fax*

mwmetcalf@integrysgroup.com

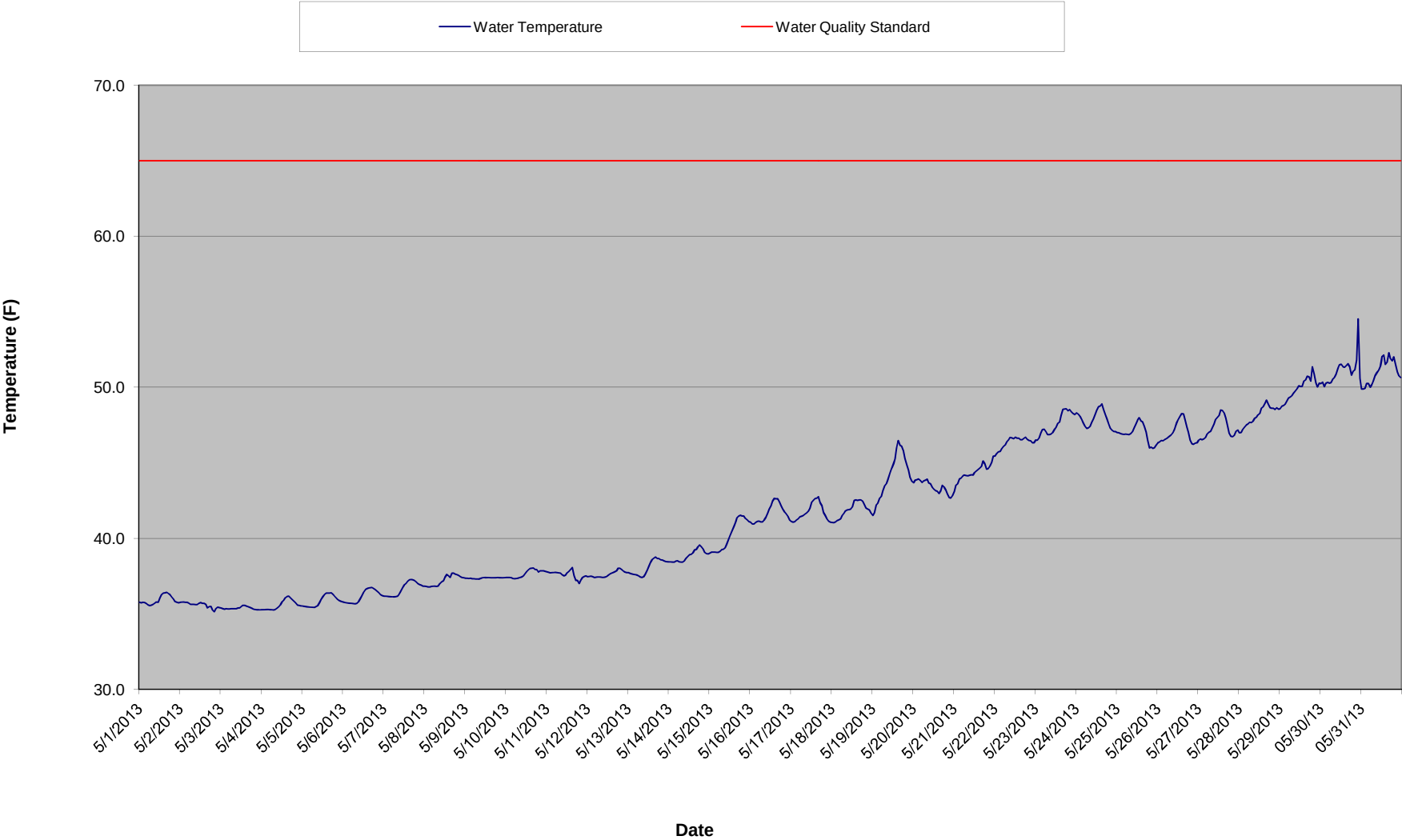
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Providing support for Integrys Energy Group, Integrys Energy Services, Michigan Gas Utilities, Minnesota Energy Resources, North Shore Gas, Peoples Gas, Trillium CNG, Upper Peninsula Power Company and Wisconsin Public Service.

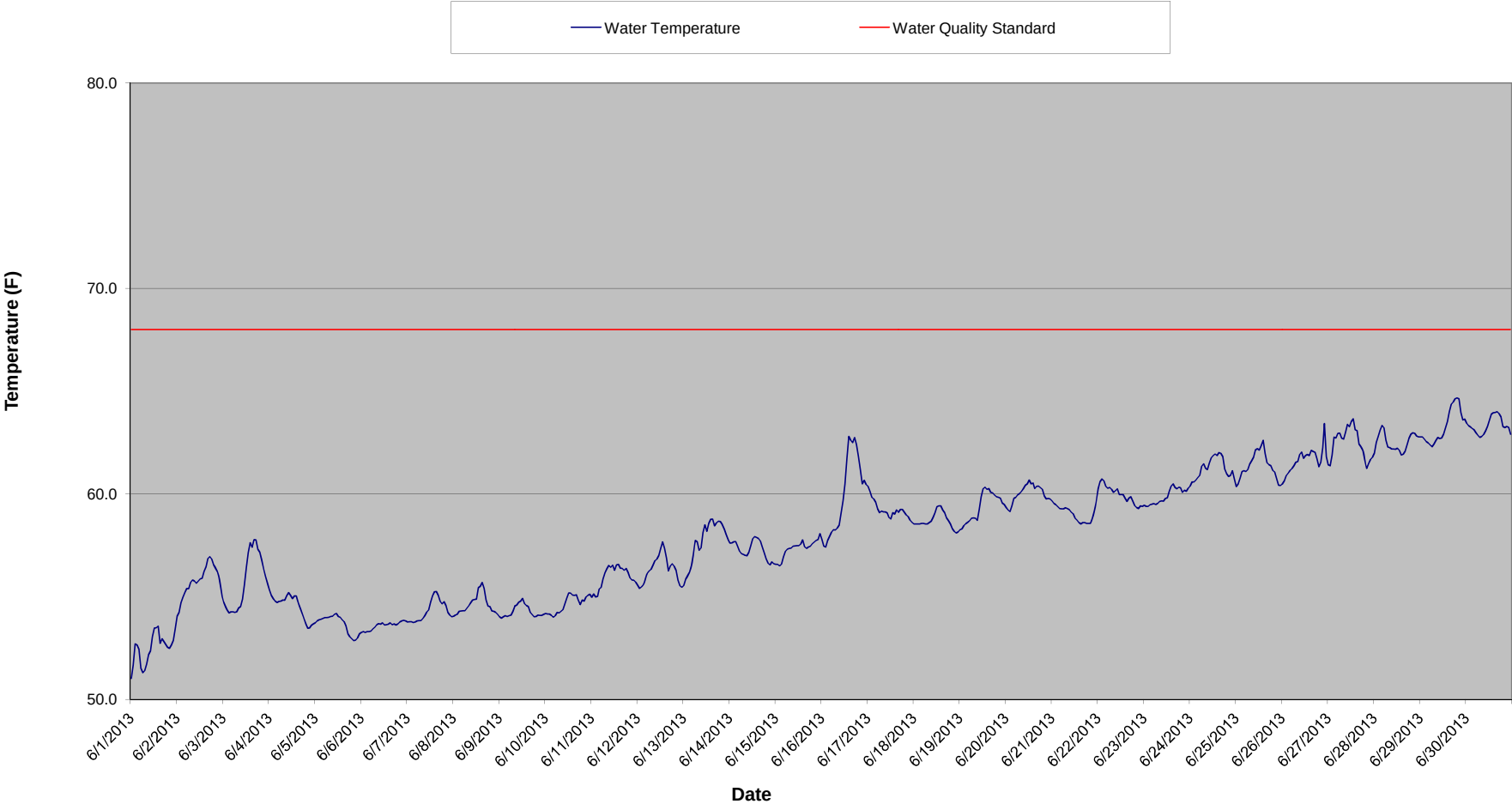
Hoist Powerhouse Dissolved Oxygen Summary - June 2013



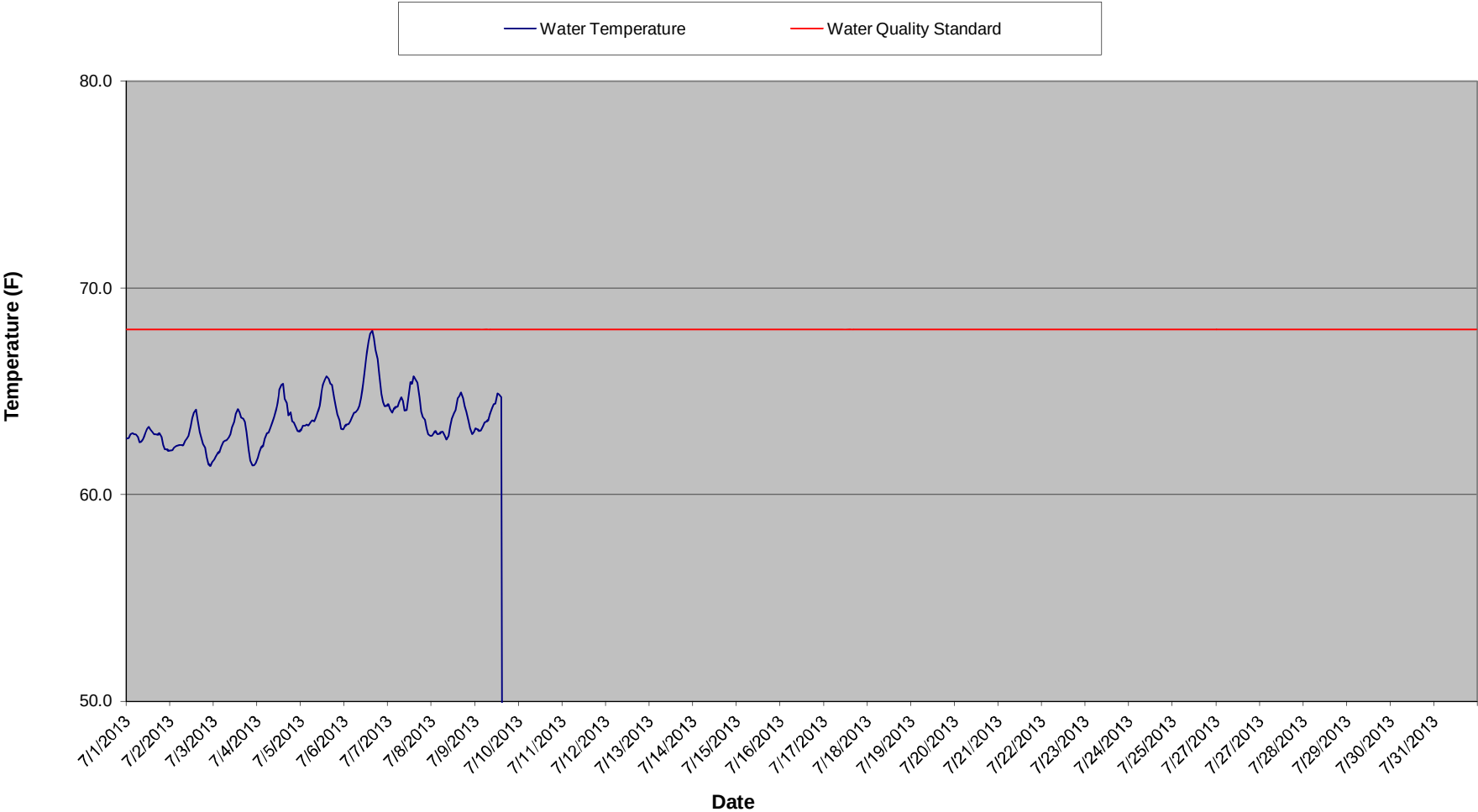
Hoist Powerhouse Temperature Summary - May 2013



Hoist Powerhouse Temperature Summary - June 2013



Hoist Powerhouse Temperature Summary - July 2013



Metcalfe, Mark W

From: Metcalf, Mark W
Sent: Wednesday, July 24, 2013 2:54 PM
To: 'Burr Fisher '; 'Kruger, Kyle'; 'Koetje, Mitch (DEQ)'; Klemans, Diana (DEQ); Kohlhepp, Gary (DEQ); Carpenter, Koren
Cc: Meyers, Robert J; Schlorke, Virgil E; Puzen, Shawn C
Subject: Water Quality monitoring - Dead River Hydroelectric Project.
Attachments: 20130723 Hoist data.pdf

Good afternoon,

Pursuant to Article 408 of the Project License and the water quality monitoring plan for the Dead River Hydroelectric Project, UPPCO is monitoring water quality (dissolved oxygen and temperature) downstream of the Hoist Powerhouse (SE ¼, of the NE ¼ of Section 16, T48N, R26W (Township of Negaunee)). Per the monitoring plan, temperature data is collected on an hourly basis from May 1st through October 31st. Dissolved oxygen data is collected hourly from June 1st through September 30th.

Between July 9th and July 23rd, deviations from the dissolved oxygen water quality standard were observed. Water quality monitoring data from this monitoring location collected in the month of July is attached for your review. The lowest DO reading observed was 5.6 mg/l. The likely cause of the low DO readings is a natural stratification of the reservoir. Dissolved oxygen and temperature profiles conducted at the powerhouse intake on July 9th and July 23rd show that the reservoir is stratified. Dissolved oxygen levels below the water quality standard of 7 mg/l are present in the hypolimnion of the reservoir, where water is being withdrawn and subsequently released through the powerhouse. Consequently, low dissolved oxygen levels were observed downstream of the facility.

Please feel free to contact me if you have questions on the monitoring data.

Mark

Mark Metcalf

Environmental Consultant - Air & Water | Integrus Business Support, LLC

920-433-1833 (Green Bay)

920-617-6046 (De Pere)

920-606-8432 *cell*

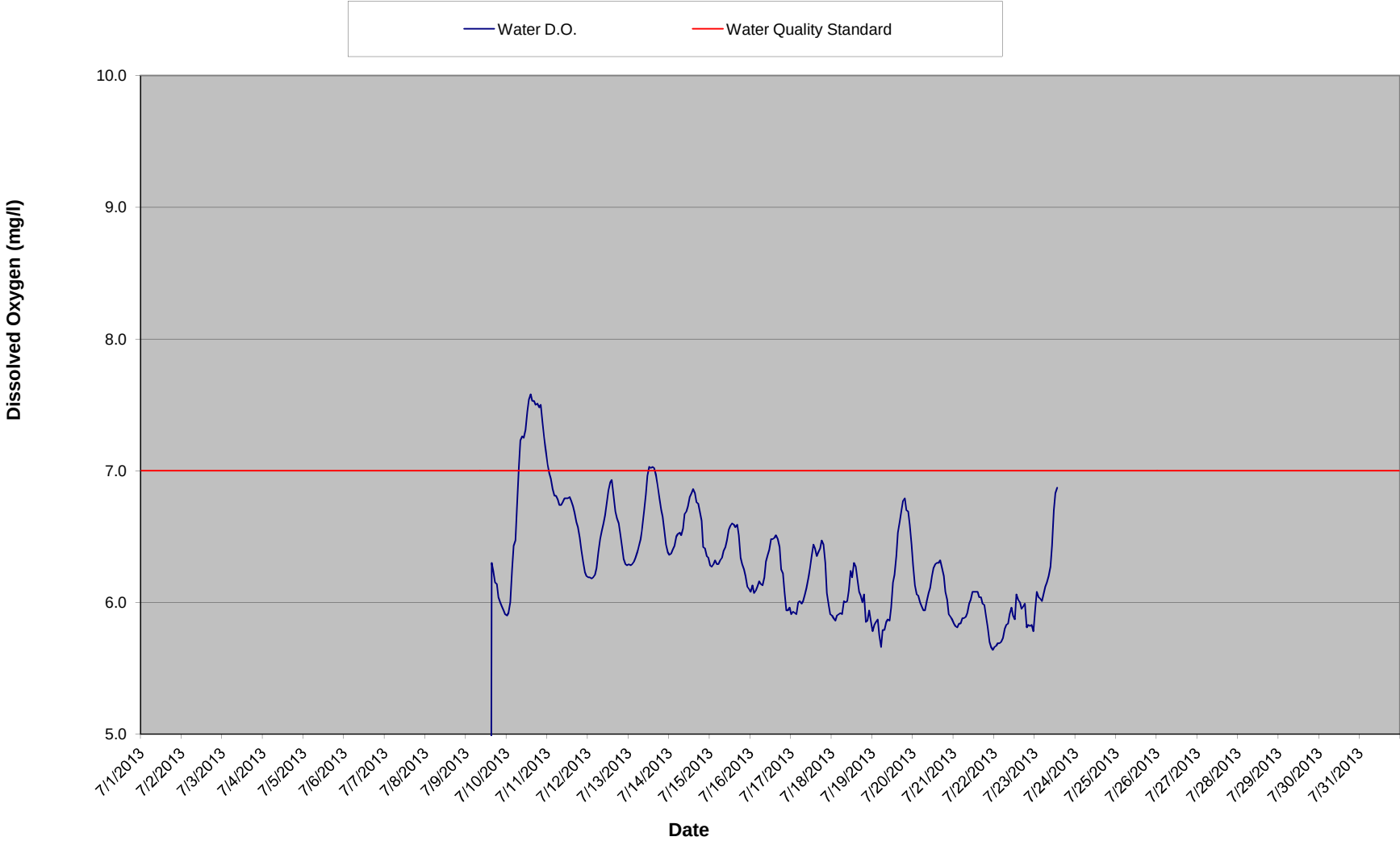
920-433-4916 *fax*

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Hoist Powerhouse Dissolved Oxygen Summary - July 2013



Dead River Below Hoist Powerhouse - July 2013 Dissolved Oxygen Monitoring Data

Time HHMMSS	07/01/13	07/02/13	07/03/13	07/04/13	07/05/13	07/06/13	07/07/13	07/08/13	07/09/13	07/10/13	07/11/13	07/12/13	07/13/13	07/14/13	07/15/13	07/16/13
0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	5.9	7.2	6.2	6.3	6.4	6.3	6.1
10000	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	5.9	7.1	6.2	6.3	6.4	6.3	6.1
20000	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	5.9	7.0	6.2	6.3	6.4	6.3	6.1
30000	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	6.0	6.9	6.2	6.3	6.4	6.3	6.1
40000	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	6.3	6.9	6.2	6.3	6.4	6.3	6.1
50000	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	6.4	6.8	6.2	6.3	6.5	6.3	6.1
60000	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	6.5	6.8	6.3	6.4	6.5	6.3	6.2
70000	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	6.7	6.8	6.4	6.4	6.5	6.3	6.1
80000	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	7.0	6.7	6.5	6.5	6.5	6.3	6.1
90000	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	7.2	6.7	6.5	6.6	6.6	6.4	6.2
100000	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	7.3	6.8	6.6	6.7	6.7	6.4	6.3
110000	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	7.3	6.8	6.7	6.8	6.7	6.5	6.4
120000	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	7.3	6.8	6.8	7.0	6.7	6.6	6.4
130000	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	7.5	6.8	6.9	7.0	6.8	6.6	6.5
140000	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	7.5	6.8	6.9	7.0	6.8	6.6	6.5
150000	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	6.3	7.6	6.8	6.9	7.0	6.9	6.6	6.5
160000	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	6.3	7.5	6.7	6.8	7.0	6.8	6.6	6.5
170000	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	6.2	7.5	6.7	6.7	7.0	6.8	6.6	6.5
180000	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	6.2	7.5	6.6	6.6	6.9	6.8	6.5	6.4
190000	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	6.1	7.5	6.6	6.6	6.8	6.7	6.3	6.3
200000	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	6.0	7.5	6.5	6.5	6.7	6.6	6.3	6.2
210000	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	6.0	7.5	6.4	6.4	6.7	6.4	6.3	6.1
220000	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	6.0	7.4	6.3	6.3	6.5	6.4	6.2	5.9
230000	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	5.9	7.3	6.2	6.3	6.4	6.4	6.1	5.9
Daily Max	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	6.3	7.6	7.2	6.9	7.0	6.9	6.6	6.5
Daily Min	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	5.9	6.2	6.2	6.3	6.4	6.1	5.9
Average	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	2.4	7.0	6.7	6.5	6.6	6.6	6.4	6.2

Water Quality Standard: 7 mg/l Dissolved Oxygen

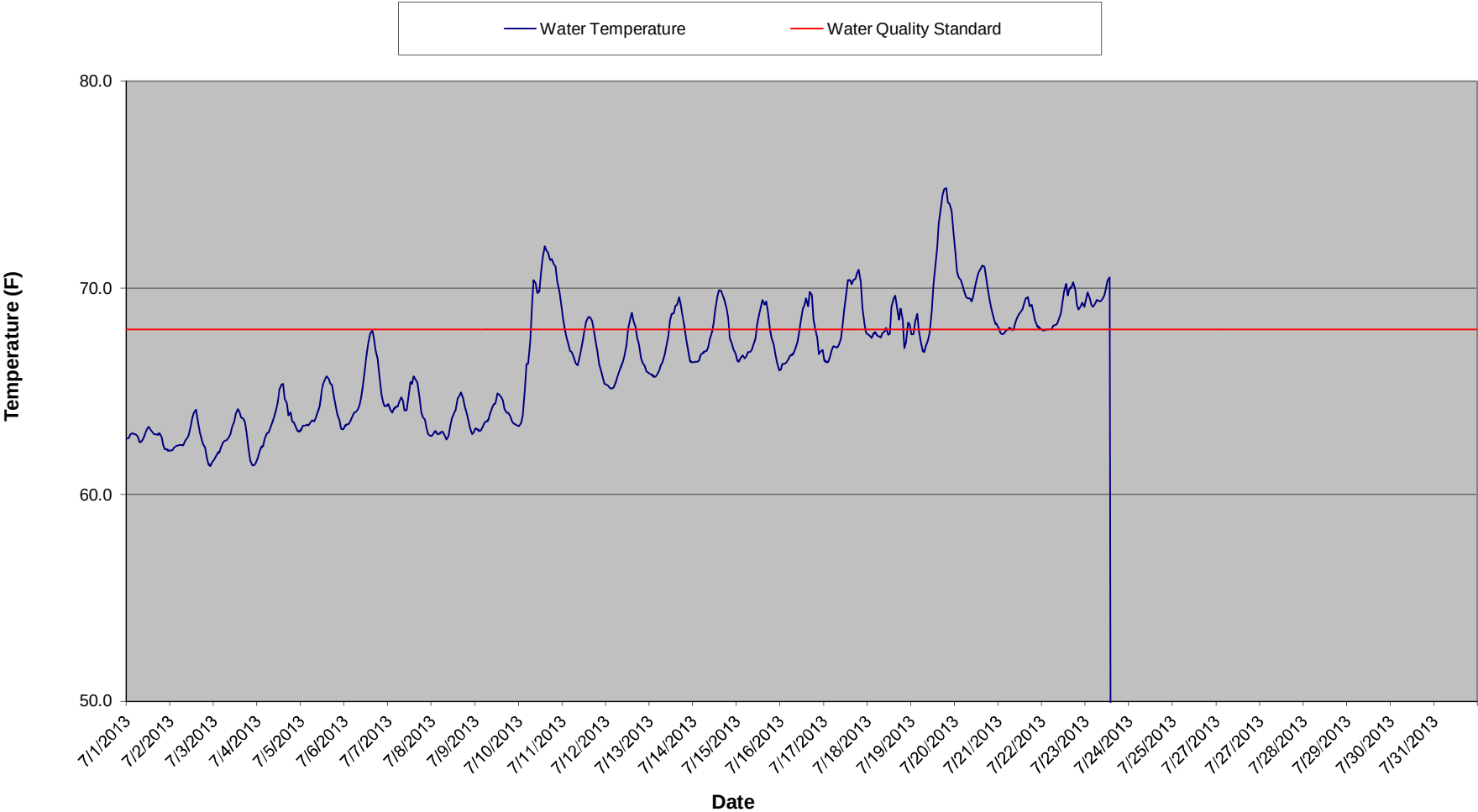
Below water quality standard
No data - Equipment Malfunction

Dead River Below Hoist Powerhouse - July 2013 Dissolved Oxygen Monitoring Data

Time HHMMSS	07/17/13	07/18/13	07/19/13	07/20/13	07/21/13	07/22/13	07/23/13	07/24/13	07/25/13	07/26/13	07/27/13	07/28/13	07/29/13	07/30/13	07/31/13
0	6.0	5.9	5.9	6.4	5.9	5.6	5.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10000	5.9	5.9	5.8	6.3	5.8	5.7	6.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
20000	5.9	5.9	5.8	6.1	5.8	5.7	6.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
30000	5.9	5.9	5.9	6.1	5.8	5.7	6.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
40000	5.9	5.9	5.9	6.1	5.8	5.7	6.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
50000	6.0	5.9	5.8	6.0	5.8	5.7	6.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
60000	6.0	5.9	5.7	6.0	5.9	5.7	6.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
70000	6.0	5.9	5.8	5.9	5.9	5.8	6.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
80000	6.0	6.0	5.8	5.9	5.9	5.8	6.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
90000	6.1	6.0	5.9	6.0	5.9	5.8	6.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
100000	6.1	6.0	5.9	6.1	6.0	5.9	6.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
110000	6.2	6.1	5.9	6.1	6.0	6.0	6.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
120000	6.3	6.2	6.0	6.2	6.1	5.9	6.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
130000	6.4	6.2	6.2	6.3	6.1	5.9	6.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
140000	6.4	6.3	6.2	6.3	6.1	6.1	6.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
150000	6.4	6.3	6.4	6.3	6.1	6.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
160000	6.4	6.2	6.5	6.3	6.0	6.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
170000	6.4	6.1	6.6	6.3	6.0	6.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
180000	6.4	6.1	6.7	6.3	6.0	6.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
190000	6.5	6.0	6.8	6.2	6.0	6.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
200000	6.4	6.1	6.8	6.1	5.9	5.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
210000	6.3	5.9	6.7	6.0	5.8	5.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
220000	6.1	5.9	6.7	5.9	5.7	5.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
230000	6.0	5.9	6.6	5.9	5.7	5.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Daily Max	6.5	6.3	6.8	6.4	6.1	6.1	6.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Daily Min	5.9	5.9	5.7	5.9	5.7	5.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Average	6.2	6.0	6.2	6.1	5.9	5.8	3.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Below water quality standard

Hoist Powerhouse Temperature Summary - July 2013



Dead River Below Hoist Powerhouse - July 2013 Temperature Monitoring Data

Time HHMMSS	7/1/13	7/2/13	7/3/13	7/4/13	7/5/13	7/6/13	7/7/13	7/8/13	7/9/13	7/10/13	7/11/13	7/12/13	7/13/13	7/14/13	7/15/13	7/16/13
0	62.7	62.1	61.7	61.8	63.1	63.3	64.4	62.9	63.2	63.3	68.5	65.3	65.8	66.4	66.5	66.0
10000	62.7	62.2	61.9	62.1	63.3	63.4	64.1	63.0	63.1	63.5	68.1	65.2	65.8	66.4	66.4	66.3
20000	62.9	62.3	62.0	62.3	63.3	63.4	64.0	63.1	63.1	63.8	67.6	65.2	65.7	66.4	66.7	66.3
30000	63.0	62.3	62.1	62.4	63.4	63.5	64.1	62.9	63.1	65.1	67.3	65.1	65.7	66.5	66.7	66.4
40000	62.9	62.4	62.3	62.7	63.3	63.7	64.2	62.9	63.3	66.3	67.0	65.2	65.8	66.8	66.6	66.5
50000	62.9	62.4	62.6	63.0	63.5	64.0	64.2	63.0	63.5	66.3	66.9	65.4	66.0	66.8	66.7	66.7
60000	62.8	62.4	62.6	63.0	63.6	64.0	64.5	63.1	63.6	67.4	66.6	65.7	66.3	66.9	66.9	66.7
70000	62.5	62.4	62.6	63.2	63.6	64.1	64.7	62.9	63.6	69.1	66.4	65.9	66.4	66.9	66.9	66.8
80000	62.6	62.6	62.8	63.5	63.7	64.3	64.5	62.7	63.9	70.4	66.3	66.2	66.8	67.1	67.0	67.0
90000	62.7	62.7	62.9	63.7	64.0	64.7	64.1	62.8	64.2	70.2	66.6	66.4	67.2	67.5	67.2	67.4
100000	62.9	62.9	63.3	64.1	64.3	65.4	64.1	63.3	64.4	69.8	66.9	66.7	67.7	67.9	67.6	67.8
110000	63.2	63.3	63.5	64.5	64.8	66.0	64.7	63.7	64.4	69.9	67.5	67.2	68.4	68.3	68.2	68.4
120000	63.3	63.7	63.9	65.1	65.3	66.9	65.4	63.9	64.9	70.7	68.0	68.0	68.7	68.9	68.8	69.0
130000	63.2	64.0	64.1	65.3	65.6	67.4	65.4	64.1	64.9	71.4	68.4	68.5	68.8	69.6	69.1	69.2
140000	63.0	64.1	64.0	65.4	65.7	67.8	65.7	64.7	64.7	72.0	68.6	68.8	69.1	69.9	69.4	69.5
150000	62.9	63.6	63.7	64.6	65.6	67.9	65.6	64.8	64.6	71.8	68.6	68.4	69.2	69.9	69.2	69.1
160000	62.9	63.0	63.7	64.4	65.4	67.6	65.4	65.0	64.1	71.7	68.4	68.1	69.5	69.6	69.3	69.8
170000	62.9	62.7	63.5	63.8	65.3	67.0	64.7	64.7	64.0	71.3	68.0	67.6	69.2	69.4	68.9	69.7
180000	63.0	62.5	63.0	64.0	64.7	66.6	64.0	64.3	64.0	71.4	67.5	67.3	68.5	69.0	68.0	68.5
190000	62.8	62.3	62.2	63.6	64.3	65.8	63.8	64.0	63.8	71.1	66.9	66.6	68.1	68.6	67.6	68.0
200000	62.4	61.8	61.6	63.5	63.9	64.9	63.6	63.6	63.6	71.0	66.3	66.4	67.5	67.6	67.3	67.6
210000	62.2	61.5	61.4	63.3	63.6	64.5	63.2	63.2	63.4	70.3	66.0	66.2	66.9	67.3	66.8	66.8
220000	62.2	61.4	61.4	63.1	63.2	64.3	62.9	62.9	63.4	69.9	65.6	66.0	66.5	67.0	66.4	66.9
230000	62.1	61.6	61.5	63.1	63.2	64.3	62.8	63.0	63.3	69.3	65.4	65.9	66.4	66.8	66.0	67.0
Daily Max	63.3	64.1	64.1	65.4	65.7	67.9	65.7	65.0	64.9	72.0	68.6	68.8	69.5	69.9	69.4	69.8
Daily Min	62.1	61.4	61.4	61.8	63.1	63.3	62.8	62.7	63.1	63.3	65.4	65.1	65.7	66.4	66.0	66.0
Average	62.8	62.6	62.7	63.5	64.1	65.2	64.3	63.5	63.8	69.1	67.2	66.6	67.3	67.8	67.5	67.6

Monthly average temp (F): 57.1
License Max. Average Temperature: 68 F

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Time	7/17/13	7/18/13	7/19/13	7/20/13	7/21/13	7/22/13	7/23/13	7/24/13	7/25/13	7/26/13	7/27/13	7/28/13	7/29/13	7/30/13	7/31/13
0	66.5	67.8	67.7	71.7	68.1	68.0	69.4	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0
10000	66.4	67.7	67.8	70.8	67.8	67.9	69.8	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0
20000	66.4	67.6	68.4	70.5	67.7	68.0	69.5	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0
30000	66.6	67.7	68.7	70.4	67.8	68.0	69.2	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0
40000	67.0	67.9	67.9	70.1	67.9	68.0	69.1	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0
50000	67.2	67.7	67.5	69.9	68.0	68.0	69.2	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0
60000	67.2	67.7	67.0	69.5	68.1	68.2	69.4	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0
70000	67.1	67.6	66.9	69.5	68.0	68.2	69.4	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0
80000	67.2	67.8	67.2	69.5	68.0	68.3	69.4	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0
90000	67.6	67.9	67.5	69.4	68.3	68.5	69.4	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0
100000	68.2	68.1	67.8	69.6	68.5	68.7	69.6	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0
110000	68.9	67.7	68.9	70.1	68.7	69.3	70.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0
120000	69.7	67.8	70.1	70.5	68.8	69.8	70.4	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0
130000	70.4	69.1	70.9	70.7	69.0	70.2	70.5	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0
140000	70.4	69.5	71.9	70.9	69.3	69.6	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0
150000	70.2	69.6	73.1	71.1	69.5	69.9	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0
160000	70.4	69.1	73.9	71.0	69.5	70.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0
170000	70.4	68.5	74.5	70.5	69.1	70.3	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0
180000	70.7	69.0	74.8	70.0	69.2	69.9	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0
190000	70.9	68.5	74.8	69.4	68.8	69.2	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0
200000	70.3	67.1	74.1	69.0	68.4	69.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0
210000	69.0	67.4	74.1	68.6	68.2	69.1	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0
220000	68.2	68.3	73.7	68.3	68.1	69.3	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0
230000	67.8	68.2	72.8	68.2	68.0	69.1	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0
Daily Max	70.9	69.6	74.8	71.7	69.5	70.3	70.5	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0
Daily Min	66.4	67.1	66.9	68.2	67.7	67.9	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0
Average	68.5	68.1	70.5	70.0	68.5	68.9	53.9	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0

Dead River (Hoist) Storage Basin
2013 Dissolved Oxygen and Temperature Profile Data

6/11/2013
Time: 16:15 EDT
Weather: Sunny, 73F, 5-10 mph wind

Secchi Disk - 6' 10"

Depth (meters)	DO mg/l	Temp °C	Temp °F
0.5	8.73	20.4	68.7
1.0	8.73	18.7	65.7
1.5	8.71	17.4	63.3
2.0	8.7	17.1	62.8
2.5	8.63	16.8	62.2
3.0	8.6	16.7	62.1
3.5	8.55	16.5	61.7
4.0	8.51	16.2	61.2
4.5	8.12	15	59.0
5.0	7.75	14.5	58.1
5.5	7.79	14.3	57.7
6.0	7.76	14.2	57.6
6.5	7.62	13.4	56.1
7.0	7.6	13.4	56.1
7.5	7.58	13.1	55.6
8.0	7.56	13.1	55.6
8.5	7.57	12.2	54.0
9.0	7.66	11.8	53.2
9.5	7.7	11.8	53.2
10.0	7.8	10.7	51.3
10.5	7.8	10.4	50.7
11.0	7.8	9.1	48.4
11.5	7.84	8.9	48.0
12.0	7.52	8.6	47.5
12.5	7.45	8	46.4
13.0	7.52	7.4	45.3

Comparison Readings - 2nd meter

0.5 m	8.83	19.9	102.3
13.0 m	7.21	65.3	8.8

6/25/2013
Time: 14:50 EST
Weather: Cloudy, 75°F, light winds
Secchi Disk - 7' 4"

Depth (m)	DO mg/l	Temp °C	Temp °F
0.5	8.83	22.7	72.9
1.0	8.81	21.7	71.1
1.5	7.91	20.0	68.0
2.0	7.67	19.2	66.6
2.5	7.63	18.9	66.0
3.0	7.57	18.4	65.1
3.5	7.02	17.7	63.9
4.0	6.97	17.2	63.0
4.5	6.45	16.4	61.5
5.0	6.31	16.1	61.0
5.5	6.12	15.5	59.9
6.0	5.93	15.2	59.4
6.5	5.92	15.1	59.2
7.0	5.93	15	59.0

Debris around intake prevented deeper readings

Comparison Readings - 2nd meter

0.5 m	8.07	23.1	73.6
7.0 m	5.28	15.7	60.3

7/9/2013
Time: 16:45 EDT
Weather: Overcast, breezy
Secchi Disk - 8'

Depth (m)	DO mg/l	Temp °C	Temp °F
0.5	7.96	23.6	74.5
1.0	7.84	23.8	74.8
1.5	7.83	23.8	74.8
2.0	7.79	23.8	74.8
2.5	7.77	23.9	75.0
3.0	7.76	23.9	75.0
3.5	7.73	23.8	74.8
4.0	6.28	21.7	71.1
4.5	4.88	20.1	68.2
5.0	4.76	19.6	67.3
5.5	4.49	19.1	66.4
6.0	4.43	18.3	64.9
6.5	4.42	18	64.4
7.0	4.44	17.9	64.2
7.5	4.43	17.5	63.5
8.0	4.04	16.9	62.4
8.5	3.75	16	60.8
9.0	3.71	15.8	60.4
9.5	3.58	15.3	59.5
10.0	3.54	14.9	58.8
10.5	3.52	14.8	58.6
11.0	3.53	14.8	58.6
11.5	3.53	14.8	58.6
12.0	3.53	14.8	58.6

Comparison Readings - 2nd meter

0.5 m	7.93	23.6	74.5
9.5 m	3.58	14.6	58.3

Dead River (Hoist) Storage Basin
2013 Dissolved Oxygen and Temperature Profile Data

7/23/2013

Time: 16:35 EDT

Weather: Sunny, 10-20 mph winds

Secchi Disk - 5' 10"

Depth (m)	DO mg/l	Temp °C	Temp °F
0.5	7.69	22.8	73.0
1.0	7.61	23.0	73.4
1.5	7.57	23.1	73.6
2.0	7.54	23.1	73.6
2.5	7.51	23.2	73.8
3.0	7.51	23.2	73.8
3.5	7.49	23.2	73.8
4.0	7.48	23.3	73.9
4.5	7.46	23.3	73.9
5.0	7.44	23.3	73.9
5.5	7.44	23.3	73.9
6.0	7.39	23.3	73.9
6.5	7.10	23.0	73.4
7.0	6.97	22.8	73.0
7.5	6.89	22.6	72.7
8.0	6.81	22.5	72.5
8.5	2.82	19.1	66.4
9.0	1.99	17.6	63.7
9.5	1.74	17.2	63.0
10.0	1.58	16.1	61.0
10.5	1.92	14.5	58.1
11.0	2.31	12.9	55.2

Comparison Readings - 2nd meter

0.5 m	7.68	22.9	73.2
11 m	2.27	13.2	55.8

8/6/2013

Time:

Weather: Sunny

Secchi Disk -

Depth (m)	DO mg/l	Temp °C	Temp °F
0.5			32.0
1.0			32.0
1.5			32.0
2.0			32.0
2.5			32.0
3.0			32.0
3.5			32.0
4.0			32.0
4.5			32.0
5.0			32.0
5.5			32.0
6.0			32.0
6.5			32.0
7.0			32.0
7.5			32.0
8.0			32.0
8.5			32.0
9.0			32.0
9.5			32.0
10.0			32.0

Comparison Readings - 2nd meter

0.5 m	
9.5 m	

8/20/2013

Time:

Weather:

Secchi Disk -

Depth (m)	DO mg/l	Temp °C	Temp °F
0.5			
1.0			
1.5			
2.0			
2.5			
3.0			
3.5			
4.0			
4.5			
5.0			
5.5			
6.0			
6.5			
7.0			
7.5			
8.0			
8.5			
9.0			
9.5			
10.0			
10.5			

Comparison Readings - 2nd meter

0.5 m	
9.5 m	

Metcalfe, Mark W

From: Metcalf, Mark W
Sent: Wednesday, August 07, 2013 2:14 PM
To: 'Burr Fisher'; 'Kruger, Kyle'; 'Klemans, Diana (DEQ)'; 'Kohlhepp, Gary (DEQ)'; 'Koetje, Mitch (DEQ)'; 'Carpenter, Koren'
Cc: Meyers, Robert J; Schlorke, Virgil E; Puzen, Shawn C
Subject: Dead River water quality monitoring - July 23 to August 6
Attachments: Hoist data 080713.pdf

Good afternoon,

Pursuant to Article 408 of the Project License and the water quality monitoring plan for the Dead River Hydroelectric Project, UPPCO is monitoring water quality (dissolved oxygen and temperature) downstream of the Hoist Powerhouse (SE ¼, of the NE ¼ of Section 16, T48N, R26W (Township of Negaunee)). Per the monitoring plan, temperature data is collected on an hourly basis from May 1st through October 31st. Dissolved oxygen data is collected hourly from June 1st through September 30th.

Between July 23rd and July 26th, deviations from the dissolved oxygen water quality standard were observed. On July 26th between 5 a.m. and 6 a.m. EST, the water quality monitor experienced an electrical failure. Consequently, dissolved oxygen and temperature data was not collected from 6 a.m. on July 26th through August 6th at 13:00 when a replacement monitor was deployed. Water quality monitoring data from this monitoring location collected in the month of July is attached for your review.

The lowest DO reading observed between July 23rd and 26th was 6.0 mg/l. The likely cause of the low DO readings is a natural stratification of the reservoir. Dissolved oxygen and temperature profiles conducted at the powerhouse intake on July 23rd and August 6th show that the reservoir is stratified. Dissolved oxygen levels below the water quality standard of 7 mg/l are present in the hypolimnion of the reservoir, where water is being withdrawn and subsequently released through the powerhouse. Consequently, low dissolved oxygen levels were observed downstream of the facility.

Also, please note that the average monthly water temperature (from the available data) recorded at this monitoring location was 66.7°F. The monthly maximum average temperature limitation is 68°F. In general, water temperature at this location was trending up towards the end of the month. As monitoring data is not available for the last 5 days of the month, it cannot be determined with certainty whether the monthly average temperature was above or below the water quality standard.

Please feel free to contact me if you have questions on the monitoring data.

Mark

Mark Metcalf

Environmental Consultant - Air & Water | Integrys Business Support, LLC

920-433-1833 (Green Bay)

920-617-6046 (De Pere)

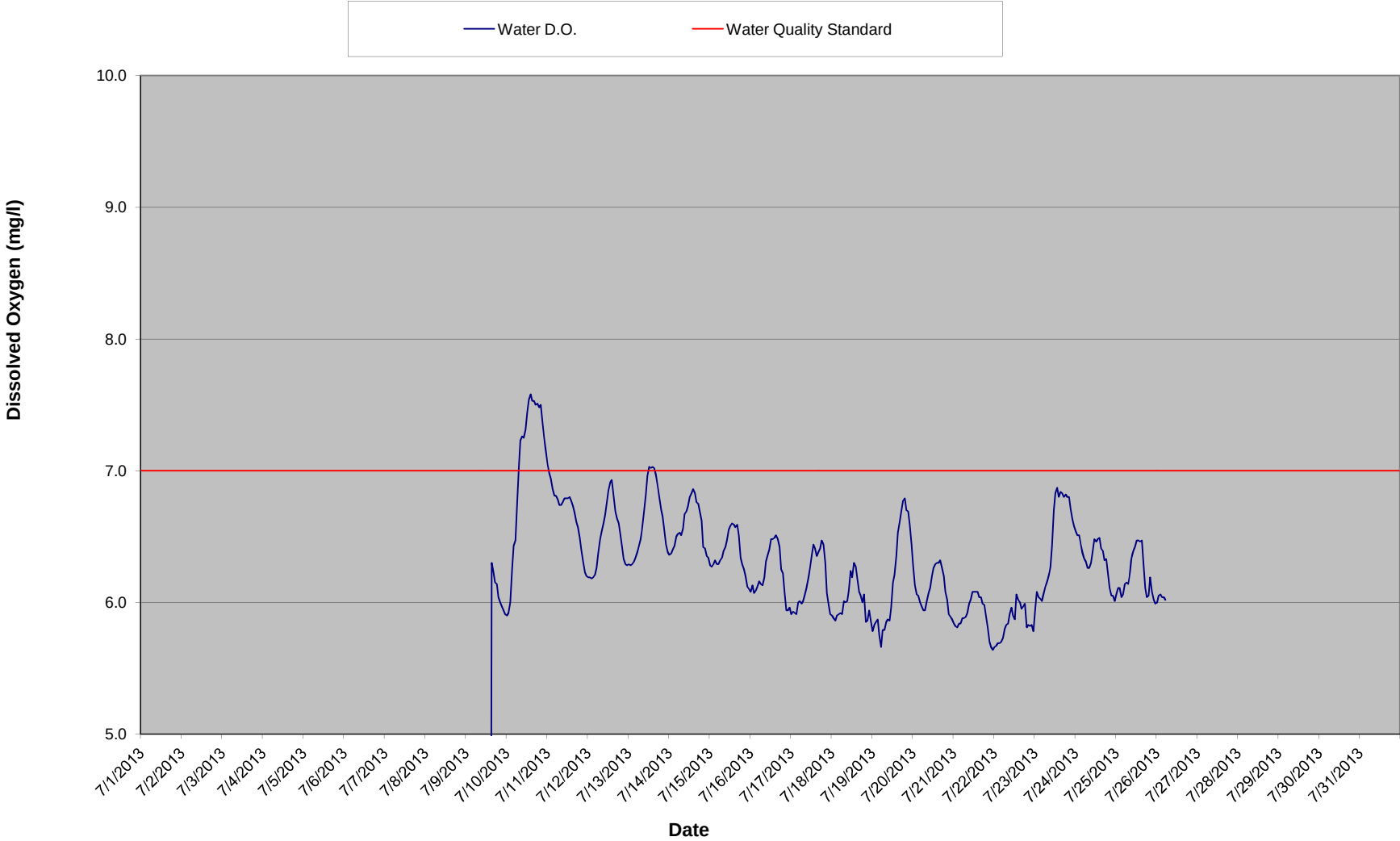
920-606-8432 *cell*

920-433-4916 *fax*

mwmetcalf@integrysgroup.com

www.integrysgroup.com

Hoist Powerhouse Dissolved Oxygen Summary - July 2013



Dead River Below Hoist Powerhouse - July 2013 Dissolved Oxygen Monitoring Data

Time HHMMSS	07/01/13	07/02/13	07/03/13	07/04/13	07/05/13	07/06/13	07/07/13	07/08/13	07/09/13	07/10/13	07/11/13	07/12/13	07/13/13	07/14/13	07/15/13	07/16/13
0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	5.9	7.2	6.2	6.3	6.4	6.3	6.1
10000	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	5.9	7.1	6.2	6.3	6.4	6.3	6.1
20000	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	5.9	7.0	6.2	6.3	6.4	6.3	6.1
30000	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	6.0	6.9	6.2	6.3	6.4	6.3	6.1
40000	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	6.3	6.9	6.2	6.3	6.4	6.3	6.1
50000	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	6.4	6.8	6.2	6.3	6.5	6.3	6.1
60000	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	6.5	6.8	6.3	6.4	6.5	6.3	6.2
70000	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	6.7	6.8	6.4	6.4	6.5	6.3	6.1
80000	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	7.0	6.7	6.5	6.5	6.5	6.3	6.1
90000	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	7.2	6.7	6.5	6.6	6.6	6.4	6.2
100000	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	7.3	6.8	6.6	6.7	6.7	6.4	6.3
110000	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	7.3	6.8	6.7	6.8	6.7	6.5	6.4
120000	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	7.3	6.8	6.8	7.0	6.7	6.6	6.4
130000	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	7.5	6.8	6.9	7.0	6.8	6.6	6.5
140000	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	7.5	6.8	6.9	7.0	6.8	6.6	6.5
150000	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	6.3	7.6	6.8	6.9	7.0	6.9	6.6	6.5
160000	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	6.3	7.5	6.7	6.8	7.0	6.8	6.6	6.5
170000	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	6.2	7.5	6.7	6.7	7.0	6.8	6.6	6.5
180000	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	6.2	7.5	6.6	6.6	6.9	6.8	6.5	6.4
190000	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	6.1	7.5	6.6	6.6	6.8	6.7	6.3	6.3
200000	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	6.0	7.5	6.5	6.5	6.7	6.6	6.3	6.2
210000	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	6.0	7.5	6.4	6.4	6.7	6.4	6.3	6.1
220000	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	6.0	7.4	6.3	6.3	6.5	6.4	6.2	5.9
230000	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	5.9	7.3	6.2	6.3	6.4	6.4	6.1	5.9
Daily Max	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	6.3	7.6	7.2	6.9	7.0	6.9	6.6	6.5
Daily Min	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	5.9	6.2	6.2	6.3	6.4	6.1	5.9
Average	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	2.4	7.0	6.7	6.5	6.6	6.6	6.4	6.2

Water Quality Standard: 7 mg/l Dissolved Oxygen

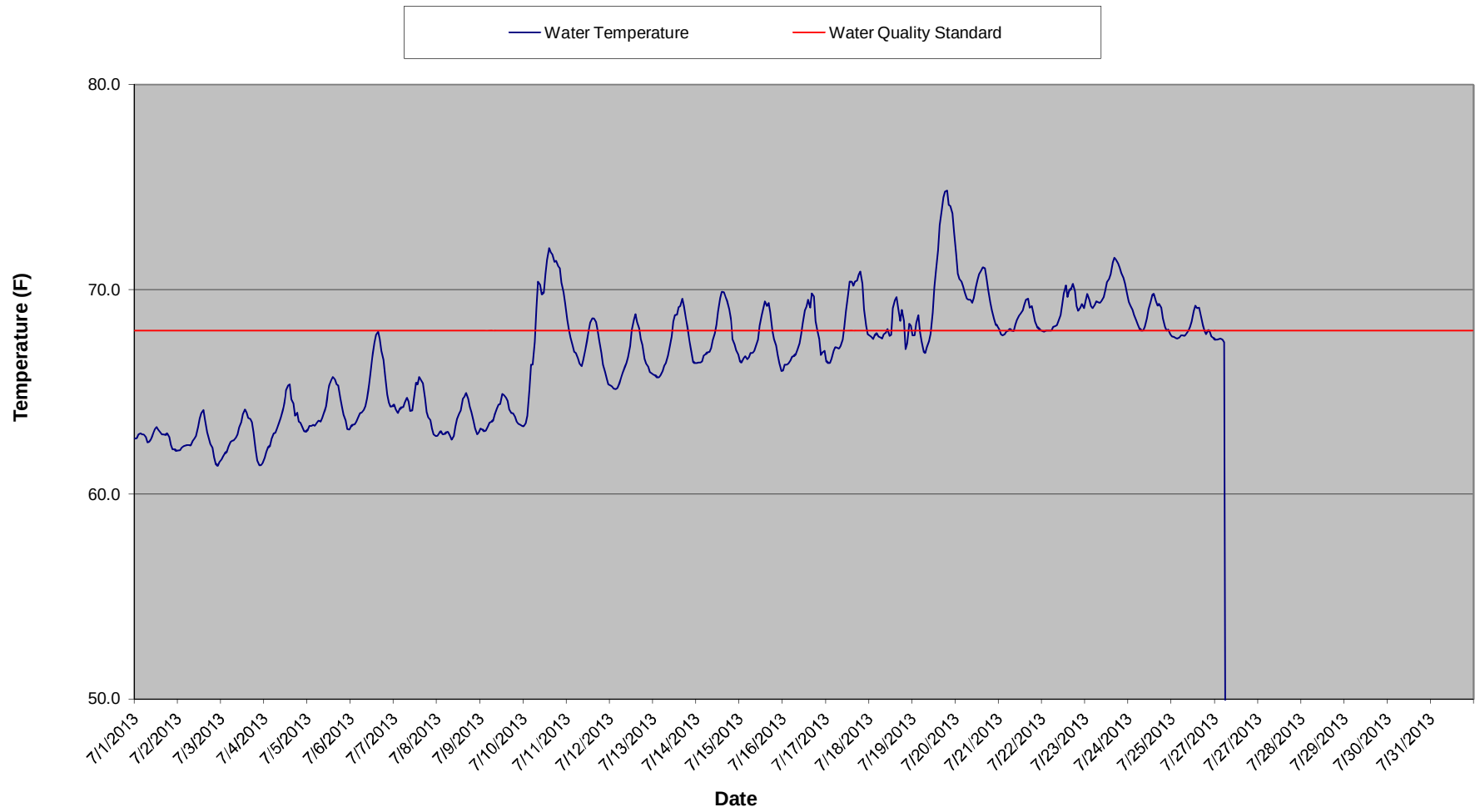
Below water quality standard
No data - Equipment Malfunction

Dead River Below Hoist Powerhouse - July 2013 Dissolved Oxygen Monitoring Data

Time HHMMSS	07/17/13	07/18/13	07/19/13	07/20/13	07/21/13	07/22/13	07/23/13	07/24/13	07/25/13	07/26/13	07/27/13	07/28/13	07/29/13	07/30/13	07/31/13
0	6.0	5.9	5.9	6.4	5.9	5.6	5.8	6.5	6.1	6.0	0.0	0.0	0.0	0.0	0.0
10000	5.9	5.9	5.8	6.3	5.8	5.7	6.0	6.5	6.1	6.1	0.0	0.0	0.0	0.0	0.0
20000	5.9	5.9	5.8	6.1	5.8	5.7	6.1	6.5	6.1	6.1	0.0	0.0	0.0	0.0	0.0
30000	5.9	5.9	5.9	6.1	5.8	5.7	6.0	6.4	6.0	6.0	0.0	0.0	0.0	0.0	0.0
40000	5.9	5.9	5.9	6.1	5.8	5.7	6.0	6.4	6.1	6.0	0.0	0.0	0.0	0.0	0.0
50000	6.0	5.9	5.8	6.0	5.8	5.7	6.0	6.3	6.1	6.0	0.0	0.0	0.0	0.0	0.0
60000	6.0	5.9	5.7	6.0	5.9	5.7	6.1	6.3	6.2	0.0	0.0	0.0	0.0	0.0	0.0
70000	6.0	5.9	5.8	5.9	5.9	5.8	6.1	6.3	6.1	0.0	0.0	0.0	0.0	0.0	0.0
80000	6.0	6.0	5.8	5.9	5.9	5.8	6.2	6.3	6.2	0.0	0.0	0.0	0.0	0.0	0.0
90000	6.1	6.0	5.9	6.0	5.9	5.8	6.2	6.3	6.3	0.0	0.0	0.0	0.0	0.0	0.0
100000	6.1	6.0	5.9	6.1	6.0	5.9	6.3	6.4	6.4	0.0	0.0	0.0	0.0	0.0	0.0
110000	6.2	6.1	5.9	6.1	6.0	6.0	6.4	6.5	6.4	0.0	0.0	0.0	0.0	0.0	0.0
120000	6.3	6.2	6.0	6.2	6.1	5.9	6.7	6.5	6.5	0.0	0.0	0.0	0.0	0.0	0.0
130000	6.4	6.2	6.2	6.3	6.1	5.9	6.8	6.5	6.5	0.0	0.0	0.0	0.0	0.0	0.0
140000	6.4	6.3	6.2	6.3	6.1	6.1	6.9	6.5	6.5	0.0	0.0	0.0	0.0	0.0	0.0
150000	6.4	6.3	6.4	6.3	6.1	6.0	6.8	6.4	6.5	0.0	0.0	0.0	0.0	0.0	0.0
160000	6.4	6.2	6.5	6.3	6.0	6.0	6.8	6.4	6.3	0.0	0.0	0.0	0.0	0.0	0.0
170000	6.4	6.1	6.6	6.3	6.0	6.0	6.8	6.3	6.1	0.0	0.0	0.0	0.0	0.0	0.0
180000	6.4	6.1	6.7	6.3	6.0	6.0	6.8	6.3	6.0	0.0	0.0	0.0	0.0	0.0	0.0
190000	6.5	6.0	6.8	6.2	6.0	6.0	6.8	6.2	6.1	0.0	0.0	0.0	0.0	0.0	0.0
200000	6.4	6.1	6.8	6.1	5.9	5.8	6.8	6.1	6.2	0.0	0.0	0.0	0.0	0.0	0.0
210000	6.3	5.9	6.7	6.0	5.8	5.8	6.7	6.1	6.1	0.0	0.0	0.0	0.0	0.0	0.0
220000	6.1	5.9	6.7	5.9	5.7	5.8	6.6	6.1	6.0	0.0	0.0	0.0	0.0	0.0	0.0
230000	6.0	5.9	6.6	5.9	5.7	5.8	6.6	6.0	6.0	0.0	0.0	0.0	0.0	0.0	0.0
Daily Max	6.5	6.3	6.8	6.4	6.1	6.1	6.9	6.5	6.5	6.1	0.0	0.0	0.0	0.0	0.0
Daily Min	5.9	5.9	5.7	5.9	5.7	5.6	5.8	6.0	6.0	0.0	0.0	0.0	0.0	0.0	0.0
Average	6.2	6.0	6.2	6.1	5.9	5.8	6.4	6.3	6.2	1.5	0.0	0.0	0.0	0.0	0.0

Below water quality standard
No data - Equipment Malfunction

Hoist Powerhouse Temperature Summary - July 2013



Dead River Below Hoist Powerhouse - July 2013 Temperature Monitoring Data

Time HHMMSS	7/1/13	7/2/13	7/3/13	7/4/13	7/5/13	7/6/13	7/7/13	7/8/13	7/9/13	7/10/13	7/11/13	7/12/13	7/13/13	7/14/13	7/15/13	7/16/13
0	62.7	62.1	61.7	61.8	63.1	63.3	64.4	62.9	63.2	63.3	68.5	65.3	65.8	66.4	66.5	66.0
10000	62.7	62.2	61.9	62.1	63.3	63.4	64.1	63.0	63.1	63.5	68.1	65.2	65.8	66.4	66.4	66.3
20000	62.9	62.3	62.0	62.3	63.3	63.4	64.0	63.1	63.1	63.8	67.6	65.2	65.7	66.4	66.7	66.3
30000	63.0	62.3	62.1	62.4	63.4	63.5	64.1	62.9	63.1	65.1	67.3	65.1	65.7	66.5	66.7	66.4
40000	62.9	62.4	62.3	62.7	63.3	63.7	64.2	62.9	63.3	66.3	67.0	65.2	65.8	66.8	66.6	66.5
50000	62.9	62.4	62.6	63.0	63.5	64.0	64.2	63.0	63.5	66.3	66.9	65.4	66.0	66.8	66.7	66.7
60000	62.8	62.4	62.6	63.0	63.6	64.0	64.5	63.1	63.6	67.4	66.6	65.7	66.3	66.9	66.9	66.7
70000	62.5	62.4	62.6	63.2	63.6	64.1	64.7	62.9	63.6	69.1	66.4	65.9	66.4	66.9	66.9	66.8
80000	62.6	62.6	62.8	63.5	63.7	64.3	64.5	62.7	63.9	70.4	66.3	66.2	66.8	67.1	67.0	67.0
90000	62.7	62.7	62.9	63.7	64.0	64.7	64.1	62.8	64.2	70.2	66.6	66.4	67.2	67.5	67.2	67.4
100000	62.9	62.9	63.3	64.1	64.3	65.4	64.1	63.3	64.4	69.8	66.9	66.7	67.7	67.9	67.6	67.8
110000	63.2	63.3	63.5	64.5	64.8	66.0	64.7	63.7	64.4	69.9	67.5	67.2	68.4	68.3	68.2	68.4
120000	63.3	63.7	63.9	65.1	65.3	66.9	65.4	63.9	64.9	70.7	68.0	68.0	68.7	68.9	68.8	69.0
130000	63.2	64.0	64.1	65.3	65.6	67.4	65.4	64.1	64.9	71.4	68.4	68.5	68.8	69.6	69.1	69.2
140000	63.0	64.1	64.0	65.4	65.7	67.8	65.7	64.7	64.7	72.0	68.6	68.8	69.1	69.9	69.4	69.5
150000	62.9	63.6	63.7	64.6	65.6	67.9	65.6	64.8	64.6	71.8	68.6	68.4	69.2	69.9	69.2	69.1
160000	62.9	63.0	63.7	64.4	65.4	67.6	65.4	65.0	64.1	71.7	68.4	68.1	69.5	69.6	69.3	69.8
170000	62.9	62.7	63.5	63.8	65.3	67.0	64.7	64.7	64.0	71.3	68.0	67.6	69.2	69.4	68.9	69.7
180000	63.0	62.5	63.0	64.0	64.7	66.6	64.0	64.3	64.0	71.4	67.5	67.3	68.5	69.0	68.0	68.5
190000	62.8	62.3	62.2	63.6	64.3	65.8	63.8	64.0	63.8	71.1	66.9	66.6	68.1	68.6	67.6	68.0
200000	62.4	61.8	61.6	63.5	63.9	64.9	63.6	63.6	63.6	71.0	66.3	66.4	67.5	67.6	67.3	67.6
210000	62.2	61.5	61.4	63.3	63.6	64.5	63.2	63.2	63.4	70.3	66.0	66.2	66.9	67.3	66.8	66.8
220000	62.2	61.4	61.4	63.1	63.2	64.3	62.9	62.9	63.4	69.9	65.6	66.0	66.5	67.0	66.4	66.9
230000	62.1	61.6	61.5	63.1	63.2	64.3	62.8	63.0	63.3	69.3	65.4	65.9	66.4	66.8	66.0	67.0
Daily Max	63.3	64.1	64.1	65.4	65.7	67.9	65.7	65.0	64.9	72.0	68.6	68.8	69.5	69.9	69.4	69.8
Daily Min	62.1	61.4	61.4	61.8	63.1	63.3	62.8	62.7	63.1	63.3	65.4	65.1	65.7	66.4	66.0	66.0
Average	62.8	62.6	62.7	63.5	64.1	65.2	64.3	63.5	63.8	69.1	67.2	66.6	67.3	67.8	67.5	67.6

Monthly average temp (F): 66.7
License Max. Average Temperature: 68 F

Dead River Below Hoist Powerhouse - July 2013 Temperature Monitoring Data

Time HHMMSS	7/17/13	7/18/13	7/19/13	7/20/13	7/21/13	7/22/13	7/23/13	7/24/13	7/25/13	7/26/13	7/27/13	7/28/13	7/29/13	7/30/13	7/31/13
0	66.5	67.8	67.7	71.7	68.1	68.0	69.4	69.4	67.7	67.6					
10000	66.4	67.7	67.8	70.8	67.8	67.9	69.8	69.2	67.7	67.6					
20000	66.4	67.6	68.4	70.5	67.7	68.0	69.5	69.0	67.6	67.6					
30000	66.6	67.7	68.7	70.4	67.8	68.0	69.2	68.8	67.6	67.6					
40000	67.0	67.9	67.9	70.1	67.9	68.0	69.1	68.5	67.6	67.6					
50000	67.2	67.7	67.5	69.9	68.0	68.0	69.2	68.3	67.7	67.4					
60000	67.2	67.7	67.0	69.5	68.1	68.2	69.4	68.1	67.7						
70000	67.1	67.6	66.9	69.5	68.0	68.2	69.4	68.0	67.7						
80000	67.2	67.8	67.2	69.5	68.0	68.3	69.4	68.0	67.8						
90000	67.6	67.9	67.5	69.4	68.3	68.5	69.4	68.2	68.0						
100000	68.2	68.1	67.8	69.6	68.5	68.7	69.6	68.6	68.2						
110000	68.9	67.7	68.9	70.1	68.7	69.3	70.0	69.0	68.4						
120000	69.7	67.8	70.1	70.5	68.8	69.8	70.4	69.4	69.0						
130000	70.4	69.1	70.9	70.7	69.0	70.2	70.5	69.7	69.2						
140000	70.4	69.5	71.9	70.9	69.3	69.6	70.8	69.8	69.1						
150000	70.2	69.6	73.1	71.1	69.5	69.9	71.3	69.4	69.1						
160000	70.4	69.1	73.9	71.0	69.5	70.0	71.6	69.2	68.7						
170000	70.4	68.5	74.5	70.5	69.1	70.3	71.4	69.3	68.3						
180000	70.7	69.0	74.8	70.0	69.2	69.9	71.3	69.1	68.0						
190000	70.9	68.5	74.8	69.4	68.8	69.2	71.1	68.6	67.8						
200000	70.3	67.1	74.1	69.0	68.4	69.0	70.8	68.2	68.0						
210000	69.0	67.4	74.1	68.6	68.2	69.1	70.6	68.0	67.9						
220000	68.2	68.3	73.7	68.3	68.1	69.3	70.3	68.1	67.7						
230000	67.8	68.2	72.8	68.2	68.0	69.1	69.8	67.8	67.6						
Daily Max	70.9	69.6	74.8	71.7	69.5	70.3	71.6	69.8	69.2	67.6	0.0	0.0	0.0	0.0	0.0
Daily Min	66.4	67.1	66.9	68.2	67.7	67.9	69.1	67.8	67.6	67.4	0.0	0.0	0.0	0.0	0.0
Average	68.5	68.1	70.5	70.0	68.5	68.9	70.1	68.7	68.1	67.5	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

 No data - equipment malfunction

Dead River (Hoist) Storage Basin
2013 Dissolved Oxygen and Temperature Profile Data

6/11/2013
Time: 16:15 EDT
Weather: Sunny, 73F, 5-10 mph wind

Secchi Disk - 6' 10"

Depth (meters)	DO mg/l	Temp °C	Temp °F
0.5	8.73	20.4	68.7
1.0	8.73	18.7	65.7
1.5	8.71	17.4	63.3
2.0	8.7	17.1	62.8
2.5	8.63	16.8	62.2
3.0	8.6	16.7	62.1
3.5	8.55	16.5	61.7
4.0	8.51	16.2	61.2
4.5	8.12	15	59.0
5.0	7.75	14.5	58.1
5.5	7.79	14.3	57.7
6.0	7.76	14.2	57.6
6.5	7.62	13.4	56.1
7.0	7.6	13.4	56.1
7.5	7.58	13.1	55.6
8.0	7.56	13.1	55.6
8.5	7.57	12.2	54.0
9.0	7.66	11.8	53.2
9.5	7.7	11.8	53.2
10.0	7.8	10.7	51.3
10.5	7.8	10.4	50.7
11.0	7.8	9.1	48.4
11.5	7.84	8.9	48.0
12.0	7.52	8.6	47.5
12.5	7.45	8	46.4
13.0	7.52	7.4	45.3

Comparison Readings - 2nd meter

0.5 m	8.83	19.9	102.3
13.0 m	7.21	65.3	8.8

6/25/2013
Time: 14:50 EST
Weather: Cloudy, 75°F, light winds
Secchi Disk - 7' 4"

Depth (m)	DO mg/l	Temp °C	Temp °F
0.5	8.83	22.7	72.9
1.0	8.81	21.7	71.1
1.5	7.91	20.0	68.0
2.0	7.67	19.2	66.6
2.5	7.63	18.9	66.0
3.0	7.57	18.4	65.1
3.5	7.02	17.7	63.9
4.0	6.97	17.2	63.0
4.5	6.45	16.4	61.5
5.0	6.31	16.1	61.0
5.5	6.12	15.5	59.9
6.0	5.93	15.2	59.4
6.5	5.92	15.1	59.2
7.0	5.93	15	59.0

Debris around intake prevented deeper readings

Comparison Readings - 2nd meter

0.5 m	8.07	23.1	73.6
7.0 m	5.28	15.7	60.3

7/9/2013
Time: 16:45 EDT
Weather: Overcast, breezy
Secchi Disk - 8'

Depth (m)	DO mg/l	Temp °C	Temp °F
0.5	7.96	23.6	74.5
1.0	7.84	23.8	74.8
1.5	7.83	23.8	74.8
2.0	7.79	23.8	74.8
2.5	7.77	23.9	75.0
3.0	7.76	23.9	75.0
3.5	7.73	23.8	74.8
4.0	6.28	21.7	71.1
4.5	4.88	20.1	68.2
5.0	4.76	19.6	67.3
5.5	4.49	19.1	66.4
6.0	4.43	18.3	64.9
6.5	4.42	18	64.4
7.0	4.44	17.9	64.2
7.5	4.43	17.5	63.5
8.0	4.04	16.9	62.4
8.5	3.75	16	60.8
9.0	3.71	15.8	60.4
9.5	3.58	15.3	59.5
10.0	3.54	14.9	58.8
10.5	3.52	14.8	58.6
11.0	3.53	14.8	58.6
11.5	3.53	14.8	58.6
12.0	3.53	14.8	58.6

Comparison Readings - 2nd meter

0.5 m	7.93	23.6	74.5
9.5 m	3.58	14.6	58.3

Dead River (Hoist) Storage Basin
2013 Dissolved Oxygen and Temperature Profile Data

7/23/2013

Time: 16:35 EDT

Weather: Sunny, 10-20 mph winds

Secchi Disk - 5' 10"

Depth (m)	DO mg/l	Temp °C	Temp °F
0.5	7.69	22.8	73.0
1.0	7.61	23.0	73.4
1.5	7.57	23.1	73.6
2.0	7.54	23.1	73.6
2.5	7.51	23.2	73.8
3.0	7.51	23.2	73.8
3.5	7.49	23.2	73.8
4.0	7.48	23.3	73.9
4.5	7.46	23.3	73.9
5.0	7.44	23.3	73.9
5.5	7.44	23.3	73.9
6.0	7.39	23.3	73.9
6.5	7.10	23.0	73.4
7.0	6.97	22.8	73.0
7.5	6.89	22.6	72.7
8.0	6.81	22.5	72.5
8.5	2.82	19.1	66.4
9.0	1.99	17.6	63.7
9.5	1.74	17.2	63.0
10.0	1.58	16.1	61.0
10.5	1.92	14.5	58.1
11.0	2.31	12.9	55.2

Comparison Readings - 2nd meter

0.5 m	7.68	22.9	73.2
11 m	2.27	13.2	55.8

8/6/2013

Time: 16:15

Weather: Cloudy, 5-10 mph winds

Secchi Disk - 7' 6"

Depth (m)	DO mg/l	Temp °C	Temp °F
0.5	7.87	20.2	68.4
1.0	7.88	20.1	68.2
1.5	7.88	20.1	68.2
2.0	7.87	20	68.0
2.5	7.85	20	68.0
3.0	7.82	20	68.0
3.5	7.82	20	68.0
4.0	7.81	19.9	67.8
4.5	7.8	19.9	67.8
5.0	7.78	19.9	67.8
5.5	7.76	19.9	67.8
6.0	7.75	19.9	67.8
6.5	7.76	19.9	67.8
7.0	7.75	19.9	67.8
7.5	7.69	19.8	67.6
8.0	4.04	18.2	64.8
8.5	4	18.1	64.6
9.0	3.61	17.6	63.7
9.5	2.87	17.3	63.1
10.0	1.03	16.2	61.2
10.5	0.63	14.9	58.8
11.0	0.69	13.9	57.0

Comparison Readings - 2nd meter

0.5 m	7.85	20.4	68.7
9.5 m	0.7	14.2	57.6

8/20/2013

Time:

Weather:

Secchi Disk -

Depth (m)	DO mg/l	Temp °C	Temp °F
0.5			
1.0			
1.5			
2.0			
2.5			
3.0			
3.5			
4.0			
4.5			
5.0			
5.5			
6.0			
6.5			
7.0			
7.5			
8.0			
8.5			
9.0			
9.5			
10.0			
10.5			

Comparison Readings - 2nd meter

0.5 m	
9.5 m	

Metcalfe, Mark W

From: Metcalf, Mark W
Sent: Wednesday, August 21, 2013 12:36 PM
To: 'Burr Fisher'; 'Kruger, Kyle'; 'Klemans, Diana (DEQ)'; 'Kohlhepp, Gary (DEQ)'; 'Koetje, Mitch (DEQ)'; 'Carpenter, Koren'
Cc: Meyers, Robert J; Schlorke, Virgil E; Puzen, Shawn C
Subject: Dead River water quality monitoring - August 6 to August 20
Attachments: LS&I WQM data Aug 2013.pdf

Good afternoon,

Pursuant to Article 408 of the Project License and the water quality monitoring plan for the Dead River Hydroelectric Project, UPPCO is monitoring water quality (dissolved oxygen and temperature) at 4 locations within the project. Per the monitoring plan, temperature data is collected on an hourly basis from May 1st through October 31st. Dissolved oxygen data is collected hourly from June 1st through September 30th.

On August 6th, a water quality monitor was deployed downstream of the McClure Dam in the Dead River, east of where the LS&I railroad crosses the Dead River (SW ¼ of the NE ¼, Section 16, T48N, R26W, Township of Negaunee). On August 9th between 23:00 and 00:00 August 10th, the monitor experienced a malfunction causing it to stop operating. As a result of the malfunction, temperature and dissolved oxygen data was not collected from August 10th at 00:00 through 11:00 on August 20th when a replacement monitor was deployed.

As you are aware, UPPCO is releasing a minimum of 20 cfs of flow from a low level siphon at the McClure Dam located approximately 18' below the spillway crest. The dissolved oxygen water quality standard at this location is 7.0 mg/l. Prior to the equipment malfunction, dissolved oxygen levels were ranging between 8.8 and 9.4 mg/l. As UPPCO is releasing water into the bypass reach of the Dead River and dissolved oxygen levels have been above 8 mg/l during the entire monitoring season, it is likely that dissolved oxygen levels downstream of the dam were above the dissolved oxygen water quality standard during the period of missing data.

The water quality standard for temperature at this location is 68°F during the month of August. Prior to the equipment malfunction, water temperatures ranged between 61 and 65 °F. Dissolved oxygen and temperature profiles conducted on 8/6 and 8/20 showed that the water temperature at the level of the siphon intake was approximately 65°F. Therefore, it is unlikely that water temperatures downstream of the dam exceeded the standard during the period of missing data.

Attached for your review is monitoring data collected during the month of August at the above monitoring location. If you have any questions, feel free to contact me.

Thanks,
Mark

Mark Metcalf

Environmental Consultant - Air & Water | Integrys Business Support, LLC

920-433-1833 (Green Bay)

920-617-6046 (De Pere)

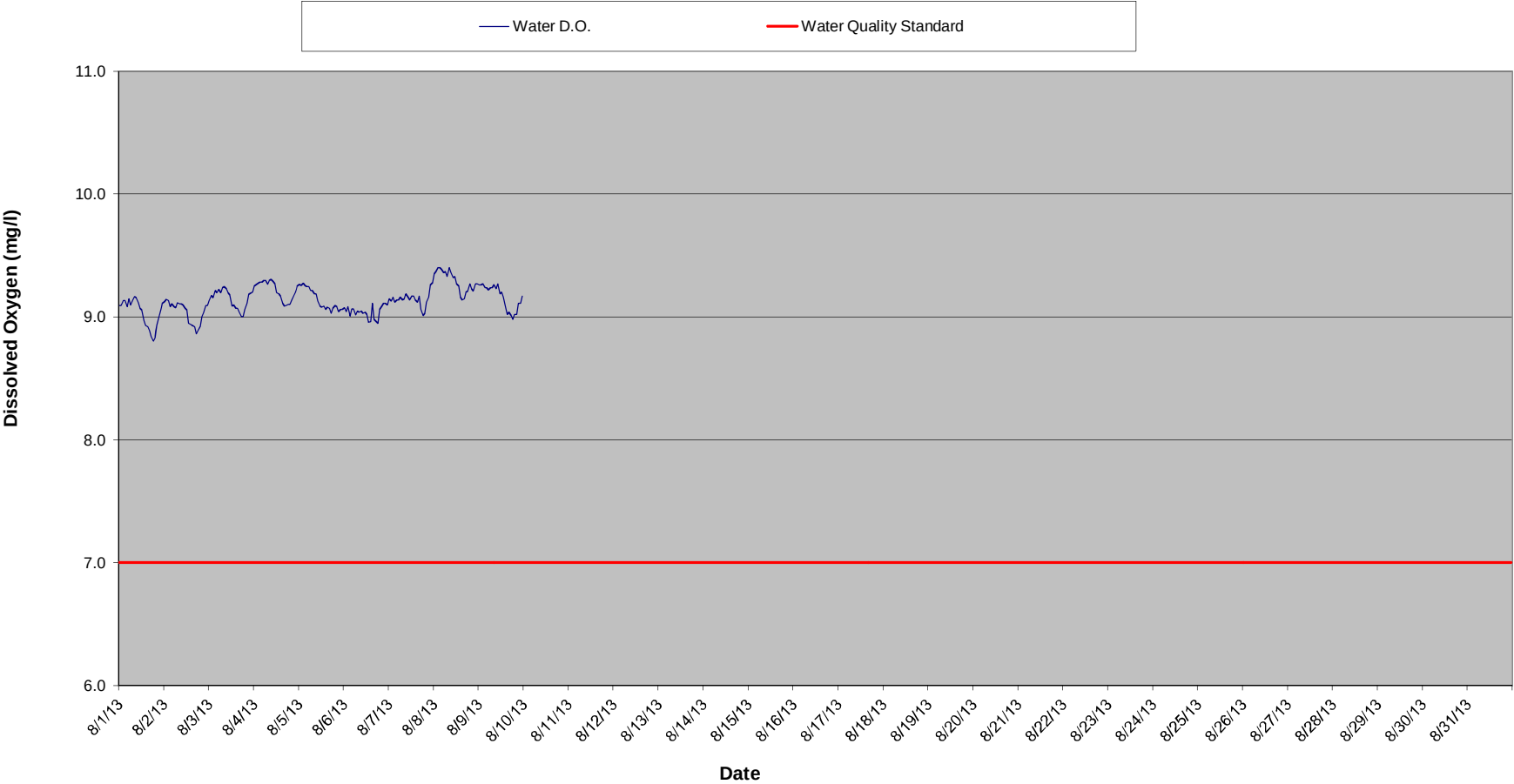
920-606-8432 *cell*

920-433-4916 *fax*

mwmetcalf@integrysgroup.com

www.integrysgroup.com

Dead River Below McClure Dam Dissolved Oxygen Summary - August 2013



Dead River Below McClure Dam - August 2013 Dissolved Oxygen Monitoring Data

Time HHMMSS	8/1/2013	8/2/2013	8/3/2013	8/4/2013	8/5/2013	8/6/2013	8/7/2013	8/8/2013	8/9/2013	8/10/2013	8/11/2013	8/12/2013	8/13/2013	8/14/2013	8/15/2013	8/16/2013
0	9.1	9.1	9.1	9.3	9.3	9.1	9.2	9.4	9.3	No data. Equipment malfunction.						
10000	9.1	9.1	9.2	9.3	9.3	9.0	9.1	9.4	9.3							
20000	9.1	9.1	9.2	9.3	9.3	9.1	9.2	9.4	9.3							
30000	9.1	9.1	9.2	9.3	9.3	9.0	9.1	9.4	9.2							
40000	9.1	9.1	9.2	9.3	9.2	9.1	9.1	9.4	9.2							
50000	9.1	9.1	9.2	9.3	9.2	9.1	9.1	9.4	9.2							
60000	9.1	9.1	9.2	9.3	9.2	9.0	9.2	9.4	9.2							
70000	9.1	9.1	9.2	9.3	9.2	9.0	9.1	9.3	9.2							
80000	9.2	9.1	9.2	9.3	9.2	9.0	9.2	9.4	9.3							
90000	9.2	9.1	9.2	9.3	9.2	9.0	9.2	9.4	9.2							
100000	9.1	9.1	9.2	9.3	9.1	9.0	9.2	9.3	9.3							
110000	9.1	9.1	9.2	9.3	9.1	9.0	9.1	9.3	9.2							
120000	9.1	9.1	9.1	9.2	9.1	9.0	9.2	9.3	9.2							
130000	9.0	8.9	9.1	9.2	9.1	9.0	9.2	9.3	9.2							
140000	8.9	8.9	9.1	9.2	9.1	9.0	9.1	9.2	9.1							
150000	8.9	8.9	9.1	9.1	9.1	9.1	9.1	9.1	9.0							
160000	8.9	8.9	9.0	9.1	9.1	9.0	9.2	9.2	9.0							
170000	8.8	8.9	9.0	9.1	9.0	9.0	9.1	9.2	9.0							
180000	8.8	8.9	9.0	9.1	9.1	9.0	9.0	9.2	9.0							
190000	8.8	8.9	9.1	9.1	9.1	9.1	9.0	9.3	9.0							
200000	8.9	9.0	9.1	9.1	9.1	9.1	9.1	9.2	9.0							
210000	9.0	9.0	9.2	9.2	9.0	9.1	9.2	9.2	9.1							
220000	9.1	9.1	9.2	9.2	9.1	9.1	9.3	9.3	9.1							
230000	9.1	9.1	9.2	9.3	9.1	9.1	9.3	9.3	9.2							
Daily Max	9.2	9.1	9.2	9.3	9.3	9.1	9.3	9.4	9.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Daily Min	8.8	8.9	9.0	9.1	9.0	9.0	9.0	9.1	9.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Average	9.0	9.0	9.1	9.2	9.1	9.0	9.1	9.3	9.2	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

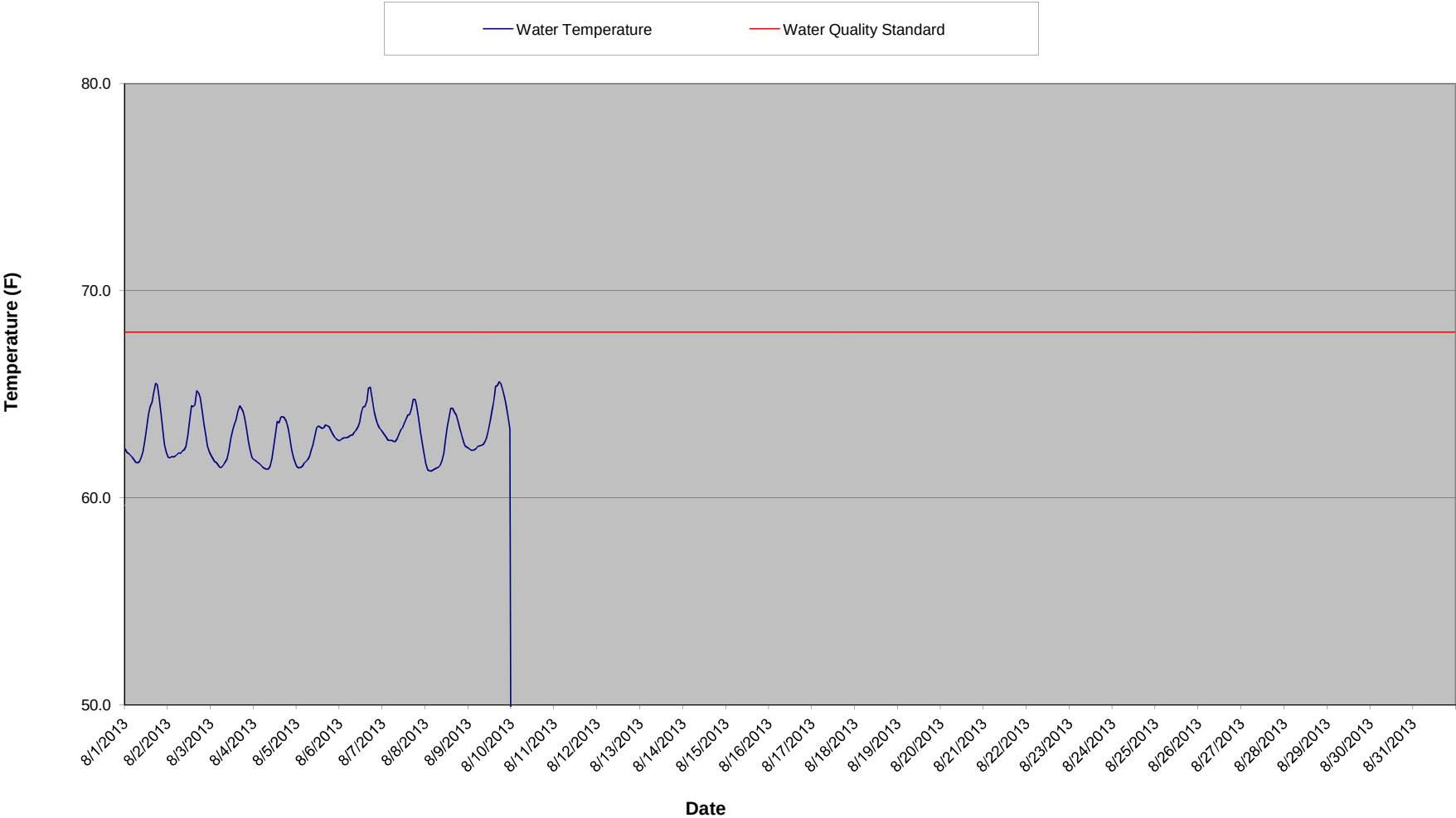
License Minimum Dissolved Oxygen: 7.0 mg/l

No data. Equipment malfunction.

Dead River Below McClure Dam - August 2013 Dissolved Oxygen Monitoring Data

Time	8/17/2013	8/18/2013	8/19/2013	8/20/2013	8/21/2013	8/22/2013	8/23/2013	8/24/2013	8/25/2013	8/26/2013	8/27/2013	8/28/2013	8/29/2013	8/30/2013	8/31/2013
HHMMSS															
0					0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10000					0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
20000					0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
30000					0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
40000					0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
50000					0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
60000					0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
70000					0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
80000					0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
90000					0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
100000					0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
110000					0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
120000				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
130000				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
140000				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
150000				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
160000				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
170000				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
180000				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
190000				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
200000				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
210000				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
220000				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
230000				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Daily Max	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Daily Min	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Average	#DIV/0!	#DIV/0!	#DIV/0!	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Dead River Below McClure Dam Temperature - August 2013



Dead River Below McClure Dam - August 2013 Temperature Monitoring Data

Time HHMMSS	8/1/2013	8/2/2013	8/3/2013	8/4/2013	8/5/2013	8/6/2013	8/7/2013	8/8/2013	8/9/2013	8/10/2013	8/11/2013	8/12/2013	8/13/2013	8/14/2013	8/15/2013	8/16/2013
0	62.3	62.0	62.0	61.8	61.5	62.8	63.2	61.7	62.4							
10000	62.2	61.9	61.9	61.8	61.4	62.8	63.0	61.4	62.3							
20000	62.1	62.0	61.8	61.7	61.5	62.9	62.9	61.3	62.3							
30000	62.0	62.0	61.7	61.6	61.5	62.9	62.8	61.3	62.3							
40000	62.0	62.0	61.6	61.6	61.7	62.9	62.8	61.3	62.4							
50000	61.8	62.1	61.5	61.5	61.8	63.0	62.8	61.4	62.5							
60000	61.7	62.2	61.5	61.4	61.8	63.0	62.7	61.4	62.5							
70000	61.7	62.2	61.6	61.4	62.0	63.0	62.7	61.5	62.5							
80000	61.8	62.3	61.8	61.4	62.3	63.2	62.9	61.6	62.6							
90000	62.0	62.3	61.9	61.5	62.6	63.3	63.1	61.8	62.7							
100000	62.2	62.5	62.3	61.9	63.0	63.4	63.3	62.2	62.9							
110000	62.7	63.0	62.9	62.5	63.4	63.7	63.4	62.8	63.3							
120000	63.4	63.7	63.2	63.1	63.5	64.1	63.6	63.4	63.7							
130000	64.0	64.4	63.5	63.7	63.4	64.4	63.8	63.9	64.3							
140000	64.4	64.4	63.8	63.6	63.4	64.4	64.0	64.3	64.6							
150000	64.6	64.5	64.2	63.9	63.4	64.7	64.0	64.3	65.4							
160000	65.1	65.2	64.4	63.9	63.5	65.3	64.3	64.1	65.4							
170000	65.5	65.1	64.3	63.9	63.5	65.3	64.8	64.0	65.6							
180000	65.5	64.8	64.1	63.7	63.4	64.8	64.7	63.7	65.5							
190000	64.9	64.2	63.8	63.4	63.2	64.3	64.4	63.4	65.2							
200000	64.1	63.6	63.2	62.9	63.1	63.9	63.8	63.1	64.9							
210000	63.3	63.0	62.7	62.3	62.9	63.6	63.2	62.7	64.4							
220000	62.6	62.5	62.3	62.0	62.8	63.4	62.6	62.5	63.9							
230000	62.2	62.2	61.9	61.7	62.8	63.3	62.2	62.4	63.3							
Daily Max	65.5	65.2	64.4	63.9	63.5	65.3	64.8	64.3	65.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Daily Min	61.7	61.9	61.5	61.4	61.4	62.8	62.2	61.3	62.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Average	63.1	63.1	62.7	62.4	62.6	63.7	63.4	62.6	63.6	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

Monthly average temp (F): 47.1
License Maximum Monthly Average: 68°F

 No data. Equipment malfunction.

Dead River Below McClure Dam - August 2013 Temperature Monitoring Data

Time	8/17/2013	8/18/2013	8/19/2013	8/20/2013	8/21/2013	8/22/2013	8/23/2013	8/24/2013	8/25/2013	8/26/2013	8/27/2013	8/28/2013	8/29/2013	8/30/2013	8/31/2013
HHMMSS															
0						32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0
10000						32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0
20000						32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0
30000						32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0
40000						32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0
50000						32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0
60000						32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0
70000						32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0
80000						32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0
90000						32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0
100000						32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0
110000						32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0
120000					32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0
130000					32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0
140000					32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0
150000					32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0
160000					32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0
170000					32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0
180000					32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0
190000					32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0
200000					32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0
210000					32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0
220000					32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0
230000					32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0
Daily Max	0.0	0.0	0.0	0.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0
Daily Min	0.0	0.0	0.0	0.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0
Average	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0

McClure Storage Basin
2013 Dissolved Oxygen and Temperature Profile Data

6/11/2013

Time: 15:17 EDT

Weather: Sunny, 73°F, light wind

Secchi Disk - 6' 4"

Depth (meters)	DO mg/l	Temp °C	Temp °F
0.5	9.34	16.3	61.3
1.0	9.16	15.9	60.6
1.5	8.64	14.4	57.9
2.0	8.5	13.8	56.8
2.5	8.47	13.6	56.5
3.0	8.42	13.3	55.9
3.5	8.43	13.1	55.6
4.0	8.43	13	55.4
4.5	8.45	13	55.4
5.0	8.44	12.9	55.2
5.5	8.42	12.7	54.9
6.0	8.42	12.6	54.7
6.5	8.46	12.5	54.5
7.0	8.35	12.2	54.0
7.5	8.24	12	53.6
8.0	7.93	11.6	52.9
8.5	7.95	9.9	49.8

6/25/2013

Time: 17:15 EDT

Weather: Clear, light wind

Secchi Disk - 6.5 ft

Depth (meters)	DO mg/l	Temp °C	Temp °F
0.5	7.27	18.9	66.0
1.0	7.32	17.7	63.9
1.5	7.31	17.5	63.5
2.0	7.31	17.1	62.8
2.5	7.31	16.8	62.2
3.0	7.28	16.5	61.7
3.5	7.28	16.3	61.3
4.0	7.27	16.2	61.2
4.5	7.23	16.0	60.8
5.0	7.22	15.9	60.6
5.5	7.19	15.7	60.3
6.0	7.10	15.5	59.9
6.5	7.05	15.4	59.7
7.0	6.87	15.1	59.2
7.5	5.78	13.6	56.5
8.0	6.38	11.0	51.8
8.5	6.19	10.3	50.5

7/9/2013

Time: 16:05 EDT

Weather: Overcast, Breezy

Secchi Disk - 7' 6"

Depth (meters)	DO mg/l	Temp °C	Temp °F
0.5	7.10	22.4	72.3
1.0	6.29	20.5	68.9
1.5	6.22	20.1	68.2
2.0	6.14	19.6	67.3
2.5	5.99	19.2	66.6
3.0	5.95	18.9	66.0
3.5	5.89	18.5	65.3
4.0	5.90	18.5	65.3
4.5	5.90	18.3	64.9
5.0	5.88	18.1	64.6
5.5	5.85	17.9	64.2
6.0	5.79	17.5	63.5
6.5	5.60	17.2	63.0
7.0	5.21	16.9	62.4
7.5	4.43	16.0	60.8
8.0	4.15	15.0	59.0
8.5	4.11	12.5	54.5

Comparison Readings - 2nd meter

0.5 m	9.36	16.4	61.5
8.5 m	7.88	10.3	50.5

Comparison Readings - 2nd meter

0.5 m	7.12	32.0
8.5 m	5.91	32.0

Comparison Readings - 2nd meter

0.5 m	7.11	22.4	72.3
8.5 m	4.56	10.9	51.6

McClure Storage Basin
2013 Dissolved Oxygen and Temperature Profile Data

7/23/2013

Time: 15:45 EDT

Weather: Sunny, 10-20 mph winds

Secchi Disk - 5' 10"

Depth (meters)	DO mg/l	Temp °C	Temp °F
0.5	8.38	21.8	71.2
1.0	8.33	22.1	71.8
1.5	8.31	22.1	71.8
2.0	8.28	22.2	72.0
2.5	8.26	22.2	72.0
3.0	8.24	22.2	72.0
3.5	8.21	22.3	72.1
4.0	7.27	21.5	70.7
4.5	7.20	21.4	70.5
5.0	7.15	21.4	70.5
5.5	5.83	21.0	69.8
6.0	4.83	20.0	68.0
6.5	3.55	18.4	65.1
7.0	2.75	17.3	63.1
7.5	2.25	16.0	60.8
8.0	2.67	14.1	57.4

Comparison Readings - 2nd meter

0.5 m	8.39	21.9	71.4
8.0 m	2.59	14.2	57.6

8/6/2013

Time: 15:10 EDT

Weather: Cloudy, 5-10 mph wind, 72F

Secchi Disk - 6' 7"

Depth (meters)	DO mg/l	Temp °C	Temp °F
0.5	8.20	20.4	68.7
1.0	8.13	20.1	68.2
1.5	7.97	19.9	67.8
2.0	7.79	19.6	67.3
2.5	7.74	19.4	66.9
3.0	7.70	19.4	66.9
3.5	7.69	19.3	66.7
4.0	6.89	19.2	66.6
4.5	6.32	18.9	66.0
5.0	5.89	18.7	65.7
5.5	5.65	18.5	65.3
6.0	5.55	18.4	65.1
6.5	5.26	18.3	64.9
7.0	4.63	17.9	64.2
7.5	2.72	17.0	62.6
8.0	1.13	15.4	59.7
8.5	1.90	13.5	56.3

Comparison Readings - 2nd meter

0.5 m	8.2	20.5	68.9
8.5 m	1.96	13.6	56.5

8/20/2013

Time: 12:10 EDT

Weather: Sunny, 75F, winds 5-10 mph

Secchi Disk - 7' 4"

Depth (meters)	DO mg/l	Temp °C	Temp °F
0.5	8.78	22.6	72.7
1.0	8.78	22.5	72.5
1.5	8.58	21.8	71.2
2.0	8.55	21.5	70.7
2.5	8.47	21.4	70.5
3.0	7.84	19.9	67.8
3.5	7.53	19.4	66.9
4.0	7.26	19	66.2
4.5	7.1	18.6	65.5
5.0	6.94	18.5	65.3
5.5	6.73	18.3	64.9
6.0	6.57	18.1	64.6
6.5	6.38	17.9	64.2
7.0	6.06	17.7	63.9
7.5	1.98	16.5	61.7
8.0	0.79	14.8	58.6
8.5	1.69	13.2	55.8

Comparison Readings - 2nd meter

0.5 m	8.82	22.8	73.0
8.5 m	1.68	13.5	56.3

Metcalf, Mark W

From: Metcalf, Mark W
Sent: Thursday, September 05, 2013 12:29 PM
To: 'Burr Fisher '; 'Kruger, Kyle'; 'Koetje, Mitch (DEQ)'; 'Kohlhepp, Gary (DEQ)'; 'Klemans, Diana (DEQ)'; 'Carpenter, Koren'
Cc: Puzen, Shawn C; Meyers, Robert J; Schlorke, Virgil E
Subject: Dead River water quality monitoring - 8/20 through 9/3/13
Attachments: Hoist Aug temp Summary.pdf; 2013 DO profile summary.pdf; Hoist Aug DO Summary.pdf

Good afternoon,

Pursuant to Article 408 of the Project License and the water quality monitoring plan for the Dead River Hydroelectric Project, UPPCO is monitoring water quality (dissolved oxygen and temperature) downstream of the Hoist Powerhouse (SE ¼, of the NE ¼ of Section 16, T48N, R26W (Township of Negaunee)). Per the monitoring plan, temperature data is collected on an hourly basis from May 1st through October 31st. Dissolved oxygen data is collected hourly from June 1st through September 30th.

Between August 20th and August 31st, deviations from the dissolved oxygen water quality standard were observed. The likely cause of the low DO readings is an equipment malfunction. The Hoist Powerhouse has been out of service since August 15th for maintenance work on the powerhouse intake valve. Since the 15th, all water was being released through a bypass valve that is approximately 2 to 3.5 m below the surface of the reservoir (depending on reservoir elevation). Between August 22nd and August 23rd, a sudden drop in dissolved oxygen levels occurred, followed by a continual decrease in DO until August 30th when there was a sudden spike in DO back to levels observed prior to the drop. UPPCO released between 100 and 115 CFS through the bypass valve from August 15th through the 31st. DO profiles conducted at the powerhouse intake on 8/20 and 9/3 show that the reservoir is stratified at a depth of 7.5 to 9 meters below the water surface. DO levels in the epilimnion (where water is being withdrawn through the bypass) is above the DO water quality standard of 7 mg/l. As DO levels of the water being withdrawn from the reservoir were above the water quality standard and there were no operational issues that could have contributed to the low DO levels, the likely cause of the low readings is due an equipment malfunction.

Also, please note that the average monthly water temperature (from the available data) recorded at this monitoring location exceeded the monthly maximum average temperature limitation of 68°F. The monthly average water temperature at this location was 68.7°F. The cause of the exceedance is the release of water through the bypass valve. The DO and temperature profiles conducted at the intake show that the water temperature of the epilimnion of the reservoir is above 68°F. As a consequence of releasing water through the bypass, warmer water was released downstream of the facility than what would normally be released if water was being withdrawn through the powerhouse.

Attached for your review is dissolved oxygen and temperature data from the monitoring location during the month of August along with profile data taken at the Hoist Powerhouse intake. Please feel free to contact me if you have questions on the monitoring data.

Mark

Mark Metcalf

Environmental Consultant - Air & Water | Integrys Business Support, LLC

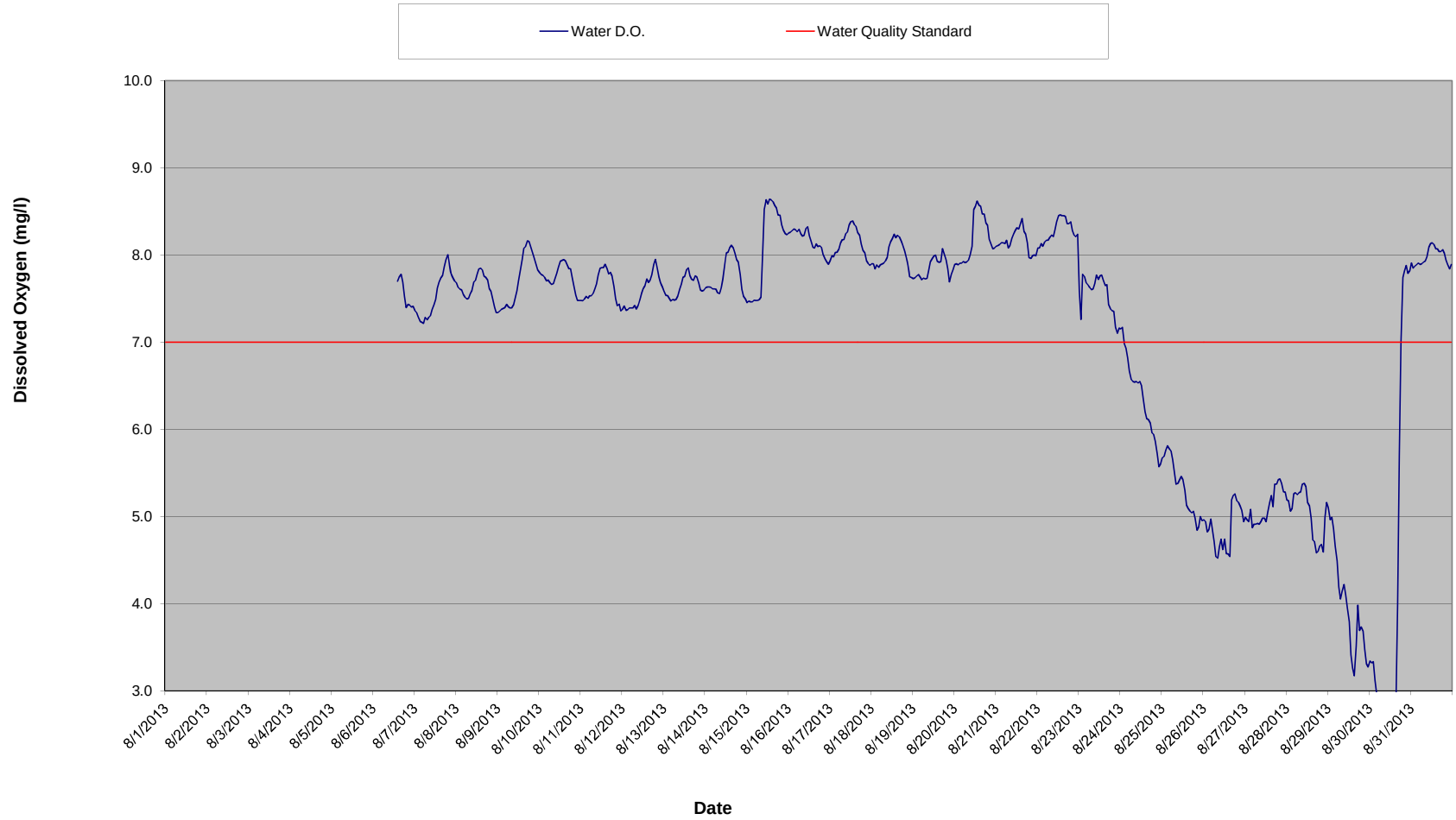
920-433-1833 (Green Bay)

920-617-6046 (De Pere)

920-606-8432 *cell*

920-433-4916 *fax*

Hoist Powerhouse Dissolved Oxygen Summary - August 2013



Dead River Below Hoist Powerhouse - August 2013 Dissolved Oxygen Monitoring Data

Time HHMMSS	8/1/2013	8/2/2013	8/3/2013	8/4/2013	8/5/2013	8/6/2013	8/7/2013	8/8/2013	8/9/2013	8/10/2013	8/11/2013	8/12/2013	8/13/2013	8/14/2013	8/15/2013	8/16/2013	8/17/2013
0	0.0	0.0	0.0	0.0	0.0	0.0	7.4	7.7	7.3	7.8	7.5	7.4	7.6	7.6	7.5	8.3	7.9
10000	0.0	0.0	0.0	0.0	0.0	0.0	7.3	7.6	7.4	7.8	7.5	7.4	7.5	7.6	7.5	8.3	8.0
20000	0.0	0.0	0.0	0.0	0.0	0.0	7.3	7.6	7.4	7.8	7.5	7.4	7.5	7.6	7.5	8.3	8.0
30000	0.0	0.0	0.0	0.0	0.0	0.0	7.2	7.6	7.4	7.7	7.5	7.4	7.5	7.6	7.5	8.3	8.0
40000	0.0	0.0	0.0	0.0	0.0	0.0	7.2	7.5	7.4	7.7	7.5	7.4	7.5	7.6	7.5	8.3	8.0
50000	0.0	0.0	0.0	0.0	0.0	0.0	7.2	7.5	7.4	7.7	7.5	7.4	7.5	7.6	7.5	8.3	8.1
60000	0.0	0.0	0.0	0.0	0.0	0.0	7.3	7.5	7.4	7.7	7.5	7.4	7.5	7.6	7.5	8.3	8.1
70000	0.0	0.0	0.0	0.0	0.0	0.0	7.3	7.5	7.4	7.7	7.6	7.4	7.5	7.6	7.5	8.2	8.2
80000	0.0	0.0	0.0	0.0	0.0	0.0	7.3	7.6	7.4	7.7	7.6	7.4	7.5	7.6	7.5	8.2	8.2
90000	0.0	0.0	0.0	0.0	0.0	0.0	7.3	7.6	7.4	7.7	7.7	7.4	7.6	7.6	8.0	8.2	8.2
100000	0.0	0.0	0.0	0.0	0.0	0.0	7.4	7.7	7.5	7.8	7.8	7.5	7.7	7.7	8.5	8.3	8.3
110000	0.0	0.0	0.0	0.0	0.0	0.0	7.4	7.7	7.6	7.9	7.8	7.6	7.7	7.9	8.6	8.3	8.3
120000	0.0	0.0	0.0	0.0	0.0	0.0	7.5	7.8	7.7	7.9	7.9	7.6	7.8	8.0	8.6	8.2	8.4
130000	0.0	0.0	0.0	0.0	0.0	0.0	7.6	7.8	7.8	7.9	7.9	7.6	7.8	8.0	8.6	8.2	8.4
140000	0.0	0.0	0.0	0.0	0.0	7.7	7.7	7.8	7.9	7.9	7.9	7.7	7.9	8.1	8.6	8.1	8.3
150000	0.0	0.0	0.0	0.0	0.0	7.7	7.7	7.8	8.1	7.9	7.8	7.7	7.8	8.1	8.6	8.1	8.3
160000	0.0	0.0	0.0	0.0	0.0	7.8	7.8	7.8	8.1	7.9	7.8	7.7	7.7	8.1	8.6	8.1	8.3
170000	0.0	0.0	0.0	0.0	0.0	7.7	7.9	7.7	8.2	7.8	7.8	7.8	7.7	8.0	8.5	8.1	8.2
180000	0.0	0.0	0.0	0.0	0.0	7.5	7.9	7.7	8.2	7.8	7.8	7.9	7.8	7.9	8.5	8.1	8.1
190000	0.0	0.0	0.0	0.0	0.0	7.4	8.0	7.6	8.1	7.7	7.6	7.9	7.7	7.9	8.5	8.1	8.1
200000	0.0	0.0	0.0	0.0	0.0	7.4	7.9	7.6	8.0	7.6	7.5	7.9	7.7	7.8	8.3	8.0	8.0
210000	0.0	0.0	0.0	0.0	0.0	7.4	7.8	7.5	8.0	7.5	7.4	7.7	7.6	7.6	8.3	8.0	7.9
220000	0.0	0.0	0.0	0.0	0.0	7.4	7.7	7.4	7.9	7.5	7.4	7.7	7.6	7.5	8.2	7.9	7.9
230000	0.0	0.0	0.0	0.0	0.0	7.4	7.7	7.3	7.8	7.5	7.4	7.6	7.6	7.5	8.2	7.9	7.9
Daily Max	0.0	0.0	0.0	0.0	0.0	7.8	8.0	7.8	8.2	7.9	7.9	7.9	7.9	8.1	8.6	8.3	8.4
Daily Min	0.0	0.0	0.0	0.0	0.0	0.0	7.2	7.3	7.3	7.5	7.4	7.4	7.5	7.5	7.5	7.9	7.9
Average	0.0	0.0	0.0	0.0	0.0	3.1	7.5	7.6	7.7	7.8	7.6	7.6	7.6	7.8	8.1	8.2	8.1

Water Quality Standard: 7.0 mg/l Dissolved Oxygen

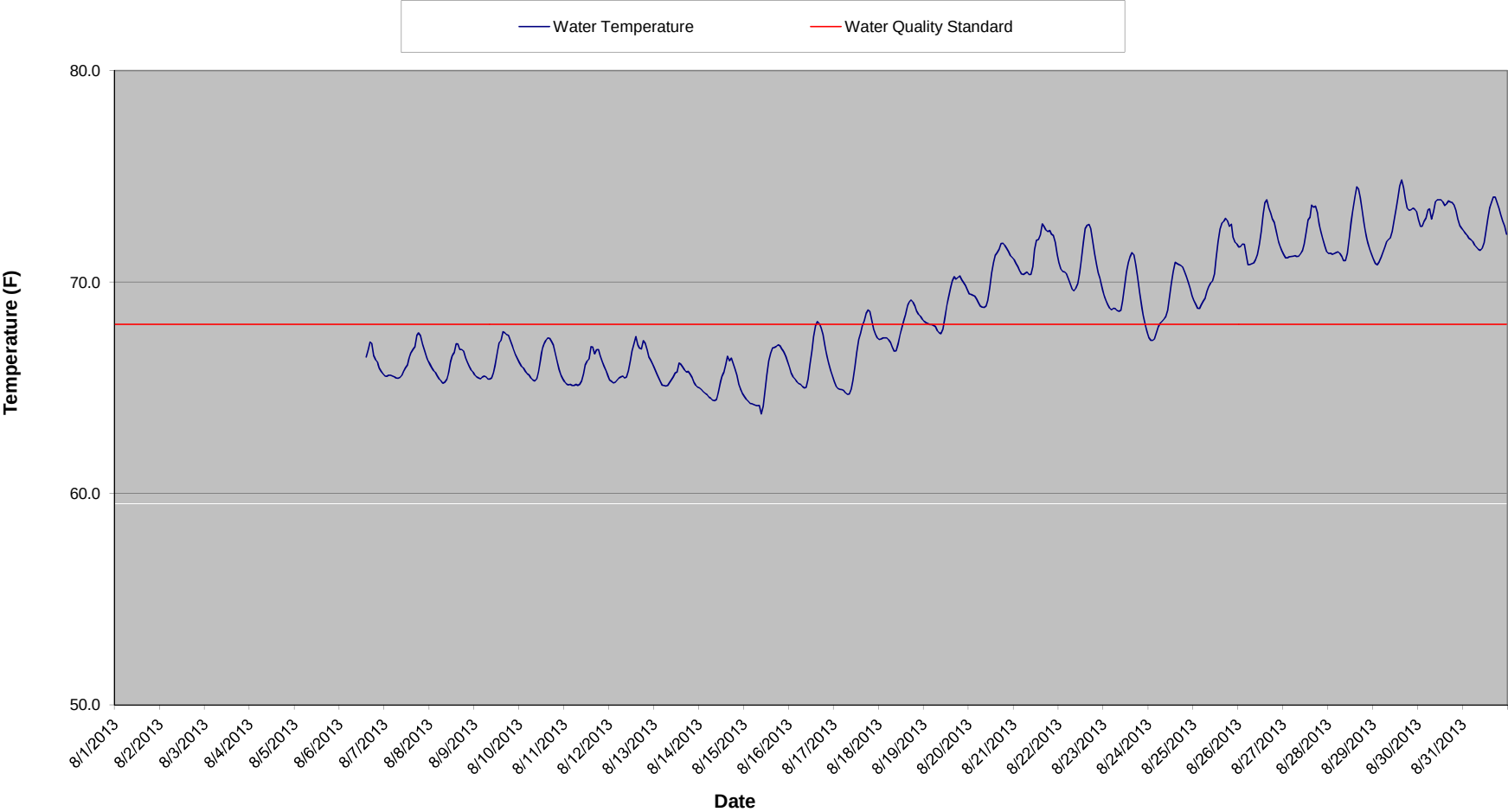
No data - Equipment Malfunction

Dead River Below Hoist Powerhouse - August 2013 Dissolved Oxygen Monitoring Data

Time HHMMSS	8/18/2013	8/19/2013	8/20/2013	8/21/2013	8/22/2013	8/23/2013	8/24/2013	8/25/2013	8/26/2013	8/27/2013	8/28/2013	8/29/2013	8/30/2013	8/31/2013
0	7.9	7.7	7.9	8.1	8.1	7.6	7.2	5.7	5.0	5.0	5.2	5.1	3.3	7.9
10000	7.9	7.7	7.9	8.1	8.1	7.3	7.2	5.7	4.9	5.0	5.2	5.0	3.3	7.9
20000	7.8	7.8	7.9	8.1	8.1	7.8	7.0	5.8	4.8	4.9	5.1	5.0	3.3	7.9
30000	7.9	7.8	7.9	8.1	8.1	7.8	6.9	5.8	4.9	5.1	5.1	4.9	3.1	7.9
40000	7.9	7.7	7.9	8.1	8.2	7.7	6.8	5.8	5.0	4.9	5.3	4.7	2.9	7.9
50000	7.9	7.7	7.9	8.1	8.2	7.7	6.7	5.8	4.8	4.9	5.3	4.5	2.7	7.9
60000	7.9	7.7	7.9	8.2	8.2	7.6	6.6	5.7	4.7	4.9	5.3	4.2	2.6	7.9
70000	7.9	7.7	7.9	8.1	8.2	7.6	6.6	5.5	4.5	4.9	5.3	4.1	2.9	7.9
80000	7.9	7.7	7.9	8.1	8.2	7.6	6.5	5.4	4.5	4.9	5.3	4.1	2.7	7.9
90000	8.0	7.8	8.0	8.2	8.2	7.7	6.6	5.4	4.7	4.9	5.4	4.2	2.5	8.0
100000	8.1	7.9	8.1	8.2	8.3	7.8	6.5	5.4	4.7	5.0	5.4	4.1	2.6	8.1
110000	8.2	8.0	8.5	8.3	8.4	7.7	6.6	5.5	4.6	5.0	5.3	4.0	2.5	8.1
120000	8.2	8.0	8.6	8.3	8.5	7.8	6.5	5.4	4.7	4.9	5.2	3.8	2.4	8.1
130000	8.2	8.0	8.6	8.3	8.5	7.8	6.4	5.3	4.6	5.1	5.1	3.4	2.5	8.1
140000	8.2	7.9	8.6	8.4	8.5	7.7	6.2	5.1	4.6	5.2	5.0	3.3	2.6	8.1
150000	8.2	7.9	8.6	8.4	8.5	7.7	6.1	5.1	4.5	5.2	4.7	3.2	2.9	8.1
160000	8.2	7.9	8.5	8.3	8.4	7.7	6.1	5.1	5.2	5.1	4.7	3.5	4.0	8.0
170000	8.2	8.1	8.5	8.2	8.4	7.4	6.1	5.0	5.2	5.4	4.6	4.0	5.7	8.0
180000	8.1	8.0	8.4	8.1	8.4	7.4	6.0	5.1	5.3	5.4	4.6	3.7	7.0	8.1
190000	8.0	7.9	8.3	8.0	8.4	7.4	5.9	5.0	5.2	5.4	4.7	3.7	7.7	8.0
200000	8.0	7.8	8.2	8.0	8.3	7.4	5.9	4.8	5.2	5.4	4.7	3.7	7.8	7.9
210000	7.9	7.7	8.1	8.0	8.2	7.2	5.7	4.9	5.1	5.4	4.6	3.5	7.9	7.9
220000	7.8	7.8	8.1	8.0	8.2	7.1	5.6	5.0	5.1	5.3	5.0	3.3	7.8	7.8
230000	7.7	7.8	8.1	8.0	8.2	7.2	5.6	5.0	4.9	5.3	5.2	3.3	7.8	7.9
Daily Max	8.2	8.1	8.6	8.4	8.5	7.8	7.2	5.8	5.3	5.4	5.4	5.1	7.9	8.1
Daily Min	7.7	7.7	7.9	8.0	8.1	7.1	5.6	4.8	4.5	4.9	4.6	3.2	2.4	7.8
Average	8.0	7.8	8.2	8.2	8.3	7.6	6.4	5.3	4.9	5.1	5.0	4.0	4.2	8.0

Suspect data. Potential equipment malfunction

Hoist Powerhouse Temperature Summary - August 2013



Dead River Below Hoist Powerhouse - August 2013 Temperature Monitoring Data

Time HHMMSS	8/1/2013	8/2/2013	8/3/2013	8/4/2013	8/5/2013	8/6/2013	8/7/2013	8/8/2013	8/9/2013	8/10/2013	8/11/2013	8/12/2013	8/13/2013	8/14/2013	8/15/2013	8/16/2013
0							65.6	66.1	65.6	66.1	65.3	65.4	65.9	65.0	64.6	66.0
10000							65.5	65.9	65.5	66.0	65.2	65.3	65.7	64.9	64.5	65.7
20000							65.6	65.8	65.5	65.9	65.1	65.2	65.5	64.8	64.4	65.5
30000							65.6	65.7	65.4	65.8	65.2	65.3	65.3	64.7	64.3	65.4
40000							65.6	65.6	65.5	65.7	65.1	65.4	65.1	64.7	64.2	65.3
50000							65.5	65.4	65.6	65.6	65.1	65.5	65.1	64.6	64.2	65.2
60000							65.5	65.3	65.5	65.5	65.2	65.5	65.1	64.5	64.2	65.2
70000							65.4	65.2	65.4	65.4	65.1	65.6	65.1	64.4	64.1	65.0
80000							65.5	65.3	65.4	65.3	65.2	65.5	65.2	64.4	64.2	65.0
90000							65.6	65.4	65.5	65.4	65.3	65.5	65.4	64.4	63.8	65.0
100000							65.8	65.7	65.7	65.8	65.7	65.8	65.5	64.8	64.1	65.4
110000							65.9	66.2	66.2	66.3	66.1	66.3	65.7	65.2	64.9	66.1
120000							66.1	66.5	66.7	66.8	66.3	66.7	65.8	65.5	65.6	66.7
130000							66.5	66.7	67.1	67.1	66.4	67.1	66.2	65.7	66.3	67.4
140000						66.5	66.7	67.1	67.2	67.2	66.9	67.4	66.1	66.1	66.6	67.9
150000						66.8	66.8	67.1	67.6	67.4	66.9	67.0	66.0	66.5	66.9	68.1
160000						67.2	66.9	66.8	67.6	67.3	66.6	66.9	65.8	66.3	66.9	68.0
170000						67.1	67.5	66.8	67.5	67.2	66.8	66.8	65.7	66.4	67.0	67.8
180000						66.5	67.6	66.7	67.5	67.0	66.8	67.2	65.8	66.1	67.0	67.5
190000						66.3	67.5	66.4	67.2	66.6	66.5	67.1	65.6	65.9	67.0	67.0
200000						66.2	67.1	66.2	67.0	66.2	66.3	66.8	65.5	65.6	66.8	66.5
210000						65.9	66.8	66.0	66.7	65.9	66.0	66.5	65.2	65.2	66.7	66.1
220000						65.8	66.5	65.8	66.5	65.6	65.8	66.3	65.1	64.9	66.5	65.8
230000						65.7	66.3	65.7	66.3	65.4	65.6	66.1	65.0	64.7	66.2	65.6
Daily Max	0.0	0.0	0.0	0.0	0.0	67.2	67.6	67.1	67.6	67.4	66.9	67.4	66.2	66.5	67.0	68.1
Daily Min	0.0	0.0	0.0	0.0	0.0	65.7	65.4	65.2	65.4	65.3	65.1	65.2	65.0	64.4	63.8	65.0
Average	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	66.4	66.2	66.1	66.3	66.2	65.8	66.2	65.5	65.2	65.5	66.2

Monthly average temp (F): 68.7
License Max. Average Temperature: 68 F

No data - equipment malfunction

Dead River Below Hoist Powerhouse - August 2013 Temperature Monitoring Data

Time	8/17/2013	8/18/2013	8/19/2013	8/20/2013	8/21/2013	8/22/2013	8/23/2013	8/24/2013	8/25/2013	8/26/2013	8/27/2013	8/28/2013	8/29/2013	8/30/2013	8/31/2013
HHMMSS															
0	65.3	67.3	68.1	69.4	71.1	70.9	69.4	67.4	69.1	71.7	71.3	71.3	71.0	72.9	72.4
10000	65.0	67.3	68.1	69.4	70.9	70.6	69.2	67.2	69.0	71.7	71.1	71.4	70.9	72.6	72.3
20000	65.0	67.4	68.0	69.4	70.7	70.5	68.9	67.2	68.8	71.8	71.1	71.3	70.8	72.6	72.2
30000	64.9	67.4	68.0	69.3	70.5	70.5	68.8	67.3	68.7	71.8	71.2	71.3	71.0	72.9	72.1
40000	64.9	67.4	68.0	69.2	70.4	70.4	68.7	67.6	68.9	71.2	71.2	71.4	71.2	73.0	72.0
50000	64.9	67.3	67.9	69.0	70.4	70.2	68.8	67.9	69.1	70.8	71.2	71.4	71.4	73.4	71.9
60000	64.8	67.1	67.9	68.9	70.4	69.9	68.7	68.1	69.2	70.8	71.2	71.3	71.6	73.5	71.7
70000	64.7	66.9	67.7	68.8	70.5	69.7	68.6	68.1	69.6	70.9	71.2	71.2	71.9	73.0	71.6
80000	64.7	66.7	67.6	68.8	70.4	69.6	68.6	68.2	69.8	70.9	71.2	71.0	72.0	73.3	71.5
90000	64.9	66.7	67.6	68.9	70.4	69.7	68.7	68.4	69.9	71.0	71.3	71.0	72.1	73.8	71.5
100000	65.3	67.0	67.8	69.1	70.7	69.9	69.1	68.7	70.1	71.3	71.5	71.4	72.4	73.9	71.6
110000	66.0	67.5	68.3	69.7	71.5	70.4	69.8	69.2	70.4	71.8	71.8	72.1	72.9	73.9	71.9
120000	66.7	67.8	68.9	70.4	72.0	71.2	70.5	69.9	71.1	72.4	72.3	72.8	73.5	73.9	72.4
130000	67.3	68.1	69.2	70.9	72.0	71.8	70.9	70.5	71.9	73.2	72.9	73.4	73.9	73.8	73.0
140000	67.6	68.5	69.7	71.3	72.2	72.5	71.2	70.9	72.5	73.7	73.1	74.0	74.5	73.6	73.5
150000	67.9	68.9	70.1	71.4	72.8	72.7	71.4	70.9	72.8	73.9	73.6	74.5	74.8	73.7	73.8
160000	68.2	69.0	70.3	71.5	72.6	72.7	71.3	70.8	72.9	73.5	73.5	74.4	74.5	73.8	74.0
170000	68.5	69.2	70.1	71.8	72.5	72.5	70.8	70.8	73.0	73.3	73.6	74.0	73.9	73.8	74.0
180000	68.7	69.0	70.2	71.8	72.4	71.9	70.3	70.7	72.9	73.0	73.3	73.3	73.5	73.8	73.7
190000	68.6	68.9	70.3	71.7	72.4	71.3	69.6	70.5	72.6	72.8	72.7	72.7	73.4	73.7	73.5
200000	68.2	68.6	70.1	71.6	72.3	70.8	68.9	70.3	72.7	72.4	72.3	72.2	73.4	73.4	73.2
210000	67.8	68.5	70.0	71.4	72.2	70.4	68.4	70.0	72.1	72.0	72.0	71.8	73.5	73.0	72.9
220000	67.5	68.4	69.8	71.2	71.9	70.1	68.0	69.7	71.9	71.7	71.7	71.5	73.4	72.7	72.6
230000	67.4	68.2	69.6	71.2	71.3	69.7	67.7	69.4	71.8	71.5	71.4	71.3	73.3	72.6	72.2
Daily Max	68.7	69.2	70.3	71.8	72.8	72.7	71.4	70.9	73.0	73.9	73.6	74.5	74.8	73.9	74.0
Daily Min	64.7	66.7	67.6	68.8	70.4	69.6	67.7	67.2	68.7	70.8	71.1	71.0	70.8	72.6	71.5
Average	66.4	67.9	68.9	70.3	71.4	70.8	69.4	69.2	70.9	72.0	72.0	72.2	72.7	73.3	72.6

Dead River (Hoist) Storage Basin
2013 Dissolved Oxygen and Temperature Profile Data

6/11/2013
Time: 16:15 EDT
Weather: Sunny, 73F, 5-10 mph wind

Secchi Disk - 6' 10"

Depth (meters)	DO mg/l	Temp °C	Temp °F
0.5	8.73	20.4	68.7
1.0	8.73	18.7	65.7
1.5	8.71	17.4	63.3
2.0	8.7	17.1	62.8
2.5	8.63	16.8	62.2
3.0	8.6	16.7	62.1
3.5	8.55	16.5	61.7
4.0	8.51	16.2	61.2
4.5	8.12	15	59.0
5.0	7.75	14.5	58.1
5.5	7.79	14.3	57.7
6.0	7.76	14.2	57.6
6.5	7.62	13.4	56.1
7.0	7.6	13.4	56.1
7.5	7.58	13.1	55.6
8.0	7.56	13.1	55.6
8.5	7.57	12.2	54.0
9.0	7.66	11.8	53.2
9.5	7.7	11.8	53.2
10.0	7.8	10.7	51.3
10.5	7.8	10.4	50.7
11.0	7.8	9.1	48.4
11.5	7.84	8.9	48.0
12.0	7.52	8.6	47.5
12.5	7.45	8	46.4
13.0	7.52	7.4	45.3

Comparison Readings - 2nd meter

0.5 m	8.83	19.9	102.3
13.0 m	7.21	65.3	8.8

6/25/2013
Time: 14:50 EST
Weather: Cloudy, 75°F, light winds
Secchi Disk - 7' 4"

Depth (m)	DO mg/l	Temp °C	Temp °F
0.5	8.83	22.7	72.9
1.0	8.81	21.7	71.1
1.5	7.91	20.0	68.0
2.0	7.67	19.2	66.6
2.5	7.63	18.9	66.0
3.0	7.57	18.4	65.1
3.5	7.02	17.7	63.9
4.0	6.97	17.2	63.0
4.5	6.45	16.4	61.5
5.0	6.31	16.1	61.0
5.5	6.12	15.5	59.9
6.0	5.93	15.2	59.4
6.5	5.92	15.1	59.2
7.0	5.93	15	59.0

Debris around intake prevented deeper readings

Comparison Readings - 2nd meter

0.5 m	8.07	23.1	73.6
7.0 m	5.28	15.7	60.3

7/9/2013
Time: 16:45 EDT
Weather: Overcast, breezy
Secchi Disk - 8'

Depth (m)	DO mg/l	Temp °C	Temp °F
0.5	7.96	23.6	74.5
1.0	7.84	23.8	74.8
1.5	7.83	23.8	74.8
2.0	7.79	23.8	74.8
2.5	7.77	23.9	75.0
3.0	7.76	23.9	75.0
3.5	7.73	23.8	74.8
4.0	6.28	21.7	71.1
4.5	4.88	20.1	68.2
5.0	4.76	19.6	67.3
5.5	4.49	19.1	66.4
6.0	4.43	18.3	64.9
6.5	4.42	18	64.4
7.0	4.44	17.9	64.2
7.5	4.43	17.5	63.5
8.0	4.04	16.9	62.4
8.5	3.75	16	60.8
9.0	3.71	15.8	60.4
9.5	3.58	15.3	59.5
10.0	3.54	14.9	58.8
10.5	3.52	14.8	58.6
11.0	3.53	14.8	58.6
11.5	3.53	14.8	58.6
12.0	3.53	14.8	58.6

Comparison Readings - 2nd meter

0.5 m	7.93	23.6	74.5
9.5 m	3.58	14.6	58.3

Dead River (Hoist) Storage Basin
2013 Dissolved Oxygen and Temperature Profile Data

7/23/2013

Time: 16:35 EDT

Weather: Sunny, 10-20 mph winds

Secchi Disk - 5' 10"

Depth (m)	DO mg/l	Temp °C	Temp °F
0.5	7.69	22.8	73.0
1.0	7.61	23.0	73.4
1.5	7.57	23.1	73.6
2.0	7.54	23.1	73.6
2.5	7.51	23.2	73.8
3.0	7.51	23.2	73.8
3.5	7.49	23.2	73.8
4.0	7.48	23.3	73.9
4.5	7.46	23.3	73.9
5.0	7.44	23.3	73.9
5.5	7.44	23.3	73.9
6.0	7.39	23.3	73.9
6.5	7.10	23.0	73.4
7.0	6.97	22.8	73.0
7.5	6.89	22.6	72.7
8.0	6.81	22.5	72.5
8.5	2.82	19.1	66.4
9.0	1.99	17.6	63.7
9.5	1.74	17.2	63.0
10.0	1.58	16.1	61.0
10.5	1.92	14.5	58.1
11.0	2.31	12.9	55.2

Comparison Readings - 2nd meter

0.5 m	7.68	22.9	73.2
11 m	2.27	13.2	55.8

8/6/2013

Time: 16:15

Weather: Cloudy, 5-10 mph winds

Secchi Disk - 7' 6"

Depth (m)	DO mg/l	Temp °C	Temp °F
0.5	7.87	20.2	68.4
1.0	7.88	20.1	68.2
1.5	7.88	20.1	68.2
2.0	7.87	20	68.0
2.5	7.85	20	68.0
3.0	7.82	20	68.0
3.5	7.82	20	68.0
4.0	7.81	19.9	67.8
4.5	7.8	19.9	67.8
5.0	7.78	19.9	67.8
5.5	7.76	19.9	67.8
6.0	7.75	19.9	67.8
6.5	7.76	19.9	67.8
7.0	7.75	19.9	67.8
7.5	7.69	19.8	67.6
8.0	4.04	18.2	64.8
8.5	4	18.1	64.6
9.0	3.61	17.6	63.7
9.5	2.87	17.3	63.1
10.0	1.03	16.2	61.2
10.5	0.63	14.9	58.8
11.0	0.69	13.9	57.0

Comparison Readings - 2nd meter

0.5 m	7.85	20.4	68.7
11 m	0.7	14.2	57.6

8/20/2013

Time: 13:00

Weather: Mostly sunny, 75F, 10-15 mph winds

Secchi Disk - 8' 7"

Depth (m)	DO mg/l	Temp °C	Temp °F
0.5	8.14	22.1	71.8
1.0	8.20	21.9	71.4
1.5	8.27	21.9	71.4
2.0	8.30	21.8	71.2
2.5	8.34	21.8	71.2
3.0	8.31	21.8	71.2
3.5	8.24	21.7	71.1
4.0	8.16	21.4	70.5
4.5	8.16	21.3	70.3
5.0	7.73	20.5	68.9
5.5	7.39	20.1	68.2
6.0	7.03	19.3	66.7
6.5	6.75	19.0	66.2
7.0	6.60	18.8	65.8
7.5	6.40	18.7	65.7
8.0	6.06	18.5	65.3
8.5	5.10	18.1	64.6
9.0	4.85	18.0	64.4
9.5	4.44	17.8	64.0
10.0	2.42	17.0	62.6
10.5	0.33	15.8	60.4

Comparison Readings - 2nd meter

0.5 m	8.19	22.3	72.1
10.5 m	0.34	15.9	60.6

Dead River (Hoist) Storage Basin
2013 Dissolved Oxygen and Temperature Profile Data

9/3/2013
Time: 17:15 EDT
Weather: Partly Cloudy, 66F
Secchi Disk - 7' 6"

Depth (m)	DO mg/l	Temp °C	Temp °F
0.5	8.22	21.9	71.4
1.0	8.22	22.0	71.6
1.5	8.2	22.0	71.6
2.0	8.18	22.0	71.6
2.5	8.17	22.0	71.6
3.0	8.11	21.9	71.4
3.5	8.09	21.9	71.4
4.0	8.05	21.9	71.4
4.5	8.06	21.8	71.2
5.0	8.02	21.8	71.2
5.5	8	21.8	71.2
6.0	7.97	21.8	71.2
6.5	7.92	21.7	71.1
7.0	7.93	21.7	71.1
7.5	7.93	21.7	71.1
8.0	7.63	21.5	70.7
8.5	7.12	21.2	70.2
9.0	6.87	20.9	69.6
9.5	3.57	18.8	65.8
10.0	3.35	18.4	65.1
10.5	3.22	18.3	64.9
11.0	3.25	18.3	64.9

Comparison Readings - 2nd meter

0.5 m	8.17	21.7	71.1
11 m	3.17	17.9	64.2

Time: EDT
Weather:
Secchi Disk -

Depth (m)	DO mg/l	Temp °C	Temp °F
0.5			
1.0			
1.5			
2.0			
2.5			
3.0			
3.5			
4.0			
4.5			
5.0			
5.5			
6.0			
6.5			
7.0			
7.5			
8.0			
8.5			
9.0			
9.5			
10.0			
10.5			

Comparison Readings - 2nd meter

0.5 m	
9.5 m	

Time: EDT
Weather: Cloudy,
Secchi Disk -

Depth (m)	DO mg/l	Temp °C	Temp °F
0.5			
1.0			
1.5			
2.0			
2.5			
3.0			
3.5			
4.0			
4.5			
5.0			
5.5			
6.0			
6.5			
7.0			
7.5			
8.0			
8.5			
9.0			
9.5			
10.0			
10.5			

Comparison Readings - 2nd meter

0.5 m	
9.5 m	

Metcalfe, Mark W

From: Metcalf, Mark W
Sent: Wednesday, September 18, 2013 3:29 PM
To: 'Burr Fisher '; 'Kruger, Kyle'; 'Koetje, Mitch (DEQ)'; 'Kohlhepp, Gary (DEQ)'; 'Klemans, Diana (DEQ)'; 'Carpenter, Koren'
Cc: Puzen, Shawn C; Meyers, Robert J; Schlorke, Virgil E
Subject: RE: Dead River water quality monitoring - 9/3/13 through 9/17/13
Attachments: Hoist DO summary 091813.pdf

Good afternoon,

Pursuant to Article 408 of the Project License and the water quality monitoring plan for the Dead River Hydroelectric Project, UPPCO is monitoring water quality (dissolved oxygen and temperature) downstream of the Hoist Powerhouse (SE ¼, of the NE ¼ of Section 16, T48N, R26W (Township of Negaunee)). Per the monitoring plan, temperature data is collected on an hourly basis from May 1st through October 31st. Dissolved oxygen data is collected hourly from June 1st through September 30th.

On September 6th, the dissolved oxygen sensor on the water quality monitor malfunctioned, resulting in non-representative dissolved oxygen data to be recorded. Temperature monitoring data was not affected by the malfunction. Dissolved oxygen monitoring data, along with a summary of dissolved oxygen and temperature profiles conducted at the Hoist Powerhouse intake, collected through September 17th is enclosed for your review. At the time of the malfunction, dissolved oxygen levels were above the water quality standard of 7 mg/l. Please note that between September 3rd and September 17th, the reservoir went through the fall turnover and is no longer stratified. The DO and temperature profile conducted on the 17th shows that DO levels are above the water quality standard at all depths.

As you are aware, UPPCO has experienced a significant number of malfunctions of water quality monitoring equipment during the 2013 monitoring season. UPPCO has been in contact with the equipment manufacturer regarding the equipment malfunctions observed. The manufacturer has indicated they are aware of an issue with failures of the dissolved oxygen sensor due to a bad solder connection within the sensor. The manufacturer has not provided cause analysis of the equipment failures that resulted in the monitors to stop logging data. At this time, the manufacturer has not provided a procedure for repairing the equipment to UPPCO or provided a method to try and troubleshoot the equipment prior to use. UPPCO had previously indicated we would investigate the use of equipment from an alternate manufacturer. Given the number of equipment failures observed this year and a lack of resolution to prevent reoccurrence of the problems from the manufacturer, UPPCO will be moving forward with changing monitoring equipment to a new vendor for the 2014 monitoring season to improve data reliability.

Attached for your review is dissolved oxygen data from the Hoist monitoring location during the month of September along with profile data taken at the Hoist Powerhouse intake. Please feel free to contact me if you have questions on the monitoring data.

Mark

Mark Metcalf

Environmental Consultant - Air & Water | Integrys Business Support, LLC

920-433-1833 (Green Bay)

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920-606-8432 *cell*

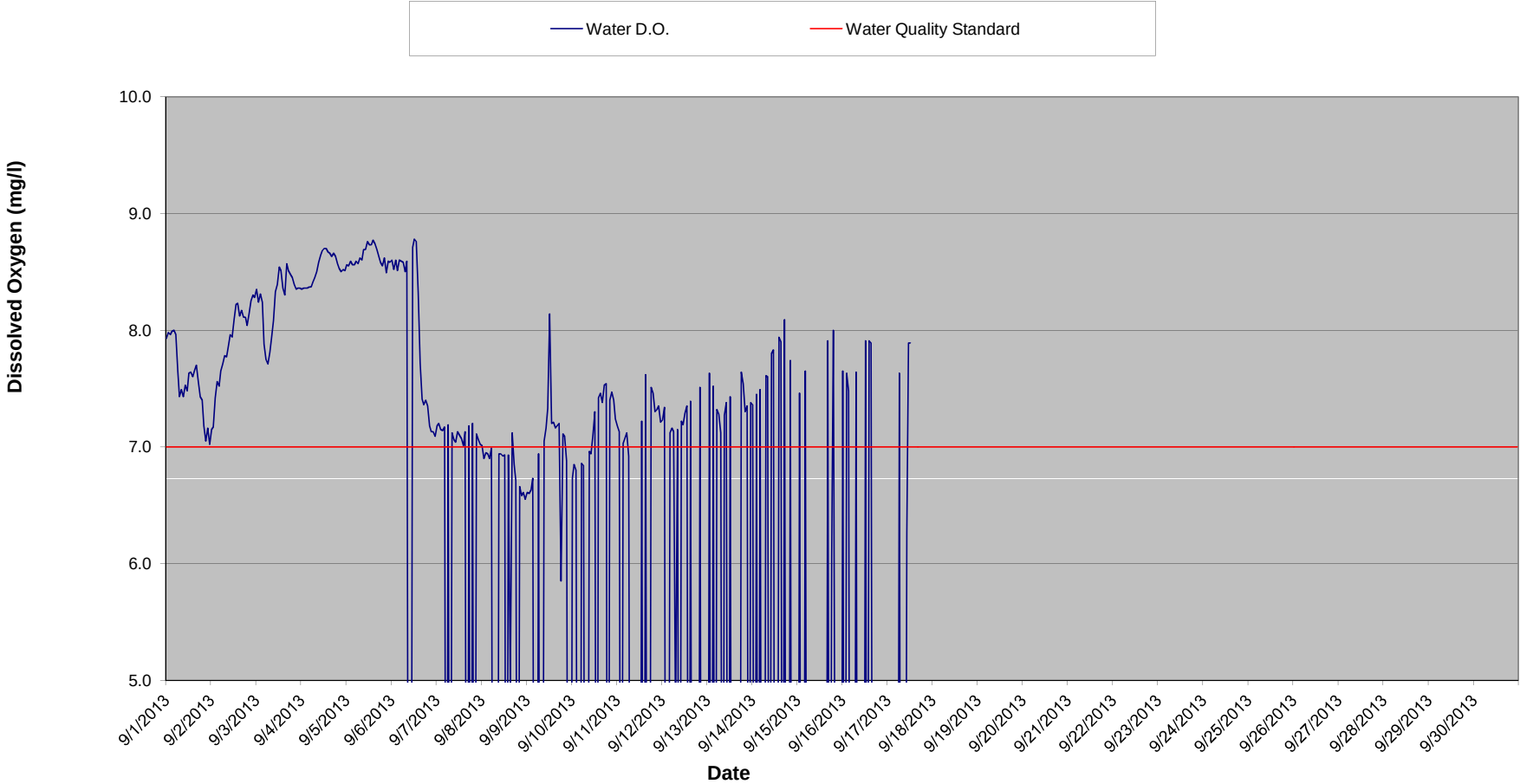
920-433-4916 *fax*

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Providing support for Integrys Energy Group, Integrys Energy Services, Michigan Gas Utilities, Minnesota Energy Resources, North Shore Gas, Peoples Gas, Trillium CNG, Upper Peninsula Power Company, Wisconsin River Power Company and Wisconsin Public Service Corporation.

Hoist Powerhouse Dissolved Oxygen Summary - September 2013



Dead River Below Hoist Powerhouse - September 2013 Dissolved Oxygen Monitoring Data

Time	9/1/2013	9/2/2013	9/3/2013	9/4/2013	9/5/2013	9/6/2013	9/7/2013	9/8/2013	9/9/2013	9/10/2013	9/11/2013	9/12/2013	9/13/2013	9/14/2013	9/15/2013	9/16/2013
HHMMSS																
0	7.9	7.2	8.4	8.4	8.6	8.6	7.2	7.0	6.6	6.7	7.2	7.2	0.1	7.4	0.1	7.7
10000	8.0	7.2	8.2	8.4	8.6	8.5	7.2	6.9	6.6	6.9	7.1	7.3	7.6	0.1	7.5	0.1
20000	8.0	7.4	8.3	8.4	8.6	8.6	7.2	7.0	6.6	6.8	0.2	0.2	0.1	7.5	0.1	7.6
30000	8.0	7.6	8.2	8.4	8.6	8.5	7.1	6.9	6.7	0.1	7.0	0.2	7.5	0.1	0.1	7.5
40000	8.0	7.5	7.9	8.4	8.6	8.6	7.2	6.9	0.1	0.1	7.1	7.1	0.1	7.5	7.7	0.1
50000	8.0	7.7	7.8	8.4	8.6	8.6	0.2	7.0	0.1	6.9	7.1	7.2	7.3	0.1	0.1	0.1
60000	7.7	7.7	7.7	8.4	8.6	8.6	7.2	0.1	6.9	6.8	6.9	7.1	7.3	0.1	0.1	0.1
70000	7.4	7.8	7.8	8.5	8.6	8.5	0.2	0.1	0.1	0.1	0.2	4.6	7.1	7.6	0.1	7.6
80000	7.5	7.8	7.9	8.5	8.6	8.6	7.1	0.2	0.1	0.1	0.2	7.2	0.1	7.6	0.1	0.1
90000	7.4	7.9	8.1	8.6	8.7	0.2	7.1	6.9	7.1	7.0	0.2	0.2	7.3	0.1	0.1	0.1
100000	7.5	8.0	8.3	8.6	8.7	0.2	7.0	6.9	7.2	6.9	0.2	7.2	7.4	7.8	0.1	0.1
110000	7.5	7.9	8.4	8.7	8.8	8.7	7.1	6.9	7.3	7.1	0.2	7.2	0.1	7.8	0.1	0.1
120000	7.6	8.1	8.5	8.7	8.7	8.8	7.1	6.9	8.1	7.3	0.2	7.3	7.4	0.1	0.1	7.9
130000	7.6	8.2	8.5	8.7	8.7	8.8	7.1	0.2	7.2	0.2	7.2	7.4	0.1	0.1	0.1	0.1
140000	7.6	8.2	8.4	8.7	8.8	8.3	7.0	6.9	7.2	7.4	0.2	0.2	0.1	7.9	0.1	7.9
150000	7.7	8.1	8.3	8.7	8.7	7.7	7.1	4.9	7.2	7.5	7.6	7.4	0.1	7.9	0.1	7.9
160000	7.7	8.2	8.6	8.6	8.7	7.4	0.2	7.1	7.2	7.4	0.2	0.2	0.1	0.1	7.9	0.1
170000	7.6	8.1	8.5	8.7	8.6	7.4	7.2	6.9	7.2	7.5	0.2	0.2	0.1	8.1	0.1	0.1
180000	7.4	8.1	8.5	8.6	8.6	7.4	0.2	6.7	5.9	7.5	7.5	0.2	7.6	0.1	6.1	0.1
190000	7.4	8.0	8.5	8.6	8.6	7.4	7.2	0.1	7.1	0.2	7.5	0.2	7.5	0.1	8.0	0.1
200000	7.2	8.1	8.4	8.5	8.6	7.2	0.2	6.7	7.1	7.4	7.3	7.5	7.3	7.7	3.2	0.1
210000	7.1	8.3	8.4	8.5	8.5	7.1	7.1	6.6	6.9	7.5	7.3	0.1	7.4	0.1	0.1	0.1
220000	7.2	8.3	8.4	8.5	8.6	7.1	7.1	6.6	0.2	7.4	7.4	0.1	0.1	0.1	0.1	0.1
230000	7.0	8.3	8.4	8.5	8.6	7.1	7.0	6.6	0.2	7.2	7.2	0.1	7.4	0.0	0.1	4.4
Daily Max	8.0	8.3	8.6	8.7	8.8	8.8	7.2	7.1	8.1	7.5	7.6	7.5	7.6	8.1	8.0	7.9
Daily Min	7.0	7.2	7.7	8.4	8.5	0.2	0.2	0.1	0.1	0.1	0.2	0.1	0.1	0.0	0.1	0.1
Average	7.6	7.9	8.3	8.5	8.6	7.4	5.7	5.4	5.3	5.4	4.3	3.9	4.1	3.6	1.8	2.5

Water Quality Standard: 7 mg/l Dissolved Oxygen

Suspect data. May not be representative of actual conditions due to equipment malfunction

Dead River Below Hoist Powerhouse - September 2013 Dissolved Oxygen Monitoring Data

Time														
HHMMSS	9/17/2013	9/18/2013	9/19/2013	9/20/2013	9/21/2013	9/22/2013	9/23/2013	9/24/2013	9/25/2013	9/26/2013	9/27/2013	9/28/2013	9/29/2013	9/30/2013
0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10000	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
20000	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
30000	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
40000	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
50000	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
60000	7.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
70000	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
80000	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
90000	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
100000	6.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
110000	7.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
120000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
130000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
140000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
150000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
160000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
170000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
180000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
190000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
200000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
210000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
220000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
230000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Daily Max	7.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Daily Min	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Average	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Dead River (Hoist) Storage Basin
2013 Dissolved Oxygen and Temperature Profile Data

6/11/2013

Time: 16:15 EDT

Weather: Sunny, 73F, 5-10 mph wind

Secchi Disk - 6' 10"

Depth (meters)	DO mg/l	Temp °C	Temp °F
0.5	8.73	20.4	68.7
1.0	8.73	18.7	65.7
1.5	8.71	17.4	63.3
2.0	8.7	17.1	62.8
2.5	8.63	16.8	62.2
3.0	8.6	16.7	62.1
3.5	8.55	16.5	61.7
4.0	8.51	16.2	61.2
4.5	8.12	15	59.0
5.0	7.75	14.5	58.1
5.5	7.79	14.3	57.7
6.0	7.76	14.2	57.6
6.5	7.62	13.4	56.1
7.0	7.6	13.4	56.1
7.5	7.58	13.1	55.6
8.0	7.56	13.1	55.6
8.5	7.57	12.2	54.0
9.0	7.66	11.8	53.2
9.5	7.7	11.8	53.2
10.0	7.8	10.7	51.3
10.5	7.8	10.4	50.7
11.0	7.8	9.1	48.4
11.5	7.84	8.9	48.0
12.0	7.52	8.6	47.5
12.5	7.45	8	46.4
13.0	7.52	7.4	45.3

Comparison Readings - 2nd meter

0.5 m	8.83	19.9	102.3
13.0 m	7.21	65.3	8.8

6/25/2013

Time: 14:50 EST

Weather: Cloudy, 75°F, light winds

Secchi Disk - 7' 4"

Depth (m)	DO mg/l	Temp °C	Temp °F
0.5	8.83	22.7	72.9
1.0	8.81	21.7	71.1
1.5	7.91	20.0	68.0
2.0	7.67	19.2	66.6
2.5	7.63	18.9	66.0
3.0	7.57	18.4	65.1
3.5	7.02	17.7	63.9
4.0	6.97	17.2	63.0
4.5	6.45	16.4	61.5
5.0	6.31	16.1	61.0
5.5	6.12	15.5	59.9
6.0	5.93	15.2	59.4
6.5	5.92	15.1	59.2
7.0	5.93	15	59.0

Debris around intake prevented deeper readings

Comparison Readings - 2nd meter

0.5 m	8.07	23.1	73.6
7.0 m	5.28	15.7	60.3

7/9/2013

Time: 16:45 EDT

Weather: Overcast, breezy

Secchi Disk - 8'

Depth (m)	DO mg/l	Temp °C	Temp °F
0.5	7.96	23.6	74.5
1.0	7.84	23.8	74.8
1.5	7.83	23.8	74.8
2.0	7.79	23.8	74.8
2.5	7.77	23.9	75.0
3.0	7.76	23.9	75.0
3.5	7.73	23.8	74.8
4.0	6.28	21.7	71.1
4.5	4.88	20.1	68.2
5.0	4.76	19.6	67.3
5.5	4.49	19.1	66.4
6.0	4.43	18.3	64.9
6.5	4.42	18	64.4
7.0	4.44	17.9	64.2
7.5	4.43	17.5	63.5
8.0	4.04	16.9	62.4
8.5	3.75	16	60.8
9.0	3.71	15.8	60.4
9.5	3.58	15.3	59.5
10.0	3.54	14.9	58.8
10.5	3.52	14.8	58.6
11.0	3.53	14.8	58.6
11.5	3.53	14.8	58.6
12.0	3.53	14.8	58.6

Comparison Readings - 2nd meter

0.5 m	7.93	23.6	74.5
9.5 m	3.58	14.6	58.3

Dead River (Hoist) Storage Basin
2013 Dissolved Oxygen and Temperature Profile Data

7/23/2013

Time: 16:35 EDT

Weather: Sunny, 10-20 mph winds

Secchi Disk - 5' 10"

Depth (m)	DO mg/l	Temp °C	Temp °F
0.5	7.69	22.8	73.0
1.0	7.61	23.0	73.4
1.5	7.57	23.1	73.6
2.0	7.54	23.1	73.6
2.5	7.51	23.2	73.8
3.0	7.51	23.2	73.8
3.5	7.49	23.2	73.8
4.0	7.48	23.3	73.9
4.5	7.46	23.3	73.9
5.0	7.44	23.3	73.9
5.5	7.44	23.3	73.9
6.0	7.39	23.3	73.9
6.5	7.10	23.0	73.4
7.0	6.97	22.8	73.0
7.5	6.89	22.6	72.7
8.0	6.81	22.5	72.5
8.5	2.82	19.1	66.4
9.0	1.99	17.6	63.7
9.5	1.74	17.2	63.0
10.0	1.58	16.1	61.0
10.5	1.92	14.5	58.1
11.0	2.31	12.9	55.2

Comparison Readings - 2nd meter

0.5 m	7.68	22.9	73.2
11 m	2.27	13.2	55.8

8/6/2013

Time: 16:15

Weather: Cloudy, 5-10 mph winds

Secchi Disk - 7' 6"

Depth (m)	DO mg/l	Temp °C	Temp °F
0.5	7.87	20.2	68.4
1.0	7.88	20.1	68.2
1.5	7.88	20.1	68.2
2.0	7.87	20	68.0
2.5	7.85	20	68.0
3.0	7.82	20	68.0
3.5	7.82	20	68.0
4.0	7.81	19.9	67.8
4.5	7.8	19.9	67.8
5.0	7.78	19.9	67.8
5.5	7.76	19.9	67.8
6.0	7.75	19.9	67.8
6.5	7.76	19.9	67.8
7.0	7.75	19.9	67.8
7.5	7.69	19.8	67.6
8.0	4.04	18.2	64.8
8.5	4	18.1	64.6
9.0	3.61	17.6	63.7
9.5	2.87	17.3	63.1
10.0	1.03	16.2	61.2
10.5	0.63	14.9	58.8
11.0	0.69	13.9	57.0

Comparison Readings - 2nd meter

0.5 m	7.85	20.4	68.7
11 m	0.7	14.2	57.6

8/20/2013

Time: 13:00

Weather: Mostly sunny, 75F, 10-15 mph winds

Secchi Disk - 8' 7"

Depth (m)	DO mg/l	Temp °C	Temp °F
0.5	8.14	22.1	71.8
1.0	8.20	21.9	71.4
1.5	8.27	21.9	71.4
2.0	8.30	21.8	71.2
2.5	8.34	21.8	71.2
3.0	8.31	21.8	71.2
3.5	8.24	21.7	71.1
4.0	8.16	21.4	70.5
4.5	8.16	21.3	70.3
5.0	7.73	20.5	68.9
5.5	7.39	20.1	68.2
6.0	7.03	19.3	66.7
6.5	6.75	19.0	66.2
7.0	6.60	18.8	65.8
7.5	6.40	18.7	65.7
8.0	6.06	18.5	65.3
8.5	5.10	18.1	64.6
9.0	4.85	18.0	64.4
9.5	4.44	17.8	64.0
10.0	2.42	17.0	62.6
10.5	0.33	15.8	60.4

Comparison Readings - 2nd meter

0.5 m	8.19	22.3	72.1
10.5 m	0.34	15.9	60.6

Dead River (Hoist) Storage Basin
2013 Dissolved Oxygen and Temperature Profile Data

9/3/2013
Time: 17:15 EDT
Weather: Partly Cloudy, 66F
Secchi Disk - 7' 6"

Depth (m)	DO mg/l	Temp °C	Temp °F
0.5	8.22	21.9	71.4
1.0	8.22	22.0	71.6
1.5	8.2	22.0	71.6
2.0	8.18	22.0	71.6
2.5	8.17	22.0	71.6
3.0	8.11	21.9	71.4
3.5	8.09	21.9	71.4
4.0	8.05	21.9	71.4
4.5	8.06	21.8	71.2
5.0	8.02	21.8	71.2
5.5	8	21.8	71.2
6.0	7.97	21.8	71.2
6.5	7.92	21.7	71.1
7.0	7.93	21.7	71.1
7.5	7.93	21.7	71.1
8.0	7.63	21.5	70.7
8.5	7.12	21.2	70.2
9.0	6.87	20.9	69.6
9.5	3.57	18.8	65.8
10.0	3.35	18.4	65.1
10.5	3.22	18.3	64.9
11.0	3.25	18.3	64.9

Comparison Readings - 2nd meter

0.5 m	8.17	21.7	71.1
11 m	3.17	17.9	64.2

9/17/2013
Time: 13:40 EDT
Weather: Sunny, 60-65F, 5-10 mph wind
Secchi Disk - 6'

Depth (m)	DO mg/l	Temp °C	Temp °F
0.5	7.90	17.7	63.9
1.0	7.88	17.7	63.9
1.5	7.85	17.6	63.7
2.0	7.82	17.6	63.7
2.5	7.81	17.6	63.7
3.0	7.79	17.6	63.7
3.5	7.79	17.6	63.7
4.0	7.78	17.5	63.5
4.5	7.78	17.5	63.5
5.0	7.76	17.5	63.5
5.5	7.73	17.5	63.5
6.0	7.72	17.5	63.5
6.5	7.71	17.5	63.5
7.0	7.70	17.5	63.5
7.5	7.71	17.5	63.5
8.0	7.71	17.5	63.5
8.5	7.71	17.5	63.5
9.0	7.70	17.5	63.5
9.5	7.69	17.5	63.5
10.0	7.68	17.5	63.5
10.5	7.65	17.5	63.5

Comparison Readings - 2nd meter

0.5 m	7.85	17.9	64.2
9.5 m	7.59	17.7	63.9

Time: EDT
Weather: Cloudy,
Secchi Disk -

Depth (m)	DO mg/l	Temp °C	Temp °F
0.5			
1.0			
1.5			
2.0			
2.5			
3.0			
3.5			
4.0			
4.5			
5.0			
5.5			
6.0			
6.5			
7.0			
7.5			
8.0			
8.5			
9.0			
9.5			
10.0			
10.5			

Comparison Readings - 2nd meter

0.5 m	
9.5 m	

Metcalfe, Mark W

From: Metcalf, Mark W
Sent: Thursday, October 03, 2013 1:39 PM
To: 'Burr Fisher '; 'Kruger, Kyle'; 'Koetje, Mitch (DEQ)'; 'Kohlhepp, Gary (DEQ)'; 'Klemans, Diana (DEQ)'; 'Carpenter, Koren'
Cc: Puzen, Shawn C; Meyers, Robert J; Schlorke, Virgil E
Subject: Dead River - deviation from monthly temperature standard below the Hoist Powerhouse
Attachments: Hoist temp table sept.pdf; Hoist temp grph sept.pdf; Hoist 2013 DO profile summary.pdf

Good afternoon,

Pursuant to Article 408 of the Project License and the water quality monitoring plan for the Dead River Hydroelectric Project, UPPCO is monitoring water quality (dissolved oxygen and temperature) downstream of the Hoist Powerhouse (SE ¼, of the NE ¼ of Section 16, T48N, R26W (Township of Negaunee)). Per the monitoring plan, temperature data is collected on an hourly basis from May 1st through October 31st. Dissolved oxygen data is collected hourly from June 1st through September 30th.

The monthly average water temperature recorded at this location has exceeded the license maximum. The license maximum monthly average water temperature for the month of September is 63°F. The monthly average water temperature observed was 64.4°F. A significant contributing factor to the high average water temperature was that the Hoist powerhouse was off-line from August 15th through September 6th for maintenance work on the powerhouse intake valve. During this period all water was being released through a bypass valve that withdraws warmer water from the hypolimnion of the reservoir approximately 3 to 4 meters below the surface of the reservoir. Consequently, colder water in the hypolimnion was not being released from the facility. Dissolved oxygen and temperature profiles conducted at the powerhouse intake show water temperatures in the epilimnion were over 70°F when the bypass valve was being used. The average daily water temperature at the monitoring location was above 63°F through August 16th.

Temperature monitoring data for the month of September is attached for your review. Please contact me if you have questions.

Mark

Mark Metcalf

Environmental Consultant - Air & Water | Integrys Business Support, LLC

920-433-1833 (Green Bay)

920-617-6046 (De Pere)

920-606-8432 cell

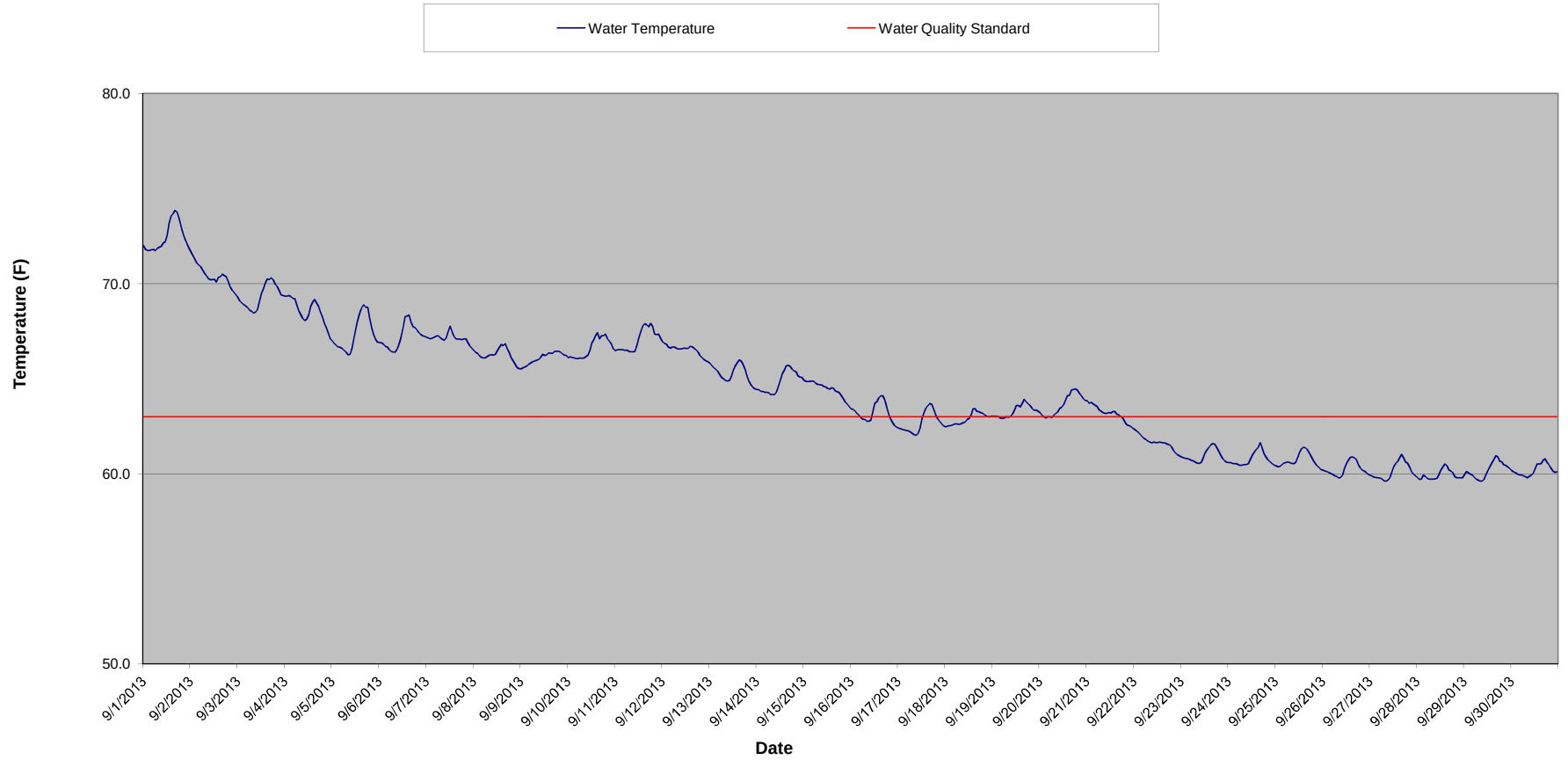
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Providing support for Integrys Energy Group, Integrys Energy Services, Michigan Gas Utilities, Minnesota Energy Resources, North Shore Gas, Peoples Gas, Trillium CNG, Upper Peninsula Power Company, Wisconsin River Power Company and Wisconsin Public Service Corporation.

Hoist Powerhouse Temperature Summary - September 2013



Dead River Below Hoist Powerhouse - September 2013 Temperature Monitoring Data

Time HHMMSS	9/1/2013	9/2/2013	9/3/2013	9/4/2013	9/5/2013	9/6/2013	9/7/2013	9/8/2013	9/9/2013	9/10/2013	9/11/2013	9/12/2013	9/13/2013	9/14/2013	9/15/2013	9/16/2013
0	72.0	71.7	69.3	69.4	67.0	66.9	67.2	66.5	65.5	66.1	66.5	67.0	65.8	64.4	64.9	63.4
10000	71.8	71.5	69.1	69.4	66.9	66.9	67.1	66.4	65.6	66.1	66.5	66.9	65.7	64.4	64.9	63.4
20000	71.8	71.3	69.0	69.4	66.8	66.8	67.1	66.3	65.6	66.1	66.5	66.8	65.6	64.3	64.9	63.3
30000	71.7	71.1	68.9	69.3	66.7	66.7	67.1	66.2	65.7	66.1	66.5	66.7	65.5	64.3	64.9	63.2
40000	71.8	71.0	68.8	69.2	66.7	66.7	67.2	66.1	65.8	66.1	66.5	66.6	65.4	64.3	64.9	63.1
50000	71.8	70.9	68.7	69.2	66.6	66.5	67.2	66.1	65.8	66.1	66.5	66.7	65.2	64.3	64.9	62.9
60000	71.7	70.7	68.6	68.9	66.5	66.4	67.3	66.1	65.9	66.1	66.5	66.7	65.1	64.3	64.8	62.9
70000	71.9	70.5	68.5	68.6	66.4	66.4	67.2	66.2	65.9	66.1	66.4	66.6	65.0	64.2	64.7	62.9
80000	71.9	70.4	68.5	68.4	66.3	66.4	67.1	66.2	66.0	66.1	66.4	66.6	64.9	64.2	64.7	62.8
90000	72.0	70.3	68.5	68.2	66.3	66.6	67.0	66.3	66.0	66.2	66.4	66.6	64.9	64.2	64.7	62.8
100000	72.1	70.2	68.6	68.1	66.6	66.9	67.1	66.2	66.1	66.2	66.4	66.6	64.9	64.3	64.6	62.8
110000	72.2	70.2	69.1	68.1	67.1	67.2	67.5	66.3	66.3	66.5	66.8	66.6	65.1	64.6	64.6	63.3
120000	72.6	70.2	69.5	68.4	67.7	67.7	67.8	66.5	66.2	66.9	67.2	66.6	65.5	64.9	64.5	63.7
130000	73.2	70.1	69.7	68.8	68.1	68.3	67.5	66.7	66.3	67.0	67.5	66.6	65.7	65.3	64.5	63.8
140000	73.6	70.3	70.0	69.0	68.5	68.3	67.2	66.8	66.4	67.3	67.8	66.7	65.8	65.4	64.5	64.0
150000	73.7	70.4	70.3	69.2	68.8	68.4	67.1	66.7	66.3	67.4	67.9	66.7	66.0	65.7	64.5	64.1
160000	73.9	70.5	70.2	69.0	68.9	68.0	67.1	66.8	66.3	67.1	67.8	66.6	65.9	65.7	64.3	64.1
170000	73.8	70.4	70.3	68.8	68.8	67.7	67.1	66.6	66.4	67.3	67.7	66.5	65.7	65.6	64.3	63.9
180000	73.5	70.4	70.2	68.5	68.8	67.7	67.0	66.4	66.5	67.3	67.9	66.4	65.5	65.5	64.3	63.5
190000	73.0	70.1	70.0	68.3	68.2	67.6	67.1	66.1	66.5	67.4	67.7	66.2	65.1	65.4	64.1	63.2
200000	72.7	69.8	69.9	67.9	67.7	67.4	67.1	65.9	66.4	67.1	67.4	66.1	64.9	65.4	64.0	62.9
210000	72.4	69.7	69.6	67.7	67.3	67.3	66.9	65.8	66.3	67.0	67.3	66.0	64.7	65.1	63.8	62.7
220000	72.1	69.5	69.4	67.4	67.1	67.3	66.7	65.6	66.2	66.8	67.4	65.9	64.5	65.1	63.7	62.5
230000	71.9	69.4	69.4	67.1	66.9	67.2	66.6	65.5	66.2	66.6	67.1	65.9	64.5	65.1	63.5	62.5
Daily Max	73.9	71.7	70.3	69.4	68.9	68.4	67.8	66.8	66.5	67.4	67.9	67.0	66.0	65.7	64.9	64.1
Daily Min	71.7	69.4	68.5	67.1	66.3	66.4	66.6	65.5	65.5	66.1	66.4	65.9	64.5	64.2	63.5	62.5
Average	72.4	70.4	69.3	68.6	67.3	67.2	67.1	66.3	66.1	66.6	67.0	66.5	65.3	64.8	64.5	63.2

Monthly average temp (F): 64.4

License Max. Average Temperature: 63 F

Dead River Below Hoist Powerhouse - September 2013 Temperature Monitoring Data

Time														
HHMMSS	9/17/2013	9/18/2013	9/19/2013	9/20/2013	9/21/2013	9/22/2013	9/23/2013	9/24/2013	9/25/2013	9/26/2013	9/27/2013	9/28/2013	9/29/2013	9/30/2013
0	62.4	62.5	63.0	63.2	63.8	62.3	60.9	60.6	60.4	60.2	59.9	59.8	60.0	60.2
10000	62.4	62.5	63.0	63.1	63.7	62.3	60.8	60.6	60.4	60.2	59.9	59.7	60.1	60.1
20000	62.3	62.5	63.0	63.0	63.8	62.2	60.8	60.5	60.4	60.1	59.8	59.7	60.0	60.1
30000	62.3	62.5	63.0	62.9	63.7	62.1	60.8	60.5	60.5	60.1	59.8	59.9	60.0	60.0
40000	62.3	62.6	62.9	63.0	63.6	62.0	60.8	60.5	60.6	60.0	59.8	59.9	59.9	59.9
50000	62.3	62.6	62.9	63.0	63.6	61.9	60.7	60.5	60.6	60.0	59.8	59.8	59.8	59.9
60000	62.2	62.6	62.9	63.0	63.4	61.8	60.7	60.4	60.6	59.9	59.7	59.7	59.7	59.9
70000	62.1	62.6	63.0	63.1	63.3	61.7	60.6	60.5	60.6	59.9	59.6	59.7	59.7	59.8
80000	62.1	62.6	63.0	63.2	63.2	61.7	60.6	60.5	60.5	59.8	59.6	59.7	59.6	59.8
90000	62.0	62.7	63.0	63.2	63.2	61.6	60.5	60.5	60.5	59.8	59.7	59.7	59.6	59.9
100000	62.1	62.7	63.1	63.4	63.2	61.7	60.6	60.5	60.6	59.9	59.8	59.8	59.7	59.9
110000	62.4	62.9	63.3	63.5	63.2	61.6	60.8	60.7	60.8	60.3	60.1	60.0	59.9	60.0
120000	62.9	62.9	63.6	63.6	63.2	61.6	61.1	61.0	61.1	60.5	60.4	60.2	60.2	60.3
130000	63.2	63.1	63.6	63.9	63.3	61.7	61.3	61.1	61.3	60.7	60.5	60.4	60.4	60.5
140000	63.5	63.4	63.5	64.1	63.3	61.6	61.4	61.3	61.4	60.9	60.7	60.5	60.6	60.5
150000	63.6	63.4	63.7	64.1	63.1	61.6	61.5	61.4	61.4	60.9	60.8	60.4	60.7	60.5
160000	63.7	63.3	63.9	64.4	63.1	61.6	61.6	61.6	61.3	60.8	61.0	60.2	60.9	60.7
170000	63.6	63.3	63.8	64.4	63.0	61.6	61.6	61.4	61.1	60.7	60.8	60.2	60.9	60.8
180000	63.4	63.2	63.7	64.5	62.9	61.5	61.4	61.1	60.9	60.5	60.6	60.1	60.7	60.6
190000	63.1	63.2	63.6	64.4	62.8	61.4	61.2	60.9	60.7	60.3	60.6	59.8	60.6	60.5
200000	62.9	63.1	63.4	64.2	62.6	61.2	61.0	60.7	60.6	60.2	60.4	59.8	60.5	60.3
210000	62.7	63.0	63.3	64.1	62.5	61.1	60.8	60.6	60.4	60.2	60.1	59.8	60.4	60.2
220000	62.6	63.0	63.4	64.0	62.5	61.0	60.7	60.5	60.3	60.1	60.0	59.8	60.4	60.1
230000	62.5	63.0	63.3	63.9	62.4	60.9	60.6	60.5	60.2	60.0	59.9	59.8	60.3	60.1
Daily Max	63.7	63.4	63.9	64.5	63.8	62.3	61.6	61.6	61.4	60.9	61.0	60.5	60.9	60.8
Daily Min	62.0	62.5	62.9	62.9	62.4	60.9	60.5	60.4	60.2	59.8	59.6	59.7	59.6	59.8
Average	62.7	62.9	63.3	63.6	63.2	61.7	60.9	60.8	60.7	60.2	60.1	59.9	60.2	60.2

Dead River (Hoist) Storage Basin
2013 Dissolved Oxygen and Temperature Profile Data

6/11/2013

Time: 16:15 EDT

Weather: Sunny, 73F, 5-10 mph wind

Secchi Disk - 6' 10"

Depth (meters)	DO mg/l	Temp °C	Temp °F
0.5	8.73	20.4	68.7
1.0	8.73	18.7	65.7
1.5	8.71	17.4	63.3
2.0	8.7	17.1	62.8
2.5	8.63	16.8	62.2
3.0	8.6	16.7	62.1
3.5	8.55	16.5	61.7
4.0	8.51	16.2	61.2
4.5	8.12	15	59.0
5.0	7.75	14.5	58.1
5.5	7.79	14.3	57.7
6.0	7.76	14.2	57.6
6.5	7.62	13.4	56.1
7.0	7.6	13.4	56.1
7.5	7.58	13.1	55.6
8.0	7.56	13.1	55.6
8.5	7.57	12.2	54.0
9.0	7.66	11.8	53.2
9.5	7.7	11.8	53.2
10.0	7.8	10.7	51.3
10.5	7.8	10.4	50.7
11.0	7.8	9.1	48.4
11.5	7.84	8.9	48.0
12.0	7.52	8.6	47.5
12.5	7.45	8	46.4
13.0	7.52	7.4	45.3

Comparison Readings - 2nd meter

0.5 m	8.83	19.9	102.3
13.0 m	7.21	65.3	8.8

6/25/2013

Time: 14:50 EST

Weather: Cloudy, 75°F, light winds

Secchi Disk - 7' 4"

Depth (m)	DO mg/l	Temp °C	Temp °F
0.5	8.83	22.7	72.9
1.0	8.81	21.7	71.1
1.5	7.91	20.0	68.0
2.0	7.67	19.2	66.6
2.5	7.63	18.9	66.0
3.0	7.57	18.4	65.1
3.5	7.02	17.7	63.9
4.0	6.97	17.2	63.0
4.5	6.45	16.4	61.5
5.0	6.31	16.1	61.0
5.5	6.12	15.5	59.9
6.0	5.93	15.2	59.4
6.5	5.92	15.1	59.2
7.0	5.93	15	59.0

Debris around intake prevented deeper readings

Comparison Readings - 2nd meter

0.5 m	8.07	23.1	73.6
7.0 m	5.28	15.7	60.3

7/9/2013

Time: 16:45 EDT

Weather: Overcast, breezy

Secchi Disk - 8'

Depth (m)	DO mg/l	Temp °C	Temp °F
0.5	7.96	23.6	74.5
1.0	7.84	23.8	74.8
1.5	7.83	23.8	74.8
2.0	7.79	23.8	74.8
2.5	7.77	23.9	75.0
3.0	7.76	23.9	75.0
3.5	7.73	23.8	74.8
4.0	6.28	21.7	71.1
4.5	4.88	20.1	68.2
5.0	4.76	19.6	67.3
5.5	4.49	19.1	66.4
6.0	4.43	18.3	64.9
6.5	4.42	18	64.4
7.0	4.44	17.9	64.2
7.5	4.43	17.5	63.5
8.0	4.04	16.9	62.4
8.5	3.75	16	60.8
9.0	3.71	15.8	60.4
9.5	3.58	15.3	59.5
10.0	3.54	14.9	58.8
10.5	3.52	14.8	58.6
11.0	3.53	14.8	58.6
11.5	3.53	14.8	58.6
12.0	3.53	14.8	58.6

Comparison Readings - 2nd meter

0.5 m	7.93	23.6	74.5
9.5 m	3.58	14.6	58.3

Dead River (Hoist) Storage Basin
2013 Dissolved Oxygen and Temperature Profile Data

7/23/2013

Time: 16:35 EDT

Weather: Sunny, 10-20 mph winds

Secchi Disk - 5' 10"

Depth (m)	DO mg/l	Temp °C	Temp °F
0.5	7.69	22.8	73.0
1.0	7.61	23.0	73.4
1.5	7.57	23.1	73.6
2.0	7.54	23.1	73.6
2.5	7.51	23.2	73.8
3.0	7.51	23.2	73.8
3.5	7.49	23.2	73.8
4.0	7.48	23.3	73.9
4.5	7.46	23.3	73.9
5.0	7.44	23.3	73.9
5.5	7.44	23.3	73.9
6.0	7.39	23.3	73.9
6.5	7.10	23.0	73.4
7.0	6.97	22.8	73.0
7.5	6.89	22.6	72.7
8.0	6.81	22.5	72.5
8.5	2.82	19.1	66.4
9.0	1.99	17.6	63.7
9.5	1.74	17.2	63.0
10.0	1.58	16.1	61.0
10.5	1.92	14.5	58.1
11.0	2.31	12.9	55.2

Comparison Readings - 2nd meter

0.5 m	7.68	22.9	73.2
11 m	2.27	13.2	55.8

8/6/2013

Time: 16:15

Weather: Cloudy, 5-10 mph winds

Secchi Disk - 7' 6"

Depth (m)	DO mg/l	Temp °C	Temp °F
0.5	7.87	20.2	68.4
1.0	7.88	20.1	68.2
1.5	7.88	20.1	68.2
2.0	7.87	20	68.0
2.5	7.85	20	68.0
3.0	7.82	20	68.0
3.5	7.82	20	68.0
4.0	7.81	19.9	67.8
4.5	7.8	19.9	67.8
5.0	7.78	19.9	67.8
5.5	7.76	19.9	67.8
6.0	7.75	19.9	67.8
6.5	7.76	19.9	67.8
7.0	7.75	19.9	67.8
7.5	7.69	19.8	67.6
8.0	4.04	18.2	64.8
8.5	4	18.1	64.6
9.0	3.61	17.6	63.7
9.5	2.87	17.3	63.1
10.0	1.03	16.2	61.2
10.5	0.63	14.9	58.8
11.0	0.69	13.9	57.0

Comparison Readings - 2nd meter

0.5 m	7.85	20.4	68.7
11 m	0.7	14.2	57.6

8/20/2013

Time: 13:00

Weather: Mostly sunny, 75F, 10-15 mph winds

Secchi Disk - 8' 7"

Depth (m)	DO mg/l	Temp °C	Temp °F
0.5	8.14	22.1	71.8
1.0	8.20	21.9	71.4
1.5	8.27	21.9	71.4
2.0	8.30	21.8	71.2
2.5	8.34	21.8	71.2
3.0	8.31	21.8	71.2
3.5	8.24	21.7	71.1
4.0	8.16	21.4	70.5
4.5	8.16	21.3	70.3
5.0	7.73	20.5	68.9
5.5	7.39	20.1	68.2
6.0	7.03	19.3	66.7
6.5	6.75	19.0	66.2
7.0	6.60	18.8	65.8
7.5	6.40	18.7	65.7
8.0	6.06	18.5	65.3
8.5	5.10	18.1	64.6
9.0	4.85	18.0	64.4
9.5	4.44	17.8	64.0
10.0	2.42	17.0	62.6
10.5	0.33	15.8	60.4

Comparison Readings - 2nd meter

0.5 m	8.19	22.3	72.1
10.5 m	0.34	15.9	60.6

Dead River (Hoist) Storage Basin
2013 Dissolved Oxygen and Temperature Profile Data

9/3/2013

Time: 17:15 EDT

Weather: Partly Cloudy, 66F

Secchi Disk - 7' 6"

Depth (m)	DO mg/l	Temp °C	Temp °F
0.5	8.22	21.9	71.4
1.0	8.22	22.0	71.6
1.5	8.2	22.0	71.6
2.0	8.18	22.0	71.6
2.5	8.17	22.0	71.6
3.0	8.11	21.9	71.4
3.5	8.09	21.9	71.4
4.0	8.05	21.9	71.4
4.5	8.06	21.8	71.2
5.0	8.02	21.8	71.2
5.5	8	21.8	71.2
6.0	7.97	21.8	71.2
6.5	7.92	21.7	71.1
7.0	7.93	21.7	71.1
7.5	7.93	21.7	71.1
8.0	7.63	21.5	70.7
8.5	7.12	21.2	70.2
9.0	6.87	20.9	69.6
9.5	3.57	18.8	65.8
10.0	3.35	18.4	65.1
10.5	3.22	18.3	64.9
11.0	3.25	18.3	64.9

Comparison Readings - 2nd meter

0.5 m	8.17	21.7	71.1
11 m	3.17	17.9	64.2

9/17/2013

Time: 13:40 EDT

Weather: Sunny, 60-65F, 5-10 mph wind

Secchi Disk - 6'

Depth (m)	DO mg/l	Temp °C	Temp °F
0.5	7.90	17.7	63.9
1.0	7.88	17.7	63.9
1.5	7.85	17.6	63.7
2.0	7.82	17.6	63.7
2.5	7.81	17.6	63.7
3.0	7.79	17.6	63.7
3.5	7.79	17.6	63.7
4.0	7.78	17.5	63.5
4.5	7.78	17.5	63.5
5.0	7.76	17.5	63.5
5.5	7.73	17.5	63.5
6.0	7.72	17.5	63.5
6.5	7.71	17.5	63.5
7.0	7.70	17.5	63.5
7.5	7.71	17.5	63.5
8.0	7.71	17.5	63.5
8.5	7.71	17.5	63.5
9.0	7.70	17.5	63.5
9.5	7.69	17.5	63.5
10.0	7.68	17.5	63.5
10.5	7.65	17.5	63.5

Comparison Readings - 2nd meter

0.5 m	7.85	17.9	64.2
9.5 m	7.59	17.7	63.9



Upper Peninsula Power Company

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November 21, 2013

FERC Project No. 10855

Mr. Gary Kohlhepp
Water Resources Division
Michigan Dept. of Environmental Quality
P. O. Box 30273
Lansing, MI 48909

Mr. Kyle Kruger
Michigan Dept. of Natural Resources
Mio Field Office
191 South Mt. Tom Rd
Mio, MI 48647

Dear Mr. Kohlhepp and Mr. Kruger:

Re: Dead River Hydroelectric Project – 2013 Water Quality Monitoring Report

Per the Order Modifying and Approving Water Quality Monitoring Plan Under Article 408, dated April 17, 2003, and the Order Approving Modification to Approved Water Quality Monitoring Plan Under Article 408, dated March 3, 2005, Upper Peninsula Power Company (UPPCO) is pleased to submit water quality monitoring data collected at the Dead River Hydroelectric Project in 2013 for your review and comment.

During the 2013 monitoring period, water quality monitoring was conducted at the following locations:

- In the Dead River where County Road AAO crosses the Dead River (SE ¼ of the NE ¼, Section 22, T49N, R28W, Township of Champion).
- Downstream of the Hoist Powerhouse in the natural river channel (SE ¼ of the NE ¼, Section 16, T48N, R26W, Township of Negaunee).
- Downstream of the McClure Dam in the Dead River, east of where the LS&I railroad crosses the Dead River (NW ¼ of the SW ¼, Section 13, T48N, R26W, Township of Negaunee).
- In the tailrace of the McClure Powerhouse, upstream of the confluence of the tailrace and the Forestville Basin (SW ¼ of the NE ¼, Section 7, T48N, R25W, Township of Marquette).

Per the water quality monitoring plan, water temperature was monitored at each of the above locations on an hourly basis from May 1st through October 31st, while dissolved oxygen (D.O.) was monitored from June 1st through September 30th. Monitoring data for each location can be found in Appendix A. In addition to the hourly monitoring, D.O. and temperature profiles were taken at

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 Mr. Kohlhepp and Mr. Kruger
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the intake structures of the Dead River Storage Basin and the McClure Storage Basin powerhouses every two weeks during the months of June through September. Profile data can be found in Appendix B. Equipment quality assurance data can be found in Appendix C.

Please note that the D.O. water quality monitoring equipment has an accuracy of +/- 0.1 mg/l, per the manufacturer. The water quality monitoring equipment was cleaned and calibrated every other week during the monitoring period. Equipment calibration information was used to determine calibration drift that occurred since the previous calibration event. In the event that the meter calibration had drifted by more than 0.1 mg/l between calibration events, the raw monitoring data is corrected assuming a linear degradation of calibration. Therefore, dissolved oxygen concentrations less than 6.9 mg/l are potential deviations from the water quality standard.

AAO Bridge Monitoring Location

At the County Road AAO monitoring location, no deviations from the D.O. or temperature water quality standards were observed during the monitoring season. 2013 was the first season of operational testing of Silver Lake. UPPCO was able to maintain reservoir elevation above start of month target elevations throughout the monitoring season. Minimum flow was being released from Silver Lake between June 15 and August 12th, with higher release flows for the remainder of the monitoring season. Additional flow from Silver Lake was not required to maintain reservoir elevation in the Dead River Storage Basin. In 2012, intermittent D.O. deviations were observed between July 1st and September 6th. In 2013, no deviations were observed. In general, water levels were higher in Silver Lake, while in stream temperatures were lower in 2013 compared to 2012. This likely contributed to attaining the D.O. and temperature water quality standards at this location. For your reference, the following table contains the observed monthly average water temperature at this location during the monitoring season for calendar years 2012 and 2013.

Table 1 – Monthly Average Water Temps @ C.R. AAO monitoring location

	2012	2013
May	57.7 °F	41.2 °F
June	65.2 °F	60.1 °F
July	71.1 °F	65.2 °F
August	66.6 °F	63.9 °F
September	57.1 °F	61.1 °F
October	46.2 °F	49.1 °F

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Hoist Powerhouse Monitoring Location

At the Hoist powerhouse monitoring location, deviations from the D.O. water quality standard were observed in July, August, and September, while temperature deviations were observed in August and September. Dissolved oxygen levels as low as 5.6 mg/l were recorded during the month of July. The low D.O. readings observed were likely due to low DO levels in the hypolimnion of the Dead River Storage Basin. Dissolved oxygen and temperature profiles conducted at the powerhouse intake (Appendix C) showed that the reservoir was stratified in July, with D.O. levels below 4 mg/l at the bottom of the reservoir where water is withdrawn and subsequently released through the powerhouse.

In August, there was an unusual drop in DO levels from August 23rd through August 30th when D.O. levels abruptly increased to concentrations above the water quality standard. The Hoist powerhouse was off-line for maintenance work on the powerhouse intake valve between August 15th and September 6th. While the powerhouse was off-line, water was being released through a bypass valve located approximately 3 to 4 meters below the surface of the reservoir that withdraws water from the epilimnion of the reservoir. Profiles conducted at the powerhouse intake in late August and early September showed D.O. levels in the epilimnion were above the downstream water quality standard. Water quality monitoring conducted in 2007 determined that D.O. levels increase with distance from the powerhouse due to aeration in the Dead River, however; water temperature also increases with distance from the powerhouse due to atmospheric conditions. As D.O. levels in the epilimnion where water was being withdrawn were above the water quality standard and knowing that D.O. levels increase with distance from the powerhouse, the likely cause of the low D.O. readings is likely due to an equipment malfunction.

Between September 6th and September 17th, low D.O. readings were recorded at the monitoring location. Dissolved oxygen readings during this time period were very erratic, varying from 0 mg/l to greater than 7 mg/l over the span of an hour. The erratic readings are due to malfunction of the D.O. sensor. At the time of the malfunction started, dissolved oxygen levels were above the water quality standard of 7 mg/l. Please note that between September 3rd and September 17th, the reservoir went through the fall turnover and was no longer stratified. A D.O. and temperature profile conducted on September 17th shows that D.O. levels were above the water quality standard at all depths. Therefore it is likely that D.O. levels were above the water quality standard during the period of the equipment malfunction.

Deviations from the License monthly maximum average temperature of 68°F in August and 63°F in September occurred during the monitoring season. The average monthly water temperatures at this location were 68.7°F and 64.4°F, respectively. A significant contributing factor to the high

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average water temperature during these months was that the Hoist powerhouse was off-line from August 15th through September 6th for maintenance work on the powerhouse intake valve. For this twenty three day period, warmer water from the epilimnion was being released rather than colder water from the hypolimnion. Dissolved oxygen and temperature profiles conducted at the powerhouse intake show water temperatures in the epilimnion were over 70°F when the bypass valve was being used. As a result, deviations from the monthly temperature standard occurred.

As stated above, additional flow from Silver Lake was not required to maintain reservoir elevation in the Dead River Storage Basin, yet the facility was able to release more than minimum flow (100 cfs) for much of the summer. Compared to previous monitoring seasons, fewer D.O. deviations were observed. Aside from the low readings observed in August and September that were likely due to equipment issues, D.O. deviations were only observed in July. In general, water temperatures were lower in 2013 than in 2012, which likely contributed to the reduced occurrence of deviations from D.O. and temperature water quality standards at this location. For your reference, the following table contains the observed monthly average water temperature at this location during the monitoring season for calendar years 2012 and 2013:

Table 2 – Monthly Average Water Temps @ the Hoist Powerhouse monitoring location

	2012	2013
May	55.5 °F	41.8 °F
June	65.1 °F	58.0 °F
July	71.9 °F	66.7 °F
August	70.2 °F	68.7 °F
September	62.9 °F	64.4 °F
October	49.4 °F	54.1 °F

Downstream of the McClure Dam

Downstream of the McClure Dam at the LS&I Railroad Bridge monitoring location, there were no deviations from the dissolved oxygen or temperature standards during the monitoring season. Dissolved oxygen levels were above 8.0 mg/l all season. D.O. levels at this location are significantly higher than at the Hoist powerhouse monitoring location, while water temperature is generally lower than the temperature below the Hoist powerhouse. This is expected due to two factors. First, there is significantly more aeration of water in this stretch of river due to the elevation change from the McClure Dam to the monitoring location compared to the elevation change between the Hoist powerhouse and the downstream monitoring location. Second, the McClure Basin is generally cooler than the Dead River Storage Basin. Temperature profiles of the reservoir generally show cooler water in the McClure storage basin compared to the Dead River Storage Basin. Releasing water through a deep-water draw (located approximately 18' below the spillway crest) at the

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McClure Dam, along with groundwater seepage and springs feeding into this section of river, results in lower water temperatures downstream of the McClure Dam compared to downstream of the Hoist Powerhouse. For your reference, the following table contains the observed monthly average water temperature at this location during the monitoring season for calendar years 2012 and 2013:

Table 3: Monthly Average Water Temps Downstream of the McClure Dam

	2012	2013
May	51.6 °F	43.1 °F
June	60.4 °F	60.2 °F
July	65.7 °F	62.8 °F
August	65.4 °F	63.8 °F
September	59.2 °F	62.0 °F
October	48.8 °F	52.6 °F

Downstream of the McClure Powerhouse

Downstream of the McClure Powerhouse, there were no deviations from the dissolved oxygen or temperature standards during the monitoring season. Dissolved oxygen levels were above the water quality standard of 5.0 mg/l all season. The water temperature observed at this location was slightly lower than the temperature observed at the Hoist Powerhouse monitoring location, which is consistent with the temperature profile data. DO levels were slightly higher at this monitoring location compared to the monitoring location downstream of the Hoist Powerhouse. A comparison of D.O. and temperature data collected from the Hoist and McClure developments is included in Appendix A. For your reference, the following table contains the observed monthly average water temperature at this location during the monitoring season for calendar years 2012 and 2013:

Table 4: Monthly Average Water Temps Downstream of the McClure Powerhouse

	2012	2013
May	56.0 °F	43.4 °F
June	65.0 °F	57.8 °F
July	72.5 °F	66.7 °F
August	69.9 °F	66.9 °F
September	61.3 °F	62.7 °F
October	49.5 °F	52.5 °F

Monitoring Equipment

During the 2013 monitoring season, UPPCO experienced multiple equipment issues that lead to missing or inaccurate monitoring data. As previously communicated, UPPCO is evaluating alternate

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equipment manufacturers to determine if switching equipment would result in improved data reliability. UPPCO has been using Hydrolab™ water quality monitors, manufactured by Hach Environmental for several years. At the Hoist powerhouse monitoring location, equipment issues during the 2013 monitoring season resulted in 27% of D.O. data and 6.2% of temperature monitoring data to be invalid or missing. At the monitoring location downstream of the McClure Dam, equipment failures resulted in missing data for 10.6% of the temperature monitoring period and 15.9% of the D.O. monitoring period.

UPPCO has contacted Hach regarding the equipment malfunctions observed. Hach indicated they were aware of an issue with failures of the dissolved oxygen sensor due to a bad solder connection within the sensor. However, they have not provided UPPCO a procedure for repairing the equipment or a method to try and troubleshoot the equipment prior to use. With regards to the problem of the equipment suddenly failing to log data, they have not been able to provide a cause analysis of the equipment failures that resulted in the monitors to stop logging data. Given the number of equipment failures observed this year and a lack of resolution to prevent reoccurrence of the problems from the manufacturer, UPPCO will be moving forward with changing monitoring equipment to a new vendor for the 2014 monitoring season in an effort to improve data reliability.

UPPCO has identified three other manufacturers that make portable, multi-parameter monitoring equipment that could be used for water quality monitoring: Eureka Manta™ multi-parameter sondes by Eureka Environmental, Troll™ multi-parameter sondes by In-Situ, Inc., and EXO™ sondes by YSI, Incorporated. The Eureka Manta™ and Troll™ monitors are similar in nature to the Hydrolab monitors in that the individual sensors are made of molded plastic that are connected to a circuit board for data processing and storage inside the body of the monitor. The EXO™ sondes are considerably different from the other vendors as the individual sensor housings are made of titanium and the sensors have internal memory and processing capabilities, rather than a connection from the sensor to a separate circuit board. While all three vendors manufacture equipment that is appropriate for water quality monitoring, the method of manufacturing of the EXO™ sondes and sensors is more robust (titanium versus plastic, integrated memory and processing capabilities versus connections to a separate circuit board). UPPCO reached out to a YSI equipment user to inquire about their experience using YSI equipment. They reported not having experienced a failure of the dissolved oxygen sensor or a sudden shutdown of a sonde during a deployment period over the past 10 years with YSI equipment. While it cannot be guaranteed that YSI equipment will not malfunction, the manufacturing design and experience of another user suggests that the YSI monitors are more durable, which could result in improved data reliability. Consequently, UPPCO is planning to use YSI monitoring equipment for the 2014 monitoring season.

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Enclosed for your review is the D.O. and temperature monitoring data from the four monitoring locations, profile monitoring data from the Hoist and McClure developments, and all quality assurance documentation. Please review the enclosed information and provide any comments you may have as soon as possible, but within 30 days of this letter. Should you have any questions or concerns, please do not hesitate to call me at (920) 433-1833.

Sincerely,

A handwritten signature in black ink that reads "Mark Metcalf". The signature is written in a cursive, flowing style.

Mark W. Metcalf
Environmental Consultant - Air & Water
Integrays Business Support, LLC
Telephone: (920) 433-1833

Attach: 2013 Water Quality Monitoring Data

cc: Mr. Burr Fisher - USFWS
Ms. Dianna Klemans - MDEQ
Ms. Koran Carpenter - MDEQ
Mr. Robert Meyers - UPPCO
Mr. Virgil Schlorke - UPPCO
Mr. Shawn Puzen - IBS

Response to Comments from the U.S. Fish and Wildlife Service on the 2013 Dead River Water Quality Monitoring Report:

The U.S. Fish and Wildlife Service did not provide comments on the 2013 water quality monitoring report.

Response to Comments from the Michigan Department of Natural Resources on the 2013 Dead River
Water Quality Monitoring Report:

The Michigan Department of Natural Resources did not provide comments on the 2013 water quality monitoring report.

Response to Comments from the Michigan Department of Environmental Quality on the 2013 Dead
River Water Quality Monitoring Report:

The Michigan Department of Environmental Quality did not provide comments on the 2013 water quality monitoring report.

Document Content(s)

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