



**Upper Peninsula Power Company**  
1002 Harbor Hills Drive  
Marquette, MI 49855  
[www.UPPCO.com](http://www.UPPCO.com)

August 13, 2015

FERC Project No. 2506  
NATDAM No. 00167

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

Dear Secretary Bose:

Escanaba River Hydroelectric Project – Boney Falls Development  
Notice of Potential Deviation – Escanaba River Hydroelectric Project Water Quality Monitoring

Per the Order Modifying and Approving the Water Quality Monitoring Plan under Article 415, dated March 9, 2005, Upper Peninsula Power Company (UPPCO) is conducting water quality monitoring at the following locations within the Escanaba River Hydroelectric Project:

- In the tailrace of Escanaba Boney Falls (Dam #4), approximately 600 feet downstream of the powerhouse
  - The dissolved oxygen standard for Boney Falls (Dam #4) is: 7.0 mg/L
  - The water quality monitoring equipment has a manufacturer-rated accuracy of  $\pm 0.1$  mg/L. Given this information, readings below 6.9 mg/L at Boney Falls (Dam #4) are potential deviations from the D.O. standard
- Additionally, UPPCO attempts to operate Boney Falls (Dam #4) at temperatures specified by the Michigan Coldwater Stream Standard.
  - The standard for the months of July and August is: 68°F

Monitoring is completed in accordance with the Water Quality Monitoring Plan. Dissolved Oxygen (D.O.) data is collected continuously throughout the annual monitoring period at Boney Falls (Dam #4). Additionally, equipment is cleaned, calibrated and data downloaded weekly during the month of July, and bi-weekly during the month of August.

After collection, a post calibration of the monitoring equipment is conducted to determine calibration drift. Raw dissolved oxygen (D.O.) data is adjusted assuming a linear degradation of the calibration based upon the post calibration of the equipment.

During the monitoring period of July 27 at 14:00 EST through August 3 at 12:00 EST (when equipment maintenance occurred), dissolved oxygen readings below 7.0 mg/l were observed July 27 thru July 30 and again on August 3. After verifying and correcting (as necessary) the monitoring data for calibration drift, the lowest D.O. concentration observed was 5.8 mg/l on August 1 and August 2. The likely cause of the low D.O. levels observed is warm water temperatures. Daily average water temperatures during this time period ranged from 72 °F to 76 °F, with daily maximum temperatures reaching a high from the monitoring period of 77°F on July 30.

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August 13, 2015  
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During the monitoring period, flow augmentation was initiated daily between on July 27 and August 3. Flow augmentation<sup>1</sup> is initiated in an attempt to mitigate warm water temperatures in the Escanaba River downstream of the powerhouse.

Dissolved oxygen corrective action occurred as required by the approved plan<sup>2</sup> daily between July 27 and July 30 and again on August 3.

UPPCO provided notice of the low D.O. readings to the Michigan Department of Natural Resources (MDNR), Michigan Department of Environmental Quality (MDEQ), and the U.S. Fish and Wildlife Service (FWS) via e-mail on July 28. Documentation of agency consultation is attached.

If you have any questions regarding this letter, please contact Bob Meyers at (906) 485-2419 or Jarrod Nelson at (906) 232-1433.

Sincerely,



Virgil Schlorke  
Director - Energy Supply & Resource Planning

JN/rjv

Enc: 20150728 Agency Notification

cc: Mr. James Melchiori, UPPCO - UVD      Mr. David Tripp, UPPCO - UISC  
Mr. Robert Meyers, UPPCO - UISC      Mr. John Zygaj, FERC - CRO  
Mr. Keith Moyle, UPPCO - UISC      Mr. John Myers, IBS - D2  
Mr. Jarrod Nelson, UPPCO - UISC

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<sup>1</sup> As part of the procedure, when augmentation is initiated, flow from the powerhouse is increased to 150 percent of the base flow between 11:00 EST and 18:00 EST; the flow is then reduced to 75 percent of the base flow to allow the reservoir to refill.

<sup>2</sup> The approved plan requires corrective action when real time monitoring indicates dissolved oxygen levels were less than 7.0 mg/l downstream of the powerhouse. Flow augmentation is a corrective action and when the facility is not augmenting flow, corrective action is initiated by releasing aeration flow through a spillway gate.

All,

Per the Order dated March 9, 2005, approving modifications to the Dissolved Oxygen Monitoring Plan as required by Article 415 in the License issued July 13, 1995 and amended November 4, 2013, UPPCO is conducting annual monitoring of dissolved oxygen (D.O.) downstream of its Boney Falls (Dam #4) development. Data is collected continuously throughout the annual monitoring period. Additionally, equipment is cleaned, calibrated and data downloaded weekly in the month of July and bi-weekly in the month of August. Manufacturer specifications indicate that the accuracy of the D.O. monitoring equipment is  $\pm 0.1$  mg/L, therefore, readings below 6.9 mg/L are potential deviations. Raw data is adjusted assuming a linear degradation of calibration based upon post-calibration of equipment.

UPPCO is required to meet the water quality standard of 7.0 mg/L for D.O. below the Boney Falls (Dam #4) development. UPPCO attempts to meet the D.O. standard by releasing water out of spillway gates in the event that D.O. readings are below 7.0 mg/L.

UPPCO also makes attempts to meet the cold water stream requirements for Michigan below the Boney Falls (Dam #4) development in an effort to maintain trout fishery integrity. UPPCO augments flow from the powerhouse during times of high temperatures, as a method for reducing temperatures. The augmentation consists of increasing flows to 150% of base flow between 11:00 EST and 18:00 EST, then reducing flows to 75% of base flows in order to allow the reservoir to refill. Suggested cold water temperatures for July and August are 68°F.

Dissolved oxygen corrective action occurred at UPPCO's Escanaba (Dam #4) development from July 27 to July 30 and again on August 3. Corrective actions for D.O. were stopped during times of temperature augmentation occurring during the same window. Both low D.O. (readings below 7.0 mg/L) and temperature above 68°F were observed at this time. Corrective actions for both low D.O. and low temperatures were also taken during the timeframe above, including opening spillway gates (for D.O.) and augmentation flows through the powerhouse (for temperature).

Attached for your review is the data for the months of July and August as well as a graphical summary of the data. Please feel free to contact me if you have any questions at (906)232-1433.

Thank you,  
-Jarrod Nelson

**Jarrod Nelson**

**Environmental Consultant | Upper Peninsula Power Company**

**Cell:** (989)600-5665

**Direct:** (906)232-1433

**Email:** jfnelson@uppc.com

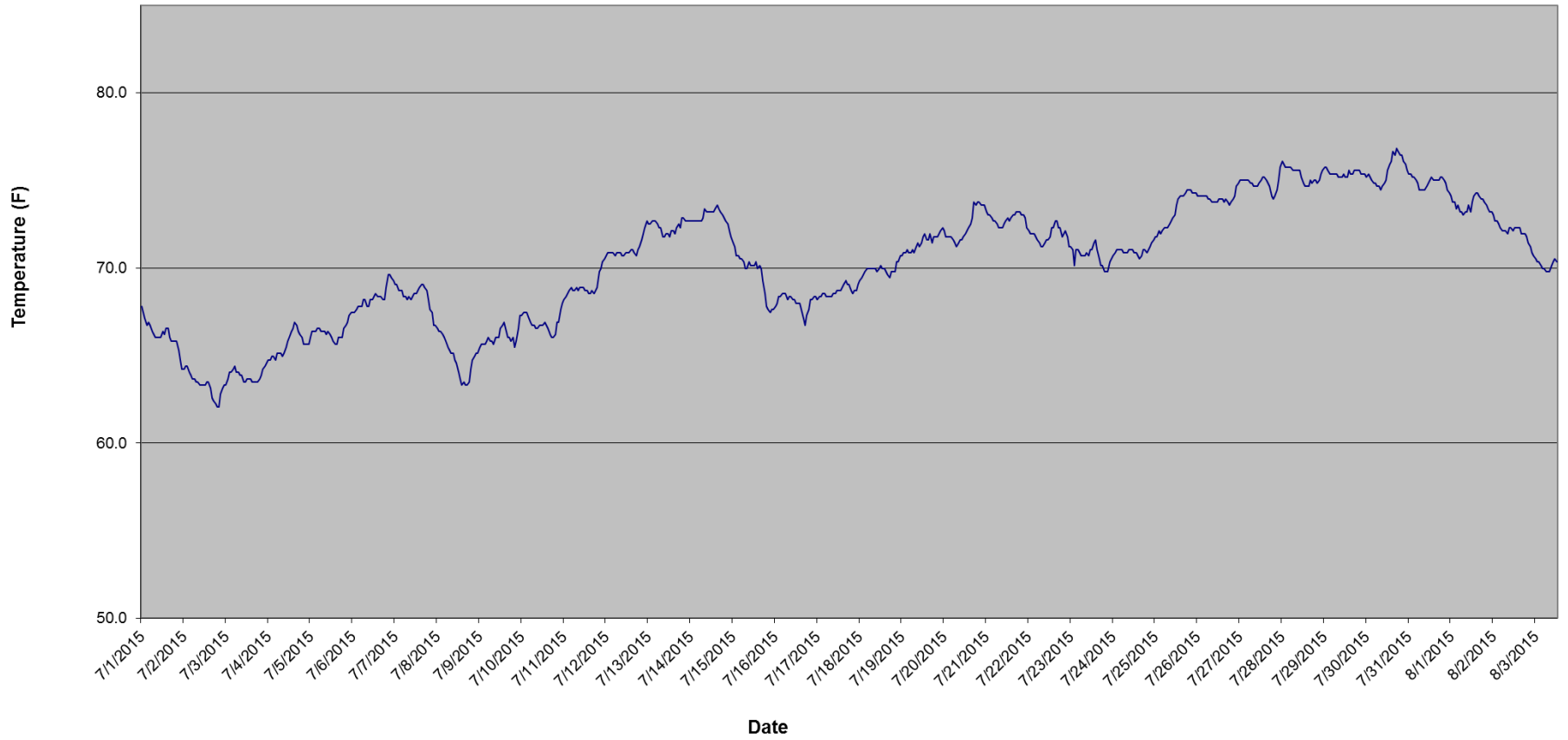
**LivingZero**

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### Escanaba Dam 4 Water Temperature - 2015 Monitoring Period

— Water Temperature



Time HHMMSS	07/01/15	07/02/15	07/03/15	07/04/15	07/05/15	07/06/15	07/07/15	07/08/15	07/09/15	07/10/15	07/11/15	07/12/15	07/13/15	07/14/15	07/15/15	07/16/15	07/17/15
0	68	64	63	65	66	67	69	67	65	67	68	71	73	73	71	68	68
10000	67	64	64	65	66	67	69	66	66	67	68	71	73	73	71	68	68
20000	67	64	64	65	66	68	69	66	66	67	69	71	73	73	71	68	68
30000	67	64	64	65	66	68	69	66	66	67	69	71	73	73	71	68	69
40000	67	64	64	65	67	68	69	66	66	67	69	71	73	73	71	69	69
50000	67	64	64	65	67	68	68	66	66	67	69	71	73	73	71	69	68
60000	66	64	64	65	66	68	68	65	66	67	69	71	72	73	70	69	68
70000	66	64	64	65	66	68	68	65	66	67	69	71	72	73	70	68	68
80000	66	64	64	65	66	68	68	65	66	67	69	71	72	73	70	68	68
90000	66	63	64	65	66	68	68	65	66	67	69	71	72	73	70	68	69
100000	66	63	64	65	66	68	68	65	66	67	69	71	72	73	70	68	69
110000	66	63	64	66	66	68	69	65	66	67	69	71	72	73	70	68	69
120000	66	63	64	66	66	68	69	64	67	67	69	71	72	73	70	68	69
130000	66	64	64	66	66	69	69	64	67	67	69	71	72	73	70	68	69
140000	67	64	64	67	66	68	69	63	67	67	69	71	72	73	70	68	69
150000	67	63	64	67	66	68	69	64	67	67	69	71	72	74	70	68	69
160000	66	63	64	67	66	68	69	63	66	66	69	71	72	73	70	67	69
170000	66	62	64	66	66	68	69	63	66	66	69	71	73	73	69	67	69
180000	66	62	64	66	66	68	69	64	66	66	69	71	72	73	69	67	69
190000	66	62	64	66	67	69	68	64	66	66	69	71	73	73	68	68	69
200000	66	62	64	66	67	70	68	65	65	67	70	72	73	73	68	68	69
210000	65	63	64	66	67	70	67	65	66	67	70	72	73	73	67	68	69
220000	65	63	64	66	67	69	67	65	67	68	70	72	73	72	68	68	69
230000	64	63	65	66	67	69	67	65	67	68	71	73	73	72	68	68	69
Daily Max	68	64	65	67	67	70	69	67	67	68	71	73	73	74	71	69	69
Daily Min	64	62	63	65	66	67	67	63	65	66	68	71	72	72	67	67	68
Average	66	63	64	66	66	68	68	65	66	67	69	71	72	73	70	68	69

Augmentation Event  
 DO corrective action occurring. Water being released through spillway gate.

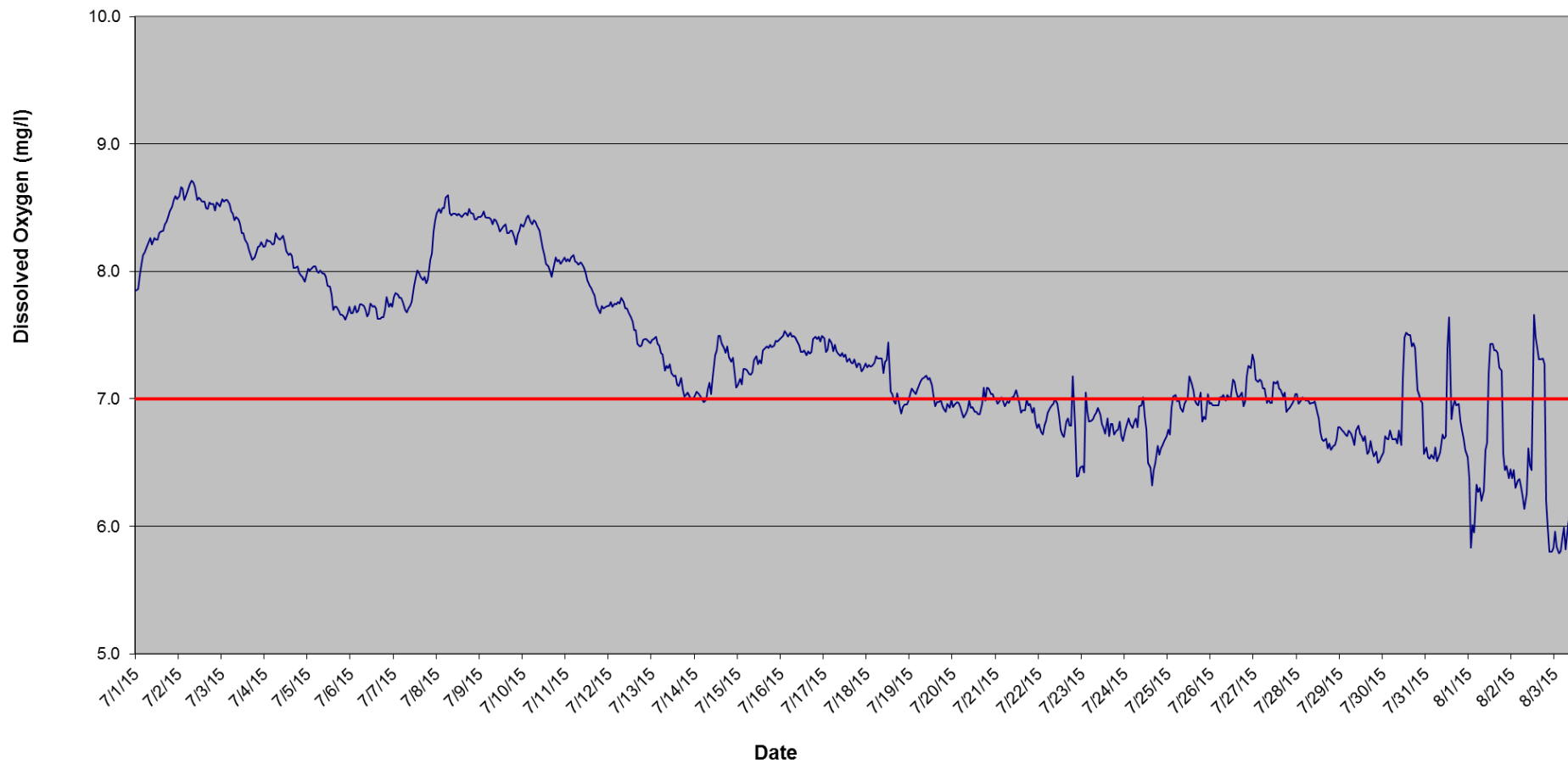
Time HHMMSS	07/18/15	07/19/15	07/20/15	07/21/15	07/22/15	07/23/15	07/24/15	07/25/15	07/26/15	07/27/15	07/28/15	07/29/15	07/30/15	07/31/15	8/1/2015	8/2/2015	8/3/2015
0	69	71	72	73	72	71	71	72	74	75	76	76	75	75	74	73	71
10000	69	71	72	73	72	71	71	72	74	75	76	76	75	75	74	73	70
20000	70	71	72	73	72	70	71	72	74	75	76	76	75	75	74	73	70
30000	70	71	72	73	72	71	71	72	74	75	76	75	75	75	73	73	70
40000	70	71	72	73	72	71	71	72	74	75	76	75	75	75	74	72	70
50000	70	71	72	73	72	71	71	72	74	75	76	75	75	75	73	72	70
60000	70	71	71	73	71	71	71	72	74	75	76	75	75	74	73	72	70
70000	70	71	71	72	71	71	71	72	74	75	76	75	75	74	73	72	70
80000	70	71	71	72	71	71	71	73	74	75	76	75	74	74	73	72	70
90000	70	71	72	72	71	71	71	73	74	75	76	75	75	74	73	72	70
100000	70	71	72	73	72	71	71	73	74	75	76	75	75	75	74	72	70
110000	70	71	72	73	72	71	71	73	74	75	75	75	75	75	73	72	71
120000	70	72	72	73	72	71	71	74	74	75	75	75	76	75	74	72	70
130000	70	72	72	73	72	71	71	74	74	75	75	75	76	75	74	72	
140000	70	72	72	73	72	72	71	74	74	75	75	76	76	75	74	72	
150000	70	72	73	73	73	71	71	74	74	75	75	75	77	75	74	72	
160000	70	72	73	73	73	71	71	74	74	75	75	75	76	75	74	72	
170000	69	71	74	73	72	70	71	74	74	75	75	76	77	75	74	72	
180000	70	72	74	73	72	70	71	74	74	74	75	76	77	75	74	72	
190000	70	72	74	73	72	70	71	74	74	74	75	76	76	75	74	72	
200000	70	72	74	73	72	70	71	74	74	74	75	76	76	75	74	71	
210000	70	72	74	73	72	70	71	74	74	74	75	75	76	75	73	71	
220000	70	72	74	73	72	70	71	74	75	75	75	75	76	74	73	71	
230000	71	72	74	72	71	71	72	74	75	76	76	75	76	74	73	71	

Daily Max	71	72	74	73	73	72	72	74	75	76	76	76	77	75	74	73	NA
Daily Min	69	71	71	72	71	70	71	72	74	74	75	75	74	74	73	71	NA
Average	70	71	72	73	72	71	71	73	74	75	75	75	76	75	74	72	NA

Augmentation Event  
 DO corrective action occurring. Water being released through spillway gate.

### Escanaba Dam 4 Dissolved Oxygen Summary - 2015 Monitoring Period

— Water D.O.      — Water Quality Standard



Time HHMMSS	07/01/15	07/02/15	07/03/15	07/04/15	07/05/15	07/06/15	07/07/15	07/08/15	07/09/15	07/10/15	07/11/15	07/12/15	07/13/15	07/14/15	07/15/15	07/16/15	07/17/15
0	7.9	8.6	8.6	8.2	8.0	7.7	7.8	8.5	8.4	8.4	8.1	7.7	7.5	7.0	7.1	7.5	7.5
10000	7.9	8.7	8.6	8.3	8.0	7.7	7.8	8.5	8.4	8.4	8.1	7.8	7.5	7.1	7.2	7.5	7.4
20000	8.0	8.7	8.6	8.2	8.0	7.7	7.8	8.5	8.5	8.4	8.1	7.7	7.5	7.0	7.1	7.5	7.4
30000	8.1	8.6	8.6	8.2	8.0	7.7	7.8	8.5	8.4	8.4	8.1	7.8	7.4	7.0	7.2	7.5	7.5
40000	8.1	8.6	8.5	8.2	8.0	7.7	7.8	8.5	8.4	8.4	8.1	7.7	7.4	7.0	7.2	7.5	7.4
50000	8.2	8.7	8.5	8.2	8.0	7.7	7.8	8.6	8.4	8.4	8.1	7.8	7.4	7.0	7.2	7.5	7.4
60000	8.2	8.7	8.5	8.3	8.0	7.7	7.7	8.6	8.4	8.4	8.1	7.8	7.4	7.0	7.2	7.5	7.4
70000	8.2	8.7	8.4	8.3	8.0	7.7	7.7	8.5	8.4	8.4	8.1	7.8	7.2	7.1	7.2	7.5	7.4
80000	8.3	8.7	8.4	8.3	8.0	7.7	7.7	8.4	8.4	8.4	8.1	7.8	7.3	7.1	7.2	7.5	7.4
90000	8.2	8.7	8.4	8.3	8.0	7.7	7.7	8.5	8.4	8.3	8.1	7.7	7.2	7.0	7.3	7.5	7.3
100000	8.3	8.6	8.4	8.3	8.0	7.7	7.8	8.5	8.4	8.3	8.0	7.7	7.3	7.2	7.3	7.4	7.4
110000	8.3	8.6	8.3	8.2	7.9	7.8	7.9	8.4	8.3	8.2	8.0	7.7	7.2	7.3	7.3	7.4	7.3
120000	8.3	8.6	8.3	8.2	7.9	7.7	8.0	8.5	8.3	8.1	7.9	7.6	7.2	7.4	7.3	7.4	7.4
130000	8.3	8.6	8.3	8.1	7.8	7.7	8.0	8.4	8.4	8.1	7.9	7.6	7.2	7.5	7.3	7.4	7.3
140000	8.3	8.6	8.2	8.1	7.7	7.7	8.0	8.4	8.4	8.0	7.9	7.5	7.1	7.5	7.4	7.3	7.3
150000	8.3	8.5	8.2	8.1	7.7	7.6	8.0	8.5	8.3	8.0	7.8	7.5	7.1	7.4	7.4	7.4	7.3
160000	8.4	8.5	8.1	8.0	7.7	7.6	7.9	8.5	8.3	8.0	7.8	7.4	7.2	7.4	7.4	7.4	7.3
170000	8.4	8.5	8.1	8.0	7.7	7.6	8.0	8.4	8.3	8.0	7.7	7.4	7.1	7.4	7.4	7.4	7.3
180000	8.4	8.5	8.1	8.0	7.7	7.6	7.9	8.5	8.3	8.1	7.7	7.4	7.0	7.4	7.4	7.5	7.2
190000	8.5	8.5	8.2	8.0	7.7	7.7	7.9	8.5	8.3	8.1	7.7	7.5	7.0	7.3	7.4	7.5	7.3
200000	8.5	8.5	8.2	8.0	7.7	7.8	8.1	8.5	8.2	8.1	7.7	7.5	7.1	7.3	7.4	7.5	7.3
210000	8.6	8.5	8.2	8.0	7.6	7.7	8.1	8.4	8.3	8.1	7.7	7.5	7.0	7.3	7.5	7.5	7.2
220000	8.6	8.5	8.2	7.9	7.7	7.8	8.3	8.4	8.3	8.1	7.7	7.5	7.0	7.2	7.4	7.5	7.2
230000	8.6	8.5	8.2	8.0	7.7	7.7	8.4	8.4	8.4	8.1	7.7	7.4	7.0	7.1	7.5	7.5	7.3
Daily Max	8.6	8.7	8.6	8.3	8.0	7.8	8.4	8.6	8.5	8.4	8.1	7.8	7.5	7.5	7.5	7.5	7.5
Daily Min	7.9	8.5	8.1	7.9	7.6	7.6	7.7	8.4	8.2	8.0	7.7	7.4	7.0	7.0	7.1	7.3	7.2
Average	8.3	8.6	8.3	8.1	7.9	7.7	7.9	8.5	8.4	8.2	7.9	7.6	7.2	7.2	7.3	7.4	7.3

License Minimum Dissolved Oxygen: 7.0 mg/l

- Augmentation Event
- DO corrective action occurring. Water being released through spillway gate.
- Monitoring after DO corrective action period.



Time HHMMSS	07/18/15	07/19/15	07/20/15	07/21/15	07/22/15	07/23/15	07/24/15	07/25/15	07/26/15	07/27/15	07/28/15	07/29/15	07/30/15	07/31/15	08/01/15	08/02/15	08/03/15
0	7.2	7.0	6.9	7.0	6.8	6.5	6.8	6.8	7.0	7.3	7.0	6.8	6.6	6.6	6.4	6.4	6.0
10000	7.3	7.1	7.0	7.0	6.7	6.4	6.8	6.7	7.0	7.2	7.0	6.8	6.7	6.5	5.8	6.4	5.8
20000	7.3	7.1	7.0	7.0	6.7	7.1	6.9	6.9	7.0	7.1	7.0	6.7	6.7	6.5	6.0	6.3	5.8
30000	7.3	7.0	7.0	7.0	6.8	6.9	6.8	7.0	7.0	7.2	7.0	6.7	6.7	6.6	6.0	6.4	5.8
40000	7.3	7.1	6.9	7.0	6.8	6.8	6.8	7.0	7.0	7.1	7.0	6.7	6.8	6.5	6.3	6.4	5.9
50000	7.3	7.1	6.9	6.9	6.9	6.8	6.8	7.0	7.0	7.1	7.0	6.8	6.7	6.6	6.3	6.3	6.0
60000	7.3	7.1	6.9	7.0	6.9	6.8	6.9	7.0	7.0	7.1	7.0	6.7	6.7	6.5	6.3	6.2	5.8
70000	7.3	7.2	6.9	7.0	7.0	6.9	6.8	6.9	7.0	7.0	7.0	6.7	6.7	6.5	6.2	6.1	6.0
80000	7.3	7.2	6.9	7.0	7.0	6.9	6.9	6.9	7.0	7.0	7.0	6.6	6.7	6.6	6.3	6.3	6.1
90000	7.2	7.2	7.0	7.0	7.0	6.9	7.0	7.0	7.0	7.0	7.0	6.8	6.8	6.7	6.6	6.6	6.6
100000	7.3	7.2	6.9	7.0	7.0	6.9	7.0	7.0	7.0	7.0	7.0	6.8	6.6	6.7	6.7	6.5	7.0
110000	7.3	7.2	6.9	7.1	6.9	6.8	6.9	7.0	7.0	7.1	6.9	6.7	7.2	6.7	7.2	6.4	7.0
120000	7.4	7.1	6.9	7.0	6.8	6.8	6.8	7.2	7.2	7.1	6.9	6.7	7.5	7.4	7.4	7.7	6.9
130000	7.1	7.0	6.9	7.0	6.7	6.7	6.5	7.1	7.1	7.1	6.7	6.7	7.5	7.6	7.4	7.5	0.0
140000	7.0	6.9	6.9	6.9	6.7	6.9	6.5	7.1	7.1	7.1	6.7	6.7	7.5	6.8	7.4	7.4	0.0
150000	7.0	7.0	6.9	6.9	6.8	6.7	6.3	7.0	7.0	7.1	6.7	6.6	7.5	6.9	7.4	7.3	0.0
160000	7.0	7.0	7.0	6.9	6.9	6.8	6.4	7.0	7.0	7.0	6.7	6.6	7.4	7.0	7.4	7.3	0.0
170000	7.0	7.0	7.1	7.0	6.8	6.8	6.5	7.0	7.1	7.1	6.6	6.7	7.4	7.0	7.3	7.3	0.0
180000	6.9	6.9	7.0	7.0	6.8	6.7	6.6	7.1	6.9	6.9	6.7	6.6	7.4	7.0	7.2	7.3	0.0
190000	6.9	6.9	7.1	7.0	7.2	6.8	6.6	6.8	7.0	6.9	6.6	6.6	7.1	6.8	6.6	6.2	0.0
200000	6.9	6.9	7.1	6.9	6.8	6.8	6.6	6.9	7.2	6.9	6.6	6.6	7.0	6.8	6.4	6.0	0.0
210000	7.0	7.0	7.0	6.9	6.4	6.8	6.6	6.8	7.3	7.0	6.6	6.5	7.0	6.7	6.5	5.8	0.0
220000	7.0	6.9	7.0	6.8	6.4	6.7	6.7	7.0	7.2	7.0	6.7	6.5	7.0	6.6	6.4	5.8	0.0
230000	7.0	7.0	7.0	6.8	6.5	6.7	6.7	7.0	7.4	7.0	6.8	6.5	6.6	6.5	6.5	5.8	0.0
Daily Max	7.4	7.2	7.1	7.1	7.2	7.1	7.0	7.2	7.4	7.3	7.0	6.8	7.5	7.6	7.4	7.7	NA
Daily Min	6.9	6.9	6.9	6.8	6.4	6.4	6.3	6.7	6.9	6.9	6.6	6.5	6.6	6.5	5.8	5.8	NA
Average	7.1	7.0	7.0	7.0	6.8	6.8	6.7	7.0	7.1	7.1	6.8	6.7	7.0	6.8	6.7	6.6	NA

License Minimum Dissolved Oxygen: 7.0 mg/l

- Augmentation Event
- DO corrective action occurring. Water being released through spillway gate.
- Monitoring after DO corrective action period.

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