

Dam Operating Order

Amended Water Level Order for the (3-SD-82-809 Amended
Indianford Dam on the Rock River in (Amended Water Level
Rock County (

FINDINGS OF FACT

1. The Indianford Dam is located on the Rock River in the NW $\frac{1}{4}$ of the NW $\frac{1}{4}$ of Section 21, T4N, R12E, (Town of Fulton) in Rock County. The Rock River is a navigable river.
2. Lake Koshkonong is a natural widening of the Rock River located about 6 miles upstream of the dam, which has been raised by the Indianford Dam.
3. The Indianford Dam consists of a slide gate section consisting of six slide gates on the east bank, a 227-foot long concrete, fixed-crest spillway with an average crest elevation of 775.2 msl and a powerhouse on the west bank containing two wicket gates.
4. Rock County currently owns the Indianford Dam and proposes to transfer ownership to the Rock Koshkonong Lake District (the 'District').
5. On April 25, 1991, the department issued water level order 3-SD-82-809 governing the operation of the Indianford Dam.
6. A US Geological Survey (USGS) gage has installed in Fort Atkinson on the Rock River in October 1998 which is suitable for monitoring the incoming flow to Lake Koshkonong in place of the continued use of the USGS gages on the Crawfish River at Milford and the Rock River at Watertown.
7. Debris collection on the trash racks protecting the wicket gages can greatly reduce the dam's capacity to pass flow.
8. The Indianford Dam's capacity to pass flow depends on the downstream water levels. As the downstream water levels, also called the tailwater, rises, the flow from the slide gates and wicket gates decrease. The dam submerges in floods resulting in the dam's capacity being controlled by the downstream channel during times of higher flow.
9. The dam's wicket gates have been repaired and are relatively easy to operate. The District requested that the gate operating sequence be changed to allow the wicket gates to be used to regulate the dam's discharge before the lift gates are operated.
10. This revised water level order does not change the target, maximum or minimum water levels on Lake Koshkonong, or the dates these levels are applicable or the flow capacity of the Indianford Dam.
11. The department has conferred with the parties to these proceeding of Docket No. 3-SD-82-809. If any party determines that a review of the operating regime is necessary, they should contact the Department of Natural Resources and Rock Koshkonong Lake District requesting such a review.

CONCLUSION OF LAW

The Department has authority under Section 31.02, Wis. Stats. to set flows and levels at a dam.

ORDER

THE DEPARTMENT ORDERS:

1. This amended order supersedes water level order 3-SD-82-809 dated April 25, 1991. The water levels and operation requirements for the Indianford Dam are continued by this amended order.

2. From May 1 through October 31 the following water levels and dam operation shall be in effect:

A. Minimum lake elevation 775.73 feet, MSL

B. Maximum lake elevation 776.33 feet, MSL

C. Power generation is not allowed when the lake elevation is below 775.73 feet, MSL.

D. Subject to the provisions of 1.E., 1.F. and 1.G., the dam owner shall attempt to maintain the lake level as close to 776.20 feet, MSL, as possible, except after October 15 when the transition to the November 1 through April 30 lake level occurs.

E. Three slide gates shall be fully opened (700 cfs calculated flow) and shall remain open whenever the lake elevation exceeds 776.10 feet, MSL

F. Six slide gates and the wicket gates shall be fully opened (2230 cfs calculated flow at elevation 776.30) and shall remain open whenever the lake elevation exceeds 776.33 feet, MSL

G. In lieu of the requirement that the slide gate operations occur prior to the wicket gate operation in 1.E. and F., the wicket gate operation can be substituted providing that:

1) The District provides a rating curve of stage and flow for the wicket gate operation followed by slide gate operation similar to EXHIBIT 1 in 3-SD-82-809 dated April 25, 1991 and submits it to the department for review and approval.

2) The dam passes at least the equivalent of the slide gate flows required in 1.E and F. with wicket gate operation.

3) Within 4 hours after any gate changes, the District will post the wicket gates' opening settings on either its website or at a location convenient to the public and approved by the department.

4) The District will provided department staff access to the wicket gate operations inside the powerhouse to confirm wicket gate settings within 1 hour of the department's request. The District will provide the department with the contact information for access or another means of confirming wicket gate settings as approved by the department.

H. The District shall monitor the average daily flow of the Rock River at the US Geological Survey gage at Fort Atkinson. The intent of subparagraphs (1) and (2) is to establish minimum performance standards to enable the operator of the dam to keep lake levels within the established limits. Flow releases described in subparagraphs (1) and (2) shall be accomplished by operating the slide and wicket gates in accordance with

the rating tables prepared by the Department and incorporated by reference as Exhibit A or additional rating curves approved by the department.

1) Whenever the lake level is above 776.20 msl at the US Geological Survey gage station on Lake Koshkonong and the Rock River average daily flow at Fort Atkinson gage station has increased more than 200 cubic feet per second (cfs) from the previous day, the dam operator shall release at least 1.2 times the average daily flow measured at the Fort Atkinson gage station.

2) Whenever the lake level is at or below 776.20 msl at the US Geological Survey gage station on Lake Koshkonong and the Rock River average daily flow at Fort Atkinson gage station has decreased over the four previous consecutive days, the dam operator shall release no more than least 1.2 times the average daily flow measured at the Fort Atkinson gage station.

I. In lieu of 1.E, 1.F. and 1.G., the District may operate gates in any sequence to accomplish the necessary flow, provided a US Geological Survey acoustic gage is installed to replace the gage at the Indianford Dam that measures and records flow and stage through and over the dam.

3. From November 1 through April 30, the following water levels and dam operation shall be in effect:

- A. Minimum lake elevation 775.00 feet, MSL
- B. Maximum lake elevation 775.77 feet, MSL
- C. Power generation is not allowed when the lake level is lower than 775.00 feet, MSL.

D. Six slide gates and the wicket gates shall be fully opened and remain open when the lake level is higher than 775.77 feet, MSL.

4. Beginning October 1, 2005, the District will to pay the local share of the cost of operation of US Geological Survey gages at the Rock River at Fort Atkinson, at Lake Koshkonong; and at the Indianford Dam.

5. The slide gates shall be maintained in a condition that will allow all of the gates to be opened or closed in four hours.

6. The powerhouse, wicket gates and slide gates shall be maintained in an operable condition and shall be used to achieve water levels and flows established in this order regardless of whether or not power is generated by the dam. The trash racks on the powerhouse shall be cleaned on a daily basis when the wicket gates are passing flow to maintain maximum flow through the powerhouse. Organic debris including leaves and woody vegetation can be sluiced over the spillway. Waste such as plastics, rubber and metal shall be removed from the rack and disposed of at a proper solid waste facility.

7. A minimum of 64 cubic feet per second shall be discharged through the dam at all times.

8. After installation, the tailwater gage shall be maintained in a readable condition and replaced when necessary.

9. The District will provide the Indianford Dam gate settings within four hours on their website or communicated by email or facsimile to the department, US Geological Survey, North American Hydro, City of Janesville, Rock and Jefferson County upon their request.

10. The District shall maintain a daily log of lake levels and gate manipulations and make the log available to the department upon request.

STATE OF WISCONSIN DEPARTMENT OF NATURAL RESOURCES

For the Secretary

By _____

Date _____

Susan G. Josheff, PE, PH

Rock River Basin Engineer

Attachment – Exhibit A, gate and turbine rating curve

3-SD-82-809-AMENDED

EXHIBIT A

The following gate settings and associated flows are the Department's best flow estimates through the slide and wicket gates as of the date of this order. These flows are based on current USGS rating tables for the slide gates and theoretical flow calculations through the wicket gates without turbines/generators in place. This exhibit will be revised after actual wicket gate calibrations become available or turbines/generators are installed in the powerhouse.

DISCHARGE (CFS) AT LAKE STAGE:

<u>OPENINGS</u>	<u>776.1</u>	<u>776.2</u>	<u>776.3</u>	
3 GATES	700	800		860
4 GATES	850	900	960	
5 GATES	925	1000	1060	
6 GATES	1050	1100	1150	
6 GATES and 25% of #1 TURBINE	1150	1200	1300	
6 GATES and 25% of #1 TURBINE				
25% of #2 TURBINE	1300	1350	1425	
6 GATES				

and 50% of #1 TURBINE

25% of #2 TURBINE	1450	1500	1550
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6 GATES and

50% of #1 TURBINE

50% of #2 TURBINE	1600	1650	1700
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6 GATES and

75% of #1 TURBINE

50% of #2 TURBINE	1750	1770	1830
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6 GATES and

75% of #1 TURBINE

75% of #2 TURBINE	1875	1925	1960
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6 GATES and

100% of #1 TURBINE

75% of #2 TURBINE	2000	2050	2085
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6 GATES and

100% of #1 TURBINE

100% of #2 TURBINE	2160	2190	2230
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