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VIA Electronic Filing

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

Subject: **Deficiency of License Application and Additional Information Request
Gile Flowage Storage Reservoir Project (FERC Project No. 15055-001)**

Dear Secretary Bose:

On September 18, 2023, the Federal Energy Regulatory Commission (Commission) issued a Deficiency of License Application and Additional Information Request letter to Northern States Power Company, a Wisconsin corporation (NSPW), regarding its final license application (FLA) for the Gile Flowage Storage Reservoir Project (FERC No. 15055). While developing our response to the Commission's request, NSPW identified an error in the FLA regarding the surface acreage of the reservoir at elevation 1,490.0 feet NGVD. The FLA incorrectly listed the acreage as 3,454 acres. The correct acreage is 3,354 acres. The incorrect information appears in the Initial Statement, Exhibit A, Exhibit E, and the Supporting Design Report (SDR). NSPW has corrected the acreage in the revised Exhibit A, Exhibit E, and SDR enclosed in this filing. NSPW has not provided a revised Initial Statement.

Additionally, NSPW hereby submits the following information and responses as requested in the Commission's aforementioned letter.

DEFICIENCIES

Exhibit A

Section 5.17(d)(2) of the Commission's regulations requires that an applicant publish notice twice of the filing of its application in a daily or weekly newspaper of general circulation in each county in which the project is located and provide the Commission with proof of the publication of this notice. Please file proof of the publication of this notice.

NSPW Response

NSPW filed the proof of publication on September 20, 2023 ([Accession #20230920-5052](#)).

Section 5.17(d)(e) of the Commission's regulations requires that an application include copies of its statements made under 18 C.F.R. § 4.38 (b)(2)(vi), regarding Public Utility Regulatory Policies Act (PURPA) benefits. Section 23 of Exhibit A states that Northern States Power reserves any future rights it may have under PURPA; however, section 7 of the November 17, 2020 Pre-Application Document (PAD) states that Northern States Power is not seeking benefits under PURPA. It is not clear if Northern States Power is reversing the statement of intent not to seek PURPA benefits included in the PAD. Please clarify whether Northern States intends to seek PURPA benefits.

NSPW Response

NSPW is not seeking benefits under PURPA and the revised Exhibit A is enclosed as Appendix AIR-1.

Exhibit A

Section 4.61(c)(1)(viii) of the Commission's regulations requires that Exhibit A include the sizes, capacities, and construction materials of project facilities. Exhibit A of the application does not include: (1) dimensions (width and length) of: (a) the east and west abutment sections of the dam; (b) the pier between the sluiceway and gated spillway; and (c) the weir at the stilling basin; (2) length of the sluiceway bay; and (3) maximum discharge capacity of the gated spillway. Please revise Exhibit A to provide this information.

NSPW Response

Section 2 of Exhibit A has been revised to provide the length and width of the east and west abutment sections, the pier between the sluiceway and gated spillway, and the weir at the stilling basin. Exhibit A now also provides the length of the sluiceway bay and the maximum discharge capacity of the gated spillway.

Exhibit F

Section 4.41(g)(3) of the Commission's regulations requires a Supporting Design Report (SDR) demonstrating that the existing and proposed project structures are safe and adequate to fulfill their stated functions. The license application does not include an SDR. Please revise the application to include it.

NSPW Response

The SDR has been enclosed as Appendix AIR-2.

Exhibit H

Section 5.18(c)(1)(ii)(B)(1) of the Commission's regulations requires that an application include a description of the existing and proposed operation of the project during flood conditions. Exhibit H does not include this information. Please revise Exhibit H to include it.

NSPW Response

Section 2.1 of Exhibit H has been revised to include a description of the existing and proposed operation of the project during flood conditions. The revised Exhibit H has been enclosed as Appendix AIR-3.

ADDITIONAL INFORMATION

Exhibit A

Figure A-1 of Exhibit A depicts the impoundment surface elevation from 1994 through 2021. Please provide the underlying data associated with Figure A-1, in tabular format. Additionally, please describe how the impoundment elevations are measured, monitored, and/or verified, including any devices used.

NSPW Response

The tabular data for the impoundment surface elevations are enclosed as Appendix AIR-4. Elevations are measured using the electronic headwater monitoring device located to the left of the radial gate on the pier between the sluiceway and gated spillway and recorded on a circular chart. The elevations are verified using the headwater staff gage located on the right abutment wall.

Exhibit A of the application states that Northern States Power utilized daily outflow and storage reservoir elevation data from 1994 through 2021, to calculate inflows to the project and create the flow duration curves in Appendix A-3. To assist Commission staff with evaluating the effects of the impoundment fluctuations on aquatic and terrestrial resources, please provide the underlying data

associated with the flow duration curves, including daily outflow and calculated inflow, in tabular format. To the extent available, please also provide outflows for the sluice gate and gated spillway. In addition, please provide record of any maintenance activities that required lowering the impoundment elevation from 2015 to 2021.

NSPW Response

The data associated with the flow duration curves are enclosed as Appendix AIR-4. As a standard practice, except for emergencies, the sluice gate is only open to release minimum flows. There were no attempts made to distinguish between sluice gate and gated spillway releases.

Regarding the data, reservoir elevation data were not available for the period beginning January 1, 2017 through April 28, 2017. When the entire elevation data record was reviewed, it contained numerous typographical errors. Obvious typographical errors were corrected with care so as not to unnecessarily manipulate data. With the obvious errors corrected, negative inflows were still being calculated for reasons that were often difficult to identify. As a result, an iterative averaging/interpolation method using non-negative inflows from adjacent days was used to eliminate as many negative inflow values as possible. It is believed the final dataset used to compute the flow duration curves, as enclosed in Appendix AIR-4, is the best data available.

NSPW has no record of any maintenance drawdowns conducted at the Gile Reservoir.

Figure A-1 of Exhibit A indicates that the range of the impoundment fluctuations from 2015 through 2021, is less than the range in previous years. Please describe any environmental factors or operational issues that decreased the operating range of the impoundment from 2015 through 2021.

NSPW Response

Figure A-1 has also been revised to utilize the data associated with the development of the flow duration curves enclosed in Appendix AIR-4. According to Figure 5 on [NOAA's climate data for Wisconsin](#), the period 1985 to 2020 showed that the wettest consecutive 5-year interval was from 2015-2019, with an annual average of 39.4 inches. With such wet conditions, deeper reservoir drawdowns were unnecessary to augment river flows downstream generation. Therefore, the period of 2015-2021 should not be the basis for determining drawdown needs in the future.

Section 9 of Exhibit A indicates that the project provides scheduled whitewater releases. Please revise Exhibit A to include a description of the whitewater releases, including the schedule, frequency, duration, amount, and release point (e.g., sluice gate, gated spillway) of the whitewater releases.

NSPW Response

Section 9 of Exhibit A has been revised. The revised Exhibit A is enclosed in Appendix AIR-1.

Section 12 of Exhibit A states that the 10% exceedance flow at the project is 10 cubic feet per second (cfs) and the 90% exceedance flow is 305 cfs, but the annual flow duration curve in Appendix A-3 of Exhibit A indicates the opposite. Please verify the 10% and 90% exceedance flows and revise Exhibit A to correct this inconsistency.

NSPW Response

Section 12 of Exhibit A has been revised. The revised Exhibit A is enclosed in Appendix AIR-1.

Exhibit E

Coastal Zone Management

Under section 307(c)(3)(A) of the Coastal Zone Management Act (CZMA), 16 U.S.C. § 1456(3)(A), the Commission cannot issue a license for a project within or affecting a state's coastal zone unless the coastal zone management agency concurs with the license applicant's certification of consistency with the state's CZMA program, or the agency's concurrence is conclusively presumed by its failure to act within 180 days of its receipt of the applicant's certification. Section 1.3.5 of Exhibit E states that Northern States Power requested a determination of consistency from the Wisconsin Coastal Resources Management Program (Wisconsin CMP) on February 23, 2023, and that no response from Wisconsin CMP was received by the filing date of the license application, i.e., August 18, 2023. Please file copies of the correspondence sent to Wisconsin CMP and any response from Wisconsin CMP received by the 180-day deadline, i.e., August 22, 2023.

NSPW Response

No response has been received from the Wisconsin CMP by the 180-day deadline. The correspondence sent to Wisconsin CMP is enclosed as Appendix AIR-6.

Aquatic Resources

The license application states that Northern States Power is proposing to continue restricting the typical daily impoundment drawdown to approximately 0.1 foot per day, but no more than 0.2 foot per day. So that staff can better evaluate Northern States Power's proposal, please describe: (1) the environmental and operational conditions under which Northern States Power would lower the impoundment at a rate of 0.1 foot per day versus 0.2 foot per day (e.g., volume of inflow, downstream flow requirements, maintenance requirements, etc.); (2) annual duration and frequency of drawdowns at a rate of 0.1 feet per day and 0.2 foot per day, from 2010 through 2022; and (3) the environmental effects of restricting drawdowns to 0.1 and 0.2 feet per day, including, for example, potential effects on water quality, aquatic habitat, fishery resources, and recreation.

NSPW Response

Operational conditions to lower the impoundment at a rate of 0.1 ft/day versus 0.2 ft/day
When inflows increase, or the weather forecast indicates inflows could increase significantly creating potential flood conditions, NSPW, based upon the current reservoir elevation, the weather forecast, and incoming inflows (determined by rate of rise of the reservoir, gate opening curves, and the stage storage curve), determines the appropriate course of action. This could include maintaining the current outflow and allowing the reservoir to rise, increasing the outflow to match inflow by opening the radial gate and allowing the reservoir elevation to remain relatively stable, or in the case of expected inflow increases, such as prior to spring runoff, increasing the outflow to reduce the reservoir elevation in anticipation of the runoff.

During normal operations, releases from the Gile Dam are such that the reduction in reservoir elevation is typically no more than 0.1-foot per day. However, in anticipation of runoff events, NSPW may reduce the elevation at a rate not to exceed 0.2 feet per day to allow the reservoir to store or "peak shave" the incoming flows before passing them downstream.¹ Such changes

¹ Please note: as described in Exhibit E, Section 3.4.3, footnote 23, of the FLA, both the current operation and the proposed operational restrictions of 0.1 and 0.2 feet do not include scheduled whitewater releases and emergencies beyond Applicant's

exceeding 0.1 feet per day up to 0.2 feet per day for the period 2010 through 2022, almost entirely needed to occur when the reservoir elevation at the time was greater than 1,485.0 feet. For the period 2010 through 2022, the lowest elevation in which a daily reservoir reduction between 0.1 and 0.2 feet occurred was at 1,482.75 feet on March 29, 2014. During the period 2010 through 2022, changes where the reservoir reduction exceeded 0.2 feet per day typically occurred when the reservoir elevation was greater than 1,487.0 feet. For the period 2010 through 2022, the lowest elevation in which a daily reservoir reduction greater than 0.2 feet occurred was at 1,483.94 feet on March 18, 2014.

Annual duration and frequency of drawdowns at a rate of 0.1 feet per day and 0.2 foot per day, from 2010 through 2022

To complete the requested drawdown analysis, NSPW normalized the data by relying primarily upon the recorded releases. Beginning in 2016, we added an additional 24 cfs to the recorded discharge to account for the sluice gate discrepancy discovered during the 2021 Water Quality Study.²

When analyzing reservoir elevation fluctuations within the range of 0.1 to 0.2 feet using the existing data, care was taken to only include daily reservoir reductions where the recorded discharge information was within a reasonable range (plus or minus 33%) to support the daily reduction in reservoir elevation that was recorded.

Year	0.1 to 0.19 ft/day drawdown		0.2 ft/day or greater drawdown	
	Frequency (events/year)	Average Duration (days)	Frequency (events/year)	Average Duration (days)
2010	9	1.125	1	1.0
2011	17	1.42	1	1.0
2012	0	0	0	0
2013	6	1.20	2	1.0
2014	18	1.00	3	1.0
2015	10	1.00	0	0
2016 ³	15	1.00	1	1.0
2017 ^{1,4}	1	1.00	2	1.0
2018 ¹	9	1.29	1	1.0
2019 ¹	5	5	0	0
2020 ¹	5	1.67	2	2.0
2021 ¹	5	1.25	0	0
2022 ¹	6	1.2	0	0
Average				

The environmental effects of restricting drawdowns to 0.1 and 0.2 feet per day

Current Conditions

Although it is not common practice for NSPW to draw down the reservoir more than 0.2' per day

control, which includes preemptive drawdowns for expected large inflow events due to precipitation or snow melt to reduce flooding and increased reservoir elevations at the downstream hydroelectric projects.

² This is to ensure the additional 24 cfs measured in 2022 (total minimum flow of 36 cfs) is taken into account in the analysis when only 12 cfs minimum flow is recorded in the discharge data.

³ 24 cfs added to the discharge record for additional minimum flow that was released by NSPW when it believed it was releasing 12 cfs.

⁴ A full data record for 2017 is not available.

on a regular basis, there are no restrictions regarding the maximum daily drawdown rate. NSPW can and has reduced the reservoir elevation more than 0.2 feet per day and exceeded 0.3 feet per day in the period 2010 through 2022. It is unclear from the data available if those drawdowns exceeding 0.2 feet per day were due to emergencies beyond NSPW's control. Those emergencies could include preemptive drawdowns to accommodate extreme runoff events from heavy rainfall, snow melt, or long-term precipitation to reduce downstream flooding.

Proposed Conditions

NSPW proposes to restrict the typical daily drawdown to approximately 0.1 feet per day, but no more than 0.2 feet per day, except for scheduled whitewater releases and emergencies beyond its control. Those emergencies include, but are not limited to, preemptive drawdowns in anticipation of significant runoff events due to rainfall or snow melt to reduce flooding and limit increased reservoir elevations at the downstream hydroelectric projects.⁵

Water quality

The Gile Flowage is listed as a "Healthy Waterbody" in WDNR's 2022 Healthy Waters List. Water quality monitoring conducted within the reservoir and tailwater in 2022 indicated all analyzed water quality parameters exceeded Wisconsin's water quality standards. Although the 2022 profile monitoring did not identify stratification in the reservoir, water temperatures at the surface were at times slightly higher than water temperatures at the bottom of the water column. Regarding discharge from the dam, minimum flows are generally released from near the bottom of the water column or 1465.5 feet NGVD and above. Discharges in excess of the minimum flow are generally released through the radial gate at an elevation of 1478.0 feet NGVD and above.

Environmental Effects

Although the Gile Flowage does not stratify, 2022 water monitoring results indicate that water located near the bottom of the water column can occasionally be slightly cooler than water near the surface. Therefore, flows released through the radial gate, with a sill elevation of 1,478.0 feet NGVD, can release water that is slightly warmer than the minimum flows released through the sluice gate (sill elevation of 1,465.5 feet). The greater the water released through the radial gate, the greater this water-warming effect can be downstream of the Project.

Proposed Environmental Measures

Although the effect of releasing large volumes of water from the dam (e.g., during drawdowns to rapidly lower the reservoir elevation) can warm the water downstream of the Project, it is not expected to result in an adverse or even measurable effect upon water quality (water temperature) nor is it expected to adversely impact aquatic resources that require cooler water. However, the proposed restriction on the typical daily drawdown to approximately 0.1 feet per day, but no more than 0.2 feet per day, is an enhancement for water resources at the Project when compared to the alternative of no-action or denial of the license application, which would result in no restrictions on daily drawdowns.

Aquatic habitat and fishery

According to a linear interpretation of the reservoir's stage area curve, included in Exhibit A, Figure A-3, daily reductions in reservoir elevations that have commonly occurred equate to changes in wetted acreages at various starting reservoir elevations as shown in the following table.

⁵ In an effort to provide a more-defined definition, NSPW recommends the phrase "large inflow events due to precipitation or snow melt to reduce flooding and increased reservoir elevations at the downstream hydroelectric projects." be replaced with "extreme inflow events due to isolated thunderstorms, long-term precipitation, or above average snow melt to reduce downstream flooding and increased reservoir elevations at the downstream hydroelectric projects."

Starting Elevation (feet NGVD)	Ending Elevation (feet NGVD)	Elevation Reduction per day (feet)	Starting Area for the day (acres)	Ending Area for the day (acres)	Whole Percentage of reduction/day
1,490.0	1,489.9	0.1	3,354	3,329	1
1,490.0	1,489.8	0.2	3,354	3,305	1
1,490.0	1,489.7	0.3	3,354	3,280	2
1,485.0	1484.9	0.1	2,617	2,603	1
1,485.0	1,484.8	0.2	2,617	2,588	1
1,485.0	1,484.7	0.3	2,617	2,574	2
1,481.0	1,480.9	0.1	2,057	2,037	1
1,481.0	1,480.8	0.2	2,057	2,017	2
1,481.0	1,480.7	0.3	2,057	2,000	3
1,480.5	1,480.4	0.1	1,957	1,937	1
1,480.5	1,480.3	0.2	1,957	1,917	2
1,480.5	1,480.2	0.3	1,957	1,897	3
1,480.0	1,479.9	0.1	1,856	1,827	2
1,480.0	1,479.8	0.2	1,856	1,798	3
1,480.0	1,479.7	0.3	1,856	1,769	5
1,475.3	1,475.0	0.1	525	482	8
1,475.3	1,475.1	0.2	525	439	16
1,475.3	1,475.0	0.3	525	396	25

Environmental Effects

Regular, rapid reductions in reservoir elevation can result in adverse impacts to aquatic resources that are immobile (e.g., submergent and emergent aquatic vegetation), relatively immobile (e.g., freshwater mussels), or entirely mobile (e.g., fish). As shown in the gray shaded rows in the table above, reservoir elevation reduction rates of up to 0.2 foot per day generally occur down to an elevation of 1480.5 feet NGVD. They cause a maximum reduction in the reservoir's wetted area of an estimated 2% per occurrence which equates to 40 acres per day. The proposed normal rate of drawdown is 0.1 foot per day, and 0.2 feet per day is reserved for days when runoff events are anticipated. This 0.2 feet per day reduction is generally utilized to allow the storage reservoir to "peak shave" the incoming flows before passing them downstream when the elevation is greater than 1,485.0 feet.

Considering the small percentage of wetted area that becomes exposed during both a 0.1 and 0.2 foot per day drawdown, combined with the fact that the 0.2 foot drawdown almost always occurs when the reservoir elevation is greater than 1,485.0 feet NGVD, the proposed Project operation is not expected to adversely affect relatively immobile aquatic species such as freshwater mussels and other invertebrates. In addition, the 2022 freshwater mussel survey, included in [Appendix E-13](#) of the FLA, indicates that mussels are uncommon and that habitat is likely the limiting factor. The existing mussel community has evolved under the Project's current operating regime and is composed of common and widespread species (Paper Pondshell and Giant Floater) that are tolerant of impounded conditions and soft substrates such as those observed in the Gile Flowage.

For completely immobile species such as aquatic macrophytes, the reservoir appears to have a healthy aquatic plant community with high floristic quality indices that exist under the current Project operation. This is evidenced by the 2022 Aquatic and Terrestrial Species Report enclosed in [Appendix E-10 of the FLA](#).

The vast amount of available fisheries data for the reservoir indicates that the fishery is diverse and healthy ([see Section 3.5.2.1.4 of the FLA](#)). Fish populations currently found in the reservoir are healthy and have adjusted to the reservoir's seasonal drawdowns.

Proposed Environmental Measures

As stated in the FLA under Section 9 of Exhibit A, NSPW proposes to continue the practice of avoiding "over releasing" water from the reservoir as well as restricting the typical daily drawdown to approximately 0.1 feet per day, but no more than 0.2 feet per day, to balance the needs of generation with the needs of recreation and aquatic resources.⁶ Therefore, implementing reservoir drawdown restrictions where such restrictions currently do not exist for the Project without a license will only help to maintain and enhance aquatic resources. The revised Exhibit A is enclosed as Appendix AIR-5.

Recreation

Current Conditions

Although it is not normal practice to draw down the reservoir beyond 0.2 feet per day on a regular basis, there are currently no restrictions regarding the maximum daily drawdown. Indeed, NSPW has reduced the reservoir elevation more than 0.2 feet per day and exceeded 0.3 feet per day during the period from 2010 through 2022.

As shown in the gray shaded rows in the table above, reservoir drawdowns of up to 0.2 feet per day generally occur beginning at elevation 1,490.0 feet NGVD and continue down to an elevation of 1,480.5 feet NGVD. During the first 9.5 feet of drawdown, the maximum daily reduction in the reservoir's wetted area is estimated at 2% which equates to 40 acres per day. The analysis indicates the 0.2-foot daily drawdown almost always coincides when the reservoir elevation is greater than 1,485.0 feet NGVD.

Environmental Effects

Rapid reductions in the daily reservoir elevation can result in potential navigational hazards for motorized watercraft by exposing underwater obstacles, such as stumps and rocky shoals, that are typically submerged at higher elevations. These hazards only increase at lower reservoir elevations as even experienced boaters may not be as familiar with submerged obstacles at the relatively uncommon lower reservoir elevations.

Proposed Conditions

As stated in the FLA under Section 9 of Exhibit A, NSPW proposes to continue the practice of avoiding "over releasing" water from the reservoir and to restrict the typical daily reservoir drawdown to approximately 0.1 feet per day, but no more than 0.2 feet per day, to balance the needs of generation with the needs of recreation and aquatic resources.⁷ Therefore, implementing reservoir drawdown restrictions where such restrictions currently do not exist for the Project without a license will only help to maintain and enhance aquatic resources. The

⁶ Except for scheduled whitewater releases and emergencies beyond NSPW's control, which include but are not limited to preemptive reservoir drawdowns necessary for dam safety concerns or to accommodate major runoff events to reduce the risk of downstream flooding.

⁷ Except for scheduled whitewater releases and emergencies beyond NSPW's control, which include but are not limited to preemptive reservoir drawdowns necessary for dam safety concerns or to accommodate major runoff events to reduce the risk of downstream flooding.

revised Exhibit A is enclosed as Appendix AIR-5.

Section 3.1.4 of Exhibit E indicates that the annual summer and winter drawdowns begin around May 1 and December 1, respectively. Please describe when the summer and winter drawdowns end and whether refill rates are controlled (i.e., whether a specific proportion of inflow is held in storage during/after the drawdown periods).

NSPW Response

The end of the summer and winter drawdowns are not triggered by a specific event or date. Rather, they are in response to reduced inflow to the Project and the need to compensate for reduced inflow by releasing more water from the Gile Project. As inflow decreases the flows discharged from the Project exceed inflows to the Project such that the reservoir elevation decreases. Therefore, the end of the summer and winter drawdowns are initiated when the reservoir inflows increase, and the elevation begins to rise during the fall or spring seasons. Generally, both periods occur when the episodic fall rains begin (September, October, and November) or the spring runoff begins (March, April, or May) as part of the natural hydrologic cycle in this region.

Refill rates associated with fall rains and the spring runoff are generally not controlled unless the weather forecasts and the stage storage curves indicate the upper elevation of 1,490.0 feet NGVD is expected to be exceeded.

Section 3.5.1.4.2 of Exhibit E states that the sluice gate normally provides downstream minimum flow releases and that it is also used to pass water downstream during periods of high flow and during the winter when ice accumulation prevents operation of the radial gate. Based on the Exhibit F drawings, it appears that the sluice gate releases flow from the bottom of the water column, and the radial gate releases flows from the middle of the water column. So that staff can better understand the effects of each release (sluice gate and radial gate, respectively) on aquatic resources, please describe: (1) the environmental factors or operational conditions that lead to operation of the sluice gate versus the gated spillway; and (2) the anticipated effects, if any, of low- level and mid-level releases on downstream water quality and aquatic habitat.

NSPW Response

The sluice gate remains open year-round for the purpose of discharging the minimum flow requirement. The only time the sluice gate is opened beyond the minimum flow setting is to pass water during flood events or when the radial gate is inoperable. Therefore, any additional flow passed through the sluice gate will be considerably less than the discharge from the radial gate (gated spillway). Therefore, no adverse effects to water quality or aquatic resources are expected from sluice gate operations.

As stated previously, the 2022 dissolved oxygen profile monitoring did not identify stratification in the reservoir. Therefore, if the sluice gate were to be used to release flows greater than the minimum flow, other than for flood events, no adverse impacts from low dissolved oxygen would be expected on downstream water quality. Water temperatures at the surface of the reservoir can be slightly higher than water temperatures at the bottom. Releases from the sluice gate are generally discharged from the bottom portion of the water column (i.e., 1,465.5 feet NGVD and above) versus the discharge elevation from the radial gate (i.e., 1,478.0 feet NGVD and above). Therefore, flows released from the sluice gate that exceed the minimum flow requirement, other than during flood events, are not expected to increase water temperatures downstream such that they would adversely affect downstream water quality.

Section 3.5.1.4.3 of Exhibit E states that during the August 30, 2022 Minimum Flow Habitat Evaluation Study (minimum flow study), a flow of 35.25 cfs was passed downstream of the dam through the sluice gate, instead of the assumed discharge of 12 cfs at the minimum gate setting. Section 3.4.1.2.3 of Exhibit E describes a water quality study during which water quality data was collected downstream of the dam on four days between May 18 and September 6, 2022. Appendix E-9 of Exhibit E includes the water quality monitoring study report but does not describe project outflow during data collection. So that staff can better understand the project's minimum flow releases and effects on water quality, please: (1) provide the flows that were being passed downstream during the water quality study, including any changes in flow that occurred during the study (in cfs); and (2) discuss whether the proposed minimum flow release from the sluice gate is 10, 12, or 35.25 cfs; and any potential effects on water quality associated with these flow releases.

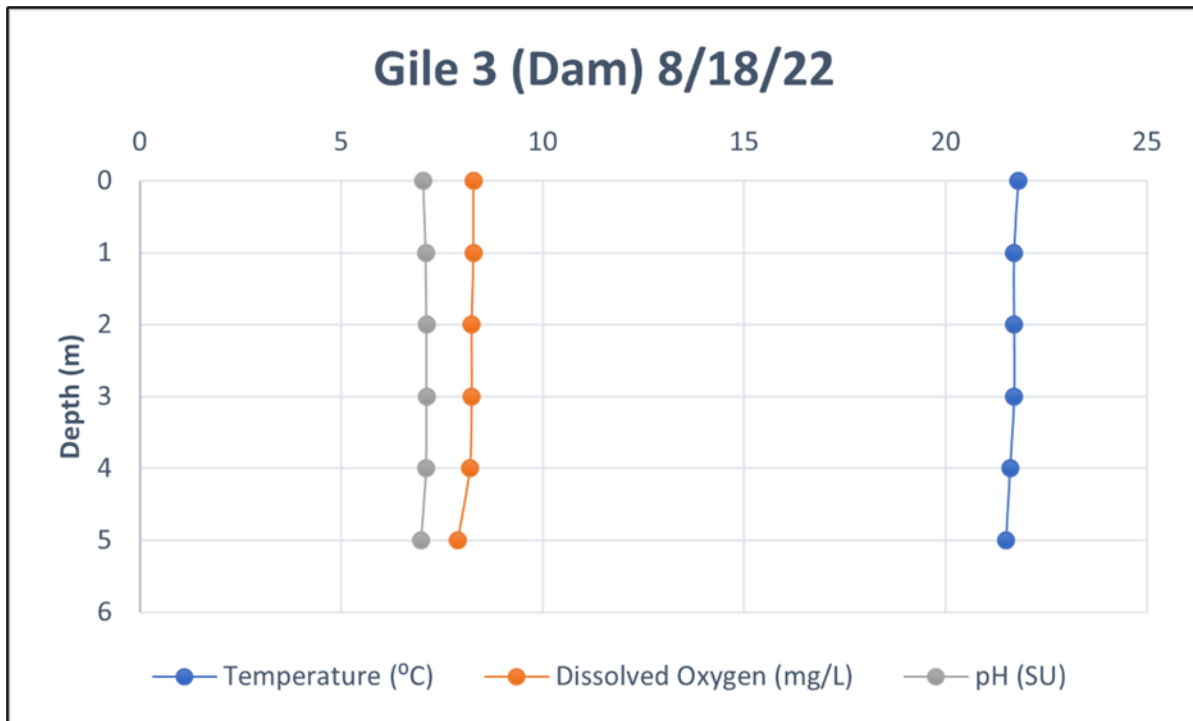
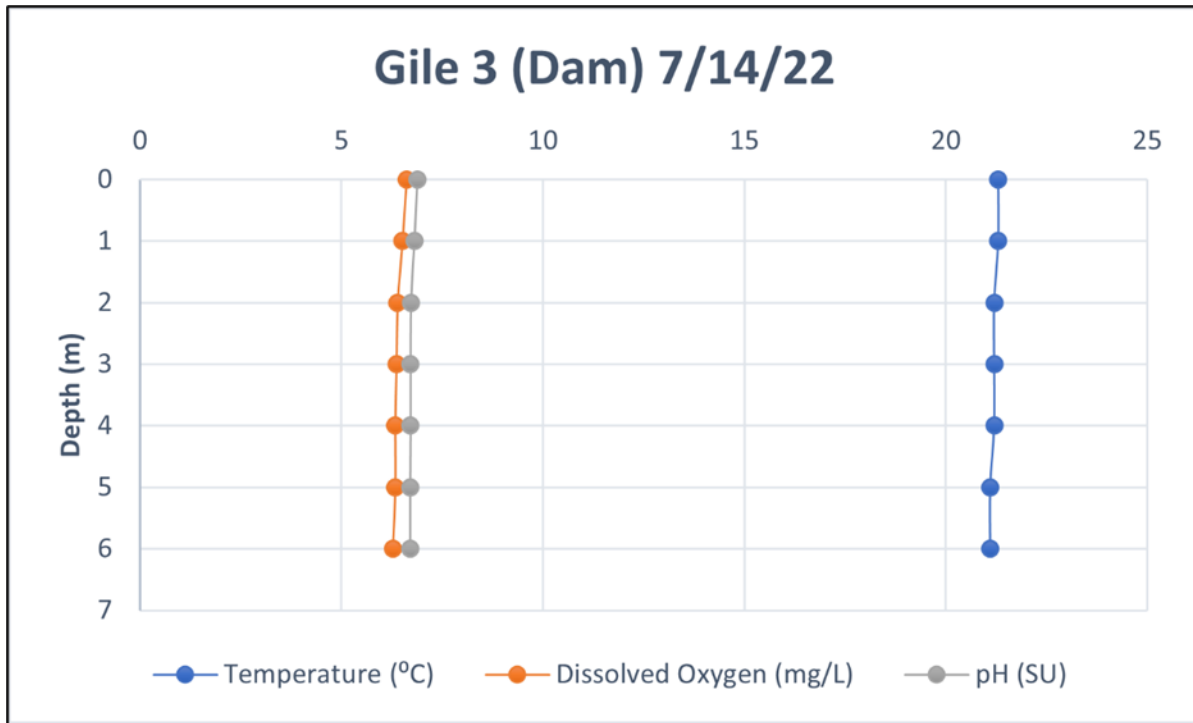
NSPW Response

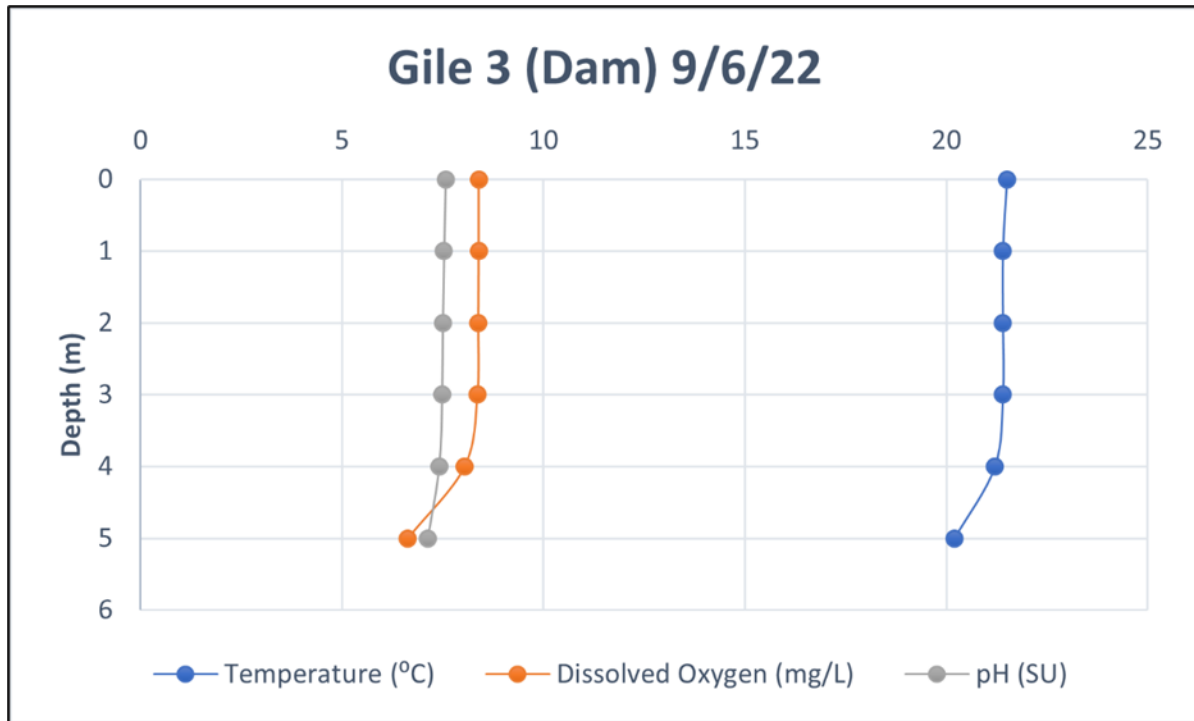
The downstream water quality monitoring was conducted on May 18, July 13, August 18, and September 6, 2022. The water released from the Project during said dates is shown in the following table (no changes to flow were made during the monitoring).

Monitoring Date	Flow Release Radial Gate (cfs)	Flow Release Sluice Gate (cfs)	Total Flow Release (cfs)
05/18/2022	200	35	235
07/13/2022	40	35	75
08/18/2022	0	35	35
09/06/2022	0	35	35

As outlined in Section 9 in Exhibit A of the FLA, NSPW is proposing to continue with the minimum flow requirement of 10 cfs.

The figures below are water quality profiles immediately above the Gile Dam (location #3) developed from data collected during the 2022 water quality study. The figures are also included in Section 3.4.1.2.3 in Exhibit E of the FLA.





The sill of the sluice gate is at elevation of 1,465.5 feet NGVD. On the profile figures shown above, the bottom sill of the sluice gate is the bottom of the profile taken. The reservoir does not stratify and the lowest dissolved oxygen readings in the profiles are greater than the Wisconsin dissolved oxygen standard of 5 mg/L. Water temperatures are also within Wisconsin water temperature standards. Therefore, reducing the minimum flow to 10 cfs, as proposed by NSPW in the FLA, is not expected to lower dissolved oxygen levels below the Wisconsin water quality standards.

Section 3.5.2.1.3 of Exhibit E states the spawning season of many fish species extends through mid-June and that reservoir substrates, that are critical to fish spawning, generally remain submerged from spring to early summer. However, section 3.1.4 indicates that summer drawdowns begin around May 1. To assist staff with an evaluation of the effects of impoundment drawdowns on fishery resources, please provide the approximate spawning seasons and depths for black crappie, bluegill, smallmouth bass, yellow perch, walleye, and northern pike in the project area. Please also file as ESRI GIS shapefiles: (1) the bathymetric data associated with Figure 11 of Appendix E-6; and (2) the substrate survey results depicted in Figure 3.5.1.3-1 of Exhibit E.

NSPW Response

The end of the summer and winter drawdowns are not triggered by a specific event or date. Rather, they are in response to reduced inflow to the Project and the need to compensate for reduced inflow by releasing more water from the Gile Project. As inflow decreases the flows discharged from the Project exceed inflows to the Project such that the reservoir elevation decreases. Therefore, the end of the summer and winter drawdowns are initiated when the reservoir inflows increase, and the elevation begins to rise during the fall or spring seasons. Generally, both periods occur when the episodic fall rains begin (September, October, and November) or the spring runoff begins (March, April, or May) as part of the natural hydrologic cycle in this region.

Typical fish spawning seasons, according to the [Wisconsin Department of Natural Resources](#), are shown in the following table.

Common Name	Spawning Season
Black crappie	May and June; however, during a colder season, spawning may be delayed until July.
Bluegill	Late May to early August (peaking in June).
Northern pike	Late March to early April, as soon as the ice begins to break up in the spring.
Smallmouth bass	Usually occurs at water temperatures between 62 - 64° F ⁸ , but they have been found spawning at 53° F.
Walleye	Soon after the ice goes out, at water temperatures of 38 - 44° F. Spawning in Wisconsin generally occurs between mid-April and early May, although it may extend from the beginning of April to the middle of May. Walleye spawning ordinarily reaches a peak when water temperatures are 42 - 50° F.
Yellow perch	Shortly after ice-out in April or early May at water temperatures of 45 - 52° F.

The bathymetric data associated with Figure 11 in Appendix E-6 of the FLA are raster files and are attached herein. They are not ESRI GIS shapefiles. The ESRI GIS shapefiles for the substrate survey results, depicted in Figure 3.5.1.3-1 of Exhibit E of the FLA, as well as the derived bathymetric shapefile (see Map Notes on Figure 3.5.1.3-1 of Exhibit E) are also attached as separate files.

Section 4.1.2.2 of the whitewater recreation flow study report (Exhibit E, Appendix E-24) indicates that a 10-cfs minimum flow has historically been passed downstream of the dam in accordance with an agreement with the Village of Montreal. However, the basis for establishing a 10-cfs minimum flow and the terms of the agreement are unclear. Please provide: (1) a copy of the agreement with the Village of Montreal, and a summary of the terms of the agreement; and (2) the basis for choosing 10 cfs instead of other minimum flows, including any studies conducted.

NSPW Response

There is no written agreement between NSPW and the Village of Montreal. However, in the Village of Montreal's wastewater permit⁹, it lists the Q_{7,10} streamflow as 10.0 cfs because the 7-day, 10-year lowest flow is the minimum flow release from the Project. Therefore, NSPW maintains the minimum flow of 10 cfs at all times to remain consistent with the Q_{7,10} streamflow value listed in the permit.

Terrestrial Resources

Section 3.7.1.2 of Exhibit E indicates that vegetation management or construction activities at the project could affect wildlife resources. However, the license application does not identify any proposed construction or regularly occurring vegetation management (e.g., mowing, tree-trimming, pesticide application, etc.). So that Commission staff can evaluate the effects of project maintenance activities on terrestrial resources, please describe any current/proposed vegetation management activities (e.g., regular/seasonal mowing, or tree-cutting), including

⁸ Per a review of previous [water temperature monitoring information](#) in the vicinity, spawning between 62° and 64° F occurs from mid-May through the month of June.

⁹ Go to: <https://apps.dnr.wi.gov/potw/> and search "Montreal" to view the permit documents.

methods, total acreage of project land affected by each method, and the approximate dates when the activities typically occur. Please account for routine vegetation management and any additional vegetation management associated with proposed measures (e.g., recreation improvements).

NSPW Response

Section 3.7.1.2 of Exhibit E does not include the term “construction activities”. NSPW believes Commission Staff is referring to Section 3.7.1.2.3, which does include this term, and which has been updated to provide additional information on construction activities and vegetation management. The revised Exhibit E is enclosed in Appendix AIR-5.

Section 3.7.2.2.2 of Exhibit E states that “day-to-day operational activities, such as routine maintenance at a recreation site,” could affect wood turtles. Please describe any proposed maintenance activities that could potentially affect wood turtles, and the potential effects of those activities on wood turtles.

NSPW Response

NSPW has revised Section 3.7.2.2.2 of Exhibit E to correct its previous statement regarding potential adverse effects to wood turtles from routine maintenance at recreation sites. In the original version of Section 3.7.2.2.2, NSPW inadvertently considered one of the non-Project recreation sites, which is neither owned nor maintained by NSPW, as being within the Project. That same facility was identified by the wood turtle study to contain wood turtle nesting habitat. The revised Exhibit E is enclosed in Appendix AIR-5.

Threatened and Endangered Resources

Sections 3.7.1.1.3 and 3.7.1.1.4 of Exhibit E state that “project operations that involve tree removal activities may impact unknown maternity roosts” or “roost trees” for the northern long-eared bat and the tricolored bat, respectively. Sections 3.7.2.1.3 and 3.7.2.1.4 of Exhibit E state that “day-to-day operational activities, such as removal of a hazard tree at a recreation site,” may affect these species. It is unclear whether non-hazardous tree removal is proposed, or if tree removal would only occur in the event of a hazardous tree. Please clarify the proposed tree removal activities, including the type of tree removal (i.e., hazardous vs. non-hazardous) and the timing of any non-hazardous tree removal (i.e., any seasonal restrictions).

NSPW Response

Sections 3.7.1.1.3 and 3.7.1.1.4 of Exhibit E have been revised to address hazardous and non-hazardous tree removal and timing. The revised Exhibit E is enclosed in Appendix AIR-5.

Recreation Resources

Section 3.3.1.4 of Exhibit E describes an erosion site in the downstream tailwater area caused by human foot traffic or high flows. Section 3.3.1.4 also states that Northern States Power will address the tailwater erosion site by August 31, 2023, by placing filter fabric and rock rip rap over the eroded area. Please describe whether the filter fabric and rock riprap were installed, and provide photographs of any finished maintenance.

NSPW Response

As discussed in the Updated Study Report ([Accession #20230926-5130](#)), the erosion at the downstream tailwater was addressed prior to August 31, 2023. The mitigation included placement of filter fabric and rock riprap. Section 3.3.1.4 of Exhibit E has been updated to include a description of the mitigation along with photographs. The information was not available by the time of the submittal of the FLA on August 18, 2023. The revised Exhibit E is enclosed in Appendix AIR-5.

Section 3.8.1.1 of Exhibit E describes the existing recreation facilities at the project, including recreation sites within the proposed project boundary and non-project recreation sites adjacent to the impoundment. So that staff can fully analyze recreation opportunities in the project vicinity, please describe any regional recreation opportunities within a 20-mile radius of the project boundary, including parks and boating/fishing access areas.

NSPW Response

A review has determined the following regional recreation opportunities and natural areas within a 20 miles radius of the Gile Project:

- Bald Mountain Scenic Overlook
- Black River Harbor Boat Launch
- Black River National Forest Campground
- Big Powderhorn Mountain Ski Resort
- Black River Basin Ski Hill
- Carow Park
- Caroline Lake Preserve
- Catherine Lake Hemlock-Hardwoods State Natural Area
- Copper Falls State Park
- Copper Falls State Natural Area
- Copper Peak Winter Recreation Area
- Curry Park Campground
- DuPage Lake Peatlands State Natural Area
- Eddy Park at Sunday Lake
- Gabbro Falls Trail
- Indianhead Mountain Ski Hill
- Interstate Falls Park
- Lake Evelyn State Natural Area
- Little Girls Point County Park
- Longyear Park
- MacDonald Lake County Park
- Mary Lake State Natural Area
- Miners Memorial Heritage Park and Miners Trail
- Moose Lake State Natural Area
- Mt. Zion Park and Ski Hill
- North Country Trail-Algonquin Falls Section
- Norrie Park
- Ottawa National Forest
- Rainbow Falls Trail
- Schomberg County Park
- Uller Trail
- Underwood State Wildlife Area

- Whitecap Mountain Ski Resort

Each of these regional recreation sites is maintained by entities other than NSPW and can encompass several ADA accessible amenities including campgrounds, picnic areas, and trailheads.

Exhibit G shows the Gile Dam canoe portage on the east side of the spillway while photographs in Appendix E-23 show multiple options for boaters to portage around the dam. Signs on the spillway indicate the portage take-out is adjacent to the spillway and that hazardous conditions exist in front of the spillway. Please provide the following information: (1) the location(s) of the existing and proposed canoe portage route(s); (2) the length, width, and composition of the proposed canoe portage route; (3) any existing and proposed safety measures (including barriers or signage) to protect boaters from the hazardous conditions in proximity to the spillway and canoe portage take-out; and (4) any existing or proposed maintenance, including the methods used (e.g., vegetation trimming, gravel addition, etc.), schedule/frequency of activities, and capital and annual cost of activities.

NSPW Response

The location of the existing and the proposed canoe portages are depicted in the following figure, along with proposed signage and safety measures.



The proposed portage is approximately 500 feet long and 12 feet wide. That portion of the proposed portage, which is not a gravel substrate, will be composed of grass that will be mowed at least twice per month during open water season. In order to keep the portage trail safe for

recreational users, any hazard trees that are identified to the north of the proposed trail will be removed (hand cut), as needed. Currently, there are no hazard trees adjacent to the proposed trail. Any hazardous tree removal will follow the proposed mitigation measures included in Section 3.7.3 of Exhibit E. These measures address the appropriate timing of tree removal so as to avoid potential adverse impacts to threatened or endangered bat species. The following photographs show the proposed portage beginning near the take-out site and leading to the existing put-in location.







Table 4.3-1 in the revised Exhibit E has been updated with the additional costs. The revised Exhibit E is enclosed as Appendix AIR-5.

Table 3.8.1.3.3-1 of Exhibit E reports that 50 visitors and 4 vehicles were counted at the canoe portage during the Recreation Study in May 2022. However, data collection forms from the Recreation Study indicate that all recreational use was attributed to Gile Dam. Given the proximity of Gile Park to the canoe portage and the number of users recorded as walking/wildlife viewing, it is not clear how many people use the canoe portage. So that staff can better evaluate recreational use of the canoe portage, please characterize the demand for the canoe portage trail from boaters compared to demand originating at Gile Park for non-boating purposes, if known.

NSPW Response

During the 2022 recreation study, only one spot count documented the canoe portage being used for boating purposes. On May 21, 2022, an individual that is a regular visitor, and lives within one mile of the Project, indicated they canoed to the dam site for bank fishing. NSPW did not document any use of the canoe portage by boaters on the reservoir using the portage to

continue their travel downstream, nor was the portage used by any boaters first putting in below the dam to travel downriver. Indeed, all documented use at the canoe portage site was for bank fishing, wildlife viewing, sight-seeing, hiking, or dog walking.

Section 3.8.3 of Exhibit E describes Northern States Power's proposal to develop a land management plan to address use of the islands within the project boundary and to formalize the existing land management policy. However, the existing land management policy and the proposed land management plan are not described in detail. Please describe Northern States Power's existing land management policy for shoreline and island properties. Please also describe whether the proposed land management plan differs from current policy on: (1) overnight use and sanitation of islands within the project boundary; (2) dock approvals; and (3) compliance monitoring for private shoreline uses.

NSPW Response

The proposed land management plan does not differ from the current land management policy. The current policy prohibits the following activities by others on NSPW-owned land within the Project boundary: fires, overnight camping, littering, tree removal, mowing, and docks that do not meet WDNR dock specifications, are not maintained for safety, or constructed and maintained by non-riparians. The proposed land management plan will include a provision for signage, periodic monitoring, and enforcement. The current policy does not include such provisions.

Section 3.8.3 of Exhibit E describes Northern States Power's proposal to provide two 1,200-cfs whitewater releases each year from Gile Dam, for 3 hours in June and September, beginning in the morning. To assist staff with its evaluation of the proposed measure, please clarify: (1) the start time for making releases from the impoundment; (2) the arrival time of the flows to sections 2 and 3 of the West Montreal River (as shown on Figure 4.3.2-1 of Appendix 24, Whitewater Recreation Flow Study Report); (3) optimal flows (in cfs) and the duration of time that flows will be optimal in sections 2 and 3 of the West Montreal River; (4) the arrival time and duration of optimal flows downstream of Saxon Falls; (5) any proposed ramp-up and ramp-down rates; and (6) how any proposed ramp-up and ramp-down rates would affect flow in sections 2 and 3 of the West Montreal River.

NSPW Response

As stated in Section 3.8.3 of Exhibit E, the time of day that each flow release should begin will be determined in consultation with AW and NPS during development of the Whitewater Recreation Plan. Through discussions with individual boaters during the 2022 whitewater study, it is anticipated the releases would begin early in the morning.

Table 5.1.7-1 of the 2022 whitewater study report included completion times for boating Reach 1 and Reach 2 at the 1,200 cfs flow release as 39 and 27 minutes, respectively. Therefore, it is reasonable to assume the arrival time to Reach 2 is no more than 39 minutes and the arrival time to Reach 3 is no more than 66 (39 + 27) minutes.

As outlined in Table 5.1.2-1 of Appendix E-24 of the FLA, the 1,200 cfs flow in Reach 2 and Reach 3 was rated as optimal by 80% of boaters during the 2022 study. The remaining boaters felt the optimal flow should be lower, but not much lower. Tables 5.1.2-3 and 5.1.2-4 indicate that all boaters who participated in the study strongly agreed they would return to boat a 1,200 cfs flow in Reaches 2 and 3.

NSPW is proposing to ramp up and ramp down the flows over two hours. To determine the

timing of flow arrival and duration of optimal flows at the various reaches, NSPW utilized its Reservoir Flow Routing Model 1 enclosed in the FLA as Appendix E-28 and 2003 historic streamflow data to typify a normal year. Although the model cannot specifically determine arrival times, durations, and flows specifically for Reaches 2 and 3, specifics for Reaches 2 and 3 are included in the results displayed in the following table as “Montreal River and West Fork Confluence.”

Date/Time	Gile Dam Release (cfs)	Montreal River and West Fork Confluence (cfs)	Saxon Falls Bypass (cfs)	Superior Falls Bypass (cfs)
29-Jun 6:00	600			
29-Jun 7:00	1200	530		
29-Jun 8:00	1200	1073		
29-Jun 9:00	1200	1337	723	622
29-Jun 10:00	600	1090	1128	966
29-Jun 11:00		754	1518	1394
29-Jun 12:00			1451	1543
29-Jun 13:00			998	1190
29-Jun 14:00			583	705
28-Sep 6:00	600			
28-Sep 7:00	1200	464		
28-Sep 8:00	1200	1115		
28-Sep 9:00	1200	1339	415	291
28-Sep 10:00	600	1070	927	720
28-Sep 11:00		758	1349	1229
28-Sep 12:00			1231	1348
28-Sep 13:00			738	939
28-Sep 14:00			300	430

The blue shading indicates when the flows are within the reasonable range of optimal flows per the results of the whitewater boating studies.

Table 6-1 of Appendix E-24, Whitewater Recreation Flow Study Report, includes statistics on when flow from the project’s dam exceeded certain threshold values from 1994 through 2020, including total days, average number of days a year, and monthly frequency of the flow releases included in the study. It is unclear if the daily flow data represents an average flow over the course of a 24-hr period or if this data represents an instantaneous flow measurement on a given day. Please clarify the reporting of these flows within the table.

NSPW Response

The daily flow data represents an instantaneous flow measurement on any given day.

Exhibit G

The Exhibit G maps indicate that the proposed project boundary encloses some of the islands located in the impoundment, but does not enclose the rest. Please explain why the proposed project boundary encloses some, but not all, of the islands located in the impoundment. Additionally, please revise the Exhibit G maps to identify ownership of the islands located in the impoundment that are not included in the project boundary.

NSPW Response

The proposed Project boundary includes only those islands where NSPW is the sole owner. Islands that are not entirely owned by NSPW would make it difficult to enforce the provisions of the proposed land management plan and restrict public use to NSPW's ownership. Therefore, those islands have not been included in the Project boundary identifying them as open for general recreation use by the public. A revised Exhibit G Map identifying ownership of the islands located in the impoundment, that are not included in the Project boundary, is enclosed in Appendix AIR-7.

Exhibit H

Sections 1.1.2, 1.2, and 1.2.2 of Exhibit H state that project operation provides a 21% increase in power generation for the two downstream projects (i.e., Saxon Falls Hydroelectric Project No. 2610 and Superior Falls Hydroelectric Project No. 2587). To assist Commission staff with its developmental analysis, please revise Exhibit H to include percentage of increase in power generation for each of the downstream projects on a monthly basis, as a result of the project operation.

NSPW Response

A revised Exhibit H is enclosed as Appendix AIR-3 to include the percent increase in power generation on a monthly basis for each of the downstream projects.

Section 2.1 of Exhibit H indicates that the project includes the necessary warning devices to ensure downstream public safety. However, section 2.1 does not describe the type of devices used and safety measures used in conjunction with the devices, if any. Please revise Exhibit H to include this information.

NSPW Response

A revised Exhibit H is enclosed as Appendix AIR-3 to describe the type of devices used and the safety measures used in conjunction with those devices.

Section 2.1 of Exhibit H indicates that the project includes the necessary monitoring devices to detect structural failure condition. However, Exhibit H does not describe the type of devices used and maintenance and monitoring programs used in conjunction with the devices, if any. Please revise Exhibit H to include this information.

NSPW Response

A revised Exhibit H is enclosed as Appendix AIR-3 to describe the type of devices used and maintenance and monitoring programs used in conjunction with the devices.

Ms. Kimberly D. Bose
December 18, 2023
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Should you wish to access the information provided in this submittal, it is posted at the following website: <https://hydrolicensing.com/Gile/>. Should you have any questions, please contact Matthew Miller at 715-737-1353 or matthew.j.miller@xcelenergy.com.

Sincerely,

Donald Hartinger
Plant Director, Renewable Operations-Hydro

Enclosure

CC: Stakeholder List

Appendix AIR-1 – Revised Exhibit A Document
This information has been submitted as a separate file.

Appendix AIR-2 – Revised SDR

This information has been submitted as a separate file.

Appendix AIR-3 – Revised Exhibit H

This information has been submitted as a separate file.

Appendix AIR-4 – Gile Flowage Elevation Data (1994-2021)

This information has been submitted as a separate file.

Appendix AIR-5 – Revised Exhibit E

This information has been submitted as a separate file.

Appendix AIR-6 – Coastal Zone Management Act Documentation

This information has been submitted as a separate file.

Appendix AIR-7 – Revised Exhibit G

This information has been submitted as a separate file.