STATE OF VERMONT

SUPERIOR COURT — ENVIRONMENTAL DIVISION
Docket No. 103-9-16 Vtec

Morrisville Hydroelectric Proj Water Quality	DECISION ON THE MERITS Following Remand

This is an appeal of a water quality certification issued by the Agency of Natural Resources (ANR) to Morrisville Water and Light (MWL), pursuant to Clean Water Act (CWA) § 401, for three Morrisville Hydroelectric Facilities located on the Lamoille River and its tributaries (the Project): the Morrisville, Cadys Falls, and Green River Facilities. MWL appealed ANR's § 401 certification, which imposed additional conditions.[1] See 10 V.S.A. § 8504(a); 33 U.S.C. §1341(a)(1). The American Whitewater and Vermont Paddlers' Club (AW/VPC), Vermont Natural Resources Council (VNRC), and the Vermont Council of Trout Unlimited (TU) all filed cross-appeals. After an eight day trial, this Court issued a Merits Decision on September 18, 2018, which ANR appealed and MWL cross appealed to the Vermont Supreme Court. The Supreme Court issued its decision on November 22, 2019, affirming in part and reversing and remanding in part. On February 4, 2020, this Court concluded the scope of the remand is limited to considering "[w]hat flow conditions are consistent with the Vermont Water Quality Standards (VWQS) and ANR's definition of high-quality habitat."[2] In re Morrisville Hydroelectric Project Water Quality, No. 103-9-16 Vtec, slip op. at 1 (Vt. Super. Ct. Envtl. Div. Feb. 4, 2020) (Walsh, J.). Presently before the Court is the remaining remand issue.

[1] The conditions included flow rate and winter drawdown limitations sufficient to support habitat for fish.

[2] At a status conference on December 9, 2019, the parties noted ambiguity on the scope of remand and this Court ordered parties to submit briefs defining the scope. In re Morrisville Hydroelectric Project Water Quality, No. 103-9-16 Vtec, slip op. at 1 (Vt. Super. Ct. Envtl. Div. Dec. 13, 2020) (Walsh, J.).

Based upon the evidence in the record, the Court issues the following Findings of Fact, Conclusions of Law, and Judgment Order that accompanies this Merits Decision.[3]

MWL is represented by Ryan M. Long, Esq. ANR is represented by Kane Smart, Esq. VNRC is represented by Jon Groveman, Esq. TU is represented by Robert J. Carpenter, Esq. AW/VPC is represented by Daniel P. Richardson, Esq.

Procedural History

This Court held a trial from April 2, 2018 to April 11, 2018 at the Vermont Superior Court, Costello Courthouse in Burlington, Vermont.[4] On September 18, 2018, we issued a Merits Decision that instituted MWL's proposed flow rates, ANR's winter drawdown conditions, and scheduled releases of water as requested by the Paddlers.[5] In re Morrisville Hydroelectric Project Water Quality, No. 103-9-16 Vtec, slip op. at 68–69 (Vt. Super. Ct. Envtl. Div. Sept. 18, 2018) (Walsh, J.). Following the Merits Decision, ANR timely appealed and MWL cross appealed the decision to the Vermont Supreme Court.

The Supreme Court decision affirmed in part and revered and remanded in part. In re Morrisville Hydroelectric Project Water Quality, 2019 VT 84, ¶ 15. The Decision is broken into five issues: winter drawdown, social and economic factors, timed releases, antidegradation policy, and high-quality aquatic habitat. Id. The Supreme Court affirmed this Court's decision (1) to impose ANR's 1.5-foot requirement for winter drawdown conditions as reasonable and supported by the evidence for the Green River Reservoir;[6] (2) that ANR was not obligated to

[3] All parties agreed that the record should not be reopened to take additional evidence and that the Court can resolve this matter using the evidence in the record." In re Morrisville Hydroelectric Project Water Quality, No. 103-9-16 Vtec 1 (Feb. 4, 2020).

[4] The Court conducted a half-day site visit on April 13, 2018.

[5] The Decision concluded that (1) MWL's proposed flow regimes at the three facilities complied with Vermont Water Quality Standards (VWQS); (2) ANR's condition limiting winter drawdown to 18 inches to provide for high quality water habitat was supported at the Green River Facility; and (3) the whitewater boating at the Green River Facility be annually scheduled for three releases lasting for a duration go six hours. In re Morrisville Hydroelectric Project Water Quality, No. 103-9-16 Vtec at 68–69 (Sept. 18, 2018). Finally, the Decision imposed a total phase-in period of four years for all three facilities to comply with ANR's water quality certification. Id.

[6] The conditions require a 1.5 foot maximum limit for the winter drawdown for the Green River Reservoir from December 16 to March 31. In re Morrisville Hydroelectric Project Water Quality, 2019 VT 84, at ¶ 56.

consider social and economic factors in setting water quality conditions; and (3) to require three scheduled releases per year from the Green River Reservoir to support whitewater boating.[7] Id. at ¶¶ 55–56, 61, 71.

The Supreme Court concluded that this Court failed to recognize that ANR is entitled to deference when interpreting its own regulations, including the antidegradation policy in the VWQS. Id. at ¶¶ 20–22 ("Absent 'compelling indications of error,' ANR is entitled to deference.") (quoting In re Musto Wastewater, 2014 VT 103, ¶ 10). In giving ANR reasonable deference, the Supreme Court held that this Court erred in applying a balancing approach and reinstated ANR's flow condition of 100 cfs for the Cadys Falls Facility.[8] Id. at ¶ 28. In the same vein, the Supreme Court reversed the Morrisville and Green River Facilities' flow conditions for failure to give deference to ANR's interpretation of high-quality aquatic habitat.[9] Id. at ¶¶ 29–30, 45. The Supreme Court, however, did not impose flow conditions for the Morrisville and Green River Facilities but rather remanded this to this Court. Id.

On remand, this Court is directed, as fact finder, to "*reinstate* the flow conditions [at the Morrisville and Green River facilities] that are consistent with the VWQS and ANR's definition of

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[7] On remand, AW/VPC raises a concern that ANR's position retroactively imposes conditions on whitewater releases by requiring that releases "maintain compliance with the seasonal operational constraints and reservoir elevation requirements." American Whitewater's objection to Agency of Natural Resources' Proposed Decision and Certification (Appendix A) at 2, filed May 15, 2020. This Court's September 18, 2018, Merits Decision clearly notes that "[t]o adequately support the use [of whitewater boating], scheduled releases must occur *at a time during which boaters can take advantage of the flows,*" which naturally excludes timed releases during unsafe conditions. Id. at 58 (emphasis added) (indicating that this includes considerations for the timing of releases); see also In re Morrisville Hydroelectric Project Water Quality, 2019 VT 84, at ¶¶ 62–67 (recognizing that the minimum flow required to safely support whitewater boating is between 128 cfs and 140 cfs and "merely passing naturally occurring high flow was not enough to support whitewater use"). In addition to this clear language directing releases to support whitewater boating, the Supreme Court has recognized this issue and concluded that whitewater boating is a designated and existing use to be protected under VWQS § 3-04(A) and water quality criteria implementing the CWA. Id. at ¶67. Given these considerations, we see no reason to strike or alter ANR's language.

[8] Here, remand was unnecessary to reinstate ANR's Cadys Falls flow rates as this Court had concluded that 100 cfs would provide high-quality aquatic habitat. Id. at ¶ 28 n.9; see also In re Morrisville Hydroelectric Project Water Quality, No. 103-9-16 Vtec at 48 (Sept. 18, 2018) (holding that there was insufficient evidence to support that 90 cfs could provide high-quality aquatic habitat).

[9] The Supreme Court noted that ANR should receive deference because ANR: (1) has statutory authority to certify compliance and enact regulations to maintain water quality; (2) the methodology of calculating high-quality aquatic habitat standards is complex; and (3) has consistently applied its interpretation; and (4) its interpretation is consistent with the statutory and regulatory scheme. In re Morrisville Hydroelectric Project Water Quality, 2019 VT 84, at ¶¶ 30, 36–9.

high-quality aquatic habitat." Id. at ¶¶ 28 n.9, 45 (emphasis added). As parties expressed ambiguity in this directive's scope, this Court directed parties to submit briefs defining the scope of remand. This Court concluded that the remaining question before the Court on remand is limited to "[w]hat flow conditions are consistent with the [VWQS] and ANR's definition of high-quality habitat." In re Morrisville Hydroelectric Project Water Quality, No. 103-9-16 Vtec at 2 (Feb. 4, 2020).

Findings of Fact

1. On September 9, 2015, MWL submitted an application for a water quality certification to ANR for hydroelectric facilities located on the Lamoille River and its tributaries in north-central Vermont (the Project).

2. The Project consists of four facilities: the Morrisville Facility, the Cadys Falls Facility, the Green River Facility, and the Lake Elmore Facility. These facilities were constructed between the 1890s and the 1940s.

3. Pursuant to its FERC application, MWL has sought to remove the Lake Elmore development from its FERC license.

4. The 2014 Vermont Water Quality Standards (VWQS) are applicable to the water quality certification on appeal.

5. The Project does not affect any high-quality waters. All relevant project waters are defined as Class B waters under the VWQS.

6. The Project was granted an original FERC license on August 21, 1981, which ran until April 30, 2015.

7. The Project as currently operated does not meet the VWQS.

8. On August 9, 2016, ANR issued a water quality certification to MWL with conditions pursuant to the Clean Water Act (CWA) and the VWQS.

9. On September 7, 2016, MWL appealed the water quality certification to this Court.

Morrisville Facility

10. The Morrisville Facility is in Morristown, Vermont. The facility was originally constructed in 1924.

11. The Morrisville Facility has a small impoundment and has a dam that is approximately 216 feet long at the main spillway.

12. The facility is licensed to operate in modified run-of-river mode and both the water quality certification and MWL's proposed conditions seek to transition the facility into true run-of-river operation.

13. The Morrisville Facility currently has an inflatable crestgate installed on the dam.

14. There are two bypass reaches at the facility, a primary reach approximately 400 feet long and a secondary reach approximately 800 feet long.

15. MWL is currently required to maintain a bypass flow of 12 cubic feet per second (cfs) in the primary bypass reach. There is no required flow in the secondary bypass reach.

16. The substrate in the primary bypass reach is primarily bedrock. The reach lacks gravel and cobble substrate that would support macroinvertebrate habitat that would provide a food source to fish or other aquatic biota. Because of this, the reach is unlikely to support trout spawning or incubation.

17. At the end of the reach there is a large drop off approximately 15 feet tall.

18. Brook trout, brown trout, and rainbow trout have been found at the primary bypass reach and were used as target species.

19. Fish move through the bypass reach over the dam down the bypass reach and over the drop off to the Lamoille River. It is highly unlikely that fish move up-stream from the Lamoille River towards the dam because of the drop off.

20. The Morrisville Facility and the primary bypass reach are visible from a bridge off B Street in Morristown.

21. The Morrisville Facility is currently manually operated and does not have the necessary equipment to operate remotely.

22. MWL retained the consulting firm Gomez & Sullivan, and with participation from ANR, Gomez & Sullivan conducted a habitat-flow study within the primary bypass reach to determine the flow necessary to meet VWQS.

23. ANR, MWL, and other participating parties agreed upon the study's scope and goals.

24. Gomez & Sullivan conducted a habitat suitability analysis for adult and juvenile rainbow trout, brook trout, and brown trout (the target species).

25. Flows of 4.5, 21, 59, and 91 cfs were evaluated in the bypass reach to assess downstream passage and habitat connectivity for fish, as well as water movement and the availability for cover. These flows represented leakage flow, one-inch spill, 0.2 cubic feet per second per square mile (cfsm), and 0.4 cfsm flow scenarios.

26. From this evaluation, the analysis produced habitat-flow curves representing the amount of habitat observed at the different flows for each target species at relevant life stages.

27. Both ANR and MWL relied upon the habitat-flow curves in reaching the respective flow regime at the Morrisville Facility.

28. The Gomez & Sullivan analysis concluded that a flow of 59 cfs would provide 73% of available habitat relative to the maximum observed available habitat for adult rainbow trout, which is the most limiting habitat species, of that provided at a flow of 91 cfs.

29. In 2017, MWL consultant Meddie Perry conducted an assessment of the Project and its compliance with the relevant sections of the VWQS. Additionally, Mr. Perry created a flow-energy model to evaluate how changes in flow over time relate to hydroelectric generation. Mr. Perry also conducted an aesthetic evaluation.

30. Mr. Perry is a senior hydrogeologist with the consulting firm VHB. Mr. Perry has a Bachelor's degree in environmental science and biology and many years of relevant work experience in the area of hydrology.

31. Mr. Perry combined the results of the flow-energy model and the habitat-flow analysis to develop a flow and habitat duration analysis to evaluate the availability of habitat over time under different scenarios.

32. Mary Nealon aided Mr. Perry in his analysis of the Morrisville Facility. Ms. Nealon is a fisheries biologist with Bear Creek Environmental, LLC. Ms. Nealon and Mr. Perry used habitat

supply information from the Gomez & Sullivan study, United States Geological Survey (USGS) streamflow data from the USGS streamflow gauging station in Johnson, Vermont, and project operation information to perform a habitat time series analysis. In addition, Ms. Nealon made general habitat observations.

33. The original analysis did not include rainbow trout. An updated time series analysis was provided which analyzed that species. Both Mr. Perry and Ms. Nealon testified that their overall conclusions regarding the facility were not changed by the updated time series analysis.

34. From this, Mr. Perry concluded that a flow of 43 cfs in the primary bypass reach would provide the target species and their life stages, on annual average, 80% of the amount of suitable habitat that would be available under natural flow conditions.

35. The results also concluded that a flow of 43 cfs would provide on average annually, relative to natural flow conditions, 70% of available habitat for adult rainbow trout, 76% of habitat for juvenile rainbow trout, 79% of habitat for adult brown and brook trout, and 94% of habitat for juvenile brown and brook trout.

36. Ms. Nealon concluded that a flow of 43 cfs in the bypass reach provided adequate habitat connectivity. This allows fish that wash over the dam to move through and exit the bypass reach safely.

37. Ms. Nealon concluded that a flow of 43 cfs provided adequate cover in the forms of turbulence and depth. Ms. Nealon observed that the pool in the bypass reach and holes in the bedrock provide high quality cover for juvenile and adult trout at this flow. A flow of 43 cfs provides turbulence in the reach that would provide additional cover.

38. In 2012, Gomez & Sullivan also conducted a water quality study at the Morrisville Facility. The study monitored dissolved oxygen (DO) and temperature at the facility's then-current flow regime of 12 cfs.

39. The water quality study consisted of bi-monthly DO and temperature readings in the development's reservoir, penstock tap, and tail race; as well as observations of river flows, weather, spillage, and turbine operations during sampling. Periodic data was collected at these locations from May 2012 to October 2012. Continuous data was collected from September 6 to October 23.

40. A draft sampling plan was submitted to ANR for comments prior to beginning the study. Comments submitted by ANR were then incorporated into the final study plan, which was also submitted to ANR.

41. The water quality study concluded that the Morrisville Facility was complying with the DO and temperature requirements of the VWQS.

42. Mr. Perry concluded in his analysis of the bypass reach that a flow of 43 cfs complies with the DO and temperature requirements of the VWQS because the Gomez & Sullivan water quality study concluded that a flow of 12 cfs was in compliance with these standards.

43. Ms. Nealon concluded that a flow of 43 cfs in the primary bypass reach would meet the criteria for DO and temperature, based on the existing Gomez & Sullivan data.

44. In 2012, Gomez & Sullivan also conducted an aesthetics flow study in connection with ANR and MWL. The study was conducted pursuant to a mutually agreed upon study plan and involved a team of Gomez & Sullivan representatives, ANR representatives, and MWL representatives observing predetermined demonstration flows from predetermined vantage points.

45. Flows of 4.5, 21, 59, and 91 cfs were observed in the primary bypass reach. While there were 3 total predetermined vantage points, only one was used for the primary bypass reach. This point was located on the bridge in front of the dam, over the reach. These flows represented leakage flow, one-inch spill over the dam, 0.2 cfsm, and 0.4 cfsm flow scenarios.

46. A flow of 21 cfs in the primary bypass reach provided good aesthetic value at the primary bypass reach vantage point. This flow only provided fair aesthetic value in the secondary bypass reach. Good aesthetic value was observed in the secondary bypass reach at 59 cfs, which provided good to excellent aesthetic value in the primary bypass reach.

47. In 2017, Mr. Perry conducted an independent aesthetic evaluation of additional demonstration flows of 12, 28, 43, and 70 cfs at the Morrisville Facility.

48. Mr. Perry's concluded that a flow of 43 cfs provided a full veil of whitewater over the crest of the dam, full water levels in the reach, scenic views of the ledge within the reach, a mixture of deep pools and whitewater, and pleasant auditory aesthetics. This flow would provide for

approximately two inches of spillage over the dam. Mr. Perry concluded that a 43 cfs flow would provide good aesthetic value at the primary bypass reach.

49. At 70 cfs, Mr. Perry concluded that other than an increase in the sound of falling water, the aesthetic value of the dam itself or in the reach were not improved.

50. Changes to the equipment at the Morrisville Facility will be needed to comply with either the water quality certification's flow regime or MWL's proposal.

51. Mr. Perry testified that the proposed 43 cfs condition does not balance social and economic factors, in accord with our prior order.

52. The Morrisville Facility is currently manually operated and lacks the equipment to be operated or monitored remotely so the facility would require automated and remote controls. Additionally, the facility would require the installation of automated communications equipment and other flow-measurement devices. MWL would need to make programming changes to the existing crestgate equipment.

Green River Facility

53. The Green River Facility is in Hyde Park, Vermont. It was originally constructed in 1947 and generation capacity was installed in 1984.

54. The facility has a 360-foot long, 105-foot high concrete arch dam. The facility is operated in a store and release mode. The facility was not designed to operate in run-of-river mode or to spill water over the dam crest.

55. The dam maintains, and uses stored water from, the Green River Reservoir. The reservoir is approximately 653 acres, has a normal maximum water elevation of 1220 feet, a maximum depth of 93 feet, and an average depth of 35 feet. The reservoir is characterized as large, and it is located in a small watershed.

56. The Green River is approximately 4.3 miles long with a culvert located on Garfield Road (Garfield Road culvert). The Garfield Road culvert likely impedes fish from traveling upstream.

57. The current operating license places conditions on the facility's conservation flows, maximum generation flows, and maximum reservoir drawdown levels.

58. Current license conditions require a continuous 5.5 cfs conservation flow into the Green River. From November to April, there is a maximum generation flow of 283 cfs. From May to

October, the maximum generation flow is set at 160 cfs, except when necessary to prevent spillage over the dam.

59. Generation cycles last a minimum of six hours.

60. From May to October, a one-foot maximum fluctuation in the reservoir level is permitted from the full reservoir elevation of 1220 feet. Additionally, the reservoir is managed to protect loon nesting habitat during this time. From December 1 to April 30, a 10-foot maximum total drawdown is allowed from this elevation (the winter drawdown). The reservoir level must be refilled no later than May 1.

61. MWL determines the actual amount of winter drawdown based on annual snowpack. The average drawdown is 3.7 feet, the maximum on record was 5.9 feet, and the minimum was 0 feet.

62. Fisheries management goals for the Green River Reservoir include protecting spawning fish, eggs, and fry from harmful water level fluctuation in the spring and early summer and maintaining the ecological integrity of the littoral zones and their habitat value for fish populations.

63. Littoral zones serve a vital role in lake and reservoir ecosystems and influence the overall productivity of the lentic system.

64. Light penetrates the littoral zones. This light produces macrophyte (plant) growth, which enables diverse species composition and habitat complexity, supporting life cycle functions at each level of the food chain.

65. Drawdowns cause dewatering of littoral zones. In the winter, these drawdowns can prevent the establishment of healthy near-shore communities which provide habitat and life cycle functions, such as forage and reproduction, for organisms serving as food sources for larger fish and wildlife.

66. Dewatering also exposes aquatic plants to drying and freezing conditions and can remove fine sediments from the near-shore area which support macrophyte growth.

67. Drawdowns are associated with reduced abundance and richness of larger, longer-lived macroinvertebrates.

68. Natural water fluctuations can promote structural and biotic diversity by providing a wider variety of habitats and conditions for different species through the disturbance.

69. The Green River Reservoir's natural fluctuation is 1.7 feet.

70. A six-foot winter drawdown, as proposed by MWL, would result in the dewatering of approximately 80 acres of near-shore habitat at the reservoir.

71. A 1.5-foot drawdown, as imposed by the 2016 water quality certification, would resulting in dewatering consistent with the limits of the reservoir's natural fluctuation.

72. In the Green River Reservoir, there are populations of smallmouth bass, chain pickerel, northern pike, yellow perch, brown bullhead, and pumpkinseed sunfish.

73. Bass species begin spawning in late-May. Spawning requires the maintenance of a stable reservoir elevation from May into July to protect the spawning, incubation, and black fry stages.

74. Two or three territorial loon pairs are typically supported from May to August during nesting season.

75. Loons are a species of great conservation need in Vermont. They nest near the edges of the water and their reproductive success can be negatively affected by water fluctuations.

76. In 2012, the consulting firm TRC conducted an aquatic resource assessment of the near-shore aquatic habitat. The assessment sought to inventory the existing habitat within the drawdown zone and assess the effect project operations have on the availability of aquatic habitat by comparison to other sites. The assessment was a cursory evaluation that failed to achieve study objectives.

77. ANR performed a littoral habitat assessment of the Green River Reservoir in 2014. The assessment sampled 17 sites at the reservoir and compared the Green River Reservoir's littoral habitat to those of reference waterbodies in Vermont.

78. The reference waterbodies were eight large naturally occurring mesotrophic lakes that were sampled by ANR in 2007 and 2008, at which 54 sites were sampled. The assessment states that these samples provided conditions of waterbody types like that of the Green River Reservoir and were of similar size and trophic status. These reference sites represented minimally impacted conditions, and a range of biological, physical, and chemical attributes that were potentially attainable in the Green River Reservoir.

79. Sites were assessed for substrate composition, aquatic plant cover, woody debris, embeddedness, odonate exuviae (dragonfly exoskeletons), and riparian habitat characteristics.

80. The assessment concluded that the reservoir's littoral zone had many areas that were highly suitable for aquatic macrophyte growth that currently lacked macrophytes and, as compared to these other lakes, the reservoir had less aquatic plant cover and odonate exuviae. The assessment concluded that this impact is consistent with water level fluctuations.

81. The 2014 littoral habitat assessment was implemented to study the effects of shoreline development and was not conducted in direct relationship with the Project.

82. In 2017, MWL consultants EcoLogic conducted a study to assess the appropriateness of a 1.5-foot winter drawdown (the EcoLogic study).

83. The study was conducted by Kurt Jirka, an associate scientist with EcoLogic. Mr. Jirka has a Bachelor's degree in wildlife ecology and a Master's in fisheries science. He has over thirty years of biological consulting experience.

84. The EcoLogic study only involved a qualitative review and contained no quantitative or comparative analysis. The participants observed the habitat and species composition along the perimeter of the reservoir and compiled a list of the macrophyte species observed. No data was collected regarding macroinvertebrates.

85. There is a self-sustaining population of brook trout located above the Garfield Road culvert. Below the culvert there are brook trout, brown trout, and rainbow trout populations. Adult brown and rainbow trout successfully spawn in the lower portion of the river.

86. Other species found in the Green River include: blacknose dace, creek cub, lake chub, longnose dace, Northern redbelly dace, pumpkinseed, slimy sculpin, longnose sucker, and white sucker.

87. Fisheries management goals for the Green River include management for wild brook, brown, and rainbow trout and improvement of the flow regime to provide high quality aquatic habitat for all life stages of trout.

88. Current conditions at the Green River do not meet the VWQS.

89. Historical data collected prior to the construction of the dam indicates the following monthly median flows: January 13.0 cfs, February 9.8 cfs, March 14.0 cfs, April 88.0 cfs, May 36.0

cfs, June 17.0 cfs, July 11.0 cfs, August 8.6 cfs, September 9.8 cfs, October 17.0 cfs, November 25.0 cfs, December 17.0 cfs.

90. The Green River provides relatively abundant spawning and incubation habitat for many fish species, but particularly trout species.

91. Overwintering and reproductive requirements are presently being supported by the Green River.

92. Habitat found along the Green River includes bedrock gorges, confined riffle-pools, confined step-pools, unconfined riffle-pools, and wetland channels.

93. Whitewater boating generally and boating on scheduled releases (together, whitewater boating) are existing uses of the Green River. Whitewater boating occurs year-round on both naturally occurring high flow events and scheduled releases.

94. MWL has provided two or three scheduled releases annually to support whitewater boating on the Green River. The releases last at least five hours.

95. MWL conducted a whitewater boating study to address the whitewater boating activities on the Green River. The study concluded that the minimum flow required to safely support whitewater boating is between 128 cfs and 140 cfs. A flow of 222 cfs provides the best flow level for a standard run and a flow of 280 cfs provides the best level for a highly challenging run.

96. Natural flows of 128 cfs or above have historically occurred within the Green River.

97. MWL asserts that natural high flows over 70 cfs will be passed downstream, outside of the winter drawdown and spring refill period. The water quality certification requires the passage of natural high flows over 128 cfs From June 1 to December 14. Additionally, natural high flows would be required to be passed after April 1 after the reservoir has been refilled.

98. Time shifting is when a naturally occurring high flow is stored for a period and then released. In the context of whitewater boating, this would result in the storage of natural high flows that occur when whitewater boating is unlikely to occur, such as overnight or during the weekdays, until whitewater boaters are likely to boat, such as daylight hours on the weekend.

99. In order for a time shifted release to be proper, it must account for timing, frequency, rate of change (ramping), magnitude and amplitude, and duration.

100. In 2012, Gomez & Sullivan, with ANR participation, conducted a habitat-flow study to quantitatively assess the relationship between flow and aquatic habitat for selected target organisms in the Green River. The study's scope and goals were agreed upon by MWL, ANR, and other participating and interested parties.

101. This study mapped the habitat along the river and collected data at nine transects. The transects were selected to be representative of various habitat conditions. Five of the transects were "spawning transects," which were transects identified as likely spawning areas.

102. Flows of 10, 75, and 160 cfs were observed. Depth, velocity, substrate, and cover measurements were collected at each flow.

103. Target species and life stages included: spawning, incubation, early fry, late fry, juvenile, and adult stages for brook, brown, and rainbow trout, spawning and incubation stages for longnose sucker, and macroinvertebrates.

104. The habitat-flow study produced habitat-flow curves used to determine the flows at which the maximum amount of suitable habitat was available for each life stage of the target species, together with a range of flows providing at least 80% of the maximum amount of suitable habitat potentially provided. The curves can be summarized as follows:

Species	Season	Flow maximizing WUA	WUA > 80% of max
Rainbow trout Spn & Inc	Spring	75 cfs	60-120 cfs
Longnose sucker Spn & Inc	Spring	40 cfs	30-120 cfs
Brook/Brown trout Spn & Inc	Fall/Winter	15 cfs	10-30 cfs

Species/life stage	Flow maximizing WUA	WUA > 80% of max
Trout species combined: early fry	4 cfs	4-5.5 cfs
Rainbow trout: late fry	15 cfs	10-40 cfs
Brook/brown trout: late fry	5.5 cfs	4-20 cfs

Species/life stage	Flow maximizing WUA	WUA > 80% of max	% of max WUA at		
			5.5 cfs	20 cfs	30 cfs
Brook trout juvenile	40 cfs	20-70 cfs	41%	84%	99%
Brook trout adult	70 cfs	30-150 cfs	31%	67%	83%
Rainbow trout juvenile	60 cfs	30-110 cfs	31%	68%	85%
Rainbow trout adult	80 cfs	50-130 cfs	13%	44%	62%

Exhibit I at 8-11.

105. Rapid flow fluctuations caused by hydropeaking (the shifting from low conservation flows to high generation flows) can impact fish populations through dewatering, stranding, disruption of spawning or migration, and habitat loss. These occurrences can have the largest effect on immobile species or life stages, because they cannot relocate to suitable habitat when the shifts occur.

106. ANR conducted dual flow analysis using the results of the habitat-flow study. This analysis accounts for species immobility and quantifies the remaining habitat available to a species and life stage under a peaking regime.

107. The dual flow analysis reached the following results:

Dual Flow Effective Habitat Analysis - Green River, Spawning Transects					
Species/Life Stage	Effective Habitat for the Base-Peak Flow Combination Shown, As a Percentage of Maximum Habitat (WUA)				
	5.5-75 cfs	5.5-140 cfs	10-75 cfs	30-75 cfs	30-140 cfs
Rainbow trout Spn & Inc	0%	0%	0.6%	20%	1%
Brook/brown trout Spn & Inc	6%	0%	7%	21%	4%
Longnose sucker Spn & Inc	36%	31%	52%	85%	65%
All trout - early fry	1%	0.4%	3%	8%	1%
Rainbow trout late fry	25%	9%	30%	41%	17%
Brook/brown trout late fry	37%	19%	39%	44%	25%
Brown trout adult	35%	29%	47%	76%	58%
Macroinvertebrates	3%	3%	12%	57%	49%

108. In 2017, Mr. Perry created a flow-energy model to assess how flows compare to a natural flow regime, evaluate how inputs to and from storage in the reservoir relate to hydroelectric generation, quantify changes in energy production resulting from different flow regimes, and analyze the aquatic habitat in the river. Mr. Perry employed the same methodology at the Green River as used at the Morrisville and Cadys Falls Facilities. Similarly, the flow-energy model was combined with the habitat-flow study in the same manner described above to develop a flow and habitat duration analysis. The flow and habitat duration analysis evaluated the overall habitat availability under different flow scenarios. Ms. Nealon aided in this analysis.

109. The original analysis did not include rainbow trout. An updated time series analysis was provided which analyzed the species. Both Mr. Perry and Ms. Nealon testified that their overall conclusions regarding the facility were not changed by the updated time series analysis.

110. Mr. Perry also reviewed Ms. Nealon's fish population study, USGS data, and Mr. Jirka's report.

111. Mr. Perry and Ms. Nealon observed flows of 5.5, 60, and 100 cfs.

112. Ms. Nealon walked the entirety of the Green River from the dam to its confluence with the Lamoille River. She characterized fish habitat throughout the river. The three main types of habitat in the Green River are bedrock gorge, confined valley with riffle pool habitat, and unconfined valley with wetlands adjacent to the channel.

113. Ms. Nealon observed that the Green River has good channel and bank integrity under existing conditions and observed little bank erosion and scour.

114. In 2017, Ms. Nealon conducted a fish population survey in the Green River. The fish population survey sought to gain site-specific data within the river to determine whether existing conditions met the aquatic biota and habitat requirements of the VWQS. The fish population study used the Index of Biotic Integrity (IBI) and the results of the study to evaluate the fish community.

115. The IBI looks at the structure, function, and abundance of a given fish community to determine if there are deviations between the sampled community and a reference community. The IBI does not directly address the impacts of flow.

116. Ms. Nealon used electrofishing during fish population monitoring. She selected four electrofishing stations at river mile (RM) 3.5, RM 3.2, RM 2.9, and RM 0.1. At each station, Ms. Nealon and her team conducted multiple electrofishing passes. Fish population estimates were calculated based on this. Then the Cold Water IBI (CWIBI) and Mixed Water IBI (MWIBI) were used to score each station and evaluate the health of the fish.

117. The fish population monitoring and analysis indicated that there is a self-sustaining population of native trout, there is excellent natural reproduction of fish, and there is full support of aquatic biota and habitat. All life cycle functions like overwintering and reproductive requirements are maintained and protected under existing conditions.

118. MWL concluded that current conditions in the Green River are in compliance with VWQS aquatic habitat and biota requirements.

119. The Green River Facility is currently manually operated and does not have the necessary equipment to be operated remotely. The reservoir level, however, can be adjusted remotely.

120. To comply with any new flow regime, MWL would need to install utility lines, sensors, and controls to regulate flow, including an aerator turbine.

Conclusions of Law

The purpose of the CWA "is to restore and maintain the chemical, physical, and biological integrity of the Nation's waters." 33 U.S.C. § 1251(a). In furtherance of this purpose, § 303 of the CWA directs states to develop water quality standards[10] and § 401 includes a certification process[11] for ensuring that licensed or permitted activities comply with CWA "effluent limitations or other limitations."[12] Id. § 1313(c)(2)(A). States may impose water quality standards as "other limitations" and include reasonable conditions "to assure compliance with state water quality standards." PUD No. 1 of Jefferson Cty. V. Washington Dep't of Ecology, 511 U.S. 700, 712–713 (1994) (stating that water quality standards are considered as ""appropriate requirement[s] of State Law."); S.D. Warren Co. v. Maine Bd. of Environmental Protection, 547 U.S. 370, 386 (2006).

Pursuant to § 303, Vermont has adopted the VWQS and delegated the administration of § 401 certification to ANR. In re Clyde River Hydroelectric Project, 2006 VT 11, ¶ 3, 179 Vt. 606; 10 V.S.A. §§ 1250, 1004, 1006(b) (stating that the VWQS is intended to achieve the goals set out in the CWA and the Vermont Water Pollution Control Act). As such, any § 401 certification issued in Vermont must ensure compliance with the VWQS. PUD No. 1, 511 U.S. 700; 40 C.F.R. § 121.

[10] The water quality standards include designated uses for a waterbody and the water-quality criteria necessary to support designated uses. 33 U.S.C. § 1313(c)(2)(A).

[11] CWA § 401 requires "[a]ny applicant for a Federal license or permit to conduct an activity . . . which may result into discharge to navigable waters, shall provide the licensing or permitting agency a certification" to the licensing or permitting agency. 33 U.S.C. § 1341(a)(1). Should a State or agency fail or refuse to act upon a request for certification "within a reasonable period of time (which shall not exceed one year) after receipt of such request, the certification requirements of this subsection shall be waived . . . . [and] [n]o license or permit shall be granted until the certification required by this section has been obtained . . . ." Id.

[12] State water quality standards must be approved by the U.S. Environmental Protection Agency. 33 U.S.C. § 1313; 40 C.F.R. § 131. CWA § 303 requires States to adopt water quality standards, which are considered as "other limitations." PUD No. 1, 511 U.S. 700, 712–713 (1994). "Although § 303 is not one of the statutory provisions listed in § 401(d), the statute allows States to impose limitations to ensure compliance with § 301 of the Act, 33 U.S.C. § 1311. [§] 301 in turn incorporates § 303 by reference." Id. at 713 (citing 33 U.S.C. § 1311(b)(1)(C); see also H.R. Conf. Rep. No. 95–830, p. 96 (1977), U.S. Code Cong. & Admin. News 1977, pp. 4326, 4471 ("Section 303 is always included by reference where section 301 is listed")).

ANR may also impose reasonable conditions on a permit that regulate water quantity, such as flow rate, due to its impact on water quality. Id. at 712, 719.

The CWA and VWQS require waterbodies "to achieve and maintain a level of quality that fully supports" a designated use. 33 U.S.C. § 1313(c)(2)(A). Designated uses are "those uses specified in water quality standards for each waterbody or segment." 40 C.F.R § 131.10; VWQS §§ 1-01(B)(14), 3-04(A) (defining designated use as "any value or use, whether presently occurring or not, that is specified in the management objectives for each class of water [listing water classes]"). While the CWA provides minimum standards for designated uses, it gives states discretion to identify and define designated uses. 33 U.S.C. §§ 1251(a) (noting that designations must consider and protect CWA purposes); 40 C.F.R. § 131.10.

ANR is the authorized agency tasked with identifying designated uses for waterbodies. In re Stormwater Npdes Petition, No. 14-1-07 Vtec, slip op. at 1-2 (Vt. Envtl. Ct. Aug. 28, 2008) (Durkin, J.). The VWQS designated uses are divided by class of water. See VWQS § 1-01(B)(14). In this case, the Project contains Class B waters, which include the designated use of preserving aquatic biota, wildlife, and "high quality" aquatic habitat.[13] VWQS § 3-04(A)(1). In addition, the VWQS includes an antidegradation policy, which requires that waters be managed "to protect, maintain, and improve water quality." VWQS § 1-03(A); PUD No. 1, 51 U.S. at 705 (noting that antidegradation policies protect "existing beneficial uses of navigable waters, preventing their further degradation"); 40 C.F.R. § 131.12(a) (requiring states to adopt antidegradation policies).

States also designate "existing uses" which are uses "actually attained in the waterbody on or after November 28, 1975, whether or not they are included in the standard for classification of the waters, and whether or not he use is presently occurring." VWQS § 1-01(B)(18); 40 C.F.R.

[13] Class B water designated uses also include aesthetics; public water supply; irrigation of crops and other agricultural uses; swimming and other primary contact recreational uses; and boating, fishing and other recreational use. VWQS § 3-04(A)(1)–(6). Aesthetics includes "water character, flows, water level, bed and channel characteristics, exhibiting good aesthetic value." VWQS § 3-04(A)(2).

§ 131.3(e). ANR identifies existing uses through either the basin planning process[14] or by considering five factors:

> a. Aquatic biota and wildlife that utilize or are present in the waters;
>
> b. Habitat that supports existing aquatic biota, wildlife, or plant life;
>
> c. The use of the waters for recreation or fishing;
>
> d. The use of the water for water supply, or commercial activity that depends directly on the preservation of an existing high level of water quality; and
>
> e. . . . under paragraphs (a) and (b) above, evidence of the use's ecological significance in the function of the ecosystem or evidence of the use's rarity.

Id. § 1-03(B)(1).

VWQS compliance requires satisfaction of the Hydrology Policy (§1-2(E)), the Hydrology Criteria (§3-01(C)), and the water quality criteria for Class B waters (§ 3-04(B)). The Hydrology Criteria "provide a means for determining conditions which preserve, to the extent practicable, the natural flow regime of waters." VWQS § 102(E)(1). Indeed, "any change from the flow regime shall provide for maintenance of flow characteristics that ensure the full support of uses and comply with the applicable water quality criteria." VWQS §§ 3-01(C)(1)(c), (2)(a) (considering the relationship between aquatic habitat and streamflow).

Waters must comply with the general water quality criteria as well as the applicable criteria for their class. VWQS § 3-01; VWQS § 3-04(B) (setting water quality criteria for Class B waters). The water quality criteria require "[n]o change from reference condition that would prevent full support of aquatic biota, wildlife, or aquatic habitat uses." VWQS § 3-04(B)(4). The water quality criteria also prohibit changes from conditions that would have an "undue adverse effect on the composition of the aquatic biota . . . or the species composition or propagation of fishes." VWQS § 3-04(B)(4)(d).

[14] The basin planning process requires ANR to develop a management strategy that coordinates conservation, mitigation, and remediation efforts for all fifteen major drainage basin units in Vermont. VWQS §§ 1-03(B)(1), 1-02(D)(2), (4).

Here, ANR issued a § 401 certification with conditions to MWL for the Project and MWL, AW/VPC, VNRC, and TU appealed that certification. In a § 401 certification appeal, this Court is tasked with determining whether the Project complies with the provisions of § 401 of the CWA, the VWQS, any other appropriate state law, and whether any conditions or limitations should be imposed to ensure § 401 compliance.[15] See 10 V.S.A. § 8504(h). The question in this appeal, on remand from the Vermont Supreme Court, is limited to what flow conditions at the Green River and Morrisville facilities are consistent with the Vermont Water Quality Standards (VWQS) and ANR's definition of high-quality habitat.[16]

I. High-Quality Aquatic Habitat and Antidegradation Policy Deference

An agency receives substantial deference when interpreting its own regulations and can be "overcome only by compelling indications of error." Conservation Law Found. v. Burke, 162 Vt. 115, 121, 645; In re ANR Permits in Lowell Mountain Wind Project, 2014 VT 50, ¶ 15, 196 Vt. 467 (citing In re Peel Gallery of Fine Arts, 149 Vt. 348, 351 (1988)). Indeed, "[a]bsent a clear and convincing showing to the contrary, decisions made within the expertise of such agencies are presumed correct, valid and reasonable." In re Johnston, 145 Vt. 318, 322 (1985). Any party challenging ANR's interpretation bears the burden of showing the interpretation is "wholly irrational and unreasonable in relation to its intended purpose." ANR Permits, 2014 VT 50, ¶ 17 (citations omitted); see also Plum Creek Me. Timberlands, LLC v. VT. Dep't of Forests, Parks & Recreation, 2016 VT 103, ¶ 28, 203 Vt. 197; In re Costco Stormwater Discharge Permit, 2016 VT 86, ¶ 5, 202 Vt. 564.

Absent compelling indications of error, ANR is entitled to deference as to the interpretation of the antidegradation policy in the VWQS.[17] In re Morrisville Hydroelectric Project

[15] The Supreme Court remanded "to impose conditions that comply with the VWQS and ANR's interpretation of high-quality aquatic habitat." In re Morrisville Hydroelectric Project Water Quality, 2019 VT 84, ¶ 29.

[16] Complete compliance with the VWQS requires satisfaction of the Hydrology Policy (§1-2(E)), the Hydrology Criteria (§3-01(C)), the Anti-Degradation Policy, the water quality criteria for Class B waters (§ 3-04(B)), the DO and temperature requirements, and support of the designated uses (§ 3-04(A)).

[17] The Vermont Supreme Court concluded that ANR's interpretation is reasonable and entitled to deference as it is "consistent with the purposes of the VWQS, state water-quality law, and the CWA, and accords with the rationale of the U.S. Supreme Court." In re Morrisville Hydroelectric Project Water Quality, 2019 VT at ¶ 22

Water Quality, 2019 VT at ¶ 22 (quoting In re Musto Wastewater, 2014 VT 103, ¶ 10 (citation omitted)). The purpose of the antidegradation policy in the VWQS is "to protect, maintain, and improve water quality." VWQS § 1-03(A). Under this provision, "[e]xisting uses of waters and the level of water quality necessary to protect those existing uses shall be maintained and protected regardless of the water's classification." VWQS § 1-03(B)(1).

ANR has interpreted the antidegradation policy to "mean that water quality necessary to support the water's highest and best use must be protected and that conditions cannot be imposed to 'protect' and existing use if those conditions will not provide water quality for the highest and best use." In re Morrisville Hydroelectric Project Water Quality, 2019 VT at ¶ 21.

In the same vein, ANR's interpretation of the term high-quality aquatic habitat is also entitled to deference.[18] Id. at ¶ 35. The VWQS requires that Class B waters be managed to achieve and maintain a level of quality that supports the designated use of aquatic biota, wildlife, and "high quality aquatic habitat." VWQS § 3-04(A)(1). While the term "high-quality aquatic habitat" is not defined in the VWSQ, ANR defines it as setting flow rates to provide for 80% of the maximum habitat value for the most limiting species and life stages. Id. at ¶ 31.

Here, ANR applies the most limiting habitat approach, or habitat optimization analysis, which sets habitat as a percentage of the maximum habitat observed when determining what is high quality aquatic habitat. ANR offers that, based on scientific literature, 80% is a significant threshold level, because if less than 80% of the maximum habitat value observed is provided, species may experience various stressors, resulting in a decline of fish populations.

This interpretation of high-quality aquatic habitat is reasonable as ANR: (1) "has statutory authority to enact regulations to certify compliance with the CWA and maintain water quality;" (2) implements a complex methodology for calculating high-quality habitat; (3) has consistently applied this interpretation; and (4) has an interpretation that is consistent with the CWA and VWQS purposes. Id. ¶¶ 31–39. Here, MWL has not met the high burden of overcoming

[18] An agency is entitled to deference in interpreting its own policy or terms "when: (1) that agency is statutorily authorized to provide such guidance; (2) complex methodologies are applied; or (3) such decisions are within the agency's area of expertise." In re Korrow Real Estate, LLC Act 250 Permit Amend. App., 2018 VT 39, ¶ 20, 207 Vt. 274.

deference by proving that ANR's approach was "standardless, unsupported by the evidence, or contrary to the law." Id. at 45.

Therefore, we now look to the flow conditions at the Morrisville and Green River facilities to determine whether the conditions are consistent with providing 80% of the maximum habitat value for the most limiting species and life stages.

II. Morrisville Facility

The current conditions at the Morrisville Facility primary bypass reach do not comply with the VWQS.[19] When considering whether a proposed flow rate supports high quality fish habitat, we adopt the most limiting habitat approach. This approach seeks to provide sufficient habitat for the most sensitive life state of the target species. In this case, the limiting habitat species is adult rainbow trout.

ANR contends that a conservation flow of 70 cfs in the primary bypass reach at the Morrisville facility is required to provide high-quality aquatic habitat and one inch of water depth to be spilled over the dam spillway for aesthetic purposes. ANR applied the most limiting habitat approach in reaching this calculation. The calculation required that the minimum conservation flows must provide adult rainbow trout with at least 80% of the amount of suitable habitat that is available. ANR's calculation notes that flows below 70 cfs do not satisfy ANR's interpretation of high-quality aquatic habitat and increase stress levels on the target species. Moreover, ANR argues that the analysis of high-quality aquatic habitat is limited to consideration of the flows required to provide adult rainbow trout with high-quality habitat. It therefore omits general observations, such as the composition of substrate as lacking gravel or cobble, cover, and the presence of a 15 foot waterfall, which have no bearing on the target species.

MWL asserts a flow of 43 cfs with no required spillover is sufficient. A flow rate of 43 cfs would provide 67% of the maximum habitat preserved for the most limiting species, adult rainbow trout. When analyzing the habitat provided by a natural flow regime, 79% of habitat is

[19] The Morrisville Facility primary bypass reach currently operates at 12 cfs. The Morrisville secondary bypass reach is not at issue in this appeal.

provided for adult brook and brown trout, 70% for adult rainbow trout, 94% for juvenile brook and brown trout, and 76 % for juvenile rainbow trout.

MWL argues that this Court's factual findings in our Decision on the Merits support ML's proposed flow conditions and is entitled to deference. In light of the Supreme Court's decision, however, which directs this Court to reinstate flow conditions consistent with ANR's definition of high-quality aquatic habitat, this Court's prior factual findings considering substrate composition and trout spawning and incubation holds little relevance to ANR's definition of flow conditions need for high-quality aquatic habitat. Here, the Supreme Court approved the ANR's metric that assesses only flow conditions necessary for the protection of the most sensitive species' life stages. Id. at 41.

This Court is bound by deference to ANR's interpretation of high-quality habitat to find that 70 cfs would support high-quality aquatic habitat. As such, we are inhibited from engaging in any balancing of interests or social and economic factors, however reasonable, as there is no basis that ANR's interpretation of high-quality aquatic habitat is "standardless, unsupported by the evidence, or contrary to the law." Id. at 45. Thus, in order to comply with the Vermont Supreme Court decision in this matter, we must "reinstate'" ANR's flow conditions of 70 cfs for the Morrisville Facility as it is consistent with ANR's definition of high-quality habitat and VWQS." Id. at ¶ 28 n.9.

III. Green River Facility

The current conditions at the Green River Facility primary bypass reach do not comply with the VWQS. As this facility, which operates in store and release mode, utilizes a fluctuating flow rate schedule based upon the season and relevant drawdown in the reservoir. The current flow structure allows for maximum generation flows of 283 cfs and 160 cfs at various times of the year. The Green River Facility maintains a large reservoir behind the dam and operates in store and release mode.[20] The Green River also currently sustains abundant fish populations including brook and brown trout.

[20] "From May to October, the reservoir is permitted a maximum fluctuation of one foot and the water levels must be managed for recreation and loon nesting habitat. During the winter, from December 30 to April 1, MWL is

a. High-quality Aquatic Habitat

Here, ANR imposed multiple conditions reflecting the Facility's fluctuating flow schedule that results in a 111% habitat availability. First, the seasonal conservation flows operate at levels to protect habitat for the target species.[21] Second, the water quality certification also imposes maximum generation flow conditions on a seasonal basis.[22] The purpose of ANR's conditions are to address flow fluctuations from peak flows and apply a dual flow analysis that identifies the maximum percentage of habitat available in different base-peak flow combinations for each immobile life stage of target species. See VWQS § 3-04(B)(4) (noting that water quality certification provides protection to sensitive life stages and critical life cycle functions in target species). ANR notes that, as a store and release facility, Green River is especially vulnerable to significant evaporation rates, must manage limited allocation of water supply between the reservoir and riverine environments, and must allow for natural high flows. [23] VWQS § 3-01(C).

MWL's proposed flow schedule would increase habitat availability from 76% to 95%. MWL also suggests a seasonal flow regime that incorporates seasonal minimum downstream flows that requires downstream flows to match inflow if inflows are less than the enumerated flow

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permitted have a winter drawdown of ten feet. The reservoir must be refilled by May 1. The minimum downstream flow year-round is 5.5 cfs. From May to October, the maximum generation flow is 160 cfs and from November to April the maximum generation flow is 283 cfs." In re Morrisville Hydroelectric Project Water Quality, No. 103-9-16 Vtec at 53 (Sept. 18, 2018).

[21] The conditions include: (1) a minimum downstream flow of inflow, 5.5 cfs, or 7 cfs from June 1 to September 30 (summer) based on drawdown; (2) a minimum downstream flow of inflow, 7 cfs, or 10 cfs based on drawdown from October 1 to December 15 (fall); (3) flows of inflow, 6 cfs, or 8 cfs, based on drawdown from December 16 to March 31 (winter); and (4) flows of 15 cfs, 30, cfs, 60 cfs, or inflow based on the refilling of the reservoir from the winter drawdown and general drawdown in the reservoir from April 1 to May 31 (spring). Id.

[22] The condition requires: (1) a maximum generation flow of 0 cfs, unless is greater than 60 cfs, in which case, MWL must match the inflow, from June 1 to December 15; (2) the a maximum generation flow of 110 cfs, or inflow if inflow exceeds 110 cfs, from December 16 to March 31; (3) a maximum generation flow of 0 cfs, unless inflow is greater than 60 cfs, in which case, a maximum of 60 cfs is required until the reservoir is refilled after the winter drawdown from April 1 to May 31; and (4) if inflows exceed 60 cfs, MWL generation flows must match the inflow. Id.

[23] ANR relied upon the PHABSIM Gomez & Sullivan flow study, which indicates consistent and lower flows support high-quality aquatic habitat. The study also developed habitat and flow relationships for the target species at different life stages. Id.

rate in the seasonal schedule.[24] MWL also submitted alternative conditions that include a seasonal maximum reservoir fluctuation of 0.25 feet,[25] a maximum winter drawdown of 6 feet,[26] and a required refill of the reservoir by May 1 with a post-refill maximum fluctuation of 0.25 feet.

Given the intent of the CWA and VWQS in providing high- quality aquatic habitat and discouraging uses or activities that degrade water quality, we conclude that ANR's proposed flow regime supports the designated use of aquatic biota, wildlife, and aquatic habitat, consistent with the VWQS and ANR's interpretation of high-quality aquatic habitat. In re Morrisville Hydroelectric Project Water Quality, 2019 VT at ¶ 25, 28 ("Given that the statute delineates specific circumstances when water quality can be degraded, ANR's position—that the statute did not intend to allow degradation generally in support of existing uses—is reasonable."). Here, we are directed by the Supreme Court to forgo a balancing approach in favor of deference to ANR's interpretation that the CWA and VWQS do not allow promoting or protecting a use that degrades water quality. Id. at ¶ 28.

b. Hydrology Policy

The VWQS Hydrology Policy provides that the VWQS "in conjunction with other applicable law, provide a means for determining conditions which preserve, to the extent *practicable*, the natural flow regime of waters." VWQS § 1-02 (emphasis added). This management "requires careful consideration of the interruption of the natural flow regime" and impacts resulting from dams. Id. The VWQS, however, does not define the term "practicable." Id.

MWL interprets "practicable" in the same manner as the Vermont Wetland Rules, which define the term as "available and capable of being done after taking into consideration logistics, existing technology and cost in light of overall project purpose." See Morrisville Water & Light Brief on Remand at 4, filed Apr. 14, 2020 (citing Vermont Wetland Rules, Vt. Code of Regulations 12004056, §2.28). MWL argues that practicability should consider the dam's characteristics,

[24] The seasonal minimum downstream flows are as follows: (1) 7 cfs from June 1 to September 30; (2) 10 cfs from October 1 to December 15; (3) 8 cfs from December 16 to March 31; and (4) 60/30 cfs from April 1 to May 31.

[25] This maximum reservoir reduction would occur from June 1 to December 15.

[26] The winter drawdown would occur from December 16 to March 31 and will be determined annually based upon snowpack measurements.

complexity of conditions, and the dam's inability to perform emergency generation and the requisite routine capacity testing. MWL contends that ANR's conditions do not satisfy the Hydrology Policy definition of what is "practicable."

In contrast, ANR's interpretation of the term "practicable" is limited to the preservation of a natural flow regime and does not take into account social or economic considerations. ANR notes that protecting risks to water quality is contrary to the purpose of the VWQS and CWA.

As stated above, we owe deference to ANR's interpretation of policy or terms when: "(1) that agency is statutorily authorized to provide such guidance; (2) complex methodologies are applied; or (3) such decisions are within the agency's 'area of expertise.'" Korrow Real Estate, LLC, 2018 VT 39, ¶ 20 (citation omitted). The Supreme Court has directed that when interpreting VWQS, ANR is entitled to this deference, to be overcome only by a "compelling indications of error." In re Morrisville Hydroelectric Project Water Quality, 2019 VT 84, ¶ 35 (requiring MWL to show that ANR's interpretation is wholly irrational and unreasonable in relation to its intended purpose").

Here, ANR's interpretation is consistent with the state's overall water policy, which seeks to protect, engage in a "long term upgrade," and reduce existing risks to water quality. See 10 V.S.A. § 1250. Moreover, ANR's interpretation aligns with the purpose of the CWA that state water quality standards "enhance the quality of water." 33 U.S.C. § 1313(c)(2)(A); PUD No. 1, 511 U.S. 700 (prioritizing the importance of protecting designated uses over a reduction in hydroelectric power generation); Morrisville Hydroelectric Project Water Quality, 2019 VT at ¶ 27–28. In addition, given that the VWQS specifically provides for economic considerations in the antidegradation policy and for high-quality waters, the interpretation that the statute did not intent to allow consideration of these factors generally is reasonable. VWQS § 1-03(C); see 40 C.F.R. § 131.3(n) (referring to 40 C.F.R. § 131.12(a)(2)(ii)). We therefore conclude that ANR's interpretation of the term "practicable" is reasonable and entitled to deference.

Thus, this Court is again bound by the directive of the Supreme Court to "reinstate" the flow conditions at the Green River Facility that are consistent with the VWQS and ANR's definition of high-quality aquatic habitat.

The reinstated ANR flow regime includes a complex regime of conditions necessary to protect target species' habitats and balance water supply in the watershed. First, the conditions institute a seasonal maximum reservoir fluctuation. Fluctuations are limited to 0.25 feet between June 1 and December 15 and is to be refilled by May 1.[27] Once refilled, the reservoir would be permitted maximum fluctuations of 0.25 feet.

Second, the conditions require: (1) a minimum downstream flow of inflow of 5.5 cfs or 7 cfs from June 1 to September 30 and 7 cfs or 10 cfs from October 1 to December 15, based upon their respective seasonal drawdowns; (2) flows of inflow of 6 cfs or 8 cfs from December 16 to March 31, based upon drawdown; and (3) flows of 15 cfs, 30, cfs, 60 cfs, or inflow based on the refilling of the reservoir from the winter drawdown and general drawdown in the reservoir from April 1 to May 31.

Third, the conditions include maximum generation flows of: (1) 0 cfs from June 1 to December 15, unless flow is greater than 60 cfs in which case inflow is matched; (2) 110 cfs or inflow, if the inflow exceeds 110 cfs, from December 16 to March 31; and (3) 0 cfs from April 1 to May 31, unless inflow is greater than 60 cfs. If inflow is greater than 60 cfs from April 1 to May 31, a maximum of 60 cfs is required until the reservoir is refilled after the winter drawdown. In addition, should the inflows exceed 60 cfs, MWL generation flows must match the inflow.

Conclusion

For the reasons detailed above, we find that ANR's flow rates for the Morrisville and Green River Facilities are consistent with the VWQS and ANR's definition of high-quality aquatic habitat. As we are bound by the directive of the Supreme Court, we reinstate ANR's flow rates

[27] In addition, the Supreme Court's decision affirmed this Court's holding that ANR's maximum winter drawdown condition of 1.5 feet between December 16 and March 31 be imposed. In re Morrisville Hydroelectric Project Water Quality, 2019 VT 84, at ¶ 56.

with respect to the Morrisville and Green River Facilities. A Judgment Order accompanies this decision. This completes the current proceedings before the Court.

Electronically signed on August 26, 2020 at 09:44 AM pursuant to V.R.E.F. 9(d).

Thomas G. Walsh, Judge
Superior Court, Environmental Division