



JANET T. MILLS
GOVERNOR

STATE OF MAINE
DEPARTMENT OF ENVIRONMENTAL PROTECTION



MELANIE LOYZIM
COMMISSIONER

TESTIMONY OF
BRIAN KAVANAH, DIRECTOR
BUREAU OF WATER QUALITY
MAINE DEPARTMENT OF ENVIRONMENTAL PROTECTION

SPEAKING IN OPPOSITION OF L.D. 676

AN ACT TO RECLASSIFY PART OF THE ANDROSCOGGIN RIVER TO CLASS B

SPONSORED BY SENATOR CLAXTON

BEFORE THE JOINT STANDING COMMITTEE
ON
ENVIRONMENT AND NATURAL RESOURCES

DATE OF HEARING:

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Senator Brenner, Representative Tucker, and members of the Committee, I am Brian Kavanah, Director of the Bureau of Water Quality at the Department of Environmental Protection. I am speaking in opposition to L.D. 676. This is the same position the Department has taken on similar bills in 2011 and 2013. While I really wish I could be here speaking in support of the bill, after evaluating all the issues as outlined in my testimony, the Department did not believe that would be an appropriate position to take.

First, I want to commend the many individuals and organizations that are advocating for the Androscoggin River today. They have dedicated a tremendous amount of time and resources to

AUGUSTA
17 STATE HOUSE STATION
AUGUSTA, MAINE 04333-0017
(207) 287-7688 FAX: (207) 287-7826

BANGOR
106 HOGAN ROAD, SUITE 6
BANGOR, MAINE 04401
(207) 941-4570 FAX: (207) 941-4584

PORTLAND
312 CANCO ROAD
PORTLAND, MAINE 04103
(207) 822-6300 FAX: (207) 822-6303

PRESQUE ISLE
1235 CENTRAL DRIVE, SKYWAY PARK
PRESQUE ISLE, MAINE 04769
(207) 764-0477 FAX: (207) 760-3143

monitor the river, provide public educational events, and advocate for improvements in water quality. Their work is important, and the Department appreciates all their efforts.

Secondly, I want to recognize that the Department understands the important symbolism of the Androscoggin River and its place in the development of the Clean Water Act through Senator Edmund Muskie. The Androscoggin River is an incredible example of how badly we as a society can abuse our natural resources given that this was once one of the most highly polluted rivers in the country. But, it is also an incredible example of how good policy, proper regulation, and the work of many, can make tremendous improvements in water quality. The Androscoggin River now has very good water quality, vastly different from the bad old days of rafts of foam and fish kills, and we can all be proud of that.

I also want to note that my written testimony and supporting material is extensive at 16 pages. Obviously, I will not be reading all my testimony today, but I hope that you can read it to fully understand the issues I will summarize today, and to assist you with the discussions at the work session. It is extensive because the issue of reclassifying a river like the Androscoggin is a very important policy decision and it is a legally and technically complex issue. The role of the Department in this issue is to provide you with the most complete and accurate information that we can so that you can make a fully informed decision. My full written testimony includes background information on important issues related to L.D. 676 including water quality standards, the waste discharge permitting process, water quality modeling, and the legislative history of similar proposals to upgrade the lower Androscoggin.

In the interest of time I'll summarize the Department's position with the expectation of more detailed discussion at work session. Water classifications are essentially a directive to the Department on how to manage the water quality. The Department has historically supported upgrades where we see a path forward to ensure that the classification can be fully attained, with reasonable controls, under critical water quality conditions established in law. Based on our evaluation of all the information available to us we don't see a clear path forward to ensure that happens. What we do see is that a reclassification would likely create significant regulatory uncertainty.

I encourage you to carefully consider the additional details in the Department's full written testimony, as well as all the other testimony you will receive. I'm happy to answer any questions now or at the work session.

Thank you.

Additional Testimony on L.D. 676, An Act to Reclassify Part of the Androscoggin River to Class B

Some important issues to consider include:

1). This is not a new issue. This issue has been considered several times since at least 2009 by the Department, the Board of Environmental Protection, and the Legislature. The Department reluctantly opposed an upgrade in all of the previous proceedings for many of the same reasons summarized below. In addition, at the request of interested parties, the Department is currently evaluating the same proposal via the Triennial Review Process which is a public process, including a comment period and public hearing, whereby changes in water quality standards are evaluated by the Department and the Board of Environmental Protection (BEP). As a result of that process it is possible the BEP may, or may not, recommend to the Legislature in the second session a reclassification of the Lower Androscoggin.

2). Reclassification upgrades are likely permanent. It is relatively easy to upgrade a waterbody. The legislature can do that with a simple vote. However, the requirements of the Clean Water Act and state law make it extremely difficult to downgrade a waterbody's classification. Therefore, you should consider any decision to upgrade a waterbody as if it is permanent. To be clear, none of the potential issues raised in the Department's testimony prevent the legislature from upgrading the Lower Androscoggin. Neither, are you obligated by law to approve this upgrade. This is a policy decision and you can vote on whatever you believe to be the best policy for the state.

3). Each classification sets in motion specific legal requirements. You may hear the classification system described as a goal-based or aspirational system. That is true, but only in limited sense. It is a goal in that the legislature can upgrade a waterbody's classification even if it is not currently meeting all of the requirements for that higher classification. The Department believes it is more accurate to consider a waterbody's classification as a directive to the Department on how to manage that waterbody in relation to a variety of interconnected requirements of the Clean Water Act and state law. These interconnected requirements include: licensing of existing discharges such as

municipal wastewater treatment facilities and industries, licensing of any new or increased discharges, water quality certification and licensing of dams, and regulatory actions that must be taken if water quality standards are not met. The specifics of these regulatory requirements are established in federal and state laws and rules, are not discretionary, and are driven largely by the classification of a water body. To be clear, none of the potential implications to these, or other regulatory programs, prevent the legislature from upgrading the Lower Androscoggin. However, the Department recommends that you understand and consider the potential implications of these programs as part of a fully informed decision making process.

4). There are significant differences between the criteria for Class C and Class B waters. The most significant difference between these classifications is that Class C waters have a dissolved oxygen criterion of 5 parts per million (ppm). Class B has a higher dissolved oxygen criterion of 7 ppm. The Class B criterion is harder to attain. 5 ppm implies a reasonable amount of assimilative capacity, whereas 7 ppm implies very little assimilative capacity. A summary comparison of the two classes is shown below:

Comparison of Class B and Class C Water Quality Standards				
Class	Dissolved Oxygen	Bacteria (<i>E.coli</i>)	Habitat	Aquatic Life (Biological)
B	Not less than 7 ppm; or 75% of saturation.	May not exceed geometric mean of 64/100 ml over 90-day interval or 236/100 ml in more than 10% of samples in any 90-day interval from 4/15 to 10/31.	Habitat for fish and other aquatic life; unimpaired.	Support all aquatic species indigenous to the receiving water; no detrimental changes to the resident biological community.
C	Not less than 5 ppm; or 60% of saturation.; 30-day avg. 6.5 ppm.	May not exceed geometric mean of 100/100 ml over 90-day interval or 236/100 ml in more than 10% of samples in any 90-day interval from 4/15 to 10/31.	Habitat for fish and other aquatic life.	Support indigenous fish; maintain the structure and function of the resident biological community.

5). Water quality in the lower section of the Androscoggin River is significantly influenced by water quality in the upper section of the Androscoggin River. 97% of the water in the lower section of the river originates by flowing over or through the Gulf Island Dam at the upper boundary of the river section proposed for reclassification. The proposed upgrade of the lower section to Class B would require the lower section to have a dissolved oxygen level of 7 ppm. The upper section of the river is classified as C which requires a dissolved oxygen level of only 5 ppm. While the actual dissolved oxygen level of water flowing over or through the Gulf Island Dam is often higher than 5 ppm, there are currently no regulatory controls in place that require it to be higher than 5 ppm. If the lower Androscoggin is upgraded to Class B the Department will be required to establish regulatory controls in waste discharge licenses, and potentially future water quality certifications for the Gulf Island Dam, to ensure the water flowing over or through the dam meets the 7 ppm dissolved oxygen criterion.

6). The upper section of the Androscoggin is unique. Water quality in the upper Androscoggin above Gulf Island Dam is influenced by the discharges from 3 paper mills (Gorham, NH; Rumford; and Jay,) and the presence of the Gulf Island Dam which creates a large deep impoundment. Attainment of Class C standards is met through a combination of water quality-based discharge limits on the paper mills and the injection of oxygen into the river approximately 2.5 miles above the dam. The oxygen injection is managed through the Gulf Island Pond Oxygenation Partnership (GIPOP) as specified in the mill's discharge licenses and the Gulf Island Dam water quality certification. The necessity of oxygen injection to attain water quality standards is extremely rare and is only used in a few other locations nationally.

7). If the lower Androscoggin is upgraded to Class B the Department will be required to lower existing discharge limits on certain discharges above Gulf Island Dam. The Department can only issue a waste discharge license if a finding can be made that the discharge, either by itself or in combination with other discharges, will not lower the quality of the waterbody below its classification, during critical low flow river conditions as specified in law. We are aware that the mill discharges above Gulf Island Dam can influence dissolved oxygen levels all the way to Gulf Island Dam and potentially beyond. Through water quality modeling we have evaluated potential reductions to license limits and requirements for instream oxygen injection that would ensure water flowing over or through the dam

meets 7 ppm of dissolved oxygen. There are a variety of license limit allocation scenarios that are possible, and the final limits would be derived through a formal licensing process. An example allocation based on a 54% reduction in biochemical oxygen demand (BOD₅) limits for all three mills is summarized below.

Example reduction in BOD₅ limits that would be required to ensure water flowing over or through Gulf Island Dam contains 7 ppm of dissolved oxygen during critical low flow (7Q10) river flows. Reductions based on a 54% reduction for limits for all three mills.

Facility	Current Permit Limit lbs/day weekly avg. (June 1 - Sept. 30)	New Permit Limit lbs/day weekly avg. (June 1 - Sept. 30)	Actual discharge for last 3 years at 95th percentile
Pixelle (Jay)	6,400	2,944	1,700
Nine Dragons (Rumford)	12,500	5,750	7,800
White Mountain Paper Co. (Gorham, NH)	10,298	4,737	5,000

8). Water quality in the lower section of the Androscoggin is also influenced by activities and discharges in the watershed of the lower section. If the lower Androscoggin is upgraded to Class B the Department will be required to lower existing discharge limits on certain discharges. The Lewiston Auburn Water Pollution Control Authority (LAWPCA) is the wastewater treatment facility that serves Lewiston and Auburn. To address the predicted impacts of the LAWPCA discharge on dissolved oxygen levels, a BOD₅ limit reduction of 33% is expected to be required.

Facility	Current Permit Limit lbs/day weekly avg.	New Permit Limit lbs/day weekly avg. (June 1 - Sept. 30)	Actual discharge for last 3 years at 95th percentile (June 1 - Sept. 30)
LAWPCA	5,329	3,570	1,800
	Current Permit Limit lbs/day monthly avg.	New Permit Limit lbs/day monthly avg. (June 1 - Sept. 30)	Actual discharge for last 3 years at 95th percentile (June 1 - Sept. 30)
	3,553	2,380	1,000

It is noted that a potential regionalization project to eliminate the Sabattus wastewater treatment facility and send the wastewater from Sabattus to LAWPCA is in the preliminary discussion phase. If

completed this project would eliminate the Sabattus wastewater discharge to the Sabattus River. It is expected that the elimination of this discharge would improve water quality in a ten-mile segment of the Sabattus River from Sabattus to the Androscoggin River. It is possible the potential for this project to proceed would be diminished if the limits for LAWPCA are reduced by 33%.

In addition, at a dissolved oxygen criterion of 7 ppm under critical conditions there is essentially no assimilative capacity remaining in the river. This condition would likely prohibit any new or increased discharge that requires a waste discharge license.

9). Water quality in the lower section of the Androscoggin may also be influenced by dams in the lower section. The following dams exist in the section proposed for reclassification and are subject to relicensing requirements of the Federal Energy Regulatory Commission (FERC) and water quality certification requirements of the Department. Relicensing begins with a 3-to-5 year pre- application consultation process during which applicants, agencies and other interested parties identify environmental issues, address information needs, and explore mitigation options. Any necessary studies are then conducted, and a draft application is prepared for review and comment. At this point it is unclear if a reclassification would affect relicensing or water quality certifications for these dams.

Dam	Owner	License Expiration
Gulf Island Dam	Brookfield	2036
Deer Rips/Andro 3	Brookfield	2036 (with Gulf Island Dam)
Lewiston Falls Dam	Brookfield	2026
Worumbo Dam	Eagle Creek	2025
Pejepscot Dam	Brookfield	2022
Brunswick Dam	Brookfield	2029

10). In closing, from the Department's perspective, this is a complex issue. Some reclass proposals are relatively simple and straightforward. This one is not. Department staff have spent a significant amount of time analyzing and discussing the legal and technical issues in relation to this upgrade. Our intent is to provide you with the most complete and accurate information that we can so that you can make a fully informed decision. But some of the legal and technical issues related to the potential implications of this reclassification could be interpreted differently by the Department, the Environmental Protection Agency, interested parties in a waste discharge licensing proceeding, interested parties in a dam relicensing proceeding, and the Board of Environmental Protection and the courts if licensing decisions were challenged on appeal. The Department does not see a clear path forward to ensure Class B water quality standards would be attained under the conditions required by law. Therefore, an upgrade to Class B would likely cause significant regulatory uncertainty.

The table below summarizes the issues discussed above:

Comparison of Issues for Current Class C and Proposed Class B for Lower Androscoggin River		
Issue	Class C	Class B
Environmental benefit / changes in water quality. (See “Comparison of Class B and Class C Water Quality Standards” table above in #4 for full comparison of classes.)	Class C meets all requirements of CWA and state law. It allows lower dissolved oxygen levels, higher bacteria levels, and more impacts to habitat and aquatic life than Class B.	Class B meets all requirements of CWA and state law. Requires higher dissolved oxygen levels, lower bacteria levels, and less impacts to habitat and aquatic life than Class C.
Current attainment relative to Class.	Fully attains Class C by meeting or exceeding minimum requirements of all criteria.	Attains Class B most of the time. Projected to not meet Class B dissolved oxygen criteria during critical conditions of low flow and high temperature.
Remaining assimilative capacity for dissolved oxygen under critical conditions of low flow and high temperature.	Approximately 1.6 ppm.	Approximately 0 ppm.
Potential regulatory impacts to new or increased discharges that require a waste discharge license.	Due to remaining assimilative capacity, new or increased discharges could be allowed if antidegradation requirements are met by demonstrating important social or economic benefit.	The lack of remaining assimilative capacity would likely prevent any new or increased discharges.
Potential regulatory impacts to current licensed discharges in upper and lower river.	None. Current license limits ensure attainment of Class C standards and all discharges currently meet license limits.	Significant reduction of license limits for BOD ₅ would be needed for mills in Gorham, NH; Rumford; and Jay, and a 33% reduction for LAWPCA to ensure attainment of Class B dissolved oxygen criteria. Regulatory uncertainty for all dischargers is likely.
Potential regulatory impacts to dams.	None known.	Uncertain.

Additional background information related to L.D. 676, An Act to Reclassify Part of the Androscoggin River to Class B

Water Quality Standards:

State water quality standards (standards) are generally established pursuant to Maine law, including provisions in Maine's water classification program, 38 M.R.S. §§464-470. Standards are comprised of the following three components: designated uses, criteria, and an antidegradation policy. Standards may be established in law or rule and must be consistent with the Clean Water Act and approved by the Environmental Protection Agency.

Designated uses are the uses specified in law that water quality must support such as supporting aquatic life and human activities, such as swimming and fishing. They are used to determine water quality criteria, which must protect designated uses and serve as the basis for water quality-based discharge permit limits. The following are the designated uses specified at 38 M.R.S. §465 for Class B and C waters. Most uses are similar. Differences in uses are underlined.

- **Class B:** drinking water supply after treatment; fishing; agriculture; recreation in and on the water; industrial process and cooling water supply; hydroelectric power generation, except as prohibited under Title 12, section 403; navigation; and as habitat for fish and other aquatic life. The habitat must be characterized as unimpaired.
- **Class C:** drinking water supply after treatment; fishing; agriculture; recreation in and on the water; industrial process and cooling water supply; hydroelectric power generation, except as prohibited under Title 12, section 403; navigation; and as a habitat for fish and other aquatic life.

Water quality criteria are limits on conditions in a water body. Criteria protect particular designated uses, such as habitat for fish and other aquatic life, recreation, and drinking water supply. Criteria can be expressed as acceptable levels (constituent concentrations) or as narrative statements.¹

For context, as a percentage, Maine's rivers and streams are classified as follows:

Class	%
AA	6.3
A	47.2
B	45.4
C	1.1

¹ See 38 M.R.S. §§465.3 and 465.4 for a full description of the statutory criteria in those provisions applicable to Class B and C waters.

The Class C waters are generally located in areas with a relatively large population and/or industrial base relative to the size of the water body. All the rivers below the remaining six pulp and paper mills are classified as Class C for at least some portion of the river. These are the St. John, St. Croix, Androscoggin, Kennebec, and Presumpscot.

The state's Antidegradation Policy, 38 M.R.S. §464.4.F, addresses among other things protection of water quality for existing uses, protection of high-quality waters, and Outstanding National Resource Waters.

The following provision found at 38 M.R.S. §464.4.F.4. has been previously discussed in the context of a reclassification of the lower Androscoggin River.

“When the actual quality of any classified water exceeds the minimum standards of the next highest classification, that higher water quality must be maintained and protected. The board shall recommend to the Legislature that that water be reclassified in the next higher classification.”

The Department recognizes that under certain conditions, and in certain locations, the lower Androscoggin River meets the criteria for Class B waters. However, the Department's long-standing interpretation of 38 M.R.S. §464.4.F.4. is that it must generally be read in the full context of the water quality laws including the sections of law that establish the conditions under which a discharge may be licensed.² The Department's interpretation is where any criterion of water quality (for example, dissolved oxygen) exceeds the minimum standards of the next highest classification under critical water quality conditions, then that higher water quality criterion must be maintained and protected. Critical water quality conditions include, but are not limited to, conditions of low flow, high water temperature, and licensed loading from point source discharges.

This interpretation does not consider a wastewater discharge to be an existing use, but it does recognize the legal condition that exists when a waste discharge license is issued. In addition, it recognizes the findings that the Department had to make to issue any waste discharge license, in particular the finding that, “The discharge, either by itself or in combination with other discharges, will not lower the quality of any classified body of water below such classification.”³ This finding is based in part on the critical flow condition specified at 38 M.R.S. §464.4.D, “Except as otherwise provided in this paragraph, for the purpose of computing whether a discharge will violate the classification of any river or stream, the assimilative capacity of the river or stream must be computed using the minimum 7-day low flow that can be expected to occur with a frequency of once in 10 years.”

² See DEP Antidegradation Waste Discharge Program Guidance, June 13, 2001, prepared in consultation with EPA, the DEP Division of Environmental Assessment, and the Maine Attorney General's Office.

³ 38 M.R.S. §414-A.1.A.

Based on the above, the Department's position remains that 38 M.R.S. §464.4.F.4. does not require the Board of Environmental Protection (BEP) "recommend to the Legislature that that water be reclassified in the next higher classification" solely based on monitoring data that is not representative of critical conditions. However, the Legislature is not precluded from enacting a reclassification if it chooses to do so.

Permitting Process:

The Department is authorized by the Environmental Protection Agency (EPA) to implement the waste discharge licensing requirements of the Clean Water Act. The Department also implements the waste discharge licensing requirements established in Maine law at 38 M.R.S. §§411-424-B. and 38 M.R.S. §464.4., and various Department regulations.

As specified at 38 M.R.S. §464.4.A.8., the Department may not issue a waste discharge license for, "Discharges for which the imposition of conditions cannot ensure compliance with applicable water quality requirements of this State or another state". This is an important requirement when a reclassification is being evaluated. Licenses that contain discharge limits that currently ensure attainment of Class C criteria, may not be adequate to ensure Class B criteria are attained under the conditions required by law. If that is the case, the license limits would need to be made more stringent to ensure the new Class B criteria can be attained. In some cases, depending on the specific conditions of the water body, it may not be possible to create a licensed condition that ensures attainment of a higher classification. As explained below, this is the situation with the Androscoggin River.

The important summary of the above is that a reclassification to a higher class creates legally binding licensing requirements that must be met. These are not only goals, they also carry legal requirements. Also, in water bodies that are not attaining their classification, the licensing of any new or increased discharge would be prohibited if the discharge would contribute to the non-attainment. It is highly recommended that the Legislature fully understands any new licensing requirements that will be imposed on any discharge prior to a reclassification decision being made.

History of Lower Androscoggin Reclassification Requests:

- 2009 – During a water reclass review process the Department made recommendations to the BEP to not upgrade the Lower Androscoggin due to lack of data. The Lower Androscoggin was not included in the BEP upgrade recommendations to the Legislature. The Friends of Merrymeeting Bay testified in favor of the upgrade during a public hearing on the reclassification bill. The Legislature requested the Department conduct necessary studies "to determine if the section of the Androscoggin River from Worumbo Dam in Lisbon Falls to the line formed by the extension of the Bath-Brunswick boundary across Merrymeeting Bay in a northwesterly direction meets, or can reasonably be expected to meet, the criteria for reclassification from Class C to Class B."
- 2010 – The Department completed river sampling.

- 2011 – The Department completed *Lower Androscoggin River Basin Water Quality Study Modeling Report (March 2011)*. The Report findings did not support reclassification as there was not an identified way to ensure that the more stringent dissolved oxygen standard of 7 mg/L for Class B could be met even with the complete elimination of the wastewater discharges from the Lewiston Auburn Water Pollution Control Authority (LAWPCA) and the Town of Lisbon.⁴
- 2011 - L.D. 154, *An Act to Change the Classification of the Lower Androscoggin River*. The Department testified in opposition to this L.D. based on model results. The bill was placed in Legislative files (DEAD) pursuant to Joint Rule 310.3.
- 2013 - L.D. 845, *An Act to Change the Classification of the Lower Androscoggin River*. The Department testified in opposition to this L.D. based on model results. The ENRC voted ONTP 11-2 and ultimately the bill was not passed.
- 2018 – Statewide reclassification proceedings. The Department recommended to the BEP that the lower Androscoggin River not be included with upgrade reclassifications for ten other water bodies. (In addition to the lower Androscoggin, the Department also did not recommend two other water bodies for upgrade). The BEP agreed with this recommendation.

Department Water Quality Models for the Upper and Lower Androscoggin River:

Water quality models are computer models that use inputs of water quality monitoring data, discharge data, and various input parameters to simulate and predict water quality conditions under various scenarios. They are very useful to determine potential attainment status when considering a change in water classification. Models can be used to simulate attainment status of water quality criteria such as dissolved oxygen at critical conditions that are required as part of the waste discharge licensing process. The models used by the Department are developed and supported by EPA.

The Department has developed two water quality models for the Androscoggin River. The upper Androscoggin model was completed in 2005 and was used as the basis for the issuance of renewal waste discharge licenses for discharges in the upper Androscoggin from New Hampshire to Gulf Island Dam, and for the relicensing of the Gulf Island Dam in 2005.

The lower Androscoggin model was developed in 2011 as noted above.

⁴ See additional discussion of model findings below under the heading Department Water Quality Models for the Upper and Lower Androscoggin River.

Upper Androscoggin Model

The upper Androscoggin is Class C from the confluence with the Ellis River at Rumford Point to the Gulf Island Dam. One of the primary issues with the 2005 relicensing process was the non-attainment of the dissolved oxygen criterion in the lower portions of the impoundment (Gulf Island Pond) created by Gulf Island Dam and non-attainment with the designated use of “recreation in and on the water” due to periodic algal blooms within the pond. This licensing process was the most technical and legally complex waste discharge licensing process the Department has ever undertaken. In the end, renewal permits were issued to the pulp and paper mills in Jay and Rumford and the municipal wastewater facility in Livermore Falls, and a water quality certification was issued for Gulf Island Dam that included various water quality-based limits and operating conditions that would allow Class C criteria to be met.

An important aspect of this process was the finding that the Class C dissolved oxygen standard could not be attained without the use of an instream oxygenation system. This system is in the upper reaches of Gulf Island Pond (at upper and lower narrows) and injects oxygen into the water column from June 1 – September 30. This type of “in stream” treatment system is extremely rare. There are no other systems like it in Maine and very few others in the country. Under federal and state regulations, it can only be used to meet water quality based limits if, among other things, the technology-based treatment requirements are not sufficient to achieve the standards, and the alternative selected has been demonstrated to be a preferred environmental and economic alternative to achieve the standard after consideration of alternatives such as advanced treatment, recycle and reuse, land disposal, changes in operating modes and other available methods.

The findings of this model are explained in the Department reports: *Androscoggin River Total Maximum Daily Load – Final (May 2005)* and *Addendum to the Androscoggin River 2005 Total Maximum Daily Load (May 2010)*.

The findings of these documents are important to any discussion of upgrading the lower Androscoggin because the water that flows from Gulf Island Pond into the lower Androscoggin contributes 97% of the boundary condition flow for any modeling of the lower Androscoggin. It is important to note that as a Class C water the upper Androscoggin is only required to attain the criterion of 5 ppm for dissolved oxygen. There are currently no regulatory controls in place to ensure it attains higher than 5 ppm. In order to ensure a boundary condition of 7 ppm dissolved oxygen flowing over or through the dam signification reductions in license limits for the three mills would be required. An example of these reductions is summarized in the #7 of the Department’s testimony.

Lower Androscoggin Model

Important findings of the lower Androscoggin model that indicate there is no feasible approach to ensure attainment of proposed Class B dissolved oxygen criteria include:

Within the lower section of the river, during critical low flow conditions, 97% of the flow is from the main stem of the river (Class C), 2.5% is from the Little Androscoggin River (Class C), 0.4% is from the Sabattus River, and 0.1% is from the Little River.

The increased depth, volume, and decreased velocity in the impoundments diminish the reaeration rate and depress the overall dissolved oxygen concentration. These impoundments also create slow moving segments that accumulate organic sediment, which also decreases the dissolved oxygen concentration.

During critical water quality conditions of low river flow, high water temperature, and maximum licensed discharge from the Publicly Owned Treatment Works, the model predicts dissolved oxygen concentrations will be below the Class B criterion of 7.0 mg/L in eight of the twelve river segments from the confluence with the Little Androscoggin River in Auburn to the Brunswick-Topsham Dam. Predicted dissolved oxygen concentrations were below the Class B criterion of 7.0 mg/L for all segments from the Worumbo Dam to the Brunswick-Topsham Dam. This model run was based on the least conservative measured dissolved oxygen boundary condition of 7.69 mg/L. When using a modeled dissolved oxygen boundary condition of 7.0 mg/L all twelve segments indicate non-attainment. When using the most appropriate boundary condition of 5.0 mg/L that reflects the current Class C dissolved oxygen criteria of the upper Androscoggin and the Little Androscoggin River that comprise the boundary condition, all twelve segments indicate non-attainment, with five of the segments more than 0.5 mg/L below the Class B criteria. Non-attainment is primarily driven by periphyton respiration during non-daylight hours. (Periphyton are algae that grow attached to submerged objects such as logs, rocks, plants and debris.)

The river sampling showed a nutrient loading from sources upstream of the study area. A separate model run was performed to assess the effect of these upstream sources relative to the point source discharges within the study area. After completely removing the discharges from the Lewiston-Auburn Water Pollution Control Authority and the Lisbon Wastewater Treatment Facility, the water quality model predicted dissolved oxygen concentrations would still be below the Class B criterion of 7.0 mg/L in two of the twelve fresh water river segments based on the least conservative measured dissolved oxygen boundary condition of 7.69 mg/L.

While the sampling data showed nutrient loading from sources upstream of the study area, these loads are not considered excessive. 39 of the 42 phosphorus samples taken during the 2010 sampling period indicate phosphorus levels below the numeric ambient criteria for Class B waters the Department is considering for rulemaking. The diurnal swings in dissolved oxygen of approximately 1 mg/L driven by periphyton respiration during non- daylight hours are also not considered excessive.

Summary:

In summary, the existing models provide enough information to support the Department's previous assessment that there is no practical approach to ensure attainment of Class B dissolved oxygen criteria in the lower Androscoggin River under critical low flow conditions. Based on these studies, the Department does not recommend that the lower Androscoggin River be upgraded to Class B at this time.