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TECHNICAL REVIEW MEMORANDUM
Bureau of Water Quality

TO: Billie J. MacLean, Project Manager – Land Use Planning Commission
FROM: Jeff Dennis, Biologist -- Division of Environmental Assessment, Bureau of Water Quality
DATE: June 6, 2019
RE: Review of Fish River Concept Plan Phosphorus Control Language

This memorandum provides a review of the updated Fish River Concept Plan Phosphorus Control Language, particularly the language in section 10.32, as presented in a May 29, 2019 letter from Noel Musson, Noel Musson Group, to Tim Beaucage, Land Use Planning Commission. This updated language is the culmination of years of discussion between representatives of Irving Corporation consultants, LUPC staff and DEP Division of Environmental Assessment staff. The goal of these discussions has been to ensure that activities within the Plan Area will not cause or contribute to a perceivable increase in trophic state, and thus a violation of water quality standards, of Long Lake, Mud Lake or Square Lake and to insure that activities within the Plan Area will not result in worsening of the current water quality violations in Cross Lake. The following excerpt from a December 7, 2017 memo from DEP to LUPC is included to give a context for these discussions.

Excerpt begins:

Background

Water Quality. The water quality standards for Maine lakes require that they have a stable or decreasing trophic state, subject only to natural fluctuations, and must be free of culturally induced algal blooms that impair their use and enjoyment. Of the four lakes included in the proposed plan (Long Lake, Mud Lake, Cross Lake and Square Lake), only Cross Lake fails to meet these standards. Cross Lake has for many years supported mid-summer blue green algal blooms that reduce measured secchi disc transparency, in most years, to 2.0 m or less. Long Lake is a productive lake that, in past years has supported algal blooms, but is currently exhibiting a promising trend of decreasing trophic state. Mud Lake is a productive lake with an apparent stable trophic state, though little water quality data has been collected on the lake in recent years. Square Lake is a moderately productive lake with a stable trophic state.

While the principle reason for impairment of Cross Lake is inputs of phosphorus from agricultural activities located primarily in the Dickey Brook watershed, runoff from roads and harvesting operations also contribute to the problem. Any additional phosphorus load to the lake has the potential to increase the duration and intensity of the algal blooms, so any new phosphorus sources or expansion of existing phosphorus sources should be treated with particular care.

The Phosphorus Standard and the General Standard. The Chapter 500 Stormwater Management Rules require that any project disturbing one acre or more of land and creating 20,000 sq ft or more (in Most at Risk Lake watersheds) or one acre or more (in all other lake watersheds) of new impervious area either meet the Phosphorus Standard or the General Standards. The goal of both of these standards is to insure management and treatment of stormwater runoff sufficient to avoid significant cumulative impacts to downstream lakes. If a project in a lake watershed requires a Site Law permit, it is required to meet the Phosphorus Standard; the option of meeting the General Standard is not available.

The General Standards require that BMPs of approved type and sizing be incorporated such that they provide treatment for runoff from at least 95% of the project's impervious area and at least 80 % of the project's Development Area. There are several possible exceptions to this, the most significant one dealing with linear portions of the project (i.e. roads). For a linear portion of the project the area required to be treated may be reduced to no less than 75% of the linear portions impervious cover and no less than 50% of its Development Area. All projects are treated the same regardless of the nature of the waterbody to which they drain.

Under the Phosphorus Standard, the amount of phosphorus mitigation and/or stormwater treatment required for a given project is a function of the size of the parcel, the per acre phosphorus allocation for the lake watershed in which the project is located and the potential for the project to export phosphorus in its stormwater. Per acre phosphorus allocations are determined for each lake in a three step process: (1)an allowable increase in phosphorus load to the lake is estimated based on the hydrologic sensitivity of the lake to phosphorus loading, the water quality of the lake and its potential to recycle phosphorus from its sediments and to support cold water fisheries; (2)the area within the watershed that over time will be subject to development is predicted based on the anticipated growth rate in the watershed and the amount of land available for development; and (3)the allowable increase in phosphorus load (lbs P/yr) is divided by the expected area of growth in acres to get the per acre phosphorus allocation (lbs P/acre/year). To determine the phosphorus budget for a project (the Project Phosphorus Budget, PPB) the per acre allocation for the watershed is multiplied by the acreage of the parcel being developed. The project design must then incorporate enough appropriate mitigation measures and/or stormwater treatment BMPs to prevent the projects projected phosphorus export (PPE) from exceeding the project's phosphorus budget. Low density projects in relatively less sensitive watersheds are required to do less stormwater management and treatment than high density projects in sensitive watersheds.

The goal of this methodology is to provide protection sufficient to avoid increase in the lake's trophic state, and to distribute the burden of this protection over the watershed and over time, thus allowing for the maximum development potential within any watershed. This strategy works best in watersheds where most of the new sources of phosphorus are associated with development activities that are subject to regulation and required to meet some version of this standard. In watersheds with other significant, and potentially expanding, phosphorus sources (i.e. agriculture, harvesting roads) account for a substantial portion of the threat to the lake's water quality, the Phosphorus Standard is not likely to provide sufficient protection unless some of the allowable increase in phosphorus load is reserved for these un- or under-regulated sources.

Strategies for protecting lakes in Concept Plan type development. In the southern, more developed part of Maine the activity that is likely to result in increased phosphorus loading to lakes is watershed development, especially development that includes roads and other transportation infrastructure (i.e. parking, driveways, etc.). Usually this type of development is regulated, at least at the local level, and the parcels on which the development takes place are relatively small, not much more than is required for the proposed development. In this situation implementation of the Phosphorus Standard is likely to be effective. In LUPC jurisdiction, especially in cases of Concept Plan and Planned Development districts, this is not the case. The parcels involved are very large, orders of magnitude bigger than that required for the proposed level of development, and, unlike in the more developed portions of the state, may encompass large parts of, or even the entire watershed of the lake(s) involved. In this case the owner of the land involved in the Concept Plan or Planned Development has complete control of what happens on these lands, and the plan poses a course of management and development that will avoid unacceptable impacts to natural resources. Since the landowner controls much if not all of the watershed it seems reasonable to allocate an appropriate portion of the allowable increase in lake phosphorus loading, call it the Plan's phosphorus budget, to the owner, and let him or her decide how that allocation should be applied within the Plan area, provided that the total net addition of phosphorus to the lake associated with activities in the Plan area does not exceed the Plan phosphorus budget.

This is the strategy that was applied in both the Saddleback Plan and the Plum Creek Plan. In the case of Saddleback, it has worked well, with Saddleback's consultants keeping track of the magnitude of additional phosphorus sources from new development projects as well as the reduction of phosphorus export resulting from retrofitting stormwater management BMPs on many existing, grandfathered sources. As long as the net increase phosphorus load does not exceed the Plan phosphorus budget, Saddleback is in compliance with its Plan requirements. In the case of Saddleback, most, if not all of the potential increased phosphorus load to the lake is associated with new development activities that were regulated under the plan, so there was no issue of not dealing with other potential uncontrolled sources in the watershed.

When we at DEP were initially questioned about the Fish River Lake Concept Plan, we suggested the same strategy be applied, but with a recognition that much of the potential for future phosphorus sources is associated not with proposed development activities, but with unregulated road construction and enhancement servicing harvesting operations. The following table is one developed in 2012 by DEP staff and Conway Elkins, who was working with Irving at the time. It presents a phosphorus allocation proposal where the plan's phosphorus budget is based on the percentage of the lakes' watersheds that were within the plan area, and where a significant portion of the budget was reserved for future harvesting activity and for other potential uncontrolled future sources.

Fish River Chain of Lakes										Net Increase		Net Increase		% of	
P Allocation Discussion Meeting 1/19/12										due to	due to New	Allocation	Remaining		
Lake	Phosphorus allocated to total direct watershed per ppb in lake (lbs) [F]	Acceptable increase in lake's phosphorus concentration in ppb [C]	Allowable increase in annual phosphorus load to the lake (lb/year) [FC]	Direct Watershed per Town Pak (acres)	Direct Watershed per GIS (acres)	Irving Ownership in Direct Watershed per GIS (acres)	Irving Ownership in Direct Watershed per GIS (%)	Possible Irving Allocation for Direct Watershed (lb/yr)	Proposed Development	Roads since 2000	Used	Allocation	Remaining		
Long Lake	707	0.75	530.25	48,260	49,450	19,449	39%	208.55	9.67	52	29.6%	146.88			
Mud Lake	115.5	1.00	115.5	7,502	7,404	6,651	90%	103.75	3.28	17	19.5%	83.47			
Cross Lake	398	0.50	199	34,654	37,267	15,392	41%	82.19	19.05	3	26.8%	60.14			
Square Lake	728	0.75	546	44,558	48,402	40,613	84%	458.14	22.39	58	17.5%	377.75			
								852.63	54.39	130	21.6%	668.24			

This table is very similar to Table 3 on page 10 in the Shoreland Criteria section (Question #14) of Volume 1 (Part C) of the Concept Plan shown below.

**TABLE 3
PHOSPHOROUS EXPORT BY DEVELOPMENT AREA ON/ADJACENT TO EACH LAKE**

Lake	P allocated to total dir. watershed per ppb in lake (lbs) [F]	Acceptable increase in lake P conc. in ppb [C]	Allowable increase in ann. P load to lake (lbs/year) [FC]	Direct Watershed per GIS (acres)	Irving Ownership in Direct Watershed per GIS (acres)	Irving Ownership in Direct Watershed per GIS (%)	Possible Irving Allocation for Direct Watershed (lbs/yr)	Net Increase due to allowed Development	Net Increase due to New Roads since 2000	% of Allocation Used	Remaining Allocation
Long	707	0.75	530.25	49,450	19,449	39%	208.55	14.02	52	31.7	142.53
Mud	115.5	1	115.5	7,404	6,651	90%	103.75	0.58	17	19	84.07
Cross	398	0.5	199	37,267	15,392	41%	82.19	21.3	3	30.5	57.14
Square	728	0.75	546	48,402	40,613	84%	458.14	22.39	58	17.5	377.75
TOTALS							852.63	58.29	130	22.4	662.24

The strategy discussed above works well in the case of the Saddleback Planned Development District in part because Saddleback is the developer of each of the projects implemented under the plan. They therefore determine how much of their available phosphorus budget will be applied to the project (the magnitude of the project and the level of stormwater management applied to it), and have an understanding of what remains available for future projects. In the proposed Fish River Concept Plan a different development process is involved. Rather than acting as the developer of the proposed Development Areas, Irving plans to sell the Development Areas to other entities to develop as they intend within the limitations (e.g. number of lots) described in the plan. Another difference is that LUPC no longer has jurisdiction over Site Law projects in the Unorganized Territories. They are now handled by DEP, and will be required to meet the phosphorus allocation for the parcel being permitted. Unless Irving is willing to decide up front how much of the Concept Plan’s phosphorus budget is allocated to each Development Area and include that in the sales agreement and deed restrictions, the buyers will not know the potential for development in the area they are purchasing, and the DEP will not know what the phosphorus budget is for the parcel.”
Excerpt ends.

The initial draft of the concept plan, to which the above cited December 7, 2019 memo was responding, presented draft annual phosphorus budgets for Irving’s share of each of the lake’s direct watersheds (column 8 in Table 3). These were 208.55 lb P/yr for Long Lake, 198.75 lb P/yr for Mud Lake, 82.19 lb P/yr for Cross Lake and 458.14 lb P/yr for Square Lake, and they were the same as originally provided by DEP. The bulk of the December 7th memo was devoted to an evaluation of the likely annual phosphorus export that would result from full build out of the Development Areas as allowed under the draft plan. This analysis indicated that for Long Lake, Mud Lake and Square Lake there was more than enough room in the annual phosphorus budgets to accommodate both the allowed development in the Plan’s Development Areas and the likely increase in phosphorus export from new or enhanced activities outside of the Development Areas, even if no clearing restrictions or treatment of stormwater runoff were required. Cross Lake, which in part because of its relatively poor water quality has a smaller budget, was more problematic. The memo stated: “If all proposed lots in the Development Areas in the Cross Lake watershed were developed without restrictions or treatment increase in phosphorus load to the lake would exceed the plan’s phosphorus budget, even without taking into account all the increases in phosphorus export that would likely occur over time within the Concept Plan area but outside of the Development Areas.”

As a result of this analysis, most of the rest of the discussions/negotiations have been devoted to Cross Lake, in particularly to (A) defining the amount of the Cross Lake annual phosphorus budget that could be applied to development in the designated Development Areas, and, by difference, the amount that would be reserved for harvesting related and other activities within the Concept Plan area but outside the Development Areas, (B) a process for allocating and distributing available phosphorus export within the Development Areas and tracking its consumption as development occurs for all of the lake watersheds and (C) a process that ensures that activities outside the Development Areas within the Cross Lake watershed do not result in more phosphorus export than that which has been reserved for them.

A. Cross Lake Phosphorus Budget

In a memo dated April 9, 2013 to Jeff Dennis (DEP/DEA) from Pat Clark, a Stantec engineer working on the Concept Plan, Mr. Clark proposed, after presenting a detailed analysis, that 55.5 lb P/yr be applied to regulated development projects in the Development Areas and that 26.7 lb P/yr be reserved for unregulated activities outside of the Development Areas. DEP staff evaluated Mr. Clark's proposal in a memo dated April 30, 2018 to Billie MacLean, LUPC and concluded that the 26.7 lb P/yr reserved for unregulated activities was not adequate. An excerpt from that memo explaining the reasons for this conclusion is presented below.

Excerpt begins:

"Stantec identifies the exact amount of new (7.9 miles) and upgraded (2.1 miles) harvesting road construction that the petitioner plans to implement in the Cross Lake watershed portion of the Concept Plan area. It also anticipates that as many as 8 non-plan house lots are likely to be developed in this area after the Plan expires, and even identifies likely locations for these house lots. The estimated export from these activities is 26.35 lb. P/yr., and this is the amount that the petitioner proposes to reserve for future non-plan activities. The difference between this amount and the phosphorus budget (82.19 lb. P/yr. – 26.35 lb. P/yr. = 55.84 lb. P/yr.) would then be the amount available for Concept Plan development. Regardless of the memo's detailed estimates of future export from each of the Plan development areas, the land owner could allocate this amount to the development areas in any way they want, as long as the available budget is not exceeded. It is even possible for the land owner to eliminate existing phosphorus sources (e.g. discontinue and revegetate some existing roads) to gain credit that would allow more phosphorus allocation to be applied to these developments.

The most critical portion of this evaluation is the determination of the amount of phosphorus export that will be reserved for future unregulated and unevaluated non-plan phosphorus generating activities in the Concept Plan area, because this determines how much is available for regulated and evaluated Concept Plan development.

We generally agree with Stantec's assessment of the likely export from the Concept Plan development activities with only a few concerns discussed below which are not critical because these values are only advisory. We do however have significant disagreement, also discussed below, with the assessment of likely future export from anticipated non-plan activities and the amount of phosphorus export that would be reserved for these activities.

Concept Plan Development

1. *As stated in the Stantec memo the assumptions on which the export from residential lots are based are conservatively high. The export estimates assume typical single family lot development with significant lawn area and house area. We agree that it is likely that much of the development that occurs in the development areas is likely to be less intense than this, with relatively less total disturbance of the landscape and less phosphorus export. Although there is no way of guaranteeing this, we think it is likely that the export associated with development of the proposed 125 house lots in the five residential development areas will, if anything, be less than the amount estimated in the memo.*

On the other hand, the assumptions about the level of development that will happen in the community and economic development areas are very low, and if strictly adhered to (i.e. if the allocation for these areas were based on these estimates) the potential for significant development would be severely limited. The export estimates for these areas assume only 5,000 sq. ft. of roof, 5000 sq. ft. of parking and 7,000 sq. ft. of lawn for each lot. A typical convenience store, for example, would likely have more roof area and much more paved or gravel parking and delivery access; and any kind of light industry (e.g. a vehicle maintenance facility) would likely have even more Development Area.

2. *All of the above estimates assume that no measures (e.g. clearing restrictions, stormwater treatment buffers) that would mitigate phosphorus export from these lots and the associated roads will be incorporated in the development of these areas. Such measures were not included because it was recognized that it would be difficult for LUPC to insure the proper implementation and maintenance of these measures. However, there may be instances where incorporation of such measures is appropriate, resulting in potentially significant reduction in the export from the development areas.*
3. *The export associated with development of these areas will be determined when the developments are designed and submitted to LUPC for approval, or, alternatively, when Irving assigns an allocation of phosphorus export to the parcel before it is sold to the developer. If the net density and intensity of development proposed is less than that assumed in Stantec's calculations or if mitigation measures are incorporated, the export could be less, perhaps significantly less, than the memo's estimate of 55.46 lb. P/yr.*

Non-Plan Activities

4. *Stantec bases its calculation of the amount of P allocation that should be reserved for non-plan activities on a long-range harvesting road plan which indicates that 7.9 miles of new harvesting road will be created and 2.1 miles of harvesting road will be upgraded, and on an assumption that, after the Concept Plan expires, 8 new single family house lots will be developed. The memo also indicates that Irving plans to decommission 2.0 miles of harvesting roads, but does not incorporate the associated reduction of phosphorus export into the estimate. As stated above, the resulting phosphorus export that would be reserved for non-Plan activities is 26.35 lb. P/yr.*
5. *We are concerned that the 26.35 lb. P/yr. value may significantly underestimate the new phosphorus load to the lake that would likely be associated with implementation of the planned harvesting road activities for the following reasons.*

- a. *The estimates of export from new and upgraded harvesting roads assume only 0.6 lb. P/acre/yr. from the 10 foot cleared area on either side of the road. This is only appropriate if these areas are well vegetated (either planted or naturally revegetated) and not subject to significant erosion. If it is likely that at least some of these areas may be functioning as ditches and, in the long term, not have sufficient vegetation to avoid erosion, a higher export factor, perhaps two or three times as high, should be applied to a portion of these areas. As a possible counter to this, it is also possible that some sections of new road will drain, intentionally or not, in unconcentrated flow into adjacent buffer areas, thus reducing export from these areas. Without more knowledge of actual site conditions and road layout it is impossible to say whether the net result of these qualifiers will be a greater or lesser export than that estimated for the anticipated new harvesting roads.*
- b. *More importantly, the estimate of export from new and upgraded harvesting roads includes a reduction of export of 25% from the road surface and 50% from the cleared area on either side of the road. The justification for this comes from the LUPC exception cited in the memo, but use of these reductions when calculating phosphorus export in this context is not appropriate. The standard cited (LUPC Chapter 10.25.L.3.d) applies to regulated projects that are incorporating the alternative buffer standard. These roads will not be regulated and implementation of the alternative buffer standard is not proposed for these harvesting roads, and, even if it was, there would be no justification for incorporating these reductions into estimates of phosphorus export. If these inappropriate reductions are eliminated the estimated phosphorus export from planned harvesting road construction and upgrades will be 35.87 lbP/yr. as opposed to the 24.03 lbP/yr. in the Stantec memo. The following is a revision of the table in the Stantec memo that reflects this revised estimate:*

Export for anticipated non-plan activities

17 possible new logging roads

41,750 LF x 14' (584,500 sf; 13.42 ac) x 1.75 = 23.48 lbs

41,750 LF x 20' (835,000 sf; 19.17 ac) x 0.6 = 11.5 lbs

3 road upgrades

11,100 LF x 2' (22,200 sf; 0.51 ac) x 1.75 = 0.89 lb

Total P export from all roads = 35.87 lbs

Exempt house lots (future)

*8 new single family house lots = 8 x 0.29 = **2.32 lbs***

*Total Cross Lake P export from unregulated non-Concept Plan Sources = 38.19 lbs**

6. *Stantec indicates that Irving intends to decommission and revegetate 2.0 miles of existing harvesting roads. If this occurs, it could result in as much as 5.21 lb. P/yr. of phosphorus export mitigation credit. This credit could be used to offset any non-plan activities above and beyond those included in the above calculations, or it could be applied to Concept Plan development.*

7. *Except for a possible phosphorus credit that could be gained by the decommissioning and revegetation of 2.0 miles of harvesting roads, the phosphorus budget for non-Plan activities leaves no allocation for any activities other than the planned harvesting road construction and the eight single family house lots. Is Irving committing to limiting non-Plan activities to only these? If so, for how long and via what mechanism?*

The implication of the above is that, based on the petitioner's expressed intentions for new harvesting road construction, upgrades of existing harvesting roads, and potentially 8 new single family lots, the amount of phosphorus export that is reserved for non-concept plan activities should be no less than 38.19 lb. P/yr., and it should be recognized that this would leave no room for any other future non-plan activities unless mitigation credits from the decommissioning of existing roads or elimination of other existing sources was made available for such activities.

Concluding Remarks

As stated above, based on the petitioner's expressed intentions the amount of phosphorus export reserved for future non-Plan activities should be no less than 38.19 lb. P/yr. If this amount is agreed upon, then the maximum amount of phosphorus export available for allocation to the planned development areas defined in the Concept Plan, absent any mitigation credit, would be 44.00 lb. P/yr. This could be allocated in any way that the petitioner wants. While the amount is significantly less than the 55.46 lb. P/yr. estimated in the Stantec memo, it still could allow, under a variety of scenarios, a level of development activity equivalent or at least similar to that proposed in the Plan. These scenarios, however, might limit the intensity of development in the community and economic development areas; reduce the density of the residential developments; incorporate some measures for mitigation of phosphorus export (e.g. clearing restriction, stormwater buffers) in the development design; or utilize mitigation credits gained by elimination of existing sources of phosphorus. Any scenarios would be acceptable that limit the total net phosphorus export from Concept Plan activities to 44.00 lb./yr. Neither the details of these scenarios, nor the allocation of export between the various development areas need be ironed out at this stage, if there is agreement on the amount of phosphorus available for Concept Plan development activities and there is a framework defined for keeping track of the remaining available phosphorus export allocation as Plan development activities are approved and implemented."

Excerpt ends.

In accordance with the maximum value given in the concluding remarks above, Paragraph 10.32.B.1.c in the Plan sets the portion of the phosphorus budget that can be applied to new development within Plan Development Areas, including new or expanded roads to access such development that are not within Development Areas, called the "Cross Lake Development Area Phosphorus Budget", at 44.00 lb P/yr. The remaining 38+ lb P/yr is reserved for future activities and/or development outside of the Plan Development Areas and is called the "Remaining Cross Lake Phosphorus Budget". The combination of these allocations should limit the increase in phosphorus contribution from Irving's holdings in the direct watershed of Cross Lake sufficiently to prevent a perceivable increase in the lake's trophic state (its ability to support algal biomass).

B. Allocating and tracking available phosphorus export within the Plan Development Areas

Section 10.32.C.1 and 3 of the Concept Plan defines the process by which the petitioner will allocate portions of the available phosphorus budget for Plan Development Areas to various development projects. Upon conveyance of land the petitioner must determine the amount of annual phosphorus export that is allocated to the conveyed parcel, thus defining the Project Phosphorus Budget for development on that parcel. It also defines a process for reallocating unused allocation to other projects. This applies to all four lake watersheds.

In order to ensure that the phosphorus budget for Plan Development Areas is not exceeded, Section 10.32.B.2.a requires the petitioner to keep records on the allocation of phosphorus to each project, the date, location, size and a description of the project, and the calculated phosphorus export from the project.

C. Managing activities in the Cross Lake watershed that are not within Plan Development Areas

Conveyance of Land. In order to address conveyance of land outside of the Cross Lake Development Areas, paragraph 10.32.C.2 requires the Petitioner or owner to, at the time of conveyance of any land within the Plan Area that is within the Cross Lake watershed, identify what portion of the Remaining Cross Lake Phosphorus Budget, if any, is being allocated as part of the transaction. The total phosphorus allocations for the Development Areas plus all other activities in the Cross Lake watershed shall not exceed the Cross Lake Phosphorus Budget.

Mitigation. In order to allow the petitioner to earn additional phosphorus allocation in the Cross Lake Development Area Phosphorus Budget, the Concept Plan provides a limited opportunity for mitigation of significant existing sources of phosphorus in the non-Development Area portions of the plan area. Mitigation is allowed only for projects that eliminate the source and return the site to natural condition.

Section 10.32.D defines the process for earning mitigation credits. The determination of how much credit is earned will be based, where appropriate, on the procedure for calculation of mitigation credits in Chapter 5 of the Phosphorus Control Manual. However, in some if not most cases the export coefficients in the Manual will not be representative of the land uses being mitigated, in which case the DEP will determine the most appropriate way of estimating the amount of phosphorus reduction associated with the mitigation project.

If the petitioner wishes to claim a mitigation credit for phosphorus export reduction, Section 10.32.B.2.b requires that the petitioner maintain records for calculating phosphorus export from development, new or upgraded land management roads and new or upgraded landings in Development Areas and non-development areas. The Commission will only certify the credit if the Petitioner can demonstrate that the cumulative calculated phosphorus export from all development, land management roads and landings in the non-development areas of the Cross Lake watershed, and all land management roads and landings in the Development Areas, that were developed or upgraded after April 9, 2018 is no more than 35.87 pounds per year (10.32.D.3).

Conclusion

The goal DEP had in its participation in the development of the phosphorus allocation and control measures in the Concept Plan has been to limit phosphorus contributions from the Plan area sufficiently to prevent perceivable increase in the trophic state of the Concept Plan lakes. The Plan limits the amount of additional contribution to levels that should meet this goal provided:

1. Phosphorus loading from activities on portions of the watershed not controlled by Irving do not increase significantly;
2. All aspects of the plan are adhered to;
3. Actual construction and maintenance of development within the Development Areas adheres to the requirements of the specific permits under which they are developed;
4. Irving's estimate of future land management and other activities outside of the Development Areas is accurate and is not exceeded; and
5. Harvesting activities (e.g. clear cuts) within the watersheds are no more intense than those that have been applied in recent decades in the watersheds. Concentration of intense forestry practices in the watershed of any single tributary to any of the Plan lakes could alter the contributing watershed's hydrology and, during large, intense storms expose the stream channel to unnaturally high flows resulting in extreme erosion of the stream channel and its banks. The eroded soil could carry large amounts of phosphorus to the downstream lake – phosphorus inputs that have not been accounted for in the allocations adopted in the Plan.