



PAUL R. LEPAGE  
GOVERNOR

PAUL MERCER  
COMMISSIONER

**TECHNICAL REVIEW MEMORANDUM**  
*Bureau of Water Quality*

**TO: Billie J. MacLean, Project Manager – Land Use Planning Commission**  
**FROM: Jeff Dennis, Biologist and David A. Waddell, Asst. Env. Eng. -- Division of Environmental Assessment, Bureau of Water Quality**  
**DATE: April 30, 2018**  
**RE: Response to Stantec 04/09/18 Cross Lake Phosphorus Export Memo**

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The purpose of this memorandum is to respond to the April 9, 2018 memo from Pat Clark, a Stantec engineer working on the Fish River Concept Plan proposal, that assesses future phosphorus export to Cross Lake from Irving’s ownership within the lake’s direct watershed in relation to the available phosphorus budget for that portion of the watershed.

**Stantec’s Evaluation**

Stantec recognizes that the Cross Lake watershed is the only lake watershed within the proposed Fish River Concept Plan area where the increase in annual phosphorus load to the lake that would result from both the development proposed in the plan and likely future non-plan activities could potentially exceed the available phosphorus budget (82.19 lb. P/yr.) for the lake. The memo evaluates “the phosphorus export that could be generated from two main sources:

- anticipated development that would be permitted within areas identified as appropriate for future development within the Plan Area (Development Areas or Development Zones), and
- potential future unregulated, non-Concept Plan activities (e.g. new logging roads, upgrades to existing roads, and additional house lots within the watershed after the plan expires).”

The memo summarizes this detailed evaluation and concludes that “The total export from all residential and community development within the Cross Lake watershed (*Concept Plan development areas*), after considering the residential unit cap, will not exceed the PB (*phosphorus budget*) for the lake while still allowing some reserve budget capacity for off-site and unregulated activities not associated with the development areas. As a result, the water quality of the lake will be protected.”

Stantec’s evaluation is based on the premise that the annual phosphorus budget (the acceptable increase in annual phosphorus load to Cross Lake) from land within the Concept Plan area is 82.19 lb. P/yr. and that the sum of future increases in phosphorus export from both plan related development activities and non-plan activities should not exceed this budget.

The assertion stated above that the phosphorus budget will not be exceeded is based on very detailed estimates of phosphorus export from each of the Concept Plan residential development areas (adjusted to reflect the limitation of a total 125 new lots for all of the Cross Lake areas); from the Concept Plan community and economic areas; and from anticipated future non-plan activities (7.9 miles of new harvesting roads, 2.1 miles of harvesting road upgrades and 8 exempt house lots). The following is a summary from the memo of the results of this detailed evaluation:

### **Cross Lake Export for all Concept Plan Developments w/ Residential Unit Cap**

Total P export (full-build) from all residential areas (does not include A-1) = 74.73 lbs (185 units)

Maximum residential unit cap = 125 units

$(52.15 + 20.86) \times (125/185) + 1.73 = \mathbf{51.06 \text{ lbs}}$  (max. export with cap)

This assumes that approximately 2/3rds of the roads envisioned for the full build-out scenarios would be constructed to achieve the residential unit cap of 125 units.

Total P export from all community/economic development areas

0.72 lb (CD-3) + 3.68 lbs (CD-4) = **4.40 lbs**

**Total P export to Cross Lake for all Concept Plan developments (PE) = 55.46 lbs**

Total Phosphorus Budget (PB) to Cross Lake = 82.19 lbs/yr

$PB - PE = 82.19 - 55.46 = \mathbf{26.73 \text{ lbs (32.5\%) = budget reserved for unregulated sources}}$

and

### **Export for anticipated non-plan activities**

#### 17 possible new logging roads

$41,750 \text{ LF} \times 14' \text{ (584,500 sf; 13.42 ac)} \times 1.75 \times 0.75 = 17.61 \text{ lbs}$

$41,750 \text{ LF} \times 20' \text{ (835,000 sf; 19.17 ac)} \times 0.6 \times 0.5 = 5.75 \text{ lbs}$

#### 3 road upgrades

$11,100 \text{ LF} \times 2' \text{ (22,200 sf; 0.51 ac)} \times 1.75 \times 0.75 = 0.67 \text{ lb}$

**Total P export from all roads = 24.03 lbs**

Exempt house lots (future)

8 new single family house lots =  $8 \times 0.29 = \mathbf{2.32 \text{ lbs}}$

**Total Cross Lake P Export From unregulated Non-Concept Plan Sources = 26.35 lbs\***

Since the sum of the Concept Plan development sources and the non-plan sources ( $55.46 \text{ lbP/yr} + 26.35 \text{ lbP/yr} = 81.81 \text{ lbP/yr}$ ) is less than the phosphorus budget ( $82.19 \text{ lbP/yr}$ ) the memo concludes that the phosphorus budget for the Concept Plan area will not be exceeded by planned and anticipated development.

## **Comments and Concerns**

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 developed 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.



PAUL R. LEPAGE  
GOVERNOR

STATE OF MAINE  
DEPARTMENT OF  
ENVIRONMENTAL PROTECTION



PAUL MERCER  
COMMISSIONER

Memorandum

To: Tim Beaucage, Land Use Planning Commission  
From: Jim Beyer, Department of Environmental Protection  
Subject: Irving’s Concept Plan Comments, Zoning Petition #768

In response to your request for comments on Allagash Timberlands, LP, Aroostook Timberlands, LLC and Maine Woodlands Realty Company’s (collectively “Irving”) petition to the Land Use Planning Commission for approval of a Concept Plan for development in several townships in and around Cross Lake Township. No specific plans have been developed so far for individual developments within the Concept Plan area, however some of those developments may trigger the Site Location of Development Law (Site Law) (38 M.R.S. § 483-490). For the projects that do trigger the Site Law, the Department will be the lead permitting agency. The LUPC would provide a certification that the project is an allowed use and that for those standards not reviewed by the Department, the project meets the LUPC’s requirements. The following are some of the projects that trigger Site Law jurisdiction:

1. Subdivisions where **all** lots are for single-family detached residential housing which consist of 15 or more lots on 30 or more acres of land in any five-year period.
2. All other subdivisions consisting of 5 or more lots on 20 or more acres of land in any five-year period.
3. A development project which consists of 3 or more acres of area that is stripped, graded and not revegetated.
4. Other developments which occupy a land area more than 20 acres, such as golf courses or campgrounds.

It should be noted that the existing lease lots are considered grandfathered and sale of additional land to make those lots larger is considered sale to an abutter and exempt from the Site Law. My comments are limited to those projects that require a Site Law permit and are in the order for which they will be addressed at the upcoming public hearing.

Topic 1: Access and Impacts to Existing Camp Owners:

Roads which access developments that require a Site permit will be considered part of the development from the point where the public road ends and a private road begins up to the point where that road enters the development. The developer of the project, assuming it is not Irving, will need to have sufficient title, right, or interest in the road and the ability to convey that interest to the lot owners or occupants of the development. This is necessary so the owners or occupants of the development can construct, maintain, and operate any require storm water structures or other required storm water BMPs. Based on the concept plan the proposed developments will be in a lake watershed, therefore, the projects will be required to meet the Phosphorus Standard in Chapter 500 of the Department’s Rules. Dave Waddell and/or Jeff

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PRESQUE ISLE  
1235 CENTRAL DRIVE, SKYWAY PARK  
PRESQUE ISLE, MAINE 04769  
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Dennis will provide LUPC with comments specific to any potential impacts from phosphorus. The mechanism to transfer the rights to the road to potential developers is not prescribed in Department Rules, and is at the discretion of Irving. For water access only developments, sufficient title, right, or interest will need to be shown from a public road to a boat launch.

### Topic 3: Anticipated Use of Lakes and Lake Character

For developments, which trigger the Site Law, an applicant must demonstrate that there is no unreasonable adverse effect on the scenic character and that the development fits harmoniously into the environment. The Department's Rules regarding scenic character are primarily focused on lighting and planting requirements for large parking lots, however they are broad enough for the Department to evaluate impacts from other developments as well. The scope of the rule is:

***Scope of Review.** In determining whether the proposed development will have an unreasonable adverse effect on the scenic character of the surrounding area, the Department shall consider all relevant evidence to that effect, such as evidence that:*

- (1) The design of the proposed development takes into account the scenic character of the surrounding area.*
- (2) A development which is not in keeping with the surrounding scenic character will be located, designed and landscaped to minimize its visual impact to the fullest extent possible.*
- (3) Structures will be designed and landscaped to minimize their visual impact on the surrounding area.*

In the latest version of the Concept Plan, Irving has proposed several requirements for hillside developments that address scenic impact. None of the proposed requirements conflict with the Site Law standards or rules. Depending on how the LUPC adopts these requirements, a hillside development may be required to meet both LUPC standards and Site Law scenic standards. If the requirements are placed in the chapter of the rule that the LUPC may adopt, which is specific to the subdivision design requirements in Concept Plan, then they become a requirement above and beyond Site Law requirements and the LUPC would review the project to determine if they are met as part of their certification process. If they are placed in the LUPC's general scenic standard, it is my understanding that these would only apply to projects where the LUPC has sole jurisdiction.

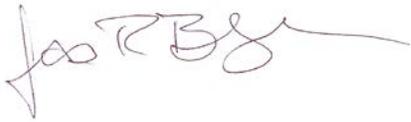
Memo to Tim Beaucage, LUPC

May 3, 2018

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If you need further assistance, please do not hesitate to contact me either by phone or e-mail.

Sincerely

A handwritten signature in black ink, appearing to read "JR Beyer", with a long horizontal flourish extending to the right.

James R. Beyer  
Regional Licensing and Compliance Manager  
Eastern Maine Regional Office  
Department of Environmental Protection