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MEMORANDUM

TO: Helen MacPhail, Environmental Assessment Officer

FROM: Darrell Taylor, Environmental Analyst

COPY: David Briggins, Manager Water & Wastewater Branch
John Theakston, Environmental Engineer
John Drage, Hydrogeologist

DATE: March 6, 2008

SUBJECT: **Fundy Gypsum Miller's Creek Mine Extension Environmental Assessment Registration Document**

I have reviewed the document referenced above as requested, focussing on surface water resources in the project area. My comments are provided for your consideration as follows;

1. Material has been added to the registration document addressing some of the surface water related issues outlined in my previous comments. Nevertheless, I would suggest that more complete information would be beneficial to support predictions, extent of impacts from this undertaking, and overall conclusions. Proposed monitoring plans to confirm predictions if the undertaking proceeds would also be beneficial. Previous comments are provided for reference at end of this memo, and additional comments are as below.

2. It is understood that there would be no process water or other water requirements for this project, which would require a withdrawal approval.

3. It is acknowledged that more information on water use in the project area has been provided, particularly related to agricultural water use.

4. Of the 19 watercourses identified in the project area Shaw Brook appears to be the most significant in terms of having continuous annual flows, higher flow rates, and identified water use (agricultural) in the lower reaches. It is also shown in the report to be the watercourse with the greatest percentage of the watershed disturbed by the proposed mine footprint (about 53%), and 1 of 5 streams having headwaters located directly in the footprint. More detailed and well defined protection plans as well as monitoring plans might well be prudent to ensure the continued use of this water resource.

5. It would be helpful to the assessment process for additional items mentioned in text to be located on maps. These items include;
   - pond in Highfield (page 62) which fire dept uses as a water supply,
   - Alison Pond location (page 63),
   - Bailey's Quarry location.

   Maps showing property boundaries in relation to the project would be useful in selection of monitoring stations and assessment of potential down stream effects.

6. Very generic methods and protocols used in surface water sampling have been provided

in Appendix B. They seem to be focussed on contaminated sites, are mixed in with groundwater sampling protocols, and do not provide specifics such as outlining QA/QC methods, or any sample preservation measures. This information has been requested to assess the quality of the data collected, and to date seems incomplete.

7. The principle of avoidance of watercourses and wetlands has been acknowledged but does not seem to be applied to a great extent. The headwaters of 6 watercourses and 12 wetlands are planned to be within the proposed mine footprint. Perhaps options for mine development could be proposed such that more of the water resources could be avoided and protected with vegetated buffers.

8. The use of riparian vegetative buffers would help protect watercourses. Although mentioned, use of this important mitigative tool seems quite minimal.

9. Cumulative effects do not seem to be addressed fully, either in terms of effects to the multiple streams and/or wetlands within the project area, or related to effects (over time or space) from multiple undertakings or activities in the area that could impact water resources.

10. Baseline stream flow monitoring frequency may not be sufficient to capture seasonal variations including peak flows and low flows. Text indicates monitoring on a monthly basis (page 81) while Table B1, Appendix B indicates a frequency of 7 times per year between Dec 2005 and Dec 2006. This data indicates the highest flows on the June sampling date, which is not the time of year when peak flows are normally expected Since pre- and post- development comparisons would be based on such baseline data, more frequent, reliable data would seem important. This applies to baseline water quality data as well, where baseline conditions could be better defined.

11. Interpretation of baseline ambient water quality in streams should use appropriate CCME water quality guidelines as opposed to effluent limits established under pit and quarry guidelines for settling pond discharges (eg TSS limits proposed).

12. Details of follow-up monitoring plans to confirm EA predictions and for assessing need for improved mitigation measures would be beneficial as well. This applies to both water quantity and quality aspects.

13. Groundwater / surface water interaction is noted as an important consideration in assessing mining projects. This would seem particularly important in the context of karst topography. Is there any suggestion in this report as to how long it would take for the series of lakes proposed in reclamation plans to be filled with water and capable of producing the water supply to down-stream users as proposed? The suggested time line to achieve full reclamation (up to 50 years I believe) would suggest that controlled release of stormwater would be ongoing for an extended period prior to final reclamation and the existence of the proposed lakes.

14. Few details of a stormwater management plan are provided which would support the contention that a " continued water supply to the downstream reaches of impacted catchments" could be ensured (page 88, Summary). It would seem prudent to provide this information to confirm that this supply can indeed be ensured.

15. Stormwater management structures eg settling ponds are proposed to be designed to "typical design standards" . There seems to be no mention of increased peak flows due

[redacted] surface water sampling have been provided to climate change influences, which should be considered.

16. A number of fish species are identified as being important to the area, including IBOF salmon (page 174). An assessment by DFO staff as to the completeness of fish and fish habitat surveys would be beneficial. Also input as to the significance of fish habitat, and whether potentially effected streams / rivers are recommended to be protected as fish habitat or might be candidates for restoration efforts would be useful in this assessment process.

17. Relevant existing approvals are typically provided in EA registration documents for reference. The existing Industrial Approval would be one such approval.

My previous comments on the draft EA registration document dated November 8, 2007 are as follows;

1. This draft registration document appears to be quite well written and generally provides a comprehensive approach to the EA.

2. Surface water is recognized as a VEC, and associated water uses are generally mentioned. Fish Habitat is discussed in some detail, but other water uses such as agricultural use are only cursorily mentioned and should be discussed in more detail with protective measures offered as well as proposed monitoring to ensure protection. The report should mention whether there are any water withdrawals to support identified uses, along with withdrawal locations, protective measures, and pre- and post-development monitoring for flow and water quality, if extant.

3. It would be helpful to have VEC related information presented in a table. This could include the various VECs, with potential impacts from the project identified, proposed mitigation measures, pre & post development monitoring, and assessment of significance of residual effects. A similar approach could even be extended to address the numerous streams identified around the project area.

4. Contaminant sources and potential impacts have been identified related to siltation and possible release of fuels and lubricants during construction and operational phases of the project. The potential for acid runoff from disturbance of pyritic slates is also discussed to some degree. I found no intended water withdrawals for process source water or any other use as part of this project.

5. Mitigation measures are identified in general terms with siltation prevention and control measures proposed through implementation of the "Erosion and Sedimentation Control Handbook for Construction Sites". Contingency plans to address possible spills or accidental upset conditions should be developed before construction begins. Pit and Quarry Guidelines should be mentioned regarding their applicability. More detail regarding all proposed mitigative measures to protect surface waters would be beneficial to aid assessment.

6. More detail on the baseline and proposed follow-up surface water monitoring and reporting would be beneficial. This relates to both flows / levels and water quality. The information provided in Appendix B should include units, sampling date, comparisons to appropriate CCME water quality guidelines, and could be presented in graphs similarly to the groundwater data. Sampling methods and / or protocols used should be

7. It is unclear whether avoidance of watercourses and wetlands has been proposed to any great degree, or whether this is possible. This should be clarified. Considerations for the use of riparian vegetative buffers should be included.

8. A map showing final project development complete with structures eg settling ponds, drainage patterns, watercourses, wetlands, and proposed monitoring stations would aid assessment.

9. Sections should be included in the report which provides an overall conclusion or assessment of the project in terms of significance of impacts, as well as an executive summary.