



February 10, 2017

Mr. Asit Dey, P.Eng.
Department of Sustainable Development
Environmental Approvals Branch
Box 80, 160-123 Main Street
Winnipeg, MB R3C 1A5

**Subject: Riverdale Colony Lagoon - Client File No. 1981.20
Alteration Notification No. 2 - Request for Additional Information**

Dear Asit,

Clause 23(e) – Phosphorus limit

Since 1975 the Riverdale Colony population has varied from 78-86 people with a current population of 85 people. Based on our calculations using this population, we anticipate a consistent spring and fall discharge of approximately 4,500 cubic metres (m^3) and 3,250 m^3 , respectively. These calculations consider a 4 week discharge period, which can be extended, if necessary. The average discharge rates associated with the aforementioned volumes are 1.86 litres per second (L/s) in the spring and 1.34 L/s in the fall.

The Colony is open to implementing a sampling and monitoring program to assess the performance of the 230 m discharge ditch prior to entering Bear Creek. This discharge ditch will be constructed with a sand bottom to improve its polishing and biological nutrient removal capabilities. Sampling would be conducted at end-of-pipe, the ditch mid-point, and at the ditch end. This program's duration would be over the course of the first 3 years of discharge events.

Clause 39(c) – Sludge removal

An assessment has not been conducted to determine the quantity or quality of the sludge and biosolids in the existing cells. Based on our experience with sludge removal in lagoons, we anticipate the volume to range between 250 – 450 m^3 . If placed above the dyke rip rap up to the top of dyke for both cells, these volumes equate to placement depths of 0.13 – 0.22 m.

Sludge placement in these areas will not affect the operation or liquid levels in the lagoon. Use of sludge in this manner serves as a topsoil replacement for this area, while, also promoting the growth of seeded vegetation, thus contributing to protection of the dyke liner from erosive forces. We see this a beneficial end use of this sludge.

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If the volume of sludge is greater than anticipated, we are comfortable with placement on the dyke up to a thickness of 0.3 m. This depth corresponds to a volume of 570 m³.

If excess sludge still remains, we propose the remainder be land applied. If this situation arose, we would provide written notification to Sustainable Development and provide the remaining volume and quality of sludge to be land applied. The selected land would be identified and sampled. An analysis of the soil would be conducted to assess its suitability for receiving such sludge and an application rate would be proposed. Post application, the sludge would be cultivated into the receiving land.

We welcome further discussion on these matters and look forward to your response to this additional information.

Kind regards,

A handwritten signature in red ink, appearing to read 'J. Bunn'.

Jason Bunn, P.Eng.
Engineer, Environmental Infrastructure