



Conservation and Water Stewardship

Climate Change and Environmental Protection Division
Environmental Approvals Branch
123 Main Street, Suite 160, Winnipeg Manitoba R3C 1A5
T 204 945-8321 F 204-945-5229
www.gov.mb.ca/conservation/eal

File: 914.20

July 24, 2013

Joy Kennedy
Water Quality Management Section
Water Science and Management Branch
160-123 Main Street, Winnipeg, MB
R3C 1A5

Dear Ms. Kennedy:

Re: Village of Dunnottar Wastewater Treatment Lagoon – Passive Filter Project - Environment Act Proposal

The responses from the Technical Advisory Committee (TAC) that contained requests for additional information regarding the Environment Act Proposal (EAP) for the Village of Dunnottar Wastewater Treatment Lagoon – Passive Filter Project were forwarded to the proponent's consultant. The consultant was asked to address the comments contained in the responses and to provide additional information for the environmental review that is continuing.

Attached you will find the consultant's July 4, 2013 letter responding to the comments and requests for additional information presented by the TAC. Please review the response to determine if your comments and requests for additional information have been satisfactorily addressed.

Your comments, if any, are required not later than three weeks after the date of this letter. No response on your part will be assumed to indicate no concern.

If you have any questions, please contact me at (204) 945-2614 or by e-mail at Rafiqul.Chowdhury@gov.mb.ca.

Yours truly,
"Originally signed by"

Rafiqul Chowdhury, M.Eng., P.Eng
Environmental Engineer

Attachment

- c. Donna Smiley, Provincial Manager, Environmental Compliance and Enforcement Branch
Public Registries



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July 24, 2013

Laureen Janusz
Fisheries Science and Fish Culture Section
Manitoba Conservation and Water Stewardship
Box 20, 200 Saulteaux Crescent
Winnipeg, MB R3J 3W3

Dear Ms. Janusz:

Re: Village of Dunnottar Wastewater Treatment Lagoon – Passive Filter Project - Environment Act Proposal

The responses from the Technical Advisory Committee (TAC) that contained requests for additional information regarding the Environment Act Proposal (EAP) for the Village of Dunnottar Wastewater Treatment Lagoon – Passive Filter Project were forwarded to the proponent's consultant. The consultant was asked to address the comments contained in the responses and to provide additional information for the environmental review that is continuing.

Attached you will find the consultant's July 4, 2013 letter responding to the comments and requests for additional information presented by the TAC. Please review the response to determine if your comments and requests for additional information have been satisfactorily addressed.

Your comments, if any, are required not later than three weeks after the date of this letter. No response on your part will be assumed to indicate no concern.

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July 24, 2013

Mr. Robert Haip, President
Dunnottar Ratepayers Association
157 Dunrobin Ave., Winnipeg
Manitoba R2K 0T3

Dear Mr. Haip:

Re: Village of Dunnottar Wastewater Treatment Lagoon – Passive Filter Project - Environment Act Proposal

The environmental concerns received from the public and the Technical Advisory Committee (TAC) regarding the Environment Act Proposal (EAP) for the Village of Dunnottar Wastewater Treatment Lagoon – Passive Filter Project were forwarded to the proponent's consultant for review and comment. The consultant was asked to address the concerns and to provide additional information for the environmental review that is continuing.

Attached you will find the consultant's July 4, 2013 letter responding to the comments and requests for additional information presented by the public and the TAC. Please review the response to determine if your comments and requests for additional information have been satisfactorily addressed.

Your comments, if any, are required not later than three weeks after the date of this letter. No response on your part will be assumed to indicate no concern.

If you have any questions, please contact me at (204) 945-2614 or by e-mail at Rafiqul.Chowdhury@gov.mb.ca.

Yours truly,
"Originally signed by"

Rafiqul Chowdhury, M.Eng., P.Eng
Environmental Engineer

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- c. Donna Smiley, Provincial Manager, Environmental Compliance and Enforcement Branch
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In reply, please refer to:

Our File: 12-6920

July 4, 2013

Climate Change and Environmental Protection Division
Environmental Approvals Branch –
Manitoba Conservation and Water Stewardship
123 Main Street, Suite 160
Winnipeg, Manitoba R3C 1A5

Attention: Rafiqul Chowdhury, M.Eng., P.Eng.
Environmental Engineer

File: 914.20

**Response to comments for the Environment Act Proposal for the Village of
Dunnottar Wastewater Treatment Passive Filter Project**

Dear Mr. Chowdhury:

Please find the attached response from Dillon Consulting Limited, provided on behalf of the Village of Dunnottar, regarding the comments and requests from the Technical Advisory Committee, and the comments and questions from the Dunnottar Ratepayers Association, as compiled by the EAB (Climate Change and Environmental Protection Division - Environmental Approvals Branch).

If you have any questions please feel free to contact me 204-453-2301 Ext. 4002 at your convenience.

Sincerely,

DILLON CONSULTING LIMITED

Ian Parkinson, P.Eng.
Associate

FZ/knh



Attachments: Response to the April 26, 2013 Memorandum from the Water Quality Management Section (Joy Kennedy)
Response to the May 05, 2013 email from Fisheries Science and Fish Culture Section, Fisheries Branch (Laureen Janusz)
Response to the May 15, 2013 Letter from Dunnottar Ratepayers Association (Robert Haip)



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**Dillon Consulting
Limited**

Response to the April 26, 2013 Memorandum from the Water Quality Management Section (Joy Kennedy)

1. *The following effluent standards should be in place for the Village of Dunnottar as per the Manitoba Water Quality Standards, Objectives and Guidelines Regulation (196/2011).
BOD 25 mg/L; TSS 25 mg/L; E.Coli 200 MPN/100ml; TP < 1 mg/L.*

The full scale filter is designed to improve the effluent quality discharged from the lagoon treatment system at Dunnottar. Effluent from the filter will meet or exceed the BOD, TSS and E.Coli limits contained in the Manitoba water quality standards, objectives and guidelines regulation (196/2011) for facultative lagoons. The pilot scale filter operating objectives include maximizing TP reductions which may meet and exceed a 1 mg/L objective.

Proposing a firm 1 mg/L TP for a system of this size is unprecedented and effectively penalizes the proactive nature of the Dunnottar passive filter project. Under the aforementioned guidelines, a community such as Dunnottar (population 750) has the option to demonstrate a nutrient reduction strategy instead of the 1 mg/L phosphorous limit. The full scale filter implementation represents a nutrient management strategy that is intended to reduce TP and effectively and permanently remove this from the effluent stream, not delay its release, as is the experience in 'wetland' treatment systems.

TP will be monitored in the effluent and reported in year-end reports. We are quite confident that the filter will bring the phosphorous levels to within the 1 mg/L limit but we feel that the target should be written in as a reduction plan. The results will be recorded and reported as point in time results and rolling 30 day averages.

2. *Weekly monitoring for E. Coli. at the outlet of the UV disinfection system.*

Conventional lagoons are tested once prior to release. Continuous discharge mechanical plants with discharges equivalent to the daily sewage inflow are typically monitored for E. Coli. on a more frequent schedule; typically with weekly or rolling 30 day averages used for compliance. As the effluent flow rate is a fraction of the sewage inflow rate, it is proposed that bi-weekly monitoring during initial operation be conducted with provision to reduce the monitoring frequency to monthly should the filter demonstrate a consistent coliform reduction concentration below effluent standard requirements (200 MPN / 100 ml).

3. *Monthly monitoring for BOD, TSS, and TP at the outlet of the UV disinfection system.*

Monthly monitoring at the outlet of the UV disinfection system for BOD, TSS are proposed and TP concentrations will also be measured monthly for regulatory reporting. It is proposed that the effluent criteria for the facility remain at the current level of 30/30, mg/L BOD and TSS, respectively and that TP be measured and reported as information demonstrating the TP concentration and total removal rates, as part of the nutrient reduction strategy. This would recognize that TP is not an effluent standard requirement for a community under 2000 people (Dunnottar population = 695; 2011 census data).

4. *That the proponent would actively participate in any future watershed based management study, plan, or nutrient reduction program, approved by the director.*

Construction of a full scale passive filter is in fact a nutrient reduction plan that the Village is pursuing proactively.

Response to the May 05, 2013 email from Fisheries Science and Fish Culture Section, Fisheries Branch (Laureen Janusz)

It would appear from the information provided that there will be an increased improvement in reducing the limits of a number of effluent parameters . . . ammonia should be included as a discharge parameter. However; we defer to Water Science Management regarding parameters and monitoring requirements.

Presently, facultative lagoons are not required to monitor ammonia discharge between June 16 and September 15 (the proposed filter operation interval).

Response to the May 15, 2013 Letter from Dunnottar Ratepayers Association (Robert Haip)

From the initial conception to final implementation of the passive filter, the foremost objective has been to improve lagoon effluent quality for the purpose of protecting the ecology of Lake Winnipeg. The 5 years of bench scale and pilot testing has shown that the filter can significantly reduce the amount of harmful contaminants (nutrients, coliforms) entering the Lake from lagoon effluent each year. The concerns of the Ratepayers reflect the issues that motivated the development of the filter and will be addressed in the following sections.

1. *Public Health and Safety:*

Effluent from the passive filter will be monitored regularly for public safety considerations. As mentioned in the filter operating procedure, any divergence from the specified effluent quality standards will result in recycling of effluent back to the lagoon, preventing lower quality effluent from being discharged into the receiving drains during the June 16 to Sept 30 period (continuous discharge period). All testing and monitoring information will be provided in the operating reports which are submitted to Manitoba Conservation and are available to the public.

In terms of actual risk to residents, whether swimming near the discharge point or coming into contact with the effluent along the discharge route, the UV disinfection at the filter outlet ensures that the effluent added to the discharge route will not negatively affect (i.e. increase) the background coliform levels of the water already present in the ditches along the discharge route.

The existing lagoon discharge route, which has been operated without issues over the lifetime of the facility, will continue to be used. We will continue to monitor the discharge effluent and we have clear operational protocols for effluent recycling if quality issues are not met.

2. *Environment:*

Effluent coming from the passive filter is subject to discharge limits similar to that applied to other wastewater treatment facilities, be it a facultative lagoons, aerated lagoons and mechanical treatment plants. The proposal includes the addition of a seasonal, low flow discharge, to offset and reduce the large single release event in the fall. The lagoon will be continuously discharged at a low rate (up to 500 m³/day) over the summer months.

To operate the filter, Manitoba Conservation will specify acceptance of an operating protocol within the EA License. The purpose and goal of the passive filter is to provide the Village of Dunnottar with a nutrient reduction strategy that involves a natural wastewater treatment solution that will result in cleaner effluent. The Village has been fully supportive of the provincial initiatives to protect Lake Winnipeg and a passive filter is a significant part of that strategy.

The Village of Dunnottar does accept municipal wastewater from other municipalities such as the RV Park in Winnipeg Beach. However; the Dunnottar lagoons have sufficient organic and hydraulic capacities to accommodate such loads. The lagoon operating license, as prescribed by Manitoba Conservation, limits the amount of incoming wastewater based on loading rates in order to preserve the integrity of the surrounding environment. The amount of sewage and effluent accepted by the Village from other municipalities is not proposed to increase with the construction of the passive filter.

3. *Operations:*

The design of the filter is based on empirical data for filters operating in similar climates to Manitoba and 5 years of operation of the pilot scale test filters at Dunnottar. There is additional extensive research conducted in northern Europe, northern U.S., and Canada on the design and operation of lagoon effluent filters, which; have some similarities to the filter proposed for Dunnottar. The current pilot scale filter represents a scale model that has been shown to operate successfully in the proposed climatic and flow conditions. Hydraulic conditions, filtration and adsorption dynamics, as well as plant uptake rates will not change significantly upon scale up of the filter due to the large size (and extensive testing) of the pilot filter.

The pilot scale filter has operated for over 4 years and no measurable clogging or reduction in hydraulic flow characteristics has been observed. The operating 'life' of the filter will be dependent on the operations and quality of the lagoon effluent introduced into the filter. However, based on the observations during the pilot scale filter operation, there are positive indications that this filter will operate well beyond conventional life cycle time frame of 20 years.

Typically most treatment systems are developed through pilot testing, before full scale systems are developed. For small municipalities cost effective nutrient reduction has been traditionally achieved through a physical/chemical process by adding alum to the effluent. While alum addition does effectively remove P, it results in increased excess sludge production which requires removal and disposal. Additionally, the P in alum sludge is effectively unrecoverable and cannot be recycled as a plant nutrient. A full size passive filter offers a truly sustainable solution to P removal from wastewater; no excess sludge is produced, P is removed from wastewater in a recoverable form (plant biomass), and no chemical inputs are required. Based on the data from 5 years of testing, we are quite confident that a full scale passive filter will achieve the role of an active contributor to the nutrient reduction strategy to save Lake Winnipeg.