



Mackenzie Valley Land and Water Board
7th Floor - 4922 48th Street
P.O. Box 2130
YELLOWKNIFE NT X1A 2P6
Phone (867) 669-0506
FAX (867) 873-6610

Staff Report

| | |
|---|---|
| Applicant: City of Yellowknife | |
| Location: Yellowknife, NT | Application: MV2009L3-0007 |
| Date Prepared: September 29, 2015 | Meeting Date: October 8, 2015 |
| Subject: Proposed revisions to the Surveillance Network Program (SNP) | |

1. Purpose/Report Summary

The purpose of this Report is to present to the Mackenzie Valley Land and Water Board (MVLWB/the Board):

- a) A proposal to add two new stations to the SNP submitted by the City of Yellowknife (City); and
- b) A request to add parameters to the SNP stations that monitor landfill runoff.

2. Background

- May 31, 2010 – Water Licence (Licence) MV2009L3-0007 issued for 12 years;
- March 20, 2014 – City submitted the Study on the Impact of the Solid Waste Facility (SWF) on Surface Water Metal Concentrations (SWF Metals Study);
- July 17, 2014 – Board approved the SWF Metals Study and required a SNP proposal to be submitted by September 30, 2014;
- November 30, 2014 – SNP proposal submission date extension;
- December 2, 2014 – SNP proposal received from the City;
- June 10, 2015 – Request to revise SNP parameters received from the Environment and Natural Resources (ENR) Water Resources Officer (WRO);
- June 30, 2015 – SNP proposal from the City and SNP request from the WRO sent out for review;
- July 21, 2015 – Reviewer comments due;
- July 28, 2015 – Proponent responses due;
- October 8, 2015 – SNP proposal from the City and SNP request from the WRO presented to the Board; and
- May 31, 2022 – Licence expiry date.

3. Discussion

City SNP Proposal

As part of their approval letter for the SWF Metals Study (attached), the Board included a requirement to submit a proposal for the revision of the SNP for the City's municipal WL MV2009L3-0007. A deadline of September 30, 2014 was given for this submission. In response to a request from the City, the submission date for the SNP proposal was extended to November 30, 2014. On December 2, 2014 the City submitted their proposal to add two new SNP stations (attached).

The SWF Metals Study results indicated that adding two stations to the City's SNP at Fault Lake and Vicinity Lake #3 would provide valuable data to help monitor the impact of the SWF on surface water metal concentrations in the vicinity of the landfill. The City's SNP proposal follows the Study's recommendations by providing specific locations, sampling frequencies and parameters for SNP stations at these lakes. In their letter, the City indicates that the proposed stations were identified in consultation with the WRO, as directed by the Board in their July 17, 2014 letter (attached).

WRO SNP Request

The MVLWB received a letter from the WRO to add three parameters to the current analyses at SNP 0032-13A, 0032-14, 0032-15A, 0032-16, and the two new stations recommended by the SWF Metals Study (proposed as 0032-19 and 0032-20), all of which are intended to monitor surface water as it leaves the SWF and reports downstream. The request from the WRO stems from changes that have been observed in the aquatic ecosystem and water quality of Jackfish Lake, which is downstream of the City's SWF. Testing for these parameters may help determine whether runoff from the landfill is contributing to the high phosphorus levels in Jackfish Lake that have led to algal blooms for the past two springs.

4. Comments

According to CCME's document, *Phosphorus: Canadian Guidance Framework for the Management of Freshwater Systems*¹, "in the majority of lakes, phosphorus is normally the limited nutrient for algal growth." Also, the document provides a description of the different forms of phosphorus and uptake in aquatic systems: "Phosphorus in aquatic systems occurs in three forms: inorganic phosphorus, particulate organic phosphorus, and dissolved (soluble) organic phosphorus. Aquatic plants require inorganic phosphate for nutrition, typically in the form of orthophosphate ions (PO₄³⁻). This is the

¹ Canadian Council for Ministers of the Environment, Canadian Environmental Quality Guidelines (2004). Canadian Water Quality Guidelines for the Protection of Aquatic Life, Phosphorus: Canadian Guidance Framework for the Management of Freshwater Systems. Retrieved from: <http://ceqg-rcqe.ccme.ca/download/en/205>

most significant form of inorganic phosphorus, and is the only form of soluble inorganic phosphorus directly utilized by aquatic biota.”

The three parameters requested for analysis at the SNP stations related to water quality leaving the SWF are common components of landfill leachate, as found in the *Standards for Landfills in Alberta*² and British Columbia’s *Guidelines for Environmental Monitoring at Municipal Solid Waste Landfills*³.

It is important to note that under MV2009L3-0007, the City is required to submit, by January 28th, 2016, a Groundwater Monitoring Program (Program) as part of the submission of an updated Interim Landfill Closure and Reclamation Plan. There is currently no ongoing groundwater monitoring being conducted as part of the City’s municipal Licence. This Program may address the concerns raised by the WRO and may include monitoring of the additional parameters requested; however, until the Program has been approved by the Board, data is not being collected on the parameters of concern, and the contribution of SWF runoff to the nutrient loading occurring downstream at Jackfish Lake remains unknown.

5. Reviewer Comments

By July 21, 2015, comments were received from Environment Canada and ENR. The reviewer comment summary table (attached) presents the concerns identified through the review of the proposed SNP revisions.

6. Conclusion

The City has requested the addition of two SNP stations at Fault Lake and Vicinity Lake #3. These additional stations would provide valuable data to help monitor the impact of the SWF on surface water quality and are in line with SWF Metals Study recommendations.

The WRO has requested that the City, under MV2009L3-0007, add three parameters to the analyses at the SNP stations that monitoring water quality as a result of SWF operations. These parameters are typical constituents of landfill leachate and raised concentrations may affect downstream aquatic systems, particularly algal blooms. These parameters may be incorporated into the Groundwater Monitoring Program that is required by January 28th, 2016; however, until groundwater monitoring is implemented, sampling at existing surface water SNP stations is the only method available to monitor water quality downstream of the SWF.

² Government of Alberta. (2010, February). Standards for Landfills in Alberta. Retrieved from Alberta Environment and Sustainable Resource Development: <http://environment.gov.ab.ca/info/library/7316.pdf>

³ BC Ministry of Environment. (n.d.). Guidelines for Environmental Monitoring at Municipal Solid Waste Landfills. Retrieved from http://www2.gov.bc.ca/gov/DownloadAsset?assetId=DDDE9224A6354A90B951A7BB73581EF4&filename=guidelines_environmental_monitoring_municipal_solid_waste_landfills.pdf

Proposed changes to the SNP have been drafted in red type in the attached draft Licence.

7. Recommendation

Board staff have prepared the following options for the Board's consideration:

- a) Approve the three additional parameters to the analyses required at SNP 0032-13A, 0032-14, 0032-15A, 0032-16, **and** at the two new SNP stations 0032-20 and 0032-21. Upon receiving the City's SWF Groundwater monitoring plan, and if redundancies exist, a review of the parameter requirements of these SNP stations can occur if certain parameters are covered by the groundwater monitoring program.
- b) Do not approve the three additional parameters to the analyses required at SNP 0032-13A, 0032-14, 0032-15A, 0032-16, **and** at the two new SNP stations 0032-20 and 0032-21. Wait until the City has submitted their Proposed Groundwater Monitoring Program to determine if the parameters that the WRO has recommended are covered under the Groundwater Monitoring Program.

8. Attachments

- [July 17, 2014 approval letter from the Board](#) for the SWF Metals Study
- [December 2, 2014 Letter from the City requesting two additional SNP stations](#)
- [June 9, 2015 Letter from the Water Resources Officer requesting additional parameters for several SNP stations](#)
- Reviewer Comment Summary Table
- Draft Water Licence including revised SNP
- Draft Decision Letter from the Board

Respectfully Submitted,



Miki Ehrlich
Regulatory Officer



Heather Scott
Technical Advisor

Review Comment Table

| | |
|--|---|
| Board: | MVLWB |
| Review Item: | City of Yellowknife - Proposed Revisions to the Surveillance Network Program (MV2009L3-0007) |
| File(s): | MV2009L3-0007 |
| Proponent: | City of Yellowknife |
| Document(s): | MV2009L3-0007 - City of Yk - City proposal to add two SNP sampling stations (1 MB) MV2009L3-0007 - City of Yk - Water Resource Officer proposal to add parameters to SNP stations monitoring landfill runoff (1 MB) |
| Item For Review Distributed On: | June 30 at 12:00 Distribution List |
| Reviewer Comments Due By: | July 21, 2015 |
| Proponent Responses Due By: | July 28, 2015 |
| Item Description: | <p>Two proposals have been submitted for revisions to the Surveillance Network Program (SNP) for the City of Yellowknife's Water Licence (MV2009L3-0007):</p> <ol style="list-style-type: none"> 1. The City of Yellowknife has submitted a proposal to add two stations following up on the recommendations from the Surface Water Metal Concentrations Study 2. The Water Resource Officer has submitted a proposal to add parameters to SNP sampling stations monitoring landfill runoff. <p>Reviewers are encouraged to submit comments on these proposals prior to the review deadline of July 21, 2015.</p> |
| General Reviewer Information: | <p>In addition to the email distribution list, the following organizations received review materials by fax:</p> <p>Fort Resolution Métis Council - Trudy King - (867)394-3322</p> <p>Hay River Metis Council - Wally Shuman, President - (867)874-4472</p> <p>NWT Metis Nation - Tim Heron, NWTMN IMA Coordinator - (867)872-3586</p> |
| Contact Information: | <p>Miki Ehrlich 867-766-7469</p> <p>Tyree Mullaney 867-766-7464</p> |

Comment Summary

| Environment Canada: Bradley Summerfield | | | | |
|--|------------------------|---|---|--|
| ID | Topic | Reviewer Comment/Recommendation | Proponent Response | Board Response |
| 1 | General File | Comment (doc) EC comment letter Recommendation | | Noted |
| GNWT - Environment and Natural Resources: Central Email GNWT | | | | |
| ID | Topic | Reviewer Comment/Recommendation | Proponent Response | Board Response |
| 2 | General File | Comment (doc) ENR Letter with Comments and Recommendation Recommendation | | |
| 1 | Topic 1: SNP Revisions | <p>Comment ENR understands that the Board is seeking comment on the following two proposals for revisions to the City of Yellowknife's SNP: . Request from the City to add two SNP stations at Fault Lake and Vicinity Lake to determine if run-off is affecting these lakes, in response to the Surface Metals study; and . Request from GNWT-ENR to add Total Phosphorus, Ortho-Phosphorus and Dissolved Organic Carbon to parameters required under referenced SNP stations.</p> <p>Recommendation 1.) ENR supports these recommendations and concurs with both revisions to the SNP as outlined by the Board.</p> | <p>July 23: The City of Yellowknife understands that the request from ENR to add Total Phosphorus, Ortho-Phosphorus, and Dissolved Organic Carbon to the testing parameters is directly related to the changes in the ecosystem in Jackfish Lake. The City is willing to add these parameters to the testing if the MVLWB feels it is appropriate, however, the City would like to request that if the levels of these parameters are within acceptable ranges and it is determined that the ecosystem changes in Jackfish Lake are due to other factors, that testing for these parameters be discontinued at that point. As for the other proposed change, the City has already begun testing at the two new proposed stations and has no issue with these being added to the SNP.</p> | Any desired changes to the SNP should be proposed in a letter to the Board and will undergo review before being submitted to the Board for a decision. |



Environment Canada Environnement
Canada Canada

Environmental Protection Operations Directorate (EPOD)
Prairie & Northern Region (PNR)
5019 52nd Street, 4th Floor
P.O. Box 2310
Yellowknife, NT X1A 2P7

July 21, 2015

EC File: 5200 000 001/004
MVLWB File: MV2009L3-0007

Miki Ehrlich
Regulatory Officer
Mackenzie Valley Land and Water Board
7th Floor, 4922 48th St.
P.O. Box 2130
Yellowknife, NT X1A 2P6

Via online submission

**RE: MV2009L3-0007 – City of Yellowknife – Proposed Revisions to the
Surveillance Network Program**

Attention: Miki Ehrlich

Environment Canada (EC) has reviewed the information submitted to the Mackenzie Valley Land and Water Board (MVLWB) regarding the above-mentioned file revisions and is submitting comments via the online review system as requested by the MVLWB.

EC supports the Department of Environment and Natural Resources, North Slave Regional Water Resource Officer's request that Total Phosphorus, Ortho-Phosphorus and Dissolved Organic Carbon be immediately added to the required parameters monitored at the City of Yellowknife's Surveillance Network Program stations 0032-13A, 0032-14, 0032-15A, 0032-16 and the two new stations 0032-19 and 0032-20 (names yet to be made official.)

EC's specialist advice is provided pursuant to the *Canadian Environmental Protection Act, 1999*, the pollution prevention provisions of the *Fisheries Act*, the *Migratory Birds Convention Act, 1994*, and the *Species at Risk Act*.

Should you require further information, please do not hesitate to contact me at (867) 669-4707 or Bradley.Summerfield@ec.gc.ca.

Sincerely,

A handwritten signature in black ink, appearing to read "Bradley Summerfield". The signature is written in a cursive, flowing style.

Bradley Summerfield
A/Senior Environmental Assessment Coordinator

cc: Sarah-Lacey McMillan, A/Head, Environmental Assessment North (NT and NU),
PNR-EPOD

July 21, 2015

Miki Ehrlich
Regulatory Officer
Mackenzie Valley Land and Water MVLWB
7th Floor – 4910 50th Avenue
P.O. Box 2130
Yellowknife, NT
X1A 2P6

Dear Ms. Ehrlich,

**Re: City of Yellowknife
Water Licence Amendment – MV2009L3-0007
Proposed Revisions to the Surveillance Network Program
Request for Comments**

The Department of Environment and Natural Resources (ENR), Government of the Northwest Territories (GNWT) has reviewed the report and plans at reference based on its mandated responsibilities under the *Environmental Protection Act*, the *Forest Management Act*, the *Forest Protection Act*, the *WRD Act* and the *Wildlife Act* and has the following comments and recommendations for the consideration of the Board.

Topic 1: SNP Revisions

Comment(s):

ENR understands that the Board is seeking comment on the following two proposals for revisions to the City of Yellowknife's SNP:

- Request from the City to add two SNP stations at Fault Lake and Vicinity Lake to determine if run-off is affecting these lakes, in response to the Surface Metals study; and
- Request from GNWT-ENR to add Total Phosphorus, Ortho-Phosphorus and Dissolved Organic Carbon to parameters required under referenced SNP stations.

Recommendation(s):

- 1) ENR supports these recommendations and concurs with both revisions to the SNP as outlined by the Board.

Comments and recommendations were provided by ENR technical experts in the Water Resources Division and the North Slave Region, and were coordinated and collated by the Environmental Impact Assessment, Conservation, Assessment and Monitoring Section (CAM).

Should you have any questions or concerns, please do not hesitate to contact Patrick Clancy, Environmental Regulatory Analyst at 920-6118 or patrick_clancy@gov.nt.ca.

Sincerely,



Patrick Clancy
Environmental Regulatory Analyst
Environmental Impact Assessment Section
Conservation, Assessment and Monitoring Division
Department of Environment and Natural Resources
Government of the Northwest Territories