Mackenzie Valley Land and Water Board
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Staff Report

Applicant: City of Yellowknife	
Location: Yellowknife, NT	**File Number:** MV2009L3-0007
Date Prepared: June 10, 2019	**Date of Board Meeting:** June 20, 2019
Subject: 2018 Annual Water Licence Report	

1. Purpose

The purpose of this Report is to present to the Mackenzie Valley Land and Water Board (MVLWB/the Board) the 2018 Annual Water Licence Report (2018 Annual Report) submitted by the City of Yellowknife (City) to fulfill Part B, Condition 3 and Schedule 1, Condition 1 of their municipal Water Licence MV2009L3-0007 (Licence).

2. Background

- May 31, 2010 – Issuance of Licence MV2009L3-0007;
- March 29, 2019 – 2018 Annual Report received;
- April 3, 2019 – Review commenced;
- April 8, 2019 – Board staff grants reviewers additional time to submit comments and recommendations;
- April 25, 2019 – original review comment deadline;
- May 2, 2019 – Reviewer comments and recommendations due and received;
- May 6, 2019 – Board staff grant City's request to extend response deadline;
- May 16, 2019 – Original response deadline;
- May 30, 2019 – Responses due;
- May 31, 2019 – Responses received;
- **June 20, 2019 – 2018 Annual Report presented to the Board;** and
- May 30, 2022 – Expiration of Licence MV2009L3-0007.

3. Discussion

On March 29, 2019, the City submitted their 2018 Annual Report (attached) to fulfill Part B, Condition 3 and Schedule 1, Condition 1 of Licence MV2009L3-0007. This submission is not for Board approval; however, it is being presented as an update to the Board.

4. Comments

The City does not use an annual reporting template created by Board staff, but Board staff note that each condition listed in Schedule 1 of the Licence is clearly addressed in the 2018 Annual Report.

Board staff recognize that the City has incorporated additional monitoring under their Licence Surveillance Network Program (SNP) in recent years, in accordance with Board direction. This includes:

1. the addition of Total Metals, Total Petroleum Hydrocarbons, and BTEX to SNP stations 0032-F1 and 0032-F3, downstream of the Fiddlers Lake Lagoon, to monitor for any potential impacts of non-sewage wastes being disposed of in the Sewage Disposal Facilities, in accordance with Board direction and SNP revisions provided on August 17, 2017 (attached); and
2. the addition of three groundwater monitoring wells on the perimeter of the Solid Waste Disposal Facilities to the monitoring of potential impacts of the landfill on the receiving environment, and for which the City was required to obtain a Land Use Permit (attached).

With respect to water quality results from SNP stations 0032-10, 0032-F3 and 0032-F1, Board staff noted concentrations exceeding the Canadian Council of Ministers of the Environment (CCME) *Guideline for the Protection of Aquatic Life* for the following metals: Aluminum, Arsenic, Copper and Iron. Board staff note that metals did not consistently increase or decrease downstream from the lagoon (itself referred to as Lake F6); some metals decreased towards SNP 0032-F1 (the station closest downstream to the lagoon), and some metals increased.

Board staff are of the opinion that the continued collection and reporting of monitoring data over the next several years will enable reviewers and the Board to evaluate and consider any potential impacts of the City's facilities and operations on the receiving environment at the time of the renewal proceedings for the City's Licence.

5. Public Review

By May 2, 2019, comments and recommendations on the 2018 Annual Report were received from Environment and Climate Change Canada (ECCC) and the Government of the Northwest Territories Department of Environment and Natural Resources (GNWT-ENR).

After requesting a two-week extension to respond to reviewer comments that was granted by Board staff on May 6, 2019 (attached), the City responded one day after the response deadline of May 30, 2019, on May 31, 2019. As such, the Board will have to consider whether to accept the City's late comment responses. The Review Summary and Attachments (attached) presents the concerns identified through this review.

Main Issues Raised during the Review

The following summarizes the main issues raised during the review:

Surveillance Network Program data analysis

ECCC (Comment ID 2) recommended that the City provide a discussion of potential mitigation measures to reduce total phosphorus concentrations in sewage effluent. As the City notes, the City indicated in their June 20, 2018 letter to the Board (attached) that they are moving forward with a multi-year desludging program for Fiddlers Lake Lagoon, which is anticipated to have a positive impact on total phosphorus concentrations in sewage effluent. Board staff also note this topic was discussed by the City, Board staff, and interested parties on December 11, 2018 (summary notes attached); consensus at this meeting was that limited resources are better spent on research in partnership with academic institutions than on continued monitoring, and a follow-up meeting is planned for October 2019 to further discuss potential research projects in collaboration with academics.

Stormwater Effluent Trends

ECCC (Comment ID 4) also recommended the City provide a discussion of stormwater effluent data compared to previous sampling years. As the City notes, the Board accepted the City's proposed approach to the Stormwater Trend Analysis and Stormwater Management Plan (required by Part D, Condition 10 and Schedule 2, Condition 1 and Board direction, respectively) in their February 7, 2019 letter (attached).

Baling Facility Waste Characterization and Disposal

GNWT-ENR (Comment ID 1, 2, 3) recommended the City provide 2017 monitoring results of baling facility waste as an attachment to the 2018 Annual Report, and monitor baling facility wastes at the sump level, prior to being combined with other wastes. In addition, GWNT-ENR (Comment ID 4) recommended that to prepare for the City's Licence renewal in 2022, baling facility waste monitoring and submission of results be conducted yearly until relevant characterization is completed. The City responded that analytical data was not available for 2017 or 2018, and that separation of baling facility wastes is not possible due to the internal configuration of the facility. In addition, the City is currently looking at alternative disposal methods for the sludge from the baling sump, which will be described in the next version of the Sewage Disposal Facilities Operation and Maintenance Plan.

Board staff note that the Board's August 17, 2017 letter denying approval of the Sewage Disposal Facilities Operation and Maintenance Plan Version 2 outlined required revisions to the Plan, including:

1) analytical results from SNP stations 0032-F1 and 0032-F3, including Total Metals, BTEX and Total Petroleum Hydrocarbons, as reflected in the revised SNP Annex of the Licence;
2) A complete sludge management plan in accordance with Schedule 4, item 1.e (sludge management planning), including maintenance procedures (periodic removal and disposal of sewage sludge); quantities and composition of sludge likely to be produced; identification of the required frequency of extraction from the lagoons; and operational procedures developed for environmentally sound removal and disposal, rationale for sampling guidelines and criteria, and proposed end uses of sludge; and
3) A plan that outlines how the City will work to meet the criteria set out in the Guideline for Industrial Waste Discharges in the NWT and/or the City's By-Law 4663, in accordance with Schedule 4, item 1.c of the Licence. As revisions to the SDF O&M Plan were to be submitted August 1, 2018. The Board could request the City to formally indicate when they plan to submit this revision (Version 3).

Board staff are of the opinion that the revisions listed above, in addition to the continued monitoring and reporting required by the Licence SNP, will help inform leachate management decisions under the current Licence, as well as the upcoming Licence renewal proceedings.

GNWT-ENR (Comment ID 5) also recommended that the next version of the City's Sewage Disposal Facilities Operation and Maintenance Plan specify which baling facility wastes will be monitored and reported on annually; as above, the City responded that those will be described in the revised Plan.

Annual Report corrections

GNWT-ENR (Comment ID 7) pointed out that the City did not highlight all exceedances of parameter concentrations in the Annual Report; the City clarified the number of exceedances, and supplied a revised 2018 Annual Report (Version 2), with all exceedances highlighted, which Board staff have posted to the public registry.

6. Security

Not applicable.

7. Conclusion

Board staff conclude that further information was provided by the City in their responses to reviewer comments. While several reviewers recommended the City provide additional information on phosphorus concentrations in sewage effluent, stormwater effluent trends, and analysis of baling facility leachate, Board staff are of the opinion that through previous reviews and collaborative work by the City, Board staff, and interested parties, efforts are already underway to ensure improved monitoring and data analysis of these various waste streams, which will ultimately lead to a better understanding of their potential impacts. As such, Board staff conclude there are no outstanding issues or concerns with the 2018 Annual Report.

Board staff conclude that the City plans to include significant additional detail concerning the monitoring of sewage and non-sewage effluent in the revised Sewage Disposal Facilities Operation and Maintenance Plan (Version 2), but has not formally indicated when the revised Plan will be submitted to the Board. Board staff suggest the Board could request that the City indicate when they plan to submit the revised Plan.

8. Recommendation

Board staff recommend the Board accept the late comment responses from the City.

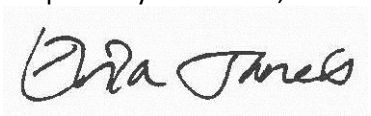
Board staff recommend the Board **acknowledge the 2018 Annual Water Licence Report** as submitted to fulfill Part B, condition 3 and Schedule 1, condition 1 of municipal Water Licence MV2009L3-0007.

A draft letter is attached.

9. Attachments

- 2018 Annual Report
- May 6, 2019 request from City to extend response deadline
- August 17, 2017 Board letter denying approval of Sewage Disposal Facilities Operations and Maintenance Plan Version 1.0, with notification of SNP changes
- Permit MV2018X0015 for City groundwater wells
- June 20, 2018 letter from City accompanying submission of Fiddlers Lake Treatment System Plan Version 2 and describing lagoon desludging plans
- December 11, 2018 Meeting of Parties: summary notes
- February 7, 2019 Board letter deferring decision on Stormwater Management Plan Version 4 and Stormwater Trend Analysis Proposal
- Review Summary and Attachments
- Draft Letter from the Board

Respectfully submitted,



Erica Janes
Regulatory Specialist

Heather Scott
Technical Advisor

Review Comment Table

Board:	MVLWB
Review Item:	City of Yellowknife - 2018 Annual Water Licence Report (MV2009L3-0007)
File(s):	MV2009L3-0007
Proponent:	City of Yellowknife
Document(s):	MV2009L3-0007 - City of YK - 2018 Annual Water Licence Report - Mar29-19 (5.06 MB)
Item For Review Distributed On:	Apr 3 at 10:04 Distribution List
Reviewer Comments Due By:	May 2, 2019
Proponent Responses Due By:	May 30, 2019
Item Description:	**May 6, 2019 Update: The City has requested and been granted additional time to respond to reviewer comments. The new response deadline is May 30, 2019.** **April 8, 2019 Update: Reviewers have requested and been granted additional time for this review. The new comment deadline is May 2, 2019, and the new response deadline is May 16, 2019.** The City of Yellowknife has submitted their 2018 Annual Water Licence Report, to fulfill Part B, condition 3 and Schedule 1, condition 1 of their municipal Water Licence MV2009L3-0007. Although formal approval of Annual Reports is not required under the Licence, the Board must be satisfied that the City has reported in accordance with the requirements of their Licence. Reviewers are invited to submit questions, comments and recommendations on the 2018 Annual Water Licence Report by **April 25, 2019**. If you have questions or comments regarding this review or the Online Review System, please contact Erica Janes at (867)766-7466 or ejanes@mvlwb.com.
General Reviewer Information:	In addition to the email distribution list, the following organization received review materials by fax: • NWT Metis Nation - Tim Heron, NWTMN IMA Coordinator: (867)872-3586
Contact Information:	Erica Janes 867-766-7466 Heather Scott 867-766-7463 Jen Potten 867-766-7468

Comment Summary

City of Yellowknife (Proponent)				
ID	**Topic**	**Reviewer Comment/Recommendation**	**Proponent Response**	**Board Staff Analysis**
1	General File	**Comment** (doc) Submitted after Due Date As per ENR comment #7, attached is version 2 of the 2018 City of Yellowknife annual water licence report. This version replaces the June 27 lagoon sampling results in Appendix B that were incorrectly copied, and highlights the single max grab faecal coliform exceedance in 2018. **Recommendation**	N/A	Noted. Board staff will post this revised version of the 2018 Annual Report to the public registry.
Environment and Climate Change Canada: Eva Walker				
ID	**Topic**	**Reviewer Comment/Recommendation**	**Proponent Response**	**Board Staff Analysis**
1	General File	**Comment** (doc) ECCC Cover Letter **Recommendation**	--	
2	City Of Yellowknife Water Licence MV2009L3-0007 Section V - Surveillance Network Program (SNP) Data Analysis	**Comment** For both the ammonia (Figure 3) and fecal coliform (Figure 5) analysis the graph depicts that over a number of concurrent sampling periods the maximum average was exceeded. In the corresponding text, only the exceedances of maximum grabs are identified, with no mention of an exceedance of the maximum average. **Recommendation** ECCC recommends that the report identify all exceedances including both maximum grab and maximum average.	**May 31:** In future Annual Reports, the City will ensure that both maximum grab and maximum average are indicated in the corresponding text.	Acceptable response.
3	City Of Yellowknife	**Comment** Total phosphorus is above the maximum	**May 31:** As indicated in the letter to the Board dated	Acceptable response.

	Water Licence MV2009L3-0007 Section V - SNP Data Analysis	average at the point of compliance (F3) for the entire 2018 sampling year, and above the maximum grab for the majority of sampling events. However, there is no discussion of potential mitigation measures which could be implemented to reduce the concentrations of total phosphorus in sewage effluent. **Recommendation** ECCC recommends that the Proponent provide a discussion of potential mitigation measures or initiatives to reduce total phosphorus concentration in sewage effluent.	June 20, 2018 regarding the Fiddler's Lake Treatment System Plan, the City is moving forward with sludge removal at Fiddler's Lagoon which is anticipated to have an impact on the phosphorus concentrations at the SNP stations. Please refer to the City's Sewage O&M Manual for details on phosphorus management. Also, please note that the max grab and average phosphorus values in the water licence are discharge objectives and not effluent quality requirements.	
4	City Of Yellowknife Water Licence MV2009L3-0007 Section U - Stormwater Effluent Trends	**Comment** The report states that since stormwater was only sampled once during 2018 that an analysis of trends was not completed. However, in the stormwater data presented there are numerous exceedances of guidelines for metals. While a trend within 2018 could not be completed, this data could be compared to previous years stormwater data to assess potential trends. **Recommendation** ECCC recommends that the Proponent provide a discussion of the stormwater effluent data compared to previous sampling years.	**May 31:** Please refer to the City's proposal dated October 28, 2018 and the Board's acceptance of said proposal, dated February 7, 2019 regarding the stormwater trendline analysis.	Acceptable response.
GNWT - ENR: Central Email GNWT				

ID	Topic	Reviewer Comment/Recommendation	Proponent Response	Board Staff Analysis
8	General File	**Comment** (doc) ENR Letter with Comments and Recommendations **Recommendation**	--	Noted.
1	Topic 1: Bailing Facility Wastes Characterization	**Comment** In August 2017, the City specified that "Testing of the bailing facility has not, and will not, be an ongoing process" (p. 16-17 of 27 - SWDF O&M Plan (v. 5)). In an Acceptance Letter of the 2016 Annual Report (AR), the Board recommended that 'future annual reports should include monitoring and characterization results for all non-sewage wastes disposed of in the lagoon'. In a response provided to ECCC during the 2017 AR review process, the City stated that results for all non-sewage should be available within their 2018 AR. Although both Bailing Facility leachate and sludge were discharged to the municipal sewage system in 2017 (as per 2018 AR), no results were provided for this waste stream in the 2018 AR. ENR notes that the recent SDF O&M Plan (v. 2) specifies that "the City is currently in the process of characterizing and quantifying the sludge and leachate generated from the bailing process" (p. 24 of 166). **Recommendation** 1) ENR recommends that the 2017 monitoring of Bailing Facility wastes (both leachate and sludge) be submitted to the Board in attachment of their	**May 31:** The documents noted indicate that testing data was not available for 2017. The sampling intended to be completed in 2018 was hampered by numerous factors. The City is currently looking at alternative disposal methods for the sludge from the baling sump.	Acceptable response. See also GNWT-ENR Comment ID 3.

		2018 AR, if available (see comments below).		
2	Topic 2: Bailing Sump Monitoring - For Relevant Waste Stream Characterization	**Comment** The 2018 AR currently being reviewed specifies (p. 6 of 140) that it is currently not possible to measure liquid volumes of leachate removed at the Bailing Facility, because the sump is tied into the facilities sewage system. The report further specifies that liquid from the bailing sump ends up in the sewage holding tank that is being pumped out by Kavanaugh on a regular basis - with no method to track volumes removed. ENR notes that results towards characterization of Bailing Facility wastes were submitted only once in the past, in the 2014 AR. **Recommendation** 1) To accurately assess the quality of the Bailing Facility sump wastes alone, ENR recommends for monitoring to occur at the sump level, prior to being combined/mixed and managed with another type of wastes (i.e. sewage tank(s)).	**May 31:** Separation of the leachate (liquid) from the baling sump is not possible at this time due to the internal configuration of the baling facility. The Board added hydrocarbon and metal testing requirements at SNP stations 0032-F1 and 0032-F3 in order to determine whether the leachate is having an effect on the effluent at these SNP stations.	Acceptable response.
3	None	**Comment** None **Recommendation** 2) Should the quality of Bailing Facility sump wastes be such that it would prevent an authorization to discharge into the sewage lagoon, ENR recommends that the City increase the storage capacity for this type of leachate. Leachate with exceedances which prevent disposal should not be diluted or	**May 31:** The City is currently looking at alternative disposal methods for liquid waste from the bailing facility, which will be described in the next version of the Sewage Waste Disposal O&M manual.	Acceptable response.

		mixed with other types of wastes prior to disposal.		
4	Topic 3: Leachate Characterization To Inform Subsequent Management	**Comment** Recommendations regarding characterization of landfill leachate discharged into the sewage lagoon has been an on-going process since 2011. ECCC first outlined the need for 'non-sewage' landfill waste streams characterization in Nov. 2011, to determine if pre-treatment prior to discharge, or an alternative disposal method/location, should be warranted. Years later (Aug 2017), ECCC made similar comments and recommendations stating that 'discharging sludge to a sewage lagoon may affect lagoon performance and is not a recommended practice'. ECCC then recommended that non-sewage sources of sludge [and leachate] be diverted to a dedicated pit/lagoon, rather than being directly discharged into the sewage lagoon, ultimately discharging to the environment. The latest SDF O&M Plan version specifies that once the Bailing Facility wastes characterization is completed, the City will assess available options for alternative disposal. An evaporator was specified as a method to eliminate the need to discharge Cell A and Cell B leachate to the sewage lagoon. During a February 2019 SWANA Landfill Leachate Management workshop, it was clarified	**May 31:** Details on the monitoring of the bailing facility waste will be described in the next version of the Sewage Waste Disposal O&M manual.	Noted that the next version of the Sewage Disposal Facilities O&M Plan will contain details on the monitoring of baling facility waste. The Board's August 17, 2017 letter denying approval of the SDF O&M Plan Version 2 outlined required revisions to the Plan, including Analytical results from SNP stations 0032-F1 and 0032-F3, including Total Metals, BTEX and Total Petroleum Hydrocarbons, as reflected in the revised SNP Annex of the Licence; 2. A complete sludge management plan in accordance with Schedule 4, item 1.e (sludge management planning), including maintenance procedures (periodic removal and disposal of sewage sludge); quantities and composition of sludge likely to be produced; identification of the required frequency of extraction from the

		that landfill leachate disposal to the environment - even pre-treated - is not approved in Alberta, Saskatchewan or Manitoba. Disposing of pre-treated leachate to a sanitary wastewater collection system is/was said to be uncommon and requires compliance with any local by-laws. This also briefly described collection ponds used in dry environments such as the Canadian Prairies, where landfill leachate is gathered and evaporated as a final disposal method, with some success over the warmer season. Revised Guidelines for non-sewage discharges to municipal sewage lagoon are not yet available. As such, to help provide some context, a preliminary comparison was made between Bailing Facility sump quality results (available for 2013 only) and EQCs established for discharging HCSTF leachate to Hay River municipal sewage lagoon (see derived Guidelines, p. 39 of Bio Treatment Facility O&M plan). The 2013 results surpassed HCSTF leachate EQCs for Total Phenols, Toluene and several metals. When compared to reported results (in 2018 AR) for the new Composting Pad leachate, which is to be monitored yearly under the Water Licence, the Bailing Facility sump waste results were more elevated, notably for Calcium, Chloride, Sodium, Magnesium, TDS,		lagoons; and operational procedures developed for environmentally sound removal and disposal, rationale for sampling guidelines and criteria, and proposed end uses of sludge; and 3. A plan that outlines how the City will work to meet the criteria set out in Guideline for Industrial Waste Discharges in the NWT and/or the City's By-Law 4663, in accordance with Schedule 4, item 1.c of the Licence. As revisions to the SDF O&M Plan were to be submitted August 1, 2018. The Board could request the City to formally indicate when they plan to submit this revision (Version 3).

		Total Phenols, Toluene, Total Chromium, Lead, Manganese, Strontium, Vanadium, as well as for Aluminum, Iron and Zinc. **Recommendation** 1) To prepare for the Water Licence renewal due in 2022, and to inform adequate management decisions with respect to landfill leachate management, ENR recommends for monitoring, and Annual Report results submission of Bailing Facility wastes (both Leachate and Sludge), to be conducted yearly until relevant characterization is completed.		
5	None	**Comment** None **Recommendation** 2) ENR recommends that the next version of the City SDF O&M Plan to specify that Bailing Facility wastes will be monitored and reported upon yearly.	**May 31:** Details on the monitoring of the bailing facility waste will be described in the next version of the Sewage Waste Disposal O&M manual.	Noted.
6	Topic 4: Leachate Characterization Water Treatment Plant	**Comment** The 2018 AR specifies (p. 6 of 140) that all Water Treatment Plant (WTP) backwash was discharged to the sewage system. A preliminary comparison was made between WTP quality results (raw data, p. 137-138 of 2018 AR) and EQCs established for discharging HCSTF leachate to Hay River municipal sewage lagoon. Elevated levels were noted TSS, Aluminum, Arsenic, Cobalt, Copper, Selenium and Zinc The reported pH was 5.56, and the Aluminum concentration was 60.4 mg/L. **Recommendation** 1)	**May 31:** The City currently samples the waste from the WTP once annually. As the lab report provides the results in a tabular format, the City has not deemed it necessary to reformat this data.	Noted.

		Considering the amount of data submitted each year, and to foster efficient reviews, ENR recommends that WTP monitoring data be extracted and presented in a tabular format that is easily accessible within the AR.		
7	Topic 5: Exceedances Highlighted - Current/Future Annual Reports	**Comment** During the 2017 AR review period, it was specified that exceedances will be highlighted in future data compilation prepared by the City. ENR notes that exceedances for BOD and fecal coliforms monitored at the Fiddler's lagoon were not identified in the Appendix B compilation Table. **Recommendation** 1) Considering the amount of data submitted each year, and to foster efficient reviews, ENR recommends that the results be highlighted in the Tabular Summaries of future Annual Reports.	**May 31:** The only max grab BOD exceedance in 2018 was on July 25, this is highlighted in the Appendix B compilation table. For June 27, the date of the only Fecal Coliform max grab exceedance in 2018, the data in the Appendix B table appears to have been copied into the table incorrectly. The City will amend the table with the correct data and highlight the exceedance	Board staff note that the City submitted Version 2 of the 2018 Annual Report with this correction made, and have posted it to the public registry.

May 2, 2019

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

Dear Ms. Janes,

Re: City of Yellowknife
Water Licence – MV2009L3-0007
2018 Annual Water Licence Report
Request for Comment

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

Topic 1: Bailing Facility Wastes Characterization

Comment(s):

In August 2017, the City specified that "Testing of the bailing facility has not, and will not, be an ongoing process" (p. 16-17 of 27 - SWDF O&M Plan (v. 5)).

In an Acceptance Letter of the 2016 Annual Report (AR), the Board recommended that 'future annual reports should include monitoring and characterization results for all non-sewage wastes disposed of in the lagoon'. In a response provided to ECCC during the 2017 AR review process, the City stated that results for all non-sewage should be available within their 2018 AR.

Although both Bailing Facility leachate and sludge were discharged to the municipal sewage system in 2017 (as per 2018 AR), no results were provided for this waste stream in the 2018 AR. ENR notes that the recent SDF O&M Plan (v. 2) specifies that "the City is currently in the process of characterizing and quantifying the sludge and leachate generated from the bailing process" (p. 24 of 166).

Recommendation(s):

1) ENR recommends that the 2017 monitoring of Bailing Facility wastes (both leachate and sludge) be submitted to the Board in attachment of their 2018 AR, if available (see comments below).

Topic 2: Bailing Sump Monitoring - For Relevant Waste Stream Characterization

Comment(s):

The 2018 AR currently being reviewed specifies (p. 6 of 140) that it is currently not possible to measure liquid volumes of leachate removed at the Bailing Facility, because the sump is tied into the facilities sewage system. The report further specifies that liquid from the bailing sump ends up in the sewage holding tank that is being pumped out by Kavanaugh on a regular basis - with no method to track volumes removed.

ENR notes that results towards characterization of Bailing Facility wastes were submitted only once in the past, in the 2014 AR.

Recommendation(s):

1) To accurately assess the quality of the Bailing Facility sump wastes alone, ENR recommends for monitoring to occur at the sump level, prior to being combined/mixed and managed with another type of wastes (i.e. sewage tank(s)).

2) Should the quality of Bailing Facility sump wastes be such that it would prevent an authorization to discharge into the sewage lagoon, ENR recommends that the City increase the storage capacity for this type of leachate. Leachate with exceedances which prevent disposal should not be diluted or mixed with other types of wastes prior to disposal.

Topic 3: Leachate Characterization – To Inform Subsequent Management

Comment(s):

Recommendations regarding characterization of landfill leachate discharged into the sewage lagoon has been an on-going process since 2011. ECCC first outlined the need for 'non-sewage' landfill waste streams characterization in Nov. 2011, to determine if pre-treatment prior to discharge, or an alternative disposal method/location, should be warranted. Years later (Aug 2017), ECCC made similar comments and recommendations stating that 'discharging sludge to a sewage lagoon may affect lagoon performance and is not a recommended practice'. ECCC then recommended that non-sewage sources of sludge [and leachate] be diverted to a dedicated pit/lagoon, rather than being directly discharged into the sewage lagoon, ultimately discharging to the environment.

The latest SDF O&M Plan version specifies that once the Bailing Facility wastes characterization is completed, the City will assess available options for alternative disposal. An evaporator was specified as a method to eliminate the need to discharge Cell A and Cell B leachate to the sewage lagoon. During a February 2019 SWANA Landfill Leachate Management workshop, it was clarified that landfill leachate disposal to the environment – even pre-treated - is not approved in Alberta, Saskatchewan or Manitoba. Disposing of pre-treated leachate to a sanitary wastewater collection system is/was said to be uncommon and requires compliance with any local by-laws. This also briefly described collection ponds used in dry environments such as the Canadian Prairies, where landfill leachate is gathered and evaporated as a final disposal method, with some success over the warmer season.

Revised Guidelines for non-sewage discharges to municipal sewage lagoon are not yet available. As such, to help provide some context, a preliminary comparison was made between Bailing Facility sump quality results (available for 2013 only) and EQCs established for discharging HCSTF leachate to Hay River municipal sewage lagoon (see derived Guidelines, p. 39 of Bio Treatment Facility O&M plan). The 2013 results surpassed HCSTF leachate EQCs for Total Phenols, Toluene and several metals. When compared to reported results (in 2018 AR) for the new Composting Pad leachate, which is to be monitored yearly under the Water Licence, the Bailing Facility sump waste results were more elevated, notably for Calcium, Chloride, Sodium, Magnesium, TDS, Total Phenols, Toluene, Total Chromium, Lead, Manganese, Strontium, Vanadium, as well as for Aluminum, Iron and Zinc.

Recommendation(s):

1) To prepare for the Water Licence renewal due in 2022, and to inform adequate management decisions with respect to landfill leachate management, ENR recommends for monitoring, and Annual Report results submission of Bailing

Facility wastes (both Leachate and Sludge), to be conducted yearly until relevant characterization is completed.

2) ENR recommends that the next version of the City SDF O&M Plan to specify that Bailing Facility wastes will be monitored and reported upon yearly.

Topic 4: Leachate Characterization – Water Treatment Plant

Comment(s):

The 2018 AR specifies (p. 6 of 140) that all Water Treatment Plant (WTP) backwash was discharged to the sewage system.

A preliminary comparison was made between WTP quality results (raw data, p. 137-138 of 2018 AR) and EQCs established for discharging HCSTF leachate to Hay River municipal sewage lagoon. Elevated levels were noted TSS, Aluminum, Arsenic, Cobalt, Copper, Selenium and Zinc The reported pH was 5.56, and the Aluminum concentration was 60.4 mg/L.

Recommendation(s):

1) Considering the amount of data submitted each year, and to foster efficient reviews, ENR recommends that WTP monitoring data be extracted and presented in a tabular format that is easily accessible within the AR.

Topic 5: Exceedances Highlighted - Current/Future Annual Reports

Comment(s):

During the 2017 AR review period, it was specified that exceedances will be highlighted in future data compilation prepared by the City.

ENR notes that exceedances for BOD and fecal coliforms monitored at the Fiddler's lagoon were not identified in the Appendix B compilation Table.

Recommendation(s):

1) Considering the amount of data submitted each year, and to foster efficient reviews, ENR recommends that the results be highlighted in the Tabular Summaries of future Annual Reports.

Comments and recommendations were provided by ENR technical experts in the Water Management and Monitoring Division and the North Slave Region and were

coordinated and collated by the Environmental Assessment and Monitoring Section (EAM), Environmental Stewardship and Climate Change Division.

Should you have any questions or concerns, please do not hesitate to contact Patrick Clancy, Environmental Regulatory Analyst at (867) 767-9233 Ext: 53096 or email patrick_clancy@gov.nt.ca.

Sincerely,

Patrick Clancy
Environmental Regulatory Analyst
Environmental Assessment and Monitoring Section
Environmental Stewardship and Climate Change Division
Department of Environment and Natural Resources
Government of the Northwest Territories

Environment and Climate Change Canada | Environnement et Changement climatique Canada

Environmental Protection Operations Directorate
Prairie & Northern Region
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Yellowknife, NT X1A 2P7

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

May 1, 2019

Via online submission

Erica Janes
Regulatory Specialist
Mackenzie Valley Land and Water Board
7th Floor, 4922 48th Street
P.O. Box 2130
Yellowknife, NT X1A 2P6

Dear Erica Janes:

RE: MV2009L3-0007– City of Yellowknife – 2018 Annual Water Licence Report

Environment and Climate Change Canada (ECCC) has reviewed the information submitted to the Mackenzie Valley Land and Water Board (MVLWB) regarding the above-mentioned Annual Water Licence report and is submitting comments via the online review system. ECCC's specialist advice is provided based on our mandate, in the context of the *Canadian Environmental Protection Act*, the pollution prevention provisions of the *Fisheries Act*.

Should you require further information, please do not hesitate to contact me at (867) 669-4744 or eva.walker@canada.ca.

Sincerely,

[original signed by]

Eva Walker
Acting Senior Environmental Assessment Coordinator

Attachment(s): ECCC Comments Excel Sheet

cc: Georgina Williston, Head, Environmental Assessment North (NT and NU)