Review Comment Table

Board:	MVLWB
Review Item:	Hay River Municipal Water Licence Renewal Application (MV2019L3-0010)
File(s):	MV2009L3-0005 MV2019L3-0010
Proponent:	Town of Hay River
Document(s):	Engagement Plan (1) Water Treatment Plant O and M (1) Sewage Disposal Facility O and M (1) Solid Waste O and M (1) Hydrocarbon Contamianted Soil Treatment Facility O and M (1) Snow Disposal Plan (1) Spill Contingency Plan (1) Water Monitoring Plan (1) CBOD/BOD Study Request (1) Work Plan V1 (1) N1L3-0053 - Signed Preliminary Screening September 13 2004 - Sept27-19 (3200 KB) N1L4-0053 PRELIMINARY SCREENING REPORT FORM August 2 2001 - Sept27-19 (229 KB) Municipal Water Licence Questionnaire (1756 KB) Draft Work Plan V2 (176 KB) Cover Letter and Application (1) Work Plan V3 (175 KB) MV2019L3-0010 - Hay River - Groundwater Monitoring Program Proposal - Jan30-20 (28542 KB) MV2019L3-0010 - Hay River - Technical Session - Information Requests to TOHR and GNWT-ENR - Feb19-20 (801.3 KB) MV2019L3-0010 - Hay River - GNWT-ENR response to Technical Session Information Requests - Mar10-20 (10.56 MB) MV2019L3-0010 - Hay River - Final Landfill Fire Sampling Report - Feb10-20 (67.78 MB) MV2019L3-0010 - Hay River - Town response to Technical Session Information Requesets - Mar11-20 (4038 KB) MV2019L3-0010 - Hay River - Town response to Technical Session Information Requests - groundwater - RAW DATA - Mar11-20 (49 KB) MV2019L3-0010 - Hay River - Work Plan Version 4 (200 KB) Work Plan Version 5 (196 KB)
Item For Review Distributed On:	Sep 26 at 13:54 Distribution List

Reviewer Comments Due By:	Oct 31, 2019
Proponent Responses Due By:	Dec 12, 2019
Item Description:	**October 8, 2020 Update**: The draft Water Licence conditions have been distributed as a separate Item For Review. Reviewers have been notified that Closing Arguments to the Proceeding are due to Board staff on October 30, 2020: the same date as comments on the draft Licence Conditions. **August 10, 2020 Update**: the Town of Hay River's responses to Public Hearing Interventions have been received and posted to the Public Regsitry for MV2019L3-0010. **July 27, 2020 Update**: Public Hearing Interventions have been received and posted to the Public Registry for MV2019L3-0010. **July 17, 2020 Update: Board staff have revised the Work Plan for this proceeding. Work Plan Version 5 is linked below and posted to the public registry for MV2019L3-0010.** **May 20, 2020 Update: Board staff have revised the Work Plan for this proceeding. Work Plan Version 4 is linked below and posted to the public registry for MV2019L3-0010.** **March 26, 2020 Update**: The Town of Hay River has requested an extension to respond to review comments on both the Groundwater Monitoring Plan Proposal and the Final Landfill Fire Sampling Report. Board staff have granted this request; the new response deadline is currently April 15, 2020. Given this change, these reviews will not be complete before the scheduled Pre-Hearing Conference on April 2, 2020, as outlined in the Draft Work Plan

	Version 3; Board staff also anticipate that parties will not have adequate time to prepare interventions for the April 16, 2020 deadline. In light of this, and given the uncertainty and rapidly evolving situation associated with the COVID-19 pandemic, revisions to the timeline for the MV2019L3-0010 renewal proceeding are being discussed, and will be distributed at a later date.
	March 11, 2020 Update: Board staff have added links to this review page, for the Technical Session Information Requests, and for the Final Landfill Fire Sampling Report, which is being reviewed separately. All of these items have been posted to the public registry page for MV2019L3-0010.
	January 30, 2020 Update: The Town of Hay River has submitted a Groundwater Monitoring Program Proposal for consideration by reviewers in advance of the upcoming Technical Session. Board staff have posted the Plan to the MV2019L2-0010 public registry page and linked it below.
	November 21, 2019 Update: Board staff have revised the draft Work Plan (Version 3), which has been posted to the Town's public registry page and linked below. The Technical Session is now planned for February 11-13, 2019 in Hay River.
	November 12, 2019 Update: The Town of Hay River has requested and been granted an extension to respond to reviewer comments on their Licence renewal Application. The new deadline for responses is December 12, 2019. The Technical Session will therefore not be held in Hay River from December 10-12, 2019, but instead at a later date. Board staff are working to revise the Work Plan for this proceeding accordingly, and will distribute it in the near future.
	October 8, 2019 Update: Board staff have identified a scheduling conflict within the Draft Work Plan V1. As such, the Draft Work Plan has been revised (please see link below for Draft Work Plan V2). Consequently,

review timelines have also been adjusted; comments on the Preliminary Screening and Draft Work Plan are due directly to Board staff on October 17, 2019, with Town responses due October 22, 2019. Reviewer comments on the Application are due OCtober 31, 2019, with Town responses due November 21, 2019.

The Town of Hay River (Town) has submitted a complete renewal application for a type A water licence. This Application is to renew Town's current Water Licence (Licence) MV2009L3-0005. The purpose of this Application is to continue to conduct municipal operations at the Water Treatment Plant (water withdrawal), Sewage Disposal Facilities, and Solid Waste Disposal facilities (deposit of waste) in Hay River, NT. The Town has also requested an exemption from preliminary screening, stating that the two previously-conducted preliminary screenings (from 2001 and 2004, and referenced below) adequately encompass the proposed activities.

Reviewers are invited to submit comments and recommendations using the Online Review System (ORS) by the review comment deadline specified below. Notices of application for water compensation must also be submitted by the review comment deadline. If reviewers seek clarification on the submission, they are encouraged to correspond directly with the applicant prior to submitting comments and recommendations.

Please provide comments and recommendations on the documents linked below. Reviewers may also wish to consider providing an overarching recommendation regarding whether the Board should approve the submission, to provide context for the comments and recommendations and assist the Board with its decision.

A draft work plan for this Application has been developed by Board staff. **Board staff are requesting your comments on the draft work plan by October 17, 2019**. Comments on the draft work plan should be submitted by email to Erica Janes: ejanes@mvlwb.com.

Board staff agree that this renewal request is exempt from preliminary screening, in accordance with the Preliminary Screening Exemption List Regulations and Exemption List Regulations because they have not been modified since the previous screening. If you have comments or recommendations on the possible exemption, please include them in your

	submission. The most recent preliminary screenings that were approved by the Board is located under Document(s) below. All documents that have been uploaded to this review are also available on our public Registry. If you have any questions or comments about the ORS or this review, please contact Board staff identified below.
General Reviewer Information:	This information was also faxed to the following: Fort Simpson Métis Local #52 - Marie Lafferty President (867)695-2040; and Northwest Territory Métis Nation - Garry Bailey c/o 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 Katherine Harris

Comment Summary

Town of Hay River (Proponent)			
ID	**Topic**	**Reviewer Comment/Recommendation**	**Proponent Response**
1	General File	**Comment** (doc) Town of Hay River's written response **Recommendation**	
Environment and Climate Change Canada: Russell Wykes			
ID	**Topic**	**Reviewer Comment/Recommendation**	**Proponent Response**
1	ECCC-TC1: Water Monitoring Plan V1Section 5.1 Leachate Monitoring and Management at the Biotreatment Pad	**Comment** Throughout this section the term "Biotreatment Pad" is used in reference to the clay lined cell used to store and treat hydrocarbon contaminated soil that is part of the Hydrocarbon Contaminated Soil Treatment Facility. However, the term "Biotreatment Pad" is not defined in this document (Water Monitoring Plan V1). Moreover, the term "Biotreatment Pad" is not defined or used in reference to	**Dec 12:** The TOHR will update the Water Monitoring Plan by removing the term “Biotreatment Pad” and replacing it with

		the treatment cell in the Hydrocarbon Contaminated Soil Treatment Facility O and M document. **Recommendation** ECCC recommends that the Proponent provide a definition of Ã¢Â€ÂœBiotreatment Pad" in the Water Monitoring Plan document and/or the Facility O and M document as necessary to clarify the use and consistency of terminology across and within documents.	“Hydrocarbon Contaminated Soil Treatment Facility” (HCSTF for consistency. The HCSTF will cease operations in 2020. The remaining soil will be tested and if within criteria will be removed for landfill cover. If not within criteria, plans w be made to move the remaining soil to another treatment facility.
2	ECCC-TC2: Water Monitoring Plan V1 Section 5.1 Leachate Monitoring and Management at the Biotreatment Pad	**Comment** "Summer season" and "snow-free months" are used interchangeably, but could indicate different times/durations of the year. **Recommendation** ECCC recommends the Proponent increase the consistency of terminology to indicate the timeframe of monitoring/inspections.	**Dec 12:** The Town will define the timeframe/durations in the Plans for the terms “summer season” and “snow-free months” to provide clarity and consistency.
3	ECCC-TC3:Water Monitoring Plan V1 Section 5.4 Surface Water Sampling of the Hay River	**Comment** The water-monitoring plan V1 states, "Annually, surface water samples will be taken of the Hay River." However, no date or timeframe information is provided. **Recommendation** ECCC recommends the Proponent provide information on timing of sampling such that annual samples can be consistent for comparison across years.	**Dec 12:** Surface water sampling of the Hay River was done outside of the Water Licence Surveillance Network Program by the Town. As such, there are no licence requirements t the timing or parameters to be sampled. Typically, the sampling has been completed at the same time as the groundwat monitoring due to cost impact.

4	ECCC-TC-4: Water Monitoring Plan V1 Section 5.5 Surface Water and Sewage Effluent Monitoring and Sampling Methodology	**Comment** The link provided for further information on sampling technique is broken: (http://www.maca.gov.nt.ca/operations/water/docs/MACA-small-systems-waste-water-treatmentstudentmanual.pdf) **Recommendation** ECCC recommends the Proponent provide an active link, or remove the link and provide pertinent details in the following paragraphs instead.	**Dec 12:** The Town will update the link or revis the Water Monitoring Plan to provide the pertinent details regarding sampling methods.
5	ECCC-TC5: Water Monitoring Plan V1 Appendix B Table B â€“ 4 Biotreatment Pad Groundwater Monitoring Action Levels (SNP 0053-7a, 7b, 7c, 7de)	**Comment** During review of the 2018 Annual Report, it was recommended that sulphate, chloride and fluoride be monitored at all Biopad groundwater wells (SNP 0053-7 A, B, C, D) during future sampling events. **Recommendation** ECCC recommends the Proponent include sulphate, chloride and fluoride in the SNP 0053-7X series monitoring or provide sufficient rationale for their exclusion.	**Dec 12:** Refer to response for Topic ECC – TC1 regarding the termination of operations at the HCST The Town is currently undergoing a review of the groundwater monitoring data and intends to present recommendations for the parameters to be included in the prograr at the Technical Sessio It would be useful to th Town for ECCC to provide the rationale o including sulphate, chloride and fluoride ir the SNP 0053-7X series of monitoring wells as they are intended to monitor the potential impacts from the HCST not the landfill. The Town will forward a copy of the proposal to the reviewers prior to the session to facilitate meaningful discussion.
6	ECCC-TC6: Water Monitoring Plan V1 Section 3.0 Surveillance Network Program Sample Locations	**Comment** During review of the 2018 Annual Report, it was recommended that the following metals be included in groundwater monitoring efforts for the 0053-5x series and 0053-7x series wells: aluminum (Al), antimony (Sb), arsenic (As), barium (Ba), beryllium (Be), boron (B), cadmium (Cd), chromium (Total) (Cr), cobalt (Co), copper (Cu), iron (Fe),	**Dec 12:** The Town is currently undergoing a review of the groundwater monitorir data and intends to present

	and Rationale Tables 3-7, 3-8, and 3-10	lead (Pb), manganese (Mn), mercury (Hg), molybdenum (Mo), nickel (Ni), selenium (Se), silver (Ag), thallium (Tl), titanium (Ti), uranium (U), vanadium (V), and zinc (Zn). Many of these metals have been included in the proposed Ground Water monitoring plan, however, antimony (Sb), barium (Ba), thallium (Tl), titanium (Ti), and uranium (U) have not been included as previously recommended. **Recommendation** ECCC recommends the Proponent include the following metals in monitoring of the 0053-5x series and 0053-7x series wells: antimony (Sb), barium (Ba), thallium (Tl), titanium (Ti), and uranium (U), or provide sufficient rationale for their exclusion.	recommendations for the parameters to be included in the prograr It would be useful to th Town for ECCC to provide the rationale o including antimony (Sb barium (Ba), thallium (Tl), titanium (Ti), and uranium (U) as they were not included in th Surveillance Network Program as part of Licence MV2009L3-0005. The Town will forward a copy of the proposal to the reviewers prior to the session to facilitate meaningful discussion.
7	ECCC-TC7: Water Monitoring Plan V1 Section 3.0 Surveillance Network Program Sample Locations and Rationale Table 3-7	**Comment** Table 3-7 indicates that SNP0053-5a will only be monitored monthly during periods of flow. However, given that the intent of this Surveillance Network Program location is to capture surface water runoff/leachate from the site, sampling conducted after any major rainfall event could provide valuable data. **Recommendation** ECCC recommends sampling at SNP0053-5a after major rain events in addition to monthly during periods of flow.	**Dec 12:** The Town wou like to discuss the inter location and timing of the sampling at SNP 0053-5a during the technical sessions to ensure practical and economic best practice are considered in the discussion.
8	ECCC-TC8: Water Monitoring Plan V1 Monitored Parameters - Post-landfill fire	**Comment** The recent landfill fire (2019), it may warrant expanding the suite of parameters monitored in surface water runoff/groundwater monitoring associated with the solid waste disposal facility to include monitoring of contaminants that may have been mobilized by the landfill fire. Examples of contaminants not currently monitored that could be mobilized by fire may include: BTEX, VOC's, PAH's, and dioxins and furans. **Recommendation** ECCC recommends a more fulsome suite of parameters that includes contaminants that could be mobilized by the landfill fire, be monitored in surface water runoff/groundwater from the solid waste disposal facility until such a time that monitoring has demonstrated that	**Dec 12:** The Town wou like to propose keeping the monitoring of contaminates that coul have been mobilized b the fire separate from the Licence parameters as there is no clear mechanism to remove the parameters should there be no impacts to water quality. At a minimum, the

		impacts to water quality and groundwater quality from the fire are not occurring.	parameters should be based on the monitorir completed to date. A clear definition, and distinction can be mad between the paramete related to the fire and a full description of the mechanism to remove the sampling requirements once the monitoring has demonstrated that impacts to water qualit and groundwater quali from the fire are not occurring.
9	ECCC-TC9: Water Monitoring Plan V1 Groundwater Monitoring Table 3.8	**Comment** Table 3.8 states that the rationale for sampling the groundwater wells at SNP0053-5b,c,d,e is to provide baseline and background groundwater quality. ECCC notes that only SNP0053-5b is up gradient of the solid waste disposal facility and therefore represents a baseline or background sample. SNP0053-5c,d,e are all down gradient of the facility and are therefore monitoring for potential impacts to groundwater and mobilization of contaminants from the facility. **Recommendation** ECCC recommends the Proponent differentiate in background versus exposure in the rationale for sampling of groundwater wells	**Dec 12:** The Town will update the Water Monitoring plan to differentiate between the background groundwater monitorir well and the other groundwater monitorir wells.
10	ECCC-TC10: Water Monitoring Plan V1 Action Levels - Surface Water SamplingSection 7.0 Appendix 2 - Table B	**Comment** Action levels have been developed for groundwater monitoring from the landfill (SNP0053-5 b,c,d,e) and biotreatment plant (SNP0053-7a,b,c,d) and discharge criteria exist for sewage effluent at the point of compliance (SNP0053-2b) and the storage pond collecting leachate from the biotreament plant (SNP0053-8). However, no action levels are discussed regarding leachate/surface runoff sampling from the landfill (SNP0053-5a). Appendix 2, Table B includes this station in the action levels for groundwater monitoring, however given that this monitoring station is not a groundwater sampling location the criteria for groundwater would not be applicable to this surface water runoff station. In addition, it is unclear based on the description of SNP0053-5a whether leachate/runoff	**Dec 12:** The Town wou like to make the distinction between leachate verses runoff. intermediate cover is placed correctly then there is no contact of the precipitation with the waste and it is runoff not leachate. With compliance to proper intermediate cover placement the runoff should not

		is collected via a storage pond and sampled, or is directly flowing towards the Hay River. Given the close proximity of the landfill to the Hay River (approximately 100m), it is recommended that any runoff is collected and analyzed rather than be allowed to flow uncollected into the Hay River. **Recommendation** ECCC recommends the Proponent: 1) clarify how runoff/leachate from the solid waste disposal facility is collected and sampled;2) And, develop action levels, relevant to surface water quality for SNP0053-5a	require sampling/monitoring.
11	ECCC-TC11: Water Monitoring Plan V1 Appendix A â€“ Maps Figure 7	**Comment** Figure 7 displays all the sampling associated with the landfill and the biotreatment plan (SNP0053-5,7,8). However, neither SNP station 0053-5a, nor the direction of flow, is depicted on the figure. Given these omissions, it is unclear to ECCC whether the selected sampling location adequately detects all potential runoff/leachate from the solid waste disposal facility. **Recommendation** ECCC recommends the Proponent update the figure to include the location of SNP0053-5a, the direction of flow, and any runoff pathways from the landfill to the Hay River.	**Dec 12:** The detailed figures are included in the SWDF O&M Plan. All Plans will be updated to the Board directed specifications, however to avoid confusion details will b located in one Plan (i.e SWDF O&M Plan) and the other Plans (i.e WMP) will reference which Plan and where the Plan the informatic can be found.
GNWT - ENR - EAM: Central Email GNWT			
ID	**Topic**	**Reviewer Comment/Recommendation**	**Proponent Response**
31	General File	**Comment** (doc) ENR Letter with Comments and Recommendations **Recommendation**	
1	Topic: 2018 AR and ICRP Recommendations	**Comment** With the occurrence of a fire emergency at the landfill this past year, ENR looked closely at SNP (Surveillance Network Program) results and monitoring network design, prompting more recommendations via the 2018 Annual Report (AR) and Interim Closure and Reclamation Plan, v.1.3 (ICRP) review periods. Board Staff Reports for the 2018 AR and ICRP directed that some of these items be submitted as part of 2019 AR. Other items/recommendations made during that period were postponed for further discussion during the renewal	

		proceedings. As such, some of the following comments will be touching on topics previously introduced, and references to specific comments of the 2018 AR and ICRP Comment Table Summaries will be provided when helpful. As approval of the ICRP was deferred based on a specific list of items to be submitted or updated, details submitted in the ICRP have been referenced below, even though the plan has not been circulated with the current review. **Recommendation** None.	
2	Topic: Fire Impacts to Water Quality - Opportunistic Monitoring in 2019	**Comment** In a June 6th, 2019 e-mail to the Town of Hay River (the Town), the ENR Inspector recommended that opportunistic post-fire surface water samples at the landfill site be collected after any major rain events, most specifically of ponded water at/near the SW1, SW7 and SW13 sampling locations (SW# locations were established during the fire). A full suite of parameters should be monitored, including total cyanide, toluene, PAHs, VOCs and 2,3,7,8-TCDD measured at levels above guidelines during the fire. To assess potential impacts of the fire on surface water in the river, the ENR Inspector also requested that samples be collected at SW2 &SW14 during the remaining 2019 open water season (summer & fall). A full suite of parameters should be monitored, including PAHs and 2,3,7,8-TCDD. Following a similar logic with groundwater quality, monitoring for a full suite of parameters was also required in August by the ENR Inspector, and again before fall freeze-up (as already required yearly under Water Licence SNP groundwater monitoring requirements), in order to maintain a temporal record. These parameters should be monitored as well in 2019, including benzene, ethylbenzene, PAHs, VOCs, OCDD [45.4], OCDF[2.36], Total Hepta-Dioxins [16.4], as detected or measured above guidelines during the fire. The submission of a trends analysis for 2019, compiling data collected before, during and after the fire, would allow synthesizing of all monitoring efforts into one concise informative tool. **Recommendation** 1) ENR recommends fire impacts on surface water quality be monitored opportunistically before the end of the 2019 open water season, most specifically at the landfill site (at/near SW1, SW7 and SW13) and in the Hay River (at SW2 and SW14).	**Dec 12:** <p style="margin-left:1.0cm">The Town would like to note that this comment is not regarding the application for the renewal of the municip water licence and shou have been presented i an email or call prior to the end of open water season.
3	None	**Comment** None **Recommendation** 2) ENR recommends that all data	**Dec 12:** <p style="margin-

		collected during the year 2019 (before, during and after the fire) for groundwater, as well as surface water at the landfill and in the river, to be compiled to allow for quick understanding and best presentation of monitoring efforts.	left:1.0cm">Please see above. The Town will present all of the data collected will be presented in the 2019 Annual Report.
4	None	**Comment** None **Recommendation** 3) ENR recommends for this/these trend(s) to be submitted with other updated trends in the 2019 AR, including for parameters specified above that were detected and/or measured at elevated levels during the fire.	**Dec 12:** <p style="margin-left:1.0cm">Please refe to the previous two responses.
5	Topic: Runoff/Leachate - Contingency Planning & Final Disposal	**Comment** Emergency crews involved applied water on the landfill fire that was first seen in early March, during which a first spill report was completed to indicate that runoff/leachate was escaping the property. A berm was established to retain that water following directions from ENR inspectors (March 14th), and crews continuously re-circulated the water collected in a catchment thereafter (at SW7-north perimeter), until fire extinction on March 30th. The resulting leachate was subsequently pumped by vacuum truck, and stored temporarily in a pre-existing trench on the east perimeter of the landfill (SW15). Loss of containment from a natural drainage catchment (tree pond or SW1-north/east perimeter beside SW7 catchment) at that temporary storage location was reported as a spill on March 28, 2019. The remaining fire suppression leachate/run-off was pumped from various catchments and temporary storage ponds (SW1, SW15) around site and trucked off-site for proper disposal at an approved facility (Tervita), in Red Earth (Alberta) in mid-April 2019. ENR notes that another fire occurred at the landfill in 2014. The Solid Waste Disposal Facility (SWDF) Operations and Maintenance Plan (O&M) outlines operation and maintenance practices to prevent future fire occurrences at the landfill in Section 17 (as well as in other sections of the document), Details on management and containment of re-circulated water used as fire-suppressant could not be located. **Recommendation** 1) ENR recommends that management practices of water used as suppressant during a landfill fire (eg. containment of water on-site via construction of berms) be specified in either the TownÃ¢Â€Â™s SCP or SWDF O&M Plan, where deemed most appropriate.	**Dec 12:** <p style="margin-left:1.0cm">The Town will update the SWDF O&M Plan to specify the manageme of water used as suppressant during a landfill fire.

6	None	**Comment** None **Recommendation** 2) ENR recommends that management practices of residual re-circulated contaminated water accumulated during/after the fire, be specified in either the TownÃ¢Â€Â™s SCP or SWDF O&M Plan, where deemed most appropriate, in a context where Red Earth may no longer be accepting NWT leachate for final disposal.	**Dec 12:** <p style="margin-left:1.0cm">The Town will update the SWDF O&M Plan to specify management practices of residual re circulated contaminate water accumulated during/after a fire.
7	Topic: Fire Prevention Practices	**Comment** Section 6 of the SWDF O&M Plan lists all materials currently accepted at the landfill. Figure 3-1 (p. 20 of 29) illustrates storage locations used on-site. ENR notes that the 2019 fire was located in the large and high unsegregated household pile (no. 8 in Figure 3-1). ENR further notes that a large pile of tires currently remains stored at the landfill. **Recommendation** 1) ENR recommends that the Town specify any plans to reduce/manage the current household wastes cell, via further segregation and/or re-use of segregate household material. Any household wastes pile management strategies should be outlined into the SWDF O&M Plan.	**Dec 12:** <p style="margin-left:1.0cm; margin-right:0cm">The Town will continue to review landfill practices as par of on-going operations and will update the O&M Plan as new practices are implemented.
8	None	**Comment** None **Recommendation** 2) ENR recommends that details on shipment of items stockpiled at the site be provided in the Town SWDF O&M Plan.	**Dec 12:** <p style="margin-left:1.0cm; margin-right:0cm">The Town provides details on shipment of items stockpiled at the site vi the requirements of th Annual Report as per t Water Licence. As the inventory of items is constantly changing th addition of this information in the SWD O&M Plan is not practical. The purpose the O&M Plan is t lay out the “how” o managing the material

			on site. The annual report is where the specific details of volumes and inventory are provided.
9	Topic: SWDF Site Closure â€“ Tentatively in 2024	**Comment** Early objectives/goals of SWDF groundwater monitoring efforts is to determine if contaminants are present beneath the facilities, and if the contaminants are migrating off-site to the environment. The Federal Interim Groundwater Quality Guidelines (FIGWQG) were developed to assist federal custodians in assessing, remediating/risk managing federal contaminated sites funded under the FCSAP. In Hay River, the trends analyses submitted in the 2018 AR indicated elevated concentrations for several parameters throughout the site, as well as ~ 60 m before entering the Hay River (SNP 0053-5 c/d/e). In their ICRP, the Town specified the year 2024, as a tentative closure year of the landfill. Section 5.1.2. specifies best practices designs and grading for the SWDF final cover. **Recommendation** 1) ENR recommends that the Town specify if a site has been identified/selected for a new Solid Waste Disposal Facility.	**Dec 12:** <p style="margin-left:1.0cm">The Town has not yet identified/selected a si for a new Solid Waste Disposal Facility.
10	None	**Comment** None **Recommendation** 2) ENR recommends that the Town further clarify which areas/sections of the current landfill may be closed earlier compared to other areas.	**Dec 12:** <p style="margin-left:1.0cm">The Town submitted the ICRP which provided the details for the closure o the landfill. The Town intends to update the ICRP as per the directio of the MVLWB (Octobe 10, 2019 Decision Lette Solid Waste Disposal Facilities Interim Closure and Reclamation Plan Version 1.3 and Drainage Study &ndash Deferral Town of Hay River – Municip Water Licence MV2009L3-0005)</em

11	None	**Comment** None **Recommendation** 3) ENR recommends that the Town specify any plans related to Progressive Closure and Reclamation of the landfill site, prior to the 2024 tentative final closure date.	**Dec 12:** <p style="margin-left:1.0cm">Please refe to the response above.
12	Topic: On-going Non-compliance at the HCSTF	**Comment** The 2018 AR trends analyses indicate the likely contribution of the HCSTF to groundwater elevated levels underneath the facility. A number of issues with the Town's HCSTF were noted during ENR inspector most recent visit: . Inadequate and improper fence installation around the perimeter of the Surface Run-off retention Pond (SRRP) at the HCSTF. Delays in fixing areas that have fallen in have caused wildlife mortalities; . Unidentified soil piles during treatment; . Inadequate freeboard at the surface run-off retention pond, due to leachate management issues; . Excessive surface run-off on the pad, and poor drainage due to limited space inside the facility; . Inadequate berm height and space between berms and soil piles, to contain increased surface runoff and potential shifting/slumping of piled material; . Improper storage of treatment material (eg. ammonium nitrate prills); . Lack of contingencies in place, to mitigate contaminated material from being tracked outside of the facility; . No copies of hazardous waste manifests/movement documents for leachate shipment tracking were found in the gatehouse binder; . Failure to inform ENR inspector of updated results of soils; . Failure to address outstanding HCSTF operational, management and compliance issues; . Little/no improvement in between inspections. Also enumerated in past ENR inspection reports: . Operating without an approved O&M Plan. Section 4.1 of the HCSTF O&M Plan states that 'Should liner or berms become damaged during operations, repairs will be made immediately..' ENR is concerned that on-going non-compliant operational and maintenance issues have impaired the Town's capacity to maintain liner integrity, and suggests for the new Water Licence condition(s) to provide further provision towards maintenance of the liner and HCSTF. ENR notes that Section 13.4.5 of the SWDF O&M plan (September 2019) specifies that the SWDF contains a HCSTF, but that "this facility is no longer accepting wastes, and that any hydrocarbon contaminated soil, snow or water will be redirected to another off-site treatment and disposal option."	**Dec 12:** <p style="margin-left:1.0cm">The Town confirms that the non-acceptance of contaminated soils at the HCSTF will be permanent until site closure. The treatment and removal of the contaminated soils will be completed prior to the issuance of the renewal and therefore the Town proposes to remove the HCSTF operations from the licence. <p style="margin-left:1.0cm">For greate clarity, waste will no longer be received at the pad and the remaining soil will be treated this spring and removed from the pad or relocated offsite to another HCSTF. The Town will include the decommissioning of th pad as part of the ICRP and follow that proces once the licence has been issued.

		Recommendation 1) ENR recommends that the Town clarify if the Non-acceptance of Contaminated Soils will be permanent until site closure, or if it is planned only for a temporary period of time.	
13	None	**Comment** None **Recommendation** 2) ENR recommends that the new Water Licence include a condition for HCSTF maintenance to the satisfaction of an Inspector.	**Dec 12:** <p style="margin-left:1.0cm">Please see the response to the previous recommendation regarding the operatio of the HCSTF.
14	None	**Comment** None **Recommendation** 3) ENR recommends that the new Water Licence include a condition for HCSTF operations to be suspended until liner integrity is re-established and verified by an engineer, in times when failure of the liner is suspected with sufficient evidence, such as groundwater results analyses, structural inspections, etc.	**Dec 12:** <p style="margin-left:1.0cm">Please see the response to the previous recommendation (1) regarding the operatio of the HCSTF.
15	Topic: SNP Monitoring at SWDF â€“ More GW Wells around the SWDF Perimeter	**Comment** As part of the current Water Licence renewal review, the addition of groundwater monitoring wells should be considered around the perimeter of the landfill site, as suggested in Dillon's 'Preliminary suggested locations for additional monitoring wells' (Fig 2, Dec 2012 report), as well as in Section 4.2.6 of the ICRP. The placement of additional wells should also take into consideration historic waste deposit areas locations, as presented in older site maps, or indicated elsewhere. Knowledge acquired via these supplementary wells would help further delineate the extent of contaminated groundwater flow exiting the SWDF in order to inform on the efficiency of current SWDF management operations (and associated mitigative action(s)). In addition this would assist in the understanding of progressive closure/reclamation that may be required prior to the planned final closure, therefore facilitating the transition into final closure activities in the future. **Recommendation** 1) ENR recommends the addition of groundwater monitoring wells, between the outside perimeter of the SWDF and the river, and as deemed most relevant/effective by the Board, in order to fill existing perimeter monitoring gaps, further delineate the extent of groundwater exiting the SWDF to the north/northeast or	**Dec 12:** <p style="margin-left:1.0cm">The Town currently undergoing a review of the groundwater monitorir wells and data and intends to propose the wells to be included in the surveillance netwo program during the Technical Session. The Town will forward a copy of the proposal to the reviewers prior to the session to facilitate meaningful discussion.

		southeast portions of the facilities, and inform progressive and final closure activities.	
16	Topic: SNP Monitoring at SWDF â€“ Cl-, SO4-2, F- & Dissolved Metals	**Comment** Levels of Chloride (Cl-) and Sulphate (SO4-2) are typically associated with municipal and industrial wastes stored on the ground surface, and may serve as indicators of groundwater pollution at (or near) landfills. Trends analyses submitted in the 2018 AR indicate higher concentrations of Chloride (5-8 times FIGWQG) at the Background well and to the northeast portion of the site at SNP 0053-5 c & SNP 0053-5 d. Elevated Sulphate concentrations were also measured (5-25 times FIGWQG) at the Background well and at 0053-5e, located to the east of the 'Auto Hulk Storage Area' (Fig. 2, Dec 2012 Dillon Report). Elevated fluoride (F-) was also measured in multiple years at Background well and SNP 0053-5 c, d & e. ENR notes that Chloride, Sulphate and Fluoride were not monitored and reported in trends at all HCSTF monitoring wells (SNP 0053-7 A/B/C/D), as the current Licence SNP section only specified these parameters at the 0053-5 wells, and not at 0053-7 A/B/C/D. Monitoring these parameters in the groundwater at mid-site points (0053-7) between the Background well and the outside limits of the landfill near the river, would allow to further visualize and understand the concentrations changes throughout the site for these parameters. **Recommendation** 1) ENR recommends that Chloride, Sulphate and Fluoride be added to SNP groundwater monitoring requirements for SNP 0053-7A/B/C/D, also to extend temporal analysis for these parameters in time of closure activities.	**Dec 12:** <p style="margin-left:1.0cm">The Town currently undergoing a review of the groundwater monitorir data and intends to present a proposal for the parameters to be included in the surveillance network program at the Technical Session. It would be useful to the Town for ENR to provic the rationale of including sulphate, chloride and fluoride ir the SNP 0053-7X series of monitoring wells as they are intended to monitor the potential impacts from the HCST not the landfill. The Town will forward a copy of the proposal to the reviewers prior to the session to facilitate meaningful discussion.
17	None	**Comment** None **Recommendation** 2) To allow a better comparability with FIGWQG, ENR also recommends for Dissolved Metals to be included under SNP monitoring requirements for all SNP groundwater monitoring at the site (SNP 0053-5 b/c/d/e & SNP 0053-7 A/B/C/D) (see further background in the 2018 AR Staff Report - ENR Comment 11).	**Dec 12:** <p style="margin-left:1.0cm">The Town currently doing a revie of best practices to determine the most appropriate guidelines for the surveillance network program including the rationale and will present a proposal during the

			technical session. This will also include a proposal around dissolved- verses total-metals. The Town will forward a copy of the proposal to the reviewers prior to the session to facilitate meaningful discussion.
18	Topic: SNP Monitoring at SWDF - Insufficient Groundwater Elevation Data	**Comment** Section 4.2.5 of the ICRP specifies under Hydrogeological Setting and Characteristics (p. 29 of 66) that 'The river elevation controls groundwater contours flow, and is at approximately 158 masl, though river stage likely varies seasonally and annually. There is insufficient groundwater elevation data to quantify seasonal and interannual variation in water table position.' In the June 6th 2019 post-fire e-mail, the ENR Inspector recommended that 'Continuous measurement of water levels in groundwater wells be measured to provide the Town with more information on the recharge/discharge rates.' Although more consistently reported in recent years, ENR notes that groundwater elevations were not always provided in the past. When recorded/reported, various measurements have been used, such as masl (meters above sea level), mbgs (meters below ground surface) or depth to groundwater. ENR notes that masl may be most practical, as it does not require further calculation(s) which may be required when measuring from ground elevations. **Recommendation** 1) ENR recommends for the SNP section of the new licence require that groundwater monitoring elevation to be measured each time groundwater quality results are being collected, and reported preferably in Ã¢Â€Â˜maslÃ¢Â€Â™ (or meters above sea level).	**Dec 12:** <p style="margin-left:1.0cm">The Town accepts this recommendation.
19	Topic: SNP Monitoring at SWDF â€“ Background Well (no. 3)	**Comment** Further to Comments 7 & 15 in 2018 AR Review Comment Table, and Comment 3 & 4 in ICRP Review Comment Table, ENR offers the following for consideration through the current review on the selection of a background/reference well: . Road salts influence on groundwater are typically associated with Chloride, which may not explain Sulphate and Fluoride levels at Background well. . Elevated Chloride and Sulphate can serve as pollution indicators of industrial wastes stored/deposited on the	**Dec 12:** <p style="margin-left:1.0cm">The Town understands the desire to have a background well outside the influence from the highway or other industrial sources.

		ground. . Current proximity of Background well to landfill (within SWDF perimeter). . Freezing and thawing in subsurface water can directly affect groundwater flow patterns. . ICRP Section 5.2.5 specifies 'contaminated soil within the SWDF may be found where hazardous waste or bulky wastes are currently and have been previously stored.' Hazardous waste previously stored near Background well (Fig. 2, Dillon's Dec 2012 Report). . The location of the Background well is topographically lower than the rest of the site (except nearby river), according to Google Earth, which may influence runoff/infiltration. . If located within the SWDF zone of influence, further contamination delineation may be required in that direction during closure activities. **Recommendation** 1) ENR recommends that the points discussed above be considered during the selection of a relevant Background well.	However, the Town should not be responsible for any contaminants which ar introduced to the environment from highway operations (or other sources outside o SWDF operations). Having a background well upstream from the highway will not allow any method of determining if contaminants have bee introduced by the SWD operations or by outsid influences. (i.e. highwa operations). The Town should not be responsible for addressing contaminants which ar introduced by other parties outside of the Town operations. The Town is undergoing a review of the historical groundwater monitorir and will be presenting proposal during the Technical Session. The Town will forward a copy of the proposal to the reviewers prior to the session to facilitate meaningful discussion.
20	Topic: SNP Monitoring at SWDF â€“ Surface Water at SNP 0053-5 a	**Comment** Surface water at the Town Landfill (or SNP 0053-5 a) has not been consistently monitored in the past. The 2018 Annual Report Staff Report - ENR Comment 17 suggests that separating SNP 0053-5 a) as a distinct SNP station may be a simple fix to correct this situation in the future. Past surface water reports at SNP 0053-5 a) excerpts,	**Dec 12:** <p style="margin-left:1.0cm">The Town agrees that separating out SNP 0053-5a as a distinct SNP station wit

		which may be difficult to locate on the Public Registry for various reasons, were attached to the current recommendations for the Town's convenience. **Recommendation** 1) ENR recommends that yearly surface water monitoring be facilitated at Hay River SWDF in the approach considered most suitable by the Board.	a better description of expectations (i.e., standing or pooling water vs. periods of flow) may be a simple f to correct the situation in the future.
21	None	**Comment** None **Recommendation** 2) ENR recommends that all available SNP 0053-5 a) surface water results be plotted in trend(s), and submitted with other updated trends in the 2019 AR, in order to inform current management practices at the site.	**Dec 12:** <p style="margin-left:1.0cm">Due to the inconsistency of the sampling, locations, precipitation events, ar surficial flow over landfill material could cause significant inconsistency between sampling events (uncontrolled variables Historical trend analysi may not provide the desired information. Th Town requests further discussion during the technical session.
22	Topic: Trends Analyses â€“ Fine Tuning No. 1	**Comment** Date and sampling frequency discrepancies were noted since the initial review of the trends analyses in the 2018 AR. For example, dates provided in these graphs may not align with monitoring dates and frequencies specified in lab reports. For example, trends analyses dates specified in graphs prepared for SNP 0053-5 b/c/d/e were presented as followed July 6 2009, Nov 18 2010, April 1 2012, Aug 14 2013, Dec 27 2014, May 10 2016, Sept 22 2017, Feb 4 2019. However, monitoring dates for pasts report data Tables for the same wells were as followed: Dec 3 2009, July 21 2011, Sept 28 2011, Aug 2012, Oct 2012, June 4 2014, July 30 2014, Sept 24 2016, June 29 2017, July 25 2017, Aug 29 2017 and Sept 20 2017. Similar discrepancies were also noted for dates/frequencies plotted in trends analyses at wells 0053-7 A/B/C/D (HCSTF). As compilation/analyses are important in informing future decision making, dates and yearly number of sampling events should be accurately represented in the trends analyses. Groundwater	**Dec 12:** <p style="margin-left:1.0cm">The Town notes that these comments are regardir information for the Annual Report and are not part of the Renewa Application.

		monitoring data excerpts from various past submissions were attached to current comments, for the TOHR convenience. Elevated levels of manganese were also recorded during ENR groundwater monitoring, but was not amongst parameters presented with the 2018 AR trends analyses. **Recommendation** 1) ENR recommends that the Town ensure that dates and number of yearly monitoring events presented in trends analyses align with past monitoring reports, at SNP 0053-5 b/c/d/e and SNP 0053-7 A,B,C,D groundwater monitoring wells.	
23	None	**Comment** None **Recommendation** 2) If possible, ENR recommends that past manganese concentrations monitored at SWDF groundwater monitoring stations, also be presented in the updated trends analyses.	**Dec 12:** <p style="margin-left:1.0cm; margin-right:0cm">The Town notes that these comments are regardir information for the Annual Report and are not part of the Renewa Application. <p style="margin-left:1.0cm; margin-right:0cm">The Town presented manganese the 2018 Annual Repor with trend graph (Appendix L) and in Table 15-3. The trend was decreasing or consistent at the wells as identified in the Annual Report.
24	Topic: Trends Analyses â€“ Fine Tuning No. 2	**Comment** ENR notes that groundwater results were generally higher (several order(s) of magnitude higher in some cases) near the HCSTF at the SNP 0053-7 A/B/C/D, when compared to concentrations monitored further downstream between the SWDF and the Hay River (at SNP 0053-5 c/d/e wells). This range difference in concentrations was specified in the Town's response (2018 AR Staff Report, ENR Comment 6, p. 9 of 43), where the Town suggested that representing of all groundwater data for one parameter within a same graph for both 0053-7s and 0053-5s, may not	**Dec 12:** <p style="margin-left:1.0cm">The Town notes that these comments are regardir information for the Annual Report and are not part of the Renewa Application. <p style="margin-

		be practical/useful considering the wide concentrations' range. **Recommendation** 1) To help visualizing concentration trends for each parameter moving through the site, ENR recommends regrouping trends graphs by parameter (even if not within the same graph), rather than by series.	left:1.0cm">The Town will provide graphs in the 2019 Annual Repor by parameter and not b SNP series.
25	Topic: WTP Wastes â€“ Sludge	**Comment** Usage of flocculants and coagulants (such as Aluminum salts) are part of water treatment processes in NWT communities such as Hay River, Inuvik, Sambaa K'e, Fort Providence, Fort Resolution, Fort Smith and Yellowknife. Wastes generated from these processes need to be better understood for appropriate consideration under the Waters Act, with respect to: the chemical composition of the sludge and backwash; volumes generated/disposed for each waste type; management procedures; discharge locations, etc. These details are not always provided and available via WTP templates, or elsewhere. For example, sludge composition data and estimated monthly quantity remained unknown for Hay River, as per Section 7.0 of Hay River WTP Template. Also, no details were provided on other waste streams generated at Hay River WTP (p. 12 of 26). **Recommendation** 1) ENR recommends that condition(s) of the Hay River new Water Licence require a Plan for the Management of Water Treatment Residuals (such as requested in Fort Resolution Water Licence, Part D).	**Dec 12:** <p style="margin-left:1.0cm">The Town follows the template fo the Plan as per the MVLWB. The Town proposes to update the submitted WTP O&M Plan to include the management of water treatment residuals rather than creating a separate plan for the management of the residuals.
26	None	**Comment** None **Recommendation** 2) ENR recommends that currently missing details, such as other waste streams produced at the facility, to be specified in Section 7.0 of the WTP O&M Plan.	**Dec 12:** <p style="margin-left:1.0cm">The Town will update the WTP O&M with the information regarding the management of waste streams generated at the WTP.
27	Topic: WTP Wastes â€“ Backwash	**Comment** ENR understands flocculants and coagulants treatment occurs before water is filtered in the membranes tank(s). As such, daily membrane backwashes occurring in the membranes tank(s) may also contain coagulants and flocculants residuals. Section 7 of the Town WTP template did not provide details on the estimated monthly quantity of filter backwash, regeneration and/or membrane reject wastewater disposed. Furthermore, the final disposal	**Dec 12:** <p style="margin-left:1.0cm">The Town stores the backwash in the Backwash Water Holding Tank (see figur 3 in WTP O&M Plan). Any solids in the

		location for backwash was only specified as "Other", without providing further clarification. **Recommendation** 1) ENR recommends that the Town specify which containment/tank(s) is currently used to store backwash at the WTP, and if the backwash is at times being mixed with the sludge.	backwash are allowed t settle, then when the levels in the tank reach designated height, the backwash liquid is released to Great Slave Lake. The backwash is not mixed with the sludge.
28	Topic: WTP Wastes - SCP and Wastes Managed/Stored at WTPs	**Comment** Section 2.9 of Spill Contingency Templates regroups various lists of potential spill sources managed and/or stored at various community facilities. During a recent Water Licence review, it was specified that citric acid is used during WSF a membranes' cleaning process called 'Clean-in-place', occuring typically every 1-3 months. Chlorine is also typically used as part of WSF water treatment processes, and stored at these facilities. **Recommendation** 1) ENR recommends for the Board to consider adding Citric acid and Chlorine to the list of substances typically used and stored at WSF in the SCP Template, under Section 2.9 on Water Treatment Plant.	**Dec 12:** <p style="margin-left:1.0cm">The Town accepts this recommendation.
29	Topic: Letter from the TOHR on BOD/CBOD Trend Analysis	**Comment** The Town submitted a letter to the Board in September 2019, on CBOD/BOD ratio. As previously required for other municipal Water Licence renewals such as Fort Providence, Inuvik and Gameti, ENR agrees that Discharge Criteria be derived at 90% of existing BOD value(s), as initially established by the City of Yellowknife. **Recommendation** 1) ENR agrees with the Town that the 90% CBOD/BOD ratio established by the City of Yellowknife could also be applied to Hay RiverÃ¢Â€Â™s Water Licence conditions, where appropriate.	**Dec 12:** <p style="margin-left:1.0cm">The Town Hay River accepts with this recommendation.
30	Topic: Updated SDF Designs â€“ As per 2006 Drawing 00-CM1003 Improvements	**Comment** ENR understands that SDF sewage lagoon cell improvements occurred in 2006 with the additions of 2 new cells, for a total of 4. These improvements were referred to as 'UMA Engineering Limited TOHR SDF Improvement drawing number 00-CM1003' in the Definition of 'Sewage Disposal Facilities', in the Town's Licence. As improvements have occurred in 2006, the SDF O&M Plan may now present the updated version only (4 cells) to prevent confusion. The real-life 4 cells picture provided in p. 27 of the Water Monitoring Plan would also rightfully belong in the SDF O&M plan. As it is also important to see the entire SDF from the location where wastewater is discharged all the way to	**Dec 12:** <p style="margin-left:1.0cm">The Town Hay River accepts with this recommendation.

		the receiving environment, the Drawing 00-CM1000 may be adapted to include the 2 new cells (as done in the 00-CM1001 Drawing), and/or relevant drone survey photos collected in 2017 (with identified components) could be inserted in the SDF O&M Plan. **Recommendation** 1) ENR recommends that images/pictures used in the Town SDF O&M Plan to include the 4 lagoon cells, as per improvements constructed in 2006 (if/as accurate).	
Katlodeeche First Nation: Peter Redvers			
ID	**Topic**	**Reviewer Comment/Recommendation**	**Proponent Response**
1	KFN Comments	**Comment** K'at'lodeeche First Nation (KFN) has reviewed the Town of Hay River's (TOHR) renewal application for a Type A Water License (WL) - MV2009L3-0005 - to continue to conduct muncipal operations at the Water Treatment Facility, Sewage Disposal Facilities and Solid Waste Disposal facilities in Hay River. KFN specific comments on the TOHR's WL Renewal Application are provided below. **Recommendation** N/A	
2	Water Contamination in the Hay River	**Comment** KFN has expressed concerns in the past regarding the lack of liner system at the Solid Waste Disposal Facility (SWDF) which means that leachate can percolate through the waste and soil and into the environment. KFN has further concerns that there have been exceedances of multiple contaminants found during groundwater monitoring sampling. Given that the Hay River is in close proximity to the SWDF which is a fish spawning ground for pickerel and whitefish and the Hay River is used extensively for catching fish downstream of the SWDF, KFN has serious concerns about water contamination emanating from the SWDF and the infringement of KFN's treaty and Indigenous rights. **Recommendation** N/A	
3	SWMF Operations and Management	**Comment** The TOHR's Solid Waste Facility Operations and Management Plan (OMP) details the manner in which the TOHR will operate the Hay River Solid Waste Management Facility. It is noted that the facility has been in operation since 1973. Currently the facility is registered as a Hazardous Waste Generator with two designate waste storage areas. **Recommendation** Can the TOHR provide any clarity	**Dec 12:** The Town will manage any historical waste that it comes across during regular operations as per the SWDF O&M Plan. During closure activitie

		regarding how historic hazardous waste will be found and managed within the site?	any historical hazardou wastes that are identified will be managed as per an approved ICRP.
4	Water Monitoring Plan - Hydrogeological Assessment	**Comment** From the Solid Waste Management for Northern and Remote Communities 2017: hydrogeological assessment should also be carried out to better understand the interaction between groundwater and geologic conditions of the site including:9 . depth to groundwater; . flow direction; . gradients; . estimated travel times to potential receptors; and . baseline groundwater quality. **Recommendation** KFN understands that work on flow direction has been carried out at the SWDF. KFN requests that the TOHR explain if the other hydrogeological assessment work on the groundwater and geologic conditions of the site have been completed. KFN also recommends that this work (if completed) should be added in the context of the location of groundwater sampling locations.	**Dec 12:** The landfill wa built in 1973 and a hydrogeological study was not completed at that time. The Town reviewed the Solid Waste Management fo Northern and Remote Communities 2017 and the completion of a hydrogeological assessment is within th context of initial studie and site selection. The Town will continue to provide any informatio (i.e., flow direction) on the monitoring at the site to the MVLWB.
5	Water Monitoring Plan - drainage paths, water holding areas and water monitoring/sampling plans	**Comment** Left Blank. **Recommendation** KFN notes that in the Water Monitoring Plan there is no note of work completed to determine drainage paths, changes to water holding areas or water monitoring/sampling plans since the March 2019 landfill fire. There is also no indications that a topographical survey will be required as the areas and elevations have changed significantly due to the landfill fire that burned during the month of March 2019. KFN requests that the Town of Hay River address: 1.) when and how the potential studies will be completed and2.) how the results of these studies may impact the water monitoring/sampling plans contained within the Water Management Plan.	**Dec 12:** The Town of H River has been working on collecting the information related to the impacts caused by the fire in March of 20 sampling of potential contaminants of conce that are not in the SNP but could be a result of the fire, and a drone survey. These will be presented in the 2019 Annual Report. The Town does not anticipate a change to the groundwater flow patterns as a result of the fire. A revision to t

			drainage study and the ICRP is anticipated to b completed as part of th licence conditions once the renewal has been issued. As new information is established, the Water Monitoring Plan will be reviewed as revised to reflect the new information. The Wate Monitoring Plan was submitted as a starting point for discussions around the monitoring program. A review of the monitoring plan is being conducted and a proposed monitoring program will be presented at the Technical Session. The Town will forward a copy of the proposal to the reviewers prior to the session to facilitate meaningful discussion.
6	Water Management Plan - Background well - SNP 0053-5b	**Comment** In the Staff Report for the Town of Hay River's Interim Closure and Reclamation Plan - It states that the "Board are of the opinion that while the Town has demonstrated that the groundwater monitoring well at SNP 0053-5b is upgradient from the landfill, it has not been proven that this location is outside the influence of the landfill or potentially the nearby highway. Board staff suggest that an appropriate location for SNP 0053-5b(background well) could be discussed during the upcoming licence renewal proceedings, and any revisions incorporated into future version of the ICRP." **Recommendation** KFN notes that there is a need for a second upstream groundwater site that is upgradient of the landfill that is away from the influence of the landfill and the highway. Location of background well should be supported	**Dec 12:** The Town understands the desire to have a background well outside the influence from the highway or other industrial sources. However, the Town should not be responsible for any contaminants which ar introduced to the environment from highway operations (or

		by a trend analysis and assessment of potential influence of other anthropogenic factors (e.g., proximity of the highway, potential influence of residual road salt).KFN recommends that this information is included as part of the Water Monitoring Plan.	other sources outside o SWDF operations). Having a background well upstream from the highway will not allow any method of determining if contaminants have bee introduced by the SWD operations or by outsid influences. (i.e. highwa operations). The Town should not be responsible for addressing contaminants which ar introduced by other parties outside of the Town operations.&nbs The Town is undergoin a review of the historic groundwater monitorir and will be presenting proposal during the Technical Session.
7	Water Monitoring Plan - Leachate composition	**Comment** The Water Monitoring Plan provides a description of the SWDF site and describes the current monitoring network, but does not speak to leachate composition across the site. **Recommendation** KFN requests that the TOHR provide a description of leachate composition across the site and potential hazards/contaminates at the SWDF.	**Dec 12:** <p style="margin-left:0cm margin-right:0cm">The Town would like to confirm what KFN is defining as “leachate&rdqu in order to provide an appropriate response.
8	Water Monitoring Plan - Groundwater Monitoring Results	**Comment** TOHR has provided long term trend analysis of groundwater monitoring results through inclusion of graphs of parameters of potential concern in the 2018 Annual Report. KFN considers this information and the inclusion of any additional groundwater monitoring data collected after the March 2019 fire to be directly relevant to the Water Monitoring Plan. **Recommendation** KFN recommends that TOHR includes the	**Dec 12:** The Town recognizes that the lon term graph trend summaries provide valuable information fo evaluation. However, given that the plans tha are associated with the

		information referenced above to accompany the Water Monitoring Plan. Specifically, KFN recommends that long term graph trend summaries be inserted and discussed within the WMP, as they provide important status updates on groundwater monitoring efforts and results collected to date. The on-going characterization of groundwater quality at the site will help inform WMP activities as well as if additional monitoring sites are required. KFN further requests that the TOHR include a dataline of the FIGCG criteria would help facilitate review of the data.	water licence are mean to provide direction on the “how to” of the operation, the more appropriate place for the long-term graph trend summaries is in the annual reports. The trends are evaluated and updated on an annual basis and the information in the plan would quickly become outdated.
9	Water Monitoring Plan - Groundwater Monitoring Results	**Comment** Comment - see above **Recommendation** 2) Along with the insertion of this information into the WMP, ENR also recommends that graphs representing the same parameter to be regrouped together (eg. Arsenic at SNP 0053-5b/c/d/e, regrouped with Arsenic at SNP 0053-7a/b/c/d).	**Dec 12:** <p style="margin-left:1.0cm">The Town will provide graphs in the 2019 Annual Repor by parameter and not b SNP series.
10	Water Monitoring Plan - SNP sites and Hay River Water Sampling results	**Comment** The Water Monitoring Plan references the SNP sites in the TOHR Water License and the Hay River Water Sampling locations. **Recommendation** KFN requests that information collected for the SNP sites and the Hay River Water Sampling locations are provided as an Appendix to the Water Monitoring Plan. Specifically, KFN recommends that long term graph trend summaries be inserted and discussed within the WMP.	**Dec 12:** The Town recognizes that the lon term graph trend summaries provides valuable information fo evaluation. However, given that the plans tha are associated with the water licence are mean to provide direction on the “how to” of the operation, the more appropriate place for the long-term graph trend summaries is in the annual reports. The trends are evaluated and updates on an annual basis and the information in the plan

			would quickly become outdated.
11	Water Monitoring Plan - Surface water monitoring	**Comment** KFN also notes that the document Solid Waste Management for Northern and Remote Communities 2017 prescribes best practices for surface water monitoring, which should include: - measuring surface water quality upstream of the site, immediately downstream and in a receiving body; - visually inspecting the landfill for leachate seeps; - detecting and measuring leachate in the surface water; and - quality assurance and quality control (QA/QC). . Surface water samples should be collected at the same time as groundwater samples. . Surface water samples should be analyzed for, at a minimum, routine water chemistry, dissolved metals, volatile organic compounds, and dissolved organic carbon. Additional parameters may be added in consultation with a suitably qualified professional. . Surface water analysis results should be compared against local surface water standards (e.g., in the Yukon, the Yukon Contaminated Sites Regulation) or against the Canadian Environmental Quality Guidelines (CEQG) if no local standard is available. Results should also be compared to background levels and predevelopment conditions.30,3 **Recommendation** KFN recommends that these best practices are incorporated into TOHR's Water Management Plan.	**Dec 12:** The monitoring of the Hay River is not part of the current SNP however, the Town has been conducting the sampling of the Hay River for the past three years. The Town does sample at the same tim as the groundwater, upstream, downstream and at the receiving body. The results have been included in the past annual reports.
12	None	**Comment** In March 2019, the SWDF experienced a landfill fire that lasted for almost the entire month of March. **Recommendation** KFN recommends that the TOHR report on the remaining storage volume for the SWDF should be updated, post-landfill fire.	**Dec 12:** The Town has conducted a drone survey and will be usin the survey information to determine the remaining storage volume for the SWDF which will be reported the 2019 Annual Report.
13	Water Monitoring Plan - Action Levels	**Comment** Within the Water Monitoring Plan, TOHR proposes to develop Action Levels to trigger Corrective Actions. Results from groundwater monitoring and sampling will be evaluated against the Action Levels and if a contaminant of concern has an exceedance, corrective action plan will be initiated. The determined action levels and definitions are presented in tables in Appendix B. Action levels have been developed using two separate methods in	**Dec 12:** Please refer to the Town’s response to KFN Topic

		relation to the SWDF (SNP0053-5b through 5e): . if background concentrations were below the most stringent guideline, then the most stringent guideline is used as the Action Level; and . if a parameter background concentration was above or approaching (less than 25% difference) the guideline value, then the maximum background concentration plus 25% is used as the Action Level. **Recommendation** Past Landfill Groundwater Quality Reports prepared for the TOHR from Klohn Crippen Berger (2009), EBA (2011) & EBA Tetra Tech (2012) all suggested the current SNP 0053-5b location is influenced/impacted either by the landfill, or by a separate (unidentified) source. Higher concentrations at SNP 0053-5b or BH-01 (when compared to other downstream landfill monitoring locations) were also illustrated in KBL long term trends analyses (2018 Annual Report) with higher background results for Calcium, Magnesium, Sodium, Sulphate, Chloride, TDS, F1, F2, F3, F4, Hardness, Aluminum, Beryllium, Chromium, Mercury, Silver, Strontium and Vanadium. KFN has concerns that using historic maximum background concentration (plus 25%) is problematic as several studies have pointed out that the background groundwater monitoring station is influenced by the landfill or an unidentified source. In addition, using historic maximum background concentration (plus 25%) would lead to a criteria or standard that far exceeds FIGQC standards. For example, for lead the FIGQC Groundwater Level is 0.001 and the standard for the TOHR SWDF would be 0.0264 (which over 25 times the FIGQC standard).	
14	Water Monitoring Plan - Action Levels	**Comment** From the BC Landfill Criteria for Muncipal Solid Waste: "Further monitoring is required whenever a statistically significant increase has been detected for one or more of the constituents or where the monitored value of one or more constituents is greater than that of the criteria."... The document also notes and references: Examples of appropriate statistical methods and performance standards are outlined in the EPA document Criteria For Municipal Solid Waste Landfills, Subpart E section 258.53 paragraphs (g) & (h) (EPA, 1993). **Recommendation** KFN requests that the TOHR consider other methods to develop an Action Level to trigger a corrective action plan. KFN has included the reference	**Dec 12:** The Town will review the referenced document and conside other methods to develop Action Level triggers for corrective actions. The proposed method based on the review will be provided in the monitoring plan proposal to be presented at the Technical Session. The Town will forward a

		above as an example of performance standard that could be considered and adopted by TOHR.	copy of the proposal to the reviewers prior to the session to facilitate meaningful discussion.
15	Sampling interval	**Comment** In the British Columbia Landfill Criteria for Muncipal Solid Waste, it states: "Up-gradient and down-gradient monitoring wells should be sampled at quarterly intervals as a minimum, and their individual analytical results used as a baseline for comparison. In this manner, natural variations in quality can be taken into consideration when interpreting monitoring program data." **Recommendation** KFN requests that the sampling intervals be increased if there have been historic exceedances in the water sampling in the past.	**Dec 12:** The Town of H River would like to not that due to the norther climate it is not practic to sample the groundwater wells during the winter season. Sampling in spring and fall prior to freeze up is the most practical sampling interval.
16	Water License - CBOD and BOD Trend Analysis	**Comment** In the TOHR Water License it states that "Licensee shall complete monitoring of wastewater effluent quality for carbaceous biological demand (CBOD) and biological oxygen demand (BOD) for a minimum of three years. The study findings, including a trend analysis shall be submitted to the Board for approval in a report that is completed before August 31, 2014. **Recommendation** KFN notes that the TOHR has been collecting this information but does not want to report a trend analysis. Given that this information is used to measure the degree of organic pollution of water and are used to test the water quality of discharge; there is value in presenting a trend analsis of CBOD and BOD; particularly since the TOHR is proposing to remove CBOD as a testing requirement.	**Dec 12:** The purpose of the study was to establish if there was a significant difference between the use of the CBOD and BOD test methods for the purposes of monitoring The City of Yellowknife conducted the study ar determined that there was a 90% CBOD/BOD ratio. The study was accepted by the MVLWB. As previously required for other municipal Water Licenc renewals such as Fort Providence, Inuvik and Gameti, the Town is asking that Discharge Criteria be derived at 90% of existing BOD value(s), as initially established by the City of Yellowknife.

17	SNP stations	**Comment** KFN has reviewed the Groundwater Flow diagram from September 2018. It generally appears that groundwater flow through the SWDF moves east. There are numerous SNP stations across the SWDF with the exception of the bottom southern corner of the facility. **Recommendation** Given the close proximity to the Hay River (150 m) and parameters exceedances observed in the groundwater data, KFN is proposing that there could be an additional SNP station added to the southern corner of the facility to increase the coverage and provide an additional monitoring station to capture more information about potential leachate from the SWDF.	**Dec 12:** The Town is currently undergoing a review of the groundwater monitorir wells and data with the intent of presenting recommendations for the program at the Technical Session. The Town will forward a copy of the proposal to the reviewers prior to the session to facilitate meaningful discussion.
18	Sludge Management Plan	**Comment** Sludge Management Plan due Oct 31 2010 has not been submitted and is overdue. Licence Condition D.7 **Recommendation** KFN recommends that both the Sludge Management Plan be submitted to the Board for approval.	**Dec 12:** The Town has included the management of sludge within the Sewage Treatment Facility O&M Plan.
MVLWB: Erica Janes			
ID	**Topic**	**Reviewer Comment/Recommendation**	**Proponent Response**
1	Application: CBOD-BOD request letter	**Comment** The Town has indicated its intent to continue to collect BOD and CBOD samples under the current water licence, MV2009L3-005. **Recommendation** Does the Town intend to sample for both BOD and CBOD at SNP 0053-2 and -3, moving forward?	**Dec 12:** The Town is requesting to only sample BOD in SNP 0053-2 and -3 and that the discharge Criteria b derived at 90% of existing BOD values as part of the renewal.
2	Application	**Comment** Section 10.2.2 says that no land clearing or disturbance is anticipated during life of Licence, and 12.0 says that the ICRP will need to be re-evaluated to determine the remaining lifespan of the Facility post-fire. **Recommendation** Does this mean the SWDF will not be expanded or moved? Can the Town clearly define the remaining volumes and timeline for needing to expand/move the SWDF?	**Dec 12:** The Town will provide an update on the remaining volume the SWDF as part of th 2019 Annual Report. Currently the Town do not anticipate expandi or moving the SWDF within the near future.

3	Application	**Comment** Section 10.2.3 says there is a need to reevaluate the SNP at the landfill. **Recommendation** What changes does the Town propose to the Water Monitoring Plan Version 2, in order to address concerns that have been raised regarding the current SNP, in particular, concerns related to the March 2019 landfill fire?	**Dec 12:** The Town of H River has been working on collecting the information related to the impacts caused by the fire in March of 2019. This includes the sampling o potential contaminants of concern that are not in the SNP but could be a result of the fire, and drone survey. These wi be presented in the 2019 Annual Report. The Town would like to propose keeping the monitoring of contaminates that coul have been mobilized b the fire separate from the Licence parameters as there is no clear mechanism to remove the parameters should there be no impacts to water quality. A a minimum, the parameters should be based on the monitorir completed to date. A clear definition, and distinction be made between the paramete related to the fire and a full description of the mechanism to remove the sampling requirements once the monitoring has demonstrated that impacts to water qualit

			and groundwater quali from the fire are not occurring.
4	Engagement Plan	**Comment** Board staff note that the Town's pre-submission Engagement Log documents electronic communications with potentially affected parties. **Recommendation** Has the Town considered reaching out to potentially affected parties that didn't respond to emails, by phone?	**Dec 12:** The Town did reach out by phone to these parties regarding other matters and they were unresponsive to those inquiries. As the phone calls were not directly related to the Water Licence engagement, they were not included in the Log
5	Snow Disposal Plan	**Comment** Board staff note the requirement listed in Part D, condition 11 of MV2009L3-0005 includes a topographic map identifying areas currently used or planned to be used. This Plan should include a topographic map and also an understanding of where snowmelt drains to. **Recommendation** Does the Town have a topographic/drainage map indentifying areas currently used or planned to be used?	**Dec 12:** The Town does not have a topographic/drainage map identifying areas currently used or planned to be used at this time.
6	Spill Contingecy Plan	**Comment** Board staff note that no map is attached to the Plan. **Recommendation** Can the Town provide a map for the Spill Contingency Plan?	**Dec 12:** The Town can provide a map for the Spill Contingency Plan.
7	Spill Contingecy Plan, page 13	**Comment** Board staff note that an Emergency Reservoir is listed on pg 13. **Recommendation** Can the Town clarify what the emergency reservoir is used for? Is it identified on a map with one of the submitted plans?	**Dec 12:** The Town’s emergency reservoir is not a separate reservoi The reservoir is also used for emergency situations like a fire.
8	Spill Contingecy Plan, SDSs	**Comment** Board staff note that the Town has not included Safety Data Sheets (SDSs) with the Plan. **Recommendation** Can the Town include SDSs with the plan?	**Dec 12:** The SDS’s for each location are maintaine at each specified location. The Town would like to keep the SDS’s at the location verses within the SPC as a copy of th

			SPC is kept at each location and not all materials are stored at each location. Also, having the SDS’ stored in multiple locations increases the difficulty of managing them and ensuring tha they are up to date.
9	General Comment regarding SWDF O&M Plan and best practices	**Comment** Board staff note that while there is currently no NWT-specific guidance for the operation and maintence of solid waste disposal facilities, guidance from other jurisdictions exists. Board staff further note that the Board formally adopted the Environment and Climate Change Canada Planning and Technical Guidance Guidance Document on Solid Waste Management for Northern and Remote Communities (ECCC Guidance Document) in 2017, which staff use to help develop licence conditions. More specific guidance may be found in other Canadian jurisdictions, e.g. Alberta; in addition, the Solid Waste Association of North America (SWANA) provides guidance for landfilling best practices. Board staff have drawn upon some of this guidance in formulating review comments below. **Recommendation** This is provided to contextualize further comments from Board staff to the Town on the SWDF.	
10	Solid Waste Disposal Facility O&M Plan, Section 5.6	**Comment** Board staff note that the maps provided reflect pre-fire conditions at the SWDF. The Town responded during the 2018 Annual Report review that a proposal "for the use of drone surveys [by a third party, on an annual basis] will be presented as part of the WL renewal application"; this proposed approach is included in Section 7.1 Waste Measurement. In addition,the current remaining landfill volume (post-fire) is unknown, which makes it difficult to understand the urgency, if any, behind planning for closure of the current site. **Recommendation** Please provide an updated landfill capacity estimate.	**Dec 12:** The Town will provide an update on the remaining volume the SWDF as part of th 2019 Annual Report.
11	Solid Waste Disposal Facility O&M Plan: General Comment 1	**Comment** This document does not provide sufficient detail on site operations. This level is intended to provide sufficient detail for operators/managers to be able to run the facility, and could be provided in a Standard Operating	**Dec 12:** The Town does not have a separate SO or Operations Manual for the SWDF. The

		Procedures or Operations Manual. For example, Board staff note the following operational details were missing: - forms section for daily/weekly/monthly inspections; - information on fill progression; - full emergency response plan; - incomplete instructions on how to manage each waste diversion area, etc.; - a complete organizational chart (SAO, Director, Landfill Manager, Lead Hand, Site Attendant, Equipment Operator, etc.); - indicate what training is provided for each piece of equipment (details on each piece of equipment, pre- and post-operations checks); - indicate how the management of waste described in the O&M Plan is achieved on the ground, including public drop-off areas and unacceptable waste; - site attendant checklist to determine waste types, a visual inspection, and potentially a waste audit as per SWANA training (up to 5% of loads screened); and - details on collection,management and tracking of tipping fees. Board staff note that SWANA has applicable training courses that would help improving the content of the Operations Plan, such as Landfill Operator Basics, Manager of Landfill Operations, Waste Screening, C&D landfill operations, and Fire courses. **Recommendation** Does the Town have a separate SOP or Operations Manual for the SWDF? Please provide detail on how the Town ensures operations (completed by the Town or the Town's contractor) align with the information in the SWDF O&M Plan? How does the Town ensure the O&M Plan and Operations Manual is followed on-site?	requirements of the O&M Plan are included in the contrac requirements with the Town’s contractor.
12	Solid Waste Disposal Facility O&M Plan: General Comment 2	**Comment** None **Recommendation** Please update the O&M plan to include more detailed compaction and cover operations for municipal solid waste and constructoin and demolition operations, how to manage/fill the fire area, active face monitoring procedures to check for fire/hotspots, leachate breakout, grade control to fill to defined top of waste contours, intermediate cover application on areas that are at design top of waste grade, and any surface water structures implemented from the fire?	**Dec 12:** The Town will update the O&M Plan to include more details.
13	Solid Waste Disposal Facility O&M Plan, Section 1.2: References	**Comment** Full reference for EBA report is needed. There are no references provided in the report. **Recommendation** Please provide complete references for the documents referred to in this plan.	**Dec 12:** The Town accepts the recommendation.

14	Solid Waste Disposal Facility O&M Plan, Table 2-1	**Comment** All applicable training, based on best practices, should be listed in Table 2. **Recommendation** Please provide a full listing of appliable training that operators have. How does the Town ensure that their operators and contractors are properly trained for their respective work at the SWDF?	**Dec 12:** The Town ensures that the operators and contractors are proper trained for their respective work at the SWDF by making the training part of the contract requirements.
15	Solid Waste Disposal Facility O&M Plan, Section 3.1: Inspections - Fencing	**Comment** The operation and maintenance of a bear fence can be guided and tracked using an inspection form. Manufacturers will have inspection and maintenance recommendations to be followed. **Recommendation** How does the Town inspect the bear fence and ensure it is operational? How often is this completed? How is it documented?	**Dec 12:** The Town inspects the bear fence annually in the spring o each year. The inspection is conducted by a 3rd Party.
16	Solid Waste Disposal Facility O&M Plan, Section 3.0: Fencing	**Comment** Staff note that the O&M Plan does not indicate permanent wind fencing surrounding the SWDF. **Recommendation** Please indicate whether the Town intends to erect permanent wind fencing. Is the vegetation sufficient for blocking windblown debris?	**Dec 12:** The vegetation is sufficient for blockin windblown debris.
17	Solid Waste Disposal Facility O&M Plan, Section 5.5: Site History and Closure	**Comment** There is little information on how the landfill was developed. This information assists with assessing facility risks. A site history should be developed and refered to in the Operations Plan and in the Interim Closure Plan. Examples of information to be included are what section of the site was first opened, what were waste practices then (if buring was typical), how did waste placement progress on the site (trench fills, and then when did area get set up for above grade filling), etc. **Recommendation** Please include this information in the ICRP, and cross reference it in the O&M Plan.	**Dec 12:** The Town does not have this requested information outside of what has been provide in the ICRP that was submitted in 2019.
18	Solid Waste Disposal Facility O&M Plan, Section 5.6: Bulk Waste	**Comment** Each waste storage section is to be included in an inspection form and have a procedure for inspection and managment. **Recommendation** Please verify the policy and update the Operations Plan accordingly.	**Dec 12:** The Operations Plan will be updated to include an inspection form and procedure.
19	Solid Waste Disposal Facility O&M Plan, Section 5.6: Freon	**Comment** Board staff note that Section 5.6 indicates that appliances are required to be free of freon. It is unclear whether Town staff remove freon or if they will not accept products unless freon has been removed. **Recommendation** Please confirm whether freon is removed	**Dec 12:** The Town does not landfill white goods The freon is removed b a third party and the

		prior to landfilling white goods. When, and by whom, is freon removed from white goods? How is this freon program working for the public?	white goods are sent offsite for recycle.
20	Solid Waste Disposal Facility O&M Plan, Section 5.7: Construction Wastes	**Comment** Board staff note that C&D waste can pose issues with H2S (drywall disposal) and asbestos, and may require specific landfilling practices (i.e. fire breaks, certain cover materials). **Recommendation** Please provide additional information regarding landfilling of C&D waste, including drywall, that is different from other wastes.	**Dec 12:** The Town has reviewed the Environment and Climate Change Canada Solid Waste Management for Northern and Remote Communities, Planning and Technical Guidance Document, March 2017 to review the Best Practice and compared to the current practices at the SWDF. The Town is following the Best Practice for dry wall C&D wastes.
21	Solid Waste Disposal Facility O&M Plan, Section 5.8: Hydrocarbon Contaminated Soil Treatment Pad	**Comment** Board staff note that detail is lacking on how the remediated soil cover material from the HCSTF is managed within the SWDF. **Recommendation** Please provide more detail on how remediated soil cover material from the HCSTF is managed and tracked once in the SWDF footprint.	**Dec 12:** The soil cover material from the HCST is required to meet the remediated cover requirements prior to reuse. The material is managed the same as any other cover source
22	Solid Waste Disposal Facility O&M Plan, Section 5.9: Landfill Leachate	**Comment** Has the Town noted any leachate breakouts? Board staff note that in the absense of leachate removal and proper daily cover techniques for above grade landfills, leachate breakouts can occur with shallow pits/trenches. **Recommendation** Please provide additional detail regarding monitoring and record keeping for leachate breakouts.	**Dec 12:** To the best of the Town’s knowledge there have been no leachate breakouts in recent history. The Town will keep track of any leachate breakouts tha occur.
23	Solid Waste Disposal Facility O&M Plan, Section 6 and Section 8: MSW Management	**Comment** Board staff note that MSW compaction approach lacks some details. The equipment list includes a waste compactor so should be updated for compactor operations. How the active face is developed and progressed is not provided. A daily cover tracking program is not provided.	**Dec 12:** The Town reviewed current operations and compared against the best practices and

		This section could be updated to reflect best practices. **Recommendation** Please provide more prescriptive details on compaction and cover operations associated with MSW management. Please provide supporting information if approach is different from best practices.	confirmed that it is following current best practices. The Town will update the section to provide mor detail.
24	Solid Waste Disposal Facility O&M Plan, Section 6: C&D Waste Management	**Comment** There is no direction on how the C&D area is managed for active face size, cover, compaction, waste screening. Board staff note that best practices exist for these operations. **Recommendation** Please provide further detail on how the C&D waste area is managed. Please provide supporting information if approach is different from best practices.	**Dec 12:** The Towns approach to managing the C&D waste area is in line with best practices to the extent that resources and recycle / re-use option are available.
25	Solid Waste Disposal Facility O&M Plan, Section 6: Automobiles	**Comment** Automobiles are included in scrap metal as per the Closure Plan. Management details are not included. There should be a receipt form per vehicle disposed on its condition and if materials have been removed. **Recommendation** Please provide specific detail as to how automobiles are managed.	**Dec 12:** The Town only accepts vehicles when all batteries, fluids, and mercury switches are removed. The vehicle i inspected by the operator when it arrive on site to ensure the hazardous component have been removed. Th vehicle is then staged i the End of Life Vehicles area (refer to Appendix A Maps and Drawings, Figure No. 3-1 Existing Facility Layout for area Once enough vehicles are collected they are shipped off-site to a metal recycler.
26	Solid Waste Disposal Facility O&M Plan, Section 7.1	**Comment** For waste measurement at the SWDF, the quantity of soil used for cover activities should also be tracked by volume. **Recommendation** Please clarify if soil volumes are tracked, and if so, can that information be provided in an O&M Plan update?	**Dec 12:** The Town does not specifically track cover volumes.

27	Solid Waste Disposal Facility O&M Plan, Section 9.0: Nuisance Management	**Comment** Board staff note that little detail is provided in this section. There should be a comprehensive nuisance management section for litter, mudtracking, dust control, wildlife, and odours, as applicable for the issues at the site. This section also does not provide guidance as to what happens if there is a wildlife issue. Board staff note that SWANA training materials provide guidance on these topics. **Recommendation** Please update this section of the O&M Plan to provide greater detail regarding nuisance management.	**Dec 12:** The Town will update the O&M Plan.
28	Solid Waste Disposal Facility O&M Plan, Section 10: Surface Water Inspection and Monitoring	**Comment** Board staff note that information related to surface water inspections and monitoring is lacking. **Recommendation** Please provide information outlining surface water inspection and monitoring (i.e., site inspections, remove ponding water, collecting water samples as required for monitoring program, reporting).	**Dec 12:** The Water Licence and Water Monitoring Plan is where the information regarding the surface water monitoring is located.
29	Solid Waste Disposal Facility O&M Plan, Section 11: Record Keeping	**Comment** Forms for each of these record keeping requirements would be useful to provide in the O&M Plan. **Recommendation** Please provide record keeping forms in O&M Plan.	**Dec 12:** The Town recommends that form which should be updated on an ongoing basis be kept out of the O&M Plan in orde to avoid unnecessary process anytime changes are made to th forms. This would discourage making improvement to the forms on an ongoing basis.
30	Solid Waste Disposal Facility O&M Plan, Section 12: Inspection Forms	**Comment** Forms for items listed in Table 12-2 would be useful to provide in the O&M Plan. The table could be expanded (e.g., health and safety requirements, active face sizing and cover, litter control, housekeeping, public complaints, HHW containment, etc.). **Recommendation** Please provide daily/weekly/monthly site inspection forms in O&M Plan.	**Dec 12:** The Town recommends that form which should be updated on an ongoing basis be kept out of the O&M Plan in orde to avoid unnecessary process anytime changes are made to th forms. This wou discourage making improvement to the

			forms on an ongoing basis.
31	Solid Waste Disposal Facility O&M Plan, Section 14: Tipping Fees	**Comment** Board staff note that the Town charges tipping fees for some materials. Tracking of tipping fees related to specific wastes can aid in tracking and estimating waste types and volumes entering the SWDF. **Recommendation** Please provide additional detail on how tipping fees are collected and tracked.	**Dec 12:** The Town manages tipping fees through the Town’s bylaws and not through the MVLWB.
32	Solid Waste Disposal Facility O&M Plan, Section 17	**Comment** This section does not provide enough detail and procedures on fire management. For example, how is there enough water for fire fighting without a storm pond and pumps? There should be regular inspections of the active face with a heat sensor. Board staff note that SWANA training includes information regarding fire management. **Recommendation** Please update the Plan to include further detail on fire management.	**Dec 12:** The Town will update the Plan however, the Town would like to remind th Board that due to existing circumstances with the Town’s resources that some of the recommendations may have to be completed in stages when resources are available. The Town would also like to note that the water source i approximately 150 m from the site and therefore a storm pond is unnecessary.
33	Solid Waste Disposal Facility O&M Plan, Section 18: Emergency Response Plan	**Comment** Board staff note that the SWANA Northern Lights Chapters has a template for emergency response plans. **Recommendation** This template may help the Town include further detail in their emergency response plan.	**Dec 12:** The Town will review the template ar update the ERP to fill ir any gaps identified.
34	Solid Waste Disposal Facility O&M Plan, Figure 4: Groundwater Flow Maps	**Comment** Board staff note that groundwater flow direction maps have been included in this Plan. **Recommendation** Groundwater flow maps are most applicable to the Water Monitoring Plan.	**Dec 12:** The Town accepts the recommendation and will move the groundwater flow map to the Water Monitorir Plan.

35	Sewage Disposal Facilities O&M Plan - Section 4.0, Volume	**Comment** Section 4 idenitifies that piped system collects 671,590 m3/year and the trucked system collects 30,755 m3/year, for a total of just over 700K m3/year. However, the Application states that the total was used in 2018 was 394,561 m3. **Recommendation** Can the Town please confirm these numbers?	**Dec 12:** The Town measures the volume o water used from the force main source (394,561 m3). The volume of sewage was deposited is calculated by using the pump flow rate and the number of pump hours (671,590 m3). The volume of trucked sewage pickup is recorded monthly an recorded (30,755 m3).
36	Sewage Disposal Facilities O&M Plan - Sludge Management	**Comment** Check-boxes in Section 4 of Appendix say sludge levels are measured monthly and sludge is removed annually. **Recommendation** Can the Town confirm the freqeuncy of sludge level measurement and removal?	**Dec 12:** The Sludge at the sludge collection pi is measured monthly and removed annually from this area. The Sludge levels within the lagoon cells are measured annually and removed as required.
37	Sewage Disposal Facilities O&M Plan - Section 8.0, Sludge Management	**Comment** Board staff note that the Town estimates of sludge removal being every 5-10 years and also 4-5 years in this section. **Recommendation** Can the Town confirm the estimated frequency of sludge removal.	**Dec 12:** The estimate o 4-5 years is based on current annual production extrapolate out. The 5-10 years estimate is based on what has taken place historically.
38	Sewage Disposal Facilities O&M Plan - Section 8.0, Sludge Management	**Comment** Board staff note that the Town states the following: "Dry and stabilized sludge will be used for cover material at the landfill. Testing is required to determine suitability following the Guideline for Industrial Waste Discharges in the NWT - Schedule II & IV Standards for Solid Waste/Process Residual Suitable for Landfill (NWT, 2004). Once the sludge is anticipated to have been treated, representative samples will be taken on a 2-metre grid pattern at varying depths with a minimum of six samples. Laboratory analysis will be conducted on the samples for the parameters listed in Schedule III and IV of the Guideline	**Dec 12:** The Town does not agree that the use the CCME Guidelines fo Compost Quality is appropriate for this application. The Town would like to discuss what appropriate testi should be based on the end use of the materia and potential

		for Industrial Waste Discharges in the NWT (NWT, 2004)." **Recommendation** Board staff note that CCME Guidelines for Compost Quality for composted manures for land application and the GNWT Environmental Guideline for Contaminated Site Remediation may be more appropriate for that specific application.	contaminates of concern.
39	Sewage Disposal Facilities O&M Plan - Section 3.0, Signage	**Comment** Board staff note and commend the Town for security and signage surrounding the lagoon components of the facility. **Recommendation** Are the wetlands and the final discharge location of the wetland or at Great Slave Lake accesible by the public? Are those areas properly signed to alert the public of possible exposure to sewage?	**Dec 12:** The Town wou like to note that the wetland area is signed. The final discharge location is not signed a it would be misleading. The material is treated and no longer sewage l the time it reaches the final discharge point.
40	Sewage Disposal Facilities O&M Plan, Page 2 - Table of Contents	**Comment** Board staff note that some sections are lacking in information including: nuisance control (i.e. beavers or muskrats damaging liners), vegetation, basic pond design. **Recommendation** Please update to include missing items.	**Dec 12:** The Town can update to include specific information tha is identified by the Board.
41	Sewage Disposal Facilities O&M Plan, Page 6 - Section 5.0	**Comment** Board staff note that this section does not include Influent Wastewater Quality. **Recommendation** Please update title to reflect section content.	**Dec 12:** The Town accepts the recommendation.
42	Sewage Disposal Facilities O&M Plan, Page 6 - Section 5.0 - "â€¦sprayed into the lagoon." and Page 8 - Section 7.0 - Effluent Discharge	**Comment** Is this sprayed or discharged? Does the Town open up the discharge pipe with connection/pipe into a designated acell? Also, Section 7 states ".discharge point." This is a conflict to above section which states "sprayed" into the lagoon. **Recommendation** Please verify how sewage is discharged.	**Dec 12:** There are two discharge points at the lagoons. The firs is the Truck discharge point. The truck discharge into a chute (sprayed) which leads t the primary cells. The second discharge point is an inlet from th force main into lagoon cells #1 and #2. This inlet is below the water level of the lagoo which prevents the inle from freezing.

43	Sewage Disposal Facilities O&M Plan, Page 6 - Section 6.0 - System Capacity and Design Data - 1st paragraph	**Comment** Board staff note that how rentention time is achieved is not included in the Plan. **Recommendation** Please include additional detail to illustrate how rentention time is achieved in lagoon system.	**Dec 12:** The retention time in the pond is achieved based on the pond size and flow rate which are described in this section of the O&M Plan.
44	Sewage Disposal Facilities O&M Plan, 6 - Section 6.0 - System Capacity and Design Data - 1st paragraph	**Comment** Section 6.0 mentions a ".discharge control cell." **Recommendation** Please explain how the "discharge control cell" works.	**Dec 12:** After settling, the effluent flows to th discharge control cell which controls the effluents discharge into the discharge channel that leads to the treatment area. This is done through the collection of effluent in the cell based on flow rate (1, 528 m3/day) which allows for a controlled release into the discharge channel. Please refer to SDF O&M Plan, Appendix B Maps and Drawings, Drawing Number 00-CM1001).
45	Sewage Disposal Facilities O&M Plan, Page 8 - Section 7.0 - Effluent Discharge	**Comment** Board staff note confusion in the way "influent" and "effluent" terms are used in this section. **Recommendation** Please ensure correct use of the terms 'influent' and 'effluent'.	**Dec 12:** The Town accepts the recommendation and will update the plan accordingly.
46	Sewage Disposal Facilities O&M Plan, Page 8 - Section 7.0 - Effluent Discharge	**Comment** The Town indicated that the annual volume of wastewater collected in the piped system is 671,590 m3/year and an estimated 557,720 m3/year is discharged from the SDF. **Recommendation** How did the Town determine the volume of discharge from the SDF?	**Dec 12:** The Town estimated the volume discharge based on Stantec Lagoon Operation & Maintenance Manual – Town of Hay River, November 15, 2016.

47	Sewage Disposal Facilities O&M Plan, Page 8 - Section 8.0 - "Dry and stabilized sludge can be used for topping upâ€¦"	**Comment** Board staff note the reference to using stabilized sludge for topping up lagoon berms. **Recommendation** Has the Town ever used stabilized sludge for topping up lagoon berms? Can the Town confirm that this is an acceptable engineering practice?	**Dec 12:** The Town has not used stabilized sludge for topping up lagoon berms. The Tow will remove this option from the Plan.
48	Sewage Disposal Facilities O&M Plan, Page 9 - Section 8.0 - Sludge Accumulation and Generation	**Comment** Board staff note the Town's estimate of sludge production. **Recommendation** Please provide rationale for the sludge production estimates.	**Dec 12:** The Town estimates the sludge production based on 2016 sludge survey which showed the accumulations since approximately 2009.
49	Sewage Disposal Facilities O&M Plan, Page 10 - Section 8.0 - Sludge Lagoon Operation	**Comment** Board staff note the Site Inspection Template included in Appendix D does not include inspection of the sludge pond. **Recommendation** Is there a reason the sludge pond is not included in the inspection template?	**Dec 12:** The Town will update the inspection t include the sludge pon
50	Sewage Disposal Facilities O&M Plan, Page 10 - Section 8.0 - Drying Pad Operation	**Comment** None **Recommendation** Please provide an explanation for how sludge is placed on the drying pad.	**Dec 12:** The Town contracts out the work and the methods will vary depending on the contractor and equipment available.
51	Sewage Disposal Facilities O&M Plan, Page 12 - Section 11.0 - Water Quality Monitoring	**Comment** Board staff note that this section does not contain any reference to water quality monitoring done by Town staff. If so, I'd expect a reference here to the Monitoring plan and an overview of what they are expected to do. **Recommendation** Please include a reference to the Water Monitoring Plan and Licence sampling requirements in this section.	**Dec 12:** The Town has referenced Annex A of the municipal water licence which is “the Surveillance Network Program” which contains the information regarding the water quality monitoring for the Sewage Disposal Facilit The Town will revise th SDF O&M Plan to include reference to th Water Monitoring Plan which will contain the

			requirements for wate monitoring.
52	Sewage Disposal Facilities O&M Plan, Schedule C	**Comment** Board staff note that a number of details provided in Appendix A/Schedule C conflict with details provided in the body of the O&M Plan and that including O&M details as part of an appendix, rather than in the body of the O&M Plan is not optimal for providing clear O&M guidance. **Recommendation** Please review and revise O&M Plan to ensure all major O&M aspects, including but not limited to those listed in the Board's template, are covered in the main body of the plan.	**Dec 12:** The Town will review the O&M Plan and include the details from Schedule C within the plan and the remove Schedule C to avoid confusion.
53	Sewage Disposal Facilities O&M Plan, SDF O&M Plan: General	**Comment** There are procedures for the SDF included in both Appendix A and Appendix C. Including all operating procedures for the facility in one cohesive SOP and would improve clarity. **Recommendation** Please provide clear and comprehensice SOPs for the SDF.	**Dec 12:** The Town recommends that the O&M Plan remain the guidance documen for operations. The Pla can be updated to put all the procedures in or Appendix.
54	Sewage Disposal Facilities O&M Plan, Schedule C: Page 20 - pH - Second sentence	**Comment** This statement is incorrect. **Recommendation** Please correct.	**Dec 12:** The Town will review the O&M Plan and include the details from Schedule C within the plan and the remove Schedule C to avoid confusion.
55	Sewage Disposal Facilities O&M Plan, Schedule C: Page 20 - Berm maintenance	**Comment** Inspection is also to check for HDPE liner damage. **Recommendation** Please update.	**Dec 12:** The Town will review the O&M Plan and include the details from Schedule C within the plan and the remove Schedule C to avoid confusion.
56	Sewage Disposal Facilities O&M Plan, Schedule C: Page 22 - Lagoon Underdrain	**Comment** There should be more on this in the main details of the plan as a liner integrity program. **Recommendation** Please include.	**Dec 12:** The Town will review the O&M Plan and include the details from Schedule C within the plan and the remove Schedule C to avoid confusion.

57	Sewage Disposal Facilities O&M Plan, Appendix C: Page 47 - Cell Drainage - #3	**Comment** Board staff note that details on now the liner is protected during cell drainage are absent. **Recommendation** Please include.	**Dec 12:** The Town will review the O&M Plan and include the details from Schedule C within the plan and the remove Schedule C to avoid confusion.
58	Sewage Disposal Facilities O&M Plan, Appendix D, Page 50 - Site Inspection Template	**Comment** Missing the Daily Inspection Form. **Recommendation** Please include.	**Dec 12:** The Town documents the formal weekly, monthly and annual inspections. Dai informal inspections ar not documented.
59	Hydrocarbon Contaminated Soil Treatment Facility O&M Plan, Effluent Quality Criteria (EQC)	**Comment** ENR comments from Oct 19, 2016 and Jan 16, 2017 recommended that Inspector approval for discharge from SNP 0053-8 at biotreatment pad leachate pond require Inspector authorization within the body of the Licence. The issue of including EQC for SNP 0053-8 was also raised when the Town's SNP was revised May 25, 2017. **Recommendation** Can the Town indicate their preference for requiring EQC for the discharge of leachate from the Hydrocarbon Contaminated Soil Treatment Facility as a condition of the water licence, or having EQC as a component of the O&M Plan? Please include rationale supporting this preference.	**Dec 12:** The Town wou like to note that it has recently made the decision to close the HCSTF. Waste will no longer be received at the pad and the remaining soil will be treated this spring and removed from the pad The work will be completed prior to the issuance of the renewa and therefore the Tow proposes to remove th HCSTF operations from the licence. The intent would be to no longer accept or treat hydrocarbon contaminated soil at th facility. The Town will then include the decommissioning of th pad as part of the ICRP and follow that process once the licence has been issued.
60	Hydrocarbon Contaminated Soil	**Comment** Section 4.2, second paragraph, 7th line: the confirmatory analytical results are listed as being provided	**Dec 12:** Please refer to the Towns response to

	Treatment Facility O&M Plan, Section 4.2	to the "Landfill". Board staff further note that this Plan contains quite a number of typos and could benefit from a thorough edit. **Recommendation** Please clarify whom the confirmatory analytical results will be provided to prior to the removal of the soil from the Hydrocarbon Contaminated Soil Treatment Facility.	MVLWB Topic 59 regarding the closure c the HCSTF.
61	Hydrocarbon Contaminated Soil Treatment Facility O&M Plan, Section 6	**Comment** Board staff note that Section 6 Facility Closure is not fully developed; however, as per similar authorizations, the Board has generally required a fulsome closure plan for the facility at least 6 months prior to closure. **Recommendation** What guideline or document will the Town be using to complete a detailed Closure Plan for the Facility? When does the Town anticipate closing the Facility? When does the Town anticipate completing a Closure Plan for the Facility?	**Dec 12:** Please refer to the Towns response to MVLWB Topic 59 regarding the closure c the HCSTF.
62	Hydrocarbon Contaminated Soil Treatment Facility O&M Plan, Figures	**Comment** Board staff note that the provided drawings are from June 2014 and are not necessarily reflective of current conditions. **Recommendation** Can the Town please provide updated drawings of the Facility?	**Dec 12:** The Town will review the drawings ar provide updates (if the are any) to the current operations. At a minimum, an updated aerial of the facility wil be provided.
63	Hydrocarbon Contaminated Soil Treatment Facility O&M Plan, Appendix B	**Comment** Board staff note the following changes in the acceptance and reuse criteria (Tables B-1 and B-2) from the current approved plan (version 2.4 [V2.4]) under MV2009L3-0005: - CrVI has been left out of both tables (was in V2.4 @ CCME concentration of 1.4 mg/kg) - F1 is at 310 mg/kg rather than 330 mg/kg for coarse-grained (Table B-2), which appears to be a typo - the column for CCME criteria, for comparison, has been removed - F1-F4 acceptance criteria (Table B-1) have been changed from previous concentrations in V2.4 to % dry weight values - Fluoride is not included, although it is listed in the GNWT Environmental Guideline for Contaminated Site Remediation. **Recommendation** Can the Town provide a complete list of parameters that have been removed and/or changed between the approved V2.4 of the Plan under MV2009L3-0005 and the current submission, and provide rationale for these changes?	**Dec 12:** Please refer to the Towns response to MVLWB Topic 59 regarding the closure c the HCSTF.

64	Hydrocarbon Contaminated Soil Treatment Facility O&M Plan, Appendix B	**Comment** None **Recommendation** Can the Town provide rationale as to why flouride is not included in the acceptance or reuse criteria?	**Dec 12:** Please refer to the Towns response to MVLWB Topic 59 regarding the closure o the HCSTF.
65	Hydrocarbon Contaminated Soil Treatment Facility O&M Plan, Appendix B	**Comment** Table B-4 appears to be the same as Table 1 in Appendix E from the current approved plan (V2.4) under MV2009L3-0005. but is "below detection" a reasonable guideline if the detection limit is undefined? **Recommendation** Can the Town indicate what the detection limit is when it is used as a criterion?	**Dec 12:** Please refer to the Towns response to MVLWB Topic 59 regarding the closure o the HCSTF.
66	Hydrocarbon Contaminated Soil Treatment Facility O&M Plan, General Comment	**Comment** There is not enough information in this documeent to assess how the soil pad is to be operated. **Recommendation** Please provide detail on how the Town ensures operations (completed by the Town or the Town's contractor) align with the information in the O&M Plan? How does the Town esnure the O&M Plan is followed on-site? Does a comprehensive SOP exist for the facility?	**Dec 12:** Please refer to the Towns response to MVLWB Topic 59 regarding the closure o the HCSTF.
67	Hydrocarbon Contaminated Soil Treatment Facility O&M Plan, General Comment	**Comment** Board staff are of the understanding that the Town plans to close the Biotreatment Pad in the near future, but that no reference is made to plans for the facility in the O&M Plan. **Recommendation** Please provide confirmation of the Town's plans for operating and closing the Biotreatment Pad.	**Dec 12:** Please refer to the Towns response to MVLWB Topic 59 regarding the closure o the HCSTF.
68	Hydrocarbon Contaminated Soil Treatment Facility O&M Plan, Introduction	**Comment** Board staff note that no local phone number is listed for the operations contact. **Recommendation** Does a staff member live locally in order to accept and process soils? If not, how does the Town manage this? As it is not clear whether there is a local operator, how does the operator verify quality and determine where the material is separated?	**Dec 12:** Please refer to the Towns response to MVLWB Topic 59 regarding the closure o the HCSTF.
69	Hydrocarbon Contaminated Soil Treatment Facility O&M Plan, Page 7 Copies of shipping documents	**Comment** Board staff note that example forms are not provided in the appendix. **Recommendation** Please provide example forms in the appendix.	**Dec 12:** Please refer to the Towns response to MVLWB Topic 59 regarding the closure o the HCSTF.
70	Hydrocarbon Contaminated Soil Treatment Facility	**Comment** Board staff note that for some compost operations, which have the same minimum clay pad design, a wearing surface is added so that they know when they are removing the liner.	**Dec 12:** Please refer to the Towns response to MVLWB Topic 59

	O&M Plan, Section 4.1	**Recommendation** How is this liner maintained over time? How will liner degradation and underlying soil be managed for closure?	regarding the closure o the HCSTF.
71	Hydrocarbon Contaminated Soil Treatment Facility O&M Plan, Section 4.2	**Comment** The Federal Guidelines for Landfarming Petroleum Hydrocarbon Contaminated Soils (Federal Contaminated Sites Action Plan, 2013) suggest a 0.3 to 0.5 m thick layer for treatment. **Recommendation** How are processing areas managed, as this section suggests discrete piles or windorws and from the ICRP imagry it appears that there are large piles. What is the rationale for this size windrow? What is the designed capacity of the pad?	**Dec 12:** Please refer to the Towns response to MVLWB Topic 59 regarding the closure o the HCSTF.
72	Hydrocarbon Contaminated Soil Treatment Facility O&M Plan, Section 4.2	**Comment** Tracking form examples should be provided in the appendix. Site inspection forms shold be provided in the appendix. **Recommendation** Please provide tracking and inspection forms.	**Dec 12:** Please refer to the Towns response to MVLWB Topic 59 regarding the closure o the HCSTF.
73	Hydrocarbon Contaminated Soil Treatment Facility O&M Plan, Section 4.2	**Comment** Soil remediation facilities can place like materials together for processing in different areas of the pad, as some materials could be remediated and therefore removed from the pad sooner. **Recommendation** Does the Town manage materials differently based on their level of contamination, or time to remediate? If so, please provide this detail.	**Dec 12:** Please refer to the Towns response to MVLWB Topic 59 regarding the closure o the HCSTF.
74	Hydrocarbon Contaminated Soil Treatment Facility O&M Plan, Section 4.3	**Comment** From the most recent ICRP, it is not clear if water can flow to the pond between the piles. This should be verified. Reference to a certifield lab for analytical results should be included. **Recommendation** Please confirm if ponded water is able to flow freely and directly to the water rentetion pond. If not, how does the Town manage ponded water within the HCSTF?	**Dec 12:** The pond is constructed within the footprint of the HCSTF pad. The water is able t flow freely into the water retention pond based on the grading o the pad towards the pond.
75	Hydrocarbon Contaminated Soil Treatment Facility O&M Plan, Section 4.3	**Comment** Board staff note the Town's use of above ground storage tanks in the event of needing to store excess water from the water retention pond. **Recommendation** Please verify if the above ground storage tanks have secondary containment.	**Dec 12:** Please refer to the Towns response to MVLWB Topic 59 regarding the closure o the HCSTF.
76	Hydrocarbon Contaminated Soil Treatment Facility	**Comment** Board staff note the reference to the water treatment plant in Section 4.3.2. It is further noted that for such a small volume of water requiring a water treatment plant is out of place as compared to offsite diposal.	**Dec 12:** The mobile water treatment plant located in Yellowknife, NT and is designed to b

	O&M Plan, Section 4.3.2	**Recommendation** Where is this plant located and what are the logistics for getting it to site?	moved from location to location.
77	Hydrocarbon Contaminated Soil Treatment Facility O&M Plan, Section 4.4	**Comment** By surface area, this is a 2.6 m thick lift which far exceeds the 0.3 to 0.5 m lift thickness recommended by the Federal Guidelines for Landfarming Petroleum Hydrocarbon Contaminated Soils (Federal Contaminated Sites Action Plan, 2013). This does not account for pile segregation. **Recommendation** How was the pad capacity determined? Why are such thick lifts used? Please provide rationale from deviation from best practices.	**Dec 12:** Please refer to the Towns response to MVLWB Topic 59 regarding the closure o the HCSTF.
78	Hydrocarbon Contaminated Soil Treatment Facility O&M Plan, Section 4.4	**Comment** This Section does not indicate if any materials segregation occurs. **Recommendation** How are materials segregated for treatment? How is this coordinated with the site operator if not onsite?	**Dec 12:** Please refer to the Towns response to MVLWB Topic 59 regarding the closure o the HCSTF.
79	Hydrocarbon Contaminated Soil Treatment Facility O&M Plan, Section 4.5	**Comment** Board staff note that details related to soil treatment progression is lacking. For example, there is mention of nutrient calcuations and turning (2-3 events per year), but limited detail to understand the operations is provided. How is the progression of each soil tracked? With large stockpiles, how is the soil being aerated to maintain aerobic conditions? The plan includes for compost addition, but no information related to local compost operation has been provided. How is the moisture content being monitored if there are only 2-3 turning events? There should be more information on how the facility is being operated. How is water being incorporated into the soil (e.g., water truck, pump and hose, etc.)? **Recommendation** Please update Section 4.5 to include details on how progressive soil remediation is tracked, how nutrients/compost are added, how aerobic conditions are maintained and how moisture is monitored and maintained?	**Dec 12:** Please refer to the Towns response to MVLWB Topic 59 regarding the closure o the HCSTF.
80	Hydrocarbon Contaminated Soil Treatment Facility O&M Plan, Section 4.6	**Comment** It is noted that a PID may be utilized. **Recommendation** Please verify if the PID is being used. How is the operator checking for endpoints (field laboratory equipment, 3rd party certified laboratory)?	**Dec 12:** Please refer to the Towns response to MVLWB Topic 59 regarding the closure o the HCSTF.
81	Hydrocarbon Contaminated Soil Treatment Facility	**Comment** Board staff note that moisture control is the primary mitigation measure for wind erosion and dust issues. **Recommendation** Pleaser verify how often dust events	**Dec 12:** Please refer to the Towns response to MVLWB Topic 59

	O&M Plan, Section 4.10	occur, and whether current mitigation measures are adequate. Has the Town considered using wind fencing to reduce wind velocity and therefore dust?	regarding the closure o the HCSTF.
82	Hydrocarbon Contaminated Soil Treatment Facility O&M Plan, Section 5	**Comment** Board staff note descrepancies betwen information provided and level of detail in the emergency response sections of this Plan and the SWDF O&M Plan. **Recommendation** Please ensure consistency of information provided in emergency response sections of the SWDF O&M Plan and the Biotreatment Pad O&M Plan. Has the Town considered creating a single emergency response plan for municipal facilities that cross-references applicable O&M Plans?	**Dec 12:** Please refer to the Towns response to MVLWB Topic 59 regarding the closure o the HCSTF.
83	Hydrocarbon Contaminated Soil Treatment Facility O&M Plan, Figure 2	**Comment** Drawing shows standing water which isn't recorded on other drawing sets. Location to be check on it is on old landfill trenches. **Recommendation** Is that area of standing water still noted on site?	**Dec 12:** There is no longer standing water on the site. The Town will provide updated photos in the O&M Plan for confirmation.
84	Hydrocarbon Contaminated Soil Treatment Facility O&M Plan, Monthly Inspection checklist	**Comment** Board staff note reference to binders 1, 2, and 3. Also, Boards staff note that missing items include: mudtracking, clay pad liner damage, drainage outside of the berms, water levels in pond and tanks, water tanks and attaching a photographic record. **Recommendation** What are binders 1, 2 and 3? Please update list to include missing items.	**Dec 12:** Please refer to the Towns response to MVLWB Topic 59 regarding the closure o the HCSTF.
85	Water Treatment Plant O&M Plan, Section 5	**Comment** Board staff note that the raw water pumped value (86.4 L/s) does not match the annual average value of 412,105 m3/yr. **Recommendation** Please verify value for the flow rate of raw water presented in response to this question.	**Dec 12:** The flow rate o the pump is the maximum flow rate. Th Town does not run the pump at the maximum flow rate which is why the raw water pumped value does not match the annual average value of 412, 10 m3/yr.
86	Water Treatment Plant O&M Plan, Section 6	**Comment** Board staff note that the Town uses two coagulants and flocculants (Section 6 of the Water Treatment Plant O&M Manual). **Recommendation** Can the town provide the chemical composition of the flocculants that are added to the water treatment process?	**Dec 12:** The Town uses the following in two chemicals in the water treatment process: <ul KLARAID* PC0090P (30 – 60%

			Epichlorohydrin-dimethylamine copolymer); and - KLARAID* CDP1334 (10 – 30% Aluminum chloride hydroxide sulfate).
87	Water Treatment Plant O&M Plan, Section 7	**Comment** Board staff note that the Town discharges sludge to a settling pond and to a water body. **Recommendation** What water body is the sludge discharged to? Does the Town know the quanity or quality of sludge discharged? How often is it discharged?	**Dec 12:** The Town does not discharge sludge to a water body. The sludge is sent to the sludge pad at the Sewage Disposal Facilit where it is managed. The water removed from the sludge is discharged through the Sewage Disposal Facilit lagoons where it is treated prior to being discharged into Great Slave Lake.
88	Water Treatment Plant O&M Plan, Section 7	**Comment** Board staff note that no details regarding the discharge of backwash water are given in the Water Treatment Plant O&M Plan. **Recommendation** Can the Town describe the quality, quantity and freqency of backwash? Where is backwash discharged to?	**Dec 12:** The quantity and frequency of the backwash is difficult to ascertain. Variations ca be due to seasonal changes and dependen on many factors such a breakup; how much water is received; and, quality of water intake The backwash is discharged into Great Slave Lake.
89	Water Treatment Plant O&M Plan, Section 8	**Comment** Board staff note that the WTP O&M Manual is listed as a document from 1979. **Recommendation** Please verify the document (including date) of the WTP O&M Manual.	**Dec 12:** The WTP O&M Manual is th equipment manufactures operatio and maintenance manual for the equipment and is from

			1979 (the age of the equipment in use).
90	Water Monitoring Plan: General	**Comment** Board staff note that this Plan appears to be the same as the previously-approved Version 2 (V2) under MV2009L3-0005. **Recommendation** Can the Town confirm that this Plan is the same as V2 approved by the Board under MV2009L3-0005. If not, can the Town provide a concordance table of the details that have been changed since V2?	**Dec 12:** The Town confirms that the Wate Monitoring Plan (V2) is the same as the one approved by the Board under MV2009L3-0005 with no changes.
91	Water Monitoring Plan, Sections 1.2 and 1.3.	**Comment** Section 1.2 and 1.3 should refer to all facilities covered under the Water Licence. **Recommendation** Can the Town update Sections 1.2 and 1.3 to include all of the facilities that fall under the Water Monitoring Plan?	**Dec 12:** The Town accepts this recommendation.
92	Water Monitoring Plan, Table 3.2	**Comment** Board staff note that Table 3.2 does not differentiate between sampling required by H&SS GNWT and the water licence. **Recommendation** Can the Town update Table 3.2 accordingly?	**Dec 12:** Table 3.2 was developed based on th requirements listed in the MV2009L3-0005 Water Licence, Annex A Surveillance Network Program (SNP).
93	Water Monitoring Plan, Page 13	**Comment** Board staff note that Page 13, last paragraph indicates that HCSTF pond water may be discharged on site. Board staff's understanding is that this is incorrect - it can be discharged to the SDF if criteria met. **Recommendation** Can the Town clarify what is meant on Page 13?	**Dec 12:** The Town has reviewed the Water Licence MV2009L3-000 Annex A Surveillance Network Program and agrees that the pond water may be discharged to the SDF and not on site. The Town will update the WMP to correct the error.
94	Water Monitoring Plan, Table 5.12	**Comment** Board staff note the sampling that occurs in the Hay River as per Table 5.12. **Recommendation** Does the Town see benefit in incorporating these sampling locations and parameters into the SNP?	**Dec 12:** The Town is undergoing a review of the historical water monitoring and will be presenting a proposal during the Technical Session which will include a review of the monitoring of the Hay

			River. The Town will forward a copy of the proposal to the reviewers prior to the session to facilitate meaningful discussion.
95	Water Monitoring Plan, Table 5.12	**Comment** None **Recommendation** Would these samples answer questions about the impact(s) of municipal operations on the Hay River?	**Dec 12:** The Town believes that the ability for the sampling of the Hay River to provide answers to the impact municipal operations may have on it would depend on a variety of factors. The Town is undergoing a review of the water monitoring and will be presenting a proposal during the Technical Session. The Town will forward a copy of the proposal to the reviewers prior to the session to facilitate meaningful discussion.
96	Water Monitoring Plan, Section 5.5	**Comment** Section 5.5 says a SOP should be developed for sampling. **Recommendation** Has an SOP been developed for sampling? If so, can the Town please provide it? If not, what are the Town's plans and timeline for developing the sampling SOP?	**Dec 12:** The Town will revise Section 5.5 to include sampling procedure for surface water and sewage effluent sampling.
97	Water Monitoring Plan, Section 6.3	**Comment** Section 6.3 notes that purging is performed prior to sampling groundwater wells. There should be SOPs defining how the purging is done to meet the 3 purge volumes. How much time is required to recharge after purging? In some geologic formations this method does not work. The type of device used should be indicated (bailer, one way valve, etc). The Town notes that suspended solids can be influenced by the sampling method, but the Town has not indicated how sampling methods ensure solids do not influence results. **Recommendation** Has the Town encountered any	**Dec 12:** The Town hires a 3rd party consultant t complete groundwater sampling and monitoring. The consultant provides a report annually which details sampling methods, equipment used, QA/QC details, and field notes.

		challenges with well purging and sampling as a result of low groundwater flow? Similar to Board staff's question regarding an SOP, further sampling details should be provided.	As well, the reports contains the rationale behind the choices with regards to the collectio the groundwater samples.
98	Water Monitoring Plan, Figures	**Comment** Board staff note that figures of the landfill provided reflect pre-fire landfill conditions. **Recommendation** Can the Town provide updated aerials photos, post-fire?	**Dec 12:** The Town accepts this recommendation. Updated aerial photos will also be included in the 2019 Annual Repor
99	Water Monitoring Plan, Table B1	**Comment** Board staff note that criteria for potable water are included and remind the Town that the Water Licence requires water volume from all sources (including potable water) to be reported, but does not require inclusion of criteria for potable water. **Recommendation** Can the Town add a footnote to Table B1 to clarify that potable water criteria are not a requirement of the Water Licence?	**Dec 12:** The Town will update Table B1 with the footnote.
100	Water Monitoring Plan, Table B2	**Comment** Table B2 appears similar to current water licence requirements. **Recommendation** Does the Town have any suggested changes to the SNP for stations 0053-2, -3 or -4? Does the Town see value in collecting samples at 0053-4?	**Dec 12:** <p style="margin-left:0cm margin-right:0cm">The Town reviewed the historical results for SNP-2, -3 and -4. There does not appear to be any reason to keep 0053-4 as part of the SNP given the that it is only sampled if there were issues at SNP-2 o 3 which has not occurred.
101	Water Monitoring Plan, General	**Comment** Board staff note that the Town has housed all water monitoring under this Plan (surface water and groundwater for the WTP, SDF and SWDF), but this Plan is not a current requirement of the existing water licence (MV2009L3-005). **Recommendation** Does the Town think that the Water Monitoring Plan and associated reporting should be written into MV2019L3-0010 as a condition?	**Dec 12:** The Town does not believe that the Water Monitoring Plan should be written in as condition of the water licence as the Surveillance Network Program is how the

			monitoring is directed the licence conditions. The Water Monitoring Plan was supplied as a starting point for discussions around the monitoring.
102	Water Monitoring Plan, Tables 3.7 and 3.8.	**Comment** Board staff note that the rationale provided in Table 3.8 needs to be revised - SNP0053-5b is to provide background/baseline groundwater information; SNP0053-5c, -5d and -5e are to assess possible impacts from SWDF operations on groundwater quality. **Recommendation** Can the Town confirm the rationale in Table 3.8?	**Dec 12:** The Town will update the table to provide clearer rationa for SNP 0053-5X series wells.
103	Water Monitoring Plan, Table 3.6	**Comment** Board staff note that the return water to Great Slave Lake is tested for chlorine (SNP 0053-6). **Recommendation** Can the Town confirm what the "return water" is exactly and where it is sampled? Are any other paremeters of potential concern present in this water?	**Dec 12:** <p style="margin-left:0cm margin-right:0cm">The Town would like to not that the information regarding SNP 0053-6 i located in Table 3.9 an the UMT coordinates are provided in the tab for the exact sample location. The return water is a continuous flow and there are no other contaminates of concern.
104	Water Monitoring Plan, Table 3.6	**Comment** Board staff note that no SNP station exists for other effluent discharges from the Water Treatment Plant. **Recommendation** Do other wastewater streams exist from the Water Treatment Plant that contain parameters of potential concern for release to the receiving environment?	**Dec 12:** The Town wou like to note that the table for SNP 0053-6 is Table 3.9 not 3.6. The water used for backwash been treated and therefore, is not suspected to contain contaminants of potential concern for release to the receivin environment.

105	Water Monitoring Plan, Section 7.0. Action Levels	**Comment** Board staff note that the method for establishing action levels is identified in Section 7.0. **Recommendation** Can the Town confirm that the historical concentrations (Tables B-3 and B-4) were established using results from the background groundwater well, SNP 0053-5b?	**Dec 12:** The Town can confirm that the historical concentration (Table B-3 and B-4) we established by using th results from the background well SNP 0053-5b.
106	Water Monitoring Plan, Section 7.0. Action Levels	**Comment** None **Recommendation** Can the Town provide evidence that the water quality results from 2011-2018 being used to establish background groundwater conditions are indicative of background groundwater concentrations, i.e. have not been impacted by industrial activity of any kind?	**Dec 12:** The Town believes that the background well (SNP 0053-5b) captures potential contaminatio from highway operations and other ground well upstream from the highway operations. The Town should not be accountable for contamination generated from other sources introduced int the SWDF operations b outside influences. (i.e highway operations).
107	Water Monitoring Plan, Section 7.0. Action Levels	**Comment** None **Recommendation** Can the Town provide the rationale for using the maximum historial concentration for establishing action levels? Why not some sort of mean or statistically generated value?	**Dec 12:** The Town used this method as it has been used and accepte by the Board in other water monitoring plans
108	Water Monitoring Plan, Page 7	**Comment** Table 3-2 is missing the station rationale and status (active/inactive), which is inconsistent with subsequent station tables. **Recommendation** Please update table for consistency.	**Dec 12:** The Town will update the Table to include the rationale and status.
109	Water Monitoring Plan, Page 8 - Table 3-3 and 3-4 and Page 9 - Table 3-5 - Row 2 - Column 2	**Comment** Board staff note the Town has used the language "swampland" instead of "wetland". **Recommendation** For consistency, replace "swampland" with "wetland treatment area".	**Dec 12:** The Town accepts this recommendation.

110	Water Monitoring Plan, Section 5.1	**Comment** Board staff notice descrepancies between this Plan and the HCSTF O&M Plan. **Recommendation** Please update for consistency.	**Dec 12:** The Town wou like to note that it has recently made the decision to close the HCSTF. Waste will no longer be received at the pad and the remaining soil will be treated this spring and removed from the pad The work will be completed prior to the issuance of the renewa and therefore the Tow proposes to remove th HCSTF operations from the licence. The intent would be to no longer accept or treat hydrocarbon contaminated soil at th facility. The Town will then include the decommissioning of th pad as part of the ICRP and follow that proces once the licence has been issued. However, should the Board inclu the HCSTF operations i the renewed water licence the Town will review Section 5.1 and the HCSTF O&M Plan and the Water Monitoring Plan and update to ensure consistency.
111	Water Monitoring Plan, Page 13 - Section 5.1	**Comment** Biotreatment Pad - This section does not include the "how" of sampling. For example, where is the sample obtained from (surface, 0.3 m below the surface, bottom of pond?) to get a representative sample.	**Dec 12:** The Town currently obtains a gra sample from the pond. The Town will review

		Recommendation Similar to Board staff comment regarding SOP, can this information be included?	the section and revise t include more details.
112	Water Monitoring Plan, Page 13 - Section 5.1 - 2nd paragraph - "Inspection results and measurmentsâ€¦."	**Comment** There should be an inspections form/log included. **Recommendation** Similar to Board staff comment regarding SOP, can this type of information be included?	**Dec 12:** The Town wou like to propose that a copy of the inspection form be kept in the O&M plans and n the Water Monitoring Plan.
113	Water Monitoring Plan, Section 5.1: Discharge Volume	**Comment** What is the maximum discharge volume of 50 m3 based on? In addition, Board staff note the final statement on p. 13 is incorrect - should it be 50 m3 per discharge day or some other time measurement? **Recommendation** Please provide rationale supporting the maximum discharge volume as well as clarification on the unit reference.	**Dec 12:** Please refer to the Town response provided to Topic 110 from the MVLWB regarding the closure o the HCSTF. The Town would also like to note that there is an update to be made to the Wat Monitoring Plan. Leachate would not be discharged to surface but sent to the SDF lagoon if it meets criteria. Therefore, this section will be rewritte and the discharge volume and unit reference will be removed.
114	Water Monitoring Plan, Section 7: Action Levels	**Comment** Board staff note the reference to LNAPL. **Recommendation** Why does the Town directly refer to LNAPL here when it has not been previously mentioned?	**Dec 12:** The Town has the LNAPL comment in the section as an oversight. The referenc to LNAPL will be removed from the Plan