

**Municipal Water Licence Annual Report**  
**Reporting year: 2021**

**Hamlet of Fort Resolution**  
**Licence #: MV2014L3-0008 (amended May 20, 2021)**  
**Expires: December 2, 2025**

*Part B, condition 18: The Licensee shall submit to the Board an Annual Water Licence Report no later than March 31 of the year following the calendar year reported, which shall be in accordance with Schedule 1.*

*Schedule 1, condition 1: The Annual Water Licence Report referred to in Part B, Condition 18 of this Licence shall include, but not be limited to the following information about activities conducted during the previous calendar year:*

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<sup>1</sup> Note that the lettering used in this template corresponds to the lettering of the Schedule in the Water Licence.

**a) Water Use**

*The monthly and annual quantities in cubic metres of fresh Water obtained from all sources;*

**Table 1: Monthly and annual water quantities withdrawn**

Month	Volume from Water Treatment Plant (m <sup>3</sup> )	Volume from any other source (m <sup>3</sup> )	TOTAL Volume (m <sup>3</sup> )
January	2054.1		
February	1791.4		
March	2031.0		
April	1987.7		
May	2124.6		
June	2234.7		
July	2023.0		
August	2231.9		
September	1953.0		
October	2051.1		
November	1846.6		
December	1963.1		
<b>TOTALS</b>	<b>24292.2</b>		<sup>2</sup>
% Increase / decrease from previous year			

Reasons for increase/decrease in water withdrawn as identified in Table 1:

Name and location of other water source used (if any) as identified in Table 1, and reason for its use.

General information (e.g. information regarding any modifications to the water withdrawal procedure or facilities) should be included here. Please attach any relevant reports as an appendix to this report.

**b) Waste Disposal**

*The monthly and annual quantities in cubic metres of each and all Waste discharged to the Waste Disposal Facilities, including sludge from the Water Treatment Plant;*

<sup>2</sup> According to the Licence, this amount is not to exceed 40,000m<sup>3</sup> annually.

Please list in the sections and tables below the amounts of solid waste (i), sewage (ii), sludge from the Water Treatment Plant (iii), and any other wastes (iv) deposited at the Waste Disposal Facilities (e.g. recyclables, tires, household hazardous waste, scrap metal, and other wastes that may be periodically shipped out.).

**i) Solid Waste**

The Government of the Northwest Territories – Municipal and Community Affairs (GNWT-MACA) has provided a standard formula for estimating the amount of solid waste deposited into a Solid Waste Facility in the absence of a metered garbage truck. The following can be used: **Volume per person per day X number of days X population.**

e.g. **0.015 m<sup>3</sup> X 30 days X 860 people = 387 m<sup>3</sup> of domestic trash deposited into Solid Waste Facility in a 30 day month**

**Table 2: Monthly and annual quantities of solid waste deposited at the Fort Resolution Solid Waste Disposal Facilities**

Month	Volume of solid waste deposited (m <sup>3</sup> )	Volume of [other waste source] deposited (m <sup>3</sup> )
January	210	
February	189	
March	210	
April	203	
May	210	
June	203	
July	210	
August	210	
September	203	
October	210	
November	203	
December	210	
<b>TOTALS</b>	<b>2471</b>	
Metered or estimated using GNWT-MACA formula	Estimated using formula	
% Increase / decrease from previous year		

Reasons for increase / decrease:

**ii) Sewage**

To calculate monthly sewage waste deposited to the Sewage Disposal Facilities, please provide the information below if metered information is available. If metered information is not available, please fill in the table using the corresponding TOTAL water volumes from Table 1. This provides an estimation only, and equals water in/sewage out.

**Table 3: Monthly and annual quantities of sewage deposited at Fort Resolution Sewage Disposal Facilities**

Month	Volume of sewage waste deposited (m <sup>3</sup> )
January	1853.265
February	1577.893
March	2050.775
April	1828.029
May	1416.852
June	2060.516
July	2056.344
August	2139.355
September	1869.513
October	1458.239
November	1849.651
December	1952.510
<b>TOTALS</b>	<b>22112.942</b>
Is this an estimated volume? (yes/no)	
% Increase / decrease from previous year	

Reasons for increase / decrease:

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**iii) Sludge from Water Treatment Plant**

**Table 4: Monthly and annual quantities of Water Treatment Plant sludge deposited at Fort Resolution Waste Disposal Facilities**

Month	Volume of sewage waste deposited and location (SWDF or SDF) (m <sup>3</sup> )
January	
February	
March	
April	
May	
June	
July	
August	
September	
October	
November	
December	
<b>TOTALS</b>	
Is this an estimated volume? (yes/no)	

% Increase / decrease from previous year	
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**iv) Other Waste Sources**

Are there any other types or sources of waste that are being deposited at Fort Resolution's Waste Disposal Facilities? Please list the type and source, where it is being deposited, and monthly/annual volumes for each waste. Add additional rows if required.

Waste type and source	Where deposited	Monthly/Annual Volume (specify unit and timeframe)

**c) Waste Removed from Waste Disposal Facilities**

The monthly and annual quantities in cubic metres of Waste removed from the Waste Disposal Facilities;

Please list in the table below, wastes removed from Waste Disposal Facilities (e.g. recyclables, tires, household hazardous waste, scrap metal, and other wastes that may be periodically shipped out.). Add additional columns to Table 4 if required.

**Table 5: Monthly and annual quantities of waste removed from the Waste Disposal Facilities by Type**

Month	Waste type 1 (m <sup>3</sup> ) (fill in type)	Waste type 2 (m <sup>3</sup> ) (fill in type)	Waste type 3 (m <sup>3</sup> ) (fill in type)
January			
February			
March			
April			
May			
June			
July			
August			
September			
October			
November			
December			
<b>TOTALS</b>			
Is this an estimated volume? (yes/no)			
% Increase / decrease from previous year			

**d) Waste Volumes from outside of community**

The monthly and annual quantity of all Sewage and solid Waste deposited into the Waste Disposal Facilities by commercial and industrial operators working outside the municipal boundaries of Fort Resolution;

**Table 6: Monthly waste volumes deposited by commercial and industrial operators working outside the local government boundaries of Fort Resolution, as authorized in writing by an Inspector.**

Month	Solid Waste Disposal Facilities (m <sup>3</sup> )	Sewage Disposal Facilities (m <sup>3</sup> )	TOTAL (m <sup>3</sup> )
January			
February			
March			
April			
May			
June			
July			
August			
September			
October			
November			
December			
<b>TOTALS</b>			
Is this an estimated volume? (yes/no)			
% Increase / decrease from previous year			

**e) Maintenance activities**

A summary of major maintenance work carried out on the Water Treatment Plant and Waste Disposal Facilities, including all associated structures;

Include a summary of major maintenance activities conducted. This includes any changes, repairs and modifications. If any problems occurred during the year, please note them here. If there are no changes, make note of that.

**f) Tabular summaries of data generated under the Surveillance Network Program**

*Tabular summaries of all data generated under the Surveillance Network Program (SNP) (Part B, condition 12 and Annex A) should be included using the tables in Appendix A (attached);*

All laboratory reports for SNP sampling events should be attached in Appendix B to this report.

**g) A summary of Fencing activities**

*A summary of activities undertaken to install and maintain fencing at the Waste Disposal Facilities;*

Please include detailed information. If there were no fencing activities, please make note of that.

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**h) A summary of Construction activities conducted**

*A summary of any construction activities conducted in accordance with Part E of this Licence, undertaken during the previous calendar year;*

If there were no construction activities, please make note of that. If required, please attach any as-built drawings or reports as an appendix to this report.

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**i) Spill Contingency Plan activities**

*A list and description of all Unauthorized Discharges that occurred during the previous calendar year, including the date, NWT spill number, volume, location, and summary of the circumstances and follow-up actions taken, and the status (i.e. open or closed), in accordance with the reporting requirements referred to in Part H, Condition 3 of this Licence;*

Add additional rows and details as required. Copies of Spill Reports should be attached in Appendix C to this report.

**Table 7: Unauthorized discharge details**

Date	NWT Spill Number	Substance Discharged	Volume	Location	Circumstances and Actions Taken	Status (open/closed)
					Include details in the space below this table.	

Add additional details, as applicable:

**j) An outline of any spill training and communications exercises carried out during the previous calendar year;**

Please include any courses taken related to spill prevention, waste management, SNP sampling, etc.

**k) Closure and Reclamation Activities**

*A summary of any Closure and Reclamation work completed during the year and an outline of any work anticipated for the next year;*

Please attach any relevant as-built drawings or reports in Appendix D to this report.



**l) Studies requested by the Board**

*A summary of any studies requested by the Board that relate to Waste disposal, Water Use or reclamation, and a brief description of any future studies planned;*

If the Board has requested any specific studies, include a summary of the outcomes. Please add rows to the Table as necessary and include any studies or reports in Appendix E to this report.

**Table 8: Board-requested Studies and Reports**

Study Requested	Summary of outcomes

**m) Actions taken to address concerns, non-conformances, or deficiencies**

*A summary of actions taken to address concerns, non-conformances, or deficiencies in any reports filed by an Inspector;*

Please detail how the Hamlet is addressing any issues. Include relevant documentation and correspondence in Appendix F to this report.

**n) Updates to Plans**

*A summary of any updates or revisions to Management Plans and Operation and Maintenance Plans;*

Please add rows to the table as necessary.

**Table 9: Updates to Plans**

Plan	Summary of revisions made	Effective date

**o) Other Details Requested by the Board**

*Any other details on Water Use, operating procedures, maintenance work, or other topics, requested by the Board on or before November 1 of the year being reported.*

If the Board has requested any other details on Water use, operating procedures, maintenance work, or other topics, include details in this section with a summary of the outcome(s). Include any attachments as

a Appendix G to this report.



### **Other Information**

It could be helpful to include the following in the Annual Report:

- a summary of correspondence with the Inspector, including inspection dates and identification of any issues of non-compliance. The MVLWB is interested in this information in order to facilitate discussions to resolve any issues;
- any other information here that may help the MVLWB and public understand municipal operations at Fort Resolution;
- details on any upcoming studies/reports that are planned; and
- if there are any contaminated soil piles currently in use (land farming), please list the details of containment, remediation and progress.

## Appendix A: Tabular summaries of all data generated under the Surveillance Network Program

**Hamlet of Fort Resolution  
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### Surveillance Network Program Lab Results Summary

Surveillance Network Program (SNP) information is to be summarized in a tabular format and shall indicate date of testing, parameters tested for and any other information requested by the GNWT Water Licence Inspector or the MVLWB. Summary tables have been provided below for your convenience. Laboratory analysis results should be included in Appendix B.

**1) SNP Lab Results Summary – Station number 2015-1 (Raw Water intake line at the Water Supply Facilities)**

This station monitors the monthly and annual quantity of Water withdrawn for municipal purposes. This information is reported in Table 1 of the Annual Report.

**2) SNP Lab Results Summary – Station number 2015-2 (Sewage contained in a secondary cell of the Sewage Disposal Facilities, before it infiltrates the ground - Exact location to be determined with the Inspector)**

This station monitors effluent quality prior to infiltration and flow towards the wetland area, twice yearly (beginning and end of open water season).

Parameter	Sample 1 Date	Sample 2 Date
pH (pH units)		
CBOD <sub>5</sub> (mg/L)		
Total Suspended Solids (mg/L)		
Ammonia (mg/L)		
Total Phosphorus (mg/L)		
Nitrate (mg/L)		
Nitrite (mg/L)		
Fecal Coliforms (/100mL)		
Oil and Grease (mg/L)		

**3) SNP Lab Results Summary – Station number 2015-3 (Sewage effluent flowing downgradient of the Waste Disposal Facilities, where there is visible seepage - Exact location to be determined with the Inspector)**

This station monitors effluent quality between the lagoon and wetland area, twice yearly (beginning and end of open water season).

Parameter	Sample 1 Date	Sample 2 Date
pH (pH units)		
CBOD <sub>5</sub> (mg/L)		
Total Suspended Solids (mg/L)		
Ammonia (mg/L)		
Total Phosphorus (mg/L)		
Nitrate (mg/L)		
Nitrite (mg/L)		
Fecal Coliforms (/100mL)		
Oil and Grease (mg/L)		

**4) SNP Lab Results Summary – Station number 2015-4 (Sewage effluent flowing through the ponded area of the wetland - Exact location to be determined with the Inspector)**

This station monitors effluent quality in the wetland area that has flowed from the Sewage Disposal Facilities and Solid Waste Disposal Facilities post-lagoon and ground infiltration treatment, twice yearly (beginning and end of open water season).

Parameter	Sample 1 Date	Sample 2 Date
pH (pH units)		
CBOD <sub>5</sub> (mg/L)		
Total Suspended Solids (mg/L)		
Ammonia (mg/L)		
Total Phosphorus (mg/L)		
Nitrate (mg/L)		
Nitrite (mg/L)		
Fecal Coliforms (/100mL)		
Oil and Grease (mg/L)		
Total Cadmium (µg/L)		
Total Chromium (µg/L)		
Total Cobalt (µg/L)		
Total Copper (µg/L)		
Total Iron (µg/L)		
Total Lead (µg/L)		
Magnesium (µg/L)		
Total Manganese (µg/L)		
Total Mercury (µg/L)		

<b>Total Nickel</b> (µg/L)		
<b>Total Zinc</b> (µg/L)		
<b>Total Petroleum Hydrocarbons</b> (mg/L)		
<b>BTEX</b> (µg/L)		
<b>Total Phenols</b> (mg/L)		
<b>Calcium</b> (mg/L)		
<b>Potassium</b> (mg/L)		
<b>Sodium</b> (mg/L)		
<b>Sulphate</b> (mg/L)		
<b>Conductivity</b> (µS/cm)		

**5) SNP Lab Results Summary – Station number 2015-5 (Effluent outflow area at most inland area of Nagle Channel directly adjacent to the wetland area - Exact location to be determined with the Inspector)**

This station monitors effluent quality post-lagoon and ground infiltration treatment, twice yearly (beginning and end of open water season).

<b>Parameter</b>	<b>Sample 1 Date</b>	<b>Sample 2 Date</b>
<b>pH</b> (pH units)		
<b>CBOD<sub>5</sub></b> (mg/L)		
<b>Total Suspended Solids</b> (mg/L)		
<b>Ammonia</b> (mg/L)		
<b>Total Phosphorus</b> (mg/L)		
<b>Nitrate</b> (mg/L)		
<b>Nitrite</b> (mg/L)		
<b>Fecal Coliforms</b> (/100mL)		
<b>Oil and Grease</b> (mg/L)		

**6) SNP Lab Results Summary – Station number 2015-6 (Ponded water within or adjacent to the Solid Waste Disposal Facilities - Exact location to be determined with the Inspector)**

This station monitors potential impacts of the Solid Waste Disposal Facilities on Groundwater and surface Water, twice yearly (beginning and end of open water season).

<b>Parameter</b>	<b>Sample 1 Date</b>	<b>Sample 2 Date</b>
<b>pH</b> (pH units)		
<b>Total Suspended Solids</b> (mg/L)		
<b>Oil and Grease</b> (mg/L)		
<b>Total Cadmium</b> (µg/L)		
<b>Total Chromium</b> (µg/L)		
<b>Total Cobalt</b> (µg/L)		

Total Copper (µg/L)		
Total Iron (µg/L)		
Total Lead (µg/L)		
Magnesium (µg/L)		
Total Manganese (µg/L)		
Total Mercury (µg/L)		
Total Nickel (µg/L)		
Total Zinc (µg/L)		
Total Petroleum Hydrocarbons (mg/L)		
BTEX (µg/L)		
Total Phenols (mg/L)		
Total Phosphate (mg/L)		
Calcium (mg/L)		
Potassium (mg/L)		
Sodium (mg/L)		
Sulphate (mg/L)		
Conductivity (µS/cm)		

**7) SNP Lab Results Summary – Station number 2020-10 (Inside new lagoon Cell 2)**

This station is the point of compliance, with Effluent Quality Criteria included in Part F, condition 11 of the Licence. It monitors final Effluent quality prior to discharge to the wetland, and must be sampled prior to decant, and again one month after the start of decant.

***Please note that the Board encourages the Hamlet to highlight any exceedances of the Effluent Quality Criteria measured at Surveillance Network Program station 2020-10.***

Parameter	Licence EQC	Sample 1 Date	Sample 2 Date
pH (pH units)	6-9		
CBOD <sub>5</sub> (mg/L)	100		
Total Suspended Solids (mg/L)	150		
Ammonia (mg/L)			
Total Phosphorus (mg/L)			
Nitrate (mg/L)			
Nitrite (mg/L)			
Fecal Coliforms (/100mL)	10 <sup>5</sup> /100mL		
Oil and Grease (mg/L)	5		

## **Appendix B: Laboratory reports for all samples collected for the Surveillance Network Program**

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## **Appendix C: Spill Reports**

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## **Appendix D: As-built Drawings and Reports**

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*Please note that in accordance with Part E, condition 9 of Licence MV2014L3-0008, the Hamlet is required to submit an As-Built Report for the new Sewage Disposal Facilities, within 180 days of completion of Construction.*

## **Appendix E: Board-requested Studies and Reports**

**Hamlet of Fort Resolution  
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**Please note that for**

## **Appendix F: Follow-up Correspondence to address Inspector Reports**

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## **Appendix G: Other Details Requested by the Board**

**Hamlet of Fort Resolution  
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