

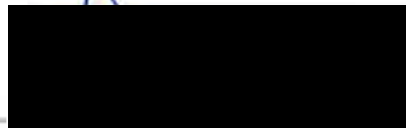


**REGIONAL DISTRICT
of Fraser-Fort George**

**MACKENZIE REGIONAL LANDFILL
2023 ANNUAL REPORT
PRINCE GEORGE, BRITISH COLUMBIA**

Prepared by:

THE REGIONAL DISTRICT OF FRASER-FORT GEORGE
155 George Street
Prince George, British Columbia
V2L 1P8



Laura Zapotichny
General Manager of Environmental Services



December 5, 2024

Attention: British Columbia Ministry of Environment and Parks

Subject: Qualified Professional Annual Report Review
Mackenzie Regional Landfill 2023 Annual Report

The Regional District of Fraser-Fort George has retained Tetra Tech Canada Inc. (Tetra Tech) as a Qualified Professional (QP) to review the Mackenzie Regional Landfill (the Site) 2023 Annual Report (Annual Report).

Relevant 3rd party information, which has been relied upon, has been used in and/or is appended to this report. Tetra Tech has reviewed the Annual Report and based on the information provided and knowledge of the Site, Tetra Tech is in general agreement with the information provided. Tetra Tech has reviewed the information presented in the Annual Report and is not responsible for the information that is included or that may have been omitted.

Respectfully submitted,
Tetra Tech Canada Inc.



Reviewed by:
Rana Mandour, P.Eng.
Project Engineer
Solid Waste Management Practice
Direct Line: 587.460.3481
Rana.Mandour@tetrattech.com

Reviewed by:
Michelle Jelinski, P.Eng.
Project Engineer – Team Lead
Solid Waste Management Practice
Direct Line: 587.460.3449
Michelle.Jelinski@tetrattech.com

PERMIT TO PRACTICE
TETRA TECH CANADA INC.
PERMIT NUMBER: 1001972

Enclosures: Declaration of Competency
Conflict of Interest Disclosure Statement

Declaration of Competency

The Ministry of Environment and Climate Change Strategy relies on the work, advice, recommendations and in some cases decision making of qualified professionals¹, under government's professional reliance regime. With this comes an assumption that professionals who undertake work in relation to ministry legislation, regulations and codes of practice have the knowledge, experience and objectivity necessary to fulfill this role.

1. Name of Qualified Professional Michelle Jelinski, P.Eng.
Title Project Engineer - Team Lead
2. Are you a registered member of a professional association in B.C.? Yes No
Name of Association: EGBC Registration # 223284
3. Brief description of professional services:

Qualified Professional Review of Landfill Annual Reports 2023 for the Regional District of Fraser-Fort George

This declaration of competency is collected under section 26(c) of the *Freedom of Information and Protection of Privacy Act* for the purposes of increasing government transparency and ensuring professional ethics and accountability. By signing and submitting this statement you consent to its publication and its disclosure outside of Canada. This consent is valid from the date submitted and cannot be revoked. If you have any questions about the collection, use or disclosure of your personal information please contact the Ministry of Environment and Climate Change Strategy Headquarters Office at 1-800-663-7867.

Declaration

I am a qualified professional with the knowledge, skills and experience to provide expert information, advice and/or recommendations in relation to the specific work described above.

Signature: 
X _____
Print Name: Michelle Jelinski

Witnessed by: 
X _____
Print Name: Lauren Quan

Date signed: November 25, 2024

¹Qualified Professional, in relation to a duty or function under ministry legislation, means an individual who

- a) is registered in British Columbia with a professional association, is acting under that organization's code of ethics, and is subject to disciplinary action by that association, and
- b) through suitable education, experience, accreditation and knowledge, may reasonably be relied on to provide advice within his or her area of expertise, which area of expertise is applicable to the duty or function.

Conflict of Interest Disclosure Statement

A qualified professional ¹ providing services to either the Ministry of Environment and Climate Change Strategy (“ministry”), or to a regulated person for the purpose of obtaining an authorization from the ministry, or pursuant to a requirement imposed under the *Environmental Management Act*, the *Integrated Pest Management Act* or the *Park Act* has a real or perceived conflict of interest when the qualified professional, or their relatives, close associates or personal friends have a financial or other interest in the outcome of the work being performed.

A real or perceived conflict of interest occurs when a qualified professional has

- a) an ownership interest in the regulated person’s business;
- b) an opportunity to influence a decision that leads to financial benefits from the regulated person or their business other than a standard fee for service (e.g. bonuses, stock options, other profit sharing arrangements);
- c) a personal or professional interest in a specific outcome;
- d) the promise of a long term or ongoing business relationship with the regulated person, that is contingent upon a specific outcome of work;
- e) a spouse or other family member who will benefit from a specific outcome; or
- f) any other interest that could be perceived as a threat to the independence or objectivity of the qualified professional in performing a duty or function.

Qualified professionals who work under ministry legislation must take care in the conduct of their work that potential conflicts of interest within their control are avoided or mitigated. Precise rules in conflict of interest are not possible and professionals must rely on guidance of their professional associations, their common sense, conscience and sense of personal integrity.

Declaration

I Michelle Jelinski Print Name, as a member of EGBC Print Name of Professional Association
declare

Select one of the following:

- Absence from conflict of interest

Other than the standard fee I will receive for my professional services, I have no financial or other interest in the outcome of this work involving annual report reviews application/project/work/etc..

I further declare that should a conflict of interest arise in the future during the course of this work, I will fully disclose the circumstances in writing and without delay to Leonard Cook ry Contact Name, erring on the side of caution.



Real or perceived conflict of interest

Description and nature of conflict(s):

I will maintain my objectivity, conducting my work in accordance with my Code of Ethics and standards of practice.

In addition, I will take the following steps to mitigate the real or perceived conflict(s) I have disclosed, to ensure the public interest remains paramount:

Further, I acknowledge that this disclosure may be interpreted as a threat to my independence and will be considered by the statutory decision maker accordingly.

This conflict of interest disclosure statement is collected under section 26(c) of the *Freedom of Information and Protection of Privacy Act* for the purposes of increasing government transparency and ensuring professional ethics and accountability. By signing and submitting this statement you consent to its publication and its disclosure outside of Canada. This consent is valid from the date submitted and cannot be revoked. If you have any questions about the collection, use or disclosure of your personal information please contact the Ministry of Environment and Climate Change Strategy Headquarters Office at 1-800-663-7867.

Signature:

X  _____

Witnessed by;

X  _____

Print name: Michelle Jelinski

Print name: Lauren Quan

Date: November 25, 2024

¹Qualified Professional, in relation to a duty or function under ministry legislation, means an individual who
a) is registered in British Columbia with a professional association, is acting under that organization’s code of ethics, and is subject to disciplinary action by that association, and
b) through suitable education, experience, accreditation and knowledge, may reasonably be relied on to provide advice within his or her area of expertise, which area of expertise is applicable to the duty or function.

EXECUTIVE SUMMARY

This 2023 Annual Operations Report has been prepared by the Regional District of Fraser-Fort George for the Mackenzie Regional Landfill located approximately 3 kilometres south of Mackenzie, British Columbia.

The objective of the 2023 Annual Operations Report is to summarize the development of the Site for the period of January 1, 2023 to December 31, 2023. The results of the Environmental Monitoring Program were submitted to the British Columbia Ministry of Environment and Climate Change Strategy (BC MOECCS) in the report entitled, “2023 Annual Groundwater Monitoring Report Mackenzie Regional Landfill” generated by Atkins Realis, (March 2024).

The Site began to accept waste in 1974. It currently operates under Operational Certificate (OC) 100206 issued March 4, 2009 by the British Columbia Ministry of Environment under the provisions of the *Environmental Management Act* and in accordance with the Regional District of Fraser-Fort George (RDFFG) Solid Waste Management Plan. The site is operating as a natural attenuation landfill.

The Site has a total permitted area of approximately 8.2 hectares.

In 2019 the municipal solid waste landfill was converted into a Transfer Station operation and Select Landfill for demolition, land clearing and construction (DLC) waste. With the completion of the transfer station facility to the west of the landfill property, municipal solid waste (MSW) is now hauled to the Foothills Boulevard Regional Landfill. As of January 1, 2020, only DLC materials are landfilled at the Site.

A planned office review inspection by the MOECCS on April 4, 2023, resulted in a *Non-Compliance Advisory Letter, Operational Certificate 100206*, report number 201680, in the following areas:

- 4. General Requirements, 4.1 Qualified Professionals
- 4. General Requirements, 4.2 Plans, 4.2.2
- 4. General Requirements, 4.2 Plans, 4.2.3
- 5. Operational Requirements, 5.1 Non-Compliance Reporting
- 5. Operational Requirements, 5.3 Electric Fencing, 5.3.2 Operating Period
- 5. Operational Requirements, 5.5 Landfill Gas
- 7. Monitoring, 7.1 Monitoring Program, 7.1.3
- 8. Reporting, 8.1 Drawings
- 8. Reporting, 8.2 Annual Report

Additionally, the review inspection officer issued a *Non-compliance Advisory Letter, Landfill Gas Management Regulation*, report number 201680 in the following areas:

- Environmental Management Act, Landfill Gas Management Regulation (391/2008) 4 (1): An owner or operator of a regulated landfill site must ensure that a qualified professional conducts an initial landfill gas generation of the landfill site in accordance with subsection (2).

Attached to the report are *Non-Compliance Advisory Letter, Operational Certificate 100206*, report number 201680 (Appendix D) and *Non-compliance Advisory Letter, Landfill Gas Management Regulation*, report number 204286 (Appendix E). In July 2023, the Regional District of Fraser-Fort George retained Morrison Hershfield (MH), (now Stantec) to prepare a Design, Operations and Closure Plan (DOCP) for the Mackenzie Regional Landfill. In preparing the DOCP, the RDFFG provided MH with the Non-Compliance advisory letters issued by the MOECCS.

Attached to the report (Appendix F) is a letter from MH (now Stantec) providing a response to the findings summarized in the MOECCS's non-compliance advisory letters. The updated DOCP was submitted to the MOECCS on April 5, 2024. The recommendations and results of the updated DOCP were not available during the Reporting Period covered by this document though will be fully incorporated into the 2024 Annual Operations Report for the Mackenzie Regional Landfill.

According to RDFFG records, the total amount of DLC landfilled at the active face is estimated at approximately 246 tonnes, (including the estimated 10% factor), during the Reporting Period.

Approximately 1,412 tonnes (per Section 3.6 and Table 2) of commercial and residential MSW were transported to Foothills Boulevard Regional Landfill during the Reporting Period.

TABLE OF CONTENTS

| | |
|---|------------|
| 1. INTRODUCTION | 1-1 |
| 2. SITE AND REGULATORY SETTING | 2-1 |
| 2.1 Site Description..... | 2-1 |
| 2.2 Site History | 2-1 |
| 2.3 Regulatory Setting | 2-1 |
| 3. LANDFILL OPERATION AND MANAGEMENT | 3-1 |
| 3.1 Site Operations..... | 3-1 |
| 3.2 Site Facilities..... | 3-2 |
| 3.3 Open Burn Activity..... | 3-2 |
| 3.4 Wildlife Observations | 3-2 |
| 3.5 Waste Diversion Activities | 3-2 |
| 3.6 Waste Disposal..... | 3-3 |
| 3.7 Landfill Volume Consumed..... | 3-3 |
| 3.8 Approved Design Volume | 3-4 |
| 3.9 Remaining Capacity and Site Life | 3-4 |
| 3.10 2024 Operations Plan..... | 3-4 |
| 3.11 Summary of Environmental Monitoring Data | 3-4 |
| 4. SUMMARY AND CLOSURE | 4-5 |
| 5. REFERENCES | 5-1 |

FIGURES

| | |
|----------|-------------------|
| Figure 1 | Site Location Map |
| Figure 2 | Site Plan |
| Figure 3 | Aerial Survey |

TABLES

| | |
|---------|------------------------------|
| Table 1 | Waste Diversion |
| Table 2 | Solid Waste Disposal Summary |

APPENDICES

| | |
|------------|--|
| Appendix A | Operational Certificate 100206 |
| Appendix B | Site Brochure |
| Appendix C | 2024 Mackenzie Volume Assessment |
| Appendix D | <i>Non-Compliance Advisory Letter</i> , Operational Certificate 100206, report number 201680 |
| Appendix E | <i>Non-compliance Advisory Letter, Landfill Gas Management Regulation</i> , report number 204286 |
| Appendix F | Morrison Hershfield response to the MOECCS Non-Compliance advisory letters |

1. INTRODUCTION

The objective of the 2023 Annual Operations Report is to summarize the development of the Site for the period of January 1, 2023 to December 31, 2023 (Reporting Period).

This report fulfils the annual operational reporting requirements outlined in Condition 8.2 of Operational Certificate 100206 (OC), issued by the British Columbia Ministry of Environment and Climate Change Strategy (BC MOECCS).

2. SITE AND REGULATORY SETTING

2.1 Site Description

The Site is located approximately 3 kilometres south of the District of Mackenzie, British Columbia on leased Crown land previously used as a gravel pit. The Site comprises an area of approximately 8.2 hectares. A site location map is provided as Figure 1.

The Site opened in 1974 and accepts waste from the District of Mackenzie and surrounding area.

Currently, the Site provides services for receiving Demolition, Land Clearing and Construction (DLC) waste for burial. Municipal Solid Waste (MSW), used oil, oil filters and containers, antifreeze, lead acid batteries, and rechargeable household batteries are received at the Transfer Station. A swap shed, marshalling site for appliances, scrap metal, and multi-material recycling (MMR) are present at the Transfer Station.

Large quantities of source separated yard and garden waste can be dropped off at the Site at no charge. Yard waste is chipped periodically and stored for future use on-site.

The existing site conditions are shown on Figure 3.

2.2 Site History

The Site began to accept waste in 1974 from the District of Mackenzie and surrounding area. The Site is operated as a “natural attenuation landfill.”

On December 1, 2019, the Transfer Station was fully operational, accepting all MSW and recyclables. The landfill site transitioned to only accept DLC waste.

The old weigh scale was replaced with a new weigh scale in 2019. The weigh scale and scale house are located at the Transfer Station entrance of the Site.

2.3 Regulatory Setting

The OC for the Site (Appendix A) was issued on March 4, 2009 by the BC MOECCS under the provisions of the *Environmental Management Act* and in accordance with the Regional District of Fraser-Fort George Solid Waste Management Plan (2015). The annual operations reporting requirements for the Site, are outlined in Condition 8.2 of the OC, including the following:

- An executive summary;
- The type and tonnage of waste received, recycled, and landfilled for the year;
- A current topographic map detailing airspace consumption, on-site borrow pit changes, and future developments (Figure 2);
- Updated estimates for the remaining capacity, closure date for the current phase, and closure date for the current landfill footprint;

- Any new information or proposed changes relating to the facilities and Design and Operating Plan;
- Composting operation activity including amount of material received for composting, material composted, material sold and number of composting cycles;
- Occurrences or observations of wildlife (medium and large carnivores) at the facility;
- A statement regarding the facility’s progress in reducing the regional solid waste stream, in accordance with the hierarchy of reduce, reuse, and recycle principles; and
- The results of monitoring programs as specified in the OC will be submitted by the RDFFG under separate cover and are not included in this report.

3. LANDFILL OPERATION AND MANAGEMENT

3.1 Site Operations

Since December 1, 2019, and the completion of the Transfer Station, the active face at the Site accepts only DLC waste from the District of Mackenzie and surrounding areas.

Other waste items accepted at the Transfer Station include the following:

- MSW;
- Scrap metal;
- Yard and Garden Waste; and
- Clean Cover.

According to Condition 6.1 of the OC, hazardous waste, as defined by the Hazardous Waste Regulation pursuant to the Environmental Management Act is prohibited from disposal unless expressly authorized by the Hazardous Waste Regulation, approved by the Director or as specified in the OC.

Condition 6.2 of the OC authorizes the disposal of waste asbestos at the Site, subject to compliance with the requirements of Section 40 of the Hazardous Waste Regulation. The Site did not accept asbestos for disposal in 2023. The Site now prohibits the disposal of asbestos.

Materials that are prohibited for disposal at the Site include: cattle carcasses; fencing wire; hazardous waste; industrial chemical waste; lubricants; radioactive waste; refuse (on fire or smouldering); special waste (except as permitted controlled waste); steel/plastic drums (if not cut, crushed, or perforated); tires on rims; explosives; fuels; ignitable waste; liquids; paints/solvents; reactive waste; and slurry/sewage sludge.

Equipment used at the Site for landfilling related activities, includes the following:

- CAT model D6M Crawler Tractor;
- CAT model EL300R hydraulic excavator;
- Kenworth model all-wheel drive dump truck; and
- CAT model 730 rock truck.

The landfill hours of operation are as follows:

- Sunday to Thursday 9 am to 5 pm.
- Closed Friday and Saturday.
- Closed all statutory holidays.

Currently, the active face area of the landfill is covered three to four times during Spring and Summer. The active face area of the landfill is covered with soil.

3.2 Site Facilities

The limit of waste of the landfill and Transfer Station is secured with an electric fence. Access to the Site is controlled by a gate located at the main entrance. The gate is locked outside of normal operating hours to prevent unauthorized access and uncontrolled disposal. The weigh scale facility includes a 12-metre long weigh scale and an adjacent scale house. When residents and commercial haulers arrive at the Site, they are instructed to report to the scale house where load inspections and discharge direction is provided.

All weigh scale records are maintained on a computer attached to the weigh scale. The software program used to collect weigh scale data at the Site is the same software used at the Foothills Boulevard Regional Landfill (FBRL). This harmonizes the data input between the Site and FBRL.

In addition to the scale house, the following facilities are maintained at the Site:

- Swap Shed;
- Used Oil Storage sea can, which consists of a double walled storage tank with a capacity of 2,200 litres and a built in catch basin within the sea can;

3.3 Open Burn Activity

No open burning activities occurred on the Site during the Reporting Period.

3.4 Wildlife Observations

Wildlife tracks of medium carnivores (coyotes) were observed on Site during the Reporting Period, a total of one time, while actual sightings were noted 110 separate times during the Reporting Period.

Large carnivore scat was observed outside the Borrow Pit gate once, while actual sightings were limited to six times in the Reporting Period. Two occurrences had black bears inside the electric fence, but the bears were ushered offsite. There were four sightings of grizzly bears, all outside the electric fence.

3.5 Waste Diversion Activities

The RDFFG encourages the reduction of solid waste generated and subsequently landfilled by the following means (Appendix B):

- Swap shed – waste exchange areas where reusable items can be either dropped off or picked up free of charge;
- Grinding of yard and garden waste;
- Multi-material recycling including:
 - Corrugated cardboard and mixed paper; and
 - Plastic cartons and containers, metal food cans.
- Automotive lead acid battery collection;
- Single use battery collection;

- Sea can for collection of used oil and antifreeze, oil filters and used oil containers;
- Marshalling area for scrap metal; and
- Marshalling area for white goods, including Ozone Depleting Substances (ODS) containing appliances.

3.6 Waste Disposal

Residential and Commercial MSW are no longer received at the Landfill Site for burial since the Transfer Station started operations on December 1, 2019. All MSW is transported to the FBRL.

Only DLC waste is accepted at the Select Landfill area. According to RDFFG records, the total amount of DLC landfilled at the active face is estimated at approximately 246 tonnes during the Reporting Period, with 224 tonnes scaled in.

According to RDFFG records, the total MSW transported to FBRL is 1,412 tonnes during the Reporting Period. This total was made up by 1,154 tonnes of MSW collected through the District of Mackenzie's curbside garbage collection and 258 tonnes brought by commercial haulers and residential self haul (see Table 2).

Prior to 2020, the amount of waste received at the site was approximated using the scale software data and average provincial per capita disposal rates. Since that time, most of the waste is accounted for in two ways.

The municipal solid waste collected at the Mackenzie Regional Transfer station is transported to the FBRL and weighed in.

Most demolition, land clearing, and construction waste was scaled in at the Site, however the RDFFG applied a factor of 10% to account for the small loads of DLC waste that were not scaled in at the Site for a total of 246 tonnes of DLC waste buried at the site in 2023.

3.7 Landfill Volume Consumed

As indicated in Section 3.6, the total amount of DLC waste received was estimated to be approximately 246 tonnes during the Reporting Period.

The apparent waste density is estimated from the calculated landfill airspace consumption and the annual tonnage landfilled. The apparent waste density is not a true density, but is a relationship that represents the mass of waste that can be disposed in each cubic metre of landfill air space. The apparent waste density is a more accurate measure of the efficiency of landfilling since soil (used for daily and interim cover) is excluded from the ratio. The apparent waste density is based on the comparison of the tonnage landfilled versus the air space consumed. Soil used as daily cover is excluded from consideration since an increase in soil usage can increase the true density and provide a skewed representation of landfilling efficiency.

Efficient landfill compaction techniques employed at well-operated landfill sites can typically attain an apparent waste density of 0.5 to 1.0 tonnes of waste per cubic

metre of air space consumed depending on the size of the landfill. A landfill similar to the Site would be anticipated to achieve an apparent waste density of 0.5 tonnes per cubic metre.

The apparent waste density was calculated by comparing the waste tonnage and air space consumed between the survey period on May 11, 2023, and May 10, 2024. Using the topographic contour plan generated during the Reporting Period, shown as Figure 3, an airspace consumption of approximately 365 cubic metres was estimated (Dillon Consulting Inc., 2024) and 213 tonnes were received on Site during this period giving an apparent waste density of 0.58 tonnes per cubic meter, (Dillon Consulting Inc., 2024), (Appendix C).

3.8 Approved Design Volume

An approved design volume has not been defined for the Site. An update to the DOCP was undertaken by Morrison Hershfield starting in 2023 and the findings and results of that undertaking will be included in the 2024 Annual Report.

3.9 Remaining Capacity and Site Life

The remaining Site life has not been quantified for the 2023 Annual Report but will be included within the 2024 Annual Report with the completion of updated DOCP.

3.10 2024 Operations Plan

The current landfill was converted into a Select Landfill, where DLC is the only waste accepted for burial. The Transfer Station portion opened on December 1, 2019.

The Site will continue to accept residential, commercial, and light industrial waste from the District of Mackenzie and surrounding areas directed to the Transfer Station. Other waste items listed in Section 3.1 will continue to be accepted at the Site.

To enhance cardboard diversion, a cardboard compactor unit was installed in October 2021 to maximize the collection of corrugated cardboard. Multi-material recycling is scheduled to be consolidated at the Site and will coincide with the removal of the recycling bins at the Fire Hall location.

Future consideration will be given to implementing the DLC waste diversion program at the Mackenzie Regional Landfill.

Weigh Scale records indicate that approximately 213 tonnes of DLC waste was received at the Site, during the survey period, May 11, 2023, and May 10, 2024. Using this information and an airspace consumption of approximately 365 cubic metres during the survey period an apparent waste density of 0.58 tonnes per cubic metre, (Dillon Consulting Inc., 2024) was calculated.

3.11 Summary of Environmental Monitoring Data

The results of the Environmental Monitoring Program were submitted to the British Columbia Ministry of Environment and Climate Change Strategy (MOECCS) in the

report entitled, “2023 Annual Groundwater Monitoring Report Mackenzie Regional Landfill” generated by Atkins Realis, (March 2024).

4. SUMMARY AND CLOSURE

The 2023 Annual Report was prepared to summarize the development and operations of the Mackenzie Regional Landfill, for the January 1, 2023, to December 31, 2023 Reporting Period.

According to RDIFFG records, approximately 246 metric tonnes of waste was received at the Site during the 2023 Reporting Period. In 2023 an update to the sites Design, Operation and Closure Plan was undertaken that will update the information currently available and will determine the lifespan of the current footprint in the 2024 Annual Report.

5. REFERENCES

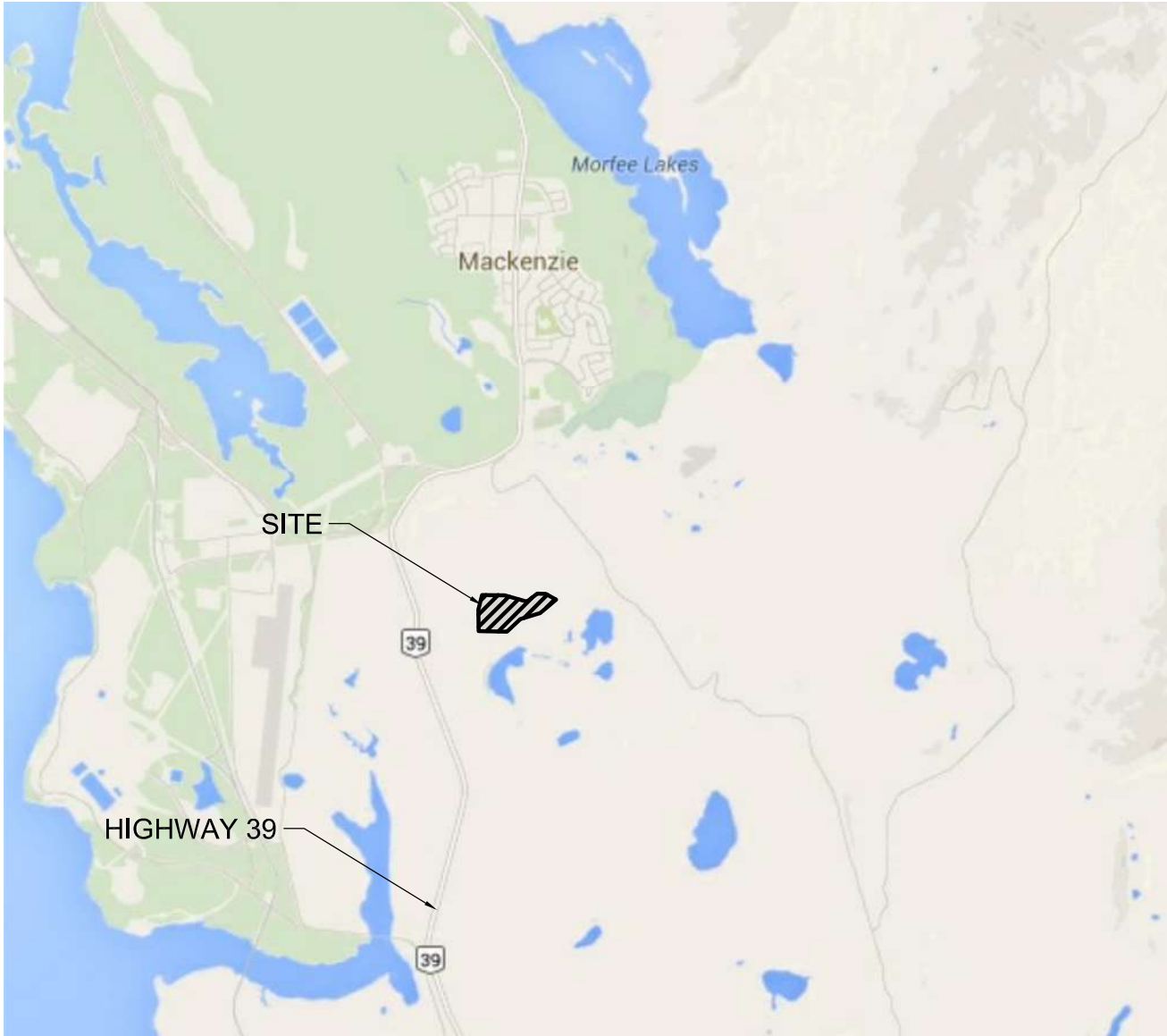
1. Aero Geometrics Ltd., 2023. “Air Survey.”
2. Dillon Consulting Inc., “2024 Volume Assessment - Mackenzie Regional Landfill.”
3. British Columbia Ministry of Environment, Second Edition, June 2016. “Landfill Criteria for Municipal Solid Waste.”
4. Environmental Management Act, 2009. “Hazardous Waste Regulation.”
5. British Columbia Ministry of Environment 2006, "Guidelines to Environmental Monitoring at Municipal Solid Waste Landfills."
6. British Columbia Ministry of Environment 2020. "Environmental Management Act."
7. Ministry of Environment 2020. "Landfill Gas Management Regulation".

FIGURES

FIGURE 1
SITE LOCATION MAP



NOT TO SCALE



SITE LOCATION MAP

2013 ANNUAL OPERATIONS REPORT
MACKENZIE REGIONAL LANDFILL
REGIONAL DISTRICT OF FRASER-FORT GEORGE



| DATE | JOB NO. | FIGURE NO. |
|-------------|--------------|------------|
| AUGUST 2014 | 4-2428-03-03 | 1 |

FIGURE 2
SITE PLAN

MACKENZIE REGIONAL LANDFILL & TRANSFER STATION SITE TOPOGRAPHY

LEGEND

- CONTOUR LINES
- GRAVEL ROAD
- DITCH
- FENCE
- MONITORING WELL
- TH2



NOTE: EXISTING CONDITIONS AS OF MAY 21, 2022

FIGURE 3
AERIAL SURVEY

MACKENZIE REGIONAL LANDFILL & TRANSFER STATION SITE PLAN WITH INFRASTRUCTURE

LEGEND

- CONTOUR LINES
- GRAVEL ROAD
- DITCH
- FENCE
- TH2
- MONITORING WELL
- WASTE FILL AREA





TABLES

TABLE 1 WASTE DIVERSION

| Material | Units |
|---------------------|--------------|
| Waste Oil | 3,475 litres |
| Oil Filters (drums) | 1 drum |
| Antifreeze | 410 litres |
| Batteries | 416 units |
| Scrap Metal | 230 tonnes |

TABLE 2 SOLID WASTE DISPOSAL SUMMARY

| Materials Received Mackenzie Regional Landfill 2023 | | |
|--|---|--|
| Materials Received and Buried at Active Face | | |
| | Construction and Demolition (tonnes) | Asbestos (tonnes) |
| Scale Data | 224 | 0 |
| Estimate | 22 | 0 |
| Total | 246 | 0 |
| MSW Materials Diverted Off-Site 2023 | | |
| | Residential Curbside (tonnes) | Residential & Commercial Self-Haul (tonnes)*includes calculated estimate. |
| Scale Data | 1,154 | 258 |
| Total | 1412 | |

APPENDIX A
OPERATIONAL CERTIFICATE 100206

MINISTRY OF ENVIRONMENT

OPERATIONAL CERTIFICATE

100206

*Under the Provisions of the Environmental Management Act
and In accordance with the
Regional District of Fraser-Fort George
Solid Waste Management Plan*

Regional District of Fraser-Fort George

155 George Street

Prince George, British Columbia

V2L 1P8

is authorised to manage recyclable material and municipal solid waste at a sanitary landfill located 4.2 km south of Mackenzie, British Columbia, subject to the conditions listed below. Contravention of any of these conditions is a violation of the *Environmental Management Act* and may result in prosecution.

1. LOCATION OF AUTHORISED FACILITY

The location of the facility for the management of recyclable material and municipal solid wastes to which this Operational Certificate is applicable is the Mackenzie Regional Landfill, covering all unsurveyed Crown Land in the vicinity of District Lot 3458, Cariboo District, containing 16.73 hectares, more or less. The Crown Licence of Occupation for the site is #705356.

2. ENTRANCE FACILITIES

The authorised facility includes recyclable material and municipal solid waste drop-off facilities, weigh scales and related appurtenances approximately as shown on attached Site Plan A.


3. MANAGEMENT OF MUNICIPAL SOLID WASTE

3.1. Sanitary Landfill

3.1.1. The authorised facilities are a sanitary landfill area, recyclable material storage areas and related appurtenances approximately as shown on the attached Site Plan. The site reference number for the discharge is E211576.

Date Issued:

MAR 04 2009


DeJ Reinheimer, P.Eng.
for Director, Environmental Management Act

Page: 1 of 7

OPERATIONAL CERTIFICATE: 100206

- 3.1.2. The characteristics of the discharge must be municipal solid waste as defined under the *Environmental Management Act* and other wastes as approved in writing by the Director.
- 3.1.3. Waste may be discharged to the areas specified in the Regional District's Design and Operation Plan, approximately located as shown on attached Site Plan A.

4. GENERAL REQUIREMENTS

4.1. Qualified Professionals

All facilities and information, including works, plans, assessments, investigations, surveys, programs and reports, must be certified by qualified professionals.

4.2. Plans

4.2.1. The Regional District shall prepare a Design and Operation Plan that will include considerations for site operation, development and closure, leachate and landfill gas management, composting operations, monitoring programs and environmental impact mitigation management.

The Design and Operation Plan must be submitted to the Director by May 15, 2009.

4.2.2. The Design and Operation Plan must address, but not be limited to, each of the subsections in the *Landfill Criteria for Municipal Solid Waste* including performance, siting, design, operational and closure and post-closure criteria.

4.2.3. The facilities must be developed and operated in accordance with the Design and Operation Plan.

4.2.4. Any updates to the plan shall be immediately submitted to the Director.

4.3. Additional Facilities or Works

The Director may require investigations, surveys, and the construction of additional facilities or works. The Director may also amend information requirements of this Operational Certificate including plans, programs, assessments and reports.

Date Issued:

MAR 04 2009


Del Reinheimer, P.Eng.
for Director, Environmental Management Act

Page: 2 of 7

OPERATIONAL CERTIFICATE: 100206

5. OPERATIONAL REQUIREMENTS

5.1. Non-Compliance Reporting

The Regional District shall immediately notify the Regional Manager, Environmental Protection, or designate by facsimile (250-565-6629) of any non-compliance with the requirements of this Operational Certificate and take appropriate remedial action.

Written confirmation of all non-compliance events, including available test results, is required by facsimile within 24 hours of the original notification unless otherwise directed by the Regional Manager, Environmental Protection.

5.2. Operator Training and Development

At a minimum, the Regional District will ensure that operating personnel are trained to industry standards and current in a SWANA recognized landfill operator course or equivalent.

5.3. Electric Fencing

Areas where putrescible materials are stored or discharged shall be surrounded by an electric fence.

5.3.1. Design, Construction and Maintenance

The electric fencing shall be designed, constructed, and maintained such that bears are prevented from penetrating the fence. The Director shall be advised of any modifications to the fence.

5.3.2. Operating Period

The electric fence shall be fully operational during the period of April 15 to November 15 inclusive each year. If snow is present during this period, any electrified strands above snow line shall be isolated from the remainder of the system and energised. The Director may vary the operating period with prior written authorisation.

5.3.3. Record Keeping and Reporting

The Regional District is required to monitor wildlife (medium and large carnivores) activity at the facility and keep records of occurrences and observations of wildlife (medium and large carnivores).

Date Issued:

MAR 04 2009


Del Reinheimer, P.Eng.
for Director, Environmental Management Act

5.4. Compost

Composting facilities shall be operated and maintained in accordance with the *Organic Matter Recycling Regulation*.

5.5. Landfill Gas

Landfill gas shall be managed in accordance with the *Landfill Gas Management Regulation*.

5.6. Leachate

The characteristics of the surface water and groundwater at the property boundary must not exceed concentrations set in the *British Columbia Approved Water Quality Guidelines (Criteria)* and *A Compendium of Working Water Quality Guidelines for British Columbia*. Where natural background water quality concentrations exceed the aforementioned guidelines, characteristics of the surface water and groundwater at the property boundary must not exceed background concentrations.

6. HAZARDOUS WASTE MANAGEMENT

6.1. Hazardous Waste

"Hazardous Wastes" as defined by the *Hazardous Waste Regulation* pursuant to the *Environmental Management Act* are prohibited from disposal unless expressly authorized by the *Hazardous Waste Regulation*, approved by the Director or as specified in the Operational Certificate.

6.2. Waste Asbestos

Waste asbestos is authorized for disposal subject to compliance with the requirements of section 40 of the *Hazardous Waste Regulation* and the following conditions:

- 6.2.1. The asbestos waste may not be mixed with any other hazardous waste.
- 6.2.2. The Regional District must approve the disposal before disposal takes place.
- 6.2.3. All other applicable requirements of the *Hazardous Waste Regulation*, including but limited to manifesting and waste record keeping, must also be complied with.

6.3. Handling of Impacted Soil

The *Environmental Management Act*, the *Contaminated Sites Regulation* and the *Hazardous Waste Regulation* are applicable for the disposal of impacted (contaminated) soil at the facility.

6.4. Hazardous Wastes from Accidental Spills or Abandonment

Hazardous wastes resulting from accidental spills or abandonment of dangerous goods may be accepted at the facility only under the authority of Section 52(1) of the *Hazardous Waste Regulation*.

7. MONITORING

7.1. Monitoring Program

7.1.1. A monitoring program shall be developed by a qualified professional to identify potential impacts to the environment and public health from the facility.

7.1.2. The monitoring program shall be submitted as part of the Design and Operation Plan.

7.1.3. The monitoring program must address, but not be limited to, subsections 4.1, 4.2 and 7.15 of the *Landfill Criteria for Municipal Solid Waste* and the *Guidelines for Environmental Monitoring at Municipal Solid Landfills*.

7.1.4. Monitoring must be conducted in accordance with the monitoring program.

8. REPORTING

All reports and drawings shall be submitted in electronic format unless otherwise requested by the Director.

8.1. Drawings


All drawings shall be certified correct and sealed by a qualified professional. Drawings shall be submitted to the Director within 30 days of completion or as otherwise specified by the Director.

8.2. Annual Report

The Regional District shall submit an Annual Report to the Director on or before June 30 each year for the previous calendar year.

Date Issued:

MAR 04 2009


Del Reinheimer, P.Eng.
for Director, Environmental Management Act

Page: 5 of 7

OPERATIONAL CERTIFICATE: 100206

The report shall contain, but not be limited to the following information:

- i.) an executive summary;
- ii.) the type and tonnage of waste received, recycled and landfilled for the year;
- iii.) a current topographic map detailing airspace consumption, on-site borrow pit changes and future developments;
- iv.) updated estimates for the remaining capacity, closure date for the current phase and closure date for the current landfill footprint;
- v.) any new information or proposed changes relating to the facilities and Design and Operation Plan;
- vi.) composting operation activity including amount of material received for composting, material composted, material sold and number of composting cycles;
- vii.) occurrences or observations of wildlife (medium and large carnivores) at the facility;
- viii.) a statement regarding the facility's progress in reducing the regional solid waste stream, in accordance with the hierarchy of reduce, reuse and recycle principles; and,
- ix.) the results of all monitoring programs as specified in this Operational Certificate. Data interpretation and comparison to the performance criteria in the *Landfill Criteria for Municipal Solid Waste* and the *Guidelines for Environmental Monitoring and Municipal Solid Waste Landfills*. Trend analysis, as well as an evaluation of the impacts of the discharges on the receiving environment in the previous year shall be carried out by a qualified professional.

9. CLOSURE PLAN

At least one year in advance of decommissioning the landfill, or as otherwise specified by the Director, a Closure Plan shall be submitted which includes at least the following information:

- i) a topographic plan showing the final elevations contours of the landfill and surface water diversion and drainage controls;
- ii) specifications for the final cap and proposed end use of the site; and,

Date Issued:

MAR 04 2009


Del Reinheimer, P. Eng.
for Director, Environmental Management Act

- iii) provisions for a minimum 25 year post-closure care period at the facility which, at a minimum, considers the following: groundwater monitoring, surface water monitoring, landfill gas management, erosion and settlement monitoring and management.

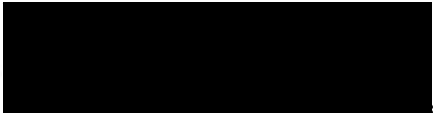
10. CLOSURE AND POST-CLOSURE FUND

The Regional District will conform to the Public Sector Accounting and Auditing Board's requirements (PS 3270) to recognize solid waste landfill closure and post-closure liability. The Regional District will develop a plan to ensure that sufficient funds are available for closure and post-closure care work.

Date Issued:

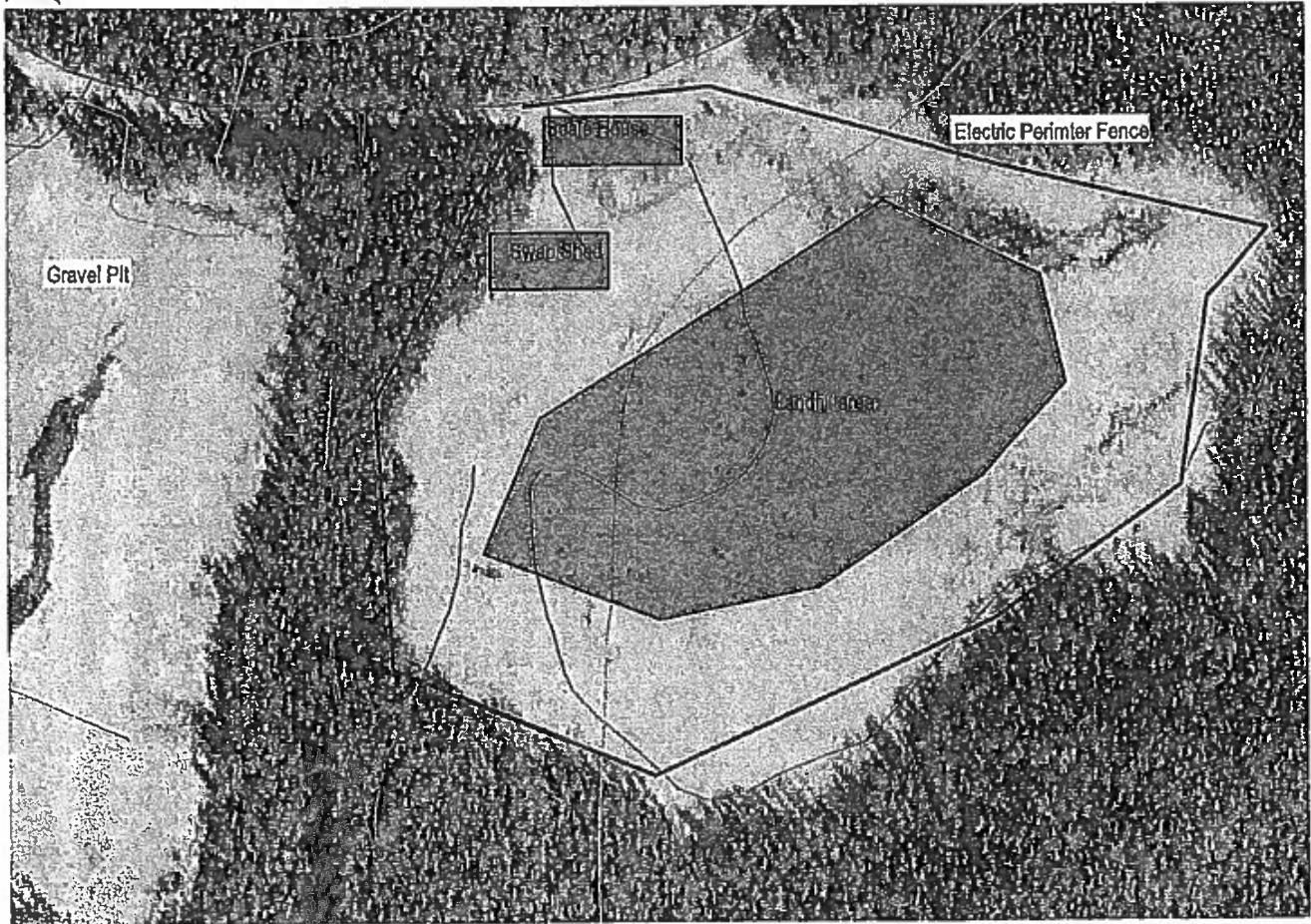
MAR 04 2009

Page: 7 of 7

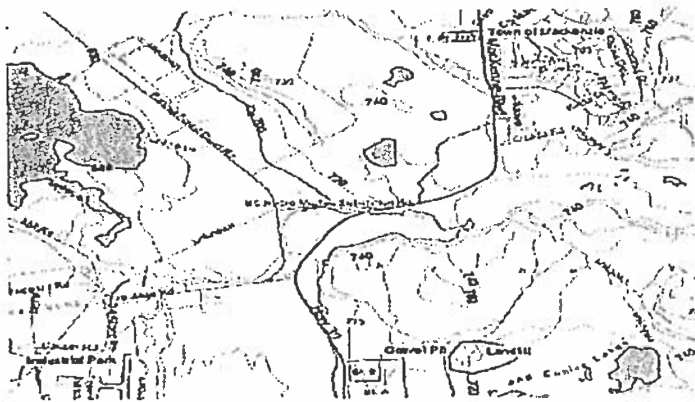

Del Reifheimer, P.Eng.
for Director, Environmental Management Act

OPERATIONAL CERTIFICATE: 100206

SITE PLAN A




Location Map



Not to Scale

Operational Certificate 100206

Date: **MAR 04 2009**


Del Reinheimer, P.Eng.
for Director, *Environmental Management Act*
Omineca and Peace Regions

APPENDIX B
SITE BROCHURE

RECYCLING BINS

Three recycling depot sites are located in Mackenzie; at the Fire Hall, the Public Works Building and the Transfer Station. The following recyclable items are accepted:

- **Containers and Cartons**
Plastic containers, steel packaging, aluminum containers and paper packaging containing liquids when sold. Empty and rinse containers - labels are okay, remove caps, pumps & lids, place loose in the bin. Put metal lids inside cans and flatten.
- **Mixed Paper**
Catalogues, glossy flyers, cereal boxes, office paper, kraft grocery bags, envelopes, magazines, newspaper and cardboard egg cartons. **NO paper that has any plastic, foil, wax or food residue attached to it.**
- **Corrugated Cardboard**
A separate bin for flattened corrugated cardboard is provided. Corrugated boxes have a rippled layer sandwiched between layers of linerboard.

For a detailed list of accepted materials, please refer to the Regional District Recycling Brochure or visit our website.

USED OIL AND ANTIFREEZE

Used oil, oil filters and containers, and used antifreeze and containers are accepted for recycling.

APPLIANCES CONTAINING REFRIGERANT

Fridges, freezers, air conditioners, dehumidifiers and water coolers are accepted **free of charge** for recycling. (<https://www.marbc.ca>)

SCRAP METAL RECYCLING

Metal materials accepted at the Mackenzie Regional Transfer Station for recycling include:

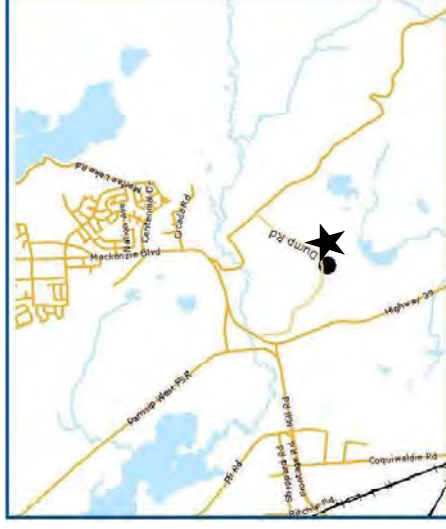
- Appliances and parts such as stoves, dishwashers, hot water tanks, washers, dryers and any other **non-refrigeration** type appliance, many of which are part of MARR;
- Bicycle frames and barbecue hulks;
- Metal roofing and siding;
- Lawnmower bodies, snowmobile and motor bike frames (fuel, lubricants and tires must be removed);
- Steel containers (drums and tanks) must be crushed or perforated to ensure that they contain no liquid or hazardous material. Pressurized containers cannot be recycled.

HOURS OF OPERATION

| Mackenzie Demolition and Construction Landfill Hours of Operation | |
|---|--|
| Operating Hours – Year Round | 9 am – 5 pm |
| Sunday to Thursday | |
| Closed on Friday & Saturday | |
| This facility is CLOSED on all Holidays: | |
| New Year's Day | Labour Day |
| Family Day | National Day of Truth and Reconciliation |
| Easter Monday | Thanksgiving Day |
| Good Friday | Remembrance Day |
| Victoria Day | Christmas Day |
| Canada Day | Boxing Day |
| BC Day | |

When delivering waste to Regional District facilities, ensure that loads are covered and secured so that material does not blow out onto the roads.

LOCATION MAP



REGIONAL DISTRICT
of Fraser-Fort George

155 George Street, Prince George, BC V2L 1P8
Tel: 250-960-4400 • Toll Free: 1-800-667-1959
Fax: 250-563-7520 • Email: environment@rdffg.bc.ca

www.rdffg.bc.ca



REGIONAL DISTRICT
of Fraser-Fort George

**Environmental
Services**

**Mackenzie
Demolition and
Construction
Landfill**



LANDFILL SERVICES

As of December 1, 2019, the site operates as a transfer station and a demolition and construction waste landfill.

SITE OPERATION

The Mackenzie Demolition and Construction Waste Landfill is a select waste landfill operated by the Regional District of Fraser-Fort George. Materials accepted for disposal include demolition and construction waste and land clearing debris.

SOLID WASTE DISPOSAL BYLAW

Regional District of Fraser-Fort George Bylaw No. 3166, 2020, Amendment Bylaw No. 3283, 2023 establishes:

- Tipping Fee rates
- Definition of terms
- Site regulations, and
- Permit and approval requirements for Controlled Waste

QUICK REFERENCE DEFINITIONS

Demolition, Land Clearing & Construction Waste

- may include waste such as PVC pipe, asphalt, lumber, stumps, roofing materials, masonry and wire, and shall not contain Prohibited Waste, Controlled Waste, Recyclable Materials or Hazardous Waste.

Contaminated Soil

- means soil, sediment and/or fill material containing substances in quantities or concentrations as defined by the Contaminated Sites Regulation but is not hazardous waste under the Hazardous Waste Regulation. Requires pre-approval as well as laboratory analysis and an application for the acceptance of controlled waste.

Concrete

- means a hardened mixture of cement with sand, gravel and/or rebar. Rebar protruding from cement shall not exceed 1 ft. in length.

Creosote Treated Wood

- means wood that is treated with creosote, which may include railway ties, telephone poles and dock pilings. Requires pre-approval.

TIPPING FEES AND SITE REGULATIONS

A tipping fee is a charge levied for disposal of waste and is based on weight and type of material. Tipping fees apply to “controlled waste”, and demolition, land clearing and construction waste (DLC).

PAYMENT

Payment may be made by Mastercard, VISA, AMEX, Discovery or debit card. Commercial customers may apply to the Regional District for credit accounts. Application forms are available from the Mackenzie Regional Transfer Station during operating hours or Financial Services at 155 George Street, Prince George, BC, between 8:45 am – 12:00 pm and 1:00 pm – 5:00 pm, Monday to Friday (excluding holidays).

FEES

The fee to dispose of DLC waste is \$96 per tonne or a \$6 minimum charge per load. Load weights are measured on scales provided at the landfill.

PROHIBITED MATERIALS

The following materials are not accepted for disposal at the Mackenzie Regional Landfill. For disposal options, please consult with the attendant or call the Regional District Service Centre at 1-800-667-1959.

Asbestos
Cattle Carcasses
Chemical Waste
Explosives
Fencing Wire
Fuels
Hazardous Waste
Ignitable Waste
Liquids
Lubricants
Paints/Solvents
Pesticides
Radioactive Waste
Reactive Waste
Refuse (on fire or smoldering)
Restaurant grease
Slurry/Sewage Sludge
Steel/Plastic Drums (if not cut, crushed, or perforated)
Tires (as of March 31, 2022)

SWAP SHED

The Mackenzie Demolition and Construction Landfill has a waste exchange area where reusable items can be either dropped off or picked up free of charge. Accepted items include clothing, books, toys, sporting goods, and furniture.

SALVAGING

Salvaging of materials from dumping areas, marshalling areas, or recycling bins is not permitted.

CENTRALIZED COMPOSTING

Large quantities of source separated yard and garden waste can be dropped off at the Mackenzie Regional Transfer Station at no charge for inclusion into the centralized compost operation. Please consult the attendant for further information on acceptable materials.

CONTROLLED WASTE

Controlled wastes are materials that require special handling and disposal techniques to avoid creating health hazards, nuisances or environmental pollution. Controlled wastes **require pre-approval** and a Regional District permit prior to delivery. Check with landfill staff concerning permits and delivery times.

| CONTROLLED WASTE | RATE PER TONNE OF WEIGHT | Minimum Charge |
|--|--------------------------|----------------|
| Bulky Waste | \$114.00 | \$6.00 |
| Concrete | \$223.00 | \$6.00 |
| Contaminated Soil | \$114.00 | \$6.00 |
| Creosote treated wood | \$175.00 | \$6.00 |
| Waste sludge from municipal sewage treatment plants and screening stations | \$0 | \$0 |

**In all cases, Bylaw No. 3166, Amendment Bylaw No. 3283, 2023, should be consulted for conditions and definitions of terms.*

Permits for Disposal of Controlled Waste

A permit issued by the Regional District is required to deposit a controlled waste at the Mackenzie Demolition and Construction Landfill. Permit application forms are available from the Mackenzie Demolition and Construction Landfill during regular operating hours, or on the Regional District website.

APPENDIX C
2024 MACKENZIE VOLUME ASSESSMENT



June 25, 2024

Regional District of Fraser-Fort George
155 George Street
Prince George, British Columbia
V2L 1P8

Attention: Mr. Darwin Paton
Environmental Services Technician

2024 Volume Assessment – Mackenzie Regional Landfill

Dear Mr. Paton:

Dillon Consulting Limited (Dillon) is pleased to provide the 2024 volume assessment for the Mackenzie Regional Landfill (Site) located in the Regional District of Fraser-Fort George (RDFFG).

Aerial photographic mapping was completed over the Site on May 10, 2024 by Aero Geometrics Ltd. Information obtained from the aerial photographic mapping was used to generate the 2024 elevation contours which were then compared against the May 11, 2023 elevation contours to determine the approximate airspace consumed at the Site between the two time periods. A comparison of May 2023 and May 2024 elevation contours (Figure 1) shows negligible change in airspace in the identified waste filling area.

In discussion with the RDFFG, it was understood that excess intermediate cover soil was excavated out of the area prior to in-filling with waste. These activities occurred between the two survey dates and as such were not captured in the contour comparisons. The area in which soil was excavated was measured to be approximately 730 square metres. Assuming an approximate soil thickness of 0.5 m, the approximate volume removed was 365 cubic metres.

Weigh scale records indicate that 212.62 tonnes of waste were landfilled at the Site between May 11, 2023 and May 10, 2024, as provided by the RDFFG. Using the total tonnage of waste landfilled at the Site and calculated volume, the apparent density for the landfill was calculated to be approximately 0.58 tonnes per cubic metre (212.62 tonnes / 365 cubic metres). The apparent density is not a true density but is a relationship that represents the mass of waste disposed in each cubic metre of landfill airspace, excluding soils used as cover. Additionally, this is an estimation based on the total volume of excess soil excavated.

3820 Cessna Drive
Suite 510
Richmond
British Columbia
Canada
V7B 0A2
Telephone
604.278.7847
Fax
604.278.7894



Dillon appreciates the opportunity to support the RDIFFG with this volume assessment. Should you have any questions or require additional information, please do not hesitate to contact us.

Sincerely,

DILLON CONSULTING LIMITED



Elise Duma, P.Eng.
Project Manager
AT: tjs

Phillip Auclair, P.Eng.
Senior Waste Engineer

Commercial Confidentiality Statement

This document contains trade secrets or scientific, technical, commercial, financial and labour or employee relations information which is considered to be confidential to Dillon Consulting Limited ("Dillon"). Dillon does not consent to the disclosure of this information to any third party or person not in your employ. Additionally, you should not disclose such confidential information to anyone in your organization except on a "need-to-know" basis and after such individual has agreed to maintain the confidentiality of the information and with the understanding that you remain responsible for the maintenance of such confidentiality by people within your organization. If the head or any other party within any government institution intends to disclose this information, or any part thereof, then Dillon requires that it first be notified of that intention. Such notice should be addressed to: Dillon Consulting Limited, 235 Yorkland Boulevard, Suite 800, Toronto, Ontario M2J 4Y8, Attention: Legal Department.

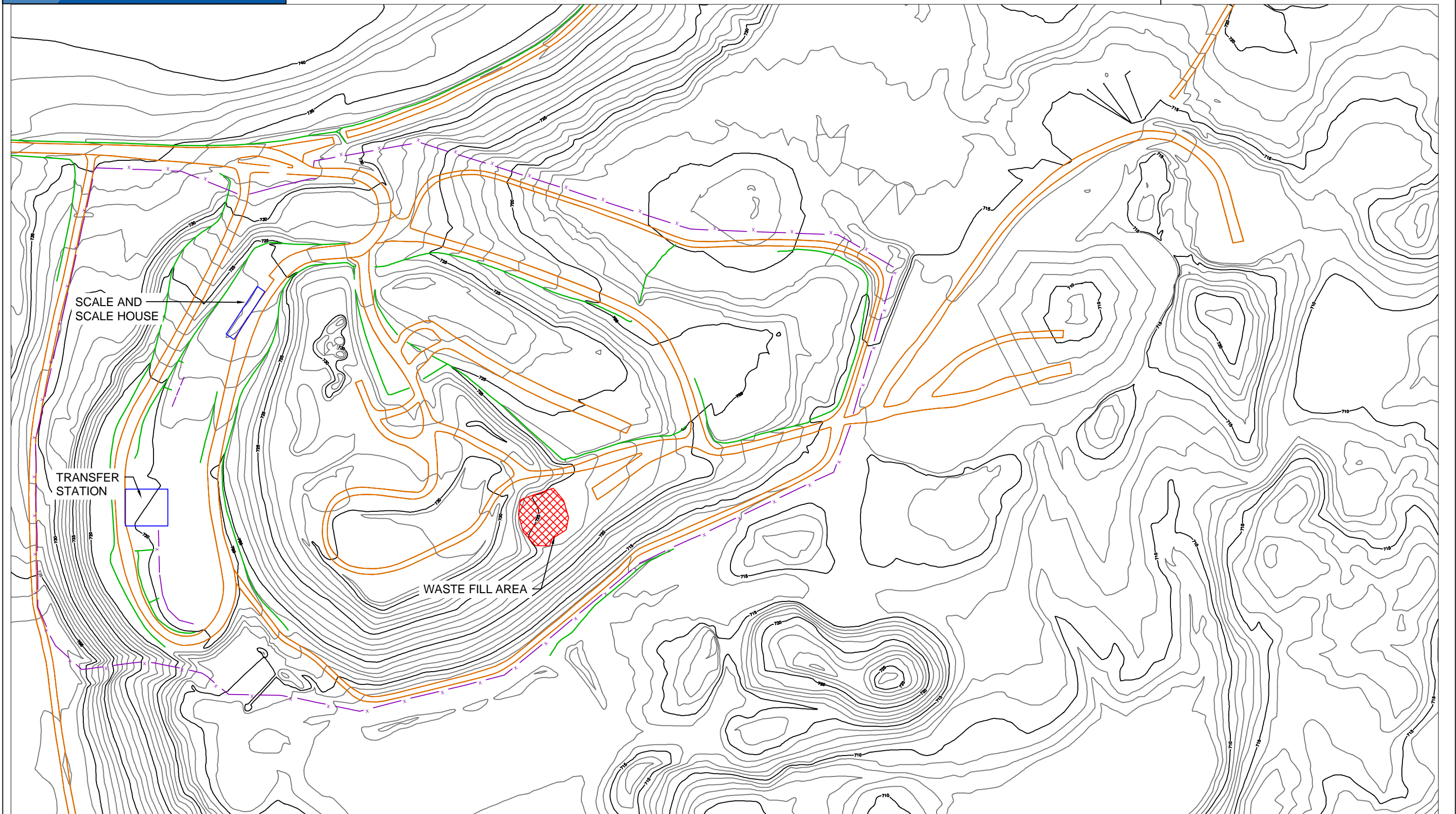


REGIONAL DISTRICT
of Fraser-Fort George

MACKENZIE REGIONAL LANDFILL AND TRANSFER STATION SITE TOPOGRAPHY

LEGEND

- CONTOURS
- GRAVEL ROAD
- DITCH
- FENCE



NOTE: EXISTING CONDITIONS AS OF MAY 2024.

SCALE 1:1,000 METRES

APPENDIX D
NON-COMPLIANCE ADVISORY LETTER, OPERATIONAL
CERTIFICATE 100206, REPORT NUMBER 201680



Report Date: April 04, 2023

File: 100206

Report Number: 201680

Regional District of Fraser-Fort George
155 George Street,
Prince George BC V2L 1P8

Dear Regional District of Fraser-Fort George,

Re: Non-compliance Advisory Letter, Operational Certificate 100206

On April 4, 2023, Ministry of Environment and Climate Change Strategy (Ministry) Compliance Officer Julia Coleman (Ministry staff) conducted a planned office review inspection of the Regional District of Fraser-Fort George (RDFFG) sanitary landfill (Facility) located near Mackenzie, BC to verify compliance with the Operational Certificate number 100206 (OC). The OC authorizes the RDFFG to manage recyclable material and municipal solid waste at the Facility, subject to the conditions in the OC. The OC was first issued on March 4, 2009, and has not been amended.

Information for this inspection was provided by Laura Zapotichny (Acting General Manager of Environmental Services [A/Environmental Manager], RDFFG).

This Advisory, the alleged violations and the circumstances to which it refers will form part of the compliance history of RDFFG, and will be taken into account in the event of future non-compliance.

Please note that this authorization is considered to be out of compliance until such a time as it can be confirmed to meet the authorization requirements.

Inspection Details:

The time period covered by this inspection is from January 18, 2021, to April 4, 2023 (inspection period). The inspection included a review of the following documents:

- The Mackenzie Landfill Operations and Closure Plan, dated December 12, 1995, prepared by AGRA Earth & Environmental Limited (1995 LOCP);
- Letter with reference number 105200, dated July 7, 2009, prepared by the Ministry (2009 SWMP Approval Letter); 2015 Regional Solid Waste Management Plan, dated 2015, prepared by MWA Environmental Consultants Ltd. in association with XCG Consultants Ltd. (2015 Solid Waste Management Plan);
- Letter with reference number 310938, dated September 13, 2017, prepared by the Ministry (2017 SWMP Approval Letter); Mackenzie Regional Landfill, 2020 Annual Report, Prince George, British Columbia, dated 2020, prepared by RDFFG (2020 Annual Report);
- Mackenzie Regional Landfill, 2021 Annual Report, Prince George, British Columbia, dated 2021, prepared by RDFFG, (2021 Annual Report);
- 2020 Annual Groundwater Monitoring Report, Mackenzie Regional Landfill, Mackenzie, British Columbia, dated April 13, 2021, prepared by SNC-Lavalin Inc. (2020 Groundwater Report);
- Auth100206 Closure Concept and Past Closure Plan, Mackenzie Regional Landfill, dated January 12, 2022, prepared by Sperling Hanson Associates (2022 Closure Concept);
- 2021 Annual Groundwater Monitoring Report, Mackenzie Regional Landfill, Mackenzie, British Columbia, dated March 17, 2022, prepared by SNC-Lavalin Inc. (2021 Groundwater Report);
- Email titled: RE: Regional District of Fraser-Fort George, Questions for Inspection - Mackenzie Landfill - OC100206, dated February 22, 2023, & March 16, 2023, prepared by RDFFG (Information Response); and,

**Ministry of Environment
and Climate Change
Strategy**

Compliance and
Environmental
Enforcement Branch

Mailing Address:
3rd Fl
1011-4th Ave
Prince George BC V2L 3H9

Telephone: 250 565 6135
Facsimile: 250 565 6629
Website: www.gov.bc.ca/env

- Mackenzie Tonnage estimates 1995-2021, dated March 24, 2023, prepared by the RDFFG (Landfill Volume Estimates).

Below are the OC Sections that were assessed for compliance during this inspection, as well as the associated details/findings and any actions required.

| | |
|--------------------------|--|
| Requirement Description: | <p>1. LOCATION OF AUTHORISED FACILITY</p> <p>1: The location of the facility for the management of recyclable material and municipal solid wastes to which this Operational Certificate is applicable is the Mackenzie Regional Landfill, covering all unsurveyed Crown Land in the vicinity of District Lot 3458, Cariboo District, containing 16.73 hectares, more or less. The Crown Licence of Occupation for the site is #705356.</p> |
| Details/Findings: | <p>Ministry staff conducted a search of the Ministry's geographic information database (ParcelMapBC) on January 19, 2023, and confirmed the location of the Facility was as described in this Section.</p> |
| Compliance: | <p>In</p> |
| Requirement Description: | <p>2. ENTRANCE FACILITIES</p> <p>2: The authorised facility includes recyclable material and municipal solid waste drop-off facilities, weigh scales and related appurtenances approximately as shown on attached Site Plan A.</p> |
| Details/Findings: | <p>The 2021 Annual Report confirms that in 2019 the Facility was converted into a waste transfer station, with municipal solid waste being transported to the Foothills Boulevard Regional Landfill in Prince George, BC (OC 1697).</p> <p>The 2021 Annual Report notes that as of December 1, 2019, the Facility began operating as a select waste landfill; only accepting and disposing of demolition, land clearing, and construction (DLC) waste.</p> <p>The 2021 Annual Report confirms that the Facility includes a scale and scale house, and a transfer station that includes recyclable material and municipal solid waste drop-off facilities.</p> <p>The location of the municipal solid waste drop-off facilities and the transfer station are not shown in Site Plan A; therefore, compliance with the location of the municipal solid waste drop-off facilities and the updated facilities, including the transfer station, was not determined.</p> |

| | |
|--------------------------|---|
| Compliance: | Not Determined |
| Actions to be taken: | The RDFFG may seek an amendment to their OC to reflect the changes to the works and the operations at the Facility. More information regarding changes to an OC can be found at the following weblink: https://www2.gov.bc.ca/gov/content/environment/waste-management/waste-discharge-authorization/change Additional inquiries can be submitted to PermitAdministration.VictoriaEPD@gov.bc.ca |
| Requirement Description: | 3. MANAGEMENT OF MUNICIPAL SOLID WASTE, 3.1 Sanitary Landfill, 3.1.1 3.1.1: The authorised facilities are a sanitary landfill area, recyclable material storage areas and related appurtenances approximately as shown on the attached Site Plan. The site reference number for the discharge is E211576. |
| Details/Findings: | The Site Plan and the drawings provided in the 2020 and 2021 Annual Reports confirm that the location of the authorized facilities is approximately as shown in the Site Plan. The location of the transfer station is not shown on the Site Plan; therefore, compliance with the location of the updated facilities including the transfer station was not determined. |
| Compliance: | Not Determined |
| Actions to be taken: | The RDFFG may seek an amendment to their OC to reflect the changes to works and the operations at the Facility. More information regarding changes to an OC can be found at the following weblink: https://www2.gov.bc.ca/gov/content/environment/waste-management/waste-discharge-authorization/change Additional inquiries can be submitted to PermitAdministration.VictoriaEPD@gov.bc.ca |
| Requirement Description: | 3. MANAGEMENT OF MUNICIPAL SOLID WASTE, 3.1 Sanitary Landfill, 3.1.2 3.1.2: The authorised facilities are a sanitary landfill area, recyclable material storage areas and related appurtenances approximately as shown on the attached Site Plan. The site reference number for the discharge is E211576. 3.1.2 The characteristics of the discharge must be municipal solid waste as defined under the Environmental Management Act and other wastes as approved in writing by the Director. |

| | |
|--------------------------|--|
| Details/Findings: | The 2020 and 2021 Annual Reports confirm that 779 tonnes of DLC waste was disposed of at the Facility in 2020 and 1,429 tonnes of DLC waste was disposed of at the Facility in 2021. Waste originating from construction, land clearing, and demolition meets the Environmental Management Act's definition of municipal solid waste. |
| Compliance: | In |
| Requirement Description: | 3. MANAGEMENT OF MUNICIPAL SOLID WASTE, 3.1 Sanitary Landfill, 3.1.3 3.1.3: The authorised facilities are a sanitary landfill area, recyclable material storage areas and related appurtenances approximately as shown on the attached Site Plan. The site reference number for the discharge is E211576. 3.1.3 Waste may be discharged to the areas specified in the Regional District's Design and Operation Plan, approximately located as shown on attached Site Plan A. |
| Details/Findings: | Figures in the 2020 and 2021 Annual Reports show that the waste disposal area was located approximately as shown on Site Plan A. |
| Compliance: | In |
| Requirement Description: | 4. GENERAL REQUIREMENTS, 4.1 Qualified Professionals 4.1 : All facilities and information, including works, plans, assessments, investigations, surveys, programs and reports, must be certified by qualified professionals. |
| Details/Findings: | The Groundwater Monitoring Reports submitted to the Ministry during the inspection period were certified by qualified professionals (QPs) from SNC-Lavalin Inc. The Annual Reports, required by Section 8.2, that were submitted to the Ministry during the inspection period, were signed by Petra Wildauer, General Manager of Environmental Services, from the RDFFG. The signature did not reference a professional body. On March 29, 2023, the A/Environmental Manager informed Ministry staff that Ms. Wildauer has an MSc. in Chemical Engineering, however; it was not known if Ms. Wildauer was a QP. |
| Compliance: | Out |

| | |
|--------------------------|---|
| Actions to be taken: | Provide the Ministry documents that confirm Ms. Wildauer is a QP and ensure that the documents, as described in this OC Section, are certified by a QP. |
| Requirement Description: | 4. GENERAL REQUIREMENTS, 4.2 Plans, 4.2.2 4.2.2: The Design and Operation Plan must address, but not be limited to, each of the subsections in the Landfill Criteria for Municipal Solid Waste including performance, siting, design, operational and closure and post-closure criteria. |
| Details/Findings: | The A/Environmental Manager informed Ministry staff that the 1995 LOCP is the most recent Design and Operations Plan for the Facility; therefore, it was used to determine compliance with this OC. The 1993 version of the Landfill Criteria for Municipal Solid Waste (1993 Landfill Criteria) was used to determine compliance with this OC Section because it is the version available when the LOCP was developed. The Landfill Criteria was updated June 2016 (2016 Landfill Criteria). The 1995 LOCP discussed siting, design, operational and closure, and post-closure of the Facility. Waste diversion strategies are discussed in the 2015 Regional Solid Waste Management Plan. However, performance criteria, as described in the 1993 Landfill Criteria, for waste management (reduce, reuse, recycle) and other waste diversion strategies were not discussed in the 1995 LOCP. |
| Compliance: | Out |
| Actions to be taken: | Update the Design and Operation Plan and ensure that it meets the Landfill Criteria for Municipal Solid Waste. |
| Requirement Description: | 4. GENERAL REQUIREMENTS, 4.2 Plans, 4.2.3 4.2.3: The facilities must be developed and operated in accordance with the Design and Operation Plan. |
| Details/Findings: | Environmental considerations for the design and operation of the Facility as a waste transfer station and DLC landfill are not discussed in the 1995 LOCP. |

| | |
|--------------------------|---|
| Compliance: | Out |
| Actions to be taken: | Update the DOCP to reflect the current works and operations at the Facility. |
| Requirement Description: | <p>4. GENERAL REQUIREMENTS, 4.3 Additional Facilities or Works</p> <p>4.3: The Director may require investigations, surveys, and the construction of additional facilities or works. The Director may also amend information requirements of this Operational Certificate including plans, programs, assessments and reports.</p> |
| Details/Findings: | In the Information Response, the A/Environmental Manager informed Ministry staff that there were no requests from the Director pertaining to OC Section 4.3 during the inspection period. Ministry staff conducted a search of the Ministry's internal files and confirmed that there were no requests made by a Director during the inspection period; therefore, compliance with this requirement was not applicable for the inspection period. |
| Compliance: | Not Applicable |
| Requirement Description: | <p>5. OPERATIONAL REQUIREMENTS, 5.1 Non-Compliance Reporting</p> <p>5.1: The Regional District shall immediately notify the Regional Manager, Environmental Protection, or designate by facsimile (250-565-6629) of any non-compliance with the requirements of this Operational Certificate and take appropriate remedial action. Written confirmation of all non-compliance events, including available test results, is required by facsimile within 24 hours of the original notification unless otherwise directed by the Regional Manager, Environmental Protection.</p> |

| | |
|--------------------------|--|
| Details/Findings: | <p>In the Information Response, the A/Environmental Manager informed Ministry staff that the RDFFG did not identify any non-compliances during the inspection period. However, the following non-compliances were identified by Ministry staff during this inspection:</p> <ul style="list-style-type: none"> - 4.1 Qualified Professionals, - 4.2.2 Plans, - 4.2.3 Plans, - 5.3.2 Electric Fence, Operating Period, - 5.5 Landfill Gas, - 7.1.3 Monitoring Period, - 8.1 Drawings, and - 8.2 - Annual Report. <p>Ministry staff conducted a search of the Ministry's internal electronic filing system and no notifications of any non-compliances with the OC requirements were submitted by the RDFFG to the Ministry during the inspection period.</p> |
| Compliance: | Out |
| Actions to be taken: | <p>Ensure to notify the Ministry of any non-compliance with the OC requirements as outlined in this OC Section.</p> <p>Non-compliance reports must be submitted to the non-compliance reporting mailbox EnvironmentalCompliance@gov.bc.ca</p> |
| Requirement Description: | <p>5. OPERATIONAL REQUIREMENTS, 5.2 Operator Training and Development</p> <p>5.2: At a minimum, the Regional District will ensure that operating personnel are trained to industry standards and current in a SWANA recognized landfill operator course or equivalent.</p> |
| Details/Findings: | <p>The Information Response included training certificates obtained by the Facility's Manager of Operations, which included Landfill Operations Basics and Manager of Landfill Operations (MOLO) training certificates, which are Solid Waste Association of North America (SWANA) recognized landfill operator courses.</p> |
| Compliance: | In |

| | |
|--------------------------|---|
| Requirement Description: | 5. 5. OPERATIONAL REQUIREMENTS, 5.3 Electric Fencing 5.3: Areas where putrescible materials are stored or discharged shall be surrounded by an electric fence. |
| Details/Findings: | The 2020 and 2021 Annual Reports describe the electric fence to fully enclose the limit of the waste deposited in the landfill and the transfer station. |
| Compliance: | In |
| Requirement Description: | 5. OPERATIONAL REQUIREMENTS, 5.3 Electric Fencing, 5.3.1 Design, Construction and Maintenance 5.3.1: Areas where putrescible materials are stored or discharged shall be surrounded by an electric fence. 5.3.1 The electric fencing shall be designed, constructed, and maintained such that bears are prevented from penetrating the fence. The Director shall be advised of any modifications to the fence. |
| Details/Findings: | In the Information Response, the A/Environmental Manager confirmed that the electric fence was not penetrated by any bears during the inspection period. The Information Response confirmed that there were no changes to the electric fence line during the inspection period. |
| Compliance: | In |
| Actions to be taken: | Ensure to notify the Director of any changes to the electric fence, notifications to the Director can be made to the following mailbox: PermitAdministration.VictoriaEPD@gov.bc.ca |
| Requirement Description: | 5. OPERATIONAL REQUIREMENTS, 5.3 Electric Fencing, 5.3.2 Operating Period 5.3.2: Areas where putrescible materials are stored or discharged shall be surrounded by an electric fence. 5.3.2 The electric fence shall be fully operational during the period of April 15 to November 15 inclusive each year. If snow is present during this period, any electrified strands above snow line shall be isolated from the remainder of the system and energised. The Director may vary the operating period with prior written authorisation. |

| | |
|--------------------------|--|
| Details/Findings: | <p>In the Information Response, the A/Environmental Manager informed Ministry staff that the electric fence was energized on the following dates during the inspection period: 2020 - The fence was turned on May 22nd and turned off on November 1st, 2021 - The fence was turned on May 13th and turned off on November 1st, and 2022 - The fence was turned on June 2nd and turned off on November 1st.</p> <p>The A/Environmental Manager explained that the electric fence is turned on once the snowpack has melted enough to energize the whole system. The A/Environmental Manager also informed Ministry staff that the electric fence was upgraded in 2022 to enable the fence to be fully energized regardless of the snowpack depth.</p> <p>The RDFFG plans to test the upgraded system the first week of May 2023, to coincide with the annual spring electric fence inspection. The RDFFG plans to have the fence fully energized no later than May 10, 2023.</p> |
| Compliance: | Out |
| Actions to be taken: | <p>The electric fence must be operational during the period of April 15 to November 15 inclusive each year. Individual strands above the snow line must be isolated and energized.</p> <p>The RDFFG must seek Director approval to vary the operating period with prior written authorization.</p> <p>The Ministry's Authorizations branch can be contacted using the following mailbox: PermitAdministration.VictoriaEPD@gov.bc.ca, or through the Waste Discharge General Inquiry Weblink: https://forms.gov.bc.ca/environment/wda-enquiry/</p> |
| Requirement Description: | <p>5. OPERATIONAL REQUIREMENTS, 5.3 Electric Fencing, 5.3.3 Record Keeping and Reporting</p> <p>5.3.3: Areas where putrescible materials are stored or discharged shall be surrounded by an electric fence. 5.3.3 The Regional District is required to monitor wildlife (medium and large carnivores) activity at the facility and keep records of occurrences and observations of wildlife (medium and large carnivores).</p> |
| Details/Findings: | <p>Wildlife sighting reports for the inspection period were provided to Ministry staff in the Information Response. The wildlife sighting reports included records of occurrences and observations of medium and large carnivore activity at the Facility.</p> |
| Compliance: | In |

| | |
|--------------------------|---|
| Requirement Description: | 5. OPERATIONAL REQUIREMENTS, 5.4 Compost 5.4: Composting facilities shall be operated and maintained in accordance with the Organic Matter Recycling Regulation. |
| Details/Findings: | The 2020 and 2021 Annual Reports confirm that organic yard waste was received at the Facility for disposal. In the Information Response, the A/Environmental Manager informed Ministry staff that the yard waste received during the inspection period was chipped and disposed of on-site. Because the yard waste received and the Facility was disposed of as waste and not composted at the Facility, compliance with the Organic Matter Recycling Regulation (OMRR) was not required during the inspection period. |
| Compliance: | Not Applicable |
| Actions to be taken: | The RDFFG is reminded that yard waste and other organic matter received at the Facility is considered to be waste and must be disposed of in accordance with this OC. Should the RDFFG choose to undertake composting operations to generate compost, it must be composted in accordance with the OMRR. |
| Requirement Description: | 5. OPERATIONAL REQUIREMENTS, 5.5 Landfill Gas 5.5: Landfill gas shall be managed in accordance with the Landfill Gas Management Regulation. |
| Details/Findings: | Compliance with the Landfill Gas Management Regulation (LFGMR) was assessed in inspection record 204286. The RDFFG was found to be out of compliance with Section 4(1) of the LFGMR. Refer to IR204286 for the complete details and findings and any required actions. |
| Compliance: | Out |
| Actions to be taken: | Ensure that landfill gas is managed in accordance with the LFGMR. |

| | |
|--------------------------|--|
| Requirement Description: | <p>5. OPERATIONAL REQUIREMENTS, 5.6 Leachate</p> <p>5.6: The characteristics of the surface water and groundwater at the property boundary must not exceed concentrations set in the British Columbia Approved Water Quality Guidelines (Criteria) and A Compendium of Working Water Quality Guidelines for British Columbia. Where natural background water quality concentrations exceed the aforementioned guidelines, characteristics of the surface water and groundwater at the property boundary must not exceed background concentrations.</p> |
| Details/Findings: | <p>The 1995 LOCP, Section 4.5 - Environmental Monitoring, notes that contributions of the surface water from the Facility are low, and it noted that long-term surface water quality monitoring was not required for the site. Therefore, surface water samples were not collected during the inspection period.</p> <p>Groundwater samples were collected and the results were compared to the Contaminated Sites Regulation (CSR) generic numerical standards for Drinking Water (DW) and aquatic life (AW) use.</p> <p>The 2020 and 2021 Groundwater Reports explain that there were exceedances in the concentration of dissolved lithium, dissolved barium, ammonia nitrogen, and total phenols in 2020, and exceedances in the concentration of dissolved arsenic, dissolved lithium, and ammonia nitrogen in 2021.</p> <p>In a review of the 1993 LOCP and the Ministry's internal filing system, no water quality guidelines were identified or agreed upon for the environmental monitoring program required by Section 7.</p> <p>The Facility is located on unsurveyed crownland and no property boundary was identified on the site plans reviewed by Ministry staff or in ParcelMapBC; therefore, compliance with this requirement cannot be determined.</p> |
| Compliance: | Not Determined |
| Actions to be taken: | <p>Ensure that characteristics of the groundwater at the property boundary do not exceed the concentration set in the British Columbia Approved Water Quality Guidelines and the Compendium of Working Water Quality Guidelines for British Columbia, or other appropriate water quality criteria identified or agreed upon in the monitoring program as required by Section 7.</p> |
| Requirement Description: | <p>6. HAZARDOUS WASTE MANAGEMENT, 6.1 Hazardous Waste</p> <p>6.1: "Hazardous Wastes" as defined by the Hazardous Waste Regulation pursuant to the Environmental Management Act are prohibited from disposal unless expressly authorised by the Hazardous Waste Regulation, approved by the Director or as specified in the Operational Certificate.</p> |

| | |
|--------------------------|--|
| Details/Findings: | The Information Response confirmed that no hazardous waste was accepted at the Facility during the inspection period. |
| Compliance: | In |
| Requirement Description: | 6. 6. HAZARDOUS WASTE MANAGEMENT, 6.2 Waste Asbestos 6.2: Waste asbestos is authorized for disposal subject to compliance with the requirements of section 40 of the Hazardous Waste Regulation and the following conditions: |
| Details/Findings: | The Information Response and the 2020 and 2021 Annual Reports confirm that waste asbestos was not accepted at the Facility during the inspection period; therefore, compliance with OC Section 6.2 and its subsections were not applicable for the inspection period. |
| Compliance: | Not Applicable |
| Requirement Description: | 6. HAZARDOUS WASTE MANAGEMENT, 6.3 Handling of Impacted Soil 6.3: The Environmental Management Act, the Contaminated Sites Regulation and the Hazardous Waste Regulation are applicable for the disposal of impacted (contaminated) soil at the facility. |
| Details/Findings: | The Information Response confirmed that contaminated soil was not accepted at the Facility during the inspection period; therefore, compliance with this requirement was not applicable for the inspection period. |
| Compliance: | Not Applicable |
| Requirement Description: | 6. HAZARDOUS WASTE MANAGEMENT, 6.4 Hazardous Wastes from Accidental Spills and Abandonment 6.4: Hazardous wastes resulting from accidental spills or abandonment of dangerous goods may be accepted at the facility only under the authority of Section 52(1) of the Hazardous Waste Regulation. |

| | |
|--------------------------|---|
| Details/Findings: | The A/Environmental Manager informed Ministry staff that hazardous waste resulting from accidental spills or abandonment of dangerous goods were not accepted at the Facility during the inspection period; therefore, compliance with this requirement was not applicable for the inspection period. |
| Compliance: | Not Applicable |
| Requirement Description: | 7. MONITORING, 7.1 Monitoring Program, 7.1.1 7.1.1: A monitoring program shall be developed by a qualified professional to identify potential impacts to the environment and public health from the facility. |
| Details/Findings: | The 2020 and 2021 Groundwater Reports confirm that a groundwater monitoring program was in place during the inspection period and delivered by QPs from SNC-Lavalin Inc. |
| Compliance: | In |
| Requirement Description: | 7. MONITORING, 7.1 Monitoring Program, 7.1.2 7.1.2: The monitoring program shall be submitted as part of the Design and Operation Plan. |
| Details/Findings: | The 1995 LOCP describes the groundwater monitoring program in Section 10.4 Groundwater Monitoring. |
| Compliance: | In |
| Requirement Description: | 7. MONITORING, 7.1 Monitoring Program, 7.1.3 7.1.3: The monitoring program must address, but not be limited to, subsections 4.1, 4.2 and 7.15 of the Landfill Criteria for Municipal Solid Waste and the Guidelines for Environmental Monitoring at Municipal Solid Landfills. |

| | |
|--------------------------|---|
| Details/Findings: | <p>The 1993 Landfill Criteria for Municipal Solid Waste was used to assess compliance with this OC Section. Each subsection (4.1, 4.2 and 7.15) below can be found at the following weblink: https://www2.gov.bc.ca/assets/gov/environment/waste-management/garbage/guidelandfillcriteria.pdf</p> <p>Section 4.1 - Ground and Surface Water Quality Impairment 1995 LOCP, Section 10 Landfill Monitoring, does not describe the quality criteria that will be utilized for the groundwater monitoring program. The 2020 and 2021 Groundwater Reports demonstrate that groundwater was sampled and analyzed for contaminants of concern associated with landfills and compared to the CSR DW and AW standards during the inspection period.</p> <p>The RDFFG has been found to be out of compliance for failing to provide a Design and Operations plan that describes the criteria that will be used to assess ground and/or surface water quality.</p> <p>4.2 Section 4.2 - Landfill Gas Management and Odour Nuisance The 1995 LOCP, Section 4.2 Gas Management, included an assessment of landfill gas emission potential to determine the need for the collection and subsequent management of landfill gases.</p> <p>Section 7.15 - Monitoring The landfill monitoring programs (landfill gas, groundwater, and surface water) were described in Section 10 of the 1995 LOCP.</p> |
| Compliance: | Out |
| Actions to be taken: | Ensure that the monitoring program, developed by a QP, addresses ground and surface water quality impairment as defined by the appropriate criteria. |
| Requirement Description: | <p>7. MONITORING, 7.1 Monitoring Program, 7.1.4</p> <p>7.1.4: Monitoring must be conducted in accordance with the monitoring program.</p> |
| Details/Findings: | The quality criteria for the monitoring program was not identified in the 1993 LOCP; therefore, compliance with this requirement was not determined. |
| Compliance: | Not Determined |

| | |
|--------------------------|---|
| Actions to be taken: | Ensure that a QP develops a monitoring program in accordance with the requirements of the OC and that the monitoring is conducted in accordance with the monitoring program. |
| Requirement Description: | 8. REPORTING 8.: All reports and drawings shall be submitted in electronic format unless otherwise requested by the Director. |
| Details/Findings: | All reports and drawings were submitted to the Ministry in electronic format as required by this Section. |
| Compliance: | In |
| Requirement Description: | 8. REPORTING, 8.1 Drawings 8.1 : All reports and drawings shall be submitted in electronic format unless otherwise requested by the Director. 8.1 All drawings shall be certified correct and sealed by a qualified professional. Drawings shall be submitted to the Director within 30 days of completion or as otherwise specified by the Director. |
| Details/Findings: | The drawings submitted to the Ministry with the 2020 and 2021 Annual Reports, and the 2020 and 2021 Annual Groundwater Reports, were not certified correct and sealed by a qualified professional. |
| Compliance: | Out |
| Actions to be taken: | Ensure that drawings that are submitted to the Ministry are certified correct and sealed by a qualified professional. |

| | |
|--------------------------|---|
| Requirement Description: | <p>8. REPORTING, 8.2 Annual Report</p> <p>8.2: All reports and drawings shall be submitted in electronic format unless otherwise requested by the Director. 8.2 The Regional District shall submit an Annual Report to the Director on or before June 30 each year for the previous calendar year. The report shall contain, but not be limited to the following information: i.) an executive summary; ii.) the type and tonnage of waste received, recycled and landfilled for the year; iii.) a current topographic map detailing airspace consumption, on-site borrow pit changes and future developments; iv.) updated estimates for the remaining capacity, closure date for the current phase and closure date for the current landfill footprint; v.) any new information or proposed changes relating to the facilities and Design and Operation Plan; vi.) composting operation activity including amount of material received for composting, material composted, material sold and number of composting cycles; vii.) occurrences or observations of wildlife (medium and large carnivores) at the facility; viii.) a statement regarding the facility's progress in reducing the regional solid waste stream, in accordance with the hierarchy of reduce, reuse and recycle principles; and, ix.) the results of all monitoring programs as specified in this Operational Certificate. Data interpretation and comparison to the performance criteria in the Landfill Criteria for Municipal Solid Waste and the Guidelines for Environmental Monitoring and Municipal Solid Waste Landfills. Trend analysis, as well as an evaluation of the impacts of the discharges on the receiving environment in the previous year shall be carried out by a qualified professional.</p> |
| Details/Findings: | <p>The 2020 and 2021 Annual Reports contained all the required information with the following exceptions:</p> <p>iv.) Section 3.10 in the 2020 and 2021 Annual Reports contained the statement "The remaining Site Life has not been quantified" with no updated estimates for the remaining capacity.</p> <p>The 2020 Annual Report was submitted to the Ministry on July 16, 2021 - 16 days after the required due date, and The 2021 Annual Report was submitted to the Ministry on August 25, 2022 - 56 days after the required due date.</p> |
| Compliance: | Out |
| Actions to be taken: | <p>Ensure to submit the Annual Reports to the Ministry before June 30 each year for the previous calendar year.</p> <p>The Annual Report must contain the information required by this OC Section. Ensure to include updated estimates for the landfills remaining capacity.</p> |

| | |
|--------------------------|---|
| Requirement Description: | <p>9. CLOSURE PLAN</p> <p>9.: At least one year in advance of decommissioning the landfill, or as otherwise specified by the Director, a Closure Plan shall be submitted which includes at least the following information: i) a topographic plan showing the final elevations contours of the landfill and surface water diversion and drainage controls; ii) specifications for the final cap and proposed end use of the site; and, iii) provisions for a minimum 25 year post-closure care period at the facility which, at a minimum, considers the following: groundwater monitoring, surface water monitoring, landfill gas management, erosion and settlement monitoring and management.</p> |
| Details/Findings: | The A/Environmental Manager informed Ministry staff that there are no plans for the RDIFFG to close the Facility; therefore, compliance with this requirement was not applicable for the inspection period. |
| Compliance: | Not Applicable |
| Requirement Description: | <p>10. CLOSURE AND POST-CLOSURE FUND</p> <p>10.: The Regional District will conform to the Public Sector Accounting and Auditing Board's requirements (PS 3270) to recognize solid waste landfill closure and post-closure liability. The Regional District will develop a plan to ensure that sufficient funds are available for closure and post-closure care work.</p> |
| Details/Findings: | <p>The A/Environmental Manager provided Ministry staff with the 2021 Regional Solid Waste Management Financial Plan which details the reserve funds for the closure and post-closure activities for the Facility.</p> <p>The 2021 Regional Solid Waste Management Financial Plan states "a 1994 Preliminary Design and Operation review estimated that closure costs for the Mackenzie facility were in the order of \$1.9 million dollars. Adjusted for inflation at 2% into 2020 dollars, this amount would equal \$3.2 million dollars reflecting closure costs without the inclusion of additional post closure costs. As of December 31, 2020, the Mackenzie Regional Landfill Closure and Post-Closure Care Reserve fund has a balance of \$3,526,513".</p> <p>The Information Response confirmed that the updated draft reserve balance was \$4,454,204 as of December 31, 2022.</p> |
| Compliance: | In |

Compliance History:

This is the first electronic compliance record for this authorization since January 1, 2012.

The Ministry of Environment Compliance and Enforcement Policy and Procedure (C&E Policy) prescribes common requirements and procedures for all Ministry staff to ensure consistent and risk-based assessment and response to non-compliance. Using the Non-Compliance Decision Matrix, the compliance determination for this inspection has been assessed as **Level 1, Category A, Advisory**.

More information about Environmental Compliance, the Non-Compliance Decision Matrix, and reporting and data submission requirements can be found at the links below:

General compliance information:

www.gov.bc.ca/environmentalcompliance

Non-Compliance Decision Matrix information:

www.gov.bc.ca/environment/how-compliance-is-assessed

Reporting and data submission requirements (to be sent to EnvAuthorizationsReporting@gov.bc.ca):

<https://www2.gov.bc.ca/gov/content/environment/waste-management/waste-discharge-authorization/comply>

Please be advised that this inspection report may be published on the provincial government website within 7 days.

If you have any questions about this letter, please contact the undersigned.

Yours truly,

Julia Coleman

Environmental Protection Officer

cc: Laura Zapotichny: lzapotichny@rdffg.bc.ca; Jim Martin: jmartin@rdffg.bc.ca;

Darwin Paton: dpaton@rdffg.bc.ca

Attachments: None

Deliver via:

Email: Fax: Mail:
Registered Mail: Hand Delivery:

**Ministry of Environment
and Climate Change
Strategy**

Compliance and
Environmental
Enforcement Branch

Mailing Address:
3rd Fl
1011-4th Ave
Prince George BC V2L 3H9

Telephone: 250 565 6135
Facsimile: 250 565 6629
Website: www.gov.bc.ca/env

DISCLAIMER:

Please note that sections of the permit, regulation or code of practice referenced in this inspection record are for guidance and are not the official version. Please refer to the original permit, regulation or code of practice.

To see the most up to date version of the regulations and codes of practices please visit

<http://www.bclaws.ca>

If you require a copy of the original permit, please contact the inspector noted on this inspection record.

It is also important to note that this inspection record does not necessarily reflect each requirement or condition of the authorization therefore compliance is noted only for the requirements or conditions listed in the inspection record.

APPENDIX E
NON-COMPLIANCE ADVISORY LETTER, LANDFILL GAS
MANAGEMENT REGULATION, REPORT NUMBER 201680



Report Date: April 04, 2023

File: LG204286

Report Number: 204286

Regional District of Fraser-Fort George
155 George Street,
Prince George BC V2L 1P8

Dear Regional District of Fraser-Fort George,

Re: Non-compliance Advisory Letter, Landfill Gas Management Regulation

On April 4, 2023, Ministry of Environment and Climate Change Strategy (Ministry) Environmental Protection Officer Julia Coleman (Ministry staff) conducted a planned office review inspection of the Regional District of Fraser-Fort George (RDFFG) sanitary landfill (Facility) located near Mackenzie, BC to verify compliance with the Landfill Gas Management Regulation (LFGMR).

Information for this inspection was provided by Laura Zapotichny (Acting General Manager of Environmental Services [A/Environmental Manager], RDFFG).

This Advisory, the alleged violations and the circumstances to which it refers will form part of the compliance history of the RDFFG, and will be taken into account in the event of future non-compliance.

Please note that this authorization is considered to be out of compliance until such a time as it can be confirmed to meet the authorization requirements.

Inspection Details:

The time period covered by this inspection is from April 4, 2021, to April 4, 2023 (inspection period). The inspection included a review of the following documents:

- The Mackenzie Landfill Operations and Closure Plan, dated December 12, 1995, prepared by AGRA Earth & Environmental Limited (1995 LOCP);
- Mackenzie Regional Landfill, 2020 Annual Report, Prince George, British Columbia, dated 2020, prepared by RDFFG (2020 Annual Report);
- Mackenzie Regional Landfill, 2021 Annual Report, Prince George, British Columbia, dated 2021, prepared by RDFFG, (2021 Annual Report);
- Mackenzie Tonnage estimates 1995 - 2021, dated March 24, 2023, prepared by the RDFFG (Landfill Volume Estimates); and,
- Email titled: RE: Regional District of Fraser-Fort George, Questions for Inspection - Mackenzie Landfill - OC100206, dated February 22, 2023 and March 16, 2023 prepared by RDFFG (Information Response).

Below are the LFGMR Sections that were assessed for compliance during this inspection, as well as the associated details/findings and any actions required.

**Ministry of Environment
and Climate Change
Strategy**

Compliance and
Environmental
Enforcement Branch

Mailing Address:
3rd Fl
1011-4th Ave
Prince George BC V2L 3H9

Telephone: 250 565 6135
Facsimile: 250 565 6629
Website: www.gov.bc.ca/env

| | |
|--------------------------|--|
| Requirement Description: | <p>Environmental Management Act, Landfill Gas Management Regulation (391/2008) (EMA)</p> <p>4 (1): An owner or operator of a regulated landfill site must ensure that a qualified professional conducts an initial landfill gas generation assessment of the landfill site in accordance with subsection (2).</p> |
| Details/Findings: | <p>Under the Landfill Gas Management Regulation (LFGMR) "regulated landfill site" means a landfill site that:</p> <p>(a) has 100 000 tonnes or more of municipal solid waste in place, or</p> <p>(b) receives 10 000 or more tonnes of municipal solid waste for disposal into the landfill site in any calendar year after 2008.</p> <p>An initial landfill gas assessment was completed as part of the 1995 LOCP. Section 4.2 Gas Management, in the 1995 LOCP, discusses the requirement for landfill gas management; the estimated waste quantity deposited in the Mackenzie landfill over the last 21 years is approximately 90,000 tonnes. An additional 35,000 tonnes of waste is estimated to be deposited in the next five years, bringing the total landfill capacity to approximately 125,000 tonnes. Therefore, an assessment of non-methane organic compounds (NMOCs) is required.</p> <p>The Landfill Volume Estimate provided by the RDFFG estimates that approximately 149,231 tonnes were deposited at the Facility between 1995 and 2020.</p> <p>The total waste volume was calculated to 2019 because, after 2019, the Facility was no longer accepting putrescible waste for disposal. In 2019 the Facility began operating as a transfer station and only accepted demolition, land clearing, and construction (DLC) waste for disposal.</p> <p>Therefore, the maximum approximate volume of waste deposited for the full lifetime of the landfill from 1974 to 2019, equates to 239,231 tonnes and the Facility is a regulated site and the LFGMR applies.</p> <p>Appendix B, Landfill Gas Estimates, in the 1995 LOCP, estimates that the annual NMOC emission levels will not exceed 150 tonnes per annum. However, it failed to meet the requirements of the initial landfill gas generation assessment as stipulated in Section 4(2) and 4(3).</p> <p>Section 4(4) of the LFGMR provides provisions for a landfill gas generation assessment that has been conducted prior to January 1, 2009, when the LFGMR became effective.</p> <p><i>4(4) If a landfill gas generation assessment has been conducted for a landfill site before January 1, 2009, the requirement for an assessment under this section may be met if a qualified professional reviews the assessment and completes a report as described in subsection (3).</i></p> <p>The A/Environmental Manager informed Ministry staff that a qualified professional (QP) has not updated or reviewed the 1995 landfill gas assessment for the Facility.</p> |
| Compliance: | Out |

| | |
|--------------------------|--|
| Actions to be taken: | Ensure that a QP completes an initial landfill gas assessment in accordance with the provisions of the LFGMR. |
| Requirement Description: | Environmental Management Act, Landfill Gas Management Regulation (391/2008) (EMA) 12 (1)(a): An owner or operator of a regulated landfill site must monitor and maintain records respecting the following, each in the manner specified by the director: (a) the quantity and sources of municipal solid waste received for disposal into the landfill site; |
| Details/Findings: | The Landfill Volume Estimate provided by the RDFFG, and the 2020 and 2021 Annual Reports included the quantity and source of municipal solid waste received for disposal at the Facility during the inspection period. |
| Compliance: | In |
| Requirement Description: | Environmental Management Act, Landfill Gas Management Regulation (391/2008) (EMA) 12 (1)(b): An owner or operator of a regulated landfill site must monitor and maintain records respecting the following, each in the manner specified by the director: (b) if the owner or operator has monitored and analyzed the composition of the municipal solid waste received for disposal into the landfill site, the composition of the municipal solid waste received; |
| Details/Findings: | The 2020 and 2021 Annual Reports described the composition of municipal solid waste received at the facility as DLC waste. |
| Compliance: | In |
| Requirement Description: | Environmental Management Act, Landfill Gas Management Regulation (391/2008) (EMA) 14 (1)(a): An owner or operator of a regulated landfill site must file an annual report with the director, in the manner and form required by the director, setting out the following information for the reporting period: (a) the information described in section 12; |
| Details/Findings: | The information described in section 12 was contained in the 2020 and 2021 annual reports, which were submitted by the RDFFG to the Ministry. |

| | |
|--------------------------|--|
| Compliance: | In |
| Requirement Description: | Environmental Management Act, Landfill Gas Management Regulation (391/2008) (EMA) 14 (1)(b): An owner or operator of a regulated landfill site must file an annual report with the director, in the manner and form required by the director, setting out the following information for the reporting period: (b) a description of any organics diversion program used at the landfill site; |
| Details/Findings: | Waste diversion activities were identified in section 3.5 of the 2020 and 2021 Annual Reports. |
| Compliance: | In |
| Requirement Description: | Environmental Management Act, Landfill Gas Management Regulation (391/2008) (EMA) 15 (1)(a)(i): If the estimate of methane generated annually at a landfill site is less than 1 000 tonnes in the calendar year immediately preceding the calendar year of an assessment under section 4, 5 or 6 or a supplementary assessment or review under this section, the owner or operator of the landfill site must, between January 1 and March 31 of the fifth calendar year following the calendar year of the previous assessment or review, ensure that a qualified professional does one of the following: (a) conducts a supplementary assessment that includes (i) the assessments required under section 4 (2) (a) to (c) and (e), and |
| Details/Findings: | Section 4.2 Gas Management, in the 1995 LOCP, estimated the volume of NMOC, not the volume of methane, generated annually at the Facility. Therefore, compliance with this requirement could not be determined. |
| Compliance: | |

Compliance History:

This is the first electronic compliance record for this authorization since January 1, 2012.

The Ministry of Environment Compliance and Enforcement Policy and Procedure (C&E Policy) prescribes common requirements and procedures for all Ministry staff to ensure consistent and risk-based assessment and response to non-compliance. Using the Non-Compliance Decision Matrix, the compliance determination for this inspection has been assessed as Level 1, Category A, Advisory.

More information about Environmental Compliance, the Non-Compliance Decision Matrix, and reporting and data submission requirements can be found at the links below:

General compliance information:

www.gov.bc.ca/environmentalcompliance

Non-Compliance Decision Matrix information:

www.gov.bc.ca/environment/how-compliance-is-assessed

Reporting and data submission requirements (to be sent to EnvAuthorizationsReporting@gov.bc.ca):

<https://www2.gov.bc.ca/gov/content/environment/waste-management/waste-discharge-authorization/comply>

Please be advised that this inspection report may be published on the provincial government website within 7 days.

If you have any questions about this letter, please contact the undersigned.

Yours truly,

Julia Coleman
Environmental Protection Officer

cc: Laura Zapotichny: lzapotichny@rdffg.bc.ca; Jim Martin: jmartin@rdffg.bc.ca;
Darwin Paton: dpaton@rdffg.bc.ca

Attachments: None

Deliver via:

Email: Fax: Mail:
Registered Mail: Hand Delivery:

**Ministry of Environment
and Climate Change
Strategy**

Compliance and
Environmental
Enforcement Branch

Mailing Address:
3rd Fl
1011-4th Ave
Prince George BC V2L 3H9

Telephone: 250 565 6135
Facsimile: 250 565 6629
Website: www.gov.bc.ca/env

DISCLAIMER:

Please note that sections of the permit, regulation or code of practice referenced in this inspection record are for guidance and are not the official version. Please refer to the original permit, regulation or code of practice.

To see the most up to date version of the regulations and codes of practices please visit
<http://www.bclaws.ca>

If you require a copy of the original permit, please contact the inspector noted on this inspection record.

It is also important to note that this inspection record does not necessarily reflect each requirement or condition of the authorization therefore compliance is noted only for the requirements or conditions listed in the inspection record.

APPENDIX F
MORRISON HERSHFIELD RESPONSE TO THE MOECCS
NON-COMPLIANCE ADVISORY LETTERS

March 27, 2024

Darwin Paton, Environmental Services Technologist, ASTTBC, CPWI
Regional District of Fraser-Fort George
155 George Street, Prince George, BC, V2L 1P8
dpaton@rdffg.bc.ca
Phone: 250 960-4400

Dear Darwin:

**Re: Mackenzie Regional Landfill DOCP – Response to MOECCS Non-Compliance
Advisory Letters 201680 and 204286**

In July 2023, Morrison Hershfield (MH) now Stantec was retained by the Regional District of Fraser-Fort George (RDFFG) to prepare a Design, Operations, and Closure Plan (DOCP) for the Mackenzie Regional Landfill. The DOCP was prepared in accordance with the BC Landfill Criteria for Municipal Solid Waste (Second Edition, June 2016).

In preparing the DOCP, the RDFFG provided MH with the following non-compliance advisory letters issued by the Ministry of Environment and Climate Change Strategy (MOECCS):

- *Non-compliance Advisory Letter, Operational Certificate 100206*, report number 201680, dated April 04, 2023.
- *Non-compliance Advisory Letter, Landfill Gas Management Regulation*, report number 204286, dated April 04, 2023.

MH understands that the purpose of the MOECCS's inspections were to verify compliance with the Operational Certificate number 100206.

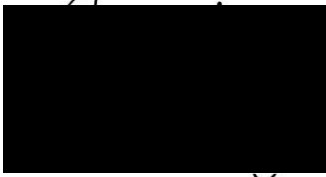
The purpose of this letter is to provide a response to the findings summarized in the MOECCS's non-compliance advisory letters. References to the specific sections of the DOCP are provided.

The DOCP was developed with consideration to the non-compliant items identified in the MOECCS's non-compliance letters identified above and in accordance with the BC Landfill Criteria for Municipal Solid Waste (Second Edition, June 2016).

A summary of the non-compliance items (or items where compliance could not be determined) identified by the MOECCS and the applicable section in the DOCP where in our opinion the item has been addressed is provided in Table 1 (attached).

The RDFFG retained MH to prepare the Mackenzie Regional landfill DOCP and this supporting letter. We trust this meets your requirements at this time however if there are any questions, please don't hesitate to contact the undersigned.

Sincerely,
Morrison Hershfield Limited



Curtis Jung, P.Eng.



March 27, 2024

Attachment: Table 1: Mackenzie Regional Landfill – Non-Compliance Response Table

Table 1: Mackenzie Regional Landfill - Non-Compliance Response Table

| MOECCS Advisory Letter | OC Item Number | Description of non-compliance or where compliance could not be determined | Actions to be taken identified in Advisory Letter | Morrison Hershfield Response |
|---------------------------------------|---------------------------------------|--|--|---|
| Report: 201680 Date: April 4, 2023 | 2, 3.1.1 | The location of the municipal solid waste drop-off facilities and the transfer station are not shown in Site Plan A | RDFFG may seek an amendment to their OC to reflect the changes to the works and the operations at the Facility | Refer to Section 2 of the DOCP (Site Description) and Figure 2 for locations of all infrastructure at the facility. |
| Report: 201680 Date: April 4, 2023 | 4.1 | Groundwater Monitoring Reports submitted to the Ministry during the inspection period were certified by qualified professionals (QPs) from SNC-Lavalin Inc. The Annual Reports, required by Section 8.2, that were submitted to the Ministry during the inspection period, were signed by Petra Wildauer, General Manager of Environmental Services, from the RDFFG. | Provide the Ministry documents that confirm Ms. Wildauer is a QP and ensure that the documents, as described in this OC Section, are certified by a QP. | Refer to Section 10 of the DOCP (Environmental Monitoring Plan). The updated EMP has been prepared by a QP. |
| Report: 201680 Date: April 4, 2023 | 4.2.2 | The Design and Operation Plan must address, but not be limited to, each of the subsections in the Landfill Criteria for Municipal Solid Waste including performance, siting, design, operational and closure and post-closure criteria. | Update the Design and Operation Plan and ensure that it meets the Landfill Criteria for Municipal Solid Waste. | Refer to the updated DOCP report. |
| Report: 201680 Date: April 4, 2023 | 4.2.3 | The facilities must be developed and operated in accordance with the Design and Operation Plan. Environmental considerations for the design and operation of the Facility as a waste transfer station and DLC landfill are not discussed in the 1995 LOCP. | Update the DOCP to reflect the current works and operations at the Facility. | Refer to the updated DOCP report. |
| Report: 201680 Date: April 4, 2023 | 5.1 | The following non-compliances were identified by Ministry staff during this inspection: - 4.1 Qualified Professionals, - 4.2.2 Plans, - 4.2.3 Plans, - 5.3.2 Electric Fence, Operating Period, - 5.5 Landfill Gas, - 7.1.3 Monitoring Period, - 8.1 Drawings, and - 8.2 - Annual Report. | Ensure to notify the Ministry of any non-compliance with the OC requirements as outlined in this OC Section. | Refer to Section 6.10 of the updated DOCP report for non-compliance reporting requirements. |
| Report: 201680 Date: April 4, 2023 | 5.3.2 | The electric fence must be operational during the period of April 15 to November 15 inclusive each year. Individual strands above the snow line must be isolated and energized. | The RDFFG must seek Director approval to vary the operating period with prior written authorization. | Refer to Section 6.7 of the updated DOCP report for electric fence operating requirements. |
| Report: 201680 Date: April 4, 2023 | 5.5 | Compliance with the Landfill Gas Management Regulation (LFGMR) was assessed in inspection record 204286. The RDFFG was found to be out of compliance with Section 4(1) of the LFGMR. Refer to IR204286 for the complete details and findings and any required actions. | Ensure that landfill gas is managed in accordance with the LFGMR. | Refer to Section 8 of the DOCP (Landfill Gas Generation Assessment). |
| Report: 204286 Date: April 4, 2023 | LFG Management Regulation, Item 4 (1) | The A/Environmental Manager informed Ministry staff that a qualified professional (QP) has not updated or reviewed the 1995 landfill gas assessment for the Facility. | Ensure that a QP completes an initial landfill gas assessment in accordance with the provisions of the LFGMR. | Refer to Section 8 of the DOCP (Landfill Gas Generation Assessment). |
| Report: 201680 Date: April 4, 2023 | 5.6 | The 2020 and 2021 Groundwater Reports explain that there were exceedances in the concentration of dissolved lithium, dissolved barium, ammonia nitrogen, and total phenols in 2020, and exceedances in the concentration of dissolved arsenic, dissolved lithium, and ammonia nitrogen in 2021. | Ensure that characteristics of the groundwater at the property boundary do not exceed the concentration set in the British Columbia Approved Water Quality Guidelines and the Compendium of Working Water Quality Guidelines for British Columbia, | Refer to Section 10 of the DOCP (Environmental Monitoring Plan). |
| Report: 201680 Date: April 4, 2023 | 7.1.3 | The RDFFG has been found to be out of compliance for failing to provide a Design and Operations plan that describes the criteria that will be used to assess ground and/or surface water quality. | Ensure that the monitoring program, developed by a QP, addresses ground and surface water quality impairment as defined by the appropriate criteria. | Refer to Section 10 of the DOCP (Environmental Monitoring Plan). The updated EMP has been prepared by a QP. |
| Report: 201680 Date: April 4, 2023 | 7.1.4 | The quality criteria for the monitoring program was not identified in the 1993 LOCP; therefore, compliance with this requirement was not determined. | Ensure that a QP develops a monitoring program in accordance with the requirements of the OC and that the monitoring is conducted in accordance with the monitoring program. | Refer to Section 10 of the DOCP (Environmental Monitoring Plan). The updated EMP has been prepared by a QP. |
| Report: 201680 Date: April 4, 2023 | 8.1 | The drawings submitted to the Ministry with the 2020 and 2021 Annual Reports, and the 2020 and 2021 Annual Groundwater Reports, were not certified correct and sealed by a qualified professional. | Ensure that drawings that are submitted to the Ministry are certified correct and sealed by a qualified professional. | Refer to the updated DOCP report, which has been sealed by a QP. |
| Report: 201680 Date: April 4, 2023 | 8.2 | The 2020 Annual Report was submitted to the Ministry on July 16, 2021 - 16 days after the required due date, and the 2021 Annual Report was submitted to the Ministry on August 25, 2022 - 56 days after the required due date. | The Annual Report must contain the information required by this OC Section. Ensure to include updated estimates for the landfills remaining capacity. | Refer to Section 4 of the DOCP (Landfill Design and Phasing) for the estimated remaining landfill capacity. |