

# **SECURE LANDFILLS**

## **COMMON ISSUES AND COMMITMENTS REPORT**

With Respect to  
an Application  
for an Environmental Assessment Certificate  
pursuant to the *Environmental Assessment Act*, S.B.C. 2002, c.43

Prepared by:

**Environmental Assessment Office**

**October 19, 2009**



## PREFACE

The Environmental Assessment Office (EAO) manages the assessment of proposed major projects in British Columbia, as required by the *Environmental Assessment Act*. The process includes:

- opportunities for the involvement of all interested parties;
- consultations with First Nations;
- technical studies to identify and examine potential significant adverse effects;
- strategies to prevent, or reduce, adverse effects; and,
- development of comprehensive reports summarizing input and findings.

At the conclusion of each environmental assessment (EA), EAO provides a comprehensive assessment report.

The Common Issues and Commitments report (CIC report, Report) is a tool to enhance, streamline and standardize EA within categories of projects where common issues arise, common mitigation is applied, and common commitments are frequently developed. This CIC report has been prepared based on a review of recently certified secure landfill projects.

The information in this Report provides a starting point for analysis for future environmental assessments while allowing flexibility for interested parties to focus on key topics as necessary on a project by project basis. This approach would still enable the public, First Nations and government to identify to both EAO and the proponent the need for studies, mitigation measures and commitments that are tailored to each project. The CIC report is intended to be used in the development of the draft Application Information Requirements (AIR), and the draft AIR should cross-reference this Report to the extent possible and appropriate.

The Report is designed as a tool to reduce redundancy, and is not intended to fully replace an EA, or render a category of projects exempt from environmental assessment. The CIC report may adequately recognize concerns or potential effects, the associated mitigation measures, and commitments to the extent that the key issues are satisfactorily addressed. In such a case, the draft AIR would indicate what the proponent intends to incorporate from the Report, which studies would be captured by the information provided in the Report, and what additional studies may be required. If the Report, or standardized commitments do not adequately address a particular potential effect, that potential effect may be further assessed during the EA process. The Application would therefore, contain only those additional studies as identified during the review of the AIR and Report that are unique to that proposed secure landfill project or studies for which the CIC analysis was not deemed adequate.

The EAO has designed the CIC report to speak to areas of potential commonality, and for this reason First Nation asserted rights and title concerns have not been addressed in this Report. Potential impacts on asserted or established aboriginal rights and title will continue to be the subject of consultation with each EA.

The EAO will follow the same review schedule as during a regular environmental assessment, however, the scope of work for the working group, First Nations, and proponent may be reduced through the use of this CIC report.

Here is a [visual representation](#) of the EA process with and without the use of the CIC Report.

Information and records relating to environmental assessments is available on the EAO website at [www.eao.gov.bc.ca](http://www.eao.gov.bc.ca). Questions or comments specific to this Report can be directed to:

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## **Appendices**

APPENDIX 1

Table of Standardized Commitments

## **Acronyms Used in this Report**

BC:	British Columbia
CIC:	Common Issues and Commitments report (Report)
EA:	Environmental Assessment
EAAC:	Environmental Assessment Advisory Committee
EAO:	Environmental Assessment Office

## **PART A – INTRODUCTION AND BACKGROUND**

### **1 Purpose of the Report**

The purpose of the Common Issues and Commitments (CIC, Report) report is to summarize the EA of proposed secure landfill projects, and identify commonalities that exist throughout all secure landfills. Particular emphasis has been placed on identifying the common concerns and issues, common mitigation measures, and the resulting commitments.

The EAO has worked closely with federal, provincial and First Nation technical experts to ensure that the standardized commitment wording presented in this report, adequately addresses concerns and issues. The EAO has submitted the report to the Environmental Assessment Advisory Committee (EAAC) for feedback and input, and have considered that feedback in finalizing the CIC report.

The CIC report is intended to facilitate a more streamlined, enhanced and standardized approach for the environmental assessment of this category of projects. The EAO believes that the reduction in redundancy, and the focus on studies that are germane and unique to a newly proposed secure landfill will assist working group members in a more timely review, will reduce the costs incurred by proponents for environmental assessments, and will address the capacity concerns of First Nations and other organizations. It is not intended to render secure landfills exempt from EA and will continue to allow First Nations, public, stakeholder, and working group members to comment on the specifics of the project. The Report allows flexibility in the EA process of a new secure landfill project to address any other outstanding concerns or issues not identified in the Report that require further review, as well as allowing First Nations, the public, stakeholders, and the working group an opportunity to comment on the Report itself, the standardized commitments and any other outstanding concerns or issues not identified in the Report.

The Report:

- identifies the common potential environmental, heritage, health, social and economic effects of secure landfills;
- identifies common measures proposed to mitigate those effects; and,
- identifies common standardized commitments.

Within this Report when commitments and mitigation measures associated with particular concerns or issues are stated, the assumption is not that no further action is warranted on that concern or issue. If, during the course of the review of a particular secure landfill project, it becomes apparent, through discussions held with working group members, First Nations, the public or stakeholders, that additional studies, review and mitigation may be necessary to adequately address a potential adverse effect, the proponent will be expected to meet these requirements. This in turn may result in additional mitigation measures and commitments.



## 2 Project Overview

### 2.1 Project Description and Scope

The following section is intended to provide an overview of the common project components of secure landfill projects. While a particular project may include additional components, the scope of the Report is limited to those identified below. If a particular secure landfill project does not include all of the components listed below, only those relevant to that project will be considered and incorporated from this Report into the proposed project's draft AIR and Application. In the general description and design of secure landfill projects the common components are:

- A landfill, of a certain dimension and size;
- A bottom dual liner system, leachate collection system and cover for each cell;
- Groundwater monitoring equipment;
- Leak detection system;
- Surface water management system (drainage ditches, culverts, etc);
- Fencing around the landfill site; and,
- Any on-site and off-site activities related to the project, including the transportation, acceptance and handling of waste materials.

The wastes proposed for acceptance for direct disposal at secure landfills usually include:

- Contaminated soils, hydrocarbon contaminated soil wastes (up to and including Hazardous Waste concentrations) from spill and leaks, flare pit and site remediation, soil treatment (landfarm) operations;
- Drilling waste from oil and gas exploration and production;
- Invert cuttings from exploration drilling;
- Industrial waste;
- Gas stations and bulk fuel facilities remediation;
- Forestry waste; and,
- Naturally Occurring Radioactive Material (NORM).

If however, a secure landfill project proposes to accept additional wastes to those listed above, those additional other wastes will be subject to review and assessment.

The characteristics of the waste are generally those of oil and gas, as well as industrial refuse and could include select hazardous waste or naturally occurring radioactive materials. Generally, residential or municipal wastes are not part of a proposal for a secure landfill. Contaminated soil accepted at secure landfills is stored in a series of "blocks", with each block made up of "cells". Once all the cells in a block are filled, or completed the block is closed with an engineered cover which is designed to keep surface water from entering the landfill. All secure landfills must post a security bond with the Ministry of Environment, the cost of which is determined in consultation with the ministry.

## **3 Assessment Process**

### **3.1 Provincial Review**

The provincial EA process is based upon the British Columbia *Environmental Assessment Act* (Act) and the *Reviewable Projects Regulation* which identifies thresholds for each type of project category. Specifically, Part 6 of the *Reviewable Projects Regulation* applies to secure landfills. As a project meets or exceeds those thresholds it is then determined to be reviewable, and undergoes an environmental assessment.

#### **3.1.1 Pre-Application Stage**

British Columbia's environmental assessment process consists of two stages: the pre-application phase and the application review phase. The pre-application phase includes determination of the need for an environmental assessment certificate, establishing the procedures for the assessment and identifying the Application Information Requirements (AIR) to be included in an application for an EA certificate.

#### **3.1.2 Application Stage**

The Application Review phase is time-limited by legislation to a maximum of 180 days, and includes detailed review of the application for an EA certificate, with opportunities for public input and issue identification and resolution, and preparation of an Assessment Report by EAO. At the conclusion of this phase, the Assessment Report is forwarded to the Minister of Environment and other responsible Minister to inform them in making a decision whether to issue an EA certificate.

## **PART B – COMMON ISSUES AND COMMITMENTS FOR SECURE LANDFILLS**

This part of the CIC report sets out EAO's substantive evaluation of the commonly occurring issues and concerns, and associated mitigation measures and commitments for secure landfill projects in terms of environment, economic, social, heritage, and health effects.

## **4 General**

### **4.1 Methodology**

#### **4.1.1 Identification of Common Issues, Concerns and Mitigation Measures**

In undertaking this evaluation, EAO has identified common concerns and issues, mitigation measures and common commitments germane to EA of secure landfill projects. The evaluation is based on the review of previously certified secure landfills that have been subject to an EA

within the last 3 years, with a focus on identifying common adverse environment, economic, social, heritage, and health effects.

More specifically, for each issue under consideration in this section, the CIC report will:

- set out a summary of relevant background information;
- discuss the relevant common concerns and issues;
- identify common mitigation measures proposed and developed as a result of public consultations, input from the working group, and consultations with First Nations on previous secure landfill EAs and provide these measures as standardized text.

The development and refinement of mitigation measures is a key component of the EA process and is the result of significant focus by EAO facilitating discussion and negotiation among the proponent, interested parties and First Nations. The CIC report amalgamates and builds upon these discussions and summarizes them into key points. The mitigation measures and commitments contained in the Report have been reviewed extensively by technical experts who have participated in previous secure landfill EA reviews as well as providing additional comments and refinement to the Report.

## **5 Environmental Effects**

### **5.1 Geophysical**

#### **5.1.1 Background Information**

The potential effects on the geophysical environment (groundwater and soils) from a secure landfill are limited primarily to the area containing the site itself (i.e. within the property boundaries) and the environment directly adjacent to, or immediately downstream of the site, including surrounding habitat and nearby watercourses.

#### **5.1.2 Primary Geophysical Concerns and Proposed Mitigation**

The primary concern for a proposed secure landfill project is the potential adverse effects on groundwater and surface water quality and sensitive habitats. More specifically, any proposed landfill needs to be assessed for the potential for leachate from the project to contaminate groundwater systems in the vicinity of the site, and the potential for contaminated groundwater to affect downstream surface sources of drinking water or aquatic habitat.

Key mitigative strategies fall into two categories; project location and project design. Favourable characteristics for site selection include:

- Previously cleared brownfield land;
- Project activities located within footprint of an existing brownfield site
- No environmentally sensitive areas in close proximity to a site;
- Nearest residence greater than 1km from a site;
- No known First Nations hunting, gathering, fishing and trapping activities within a site; and,
- No fish-bearing streams or consumptive water streams flowing within a site.

Project design specifications that mitigate potential groundwater and surface water impacts include:

- No substantial development on previously undisturbed areas;
- Meet or exceed all requirements of the Hazardous Waste Regulations, or request an exemption to the regulations, if appropriate;
- Double or greater liner and leak detection system meeting or exceeding regulatory requirements;
- Final cover using compacted, bioremediated soil and native grasses, with a sand layer to prevent tree growth;
- A surface water management plan to prevent or reduce water infiltration into the landfill and groundwater;
- Implementation of a system for the monitoring, collection, treatment, and recirculation or appropriate disposal of leachate;
- Implementation of a groundwater monitoring system, with wells up-gradient and down-gradient of the site, to ensure early detection of any changes to baseline conditions and corrective measures if required; and,
- Maintenance of a security (bond) during the operations stage and for at least 25 years after decommissioning to ensure that the Project can be monitored and maintained as necessary.

Further details on common commitments are contained in Appendix 1 in the Standardized Commitments Table.

## 5.2 Soils

### 5.2.1 Background Information

Over the expected lifespan of a proposed secure landfill project, the entire site is expected to be cleared of trees, organic topsoil and overburden clays to facilitate the construction of landfill cells and associated site works. In addition, sufficient quantity and adequate quality of soil must be obtained for capping cells and decommissioning of the site.

### 5.2.2 Primary Soil Concerns and Proposed Mitigation

Potential impacts associated with a proposed secure landfill site are due to clearing and include loss or mixing of topsoil during construction activities, loss of stockpiled soil through wind and/or water erosion, contamination from landfill wastes through failure of the liner system, and contamination from waste spills during transport to the landfill cell.

The following mitigation measures may eliminate or reduce those potential impacts:

- a storage and reclamation plan prior to site construction;
- stripping topsoil and subsoil in distinct layers;
- saving topsoil and subsoil for subsequent use in capping and closing the landfill, and, where applicable, stockpiling soil for use to construct berms to reduce the visual impact of a proposed landfill project;

- re-vegetating stockpiles as soon as possible to minimize losses through wind and water erosion; and,
- controlled acceptance and placement of wastes to minimize the potential for soil contamination, including a spill management plan.

Further details on common commitments are contained in Appendix 1 in the Standardized Commitments Table.

### 5.3 Fish and Fish Habitat

#### 5.3.1 Background Information

Potential effects on fish and fish habitat from a secure landfill include effects at the potential project site, the environment downstream of the site, contamination that may be entrained to streams via groundwater flows, and streams along transport routes leading to the site (as potential spill areas). Potential impact to fish or fish habitat may trigger a review by Fisheries and Oceans Canada under the *Canadian Environmental Assessment Act*. Impacts to fish or fish habitat may impact commercial and/or recreational uses, as well as treaty rights or aboriginal rights of Treaty or First Nations to fish in the project area.

#### 5.3.2 Primary Fisheries Concerns and Proposed Mitigation

Secure landfill projects may pose a concern to fisheries due to potential contamination to fish-bearing streams, contamination of potential fish food sources, spawning grounds, aquatic insects and impacts on stream crossings.

Key measures to mitigate potential effects to fish and fish habitat include:

- Site selection to avoid fish-bearing streams close to the site and immediately downstream of the proposed Project;
- Site selection to avoid stream crossing over fish-bearing streams, or the use of clear span bridge designs;
- An industry-proven liner system to prevent leachate contamination downstream; and,
- Surface water, groundwater and leachate quality monitoring and treatment system that meet the regulatory requirements of the BC Ministry of Environment.

Further details on common commitments are contained in Appendix 1 in the Standardized Commitments Table.

### 5.4 Atmospheric Effects

#### 5.4.1 Background

The spatial study area for atmospheric impacts associated with a proposed secure landfill site includes the site area and a boundary of 0.5 to 1.0km from the site itself.

## 5.4.2 Primary Atmospheric Concerns and Proposed Mitigation

Potential atmospheric impacts associated with a proposed secure landfill site include: fugitive dust from equipment activities that may adversely affect vegetation and increase the intake of particles on wildlife and human receptors; vehicle and equipment emissions; and vapour emissions from the leachate during operations and decommissioning activities that could potentially increase the concentrations of particles, hydrocarbons and volatile organic compounds in the atmosphere.

The following mitigation measures may eliminate or reduce those potential impacts:

- Requiring contractors to service vehicles regularly;
- Ensuring the use of modern, properly-maintained construction and maintenance equipment containing effective emissions-control devices to minimize adverse effects on air quality;
- Watering down and/or covering stored soils and dirt roads during dust-prone conditions;
- Implementing an air quality monitoring program (to the satisfaction of the Ministry of Environment), and using the results of the program to guide any ongoing mitigation measures; and,
- Developing a dust and odour control plan to avoid or minimize potential dust and odour nuisance from project activities.

Further details on common commitments are contained in Appendix 1 in the Standardized Commitments Table.

## 5.5 Terrestrial Environment and Wildlife

### 5.5.1 Background Information

Over the lifespan of a secure landfill project, access roads and the entire landfill site are typically cleared of pre-project terrestrial habitat to facilitate construction and operation of landfill cells and amenities.

### 5.5.2 Primary Terrestrial Concerns and Proposed Mitigation

Primary effects to the terrestrial environment and wildlife associated with a secure landfill are a result of direct habitat loss caused by removal of vegetation and soils and disturbance of surrounding habitat caused by activities associated with construction and operation. Specific potential effects are:

- habitat loss and alteration;
- reduced habitat effectiveness;
- habitat fragmentation;
- sensory disturbance;
- direct wildlife mortality; and,
- exposure to airborne and waterborne contaminants.

Secure landfills may create positive effects for some flora and fauna species that are able to habituate to disturbance and can benefit from habitat features created by a landfill. Positive effects to these species can result in displacement of other species in surrounding habitat. The primary means of avoiding or minimizing adverse effects to the terrestrial environment and wildlife is through appropriate site selection.

Mitigation measures that may eliminate or reduce potential adverse effects are:

- conducting work during daylight hours to limit sensory disturbance effects;
- installing fencing as required by the *Hazardous Waste Regulation* under the *Environmental Management Act*;
- designing fencing to prevent wildlife entrapment, injury, and mortality;
- use existing disturbance corridors for roads, and power lines;
- installing measures (e.g. fencing, netting) to deter waterfowl from using water storage and treatment ponds; and,
- requiring personnel to report vehicle-wildlife collisions.

Further details on common commitments are contained in Appendix 1 in the Standardized Commitments Table.

## 5.6 Environmental and Operational Management Plans

The *Hazardous Waste Regulation* sets out minimum requirements or standards that must be met for all Hazardous Waste facilities, including:

- Minimum Siting Standards;
- Operational Requirements;
- Waste Information requirements;
- Waste Record requirements;
- Access Security requirements (example: fencing requirements);
- Prevention of Fire, explosion and accidental reactions;
- Spill protection and reporting;
- Contingency plan;
- Emergency system testing;
- Personnel Training; and,
- Closure Plan.

Additional minimum requirements/standards that may need to be met for secure landfills:

- A dual liner system;
- Leachate detection, collection and removal system;
- Groundwater quality protection;
- Water control and discharge;
- Dust control;
- Closure standards; and,
- Post-closure plan.

## 6 Economic Effects

### 6.1 Community and Socio-economic Conditions

#### 6.1.1 Background

The study area for secure landfills for the assessment of community and socio-economic conditions is generally the proximate area, and any nearby communities, that may be impacted.

#### 6.1.2 Primary Community and Socio-economic Concerns and Mitigation

The potential effects of the secure landfills on community or socio-economic conditions are generally limited to the potential effects of increased traffic in the secure landfill vicinity, including increased traffic on public roads, vehicle emissions and the release of odorous substances into the air. Further concerns include:

- Noise considerations, particularly the use of engine brakes in residential communities;
- Public/pedestrian safety concerns;
- Dust and air quality concerns;
- Increased likelihood of accidents and related spills;
- Wildlife impacts (e.g., possible need for wildlife crossing structures);
- Impacts of proposed project to existing traffic patterns; and,
- Any required changes to highway design.

There may be some minor economic benefits to be incurred by those employed from local communities, including transportation sector employment opportunities. Additional employment may be created indirectly through additional remediation work that is facilitated by the presence of a new secure landfill in the region.

Mitigation measures that may reduce or avoid potential impacts from increased traffic in the vicinity of the secure landfill include:

- Development of a community transportation advisory group;
- Implementing a transportation monitoring and enforcement program;
- Developing a driver safety program;
- Improving grade crossings to increase safety of pedestrians;
- Implementing policies to ensure drivers keep to posted speed limits and are prohibited from using engine brakes within residential areas;
- Completing an assessment of potential air quality impacts to residential areas Ensuring that adequate insurance is maintained to cover third-party liability claims;
- Ensuring that measures are in place to monitor the speed of waste haulers to and from the site; and,
- Developing an environmental management plan that incorporates actions to address spills associated with waste transportation.

Further details on common commitments are contained in Appendix 1 in the Standardized Commitments Table.



## 7 Social Effects

### 7.1 Aesthetic/Visual

#### 7.1.1 Background Information

The clearing and construction of proposed secure landfill sites can cause potential aesthetic impacts on a viewshed depending on the existing visual quality of the area and the exposure of the visual impact to people.

#### 7.1.2 Primary Aesthetic/Visual Concerns and Proposed Mitigation

Members of nearby communities, tourists and visitors may be concerned that clearing and operating a site within view of a transportation route or residences may affect the visual quality of the area.

To reduce the visual impact and improve aesthetics, the following mitigation measures should be considered:

- incorporate a buffer zone into the overall Project design, consisting of undisturbed, pre-existing trees adjacent to a roadway;
- avoid interfering with viewsapes or valued land features;
- avoid placing structures on ridge lines;
- stockpile topsoil and subsoil removed from the site inside the treed buffer, parallel to a transportation route, further reducing the visibility of the Project;
- construct any access road in a manner so as to limit visibility of a site from a transportation route or residences;
- structures are designed, finished (e.g. natural coloured ) and screened with vegetation so as to blend in with the landscape;
- site is kept clean and tidy, with equipment properly stored and out of view; and
- ensure that re-vegetation associated with closure considers local/regional- appropriate plant species.

Further details on common commitments are contained in Appendix 1 in the Standardized Commitments Table.

### 7.2 Land Use Context

#### 7.2.1 Background Information

The study area for the assessment of land use context encompasses all the nearby communities and existing land use activities (such as ranching, forestry, hunting, trapping, and industrial activity). Land uses of Treaty and First Nations in the vicinity would be discussed in a separate section.

## 7.2.2 Primary Land Use Concerns and Proposed Mitigation

Secure landfills may impact existing land and/or community plans, traplines, hunting/guide outfitters and resource use activities (such as forestry, agriculture, oil and gas, mining, etc).

Mitigation measures that may reduce or avoid potential impacts to land use in the vicinity of the secure landfill include:

- Project site selection to avoid areas of incompatible land uses within existing or proposed land use or community plans;
- Project site selection to maximize area of compatible land uses;
- Adhering to appropriate operational windows to limit impacts of traffic, artificial light and noise to other land users; and,
- Fencing and signage to protect wildlife and land users from direct contact with contaminated materials.

Further details on common commitments are contained in Appendix 1 in the Standardized Commitments Table.

## 8 Heritage Effects

### 8.1 Archaeological Resources

#### 8.1.1 Background

The study area for the assessment of potential effects on archaeological resources is generally limited to the specific area in the vicinity of the secure landfill. An archaeological assessment of the site is generally conducted in consultation with, and confirmed by, the BC Archaeology Branch, and the conclusions of the assessment indicate either the absence or presence of evidence of archaeological sites within the project boundary.

#### 8.1.2 Primary Heritage Concerns and Proposed Mitigation

Generally, the primary heritage concern is regarding the presence of heritage resources within the specific vicinity of the secure landfill.

The appropriate mitigation measures for the presence of an archaeological resource would include:

- Immediate notification of BC Archaeology Branch;
- Immediate cessation of work within the site; and,
- Any other measures identified by the BC Archaeology Branch;

Further details on common commitments are contained in Appendix 1 in the Standardized Commitments Table.

## **9 Health Effects**

### **9.1 Public Health**

#### **9.1.1 Background Information**

The potential effects on human health and public health from a secure landfill are primarily limited to the area containing the site itself (for effects on staff and contractors), to the area within 1km of the site (for effects on nearby residents)

#### **9.1.2 Primary Public Health Concerns and Proposed Mitigation**

Potential public health impacts include: construction noise; strong or toxic odours or adverse effects on air quality; adverse effects on downstream drinking water quality as a result of potential groundwater contamination; health and/or groundwater contamination related to sewage disposal; and exposure to naturally occurring radioactive materials.

Mitigation measures that may reduce or avoid potential impacts to public health in the vicinity of the secure landfill include:

- development of a noise control plan that includes restricting most project activities to daylight hours;
- ensuring adequate supplies of potable water onsite for workers;
- ensuring that sanitary facilities are constructed and handled in a manner acceptable to the regional health authority;
- site is secured with adequate fencing to prevent unauthorized access;
- ensuring garbage is stored in wildlife-proof containers to reduce attractants and wildlife-human interactions;
- prior to accepting any wastes containing naturally-occurring radioactive materials (which must be permitted by the Ministry of Environment) at the landfill, conduct a comprehensive site survey, including soil and water sampling and radiochemical analysis to establish levels of naturally-occurring radioactive materials onsite; and,
- establish a management plan for monitoring site-specific background and ongoing radiation levels monitoring and management plan for detection of naturally-occurring radioactive materials to ensure that federal and provincial guidelines for exposure are met.

Further details on common commitments are contained in Appendix 1 in the Standardized Commitments Table.

## **10 Commitments**

### **10.1 Standardized Commitments for Secure Landfills**

This section of the Report is intended to provide proponents of secure landfills with standardized commitments that have been reviewed by federal, provincial, and First Nation technical experts

as well as technical working groups as formed during the EA review process. These standardized commitments have undergone further review and comment from the EAAC, as well as final review from technical experts. The commitments are not intended to exempt the proponent from further commitments, if and as necessary, associated with their proposed secure landfill. The commitments within this Report remain open to review by the public, First Nations and other parties, and may undergo revisions, if in the view of EAO revisions are warranted.

See Appendix 1: Table of Standardized Commitments.

## **Appendix 1**

### Table of Standardized Commitments

**Table of Proponent's Commitments and Assurances**

Reference in the Application	Commitment	Project Phase
Operations		
Sections X, Y	The Proponent will ensure that an underlying layer of neutralizing material (e.g. lime) will be used whenever reactive or corrosive material is accepted for disposal, as directed by the Regional Manager, Environmental Protection, Ministry of Environment.	Operation
Sections X, Y	The Proponent will ensure to the reasonable satisfaction of the Regional Manager, Environmental Protection, Ministry of Environment that storage of process chemicals or fuel (petroleum hydrocarbons) will not be located below ground. The design of above ground storage of these products will reduce of the possibility of uncontrolled release.	Operation
Sections X, Y	The Proponent will not accept free liquids for disposal at the Project.	Operation
Sections X, Y	The Proponent will ensure, to the reasonable satisfaction of the Regional Manager, Environmental Protection, Ministry of Environment, that wastes transported to the site are inspected to determine that they have been covered during transportation to minimize loss during transit and take appropriate action if they are not.	Operation
Sections X, Y	The Proponent will track each truck load of waste that is accepted into the landfill according to procedures acceptable to the Regional Manager, Environmental Protection, Ministry of Environment.	Operation
Sections X, Y	The Proponent will establish a gate monitor and develop a NORM screening protocol acceptable to the Regional Manager, Environmental Protection, Ministry of Environment.	Operation
Sections X, Y	The Proponent will establish policies and procedures for complying with the Ministry of Environment's regional protocol for the management of landfilling of contaminated soils and other hazardous and non-hazardous waste streams.	Operation
Sections X, Y	The Proponent will collect a waste sample from approximately every 15th truck load, and submit such samples to an independent accredited laboratory for chemical analysis, as directed by the Regional Manager, Environmental Protection, Ministry of Environment. The Proponent will compare the lab results with those provided by the waste generator, and if the independent results indicate that the waste is not acceptable for disposal at the landfill, the Proponent will arrange for the waste generator to have the waste removed from the landfill and relocated to an appropriate waste facility.	Operation

Leachate Management

Sections X, Y	The Proponent will ensure to the reasonable satisfaction of the Regional Manager, Environmental Protection, Ministry of Environment, that design standards for the engineered liners and leachate collection system meet or exceed regulatory requirements.	Construction
Sections X, Y	The Proponent will install a leachate monitoring system within each landfill cell and this system will be monitored and recorded on a minimum schedule of once per month, to the reasonable satisfaction of the Regional Manager, Environmental Protection, Ministry of Environment.	Construction
Sections X, Y	The Proponent will ensure to the reasonable satisfaction of the Regional Manager, Environmental Protection, Ministry of Environment that all water within the disposal cells and any water that comes in contact with waste is treated as leachate.	Construction/Operation
Sections X, Y	The Proponent will ensure that the leak/leachate detection system is designed and reviewed by a qualified professional or a team of qualified professionals, and installed under the supervision of a qualified and experienced installation expert to the reasonable satisfaction of the Regional Manager, Environmental Protection, Ministry of Environment.	Design/Construction
Sections X, Y	The Proponent will monitor and record the leak detection system on a minimum schedule of once per month, to the reasonable satisfaction of the Regional Director of the Ministry of Environment.	Operation
Sections X, Y	The Proponent will ensure that any leachate collected from the landfill is stored, tested, treated, and disposed of in a manner acceptable to the Regional Manager, Environmental Protection, Ministry of Environment.	Operation/ Decommissioning

Spill Management		
Sections X, Y	The Proponent will ensure to the reasonable satisfaction of the Regional Manager, Environmental Protection, Ministry of Environment that chemical and fuel storage during the construction phase is limited to small volumes in temporary secure areas (i.e. truck mounted fuel tanks for excavating equipment, cases of lube oil stored in equipment storage locker).	Construction
Sections X, Y	The Proponent will develop a documented inspection procedure for leaks of fuel or other construction-related materials (e.g. lubricant) prior to construction to the reasonable satisfaction of the Regional Manager, Environmental Protection, Ministry of Environment, and this procedure will be provided to and implemented by the on-site foreman and construction site supervisor.	Construction
Sections X, Y	The Proponent will develop an Accidents and Malfunctions Plan which will include, to the reasonable satisfaction of the Regional Manager, Environmental Protection, Ministry of Environment, procedures for implementation and maintenance of relevant mitigation measures such as the availability of spill kits at the Project Site. The plan will, for example, also include procedures for the prevention of fuel release to the environment during on-Site vehicle and equipment fuelling and other fuel handling activities such as tank re-filling. The plan will also cover failure of Project design and management mitigation measures, including procedures for immediate response to incidents, and also an incident review and reporting procedure, to include notification of applicable parties and implementation of remedial actions where necessary.	Construction/ Operation
Groundwater		
Sections X, Y	The Proponent will, under the direction of a qualified professional, prepare a completed, formal groundwater monitoring and sampling plan, to the reasonable satisfaction of the Regional Manager, Environmental Protection, Ministry of Environment, that includes multiple redundant monitoring systems, prior to commencement of operation.	Design
Sections X, Y	The Proponent will construct and decommission all groundwater monitoring wells in accordance with the BC Groundwater Protection Regulation and the Environmental Management Act to prevent potential adverse effects on the groundwater or surface water.	Construction/ Operation
Sections X, Y	The Proponent will ensure to the reasonable satisfaction of the Regional Manager, Environmental Protection, Ministry of Environment that no groundwater is used at the facility during construction.	Construction/ Operation



Surface Water		
Sections X, Y	The Proponent will ensure to the reasonable satisfaction of the Regional Manager, Environmental Protection, Ministry of Environment, that a surface water run-on system is in place and designed to prevent contact between surface water run-on and waste materials.	Construction/ Operation
Sections X, Y	The Proponent will inspect surface water impoundments daily during construction for sediment load and will use appropriate sediment containment measures.	Construction/ Operation
Sections X, Y	The Proponent will ensure to the reasonable satisfaction of the Regional Manager, Environmental Protection, Ministry of Environment, that potentially impacted storm water run-off from the proposed Secure Landfill development will be directed to an existing catchment pond and that on-site erosion control is utilized if required.	Construction/ Operation
Sections X, Y	The Proponent will ensure to the reasonable satisfaction of the Regional Manager, Environmental Protection, Ministry of Environment, that any collection pond(s) on site will be visually inspected on a weekly basis during operation and tested prior to release of water.	Construction/ Operation
Sections X, Y	The Proponent will ensure that slope erosion is monitored daily and any observed erosion is mitigated through the use of erosion control products (e.g. coconut matting, soil grid, woven geosynthetic) to the reasonable satisfaction of the Regional Manager, Environmental Protection, Ministry of Environment.	Operation
Sections X, Y	The Proponent will transfer any surface water that does enter the landfill to a lined storage pond where it will be visually inspected, tested, treated and/or disposed of as appropriate, to the reasonable satisfaction of the Regional Manager, Environmental Protection, Ministry of Environment.	Operation

Air Quality		
Sections X, Y	The Proponent will ensure that, to the reasonable satisfaction of the MOE, non-surfaced (dirt) on-Site and Site access roads and Soils stored within the Bio-Cells or Landfill Cells will be watered down or covered during dust prone conditions to reduce emissions of fugitive dust.	Construction, Operation and Decommissioning
Sections X, Y	The Proponent will ensure that modern, properly maintained construction and maintenance equipment containing effective emissions control devices are used to minimize adverse effects on air quality.	Construction/ Operation
Sections X, Y	The Proponent will ensure that air quality at the site is monitored for levels of oxygen, carbon monoxide, escaping methane, and other flammable vapours in a manner acceptable to the Regional Manager, Environmental Protection, Ministry of Environment.	Operation
Sections X, Y	The Proponent will develop an Air Quality Monitoring Plan which will specify, to the reasonable satisfaction of the Regional Manager, Environmental Protection, Ministry of Environment, the measures to be implemented to protect air quality at the Project Site, including measures to be used to control airborne emissions associated with Project activities and an air quality monitoring program to guide further mitigation, should air quality prove to be a problem. The plan will detail the monitoring program, including the methodologies to be employed, the timing of monitoring activities, and procedures to be followed should performance indicators (including regulatory standards) be breached.	Construction/ Operation
Geophysical Environment		
Sections X, Y	The Proponent will ensure that, to the reasonable satisfaction of the Regional Manager, Environmental Protection, Ministry of Environment, construction of the fuel and leachate storage tanks will include appropriate secondary containment to prevent accidental discharge from reaching the surrounding environment, should such occur.	Construction
Sections X, Y	The Proponent will ensure that, to the reasonable satisfaction of the Regional Manager, Environmental Protection, Ministry of Environment, for the duration of Contaminated leachate production, the leachate hydrocarbon skimming and evaporation pond levels will be monitored and containment measures will be implemented as necessary to control threatened overflow.	Operation
Sections X, Y	The Proponent will ensure that, to the reasonable satisfaction of the Regional Manager, Environmental Protection, Ministry of Environment, leachate will be transferred by an enclosed pump and hose or by vacuum truck to holding tanks. This equipment will be regularly maintained to prevent malfunction and loss of containment.	Operation

Soils		
Sections X, Y	The Proponent will support and keep apprised of treatment technology for contaminated soils; should the technology evolve such that at some time in the future remediation of the soils stored in the landfill would be economically and environmentally feasible, the Proponent will consider using that technology to remediate the landfilled soils.	Operation/Decommissioning/Post-decommissioning
Sections X, Y	The Proponent will ensure to the reasonable satisfaction of the Regional Manager, Environmental Protection, Ministry of Environment that a final topsoil and subsoil salvage, storage, and reclamation plan will be developed for the site prior to construction. The location of soil stockpiles will be documented in the plan. Soil stockpiles will be re-vegetated to minimize losses through wind and/or water erosion. Revegetation will take place as soon as practicable. Salvaged topsoil and subsoil will be used in reclamation during and fill development and in final reclamation of the site.	Construction
Sections X, Y	The Proponent will ensure that soils that contain obviously dissimilar contaminants are physically separated within a cell to minimize potential for chemical cross-reaction, as directed by the Regional Manager, Environmental Protection, Ministry of Environment.	Operation
Sections X, Y	The Proponent will strip topsoil and subsoil in distinct layers and stockpile these materials in separate areas to maintain the integrity of the different materials.	Construction
Terrestrial Environment and Wildlife		
Sections X, Y	The Proponent will ensure to the reasonable satisfaction of the Regional Manager, Environmental Stewardship, Ministry of Environment that any additional clearing activity required is scheduled to occur outside of the breeding period for any bird species nesting in the vicinity of the Project site when possible. Final timelines for construction are contingent upon receipt of all required approvals.	Construction
Sections X, Y	The Proponent will ensure that personnel are aware of the need to abide by all speed limits on site and in transit to the site and encourage contractors to do so.	Construction/Operation
Sections X, Y	The Proponent will ensure to the reasonable satisfaction of the Regional Manager, Environmental Stewardship, Ministry of Environment that a no firearms/no hunting/no pets policy for all personnel and contractors on the Project site is enforced.	Operation
Sections X, Y	The Proponent will ensure that, to the reasonable satisfaction of the Regional Manager, Environmental Stewardship, Ministry of Environment, contractors and staff will be required to comply with Project EMPs, which will include a requirement for reporting vehicle-wildlife collisions during waste transport or travel to work. These incidents will then be managed and reported as part of the Project Environmental Management Program.	Operation

Sections X, Y	The Proponent will ensure that, to the reasonable satisfaction of the Regional Manager, Environmental Stewardship, Ministry of Environment, fencing provides protection for wildlife by preventing direct contact with contaminated materials.	Operation
Sections X, Y	The Proponent will ensure that, to the reasonable satisfaction of the Regional Manager, Environmental Stewardship, Ministry of Environment, site fencing will remain in place until the post-closure period of the Project, when leachate generation has either stopped or testing has shown leachate to consistently contain concentrations of contaminant below regulatory requirements.	Operation
Sections X, Y	The Proponent will ensure that, to the reasonable satisfaction of the Regional Manager, Environmental Stewardship, Ministry of Environment, treatment and water storage ponds will be fitted with measures to discourage use by waterfowl.	Operation
Land Use Context		
Sections X, Y	The Proponent will maintain a treed buffer zone of approximately 30 metres between the project site and any existing open areas to minimize noise transmission and potential effects on wildlife, to the reasonable satisfaction of the Regional Manager, Environmental Stewardship, Ministry of Environment.	Design/Construction
Community and Socio-Economic Conditions		
Sections X, Y	The occurrence, location and frequency of wildlife mortalities caused by vehicle traffic on the access roads to the proposed landfill will be monitored to the reasonable satisfaction of the Regional Manager, Environmental Stewardship, Ministry of Environment.	Construction/Operation
Sections X, Y	The proponent will enforce a no engine braking policy through residential areas.	Construction/Operation
Sections X, Y	The Proponent will ensure that when hiring or contracting for construction and operation phases, fair consideration will be given to local employment when possible.	Construction
Sections X, Y	Any changes in the traffic patterns will be constructed to the reasonable satisfaction of the Ministry of Transportation.	Construction/Operation

Public Health		
Sections X, Y	(If the Project is within XX of a residences) The Proponent will ensure to the reasonable satisfaction of the Regional Municipality that construction noise occurs only during the daylight hours and there is no construction at night.	Construction/ Operation
Sections X, Y	The Proponent will ensure that staff and contractors are briefed of known hazards and the need to obey posted speed limits and signal well in advance of the landfill entrance.	Construction/ Operation
Sections X, Y	The Proponent will ensure that the construction site supervisor is responsible for monitoring traffic during construction in order to respond to potential or observed conflicts/issues related to effects of traffic on the environment.	Construction
Sections X, Y	The Proponent will ensure that the following plans are developed, to the reasonable satisfaction of local Health Authority and the Regional Manager, Environmental Protection, Ministry of Environment prior to construction and operation of the Project: Safe Operating Procedures, Emergency Response Plan, Nuisance Control Plan (Noise, Light), Spill Response Plan, and Health and Safety Policy.	Design
Sections X, Y	The Proponent will ensure that BC Level 3 First Aid services, acceptable to the Local Health Authority, are available on-site for the duration of construction.	Construction
Sections X, Y	The Proponent will ensure that emergency procedures, acceptable to the local Health Authority, are posted within the site prior to the commencement of construction, to ensure the safe and efficient construction of the landfill facilities.	Design
Sections X, Y	The Proponent will ensure that sanitary facilities for workers are evacuated and cleaned frequently in a manner acceptable to the local Health Authority.	Construction/ Operation
Sections X, Y	The Proponent will ensure that sanitary facilities use a corrosion resistant fibreglass tank, and vacuum truck companies specializing in removal of untreated sewage from remote locations are used in a manner acceptable to the local Health Authority and the Regional Director of the Ministry of Environment to minimize the risk of contact between sewage and humans or the environment.	Construction/ Operation
Sections X, Y	The Proponent will ensure that ample bulk and bottled water is supplied for staff consumption to prevent consumption of grey water from unsanitized holding tanks.	Construction/ Operation
Sections X, Y	The Proponent will ensure that garbage is stored in bear-proof outdoor containers to reduce wildlife attractants for ultimate disposal in a manner acceptable to the local Health Authority and the Regional Manager, Environmental Stewardship, Ministry of Environment.	Construction/ Operation

Sections X, Y	The Proponent will ensure that fugitive odour emissions are monitored in a manner acceptable to Northern Health and the Regional Director of the Ministry of Environment by on-site staff and that any aberration is investigated and rectified prior to continuation of operations.	Operation
Sections X, Y	The Proponent will develop a Traffic Management Plan which will specify measures, to the reasonable satisfaction of the Regional Managers, Environmental Stewardship and Environmental Stewardship, Ministry of Environment, control vehicles on the Project Site and Site access road, to reduce the impact of vehicle movements on the surrounding environment, including noise, light, and exhaust emissions, creation of fugitive dust and vehicle-wildlife collisions. The plan will address the measures to minimize these potential impacts, including restricting vehicle speed limits using signage on the Site access road and at the Site entrance. The plan will also include a process for addressing non-conformance of drivers with posted speed limits.	Construction
Closure		
Sections X, Y	The Proponent will, under the direction of a qualified professional, close and cap each landfill cell with multiple engineered layers, including geosynthetic material and soil, and a vegetation cover will be established to the reasonable satisfaction of the Regional Manager, Environmental Protection, Ministry of Environment	Decommissioning
Sections X, Y	The Proponent will prepare and implement a minimum 25-year post-closure monitoring plan (details of which will be available upon final engineering design completion and which will be acceptable to the Regional Manager, Environmental Protection, Ministry of Environment) to ensure continued protection of groundwater and other environmental resources.	Post-decommissioning
Sections X, Y	The Proponent will supervise decommissioning of the Project to ensure that all associated infrastructure is removed from the site and that all excavations are safely backfilled and compacted, to the reasonable satisfaction of the Regional Manager, Environmental Protection, Ministry of Environment	Decommissioning
Sections X, Y	The Proponent will ensure that each Secure Landfill Cell will be built with a final cover to the reasonable satisfaction of the Regional Manager, Environmental Protection, Ministry of Environment	Decommissioning
Sections X, Y	The Proponent will post a closure bond (in an amount satisfactory to the Regional Director of the Ministry of Environment and held in trust by the Crown) to protect the public from bearing future closure costs if the Proponent abandons the landfill prior to completing proper closure or post-closure activities.	Design

	Environmental Plans	
Sections X, Y	The Proponent will ensure that an overall environmental monitoring plan for the Project that deals with all environmental aspects of operation, including monitoring and sampling programs, is completed to the reasonable satisfaction of the Regional Manager, Environmental Protection, Ministry of Environment.	Construction/ Operation
Sections X, Y	The Proponent will ensure that an emergency response plan, detailing required actions in the event of an environmental emergency, is prepared to the reasonable satisfaction of the Regional Manager, Environmental Protection, Ministry of Environment, and is available to the construction site supervisor.	Construction/ Operation
Sections X, Y	The Proponent will develop a Surface Water Quality Monitoring Plan which will specify, to the reasonable satisfaction of the Regional Manager, Environmental Protection, Ministry of Environment the measures to be implemented to protect surface water quality at the Project Site, including those mitigation measures to be used to control emissions to surface water associated with Project activities and a surface water quality monitoring program to guide further mitigation, if required. The plan will detail the monitoring program, including the methodologies to be employed, the analyse list, the timing of monitoring activities, and procedures to be followed should performance indicators (including regulatory standards) be breached.	Construction/ Operation
Sections X, Y	The Proponent will develop a Groundwater Quality Monitoring and Contingency Plan which will specify, to the reasonable satisfaction of the Regional Manager, Environmental Protection, Ministry of Environment, the measures to be implemented to protect groundwater quality at the Project Site, including measures to be used to control emissions to ground associated with Project activities and a groundwater quality monitoring program to guide further mitigation, if required. The plan will detail the monitoring program, including the methodologies to be employed, the analyse list, the timing of monitoring activities, and procedures to be followed should performance indicators (including regulatory standards) be breached.	Construction/ Operation
Sections X, Y	The Proponent will develop an Erosion and Sediment Control Plan which will cover, to the reasonable satisfaction of the Regional Manager, Environmental Protection, Ministry of Environment, the surface water management for the entire Project Site, and include procedures for consideration of the need for implementation of necessary further mitigation measures, if necessary.	Construction/ Operation
Sections X, Y	The Proponent will develop a Waste Management Plan prior to the construction or operation of the Project to the reasonable satisfaction of the Regional Manager, Environmental Protection, Ministry of Environment.	Design
Sections X, Y	The Proponent will develop a comprehensive plan for the screening and acceptance of waste (that requires the waste generator to submit a chemical analysis of the waste from an accredited laboratory and that requires all characteristics of the waste to be within parameters specified in the landfill's operating permit) to the reasonable satisfaction of the Regional Manager, Environmental Protection, Ministry of Environment.	Operation