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(a) meets the limits specified in TABLE 4.3-A;

(b) is not a hazardous waste; and

(c) is not a dangerous oilfield waste.

TABLE 4.3-A HYDROCARBON CONTAMINATED SOIL LIMITS WHEN USED AS ALTERNATIVE DAILY OR INTERMIDATE COVER

Parameters	Limits
Total Petroleum Hydrocarbons	< 20,000 mg/kg
Chloride	< 3,000 mg/kg
Flashpoint	> 61°C
pH	≥ 6.0 and ≤ 9.0 pH units

SECTION 4.4: NUISANCE MANAGEMENT

4.4.1 The approval holder shall take all steps necessary to prevent fugitive waste from leaving the landfill boundary.

4.4.2 The approval holder shall retrieve fugitive waste outside of the landfill boundary as described in the Operations Plan, as amended.

4.4.3 The approval holder shall implement the operating procedures for nuisance management as described in the Operations Plan, as amended.

4.4.4 The approval holder shall not operate the landfill unless and until the following fugitive waste and nuisance control processes and measures are adhered to:

(a) the working face width does not exceed 35 metres;

(b) the working face length does not exceed 35 metres;

(c) waste is placed and compacted immediately after it is deposited on the working face;

(d) movable wind screens are in place at an effective distance upwind of the working face;

(e) movable litter catch fences are in place at an effective distance downwind of the working face; and

(f) daily cover is:

(i) located at the working face at all times,

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(ii) used to cover the working face immediately after closing at the end of each day, at a minimum, and

(iii) of sufficient quantity to control fugitive waste and nuisance.

4.4.5 The approval holder shall not deposit, at the landfill, waste that may become fugitive waste by any method when wind gusts exceed 70 kilometres per hour.

4.4.6 Notwithstanding 4.4.5, the approval holder shall not deposit, at the landfill, waste that may become fugitive waste when fugitive waste cannot be controlled within the landfill boundary.

4.4.7 With respect to fugitive emissions, the approval holder shall not release any substance that causes or may cause any of the following:

(a) impairment, degradation or alteration of the quality of natural resources;

(b) material discomfort, harm or adverse effect to the well-being or health of a person; or

(c) harm to property or to plant or animal life.

SECTION 4.5: LEACHATE MANAGEMENT

4.5.1 The approval holder shall only release leachate removed from the leachate collection system as follows:

(a) to a wastewater treatment facility holding a current Approval or Registration under the Act;

(b) to an onsite leachate pond;

(c) to an Alberta Energy Regulator approved disposal well;

(d) recirculation through landfill cells as described in the Operations Plan, as amended; or

(e) as otherwise authorized in writing by the Director.

4.5.2 Subject to 4.5.3, during landfill operations, final landfill closure and post-closure, the maximum acceptable leachate head in a landfill cell with a liner shall not exceed the limits specified in TABLE 4.5-A.

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TABLE 4.5-A MAXIMUM ACCEPTABLE LEACHATE HEAD LIMIT

Parameter	Limit
Maximum Acceptable Leachate Head	300 mm

4.5.3 Upon detection of any exceedance of the maximum acceptable leachate head limit, the approval holder shall reduce the leachate head to below 300 mm within a maximum of 14 days subsequent to the detection.

SECTION 4.6: LANDFILL RUN-ON AND RUN-OFF MANAGEMENT

4.6.1 The approval holder shall not release any substances from the landfill to the surrounding watershed except as authorized by this approval.

4.6.2 The approval holder shall manage run-off and run-on as described in the application, unless otherwise authorized in writing by the Director.

4.6.3 The approval holder shall not allow landfill run-on to enter the active landfill area.

4.6.4 The approval holder shall direct all landfill run-off from the active landfill area to the landfill run-off control systems.

4.6.5 Releases from the landfill run-off control systems to the surrounding watershed shall meet the limits for the parameters specified in TABLE 4.6-A.

TABLE 4.6-A LANDFILL RUN-OFF RELEASE LIMITS

Parameter	Concentration Limits
pH	$\geq$ 6.0 and $\leq$ 9.5 pH units
Oil and Grease	No visible sheen
Total Dissolved Solids	≤2500 mg/L
Total Suspended Solids	≤25 mg/L
Chemical Oxygen Demand	≤50 mg/L
Total Ammonia Nitrogen	≤5 mg/L
Chloride	≤250 mg/L
Sulphate	≤500 mg/L
Sodium	≤200 mg/L

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SECTION 4.7: SUBSURFACE LANDFILL GAS MANAGEMENT

4.7.1 The approval holder shall implement the Subsurface Landfill Gas Monitoring Program as described in the application, unless otherwise specified in this approval.

4.7.2 Throughout the active landfill life, final landfill closure and post-closure, the methane concentration in the subsurface landfill gas shall not exceed the limits specified in TABLE 4.7-A.

TABLE 4.7–A SUBSURFACE LANDFILL GAS EXPLOSIVE LIMITS

SAMPLING LOCATION	LIMITS
In the subsurface at the landfill boundary	50% LEL
In an on-site building or enclosed structure or in the area immediately outside the foundation of the building or structure	20% LEL
In an off-site building or enclosed structure or in the area immediately outside the foundation of the building or structure	1% LEL

SECTION 4.8: DOMESTIC WASTEWATER

4.8.1 The approval holder shall release domestic wastewater only to the domestic wastewater system with subsequent disposal to:

(a) a wastewater treatment facility holding a current Approval or Registration under the Act; or

(b) the onsite weeping tile septic field system.

4.8.2 The approval holder shall release sludge from the domestic wastewater system to a facility holding a current Approval or Registration under the Act.

SECTION 4.9: LANDFILL MONITORING AND REPORTING

LANDFILL OPERATIONS

4.9.1 The approval holder shall monitor the landfill operations as required in TABLE 4.9-A.

4.9.2 The approval holder shall report to the Director the results of the landfill operations monitoring as required in TABLE 4.9-A.

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TABLE 4.9-A LANDFILL OPERATIONS MONITORING AND REPORTING REQUIREMENTS

MONITORING				REPORTING
Monitoring Activity	Frequency	Method	Sampling Location	
Weighing and observing type of waste received	Continuously (when operating)	Measurement	At entrance to landfill	Annually
Weighing and observing type of material removed	Continuously (when operating)	Measurement	At entrance to landfill	
Detecting hazardous and prohibited waste	Continuously (when operating)	Observation, analytical results, or load inspections	At entrance to landfill and at all disposal or storage locations	
Tracking general location of waste deposited	Daily (when operating)	As per survey, or by estimation	At working face or survey co-ordinates	
Observing cover material for nuisance management	Continuously (when operating)	Observation	At active landfill area	
Tracking public complaints regarding nuisances and responses	Daily	Recording in daily log	At landfill	
Tracking fugitive waste retrieval	When fugitive waste is retrieved	Recording in daily log	At landfill or outside landfill	
Inspecting Intermediate cover	When intermediate cover is applied	Observation	At any landfill cell with an intermediate cover	
Inspecting final cover	When final cover is constructed	Survey or test core	At any closed landfill cell	
Tracking wind speed and direction	Continuously (when operating)	Measurement	At landfill	
Observing working face width and length	Daily	Observation	At working face	

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LEACHATE

4.9.3 The approval holder shall monitor leachate at the landfill as required in TABLE 4.9-B.

4.9.4 The approval holder shall report to the Director the results of the leachate monitoring as required in TABLE 4.9-B.

TABLE 4.9-B LEACHATE MONITORING AND REPORTING REQUIREMENTS

MONITORING				REPORTING
Parameters	**Frequency**	**Sampling Method**	**Sampling Location**	
Maximum acceptable leachate head	Weekly from April to October and monthly from November to March	Measurement	At each leachate manhole, pond or sump	Annually
Leachate parameters: pH Total Dissolved Solids Total Suspended Solids Ammonia (total) Total Kjeldahl Nitrogen Chloride Sodium Sulphate Chemical Oxygen Demand Biological Oxygen Demand Benzene Toluene Ethylbenzene Xylene F1 and F2 phenols Metals	Annually	(a) grab; or (b) representative grab		
Volume of leachate removed	As removed	Measurement or estimate		

SUBSURFACE LANDFILL GAS

4.9.5 The approval holder shall monitor subsurface landfill gas as required in TABLE 4.9-C.

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4.9.6 The approval holder shall compile an Annual Subsurface Landfill Gas Migration Monitoring Report which shall include, at a minimum, all of the following:

(a) the monitoring results as required in TABLE 4.9-C;

(b) an assessment of the monitoring results relative to the limits in TABLE 4.7-A;

(c) a map showing locations of subsurface landfill gas monitoring wells or probes;

(d) any information used to assess monitoring results including water level in the monitoring wells or probes and oxygen concentration in the soil gas;

(e) a recommendation for changes to the subsurface landfill gas monitoring program to make it more effective; and

(f) any other information as required in writing by the Director.

4.9.7 The Annual Subsurface Landfill Gas Monitoring Report shall be prepared by a professional registered with APEGA, or other professional authorized in writing by the Director.

TABLE 4.9-C SUBSURFACE LANDFILL GAS MONITORING AND REPORTING REQUIREMENTS

MONITORING				REPORTING
Parameters	Frequency	Sampling Location	Analytical Method	
Methane Concentration in the Soil Gas	Once per year	Subsurface landfill gas monitoring wells or probe	Field measurement with suitable portable meters or laboratory analyses	Annually
Soil Gas Pressure			Field measurement with suitable portable meters	

LANDFILL RUN-OFF

4.9.8 The approval holder shall monitor the landfill run-off control system as required in TABLE 4.9-D prior to release.

4.9.9 The approval holder shall monitor the release of landfill run-off from the landfill run-off control system as required in TABLE 4.9-D throughout the release period.

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4.9.10 The approval holder shall report to the Director the monitoring results as required in TABLE 4.9-D.

TABLE 4.9-D RUN-OFF MONITORING AND REPORTING REQUIREMENTS

MONITORING				REPORTING
Parameters	**Frequency**	**Sampling Method**	**Sampling Location**	
pH	a) prior to each release; and b) during any unanticipated release from the run-off control system	Representative grab	Each run-off control system pond from which a release (a) is to occur; or (b) is occurring	Annually
Total Dissolved Solids				
Total Suspended Solids				
Total Ammonia Nitrogen				
Chloride				
Sodium				
Sulphate				
Chemical Oxygen Demand				
Oil and Grease				
Volume	When released	Measured	Discharge point	

TONNAGE REPORTING

4.9.11 The approval holder shall submit annual tonnage records electronically to the Alberta Environment and Parks' online Waste Measurement System by March 31st of the year following the year in which the waste was accepted.

LANDFILL ANNUAL REPORT

4.9.12 The approval holder shall submit to the Director an Annual Landfill Operation Report which shall include, at a minimum, all of the following:

(a) the monitoring results required in TABLE 4.9-A, TABLE 4.9-B and TABLE 4.9-D;

(b) an assessment of the monitoring results required in TABLE 4.9-B relative to the limit specified in TABLE 4.5-A;

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(c) a summary of the performance of run-off and run-on control systems;

(d) a summary of the dates that wind gusts at the landfill exceeded 70 kilometres per hour;

(e) a summary of the dates when the landfill closed or restricted access to the working face due to wind conditions;

(f) a summary of the waste types stored pursuant to 4.3.4, including their origin;

(g) a summary of the changes to the landfill Operations Plan from the previous year;

(h) a summary of all records of landfill inspections conducted by the approval holder;

(i) a summary of landfill survey results;

(j) a summary of remedial actions taken for any subsidence and differential settlement of the closed landfill cells;

(k) a summary of any maintenance and repairs carried out for the closed landfill cells;

(l) the results of any environmental or compliance audits for the year;

(m) all the contraventions reported pursuant to 2.1.1; and

(n) any other information as required in writing by the Director.

SECTION 4.10: GROUNDWATER MANAGEMENT

4.10.1 The approval holder shall implement the Groundwater Monitoring Program as described in the Application.

4.10.2 The approval holder shall:

(a) protect from damage; and

(b) keep locked except when being sampled

all groundwater monitoring wells unless otherwise authorized in writing by the Director.

4.10.3 If a representative groundwater sample cannot be collected because the groundwater monitoring well is damaged or is no longer capable of producing a representative groundwater sample, the approval holder shall:

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(a) clean, repair or replace the groundwater monitoring well; and

(b) collect and analyse a representative groundwater sample prior to the next scheduled sampling event

unless otherwise authorized in writing by the Director.

4.10.4 In addition to the sampling information recorded in 2.2.1, the approval holder shall record the following sampling information for all groundwater samples collected:

(a) a description of purging and sampling procedures;

(b) the static elevations above sea level, and depth below ground surface of fluid phases in the groundwater monitoring well prior to purging;

(c) the temperature of each sample at the time of sampling;

(d) the pH of each sample at the time of sampling; and

(e) the specific conductance of each sample at the time of sampling.

4.10.5 The approval holder shall carry out remediation of the groundwater in accordance with the following:

(a) *Alberta Tier 1 Soil and Groundwater Remediation Guidelines*, Alberta Environment, February 2016, as amended; and

(b) *Alberta Tier 2 Soil and Groundwater Remediation Guidelines*, Alberta Environment, February 2016, as amended.

4.10.6 The approval holder shall:

(a) install; and

(b) maintain:

(i) groundwater monitoring wells along the compliance boundary in accordance with sections 5.5 and 5.6 of the Standards, or

(ii) as otherwise specified in writing by the Director.

GROUNDWATER PERFORMANCE STANDARDS

4.10.7 The approval holder shall assess groundwater monitoring data in accordance with section 5.3 of the Standards, unless otherwise specified in writing by the Director.

4.10.8 The approval holder shall immediately implement the Groundwater Contingency Plan in accordance with the application, if at any time until the End of Post-Closure the

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groundwater fails to meet the groundwater performance standards as specified in section 5.3 of the Standards.

GROUNDWATER MONITORING REPORTING

4.10.9 The approval holder shall compile an Annual Groundwater Monitoring Report which shall include, at a minimum, all of the following information:

(a) a completed *Record of Site Condition Form*, Alberta Environment, 2009, as amended;

(b) a legal description of the landfill and a map illustrating the landfill boundaries;

(c) a topographic map of the landfill;

(d) a description of the activities and processes at the landfill;

(e) a map showing the location of all surface and groundwater users, and, a listing describing surface water and water well use details, within at least a three kilometre radius of the landfill;

(f) a general hydrogeological characterization of the region within a five kilometre radius of the landfill;

(g) a detailed hydrogeological characterization of the landfill, including an interpretation of groundwater flow patterns;

(h) a cross-section(s) showing depth to water table, patterns of groundwater movement and hydraulic gradients at the landfill;

(i) borehole logs and completion details for groundwater monitoring wells;

(j) a map showing locations of all known buried channels within at least five kilometres of the landfill;

(k) a map of surface drainage within the landfill and surrounding area to include nearby water bodies;

(l) a map of groundwater monitoring well locations and a table summarizing the existing groundwater monitoring program for the landfill;

(m) a summary of any changes to the groundwater monitoring program made since the last groundwater monitoring report;

(n) analytical data recorded as required in 4.10.1 and 4.10.3 (b);

(o) a summary of fluid elevations recorded as required in 4.10.4 (b) and an interpretation of changes in fluid elevations;

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(p) an interpretation of the quality assurance/quality control program results;

(q) an interpretation of all the data in this report, including the following:

(i) diagrams indicating the location and extent of any contamination,

(ii) a description of probable sources of contamination, and

(iii) a site map showing the location and type of current and historical potential sources of groundwater contamination;

(r) a summary and interpretation of the data collected since the groundwater monitoring program began including:

(i) control charts which indicate trends in concentrations of parameters, and

(ii) the migration of contaminants;

(s) a description of the following:

(i) contaminated groundwater remediation techniques employed,

(ii) source elimination measures employed,

(iii) risk assessment studies undertaken, and

(iv) risk management studies undertaken;

(t) a sampling schedule for the following year(s);

(u) a description of any contaminant remediation, risk assessment or risk management action conducted at the landfill; and

(v) recommendations for changes to the groundwater monitoring program to make it more effective.

4.10.10 If the Groundwater Monitoring Report is found deficient by the Director, the approval holder shall correct all deficiencies identified in writing by the Director, within the timeline specified in writing by the Director.

PART 5: FINAL LANDFILL CLOSURE AND POST-CLOSURE

5.1.1 The approval holder shall apply for an amendment to this approval for the final landfill closure by submitting to the Director :

(a) a Detailed Final Landfill Closure Plan; and

(b) a Landfill Post-Closure Plan.

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5.1.2 The approval holder shall submit the amendment application referred to in 5.1.1 within 180 days of the landfill ceasing operations, unless otherwise authorized in writing by the Director.

5.1.3 The Detailed Final Landfill Closure Plan shall be developed in accordance with sections 6.1(b) and 6.1(c) of the Standards.

5.1.4 In addition to 5.1.3, the Detailed Final Landfill Closure Plan shall include all of the following:

(a) a plan for replacement of soil;

(b) a quality assurance/quality control program;

(c) any deviations from the most recently submitted closure plan; and

(d) any other information as required in writing by the Director.

5.1.5 The Detailed Final Landfill Closure Plan shall be signed and stamped by a professional registered with APEGA.

5.1.6 The Landfill Post-Closure Plan shall be developed in accordance with sections 6.2 and 6.3 of the Standards.

5.1.7 In addition to 5.1.6, the Landfill Post-Closure Plan shall include all of the following:

(a) a groundwater monitoring program including performance standards and points of compliance;

(b) a leachate monitoring program including leachate quantity and quality performance standards;

(c) a subsurface landfill gas monitoring program including performance standards and points of compliance;

(d) a plan for soil erosion control; and

(e) any other information as required in writing by the Director.

DEC 14 2016

DATE

Kathleen Murphy

DESIGNATED DIRECTOR UNDER THE ACT