

# APPROVAL

## PROVINCE OF ALBERTA

### **ENVIRONMENTAL PROTECTION AND ENHANCEMENT ACT** **R.S.A. 2000, c.E-12, as amended.**

APPROVAL NO.: 20954-01-00

APPLICATION NO.: 004-20954

EFFECTIVE DATE: October 2, 2015

EXPIRY DATE: October 1, 2025

APPROVAL HOLDER: Aquatera Utilities Inc.

ACTIVITY: construction, operation and reclamation of the

Aquatera Class II Landfill with Bioreactor Cells where more than

10,000 tonnes per year of non-hazardous waste are disposed of

is subject to the attached terms and conditions.

Designated Director under the Act:   
Okey Obiajulu

Date Signed: October 2, 2015

## **TERMS AND CONDITIONS ATTACHED TO APPROVAL**

### **PART 1: DEFINITIONS**

#### **SECTION 1.1: DEFINITIONS**

- 1.1.1 All definitions from the Act and the regulations apply except where expressly defined in this approval.
- 1.1.2 In all PARTS of this approval:
- (a) "Act" means the *Environmental Protection and Enhancement Act*, R.S.A. 2000, c.E-12, as amended;
  - (b) "AER" means Alberta Energy Regulator;
  - (c) "active landfill area" means the portion of the landfill that has received or is receiving waste for disposal, where final cover has not been placed and includes areas that are being used for interim management of waste and recyclables prior to disposition;
  - (d) "APEGA" means the Association of Professional Engineers and Geoscientists of Alberta;
  - (e) "application" means the written submissions from the approval holder to the Director in respect of application number 004-20954 and any subsequent applications where amendments are issued for this approval;
  - (f) "as-built plans" means survey plans, signed and stamped by a professional registered by APEGA, that document variances from design or construction plans that were either approved or authorized according to terms and conditions of this approval;
  - (g) "bioreactor landfill or bioreactor cell" means any landfill or landfill cell where liquid and/or air is injected in a controlled fashion into the waste mass in order to accelerate or enhance bio-stabilization of the waste;
  - (h) "bulk liquid" means a liquid transported in a vehicle tank or body that is not contained in barrels or other such containers;
  - (i) "cell" means compacted wastes enclosed by a liner or cover in a landfill;
  - (j) "Class II landfill" means a landfill for the disposal of waste, as defined in the Waste Control Regulation (AR 192/96) as amended;
  - (k) "clay liner" means a liner that is meeting the specifications in section 3.5(c) of the *Standards*;

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- (l) "COD" means Chemical Oxygen Demand;
- (m) "compliance boundary" means locations where measurements of groundwater quality for regulatory purposes are taken to assess a landfill performance;
- (n) "composite liner" means a liner meeting the specifications in section 3.5(d) of the *Standards*;
- (o) "construction quality assurance" means an integrated system of management activities involving planning, implementation, documentation, assessment, reporting and quality improvement to identify the level to which construction is in compliance with the specifications;
- (p) "construction quality control" means the overall system of technical activities that measures the attributes and performance of construction to verify that construction meets the specifications;
- (q) "container" means any portable device in which a substance is kept, including but not limited to drums, barrels and pails;
- (r) "cover" means soil or other material that is used to cover compacted waste in a cell;
- (s) "day" means any sampling period of 24 consecutive hours unless otherwise specified;
- (t) "decommissioning" means the dismantling and decontamination of a landfill undertaken subsequent to the termination or abandonment of any activity or any part of any activity regulated under the Act;
- (u) "decontamination" means the treatment or removal of substances from the landfill and affected lands, excluding waste approved or disposed;
- (v) "Director" means an employee of the Government of Alberta designated as a Director under the Act;
- (w) "dismantling" means the removal of buildings, structures, processes and pollution abatement equipment, vessels, storage facilities, material handling facilities, railways, roadways, pipelines and any other installations that are being or have been used or held for or in connection with the landfill;
- (x) "domestic wastewater system" means the parts of the landfill that collect, store or treat domestic wastewater from the landfill;

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- (y) "explosive" means explosive as defined in the Explosives Act R.S.C., 1985, c.E-17, as amended;
- (z) "final cover" means final cover as defined in the *Standards*;
- (aa) "final landfill closure" means final landfill closure as defined in the *Standards*;
- (bb) "fugitive emissions" means emissions of substances to the atmosphere and surrounding environment other than ozone depleting substances, originating from a landfill source other than a flue, vent, or stack but does not include sources which may occur due to breaks or ruptures in process equipment;
- (cc) "fugitive waste" means substances originating from the landfill that are moved by natural forces, including but not limited to the following:
  - (i) styrofoam;
  - (ii) paper;
  - (iii) cardboard; or
  - (iv) plastic;
- (dd) "HDPE" means High Density Polyethylene;
- (ee) "ISO 17025" means the international standard, developed and published by International Organization for Standardization (ISO), specifying management and technical requirements for laboratories;
- (ff) "incompatible wastes" means waste materials which could cause dangerous reactions from direct contact with one another;
- (gg) "landfill" means all buildings, structures, landfill cells, storage facilities, weigh scale, waste or material handling facilities, leachate control system, trenches, roadways, berms, fences, run-on and run-off control systems, equipment, groundwater monitor wells, storm water retention ponds, pipelines, survey control points and benchmarks, and other installations, and includes the land, located within the NW ¼, NE ¼ and SE ¼ of Section 2, Township 71, Range 6, West of the 6th Meridian;
- (hh) "landfill cell" means a designed or designated area of a landfill comprised of an excavation or earthen structure in which waste is enclosed;

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- (ii) "landfill post-closure" means the period of time after completion of the final landfill closure;
- (jj) "landfill run-off" means any rainwater or melt water that drains as surface flow from the active landfill area, excluding leachate or breakout of leachate from the active landfill cell above grade;
- (kk) "landfill run-off control system" means the parts of the landfill that collect, store or treat run-off from the landfill;
- (ll) "landfill run-on" means any rainwater or melt water that drains or may drain as surface flow onto the active landfill area;
- (mm) "landfill run-on control system" means parts of the landfill that diverts landfill run-on away from the active landfill area;
- (nn) "lateral expansion" means an expansion of the waste boundaries of a landfill beyond the property area of the NW ¼, NE ¼ and SE ¼ of Section 2, Township 71, Range 6, West of the 6th Meridian;
- (oo) "leachate" means a liquid that has been in contact with waste in the landfill cell and has undergone chemical and physical changes;
- (pp) "leachate collection system" means a system that gathers leachate so that it may be removed from a landfill;
- (qq) "leachate control system" means a system that includes the leachate collection system, leachate storage, and any treatment areas for the purpose of controlling, managing and removing leachate from the landfill;
- (rr) "liner" means a continuous layer along the bottom and at the sides of a landfill cell that is compatible with the waste and restricts the migration of leachate or landfill gas, or both;
- (ss) "local environmental authority" means Alberta Environment and Parks, in the Province of Alberta, or the agency that has the equivalent responsibilities for any jurisdiction within the Province;
- (tt) "lower subsoil" means the layer of soil directly below the topsoil layer that consists of the C-horizons as defined in *The Canadian System of Soil Classification*, (Third Edition), Agriculture and Agri-Food Canada, Publication 1646, 1998, as amended;

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- (uu) "maximum acceptable leachate head" means the maximum depth of leachate above the primary liner, not including the sumps or leachate pipe trenches;
- (vv) "monitoring system" means all equipment used for sampling, conditioning, analyzing or recording data in respect of any parameter listed or referred to in this approval including equipment used for continuous monitoring;
- (ww) "municipal solid waste" means solid waste resulting from or incidental to municipal, community, commercial, institutional and recreation activities, and includes garbage, rubbish, ashes, street cleanings, and all other solid wastes except hazardous waste, industrial solid waste, oilfield waste and biomedical wastes, as defined in the *Waste Control Regulation, Alberta Regulation 192/1996*, as amended;
- (xx) "points of compliance" means the location or locations where measurements of groundwater quality, subsurface gas emissions and other substances released into the environment are taken to assess landfill and waste treatment performance;
- (yy) "post-closure period" means the period of 25 years from final closure of a landfill, or so long as groundwater and leachate that do not meet the performance criteria set out in this approval, are generated at a waste management facility;
- (zz) "primary liner" means the uppermost liner of the composite liner;
- (aaa) "professional" means professional geologist or engineer registered and licensed with the Association of Professional Engineers, Geoscientists of Alberta (APEGA);
- (bbb) "protective layer" means a layer of material that protects a clay liner or final cover from freezing or dessication;
- (ccc) "QA/QC" means construction quality assurance and construction quality control;
- (ddd) "soil" means unconsolidated mineral or organic surficial materials which can be, have been, or are being, altered by weathering, biological processes, or human activity;
- (eee) "Standards" means the *Standards for Landfills in Alberta, Alberta Environment, 2010*, as amended;

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- (fff) "structural components" means leachate/liquids collection systems, leachate/liquids distribution systems, air injection systems, gas collection systems, leakage collection systems and/or other landfill components necessary to enhance the performance of the landfill cell, and to protect human health and the environment;
- (ggg) "sulphur waste" means the definition of sulphur waste as described in the *Guidelines for Landfill Disposal of Sulphur Waste and Remediation of Sulphur Containing Soils*, Alberta Environment, September 2011, as amended;
- (hhh) "tank" means a stationary device, designed to contain an accumulation of a substance, which is constructed primarily of non-earthen materials that provide structural support including wood, concrete, steel, and plastic;
- (iii) "topsoil" means the uppermost layer of soil and consists of:
- (i) the A horizons and all organic horizons as defined in *The Canadian System of Soil Classification*, Third Edition, Agriculture and Agri-Food Canada, Publication 1646, 1998, as amended, and
  - (ii) the soil ordinarily moved during tillage;
- (jjj) "upper subsoil" means the layer of soil directly below the topsoil layer that consists of the B horizons as defined in *The Canadian System of Soil Classification*, Third Edition, Agriculture and Agri-Food Canada, Publication 1646, 1998, as amended;
- (kkk) "waste storage area" means the area designated for waste container storage and/or waste tank storage as described in the application;
- (lll) "week" means any consecutive 7-day period;
- (mmm) "working face" means that portion of the active landfill area where waste is currently being placed, deposited, spread and compacted; and
- (nnn) "year" means calendar year, unless otherwise specified in this approval.

### **PART 2: GENERAL**

#### **SECTION 2.1: GENERAL**

- 2.1.1 The approval holder shall immediately report, to the Director by telephone at 780-422-4505, any contravention of the terms and conditions of this approval.

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- 2.1.2 The approval holder shall submit a written report to the Director within 7 days of reporting pursuant to 2.1.1.
- 2.1.3 The approval holder shall immediately notify the Director in writing if any of the following events occurs:
- (a) the approval holder is served with a petition into bankruptcy;
  - (b) the approval holder files an assignment in bankruptcy or Notice of Intent to make a proposal;
  - (c) a receiver or receiver-manager is appointed;
  - (d) an application for protection from creditors is filed for the benefit of the approval holder under any creditor protection legislation; or
  - (e) any of the assets which are the subject matter of this approval are seized for any reason.
- 2.1.4 If the approval holder monitors for any substances or parameters which are the subject of operational limits as set out in this approval more frequently than is required and using procedures authorized in this approval, then the approval holder shall provide the results of such monitoring as an addendum to the reports required by this approval.
- 2.1.5 All abbreviations used in this approval follow those given in the *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods*, US EPA, SW-846, September 1986, and *Standard Methods for the Examination of Water and Wastewater*, American Public Health Association, American Water Works Association, Water Environment Federation, as amended, or as otherwise specified in the approval.
- 2.1.6 The approval holder shall submit all annual reports required by this approval to be compiled or submitted to the Director on or before March 31 of the year following the year in which the information was collected, unless otherwise specified in this approval.

### **SECTION 2.2: RECORD KEEPING**

- 2.2.1 The approval holder shall record and retain all of the following information in respect of any sampling conducted or analyses performed in accordance with this approval for a minimum of ten years, unless otherwise authorized in writing by the Director:
- (a) the place, date and time of sampling;
  - (b) the dates the analyses were performed;

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- (c) the analytical techniques, methods or procedures used in the analyses;
- (d) the names of the persons who collected and analysed each sample; and
- (e) the results of the analyses.

### **SECTION 2.3: ANALYTICAL REQUIREMENTS**

2.3.1 With respect to any sample required to be taken pursuant this approval, the approval holder shall ensure that:

- (a) collection,
- (b) preservation,
- (c) storage,
- (d) handling, and
- (e) analysis;

shall be conducted in accordance with the following or otherwise as specified in writing by the Director:

(i) for leachate, landfill run-off, groundwater and domestic wastewater:

- (A) *Standard Methods for the Examination of Water and Wastewater*, published jointly by the American Public Health Association, American Water Works Association, and the Water Environment Federation, 2012, as amended;

(ii) for soil:

- (A) the *Soil Monitoring Directive*, Alberta Environment, May 2009, as amended; and
- (B) the *Soil Quality Criteria Relative to Disturbance and Reclamation*, Alberta Agriculture, March 1987, as amended;

(iii) for waste:

- (A) the *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods*, USEPA, SW-846; September 1986, as amended;

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- (B) the *Methods Manual for Chemical Analysis of Water and Wastes*, Alberta Environmental Centre, Vegreville, Alberta, 1996, AECV96-M1, as amended;
  - (C) the *Toxicity Characteristic Leaching Procedure (TCLP)*, USEPA Regulation 40 CFR261, Appendix II, Method No. 1311, as amended, or
  - (D) the *Standard Methods for the Examination of Water and Wastewater*, published jointly by the American Public Health Association, American Water Works Association, and the Water Environment Federation, 2012, as amended.
- 2.3.2 The approval holder shall analyze all samples that are required to be obtained by this approval in a laboratory accredited pursuant to ISO 17025, as amended, for specific parameter(s) to be analyzed, unless otherwise authorized in writing by the Director.
- 2.3.3 The term sample used in 2.3.2 does not include samples directed to continuous monitoring equipment, unless specifically required in writing by the Director.
- 2.3.4 The approval holder shall comply with the terms and conditions of any written authorization issued by the Director under 2.3.2.

### **SECTION 2.4: OTHER**

- 2.4.1 The terms and conditions of this approval are severable. If any term or condition of this approval, or the application of any term or condition is held invalid, the application of such term or condition to other circumstances and the remainder of this approval shall not be affected thereby.
- 2.4.2 Any conflict between the *Standards*, and the terms and conditions of this approval shall be resolved in favour of the approval.
- 2.4.3 *Environmental Protection and Enhancement Act* Approval No. 20954-00-00 is cancelled.
- 2.4.4 All tanks shall conform to the *Guidelines for Secondary Containment for Above Ground Storage Tanks*, Alberta Environmental Protection, 1997, as amended, unless otherwise authorized in writing by the Director.

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### **PART 3: CONSTRUCTION**

#### **SECTION 3.1: WASTE MANAGEMENT CONSTRUCTION**

3.1.1 Prior to commencing construction of any of the following:

- (a) landfill cell(s) including structural components,
- (b) bioreactor cell(s) including structural components,
- (c) final cover of landfill cell(s),
- (d) final cover of bioreactor cell(s),
- (e) landfill-run off control system,
- (f) landfill run-on control system;

the approval holder shall submit the following to the Director, unless otherwise authorized in writing by the Director, the following plans for the proposed construction, stamped and signed by a professional registered with APEGA:

- (A) a Detailed Construction Plan and Specifications for the proposed construction,
- (B) a Construction Quality Assurance Plan, and
- (C) a Construction Quality Control Plan.

3.1.2 If any documents in 3.1.1 are found deficient by the Director, the approval holder shall correct all deficiencies as outlined in writing by the Director within the timeline specified in writing by the Director.

3.1.3 The approval holder shall implement any work outlined in 3.1.1 as authorized in writing by the Director prior to commencement of construction.

3.1.4 During construction, the approval holder shall not make any deviation that results in an adjustment to the Design Plan and Specifications in 3.1.1, unless the following conditions are met:

- (a) the deviation results in a minor adjustment to the Design Plan and Specifications to suit field conditions encountered; and
- (b) the deviation will result in an equivalent design performance of the landfill.

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- 3.1.5 The approval holder shall submit to the Director a summary report of the Construction Quality Assurance and Construction Quality Control results stamped and signed by a professional registered with APEGA, prior to commencing operation of a new landfill cell in 3.1.1, excluding the placement of waste in a new cell as a protective layer.
- 3.1.6 The summary report in 3.1.5 shall contain the following information, at a minimum:
- (a) a summary of the construction performed, including inspection data sheets, problem identification and corrective measures reports, that confirms that the landfill has been constructed according to:
    - (i) the Construction Quality Assurance Plan;
    - (ii) the Construction Quality Control Plan; and
    - (iii) the Detailed Construction Plan and Specifications subject to the deviations as per 3.1.4;
  - (b) a description of any minor deviations as per 3.1.4;
  - (c) confirmation by a professional registered with APEGA, that deviations as per 3.1.4 will not reduce landfill performance;
  - (d) as-built drawings;
  - (e) photo-documentation of relevant construction QA/QC details and issues; and
  - (f) any other information as required in writing by the Director.
- 3.1.7 The Detailed Construction Plan and Specification in 3.1.1 for the construction of any new cell shall be in accordance with:
- (a) section 3.5(c) of the *Standards* for landfill cell(s) or
  - (b) section 3.5(d) of the *Standards* for bioreactor cells.
- 3.1.8 The Design Plan and Specifications in 3.1.1 for any final cover shall be in accordance with:
- (a) section 6.1(c) of the *Standards* for landfill cell(s); and
  - (b) design standards for bioreactor cell(s) as authorized in writing by the Director.

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3.1.9 Prior to installation of any of the following:

- (a) hydrogen sulphide removal system,
- (b) siloxane removal system,
- (c) flare stacks(s), or
- (d) gas transmission pipeline;

the approval holder shall submit design, plans and specifications to the Director, as a notification.

### **SECTION 3.2: SOIL CONSERVATION**

3.2.1 The approval holder shall not use topsoil for cover of the working face.

3.2.2 The approval holder shall:

- (a) salvage; and
- (b) conserve

all topsoil for reclamation of the landfill.

3.2.3 The approval holder shall:

- (a) salvage; and
- (b) conserve

all upper subsoil for reclamation of the landfill.

3.2.4 The approval holder shall:

- (a) salvage; and
- (b) conserve

all lower subsoil for reclamation of the landfill unless otherwise authorized in writing by the Director.

3.2.5 The approval holder shall:

- (a) conserve; and

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(b) stockpile

all topsoil, upper subsoil, and lower subsoil separately from each other.

3.2.6 The approval holder shall place all:

(a) topsoil stockpiles;

(b) upper subsoil stockpiles; and

(c) lower subsoil stockpiles

at the landfill.

3.2.7 The approval holder shall stockpile all topsoil, as follows:

(a) on stable foundations; and

(b) on undisturbed topsoil.

3.2.8 The approval holder shall stockpile all upper subsoil, as follows:

(a) on stable foundations; and

(b) on areas where topsoil has been removed.

3.2.9 The approval holder shall stockpile all lower subsoil, as follows:

(a) on stable foundations; and

(b) on areas where topsoil has been removed.

3.2.10 The approval holder shall take all steps necessary to prevent erosion, including but not limited to, all of the following:

(a) re-vegetating the topsoil and upper subsoil stockpiles; and

(b) any other steps authorized in writing by the Director.

3.2.11 The approval holder shall immediately suspend conservation of:

(a) topsoil;

(b) upper subsoil; and

(c) lower subsoil

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when wet or frozen conditions will result in mixing, loss or degradation or compaction of topsoil or subsoil.

3.2.12 The approval holder shall recommence conservation of:

- (a) topsoil;
- (b) upper subsoil; and
- (c) lower subsoil

only when conditions in 3.3.11 no longer exist.

### **SECTION 3.3: RESEARCH AND PILOT WORK**

3.3.1 Any research or pilot work shall be performed in such a manner that the terms and conditions of the approval are met or as authorized in writing by the Director.

## **PART 4: OPERATIONS, LIMITS, MONITORING AND REPORTING**

### **SECTION 4.1: GENERAL**

4.1.1 The approval holder shall maintain the geographical boundaries of the landfill located within the NW ¼, NE ¼ and SE ¼ of Section 2, Township 71, Range 6, West of the 6th Meridian, as described in the application.

4.1.2 The approval holder shall:

- (a) operate; and
- (b) maintain

the following waste management activities at the landfill:

- (i) waste disposal areas, including:
  - (A) landfill cell(s) and
  - (B) bioreactor cell(s);
- (ii) waste storage and resource recovery areas;
- (iii) leachate control system;
- (iv) structural components; and

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- (v) a gas conditioning and compressor building;

as described in the application.

4.1.3 In addition to 4.1.2 the approval holder shall:

- (a) operate; and
- (b) maintain

all of the following infrastructure components at the landfill:

- (i) any landfill run-off control system,
- (ii) any landfill run-on control system,
- (iii) groundwater monitoring wells,
- (iv) stockpiles of topsoil, upper subsoil, lower subsoil and inert excavated material,
- (v) a weigh scale with office building,
- (vi) equipment building(s),
- (vii) site fencing including electrical fencing and access control, and
- (viii) on-site all weather road;

as described in the application.

4.1.4 The approval holder shall:

- (a) erect; and
- (b) maintain

signs at the landfill entrance as per section 4.9 of the *Standards*.

4.1.5 The approval holder shall:

- (a) audit the landfill to assess compliance with the terms and conditions of this approval; and
- (b) compile the results of the audit into an Audit Report.

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- 4.1.6 The audit in section 4.1.5 shall be:
- (a) conducted by an independent third party environmental consultant or organization; and
  - (b) conducted at least once every three years, commencing in 2018.
- 4.1.7 The approval holder shall submit the Audit Report in 4.1.5 to the Director as part of:
- (a) the annual report required in 4.12.2.

### **LANDFILL OPERATOR CERTIFICATION**

- 4.1.8 The operation of the landfill shall be supervised by a Certified Operator in accordance with section 4.1 of the *Standards*.

### **SECTION 4.2: OPERATIONS PLAN**

- 4.2.1 The approval holder shall develop, maintain, and implement an Operations Plan that is in accordance with:
- (a) this approval.
- 4.2.2 The Operations Plan shall include, at a minimum, all of the following information:
- (a) an organization plan describing roles, responsibilities and lines of communication;
  - (b) the requirements of Section 4.3 of the *Standards*; and
  - (c) operating procedures for the equipment in the gas conditioning and compressor building.
- 4.2.3 The approval holder shall submit to the Director a working copy of the Operations Plan in 4.2.2 when requested in writing by the Director.
- 4.2.4 The approval holder shall correct all deficiencies in the Operations Plan as outlined in writing by the Director, within the timeline specified in writing by the Director.
- 4.2.5 The approval holder shall manage the Operations Plan, as follows:
- (a) retain a copy of the Operations Plan at the landfill;
  - (b) review the Operations Plan annually, at a minimum;

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- (c) update the Operations Plan if any of the following circumstances apply:
  - (i) there are facility expansions or changes in site operations and equipment,
  - (ii) there is a change in the *Standards*, as amended, and
  - (iii) an update is required in writing by the Director.
- (d) submit any changes to the Operations Plan as part of the Landfill Annual Reporting in 4.12.

### **SECTION 4.3: WASTE ACCEPTANCE**

- 4.3.1 The approval holder shall develop waste acceptance policies and procedures in accordance with section 4.4 of the *Standards*, as amended and this approval.
- 4.3.2 The approval holder shall not dispose of the following at the landfill:
  - (a) hazardous waste;
  - (b) bulk liquid waste, excluding:
    - (i) liquid sump waste, and
    - (ii) liquids and/or leachate required to enhance the bio-reactor landfill process;
  - (c) chemical container(s) containing liquids greater than 5 litres;
  - (d) domestic wastewater;
  - (e) explosive(s);
  - (f) radioactive waste;
  - (g) biomedical waste; and
  - (h) ozone depleting substances.
- 4.3.3 Except as provided for in 4.3.4, if any waste listed in 4.3.2 is received at the landfill, the approval holder shall remove it from the landfill within:
  - (a) seven days of receipt; or

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- (b) another time period authorized in writing by the Director.
- 4.3.4 The approval holder shall remove the following waste from designated storage areas within 365 days of acceptance:
  - (a) household hazardous waste; and
  - (b) ozone depleting substances from white goods.
- 4.3.5 The approval holder shall store the following waste on-site, unless otherwise authorized in writing by the Director:
  - (a) household hazardous waste; and
  - (b) ozone depleting substances from white goods.
- 4.3.6 The approval holder shall dispose of waste in 4.3.2 to:
  - (a) facilities holding a current Approval, Registration or as otherwise authorized under the Act;
  - (b) facilities approved by a local environmental authority outside of Alberta; or
  - (c) as otherwise authorized in writing by the Director.
- 4.3.7 The approval holder shall prevent direct contact of incompatible waste with one another.

### **SPECIAL WASTES**

- 4.3.8 The approval holder shall dispose of asbestos waste in accordance with *Guidelines for the Disposal of Asbestos Waste*, Alberta Protection Services, Alberta Environment, 1989 as amended.
- 4.3.9 The approval holder shall dispose of sulphur waste in accordance with *Guidelines for Landfill Disposal of Sulphur Wastes and Remediation of Sulphur Containing Soils*, Alberta Environment, 2011 as amended.
- 4.3.10 The approval holder shall manage biomedical waste in compliance with the *Guidelines for the Management of Biomedical Waste in Canada*, published by the Canadian Council of Ministers of the Environment.
- 4.3.11 The approval holder shall cover the following immediately after disposal at the landfill:
  - (a) dead animals;

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- (b) animal parts; and
  - (c) meal and bone meal.
- 4.3.12 The approval holder may accept municipal wastewater sludge that passes the EPA *Paint Filter Liquid Test* (Method 9095B), as amended.
- 4.3.13 The approval holder may store municipal wastewater sludge in 4.3.12 in the topsoil stock area.
- 4.3.14 Prior to the acceptance of any industrial wastewater sludge, the approval holder shall be in receipt of an authorization in writing by the Director.
- 4.3.15 The approval holder shall only use hydrocarbon contaminated soil as cover material if it meets the limits specified in specified in TABLE 4.3-A.

**TABLE 4.3-A: HYDROCARBON CONTAMINATED SOIL LIMITS WHEN USED AS COVER**

PARAMETER	LIMIT
Total Petroleum Hydrocarbons	Less than 20,000 mg/kg
Chloride	Less than 3,000 mg/kg
Flashpoint	Greater than 61°C

**NUISANCE MANAGEMENT**

- 4.3.16 The approval holder shall take all necessary measures to control nuisances within the landfill boundary in accordance with the *Standards*.
- 4.3.17 The approval holder shall retrieve all fugitive waste outside of the landfill boundary at a minimum once per week.
- 4.3.18 With respect to fugitive emissions or any source of emissions not specified in this approval, 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: or
  - (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.

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### **SECTION 4.4: LEACHATE MANAGEMENT**

- 4.4.1 The approval holder shall only dispose of leachate removed from the leachate collection system as follows:
- (a) to a wastewater treatment facility for which there is a current Approval or Registration under the Act;
  - (b) recirculation through bioreactor cells in accordance with the application;
  - (c) to an on-site leachate treatment facility authorized in writing by the Director; or
  - (d) as otherwise authorized in writing by the Director.
- 4.4.2 The approval holder may store leachate in tank(s) according to 2.4.4 and dispose of the leachate according to 4.4.1.

### **SECTION 4.5: LANDFILL RUN-ON AND RUN-OFF MANAGEMENT**

#### **MANAGEMENT**

- 4.5.1 The approval holder shall not release any substances from the landfill to the surrounding watershed except as authorized by this approval.
- 4.5.2 The approval holder shall manage landfill run-on and landfill run-off as described in the application, unless otherwise authorized in writing by the Director.
- 4.5.3 The approval holder shall not allow run-on to enter the active landfill area.
- 4.5.4 The approval holder shall direct all landfill run-off from the active landfill area to any landfill run-off control system when installed and in operation.
- 4.5.5 The approval holder shall only release landfill run-off from the landfill run-off control system to the surrounding watershed at the discharge point of the landfill run-off control system when installed and in operation.

#### **LIMITS**

- 4.5.6 Releases from the landfill run-off control system according to 4.5.5 shall meet the least stringent of the following:
- (a) the limits for the parameters specified in TABLE 4.5-A, or

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- (b) the representative background levels for any parameter that naturally exceeds the objectives specified in TABLE 4.5-A.

**TABLE 4.5-A: LANDFILL RUN-OFF CONTROL SYSTEM LIMITS**

PARAMETER	PARAMETER OR CONCENTRATION LIMIT
pH	>6.0 or <9.5 pH units
Oil and Grease	No visible sheen
Total Dissolved Solids	≤ 2500 mg/L
Total Suspended Solids	≤ 25 mg/L
Ammonia nitrogen	≤ 5 mg/L
Chloride	≤ 250 mg/L
Sodium	≤ 200 mg/L
Sulphate	≤ 500 mg/L
Chemical Oxygen Demand	≤ 100 mg/L
Total Petroleum Hydrocarbons (TPH)	≤ 10 mg/L

**SECTION 4.6: SUBSURFACE LANDFILL GAS**

**MANAGEMENT**

- 4.6.1 The approval holder shall develop a proposal for a Subsurface Landfill Gas Monitoring Program in accordance with section 5.11 of the *Standards*.
- 4.6.2 The approval holder shall submit the proposal for the Subsurface Landfill Gas Monitoring Program to the Director by March 31<sup>st</sup>, 2016.
- 4.6.3 If the Subsurface Landfill Gas Monitoring Program proposal is found deficient by the Director, the approval holder shall correct all deficiencies as outlined in writing by the Director, within the timeline specified in writing by the Director.

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4.6.4 The approval holder shall implement the Subsurface Landfill Gas Monitoring Program as authorized in writing by the Director.

4.6.5 The approval holder shall implement any updates of the Subsurface Landfill Gas Monitoring Program as authorized in writing by the Director.

**LIMITS**

4.6.6 Subsurface landfill gas at the sampling locations shall not exceed the explosive gas limits in TABLE 5.5 of the *Standards*.

**SECTION 4.7: DOMESTIC WASTEWATER**

4.7.1 The approval holder shall dispose off-site of wastewater or sludge to a facility holding a current Approval or Registration under the Act.

**SECTION 4.8: MONITORING AND REPORTING – LANDFILL**

**LANDFILL OPERATIONS**

4.8.1 The approval holder shall monitor the landfill operations as required in TABLE 4.8-A.

4.8.2 The approval holder shall report to the Director the results of the landfill operations monitoring as required in TABLE 4.8-A.

**TABLE 4.8-A: LANDFILL OPERATIONS - MONITORING AND REPORTING REQUIREMENTS**

MONITORING/MEASURING/OBSERVING				REPORTING
Monitoring/ Measuring Activity	Frequency	Sample Type	Sampling Location	
Weighing and observing the type of waste received	Continuously (when operating)	Measured	At entrance to landfill	Annually, on or before March 31 <sup>st</sup> of the year following the year in which the information was collected
Weighing and observing type of material removed	Continuously (when operating)	Measured	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	

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MONITORING/MEASURING/OBSERVING				REPORTING
Monitoring/ Measuring Activity	Frequency	Sample Type	Sampling Location	
Tracking general location of waste deposited	Continuously (when operating)	As per survey, or by estimation	At active portion of cell or survey co-ordinates	
Observing cover material for nuisance management	Continuously (when operating)	Observation	At active portion of cell.	
Tracking public complaints regarding nuisances and responses	Actions taken when a complaint has been received	Record in daily Log	Landfill or off-site	
Tracking fugitive waste retrieval	When fugitive waste is retrieved	Record in daily Log	Landfill or off-site	Annually, on or before March 31 <sup>st</sup> of the year following the year in which the information was collected
Checking final and intermediate cover material	When cover material is applied	Intermediate cover by observation; final cover by survey or test cores.	On each completed cell	
Observing working face width	Daily	Observation	At active portion of cell	

**LEACHATE**

4.8.3 The approval holder shall monitor the landfill leachate collection system in accordance with Section 5.9 of the *Standards*.

**SUBSURFACE LANDFILL GAS**

4.8.4 When authorized in 4.6.4, the approval holder shall monitor subsurface landfill gas as required in TABLE 4.8-B.

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**TABLE 4.8-B: SUBSURFACE LANDFILL GAS MONITORING AND REPORTING**

MONITORING				REPORTING
Monitoring Activity	Frequency	Method	Sampling Location	
Subsurface Landfill Gas (Methane)	Yearly	Methods as authorized in writing by the Director	Landfill gas monitoring wells or groundwater monitoring wells suitable for subsurface landfill gas monitoring as described in the application	Annual

4.8.5 When authorized in 4.6.4, the approval holder shall report to the Director the results of the subsurface landfill gas monitoring as required in TABLE 4.8-B.

4.8.6 The subsurface landfill gas monitoring data shall be interpreted by a professional registered with APEGA to determine the potential impacts from subsurface migration of landfill gas.

**LANDFILL RUN-OFF**

4.8.7 The approval holder shall monitor the Landfill Run-off Control System as required in TABLE 4.8.C, prior to any release to the surrounding natural environment.

4.8.8 The approval holder shall monitor the release of landfill run-off from the Landfill Run-off Control System as required in TABLE 4.8-C throughout the release period.

4.8.9 The approval holder shall report to the Director the results of the Landfill Run-off Control System as required in TABLE 4.8-C.

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**TABLE 4.8-C: RUN-OFF CONTROL WATER MONITORING AND REPORTING REQUIREMENTS**

MONITORING						REPORTING
PARAMETER, TEST, EVENT, STUDY PROPOSAL OR REPORTING REQUIREMENT	PRIOR TO RELEASE		THROUGHOUT THE RELEASE PERIOD			
	Frequency	Sample Type	Frequency	Sample Type	Sample Location	
Discharge volume (m3)	-	-	Once/day	Volume estimate	At point of release	Annual
pH	Once	Representative grab	Once/day	Grab	At point of release	
Oil and grease						
Total Dissolved Solids (mg/L)	Once	Representative grab	According to section 5.7 of the <i>Standards</i>	Grab	At point of release	
Total Suspended Solids (mg/L)						
Ammonia nitrogen (mg/L)						
MONITORING						REPORTING
PARAMETER, TEST, EVENT, STUDY PROPOSAL OR REPORTING REQUIREMENT	PRIOR TO RELEASE		THROUGHOUT THE RELEASE PERIOD			
	Frequency	Sample Type	Frequency	Sample Type	Sample Location	
Chloride (mg/L)	Once	Representative	According	Grab	At point	Annual
Sodium (mg/L)						
Sulphate (mg/L)						
Chemical Oxygen Demand (mg/L)						
Total Petroleum Hydrocarbons (mg/L)						

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### **SECTION 4.9: ANNUAL LANDFILL REPORTING**

- 4.9.1 The approval holder shall submit to the Director, a Landfill Annual Report in accordance with section 7.5(c) of the *Standards*.
- 4.9.2 In addition to the requirements in 4.9.1, the Landfill Annual Report shall include:
- (a) a summary of the results of the monitoring required and performed in TABLE 4.8-A, TABLE 4.8-B and TABLE 4.8-C;
  - (b) a summary assessment of the results of any monitoring as required in TABLE 4.8-C relative to the limits in 4.5.6;
  - (c) a copy of the interpretation of the subsurface landfill gas monitoring data performed in 4.8.8.
  - (d) a summary of the changes to the landfill Operations Plan from the previous year;
  - (e) all records of landfill inspections conducted by the approval holder;
  - (f) the results of any environmental or compliance audits for the year pursuant to 4.1.7;
  - (g) all the contraventions reported pursuant to 2.1.1;
  - (h) annual closure report as required in Part 5; and
  - (i) any other information requested in writing by the Director.

### **TONNAGE REPORTING**

- 4.9.3 The approval holder submit annual tonnage records electronically to the Alberta Environment and Park's online Waste Measurement System by March 31<sup>st</sup> of the year following the year in which the waste was accepted.

### **SECTION 4.10: GROUNDWATER MANAGEMENT**

#### **GROUNDWATER MONITORING PROGRAM**

- 4.10.1 The approval holder shall implement the Groundwater Monitoring Program described in the application.

## **TERMS AND CONDITIONS ATTACHED TO APPROVAL**

4.10.2 The approval holder shall:

- (a) install; and
- (b) maintain:
  - (i) groundwater monitoring wells along the compliance boundary in accordance with section 5.5 and 5.6 of the *Standards*, or
  - (ii) as otherwise specified in writing by the Director.

### **GROUNDWATER PERFORMANCE STANDARDS**

4.10.3 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.

4.10.4 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 groundwater fails to meet:

- (a) the groundwater performance standards as specified in section 5.4 of the *Standards*; or
- (b) the representative alternate background groundwater level for any parameter that naturally exceeds the objective established in section 5.4 for that parameter.

### **GROUNDWATER MONITORING REPORTING**

4.10.5 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 five kilometer radius of the landfill;

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- (f) a general hydrogeological characterization of the region within a five kilometer radius of the landfill;
- (g) a detailed hydrogeological characterization of the landfill, including an interpretation of groundwater flow patterns;
- (h) a cross-section 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 kilometers 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 4.13.1 and 4.13.2(b);
- (o) a summary of fluid elevations recorded as required in 4.13.2(b) and an interpretation of changes in fluid elevations;
- (p) an interpretation of QA/QC 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

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- (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 contaminated 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.
- 4.10.6 The Annual Groundwater Monitoring Report shall be signed and stamped by a professional registered with APEGA, or other professional authorized in writing by the Director.
- 4.10.7 If the Annual 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.

### **SECTION 4.11: FINANCIAL SECURITY REQUIREMENTS**

Not used at this time.

## **PART 5: FINAL CLOSURE, RECLAMATION AND POST-CLOSURE**

### **SECTION 5.1: LANDFILL CELL CLOSURE AND MAINTENANCE**

- 5.1.1 The approval holder shall undertake final closure and reclamation of the individual landfill cells in accordance with the closure plan specified in the application, unless otherwise authorized in writing by the Director.
- 5.1.2 The approval holder shall undertake final closure and reclamation of the individual bioreactor cells as authorized in writing by the Director.

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- 5.1.3 The approval holder shall maintain the closed landfill cells or closed bioreactor cells to:
- (a) maintain the integrity of the final cover
  - (b) prevent erosion;
  - (c) prevent surface water ponding;
  - (d) remediate areas affected by subsidence and differential settlement; and
  - (e) prevent leachate break out.
- 5.1.4 If the approval holder completed final landfill cell closure in 5.1.1 or final bioreactor cell closure in 5.1.2, the approval holder shall prepare an Annual Cell Closure Report, and shall include, at a minimum, all of the following:
- (a) as-built plans and details on the location of cells that have been closed;
  - (b) certified construction QA/QC procedures employed during cover construction and installation;
  - (c) survey reports showing the final cover depths; and
  - (d) any other information as required in writing by the Director.
- 5.1.5 The approval shall submit the Annual Landfill Cell Closure report with the Landfill Annual Report required in 4.9.
- 5.1.6 The approval holder shall notify the Director in writing prior to opening or expanding any closed cell(s) for the purpose of waste disposal.

### **SECTION 5.2: FINAL LANDFILL CLOSURE AND POST-CLOSURE**

- 5.2.1 The approval holder shall apply for an amendment to this approval for final landfill closure, by submitting to the Director all of the following:
- (a) a Detailed Final Landfill Closure Plan, and
  - (b) a Landfill Post-Closure Plan.
- 5.2.2 The approval holder shall submit the amendment application referred to in 5.2.1 within 180 days of the landfill ceasing operations, unless otherwise authorized by the Director.

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- 5.2.3 The Detailed Final Landfill Closure Plan shall be developed in accordance with:
- (a) sections 6.1(b) and 6.1(c) of the *Standards*; and
  - (b) any other information as required in writing by the Director.
- 5.2.4 In addition to 5.2.3, 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; and
  - (c) any deviations from the most recently submitted closure plan.
- 5.2.5 The Detailed Final Landfill Closure Plan shall be signed and stamped by a professional registered with APEGA.
- 5.2.6 The Landfill Post-Closure Plan shall be developed in accordance with:
- (a) sections 6.2 and 6.3 of the *Standards*, and
  - (b) any other conditions as required in writing by the Director.
- 5.2.7 In addition to 5.2.6, the Landfill Post-Closure Plan shall include all of the following:
- (a) a plan for maintaining the gas conditioning and compressor building;
  - (b) a plan for maintaining vegetative cover;
  - (c) a plan for maintaining the landfill run-off and landfill run-on control system
  - (d) a plan for maintaining the structural components;
  - (e) a plan to maintain the integrity of the landfill during emergencies; and
  - (f) any other information requested in writing by the Director.

DATE: October 2, 2015



DESIGNATED DIRECTOR UNDER THE ACT  
Okey Obiajulu