State of Utah

GARY R. HERBERT
Governor

SPENCER J. COX
Lieutenant Governor

Department of
Environmental Quality

L. Scott Baird
Executive Director

DIVISION OF WASTE MANAGEMENT
AND RADIATION CONTROL

Ty L. Howard
Director

December 13, 2019

Issa Hamud, Director
Logan City Environmental Department
153 North 1400 West
Logan, UT 84321-3740

RE: Logan City Class I Landfill Permit

Dear Mr. Hamud:

The 30-day public comment period for the Logan City Class I Landfill draft permit began September 20, 2019 and ended October 21, 2019. No comments were received.

Enclosed is the final Permit 9902R3 with an effective date of December 13, 2019 and an expiration date of December 12, 2029.

If you have any questions, please contact Doug Taylor at (801) 536-0240.

Sincerely,

Ty L. Howard, Director
Division of Waste Management and Radiation Control

TLH/DT/kl

Enclosures: Permit (DSHW-2019-002581)
Attachment #1 (DSHW-2019-006365)
Attachment #2 (DSHW-2019-006363)
Attachment #3 (DSHW-2019-006364)

c: Issa Hamud, Environmental Director, Logan City
Lloyd Berentzen, MBA, Health Officer, Bear River Health Department
Grant Koford, EHS, Environmental Health Director, Bear River Health Department
Brett Mickelson, IGES

DSHW-2019-016704

DIVISION OF WASTE MANAGEMENT AND RADIATION CONTROL SOLID WASTE LANDFILL PERMIT

City of Logan
CLASS I LANDFILL

Pursuant to the provision of the Utah Solid and Hazardous Waste Act, Title 19, Chapter 6, Part 1, Utah Code Annotated (Utah Code Ann.) (the Act) and the Utah Solid Waste Permitting and Management Rules, R315-301 through 320 of the Utah Administrative Code adopted thereunder, a Permit is issued to:

Logan City Corporation
as owner (Permittee),

is hereby approved to operate the Logan City Sanitary Class I Landfill located in Cache County, Utah as shown in the permit renewal application.

The Permittee is subject to the requirements of R315-301 through 320 of the Utah Administrative Code and the requirements set forth herein.

All references to R315-301 through 320 of the Utah Administrative Code are to regulations that are in effect on the date that this permit becomes effective.

This Permit shall become effective December 13, 2019.

This Permit shall expire at midnight December 12, 2029.

Closure Cost Revision Date: December 13, 2024.

Signed this 13th day of December 2019.

Ty L. Howard, Director
Division of Waste Management and Radiation Control

FACILITY OWNER/OPERATOR INFORMATION

LANDFILL NAME:	Logan City Class I Landfill
OWNER NAME:	City of Logan
OWNER ADDRESS:	153 West 1400 North Logan, Utah 84341
OWNER PHONE NO.:	435-716-9755
OPERATOR NAME:	City of Logan
OPERATOR ADDRESS:	153 West 1400 North Logan, Utah 84341
OPERATOR PHONE NO.:	435-716-9755
TYPE OF PERMIT:	Class I Landfill
FACILITY LOCATION:	Southwest 1/4 section of Section 31, Township 12 North, Range 1 East, Salt Lake Base and Meridian
PERMIT NUMBER:	Permit number 9432R3
PERMIT HISTORY	Permit Renewal Signed December 13, 2019

The term, "Permit," as used in this document is defined in R315-301-2(55) of the Utah Administrative Code. Director as used throughout this permit refers to the Director of the Division of Waste Management and Radiation Control.

The Permit renewal application for the Logan City Class I Landfill was deemed complete on the date on the signature page of this Permit. All representations made in the attachments of this permit are enforceable under R315-301-5(2) of the Utah Administrative Code. Where differences in wording exist between this Permit and the attachments, the wording of this Permit supersedes that of the attachments.

This Permit consists of the signature page, Facility Owner/Operator Information section, sections I through IV, and all attachments to this Permit.

The facility as described in this Permit consists of a Class I disposal cell as well as accumulation areas for recycling materials, an area for household hazardous waste collection, a used oil collection area, an area for waste tire collection and a green waste accumulation area associated with a composting operation.

Compliance with this Permit does not constitute a defense to actions brought under any other local, state, or federal laws. This Permit does not exempt the Permittee from obtaining any other local, state or federal permits or approvals required for the facility operation.

The issuance of this Permit does not convey any property rights, other than the rights inherent in this Permit, in either real or personal property, or any exclusive privileges other than those inherent in this Permit. Nor does this Permit authorize any injury to private property or any invasion of personal rights, nor any infringement of federal, state or local laws or regulations, including zoning ordinances.

The provisions of this Permit are severable. If any provision of this Permit is held invalid for any reason, the remaining provisions shall remain in full force and effect. If the application of any provision of this Permit to any circumstance is held invalid, its application to other circumstances shall not be affected.

By this Permit, the Permittee is subject to the following conditions.

PERMIT REQUIREMENTS

I. GENERAL COMPLIANCE RESPONSIBILITIES

I.A. General Operation

I.A.1. The Permittee shall operate the landfill in accordance with all applicable requirements of R315-301 through 320 of the Utah Administrative Code, for a Class I landfill, that are in effect as of the date of this Permit unless otherwise noted in this Permit. Any permit noncompliance or noncompliance with any applicable portions of Utah Code Ann. § 19-6-101 through 126 and applicable portions of R315-301 through 320 of the Utah Administrative Code constitutes a violation of the Permit or applicable statute or rule and is grounds for appropriate enforcement action, permit revocation, modification, or denial of a permit renewal application.

I.B. Acceptable Waste

I.B.1. This Permit is for the disposal of non-hazardous solid waste that may include:

I.B.1.a Municipal solid waste as defined by R315-301-2(47) of the Utah Administrative Code;

I.B.1.b Commercial waste as defined by R315-302-2(14) of the Utah Administrative Code;

I.B.1.c Industrial waste as defined by R315-302-2(35) of the Utah Administrative Code;

I.B.1.d Construction/demolition waste as defined by R315-301-2(17) of the Utah Administrative Code;

I.B.1.e Special waste as allowed by R315-315 of the Utah Administrative Code and authorized in section III-I of this Permit and limited by this section;

I.B.1.f Conditionally exempt small quantity generator hazardous waste as specified in R315-303-4(7)(a)(i)(B) of the Utah Administrative Code; and

I.B.1.g PCB's as specified by R315-315-7(2) of the Utah Administrative Code.

I.B.1.h Acceptable wastes are restricted to wastes that are received under sole contracts with local governments, within Utah, for waste generated within the boundaries of the local government. Each contract shall be approved by the Director prior to acceptance of the waste at the landfill.

I.C. Prohibited Waste

I.C.1. Hazardous waste as defined by R315-1 and R315-2 of the Utah Administrative Code except as allowed in permit condition I-B (Acceptable Waste) above;

I.C.2. Containers larger than household size (five gallons) holding any liquid; non-containerized material containing free liquids; or any waste containing free liquids in containers larger than five gallons; or

I.C.3. PCB's as defined by R315-301-2(53) of the Utah Administrative Code, except as allowed in Section I-B (Acceptable Waste) of this Permit. Any prohibited waste received and accepted for treatment, storage, or disposal at the facility shall constitute a violation of this Permit, of Utah Code Ann. § 19-6-101 through 126 and of R315-301 through 320 of the Utah Administrative Code.

I.D. Inspections and Inspection Access

I.D.1. The Permittee shall allow the Director or an authorized representative, or representatives from the Bear River Health Department, to enter at reasonable times and:

I.D.1.a Inspect the landfill or other premises, practices or operations regulated or required under the terms and conditions of this Permit or R315-301 through 320 of the Utah Administrative Code;

I.D.1.b Have access to and copy any records required to be kept under the terms and conditions of this Permit or R315-301 through 320 of the Utah Administrative Code;

I.D.1.c Inspect any loads of waste, treatment facilities or processes, pollution management facilities or processes, or control facilities or processes required under this Permit or regulated under R315-301 through 320 of the Utah Administrative Code; and

I.D.1.d Create a record of any inspection by photographic, video, electronic, or any other reasonable means.

I.E. Noncompliance

I.E.1. If monitoring, inspection, or testing indicates that any permit condition or any applicable rule under R315-301 through 320 of the Utah Administrative Code may be or is being violated, the Permittee shall promptly make corrections to the operation or other activities to bring the facility into compliance with all permit conditions or rules.

I.E.2. In the event of noncompliance with any permit condition or violation of an applicable rule, the Permittee shall promptly take any action reasonably necessary to correct the noncompliance or violation and mitigate any risk to human health or the environment. Actions may include eliminating the activity causing the noncompliance or violation and containment of any waste or contamination using barriers or access restrictions, placing of warning signs, or permanently closing areas of the facility.

I.E.3. The Permittee shall:

I.E.3.a Document the noncompliance or violation in the daily operating record, on the day the event occurred or the day it was discovered;

I.E.3.b Notify the Director by telephone within 24 hours, or the next business day following documentation of the event; and

I.E.3.c Give written notice of the noncompliance or violation and measures taken to protect human health and the environment within seven days after Director notification.

I.E.4. Within thirty days after the documentation of the event, the Permittee shall submit to the Director a written report describing the nature and extent of the noncompliance or violation and the remedial measures taken or to be taken to protect human health and the environment and to eliminate the noncompliance or violation. Upon receipt and review of the assessment report, the Director may order the Permittee to perform appropriate remedial measures including development of a site remediation plan for approval by the Director.

I.E.5. In an enforcement action, the Permittee may not claim as a defense that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with R315-301 through 320 of the Utah Administrative Code and this Permit.

I.F. Revocation

I.F.1. This Permit is subject to revocation if the Permittee fails to comply with any condition of the Permit. The Director will notify the Permittee in writing prior to any proposed revocation action and such action shall be subject to all applicable hearing procedures established under R305-7 of the Utah Administrative Code and the Utah Administrative Procedures Act.

I.G. Attachment Incorporation

I.G.1.a Attachments to the Permit Application are incorporated by reference into this Permit and are enforceable conditions of this Permit, as are documents incorporated by reference into the attachments. Language in this Permit supersedes any conflicting language in the attachments or documents incorporated into the attachments.

I.H. DESIGN AND CONSTRUCTION

I.H.1. Design and Construction

I.H.1.a The Permittee shall construct any landfill cell, sub-cell, run-on diversion system, runoff containment system, waste treatment facility, leachate handling system, or final cover in accordance with design submitted as part of the Permit Application and in accordance with R315-301 through 320 of the Utah Administrative Code.

I.H.2. Run-On Control

I.H.2.a The Permittee shall construct drainage channels and diversions as specified in the Permit Application and shall maintain them at all times to effectively prevent runoff from the surrounding area from entering the landfill.

II. LANDFILL OPERATION

II.A. Operations Plan

II.A.1. The Permittee shall keep the Operations Plan included in Attachment I on site at the landfill or at the location designated in Section II.A. of this Permit. The Permittee shall operate the landfill in accordance with the operations plan. If necessary, the Permittee may modify the Operations Plan, provided that the modification meets all of the requirements of R315-301 through 320 of the Utah Administrative Code, is as protective of human health and the environment as the Operations Plan approved as part of this Permit, and is approved by the Director as a minor modification under R315-311-2 of the Utah Administrative Code. The Permittee shall note any modification to the Operations Plan in the daily operating record.

II.A.1.a Security

II.A.1.a.(i) The Permittee shall operate the Landfill so that unauthorized entry to the facility is restricted. The Permittee shall:

II.A.1.a.i.A Lock all facility gates and other access routes during the time the landfill is closed.

II.A.1.a.i.B Have at least one person employed by the Permittee at the landfill during all hours that the landfill is open.

II.A.1.a.i.C Construct all fencing and any other access controls as shown in the Permit Application to prevent access by persons or livestock by other routes.

II.B. Training

II.B.1. The Permittee shall provide training for on-site personnel in landfill operation, including waste load inspection, hazardous waste identification, and personal safety and protection.

II.C. Burning of Waste

II.C.1. Intentional burning of solid waste is prohibited and is a violation of R315-303-4(2)(b) of the Utah Administrative Code.

II.C.2. The Permittee shall extinguish all accidental fires as soon as reasonably possible.

II.D. Daily Cover

II.D.1. The Permittee shall completely cover the solid waste received at the landfill at the end of each working day with a minimum of six inches of earthen material. The Permittee may use an alternative daily cover material when the material and the application of the alternative daily cover meets the requirements of R315-303-4(4)(b) through (e) of the Utah Administrative Code.

II.E. Ground Water Monitoring

II.E.1. The Permittee shall monitor the ground water underlying the landfill in accordance with the Ground Water Monitoring Plan and the Ground Water Monitoring Quality Assurance/Quality Control Plan contained in Attachment 2. If necessary, the Permittee may modify the Ground Water Monitoring Plan and the Ground Water Monitoring Quality Assurance/Quality Control Plan, provided that the modification meets all of the requirements of R315-301 through 320 of the Utah Administrative Code and is as protective of human health and the environment as that approved in the Permit Application, and is approved by the Director as a minor modification under R315-311-2(1)(a) of the Utah Administrative Code. The Permittee shall note in the daily operating record any modification to the Ground Water Monitoring Plan and the Ground Water Monitoring Quality Assurance/Quality Control Plan. A plan change that the Director finds to be less protective of human health or the environment than the approved plan is a major modification and is subject to the requirements of R315-311 of the Utah Administrative Code.

II.F. Gas Monitoring

II.F.1. The Permittee shall monitor explosive gases at the landfill in accordance with the Gas Monitoring Plan contained in Attachment 2 and shall otherwise meet the requirements of R315-303-3(5) of the Utah Administrative Code. If necessary, the Permittee may modify the Gas Monitoring Plan, provided that the modification meets all of the requirements of R315-301 through 320 of the Utah Administrative Code and is as protective of human health and the environment as that approved in the Permit Application, and is approved by the Director as permit modification under R315-311-2 of the Utah Administrative Code. The Permittee shall note any modification to the Gas Monitoring Plan in the daily operating record.

II.F.2. If the concentrations of explosive gases at any of the facility structures, at the property boundary, or beyond the property boundary ever exceed the standards set in R315-303-2(2)(a) of the Utah Administrative Code, the Permittee shall:

II.F.2.a Immediately take all necessary steps to ensure protection of human health and notify the Director;

II.F.2.b Within seven days of detection, place in the daily operating record the explosive gas levels detected and a description of the immediate steps taken to protect human health;

II.F.2.c Implement a remediation plan that meets the requirements of R315-303-3(5)(b) of the Utah Administrative Code; and

II.F.2.d Submit the remediation plan to the Director for review and approval prior to implementation.

II.G. Waste Inspections

II.G.1. The Permittee shall visually inspect incoming waste loads to verify that no wastes other than those allowed by this permit are disposed in the landfill. The Permittee shall conduct a complete waste inspection at a minimum frequency of 1 % of incoming loads, but no less than one complete inspection per day. The Permittee shall select the loads to be inspected on a random basis.

II.G.2. The Permittee shall inspect all loads suspected or known to have one or more containers capable of holding more than five gallons of liquid to ensure that each container is empty.

II.G.3. The Permittee shall inspect all loads that the Permittee suspects may contain a waste not allowed for disposal at the landfill.

II.G.4. The Permittee shall conduct complete random inspections as follows:

II.G.4.a The Permittee shall conduct the random waste inspection at the working face or an area designated by the Permittee.

II.G.4.b The Permittee shall direct that loads subjected to complete inspection be unloaded at the designated area;

II.G.4.c Loads shall be spread by equipment or by hand tools;

II.G.4.d Personnel trained in hazardous waste recognition and recognition of other unacceptable waste shall conduct a visual inspection of the waste; and

II.G.4.e The personnel conducting the inspection shall record the results of the inspection on a waste inspection form and shall place the form in the daily operating record at the end of the operating day.

II.G.4.f The Permittee or the waste transporter shall properly dispose of any waste found that is not acceptable at the facility at an approved disposal site for the waste type and handle the waste according to the rules covering the waste type.

II.H. Disposal of Special Wastes

II.H.1. If a load of incinerator ash is accepted for disposal, the Permittee shall transport it to the place of disposal in such a manner as to prevent leakage or the release of fugitive dust. The Permittee shall completely cover the ash with a minimum of six inches of material, or the Permittee shall use other methods or material, if necessary, to control fugitive dust. The Permittee may use ash for daily cover when its use does not create a human health or environmental hazard.

Animal carcasses may be disposed at the bottom of the landfill working face and must be covered with other solid waste or earth by the end of the operating day in which they are received. Alternatively, animal carcasses may be disposed in a special trench or pit prepared for the acceptance of dead animals. If a special trench is used, animals placed in the trench shall be covered with six inches of earth by the end of each operating day.

Asbestos waste shall be handled and disposed in accordance with R315-315- 2) of the Utah Administrative Code.

II.I. Self Inspections

II.I.1. The Permittee shall inspect the facility to prevent malfunctions and deterioration, operator errors, and discharges that may cause or lead to the release of wastes or contaminated materials to the environment or create a threat to human health or the environment. The Permittee shall complete these general inspections no less than quarterly and shall cover the following areas: Waste placement, compaction, cover; fences and access controls; roads; run-on/run-off controls; ground water monitoring wells; final and intermediate cover; litter controls; and records. The Permittee shall place a record of the inspections in the daily operating record on the day of the inspection. The Permittee shall correct the problems identified in the inspections in a timely manner and document the corrective actions in the daily operating record.

II.J. Recordkeeping

II.J.1. The Permittee shall maintain and keep on file at the Administration Building, a daily operating record and other general records of landfill operation as required by R315-302-2(3). The landfill operator, or other designated personnel, shall date and sign the daily operating record at the end of each operating day. Each record to be kept shall contain the signature of the appropriate operator or personnel and the date signed. The Daily operating record shall consist of the following two types of documents:

II.J.1.a Records related to the daily landfill operation or periodic events including:

II.J.1.a.(i) The number of loads of waste and the weights or estimates of weights or volume of waste received each day of operation and recorded at the end of each operating day;

II.J.1.a.(ii) Major deviations from the approved plan of operation, recorded at the end of the operating day the deviation occurred;

II.J.1.a.(iii) Results of monitoring required by this Permit, recorded in the daily operating record on the day of the event or the day the information is received;

II.J.1.a.(iv) Records of all inspections conducted by the Permittee, results of the inspections, and corrective actions taken, recorded in the record on the day of the event.

II.J.1.b Records of a general nature including:

II.J.1.b.(i) A copy of this Permit, including the Permit Application;

II.J.1.b.(ii) Results of inspections conducted by representatives of the Director, and of representatives of the local Health Department, when forwarded to the Permittee;

II.J.1.b.(iii) Closure and Post-closure care plans; and

II.J.1.b.(iv) Records of employee training.

II.K. Reporting

II.K.1. The Permittee shall prepare and submit to the Director an Annual Report as required by R315-302-2(4) of the Utah Administrative Code. The Annual Report shall include: the period covered by the report, the annual quantity of waste received, an annual update of the financial assurance mechanism, and all training programs completed.

II.L. Roads

II.L.1. The Permittee shall improve and maintain all access roads within the landfill boundary that are used for transporting waste to the landfill for disposal. The roads shall be improved and maintained as necessary to assure safe and reliable all-weather access to the disposal area.

II.M. Litter Control

II.M.1. Litter resulting from operations of the landfill shall be minimized. In addition to the litter control plans found in Attachment 1 of the Permit, the Permittee shall implement the following procedures when high wind conditions are present:

II.M.1.a Reduce the size of the tipping face;

II.M.1.b Reduce the number of vehicles allowed to discharge at the tipping face at one time;

II.M.1.c Orient vehicles to reduce wind effects on unloading and waste compaction;

II.M.1.d Reconfigure tipping face to reduce wind effect;

II.M.1.e Use portable and permanent wind fencing as needed; and

II.M.1.f Should high winds present a situation that the windblown litter cannot be controlled, the Permittee shall cease operations of the landfill until the winds diminish.

III. CLOSURE REQUIREMENTS

III.A. Closure

III.A.1. The Permittee shall install final cover of the landfill as shown in Attachment 3. The final cover shall meet, at a minimum, the standard design for closure as specified in the R315-303-3(4) of the Utah Administrative Code plus sufficient cover soil or equivalent material to protect the low permeability layer from the effects of frost, desiccation, and root penetration. The Permittee shall submit to the Director a quality assurance plan for construction of the final landfill cover, and approval of the plan shall be received from the Director prior to construction of any part of the final cover at the landfill. A qualified person not affiliated with the Permittee or the construction contractor shall perform permeability testing on the recompacted clay placed as part of the final cover.

III.A.2. Title Recording

III.A.2.a The Permittee shall meet the requirements of R315-302-2(6) of the Utah Administrative Code by recording a notice with the Cache County Recorder as part of the record of title that the property has been used as a landfill. The notice shall include waste disposal locations and types of waste disposed. The Permittee shall provide the Director the notice as recorded.

III.B. Post-Closure Care

III.B.1. The Permittee shall perform post-closure care at the closed landfill in accordance with the Post-Closure Care Plan contained in Attachment 3. Post-closure care shall continue until all waste disposal sites at the landfill have stabilized and the finding of R315-302-3(7)(c) of the Utah Administrative Code is made.

III.C. Financial Assurance

III.C.1. The Permittee shall keep in effect and active the currently approved financial assurance mechanism or another approved mechanism that meets the requirements of R315-309 of the Utah Administrative Code and is approved by the Director to cover the costs of closure and post-closure care at the landfill. The Permittee shall adequately fund and maintain the financial assurance mechanism(s) to provide for the cost of closure at any stage or phase or anytime during the life of the landfill or the permit life, whichever is shorter.

III.D. Financial Assurance Annual Update

III.D.1. The Permittee shall submit an annual revision of closure and post-closure costs for inflation and financial assurance funding as required by R315-309-2(2) of the Utah Administrative Code, to the Director as part of the annual report. The Permittee shall submit the information as required in R315-309-8 of the Utah Administrative Code and shall meet the qualifications for the "Local Government Financial Test" each year.

III.E. Closure Cost and Post-Closure Cost Revision

III.E.1. The Permittee shall submit a complete revision of the closure and post-closure cost estimates by the Closure Cost Revision Date listed on the signature page of this Permit and any time the facility is expanded, any time a new cell is constructed, or any time a cell is expanded.

IV. ADMINISTRATIVE REQUIREMENTS

IV.A. Permit Modification

IV.A.1. Modifications to this Permit may be made upon application by the Permittee or by the Director. The Permittee shall be given written notice of any permit modification initiated by the Director.

IV.B. Permit Transfer

IV.B.1. This Permit may be transferred to a new Permittee by complying with the permit transfer provisions specified in R315-310-11 of the Utah Administrative Code.

IV.C. Expansion

IV.C.1. This Permit is for a Class I Landfill. The permitted landfill shall operate according to the Design and Operations Plan described and explained in this Permit. Any expansion of the current footprint designated in the description contained in the Permit Application, but within the property boundaries designated in the Permit Application, shall require submittal of plans and specifications to the Director. The plans and specifications shall be approved by the Director prior to construction.

IV.C.2. Any expansion of the landfill facility beyond the property boundaries designated in the description contained in the Permit Application shall require submittal of a new permit application in accordance with the requirements of R315-310 of the Utah Administrative Code.

IV.D. Expiration

IV.D.1. If the Permittee desires to continue operating this landfill after the expiration date of this Permit, the Permittee shall submit an application for permit renewal at least six months prior to the expiration date, as shown on the signature (cover) page of this Permit. If the Permittee timely submits a permit renewal application and the permit renewal is not complete by the expiration date, this Permit shall continue in force until renewal is completed or denied.

Attachments
Attachment 1 – Plan of Operation
Attachment 2 – Ground Water Monitoring
Attachment 3 - Closure and Post Closure

Attachment 1
Plan of Operation

SECTION 3 – OPERATIONS PLAN

This Operations Plan has been written to address the requirements of UAC R315-302-2 and briefly describes the operations of the Logan Landfill.

A more extensive document titled City of Logan Landfill Plan of Operation (Plan of Operation) contains more detailed information regarding specific operating procedures that apply to the entire solid waste, recycling and composting activities. The purpose of the Plan of Operation is to provide the Manager and operating personnel with standard procedures for day-to-day operation of the landfill. The City of Logan Landfill Plan of Operation is included as Appendix E.

The primary function of the Logan Landfill is to provide for the responsible disposal of MSW and C&D wastes generated by the citizens of Cache County. The landfill is operated in accordance with the UAC R315-301 through 320.

3.1 SCHEDULE OF CONSTRUCTION

Currently operations at the Logan Landfill are occurring near the center of landfill. All landfill operations consist of the importing, compacting, and covering of wastes with soil. All materials brought to the landfill are being disposed at or above original surface elevations. The majority of the 90-acre (85 acres of MSW and 5 acres of C&D) waste footprint has been covered with at least one level of disposed material. There are no plans to expand the landfill footprint (lateral expansion) therefore all landfill will occur only in areas previously permitted.

Soil is utilized as the primary cover material on the working faces. Soil is imported in from sources outside the landfill boundaries. Some soil comes from overburden from construction projects around the Cache Valley area with the majority of cover soil imported from property west of the landfill. The property west of the landfill is owned by Logan City and is being

converted to a planned wetland by the removal of soil for landfill use. Soil excavated in the wetland development is excavated during the summer months when the ground is dry enough to work and hauled to the landfill for use during the year. Additional operational soil will be obtained from the construction of the new Logan City Wastewater Plant.

3.2 WASTE STREAM MANAGEMENT - DESCRIPTION OF HANDLING PROCEDURES

3.2.1 General

A waste control program designed to detect and deter attempts to dispose of hazardous and other unacceptable wastes will continue to be implemented at the Logan Landfill in conjunction with the operation of the transfer station. The program is designed to protect the health and safety of employees, customers, and the general public, as well as to protect against the contamination of the environment.

The landfill is open for public and private disposal. Signs posted near the landfill entrance clearly indicate (1) the types of wastes that are accepted; (2) the types of wastes not accepted at the site; and (3) the penalty for illegal disposal.

The following procedures are practiced at the Logan Landfill to deter disposal of hazardous and unacceptable waste. All waste entering the facility must stop at the scale house. The scale house is operated by at least one scale house attendant. The scale house attendant asks the waste hauler what kind of waste they are bringing to the landfill and whether there are any tires, batteries, used oil, paint, computer monitors or refrigerators in their loads.

The scalehouse personnel also inquire as to the contents of each incoming load to screen for unacceptable materials. Any vehicle suspected of carrying unacceptable materials (liquid waste, sludges, or hazardous waste) are prevented from entering the disposal site unless the driver can provide evidence that the waste is acceptable for disposal at the site. Logan Landfill reserves the right to refuse service to any suspect load. Vehicles carrying unacceptable materials are required to exit the site without discharging their loads, and the

Bear River Health Department is informed about the incident. If a load is suspected of containing unacceptable materials, the following information is recorded: date, time, name of the hauler, driver, telephone number of hauler, vehicle license plate, and source of the waste. The scalehouse then notifies the working face operator that a load is suspect, then that load is further inspected at the landfill tipping area before final disposal is allowed. Appendix E contains the forms utilized to document waste inspections.

After a vehicle leaves the scalehouse, the vehicle is routed to the appropriate discharge location. All MSW loads are sent to the transfer station (with the exception of rare disruptions of transfer station operations) with all C&D loads being directed to the Logan Landfill. All loads are regularly surveyed and or inspected at each tipping area. If a discharged load contains inappropriate or unacceptable material, the discharger is required to reload the material and remove it from the landfill site. If the discharger is not immediately identified, the area where the unacceptable material was discharged is cordoned off. Unacceptable material is moved to a designated area for identification and preparation for proper disposal.

3.2.2 Waste Acceptance

The Logan personnel utilize two software packages (SMSTurbo and Inoprise) in the scale house to record information about incoming loads. The software records scale weights, waste type, account information and amount charged. With this program landfill personnel are able to track all incoming waste as well as bill and receive payment from all customers. When a vehicle with waste stops on the scale; the scale operator identifies the load as to whether it is a commercial hauler, general public or private individual with an account. The proper codes are entered into the computer identifying the material, hauler, and account number. All loads larger than a pickup or a single axle trailer are weighed and charged accordingly. This information is printed on a two-part ticket; the customer receives one copy and one copy is saved for use by the Manager, the Utility Billing Editor or any other employee who has responsibilities relating to the landfill that may need information from these tickets. The tickets are ultimately stored in the archive at the Logan City Environmental Center. All transactions are backed up on a nightly basis to the Logan City computer network. Data extracted from the scale house computer is used to create a portion of the daily landfill record. Any or all transactions may be retrieved as necessary. A copy of a typical Daily Operating

Record, Daily Cash Reconciliation & Revenue Receipt, and Material Summary Reports are included in Appendix E.

After each load has been recorded, the driver is directed where to take the load. The bulk of household wastes and commercial wastes are directed to the transfer station for transfer to NVL with any animal by-products and small dead animals being directed to the Logan Landfill. Large dead animals will be directed to the Logan Landfill working face. Green wastes and manure are directed to the composting facility with C&D materials being directed to the Logan Landfill working face.

Waste screening is done as needed or scheduled according to the procedures outlined in Section 3.3 Waste Inspection. No open burning is allowed. No smoking is allowed anywhere on the landfill, green waste facility, or near the transfer station.

3.2.3 Waste Disposal

Due to the newly constructed NVL, the bulk of the waste delivered to the landfill are C&D wastes. MSW is delivered to the landfill periodically if there are disruptions to the transfer station or NVL operations.

Wastes are dumped at the toe of the work face when possible and spread up the slope in one to two-foot lifts, keeping the slope at a maximum of three to one (horizontal to vertical) configuration.

Work face dimensions are kept narrow enough to minimize blowing litter and reduce the amount of material needed for daily cover. Typically, the width of the working face is two and one-half times the width of the dozer blade (40 feet). This facilitates complete compaction of the waste and keeps the width narrow enough to minimize amount of daily cover required.

Typically, the compactor is operated with the blade facing uphill. Equipment operations across the slope are avoided to minimize the potential of equipment tipping over.

Grade stakes are used when necessary to control cell height and top surface grade. The top of the interim surfaces typically ranges from 2 to 5 percent to promote runoff with the cell heights ranging from 8 to 10 feet.

Wastes are compacted by making three to five passes up and down the slope. Compaction reduces litter, differential settlement, and the quantities of cover soil needed. Care is taken that no holes are left in the compacted waste. Voids are filled with additional waste as they develop.

Intermediate cover is applied to all areas of the active cell which will not receive additional waste within 30 days. Intermediate cover consists of an additional 12 inches of soil being placed over the 6 inches of daily cover soil.

3.2.4 Special Wastes

3.2.4.1 Used Oil and Batteries

Used oil and batteries will not be accepted at the Logan Landfill. All used oil or batteries brought to the facility will be handled as part of the transfer station operation.

3.2.4.2 Bulky Wastes

White goods will not be disposed of at the Logan Landfill. White goods and bulky wastes are separated for recycling. All appliances containing refrigerants are segregated in a separate area, with refrigerant being removed by a qualified contractor. Used cars are not accepted at the Logan Landfill. Persons seeking to dispose of used car bodies are directed to take the car to Western Metals located near Plymouth, Utah.

3.2.4.3 Tires

Logan Landfill charges for tires from the general public. Commercial haulers are prohibited from disposing of tires at the landfill. All tires are stored in a designated tire storage area. When sufficient quantities of tires are collected, a tire hauler is contacted, and the tires are removed from the facility for recycling.

3.2.4.4 Dead Animals

Dead animals are accepted at the Logan Landfill. A designated trench is prepared for the acceptance of these animals. They are collected in the trench and a minimum of 6" of cover is placed over the animals at the end of each day. In the event the trench is inaccessible, the dead animals are incorporated into the face of the landfill. The incorporation of the carcasses into the landfill is accomplished by pushing up the toe of the face and depositing the animal in the bottom of the toe; waste is then pushed over the top of the animal.

3.2.4.5 Asbestos Waste

The Logan Landfill is permitted to accept asbestos waste. Asbestos waste is handled, transported and disposed in a manner that will not permit the release of asbestos fibers into the air and that complies with State regulations. No transporter or disposal facility shall accept friable asbestos waste unless the waste has been adequately wetted and containerized.

3.2.4.6 Grease Pit and Animal Waste By-Products

Waste from restaurant grease traps and slaughterhouse by-products are accepted at the Logan Landfill. These wastes require 24 to 48-hour notice before disposal. If the waste passes the paint filter test, it is deposited in the dead animal trench and covered daily. If excess liquid is present in the waste, the waste is unloaded on a specially prepared drying pad. The waste remains on the drying pad until the moisture has been sufficiently reduced to pass the paint filter test. Once the waste passes the paint filter test, the waste is deposited either in the dead animal trench or at the toe of the working face where it is immediately covered.

3.3 WASTE INSPECTION

3.3.1 Landfill Spotting

Learning to identify and exclude prohibited and hazardous waste is necessary for the safe operation of the Logan Landfill. The Operators and Attendants are required to receive initial and periodic hazardous waste inspection training. Inspectors are required to obtain the initial 40-hour HAZWOPER Training and attend yearly refresher courses. Certificates of training are kept in the personnel files.

Hazardous wastes have either physical or chemical characteristics that could harm human health or the environment. A waste is considered hazardous if it falls into either of two categories: 1) a listed waste, or 2) a characteristic waste. Hazardous wastes are not accepted at the Logan Landfill.

Small quantity generators (<100 kg/mo) and household quantities are exempt from hazardous waste regulations. However, hazardous wastes are most likely to enter the landfill mixed in with common household waste. Public education and periodic waste screening are the tools used to minimize the amount of inadvertent hazardous waste entering the landfill or transfer station.

3.3.2 Random Waste Screening

Random inspections of incoming loads are conducted according to the schedule established by the landfill management. More than one percent of the vehicles coming in the landfill are selected randomly for inspection according to the schedule. If frequent violations are detected, additional random checks are scheduled at the discretion of the landfill management.

If a suspicious or unknown waste is encountered, the Operator proceeds with the waste screening as follows:

- The driver of the vehicle containing the suspect material is directed to the waste screening area
- The waste screening form is completed
- Protective gear is worn (leather gloves, steel-toed boots, goggles, coveralls, and hard hat)
- The suspect material is spread out with the loader or hand tools and visually examined
- Suspicious marking or materials, like the ones listed below, are investigated further:

    - Containers labeled hazardous
    - Material with unusual amounts of moisture
    - Biomedical (red bag) waste
    - Unidentified powders, smoke, or vapors
    - Liquids, sludges, pastes, or slurries

- Asbestos or asbestos contaminated materials
- Batteries
- Other wastes not accepted by the landfill

The landfill management is called if unstable wastes that cannot be handled safely or radioactive wastes are discovered or suspected. The forms utilized by landfill personnel to record waste screening activities are included in Appendix E.

3.3.3 Removal of Hazardous or Prohibited Waste

Should hazardous or prohibited wastes be discovered during random waste screening or during tipping, the waste is removed from the landfill as follows:

The waste is loaded back on the hauler's vehicle. The hauler is then informed of the proper disposal options. If the hauler or generator is no longer on the premises and is known, they are asked to retrieve the waste and informed of the proper disposal options. The landfill management will arrange to have the waste transported to the proper disposal site and then bill the original hauler or generator. The landfill management will also inform Bear River Health Department about the incident.

A record of the removal of all hazardous or prohibited wastes is kept in the site operational records.

3.3.4 Hazardous or Prohibited Waste Discovered After the Fact

If Hazardous or prohibited wastes are discovered in the landfill, the following procedure is used to remove them:

- Access to the area is restricted
- The landfill management is immediately notified
- The Operator will remove the waste from the working face if it is safe to do so
- The waste is isolated in a secure area of the landfill and the area cordoned off

- The Fire Marshall's Hazardous Materials Response Team is notified
- The Bear River Health Department is also notified

The DWMRC, the hauler (if known), and the generator (if known) are notified within 24 hours of the discovery. The generator (if known) is responsible for the proper cleanup, transportation, and disposal of the waste.

3.3.5 Notification Procedures

The following agencies and people are contacted if any hazardous materials are discovered at the landfill:

Issa Hamud, Logan Environmental Director.....(435) 716-9755
Bear River Health Department.....(435) 792-6500
Director, DWMRC .....(801) 536-0200
City of Logan Fire Marshall.....(435) 716-9515

A record of conversation is completed as each of the entities is contacted. The record of conversation is kept in the site operational records.

3.4 FACILITY MONITORING AND INSPECTION

3.4.1 Groundwater

The Logan Landfill has a DWMRC approved groundwater monitoring plan and will continue to follow the plan. This plan includes sampling and analysis plans for the monitoring of groundwater at the landfill. Appendix B includes a copy of the table of contents for the most current Groundwater Monitoring Plan. Appendix B also includes a letter to the DWMRC with listed modifications to the Groundwater Monitoring Plan.

3.4.2 Surface Water

The Logan Landfill permit drawings illustrate the locations and details of the surface water drainage control systems for both run-on and run-off. In general, surface water is prevented

from running into the active landfill area by berms. Each area will have a storm water basin sized to collect the run-off from the active area. The drawings (Appendix A) indicate the location of the storm water basins as well as the contour of the final cover. Calculations of the anticipated run-off volumes are shown in Appendix F. Run-off from the final cover will be managed by a combination of berms and ditches. The berms will be placed to divert the water around the active area to culverts and a settling pond. Landfill staff will inspect the drainage system monthly. Temporary repairs will be made to any observed deficiencies until permanent repairs can be scheduled. Logan City staff or a licensed general contractor will repair drainage facilities as required.

The Logan Landfill has an approved Multi-Sector General Permit for Storm Water Discharges Associated with Industrial Activity, Coverage No. UTR000703. A copy of the most current UPDES Permit is included in Appendix G. A copy of the most recent Stormwater Protection Plan for the Logan Landfill is included in Appendix G as well.

3.4.3 Leachate Collection

The Logan Landfill has a commingled leachate and groundwater collection system at the landfill. This collection system extended the entire south and west perimeter of the landfill. Any water that comes in contact with the water will be direct into this collection system and treated through the serious wetland treatment system west of the landfill. Logan Landfill is currently in the process of installing a storm water, and leachate management system at the north perimeter of the landfill.

3.4.4 Landfill Gas

This facility is monitored for methane gas on a quarterly basis. Concentrations of methane gas are measured with a hand-held gas monitor.

Gas readings are recorded at the all Groundwater Monitoring Well Locations, the New Scale House, Old Scale House (landfill Building), Big Equipment Shed, Southeast Corner, South Boundary, Scale House Green Waste, North West Stream, North East Corner, South West Stream, Household Hazardous Waste Shed, all Groundwater/Leachate Manhole Covers, shed at the Green Waste Facility and Little Cat Shed. Readings are recorded on the "Gas Log" sheet and kept on file in the office. A copy of the Gas Log sheet is included in Appendix E.

If methane releases are detected in excess of 25 percent of the LEL, in the landfill building or more than 100 percent of LEL at the property boundary, the procedure outlined in the "Explosive Gases" section is followed. The forms utilized by landfill personnel to record gas monitoring activities are included in Appendix E.

The Logan Landfill has a Title V Operating Permit issued from the Division of Air Quality. A copy of the most current Title V Operating Permit is included in Appendix H.

3.4.5 General Inspections and Quarterly Inspection

Routine inspections are necessary to prevent system malfunctions, facility deterioration, operator errors, and discharges that may cause or lead to release of wastes to the environment or a threat to human health. Operators are responsible for conducting and recording routine inspections of the landfill facilities according to the following schedule:

Operators perform pre-operational inspections of all equipment daily. A post-operational inspection is performed at the end of each shift while equipment is cooling down.

All equipment is on a regular maintenance schedule. The on-site mechanic performs all oil changes and a complete inspection of each piece of equipment at this time. A logbook is maintained on each piece of equipment and any repairs and comments concerning the inspection are contained in the log. Oil samples are pulled when each machine is serviced, and results are recorded in the machine log.

Facility inspections are completed on a quarterly basis. Any needed corrective action items are recorded, and the Operators complete needed repairs. If a problem is of an urgent nature, the problem is corrected immediately.

Scale maintenance is performed annually at a minimum. If specific problems arise before scheduled maintenance, scale maintenance is done as required. The scale is certified on an annual basis.

Landfill personnel also conduct quarterly inspections. This inspection is performed by a team of qualified landfill employees and is intended to asses the condition of the following area of the landfill. This include dust control activities, cover condition, waste control, scale house

and recycling area, recycling area, perimeter fence, run-off/ run-on system, roads, buildings (Scale house, oil collection, office area, equipment building), groundwater monitoring well, compost area, tipping face, disease vector, general appearance. The forms utilized by landfill personnel to record general and quarterly inspection activities are included in Appendix E.

3.5 CONTIGENCY AND CORRECTIVE ACTION PLANS

The following sections outline procedures to be followed in case of fire, explosion, groundwater contamination, release of explosive gases, or failure of the storm water management system.

The City Fire Marshal's Hazardous Materials Response Team is contacted in all cases where hazardous materials or materials contaminated with PCB's are suspected to be involved.

3.5.1 Fire

The potential for fire is a concern in all landfills. Logan Landfill staff follows a waste handling procedure to minimize the potential for a landfill fire. If any load comes to the landfill on fire, the driver of the vehicle is directed to an area away from the working face. The burning waste is unloaded, spread out, and immediately covered with sufficient amounts of soil to smother the fire. Once the burning waste cools and is deemed safe, the material is then incorporated into the working face. Some loads coming to the landfill may be on fire but not detected until after being unloaded at the working face. If a load of waste that is on fire is unloaded at the working face, the load of waste is immediately removed from the working face, spread out, and covered with soil.

The City of Logan Fire Department is called if it appears that landfill personnel and equipment cannot contain any fire at the landfill. The City Fire Department is also called if a fire is burning below the landfill surface or is difficult to reach or isolate.

In case of fire, the Manager and Director are notified immediately. A written report detailing the event is placed in the operating record within seven days, including any corrective action taken.

3.5.2 Release of Explosive Gases

Methane gas generation and concentration is not anticipated to be a problem at the Logan Landfill. However, due to the production of methane in all landfills, landfill gas levels are

monitored quarterly. If a concentration of methane is detected in excess of 25 percent of LEL in a landfill building, 100 percent LEL at the property boundary, or over 100 parts per million in an off-site building, the following procedure is followed:

- Landfill operations cease immediately. The landfill is evacuated if personnel or buildings may be threatened
- If gas is detected in a building, the doors and windows are opened to allow the gas to escape
- If off-site buildings or structures appear to be threatened, the Logan Fire Department is called, the property evacuated, and the property owners notified
- The Manager and Director are called. The release is monitored, and a temporary corrective action implemented as soon as possible. Permanent corrective action is completed as soon as practicable

The DWMRC is notified immediately and a written report submitted within 14 days of detecting the release. The gas levels detected, and a description of the steps taken to protect human health are placed in the operating record within seven days of detection. A remediation plan for the methane gas release is place in the operating record within 60 days of detection and the Director of the Division of Waste Management and Radiation Control is notified that the plan has been implemented.

3.5.3 Explosion

If an explosion occurs or seems eminent, all personnel and customers are accounted for and the landfill will be evacuated. Corrective action is immediately evaluated and implemented as soon as practicable.

The Manager and Director will be notified immediately, and the City of Logan Fire Department will be called. The Director of the Division of Waste Management and Radiation Control is notified immediately.

If the explosion is the result of methane gas, the gas levels detected, and a description of the steps taken to protect human health is placed in the operating record within seven days of detection. A remediation plan for the methane gas release is placed in the operating record within 60 days of detection and the Director of the Division of Waste Management and Radiation Control is notified that the plan has been implemented.

3.5.4 Failure of Run-On/Run-Off Containment

The purpose of the run-on/run-off control systems is to manage the stormwater falling in or near the landfill. Water is diverted away from the landfill using a series of ditches, berms, and roads. These structures are inspected on a regular basis and repaired as needed. All stormwaters falling or flowing near the active landfill cell are prevented from flowing into the active area by diversion berms and ditches.

If the run-on system fails, temporary measures such as temporary berms, ditches, or other methods are used to divert water from the active landfill cell.

If a run-off ditch or berm fails, temporary berms or ditches are constructed until a permanent run-off structure can be constructed.

Any temporary berms or other structures are checked at least every 2 hours during working hours of the landfill. Permanent improvements or repairs are made as soon as practicable.

The Manager and Director are notified immediately if a failure of either of the run-on or run-off systems is discovered. The event is fully documented in the operating record, including corrective action within 14 days.

3.5.5 Groundwater Contamination

If groundwater contamination is ever suspected, studies to confirm contamination will be conducted and the extent of contamination documented. This program may include the installation of additional groundwater monitoring wells. The groundwater monitoring program may be updated, and corrective action taken as deemed necessary, with the approval of the Director of the Division of Waste Management and Radiation Control.

3.6 CONTINGENCY PLAN FOR ALTERNATIVE WASTE HANDLING

The most probable reason for a disruption in the waste handling procedures at the Logan Landfill will be weather related. The landfill may close during periods of inclement weather such as high winds, heavy rain, snow, flooding, or any other weather-related condition that would make travel or operations dangerous. The Logan Landfill may also close for other reasons like fire, natural disaster, etc. In general, the Logan Landfill minimizes the possibility of disruption of waste disposal services from an operational standpoint.

In case of equipment failure, the Logan City Road Department will provide the necessary equipment to continue operations while repairs are being made. If the landfill is not operational for any unforeseen reasons, the City of Logan Environmental Department Collection Division will be notified.

Logan City will deliver all waste to the NVL should the landfill operation at Logan Landfill be disrupted.

3.7 MAINTENANCE PLAN

3.7.1 Groundwater Monitoring Wells and Leachate System

The Logan Landfill personnel will conduct quarterly inspection which includes the assessment of the groundwater monitoring wells and the groundwater/leachate collection system.

3.7.2 Gas Monitoring System

The Logan Landfill is not expected to produce and concentrate significant amounts of landfill gas. No gas collection system is planned. Quarterly gas monitoring is conducted using a hand-held meter.

3.8 DISEASE AND VECTOR CONTROL

The vectors encountered at the Logan Landfill are flies, birds, mosquitoes, rodents, skunks, and snakes. The program for controlling these vectors is as follows:

3.8.1 Insects

Eliminating breeding areas is essential in the control of insects. Logan Landfill minimizes the breeding areas by covering the waste daily and maintaining surfaces to reduce ponded water. The Logan City mosquito abatement program personnel assist the landfill as necessary.

3.8.2 Rodents

Reducing potential food sources minimizes rodent populations at the landfill. The potential food sources are minimized by properly applying daily cover.

In the event of a significant increase in the number of rodents at the landfill, a professional exterminator will be contacted. The exterminator would then establish an appropriate protocol for pest control in accordance with all county, state and federal regulations. Since the bulk of the waste delivered to the Logan Landfill is C&D waste, the problems with rodents should be minimal.

3.8.3 Birds

The Logan Landfill has birds (seagulls). Good landfilling practices of waste compaction, daily covering of active working face, and the minimization of ponded water has to date alleviated most of the bird problems. Occasionally the landfill scares the birds by using cracker and whistler shells. Since the bulk of the waste delivered to the Logan Landfill is C&D waste, the problems with birds should be minimal.

3.8.4 Fugitive Dust

The roads leading to the landfill are paved with site access provided via a maintained gravel access road. Some construction activities and daily traffic produce a certain amount of dust. Landfill activities compounded by the occasional high wind present a periodic fugitive dust problem. If the dust problem elevates above the “minimum avoidable dust level”, the landfill applies water to problem areas.

The landfill has a water tank truck and is used to suppress the dust. Water is applied to the gravel roads leading to all landfill facilities and to the tipping face. The water is applied as often as needed to control the dust.

3.8.5 Litter Control

Due to the nature of landfilling operations, litter control is an ongoing challenge. Landfill personnel perform routine litter cleanup to keep the landfill and surrounding properties clear of windblown debris.

Whenever possible, the working face is placed down wind so that blowing litter is worked into the landfill face. During windy conditions, landfill personnel minimize the spreading of the waste to reduce the amount of windblown debris. Since the bulk of the waste delivered to the Logan Landfill is C&D waste, the problems associated with blowing litter should be minimal.

3.9 RECYCLING

The Logan Landfill provides bins at the landfill for the recycling of cardboard, newspaper, magazines, carpet padding and scrap metal. The Logan City Environmental Department manages a county-wide single stream residential recycling program. Currently, all of the households in Cache Valley are participating in this program.

The Environmental Department also provides recycling services to some of the retail and commercial entities in Cache Valley.

The Logan Landfill tries to divert as much green waste as possible to the composting facility that operates immediately east of the landfill and is managed by the Environmental Department. The composting facility accepts manure, hay, yard wastes, trees, tree limbs and some untreated lumber. These materials are composted or ground and processed to produce various landscaping products that are sold to the public. Logs and tree limbs brought to the facility that are too large to feasibly process into landscaping materials are stockpiled and sold as firewood.

The Environmental Department operates and services several green waste recycling drop sites in the county outside of Logan City and they provide an optional curbside green waste recycling service to county residents.

3.10 TRAINING PROGRAM

As part of the initial training of new employees, the City of Logan Landfill Plan of Operation is required reading. All personnel are required to review the approved permit annually.

All personnel associated with the operation of the landfill receive training annually. The "Sanitary Landfill Operator Training Course" offered by the Solid Waste Association of North America (SWANA) is required by all employees within 1 year of hire date. Certificates of completion are kept in personnel files. Regular safety and equipment maintenance training sessions are held to ensure that employees are aware of the latest technologies and that good safety practices are used at all times.

3.11 RECORDKEEPING

A daily operating record is maintained as part of a permanent record on the following items:

- Number of loads entering the landfill and types of wastes received
- Deviations from the approved Plan of Operation
- Number of waste inspections conducted
- Percentage of loads inspected
- Amount and type of cover material used
- Asbestos cell monitoring
- Dust control record keeping
- Personnel training and notification procedures
- Landfill gas-monitoring results
- And a scale house load inspection log

An example copy of daily operating record can be found in Appendix E.

3.12 SUBMITTAL OF ANNUAL REPORT

The Logan City Environmental Department will submit a copy of its solid waste facility annual report to the Director of the Division of Waste Management and Radiation Control by March 1 of each year for the most recent calendar or fiscal year of facility operation. The annual report will include facility activities during the previous year and will include, at a minimum, the following:

- Name and address of facility
- Calendar or fiscal year covered by the annual report

- Facility type and status
- Annual quantity, in tons or volume, in cubic yards of solid waste handled for each disposal facility, including applicable recycling facilities
- Annual update of required financial assurances mechanism pursuant to Utah Administrative Code R315-309
- Ground water monitoring results
- Explosive gas monitoring results
- And an annual training report

3.13 INSPECTIONS

The Manager, or his/her designee, inspects the facility to minimize malfunctions and deterioration, operator errors, and discharges that may cause or lead to the release of wastes to the environment or to a threat to human health. These inspections are conducted on a quarterly basis, at a minimum. An inspection log is kept as part of the operating record. This log includes at least the date and time of inspection, the printed name and handwritten signature of the inspector, a notation of observations made, and the date and nature of any repairs or corrective actions. Inspection records are available to the Director of the Division of Waste Management and Radiation Control or an authorized representative upon request.

3.14 RECORDING WITH COUNTY RECORDER

Plats and other data, as required by the County Recorder, will be recorded with the Cache County Recorder as part of the record of title no later than 60 days after certification of closure.

3.15 STATE AND LOCAL REQUIREMENTS

The Logan Landfill maintains and will continue to maintain compliance with all applicable state and local requirements including zoning, fire protection, water pollution prevention, air pollution prevention, and nuisance control.

CITY OF LOGAN

City of Logan Landfill

Plan of Operation

LOGAN CITY, UTAH

153 North 1400 West Bldg. A

Logan, Utah 84321

October 2014

Prepared By:
Logan City Environmental Department
Landfill Division

TABLE OF CONTENT

1. INTRODUCTION

1.1 Purpose

The purpose of this operations plan is to provide the necessary guidance to City of Logan Landfill employees to operate the landfill in manner that is safe, protective of the health and environment, and efficient while conforming to the requirements of the State of Utah Class I Landfill Permit and Solid Waste Rules and Standards for Maintenance and Operation of landfill section R315-303-4. Appendix A of this plan contains a copy of the City of Logan Landfill permit.

The landfill management shall keep a copy of this operating plan at a location easily assessable to employees at the facility.

1.2 Facility Location and Description

The City of Logan Landfill is located on approximately 200 North and 1400 West in Logan Cache County, Utah. The landfill site and surrounding buffer properties occupy approximately 319 acres, which includes the currently permitted landfill cell, maintenance building, scale, scale house, household hazardous waste collection center; citizens drop site, storm water detention ponds, open space, wetlands and access roads. The currently permitted landfill cell occupies 85.11 acres.

The City of Logan Landfill is a Class I Municipal Solid Waste (MSW) disposal facility used primarily for the disposal of MSW generated within Cache County. Since its development the landfill has been continually operated by the City of Logan personnel.

City of Logan Landfill is located in the Southeast ¼ of Section 31 and the Southwest ¼ of Section 32, Township 12 North, Range 1 East, Salt Lake Base and Meridian, Cache

County, Utah at Latitude 41° 43' 54" and Longitude 111° 52' 06". Drawing 1 in Appendix B shows the vicinity map of landfill.

The existing landfill is unlined and it was established as a sanitary landfill in 1962 with scales being installed in approximately 1994. The City of Logan Landfill currently disposes of approximately 78,000 tons of MSW per year with the current population of Cache County being approximately 117,000 people. The landfill service area includes all of Cache County political boundary.

2. HOURS OF OPERATION

City of Logan Landfill is open to the general public and commercial haulers for solid waste disposal Monday through Saturday from 8:00 a.m. to 5:30 p.m., year-round, excluding holidays (New Year's Day, Memorial Day, Fourth of July, Thanksgiving Day, and Christmas Day). The landfill has access controls to prevent illegal dumping of wastes, public exposure to hazards, scavenging, and unauthorized traffic. Access control is a key element in preventing unauthorized scavenging or injury. Fences, locked gates, and natural barriers provide the basis of the site's access control system. During operating hours, the landfill personnel monitor and control all access to facilities with at least two people on-site, one of which is at the active face.

Operating personnel stay as long as necessary to properly landfill and cover waste delivered each day. The landfill may also close in emergency situations, when faced with inclement weather, or for other reasons as determined by Landfill Manager. In addition, City of Logan Landfill may extend normal operating hours to accommodate disaster debris disposal.

Open Monday through Saturday

8:00 a.m. To 5:30 p.m. Year-round

Closed: New Year's Day, Memorial Day, Fourth of July, Thanksgiving Day, and Christmas Day

3. LANDFILL OPERATING STAFF

City of Logan Landfill maintains a qualified work force that operates the site in accordance with the operations plan. Personnel working at City of Logan Landfill are provided with health and safety training and safety equipment as discussed in Section 4 and 11.

3.1 Positions and Responsibilities

The following personnel are generally available at the facility during operating hours to perform the duties as described below:

3.1.1 LANDFILL MANAGER – The Landfill Manager is responsible for all operations at the landfill facilities. All landfill employees report to the Landfill Manager. The landfill Manager supervises all activities associated with waste disposal. The landfill Manager oversees the tasks performed by the operators and laborers. The Landfill Manager reports to the Environmental Department Director of City of Logan. The Landfill Manager is a Solid Waste Association of North America (SWANA) certified Manager of Landfill Operation (MOLO) with at least 1 year of landfill experience and/or equivalent professional experience.

3.1.2 LANDFILL FOREMAN

The Landfill Foreman is responsible for all operations at the landfill facilities in the Landfill Managers absence. All landfill employees report to the Landfill Foreman in the Landfill Managers absence. The landfill Foreman supervises all activities associated with waste disposal. The landfill Forman oversees the tasks performed by the operators and laborers. The Landfill Foreman reports to the Landfill Manager. The Landfill Foreman is a Solid Waste Association of North America (SWANA) certified Manager of Landfill

Operation (MOLO) with at least 1 year of landfill experience and/or equivalent professional experience.

3.1.3 HEAVY EQUIPMENT OPERATORS –The Heavy Equipment Operators are responsible for daily operations at the working face of the landfill. The heavy equipment operators operate the equipment used to place, compact, and cover the waste. The heavy equipment operators manage and process materials received at the Green Waste Facility. The heavy equipment operators are trained and capable of operating all on-site equipment. Equipment Operators report directly to the Landfill Manager and Landfill Foreman. There are typically two (2) and no less than one (1), Equipment Operators on duty at any given time unless the Landfill Foreman or Landfill Manager are operating equipment in their stead.

3.1.4 LANDFILL INSPECTORS – The Landfill Inspectors are responsible for inspecting incoming loads and those wastes disposed at the landfill working face to prohibit hazardous and other unacceptable materials from being unloaded. The Landfill Inspectors are responsible for managing and arranging for disposal for all household hazardous waste received at the landfill household hazardous waste facility. The Inspectors are trained in the identification of solid and hazardous wastes and report to the Landfill Manager and Landfill Foreman.

3.1.5 LANDFILL ATTENDANTS – The Landfill Attendants are responsible for screening incoming loads and collecting tipping fees at the landfill gate. There is typically one Landfill Attendant on duty during operating hours. The Landfill Attendants report to the Landfill Manager and Landfill Foreman.

3.1.6 TEMPORARY EMPLOYEES - Temporary employees such as skilled employees, unskilled employees, and contractors will report directly to the Landfill Manager, or his designee.

These may include litter control, laborers, operators, surveyors, and inspection personnel. These employees may perform a variety of tasks at the facility and are trained to operate power tools, lawn mowers, trimmers, tractors, equipment, and machinery on an as needed basis. All temporary employees must receive health and safety training that is pertinent to their assigned tasks. Unskilled laborers may be used for daily litter control and grounds maintenance. They may be qualified to run equipment including tractors, lawn mowers, roadway sweepers, centrifugal and trash pumps and the water truck.

4. LANDFILL EQUIPMENT

4.1 Equipment Inventory and Use

The following equipment is currently utilized at the CITY OF LOGAN LANDFILL:

1. Compactor 826H
2. Track Loaders (2)
3. Wheel Loaders (2)
4. Skid Steer
5. Dump Truck
6. Roll off Truck
7. Scraper
8. Grinder
9. Trommel Screen
10. Windrow Turner
11. Pick-up Trucks (3)
12. Water Truck
13. Tire Shear
14. Mule ATV

These units are currently being utilized by City of Logan Landfill personnel, and may be augmented as necessary with additional equipment from the City of Logan Environmental Department or City of Logan Streets Department. The landfill facility has utility vehicles capable of moving around the site during inclement weather and powerful enough to pull small trailer-mounted equipment, which may be needed at the site.

The compactor is used to spread and compact solid waste disposed at the landfill and for the placement of daily cover. The track loaders are used to provide backup to the compactor, to push waste into place, for placing daily cover, and for general site work. The wheel loaders are used to manage green waste materials, load these materials into the grinder and trommel screen, as well as provide support for general site work. The skid steer is used for loading smaller vehicles with green waste products and for small earth work projects. The dump truck is used for hauling of concrete and asphalt in landfill road construction projects. The roll-off truck hauls recyclable metals to the buyer as well as for moving alternative cover from the green waste facility to the working face. The scraper is used as a more efficient means of covering garbage with soil, and for road maintenance. The grinder is used for size reduction and production of green waste products. The trommel screen separates compost from woody materials, and is used for coloring of wood chips. The windrow turner aerates the compost windrows. The pick-up trucks are transportation across the sizeable property for management, inspectors, and operators. The water truck helps keep the dust down and protects the landfill's air quality. Tires are quartered with the tire shear to be disposed of in the landfill. The Mule ATV transports people and material into remote areas of the landfill. This equipment is sufficient for current operations and may be changed at any time to meet changing requirements of the landfill.

If site conditions warrant, the equipment list above may be modified to reflect amount and type of equipment necessary for the effective operation of the landfill.

4.2 Equipment maintenance

Landfill equipment is to be maintained in good working order. Maintenance is performed in accordance with recommendations of the equipment manufacturer and the equipment is washed periodically if not weekly. The landfill equipment operators

are required to perform pre-trip and post-trip equipment inspections and complete the landfill provided equipment pre-trip and post-trip forms. Equipment operators are required to record and report to management any unusual equipment deficiencies they notice during the pre-trip and post-trip equipment inspections. Landfill employees are required to keep an equipment operating and maintenance record. Below are lists of our daily pre and post trip maintenance checklists. For a more complete checklist on specific equipment refer to Appendix I.

4.2.1 Daily Maintenance Check List

- ✓ Check safety and lock bars used during maintenance to ensure proper position,
- ✓ Check radiator area for refuse blockages,
- ✓ Check for worn hoses and cracked or loose fan belts,
- ✓ Check hydraulic system for worn hoses or damaged lines,
- ✓ Check covers and guards for damage and loose or missing bolts,
- ✓ Check engine compartment for oil and fuel leaks,
- ✓ Check for proper fluid levels, on engine oil, hydraulic oil, transmission fluid, coolant, and wiper fluid,
- ✓ Check for wind shield and mirrors for cracks,
- ✓ Check equipment lights,
- ✓ Check proper tire pressure,
- ✓ Check for cracks in the arms
- ✓ Check for missing or damaged teeth or cutting edges,
- ✓ Check the track for broken or missing shoes or bolts and waste accumulation,
- ✓ Check all dials and indicator lights,
- ✓ Check the seat belt condition,
- ✓ And check sprockets for wear.

4.2.2 Rubber tire equipment

- ✓ Check the tire to vehicle clearance to prevent rubbing, and
- ✓ Check tires for cuts, damage and proper inflation.

4.2.3 Pre-Mounting

- ✓ Check all water, hydraulic fluid, oil and fuel levels,
- ✓ Lubricate all moving parts per manufacturer's handbook,
- ✓ Brush or blow out air pre-cleaner/radiators, clean engine compartment,
- ✓ Check indicators and gauges for damage,
- ✓ check battery electrolyte level,
- ✓ Walk around the equipment once to ensure that everyone is clear of the equipment.
- ✓ Check horn, back up alarm, and lights

4.2.4 Operating

- Observe equipment gauges,
- Properly handle difficult and abrasive waste,
- Clean machine of hanging or attached debris, and
- Check for oil and fluid leaks.

4.2.5 Shutdown Procedure Check List

- ✓ Fill fuel tank to prevent condensation,
- ✓ Before stopping engine, idle at 800 to 1,000 rpm for 3 to 5 minutes to let it cool off evenly and to allow turbochargers to slow down,
- ✓ Don't turn off the master switch with the engine running. If you do you can seriously damage parts of the electrical charging circuit.

- ✓ If no shelter facilities are provided, park away from potential fire hazards, preferably on a level grade to prevent roll-away. This will prevent oil leakage from roller seals on crawler equipment.
- ✓ Park the equipment on top of some type of barrier to prevent freezing to the ground.
- ✓ Lower to the ground all blades, buckets, scrapers or other movable parts and release all pressures to prevent accidents.
- ✓ Set brakes and transmission lock.
- ✓ Remove all debris, wire, trash, mud, etc. from equipment daily.
- ✓ Open equipment guards and remove trash and paper daily.
- ✓ Report the condition of equipment at the end of each shift or work period and complete equipment log sheets (complete Post-trip Form).
- ✓ Check for leaks and hose damage
- ✓ Completely walk around the equipment checking for damage and missing bolts
- ✓ Check all fluids levels

5. WASTE ACCEPTANCE

5.1 Acceptable Waste

City of Logan Landfill is a Class I Landfill which means it is a non-commercial landfill or a landfill that meets the definition found in Subsection 19-6-102(3)(a)(iii) and is permitted by the Director of Utah Division of Solid and Hazardous Waste to receive for disposal:

(i) Municipal solid waste;

(ii) Any other nonhazardous solid waste, not otherwise limited by rule or solid waste permit; or

(iii) In conjunction with municipal solid waste or other nonhazardous solid waste, waste from a conditionally exempt small quantity generator of hazardous waste, as defined by Section R315-2-5;

The City of Logan Landfill will accept municipal solid waste defined as household waste and solid waste that is generated by commercial, institutional, and industrial sources and is similar to household waste

5.2 Prohibited Waste

City of Logan Landfill employees shall exercise reasonable care to prevent acceptance of unacceptable waste or prohibited waste at the Class I Landfill, and shall not knowingly accept the following prohibited waste.

1. Hazardous waste.
2. Bulk or non-containerized liquid waste, unless the waste is a household waste other than septic waste.
3. Whole tires

4. Asbestos containing materials.
5. Licensed radioactive material (as described in the state of Utah rules), and any radioactive material considered source, special nuclear, or by-product material as defined by Atomic Energy Act of 1954.
6. Liquid waste as restricted by 40 CFR Part 258.28.
7. Refrigerators and air conditioning units.
8. Bio hazardous waste, and non autoclaved medical waste.
9. Vehicular fluids such as engine oil, transmission fluid, and antifreeze.

5.3 Liquid Restriction

Bulk or containerized liquid waste will not be disposed of in the City of Logan Landfill. Liquid restrictions are necessary because the disposal of liquids into landfills can be a significant source of leachate generation. The reduction in liquid wastes accepted at the landfill will reduce the quantity of free liquids to be managed as leachate. Containers holding liquid waste will not be disposed of in the City of Logan Landfill unless the container was generated from a household (other than septic waste), or the quantity of liquid disposed is similar in quantity to that disposed by a single household.

5.4 Waste Inspection

In addition to the general waste handling procedures described in other sections of this Plan, additional measures are taken to minimize the possibility of unacceptable waste being placed in the City of Logan Landfill. Landfill personnel will conduct routine screening, and detailed inspections of loads delivered to the landfill. The Landfill Attendants will notify the Landfill Inspector, Foreman, or Landfill Manager, and the driver of loads that appear to be suspicious and may need further inspection. These loads will be inspected. Otherwise all detailed inspections will be conducted on a random basis designed to detect illegal or inadvertent disposal of unacceptable wastes.

Loads will be inspected at a frequency of no less than one load out of every 100 (1% of loads). The Landfill Inspector shall conduct inspections of 1% of all loads at a random hour (or hours) for each day of landfill operation. The selected loads will be spread using the compactor or dozer to a maximum thickness of 1 foot. The inspector will then perform a detailed inspection of the load to determine if unacceptable materials are present in the waste. Appendix C provides a copy of the waste inspection form the landfill uses to exclude unacceptable waste. If there are unacceptable wastes in a load, the Landfill Inspector or manager will determine whether the driver should have been aware of the unacceptable wastes. If the driver could or should have recognized the unacceptable wastes, the Landfill Inspector through the Landfill Manager will issue a violation notice to the hauler; if the driver could not reasonably have been aware of the unacceptable wastes no violation notice will be prepared; however, the driver will be consulted to determine the source of the waste. For commercial haulers, the first violation for unacceptable wastes will result in a warning to the hauler; the second violation will result in the imposition of a fine; the third violation will result in suspension of hauler privileges. The landfill management may suspend all disposal privileges at the landfill facility of any company that violate landfill rules. A suspended company may not use the City of Logan Class I or Class IVb Landfills during the period of the suspension.

The Department of Solid and Hazardous Waste (DSHW) will be notified if an unacceptable waste is discovered at the facility. The Landfill Manager will be responsible for notifying the City of Logan Environmental Department Director who will then notify the Executive Secretary of the Division of Solid and Hazardous Waste, and the transporter of the waste within 24 hours of discovery. This notification will include the date of discovery, type of unacceptable waste, approximate volume, and depth and

location within the landfill. A copy of notification will be retained in the landfill operating record. If hazardous or PCB-containing waste is discovered, the Landfill Manager will take appropriate steps to protect the public and landfill personnel and will assure proper cleanup, transport, and disposal of the waste.

5.5 Examples of Hazardous Wastes

The following list includes examples of hazardous waste:

1. Lead acid batteries (automobile, boat, RV).
2. Paint thinner, degreasing solvents, used oil or kerosene
3. Pesticides and herbicides.
4. Fluorescent light ballasts, electrical transformers, or fluids from these.
5. Radioactive materials or materials contaminated by radioactive substances.
6. Acutely hazardous waste, per 40 CFR 261.33.
7. Wastes containing PCBs.
8. Friable asbestos containing materials.

If landfill personnel discover regulated hazardous or PCB waste, the landfill management will ensure that the wastes are treated, stored, or disposed of in accordance with RCRA, TSCA, and/or applicable State of Utah requirements and notify the Executive Secretary.

6. Hazardous Waste Facility and Handling

6.1 Hazardous Waste

City of Logan Landfill does not accept except hazardous waste except in household quantities (5 gallon containers or less).

6.2 Household Hazardous Waste

Many hazardous products and chemicals such as cleaners, oils and pesticides are used in the home every day. House Hold Hazardous Wastes (HHW) are discarded materials and products that are ignitable, corrosive, reactive, toxic or otherwise listed as hazardous by the EPA. Products used and disposed of by a typical residence may contain more than 100 hazardous substances including:

Cleaners	Cosmetics
Fluorescent light bulbs	Glues
Heating oil	Insecticides and pesticides
Batteries	Ink
Medicines	Motor oil and automotive supplies
Paints, thinners, stains and varnishes	Polishes
Swimming pool chemicals	Smoke detectors
Thermometers	Fuel

Since the chemicals found in HHW can cause soil and groundwater contamination, generate hazardous emissions at landfills and disrupt water treatment plants, it is important to dispose HHW properly. City of Logan encourages its residents to keep Household Hazardous Waste out of the general residential waste stream and bring HHW separately to City of Logan Landfill for proper disposal. Landfill employees are also encouraged to recognize and lookout for HHW and remove it from the waste stream if they can safely before they compact and cover the waste at the landfill. Separated HHW material shall be kept in safe location until it is shipped out of the landfill for proper disposal. Landfill employees are also required to keep records of received and shipped HHW material.

6.2.1 Elements of a Safe HHW Collection Program

- For safety, HHW collection and storage areas should be clean, well-organized, and (if at the landfill) separate from other landfill operations.
- The collected materials should be stored under a roof or in covered containers.
- The collected materials should be sorted and stored based on hazard class and the storage area for each class of materials should be clearly labeled. Examples of hazard classes include Flammables (fuels, solvents), Corrosive (vehicle batteries, acids, and Poison (pesticides).
- Any spills should be cleaned up immediately. Clean-up materials should be on hand at all times, and should include materials for both oil-based and water-based substance cleanup.
- Employees who are responsible for handling HHW should attend a Hazardous Waste Operations (HAZWOPER) Site Worker course.
- The public should be educated about which items are considered HHW and about the importance of keeping HHW out of the landfill.

6.2.2 Employee Hazardous Waste Training & Response

All employees should be trained on how to respond to hazardous waste spill or how to isolate and handle if hazardous waste is identified in the waste stream. The following are steps landfill employees should take if they encounter a suspicious material.

- ✓ Clear the area and call the City of Logan Hazardous-Materials Team
- ✓ Identify the material if you can or ask your supervisor to identify the material
- ✓ Look for labels and other signs to identify the material if you can do so safely
- ✓ Identify the source or the generator of the waste if you can do so safely
- ✓ Identify the hauler of the waste if can do so safely
- ✓ Estimate the quantity

6.3 Used Oil Facility

Citizens are encouraged to drop off used oil at participating used oil collection sites, including the landfill. Each customer is required to write their name and amount of oil that is being dropped off. Customers are asked to empty their containers of used oil into a large holding tank (approximately 500 gal.). The collected oil is used to heat the Public works equipment garage during winter months, as well as hauled away by Thermofluids Inc. Fuels and antifreeze are bulked into drums to be collected by private hazardous waste disposal companies (such as Clean Harbors).

6.4 Electronic Waste

Computer monitors and televisions containing cathode ray tubes contain hazardous materials and are prohibited from being disposed of in the landfill. Citizens are encouraged to bring these monitors as well as other electronic wastes such as flat

screen TVs and computer towers to the hazardous waste facility for recycling. These items are then picked up for disposal by a preapproved recycling company.

6.5 Landfill Mall

Customers may donate items, especially building materials that are still in good condition to the Landfill Mall. Landfill inspectors and management also have the option to retrieve materials from disposal and place them at the Landfill Mall. All items at the Mall can be purchases for $5.00 per item or $5.00 per bundle.

6.6 Reuse Shed

Landfill Inspectors are tasked with placing good household items in the reuse shed such as (latex paint, fertilizer, adhesives, household cleaners, etc...) that are in good condition and that may be of potential use by another resident. No flammables or harmful products are to be available for reuse. The landfill employees should be very conscious of products that may be used in the production of illegal substances. Interested customers may pick up these items at no charge by signing a liability waiver and detailing the items taken.

7. TRAINING PROGRAMS

Landfill personnel will be trained on how to identify unacceptable waste including liquid wastes, sludge, potential regulated hazardous waste, and PCB wastes. Personnel to be trained will include the Landfill Manager, Landfill Foreman, Heavy Equipment Operators, Landfill Inspectors and Landfill Attendants.

The training will emphasize methods of identifying containers and labels typical of hazardous and PCB waste. Training will also address the proper handling of unacceptable waste. All employees will receive on the job training in landfill operations and waste screening. This training will include operations and safety training. New employees will receive training during their first 3 months of employment. The Landfill Manager and Landfill Forman will be certified as a Solid Waste Association of North America (SWANA) Manager of Landfill Operations (MOLO). The Landfill Manager, Landfill Foreman and all Inspectors will be trained in waste screening using the SWANA techniques.

In addition Heavy Equipment Operators will be trained on the proper use of landfill equipment and safety. This will include how to conduct proper pre-trip and post-trip equipment inspection and maintenance.

7.1 Environmental Department Training

The Environmental Department holds annual training for all of its employees including the Landfill. Employees are expected to attend 70% of these classes held in the first three months of the year. The material that is covered includes the following topics:

- Household Hazardous Waste Identification, MSDS Review, and Blood Borne Pathogens
- Landfill Operations and Safety

- Slip Trip and Fall, and Lifting Safety,
- Accident Reporting, Investigation, Liability
- Work Place Violence, Sexual Harassment and Drug and Alcohol Policy
- Storm Water Management
- Spill Prevention Control and Counter Measurements
- CDL Pre-trip and Post-Trip Inspections, Backing Safety, and Tire Safety
- Evacuation Plans and Emergency Communication
- Fire extinguishing Training and Fire Prevention Training
- Radio Protocol and Etiquette
- First Aid and CPR
- Customer Service
- Lock- Out Tag-out, and Confined Space

7.2 Landfill Division Training

In addition to Department-wide training the Landfill Manager and Foreman train landfill employees in the following additional areas:

- First Report of Accident/Injury Claim Form for Compensation use and completion
- Leachate management and Oil Spill Clean-up
- Attitude, core principles and Goals
- Equipment Care
- Material Grinder safety and skiid-steer loading safety
- Compost temperature reading
- Cell phone usage, log loading, and dust control
- Backing safety
- Knuckle Boom operations and safety

8. Record Keeping

City of Logan Landfill personnel will maintain an operating record which will be available to the DSHW for review at the landfill offices located at the landfill property. This record will include at a minimum:

1. Waste quantities such as weight
2. Number of vehicles entering the landfill
3. Types of waste received at the landfill
4. Any operational modifications or deviations
5. Inspection records and hazardous waste removal
6. Methane monitoring results
7. Documentation of leachate management
8. Asbestos management and disposal
9. Air quality management and visible emissions observations
10. Storm water management
11. Compost monitoring and management
12. Groundwater monitoring results
13. Personnel training and certification
14. Closure and post-closure care plans
15. Financial assurance documentation and current closure cost estimates

Records will be kept throughout the life of the facility, including post-closure care. Documents will be organized, legible, dated, and signed by the appropriate personnel. The information in the operating record will be available to citizens through the Utah Government Records Access Management Act (GRAMA).

8.1 Weights of Incoming Waste

The landfill will record and retain in the operating record all documentation made with respect to any weights or volumes of incoming wastes as allowed by State of Utah Administrative Rule R315-302-2. An annual summary of scale records will also be recorded in the Annual Report. Appendix D contains an example of a sample ticket for landfill weight recording.

8.2 Number of Vehicles Entering Facility

The landfill will record and retain in the operating record all documentation made with respect to the number of vehicles entering the facility as allowed by State of Utah Administrative Rule R315-302.

8.3 Types of Wastes Received Each Day

The landfill will record and retain in the operating record all documentation made with respect to the types of waste received each day at the facility as allowed by State of Utah administrative Rule R315-302.

8.4 Deviation from Approved Operations Plan

At any time during the operational life or post-closure care period of the landfill, UDEQ may set alternative schedules for record keeping and notification. However, it is anticipated that any modifications to the schedule for record keeping will be discussed with City of Logan prior to official notice from the State of Utah.

8.5 Training Procedures

Landfill management will record and retain in the operating record all documentation made with respect to any training programs or procedures as allowed by State of Utah Administrative Rule R315-302.

8.6 Groundwater and Gas Monitoring Results

Landfill personnel will record and retain in the operating record all groundwater and gas monitoring results and any remediation plans required by UDEQ, Administrative Rule R315-308. Appendix E contains the Form used to monitor landfill perimeter methane gas.

8.7 Inspection Logs

Landfill personnel will record and retain in the operating record all documentation made with respect to any inspection logs as allowed by State of Utah Administrative Rule R315-302.

8.8 Documentation of Exemptions

Landfill personnel will record and retain in the operating record all documentation made with respect to any operational exemption per UDEQ, Administrative Rule 315-302.

8.9 Documentation of Leachate Management

Landfill personnel will record and retain in the operating record all documentation made with respect to any disposal of leachate as allowed by State of Utah Administrative Rule R315-303.

8.10 Closure and Post-Closure Care Plans

Landfill personnel will record and retain in the operating record all documentation made with respect to the closure and post-closure care plans as allowed by State of Utah Administrative Rule R315-302-3.

8.11 Cost Estimates and Financial Assurance Documentation

Landfill personnel will record and retain in the operating record all documentation made with respect to the cost estimates and financial assurance documentation as allowed by State of Utah Administrative Rule R315-309.

8.12 Other Records as Required by the Executive Secretary

Landfill personnel will record and retain in the operating record all documentation made with respect to other processes, variances, and violations as required by the State of Utah.

9. Cover Material Requirement

City of Logan landfills are required to utilize three types of cover. The type utilized depends on the amount of time it will be used as a cover for wastes.

1. **Daily Cover:** The required cover depth is at least 6 inches of soil or alternate green waste materials to cover all exposed wastes at the end of each operating day. The construction and demolition waste landfill (class IVb) must be covered with 6 inches of soil once every month.
2. **Intermediate Cover:** The required cover is at least 12 inches of cover material over an area not set to receive additional solid waste within 30 calendar days or as weather permits. Intermediate cover should be placed, compacted, and graded to allow proper drainage.
3. **Final Cover:** The required cover depth is the approved State of Utah final cover design depth. Long-term cover must be placed, compacted, and graded to allow for proper drainage. Erosion controls and proper seeding must be completed during the fall seeding season.

9.1 Daily and Intermediate Soil Cover

Daily cover soils must meet the 6-inch regulatory requirements. Before the start of waste placement each day, cover soil on top of the previous lift may be stripped back and stockpiled for reuse as soil cover at the end of the day or as needed. At the end of the day; these recycled cover soils will be utilized as daily cover. The remainder of daily cover will be provided with clean soil obtained from onsite and offsite sources. Wastes will be covered with a minimum of 6 inches of soil or an approved alternate daily cover at the end of each working day.

Intermediate cover soil requirements are governed by R315-303-4. The borrow area for intermediate cover soils is the same for daily cover soils. For intermediate soil cover a minimum of 12 inches of soil will be used. Soil will be placed on each partial lift if left inactive for 6 months or longer. After 30 days of inactivity on the intermediate cover, the slope will be protected against erosion and sedimentation.

9.2 Alternative Daily Cover

The use of alternative daily cover in a landfill can preserve airspace and extend landfill life. The City of Logan Landfill staff proposes to continue to utilize woodchips and mixed green waste as alternate daily cover if needed.

9.3 Final Cover (Construction Identified as Closure Areas)

The official final cover plan should be initiated by Landfill staff within 30 days of the last date of receiving solid waste. However it is anticipated that closure cover will begin to be placed much earlier than that in phases. Final cover will be placed over the landfill in a series of 5 separate phases as sufficient area is brought to final elevation. The smallest area currently scheduled for final cover is approximately 8 acres, but actual cover area will vary due to actual landfill configuration (operational, drainage and gas collection issues). The final cover closure phases start with Phase I on the west side of the landfill and will proceed in a counter clockwise direction to Phase V. Appendix B Landfill Closure Drawing shows the location of each of the planned landfill final cover closure areas.

The engineered final cover system will minimize surface water infiltration (thereby minimizing leachate generation), control gas migration, maintain slope stability, control surface water, soil erosion, and be capable of supporting vegetative cover. The vegetative cover will be selected with shallow root systems to prevent potential penetration into the drainage layer or into any geo-composite materials. Actual cover

geometry and extent may vary as site specific engineering issues are considered during the development of the final cover construction packages.

The final cover design may implement different cover systems. Typically, the landfill cover will have a minimum of 1.5 feet of soil protection and topsoil over the synthetic cover materials. Detailed design of the final cover system will be performed during the preparation of each cover construction package.

The 1.5 feet of soil cover will provide enough soil to protect the final cover components from damage. Side slopes will be maintained at a maximum 4H:1V and will typically have 10- to 15- foot-wide benches every 30 to 40 vertical feet to aid in constructing and maintaining the landfill cover slopes while providing areas for storm water management. The benches will slope a minimum of 2% to 5% to provide a positive drainage while allowing for the anticipated settlement of the MSW. Each bench will consist of an access road and ditch located at the toe of the slope.

The landfill cover design will allow for natural water shedding during a normal rainfall or snowmelt with minimal infiltration of storm waters into the landfill cover soils. In the case of unusually high rainfall event, water will rapidly drain into a perimeter ditch or directly into a retention pond at the edge of the landfill cover or be transported to storm water retention ponds via ditches associated with the landfill benches.

9.4 Elevations of Final Cover

The final cover elevation is anticipated to be constructed at approximately the following elevation depending on the covered area:

Closure Area	Final Cover Elevation
I	4491 – 4485
II	4491 – 4485
III	4530 – 4524
IV	4530 – 4524
V	4533 – 4527

Actual final cover elevations will depend on actual elevations of final cover depending on operational constraints and landfill settlement at the location of each lined cell.

10. DISEASE, DUST, ODOR, AND VECTOR CONTROL

10.1 Dust Control

Fugitive dust will be controlled by (1) timely placement of daily, intermediate, and final soil cover over the refuse fill; (2) proper maintenance of haul roads (grading and watering); (3) application of water spray on soil-covered work areas, soil excavation areas, and soil stockpile areas where conditions may result in fugitive dust; (4) application of water or planting of temporary vegetation on intermediate soil cover when conditions might create fugitive dust; and (5) planting and maintenance of vegetative cover on completed fill slopes. Most of the fugitive dust generated at the landfill is due to traffic stirring up dust on the unpaved roads. Frequent application of water to these unpaved surfaces by a water application tanker truck will keep the dust to a minimum. The application of water will be dependent upon the weather and the volume of traffic. Some dirt and mud is tracked onto the paved surfaces around the landfill. These surfaces will receive water applications as well as be periodically swept to remove the dirt and accompanying dust.

10.2 Odors

While the landfill is in operation, placing daily and intermediate soil cover will control odors from the refuse. Upon completion, the final cover and established vegetation should effectively control odors.

10.3 Litter Control

The Landfill Manager will continue the ongoing litter collection program in order to minimize the impacts of litter on and surrounding the site. This program consists of various activities designed to reduce windblown litter, as well as other site features and operations that help to reduce windblown litter. Activities specifically designed to

reduce amounts of windblown litter include minimizing the size of the active face, thereby reducing the area of wastes exposed to wind, and erecting temporary litter fences downwind from the active face. The height and length of the fences can be adjusted to maximize their effectiveness in trapping windblown litter.

Other features and operating techniques that reduce windblown litter include perimeter fencing around the landfill site to back up the temporary litter fences; applying daily and intermediate soil cover; and compacting refuse layers at a maximum thickness of 2 feet to hold freshly deposited refuse to underlying landfill layers. Site and surrounding area inspections will be conducted routinely and any windblown litter found will be collected.

10.4 Vectors & Disease

The landfill personnel will use appropriate technologies to prevent or control on-site populations of disease vectors (e.g., rodents, insects) in an effort to protect human health and the environment. Landfill personnel will be responsible for maintaining control of vectors at the landfill through continued use of appropriate daily cover procedures. Professional extermination personnel and services will be used to control vectors if it is found that daily operations are insufficient to accomplish the task.

The primary method of vector control is to eliminate conditions favorable for the production of vectors through proper compaction and daily covering. Should the landfill personnel notice the presence of vectors, cover material will be applied more frequently and in greater amounts if required.

As with vector control, the preliminary method of controlling birds is to eliminate conditions favorable to their existence. This can be accomplished by utilizing, but not limited to, one or more of the following methods:

- Minimizing the size of the fill face is the most effective control method. This, along with more frequent and heavier compaction and regular covering of the waste, will reduce the area available for birds to feed.
- Avoiding the accumulation of water in depressions, ponds, or holding areas near the fill.
- Using noise-frightening techniques that provide a short-term solution.

11. ACCESS ROAD

The landfill has access controls to prevent illegal dumping of wastes, public exposure to hazards, scavenging, and unauthorized traffic. Access control is a key element in preventing unauthorized scavenging or injury. Fences, locked gates, and natural barriers provide the basis of the site's access control system. During operating hours, the landfill personnel monitor and control all access to facilities with at least two people on-site, one of which is at the active face.

All visitors or customers must stop at the weigh station either to have their vehicles weighed or to register in a "visitor log" which shall be maintained by the City of Logan Landfill Scale House personnel. Customers will be directed by signs or the scale operator to the working face.

12. EMPLOYEE HEALTH AND SAFETY

The City of Logan landfill personnel will follow all applicable local, state and federal health and safety guidelines.

12.1 Personnel Facilities

Suitable shelter, sanitary facilities, and safe drinking water will be maintained and available for personnel at the site.

12.2 First Aid Training

Landfill will provide First Aid kits and train landfill employees on how to use first aid kits. First aid kits are to be located and maintained in the maintenance shops, scale house and the administration office.

12.3 Protective Clothing and Personal Protection Equipment

Protective clothing and foot gear are to be worn by all personnel when at the working areas of the landfill, excluding the scale house and office areas. The working areas include, but are not limited to, the working face, the access roads, the hazardous waste facility, the borrow areas, the maintenance buildings, stockpile areas, sampling wells, leachate ponds, green waste facility and areas under construction. Landfill Management will provide personal protective equipment such as gloves, glasses, steel toe shoes, coveralls, and hazardous waste handling suites.

12.4 Communication Equipment

All landfill equipment on site including compactor, track loaders, wheel loaders, dump truck, roll-off truck, and pickup trucks will be equipped with radio units. As an alternate hand held units can be used where a piece of equipment does not have a radio. A radio base station will be maintained in the maintenance shop. All units shall be kept in good

working order at all times. Communication between the operating personnel and the scale house will be maintained.

Emergency telephone numbers of nearby ambulance, hospital, police and fire services are prominently displayed near telephones in the maintenance office, and at the scale house.

13. SPECIAL WASTE MANAGEMENT

Under the Utah solid and hazardous waste rules the following types of wastes are considered special waste, and can only be accepted strictly under the conditions listed below.

13.1 Ash

Ash may be accepted at City of Logan City of Logan Landfill if it is ambient temperature and is transported in a manner to prevent leakage or the release of fugitive dust. At the City of Logan Landfill ash shall be handled and disposed at the landfill in a manner to prevent fugitive dust emissions.

13.2 Bulky Waste

Bulky waste such as automobile bodies, furniture, and appliances shall be crushed and then pushed onto the working face near the bottom of the cell. Care must be taken when bulky waste is received to ensure adequate compaction and coverage of the waste is achieved. To prevent bridging of surrounding waste, large, bulky wastes must be typically placed at the toe of the working face and crushed thoroughly prior to placement of additional solid waste.

13.3 Sludge Requirement

Sludge containing no free liquids, may be placed in the landfill working face and covered with other solid waste or other suitable cover material. Disposal of any type of sludge in a landfill must meet the requirements of Subsection R315-303-3(1).

13.4 Dead Animals

Dead animals shall be managed and disposed in a manner that minimizes odors and the attraction, harborage, or propagation of insects, rodents, birds, or other animals. Dead

animals may be disposed at the active working face or in a separate trench, specifically prepared to receive dead animals. If dead animals are disposed at the active working face the carcasses shall be immediately covered with a minimum of two feet of soil or other material. If dead animals are disposed in a separate trench, the carcasses shall be completely covered with a minimum of six inches of earth at the end of the working day that the carcasses are received.

13.5 Waste Tires

Whole waste tires are prohibited from the Landfill because of their tendency to make their way to the surface and pierce the landfill cover. Landfill employees shall segregate waste tires from the waste stream if they can do it safely. Waste tires accepted at City of Logan Landfill or segregated from the waste stream shall be shipped out to an approved waste tire disposal site.

13.6 Petroleum Contaminated Soils

Petroleum contaminated soils means soils that have been contaminated with petroleum products such as diesel or gasoline or both. Petroleum contaminated soils that are not a hazardous waste is accepted for disposal at City of Logan Landfill or can be used as daily cover. Petroleum contaminated soils containing the following constituents at or below the following levels and are otherwise not a hazardous waste they can be accepted at the Class VIb Landfill.

(a) Benzene, 0.03 mg/kg;

(b) Ethylbenzene, 13 mg/kg;

(c) Toluene, 12 mg/kg; and

(d) Xylenes, 200 mg/kg.

All other petroleum contaminated soils that are not a hazardous waste may be accepted for disposal at the Class I Landfill. Soils that cannot be accepted at the Class VIb Landfill should be tested for Toxicity Characteristic Leaching Procedure (TCLP) to determine if they are hazardous or not. The constituents and their limits for the TCLP test are found in Appendix I.

13.7 Waste Asphalt

If waste asphalt is accepted at the landfill the preferred management method is to use it as road base at the landfill.

13.8 Infectious Wastes

The City of Logan Landfill accepts infectious waste. The following procedures must be put into effect to minimize the potential human contact with the infectious waste:

1. Upon entering the landfill, the transporter of infectious waste shall notify the Landfill Attendant that the load contains infectious waste.
2. Businesses and health care facilities that that bring non residential size loads of infectious wastes will be allowed to bring their infectious waste to the landfill on Thursdays from 9:00 AM to 11:00 AM. The infectious waste containers will be placed in a hole at the bottom of the working face with sufficient care to avoid breaking them.
3. The infectious waste will be immediately and completely covered with a minimum of 12 inches of soil or MSW that does not contain infectious waste.
4. The infectious waste will not be compacted until the 12 inches of soil or noninfectious MSW is in place.

City of Logan Landfill personnel shall maintain a file on all infectious wastes delivered to the landfill as required by Section R315-316 of the Rules.

13.9 Freon Removal Policy

All refrigerant or Freon containing appliances, such as refrigerators, freezers, and some air conditioners, brought to the landfill for disposal must have written certification that the Freon has been properly removed by a certified technician. This policy ensures compliance with the 1990 Clean Air Act which addresses specific ozone depleting compounds that must be properly evacuated and disposed.

Landfill employees are prohibited from intentionally venting refrigerants into the atmosphere while maintaining, servicing, repairing, or disposing of air-conditioning or refrigeration equipment. The landfill Manager/Supervisor and personnel are required to keep records of number of Freon containing appliances they receive or process and the name of the person or the name of the company who removed the Freon.

14. SCAVENGING

State of Utah Solid Waste Rules Standards for Maintenance and Operation (R315-303-4) prohibit scavenging. Scavenging" means the unauthorized removal of solid waste from a facility".

The practice is prohibited because it and interferes with the efficient operation of the landfill. Therefore, landfill employees are prohibited from scavenging or approval of scavenging even if they are not involved. Landfill employees have the responsibility to set a safe example, because, people who see employees scavenging may try it their next trip at the landfill.

Scavenging is perhaps the greatest single cause of accidents and fatalities at landfill sites, due to the partially obstructed view of drivers of vehicles when they are reversing.

15. NUISANCE CONTROL

State of Utah Solid Waste Rules Standards for Maintenance and Operation (R315-303-4) require that an owner or operator to collect scattered litter as necessary to avoid a fire hazard or an aesthetic nuisance. Landfill employees are required to keep landfill litter to a minimum and control nuisances. Nuisance is a concern to the landfill customers, employees, and most importantly to neighbors. Nuisance may include;

- Poor traffic control
- Excessive litter on and around the site
- Odors
- Excessive noise
- Birds
- Vectors, insects, and pests
- Fire
- Dust and mud

Employees are required to minimize these nuisance factors and the following sections provide some guidance on how to deal with these issues. The guidance provided in the following sections should not be viewed as the only way to handle these nuisance concerns. Employees are encouraged to use commonsense to provide clean and safe site.

15.1 Traffic Control

The best method for efficient traffic control is to provide customers with clear directions at the scale house and then reinforce those directions with highly visible signage, so that customers should have little problem finding their intended destinations to deliver waste. It may also be necessary to block access to certain areas with barrels or traffic

cones to avoid dumping in unwanted areas. In addition to blocking access limiting the number of roads available for customers to enter will help them take a more direct route to the working area without getting lost. All areas intended for customers to access must be clearly labeled with large signs. All public access roads will also be posted with speed limit signage to promote safety and improve dust control. Employees are encouraged to route traffic away from the more sensitive areas, either permanently or at particular times. If queuing of vehicles is necessary site supervisor should establish provision to deal with queuing problem within the site.

As a general rule landfill roads will be built towards the outside edges of the landfill deck instead of the center deck to eliminate the need to continually rebuild roads as waste deposits cover them.

15.2 Litter Control

The negative visual impact from inadequate litter control at landfills can be a major cause of complaints and a significant nuisance to site neighbors. Litter control should therefore be a high priority.

Site supervisor and site employees should use the landfill litter fences and any other means available to control litter. Each working day the litter fence position should be adjusted. Place the litter fence directly against wind direction to catch litter escaping from the working area.

It is best to place waste initially around the outside edges of the landfill. As the perimeter is hemmed in with covered waste the result is the creation of a bowl in the center of the landfill deck within which the working area is protected from the wind.

In a windy day the working face activities should be adjusted to minimize wind litter. For example loads containing paper and plastic should be covered with temporary cover material or other heavy waste immediately after it is unloaded to prevent such waste from escaping from the working face. The working face should also be kept as small as possible. On some windy days the site supervisor should also consider an emergency tipping area to minimize litter. If conditions are exceptionally bad, the site should be closed until the wind has abated.

A daily patrol of the site's perimeter, access roadways and adjacent public roadways, should be undertaken. If litter has escaped from a site, a priority should be given to the clearance of gardens of domestic properties, farmland where livestock are kept, and the public highway.

The landfill policy is to require all solid waste hauling vehicles to cover or adequately contain the loads. The landfill scale house attendants should enforce the covered load requirement to all vehicles to prevent litter on access roadways. Vehicle drivers should be issued with warnings about inadequate covering and or untarped load fees of up to $10.00. Consistent violators should be precluded from using the site if the warnings and fees are not heeded.

In some areas the site supervisor should consider movable screens or nets at the site's perimeter to provide protection for adjacent sensitive properties.

All types of litter screens and nets should regularly be cleaned of litter. Otherwise, effectiveness may be reduced and/or the support structures of the litter fence could be damaged.

At the end of the day the landfill employees should cover the working site well. Cover material has a significant role in litter abatement. Accordingly, it is desirable that adequate cover material is stockpiled on the site and nearby the working face.

15.3 Noise Control

Site personnel should be aware of the need to minimize noise and of the health hazards of exposure to excessive noise. Vehicles or equipment visiting or in use on the site should conform to City of Logan Noise standards. In the event landfill employees feel that certain vehicles whether public owned or private are violating City of Logan Landfill noise standards they should report it to their supervisor or to the City of Logan Landfill Solid Waste Manager. Special attention should be given to fitting sound reduction equipment to power tools and machines. Speed limits should be used to reduce noise of vehicles accessing the site. Good quality road surfacing will also have similar effects.

Audible bird bangers may cause irritation to nearby residents, when located in inappropriate locations or operated outside the hours of the regular site working hours. Accordingly, they should not be used after the hours of darkness or in the late evening during summer months.

In certain cases, bunds, vegetative screens and other noise barriers can dampen the ability for noise to travel. These features should be provided to ensure that adjacent properties are shielded from active areas of the landfill development. However, they should be carefully sited, designed to fit in with the topography of the site and the surrounding landscape.

15.4 Pest Control

Good application of cover material, proper compaction of wastes, and general "good housekeeping" are the most effective means of pest control. Insects or animals that carry diseases-producing organisms are also known as vectors. Common vectors include: flies, mosquitoes, mice, rats, skunks, dogs, birds and cats.

Where pests and insects are a continual problem in the summer months, a temporary thick cover more than 6 inches may be used to cover these areas to control the spread of pests and insects. In addition, the prompt and proper burial of difficult wastes containing meat and foodstuffs should reduce insect infestation.

If regular site inspection indicates the prevalence of pests and significant numbers are identified, an experienced pest control specialist should be employed to deal with the problem. Logan City Landfill currently employs an animal trapper to control rock chucks, skunks, cats, dogs, beavers, and muskrats on the landfill site, adjacent wetlands, and bordering farmland properties.

15.5 Bird Control

Scavenger birds such as starlings, crows, blackbirds, and seagulls are the most common birds associated with active landfills. They can be a nuisance, transfer pathogens, litter and scraps to neighboring areas, and also be a hazard to aircraft. Landfill operations should always try to reduce the attractiveness of the deposited wastes to birds. Mainly this involves decreasing the potential supply of food by:

- Frequent covering of wastes; and
- Baling or bagging waste containing food sources and/or immediate burial;

Many of the methods may have only a short term effect as the birds adapt to the environment in which they find food. Varying the control techniques may prevent birds

from becoming accustomed to a single method. Examples of other bird control measures include:

- Gas cannons, and pyrotechnic bangers to discourage birds from food scavenging;
- Visual deterrents including the use of models of the bird's natural predators;
- Use of physical barriers such as nets around the working face;
- Utilization of birds of prey such as falcons; and

Shooting of birds without permission is prohibited and should be a last resort. Some birds including the seagull (the state bird) have protected status and must be respected unless granted specific population control permission for safety reasons.

The most consistently effective measure of bird control is the proper covering of all exposed waste as quickly as possible.

15.6 Dust and Mud Control

Dust may be a problem especially in the summer months. In addition, localized difficulties may be created by the disposal of dusty wastes and the creation of dust with grinding and aerating equipment in the green waste facility. The emission of dusts may be mitigated by spraying water and damping down of site access roads and materials being processed. All road surfaces especially the non paved surfaces should be sprayed with water on a periodic basis (up to 4 to 5 times per day) to prevent dust emissions. The surfacing of access roads with materials such as concrete and asphalt allows mechanical sweeping to reduce fugitive dust emissions. Excessive uncontrolled dust can be an air quality regulation violation if it is allowed to pass the landfill boundaries and buffer zones. The monitoring of dust emissions is a substantial portion of the Logan Landfill quarterly inspection. The Logan Landfill currently uses EPA Method 9 to monitor dust emissions and determine control strategies.

The deposition of significant quantities of mud beyond the landfill property is unacceptable and a storm water violation, and should warrant immediate attention and rectification. Road sweeping equipment should be immediately dispatched to correct the situation if mud is tracking out onto the public road ways and highway. Mud control should also be part of the routine site inspection program. The problem of the tracking out of deposited materials can be addressed by effective design and site operation. Good quality temporary access roads to the working face, a good quality site access road, wheel cleaning equipment, mud collection and road sweeping all are effective mud abatement methods. Employees and landfill management are encouraged to use any or combination of these methods to control mud on site.

In certain cases, it may be appropriate to arrange for the cleaning of the public highway if traffic has spattered mud on these access roads. Often, other non-landfill traffic has created this problem, but it may be desirable to sweep the roads for public relations reasons.

16. SIGNAGE

Landfill signage serves to fulfill the following purposes at the Logan City Landfill:

- **Directions** - Provide driving directions to help customers find their destination
- **Behavior** - Provide rules and guidelines for appropriate behavior and safety
- **Labeling**- Provide labels for products, and locations
- **Traffic Control** – Communicate the standard rules of the road

Directional signage at the landfill will typically contain the name of a desired destination and an arrow pointing the direction of travel to that destination. These signs should generally be the largest and most colorful to catch the attention of customers that are lost or trying to navigate the landfill access roads. There should be multiple signs for one destination along the route so that customers do not become discouraged and leave the route.

Behavioral oriented signs let customers know what the rules are as they enter the landfill and as they work in specific areas. An example of such a sign is one that communicates, "All Vehicles Must Cross Scales". Most of these signs are located near the scale house, but there are various throughout the landfill compound. These types of signs are meant to communicate the type of action or behavior that we expect from customers to keep them safe and create an efficient working environment. Despite how clear and concise they may read they do not substitute for verbal education from landfill attendants and heavy equipment operators.

Signs that provide labeling help people know what product is being sold, or what is acceptable for a certain area. Examples of this type of sign are: "Medium" (medium wood chip product sold in the green waste facility), "Construction and Demolition" (location for dumping construction and demolition), or "All Paint Shed" (location in Hazardous Waste Facility for placing paint).

Traffic Control signs communicate basic rules of the road. Examples of these in the Logan City Landfill include: "Stop", and "Speed Limit 14"(mph).

Signage at the landfill typically are found on posts and stands, but can also be painted or posted on buildings, or painted on the asphalt. Temporary signs are often used as reinforcement for the permanent signage. They are painted with spray paint on sheets of plywood or on culverts. Temporary signs may be used when management or operators discover customers are having difficulty finding their way when temporary access roads change or some specific temporary action is expected from customers.

17. INCLEMENT WEATHER

The following practices will help reduce the severity of problems associated with wet and extremely hot or cold working conditions.

- Maintain at least a 3 day stockpile of cover material near the working face. More, if cover must be hauled a long distance,
- Construct stock piles to promote runoff and reduce puddling,
- Drain surface water away from the working face,
- When needed, place a designated wet weather working area near the entrance and make sure adequate cover is readily available,
- Construct all-weather roads,
- Maintain a stockpile of gravel for use on roads,
- Maintain a stockpile of wood chips for vehicle traction at the garbage and construction and demolition working faces
- Provide a roll-off container on a hard surface for customers in two wheel drive vehicles
- If possible keep the equipment in a heated shed,
- Maintain equipment in accordance with manufacturers recommendations,
- On days that freeze and thaw , obtain cover material early
- Reduce operating on slopes that have already received daily or intermediate cover
- Prohibit customers and operators from accessing the tipping face during lightening storms in close proximity to the landfill

18. LANDFILL FIRES

No material should be burned on or close to the boundaries of a landfill. Fires in landfills should be regarded as emergencies and dealt with immediately. Site personnel should notify the appropriate management, agencies, and other emergency response contacts should fire or smoke emissions from the filled material be observed. Measures for fire prevention and control include:

- Training of employees in fire prevention and control;
- Posting of emergency response contact numbers (fire service, police, ambulance and other agencies);
- Providing fire extinguishers and two-way radios on all mobile equipment;
- Provision of on-site water supply, water storage and portable water tanks; and
- Provision of non-flammable cover material such as soil.

Fires in landfills are difficult to extinguish. Proper landfill control methods and operational practices afford the best protection against the risk of fires. The most effective fire prevention program combines "good housekeeping" with constant vigilance by site personnel. Fire prevention must start with advance identification of potentially hazardous areas and trouble spots. Careful handling of fuels and routine cleaning of equipment tracks and engine, turbo, or exhaust housings on equipment are examples of methods to prevent fires from starting.

Site personnel must be alert for incoming loads that show evidence of burning. Loads that are suspect should be denied entry or immediately segregated and placed in a designated quarantine area. Any waste containing hot ashes, moldy hay, batteries, or chemicals should be segregated and quenched or covering material should be immediately ploughed into it.

If a deep-seated fire is discovered or suspected, the extent of the fire can be verified by measuring temperatures in the area of the fire by means of a temperature probe inserted into pipes driven into the tipped material. Readings should start in the unaffected areas and progressively move towards the area of the fire. The affected area should be marked off by indicator boards.

Initial surface fire control can be attempted using impermeable materials such as soil. Such methods should only be used as the first plan of attack since this method may cause the fire to become deep rooted. Accordingly, the recommended strategy is to dig out the deposited waste and quench it with water. The area containing the fire may also need to be segregated by trenching. The trench should then be back-filled with inert material, such as sub-soils. Deep-seated fires can be dangerous to personnel and machines as the fire may cause the surface of the affected area to become unstable. Personnel or machines should not move over the affected area in these circumstances.

18.1 Fire Emergency Contact Information

A) The City of Logan Fire Department	Phone # 911
B) The City of Logan Police or Fire Chief	Phone # 911
C) Landfill Manager	Phone # 716-9791
	Cell Phone # 754-9754
D) Landfill Foreman	Phone # 716-9798
	Cell Phone # 881-2817

E) The City of Logan Safety Manager

Phone # 716-9670

Cell Phone # 994-0765

19. LANDFILL SETTLEMENT

The amount of settlement that will occur is dependent on several factors:

- Type of refuse,
- Depth of refuse,
- Amount of compaction,
- Rate of decomposition,
- And solid waste moisture content.

The two types of settlement that occur in a landfill are subsidence and differential.

19.1 Subsidence Settlement

Subsidence Settlement is a uniform settlement or sinking of the entire fill that occurs slowly over time. Subsidence settlement is caused by weight of fill (related to height), or decomposition of waste resulting in less volume. Poor compaction energy is also another reason why subsidence settlement will occur in landfill. The best control of settlement is accomplished by maximum compaction, final grade design, and refilling settled areas.

19.2 Differential Settlement

Differential Settlement is a non-uniform settlement of selective filled areas. These areas may be large or small in size and occur randomly throughout time. Differential settlement is caused by:

- Traffic
- Poor compaction,
- Uneven filling
- Highly organic waste placed next to inorganic or inert waste,
- Shifting of materials once decomposition occurs.

Problems created by differential settlement include:

- Allowing water to enter the fill through ponding,
- Increased leachate generation,
- Reduction of vegetative growth,

How do you control differential settlement?

- Build roadways up with inert materials
- Grade surface areas to promote runoff
- Employ principles of good compaction that include:
    1. 3:1 slope on working face
    2. 3 to 5 passes for maximum compaction
    3. Spreading in maximum 2 foot layers
    4. Push waste up slope
    5. Separate bulky wastes; compact inorganic waste tightly around bulky waste
    6. compact bulky wastes as much as possible prior to placing in fill
    7. Keep working area smooth and uniform
    8. Fill depressions with clean fill (dirt) as they become evident and grade to promote runoff.

Settlement has occurred when any of the following conditions are noticeable:

- Standing water
- Visible holes
- Cracks in cover
- Creation of high water lines
- Ponding
- Depressions

- Flat slopes

20. ACCIDENTS

20.1 Accident Reporting

All accidents resulting in property damage, injury, or death to an employee on duty shall immediately be reported by the first available employee at the scene of the accident, in person, by radio, or telephone, to one or more of the following:

- ✓ First call or have someone call 911 if necessary
- ✓ Notify the police or highway patrol, where appropriate
- ✓ Contact immediate supervisor
- ✓ Contact the Environmental Department Operations and Safety Manager
- ✓ Contact Logan City Safety Manager
- ✓ Contact the Environmental Department Director if necessary

All accidents in which the City of Logan Landfill may be involved resulting in property damage, injury or death of persons not employed by the City of Logan Landfill, shall immediately be reported by the first employee having knowledge thereof, in person, by radio, or telephone, to the City of Logan personnel designated above. Employees or management on the scene should also perform first aid if they can do it safely.

Landfill employees are required to report all accidents or incidents at the time of occurrence. Accidents and incidents are the most common cause of injuries. Employees are also required to complete the "Accident/Personal Injury Report" Forms in Appendix F of this manual at the time of occurrence. The basic report should include:

- ✓ Time and date of the accident/incident

- ✓ Reporting date
- ✓ Department or Division the employee involved is assigned to
- ✓ Location of the accident/incident (provide address if possible)
- ✓ Who was involved, name/s of the person/s
- ✓ Which vehicle/s are involved
- ✓ Who is injured
- ✓ What property is damaged
- ✓ Who is contacted
- ✓ Who investigated the accident
- ✓ List of person/s on at the site during the accident
- ✓ Which agencies or individuals responded to the accidents
- ✓ Weather conditions and relevant information
- ✓ Description of the accident and what occurred
- ✓ A drawn diagram of the accident
- ✓ Whether safety policies were followed
- ✓ Description of the damaged property
- ✓ Any other information about the accident or incident
- ✓ Signatures of employees involved and supervisor

20.2 Accident Investigation

All accidents should be investigated by the Department Operations and Safety Manager or a supervisor. They assist the employee with filling out the "Accident/Personal Injury Report" Form. If there has been an injury the employee must also fill out a form called the "First Report of Accident/Injury and Claim For Compensation. This form will protect the City of Logan and the employee if there has been a personal injury that must receive work med attention.

It is the responsibility of the supervisor or the Department Operations and Safety Manager to decide if the incident or accident is simply a "cost of doing business" or if it warrants being reviewed by the Environmental Safety Committee. The Environmental Safety Committee reviews accidents and incidents on a monthly basis and determines whether they constitute an at fault accident as well as determine the minimum disciplinary action.

It is important to procure names and addresses of all witnesses to the accidents. If there is any doubt as to the action that should be taken in respect to medical or hospital treatment, communicate with the landfill supervisor or the Safety Manager.

Employees are encouraged to be courteous to the other party involved in the accident and allow the Operations Manager or landfill supervisor to do the investigation. Employees shall not perform their own investigation.

It is the responsibility of the Landfill Manager, Landfill Foreman, and the Safety Manager to adequately train landfill employees regarding the risks associated with their working environment such that accidents may be avoided. Appendix F contains Accident Reporting Forms.

21. EMERGENCY ACTION PLAN

21.1 Introduction

City of Logan establishes this emergency action plan for the City of Logan Landfill. This emergency plan applies to all City of Logan Landfill employees, the public, volunteers and any other person who is at the landfill at a time of emergency.

This emergency action plan shall address the following subjects as they pertain to emergency situation and evacuation procedures at the City of Logan Landfills

- General Emergencies,
- Alerting of occupants,
- Initial Action of Employees,
- Evacuation of the Facility,
- Accounting for personnel,
- Notification of Response Personnel,
- Training of Employees.

A copy of this emergency action plan shall be posted at the hazardous waste office, the two landfill shops, and at the scale house for employee information purposes and use, and a copy will be on file at the City of Logan Safety Department office. The responsibility for the operation of this emergency action plan rests upon the Landfill Manager, Landfill Foreman and the City of Logan Safety Manager.

21.2 General Emergencies

A natural disaster occurrence (earthquake, hurricane, flood, etc.) fire, waterline break, or hazardous material spill or release at the Landfill is a likely event. To minimize secondary hazards associated with these events it is necessary to have an emergency action plan to give guidance and instruction to personnel. This plan shall be used as a guidance document of these various types of emergencies. Because of the types of chemicals stored and used at this facility and their associated hazards, any evacuation of an area within the facility (office, shops, scale house parking bay, etc.) shall include consideration of or be extended to include evacuation of the entire facility. Any emergency arising in any of the surrounding buildings or locations at this facility shall also be considered as a possible evacuation situation of the entire facility complex.

21.3 Alerting of Occupants

The emergency signal at the Landfill shall be a radio signal. This signal shall reach all areas within the Landfill to alert occupants of present danger. This signal shall be used only for the purpose of notifying occupants to "EVACUATE." It can be activated by radio contact via 2-way radio, and can be activated at any of the following locations:

- Scale house
- Supervisor's office
- Shops
- Working face by Heavy Equipment Operators
- Or any other area within the landfill

Appendix H Contains Evacuation Map

All personnel using the facility or buildings shall be familiar with this signal and will take appropriate emergency evacuation actions when the signal sounds. It shall be the

responsibility of the supervisor to ensure that all personnel who use the landfill facility are trained to recognize and react to this warning signal.

21.4 Initial Action of Employees

All emergency exits at the landfill buildings shall be clearly and visibly marked as an "Emergency Exit," and shall be in plain view from all areas within the building. Where applicable, signs will be posted giving directions to the nearest emergency exit if an exit is not in plain view of a given area. Upon discovery shall initiate the emergency signal by activating the 2-way radio system and giving the command signal "Attention all landfill employees; Evacuation procedures are now active," to warn others of the danger. This announcement shall be repeated 3 times by the person initiating the evacuation procedure. Once the emergency signal is given, all employees not given any specific responsibilities or actions by the Landfill Manager or the Department Manager, shall immediately go to the nearest emergency exit and exit the facility. All employees given specific duties by the Landfill Manager or the Department Manager, when safe to do so, accomplish their assigned emergency duties, and then quickly exit the emergency action plan so that an accounting for all employee actions can be assured. Each specific duty assigned by the Landfill Manager shall be included in this document as an addendum to these procedures (see any attached employee assignments). If an assigned duty is not safe to do under any given emergency then the employee shall immediately exit the building using the nearest appropriate emergency exit, report to the congregation site, and report the occurrence to the Landfill Manager or Landfill Foreman. Once an employee has exited a building or the landfill facility they shall under no circumstances return into the building until a signal from the Landfill Manager, Department Director, or Incident Commander has been given that conditions are allowable for a safe return into the building. Any emergency duties not performed shall be reported to emergency

response personnel by the Department Director or Landfill Manager so that any response action by emergency agencies can be appropriate to existing conditions within the building.

21.5 Evacuation of the Facility

Once the emergency signal is sounded employees should quickly and safely move to the nearest emergency exit and exit the building. Each employee as they are exiting a building or the facility should be conscience of their surroundings and help others, where needed, to exit the building or facility as well. The building or facility should be exited in a safe manner to avoid further panic and injury. For both Landfills the Main Entrance Gate area has been designated as the primary congregation site for employees once they have evacuated the facility. Upon exiting the facility each employee shall report to the main entrance gate if it is safe to do so. If the main entrance gate area is impossible to get to or unsafe conditions exist there for a congregation site, then all persons shall congregate at the State Park and Ride to the north (attached map for secondary congregation site.) Once an employee has exited the facility they shall under no circumstances return into the facility until a signal from the City of Logan Landfill Manager, the Department Director, the City of Logan Safety Manager, or an incident commander has been given that conditions inside are allowable for a safe return.

21.6 Accounting for Personnel

Once employees have congregated at the designated spot, the Landfill Manager or Landfill Foreman shall be responsible for knowing and accounting for all personnel from the building or facility. The Landfill Manager or Foreman shall give an accounting for the location and condition of all employees to the Environmental Department Director or the emergency incident commander. In the event that employees are missing or not accounted for, the necessary information will be relayed to emergency response

personnel. The Landfill Manager or Foreman shall be responsible for accounting for visitors or non-employee individuals within the Landfill facility. These individuals will also be accounted for when a report is given to the City of Logan Safety Manager.

21.7 Notification of Response Personnel

At the earliest safe moment, the following emergency contacts will be made:

A) The City of Logan Landfill Fire Department	Phone # 911
B) The City of Logan Police or Fire Chief	Phone # 911
C) Landfill Manager	Phone # 716-9791
	Cell Phone # 754-9740
D) Landfill Foreman	Phone # 716-9798
	Cell Phone # 881-2817
E) The City of Logan Safety Manager	Phone # 716-9670
	Cell Phone # 994-0765
F) Environmental Department Director	Phone # 716-9752
	Cell Phone # 881-5339

These contact numbers will be posted at the Landfill Manager's office, the scale house, and at the Hazardous Waste Office. In the event of any emergency the following information will be given to the lead emergency response agency:

- Location of the facility
- Location within the building or complex of the emergency
- Nature and extent of the emergency
- Information of any injuries or missing employees

Once notification of the emergency has been given to the appropriate response agency or agencies, and all employees are accounted for, any other pertinent information will be given to emergency response personnel on site and control of the emergency will be relinquished to the lead emergency response agency or incident commander. Employees will leave or remain on site at the congregation point at the discretion of the Manager and the lead emergency response agency.

21.8 Training of Employees

All employees shall receive training in this emergency action plan within a reasonable time after hire. Responsibility for each employee to receive this training rests primarily upon the Landfill Manager, Foreman, and secondarily with the City of Logan Safety Manager. All employees will be trained in both hazard communication standards and this emergency action plan. Annual refresher training will also be a part of this plan to assure employee competence with plan procedures. Training course content will include their personal knowledge of how to recognize the warning signal, how to perform any assigned emergency action responsibilities, and what are the safe evacuation procedures of the facility. Training rosters of all training accomplished along with this plan shall be kept on file at the Landfill Manager and Foreman's office, as well as in the

City of Logan Safety Manager's office. The content of training course materials shall also be available to all employees.

22. SPILL REPORTING

The City of Logan Landfill has an above ground fuel storage tank. The Landfill has one 4,000 gallon fuel tank, one 2,000 gallon used motor oil, two 500 gallon used motor oil tanks, and approximately 330 gallons in oil based materials in drums as, well as 1,980 gallons of antifreeze in drums. The total oil stored in this facility is more than 1,320 gallons and therefore, is not exempted from the Spill Prevention Control and Counter Measure requirements of Title 40, Code of Federal Regulations, Part 112. The Landfill has Spill Prevention Control and Counter Measure Plan.

The purpose of the Spill Prevention, Control, and Countermeasure (SPCC) Plan is to describe measures implemented by City of Logan Landfill Facilities to prevent oil discharges from occurring, and in the event of spill to prepare the City of Logan to respond in a safe, effective, and timely manner to mitigate the impacts of the discharge. It is also intended to establish the procedures and equipment required to prevent the discharge of oil and hazardous substances in quantities that violate applicable water quality standards, or cause sludge or emulsion to be deposited beneath the surface of the water or upon adjoining shorelines. The spill Plan also establishes the activities required to mitigate such discharges (i.e., countermeasures) should they occur.

22.1 Location of Spill Prevention Plan

A copy of the Spill Prevention Control and Counter Measure Plan is to be kept at the Landfill Manager's office.

22.2 Plan Review and Training

Any time the plan elements change the plan must be updated by a qualified person. Landfill employees must be trained to know what to do in the event of spill and how to notify the responsible authority.

22.3 Location of the Storage Tanks

The above ground 4000 gallon diesel storage tank is located at the west side of the Environmental truck wash. The two 500 gallon used motor oil storage tanks, approximately 330 gallons of oil based liquids in drums and 300 gallons of antifreeze in drums are all located at the hazardous waste facility. The 2,000 gallon used motor oil storage container is located on the east side of the green waste facility maintenance shed.

22.4 Discharge Prevention

The City of Logan will do the following to prevent discharge from the tanks reaching the waters of the US:

- The tanks have a secondary containment larger than the size of the container
- The tank is prevented from vehicular damage during loading and unloading
- The facility must keep spill cleanup kits that include absorbent material, and booms. The spill kit shall be located near the storage tank area
- In the event of a breach of the secondary containment the facility surface drainage must be directed to another containment system such as a detention basin
- Landfill employees and fuel company employees must inspect the tank and fueling system visually during loading and unloading of the storage tank
- The landfill manager shall make the location of the tanks secure from vandalism and other potential damages

All suppliers must meet the minimum requirements and regulations for tank truck loading/unloading established by the U.S. Department of Transportation. The City of Logan Landfill employees and supervisors must ensure that the vendor understands the site layout, knows the protocol for entering the facility and unloading product, and has the necessary equipment to respond to a discharge from the vehicle or fuel delivery hose.

The landfill manager or his/her designee supervises oil deliveries for all new suppliers, and periodically observes deliveries for existing, approved suppliers.

All loading and unloading of tanks and vehicles takes place only in the designated loading rack/unloading area.

Vehicle filling operations are performed by facility personnel trained in proper discharge prevention procedures. The truck driver or facility personnel remain with the vehicle at all times while fuel is being transferred. Transfer operations are performed according to the minimum procedures outlined in the table below. This table is also posted next to the loading/unloading point.

22.5 Fuel Transfer Procedure

Landfill employees must always use the following loading and unloading procedures:

- Walk around the tank prior to loading/ unloading
- Shut vehicle (ignition) off
- Inspect hose reel and connection for leaks or breaks
- Pull hose out of reel and put nozzle into fuel tank intake
- Turn ball valve to the in line position
- Energize system to start fueling
- Check that the fuel hose is straight with no kinks in the line
- While fueling is taking place, start to fill out the fuel sheet. Indicating the piece of equipment, hours, who is fueling, date, if a tank inspection occurred, and gallons removed from the 4,000 gallon tank
- DO NOT leave the area until fueling has been completed
- Always be aware of the capacity of the equipment's fuel tank
- Monitor closely as to prevent over flow spills
- When tank is full stop the pump and close the ball valve to the closed position
- Return to the equipment and replace the fuel cap, if necessary, lock it
- Finish the final paperwork on the fuel chart and re-zero the meter for the next person

- Replace hose into hose reel with the nozzle in the hanger within the drip tank
- Keep area clean of liter and trash
- Make any problems known to your supervisor.

22.6 Response to a Minor Discharge

A "minor" discharge is defined as one that poses no significant harm (or threat) to human health and safety or to the environment. Minor discharges are generally those where:

- The quantity of product discharged is small (e.g., may involve less than 10 gallons of oil);
- Discharged material is easily stopped and controlled at the time of the discharge;
- Discharge is localized near the source;
- Discharged material is not likely to reach water;
- There is little risk to human health or safety; and
- There is little risk of fire or explosion.

A "minor" discharge can usually be cleaned up by Landfill personnel. The following guidelines apply:

- Immediately notify the Landfill Manager or Foreman
- Under the direction of the Landfill Manager or Foreman, contain the discharge with discharge response materials and equipment.
- Place discharge debris in properly labeled waste containers.
- The Landfill Manager or Foreman will complete the discharge notification form in Appendix H
- If the discharge involves more than 10 gallons of oil, the Landfill Manager or Foreman must be notified (435-754-9740 or 435-881-2817), and they or another

landfill employee will call the State of Utah Department of Environmental Quality (801-536-4123), the National Response Center 1-800-424-8802, and the City Fire Department (435-716-9510).

22.7 Response to a Major Discharge

A "major" discharge is defined as one that cannot be safely controlled or cleaned up by facility personnel, such as when:

- The discharge is large enough to spread beyond the immediate discharge area;
- The discharged material enters water of the United States;
- The discharge requires special equipment or training to clean up;
- The discharged material poses a hazard to human health or safety; or
- There is a danger of fire or explosion.

In the event of a major discharge, the following guidelines apply:

- All workers must immediately evacuate the discharge site via the designated exit routes and move to the designated staging areas at a safe distance from the discharge. Exit routes are in the Facility Emergency Plan.
- If the Landfill Manager or Foreman is not present at the facility, the senior on-site person notifies the Landfill Manager or Foreman of the discharge and has authority to initiate notification and response. Certain notifications are dependent on the circumstances and type of discharge. A discharge that threatens the Storm Water system may require immediate notification to the City of Logan Landfill Environmental Department and the Storm Water Management Personnel.
- The Landfill Manager or Foreman (or senior on-site person) must call for medical assistance if workers are injured.

- The Landfill Manager or Foreman (or senior on-site person) must notify the Fire Department or Police Department.
- The Landfill Manager or Foreman (or senior on-site person) must call the spill response and cleanup contractors listed in the Emergency Contacts list in Appendix H.
- The Landfill Manager or Foreman (or senior on-site person) must immediately contact the State of Utah Department of Environmental Quality (801-536-4123) and the National Response Center (1-800-424-8802).
- The Landfill Manager or Foreman (or senior on-site person) must record the call on the Discharge Notification form in Appendix H, and file a copy with the landfill daily report.
- The Landfill Manager or Foreman (or senior on-site person) coordinates cleanup and obtains assistance from a cleanup contractor or other response organization as necessary.

22.8 Waste Disposal

Wastes resulting from a minor discharge response will be isolated. The Landfill Manager or Foreman will characterize the waste, test the waste at an approved lab, and determine if the waste can be properly disposed of in the landfill or must be containerized and removed from the facility by a licensed waste hauler within 4 months. Wastes resulting from a major discharge response will be removed and disposed of by a cleanup contractor.

22.9 Discharge Notification

Any size discharge (i.e., one that creates a sheen, emulsion, or sludge) that affects or threatens to affect navigable waters or adjoining shorelines must be reported

immediately to the National Response Center (1-800-424-8802). The Center is staffed 24 hours a day.

A summary sheet is included in Appendix H to facilitate reporting. The person reporting the discharge must provide the following information:

- Name, location, organization, and telephone number
- Name and address of the party responsible for the incident
- Date and time of the incident
- Location of the incident
- Source and cause of the release or discharge
- Types of material(s) released or discharged
- Quantity of materials released or discharged
- Danger or threat posed by the release or discharge
- Number and types of injuries (if any)
- Media affected or threatened by the discharge (i.e., water, land, air)
- Weather conditions at the incident location
- Any other information that may help emergency personnel respond to the incident

Contact information for reporting a discharge to the appropriate authorities is listed in Appendix H and is also posted in prominent locations throughout the facility (e.g., in the office building, in the maintenance building, and at the loading rack/unloading area).

22.10 Cleanup Contractors and Equipment Suppliers

City of Logan Landfill will hire a contractor as the specialized spill response and cleanup contractor. This contractor has the necessary equipment, and personnel to respond to a discharge that affects the water of the United States.

Contractor Name	Clean Harbors
Address	2150 N 470 E
Phone Number	801-645-8265

Spill kits are located at or near by the loading /unloading area and/or the inside of the maintenance building. The inventory of response supplies is verified on a quarterly basis. Additional supplies and equipment will be ordered from the following supplier on an as needed basis.

Name	Phone Number
Clean Harbors	435-830-6329
Home Depot	435-787-2657

23. APPENDIX A LANDFILL PERMIT

24. APPENDIX B DRAWINGS

25. APPENDIX C WASTE INSPECTION FORMS

Landfill Inspection
Field Notes **No.** 4450

Random☐ Non-Random ☐ Suspect ☐ Repeat Offender☐

Face☐ C&D☐ Green Waste ☐ Recycling ☐ Transfer Station ☐

Date _____ **Time** _____:_____ **AM / PM**
Lic.# _____ **State**_____
Vehicle Description _____ **Trailer Type** _____
Gross _____ **Tare** _____ **Net** _____
Owner _____ **Phone** (_____)_____-_____
Address _____ **City** _____ **Zip**_____
Waste Generator _____ **Job Location**_____

Waste Type

Household ☐ **Commercial** ☐ **Industrial** ☐ **C&D** ☐

Educational ☐**Government** ☐ **Other** _____

Driver's Name _____

Waste Composition

Cardboard ☐ Plastic ☐ Metal ☐ Paper ☐ Wood ☐

Other _____ **Notes** _____

Household Hazardous Waste

Characteristic	Description	Quantity	Units
Corrosive			
Flammable			
Reactive			
Toxic			
Other			

Notes _____

Special / Restricted Wastes

Asbestos ☐ Animals ☐ Ash ☐ Auto ☐ C&D ☐

Cont. Soil ☐ Medical☐ White Goods☐ Ref. Units☐ Tires☐

Other _____

Notes _____

Suspicious Waste

Reason for Suspicion

Sealed Container ☐ Unknown Chemical ☐ Unknown Liquid ☐
Radioactive ☐ Gas Cylinder ☐ Possible PCB ☐
Commercial Placards ☐ Type _____
Other Reasons _____
Field Tests _____
Tested By _____
Test Results _____
Follow up Action / Disposal Method _____
_____
_____
_____

Regulated Waste

What part of the load? Front ☐ Middle ☐ Back ☐

Photo's taken? ☐ By _____

Was Generator/ Hauler notified? Yes ☐ No ☐

Was State Regulating Agency notified? Yes ☐ No ☐
Regulator _____ Date _____
Instructions given by Regulator _____
_____
_____
_____
_____

Notes / Follow up _____
_____
_____

Driver's Description of Load

_____
_____

Driver's Signature _____

Was Load Accepted Yes ☐ No ☐

Supervisor's Signature _____

26. APPENDIX D SAMPLE TICKET FOR LANDFILL WEIGHT RECORDING

LOGAN CITY UNITED IN SERVICE
ENVIRONMENTAL DEPARTMENT

Logan City Landfill Ticket No : **233137**
450 N 1000 W Date : **9/13/14**
Logan, Ut 84321 Phone : (435)716-9755
Fax : (465)716-9751

Customer:1000 CASH CUSTOMER
City Landfill

Truck *Temp2
**Temp2 In/Out

Gross :	13980	lb	Scale 1 In	2:30 pm
Tare :	12900	lb	Scale 2 Out	2:40 pm
Net :	1080	lb	0.540 tn	

Weigh Master: Amber

MATERIAL	QTY		UNIT-	TOTAL-$
CONSTRUCTION DEBRIS	0.540	tn	21.00	11.34
			Total $	$11.34
			Received $	11.34

Remarks: White Truck Trailer

Driver:

27. APPENDIX E LANDFILL PERIMETER METHANE MONITORING FORMS

28. APPENDIX F ACCIDENT/INCIDENT REPORTING FORM

29. APPENDIX H SPILL REPORTING FORMS

30. APPENDIX I EQUIPMENT MAINTENANCE CHECKLISTS

City of Logan Landfill

Plan of Operations

Employee Signature Sheet

Landfill Heavy Equipment Operators and Inspectors are required to read the City of Logan Plan of Operations Manual pages 1-81 by March 31, 2015. Permission has been granted to use 15 minutes at the beginning or ending of each day if desired to complete reading. Also if it is your preference feel free to take the manual home for reading. Do not record time on your time sheet spent reading at home.

I have read the City of Logan Landfill Plan of Operations and have had the opportunity to ask questions regarding its content.

Print Name_____

Sign Name_____

Date_____

City of Logan Landfill

Plan of Operations

Employee Signature Sheet

Landfill Heavy Equipment Operators and Inspectors are required to read the City of Logan Plan of Operations Manual pages 1-81 by March 31, 2015. Permission has been granted to use 15 minutes at the beginning or ending of each day if desired to complete reading. Also if it is your preference feel free to take the manual home for reading. Do not record time on your time sheet spent reading at home.

I have read the City of Logan Landfill Plan of Operations and have had the opportunity to ask questions regarding its content.

Print Name_____

Sign Name_____

Date_____

3.16 SAFETY

Landfill personnel are required to participate in an ongoing safety program. This program complies with the Occupational Safety and Health Administration (OSHA), and the National Institute of Occupational Safety and Health (NIOSH) regulations as applicable. This program is designed to make the site and equipment as secure as possible and to educate landfill personnel about safe work practices.

The Logan City Safety Department, trains all of the landfill employees in First Aid, CPR, accident investigation, drug and alcohol policy, lockout and tagout, confined space entry, blood born pathogen, hazard communication, defensive driving, spill prevention control and counter measure, hazardous waste, and commercial driving license requirements.

3.17 EMERGENCY PROCEDURES

In the event of an accident or any other emergency situation, the Operator notifies the scale house Attendant who immediately contacts the Manager and proceeds as directed. If the Manager is not available, the Attendant calls the Director or the appropriate emergency number posted by the telephone. The emergency telephone numbers are:

Cache County Central Dispatch 911
Issa Hamud, Logan Environmental Director .....(435) 716-9755
Bear River Health Department .....(435) 792-6500
Director, DWMRC .....(801) 536-0200
City of Logan Fire Marshall .....(435) 716-9515

Attachment 2
Monitoring Systems for
Ground Water, Surface Water, leachate, and Landfill Gas

3.3.5 Equipment Requirements and Availability

Section 1.5 and 1.6 of Part II – General Report, contains a listing of equipment and personnel located at the landfill and the availability of additional equipment as needed.

3.4 MONITORING SYSTEM DESIGN

3.4.1 Groundwater Monitoring System

The existing groundwater monitoring plan is in accordance with R315-308-2 and is designed to monitor the impacts of the existing landfilling operation on the groundwater regime beneath the site. Wells are located both upgradient and downgradient of the existing landfill operations. The specifics of the groundwater monitoring system are provided in the Groundwater Monitoring Plan for the City of Logan Landfill (Kleinfelder 1998). The Table of Contents for the Groundwater Monitoring Plan is contained in Appendix B, the full plan has not been included as part of this permit renewal.

3.4.2 Surface Water

In general, surface water will be prevented from running into the active landfill area by ditches and berms. Run-off from the final cover will also be managed by a combination of berms and ditches. The berms will be placed to divert the water around the active and final cover area to ditches that will drain to nearby drainages. Landfill staff will inspect the drainage system quarterly. Temporary repairs will be made to any observed deficiencies until permanent repairs can be scheduled. Landfill personnel or a licensed contractor will repair drainage facilities as required.

3.4.3 Leachate Collection

A leachate collection system has not been installed nor will be installed due to the synthetic liner exemption status issued by the DWMRC. A leachate monitoring and removal facility is in place at the southwest corner of the landfill. This system consists of approximately 300 feet of open joint drainpipe laid generally eastward from vertical access pipe. The vertical access pipe is topped with a standard, sewer manhole top section, ring and lid. The access point is used for inspection, measurement and pumping actions to remove leachate. Leachate removed from the landfill is currently transported to and treated at the Logan City Sewage Lagoons.

Logan City is in the process of establishing a bio-treatment basin to treat leachate on adjacent property before discharging to the man-made wetlands.

3.4.4 Landfill Gas

The specifics for monitoring landfill gas are detailed in the City of Logan Landfill Plan of Operations Plan which is included in Appendix E.

3.5 DESIGN AND LOCATION OF RUN-ON/RUN-OFF CONTROL SYSTEM(S)

3.5.1 Run-On from a 24-Hour, 25-Year Storm

The location of active landfill is elevated above the surrounding topography; therefore, the potential for run-on does not exist.

3.5.2 Run-Off from a 24-Hour, 25-Year Storm

The design for the landfill will incorporate a run-off control system that will divert the surface flows resulting from a 25-year, 24-hour storm (2.41 inches – NOAA Atlas 14) that falls on the landfill cover. The proposed final cover surface will be divided into 7 sub-areas by cap access roads which will built up on berms above the final landfill cap. Collection ditches located along the proposed road(s) will collect surface runoff and transport it via the road/drop structures to the perimeter of the landfill where it will travel westward via the run-on diversion channels which are located on the north and south boundaries of the landfill. The road(s) and accompanying channels will break up the landfill cap into smaller drainage sub-areas, this also serves to reduce the peak depth/velocity of sheet flow and erosion of the surface cover. Runoff generated below the roads will also be collected in the run-off diversion channels. Preliminary calculations of the flow rates from the predicted runoff used for initial design of the storm water collection ditches are provided in Appendix F. Preliminary storm water collection ditch design calculations are also included in Appendix F. All ditches will be constructed with 2H:1V side slopes, maximum depth of flow was calculated to be 2.2 feet in the south run-off channel. Other ditches/roadway berms will be sized so that the maximum projected flow depth can be carried within the diversion channels. Evaluation of the erosion potential in the run-off control channels was also performed. This analysis indicated that flow velocities within the channels would erode the channel during the design storm unless a fair stand of vegetative cover is cultivated within the channels. Until the vegetation in the

channels becomes established, a temporary erosion resistant channel lining should be installed.

Surface water that flows off the intermediate cover will be intercepted by control berms and will be treated as non-contact run-off. The intermediate cover will be graded to provide the maximum slopes consistent with slope stability to minimize the amount of precipitation that would infiltrate into the waste materials.

Berms and ditches will be incorporated into the active landfill areas to direct the precipitation away from the working faces. Temporary, movable construction pumps will be used to dewater confined areas to minimize infiltration.

Logan Landfill personnel will be responsible for the maintenance of the slopes and drainage systems to ensure the efficient operation of the run-off system.

The Logan Landfill is designed and will be constructed so as not to cause point or non-point source discharges to surface waters, including wetlands, in violation of the CWA or in violation of State of Utah water quality management plans approved under Section 208 or 319 of the CWA. A copy of the current UPDES permit is included in Appendix G.

Appendix B: Maps

Figure 1: Spring 2017 Groundwater Elevations and Contour Lines
Logan City Sanitary Landfill
*All water level measurements recorded on April 25, 2017. Elevations provided in feet above mean sea level.

Figure 2: Fall 2017 Groundwater Elevations and Contour Lines
Logan City Sanitary Landfill
*All water level measurements recorded on October 24, 2017. Elevations provided in feet above mean sea level.

Attachment 3
Closure and Post Closure

SECTION 4 – CLOSURE PLAN

4.1 GENERAL

The primary change to the existing closure scenario is that the landfill will be closed in 7 Phases rather than 5 with the first Phase starting in the northern side of the landfill. Closure will proceed from the northern side of the landfill and progress in a counterclockwise direction. The drawings in Appendix A show the closure Phases for the landfill.

The landfill was intended to be filled to design capacity in sequential Phases; however, it will be closed sooner than intended due to the construction of the NVL. The following sections discuss the closure of the landfill under present conditions (any point in time before total design capacity) and designed closure to the new full capacity in 7 Phases.

4.2 IMMEDIATE CLOSURE

Although unlikely, it may become necessary or advantageous to close the Logan Landfill short of the final design capacity. Reasons for premature closure range from residential pressures, political pressures, alternate waste disposal options, to regulatory pressures.

Immediate closure would be closure of the landfill within the next 60 months. During that period of time, waste would need to be deposited and regraded in a manner to create a positively sloped final cover. Design, regulatory approval, and construction of a final cover system would need to be completed over the entire MSW landfill footprint. The approximate area that would constitute the final cover is approximately 90 acres.

4.3 PHASED CLOSURE

The most probable scenario for the Logan Landfill is one of Phased Closure. Phased Closure would consist of closing the landfill under the following plan, in accordance with Rules R315-302-2 and 3. The drawings in Appendix A shows the contours of the final cover.

4.3.1 Closure Phases

The closure of the Logan Landfill consists of seven Phases. The life of each of the individual Phases will depend upon the side slope of the MSW extending into surrounding Phases. The lateral extent and predicted life of each of the Phases is as follows:

4.3.1.1 Phase I

Phase I is located at the north side of the landfill over the former C&D landfill. Phase I consists of approximately 7 acres or approximately 305,000 square feet. Phase I will provide no additional landfilling capacity and is scheduled to be closed in 2019.

4.3.1.2 Phase II

Phase II is located immediately west of Phase I along the western landfill boundary. Phase II consists of approximately 10.6 acres or approximately 462,000 square feet. Phase II will provide no additional landfilling capacity and is scheduled to close in 2020.

4.3.1.3 Phase III

Phase III is located immediately south of Phase II. Phase III consists of approximately 10.3 acres or approximately 449,000 square feet. Phase III will provide no additional landfilling capacity and is scheduled to close in 2021.

4.3.1.4 Phase IV

Phase IV is located along the southern boundary of the landfill. Phase IV consists of approximately 6.8 acres or approximately 296,000 square feet. Phase IV will provide no landfilling capacity and is scheduled to close in 2023.

4.3.1.5 Phase V

Phase V is located at the eastern edge of the landfill. Phase V consists of approximately 11.6 acres or approximately 505,000 square feet. Phase V will provide landfilling no additional landfill capacity and is scheduled to be closed in 2025.

4.3.1.6 Phase VI

Phase IV is located in the west central portion of the landfill and is the current operational area for waste disposal. Phase VI consists of approximately 17.9 acres or approximately 780,000 square feet. Phase VI will provide landfilling capacity for approximately 8 years, reaching capacity in 2026. Phase VI will provide approximately 444,000 cubic yards of landfill capacity.

4.3.1.7 Phase VII

Phase VII is located in the central portion of the landfill. Phase VII consists of approximately 21.6 acres or approximately 941,000 square feet. Phase VII will provide landfilling capacity for approximately 6 years, reaching capacity in 2032. Phase IV will provide approximately 340,000 cubic yards of landfill capacity.

4.3.1.8 Total Capacity of the Site.

The approximate quantity of air space consumed in the landfill, from 1960 through the year 2017 is estimated to be approximately 7,594,000 cubic yards (CY) including daily and intermediate cover. Based on the proposed modifications outlined in this permit, the volume of air space remaining until closure is estimated at 785,000 cubic yards. A projection of landfill use is provided in Appendix N. This analysis indicates that the landfill will reach its design capacity in approximately the year 2032.

4.3.2 Closure Procedures

Closure activities for each Phase of the landfill will take place in accordance with the following procedures:

4.3.2.1 Submittal of Plans, Specifications, and QA/QC Plan

Four months before the intended closure of each of the Phases of landfilling, a design package consisting of drawings, construction specifications, and a QA/QC plan will be submitted to the DWMRC. The DWMRC will have approximately 60 days to review and comment on the adequacy of the drawings, specifications and quality assurance/quality control measure envisioned for the construction. Comments from DWMRC will be incorporated into a final "bid" package for the cover construction.

4.3.2.2 Formal Notification

The Director of the Division of Waste Management and Radiation Control will be notified of the intent to implement the closure plan in whole or part, 60 days prior to the date projected for construction.

4.3.2.3 Additional Closure Activities

Additional closure activities to close either the entire landfill or only one Phase are as follows:

- Regrading of all lower side slopes where current slopes are steeper than 3 horizontal to 1 vertical.
- Regrading of all upper side slopes and the top of the landfill to slopes between 4 horizontal to 1 vertical, but not flatter than 10 horizontal to 1 vertical.
- Finalization (including DWMRC comments) of the final cover design package. Final Cover design package will include, at a minimum, plans, construction specifications, and QA/QC protocols to guide the construction of the final cover.
- Bidding and construction of final cover.
- Construction of a maintenance road over the cover.
- Construction of run-off control structures.
- Vegetation of the final cover soils.
- Preparation of As-Built Drawings.
- Inspection of final cover construction by Owner (City of Logan), Engineer (engineer of record) and DWMRC personnel.
- Preparation of Certificate of Closure by a Utah registered Professional Engineer.
- Submittal of required documents to the State DWMRC and to the Cache County Recorders office.

4.4 CLOSURE COSTS

4.4.1 Immediate Closure

The closure of the landfill may occur before the final design capacity is reached. The costs associated with the closure of the entire landfill at once would entail the regrading of a large portion of the landfill, engineering of final cover plans, specifications, and QA/QC plan. The cost of closure under current conditions is estimated at 4.3 million dollars. Details of this estimate are provided in Appendix O.

4.4.2 Phased Closure

If the landfilling operations continue as proposed by this permit application, the landfill will be closed in 7 Phases. The approximate cost of closure for each of the Phases is as follows:

Phase I – $ 465,000
Phase II – $ 663,000
Phase III – $ 668,000
Phase IV – $ 484,000
Phase V – $ 758,000
Phase VI – $1,128,000
Phase VII – $1,400,000

Approximate Total Closure Costs = $ 5,566,000 (including a 10% contingency and factoring for inflation). Details of the closure cost estimates are provided in Appendix O.

SECTION 5 – POST-CLOSURE PLAN

5.1 GENERAL

Post-closure financial assurance will provide for continued monitoring of groundwater, surface water, leachate, gas, and maintenance of the cover as described in the post-closure plan below. The total cost of post-closure care is estimated at approximately $884,000. A detailed analysis of annual post-closure costs is provided in Appendix O.

5.2 POST-CLOSURE PLAN

In accordance with rules R315-302-2 and R315-303 post-closure activities at the landfill will continue for 30 years, or as long as the Director of the Division of Waste Management and Radiation Control deems necessary for the Logan Landfill to be stabilized and to protect human health and the environment. The Post-Closure activities will include the following work:

5.2.1 Changes to Record of Title

A Plat Map and Statement of Fact concerning the location of the landfill shall be recorded with the Cache County recorder not later than 60 days after certification of final closure. The recorded document will restrict future land use. Compatible land uses will be identified in the Logan City comprehensive planning documents.

5.2.2 Monitoring Plan

Post-closure activities will commence immediately upon closure of the total facility. The monitoring frequencies for the different media are shown in the following table. Post-closure monitoring will be conducted as follows:

Post-Closure Monitoring Schedule

Type	Frequency	Apparatus
Groundwater	Semi-Annual	Refer to Landfill Plan of Operation
Surface Water	Semi-Annual	Refer to Landfill Plan of Operation
Leachate	Quarterly	Sump at southwest corner of Landfill
Gas and Ambient Air	Quarterly	Refer to Landfill Plan of Operation
Settlement	Annual	Bench mark survey

5.2.2.1 Groundwater

Groundwater will be monitored in accordance with procedures provided in the Logan City Groundwater Monitoring Plan previously submitted to the State of Utah DWMRC. The Table of Contents for this Plan is contained in Appendix B.

5.2.2.2 Surface Water

Surface water will be monitored in accordance with procedures provided in the Plan of Operations provided in Appendix E.

5.2.2.3 Leachate

The presence of leachate will be monitored at the leachate collection sump located at the southwest corner of the landfill. Accumulations of leachate in excess of 1 foot will be removed and transported the Logan City Sewage Lagoons for treatment. Logan City is in the process of establishing a bio-treatment basin to treat leachate on adjacent property.

5.2.2.4 Gas Monitoring

Landfill gas will be monitored in accordance with procedures provided in the Plan of Operations provided in Appendix E.

5.2.2.5 Settlement

At final closure, the boundary markers used to designate closed areas of the landfill will be used to measure settlement of refuse materials. Additional survey markers will be placed as

necessary to monitor areas of suspected movement. Ground elevation will be measured at the base of each boundary marker.

5.2.3 Inspection and Maintenance

Monitoring facilities, fences, roads, buildings, cover, and run-on and run-off systems will be inspected in accordance with the schedule presented in the cost estimate (Appendix O).

Facilities will be inspected for damage, deterioration, and impaired function with regard to the listed standards and original design. Deficiencies will be corrected promptly. Deficiencies, repairs, and restoration of function will be documented in the landfill record.

The City of Logan, Environmental Director will be the contact person for the Closure and Post-Closure care period. The Environmental Director can be reached at (435) 716-9755.

APPENDIX O

(CLOSURE / POST CLOSURE COSTS)

CLOSURE COSTS (IMMEDIATE CLOSURE)

Section 1.0 - Engineering **CLOSURE NOW**

ESTIMATED DATE OF CLOSURE = NOW

APPROXIMATE CLOSURE AREA = 3,800,000

Item	Description	Unit Measure	Cost/Unit	No. Units	Total Cost
1.1	**Topographic Survey**	LS	$7,500	1	$7,500
1.2	**Boundary Survey for Closure**	NA			
1.3	**Site Evaluation**	LS	$2,500	1	$2,500
1.4	**Development of Plans**	LS	$25,000	1	$25,000
1.5	**Contract Administration - (Bidding and Award)**	LA	$7,500	1	$7,500
1.6	**Administrative Costs - (Certification of Final Cover and Closure Notice)**	LS	$10,000	1	$10,000
1.7	**Project Management - (Construction Observation and Testing)**	LS	$40,000	1	$40,000
1.8	**Monitor Well Consultant Cost**	NA			$0
1.9	**Other Environmental Permit Cost**	NA			$0
				Engineering Subtotal	$92,500

Section 2.0 - Construction **CLOSURE NOW**

Item	Description	Unit Measure	Cost/Unit	No. Units	Total Cost
2.1	**Final Cover System**				
2.1.1	***Site Preparation/ Site Regrading***	ACRE	$1,500	87.2	$130,854
2.1.2	*Gas Collection Layer/Pipes*	NA			$0
2.1.3	*Low permeability Layer (Soil - If Applicable)*				
a	Soil Purchase	NA			$0
b	Soil Processing (load)	CY	$1.00	211,111	$211,111
c	Soil Transportation	CY	$2.00	211,111	$422,222
d	Soil Placement	CY	$1.00	211,111	$211,111
e	Soil Amendment (compact)	CY	$7.00	211,111	$1,477,778
2.1.4	***Low permeability Layer (Synthetic - If Applicable)***				
a	Geotextile	NA			$0
b	GCL	NA			$0
c	Geomembrane (HDPE,PVC,LLDPE,etc…)	NA			$0
2.1.5	***Drainage Layer (Soil - If Applicable)***				
a	Geotextile	NA			$0
b	Sand/Gravel	NA			$0
2.1.6	***Drainage Layer (Synthetic - If Applicable)***				
a	Geotextile	NA			$0
b	Geonet/Geocomposite	NA			$0
2.1.7	***Erosion Protection Soil Layer***				
a	Soil Purchase	NA			$0
b	Soil Processing (load)	CY	$1.00	211,111	$211,111
c	Soil Transportation	CY	$2.00	211,111	$422,222
d	Soil Placement	CY	$1.00	211,111	$211,111
e	Soil Amendment (compact)	CY			$0
2.1.8	***Topsiol Layer***				
a	Soil Purchase	NA			$0
b	Soil Processing (load)	CY	$1.00	70,370	$70,370
c	Soil Transportation	CY	$2.00	70,370	$140,741
d	Soil Placement	CY	$1.00	70,370	$70,370
e	Soil Amendment	NA			$0
2.1.9	***Revegetation***				
a	Seeding	ACRE	$1,200	87.2	$104,683
b	Fertilizing	ACRE	$500	87.2	$43,618
c	Mulch	ACRE	$200	87.2	$17,447
d	Tacifier	ACRE	$200	87.2	$17,447
2.2	**Stormwater Protection Structures**				
a	Culverts	EA	$1,500	6	$9,000
b	Pipes	NA	$2,400	5	$12,000
c	Ditches/Berms	FT	$12,000	5	$60,000
d	Detention Basins	NA			$0
2.3	**Gas Collection System**				
a	Design	NA			$0
b	Additional Equipment / Installation	NA			$0
2.4	**Leachate Collection System**				
a	Design	NA			$0
b	Additional Equipment / Installation	NA			$0
2.5	**Groundwater Monitoring System**				
a	Monitor Well Installation	NA			$0
b	Monitor Well Abandonment	NA			$0
2.6	**Site Security**				
a	Lighting, signs, etc…	NA			$0
b	Fencing and Gates	NA			$0
2.7	**Miscellaneous**				
a	Performance Bonds	LS	$10,000	1	$10,000
b	Contract/Legal fees	LS	$5,000	1	$5,000
				Construction Subtotal	$3,858,198

LS - LUMP SUM
NA - NOT APPLICABLE
EA - EACH
CY - CUBIC YARD
FT - FEET

Total	$3,950,698
10% Contingency	$395,070
Subtotal Closure Cost	$4,345,768

CLOSURE COSTS (PHASE I & PHASE II)

Section 1.0 - Engineering

PHASE I

ESTIMATED DATE OF CLOSURE = 2019
APPROXIMATE CLOSURE AREA = 305,000

Item	Description	Unit Measure	Cost/Unit	No. Units	Total Cost
1.1	**Topographic Survey**	LS	$5,000	1	$5,000
1.2	**Boundary Survey for Closure**	NA			
1.3	**Site Evaluation**	LS	$2,500	1	$2,500
1.4	**Development of Plans**	LS	$15,000	1	$15,000
1.5	**Contract Administration** - (Bidding and Award)	LA	$7,500	1	$7,500
1.6	**Administrative Costs** - (Certification of Final Cover and Closure Notice)	LS	$7,500	1	$7,500
1.7	**Project Management** - (Construction Observation and Testing)	LS	$25,000	1	$25,000
1.8	**Monitor Well Consultant Cost**	NA			$0
1.9	**Other Environmental Permit Costs**	NA			$0
				Engineering Subtotal	$62,500

PHASE II

ESTIMATED DATE OF CLOSURE = 2020
APPROXIMATE CLOSURE AREA = 462,000

Unit Measure	Cost/Unit	No. Units	Total Cost
LS	$5,000	1	$5,000
NA			
LS	$2,500	1	$2,500
LS	$15,000	1	$15,000
LA	$7,500	1	$7,500
LS	$7,500	1	$7,500
LS	$25,000	1	$25,000
NA			$0
NA			$0
		Engineering Subtotal	62500

Section 2.0 - Construction

PHASE I

Item	Description	Unit Measure	Cost/Unit	No. Units	Total Cost
2.1	**Final Cover System**				
2.1.1	***Site Preparation/ Site Regrading***	ACRE	$1,500	7.0	$10,503
2.1.2	*Gas Collection Layer/Pipes*	NA			$0
2.1.3	*Low permeability Layer (Soil - If Applicable)*				
a	Soil Purchase	NA			$0
b	Soil Processing (load)	CY	$1.00	16,944	$16,944
c	Soil Transportation	CY	$2.00	16,944	$33,889
d	Soil Placement	CY	$1.00	16,944	$16,944
e	Soil Amendment (compact)	CY	$7.00	16,944	$118,611
2.1.4	***Low permeability Layer (Synthetic - If Applicable)***				
a	Geotextile	NA			$0
b	GCL	NA			$0
c	Geomembrane (HDPE,PVC,LLDPE,etc…)	NA			$0
2.1.5	***Drainage Layer (Soil - If Applicable)***				
a	Geotextile	NA			$0
b	Sand/Gravel	NA			$0
2.1.6	***Drainage Layer (Synthetic - If Applicable)***				
a	Geotextile	NA			$0
b	Geonet/Geocomposite	NA			$0
2.1.7	***Erosion Protection Soil Layer***				
a	Soil Purchase	NA			$0
b	Soil Processing (load)	CY	$1.00	16,944	$16,944
c	Soil Transportation	CY	$2.00	16,944	$33,889
d	Soil Placement	CY	$1.00	16,944	$16,944
e	Soil Amendment (compact)	CY			$0
2.1.8	***Topsiol Layer***				
a	Soil Purchase	NA			$0
b	Soil Processing (load)	CY	$1.00	5,648	$5,648
c	Soil Transportation	CY	$2.00	5,648	$11,296
d	Soil Placement	CY	$1.00	5,648	$5,648
e	Soil Amendment	NA			$0
2.1.9	***Revegetation***				
a	Seeding	ACRE	$1,200	7.0	$8,402
b	Fertilizing	ACRE	$500	7.0	$3,501
c	Mulch	ACRE	$200	7.0	$1,400
d	Tacifier	ACRE	$200	7.0	$1,400
2.2	**Stormwater Protection Structures**				
a	Culverts	EA	1,500	$3	$4,500
b	Pipes	NA	400	$5	$2,000
c	Ditches/Berms	FT	2,500	$5	$12,500
d	Detention Basins	NA			$0
2.3	**Gas Collection System**				
a	Design	NA			
b	Additional Equipment / Installation	NA			
2.4	**Leachate Collection System**				
a	Design	NA			$0
b	Additional Equipment / Installation	NA			$0
2.5	**Groundwater Monitoring System**				
a	Monitor Well Installation	NA			$0
b	Monitor Well Abandonment	NA			$0
2.6	**Site Security**				
a	Lighting, signs, etc…	NA			$0
b	Fencing and Gates	NA			$0
2.7	**Miscellaneous**				
a	Performance Bonds	LS	$10,000	1	$10,000
b	Contract/Legal fees	LS	$5,000	1	$5,000
				Construction Subtotal	$335,966

PHASE II

Unit Measure	Cost/Unit	No. Units	Total Cost
ACRE	$1,500	10.6	$15,909
NA			$0
NA			$0
CY	$1.00	25,667	$25,667
CY	$2.00	25,667	$51,333
CY	$1.00	25,667	$25,667
CY	$7.00	25,667	$179,667
NA			$0
NA			$0
NA			$0
NA			$0
NA			$0
NA			$0
NA			$0
CY	$1.00	25,667	$25,667
CY	$2.00	25,667	$51,333
CY	$1.00	25,667	$25,667
CY			$0
NA			$0
CY	$1.00	8,556	$8,556
CY	$2.00	8,556	$17,111
CY	$1.00	8,556	$8,556
NA			$0
ACRE	$1,200	10.6	$12,727
ACRE	$500	10.6	$5,303
ACRE	$200	10.6	$2,121
ACRE	$200	10.6	$2,121
EA	$1,500	1	$1,500
NA	$1,100	10	$11,000
FT	$4,000	5	$20,000
NA			$0
NA			$0
NA			$0
NA			$0
NA			$0
NA			$0
NA			$0
NA			$0
LS	$10,000	1	$10,000
LS	$5,000	1	$5,000
		Construction Subtotal	$504,904

LS - LUMP SUM
NA - NOT APPLICABLE
EA - EACH
CY - CUBIC YARD
FT - FEET

Total	$398,466
10% Contingency	$39,847
Subtotal Closure Cost	$438,312
Inflation Factor	1.0612
Inflated Closure Cost (2% inflation)	$465,141

Total	$567,404
10% Contingency	$56,740
Subtotal Closure Cost	$624,144
Inflation Factor	1.0612
Inflated Closure Cost (2% inflation)	$662,347

CLOSURE COSTS (PHASE III & PHASE IV)

Section 1.0 - Engineering

	PHASE III				PHASE IV			
	ESTIMATED DATE OF CLOSURE =	2021			ESTIMATED DATE OF CLOSURE =	2023		
	APPROXIMATE CLOSURE AREA =	449,000			APPROXIMATE CLOSURE AREA =	279,000		
Item	Description	Unit Measure	Cost/Unit	No. Units	Total Cost	Unit Measure	Cost/Unit	No. Units	Total Cost
1.1	**Topographic Survey**	LS	$5,000	1	$5,000	LS	$5,000	1	$5,000
1.2	**Boundary Survey for Closure**	NA				LS	$7,500	1	$7,500
1.3	**Site Evaluation**	LS	$2,500	1	$2,500	LS	$2,500	1	$2,500
1.4	**Development of Plans**	LS	$15,000	1	$15,000	LS	$15,000	1	$15,000
1.5	**Contract Administration** - (Bidding and Award)	LA	$7,500	1	$7,500	LA	$7,500	1	$7,500
1.6	**Administrative Costs** - (Certification of Final Cover and Closure Notice)	LS	$7,500	1	$7,500	LS	$7,500	1	$7,500
1.7	**Project Management** - (Construction Observation and Testing)	LS	$25,000	1	$25,000	LS	$25,000	1	$25,000
1.8	**Monitor Well Consultant Cost**	NA			$0	NA			$0
1.9	**Other Environmental Permit Costs**	NA			$0	NA			$0
				Engineering Subtotal	62500			**Engineering Subtotal**	70000

Section 2.0 - Construction

	PHASE III				PHASE IV			
Item	Description	Unit Measure	Cost/Unit	No. Units	Total Cost	Unit Measure	Cost/Unit	No. Units	Total Cost
2.1	**Final Cover System**								
2.1.1	***Site Preparation/ Site Regrading***	ACRE	$1,000	10.3	$10,308	ACRE	$1,000	6.4	$6,405
2.1.2	*Gas Collection Layer/Pipes*	NA			$0	NA			$0
2.1.3	*Low permeability Layer (Soil - If Applicable)*								
a	Soil Purchase	NA			$0	NA			$0
b	Soil Processing (load)	CY	$1.00	24,944	$24,944	CY	$1.00	15,500	$15,500
c	Soil Transportation	CY	$2.00	24,944	$49,889	CY	$2.00	15,500	$31,000
d	Soil Placement	CY	$1.00	24,944	$24,944	CY	$1.00	15,500	$15,500
e	Soil Amendment	CY	$7.00	24,944	$174,611	CY	$7.00	15,500	$108,500
2.1.4	***Low permeability Layer (Synthetic - If Applicable)***								
a	Geotextile	NA			$0	NA			$0
b	GCL	NA			$0	NA			$0
c	Geomembrane (HDPE,PVC,LLDPE,etc…)	NA			$0	NA			$0
2.1.5	***Drainage Layer (Soil - If Applicable)***								
a	Geotextile	NA			$0	NA			$0
b	Sand/Gravel	NA			$0	NA			$0
2.1.6	***Drainage Layer (Synthetic - If Applicable)***								
a	Geotextile	NA			$0	NA			$0
b	Geonet/Geocomposite	NA			$0	NA			$0
2.1.7	***Erosion Protection Soil Layer***								
a	Soil Purchase	NA			$0	NA			$0
b	Soil Processing (load)	CY	$1.00	24,944	$24,944	CY	$1.00	15,500	$15,500
c	Soil Transportation	CY	$2.00	24,944	$49,889	CY	$2.00	15,500	$31,000
d	Soil Placement	CY	$1.00	24,944	$24,944	CY	$1.00	15,500	$15,500
e	Soil Amendment	CY			$0	CY			$0
2.1.8	***Topsiol Layer***								
a	Soil Purchase	NA			$0	NA			$0
b	Soil Processing (load)	CY	$1.00	8,315	$8,315	CY	$1.00	5,167	$5,167
c	Soil Transportation	CY	$2.00	8,315	$16,630	CY	$2.00	5,167	$10,333
d	Soil Placement	CY	$1.00	8,315	$8,315	CY	$1.00	5,167	$5,167
e	Soil Amendment	NA			$0	NA			$0
2.1.9	***Revegetation***								
a	Seeding	ACRE	$1,200	10.3	$12,369	ACRE	$1,200	6.4	$7,686
b	Fertilizing	ACRE	$500	10.3	$5,154	ACRE	$500	6.4	$3,202
c	Mulch	ACRE	$200	10.3	$2,062	ACRE	$200	6.4	$1,281
d	Tacifier	ACRE	$200	10.3	$2,062	ACRE	$200	6.4	$1,281
2.2	**Stormwater Protection Structures**								
a	Culverts	EA	$1,500	1	$1,500	EA			$0
b	Pipes	NA	$900	10	$9,000	NA			$0
c	Ditches/Berms	FT	$3,500	5	$17,500	FT	$2,000	5	$10,000
d	Detention Basins	NA			$0	NA			$0
2.3	**Gas Collection System**								
a	Design	NA			$0	NA			$0
b	Additional Equipment / Installation	NA			$0	NA			$0
2.4	**Leachate Collection System**								
a	Design	NA			$0	NA			$0
b	Additional Equipment / Installation	NA			$0	NA			$0
2.5	**Groundwater Monitoring System**								
a	Monitor Well Installation	NA			$0	NA			$0
b	Monitor Well Abandonment	NA			$0	NA			$0
2.6	**Site Security**								
a	Lighting, signs, etc…	NA			$0	NA			$0
b	Fencing and Gates	NA			$0	NA			$0
2.7	**Miscellaneous**								
a	Performance Bonds	LS	$10,000	1	$10,000	LS	$10,000	1	$10,000
b	Contract/Legal fees	LS	$5,000	1	$5,000	LS	$5,000	1	$5,000
				Construction Subtotal	$482,380			**Construction Subtotal**	$298,022

Total	$544,880		**Total**	$368,022
10% Contingency	$54,488		**10% Contingency**	$36,802
Subtotal Closure Cost	$599,368		**Subtotal Closure Cost**	$404,824
Inflation Factor **1.1487**			Inflation Factor **1.1951**	
Inflated Closure Cost (2% inflation)	$688,485		**Inflated Closure Cost (2% inflation)**	$483,802

CLOSURE COSTS (PHASE V & PHASE VI)

Section 1.0 - Engineering

PHASE V

ESTIMATED DATE OF CLOSURE = 2025

APPROXIMATE CLOSURE AREA = 505,000

Item	Description	Unit Measure	Cost/Unit	No. Units	Total Cost
1.1	**Topographic Survey**	LS	$5,000	1	$5,000
1.2	**Boundary Survey for Closure**	NA			
1.3	**Site Evaluation**	LS	$2,500	1	$2,500
1.4	**Development of Plans**	LS	$15,000	1	$15,000
1.5	**Contract Administration -** (Bidding and Award)	LA	$7,500	1	$7,500
1.6	**Administrative Costs -** (Certification of Final Cover and Closure Notice)	LS	$7,500	1	$7,500
1.7	**Project Management -** (Construction Observation and Testing)	LS	$25,000	1	$25,000
1.8	**Monitor Well Consultant Cost**	NA			$0
1.9	**Other Environmental Permit Costs**	NA			$0
				Engineering Subtotal	62500

PHASE VI

ESTIMATED DATE OF CLOSURE = 2026

APPROXIMATE CLOSURE AREA = 780,000

Unit Measure	Cost/Unit	No. Units	Total Cost
LS	$5,000	1	$5,000
LS	$7,500	1	$7,500
LS	$2,500	1	$2,500
LS	$15,000	1	$15,000
LA	$7,500	1	$7,500
LS	$7,500	1	$7,500
LS	$25,000	1	$25,000
NA			$0
NA			$0
		Engineering Subtotal	70000

Section 2.0 - Construction

PHASE V

Item	Description	Unit Measure	Cost/Unit	No. Units	Total Cost
2.1	**Final Cover System**				
2.1.1	***Site Preparation/ Site Regrading***	ACRE	$1,000	11.6	$11,593
2.1.2	*Gas Collection Layer/Pipes*	NA			$0
2.1.3	*Low permeability Layer (Soil - If Applicable)*				
a	Soil Purchase	NA			$0
b	Soil Processing (load)	CY	$1.00	28,056	$28,056
c	Soil Transportation	CY	$2.00	28,056	$56,111
d	Soil Placement	CY	$1.00	28,056	$28,056
e	Soil Amendment	CY	$7.00	28,056	$196,389
2.1.4	***Low permeability Layer (Synthetic - If Applicable)***				
a	Geotextile	NA			$0
b	GCL	NA			$0
c	Geomembrane (HDPE,PVC,LLDPE,etc…)	NA			$0
2.1.5	***Drainage Layer (Soil - If Applicable)***				
a	Geotextile	NA			$0
b	Sand/Gravel	NA			$0
2.1.6	***Drainage Layer (Synthetic - If Applicable)***				
a	Geotextile	NA			$0
b	Geonet/Geocomposite	NA			$0
2.1.7	***Erosion Protection Soil Layer***				
a	Soil Purchase	NA			$0
b	Soil Processing (load)	CY	$1.00	28,056	$28,056
c	Soil Transportation	CY	$2.00	28,056	$56,111
d	Soil Placement	CY	$1.00	28,056	$28,056
e	Soil Amendment	CY			$0
2.1.8	***Topsiol Layer***				
a	Soil Purchase	NA			$0
b	Soil Processing (load)	CY	$1.00	9,352	$9,352
c	Soil Transportation	CY	$2.00	9,352	$18,704
d	Soil Placement	CY	$1.00	9,352	$9,352
e	Soil Amendment	NA			$0
2.1.9	***Revegetation***				
a	Seeding	ACRE	$1,200	11.6	$13,912
b	Fertilizing	ACRE	$500	11.6	$5,797
c	Mulch	ACRE	$200	11.6	$2,319
d	Tacifier	ACRE	$200	11.6	$2,319
2.2	**Stormwater Protection Structures**				
a	Culverts	EA	$1,500	1	$1,500
b	Pipes	NA	$900	10	$9,000
c	Ditches/Berms	FT	$3,500	5	$17,500
d	Detention Basins	NA			$0
2.3	**Gas Collection System**				
a	Design	NA			$0
b	Additional Equipment / Installation	NA			$0
2.4	**Leachate Collection System**				
a	Design	NA			$0
b	Additional Equipment / Installation	NA			$0
2.5	**Groundwater Monitoring System**				
a	Monitor Well Installation	NA			$0
b	Monitor Well Abandonment	NA			$0
2.6	**Site Security**				
a	Lighting, signs, etc…	NA			$0
b	Fencing and Gates	NA			$0
2.7	**Miscellaneous**				
a	Performance Bonds	LS	$10,000	1	$10,000
b	Contract/Legal fees	LS	$5,000	1	$5,000
				Construction Subtotal	$537,180

PHASE VI

Unit Measure	Cost/Unit	No. Units	Total Cost
ACRE	$1,000	17.9	$17,906
NA			$0
NA			$0
CY	$1.00	43,333	$43,333
CY	$2.00	43,333	$86,667
CY	$1.00	43,333	$43,333
CY	$7.00	43,333	$303,333
NA			$0
NA			$0
NA			$0
NA			$0
NA			$0
NA			$0
CY	$1.00	43,333	$43,333
CY	$2.00	43,333	$86,667
CY	$1.00	43,333	$43,333
CY			$0
NA			$0
CY	$1.00	14,444	$14,444
CY	$2.00	14,444	$28,889
CY	$1.00	14,444	$14,444
NA			$0
ACRE	$1,200	17.9	$21,488
ACRE	$500	17.9	$8,953
ACRE	$200	17.9	$3,581
ACRE	$200	17.9	$3,581
EA			$0
NA			$0
FT	$2,000	5	$10,000
NA			$0
NA			$0
NA			$0
NA			$0
NA			$0
NA			$0
NA			$0
NA			$0
NA			$0
LS	$10,000	1	$10,000
LS	$5,000	1	$5,000
		Construction Subtotal	$788,287

Total	$599,680	$858,287
10% Contingency	$59,968	$85,829
Subtotal Closure Cost	$659,648	$944,116
Inflation Factor **1.1487**		Inflation Factor **1.1951**
Inflated Closure Cost (2% inflation)	$757,728	**Inflated Closure Cost (2% inflation)** $1,128,306

CLOSURE COSTS (PHASE VII)

Section 1.0 - Engineering **PHASE VII**

ESTIMATED DATE OF CLOSURE = 2032

APPROXIMATE CLOSURE AREA = 941,000

Item	Description	Unit Measure	Cost/Unit	No. Units	Total Cost
1.1	**Topographic Survey**	LS	$5,000	1	$5,000
1.2	**Boundary Survey for Closure**	NA			
1.3	**Site Evaluation**	LS	$2,500	1	$2,500
1.4	**Development of Plans**	LS	$15,000	1	$15,000
1.5	**Contract Administration - (Bidding and Award)**	LA	$7,500	1	$7,500
1.6	**Administrative Costs - (Certification of Final Cover and Closure Notice)**	LS	$7,500	1	$7,500
1.7	**Project Management - (Construction Observation and Testing)**	LS	$25,000	1	$25,000
1.8	**Monitor Well Consultant Cost**	NA			$0
1.9	**Other Environmental Permit Costs**	NA			$0
				Engineering Subtotal	62500

Section 2.0 - Construction **PHASE VII**

Item	Description	Unit Measure	Cost/Unit	No. Units	Total Cost
2.1	**Final Cover System**				
2.1.1	***Site Preparation/ Site Regrading***	ACRE	$1,000	21.6	$21,602
2.1.2	*Gas Collection Layer/Pipes*	NA			$0
2.1.3	*Low permeability Layer (Soil - If Applicable)*				
a	Soil Purchase	NA			$0
b	Soil Processing (load)	CY	$1.00	52,278	$52,278
c	Soil Transportation	CY	$2.00	52,278	$104,556
d	Soil Placement	CY	$1.00	52,278	$52,278
e	Soil Amendment	CY	$7.00	52,278	$365,944
2.1.4	***Low permeability Layer (Synthetic - If Applicable)***				
a	Geotextile	NA			$0
b	GCL	NA			$0
c	Geomembrane (HDPE,PVC,LLDPE,etc…)	NA			$0
2.1.5	***Drainage Layer (Soil - If Applicable)***				
a	Geotextile	NA			$0
b	Sand/Gravel	NA			$0
2.1.6	***Drainage Layer (Synthetic - If Applicable)***				
a	Geotextile	NA			$0
b	Geonet/Geocomposite	NA			$0
2.1.7	***Erosion Protection Soil Layer***				
a	Soil Purchase	NA			$0
b	Soil Processing (load)	CY	$1.00	52,278	$52,278
c	Soil Transportation	CY	$2.00	52,278	$104,556
d	Soil Placement	CY	$1.00	52,278	$52,278
e	Soil Amendment	CY			$0
2.1.8	***Topsiol Layer***				
a	Soil Purchase	NA			$0
b	Soil Processing (load)	CY	$1.00	17,426	$17,426
c	Soil Transportation	CY	$2.00	17,426	$34,852
d	Soil Placement	CY	$1.00	17,426	$17,426
e	Soil Amendment	NA			$0
2.1.9	***Revegetation***				
a	Seeding	ACRE	$1,200	21.6	$25,923
b	Fertilizing	ACRE	$500	21.6	$10,801
c	Mulch	ACRE	$200	21.6	$4,320
d	Tacifier	ACRE	$200	21.6	$4,320
2.2	**Stormwater Protection Structures**				
a	Culverts	EA	$1,500	1	$1,500
b	Pipes	NA	$900	10	$9,000
c	Ditches/Berms	FT	$3,500	5	$17,500
d	Detention Basins	NA			$0
2.3	**Gas Collection System**				
a	Design	NA			$0
b	Additional Equipment / Installation	NA			$0
2.4	**Leachate Collection System**				
a	Design	NA			$0
b	Additional Equipment / Installation	NA			$0
2.5	**Groundwater Monitoring System**				
a	Monitor Well Installation	NA			$0
b	Monitor Well Abandonment	NA			$0
2.6	**Site Security**				
a	Lighting, signs, etc…	NA			$0
b	Fencing and Gates	NA			$0
2.7	**Miscellaneous**				
a	Performance Bonds	LS	$10,000	1	$10,000
b	Contract/Legal fees	LS	$5,000	1	$5,000
				Construction Subtotal	$963,838

	Total	$1,026,338
	10% Contingency	$102,634
	Subtotal Closure Cost	$1,128,972
Inflation Factor	**1.2434**	
	Inflated Closure Cost (2% inflation)	$1,403,734

POST-CLOSURE COSTS (30 YEARS)

Section 1.0 - Engineering

Item	Description	Unit Measure	Cost/Unit	No. Units	Total Cost
1.1	**Post-Closure Plan**	LS	$5,000	1	$5,000
1.2	**Annual Report** (including results from gas, leachate, and ground water sampling - details of maintenance performed)	LS	$5,000	30	$150,000
a	Semiannual Site Inspections	LS	$400	60	$24,000
b	Plan Update	LS	$200	30	$6,000
				Engineering Subtotal	$185,000

Section 2.0 - Gas Collection System - Sampling

Item	Description	Unit Measure	Cost/Unit	No. Units	Total Cost
2.1	**Sample Collection**	LS	$250	60	$15,000
2.2	**Sample Analysis**	NA			$0
2.3	**Report** (Part of Annual Report)				
				Gas Collection System - Sampling Subtotal	$15,000

Section 3.0 - Leachate Collection System - Sampling

Item	Description	Unit Measure	Cost/Unit	No. Units	Total Cost
2.1	**Sample Collection**	NA			$0
2.2	**Sample Analysis**	NA			$0
2.3	**Report** (Part of Annual Report)				
				Leachate Collection System - Sampling Subtotal	$0

Section 4.0 - Ground Water Monitoring System - Sampling

Item	Description	Unit Measure	Cost/Unit	No. Units	Total Cost
3.1	**Sample Collection**	LS	$960	60	$57,600
3.2	**Sample Analysis**	LS	$7,000	60	$420,000
3.3	**Report** (Part of Annual Report)				
				Ground Water Collection System - Sampling Subtotal	$477,600

Section 5.0 - Facility Operations and Maintenance

Item	Description	Unit Measure	Cost/Unit	No. Units	Total Cost
4.1	**Cover**				
a	Soil Replacement	LS	$1,000	30	$30,000
b	Vegetation/Reseeding	LS	$500	30	$15,000
4.2	**Storm Water Protection Structures**				
a	Ditch and Culvert Maintenance	LS	$500	30	$15,000
b	Berm and Basin Maintenance	LS	$500	30	$15,000
4.3	**Gas Collection System**				
a	System Operation	NA		30	$0
b	System Repair	LS	$200	30	$6,000
4.4	**Leachate Collection System**				
a	System Operation	NA		30	$0
b	System Repair	NA		30	$0
4.5	**Ground Water Monitoring System**				
a	System Operation	NA		30	$0
b	System Repair	LS	$500	30	$15,000
4.6	**Site Security**				
a	Lighting, signs, etc…	LS	$500	30	$15,000
b	Fencing and Gates	LS	$500	30	$15,000
4.7	**Miscellaneous**				
a					
b					
				Facility Operations and Maintenance Subtotal	$126,000

Total	$803,600
10% Contingency	$80,360
Total Post-Closure Cost	$883,960