



State of Utah

GARY R. HERBERT
Governor

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Lieutenant Governor

Department of
Environmental Quality

Alan Matheson
Executive Director

DIVISION OF WASTE MANAGEMENT
AND RADIATION CONTROL
Scott T. Anderson
Director

July 28, 2016

Robert Greenberg
Administrative Control Board
Solid Waste Special Service District #1
P.O. Box 980
Moab, UT 84532

RE: Klondike Landfill Permit Renewal

Dear Mr. Greenberg:

Enclosed is Permit No. 9509R2 for the Klondike Class I Landfill. A 30-day comment period was held from May 26, 2016 to June 24, 2016. No comments were received.

The expiration date for Permit No. 9509R2 is July 14, 2026. Please note that R315-311-1(4)(a) of the Utah Administrative Code requires that an application for renewal must be made 180 days before the expiration date.

We appreciate your efforts to operate the facility in compliance with current regulations. If you have any questions, please call Phil Burns at (801) 536-0253.

Sincerely,

Scott T. Anderson, Director
Division of Waste Management and Radiation Control

STA/PEB/kl

(Over)

Enclosure: Klondike Landfill Solid Waste Permit (DSHW- 2016-004623)
Attachment 1 - Ground Water Monitoring and Liner Exemption
Attachment 2 - Landfill Design and Construction Plans (DSHW-2016-007368)
Attachment 3 - Plan of Operations (DSHW-2015-007369)
Attachment 4 - Closure and Post Closure (DSHW-2015-007370)

c: David Cunningham, RN, MSN, Health Officer, Southeastern Utah District Health Dept.
Brady C. Bradford, MSPH, REHS, Env. Health Dir., Southeastern Utah District Health Dept.
Scott Hacking, P.E., DEQ District Engineer
Debby Barton, Manager, Solid Waste Special Service District #1

DIVISION OF WASTE MANAGEMENT
AND RADIATION CONTROL
CLASS 1 SOLID WASTE LANDFILL PERMIT

Klondike 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:

Grand County Solid Waste Management Special Service District #1,
as owner and operator, (Permittee),

to own, construct, and operate the Klondike Landfill located in S ½ of the NW ¼ of Section 14, Township 23 S, Range 19 E, Salt Lake Base and Meridian, Grand County, Utah as shown in the permit renewal application that was determined complete on December 15, 2015. (DSHW-2015-007778).

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

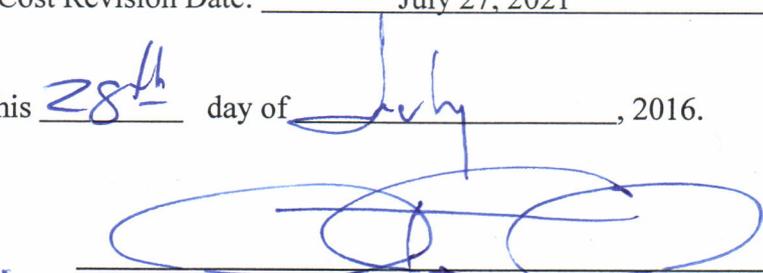
All references to R315-301 through 320 of the Utah Administrative Code are to regulations that are in effect on the date that this permit becomes effective.

This Permit shall become effective July 28, 2016.

This Permit shall expire at midnight July 27, 2026.

Closure Cost Revision Date: July 27, 2021.

Signed this 28th day of July, 2016.



Scott T. Anderson, Director
Utah Division of Waste Management and Radiation Control

FACILITY OWNER/OPERATOR INFORMATION

LANDFILL NAME: Klondike Landfill

OWNER NAME: Solid Waste Management Special Service District
#1

OWNER ADDRESS: 1000 East Sand Flats Road
P.O. Box 980
Moab, Utah 84532

OWNER PHONE NO.: (435) 259-3867

OPERATOR NAME: same as owner

TYPE OF PERMIT: Class I Landfill

PERMIT NUMBER: 9509R2

LOCATION: Landfill site is located in Township 23 S, Range 19
E, Section 14, SLMB; Grand County, Lat. 38° 48'
47", Long. 109° 47' 34" Approximately 1.2 miles
west of Highway 191, 20 miles north of Moab

PERMIT HISTORY Permit renewal July 28, 2016

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

Attachments to this permit are hereby incorporated into this Solid Waste Permit. All representation made in the attachments are part of this Permit and 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.

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 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 125 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 19-6-102(4), Utah Code Annotated;

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.C. Prohibited Waste

I.C.1. Disposal of the following wastes at the Klondike Landfill is prohibited:

I.C.1.a Hazardous waste as defined by R315-1 and R315-2 of the Utah Administrative Code except as allowed in permit condition I-B6 (Acceptable Waste) above;

I.C.1.b 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;

I.C.1.c PCB's as defined by R315-301-2 of the Utah Administrative Code, except as allowed in Section I-B (Acceptable Waste) of this Permit; and

I.C.1.d Regulated asbestos-containing material.

I.C.2. 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 123 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 Southeastern Utah District 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 the 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 Provide written notice of the noncompliance or violation and a description of measures taken to protect human health and the environment within seven days after notification of the Director.

I.E.4. Within 30 days after documenting the event, the Permittee shall submit to the Director a written report describing the nature and extent of the noncompliance or violation and a complete description of all of 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 additional appropriate remedial measures including development of a site remediation plan for approval by the Director.

I.E.5. In an enforcement action, the Permittee/s 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. Attachments to this Permit 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.

II. DESIGN AND CONSTRUCTION

II.A. Design and Construction

II.A.1. 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 the alternative design submitted in accordance with R315-301 thru 320 of the Utah Administrative Code and Attachment 1.

II.A.2. If ground water is encountered during excavation of the landfill, the Director shall be notified immediately, and the Permittee shall develop and submit an alternative construction design for approval.

II.A.3. The Permittee shall notify the Director upon completion of construction of any landfill cell, sub-cell, engineered control system, or any feature where Director approval is required. No landfill cell or engineered control system may be used until as-built documents are submitted and construction is approved by the Director and this permit has been modified to reflect the changes.

- II.A.4. The Permittee shall notify the Director of any proposed incremental closure, placement of any part of the final cover, or placement of the full final cover. Design approval shall be received from the Director and this permit modified prior to construction. The design shall be accompanied by a Construction Quality Control and Construction Quality Assurance (CQC/CQA) Plan, for each construction season where incremental or final closure is performed.
- II.A.5. A qualified party, independent of the owner and the construction contractor shall perform the quality assurance function on cover components and other testing as required by the approved CQC/CQA Plan. The results shall be submitted as part of the as-built drawings to the Director.
- II.A.6. All engineering drawings submitted to the Director shall be stamped and approved by a professional engineer with a current registration in Utah.

II.B. Run-On Control

- II.B.1. 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.C. Alternative Design

- II.C.1. The Permittee has demonstrated through geologic, hydrogeologic, climatic, waste stream information, and other factors that the landfill will not contaminate ground water and is approved for the alternative design as outlined in the Permit Application. Any contamination of ground water resulting from operation of the landfill may result in the revocation of this alternative design approval.

III. III.LANDFILL OPERATION

III.A. Operations Plan

- III.A.1. The Permittee shall keep the Operations Plan included in Attachment 2 on site at the landfill or at the location designated in section III-H 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 permit modification under R315-311-2(1) of the Utah Administrative Code. The Permittee shall note any modification to the Operations Plan in the daily operating record.
- III.A.2. The Permittee shall submit any modification to the Operations Plan to the Director for approval.

III.B. Security

- III.B.1. The Permittee shall operate the Landfill so that unauthorized entry to the facility is restricted. The Permittee shall:

- III.B.1.a Lock all facility gates and other access routes during the time the landfill is closed.
- III.B.1.b Have at least one person employed by the Permittee at the landfill during all hours that the landfill is open.
- III.B.2. Construct all fencing and any other access controls as shown in Attachment 1 to prevent access by persons or livestock by other routes.
- III.C. Training
- III.C.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.
- III.D. Burning of Waste
- III.D.1. Intentional burning of solid waste is prohibited and is a violation of R315-303-4(2)(b) of the Utah Administrative Code.
- III.D.2. The Permittee shall extinguish all accidental fires as soon as reasonably possible.
- III.E. Daily Cover
- III.E.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.
- III.E.2. 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.
- III.F. Ground Water Monitoring
- III.F.1. The ground water monitoring requirement for the Klondike Landfill has been waived in accordance with R315-308-1(3) of the Utah Administrative Code. Any contamination of ground water resulting from operation of the landfill shall result in the revocation of this waiver.
- III.G. Gas Monitoring
- III.G.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 Attachment 2, and is approved by the Director as a minor modification under R315-311-2(1) of the Utah Administrative Code. The Permittee shall note any modification to the Gas Monitoring Plan in the daily operating record.

- III.G.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:
 - III.G.2.a Immediately take all necessary steps to ensure protection of human health and notify the Director;
 - III.G.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;
 - III.G.2.c Implement a remediation plan that meets the requirements of R315-303-3(5)(b) of the Utah Administrative Code; and
 - III.G.2.d Submit the plan to, and receive approval from, the Director prior to implementation.

III.H. Waste Inspections

- III.H.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. The Permittee shall select the loads to be inspected on a random basis.
- III.H.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.
- III.H.3. The Permittee shall inspect all loads that the Permittee suspects may contain a waste not allowed for disposal at the landfill.
- III.H.4. The Permittee shall conduct complete random inspections as follows:
 - III.H.4.a The Permittee shall conduct the random waste inspection at the working face or an area designated by the Permittee.
 - III.H.4.b The Permittee shall direct that loads subjected to complete inspection be unloaded at the designated area;
 - III.H.4.c Loads shall be spread by equipment or by hand tools;
 - III.H.4.d Personnel trained in hazardous waste recognition and recognition of other unacceptable waste shall conduct a visual inspection of the waste; and
 - III.H.4.e The personnel conducting the inspection shall record the results of the inspection on a waste inspection form as found in Attachment 2. The Permittee shall place the form in the daily operating record at the end of the operating day.
 - III.H.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.

III.I. Disposal of Special Wastes

III.I.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.

III.I.2. The Permittee may dispose of animal carcasses in the landfill working face and shall cover them with other solid waste or earth by the end of the operating day in which the carcasses are received. Alternatively, the Permittee may dispose of animal carcasses in a special trench or pit prepared for the acceptance of dead animals. If a special trench is used, the Permittee shall cover animals placed in the trench with six inches of earth by the end of each operating day.

III.J. Self Inspections

III.J.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, 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.

III.K. Recordkeeping

III.K.1. The Permittee shall maintain and keep on file, at the District office, a daily operating record and other general records of landfill operation as required by R315-302-2(3) of the Utah Administrative Code. 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 be signed and dated by the appropriate operator or personnel. The Daily operating record shall consist of the following two types of documents:

III.K.1.a Records related to the daily landfill operation or periodic events including:

III.K.1.a.(1) 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;

III.K.1.a.(2) Major deviations from the approved plan of operation, recorded at the end of the operating day the deviation occurred;

III.K.1.a.(3) 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;

III.K.1.a.(4) 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.

III.K.1.b Records of a general nature including:

III.K.1.b.(1) A copy of this Permit, including all Attachments;

III.K.1.b.(2) Results of inspections conducted by representatives of the Director, and of representatives of the local Health Department, when forwarded to the Permittee;

III.K.1.b.(3) Closure and Post-closure care plans; and

III.K.1.b.(4) Records of employee training.

III.L. Reporting

III.L.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, a re-application for approval of the financial assurance mechanism, the results of gas monitoring, and all training programs completed.

III.M. Roads

III.M.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 shall be improved and maintained as necessary to assure safe and reliable all-weather access to the disposal area.

III.N. Litter Control

III.N.1. Litter resulting from operations of the landfill shall be minimized. In addition to the litter control plans found in Attachment 2, the Permittee shall implement the following procedures when high wind conditions are present:

III.N.1.a Reduce the size of the tipping face;

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

III.N.1.c Orient vehicles to reduce wind effects on unloading and waste compaction;

III.N.1.d Reconfigure tipping face to reduce wind effect;

III.N.1.e Use portable and permanent wind fencing as needed; and

III.N.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.

IV. IV. CLOSURE REQUIREMENTS

IV.A. Closure

- IV.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 recompacted clay placed as part of the final cover.
- IV.A.2. This Permittee has demonstrated through geologic, hydrogeologic, climatic, waste stream, cover material properties, infiltration factors, and other factors that the landfill will not contaminate ground water and is approved for the alternative cover design as outlined Attachment 3. Upon finding by the Director of any contamination of ground water resulting from the landfill, the Director may revoke this alternative cover design approval and the Director may require placement of a cover meeting the requirements of R315-303-3(4)(a) of the Utah Administrative Code or other remedial action.
- IV.B. Title Recording
- IV.B.1. The Permittee shall meet the requirements of R315-302-2(6) of the Utah Administrative Code by recording a notice with the Grand 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.
- IV.C. Post-Closure Care
- IV.C.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 has stabilized and the finding of R315-302-3(7)(c) of the Utah Administrative Code is made.
- IV.D. Financial Assurance
- IV.D.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 maintain the financial assurance mechanism to provide for the cost of closure at any stage or phase or any time during the life of the landfill or the permit life, whichever is shorter.
- IV.E. Financial Assurance Annual Update
- IV.E.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.

IV.F. Closure Cost and Post-Closure Cost Revision

IV.F.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.

V. **ADMINISTRATIVE REQUIREMENTS**

V.A. Permit Modification

V.A.1. Modifications to this Permit may be made upon application by the Permittee or by the Director following the procedures specified in R315-310-11-2 of the Utah Administrative Code. The Permittee shall be given written notice of any permit modification initiated by the Director.

V.B. Permit Transfer

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

V.C. Expansion

V.C.1. Any expansion of the current footprint designated in the description contained in Attachment 1, but within the property boundaries designated in Attachment 1, shall require submittal of plans and specifications to the Director. The plans and specifications shall be approved by the Director prior to construction.

V.C.2. Any expansion of the landfill facility beyond the property boundaries designated in the description contained in Attachment 1 shall require submittal of a new permit application in accordance with the requirements of R315-310 of the Utah Administrative Code.

V.C.3. Any addition to the acceptable wastes described in Section I-B shall require submittal of all necessary information to the Director and the approval of the Director. Acceptance for PCB bulk product waste under R315-315-7(3)(b) of the Utah Administrative Code can only be done after submittal of the required information to the Director and modification of Section I-C of this Permit.

V.D. Expiration

V.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 – Ground Water Monitoring and Liner Exemption

Attachment 2 – Landfill Design and Construction Plans

Attachment 3 – Plan of Operation

Attachment 4 – Closure and Post-Closure

Attachment 1

Klondike Landfill Ground Water Monitoring and Liner Exemption Statement of Basis

Klondike Landfill, owned and operated by Grand County Solid Waste Management Special Service District #1, has applied for a renewal of its solid waste permit to construct and operate the Klondike Landfill on 80 acres of land owned by the District located approximately 20 miles north of Moab, Utah west of Highway 191. The permit application includes a request for exemption to the requirements for a Class I landfill to be constructed with a bottom liner and to conduct ground water monitoring at the site, as well as an alternative final cover design consisting of an evaporation-transpiration cap. The information provided in support of the exemption request has been reviewed and has been determined to qualify for the exemption. This exemption is based on the following factors:

The climate in the area is very dry, with average annual precipitation of between 6.5 and 8.5 inches and evaporation of 55 to 60 inches. There is therefore an annual water deficit exceeding 45 inches per year.

Depth to ground water is greater than 500 feet below the site, and possibly as deep as 1,000 feet or more.

The site is underlain by Mancos Shale, a highly impermeable dark gray marine shale. The Mancos Shale is approximately 1,200 feet thick below the site. It is weathered near the surface, but rapidly grades with depth to a competent shale. Permeability values for the Mancos Shale are in the range of 10⁻⁷ to 10⁻¹³ cm/s. No evidence of significant vertical fracturing was observed during construction of the first cells at the landfill site.

The ground water in aquifers below the site is of very poor quality. Sampling of a well located approximately 0.25 mile east of the site indicates that the groundwater is highly mineralized, extremely alkaline (i.e. pH greater than 10), and brackish (i.e. TDS greater than 2,600 mg/l). Regional studies of the deep aquifers in the region indicate ground water TDS values range from 500 to 14,000 mg/l.

Modeling of open and closed landfill cells shows minimal amounts moisture infiltration through the bottom of the landfill, on the order of hundredths to thousandths of an inch per year. Modeling of leachate migration in the Mancos shale predicts that it would take more than 10,000 years for any leachate to reach the uppermost aquifer. The majority of precipitation is lost through evaporation.

The final cover on the landfill will minimize infiltration. An unsaturated flow model was used to compare the evaporation-transpiration cap to the standard final cover described in the solid waste rules. The alternative final cover, consisting of 30 inches of on-site material, was found to provide and equivalent reduction in infiltration as the standard final cover.

Attachment 2
Design and Construction

5. ENGINEERING DESIGN

The following sections discuss individual components and details involved in the landfill construction and closure design.

5.1 GENERAL DAILY OPERATION

The filling operation is specified in the Operator's Manual and is provided as an appendix to this application (Appendix D). Progressive lift filling techniques will be utilized to raise the landfill to its rough grade elevation prior to closure.

The cover details for closing the landfill cells are described in Section 5.2 below.

5.2. SOURCES FOR DAILY AND FINAL COVER

5.2.1 Daily and Intermediate Soil Cover

Daily and intermediate cover in the landfill will originate from on-site sources. Usually, the cover and capping material will come from the excavation provided by the preparation of the next operating phase (cell).

The cover soils will be obtained from excavation of expansion areas of the landfill. Based upon the nature of soils in the landfill area, as well as laboratory testing of on-site soils, these soils will meet the specifications referenced in Utah regulations. (Appendix F.)

5.2.2 Final Cover

The District will place a final cover system on each phase within 180 days after waste disposal ceases in the final lift or as soon thereafter, weather permitting, as possible. The final cover system is a cost-effective alternative to the "prescriptive cap" described in UAC R315-303-3 (4). The evaporative-transpiration (ET) cap will be constructed using on-site native materials and will consist of one 30-inch thick layer of native soil overlain by a vegetative layer of 6 inches. Soils used for the ET layer will consist of on-site native silty clay materials for the cover which will act as an infiltration barrier. Topsoil for the vegetative layer will come from adjoining areas on-site. The top layer will be vegetated to minimize erosion and enhance transpiration from established plants.

This engineered final cover system will prevent migration of rain and snow melt water into the wastes following closure of each cell. Appendices K and L describe this design.

5.3 SOURCES FOR SOIL LINERS

The first landfill cell (Phase 1) was lined with a 6-inch thick compacted liner constructed using selected on-site soils. This Phase 1 cell was also constructed with a leachate collection system. Justification for exemptions from further liner and leachate collection system requirements for all future cells (Phases 2-6) is presented in Appendix J. The landfill cells will be excavated to the depth indicated on the Landfill drawings (Appendix C) and waste will be landfilled directly on the excavated surface.

5.4 EQUIPMENT REQUIREMENTS AND AVAILABILITY

Each landfill phase will be designed with a planned operating life of 9 to 11 years. This operating life is calculated using the annual solid waste generation (refer to Section 2.1.4), and an in-place density of 1,000 pounds per cubic yard for the compacted solid waste. These are conservative estimates of the expected in-place density since this is

the lower range of density commonly achieved using roll-over compactors. The District will attempt to maximize the compacted density of the solid waste.

The District will maintain equipment on site to facilitate compaction of the solid wastes, placement of daily cover on the wastes, and excavation of soils for daily cover. This type of equipment may include the following: a dozer or drum compactor with waste cleats, a front-end loader, and a scraper.

5.5 LEACHATE COLLECTION SYSTEM DESIGN

The first cell was constructed with a leachate collection system. Future cells will not include a leachate collection system.

As part of the original permit application, several HELP model runs were completed, and indicated that the maximum amount of post-closure leachate is expected to occur during the first year of filling (100,000 gallons). During the operation of a cell, a 25-year 24-hour storm is expected to deliver approximately 29,500 gallons of water that could also be treated as leachate. Any stormwater will be temporarily stored in the cell and allowed to evaporate. Given the high evaporation rates of the region, this method of stormwater control is considered acceptable. Since these are small quantities of leachate, and since evaporation rates are generally very high in the vicinity of the Klondike Landfill, additional leachate control facilities are not considered necessary. However, the leachate system in Cell 1 will provide an early warning of significant leachate being produced in the Landfill, should that situation arise.

If UDEQ requires additional leachate control facilities, these will be engineered to meet the design of future cells. All leachate that is pumped from the landfill will be transported to an approved facility for disposal.

5.6 RUN-ON AND RUN-OFF CONTROLS SYSTEMS DESIGN

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

The design for the expansion of cells of the Klondike Landfill incorporates a run-on control system, which is capable of directing the flow away from the active portion of the landfill during the peak discharge of a 24-hour, 25-year storm (0.19 inch). The purpose of the run-on control is to minimize the amount of surface water entering the landfill facility. Run-on controls prevent: (1) erosion, which may damage the physical structure of the landfill; (2) surface discharge of wastes in solution or suspension; and (3) downward percolation of run-on through wastes, creating leachate.

District personnel will be responsible for the maintenance of the slopes and drainage systems to keep the run-on control systems operable.

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

The design for the new expansion cells of the Klondike Landfill incorporates a run-off control system that will collect and contain the water volume that falls on the active landfill area but does not contact the working areas of the landfill resulting from a 24-hour, 25-year storm. Calculations for run-on and run-off controls are included in a technical memorandum in Appendix O. As noted in the memorandum, the detention basin does not have sufficient capacity to store the runoff based on its current design. However, if the detention basin outlet is lowered by 1 foot from an elevation of 4617 to 4616, the detention basin would provide a storage volume that would be sufficient to detain the 24-hour, 25 year rainfall event. Therefore, the District intends to lower the drainage pipe to an elevation of 4616 feet. Uncontrolled run-off water from the active portion of the landfill will be directed to the stormwater detention basins located at the southwest corner of the site. Berms and ditches will be incorporated into the active landfill areas to shed the precipitation away from the working faces and leachate

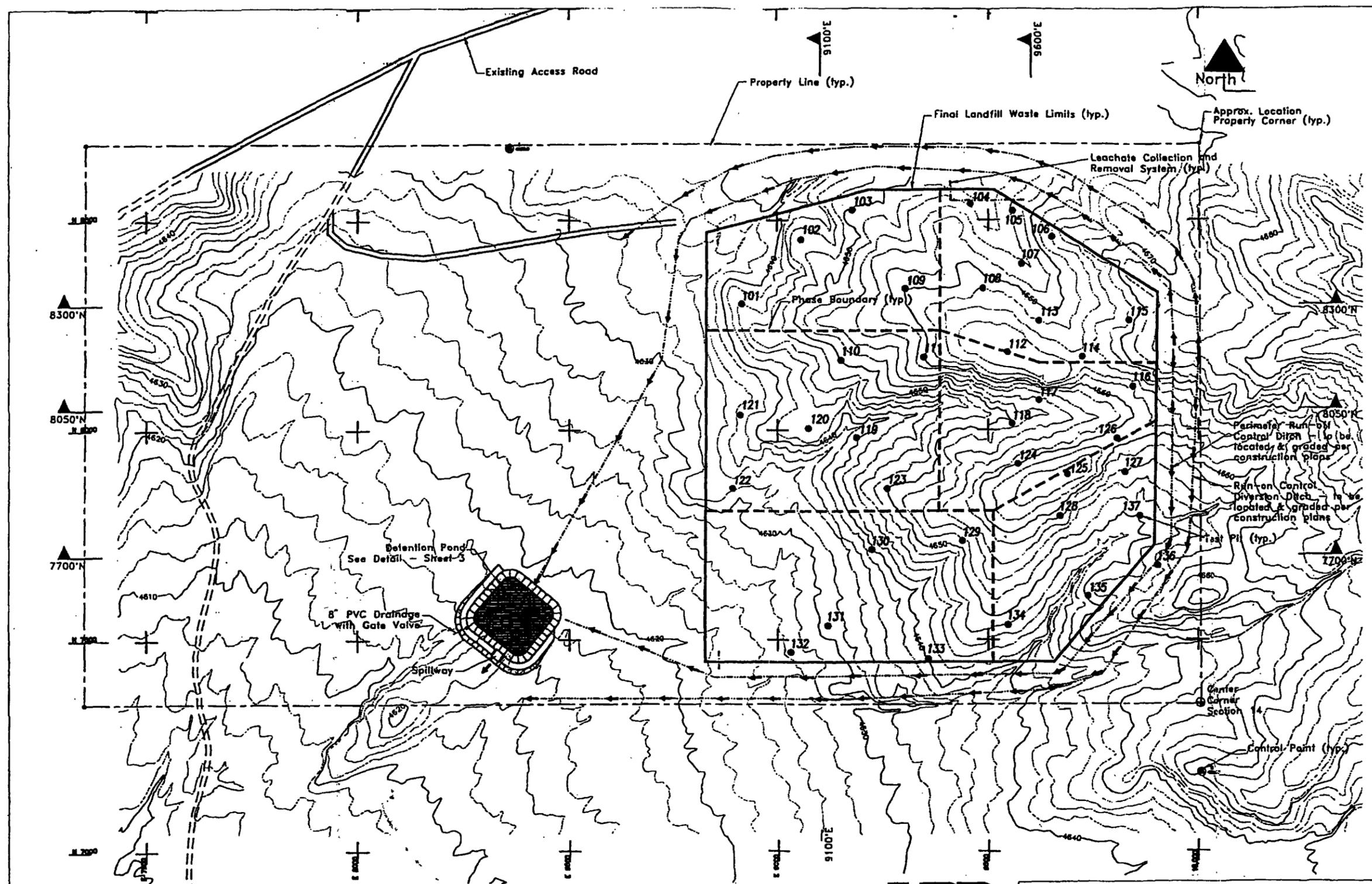
collection system. This will greatly reduce the volume of precipitation that will need to be treated as leachate.

District landfill personnel will be responsible for the maintenance of the slopes and drainage systems to ensure the efficient operations of the run-off system. Precipitation that contacts the working face or otherwise enters the leachate collection system will be transported by the leachate collection system to the evaporation pond.

The Klondike Landfill is designed and shall be constructed so as not to cause point or non-point source discharges to surface waters, including wetlands, in violation of the Clean Water Act (CWA) or in violation of State of Utah water quality management plans approved under section 208 or 319 of the CWA.

5.7 LANDFILL GAS CONTROL

Landfill gases will be monitored using combustible gas indicators along the perimeter of the site and at leachate collection system cleanouts. Should routine monitoring of the site indicate gas conditions exceeding the regulatory requirements, a horizontal or vertical gas extraction system may be installed. Gas monitoring of the site since 1997 has shown no detectible gas levels. Due to the arid climate, very little decomposition of the waste is likely to occur and it is expected that no measurable volume of methane gas will accumulate under the final cover.



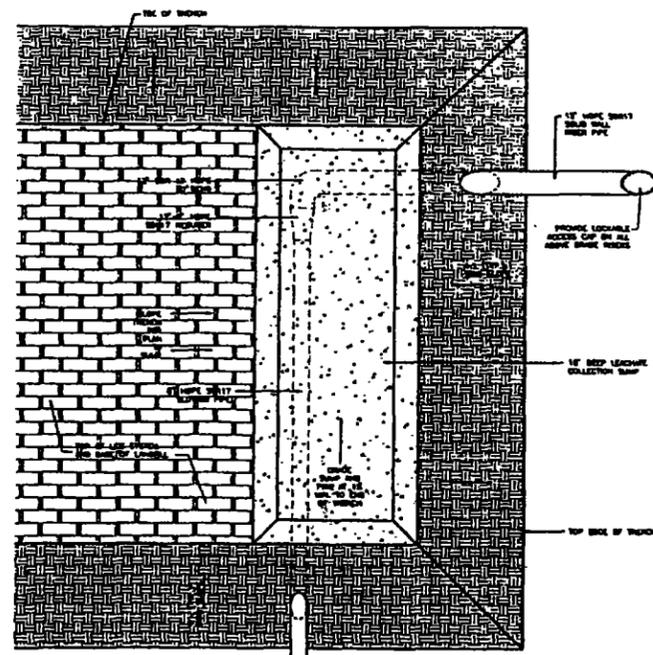
For Permit /
Regulatory Compliance Only



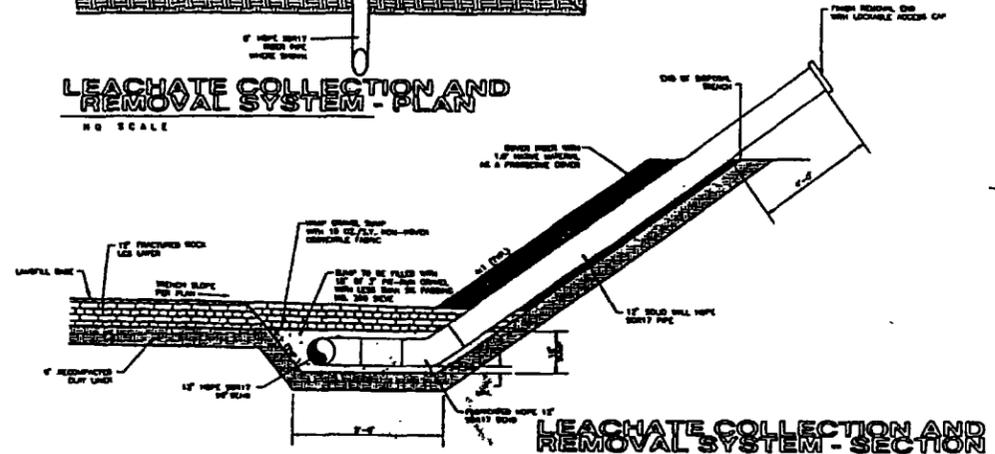
HDR Engineering, Inc.

Plan View
Klondike Landfill

Date
Sheet
2



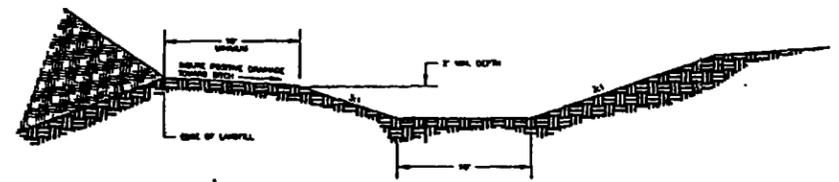
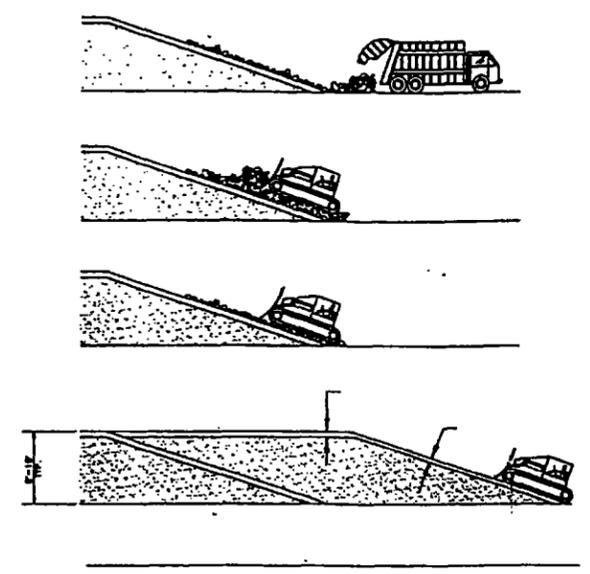
LEACHATE COLLECTION AND REMOVAL SYSTEM - PLAN
NO SCALE



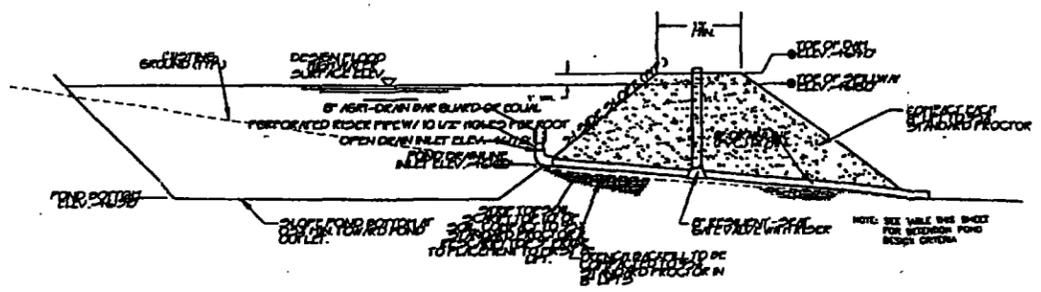
LEACHATE COLLECTION AND REMOVAL SYSTEM - SECTION
NO SCALE

DETENTION POND DESIGN CRITERIA	
HYDROLOGICAL DATA	
RUNOFF MODEL	SCS METHOD
RAINFALL EVENT	25 YR./24 HR.
DESIGN RAINFALL	2.5
RUNOFF CURVE NUMBER	75
DESIGN RUNOFF	0.8
DETENTION POND	
DRAINAGE AREA	38 ACRES
RUNOFF FROM DESIGN EVENT	107,000 CU. FT.
MAXIMUM CAPACITY	125,000 CU. FT.
MAXIMUM DEPTH	3 FT.
MAXIMUM HYDROSTATIC HEAD ON FILL	3 FT.
SIDE SLOPES	3:1
TOP WIDTH	13 FT.
POND AREA WHEN FULL	0.55 ACRES
TOP OF DAM ELEVATION	4818.0'
POND BOTTOM ELEVATION	4813.0'
SPILLWAY ELEVATION	4818.0'
SPILLWAY CAPACITY	50 CFS
PEAK DISCHARGE	38 CFS
DRAINAGE INLET INVERT	4818.0'
DRAINLINE TYPE	8" PVC W/ G.V.

CONCEPTUAL DESIGN VOLUMES	
WASTE PARAMETERS	
QUANTITY	9100 TONS/YEAR
COMPACTED WASTE DENSITY	1000/CFY
WASTE-TO-SOL. RATIO	3:1
QUANTITIES	
TOTAL EXCAVATION	279,000 C.Y.
FINAL COVER	82,000 C.Y.
DAILY COVER	187,000 C.Y.
WASTE VOLUME	360,000 C.Y.
WASTE QUANTITY	293,000 TONS
ESTIMATED LIFE	32 YEARS



TYPICAL DITCH SECTION
NO SCALE



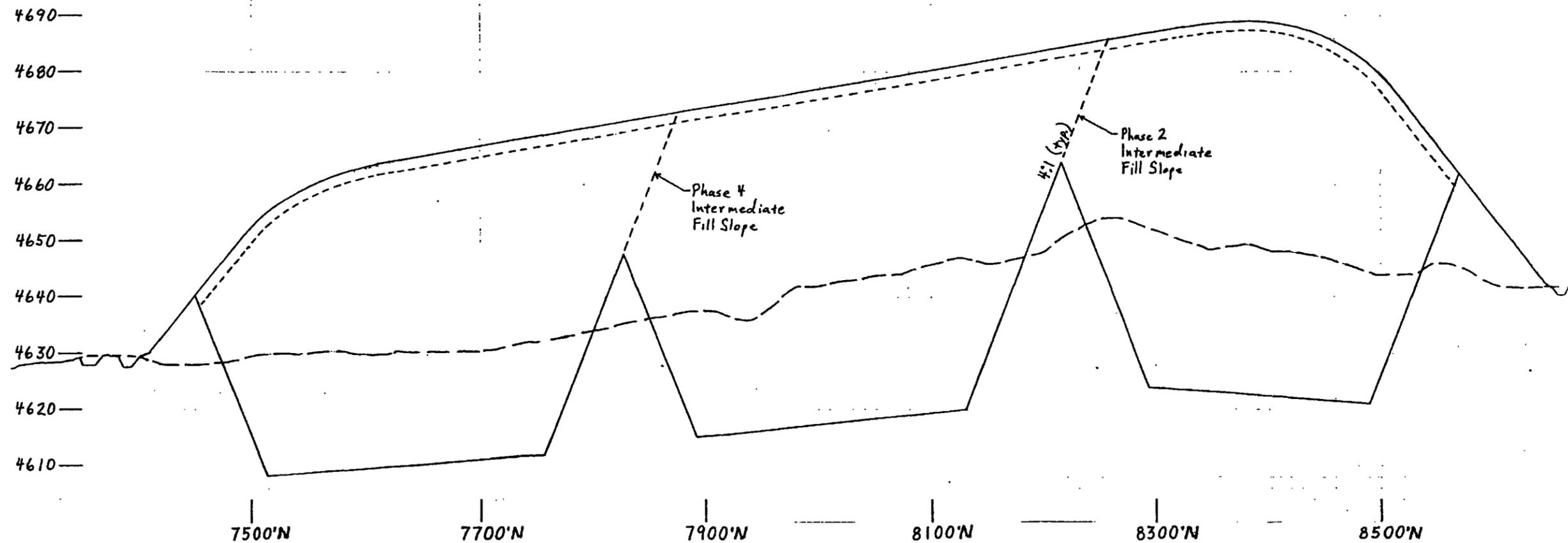
DETENTION POND DETAIL

For Permit /
Regulatory Compliance Only

HDR
HDR Engineering, Inc.

Details
Klondike Landfill

Date _____
Sheet
3



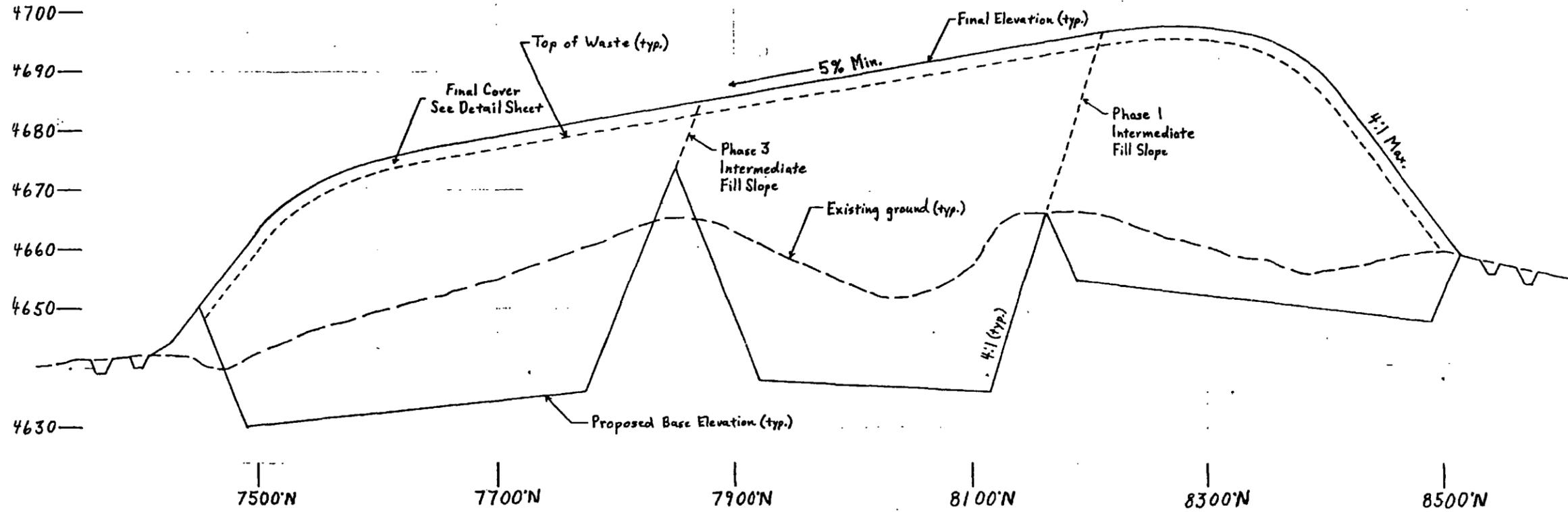
For Permit/
Regulatory Compliance Only

Scale: Horizontal 1" = 100'
Vertical 1" = 20'

Grand County Solid Waste
Management Special Service District #1
P.O. Box 980 Moab, Ut. 84532
(435) 259-3867

North-South Cross Sections
9100E
Klondike Landfill

Date: 20 Apr 2001
Drawn by:
Anthony Martineau



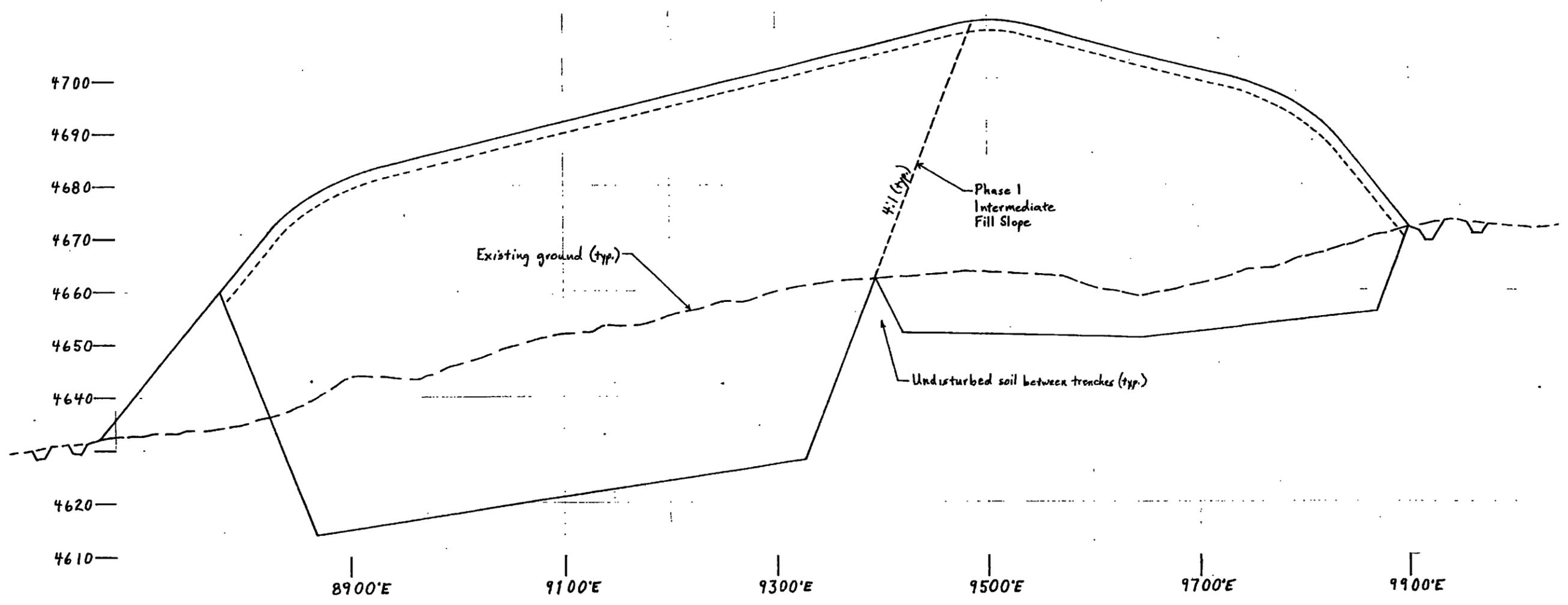
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Scale: Horizontal 1" = 100'
Vertical 1" = 20'

Grand County Solid Waste
Management Special Service District #1
P.O. Box 980 Moab, Ut. 84532
(435) 259-3867

North-South Cross Sections
9600E
Klondike Landfill

Date: 20 Apr 2001
Drawn by:
Anthony Martinez



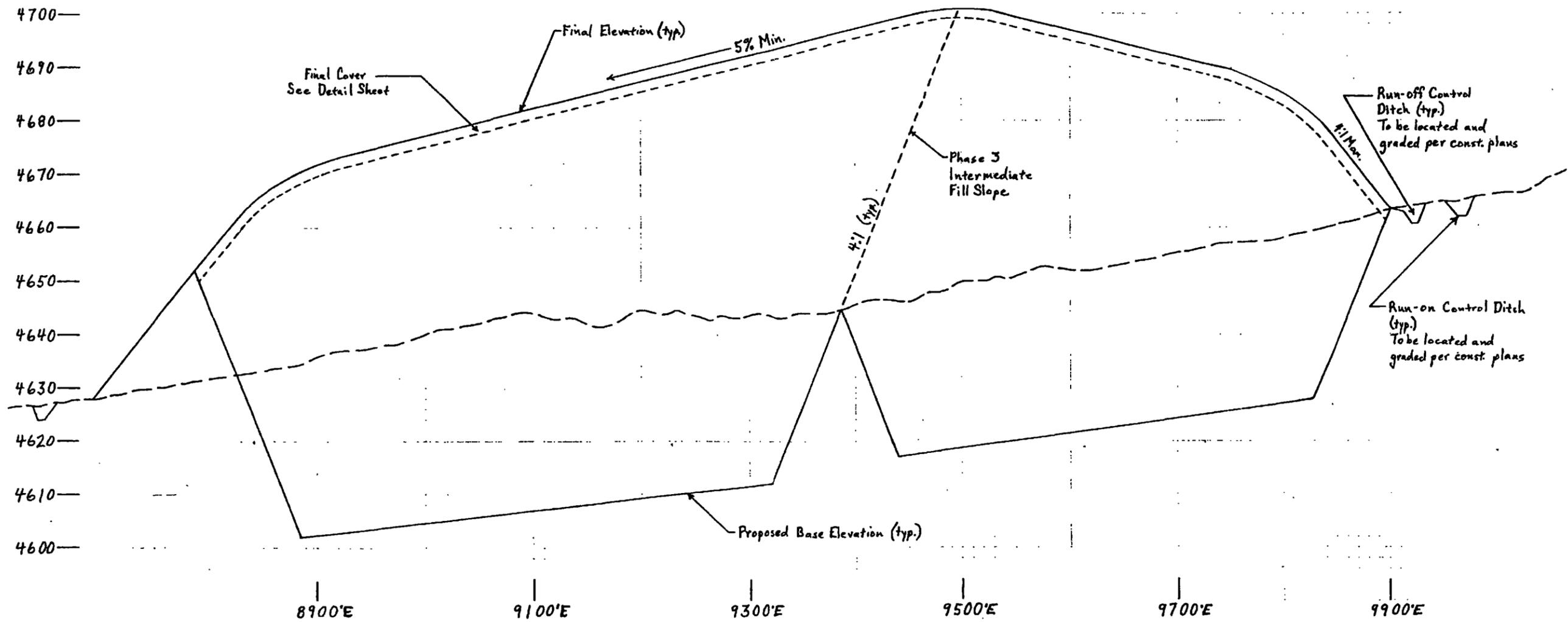
**For Permit/
Regulatory Compliance Only**

**Scale: Horizontal 1" = 100'
Vertical 1" = 20'**

Grand County Solid Waste
Management Special Service District #1
P.O. Box 980 Moab, Ut. 84532
(435) 259-3867

**East-West Cross Sections
8300N
Klondike Landfill**

Date: 20 Apr 2001
Drawn by:
Anthony Martineau



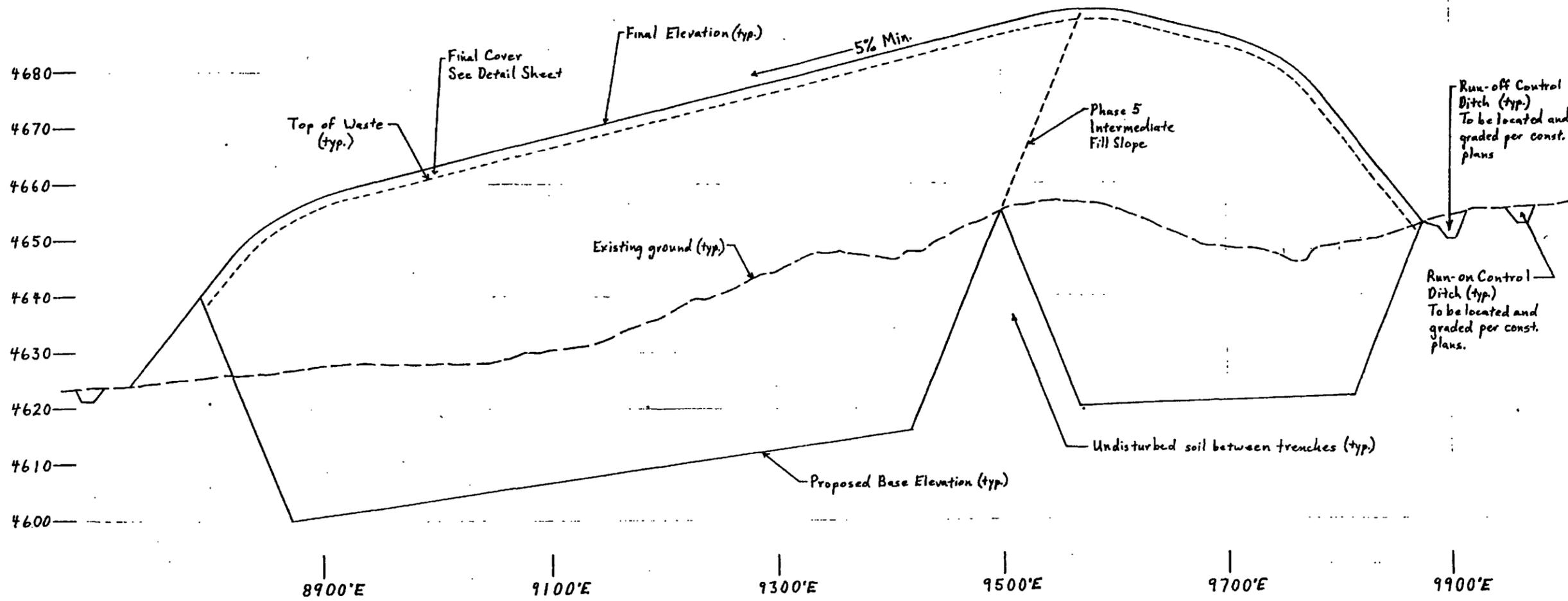
For Permit/
Regulatory Compliance Only

Scale: Horizontal 1" = 100'
Vertical 1" = 20'

Grand County Solid Waste
Management Special Service District #1
P.O. Box 980 Moab, UT 84532
(435) 259-3867

East-West Cross Sections
8050N
Klondike Landfill

Date: 20 Apr 2001
Drawn by:
Anthony Martineau



**For Permit/
Regulatory Compliance Only**

**Scale: Horizontal 1" = 100'
Vertical 1" = 20'**

Grand County Solid Waste
Management Special Service District #1
P.O. Box 980 Moab, Ut. 84532
(435) 259-3867

**East-West Cross Sections
7700N
Klondike Landfill**

Date: 20 Apr 2001
Drawn by:
Anthony Martineau

REVISED

SHEET 6 (BOTTOM)



APPENDIX L

Final Cover Construction Specifications



**KLONDIKE LANDFILL
FINAL COVER
CONSTRUCTION SPECIFICATIONS**

TABLE OF CONTENTS

GENERAL CONDITIONS AND SITE WORK

SECTION 00700	GENERAL CONDITIONS
SECTION 01010	SUMMARY OF WORK
SECTION 01310	PROJECT MANAGEMENT AND COORDINATION
SECTION 01570	TEMPORARY CONTROLS
SECTION 02315	EXCAVATION
SECTION 02320	FINAL COVER
SECTION 02920	REVEGETATION



SECTION 00700

GENERAL CONDITIONS

PART 1 - GENERAL

1.01 PARTICIPANT ROLES AND RESPONSIBILITIES

OWNER: Solid Waste Special Service District #1. Owner will issue Contract to Engineer and Contractor. Owner will be responsible for Contract administration, including payment of Engineer and Contractor.

ENGINEER: Selected by the Owner. Engineer will render technical opinions regarding issues that may arise during construction. Engineer will also conduct construction inspection and testing as the Construction Quality Assurance (CQA) Officer.

CONTRACTOR: Selected by the Owner. Contractor is responsible for construction of the project described in these specifications, as directed by Owner.

PART 2 – MATERIALS

Not used.

PART 3 – EXECUTION

Not used.

END OF SECTION



SECTION 01010

SUMMARY OF WORK

PART 1 - GENERAL

1.01 PROJECT DESCRIPTION

A. Work of this Contract consists of the installation of an evaporative-transpiration (ET) cap as final cover for Cell 1 at the Klondike Landfill near Moab, Utah. The Contractor shall be responsible for, but not limited, the following:

1. Transportation and placement of soil to be used for ET layer,
2. Grading and compaction of ET layer,
3. Excavation and placement of topsoil, and
4. Seeding of vegetative layer.

B. This document presents Specifications applicable to the scope of work. The general sequence of work includes the excavation of native soils, phased construction, and revegetation of the final cover. The final cover is designed as an evaporative-transpiration (ET) cap and will consist of one 30-inch thick layer of native soil overlain by a vegetative layer of 6 inches. Soils used for the ET layer will consist of on-site native silty clay material for the cover which will act as an infiltration barrier. Topsoil for the vegetative layer will come from adjoining areas on-site. The top layer will be vegetated to minimize erosion and enhance transpiration from established plants.

1.02 CONTRACT

A. Perform work under unit cost with the Owner.

PART 2 – PRODUCTS

2.01 SOIL

A. The Owner will provide the soil for the ET and vegetative layers, which will originate from native material on-site. In the case of final cover for Cell 1, previously excavated material that has been stockpiled over Cell 4 will be used. Modeling and design for the ET cap has been based on the properties of the native material.

B. In the event that off-site material is used, the material will need to be evaluated for engineering properties (i.e., hydraulic conductivity) required by the ET cap design.



PART 3 – EXECUTION

Not used.

END OF SECTION



SECTION 01310

PROJECT MANAGEMENT AND COORDINATION

PART 1 - GENERAL

1.01 PROJECT COORDINATION

- A. The Owner will identify the process and personnel for project coordination.
- B. Proposed changes in design or materials must be presented to the Owner or Engineer prior to implementation. The Owner/Engineer will have five (5) working days to respond to the proposed changes in approving, disapproving, requesting further information, or suggesting modifications.
- C. The Owner shall be notified in writing of any problems that develop during construction, or that are noted in the Plans or Specifications.

1.02 MEETINGS

- A. A pre-construction meeting shall be held to coordinate work activities and to assist in the scheduling of CQA personnel. The Owner will set the time and date; the Contractor will be informed of the meeting time a minimum of five (5) working days prior to the meeting.
- B. Daily "tailgate" meetings shall be held to review hazards during site activities. Routes to the nearest hospital shall be displayed at the site.
- C. Additional meetings will be held when needed to discuss construction activities, testing deficiencies, test results, testing yet to be performed, and any other items deemed necessary by the CQA personnel, Engineer, or Owner.

PART 2 – MATERIALS

Not used.

PART 3 – EXECUTION

Not used.

END OF SECTION



SECTION 01570

TEMPORARY CONTROLS

PART 1 – GENERAL

1.01 SCOPE

- A. The Contractor shall provide dust control measures as necessary to abate fugitive dust. Dust control measures shall be implemented during excavation, transport, processing, placement, and compaction of all materials.
- B. Dust control measure effectiveness shall be satisfactory to the Owner.

PART 2 – MATERIALS

2.01 WATER

- A. The Contractor shall provide a water truck for the application of clean water for dust control.
- B. The Contractor shall provide a means of supplying sufficient water.

PART 3 – EXECUTION

3.01 PROCEDURE

- A. Dry soils shall be wetted once prior to starting work each day, and thereafter throughout the day whenever construction activities produce visible fugitive dust emissions. Water shall be applied in a manner as to avoid ponding and runoff.

END OF SECTION

SECTION 02315

EXCAVATION

PART 1 - GENERAL

1.01 DESCRIPTION OF WORK

- A. The Contractor shall be responsible for providing equipment and labor required to excavate and move on-site topsoil from adjoining areas to be used in the construction of the vegetative layer.
- B. The Contractor shall be responsible to provide equipment and labor required to move the native soils from Cell 4 to be used in the construction of the ET layer. The ET layer material has been previously excavated and laid over Cell 4 for decomposition.

1.02 SOIL SEGREGATION

- A. The Contractor shall segregate the excavated soil or topsoil under the direction and to the satisfaction of the Owner.

1.03 RELATED WORK AND REFERENCES

- A. OSHA Regulations.

PART 2 – MATERIALS

2.01 SILTY CLAY

- A. The on-site native silty clay soil is to be used for the ET layer.

2.02 TOP SOIL

- A. Soils used as the vegetative layer shall consist of on-site topsoil removed from adjoining areas as directed by the Owner.

PART 3 – EXECUTION

3.01 TOPSOIL MATERIAL EXCAVATION

- A. Native topsoil material shall be excavated from the adjoining areas for use in the construction of the vegetative layer. The borrow area is to be determined by the Owner.



3.02 CLEANUP

- A. Grade to smooth, uniformly sloping surfaces all areas disturbed by construction operations. Surfaces pre- and post- construction shall be graded to drain and precautions necessary shall be taken to minimize erosion.
- B. Runoff collection system(s) will be developed as necessary by the Contractor, in coordination with the Owner, to prevent runoff from entering active cell(s).

3.03 SAFETY

- A. All excavation shall be done in accordance with OSHA regulations and by local standards and accepted safe practices.

END OF SECTION



SECTION 02320

FINAL COVER

PART 1 - GENERAL

1.01 DESCRIPTION OF WORK

- A. The Contractor shall be responsible for equipment and labor required to install the final cover.
- B. The final cover will be constructed using on-site native materials. Testing for compaction characteristics, hydraulic conductivity, and Atterberg limits will be characterized before the start of construction (see CQAP). The final cover will be placed on top of the existing surface.

PART 2 - MATERIALS

2.01 EVAPORATIVE-TRANSPIRATION LAYER

- A. The ET layer shall be constructed of 30 inches of native silty clay material that was stockpiled during excavation. The soil shall be free of debris or particles greater than 2 inches exceeding 10% of volume of material by weight. This soil shall come from areas on-site, as described in Section 02315.

2.02 VEGETATIVE LAYER

- A. The vegetative layer shall be constructed of six (6) inches of topsoil excavated from the next active cell and seeded with vegetation suited to grow under local site conditions (see Section 02920).

PART 3 - EXECUTION

3.01 PREPARED SUBGRADE

- A. Existing vegetation in the final cover area shall be stripped and stockpiled on-site at the location identified by the Owner.

3.02 MOISTURE CONDITIONING

- A. The native silty clay soil shall be moisture-conditioned within a range of two (2) percentage points dry of the optimum moisture content to a maximum of the optimum moisture content as measured by ASTM D 1557.

3.03 COMPACTION

- A. Acceptable compaction ranges from 80% to 85% of maximum dry density as measured by ASTM D 1557. Soil not within this range shall be rejected.
- B. ET layer soil shall be placed in 1-foot deep lifts and then compacted. Vegetative layer soil can be placed in lift of less than 1-foot thick.



- C. A minimum slope of 2% shall be required on the top slope and a maximum of 3:1 (horizontal:vertical) on the side slopes. Side slopes can be flatter than 3:1 as required to match existing grades.

3.04 CORRECTIVE ACTION

- A. For work or physical components that do not satisfy plans and specifications, the general actions may include:
 - Removal and replacement;
 - Additional compaction and moisture adjustment for soils.
- B. If materials are found to deviate from specified standards, they will either be rejected or their suitability demonstrated by additional testing and analysis.

3.05 CONSTRUCTION QUALITY ASSURANCE

- A. Final cover construction will be subject to CQA procedures as described in the CQA Plan which is also part of this contract.
- B. Contractor shall accommodate CQA operations in the planning and execution of operations, and shall cooperate with CQA staff.

END OF SECTION



SECTION 02920

REVEGETATION

PART 1 – GENERAL

1.01 SCOPE

- A. The Contractor shall provide all material, equipment, and operations required for reseeding the final cover after completion of construction. The Contractor shall also coordinate with Owner to determine allowable time (season dependent) to reseed.

1.02 DELIVERY, STORAGE, HANDLING

- A. Packaged Materials: Deliver packaged materials in containers showing weight, analysis, and name of manufacturer. Protect materials from deterioration during delivery and while stored at site.

PART 2 – MATERIALS

2.01 SEED

- A. The Contractor shall drill seed for the vegetative layer. The seed mixture shall meet the following specifications and have no noxious weeds. The mixture to be used shall be as follows:

<u>Seed</u>	<u>Application Rates</u>
Indian Ricegrass:	5 lbs PLS/acre drilled
4 Wing Saltbush:	2 lbs PLS/acre broadcast

*PLS = Pure Live Seed

2.02 MULCH/TACKIFIER

- A. The Contractor shall apply one of the following materials to minimize erosion of the drilled seed.

<u>Application Materials</u>	<u>Application Rates</u>
Wood fiber hydromulch	2,000 lbs/acre
Tackifier	500 lbs/acre

OR

Weed-free straw mulch* 2,000 lbs/acre

*Enough to cover surface, straw "crimped" into the ground using a tractor-mounted straw crimper.



PART 3 – EXECUTION

3.01 GROUND PREPARATION

- A. Soils that are to receive grass seed shall be properly prepared, if the soil has not already been loosened, scarify the surface to a depth not less than 3 inches. Prior to seeding, the areas shall be graded and the area shall be free of large rocks and debris.
- B. Seed should be applied prior to snowfall. If seed must be applied and no snowfall is anticipated, moisten prepared areas before planting if soil is dry. Water thoroughly and allow surface moisture to dry before planting grasses. Excess water should not be applied to where it creates muddy soil conditions. After seed has been applied, lightly harrow the surface to maximum depth of 1 inch.
- C. Apply sufficient hydromulch and Tackifier, or straw mulch, to cover the ground surface following seeding.

3.02 CLEANUP AND PROTECTION

- A. During landscape work keep structures, fencing and other exposed facilities clean. Keep work area in an orderly condition.
- B. Protect landscape work and materials from damage due to landscape operations, operations by other contractors and trades, and trespassers. Maintain protection during installation and maintenance periods. Treat, repair, or replace damaged landscape work as directed.

END OF SECTION

*no - more
closure*

**KEOGH LAND SURVEYING
REGISTERED LAND SURVEYORS
45 E. Center • P.O. Box 396
MOAB, UT 84532**

(435) 259-8171
Telephone and Fax

January 29, 2003

Ms. Jane Jones
Grand County Solid Waste
P.O. Box 980
Moab, UT 84532

RE: Cover Area Cell #1

Dear Jane,

As requested, we have determined the surface area of those lands specified by Skeet Lammert to be the limits of Klondike Cell #1.

That surface area is 100,560 sq. ft. or 2.31 acres.

Thank you and call with any questions.

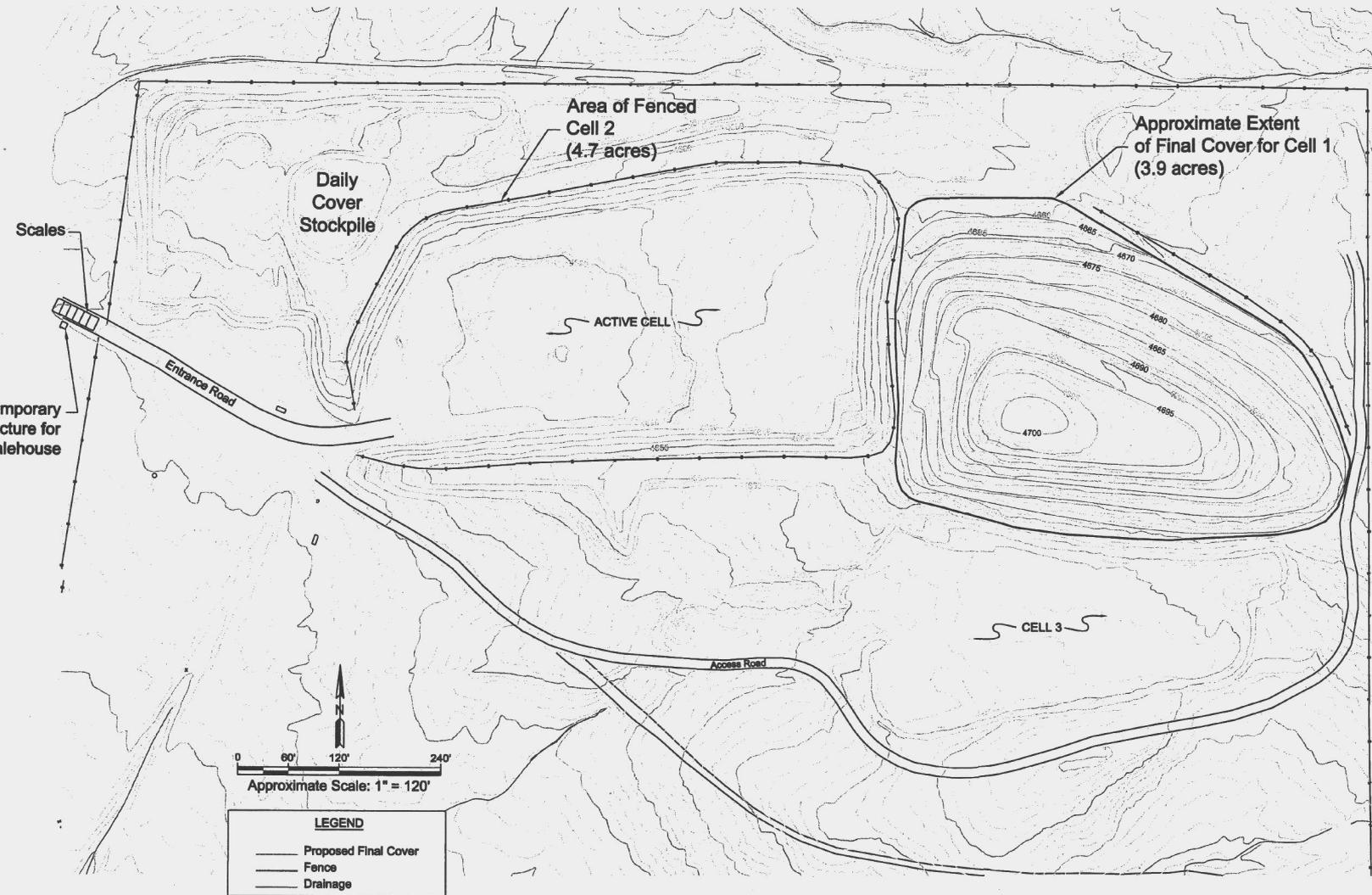
Sincerely Yours,


Timothy M. Keogh, P.L.S.

PLOTTED: 24 Oct 2008, 10:56am, scontreras

CAD FILE: L:\2008\Projects\84794\Figures\ LAYOUT: Layout1

SALT LAKE CITY, UT



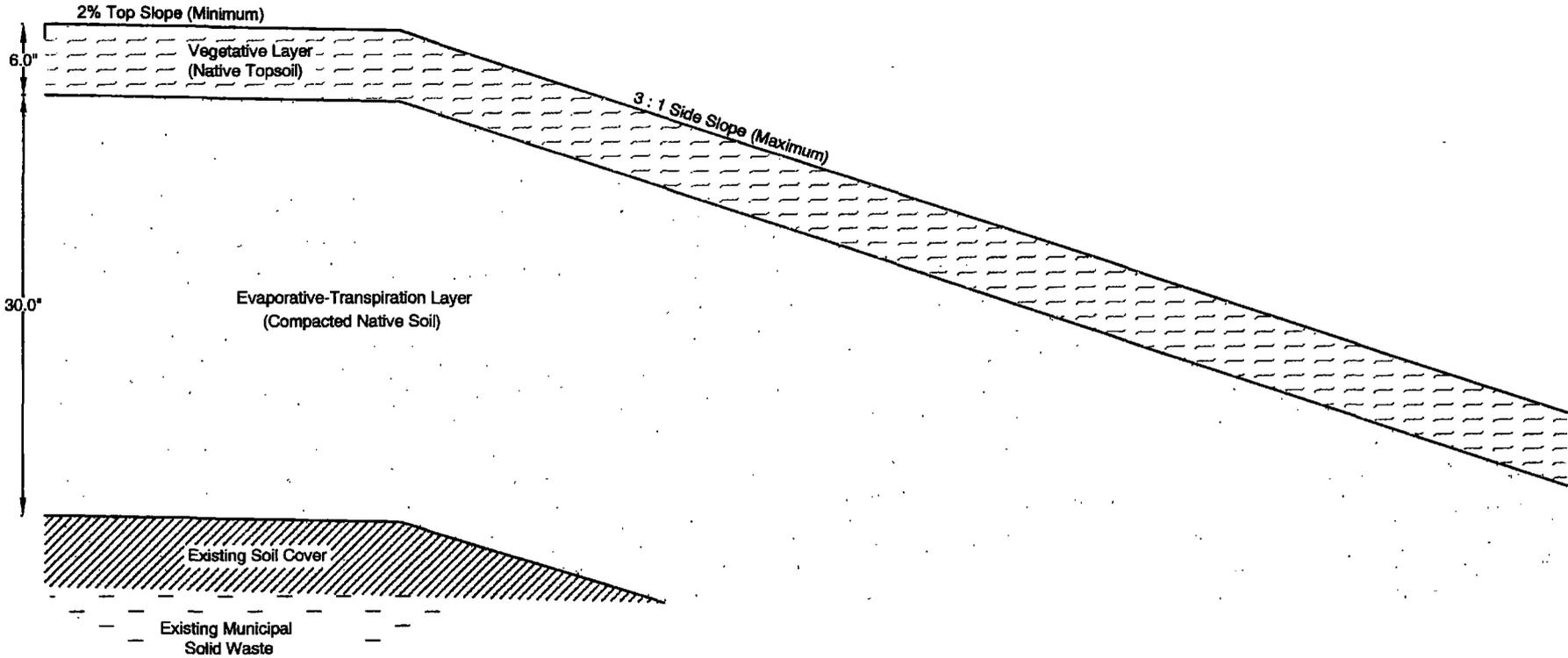
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PROJECT NO.	84794.3
DRAWN:	10/24/2008
DRAWN BY:	S.C.
CHECKED BY:	A.H.
FILE NAME:	SLC8d141.dwg

CONCEPTUAL FINAL COVER DESIGN
SOLID WASTE SPECIAL SERVICE DISTRICT # 1 KLONDIKE CLASS I LANDFILL GRAND COUNTY, UTAH

FIGURE
1



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PROJECT NO.	84974.3
DRAWN:	10/24/2008
DRAWN BY:	S.C.
CHECKED BY:	A.H.
FILE NAME:	SLC8d142.dwg

FINAL COVER SYSTEM DETAIL

SOLID WASTE SPECIAL SERVICE DISTRICT # 1
KLONDIKE CLASS I LANDFILL
GRAND COUNTY, UTAH

FIGURE

2

Attachment 3
Operations Plan



APPENDIX D OPERATIONS PLAN KLONDIKE LANDFILL

INTRODUCTION

This Operations Plan (Plan) was prepared for the Klondike Landfill. It was written to conform to the requirements of Utah Administrative Rule (UAC) 315-302-2(2) (Plan of Operation). The purpose of the Plan is to provide the Grand County Solid Waste Management Special Service District #1 (the District) with standard operating procedures for day-to-day operation of the landfill. Because of this, the Plan may be synonymously termed as the "Operator's Manual" throughout this document.

A copy of this Plan is required to be kept on-file at the landfill, the District's offices, or another location approved by the UDEQ. All employees or subcontractors of the District are required to read the manual as soon as possible after being hired, and will sign and date a training log sheet.

1. GENERAL DESCRIPTION

1.1 BACKGROUND

On October 9, 1991, the U.S. Environmental Protection Agency (EPA) published revisions within the Resource Conservation and Recovery Act (RCRA) specifically to the Criteria for Classification of Solid Waste Disposal Facilities. These regulations, developed in response to requirements of Subtitle D of the 1984 RCRA Hazardous and Solid Wastes Amendments (HSWA), defined minimum criteria for municipal solid waste landfills, including facility design and operational requirements. Subtitle D regulations became effective on October 9, 1993.

RCRA Subtitle D establishes a framework for federal, state, and local government cooperation in controlling the management of non-hazardous solid wastes. The federal government sets minimum standards for protection of human health and the environment. In conjunction with this role, the federal government provides technical assistance for individual states to plan and develop waste management practices. However, the actual planning, direct implementation, and enforcement remain in the hands of state and local governments.

On February 1, 1994, the Utah Department of Environmental Quality (UDEQ) issued final Administrative Rules implementing Subtitle D at the state level. These rules, titled *Solid Waste Permitting and Management Rules*, are found in the UAC R315-301 through 315; they have been reviewed and approved by the EPA.



1.2 FACILITY DESCRIPTION

1.2.1 General Facility Description

The Klondike Landfill will accept more than 20 tons per day (TPD) of municipal solid waste (MSW) from contracted haulers only. The public, private garbage haulers, and commercial/industrial customers will not generally have access to the landfill unless by franchise agreement. However, the District may grant limited direct access to the landfill to municipal or industrial facilities to protect public welfare or provide for orderly operation of the landfill.

The 80-acre site will be used as a Class I Landfill. In the Utah State Solid Waste Rule, R315-301-2, a Class I Landfill is described as:

A non-commercial landfill or a landfill solely under contract with a local government taking municipal solid waste generated within the boundaries of the local government that is permitted by the Executive Secretary to receive for disposal municipal solid waste; any other non-hazardous solid waste, not otherwise limited by rule or solid waste permit; and in conjunction with municipal solid waste or other non-hazardous solid waste, waste from a conditionally exempt small quantity generator of hazardous waste, as defined by Section R315-2-5.

No permanent structures or buildings are currently planned for the landfill; however, the District may develop buildings to house the landfill attendant, maintenance, or other facilities in the future. The entire site will be surveyed and marked to ensure that all improvements are performed within the boundaries of the property.

The landfill will be developed in six phases, each consisting of a four to five acre landfill cell. Each successive cell, constructed to a depth of approximately 40 feet, will have a service life of nine to eleven years. Cells will be filled in a manner designed to reduce

windblown litter and conserve cover soil. Intermediate cover consisting of 12 inches of soil will be applied over any area of the landfill not used for a period of 30 days or more; final cover will be applied on intermediate cover left in place for more than two years. As adjoining cells are completed, proper slope will be achieved with additional waste and final cover as required (see Appendix C – Facility Plans and Drawings). A 100-foot buffer zone will surround the active and closed portions of the landfill site, and may include the landfill access road and stormwater conveyance ditches and a stormwater retention pond.

The active life of the 40 acre landfilling area is expected to be approximately 48 years. Excavation of successive cells will occur during filling of the previous, thereby lowering the costs associated with development of both cells.

1.2.2 Fencing

A 100-foot buffer zone will be kept around the landfill cells at all times. This will provide an area on landfill property in which the District can maintain its stormwater and litter control facilities, and monitor the landfill facilities. The active and closed portions of the landfill will be fenced to allow the District to control access to the landfill, and to assist in controlling litter blowing from the active portions of the landfill.

Access to the landfill will be restricted to prevent illegal dumping of hazardous materials, vandalism, and unauthorized dumping of refuse. The entrance will be fenced and will include a lockable gate.

Appropriate signs will be posted at intervals along the fence and on the gate to inform people about the nature of the site and warn off trespassers.

1.2.3 Roads

Access to the site will be provided via the existing County-improved gravel road and new gravel access road.

1.2.4 Buildings

No buildings are currently planned to be constructed at the landfill site; however, the District may develop buildings to house the landfill attendant, for vehicle maintenance facilities, or other purposes in the future.

1.2.5 Operating Hours

The landfill is generally not open to the public. A schedule will be maintained for contracted haulers. The following information is to be posted at the gate:

KLONDIKE LANDFILL

FRANCHISED HAULERS ONLY • NO PRIVATE HAULERS OR RESIDENTS •
SCAVENGING IS STRICTLY FORBIDDEN • LIQUIDS AND HAZARDOUS WASTES
ARE PROHIBITED

IN CASE OF EMERGENCY, CONTACT:
Grand County Solid Waste Management Special Service District #1
(435) 259-DUMP (3867)



1.3 LANDFILL PERSONNEL

1.3.1 Job Descriptions

The following people are responsible and/or available for on-site operations at the Klondike Landfill:

Facility Supervisor (FS) or District Manager (DM). The FS or DM manages the overall operation of the solid waste management system, including the landfill; and production of annual environmental and financial reports. The FS or DM reports to and takes direction from the District's Board of Directors. The other District personnel report directly to the FS or DM.

Landfill Attendant (Attendant). The Attendant is responsible for all day-to-day operations at the landfill. His/her responsibilities include inspection/certification of wastes at the landfill and routine inspection of the facilities for compliance with permit requirements. The District may delegate this responsibility to its Landfill Contractor, if desired.

Landfill Contractor. The Landfill Contractor is responsible for the safe operation and daily maintenance of equipment; visual inspection of waste loads for unauthorized or hazardous wastes; daily operation on the working face of the landfill; directing traffic to the working face; and control of litter and dust generated from the landfilling operations. The District may self perform this function, if desired.

1.3.2 Personnel Training

Adequate training will be provided to ensure all personnel associated with the operation of the Klondike Landfill comply with the approved Operations Plan (Operator's Manual) and the Permit. At least one employee of the District or its Contractor will be trained in proper landfill operations. Other landfill personnel will receive an initial on-the-job



training from the trained staff member(s), and will receive an 8-hour refresher training annually covering landfill operations and waste screening. Refresher training will be provided as needed to ensure continued compliance. Certificates of completion are to be kept on file with the personnel records.

2. SOLID WASTE HANDLING PROCEDURES

2.1 DAILY TASKS

2.1.1 Prior to Opening

- Unlock the gate.
- Start a new page in the Daily Log with the correct date and time.
- Inventory equipment to be sure that all is on-site and ready for day's operation.
- Briefly check the fire extinguisher and other safety equipment. Once a week conduct this check more thoroughly.

2.1.2 During Operating Hours

- Visually inspect each incoming load. Certify no prohibited wastes are present. Reject materials or loads as necessary.
- Record the weight or volume, and description in the daily log and note the time of entry.
- Fill out records on incoming loads, i.e., the daily log and the driver's manifest.
- Clean/maintain equipment according to manufacturer's recommendations.

- Ensure waste is compacted as soon as practical after delivery.
- Apply cover material.

2.1.3 Closing

- Visually check the operating face and grounds to ensure no persons or animals are locked inside.
- Make necessary summaries in log book.
- Recheck grounds, and then lock the gate.

2.2 WASTE ACCEPTANCE PROCEDURES

2.2.1 General Procedure

No hazardous wastes will be accepted at the Landfill. Section 7.2 of this plan describes these prohibited wastes. The Landfill Attendant will visually inspect all loads whether from direct haul or from a transfer station and will screen out prohibited and/or special wastes. The attendant will then certify, along with the waste hauler, that no prohibited wastes are present in the load being accepted.

Log all vehicles entering the landfill into the Daily Log. Record the hauler's license number, a description of the wastes, weight or volume, and the time of entry.

2.2.2 Special Wastes

Special wastes are materials that require special handling if they are received at a landfill. Special wastes may require immediate burial, separation for recycling or recovery, or other non-routine handling. Special wastes are different than hazardous wastes, which are prohibited and are not acceptable at the Klondike Landfill even under special handling. (See Section 7.2)

Asbestos and Medical Wastes

Friable asbestos and biohazard medical wastes will generally not be accepted by the Landfill since these special wastes require special training and unusual handling procedures. Both types of wastes can transmit or cause diseases. Direct anyone inquiring about disposing of friable asbestos and medical wastes to a proper disposal facility. Under specific conditions to promote public welfare, the Board may approve limited disposal of friable asbestos or medical wastes.

Friable asbestos is material containing more than 1 percent asbestos which can easily be broken into dust-like particles. The EPA has a definition of this material which all asbestos removal contractors are required to understand. Since friable asbestos is the dangerous form of asbestos, the disposer must be asked if it is friable asbestos; if the answer is "yes," the waste must be rejected to protect landfill workers. The District will accept non-friable asbestos since this form of asbestos is expected to present little risk to landfill employees.

Bulky Wastes

Bulky wastes such as automobile bodies, furniture, and appliances should be recycled or reused wherever possible. Designated areas at the Landfill will be set aside for separating these items. Recyclers may pick them up periodically. Bulky wastes that are not recycled at least once each year must be disposed of properly at either the



Klondike Landfill or at the Class IV Moab Landfill. The Utah State Rule R315-301-2 defines a Class IV Landfill as:

A non-commercial landfill that is permitted by the Executive Secretary to receive for disposal only construction/demolition waste/ yard waste; inert waste; dead animals, as approved by the Executive Secretary and upon meeting the requirements of Section R315-315-6; waste tires and materials derived from waste tires, upon meeting the requirements of Section 19-6-804 and Section R315-320-3; and petroleum contaminated soils, upon meeting the requirements of Subsection R315-315-8(3).

If bulky wastes must be disposed of in the Class I landfill, crush them and push them onto the working face near the bottom of the cell. The preferred destination for disposal of bulky wastes is the Class IV landfill.

Used Oil and Anti-Freeze

Direct any one inquiring about disposing of used oil and anti-freeze to a proper facility. Do not accept used oil or anti-freeze.

Automobile Batteries

Automobile batteries, and similar lead-acid batteries, have a significant recycle value and cannot be landfilled in accordance with UAC 19-6-601. Collect and place any lead-acid batteries discovered at the working face onto a skid for future disposal.

Tires

Tires are accepted and stockpiled for recycling at the Class IV Moab Landfill; this is the preferred place to send tires. If tires are disposed of in the Class I landfill, spread tires out along the working face, cover with other waste, and compact.



Grease Trap Waste

The City of Moab Waste Water Treatment Plant (WWTP) cannot currently accept restaurant grease trap wastes. The WWTP is the preferred disposal site for this material and the City of Moab is considering expansion that may include the capability for grease trap waste handling. Until the WWTP can accept it, grease trap waste from franchised haulers is accepted at the landfill and applied by spraying onto a separate managed area approved by the Southeastern Utah District Health Department. The area is within the fenced portion of the landfill site and is designed for run-on and run-off control, to prevent pooling of waste, and to facilitate liquid evaporation and infiltration within 24 hours of application. Once the waste has dehydrated, it will be landfilled. A random testing procedure is in place to prevent disposal of hazardous wastes. Refer to Appendix L of the solid waste permit for documentation and drawings.

Septage

In the past, the City of Moab WWTP has experienced temporary conditions that prevent its acceptance of septage, such as high Total Suspended Solids. Under a Memorandum of Understanding with the City of Moab, the District has agreed to accept emergency septage that qualifies under the agreement at the landfill, on a case by case basis as requested in writing by the City of Moab. The septage will be delivered by franchised hauler to the landfill, and will be applied by spraying onto a separate managed area approved by the Southeastern Utah District Health Department. The area is within the fenced portion of the landfill site and is designed for run-on and run-off control, to prevent pooling of waste, and to facilitate liquid evaporation and infiltration within 24 hours of application. Once the waste has dehydrated, it will be landfilled. A random testing procedure is in place to prevent disposal of hazardous wastes. Refer to Appendix L of the solid waste permit for documentation and drawings.

2.3 WASTE DISPOSAL PROCEDURES

2.3.1 Working Face

Wastes should be deposited by trucks at the toe of the working face and spread up the slope in 1- to 2-foot layers. Keep the slope no steeper than at a 3:1 ratio (horizontal feet to vertical feet).

Keep working face dimensions narrow enough to minimize blowing litter and reduce the amount of soil needed for cover. Dimensions should be wide enough to safely accommodate vehicles bringing garbage into the landfill. The Solid Waste Association of North America (SWANA) recommends the width of the working face to be no less than three times the width of the dozer blade.

It is recommended the dozer be operated with the blade facing uphill when spreading and compacting wastes. Avoid sideways movements as the equipment may be susceptible to tipping over. In addition, an uphill orientation provides the following benefits:

- Litter blows onto the face reducing litter problems;
- There is better visibility for waste placement and compaction; and
- Loaded equipment moves up the face more easily.

Use grade stakes when necessary to control cell height and top surface grade. The top of the surface grade should range from 2 to 5 feet in 100 feet, while the cell height is commonly 8 to 10 feet.

2.3.2 Waste Compaction

Compact wastes by making three to five passes up and down slope. Compaction reduces litter, differential settlement, and the quantities of cover soil needed.

Compaction also extends the life of the site, reduces unit costs, and leaves fewer voids where vectors can breed. Avoid holes in the compacted waste; fill these with additional waste as they develop.

2.4 COVER

Landfill cover provides many benefits: it limits the production of leachate by keeping rain water from coming in contact with the wastes, reduces odors, prevents scavenging, cuts down on litter, prevents fires from spreading, and controls vermin.

2.4.1 Daily Cover

At least 6 inches of soil, or an alternate daily cover approved by the UDEQ, must be placed over the wastes by the end of each day. Use grade stakes when necessary to control cell height and top surface grade for proper drainage.

Daily cover material will be borrowed from other portions of the landfill site.

2.4.2 Intermediate Cover

Place intermediate cover when the cell will be idle for an extended period of time (30 days or more) in order to prevent water from coming in contact with waste materials. Intermediate cover consists of an additional 6 inches of soil for a total of 12 inches of soil. Intermediate cover material may be the same material as that used for daily cover.

2.4.3 Final Cover

Cover Placement

When the final planned grade height has been reached, or the time comes to close the landfill or section of the landfill, the final cover specified in the Engineering Report

section of the Landfill Permit Application must be placed. This final cover is intended to prevent rain from seeping into the waste during the post-closure life of the landfill. It allows light traffic and some settlement to occur without the risk of exposing buried waste. This cover should only be placed under the direct supervision of a registered professional engineer.

Revegetation

Each closed cell should be revegetated with native grasses and plants. After the final cover is compacted, spread and grade a six-inch layer of uncompacted top soil to form the base for reseeding. The seed mixture should include a minimum of four of the native grasses and plants. The exact mixture will depend on availability at the time of revegetation.

Plant the soil in accordance with current local Bureau of Land Management (BLM) recommendations for the Klondike Flats area.

Drainage

The upper surface of the closed cell/section should slope outward at a minimum of 2 percent slope grade, but not more than 5 percent slope grade. The 2 percent slope grade keeps water from pooling; greater than 5 percent would lead to erosion problems.

2.5 EQUIPMENT

It is recommended that any equipment utilized at the landfill be sufficiently sized for the operation of the Landfill, and that it contains an Occupational Safety and Health Administration (OSHA) approved safety cab, a fire extinguisher, a first aid kit, and a backup alarm.



All earthmoving and heavy equipment operation will be contracted, including waste compaction and daily cover operations. The contractor will be responsible for safe operation and maintenance of their equipment.

All landfill personnel are to be provided with two-way communication devices to facilitate communication with each other and the District. Emergency services can also be contacted if the need arises.

3. INSPECTIONS AND MONITORING

3.1 INSPECTIONS

The Landfill Attendant, District Manager, or Contractor is responsible for conducting and recording routine inspections of the landfill facilities according to the schedule outlined below:

Daily Inspection:

- Daily and Intermediate Cover Integrity
- Main Gate Integrity
- Condition of Equipment

Weekly or Monthly (As Needed):

- Litter Control (inside and outside fences)

Monthly Inspection:

Perimeter Fence Integrity
Stormwater Drainage System (Run-On/Run-Off Control System)
Final Cover Integrity (closed cells)
Leachate Sump in Phase I

Quarterly Inspections:

- Equipment Maintenance (Contractor)



- Site Road Integrity
- Methane Gas Monitoring

It is the responsibility of the FS to make sure all records are complete on at least a quarterly basis.

3.2 GROUNDWATER MONITORING

Because of depth to groundwater, the impermeable nature of the underlying soils, low rainfall, and high evaporation rates, the Klondike Landfill site has been exempted from groundwater monitoring.

3.3 METHANE GAS MONITORING

The Landfill will be monitored on a quarterly basis for methane gas releases using a hand-held photoionization detector (PID). A PID will be made available upon request by contacting the Southeastern District Engineer for the UDEQ at (435) 637-3671. The DM will coordinate the monitoring events, and will arrange for interpretation of the monitoring results if combustible gasses are detected at any station.

The monitoring procedure will be to walk the perimeter fence of the landfill and record PID readings at each corner of the fence line. The readings will be recorded and kept at the District office. If methane releases are detected in excess of 25 percent of the lower explosive limit (LEL) in a landfill building or structure, or more than 100 percent LEL at the property boundary, follow the procedure outlined in Section 4.4, Release of Explosive Gases. If concentration of methane exceeds the standard set in UDEQ Rules, the District will implement mitigation requirements imposed on the District by UDEQ regulations in effect at the time of the permit or revisions of the permit.



3.4 LEACHATE MONITORING

A gravity flow leachate collection system has been installed in the Phase 1 landfill cell and will be monitored monthly. The first time leachate is detected in the collection sump, it will be sampled and analyzed to assess if it is hazardous. Leachate will be sampled and analyzed annually thereafter.

If the leachate is assessed to be non-hazardous, it will be pumped from the sump and used for dust control within the footprint of the landfill cells, or transported to the local wastewater treatment plant for disposal. If the leachate is determined to be hazardous, it will be transported to an approved facility for disposal.

Records of leachate monitoring results, analytical results, leachate quantity pumped from the landfill, and ultimate disposition will be maintained in the operating record.

3.5 RUN-ON/RUN-OFF

District staff will inspect the stormwater drainage system monthly. The run-on/run-off collection and drainage system will be routinely evaluated and inspected for ponded water, blockage, and damage to drainage structures and swales. Temporary repairs will be made until permanent repairs can be scheduled.

Water in the stormwater detention pond will be tested annually for contaminants which may originate from the landfill.

4 CONTINGENCY AND CORRECTIVE ACTION PLANS

The following sections outline procedures to be followed in the event of fire, explosion, groundwater contamination, release of explosive gases, or failure of the run-off containment system. If emergency procedures are in effect and the landfill is not operational for more than an hour or two, franchise haulers will be notified by landfill personnel.

4.1 FIRE

If a fire is detected on board an incoming truck, direct the driver to the specified area where the load can be dumped and covered with soil. If the fire cannot be controlled, call the fire department. Allow the load to cool completely before transporting it to the working face.

Unfortunately, most "hot" loads are not detected until after the load has been dumped. If such a situation arises, evacuate all non-essential personnel from the area. If possible, isolate the burning material and smother it with soil. Allow the burned material to cool completely before returning it the working face. Call the fire department if the fire cannot be controlled.

If a fire is burning below the soil cover and is difficult to access or isolate, call the fire department.

In the event of fire, call the District Manager. Notify the UDEQ immediately and submit a written report within 14 days of the fire.

4.2 EXPLOSION

If an explosion occurs, evacuate the landfill and account for all personnel and customers. Shut down and abandon any equipment if it is in the vicinity of the explosion. Corrective action will be immediately evaluated and implemented as soon as practicable. Call the fire department and the District Manager. Notify the UDEQ immediately and submit a written report within 14 days.

4.3 FAILURE OF RUN-OFF/RUN-ON SYSTEM

The purpose of the run-off/run-on systems is to prevent water from entering or leaving the landfill. Inspect the systems regularly and make repairs as soon as practicable after discovery. In the case of run-on system failure, use temporary berms, ditches, sandbags, or other water diversion methods to divert water from the landfill.

Use these same methods to prevent water from leaving the landfill if the run-off system is breached. Assess the impact of any release as soon as practicable.

Monitor and inspect any temporary berms or other structures at least every two hours. Make any needed permanent improvements or repairs as soon as practicable.

As soon as any breach is discovered, call the District Manager. Notify the UDEQ immediately of any releases and submit a written report within 14 days.

4.4 RELEASE OF EXPLOSIVE GASES

Methane gas is not expected to be produced in large quantities at the Klondike Landfill. However, landfill gas production will be monitored quarterly. If a release is detected in excess of 25 percent of the LEL in a future-developed landfill building, or more than 100 percent LEL at the property boundary, the following procedure will be followed:



- Halt landfill operations immediately. If personnel or buildings appear to be threatened, evacuate the landfill.
- If gas is detected in a building, open the doors and windows to allow the gas to escape.
- If off-site buildings or structures appear to be threatened, call the fire department, evacuate the property, and notify the property owners.
- Call the District Manager. Monitor the release and determine temporary corrective action as soon as possible. Implement permanent corrective action as soon as practicable.
- Notify the UDEQ immediately and submit a written report within 14 days of detecting the release.

4.5 GROUNDWATER CONTAMINATION

Due to the extreme depth to groundwater at the site (greater than 500 feet below ground level) and the small quantities of leachate produced, it is unlikely that leachate will ever contaminate the groundwater. If groundwater contamination is ever suspected, a program to confirm this contamination will be developed and the extent of contamination documented. This program may include the installation of vadose or groundwater monitoring wells. A groundwater monitoring program will be developed and corrective action taken as deemed necessary.

4.6 ALTERNATIVE WASTE HANDLING/DISPOSAL SYSTEM

Landfill operations will be adapted for wet weather by constructing an all-weather roadway from the site entrance to the active cell. The site soils, including those used as



daily cover, consist primarily of clays derived by the weathering of Mancos shales. These soils may be impassable when wet. Given the arid climate at the Landfill site, wet weather is not often expected to be a problem. If the access roads become impassable during storms or for other reasons, waste may be temporarily (i.e. less than 24 hours) stored at the Moab transfer station.

All reasonable caution and prudence will be exercised to not dispose of wastes during any unreasonable weather conditions. If unforeseen weather conditions occur, the FS, or a designee, shall be informed and shall coordinate any changes in operation. The District will consider the system-wide requirements (including transfer station requirements) in determining what changes, if any, need to be made in operations at the landfill.

5 SYSTEM MAINTENANCE

5.1 LEACHATE COLLECTION SYSTEM

A gravity flow leachate collection system is installed in the Phase 1 cell and will be monitored monthly. The system will be inspected periodically by District staff for signs of deterioration. Needed repairs will be made by the District or a licensed contractor.

5.2 GAS COLLECTION SYSTEM

Gas collection is not planned for the Landfill. However, gas monitoring locations will be maintained on a routine basis to keep them free of weeds and debris. Weeds should be pulled at least two weeks prior to scheduled monitoring events.

5.3 RUN-ON/RUN-OFF COLLECTION SYSTEM

The run-on/run-off collection and drainage system will be routinely evaluated and inspected for ponded water and blockage of/damage to drainage structures and swales. Where erosion problems are noted or drainage control structures need repair, proper maintenance procedures will be implemented as soon as site conditions permit so that further damage is prevented. Damaged drainage pipes and broken ditch linings will be removed.

District staff will inspect the drainage system monthly. Temporary repairs will be made until permanent repairs can be scheduled. The District or a licensed general contractor will replace drainage facilities.

6. PROCEDURES FOR NUISANCE CONTROL

6.1 VECTOR CONTROL

Preventative measures for controlling disease vectors are outlined in the sections below.

6.1.1 Insects

Flies and mosquitoes can transmit disease and are nuisances. They enter the landfill with garbage and breed in moist areas. Flies and mosquitoes can be controlled by eliminating their food, shelter, and breeding areas.

Daily cover is the most effective way to control insects. If flies become a problem use fly bait. As long as there is no place for water to stagnate, mosquitoes should not be a problem.

6.1.2 Rodents

Rats, mice, and other rodents come into the landfill in loads or through natural migration. Appliance storage areas, poorly compacted cover soils, and spaces within bulky items provide refuge, and MSW provides food. Once a colony of rodents is established, it is very difficult to eliminate it.

Look for tooth marks or other signs of gnawing, droppings, holes, burrows, or nests. Rodents are usually not active during daylight hours, so if a rat or mouse is seen during daylight hours, the problem is serious. Notify the District Manager. A professional exterminator will be called who will establish a protocol for pest control in accordance with any state, county, or federal (such as FIFRA) regulations that may apply.

6.1.3 Birds

Scavenging birds, such as seagulls and crows, pose few problems around the Landfill. A control program will be implemented if the need should arise.

6.2 FUGITIVE DUST EMISSIONS

Dust is caused by traffic on unpaved roads, heavy equipment loading and unloading, compaction and cover activities, and moderate to high winds. The County-improved road into the landfill from U.S. 191 is unpaved and is the major dust source other than the landfill itself; however, dust control on this road is not the responsibility of the District. If fugitive dust becomes a problem, apply water to problem areas on the landfill or call County Road Department for water trucks that may water the unpaved road areas upon request.

6.3 LITTER CONTROL

Litter is unsightly, can clog machinery, and causes environmental as well as public relations problems. It is your responsibility as a Landfill Attendant to keep litter under control and cleaned up. Keep the working face downwind as much as possible so the wind will blow loose litter back onto the working face. Prompt compaction also reduces litter.

Effective use of litter fences also keeps blowing litter under control. These fences prevent litter from leaving the landfill site. Place the litter fences downwind and as close as possible to the working face. Constantly shifting high velocity winds accompanying storms, and thermals known as "dust devils," are common at this site. Small litter control catch fences are the most effective barrier method to control wind-blown litter. Several rows of fencing will be placed within the perimeter fence of the landfill, to break up wind patterns and allow litter to be contained and retrieved within the landfill site.



District landfill attendants will regularly patrol the catch fences and terrain surrounding the landfill.

7. SPOTTING AND WASTE SCREENING

7.1 INTRODUCTION

The municipal waste stream consists of many different types of waste. Some wastes are acceptable, some are regulated, and some are prohibited.

A vital part of your job is to know what is considered hazardous waste, how to recognize it, and how to exclude it. Landfill Attendants, or the District's contractor personnel, are required to receive periodic training in waste screening. This training consists of initial training and periodic refresher courses. Certificates of completion are to be kept on file with personnel records.

7.2 IDENTIFICATION OF REGULATED HAZARDOUS WASTE

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. Although these wastes are banned from disposal in the Klondike Landfill, various small quantity generators (less than 100 kg/month) of hazardous wastes and household hazardous wastes are exempt from hazardous waste regulation. Hazardous wastes are most likely to enter the landfill mixed in with common household waste.

Any material contaminated by a hazardous waste is also deemed to be a hazardous waste and must be managed as such. RCRA permits are also required to store, transport, and treat hazardous waste.

7.2.1 Listed Wastes

Listed wastes have been defined as hazardous waste by the EPA because they present significant risks to human health and the environment. They are listed in 40 CFR 261, subpart D.

7.2.2 Characteristic Wastes

Characteristic wastes are those considered hazardous because of their nature. Characteristic wastes exhibit one or more of the following characteristics:

- Ignitable. A flash point at temperature less than 140 degrees F; kindles under normal friction; or oxidizes. Examples are solvents, peroxide, and petroleum products. Dry cleaning establishments, machine shops and repair shops are common producers of these wastes.
- Corrosive. Acidic or alkaline, with a pH of less than 2 or greater than 12.5. Examples are car batteries, oven cleaners, and drain decloggers.
- Reactive. Normally unstable, these wastes react violently with water and may contain cyanide or sulfur. They may be easily detonated or exploded. Electroplating operations and munitions manufacturers produce reactive wastes.
- TCLP toxicity (Toxicity Characteristic Leaching Procedure). TCLP is a laboratory test designed to measure the "leachability" of heavy metals, pesticides, and some other inorganic compounds. If wastes fail the TCLP test, they may be identified as characteristic hazardous wastes.

7.2.3 Other Prohibited Wastes

The U.S. EPA has developed lists of specific types of wastes that may not be disposed of in MSW landfills. However, these lists exempt "household quantities" as hazardous wastes, and permit the disposal of household quantities in municipal landfills. Generally speaking, it is not possible to exclude "household quantities" of hazardous wastes generated in commercial establishments from landfills, since it may not be possible to determine exactly where a load originated. Therefore, small quantities of these wastes are generally considered acceptable for disposal in the Klondike Landfill.

PCBs

Polychlorinated biphenyls (PCBs) are toxic chemical compounds that do not degrade over time. Materials that may contain PCBs include power transformers, capacitors, and hydraulic systems that use PCB-containing oils. PCBs may also be found in debris, rags, or soil contaminated by a PCB spill.

Small quantities of PCBs are found in fluorescent light ballast capacitors and household appliances or other common consumer electrical products. These are not considered regulated PCB waste and can be landfilled. However, commercial facilities may not dispose of large quantities of these wastes in the landfill.

Liquids

Liquids and wastes containing free moisture cannot be put in the landfill. These wastes have the potential to increase leachate production. A waste is classified as a liquid if it readily separates from the solid portion of a waste under ambient temperature and pressure or as determined by EPA test method 9095 (the Paint Filter Test).



Radioactive Waste

Radioactive wastes are strictly controlled by the Nuclear Regulatory Commission and are banned from the landfill.

Pesticides

All pesticides are prohibited from the landfill, except those that originate at the household level. Empty pesticide containers originating from commercial or agricultural operations are prohibited unless they have been triple-rinsed, with the ends punctured or removed.

7.3 PROCEDURES FOR SCREENING WASTE

The Landfill Attendant will visually inspect all loads when unloaded and will screen out prohibited and/or special wastes for proper handling. He/she will then certify, along with the waste hauler, that no prohibited wastes are present in the load being accepted.

The Landfill Attendant will receive periodic training in detecting prohibited wastes. This training will consist of an initial training and annual refresher training.

7.4 HAZARDOUS WASTES DISCOVERED AFTER THE FACT

If hazardous wastes or wastes containing PCBs are discovered to have been inadvertently accepted (i.e., during the application of daily cover), the following shall apply:

- Restrict access to the area and conduct an inspection to assess the situation. If the waste can be safely removed from the working face, the equipment operator will transport it to a secure zone.



- Immediately contact the District Manager for further disposition of the waste.
- Try to identify the waste and the generator. Note your observations in the daily log, including a description of the material, in the daily log.
- The Executive Secretary, the hauler, and the generator (if known) will be notified within 24 hours of the discovery.
- If known, the generator will be responsible for proper cleanup, transport, and disposal of the waste. If the generator cannot be determined, the District is responsible for proper disposal of the material.

7.5 NOTIFICATION PROCEDURES

The following agencies and people must be notified if any type of banned material is discovered during a screening procedure:

District Manager.....	(435) 259-3867
County Health Department.....	(435) 259-5602
David Ariotti, District Engineer, UDEQ.....	(435) 637-3671
Sheriff's Office.....	(435) 259-8115
Highway Patrol.....	(435) 259-5441

The persons or agencies contacted with the dates should be clearly recorded in the Daily Log.

8. SAFETY

8.1 SAFETY EQUIPMENT

The following safety equipment is on-site at the landfill. It is the responsibility of all personnel to know where the equipment is located and how to use it properly.

8.1.1 Fire Extinguishers

The following fire extinguishers are to be kept on site during operating hours:

- Two 5-pound Powder-Sentry Fire Extinguishers attached to each piece of equipment.
- One 20-pound Powder-Sentry fire extinguisher is to be stored in the landfill gatehouse or in the District's on-site vehicle. In the event that the District delegates this responsibility to its contractor, the contractor shall maintain a 20-pound fire extinguisher on site.

8.1.2 Protective Gear

The following protective gear is to be kept on site during operating hours for use by Landfill Attendants or the District Manager:

- Earplugs;
- Safety glasses;
- Gloves;
- Hard hats;
- Two-way communication devices;



- Safety shoes (steel-toed);
- Coveralls or long-sleeved shirts and full-length pants;
- Respirators or dust masks; and
- Fluorescent vests or jackets.

The District's contractor must maintain safety equipment on-site required by OSHA for general construction contractors and for all contractor personnel.

8.2 SAFETY PROGRAM

The District and any contractors of the District are responsible for obtaining the necessary training for their employees operating heavy equipment and working on a construction site. This training must comply with OSHA, and NIOSH regulations as applicable.

The District is responsible for maintaining a safe working environment. Periodic safety audits of District and contractor facilities will be performed by the District Manager.

8.3 EMERGENCY PROCEDURES

If an accident occurs, respond as directed by your supervisor. The following numbers may be useful in reporting an emergency:

EMERGENCY FIRE AND RESCUE	911
Fire Department	259-5557
Highway Patrol	259-5441
Sheriff's Office	259-8115
Hospital (Moab, Utah)	259-7191
Grand County Solid Waste Management	259-3867
Special Service District #1	



LANDFILL INSPECTION

DATE: _____

TIME: _____

INSPECTOR: _____

LOCATION: _____

Daily Cover _____

Litter _____

Public Access _____

Liquid Waste _____

Hazardous Waste _____

Asbestos Site _____

Transfer Station _____

Leachate _____

Stormwater _____

Roads _____

Intermediate Cover _____

Erosion _____

Other _____

Repairs or Corrections _____

Signed _____

Attachment 4
Closure and Post-Closure

7. CLOSURE PLAN

Landfill closure will be supervised by a State of Utah licensed professional engineer. The registered engineer will be employed by the District, or will be a District-hired qualified contractor. This section describes the final cover construction, site capacity, schedule of closure implementation, estimated costs for closure, and final inspection procedures for the existing and new expansion cells of the Klondike Landfill. Appendix L describes the Final Cover Construction Specifications and Appendix M outlines the Construction Quality Assurance Plan for the Final Cover Construction.

7.1 FINAL COVER INSTALLATION

7.1.1 Cover Design

The preliminary design of the capping system for both currently active cells and future cells has been completed. Final design of the capping system for new cells will be prepared prior to closure of the facility, which is not expected to occur during the current permit. The previously permitted preliminary cap design was a capillary barrier. Because of the high cost of the capillary barrier cap, and UDEQ's request to readdress its justification as an alternative final cover, the capping system for the landfill has been changed to a modified form of the final cover described in UAC 315-303-3 (4).

The capping system is described in Section 5.2 of Part III of this permit, cost estimates are contained in Appendix E, and the justification of the cap is in Appendix K. The capping system is designed to control the emission of gas, promote the establishment of vegetative cover, minimize infiltration and percolation of water into the waste, and prevent erosion of the waste throughout the post-closure care period.

The capping system will be constructed when one or more phases of the landfill have reached final elevations and when closure will not impede future operations in adjacent phases.

7.1.2 Seeding

Early establishment of vegetation on the landfill's final slope surface will impede soil erosion and promote evapotranspiration. The District will periodically evaluate vegetative growth, vigor, and color so that the integrity of the final cover system is maintained. If stress signs on vegetation caused by landfill gas and leachate seeps are noted, the problem will be corrected. Corrective procedures will be conducted based on current design recommendations and will be built consistent with construction specifications. Typically, this will be addressed through placement of additional fill and reseeded.

The District will inspect the vegetative cover monthly during active filling on the site, and quarterly following final closure of all phases of the landfill. District staff or a licensed landscape contractor will make repairs.

7.1.3 Landscaping

The landfill facility, including all surrounding grounds, will be maintained in conjunction with any scheduled maintenance activities (i.e., vegetative control, road improvements, etc.). The landscape of the landfill will be designed to be both functional and aesthetically pleasing.

7.1.4 Contouring

The landfill's final grade will be inspected and maintained in order to ensure landfill integrity.

Evaluation and inspection of the landfill final grades will include the items specified in Section 7.1.1.

Areas where water has collected (ponded) will be regraded. District staff will inspect and maintain the final grading on a quarterly basis.

7.2 SITE CAPACITY

The Landfill is designed in six phases and each phase is designed as a separate 4- to 5-acre cell. Standard engineering calculations for the volume or capacity of landfill cells assume that daily and intermediate cover will consume approximately 20 percent of the available air space within the landfill, and that each cubic yard placed and compacted in the landfill will contain approximately 1,000 pounds of waste. Grand County currently disposes of approximately 25 tons per day of solid waste, not including C&D and recycled wastes. The facility has approximately 25 acres of disposal capacity in the initial 40-acre portion of the site planned for landfill development; resulting in more than an estimated 48 years of useful life, based on current disposal rates (described in the Phase 1 through 6 drawings in Appendix C). Phase 1 was filled level in approximately 2.5 years. Each of the remaining phases will be active for an estimated 9 to 11 years. The site will have additional capacity as additional phases are planned in the second 40-acre parcel. This additional capacity is expected to extend the useful life of the landfill site by 30 to 60 years beyond the life of the currently planned phases, giving the total site an expected life of 60 to 90 years.

7.3 CLOSURE SCHEDULE

Closure activities, including construction of the final cover and permanent drainage facilities, will be implemented periodically as areas of the landfill are filled to final grade. A Work Sequence Plan is included in the Klondike Landfill drawings provided in Appendix C.

7.4 CLOSURE COST ESTIMATES

Closure cost estimates are discussed in Section 6, Financial Assurance Plan.

7.5 FINAL INSPECTION PROCEDURES

Upon final closure, the District will submit to the Executive Secretary the following:

Facility or unit closure plan sheets signed by a professional engineer licensed in the State of Utah and modified as necessary to represent as-built changes to final closure construction as approved in the closure plan; and

Certification by the District and a professional engineer licensed in the State of Utah that the site or unit has been closed in accordance with the approved closure plan.

8. POST-CLOSURE CARE PLAN

Post-closure care for the Landfill will consist of long-term maintenance of the cover and long-term gas monitoring in accordance with UAC R315-302-3 (General Closure and Post Closure Requirements).

This post-closure care period will be 30 years unless unexpected conditions requiring corrective action arise.

8.1 MONITORING AND MAINTENANCE

The following subsections offer a description of the monitoring program, which includes groundwater monitoring systems and leachate and gas collection and systems.

8.1.1 Groundwater

Groundwater is not currently monitored at points inside or outside the limits of the landfill. Based on the Recreational and Public Purpose Report to the Bureau of Land Management (November, 1994), the depth to groundwater is unknown but greater than 503 feet below ground surface (bgs). Due to the combination of depth to groundwater, arid climate, and impermeable underlying geology (Appendices F through H), as explained in 1994, leachate infiltration into groundwater is not expected (Dames & Moore, 1994). Therefore, groundwater monitoring is not considered necessary at the site at this time.

8.1.2 Surface Water

Although no surface water sampling activities are scheduled for the Landfill, District staff will inspect any surface drainage system monthly. The District or a licensed general contractor will repair or replace surface drainage facilities if necessary.

8.1.3 Leachate Collection and Treatment

As illustrated on the Landfill drawings in Appendix C, developed in 1994, a leachate collection sump was installed in Cell 1. However, sumps are not planned for future cells. This sump will be monitored monthly for the presence of leachate. The sump will also be monitored for leachate within one week after intense storm events. The first time leachate is detected in the sump, it will be sampled and analyzed to determine if it is hazardous. Monthly monitoring of the sump for presence of leachate will continue, and leachate will be sampled and analyzed annually thereafter.

Any leachate, whether determined to be hazardous or non-hazardous, will be pumped from the sump onto the surface of Cell 1 for evaporation. After evaporation is complete, soil will be placed over the evaporated area. When constructed, the final cover will be applied to the entire cell, including the area from which the leachate evaporated.

Records of monitoring events, analytical results, and leachate quantity pumped from the landfill will be maintained in the operating record.

8.1.4 Landfill Gas

The decomposition of solid waste produces landfill gas, typically comprised of carbon dioxide and methane, a potentially explosive gas. The accumulation of methane in landfill structures can result in fire and explosions that can injure or kill employees, users of the landfill, and occupants of nearby structures. Due to the arid climate, very little decomposition of the waste is expected and, therefore, very little methane is expected to be produced as a byproduct.

No buildings exist adjacent to or near the Klondike Landfill. The nearest structure, the AT&T radio tower, is located approximately 3,000 feet east of the Landfill. Gas migration to this structure is not expected based on local geological conditions.

No permanent on-site buildings or structures are currently planned. However, the District may develop buildings to house the Landfill Attendant or to perform maintenance for the facilities in the future. Any future on-site buildings will be designed with active or passive methane protection, as appropriate, and structures will be monitored for methane in accordance to UAC R315-303-3(5).

UAC R315-302-3 requires the implementation of a routine monitoring program that is based on site-specific geology and facilities and/or list site-specific criteria that control the rate and extent of gas migration. These criteria should be considered in determining the type and frequency of monitoring, which in some instances may be more than quarterly. These factors include soil conditions, hydrogeological conditions, hydraulic conditions, and the location of facility structures relative to property boundaries.

The UAC R315-303-3(5) requires the landfills to monitor for landfill gas at least quarterly to ensure methane control at the perimeter of a landfill. Gas will be monitored using a hand-held methane detection probe. If methane exceeds the specified limits as stated in UAC R315-303-2(2)(a), the District must immediately notify UDEQ of the detection and take steps to protect human health. The District must implement a gas control or remediation plan to UDEQ within 60 days of the discovery of exceedance of methane limits.

District landfill personnel will be responsible for the inspection of all methane gas monitoring points and facility landmarks. Such inspections shall involve searching for vegetation suspected of being affected by landfill gas(es). In the event that yellowing or dead vegetation is noted or the gas monitoring program indicates that explosive gases are leaving the site, additional assessments will need to be undertaken to determine the quantity and extent of landfill gas migration. In the event of suspected gas migration, documentation of the incident will be placed in the operating record.

In addition to visual inspections of the facility, District landfill personnel shall conduct routine methane gas monitoring utilizing portable combustible gas indicators (e.g., Lumidor). In the event that readings are obtained that exceed 25 percent of the LEL, the District shall notify UDEQ immediately and undertake corrective actions.

The concentration of methane gas generated by the landfill must not exceed 25 percent of the LEL for methane in the facility structures (excluding gas control or recovery system components). The concentration of methane gas generated by the landfill must not exceed the LEL for methane at the facility boundary.

The location of site boundaries are illustrated in the Klondike Landfill drawings included as Appendix B.

8.2 MAINTENANCE PROGRAM

The following subsections offer a description of the maintenance of installed equipment including ground-water monitoring systems, and leachate and gas collection systems.

8.2.1 Groundwater

A groundwater monitoring system is not planned for the landfill. The site's geology and its extremely arid climate are consistent with an exemption from groundwater monitoring (Dames & Moore, 1994).

All future groundwater monitoring wells, if deemed necessary, will be inspected for signs of failure or deterioration during each sampling event. If damage is discovered, the nature and extent of the problem will be recorded. A decision will be made to replace or repair the well. Possible repairs include redevelopment, chemical treatment, partial casing replacement or repair, sealing the annulus, or pumping and testing. If a well needs to be replaced, it will be properly decommissioned in accordance with Utah

Administrative Rule R655-4-12 (Abandonment of Wells). Damaged wells will be scheduled for repair or replacement within 1 month after the damage is identified.

8.2.2 Surface Water

Drainage control problems can result in accelerated erosion of a particular area within the landfill. Differential settlement of drainage control structures can limit their usefulness and may result in a failure to properly direct stormwater off the site.

Implementation of a post-closure maintenance program will maintain the integrity of the final drainage system throughout the post-closure maintenance period. The final surface water drainage system will be routinely evaluated and inspected for ponded water, and blockage of and damage to drainage structures and swales. Where erosion problems are noted or drainage control structures need repair, proper maintenance procedures will be implemented as soon as site conditions permit so that further damage is prevented. Damaged drainage pipes and broken ditch linings will be removed.

District staff will inspect the drainage system monthly during active landfilling on the site, and quarterly following closure of the landfill. Temporary repairs will be made until permanent repairs can be scheduled. The District or a licensed general contractor will repair or replace drainage facilities.

8.2.3 Leachate Collection

The leachate control and recovery system must be maintained so that it operates during the post-closure maintenance period. The system will be inspected quarterly by District staff for signs of deterioration. Needed repairs will be made by the District or a licensed contractor.

8.2.4 Landfill Gas

A landfill gas monitoring system is not included as part of the design for the Klondike Landfill. However, if in the future UDEQ requires landfill gas collection and treatment, the landfill gas system will be inspected quarterly in conjunction with the scheduled monitoring tasks. The system will be repaired and parts replaced as required to maintain system capabilities. The program described previously for inspecting and maintaining the gas monitoring system will be followed during the post-closure maintenance period.

The landfill gas monitoring system will be inspected quarterly. Quarterly maintenance will include cutting weeds in a 2-foot radius around each monitoring location.

8.2.5 Facility and Facility Structures

The location of leachate and surface water management facilities are shown on the 1994 drawings included in Appendix B. The leachate facilities will consist of underground piping and sumps. The piping will transmit the leachate in Cell 1 to the collection sump. The piping will be constructed and tested to meet sanitary sewer specifications for leakage control.

The stormwater management facilities will consist of surface water ditches and a detention pond. The surface water ditches will transmit stormwater from the vicinity of the landfill to the retention pond (Sheets 2 and 3, Appendix B). The retention pond will allow settlement of sediments contained in the stormwater run off, and will discharge by overflow into intermittent streams south of the landfill site. Water in the stormwater retention pond will be tested annually for contaminants which may originate from the landfill.

8.2.6 Landfill Cover and Run-on/Run-off Systems

The final grades and capping system will incorporate features to manage stormwater, minimize erosion, and provide for efficient removal of stormwater collected in the drainage layer. Sheets 4 through 6 of the drawings provided in Appendix B show proposed final grades and Sheets 2 and 3 illustrate the extent of stormwater collection and surface water and erosions control systems on the surface of the cap. Calculations for run-on and run-off controls are included in Appendix O.

Stormwater that percolates through the topsoil and vegetative layer will be impeded from further downward percolation and will be stored in the vegetative layer until the next growing season.

Placement of all permanent drainage facilities will be completed during, or immediately following, installation of the final soil cover. Permanent drainage facilities, as shown on Drawings 2 and 3 (Appendix B), were designed to provide adequate drainage after settlement of the fill area(s).

8.3 SCHEDULE OF POST-CLOSURE ACTIVITIES

Post-closure activities, consisting of monitoring and maintaining the final cover and permanent drainage facilities, will be implemented periodically as areas of the landfill are filled to final grade. A Work Sequence Plan is included in the Klondike Landfill Permit drawings in Appendix B.

8.4 POST-CLOSURE COSTS

The District has developed a financial assurance plan for closure and post-closure of the landfill. A summary of this plan is included in Section 6.

9. LAND TITLE, LAND USE, AND ZONING RESTRICTIONS

The District will notify the Grand County Recorder's Office at any such time when there is a change to the Record of Title, land use plan, or zoning restrictions. In addition, the District will notify the Recorder at that time when the post-closure care period has expired and has been accepted by the State.

5.2.2 Final Cover

The District will place a final cover system on each phase within 180 days after waste disposal ceases in the final lift or as soon thereafter, weather permitting, as possible. The final cover system is a cost-effective alternative to the "prescriptive cap" described in UAC R315-303-3 (4). The evaporative-transpiration (ET) cap will be constructed using on-site native materials and will consist of one 30-inch thick layer of native soil overlain by a vegetative layer of 6 inches. Soils used for the ET layer will consist of on-site native silty clay materials for the cover which will act as an infiltration barrier. Topsoil for the vegetative layer will come from adjoining areas on-site. The top layer will be vegetated to minimize erosion and enhance transpiration from established plants.

This engineered final cover system will prevent migration of rain and snow melt water into the wastes following closure of each cell. Appendices K and L describe this design.

5.3 SOURCES FOR SOIL LINERS

The first landfill cell (Phase 1) was lined with a 6-inch thick compacted liner constructed using selected on-site soils. This Phase 1 cell was also constructed with a leachate collection system. Justification for exemptions from further liner and leachate collection system requirements for all future cells (Phases 2-6) is presented in Appendix J. The landfill cells will be excavated to the depth indicated on the Landfill drawings (Appendix C) and waste will be landfilled directly on the excavated surface.

5.4 EQUIPMENT REQUIREMENTS AND AVAILABILITY

Each landfill phase will be designed with a planned operating life of 9 to 11 years. This operating life is calculated using the annual solid waste generation (refer to Section 2.1.4), and an in-place density of 1,000 pounds per cubic yard for the compacted solid waste. These are conservative estimates of the expected in-place density since this is

6. CLOSURE AND POST-CLOSURE

6.1 CLOSURE AND POST-CLOSURE DESIGN

Section 5.2 of this Part describes the closure cap design for the Klondike Landfill. Appendix K provides the rationale used in formulating this design, construction specifications, and the Construction Quality Assurance Plan for the final cover.

6.2 CLOSURE AND POST-CLOSURE CONSTRUCTION

Sections 7 (“Closure Plan”) and 8 (“Post Closure Care Plan”), located in Part II, detail the closure and posts-closure construction activities for the Klondike Landfill.

6.3 CLOSURE AND POST-CLOSURE MAINTENANCE

The District intends to close the existing Landfill under UAC R315-302-3. The Facility Supervisor will inspect the closed landfill cells on a monthly basis, and correct any erosion or settlement deficiencies observed during this inspection.

A post-closure maintenance program will be implemented at the Landfill in order to maintain the integrity of the Landfill’s final cover. The final cover areas will be routinely evaluated for any evidence of erosion, ponded water, odor, disposed refuse, cracks, settlement, slope failure, and leachate seeps.

Any erosion damage, which may be caused by extremely heavy rainfall, will be repaired. Temporary berms, ditches, and straw mulch will be used to prevent further erosion damage to soil cover areas until site conditions permit the final cover to be reestablished and vegetation to be reseeded. Preventive maintenance for the final

cover should preclude problems regarding infiltration of surface water, gas venting through the cover, and vectors attracted by exposed refuse.

6.3.1 Drainage System

Drainage control problems can result in accelerated erosion of a particular area within the landfill. Differential settlement of drainage control structures can limit their usefulness and may result in a failure to properly direct storm water off the site.

Implementation of the post-closure maintenance program will maintain the integrity of the final drainage system throughout the post-closure maintenance period. The final drainage system will be routinely evaluated and inspected for ponded water, and blockage of and damage to drainage structures and swales. Where erosion problems are noted or drainage control structures need repair proper maintenance procedures will be implemented as soon as site conditions permit so that further damage is prevented and the cause of the damage is eliminated. Damaged drainage pipes and broken ditch linings will be removed and replaced.

District staff will inspect the drainage systems monthly. Temporary repairs will be made until permanent repairs can be scheduled. The District or a licensed general contractor will repair drainage facilities.

6.3.2 Vegetative Cover

Early establishment of vegetation on the landfill's final slope surface will impede soil erosion and promote evapotranspiration. The District will periodically evaluate vegetative growth, vigor, and color so that the integrity of the final cover system is maintained. If stress signs on vegetation caused by landfill gas and leachate seeps are noted, the problem will be corrected. Corrective procedures will be conducted based on current design recommendations and will be built consistent with construction specifications.

The District will inspect the vegetative cover monthly. District staff or a licensed landscape contractor will make repairs.

6.3.3 Leachate Control System

The leachate control and recovery system in the first cell must be maintained so that it operates during the post-closure maintenance period. The system will be inspected periodically by District staff for signs of deterioration. Needed repairs will be made by the District or a licensed contractor.

6.3.4 Gas Monitoring System

The landfill gas monitoring system, if required in the future by UDEQ, will be regularly inspected in conjunction with the scheduled monitoring tasks. The system will be repaired and parts replaced as required to maintain system capabilities. The program described below for inspecting and maintaining the gas monitoring system will be followed during the post-closure maintenance period.

The landfill gas monitoring system will be inspected quarterly. Quarterly maintenance will include cutting weeds in a 2-foot radius around each well, if wells are required. Preventive maintenance will be performed on all mechanical equipment at manufacturer-recommended intervals. These tasks include cleaning, lubrication, and replacement of worn parts.

6.3.5 Ground-Water Monitoring System

All ground-water monitoring wells, if required in the future by UDEQ, will be inspected for signs of failure or deterioration during each sampling event. If damage is discovered, the nature and extent of the problem will be recorded. A decision will be made to replace or repair the well. Possible repairs include redevelopment, chemical treatment, partial casing replacement or repair, sealing the annulus, or pumping and

testing. If a well needs to be replaced, it will be properly decommissioned. Damaged wells will be scheduled for repair or replacement within 1 month after the problem is identified.

6.3.6 Final Grading

The landfill's final grades will be inspected and maintained in order to maintain their integrity. At the completion of closure activities, the surface of the cap will be surveyed to provide a reference basis for monitoring settlements and movements.

Areas where water has collected (ponded) will be regraded. Erosion damage resulting from extremely heavy rainfall will be repaired. District staff will inspect the final grading quarterly.

6.4 CLOSURE AND POST-CLOSURE LAND USE

District staff or a District contractor shall design a post-closure end use plan for the landfill. It is anticipated that the District will select an end use that will be limited to those that do not threaten the integrity of the existing control systems. All activities will be approved by the County prior to implementation. Typical end uses range from recycling operations (which complement existing operations) to recreational activities. At a minimum, the site should be restored to its pre-landfill condition as much as possible. Although contours among the site may have changed, an effort to introduce native materials can help the site blend in with surrounding land uses. Since the closure of the site is 30 to 90 years in the future, it is not currently possible to develop these land use plans.