

SW131  
**RECEIVED**

MAR 07 2011

UTAH DIVISION OF  
SOLID & HAZARDOUS WASTE

2011,00659

WESTERN KANE COUNTY  
SPECIAL SERVICE DISTRICT NO. 1  
P.O. Box 36  
Kanab, UT 84741  
(435) 644-5089

March 4, 2011

Mr. Scott Anderson  
Executive Secretary  
Division of Solid & Hazardous Waste  
P.O. Box 144880  
Salt Lake City, Utah 84114-4880

Dear Mr. Anderson:

Enclosed are the necessary permit renewal documents and attachments for the Kanab Class II Landfill.

Western Kane County Special Service District No. 1 certifies under penalty of law that the documents and attachments were prepared under the direction of the Special Service District in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on the District's inquiry of those who manage the system or are directly responsible to gather the data, the information submitted is, to the best of my knowledge and belief, true, accurate and complete. The District is aware there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

If you have any questions or concerns, please contact me at (435) 644-5089. We thank you in advance for your cooperation.

Sincerely,



Nyle Willis,  
Western Kane County Special  
Service District No. 1

**RECEIVED**

**MAR 07 2011**

**UTAH DIVISION OF  
SOLID & HAZARDOUS WASTE**

*2011.00659*

**PERMIT RENEWAL APPLICATION**

**KANAB SANITARY LANDFILL**

**January, 2011**

**PREPARED BY: BEEHIVE ENTERPRISES, INC.**

## Utah Class II Landfill Permit Application Form

<b>Part I General Information</b> APPLICANT: PLEASE COMPLETE ALL SECTIONS.					
<b>I. Landfill Type</b>	<input checked="" type="checkbox"/> Class II	<b>II. Application Type</b>	<input type="checkbox"/> New Application <input checked="" type="checkbox"/> Renewal Application	<input type="checkbox"/> Facility Expansion <input type="checkbox"/> Modification	SW131
For Renewal Applications, Facility Expansion Applications and Modifications Enter Current Permit Number				9713R1	RECEIVED
<b>III. Facility Name and Location</b>					
Legal Name of Facility Kanab Class II Landfill					MAR 07 2011
Site Address (street or directions to site) 3 miles SE of Kanab				County Kane	UTAH DIVISION OF SOLID & HAZARDOUS WASTE
City		Zip Code		Telephone 2011, 00659	
Township 44 S	Range 6 W	Section(s) 11	Quarter/Quarter Section all	Quarter Section NWE	
Main Gate Latitude degrees 37 minutes 0 seconds 20		Longitude degrees 112 minutes 30 seconds 00			
<b>IV. Facility Owner(s) Information</b>					
Legal Name of Facility Owner Western Kane County Special Service District No. 1					
Address (mailing) P.O. Box 36					
City Kanab		State UT	Zip Code 84741	Telephone 435 644-8059	
<b>V. Facility Operator(s) Information</b>					
Legal Name of Facility Operator Western Kane County Special Service District No. 1					
Address (mailing) P.O. Box 36					
City Kanab		State UT	Zip Code 84741	Telephone 435 644-8059	
<b>VI. Property Owner(s) Information</b>					
Legal Name of Property Owner Western Kane County Special Service District No. 1					
Address (mailing) P.O. Box 36					
City Kanab		State UT	Zip Code 84741	Telephone 435 644-8059	
<b>VII. Contact Information</b>					
Owner Contact Nyle Willis			Title Manager		
Address (mailing) P.O. Box 36					
City Kanab		State UT	Zip Code 84741	Telephone 435 644-8059	
Email Address nww@kanab.net			Alternative Telephone (cell or other)		
Operator Contact Nyle Willis			Title Manager		
Address (mailing) P.O. Box 36					
City Kanab		State UT	Zip Code 84741	Telephone 435 644-8059	
Email Address nww@kanab.net			Alternative Telephone (cell or other)		
Property Owner Contact Nyle Willis			Title Manager		
Address (mailing) P.O. Box 36					
City Kanab		State UT	Zip Code 84741	Telephone 435 644-8059	
Email Address nww@kanab.net			Alternative Telephone (cell or other)		

## Utah Class II Landfill Permit Application Form

<b>Part I General Information</b> (continued)																																											
<b>VIII. Waste Types:</b> (check all that apply) <input checked="" type="checkbox"/> All non-hazardous solid waste <b>OR</b> the following specific waste types: <table style="width: 100%; border: none;"> <tr> <td style="width: 33%;">Waste Type</td> <td style="width: 33%;">Combined Disposal Unit</td> <td style="width: 33%;">Monofill Unit</td> </tr> <tr> <td><input type="checkbox"/> Municipal Waste</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td><input type="checkbox"/> Construction &amp; Demolition</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td><input type="checkbox"/> Industrial</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td><input type="checkbox"/> Incinerator Ash</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td><input type="checkbox"/> Animals</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td><input type="checkbox"/> Asbestos</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td><input type="checkbox"/> Other _____</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> </table>	Waste Type	Combined Disposal Unit	Monofill Unit	<input type="checkbox"/> Municipal Waste	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Construction & Demolition	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Industrial	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Incinerator Ash	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Animals	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Asbestos	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Other _____	<input type="checkbox"/>	<input type="checkbox"/>	<b>IX. Facility Area</b> <table style="width: 100%; border: none;"> <tr> <td style="width: 80%;">Facility Area.....</td> <td style="width: 10%; text-align: center;"><u>227</u></td> <td style="width: 10%; text-align: right;">acres</td> </tr> <tr> <td>Disposal Area.....</td> <td style="text-align: center;"><u>40</u></td> <td style="text-align: right;">acres</td> </tr> <tr> <td>Design Capacity</td> <td></td> <td></td> </tr> <tr> <td>Years.....</td> <td style="text-align: center;"><u>50</u></td> <td></td> </tr> <tr> <td>Cubic Yards.....</td> <td style="text-align: center;"><u>1,056,000</u></td> <td></td> </tr> <tr> <td>Tons.....</td> <td></td> <td></td> </tr> </table>	Facility Area.....	<u>227</u>	acres	Disposal Area.....	<u>40</u>	acres	Design Capacity			Years.....	<u>50</u>		Cubic Yards.....	<u>1,056,000</u>		Tons.....		
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Signature of Authorized Owner Representative  _____ Nyle W. Willis Name typed or printed	<table style="width: 100%; border: none;"> <tr> <td style="width: 60%;">Title <b>Manager</b></td> <td style="width: 40%;">Date <b>March 4, 2011</b></td> </tr> <tr> <td colspan="2">Address <b>P.O. Box 36, Kanab, Utah 84741</b></td> </tr> </table>	Title <b>Manager</b>	Date <b>March 4, 2011</b>	Address <b>P.O. Box 36, Kanab, Utah 84741</b>																																							
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## Utah Class II Landfill Permit Application Checklist

**Important Note:** The following checklist is for the permit application and addresses only the requirements of the Division of Solid and Hazardous Waste. Other federal, state, or local agencies may have requirements that the facility must meet. The applicant is responsible to be informed of, and meet, any applicable requirements. Examples of these requirements may include obtaining a conditional use permit, a business license, or a storm water permit. The applicant is reminded that obtaining a permit under the *Solid Waste Permitting and Management Rules* does not exempt the facility from these other requirements.

An application for a permit to construct and operate a landfill is the documentation that the landfill will be located, designed, constructed, operated, and closed in compliance with the requirements of Rules R315-302, R315-303, R315-308, R315-309, and R315-315 of the *Utah Solid Waste Permitting and Management Rules* and the *Utah Solid and Hazardous Waste Act* (UCA 19-6-101 through 123). The application should be written to be understandable by regulatory agencies, landfill operators, and the general public. The application should also be written so that the landfill operator, after reading it, will be able to operate the landfill according to the requirements with a minimum of additional training.

Copies of the *Solid Waste Permitting and Management Rules*, the *Utah Solid and Hazardous Waste Act*, along with many other useful guidance documents can be obtained by contacting the Division of Solid and Hazardous Waste at 801-536-0200. Most of these documents are available on the Division's web page at [www.hazardouswaste.utah.gov](http://www.hazardouswaste.utah.gov). Guidance documents can be found at the solid waste section portion of the web page.

When the application is determined to be complete, the original complete application and one copy of the complete application are required along with an electronic copy.

### Part II Application Checklist

<b>I. Facility General Information</b>	
Description of Item	Location In Document
<b><i>1a.</i> General Information - All Facilities</b>	
Completed Part I General information form above	Done
General description of the facility (R315-310-3(1)(b))	Page 2
Legal description of property (R315-310-3(1)(c))	Page 2
Proof of ownership, lease agreement, or other mechanism (R315-310-3(1)(c))	Exhibit 2b
Area served by the facility including population (R315-310-3(1)(d))	Page 3
A demonstration that the landfill is not a commercial facility	Page 3
Waste type and anticipated daily volume (R315-310-3(1)(d))	Page 3
<b><i>1b.</i> Information Required - All New Or Laterally Expanding Facilities</b>	
Intended schedule of construction (R315-302-2(2)(a))	N/A
Name and address of all property owners within 1000 feet of the facility boundary (R315-310-3(2)(i))	N/A
Documentation that a notice of intent to apply for a permit has been sent to all property owners listed above (R315-310-3(2)(ii))	N/A

## Utah Class II Landfill Permit Application Checklist

<b>I. Facility General Information</b>	
Description of Item	Location In Document
Name of the local government with jurisdiction over the facility site (R315-310-3(2)(iii))	N/A
<b>Ic. Location Standards - All New And Expanding Facilities</b>	
Documentation that the facility has meet the historical survey requirement of R315-302-1(2)(f)	N/A
Land use compatibility (R315-302-1(2)(a))	N/A
Maps showing the existing land use, topography, residences, parks, monuments, recreation areas or wilderness areas within 1000 feet of the site boundary	N/A
Certifications that no ecologically or scientifically significant areas or endangered species are present in site area	N/A
List of airports within five miles of facility and distance to each	N/A
Geology (R315-302-1(2)(b))	N/A
Geologic maps showing significant geologic features, faults, and unstable areas	N/A
Maps showing site soils	N/A
Surface water (R315-302-1(2)(c))	N/A
Magnitude of 24 hour 25 year and 100 year storm events	N/A
Average annual rainfall	N/A
Maximum elevation of flood waters proximate to the facility	N/A
Maximum elevation of flood water from 100 year flood for waters proximate to the facility	N/A
Wetlands (R315-302-1(2)(d))	N/A
Ground water (R315-302-1(2)(e))	N/A
<b>Id. Plan of Operations – All Facilities (R315-310-3(1)(e) and R315-302-2(2))</b>	
Forms and other information as required in R3315-302-2(3) including a description of on-site waste handling procedures and an example of the form that will be used to record the weights or volumes of waste received (R315-302-2(2)(b) And R315-310-3(1)(f))	Page 3
Schedule for conducting inspections and monitoring, and examples of the forms that will be used to record the results of the inspections and monitoring (R315-302-2(2)(c), R315-302-2(5)(a), and R315-310-3(1)(g))	Page 3 & 7
Contingency plans in the event of a fire or explosion (R315-302-2(2)(d))	Page 8
Corrective action programs to be initiated if ground water is contaminated (R315-302-2(2)(e))	Page 8
Contingency plans for other releases, e.g. explosive gases or failure of run-off collection system (R315-302-2(2)(f)).	Page 8

## Utah Class II Landfill Permit Application Checklist

<b>I. Facility General Information</b>	
Description of Item	Location In Document
Plan to control fugitive dust generated from roads, construction, general operations, and covering the waste (R315-302-2(2)(g))	Page 8
Plan for litter control and collection (R315-302-2(2)(h))	Page 8
Description of maintenance of installed equipment (R315-302-2(2)(i))	Page 9
Procedures for excluding the receipt of prohibited hazardous or PCB containing wastes (R315-302-2(2)(j))	Page 9
Procedures for controlling disease vectors (R315-302-2(2)(k))	Page 9
A plan for alternative waste handling (R315-302-2(2)(l))	Page 10
A general training plan for site operations (R315-302-2(2)(o))	Page 10
Any recycling programs planned at the facility (R315-303-4(6))	Page 10
Closure and post-closure care Plan (R315-302-2(2)(m))	Page 21
Procedures for the handling of special wastes (R315-315)	Page 5
Plans and operation procedures to minimize liquids (R315-303-3(1))	Page 5
Plans and procedures to address the requirements of R315-303-3(7)(c) through (i) and R315-303-4	N/A
Any other site specific information pertaining to the plan of operation required by the Executive Secretary (R315-302-2(2)(p))	N/A

<b>II Facility Technical Information</b>	
Description of Item	Location In Document
<b>IIa. Maps – All Facilities</b>	
Topographic map drawn to the required scale with contours showing the boundaries of the landfill unit, gas monitoring points, and the borrow and fill areas (R315-310-4(2)(a)(i))	Exhibit 10
Most recent U.S. Geological Survey topographic map, 7-1/2 minute series, showing the waste facility boundary; the property boundary; surface drainage channels; any existing utilities and structures within one-fourth mile of the site; and the direction of the prevailing winds (R315-310-4(2)(a)(ii))	Exhibit 10
<b>IIb. Geohydrological Assessment - All Facilities (R315-310-4(2)(b))</b>	
Local and regional geology and hydrology including faults, unstable slopes and subsidence areas on site (R315-310-4(2)(b)(i))	Page 12
Evaluation of bedrock and soil types and properties including permeability rates (R315-310-4(2)(b)(ii))	Page 13
Depth to ground water (R315-310-4(2)(b)(iii))	Page 13
Quantity, location, and construction of any private or public wells on-site or within 2,000 feet of the facility boundary (R315-310-4(2)(b)(v))	Page 13

## Utah Class II Landfill Permit Application Checklist

<b>// Facility Technical Information</b>	
Description of Item	Location In Document
Tabulation of all water rights for ground water and surface water on-site and within 2,000 feet of the facility boundary (R315-310-4(2)(b)(vi))	Page 13, Ex. 7a&b
Identification and description of all surface waters on-site and within one mile of the facility boundary (R315-310-4(2)(b)(vii))	Page 14
For an existing facility, identification of impacts upon the ground water and surface water from leachate discharges (R315-310-4(2)(b)(viii))	Page 14
Calculation of site water balance (R315-310-4(2)(b)(ix))	Page 14
<b>//c. Engineering Report - Plans, Specifications, And Calculations – All Facilities</b>	
Documentation that the facility will meet all of the performance standards of R315-303-2	Page 17
Engineering reports required to meet the location standards of R315-302-1 including documentation of any demonstration or exemption made for any location standard (R315-310-4(2)(c)(i))	Page 17
Anticipated facility life and the basis for calculating the facility's life (R315-310-4(2)(c)(ii))	Page 17
Unit design to include cover design; fill methods; and elevation of final cover including plans and drawings signed and sealed by a professional engineer registered in the State of Utah, when required (R315-303-3(3), R315-303-3(6) and (7)(a), R315-310-3(1)(b) and R315-310-4(2)(c)(iii))	Page 18
Equipment requirements and availability (R315-310-4(2)(c)(iii))	Page 18
Identification of borrow sources for daily and final cover and for soil liners (R315-310-4(2)(c)(iv))	Page 19
Run-On and run-off diversion designs (R315-303-3(1)(c), (d) and (e))	Page 20
Landfill gas monitoring and control plan that meets the requirements of Subsection R315-303-3(5) (R315-310-4(2)(c)(vii))	Page 19
Slope stability analysis for static and under the anticipated seismic event for the facility (R315-310-4(2)(b)(i) and R315-302-1(2)(b)(ii))	N/A
Design and location of run-on and run-off control systems (R315-310-4(2)(c)(viii))	Page 20
<b>//d. Closure Plan – All Facilities (R315-310-3(1)(h))</b>	
Closure Plan (R315-302-3(2) and (3))	Page 21
Closure schedule (R315-310-4(2)(d)(i))	Page 21
Design of final cover (R315-310-4(2)(c)(iii))	Page 21
Capacity of site in volume and tonnage (R315-310-4(2)(d)(ii))	Page 22
Final inspection by regulatory agencies (R315-310-4(2)(d)(iii))	Page 23
<b>//e. Post-Closure Care Plan – All Facilities (R315-310-3(1)(h))</b>	
Post-Closure Plan (R315-302-3(5) and (6))	Page 21
Site monitoring of landfill gases, and surface water, if required (R315-310-4(2)(e)(i))	Page 24

## Utah Class II Landfill Permit Application Checklist

<b>// Facility Technical Information</b>	
Description of Item	Location In Document
Changes to record of title, land use, and zoning restrictions (R315-310-4(2)(e)(v))	Page 24
Maintenance activities to maintain cover and run-on/run-off control systems (R315-310-4(2)(e)(iii))	Page 24
List the name, address, and telephone number of the person or office to contact about the facility during the post-closure care period (R315-310-4(2)(e)(vi))	Page 24
<b>//f. Financial Assurance – All Facilities (R315-310-3(1)(j))</b>	
Identification of closure costs including cost calculations (R315-310-4(2)(d)(iv))	Page 27
Identification of post-closure care costs including cost calculations (R315-310-4(2)(e)(iv))	Page 27
Identification of the financial assurance mechanism that meets the requirements of Rule R315-309 and the date that the mechanism will become effective (R315-309-1(1))	Page 26

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**EXHIBITS**

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Exhibit #2b	Property Deed
Exhibit #3	Service District Boundaries
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Exhibit #5	Quarterly Inspection Log
Exhibit #6a-b	Onsite Soil Data
Exhibit #7a-b	Well and Water Right Documentation
Exhibit #8	Proposed Cell Progression
Exhibit #9	Conceptual Cell Designs
Exhibit #10	Topographic Map
Exhibit #11	Financial Assurance Data

## APPLICATION

### INTRODUCTION

This report serves as the application for the repermitting of the Kanab Sanitary Landfill located near the Utah / Arizona border south of Kanab. The purpose of the report is to comply with the Administrative Rules of the Utah Solid and Hazardous Waste Committee, Utah Department of Environmental Quality.

The Utah Division of Solid and Hazardous Waste previously issued a Municipal Landfill permit to the Western Kane County Special Service District ( hereafter referred to as the District ) for operation of the Kanab solid waste disposal facility south of Kanab, Utah. The site is an acceptable location, and the owner desires to renew the facility permit in accordance with existing regulations.

Approximately 227 acres have been acquired by the District and identified for operation of a Class II facility. At some future date, when average annual solid waste volumes exceed 20 tons per day, the facility will be converted to Class I status. The landfill currently accepts waste from Kanab and the District's southern region. It is capable of servicing the area's current and future needs for many years. The site is centrally located in an effort to accommodate regionalization, and local municipalities participate with the District in such activities. The site is also capable servicing national and state park units if interagency agreements are reached in the future. In addition, the site is relatively isolated, has sloping topography, and has positive characteristics when considering precipitation, available cover material, and soil permeability. Exhibit 1 is a general vicinity map depicting the area. Exhibits have been extracted from the 1997 permitting documents unless otherwise noted.

### RESPONSIBLE PARTIES

The applicant, property owner, and responsible party for site operation is:

Western Kane County Special Service  
District #1  
28 North Main  
Kanab, Utah 84741  
Attn: Nyle Willis  
Phone: (801) 644-5089

Technical questions and comments regarding the renewal can be directed to:

Brian B. Bremner  
P.O. Box 59  
Panguitch, Utah 84759

It should be noted the District frequently evaluates cooperative solid waste disposal agreements with other governmental entities within its boundaries. Future agreements and alternate ownership/operation scenarios may require modification of this section of the permit. In addition, the District may contract site operations with private entities. The District will notify the Executive Secretary of any changes in responsible party status at least 30 days prior to their effective date.

#### GENERAL DESCRIPTION

The Kanab Sanitary landfill is a Class II natural attenuation facility designed to fulfill the current and future solid waste disposal needs of the District. The facility encompasses a total of 227 acres and currently serves Kanab, Church Wells, and the southern portion of Kane County. Annual average waste volumes are less than 20 tons per day, and precipitation is less than 25 inches per year.

No other reasonably practical alternative exists for disposal of the District's solid waste. Hauling distances to East Carbon Development is prohibitive. The John's Valley landfill in Garfield County is not available for the District's use, and operational characteristics make it infeasible to use the Long Valley site.

Adequate capacity exists and subsurface geohydrology is sufficient to permit future expansion to Class I status and acceptance of waste in volumes exceeding 20 tons per day. Modifications to the permit will be made as necessary to accommodate larger volumes. Facility plans are included in other sections of this document; construction specifications are not pertinent, because the facility is already operating.

#### LEGAL DESCRIPTION

The site is legally described as Lots 1,2,3,4,5 and the northwest 1/4 of the northeast 1/4 Section 11, Township 44 South Range 6 West, Salt Lake Base and Meridian. Exhibit 2a depicts the site's relationship to adjacent sections, townships and ranges. The District owns the land where the Kanab Landfill is located. Exhibit 2b is a copy of the property title for the landfill site.

The facility's main gate will be located on an existing county road 112° 30' 00" longitude and 37° 00' 20" latitude. Lands south and west of the facility are considered multiple use land and are controlled by state or federal agencies. The closest private land exists north and east of the site in Sections 2 and 12, Township 44 South, Range 6 West.

No formal zoning ordinances exist for the landfill. When located in unincorporated Kane County, the landfill was zoned in an agricultural area. However the landfill itself had no designation. The location was later annexed into Kanab City and is a grandfathered use. Future policies and ordinances will accommodate the Kanab Sanitary Landfill as they are adopted.

#### WASTE TYPES/AREA TO BE SERVED

Waste accepted by the Kanab Sanitary Landfill is comprised of nonhazardous municipal solid waste generated within the service area. Waste will be comprised of household waste, commercial waste, nonhazardous sludge, small quantity generator waste, and industrial wastes approved by the permit. Special waste shall be accepted and handled in accordance with Administrative Rule R315-315 and the conditions of this permit.

The service area may consist of all lands within the legal boundaries of the District and other areas the District is willing to serve but is generally limited to a population of about 4500 living in the southern portion of the District. The Kanab Sanitary Landfill may accept waste generated outside the service area if an appropriate agreement or memorandum of understanding has been executed. An appropriate agreement will also be sought from governmental entities and solid waste managers within the District boundaries. Exhibit 3 illustrates the Service District's boundaries.

The Western Kane County Special Service District exists to provide solid waste services and is the owner and operator of the landfill. The District is a legal body politic in the State of Utah. As such, the District is a tax exempt division of government and cannot provide public services on a commercial basis. Revenues generated at the landfill are used only for solid waste management activities.

#### REQUIRED FORMS

The daily record form used to record weights of volumes of waste received required by Subsection R315-302-2(3)(a)(i) is included as Exhibit 4a. The form for recording inspections for hazardous and PCB wastes is included as Exhibit 4b.

#### INSPECTIONS

The owner or operator will inspect the facility to prevent malfunctions, deterioration, operation errors, and discharges which may result in the release of wastes to the environment or a threat to human health. The owner or operator will conduct these inspections at least once each quarter and will complete the inspection log included as Exhibit 5. The inspection log will be kept for a minimum of 3 years from the date of inspection.

The Executive Secretary or any duly authorized officer, employee or representative of the Board

may, at any reasonable time the facility is open and upon presentation of acceptable credentials, enter the facility for inspection purposes. Certified copies of requested sampling, monitoring, and testing records, including photographic, video, electronic data, other data, communications, and results of the inspection shall be furnished to the owner and to the operator within a reasonable time of the inspection. A written summary of the inspection containing a list of any deficiencies and recommended actions will be furnished to the owner and to the operator as soon as practicable. In addition, the inspector may discuss potential problems and make preliminary recommendations prior to leaving the facility.

### FINANCIAL ASSURANCE

A detailed financial assurance plan as required by R315-309 is included in other sections of this document. The District has established an escrow account for financial assurance sufficient to assure adequate closure, post-closure care, and corrective action, if required. The District is also in the process of passing the Local Government Test. It is anticipated that the test will be passed as part of the current year's audit process. If the District is unable to pass the Local Government Test, the District will contribute minimum payments of \$50,000 per year until the account achieves a balance of \$250,000.

## PLAN OF OPERATION

### INTRODUCTION

This document constitutes the plan of operation for the Kanab Sanitary Landfill and is intended to comply with guideline R315-302-2(2) of the Utah Division of Solid and Hazardous Waste Administrative Rules. Technical questions and comments may be directed to:

Brian B. Bremner, P.E.  
P.O. Box 59  
Panguitch, Utah 84759  
(435) 676-1119

### INTENDED SCHEDULE OF CONSTRUCTION

The Kanab Sanitary Landfill is capable of meeting solid waste disposal needs for the District for many years. The landfill is operating, so the intended construction schedule contemplates continuing operations throughout the active life of the landfill. The current cell is planned for a capacity of approximately 5 to 10 years and will be expanded in an ongoing manner as portions of the cell attain final elevation. A schedule listing major activities for the next 10 years of operation is found below. The schedule may be updated as part of the regular permit review process.

Jan, 2011	Submit revised permit to Solid and Hazardous Waste.
Mar, 2011	Obtain revised permit
Mar, 2011 to Mar, 2021	Close portions of the landfill reaching final elevation and expand cell to provide additional disposal space.

### HANDLING PROCEDURES

During the active life of the landfill material designated for disposal will be brought to the working face where it will be dumped, spread, and compacted. No later than the end of each day's operation, waste will be covered with a minimum of 6 inches of earthen material, or with an alternate daily cover approved by the Executive Secretary. Currently proposed alternate daily covers include a temporary synthetic cover (tarp) with a minimum nominal thickness of 8 mils and a minimum tensile grab strength of 100 lbs. If used, the synthetic cover will be removed at least weekly and waste will be covered with 6" of earthen material. Covering operations shall minimize the

possibility of infiltration. Procedures for the handling of specific wastes including but not limited to dead animals, large appliances, car bodies and asbestos are delineated below.

The landfill currently accepts only non friable asbestos waste for disposal. Although not currently planned, friable asbestos wastes may be accepted if the conditions of UAC R 315-315-2 are satisfied as follows: a) the asbestos waste is adequately wetted and properly containerized by double bagging and sealing in 6 mil or thicker plastic bags to prevent fiber release and b) asbestos waste containers are generated, and tagged with a warning label that conforms to the requirements of 40 CFR Part 61.149(2).

If properly transported and packaged, asbestos waste which meets the above criteria is received at the landfill, the operator will:

- Verify the quantities of waste received, sign off on the waste shipment record, and send a copy of the waste shipment record to the generator within 30 days;
- Require vehicles that have transported asbestos waste to be marked with warning signs as specified in 40 CFR Part 61.149(d)(1)(iii);
- Inspect the load to verify that the asbestos waste is properly contained in leak-proof containers and properly labeled;
- Place asbestos containers at the bottom of the active face with sufficient care to avoid breaking the containers;
- Cover the waste within 18 hours with a minimum of six inches of material that does not contain asbestos;
- Provide barriers to limit public access to the asbestos disposal area until the waste has been covered with six inches of material which does not contain asbestos; and
- Place warning signs at the entrance and around the perimeter of the asbestos disposal area which comply with 40 CFR 61.154(b).

If the attendant believes the condition of an incoming asbestos load is such that significant amounts of fiber may be released during disposal, the attendant will notify the local and regional health departments and the Executive Secretary. If the wastes are not properly containerized, and the landfill operator inadvertently accepts the load, the operator shall thoroughly soak the asbestos material with a water spray prior to unloading, rinse out the haul truck, dispose of the waste near the base of the active face, and immediately cover the waste prior to compaction with six inches of non-asbestos material in a manner sufficient to prevent fiber release.

Ash will be transported in such a manner to prevent leakage or the release of fugitive dust. The

landfill operator will unload the transport vehicles at the bottom of the working face and keep the ash wetted, if necessary, to prevent fugitive emissions prior to covering; and within 24 hours, the operator will completely cover the ash with a minimum of 6 inches of other non-ash landfill waste or a minimum of 6 inches of material containing no waste or use other methods or materials, if necessary, to control fugitive dust.

Bulky waste such as automobile bodies, furniture, and appliances will be crushed and then pushed onto the working face near the bottom of the cell or into a separate disposal area.

The landfill will minimize liquids by prohibiting containerized liquids or waste containing free liquids in containers larger than five gallons, non containerized liquids, and /or sludges containing free liquids. No waste treatment plant sludge, digested waste water treatment plant sludge, or septage containing free liquids will be disposed in portions of the landfill containing other solid waste. Water treatment plant sludge, digested waste water treatment plant sludge, or septage containing no free liquids will be placed at or near the bottom of the landfill working face and covered with solid waste or other suitable cover material.

Dead animals received at the facility will be deposited onto the working face at or near the bottom of the cell with other solid waste, or into a separate disposal trench provided they are covered daily with a minimum of 6 inches of earth to prevent odors and the propagation and harborage of rodents and insects.

Areas of the landfill that have not received waste for a period of more than 30 days will be covered with an intermediate cover that consists of a minimum of 12 inches of earthen material.

## INSPECTIONS AND MONITORING

Inspection and monitoring at the Kanab Sanitary Landfill will be conducted in two components: 1) routine and 2) compliance. Routine inspections will be conducted on incoming material on a random basis to prohibit receipt of unacceptable wastes. In addition, random checks will be made during deposition, spreading, and covering operations to insure protection of the environment and absence of nuisances. Waste screening inspections will be made by trained personnel on 1% of the public using the facility and will be recorded on the appropriate forms (see Exhibit 4b). Operational inspections will be made by supervisory landfill personnel.

Compliance inspections will be conducted quarterly to assess the integrity of cover, the condition of side slopes and vegetative cover, and the impacts of erosion. In addition, a detailed annual inspection will be conducted to verify compliance with all permit conditions and state and federal regulations. All inspection records will be kept at the landfill or the closest reasonable location for the current calendar year. Within 30 days of the end of the calendar year, annual records will be transferred to the District offices and will be stored for a minimum of three years.

## FIRE/EXPLOSION CONTINGENCY PLAN

In the event of fire or explosion which prevents the use of the active area of the Kanab Sanitary Landfill, an alternate area of the landfill will be designated for temporary disposal. If use of the alternate area extends beyond one week, a plan of operation acceptable to the Executive Secretary will be developed.

## CORRECTIVE ACTION FOR CONTAMINATED GROUND WATER

This section describes corrective actions to be taken by owners and operators to regain compliance with protection levels for the Kanab Sanitary Landfill in the event concentration limits are exceeded in a down gradient well as a result of landfill operations.

No monitoring wells are proposed for the Kanab Landfill. However, if the concentrations of parameters in down gradient wells exceed the concentration limits as a result of landfill operations and as substantiated by confirmatory analyses, owners and operators of the Kanab Sanitary Landfill will implement a corrective action program as outlined in R315-308.

## CONTINGENCY PLAN FOR OTHER RELEASES

This section describes corrective actions to be taken by the Kanab Sanitary Landfill to regain compliance with the protection levels of the permit in the event releases are discovered and acceptable concentration limits are exceeded.

When the concentration of parameters exceed acceptable limits as substantiated by confirmatory analyses, owners and operators of the Kanab Sanitary Landfill will implement a corrective action program approved by the Executive Secretary.

## DUST CONTROL / AIR QUALITY

Fugitive dust is not anticipated to reach unacceptable levels at the Kanab Sanitary Landfill. If fugitive dust exceeds acceptable levels, actions will be implemented to reduce dust. These actions may include watering access roads, developing wind breaks, altering management scenarios, or other appropriate measures.

## LITTER CONTROL

Litter is controlled through use of best management practices. Active areas and working faces are limited; waste is covered shortly after deposition; and blowing trash is confined as much as practical. In addition, litter control fencing may be established along the perimeter of the active area.

However, high winds occasionally occur at the landfill. Unacceptable litter escaping the perimeter of the landfill will be periodically picked up by hand.

### EQUIPMENT MAINTENANCE

Active collection systems for leachate and/or explosive gases are not proposed for the Kanab Sanitary Landfill. Therefore, no maintenance will be required for these items. Maintenance of equipment used in day to day operations will be performed by landfill employees or contracted mechanics in accordance with manufacturers recommendations and industry practices.

### EXCLUSION OF HAZARDOUS WASTE

As a small rural landfill, the Kanab facility is in a favorable position regarding exclusion of hazardous waste. During periods when the landfill is not open to the public, waste will be observed as it is removed from the collection vehicle. The waste will be further examined for hazardous materials as it is being spread by the operator and compacted. Appropriate notations regarding hazardous waste will be made on the Daily Record forms. If unacceptable hazardous materials are found, the collection vehicle driver will be notified and the unacceptable substance will be removed from the landfill.

During periods when the landfill is open for public disposal as least one percent of the vehicles and other suspicious loads will be directed to dispose of their material near the working face. The waste generator will be detained while the load is inspected. For large loads, the waste will be spread and landfill operators will walk through the waste. If prohibited hazardous or prohibited waste containing PCB's are encountered, they will not be accepted. Considering population served, waste volumes generated, and complexity of the solid waste stream these measures are considered to be adequate.

A section documenting the results of the formal inspections outlined above has been included as part of the daily record forms (see Exhibit 4b). Including hazardous/PCB waste records on the daily record forms will allow landfill managers to incorporate inspections into their daily routine and will permit regulators to review inspection patterns efficiently while examining waste volumes.

### DISEASE VECTOR CONTROL

The primary method for disease vector control at the Kanab Sanitary Landfill will be providing appropriate cover at the close of each day's operation. The cover will consist of a 6 inch minimum layer of earthen material or an approved alternate daily cover.

Rodents and other vermin will not be permitted to burrow in the active area of the landfill;

and trapping or extinction methods will be implemented to protect the integrity of the disease vector control program.

#### ALTERNATIVE DISPOSAL

Alternative waste handling procedures for periods when the landfill is not in operation will be similar to procedures for fires and explosions. Waste will be deposited in the emergency disposal site and covered with an approved alternate daily cover. Procedures will continue in this manner until operations at the landfill can return to normal.

In the event of equipment breakdown that cannot be repaired in a reasonable time frame, equipment will be borrowed from contributing entities or leased from local distributors.

#### TRAINING AND SAFETY PLAN

Currently two District employees involved with the Kanab Sanitary Landfill have participated in the Manager of Landfill Operations Training Course and the Waste Screening Training Course provided by the Solid Waste Association of North America (SWANA). Limited training and educational experience exists for operators of rural landfills; however, employees will be encouraged to attend appropriate seminars and training as time and budgets permit. All landfill employees have been provided with timely and sufficient training to operate the landfill within regulatory requirements. New landfill employees will also be provided with timely and sufficient training to operate the landfill within regulatory requirements. Training opportunities include access to SWANA training materials, on site training from certified managers, random training from landfill owners, and training from state regulatory staff during on site inspections.

Safety procedures will conform to OSHA guidelines; and personnel will be encouraged to participate in additional landfill management, waste screening, safety, and first aid workshops.

#### RECYCLING

No viable recycling markets currently exist for solid waste disposal at the Kanab Sanitary Landfill. In an effort to promote recycling some compostable material may be diverted from areas designated for Class IV operation. However, no formal recycling program is anticipated for this facility.

#### ACCESS CONTROL & ONSITE PERSONNEL

Fencing has been placed around the active cell and any closed areas with a lockable gate

provided at the main entrance of the landfill. The fence and gate eliminate the possibility of unauthorized access.

In addition, landfill personnel are onsite during all hours the facility is open to the public. Contracted collection vehicles may enter the landfill when the facility is not open to the public; however, waste will not be accepted from the public during these periods. The existing schedule is functioning adequately, and the District intends to revise the scheduled operation of the landfill as the need arises and solid waste volumes dictate.

### ADDITIONAL REQUIREMENTS

This subsection is provided to comply with requirements of R315-303-3(7). No scales currently exist at the landfill. Volumes of all incoming waste are estimated and recorded in the facility's operation record. A sign is erected at the facility entrance that identifies the name of the facility, the hours during which the facility is open for public use, unacceptable materials, and an emergency telephone number.

Fire protection is accomplished through arrangements made with the local fire department in Kanab. Buildings and active areas are secured to prevent potential harborage of rat and other vectors, such as insects, birds, and burrowing animals;

The size of the unloading area and working face is minimized as much as possible, consistent with good traffic patterns and safe operation. All weather approach and exit roads have been constructed and provide traffic separation and traffic control on-site and at the site entrance. Communication service is provided by telephone. On site employees communicate verbally or with hand signals when required.

## GEOHYDROLOGICAL ASSESSMENT

### GEOLOGY

The Kanab Landfill is situated in the high desert of southern Utah. The area is characterized by rugged plateaus, arid desert, and the valley cut by Kanab Creek. The landfill is located on the Utah / Arizona border with the surface made up of flat to rolling slopes of alluvial deposits of variable thickness. The elevation of the landfill is approximately 4960 feet above sea level. Two miles west and 200 feet downgradient of the landfill is Kanab Creek.

Site specific geology of the landfill indicates the area predominantly covered by interbedded alluvial material. The surface material is characterized by silts and clays of low permeability. The material is approximately six feet deep and is fairly resistant to infiltration. The surface member is underlain by a thin layer of sands and gravels to a total depth of 12 to 17 feet. This thin layer of coarser material overlays a thick impermeable layers of clay and shale which extend to a minimum depth of 200 feet. No groundwater was encountered during exploratory drilling, but some minor moisture did condense on a 2 foot section of the drill rod ( from 15 to 17 feet depth ) in the second of two drill holes.

There are no apparent faults, unstable slopes and subsidence areas within the boundaries of the landfill. It should be noted that significant portions of the site are characterized by rolling slopes of alluvial material. On site investigations demonstrate natural material will stand at slopes flatter than 2:1.

### HYDROLOGY

The climate in the area is mainly dry and warm. The seasons are fairly well defined, and there is a forty degree difference in normal mean monthly temperatures. The average length of the growing season at Kanab is approximately 171 days. In any given year the length of the growing season may vary as much as 40 days from the average. Normal annual precipitation at Kanab is 13.3 inches. The largest amount of precipitation is during the months of January and August and the least during May and June. Potential evapotranspiration exceeds precipitation by more than four times. Data kept by the weather bureau on wind near the landfill indicate the windiest part of the year is in the spring and the early summer. The prevailing winds are usually dry and blow from the southwest.

## ON SITE SOIL PROPERTIES

In order to determine onsite soil properties samples were obtained throughout the drilling depth of two exploratory drill holes located in the southeast portion of the landfill property.

Data from the drill holes and topographic information indicate surface soils are thin and range from 12 ft. to 17 ft. in depth. The samples were classified by the driller according to standard industry practices at the time of extraction. Results indicate surface material is comprised various alluvial material ranging in size and permeability. The surface materials are underlain by thick layers of impermeable clay and shale. Exhibits 6a and 6b are drill logs and provide actual data concerning onsite soils.

## GROUNDWATER

No groundwater was encountered during the drilling operations. Two drill holes located within active portions of the landfill were drilled to a depth of 200 feet. No wells are located within one mile of the landfill, and information regarding depth to groundwater aquifers, directional flow rate, and water quality data is not available.

It should be noted that some minor moisture condensed on the drill rod in the sand/gravel layer from 15 to 17 feet in the second drill hole. The moisture was so minor that no accumulation occurred, and the driller indicated no groundwater was encountered.

Groundwater quality beneath the landfill site is unknown. The arid climate, local surface material and underlying clay/shale formations eliminate any reasonable probability of contaminating groundwater from the surface. Exploratory wells to determine groundwater quality are an obvious conduit for any contamination and are considered inappropriate for this site.

## WELLS AND WATER RIGHTS

Contact was made with the State Engineer's office to determine quantity, location, and construction of any private and public wells within 2,000 feet of the site as part of the original permitting process. No wells were identified within the surveyed area. An expanded search determined that no well exists within one mile of the landfill.

An examination of surface rights in the area was also conducted by the State Engineer's office. No surface rights were found in close proximity to the landfill. Four surface rights were found within one mile of the facility. All of the surface rights are for stock watering purposes and are located east of the site in an area topographically isolated from the landfill. Exhibits 7a and 7b constitute the documentation provided by the State Engineer. Information is not available regarding background and surface water quality assessments in the area.

## SURFACE WATERS

No perennial streams, rivers, or permanent surface waters exist within close proximity of the landfill. The closest perennial surface water is Kanab Creek located approximately 2 miles west of the landfill and having a flow line approximately 200 feet below the final elevation of waste. Other washes in the area are small insignificant drainages that have formed in the native soil. All intermittent washes and surface waters will be prevented from impacting areas of the landfill which have received solid waste for events smaller than the 25-year storm period.

## WATER BALANCE / MONITORING

Several water balance calculations have been performed for various landfills in the area and are on file with the Division of Solid and Hazardous Waste. Results at nearby landfills indicate no leachate was generated in the bottom 10 ft of waste during a 50 year evaluation period. Additional HELP Model simulations indicate leachate will not develop within 10 ft. of the bottom of the waste during the life of the permit.

Groundwater monitoring has not been implemented at the Long Valley landfill and is not anticipated during the life of the permit. Existing depth to groundwater, limited precipitation and extensive evapotranspiration render groundwater monitoring impractical. In addition, on site groundwater monitoring wells could serve as a conduit for contamination.

## IMPACTS TO WATER RESOURCES

As a small, arid facility the Kanab Landfill is exempt from groundwater monitoring requirements. The landfill receives less than 20 tons of waste per day, receives less than 25 inches

of precipitation per year and is located more than 100 ft. above existing groundwater aquifers. Based on Utah State regulations, these characteristics exempt the facility from groundwater monitoring requirements.

In addition, there is no potential for migration of hazardous constituents from the facility to the groundwater during the active life of the facility and during the post closure period. This conclusion is supported by three separate analysis: 1) onsite geologic and hydrologic conditions, 2) water balance and leachate production modeling, and 3) operational practices which minimize the amount of water that can come in contact with the waste. Each analysis makes its own strong argument for suspending groundwater monitoring requirements.

Onsite geologic and hydrologic conditions demonstrate a diminimus potential for hazardous constituents reaching groundwater resources. Drilling operations indicate an absence of groundwater for a depth of 200 ft. The site is characterized by interbedded layers of alluvial material of low to moderate permeability. These relatively impermeable surface materials are underlain by a dense, impermeable clay/shale formation beginning at depths of 23 to 35 feet. The impermeable shale layers extend to a depth of at least 200 feet and will preclude the downward movement of any leachate and prevent any potential contamination.

In addition to favorable soil conditions and depths to groundwater which minimize the potential for liquid migration, local climatic conditions eliminate the production of significant amounts of leachate. Average annual precipitation is only 13.3 inches per year, and potential evapotranspiration exceeds precipitation by more than 400%. The lack of significant moisture passing beyond the vegetative zone is evidenced by the sparsely grown surface plants which are limited by minimum amounts of moisture.

Water balance and leachate production modeling also demonstrate a diminimus potential for hazardous constituents reaching groundwater resources. Regional HELP model analysis described above indicates numerous worst case conditions would be required for leachate to be produced in sufficient quantities to result in the migration of any liquid to the groundwater. Worst case scenarios were used, so actual conditions should result in a greater level of confidence and a lower production of leachate than identified by the model.

Operational practices will also reduce the amount of water that could possibly come in contact with the waste. Surface waters will be diverted by a series of ditches and berms designed to protect landfill cells from run on water for storms considerably greater than the 25 year event. The size and progression of the units will result in cells being brought to final elevation and closed in the minimum amount of time possible, reducing the amount of water entering the waste. Contouring operations will reduce ponding and promote drainage away from active areas; use of alternate daily covers may prevent the infiltration of limited precipitation into the waste. The limited

working face will require the removal of any snow from the active area, so incoming waste can be deposited. All of these measures result in the reduction of an extremely limited source of moisture.

Considering onsite geologic and hydrologic conditions, water balance and leachate production modeling, and operational practices which reduce the amount of water contacting the waste, groundwater monitoring and vadose zone monitoring are not justified. In fact installation of monitoring wells may provide a more viable conduit for groundwater contamination. The Executive Secretary is requested to exempt the Kanab Sanitary Landfill from groundwater monitoring requirements in accordance with Subsection R315-303-3.(3)(e) of the Solid Waste Rules.

## PRELIMINARY ENGINEERING REPORT

### SITING CRITERIA

The Kanab Sanitary Landfill complies with siting criteria currently mandated by regulation and recognized by the State of Utah Solid and Hazardous Waste Committee. Specifically, no airport is located within 10,000 feet of the landfill. The site is free from unstable areas and is not located within a 100-year floodplain or in any wetland. In addition to federal mandated criteria, the site is compatible with existing land uses, long term landfill operation and is in a remote area free from dwellings and other incompatible structures such as churches, schools, hospitals, etc.. Cultural resources within the landfill will be mitigated in accordance with State Historic Preservation Officer requirements.

### SOLID WASTE MANAGEMENT COMPLIANCE

The Kane County Solid Waste Management Plan required by Senate Bill 255 identifies the need for landfills capable of long term service in the planning area. The plan further recommends that repermitting the landfill be made a top priority in the coming years. The Kanab Sanitary Landfill is in compliance with that recommendation and with the Solid Waste Management Plan.

### FACILITY LIFE

The anticipated facility life for the Long Valley Landfill cannot be accurately estimated. Based on the overall size of the property, relatively low waste volumes, and current efficiencies, facility life is estimated far in excess of the permit and is considered 20 years for this permit renewal process.

### LINER DESIGN

Current volumes of solid waste disposed by generators serviced by the Kanab Landfill are well below 20 tons per day, and the facility is eligible for small landfill design exemptions. The Kanab Sanitary Landfill is a natural attenuation Class II facility. No liner is required for the facility.

## CELL DESIGN AND OPERATION

The Kanab Sanitary Landfill is designed to minimize active areas and to reach final elevation as soon as practical in order to minimize infiltration and leachate generation. The cells are designed to accommodate from two to five years of waste and to expand in an orderly fashion.

Cells may be excavated as much as 30 feet in depth and may extend approximately 50 ft. in height. Bottom widths will range from 40 feet to 200 feet. Length of the cells varies with volumes of waste, season of the year, and soil stockpile needs; but approximate 200 feet. Currently cell height is above initial excavations and deposition is in a fill condition.

Near the close of each working day waste is spread, compacted, and covered with 6 inches of native soil or an alternate daily cover. When daily waste volumes are too small to permit efficient use of landfill space, solid waste may be stockpiled at the working face and covered with an alternate daily cover ( a synthetic blanket designed to prevent infiltration).

The 50 foot cell height described earlier is a nominal dimension and does not consider final slopes to promote drainage or additional covering requirements. Cells are anticipated to consist of solid waste compacted in lifts ranging from 7 feet to 12 feet and covered with 6 inches to 12 inches of daily or intermediate cover material. Several lifts may be accommodated in the nominal height. Exhibit 8 is an illustration of the proposed cell progression. Exhibit 9 is a conceptual design of a typical cell.

## EQUIPMENT AVAILABILITY

Minimum equipment requirements at the Kanab Sanitary Landfill are limited to a landfill-type compactor for daily operations and periodic use of additional equipment (dozer, scraper, grader, compactor, etc.) for specific covering, stockpiling, contouring and compacting operations. The facility has already exceeded those requirements. Over time, adequate equipment will be acquired to guarantee the needs of the landfill will continue to be met.

## BORROW SOURCES

The Kanab Sanitary Landfill will utilize onsite borrow materials for daily cover, final cover, and soil liners. Current estimates indicate more than 3 million cubic yards of suitable material is available within the landfill limits. Current cell locations utilize excavated on site material and provide ongoing borrow operations. Onsite soils will be augmented with existing offsite borrow sources as needed.

## LEACHATE COLLECTION, TREATMENT AND DISPOSAL

The Kanab Sanitary Landfill is a natural attenuation facility located in an arid region with favorable soil conditions. No leachate collection or disposal will occur at the facility.

## LANDFILL GAS CONTROL AND MONITORING

Due to the arid nature of the climate at the Kanab Sanitary Landfill and the nature of waste accepted at the facility, landfill gas concentrations are not anticipated to reach significant levels. The relatively open area of the proposed facility is designed to accommodate dissipation of any landfill gases prior to reaching the property boundary..

Monitoring for landfill gases will be conducted as part of the quarterly inspections performed by landfill managers. Monitoring requirements inside buildings will be met by installing methane detectors in any building on the site. Results will be recorded on quarterly inspection forms.

Should unacceptable levels of landfill gases be detected, contingency plans described in other areas of this permit will be implemented. If gas levels exceed 25% of the lower explosive limit in structures or the 100% of the lower explosive limit at property boundaries, immediate action will be taken to protect human health, and the Executive Secretary will be contacted within 24 hours. Additional state regulations, including operating record notations within seven days and implementation of a remediation plan within sixty days, will be completed.

## RUNON/RUNOFF CONTROL

The District will control the runoff and runoff resulting from storms smaller than the 25 year event from contacting solid waste and leaving the landfill. This will be accomplished through a series of best management practices. Any potential surface drainages will be diverted around cells. Daily, intermediate and final cover material will be excavated from the uphill side of active areas and will be accumulated at the interface between the natural ground and the waste cell, creating a excavated areas and berms to prevent any surface waters from contacting the waste.

Run off will be controlled through ditches, berms, roads, ditches and other passive systems as needed. No formal run on / run off control systems are planned for the Kanab Landfill.

## CLOSURE / POST CLOSURE PLAN

### CLOSURE/POST CLOSURE PLAN

Closure of active portions of the Kanab Sanitary Landfill contemplates controlling, minimizing, and eliminating threats to human health and the environment from post closure escape of solid waste constituents, contaminated runoff, or waste composition products to the ground, groundwater, surface water, and the atmosphere. When an area of the landfill exceeding 5 acres reaches final elevation it will be covered within 60 days with 12 inches of intermediate cover and graded to promote drainage. The surface shall be free from ponding and shall minimize infiltration. Unless the area is designated as inactive by the District, not more than 6 months after completion of the intermediate cover, the area will be covered with a minimum of 18 inches of material having a hydraulic conductivity of less than  $1 \times 10^{-5}$  cm/sec or an alternate final cover approved by the Executive Secretary. The impermeable barrier will be covered with 6 inches of native soil or 6 inches of material capable of supporting vegetative growth.

Post closure care of inactive sections of the landfill will consist of maintaining the integrity of the final and vegetative covers. Any areas subject to erosion will also be corrected; and appropriate measures will be implemented to identify and eliminate the source. Groundwater monitoring, leachate collection, and gas collection are not proposed for the Kanab Sanitary Landfill. Therefore, closure and post closure activities associated with these functions will not be performed.

### CLOSURE SCHEDULE

Closure operations at the Kanab Sanitary Landfill will be performed on an ongoing basis. Adequate capacity exists at the landfill to continue operation for many years. A final closing date cannot be determined at this time. Ongoing closure operations will generally be performed from April through November, the normal frost free construction period, or as weather permits. No area larger than 5 acres that has achieved final elevation will remain open longer than 6 months.

### FINAL COVER, SEEDING, CONTOURING

Closure operations will consist of leveling, contouring, placement of appropriate covers and seeding as necessary to reduce infiltration and preserve the integrity of the completed areas of the

landfill. Areas of the landfill reaching final elevation will be receive intermediate cover within 60 days. Closure operations will include leveling and contouring using intermediate cover to reduce infiltration and ponding. Excess material not meeting permeability requirements may be stripped and utilized in other operations or left in place. After grading operations promoting drainage are complete, a geosynthetic clay liner or 18 inches of material with a permeability of  $1 \times 10^{-5}$  cm/sec or less will be installed. Alternate designs meeting the performance standard of impermeable material may be used if approved by the Executive Secretary prior to placement. Upon completion of the impermeable cover, 6" of native material similar to existing topsoil will be placed and seeded. The seed mixture shall be developed after consultation with local range specialists and verifying availability of local seed markets. Recently closed sections of the landfill will be evaluated as part of the quarterly inspection process during the first year and then placed on postclosure status.

### SITE CAPACITY

Site capacity for the entire Kanab Sanitary Landfill property cannot be accurately estimated. Assuming an initial 40 acre parcel covered by this permit, trench style operation ( 40 ft. bottom width, 4:1 side slopes, 30 ft. depth ), three 8.5 foot lifts of waste with 1.5 foot intermediate cover, and an average density of 900 lbs. per cubic yard, waste volumes can be estimated at 1,056,000 cubic yards or 475,200 tons.

### CLOSURE TIMING AND NOTIFICATION

Closure activities at the Kanab Sanitary Landfill will be performed on an ongoing basis. The Executive Secretary will be notified of closure progress by reviewing quarterly and annual reports, and by contacting Division of Solid and Hazardous Waste inspectors who have visited the site. Considering the ongoing nature of closure operations and the justification for performing closure operations as a cell reaches final elevation, alternate notification procedures may not be feasible.

In addition to the ongoing notification indicated above, The Executive Secretary will be notified in writing prior to initiation of final cover operations, and the final cover design and the construction quality assurance/quality control (QA/QC) plan will be submitted to the Executive Secretary for review and approval. The QA/QC plan for closure will include tests for permeability and depth. Permeability tests, where required, will be performed at the rate of test per 9,000 cubic yards of material and will randomly selected throughout the working area. Permeability tests may include in field or laboratory tests, nuclear density extrapolations, or other industry wide procedures and practices. Depth tests will utilize standard cross section survey methods and will be performed at a rate equal to or greater than tests performed for permeability. Closure as-builts and certification

of closure according to the plan identified above will be signed by a registered professional engineer and forwarded to the Executive Secretary within 90 days of completion.

#### FINAL INSPECTION

The Kanab Landfill is anticipated to operate well beyond the life of this permit. At least 60 days prior to any closure, the Division of Solid and Hazardous Waste will be contacted, and a final inspection will be scheduled. The Executive Secretary will be informed of incremental closure of individual cells through routine state inspections, annual reports, and renewal applications. In addition, a QA/QC plan will be submitted for approval prior to any closure operations. Within 90 days of unit and/or facility closure, as built plans signed by a professional engineer shall be forwarded to the Executive Secretary.

Landfill owners and operators shall allow the Executive Secretary of the Utah Solid and Hazardous Waste Control Board or an authorized representative, including representatives from the local District Health Department, upon representation of credentials, to enter during operating hours and/or inspect at reasonable times any facilities, equipment, practices, or operations regulated or required under this permit.

A record of the inspection may be made by photographic, videotape, electronic or other reasonable means, and a copy of any such record shall be provided to the owner and the operator within a reasonable time.

#### SITE MONITORING

No permanent monitoring devices are proposed for the Kanab Sanitary Landfill. Landfill gas in closed sections will be monitored as described for active cells in the Preliminary Engineering Report section of this document.

No groundwater monitoring wells, lysimeters, vadose zone equipment or other monitors are planned for this facility. Surface waters in closed portions of the landfill will be evaluated as part of the annual inspection. Monitoring will be limited to identifying situations which promote infiltration.

## LAND TRANSFERS AND USES

Plats and a statement of fact concerning the location of any disposal site shall be recorded as part of the record of title with the County Recorder not later than 60 days after certification of closure. Upon recording, proof of the record of filing will be submitted to the Executive Secretary.

## POST CLOSURE MAINTENANCE

Post-closure care of inactive sections of the landfill will consist of maintaining the integrity of the final and vegetative covers. Any areas subject to erosion will be corrected, and appropriate measures will be implemented to identify and eliminate the source. No active or technical devices are proposed for use at the Kanab Sanitary Landfill. Best management practices will be implemented to minimize infiltration and assure the integrity of the run-on/run-off system. Evaluation of the system will be made during the quarterly inspections, and corrective measures, if any, will be implemented. Run-on and run-off from events smaller than the 25-year storm will be controlled.

No leachate collection devices are proposed for the facility. Closed portions of the landfill will be inspected as part of the quarterly reviews performed by the landfill operator. Closed areas will also be inspected as part of the in-depth annual inspection. Any deficiencies will be repaired as soon as practical. For those failures which jeopardize the environmental integrity of the facility or permit the uncontrolled infiltration of significant amounts of moisture, corrective measures will be initiated immediately.

No alternate land use for closed sections has been developed to date. Closed cells will remain under the jurisdiction of the landfill manager. If alternate land use plans are developed they will be addressed during the permit renewal process, or a separate permit modification may be processed.

## RESPONSIBLE PARTIES

The applicant, property owner, and responsible party for the post closure care period is:

Western Kane County Special Service  
District No. 1

28 North Main  
Kanab, Utah 84741  
Attn: Nyle Willis  
Phone: (801) 644-5089

It should be noted Western Kane County Special Service District County is continually upgrading solid waste management services. Future agreements, potential special service district creation, the extended life of the landfill, and alternate ownership/operation scenarios may require modification of this section of the permit. In addition, the District may contract site operations with private entities. The District will notify the Executive Secretary of any changes in responsible party status at least 30 days prior to their effective date. Other changes to the information listed above will be provided in annual reports and permit renewal documents.

## FINANCIAL ASSURANCE PLAN

### INTRODUCTION

This section of the permit describes compliance with Subsection R315-309, Financial Assurance of the Administrative Rules for Solid Waste Permitting and Management. Cost estimates consider the most expensive option during the period and are based on a third party performing closure and post closure care.

### MECHANISMS

The Western Kane County Special Service District complies with financial assurance test requirements for local governments based on: 1) acceptable bond ratings; 2) financial statements prepared in conformity with generally accepted accounting principles for governments audited by independent CPAs; 3) reference to closure and post closure costs in current and subsequent annual financial reports. To date, Western Kane County Special Service District has met financial assurance requirements by maintaining an existing, dedicated escrow account with the State Treasurer. In accordance with Executive Secretary approval, funds in excess of the estimate listed below may be used for capital improvements, to offset rate increases, operational expenses and other items deemed necessary by landfill managers. The Kanab Sanitary Landfill is preparing documents to verify passage of the local government test. If, the District is unable to pass the financial test, it may continue its dedicated escrow account, or it may alter the mechanism to include the government test, insurance, surety bonds, trust funds, or other options as they become feasible.

### SCHEDULE OF PAYMENTS

The Western Kane County Special Service District has made payments to a dedicated escrow account with the State Treasurer's office to insure the availability of sufficient funds for closure and post closure care. The District will contribute minimum payments of \$50,000 and inflation percentage costs annually until the UPTIF fund balance reaches the minimum requirement of closure and post-closure costs. If the District passes the local government financial test, or another financial mechanism, they may execute it after it is approved by the Executive Secretary.

## COST ESTIMATE

Closure and post-closure cost estimates were developed considering the largest area of the disposal facility requiring final cover during the operating period and using projections for a third party to perform the work. Estimates were developed using Utah State guidance, historical costs, project records and standardized rates for Kane County. A cost estimate summary identifying major closure and post-closure components is included below, and detailed information regarding closure and post-closure costs is included under separate cover. Items that are identified in the rules but are not applicable to the Kanab Landfill have not been listed.

### Closure Costs

Survey / Site Evaluation	\$ 2,400.00
Project Management	9,250.00
Site Repair	3,000.00
Grading	1,800.00
Clay Cover	144,000.00
Soil Cover	24,000.00
Vegetation	1,200.00
Gas Collection	<u>600.00</u>
Subtotal	\$186,250.00
Contingency	<u>18,750.00</u>
TOTAL	\$205,000.00

### Post-Closure Costs

Engineering	\$ 21,000.00
Cover Maintenance	2,760.00
Leachate Collection System	0.00

General Maintenance	<u>1,300.00</u>
Subtotal	\$ 25,060.00
Contingency	<u>2,540.00</u>
TOTAL	\$ 27,600.00
TOTAL CLOSURE / POST CLOSURE COSTS	\$232,600.00

# Preparation of Solid Waste Facility Closure and Post-Closure Cost Estimates for Kanab Class II

## **Introduction**

This document was prepared in accordance with guidelines developed by the Utah Division of Solid and Hazardous Waste to comply with financial assurance rules associated with landfill closure and post closure cost estimates. The cost estimates contained herein comply with Utah Administrative Code (UAC) R315-302-3. Where questions arose regarding the estimates, the text of the rule governed.

## **Closure**

Owners or operators of the Kanab Class II Landfill are required to provide cost estimates, in current dollars, for a third party to conduct and complete closure activities (i.e., hiring qualified contractors to perform closure activities). Estimates must equal the maximum closure costs at any time during the life of the facility or cell; or the permit life, whichever is shorter. Estimates must be included for each closure activity. If closure will be conducted in phases, cost estimates for completing each phase should be provided. A worksheet for estimating costs is contained herein.

The costs shown were developed after examining, local construction costs, UDOT's annual summary of construction costs, and the Oklahoma Department of Environmental Quality data and adjusting prices to reflect cost differences between Kanab, Utah and Oklahoma. In developing cost estimates, local contractors that could perform closure or post-closure activities were consulted.

The Kanab Class II Landfill is an extremely small, rural, limited use landfill with reduced requirements when compared to larger, Class I, municipal landfills. Estimates were appropriately adjusted to include the following:

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## **Closure**

Basic closure cost items include:

- Cost to provide construction details for the closure.
- Gas control system installation.
- Costs for any additional equipment.
- Final cover installation and material cost including:
  - a. Material acquisition, placement, and compaction.
  - b. Vegetative layer material acquisition, placement and grading or placement of any other approved layer to protect the compacted soil layer.
  - c. Geomembranes, drainage layers or other cover layers as required by the permit and closure plan.
  - d. Seeding, fertilization, soil amendments and mulch.
- Installation of any additional control or monitoring features as necessary.

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## **Post-Closure**

The basic post-closure cost items include:

- Final cover maintenance and repair. The following were used for estimating the amount of work to be done each year.
  - a. Erosion repair; use one half foot of cover over 3% of the landfill area per year for the

- first five years.
- b. Vegetation repair; use 5% of the landfill area per year for two years.
- Gas monitoring including costs for:
  - a. Sampling
  - b. Analyses (if necessary)
  - c. Maintenance and repair
- Passive Gas control systems do not require any expenditures.
- Other monitoring or sampling required by other environmental programs.
- Record keeping and reporting is required by UAC R315-302-2.
- Site inspections to oversee repairs and post-closure care.
- Costs associated with demonstrating that the site is stable and that the post-closure care period can be terminated.

### **Adjustments**

Kanab Class II Landfill owners or operators will annually adjust their final closure and post-closure costs for inflation or facility modifications that would affect closure or post-closure care costs (R315-309-2(2)). The first annual adjustment will occur the first year after the permit is approved by the Executive Secretary and each following year unless the actual closure costs are recalculated. The first adjustment will be made by multiplying the closure and post-closure care costs given in the permit application by the US Department of Commerce inflation factor corrected for Kane County pricing. Subsequent adjustments will be made annually on the same basis. This process of adjustment will be utilized until the actual closure and post-closure care costs are recalculated. At the time of permit renewal and at the ten year anniversary of the permit issuance, the closure and post-closure care costs will be recalculated using the current approved design and current construction costs.

### **Additional Information**

The initial closure and post-closure plans are submitted as part of a permit application and become part of the approved permit. Subsequent changes due to permit modifications, regulatory changes, operational changes, or unforeseen circumstances (e.g., increase/decrease in fill rate or premature closure with less than the total acreage utilized) which substantially affect the time schedule or costs of closure and post-closure will necessitate closure and post-closure plan and cost estimate modifications. These modifications will be submitted to the Executive Secretary for approval. In addition, adjustments to the cost estimates will be submitted with the annual report and be approved by the Executive Secretary. Any change in the financial assurance mechanism will also be submitted to, and receive Executive Secretary approval.

### **Assumptions**

Closure activities at the Kanab Class II Landfill are limited to design, final cover installation and development of any additional control features. This section identifies assumptions used in developing closure cost estimates.

Design Closure operations at the Kanab Class II Landfill are extremely limited in nature and can be accomplished with minimal equipment. Detailed construction specifications, plans and contract procedures will not be applicable. Preparation of project requirements and solicitation of quotes from selected contractors is anticipated to occupy less than 4 hours. Topographic and boundary survey costs were developed using phone quotes from Rex Friant, a local licensed surveyor. Final inspection and

reporting is assumed to occupy less than two hours time.

Final Cover Various options exist for final cover of the Kanab Class II Landfill. Compacted soils with verified permeability rates, geomembranes, and engineered fill have potential for use. This estimate considers only one option. The Western Kane County Special Service District will evaluate all reasonable options as part of the closure process and implement the technology that provides the greatest balance of integrity and economics.

Maintenance Post-Closure assumptions are listed in the appropriate section above. Due to the long term nature of the facility, it is assumed that many of the threats to the cover material will have taken place prior to final closure. Fill areas will be closed as part of the continued operation of the landfill. Areas subject to erosion will be corrected, and seeding will be conducted to bring the landfill in conformance with the sparse natural vegetation. Consequently, only the final active area will be subject to potential erosion and vegetative failures. The most significant post closure difficulty consists of arranging for regulatory and technical personnel to travel to the site to perform required inspections. It is assumed that travel time will far exceed inspection / reporting time. As a result, post closure costs are appropriately reduced below normal levels.

## **DESCRIPTION OF LINE ITEMS**

### **Closure Costs**

#### **1.0 Engineering**

##### **1.1 Topographic Survey**

A topographic survey will generally be required to ascertain the existing height and top slope of the landfill so that permit compliance can be evaluated and the final closure system, drainage system and final grading can be engineered. Costs were developed by phone quote with a local licensed surveyor.

##### **1.2 Boundary Survey**

A boundary survey is a metes and bounds description that is required for filing the closure notice and making the required changes on the record of title or deed. Costs were developed assuming existing legal descriptions maintained by the Kane County Recorder are adequate.

##### **1.3 Site Evaluation**

The site evaluation includes a site inspection to identify waste disposal areas, analyze drainage and erosion protection needs, and to determine other site operational features that may not be in compliance with the permit. Costs were developed by utilizing data from the *Solid Waste Financial Assurance Program Report* adjusting for the lack of analysis of ground water samples, landfill gas analysis, operation records, etc..

##### **1.4 Development of Plans**

The final closure plan includes the final cover system design and specifications, grading and drainage plans, specifications for revegetation, design of any other site improvements required, and preparation of a closure schedule. This item also includes the coordination of the closure plan with the Utah Division of Solid and Hazardous Waste, including the required notifications and reporting. Costs are included in Item 1.7.

##### **1.5 Contract Administration**

Included in Item 1.7.

##### **1.6 Administrative Costs**

Included in Item 1.7.

##### **1.7 Project Management, Observation and Testing**

Project Management, Observation and testing costs include the cost of a Professional Engineer to observe

the closure construction, perform appropriate cover thickness and permeability verifications, and prepare an evaluation report upon completion of the closure. Costs were developed by utilizing data from the *Solid Waste Financial Assurance Program Report* and using a 12.5% multiplier, consistent with Oklahoma recommendations.

#### 1.8 Ground Water Monitor Well Consultant Costs

Not applicable

#### 1.9 NPDES Construction Storm Water Permit Compliance Package

The consultant is to prepare all necessary plans, specifications, and other documents necessary for compliance with all applicable federal and state laws and requirements necessary for the closure of the site. One of these required steps is compliance with the Federal Clean Water Act. Included in Item 1.7.

#### 1.10 Disposal of Final Wastes

Any onsite waste that is not in the disposal cell must be placed in the cell or disposed of at a permitted facility if the waste can not be placed in the current open cell. Costs were developed by utilizing data from the *Solid Waste Financial Assurance Program Report*. No costs are anticipated for this item.

#### 1.11 Remove Temporary Buildings

Onsite buildings that are not being used for post-closure care operations at the site must be removed and disposed. Not Applicable.

#### 1.12 Remove Equipment

Onsite equipment that is not being used for post-closure care operations at the site must be removed and disposed. Not Applicable.

#### 1.13 Repair/Replace Perimeter Fencing

Costs were developed by utilizing data from the *Solid Waste Financial Assurance Program Report*.

#### 1.14 Clean Leachate Lines

Not Applicable

### **2.0 Construction Costs**

Closure construction costs include those for construction of the final cover system, site grading, and drainage improvements. Other construction costs may be necessary to correct on-site problems.

#### 2.1 Final Cover System

The standard final cover system at Class I, Class II, and some Class V Landfills is an infiltration layer that is a minimum of 18 inches of earthen material that has a permeability less than or equal to the permeability of any bottom liner system, or if there is no liner in the landfill unit, no greater than the permeability of the natural soils, or a permeability of no greater than  $1 \times 10^{-5}$  cm/sec, whichever is less, and an erosion layer of a minimum of 6 inches of earthen material that is capable of sustaining plant growth. Alternate methods that meet the required performance standards are also acceptable. The Western Kane County Special Service District currently intends to use the standard method. The vegetative layer will also serve as the drainage / holding layer for any precipitation not removed through evapotranspiration. If alternate cover systems are more economical at the time of closure, the District may choose to incorporate them into the design. Earthen material is available on site, and costs were developed using information from the Oklahoma Department of Environmental Quality and recent lining projects in the area, adjusting for the complexity and site conditions of the Kanab Class II Landfill.

##### 2.1.1 Completion of the Sidewall Liner

Not applicable

##### 2.1.2 Drainage Layer on Sidewall (if required)

Not applicable

#### 2.2 Completion of the Top Cover

##### 2.2.1 Infiltration Layer (Compacted Clay, Geosynthetic Clay Liner or Engineered Fill)

The infiltration layer at the Kanab Class II Landfill is earthen material with a permeability of no greater than  $1 \times 10^{-5}$  cm/sec.

### 2.2.2 Geosynthetic Clay Layer

See 2.1 Final Cover System.

### 2.2.3 Flexible Membrane Cover

Not applicable

### 2.2.4 Drainage Layer

A drainage layer is commonly used between the erosion layer and the infiltration layer when geosynthetic clay covers are used. The erosion layer also serves as the drainage layer when compacted clay covers are used. See 2.3 Erosion Layer.

### 2.3 Erosion Layer Placement

The erosion layer must be a minimum of 6 inches of earthen material capable of sustaining plant growth. The existing site topsoil is generally acceptable for this application, and additional material is available at District owned property or other lands near the landfill. Oklahoma Department of Environmental Quality unit prices were used as a base with adjustments for watering, mixing, compacting, processing, and testing that are not required or are greatly reduced at Kanab. The adjusted unit price is estimated to be \$2.00 per cubic yard and is included in item 2.3.

### 2.4 Revegetation

Revegetation includes the activities necessary to provide vegetative erosion protection over the surface of the completed final cover. Limited moisture for germination and growth exists at the landfill. Costs are based on local vegetation practices and seeding with grasses or other shallow rooted plants that are native to the area. Success rates will be dependant on available moisture. Costs were developed by utilizing data from the *Solid Waste Financial Assurance Program Report* after analysis of local pricing and are included in item 2.4.1.

### 2.5 Site Grading and Drainage

Site grading and drainage include the final grading of the site, drainage improvements and sedimentation controls for proper closure of the site. This activity will be limited to cleaning ditches necessary to protect cells from run on surface waters. Costs were developed by utilizing data from the *Solid Waste Financial Assurance Program Report* after analysis of local pricing and are included in item 2.5.

### 2.6 Site Fencing and Security

Site fencing and security are to be added to secure any area of the landfill which has received waste and is undergoing closure but may not have been fenced. This item is not applicable to the Kanab Class II Landfill.

### 2.7 Leachate Collection System Completion

Not applicable

## **3.0 Gas Collection System**

Not applicable

### 3.1 System Design

Not applicable

### 3.2 Completion of Gas Collection System

Not applicable

### 3.3 Equipment and Installation

Not applicable

## **4.0 Monitor Well Installation**

Not applicable

### 4.1 Ground Water Monitor Well Installation, Reworking, or Replacement

Not applicable

### 4.2 Install, rework, or Replace Methane Probe/s or Wells

Not Applicable.

### 4.3 Monitor Well or Methane Probe/Well Plugging

Not Applicable.

### **Contingency Costs and Legal Fees**

An estimated 10 percent contingency cost for all closure activities has been included. In addition a bond cost reflective of qualified contractors has been added to account for a performance bond at the time of construction. In as much as the State of Utah regulates the permitting, operation and closure of the Kanab Class II Landfill, no legal costs are anticipated to be applicable.

### **Phasing / Cost Schedule**

A phasing plan and cost schedule have been identified for the landfill. The Western Kane County Special Service District will make contributions to a dedicated PTIF account in order to have the minimum required balance in place within 5 years of the permit approval.

### **Post-Closure Care**

The post-closure care period is established to be 30 years or as long as the Executive Secretary determines is required for the facility or unit to become stabilized and to protect human health and the environment. During this period, maintenance must be ongoing to assure the integrity and effectiveness of the final cover and other required systems. Also included in this section is the cost for disposal of leachate. However, no leachate collection devices are planned for this facility. The costs for post-closure care are divided into engineering costs, construction costs. Leachate disposal costs are not applicable.

### **1.0 Engineering Costs**

Engineering costs include the amendment of a post-closure plan, site inspections, site monitoring, preparation of a post-closure permit, and preparation of correctional plans if required.

#### **1.1 Post-Closure Plan**

The post-closure plan provides a schedule for routine maintenance of the final cover system and the landfill security system. Gas and groundwater monitoring systems are not applicable. A majority of the final cover system will be in place for more than five years prior to closure and is assumed to have stabilized. The stabilized nature of the facility is reflected in the post-closure costs. The permit and any Executive Secretary approved modifications provide sufficient detail to be considered the initial post-closure plan. Costs for any additional planning are included in Items 1.2 and 1.3 and are considered to be limited.

#### **1.2 Site Inspections**

Site inspections should be performed at least quarterly but will be minimal. Inspections will include identification of areas experiencing settlement or subsidence, identification of erosion or other drainage-related problems and inspection of the fencing. Considering the long term nature of the facility prior to post-closure activities, it is not anticipated that significant corrective measures will be necessary. Costs for this item were derived from the *Solid Waste Financial Assurance Program Report* and adjusted for site complexity after examining data from Oklahoma.

#### **1.3 Correctional Plans and Specifications**

Correctional plans and specifications include the costs for an engineering consultant to prepare plans and specifications to correct problems identified during the site inspections. This cost is dependent upon the quality of care taken during the closure of the site and ongoing maintenance during previous post-closure care years. Higher costs typical of early post-closure years will occur while the landfill is still operational. This item is assumed to have tapered down to zero prior to the beginning of the official post-closure care period. However, in an effort to provide a factor of safety, it is assumed that a minimal corrective plan will be required, and a nominal value has been included.

#### **1.4 Site Monitoring**

Site monitoring is the cost to perform semiannual ground water sampling and analysis landfill gas. No

monitoring wells are planned for this facility, and gas monitoring will be performed as part of the regular inspections. Costs for gas monitoring are included in item 1.2. It is anticipated that gas monitoring requirements will be greatly reduced by the Executive Secretary early in the post closure period

## **2.0 Maintenance Costs**

Post-closure maintenance costs include the costs to correct any problems determined by the site inspections and as specified by the engineer's correctional plans and specifications. These costs will also include any ongoing site maintenance that is needed throughout the post-closure care period.

Maintenance costs are dependent upon the complexity of the site, the quality of care taken during the closure of the site and ongoing maintenance during previous post-closure care years. It is assumed that proper closure and post-closure care have been conducted and that maintenance costs are minimal.

### **2.1 Cover Maintenance Costs**

Subsidence and erosion of the cover may occur. These areas must be repaired and the vegetation reestablished. Also any damage to the protective soil layer or the cover must be repaired. Most of the landfill will have been stabilized for a considerable period of time prior to post-closure activities and higher costs associated with early maintenance will not occur. Cover maintenance is assumed to consist to be 10% of the initial cost.

### **2.2 Equipment Maintenance**

Not applicable.

### **3.0 Final Plugging of Monitoring Wells**

Not applicable.

### **4.0 Leachate Disposal**

Not applicable.

### **5.0 Site Maintenance**

General maintenance of the site will continue throughout the post-closure period. Maintenance for fences and gates or other access controls, and access roads is assumed to be non existent or minimal. Costs for these items has been included in other items of work.

### **6.0 Demonstration of Stability**

Although the post-closure care period is not automatically ended at the end of 30 years, it is anticipated that the landfill will be shown to be stable and will not present a threat to health or the environment long before the end of the 30 years. It is assumed the demonstration will be supported by analysis of inspection records and the demonstration is limited to a letter of request. Consequently, costs are minimal.

### **Landfill Closure Cost Estimate Worksheet**

Cost estimate worksheets for the Kanab Class II Landfill have been included for documentation purposes.

**Landfill Closure Cost Estimate Worksheet**

A brief description of each line item, as numbered in the tables, is given immediately following this series of tables.

Item	Unit Measure	Cost/Unit	No. Units	Total Cost	Source	Note
0 Engineering and Preliminary Site Work						
.1 Topographic Survey	Hour	\$150.00	8	\$ 1,200	Phone Quote	
.2 Boundary Survey for Closure	Not Applicable					
.3 Site Evaluation	Lump	\$ 1,200	1	\$ 1,200		
.4 Development of Plans	See 1.7					
.5 Contract Administration Bidding and Award	See 1.7					
.6 Administrative Costs for the Certification of Final Cover and Closure Notice	See 1.7					
.7 Project Management; Construction Observation and Testing	Lump	5.5%	1	\$ 9,250	Standardized Rate	
.8 Monitor Well Consultant Cost				Not Applicable		
.9 Other Environmental Permit Costs				Not Required		
.10 Disposal of Final Wastes						
.10.1 Disposal Cost	Not Required					
.11 Remove Temporary Buildings	Not Applicable					
.12 Remove Equipment	Not Applicable					
.13 Site Repair/Replace Perimeter Fencing	Lump	\$ 3,000	1	\$ 3,000		
.14 Clean Leachate Lines	Not Applicable					
<b>Subtotal</b>				<b>\$14,650</b>		

10 % Contingency					\$ 1,350		
Engineering Total					\$16,000		

Item	Unit Measure	Cost/Unit	No. Units	Total Cost	Source	Note
2.0 Construction						
2.1 Final Cover System						
2.1.1 Completion of Sidewall Liner	Not Applicable					
2.1.1a Soil Placement	Cu. Yd	\$4.00	36,000	\$144,000	Utah S&HW/ Oklahoma DEQ	
2.1.1b Soil Processing	See 2.1.1a					
2.1.1c Soil Amendment	Not Applicable					
2.1.1d Soil Purchase	Not Applicable					
2.1.1e Soil Transportation	Not Applicable					
2.1.2 Drainage Layer on Sidewall	Not Applicable					
2.1.2a Geotextile Filter Fabric	Not Applicable					
2.1.2b Geonet/Geotextile Composite	Not Applicable					
2.1.2c Geomembrane Sidewall Liner	Not Applicable					
2.2 Completion of Top Cover						
2.2.1 Infiltration Layer (Compacted Clay	Not Applicable					
2.2.1a Soil Placement (Compacted)	Not Applicable					
2.2.1b Soil Processing	Not Applicable					
2.2.1c Soil Amendment	Not Applicable					
2.2.1d Soil Purchase	Not Applicable					
2.2.1e Transportation	Not Applicable					
2.2.2 Geosynthetic Clay Layer						
2.2.2a Geosynthetic Clay Installation						

Item	Unit Measure	Cost/Unit	No. Units	Total Cost	Source	Note
2.2.3 Flexible Membrane Cover						
2.2.3a Flexible Membrane Installation	Not Applicable					
2.2.4 Drainage Layer						
2.2.4a Geonet/Geotextile	Not Applicable					
2.2.4b Sand Layer	Not Applicable					
2.2.4c Soil Cover	Not Applicable					
2.2.4d Geonet/Geotextile Composite	Not Applicable					
2.3 Erosion Layer Placement						
2.3.1 Soil Purchase	Not Required					
2.3.2 Soil Transportation	See 2.3.5					
2.3.3 Soil Processing	See 2.3.5					
2.3.4 Soil Amendment	Not Required					
2.3.5 Soil Placement	Cu. Yd	\$2.00	12,000	\$ 24,000	Utah S&HW/ Oklahoma DEQ	
2.4 Revegetation						
2.4.1 Seeding	Acre	\$600	2	\$ 1,200		
2.4.2 Fertilize	See 2.4.1					
2.4.3 Mulch	See 2.4.1					
2.5 Site Grading and Drainage	Hour	\$120	15	\$ 1,800	Standardized Rates	
2.6 Site Fencing and Security	Not Required					
2.7 Leachate Collection System Completion	Not Applicable					
<b>Subtotal</b>				\$171,000		
<b>10% Contingency</b>				\$ 17,000		
<b>Construction Total</b>				\$188,000		

Item	Unit Measure	Cost/Unit	No. Units	Total Cost	Source	Note
3.0 Gas Collection System						
3.1 System Design	Not Applicable					
3.2 Completion of Gas Collection System	See 3.3.3					
3.3 Equipment and Installation						
3.3.1 Place Sand	Not Applicable					
3.3.2 Install Geonet and Geotextile	Not Applicable					
3.3.3 Install Passive Vents	Lump	\$ 600	1	\$ 600		
3.3.4 Install, Rework or Replace Gas Control Equipment	Not Applicable					
Subtotal				\$ 600		
10% Contingency				\$ 400		
<b>Gas Collection Total</b>				<b>\$ 1,000</b>		

Item	Unit Measure	Cost/Unit	No. Units	Total Cost	Source	Note
4.0 Monitor Well Installation Cost						
4.1 Ground Water Monitoring Well Installation, Reworking, or Replacement	Not Applicable					
4.2 Install, Rework, or Replace Methane Probe/s	Not Applicable					
4.3 Monitor Well, or Methane Probe Plugging	Not Applicable					
Subtotal						
10% Contingency						
<b>Monitor Well Installation Total</b>				<b>\$ 0</b>		

Calculation of Total Closure Costs

Engineering Total: \$ 16,000  
Construction Total: \$188,000  
Gas Collection Total: \$ 1,000  
Ground Water Total: \$ 0  
0 % Contract  
Performance Bond: Included in unit costs  
SUBTOTAL: \$205,000  
Legal Fees  
(0 % Of Subtotal): \$ 0  
TOTAL CLOSURE COSTS: \$205,000

Landfill Post-Closure Care Cost Estimate Worksheet

Item	Unit Measure	Cost/Unit	No. Units	Total Cost	Source	Note
1.0 Engineering Costs						
1.1 Post-Closure Plan and Post-Closure permits	See 1.2 & 1.3					
1.2 Site Inspection and Record Keeping (annual)	Lump	\$ 18,000	1	\$ 18,000		
1.3 Correctional Plans and Specifications (annual)	Lump	\$ 3,000	1	\$ 3,000		
1.4 Site Monitoring						
1.4.1 Ground Water Monitoring						
1.4.1a Ground Water Sample Collection	Not Applicable					
1.4.1b Ground Water Sample Analysis	Not Applicable					
1.4.1c Ground Water Sample Analysis Review and Reporting	Not Applicable					
1.4.2 Landfill Gas Monitoring						
1.4.2a Gas Monitoring Data Collection	See 1.2					
1.4.2b Gas Monitoring Data Review and Reporting	See 1.2					
2.0 Maintenance Costs						
2.1 Cover Maintenance Costs						
2.1.1 Soil Replacement	Cu. Yd	\$ 2.00	1200	\$ 2,400		
2.1.2 Vegetation Reseeding	Acre	\$600	0.6	\$ 360		
2.2 Equipment Maintenance						
2.2.1 Ground Water well Maintenance and Replacement	Not Applicable					
2.2.2 Methane Probe Maintenance and Replacement	Not Applicable					
2.2.3 Gas Collection System Operation	Not Required					
2.2.4 Gas Collection System Maintenance and Repair	Not Applicable					

Item	Unit Measure	Cost/Unit	No. Units	Total Cost	Source	Note
2.2.5 Leachate Collection System						
2.2.5a Leachate Collection System Repair and Maintenance	Not Applicable					
2.2.5b Clean Leachate Lines	Not Applicable					
3.0 Final Plugging of Monitoring Wells						
3.1 Final Plugging of Methane Probes	Not Applicable.					
3.2 Final Plugging of Ground Water Monitoring Wells	Not Applicable					
3.3 Gas Control Equipment Removal	Not Applicable					
4.0 Leachate Disposal	Not Applicable					
5.0 Site Maintenance						
5.1 Repair of Surface Water Diversion Structures	Not Applicable					
5.2 Repair of Fences and Gates	Each	\$100	3	\$ 300.		
5.3 General Maintenance						
6.0 Demonstration of stability	Lump	\$1,000	1	\$ 1,000		
<b>Subtotal</b>				\$ 25,060		
<b>10% Contingency</b>				\$ 2,540		
<b>Post-Closure Care Total</b>				\$ 27,600		

Total Closure and Post-Closure Costs

Total Closure Costs: \$ 205,000

Total Post-Closure Care Costs: \$ 27,600

Total Cost: \$ 232,600

**Landfill Closure and Post-Closure Care Reference Costs**

The following are reference costs developed by the Oklahoma Department of Environmental Quality and can be used if no other costs are available (2008 update).

**2011 Worksheet for Calculating Closure and Post-closure Cost Estimates**

All site data necessary to calculate estimates of closure and post-closure costs were gathered by completing table H.1. Data from Table H.1 was inserted into Tables H.2 and I.1, as applicable to complete calculations.

**Table H.1 Site Data**

**Facility Name: Kanab Landfill**

**Permit Number:**

Description	Quantity	Units
Total Permitted Area	40	acres
Active Portion		
Composite Lined	0	acres
Soil Lined	40	acres
Area of Largest Cell/Phase Requiring Final Cap		
Composite Lined	0	acres
Soil Lined	15	acres
Perimeter Fencing	7200	linear feet
Groundwater Monitoring Wells	0	VLF
Methane Gas Probes	0	VLF
Terraces	0	linear feet
Letdown channels	0	linear feet
Perimeter drainage ditches	0	linear feet
Average Daily Flow	0	tons/day
Landfill Disposal Cost	0	\$/ton

VLF = Vertical linear feet. The sum of the depths of all monitoring wells.

**Table H.2 Closure Cost Estimate**

**Facility Name:**

**Permit Number:**

	Task/Service	Quantity	Units	Multiplier <sup>a</sup>	Unit Cost <sup>b</sup>	Subtotal
1	<b>Preliminary Site Work</b>					
	a Conduct Site Evaluation	1	Lump sum	1	\$3,120.30	\$3,120.30
	b Dispose Final Wastes					
	Average Daily Flow	0	tons/day		\$10.00	
	Disposal Cost	0	tons/day	5		
	c Remove Temporary Building(s)	0	lump sum	1	\$2,861.37	
	d Remove Equipment	0	lump sum	1	\$2,335.72	
	e Repair/Replace Perimeter Fencing	7,200	linear feet	0.25	\$3.06	\$5,508.00
	f Clean Leachate Line(s)	0	lump sum	1	\$1,413.31	
2	<b>Monitoring Equipment</b>					
	a Rework/Replace Monitoring Well(s)	0	VLF	0.25	\$65.62	
	b Plug Abandoned Monitoring Well(s)	0	VLF	0.25	\$26.26	
	c Rework/Replace Methane	0	VLF	0.25	\$56.66	

	Probe(s)					
	d Plug Abandoned Methane Probe(s)	0	VLF	0.25	\$20.71	
	e Rework/Replace Remediation and/or Gas Control Equipment	0	lump sum	0.05	\$0.00	
3	<b>Construction</b>					
	a Complete Site Grading to include on- and off-site borrow areas	15	acres	1	\$1,237.14	\$18,557.10
	b Construct Final Cap					
	Compacted On-site Clay Cap or	36,000	cubic yards	1	\$4.46	\$160,560.00
	Compacted Off-site Clay Cap or	0	cubic yards	1	\$7.21	
	Install Geosynthetic Clay Liner Cap	0	square feet	1	\$0.45	
	c Construct Landfill Gas Venting Layer					
	Place Sand or	0	acres	1	\$33,079.81	
	Install Net and Geotextile	0	square feet	1	\$0.32	
	d Install Passive Landfill Gas Vents	15	acres	1	\$792.46	\$11,886.90
	e Install Flexible Membrane Liner	0	square feet	1	\$0.35	
	f Drainage Layer					
	Place Sand or	0	acres	1	\$33,079.81	
	Install Net and Geonet	0	square feet	1	\$0.32	
	g Place On-site Topsoil	12,000	cubic yards	1	\$1.91	\$22,920.00
	Place Off-site Topsoil	0	cubic yards	1	\$15.27	
	h Establish vegetative cover, including on- and off-site borrow areas	15	acres	1	\$469.49	\$7,042.35
4	<b>Drainage/erosion control</b>					
	a Construct Terraces	0	linear feet	1	\$7.99	
	b Construct Letdown Channels	0	linear feet	1	\$7.52	
	c Clean Perimeter Drainage Ditches	0	linear feet	0.50	\$6.10	
5	<b>Tasks Not Identified</b>					
6	<b>Subtotal</b>					\$229,594.65
7	<b>Administrative Services</b>	1	lump sum	0.10		\$22,959.47
8	<b>Technical and Professional Services</b>	1	lump sum	0.12		\$27,551.36
9	<b>Closure Contingency</b>	1	lump sum	0.10		\$22,959.47
10	<b>Total Final Closure</b>					\$303,064.95

Table I.1 Post-closure Cost Estimate

Facility Name:

Permit Number:

	Task/Service	Quantity	Units	Multiplier <sup>a</sup>	Unit Cost <sup>b</sup>	Subtotal
1	<b>Site maintenance</b>					
	a Site Inspections	4	per year	8	\$567.63	\$18,164.16
	b General Maintenance	1	per year	8	\$1,701.77	\$13,614.16
	c Remediation and/or Gas					

	Control Equipment	1	lump sum	0.3 <sup>c</sup>	<sup>d</sup>	
2	<b>Monitoring equipment</b>					
	a Rework/Replace Monitoring Well(s)	0	VLF	0.25	\$66.04	
	b Plug Abandoned Monitoring Well(s)	0	VLF	0.25	\$26.26	
	c Final Plugging of Monitoring Wells	0	VLF	1	\$26.26	
	d Rework/Replace Methane Probe(s)	0	VLF	0.25	\$56.66	
	e Plug Abandoned Methane Probe(s)	0	VLF	0.25	\$20.71	
	f Final Plugging of Methane Probes	0	VLF	1	\$20.71	
	g Final Plugging of Piezometer(s)	0	VLF	1	\$20.71	
3	<b>Sampling and analysis</b>				151.07	
	a Groundwater Monitoring Wells	0	wells	60		
	b Methane Gas Probes	0	probes	60	\$39.72	
	c Surface Water Monitoring Points	0	points	60	\$73.77	
	d Leachate	0	sample	60	\$118.86	
4	<b>Final cover maintenance</b>					
	a Mow and Fertilize Vegetative Cover	n/a	acres	30 8	\$187.79	
	b Repair Erosion, Settlement, and Subsidence for On-site Soils	2	acres	30	\$2.72	\$163.20
	Repair Erosion, Settlement, and Subsidence for Off-site Soils	0	acres	30 8	\$16.27	
	c Reseed Vegetative Cover	2	acres	0.20	\$469.48	\$187.79
5	<b>Leachate management</b>					
	a Clean Leachate Line(s)	0	per year	30 (30 yrs)	\$1,455.54	
	b Maintain Leachate Collection System and Equipment	0	per year	30 (30 yrs)	\$2,261.24	
	c Collect, Treat, Transport, and Dispose of Leachate	0	gal/yr	30	\$0.29	
6	<b>Tasks not identified</b>					
7	<b>Subtotal</b>					\$32,129.31
7	<b>Administrative Services</b>	1	lump sum	0.06	\$32,129.31	\$1,927.76
8	<b>Technical and Professional Services</b>	1	lump sum	0.07	\$32,129.31	\$2,249.05
9	<b>Post-closure Contingency</b>	1	lump sum	0.10	\$32,129.31	\$3,212.93
10	<b>Total Post-closure</b>					\$39,519.05

<sup>a</sup> Multipliers are determined from the *Solid Waste Financial Assurance Program Report*, December 22, 2000.

<sup>b</sup> Unit costs include a 2.66% inflationary adjustment for 2008.

<sup>c</sup> 5% of equipment capital cost, maintenance performed once per 5 yrs for 30 years.

<sup>d</sup> Input capital cost for gas control/remediation equipment, if installed at the site.

<sup>e</sup> If the approved groundwater monitoring plan requires monitoring for alternative constituents, unit costs shall be calculated in accordance with OAC 252:515-27-52(b) or (c).

<sup>f</sup> Input subtotal from line 7.

8 Add lines 7 through 10.

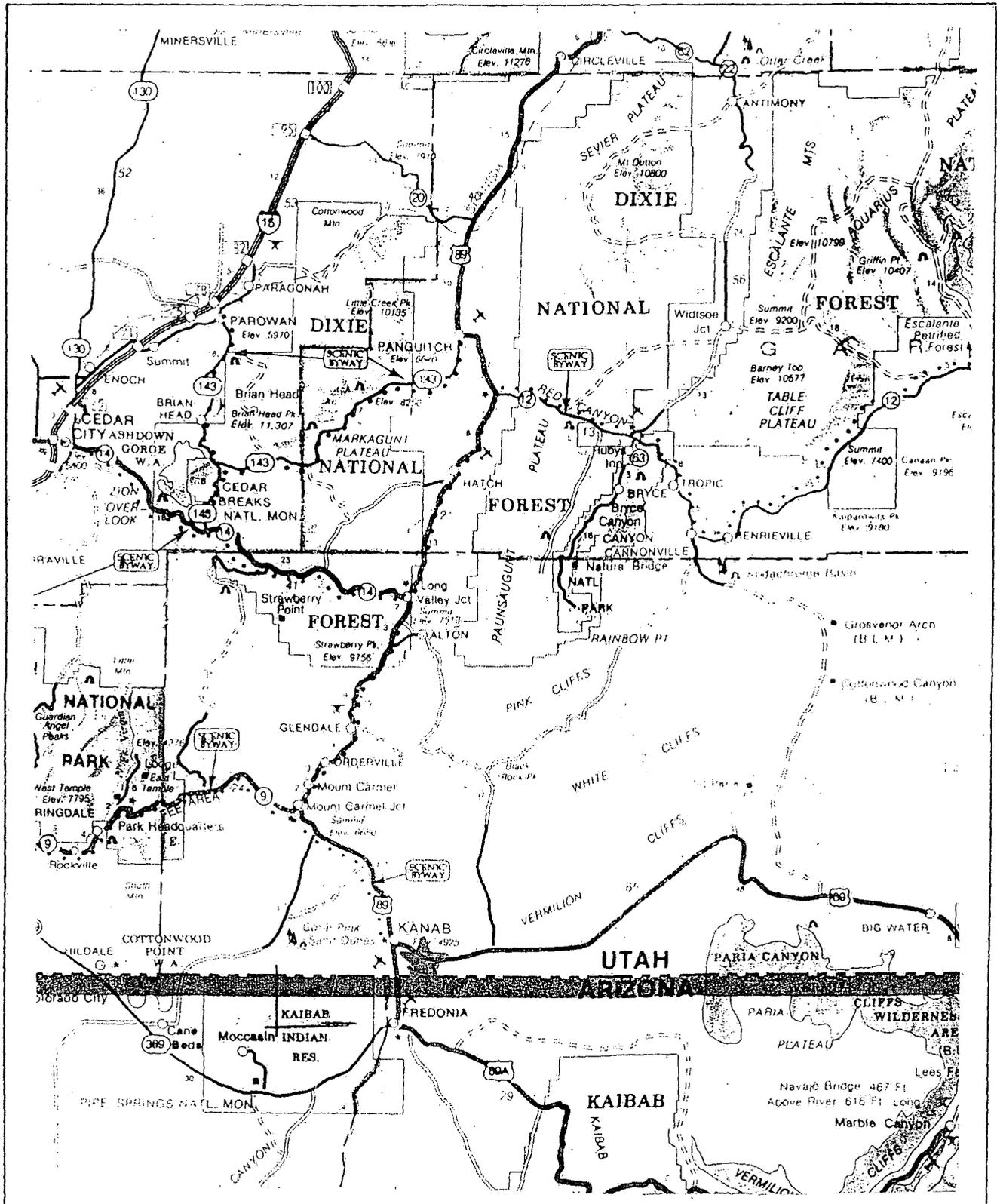
**Total Closure and Post-Closure Costs**

Total Closure Costs:	<u>\$ 303,064.95</u>
Total Post-Closure Care Costs:	<u>\$ 39,519.05</u>
Total Cost:	<u>\$ 342,584.00</u>

Closure costs are estimated to range between \$ 232,600 and \$342,584 depending on the estimating method used. Use a base value of \$250,000 for the Kanab Landfill 2011 Closure – Post Closure Cost.

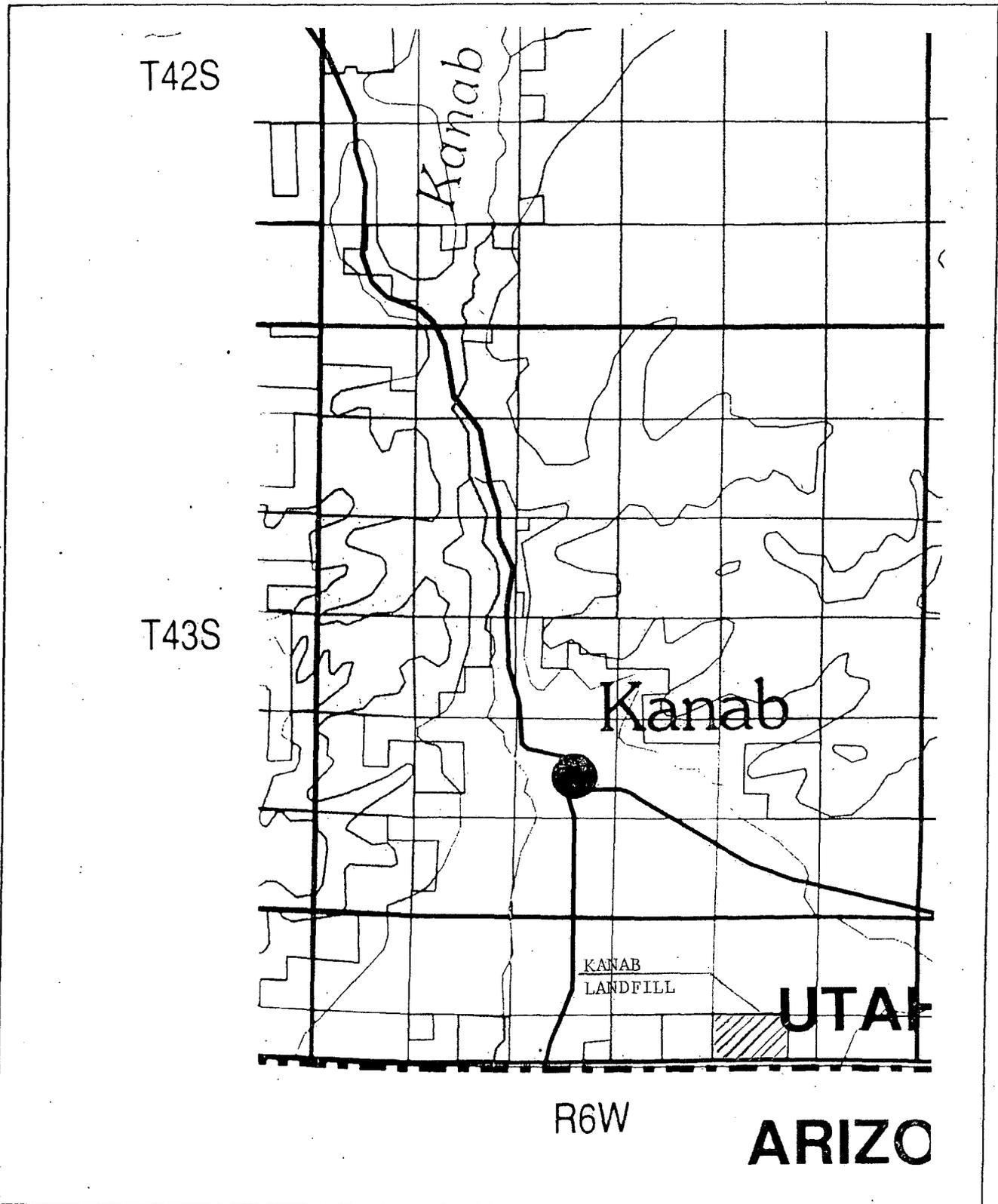
## EXHIBITS

- Exhibit #1: General Vicinity Map
  - Exhibit #2a Project Location Map
  - Exhibit #2b Property Deed
  - Exhibit #3: Service District Boundaries
  - Exhibit #4a-4b: Daily Record Form
  - Exhibit #5: Quarterly Inspection Log
  - Exhibit #6a-6b: Onsite Soil Data
  - Exhibit #7a-7b: Well and Water Right Documentation
  - Exhibit #8: Proposed Cell Progression
  - Exhibit #9: Conceptual Cell Design
  - Exhibit #10: Topographic Map
  - Exhibit #11: Financial Assurance Data
-



KANAB SANITARY LANDFILL

Exhibit 1. General Vicinity Map



KANAB SANITARY LANDFILL

Exhibit 2a, Project Location Map

# The United States of America

To all to whom these presents shall come, Greeting:

Serial: Utah 46835

WHEREAS,

Western Kane County Special Service District #1

is entitled to a land patent pursuant to the Recreation and Public Purposes Act of June 14, 1926 (44 Stat. 741), as amended and supplemented (43 U.S.C. 869; et. seq.), for the following described land:

Salt Lake Meridian, Utah

T. 44 S., R. 6 W.,  
sec. 11, lots 1 thru 5, inclusive, NW ¼ NE ¼.

containing 227.790 acres

NOW KNOW YE, that the UNITED STATES OF AMERICA; in consideration of the premises, and in conformity with said Act of Congress, HAS GIVEN AND GRANTED, and by these presents DOES GIVE AND GRANT unto the said Western Kane County Special Service District #1, the land above described for use as a solid waste sanitary landfill: TO HAVE AND TO HOLD the same, together with all rights, privileges, immunities, and appurtenances, of whatsoever nature, thereunto belonging, unto the same Western Kane County Special Service District #1, forever; and

EXCEPTING AND RESERVING TO THE UNITED STATES:

1. A right-of-way thereon for ditches or canals constructed by the authority of the United States. Act of August 30, 1890 (43 U.S.C. 945); and
2. All mineral deposits in the lands so patented, and the right of the United States, or persons authorized by the United States, to prospect for, mine, and remove such deposits from the same under applicable laws and regulations as the Secretary of the Interior may prescribe; and

ENTRY NO. 78688 RECORDED AT REQUEST OF Western Kane Co. S.S.D. FEES  
 DATE FEB. 24 1994 AT 11:30 A.M. YJ CARLSON KANE COUNTY RECORDER  
 BY DEPUTY BOOK 0133 PAGE 402-403

Serial: Utah 46835

The Western Kane County Special Service District #1, its successors or assigns, assumes all liability for and shall defend, indemnify, and save harmless the United States and its officers, agents, representatives, and employees, from all claims, loss, damage, actions, causes of action, expense, and liability (hereinafter referred to in this clause as claims) resulting from, brought for, or on account of, any personal injury, threat of personal injury, or property damage received or sustained by any person or persons (including the patentee's employees) or property growing out of, occurring, or attributable directly or indirectly, to the disposal of solid waste on, or the release of hazardous substances from the land described above, regardless of whether such claims shall be attributable to: (1) the concurrent, contributory, or partial fault, failure, or negligence of the United States, or (2) the sole fault, failure, or negligence of the United States.

The above described land has been used for solid waste disposal. Solid waste commonly includes small quantities of commercial hazardous and household hazardous waste as determined in the Resource Conservation and Recovery Act of 1976, as amended (42 U.S.C. 6901), and defined in 40 CFR 261.4 and 261.5. Although there is no indication these materials pose any significant risk to human health or the environment, future land uses should be limited to those which do not penetrate the liner or final cover of the landfill unless excavation is conducted subject to applicable State and Federal requirements.

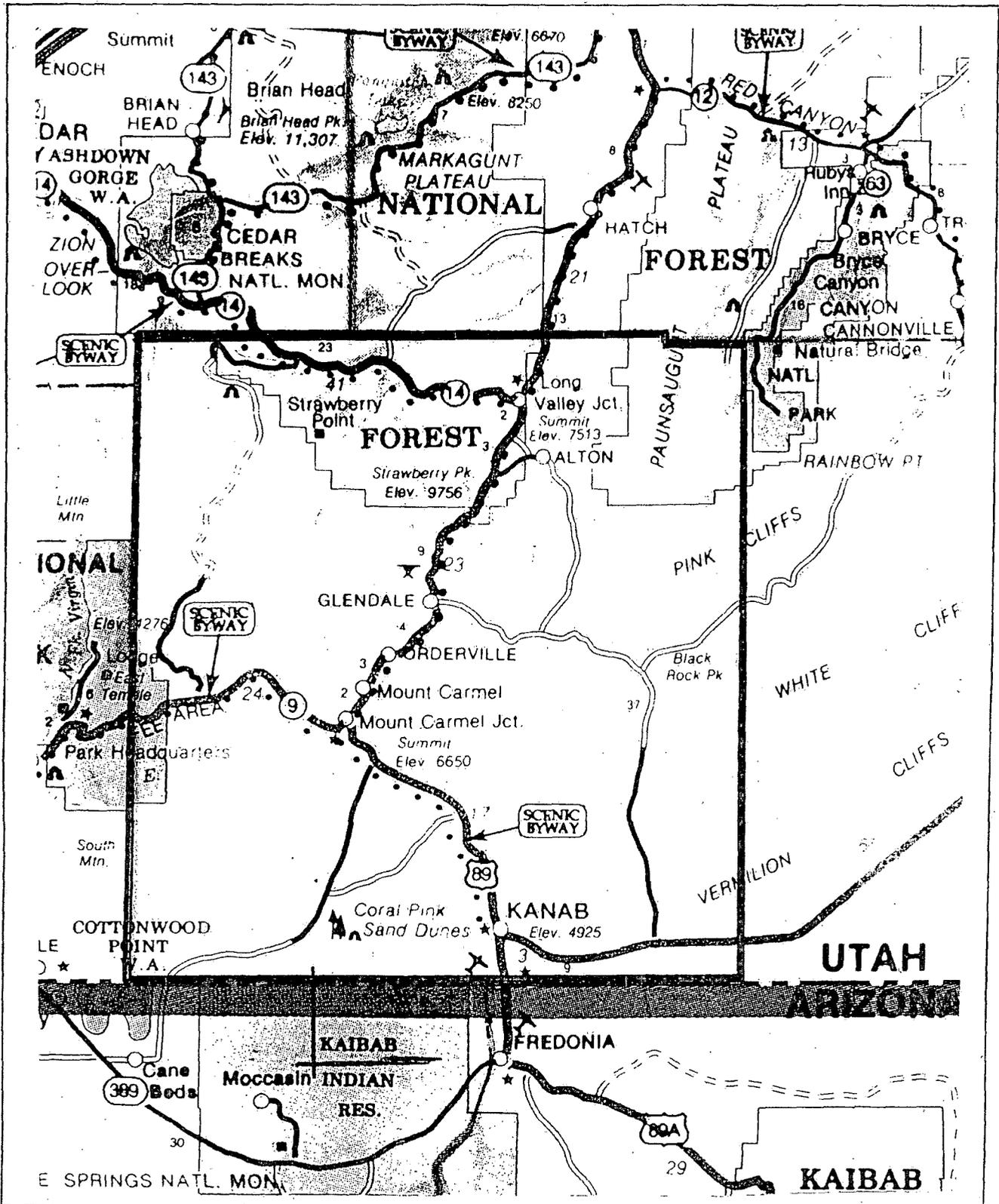


IN TESTIMONY WHEREOF, the undersigned authorized officer of the Bureau of Land Management, in accordance with the provisions of the Act of June 17, 1948 (62 Stat. 476), has, in the name of the United States, caused these letters to be made Patent, and the Seal of the Bureau to be hereunto affixed.

GIVEN under my hand, in Salt Lake City, Utah  
the tenth day of January  
in the year of our Lord one thousand nine hundred and  
ninety-four and of the Independence of the  
United States the two hundred and eighteenth

By Paul D. Stephenson  
Chief, Branch of Lands and Minerals, Operations

Patent Number 43-94-0008



KANAB SANITARY LANDFILL

Exhibit 3. Service District Boundaries

KANAB SANITARY LANDFILL  
Weight, Volume, and Vehicle Record

Date: \_\_\_\_\_ Day of Week: \_\_\_\_\_ Page \_\_\_ of \_\_\_

<u>Time</u>	<u>Vehicle No.</u>	Est. Volume <u>Cu. Yds.</u>	Est. Weight <u>Tons</u>	<u>Origin</u>	Type of <u>Waste</u>
-------------	--------------------	--------------------------------	----------------------------	---------------	-------------------------

Signature \_\_\_\_\_ Date \_\_\_\_\_

KANAB SANITARY LANDFILL

Exhibit 4a. Daily Record Form

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Kanab Sanitary Landfill Quarterly Inspection Log

This document is the official form required for compliance with R315-301-7(5)(a) for the Kanab Sanitary Landfill.

Date \_\_\_\_\_ Time \_\_\_\_\_ Weather \_\_\_\_\_

Inspection Team: \_\_\_\_\_  
\_\_\_\_\_

Observations: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Date and Nature of Repairs/Corrective Action: \_\_\_\_\_  
\_\_\_\_\_

Other: \_\_\_\_\_  
\_\_\_\_\_

Explosive Gas Monitoring \_\_\_ Structures \_\_\_ Property Boundary

Training Procedures Completed: \_\_\_\_\_

Major Deviations from Plan of Operation: \_\_\_\_\_  
\_\_\_\_\_

\_\_\_\_\_  
Name of Inspector

\_\_\_\_\_  
Signature

This form shall be kept on site or at another convenient location if no permanent office facilities for a minimum of 3 years.

KANAB SANITARY LANDFILL

Exhibit 5 Quarterly Inspection Log



# UNIZICKER & WELLS DRILLING

## WELL DATA FORM

OWNER NAME Kanab Landfill Hole # 1 of 2 Page      of     

Well Log		WATER	PERMEABLE high low	UNCONSOLIDATED					CONSOLIDATED		ROCK TYPE	COLOR	DESCRIPTIONS AND REMARKS (include comments on water quality if known.)
DEPTH (feet) FROM	TO			C L A Y	S I L T	S A N D	G R A V E L	C O B B L E S	B O U L D E R	O T H E R			
0	6		XX										
6	12		XX	X									
12	14		XX										
14	23		X	X									
23	28		X										
28	33			XXX									
33	35		X	X									
35	55							X		Shale	grey		
55	60							X		Shale	pink		
60	200							X		Shale	Red		
												Total depth 200'	
												Test diameter 5"	
												No water encountered	

KANAB SANITARY LANDFILL

Exhibit 6a. Onsite Soil Data



# UNIZICKER & WELLS DRILLING

## WELL DATA FORM

OWNER NAME Kanab Landfill Hole # 2 of 2 Page      of     

Well Log		WATER	PERMEABLE	UNCONSOLIDATED						CONSOLIDATED		ROCK TYPE	COLOR	DESCRIPTIONS AND REMARKS (include comments on water quality if known.)
DEPTH (feet) FROM	TO			CLAY	SILT	SAND	GRAVEL	COBBLES	OTHER					
			high	low										
0	5		X		X									
5	6		X		XX									
6	15		X		XX									
15	17	X	X		XX									
17	21		XX								yellow			
21	23		XX								Red			
23	200		X						X		shale	Red		
														Total depth 200'
														Test diameter 5"
														No water encountered

KANAB SANITARY LANDFILL

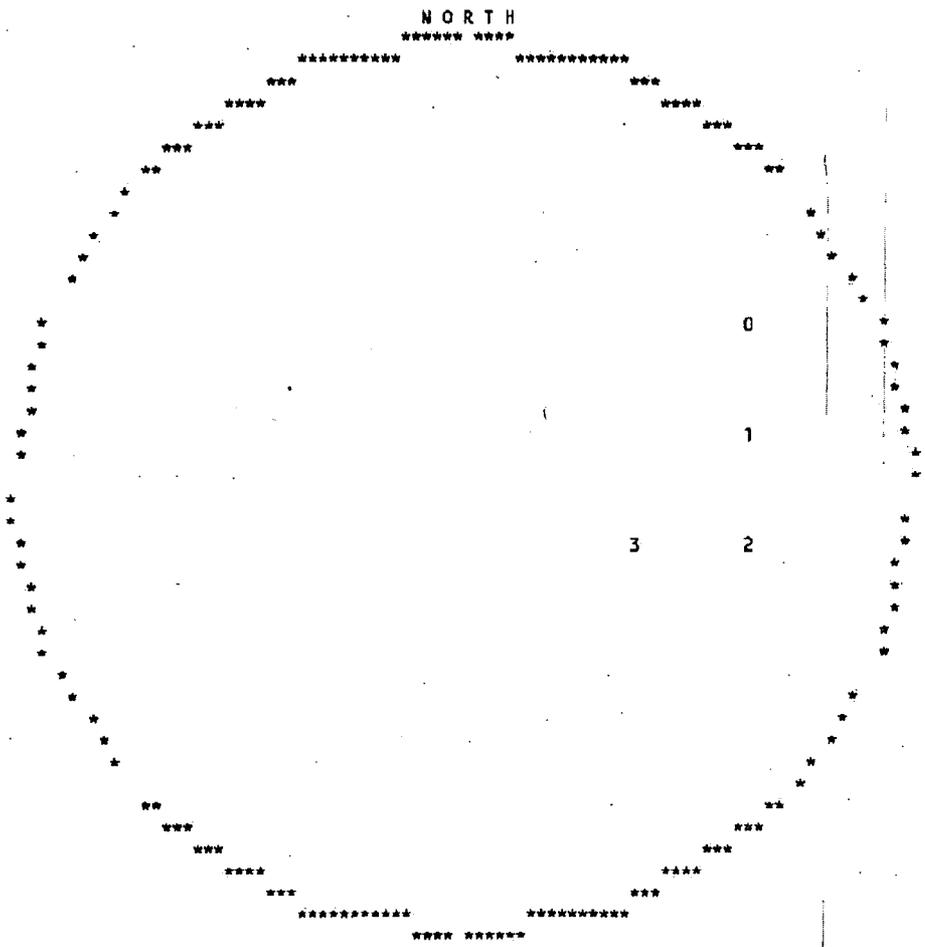
Exhibit 6b. Onsite Soil Data



UTAH DIVISION OF WATER RIGHTS  
WATER RIGHT POINT OF DIVERSION PLOT CREATED THU, JAN 16, 1997, 3:56 PM  
PLOT SHOWS LOCATION OF 4 POINTS OF DIVERSION

PLOT OF AN AREA WITH A RADIUS OF 5280 FEET FROM A POINT  
S 1320 FEET, W 1320 FEET OF THE NE CORNER,  
SECTION 11 TOWNSHIP 44S RANGE 6W SL' BASE AND MERIDIAN

PLOT SCALE IS APPROXIMATELY 1 INCH = 2000 FEET



KANAB SANITARY LANDFILL

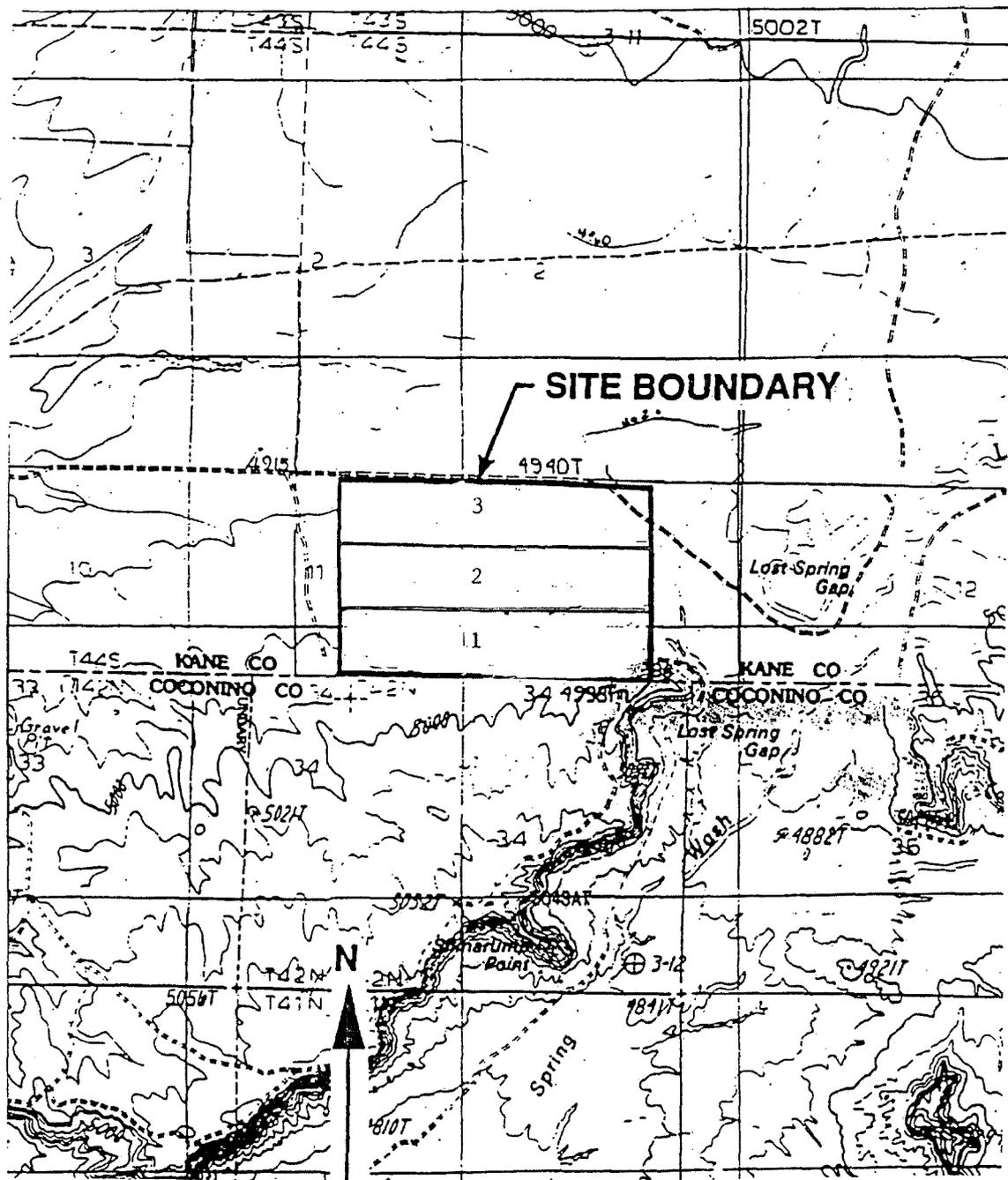
Exhibit 7a. Well and Water Right Documentation

UTAH DIVISION OF WATER RIGHTS  
 NWPLAT POINT OF DIVERSION LOCATION PROGRAM

MAP CHAR	WATER RIGHT	QUANTITY		SOURCE DESCRIPTION or WELL INFO			POINT OF DIVERSION DESCRIPTION				U A P T S U P R							
		CFS	AND/OR AC-FT	DIAMETER	DEPTH	YEAR LOG	NORTH	EAST	CNR SEC	TWN	RNG B&M	N	P	R	R	W	P	D
0	85 620	.0000	.00	Lost Spring Wash										X	X	X		
		WATER USE(S): STOCKWATERING			3718 Olive Highway			PRIORITY DATE: 00/00/1864				CA 95965						
		Chamberlain, Hoyt and Katherine						Oroville										
1	85 140	.0000	.00	Lost Spring Wash										X	X	X		
		WATER USE(S): STOCKWATERING			P.O. Box 627			PRIORITY DATE: 00/00/1864				UT 84741						
		Noel, Michael E. and Sherry M.						Kanab										
2	85 140	.0000	.00	Lost Spring Wash										X	X	X		
		WATER USE(S): STOCKWATERING			P.O. Box 627			PRIORITY DATE: 00/00/1864				UT 84741						
		Noel, Michael E. and Sherry M.						Kanab										
3	85 141	.0000	.00	Unnamed trib. to Lost Spring W										X	X	X		
		WATER USE(S):			P.O. Box 627			PRIORITY DATE: 00/00/1864				UT 84741						
		Noel, Michael E. and Sherry M.						Kanab										

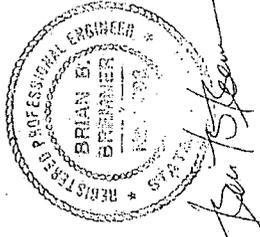
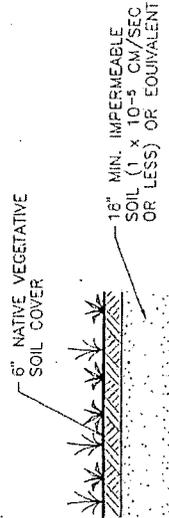
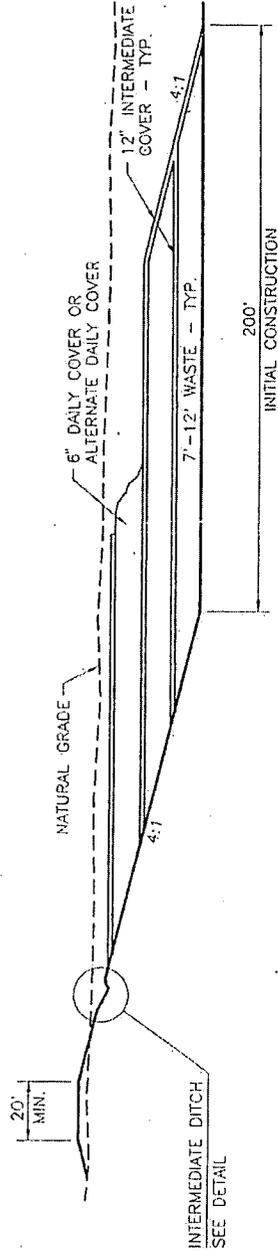
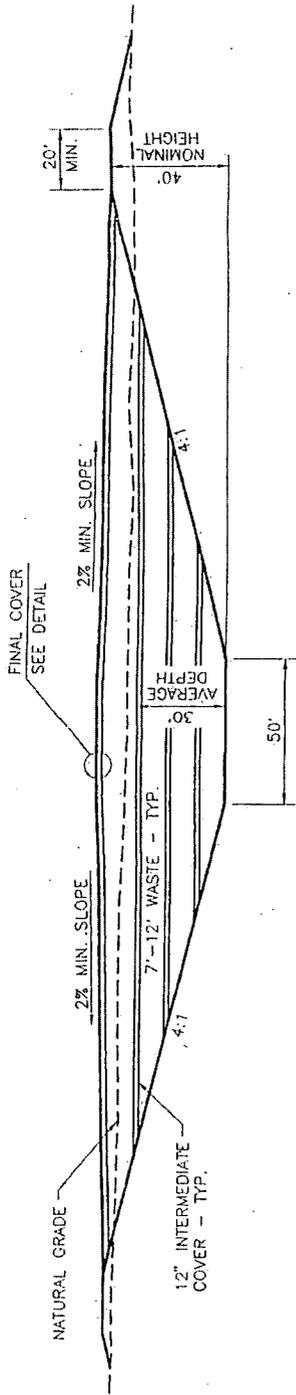
KANAB SANITARY LANDFILL

Exhibit 7b. Well and Water Right Documentation



KANAB SANITARY LANDFILL

Exhibit 8. Proposed Cell Progression



**NOTES:**

1. ALL SIDE SLOPES 4:1 OR FLATTER
2. INITIAL CELL BOTTOM DIMENSIONS 50' x 200'
3. STOCKPILE SUITABLE MATERIAL FOR FINAL COVER DURING EXCAVATION
4. STOCKPILE TOP 6" OF NATIVE MATERIAL FOR LATER TOPSOIL USE

INTERMEDIATE DITCH DETAIL

FINAL COVER DETAIL

DESIGNED BB		CHECKED	DATE	DRAWING NO.	DRAWN C/C
SCALE NONE		SHEET NO. 1 OF 1		EXHIBIT 9	
<b>KANAB SANITARY LANDFILL</b> <b>CONCEPTUAL DESIGN</b>					



# Western Kane County Special Service District No. 1

P.O. Box 36

Kanab, Utah 84741

801-644-5089

## Ratio of cash to expenditures

Cash on hand and in banks, December 31, 1996		\$ 257,713
		=====
Operating expenses for calendar year, 1996	\$ 333,687	
Less Depreciation for 1996 (non cash exp)	51,025	
	-----	
Net cash expenditures for 1996	\$ 282,662	
Equipment purchases	92,670	
	-----	
Total expenditures for 1996		\$ 375,332
		=====
Ratio of cash to expenditures for 1996:		68.66%

KANAB SANITARY LANDFILL

Exhibit 11. Financial Assurance Data