

Division of  
Solid and Hazardous Waste

JUL 19 2012  
2012-005557

# LONG HOLLOW SANITARY LANDFILL

PERMIT RENEWAL APPLICATION FOR THE EXISTING  
LONG HOLLOW SANITARY LANDFILL

JULY 2012

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JUL 19 2012

July 12, 2012

To Whom It May Concern:

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete.

I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment for knowing violations.

Sincerely,

Scott Durfey .  
Chairman, Wayne County Commission

SUBSCRIBED AND SWORN to before me this \_\_\_\_\_ day of \_\_\_\_\_, 2012.

My commission expires on the \_\_\_\_\_ day of \_\_\_\_\_, \_\_\_\_\_.

SEAL \_\_\_\_\_ County, Utah.

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## **I. APPLICATION**

### **I. INTRODUCTION**

This report serves as the renewal application for the Long Hollow Sanitary Landfill located approximately 4 miles Southwest of Loa, Utah in what is known as Long Hollow. The purpose of the report is to comply with R315-31 0-3 Administrative Rules of the Utah Solid and Hazardous Waste Control Board, Utah Department of Environmental Quality.

The landfill is currently located on two hundred acres for operation of a Class II facility. The facility also includes Class IV disposal cells. The landfills are capable of servicing the county's current and future needs. The site is centrally located in an effort to accommodate regionalization should local municipalities desire to participate with the county in such activities. The site is also capable of being expanded to service national park units 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, groundwater, available cover material, and soil permeability. Exhibit 1 and Exhibit 2 are general vicinity maps depicting the site.

### **II. GENERAL COMMENTS**

During the original permitting process for the Long Hollow Landfill, two separate permits were issued. A Class II permit was issued on December 19, 1994 for management of municipal solid waste. A Class IV permit was issued on March 1, 1995 for management of the construction/demolition waste in separate disposal cell. In 2004 the permit was renewed and the two classes were combined into one Class II permit. This permit renewal application is to renew the Class II permit application.

### **III. RESPONSIBLE PARTIES**

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

Wayne County  
Wayne County Courthouse  
18 South Main  
Loa, Utah 84747  
Attn: Scott Durfey  
Phone: (435) 836-2731

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

Travis B Walbeck, PE  
Savage Surveying  
1925 South Industrial Park Road  
Richfield, Utah 84701

Future agreements, potential special service district creation, and alternate ownership/operation scenarios may require modification of this section of the permit. In addition, the county may contract site operations with private entities. Wayne County will notify the Executive Secretary of any changes in responsible party status at least 30 days prior to their effective date.

#### **IV. GENERAL DESCRIPTION**

The Long Hollow Sanitary Landfill is a Class II natural attenuation facility designed to fulfill the current and future solid waste disposal needs of Wayne County, Utah. The facility encompasses a total of 200 acres and services Loa, Lyman, Bicknell, Torrey, Hanksville and unincorporated areas under the jurisdiction of the county commission. Annual average waste volumes are estimated at less than 20 tons per day, and precipitation is less than 25 inches per year.

Adequate capacity exists and subsurface geohydrology is sufficient to permit expansion to Class I status (with the addition of appropriate clay liners and leachate collection systems) and acceptance of waste in volumes exceeding 20 tons per day. Modifications to the permit will be made as necessary to accommodate larger volumes and as cooperative agreements are executed with other solid waste managers. Facility plans are included in other sections of this document; construction specifications may be forwarded under separate cover.

#### **V. LEGAL DESCRIPTION**

The site is legally described as the East half of the East half of the Southeast Quarter of Section 21, the East half of the Southeast Quarter of the Northeast Quarter of Section 21, the West half of the Southwest Quarter of Section 22, and the Southwest Quarter of the Northwest Quarter of Section 22, Township 28 South, Range 2 East, Salt Lake Base & Meridian. In addition to the parcels described above, the West half of the Southeast quarter of the Southwest Quarter of Section 22 is being used for a Class I V operation. Exhibit 2 depicts the sites relationship to the adjacent Sections, Townships and Ranges.

The facility's main gate is located on an existing county road 11°41'17" longitude and 38°21'57" latitude (the Northwest corner of the Southwest Quarter of the Northwest Quarter of Section 22, Township 28 South, Range 2 East). Lands surrounding the facility are considered multiple use lands and are controlled by state or federal agencies. The closest private land exists approximately 2 miles Northeast of the site in Section 11, Township 28 South, Range 2 East.

#### **VI. WASTE TYPES/AREAS TO BE SERVED**

The Long Hollow Sanitary Landfill receives less than 20 tons of waste per day, based on a 2 year average, and is therefore considered a Class II facility. The Long Hollow Sanitary Landfill accepts the following types of waste for disposal or recycling;

- household waste (excluding bulk liquids)
- non-hazardous industrial waste
- commercial waste
- dead animals
- white goods and scrap metal
- tires
- yard waste
- construction/demolition waste
- non-hazardous sludge containing no free liquids
- car bodies
- non-friable asbestos

The service area consists of all lands within the legal boundaries of Wayne County. In order to maintain it's municipal, non-profit status, the Long Hollow Sanitary Landfill only accepts waste generated outside

the service area if an appropriate interlocal agreement or memorandum of understanding has been executed with the governmental solid waste manager where the waste is generated.

## **II. PLAN OF OPERATION**

### **I. INTRODUCTION**

This Plan of Operation has been prepared by Wayne County to reflect the operation of the Long Hollow Landfill in compliance with the Utah Solid Waste Permitting and Management Rules, R31 0-301 through 320 of the UAC. This Plan of Operation is an integral part of the application for a permit to operate a Class II facility as set forth in UAC R315-31 0-4, and is submitted to UDEQ as the solid waste management authority for Wayne County.

The Long Hollow Landfill is owned and operated by Wayne County. County offices are located at 18 South Main, Loa, Utah. The original Plan of Operation shall be retained in the County offices, and a copy of the Plan will be maintained at the landfill. All components of the landfill's operating record will be provided to UDEQ upon request for review. The responsibility for compliance with the Plan shall be that of the Landfill Manager. The plan will be available for review by employees involved in the daily operations of the facility, as well as to other parties and regulatory agencies, as requested.

### **II. HOURS OF OPERATION**

Landfill personnel will be onsite during all hours the facility is open to the public. The schedule for operation of the Long Hollow Landfill is:

April 1<sup>st</sup> - October 15<sup>th</sup>

Monday, Wednesday, Friday 2 pm - 7 pm

Saturday 1 pm - 5 pm

October 15<sup>th</sup> - April 1<sup>st</sup>

Monday, Wednesday, Friday 2 pm - 5 pm

Saturday 2 pm - 5 pm

Collection vehicles enter the landfill when the facility is not open to the public. Waste is not accepted from the public during these periods. The schedule is currently in operation at Wayne County's existing facility and is functioning adequately. Wayne County intends to revise the scheduled operation of the landfill as the need arises and solid waste volumes dictate.

### **III. SCHEDULE OF CONSTRUCTION**

The existing layout and facilities are depicted on Exhibits 3A - 3E.

### **IV. WASTE HANDLING PROCEDURES**

All incoming vehicles are stopped by the landfill attendant at the gate where a landfill employee directs all loads to the appropriate disposal area. Commercial vehicles are weighed before and after discharging waste loads. Private haul vehicle load weights are estimated based on type and volume of waste. The date, time, vehicle owner, and origin of the waste are recorded on the "Weighted on a Fairbanks Scale" form for every incoming load. A copy of the form is included as Exhibit 4. A receipt is issued for every incoming load. Daily totals are recorded on the "Daily Operation Record" attached as Exhibit 5.

Commercial and private loads are inspected on a random basis, at a frequency of 1% of all loads, for the presence of prohibited waste. Incoming vehicles are stopped by the attendant at the scale house and

inspected for hazardous materials. A copy of the "Waste Inspection Form" is completed for all accepted and refused loads. A copy of this form is included as Exhibit 6. Inspection records are maintained in the Landfill office.

Landfill signs are positioned to direct incoming traffic to the appropriate disposal areas. Private haulers are directed to discharge their loads in a public discharge area near the base or top of the active face, depending on the configuration of the access road to the disposal area. Commercial haulers dump directly at the active disposal face.

Equipment dedicated to the Long Hollow Sanitary Landfill for waste and soil handling and general site operations are listed below:

- 1991 Kenworth Dump Truck
- 1990 Freightliner
- 1992 Peterbilt Roll-on Truck
- 2005 Sterling Condor Garbage Truck
- 2007 Sterling Condor Garbage Truck
- 816 CAT Compactor
- D8 CAT Dozer
- 544 G John Deere Loader
- 2001 Dodge Ram Pickup Truck
- 2002 Dodge Pickup Truck

Additional heavy equipment is available from the Wayne County Road Department on an as needed basis. Minor vehicle maintenance is performed onsite by landfill personnel. Major repairs are performed either at the County Road Department facilities or by a contractor.

## **V. HOUSEHOLD & COMMERCIAL WASTE**

Most of the waste generated in the County is picked up and hauled to the Landfill by Wayne County Landfill personnel. Incoming waste from commercial and private haulers is discharged at or near the active disposal face. Landfill personnel move discharged loads from the unloading area to the active face. The waste is spread in layers not exceeding two feet in thickness, and compacted using multiple passes of a Caterpillar 816B steel wheeled landfill compactor. Waste is covered daily with six inches of soil. Wind fences are also placed around the working face of the household/commercial waste cell for litter control.

## **VI. INDUSTRIAL WASTES**

The Long Hollow Landfill does not currently accept industrial waste. However, the facility will accept non-hazardous solid waste generated by industrial sources, provided sufficient documentation is submitted to verify the non-hazardous nature of the material.

## **VII. DEAD ANIMALS**

The Long Hollow Landfill accepts dead animals for disposal in a separate monofill within the landfill property. All received dead animals are covered at the end of the working day with a minimum of six inches of soil.

## **VIII. WHITE GOODS AND SCRAP METAL**

White goods and scrap metal are stockpiled in a designated area. A licensed metal recycling service is contracted to remove stockpile no less than once a year. Operating Records contain the date, volume, and tonnage for materials removed from the landfill.

## **IX. TIRES**

Tires are currently stockpiled in a designated area until a sufficient amount is accumulated. At that time, the State of Utah is contacted and arrangements are made for tire pickup through the State funded tire recycling program. Operating Records contain the date, volume, and tonnage for materials removed from the landfill.

## **X. YARD WASTES**

Yard waste is vegetative matter generated from landscaping, lawn maintenance, and land clearing operations and may include tree and brush trimmings, grass clippings, and other discarded material from yards, gardens and parks. Yard waste does not include garbage, paper, plastic, sludge, septage, or manure. Loads containing only stumps, branches, tree clippings, and/or grass clippings are directed to a designated yard waste stockpile. The stockpile is periodically burned after the appropriate permits are obtained from the local fire marshal.

## **XI. CONSTRUCTION/DEMOLITION WASTES**

UAC 315-301-2(16) defines construction/demolition (C&D) waste as waste from building materials, packaging, rubble resulting from construction, remodeling, repair, and demolition operations on pavements, houses, commercial buildings, and other structures. Typical C&D waste includes bricks, concrete or other masonry materials, soil, rock, untreated lumber, rebar, and tree stumps. Construction waste is deposited in a separate monofill and covered with a minimum of 6" of soil as often as is necessary to reduce the potential for fires and vector harborage.

## **XII. ASBESTOS WASTES**

The Long Hollow Landfill currently accepts only non-friable asbestos for disposal.

## **XIII. HAZARDOUS/PCB WASTE EXCLUSION PROGRAM**

According to UAC R315-303-4(7), an owner or operator shall not knowingly dispose, treat, store, or handle hazardous waste or waste containing PCSs. The following sections describe load inspection, training, and handling procedures employed at the Long Hollow Landfill. All incoming loads are visually inspected at or near the active disposal area. Private haul vehicles are also inspected at the gate for the presence of prohibited materials. The landfill manager is properly trained and certified to identify regulated hazardous or PCB wastes. Landfill employees are trained by the landfill manager in proper screening and identification of hazardous and PCB wastes. Loads which are suspected of containing a high liquid content in accordance with these procedures are sent directly to another landfill which can accept hazardous or PCB wastes.

## **XIV. BULK LIQUIDS**

Bulk liquids may not be disposed in the landfill. Loads which are suspected of containing a high liquid content in accordance with these procedures are sent directly to another facility which can accept bulk liquid wastes.

All vehicles containing nonhazardous sludge are directed to the proper disposal area where the waste is slowly spread on the ground for treatment. The driver is instructed to spread waste while driving slowly to prevent pooling of waste and to promote evaporation. The sludge spreading area is identified on the site development drawings on Exhibits 3D & 3E.

## **XV. TRAINING & SAFETY**

The landfill manager, along with one additional employee, has attended the Manager of Landfill Operations training course provided by the Solid Waste Association of North America (SWANA). His training includes the following courses:

- Operational Issues for Landfill Managers
- Manager of Landfill Operations
- Basic First Aid and Safety Training
- Solid Waste Screening
- Training Sanitary Landfill Operating Personnel

The landfill manager is responsible for disseminating his knowledge regarding landfill operations to other landfill employees. All additional employees have been trained on the identification and exclusion of hazardous wastes. Safety procedures conform to OSHA guidelines and all personnel are encouraged to participate in additional landfill management, waste screening, safety, and first aid workshops.

All new employees are required to read the landfill permit application and permit within the first month of employment. Documentation that the application and plan has been read is included in the operating record. Initial training needed to work onsite is provided by the landfill supervisor. Additional training is provided during employment at the landfill.

Communications at the landfill are facilitated by two-way radios in each county vehicle and a cellular telephone in the landfill gatehouse. As a result, communication capabilities are sufficient to enable contact with emergency services to protect the safety of staff and users of the site.

## **XVI. INSPECTIONS AND MONITORING**

Inspection and monitoring at the Long Hollow Sanitary Landfill on incoming material are performed on a random and routine basis to prohibit receipt of unacceptable wastes. Routine waste inspections are made during deposition, spreading, and covering operations to insure protection of the environment and absence of nuisances. When a vehicle enters the scale house, random loads are inspected and directed to a separate area near the working face. After unloading, a landfill operator spreads the load with equipment, and hand inspects the load using rakes and shovels, looking for hazardous and prohibited waste. Operational inspections are made by supervisory landfill personnel. Random inspections are conducted by the scale house operator on at least 1% of all incoming waste loads. Inspection results are recorded on the "Waste Load Inspection Form" included as Exhibit 6.

Compliance inspections are conducted quarterly by the Landfill supervisor to assess the integrity of cover, the condition of side slopes and vegetative cover, and the impacts of erosion. All structures, roads, fences, and gates, etc. are inspected quarterly and documented on the "Quarterly Landfill Inspection Form" which is attached as Exhibit 9. Any conditions that do not meet with the approval of the inspector are noted in writing. It becomes the responsibility of the landfill manager to correct the unsatisfactory conditions. In addition, a detailed annual inspection is conducted to verify compliance with all permit conditions and state and federal regulations. All inspections are kept on file at the Landfill office for review.

## **XVII. FUGITIVE DUST ABATEMENT**

The landfill access road surface is constructed of cold mix asphalt. Internal landfill access roads are constructed of granulated borrow as shown on Exhibit 3B. Fugitive dust generation from internal site roads is minimal. Internal access roads are watered as necessary to prevent excessive generation of fugitive dust.

## **XVIII. FIRE / EXPLOSION CONTINGENCY PLAN**

During construction of the initial cell, an alternate disposal site capable of storing one month's waste was developed. The alternative disposal site is the soil excavation area used to generate daily cover soil. In the event of a fire or an explosion that prohibits deposition of incoming waste in the existing cell, materials received at the landfill are diverted to the alternate storage site and are covered daily with a minimum of six inches of soil. Upon resolution of the unexpected event, the materials are transported to their final disposal destination and treated as incoming waste.

Landfill fires and explosions are difficult to control and require different techniques than many incidents handled by local volunteer fire departments. For this reason fires and/or explosions at the Long Hollow Sanitary Landfill are managed by landfill personnel. However, local fire departments will respond to and provide assistance if requested by the landfill manager. The outline for procedures to follow in case of fire or explosion is:

1. Secure Affected Area
2. Divert Incoming Waste
3. Isolate Fire / Explosion
4. Suppress Incident if Possible
5. Request Additional Assistance if Needed
6. Report & Record Necessary Information

## **XIX. 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 Long Hollow Sanitary Landfill in the event concentration limits are exceeded in a down gradient compliance monitoring well.

Currently, there are no monitoring wells at the Long Hollow Landfill. However, if the concentrations of parameters in down gradient wells exceed the concentration limits as substantiated by confirmatory analysis, owners and operators of the Long Hollow Sanitary Landfill will implement a corrective action program as outlined in R315-308.

## **XX. CONTINGENCY PLAN FOR OTHER RELEASES**

This section describes corrective actions to be taken by the Long Hollow 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 exceeds acceptable limits as substantiated by confirmatory analysis, owners and operators of the Long Hollow Sanitary Landfill will implement a corrective action program approved by the Executive Secretary.

## **XXI. EQUIPMENT MAINTENANCE**

Active collection systems for leachate and / or explosive gases were not proposed or installed for the Long Hollow Sanitary Landfill. Therefore, no maintenance is required for these items.

Maintenance procedures for the equipment used in day to day operations are performed by landfill employees or contracted mechanics in accordance with manufacturers' recommendations and industry practices.

## **XXII. RUNON / RUNOFF CONTROL**

Wayne County will control the runon and runoff resulting from the 25 year event from contacting solid waste and leaving the landfill. This will be accomplished through a series of best management practices. Each cell is surrounded with berm style stockpiling of excess excavated soil. The berms are approximately 10 feet nominal height and prevent sides for unit 1. The absence of any roads and existing topography South and West of the unit eliminate the possibility of unauthorized vehicular traffic. Fencing in these areas is intended to discourage unauthorized foot traffic. Fencing in areas which are adjacent to the main road are 6 foot chain link. The lockable access gates are provided in these areas.

## **XXIII. DISEASE VECTOR CONTROL**

The primary method for disease vector control at the Long Hollow Landfill is providing appropriate cover at the close of each day's operation. The cover consists of a 6 inch minimum layer of earthen material.

Rodents and other vermin are not permitted to burrow in the active area of the landfill and trapping or extinction methods are implemented to protect the integrity of the disease vector control program.

## **III. ENGINEERING REPORT**

### **I. SITING CRITERIA**

The Long Hollow Sanitary Landfill complies with siting criteria currently mandated by Subtitle D 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 flood plain 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 are mitigated in accordance with State Historic Preservation Officer requirements. The Long Hollow Sanitary Landfill is not located in a dam failure flood area, above an underground mine, above a salt dome or bed, or adjacent to geologic features which could compromise the structural integrity of the facility. Additionally, the Class II disposal cells and the Class IVB disposal cells have no liners, and the leachate collection systems would not be damaged during a seismic event. Any damage on the surface could be easily repaired with onsite equipment.

### **II. LINER DESIGN**

Current volumes of solid waste disposed, as measured by scales serviced by the Long Hollow Landfill, are well below 20 tons per day, and the facility is eligible for small landfill design exemptions. The landfill meets all the requirements of the small landfill exemption as explained in R315-303-3(3)(e) i.e. the average precipitation is less than 25 inches per year, with no evidence of groundwater contamination, and no reasonable alternative. These exemptions include liner design and groundwater monitoring. When

average annual volumes exceed 20 tons per day, the Long Hollow Sanitary Landfill may have to design the next disposal cell with liners, leachate collection and groundwater monitoring. Final cover on the facility will be an Evapotranspiration Cover. This ET cover initially consists of at least 12 inches of native material from the approved source covered with at least 24 inches of additional soil to protect from frost damage. Managers of the landfill may (with approval of the Executive Secretary) install synthetic liners, covers, or other alternate systems if they are deemed to meet the code requirements.

Waste volumes are well below 20 tons per day, based on historical records. If accepted volumes increase dramatically and average daily volumes exceed 20 tons, the liner will be constructed, and the Executive Secretary may upgrade the landfill's classification to Class I status.

Final cover, leachate collection, and other design requirements associated with Class I status will be approved by the Executive Secretary prior to implementation.

### **III. BORROW SOURCES**

The Long Hollow Sanitary Landfill utilizes 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. Cell location utilizes excavated onsite material and provides for ongoing borrow operations.

If, for any reason, existing onsite soils become unsuitable, alternate borrow sources will be obtained and submitted to the Executive Secretary for approval.

### **IV. LEACHATE COLLECTION, TREATMENT AND DISPOSAL**

The Long Hollow Sanitary Landfill is a natural attenuation facility located in an arid region with favorable soil conditions. Water balance calculations indicate a negligible volume of leachate will be generated at the landfill. HELP Model simulations for an area left open to precipitation for 5 years indicate waste would be at wilting point during several periods of each year. The model also demonstrated an absence of leachate during the 5-year simulation. As a Class II facility, the landfill is exempt from leachate and collection design requirements.

The collection and treatment option described above for Class II status includes best management practices which minimize water infiltration. Components of the best management practices may include:

1. Diversion of intermittent washes for storms smaller than the 25 year event,
2. Berm-style construction and stockpiling operations,
3. Final cover as described above placed as soon as practical after final elevation,
4. Sloping of the final cover to promote runoff, and
5. Use of intermediate soil covers which resist infiltration.

### **V. LANDFILL GAS CONTROL AND MONITORING**

Due to the arid nature of the climate at the Long Hollow Sanitary Landfill and the low volume of waste accepted at the facility, landfill gas concentrations are not anticipated to reach significant levels. The large area of the facility is designed to accommodate dissipation of any landfill gases prior to reaching the property boundary. However, gas levels are monitored in all onsite landfill buildings to ensure the accumulation of explosive gases do not exceed 25% of the explosive limit.

Monitoring for landfill gases are conducted as part of the quarterly inspections performed by landfill managers. Concentrations are measured at each onsite structure, as shown on the Quarterly Inspection Report attached as Exhibit 7. Due to the extensive nature of the site, if concentrations at active or closed

areas are negligible, landfill managers may elect to eliminate monitoring at remote locations until a reasonable probability of detection exists.

Should unacceptable levels of landfill gases be detected, the Executive Secretary will be immediately notified and the contingency plans described in other areas of this permit will be implemented. Contingency plans will be in compliance with Section R315-303-3(5) of the Utah Solid Waste Permitting and Management Rules.

## **VI. CELL DESIGN AND OPERATION**

The Long Hollow 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 from south to north and from west to east.

Cells are approximately 40 feet in depth, and bottom widths range from 40 feet to 100 feet. Lengths of the cells vary with volumes of waste, season of the year, and soil stockpile needs. Current proposals contemplate providing a minimum of 1 year excess excavated area for growth and unexpected problems. Interior side slopes were originally 4: 1 and may be steepened to 2: 1 immediately before receiving waste to expand capacity and augment covering operations.

At the end of the work day, all waste received that day in the Class II disposal cell and the dead animal trench is spread, compacted, and covered with a minimum of 6 inches of native soil. The Class IVb disposal cell will receive a minimum six inches of soil on a regular frequency to avoid a fire hazard.

The 40 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. Three lifts may be accommodated in the nominal height.

Minimum equipment requirements at the Long Hollow Sanitary Landfill are limited to a track-type loader for daily operations and periodic use of additional equipment (dozer, scraper, grader, compactor, etc.) for specific covering, stockpiling, contouring and compacting operations. Initially, the facility had at least one piece of equipment dedicated to the landfill and utilized other equipment from the Wayne County Road Department equipment pool as needed. Over time, adequate equipment has been acquired to guarantee the needs of the landfill are met in a timely manner.

## **VII. CLOSURE AND POST CLOSURE**

Closure of active portions of the Long Hollow Sanitary Landfill contemplates controlling, minimizing, and eliminating threats to human health and the environment from post-closure escape of solid waste constituents, leachate, landfill gases, contaminated runoff, or waste composition products to the ground, groundwater, surface water, and the atmosphere. When an area of the landfill reaches final elevation, intermediate cover consisting of at least 12 inches of soil will be placed on the waste and graded to promote drainage.

Not more than 6 months after completion of the intermediate cover, an Evapotranspiration (ET) cover system is to be constructed. This ET cover consists of 24 inches of native soils from preapproved locations. The sample test results from the selected locations attached as Exhibit 8, all of these soils show permeability of less than  $2 \times 10^{-5}$  cm/sec at 95% compaction and a minimum porosity of 27.0. Given the annual average rainfall in western Wayne County is approximately 8 inches per year and evapotranspiration rates for common ground cover of 20 inches or more per year, minimal ground cover

will provide the evapotranspiration needed to prevent water from penetrating the ET cover. Even in the winter months (October thru April) with a total average precipitation of 3 inches, and given a minimum soil porosity of 27.0, the depth of moisture penetration is only anticipated to reach 12 inches. This calculation is conservative as no run off has been considered. A minimum of the top 6 inches of this native soil must be capable of supporting vegetative growth and cover the entire landfill. If it is determined that native vegetation is not establishing on its own and a seed mix of drought tolerant species should be introduced.

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 have not proposed for the Long Hollow Sanitary Landfill. Therefore, closure and post-closure activities associated with these functions will not be performed.

## **IV. GEOHYDROLOGICAL ASSESSMENT**

### **I. GEOLOGY**

The Long Hollow Landfill is situated in the high desert which makes up much of South Central Utah. The area is characterized by rugged mountains commonly known as the Fish Lake area and deep valleys of the Fremont River Basin. The landfill is located on the interface between the mountains and valleys with the surface made up of flat to rolling slopes of alluvial deposits of variable thickness. The elevation of the landfill is approximately 2,500 meters above sea level. East and down gradient of the landfill is the Fremont Valley near Loa. The valley is approximately 300 feet below the landfill's elevation.

Site specific geology of the landfill indicates the area predominantly covered by interbedded alluvial material. The surface material, characterized by silty sands, ranges in depth from 65 feet to 85 feet, and is slightly resistant to infiltration. Laboratory permeability rates for the material have been determined to be as low  $1.91 \times 10^{-6}$  cm/sec. The surface member is underlain by intermittent silts, sand and clays for a depth of 40 feet to 70 feet. This material overlays a very hard to moderately hard volcanic basalt which onsite drilling indicates is at least 165 feet thick. A detailed description of exploratory drill holes can be found in other sections of this permit application.

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. Onsite investigations demonstrate natural material will stand at slopes steeper than 2:1.

### **II. HYDROLOGY**

The climate in the area is mainly dry, semi-arid, and continental. The seasons are well defined, and there is a fairly wide daily range in temperature. The average length of the growing season at Loa is assumed to be approximately 138 days. In any given year the length of the growing season may vary considerably from the average. Average annual precipitation at Loa is less than 10 inches. The largest amount of precipitation is during the months of July and August and the least during February and March. Data kept by the weather bureau on the velocity of wind near the landfill are not available for the area. It would appear, however, that 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.

### **III. ONSITE SOIL PROPERTIES**

In order to determine onsite soil properties samples were obtained throughout the drilling depth of two exploratory drill holes located adjacent to an existing road which runs through the middle third of the active area of the landfill.

Data from the drill holes and topographic information indicate surface soils within the active area range from 65 feet to 85 feet in depth. Mechanical analysis and visual classification results indicate surface material is comprised of silty sands. Permeability of the material was also examined and found to be less than  $2 \times 10^{-5}$  cm/sec at 95% of maximum laboratory density. Exhibit 8 provides additional data concerning onsite soils.

### **IV. GROUNDWATER**

No groundwater was encountered during previous drilling operations. Two drill holes located within active portions of the landfill were drilled to a depth of 300 feet and 200 feet respectively. Information regarding depth to groundwater, aquifers, directional flow rate, and water quality data is not available. A well located in Section 3, Township 28 South, Range 2 East (more than 2 miles from the facility) indicates groundwater at a depth of more than 300 feet.

### **V. WELLS AND WATER RIGHTS**

Information was gathered from the State Engineer's office to determine quantity, location, and construction of any private and public wells within 2,000 feet of the landfill site. No wells were identified within the surveyed area. An expanded search determined the closest wells to the site are located in Section 3, Township 28 South, Range 2 East, 2 miles from active portions of the landfill. The 300 feet deep wells are separated from the landfill by two major drainages and more than 300 feet of topographic relief. Considering 1) the depth of the wells; 2) their distance from the landfill, and; 3) existing drainage patterns, the wells are considered hydraulically isolated from the landfill.

An examination of surface rights in the area was also conducted by the State Engineer's office. Six surface rights were found within the two sections occupied by the landfill. Each of the water rights is owned by the BLM and permits the withdrawal of water from intermittent streams and washes for stock watering. Exhibit 9 contains the documentation obtained from the State Engineer. Information is not available regarding background and surface water quality assessments in the area.

### **VI. SURFACE WATERS**

No perennial streams, rivers, or permanent surface waters exist within close proximity of the landfill. The closest known surface waters are some flowing wells located approximately 2 miles north of the landfill which have a flow line approximately 300 feet below the final elevation of waste. One intermittent wash, Long Hollow Wash, is located at the Northern boundary of the landfill. The drainage flows only during times of heavy precipitation. It should be noted that the wash is located north of an existing road and is hydraulically isolated from the landfill. 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.

### **VII. WATER BALANCE**

A worst case water balance for the site was performed utilizing the Army Corp of Engineers HELP Model, during the last application period, to assume leachate production. Estimates were developed utilizing temperature and precipitation data obtained from the Loa area and after examining soil properties determined from onsite drilling. Evapotranspiration was generated by the model using mean monthly

temperatures for the area and solarly indices corrected for latitude. Average annual values ranged from 95.6% to 99.5% of precipitation leaving less than 0.3 inches of available water for potential leachate production. In order to insure additional safety factor, onsite soils were given a permeability rate of only  $3.1 \times 10^{-3}$  cm/sec, the life of the cell was extended from 33 years (3 years active life & 30 years post closure) to 50 years (10 years active life & 40 years post closure), and it was assumed that all precipitation falling on the site throughout the 50 year period infiltrated the cover.

Results indicate no leachate was generated in the bottom 10 feet of waste; waste from 10 to 20 feet above the landfill bottom increased in moisture content less than 0.1 % during the 50 year evaluation period. Additional HELP Model simulations indicate more than 110 years are required for leachate to reach the landfill bottom considering the worst case scenario described above. Exhibits 10 and 11A – 11C are summary outputs from the HELP Model Evaluation.

## **VIII. WATER MONITORING SYSTEM**

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: onsite geologic and hydrologic conditions; water balance and leachate production modeling, and; 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 a complete absence of groundwater for a depth of 320 feet. Examination of the closest wells indicates groundwater at elevations 600 feet below the landfill. Permeabilities for the surface material at depths of 20 feet identify laboratory results as low as  $1 \times 10^{-6}$  cm/sec. The permeabilities are for silty sands, and drill logs indicate underlying material to be comprised of intermittent silts, sands and clays with the clays having layers 12 inches to 18 inches thick. These underlying materials are typically more impermeable than the surface material. The intermittent layers of alluvial soils reduce the downward movement of water and dissolved material. Drill holes also indicate consistency, demonstrating a continuous nature of the subsurface material.

In addition to the extreme depth to groundwater and soil conditions which minimize the potential for liquid migration, climatic conditions eliminate the production of significant amounts of leachate. Precipitation is considerably less than 10 inches per year, and potential evapotranspiration exceeds precipitation by more than 500%. 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. The HELP model analysis described above indicates several centuries of 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. The worst case scenario was developed with numerous safety factors including extended open operation, a 40 year post closure period, use of free draining materials instead of impermeable onsite materials, containment of all precipitation to infiltrate the cover, bare ground conditions during a 10 year open period, and uncompacted cover material. In spite of these considerable efforts to create leachate production, results indicate the potential for hazardous constituents reaching the groundwater does not exist. Actual conditions will result in a greater level of confidence and a lower production of leachate than identified by the model.

Operational practices also reduce the amount of water that could possibly come in contact with the waste. Surface waters are diverted by a series of ditches roads and berms designed to protect landfill cells from run on water for storms considerably greater than the 25 year event. Neglecting the exterior ditch, the

perimeter road which serves as a berm or a channel, the interior ditch, and any specific channelizing performed by Wayne County, the perimeter dike alone prevents flow resulting from the 500 year event from entering the landfill. The size and progression of the units 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 reduce ponding and promote drainage away from active areas; use of alternate daily covers prevent the infiltration of limited precipitation into the waste. The limited working face requires 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 suspend groundwater monitoring requirements in accordance with Subsection R315-303-3(1) of the Solid Waste Rules.

## **V. CLOSURE PLAN**

### **I. CLOSURE SEASON AND YEAR**

Closure operations at the Long Hollow Sanitary Landfill are performed on an ongoing basis. Adequate capacity exists at the landfill to continue operation for many, many years. A final closing date is estimated to be around Fall of 2012 on the existing cell. Ongoing closure operations are generally performed from May through October, the normal frost free construction period, or as weather permits. No area larger than one disposal unit will remain open longer than 6 months after reaching final elevation. For example, the first municipal solid waste disposal cell is 2.78 acres in size.

### **II. FINAL COVER, SEEDING, CONTOURING**

Closure operations will consist of leveling, contouring, placement of 24 inches of appropriate covers and seeding, if necessary, to reduce infiltration and preserve the integrity of the completed areas of the landfill. Areas of the landfill reaching final elevation will be closed within 6 months. 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. Upon completion of the ET cover, 6 inches of native material similar to existing topsoil will be placed. If it is determined that the native vegetation is not establishing a seed mixture shall be developed after consultation with either a BLM or NRCS 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 post closure status.

### **III. SITE CAPACITY**

Site capacity for the entire Long Hollow Sanitary Landfill is estimated upon the figures in Exhibit 3C. Assuming the initial 20 acre parcel, trench style operation (40 feet bottom width, 2: 1 side slopes, 40 feet depth), five 8 foot lifts of waste with 1.5 foot intermediate cover, and an average density of 900 lbs. per cubic yard, waste volumes are estimated at 486,000 cubic yards or 218,800 tons.

### **IV. CLOSURE TIMING AND NOTIFICATION**

Closure activities at the Long Hollow Sanitary Landfill will be performed on an ongoing basis. The operator shall notify the Executive Secretary of the intent to implement the closure plan in whole or part, 60 days prior to the projected final receipt of waste at the unit or facility. Closure will be initiated within

30 days after receipt of final volume of waste. Closure activities shall be completed within 180 days from their starting time. Within 90 days after closure is completed, as built drawings will be submitted to the Executive Secretary. 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.

## **VI. FINANCIAL ASSURANCE PLAN**

### **I. INTRODUCTION**

This section of the permit describes compliance with Subsection R31S-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.

### **II. MECHANISMS**

The mechanism used at the Long Hollow Sanitary Landfill is a dedicated escrow/capital improvement account. The account is established with the State Treasurer's Office, and the Utah State Treasurer serves as the escrow agent. A detailed set of procedures has been established by the Treasurer's office. 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 Long Hollow Sanitary landfill may alter the mechanism to include insurance, surety bonds, trust funds, or other options as they become feasible with Executive Secretary approval.

### **III. COST ESTIMATE**

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. A cost estimate detailing major closure and post closure components is included below. The Executive Secretary is identified as a required signatory on all withdrawals, and transactions affecting the integrity of the account are submitted to the Executive Secretary for approval.

**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.

1.0	Engineering and Preliminary Site Work				
1.1	Topographic Survey				
1.2	Boundary Survey for Closure				
1.3	Site Evaluation				
1.4	Development of Plans				
1.5	Contract Administration Bidding and Award				
1.6	Administrative Costs for the Certification of Final Cover and Closure Notice				
1.7	Project Management; Construction Observation and Testing				
1.8	Monitor Well Consultant Cost				
1.9	Other Environmental Permit Costs				
1.10	Disposal of Final Wastes				
1.10.1	Disposal Cost				
1.11	Remove Temporary Buildings				
1.12	Remove Equipment				
1.13	Repair/Replace Perimeter Fencing				
1.14	Clean Leachate Lines				
	Subtotal				
	10 % Contingency				
	Engineering Total				

5 \*SEE ATTACHED EXHIBIT 12: BROWN BROTHERS COST ESTIMATE FOR LANDFILL COVER

2.0	Construction				
2.1	Final Cover System				
2.1.1	Completion of Sidewall Liner				
2.1.1a	*Soil Placement 6" TOPSOIL	7.65 ACRES	\$2.00/YARD	6,187 CUBIC YRDS	\$12,374.00
2.1.1 b	Soil Processing				
2.1.1c	Soil Amendment				

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2.1.Id	Soil Purchase	ON-SITE			
2.1.1e	Soil Transportation				
2.1.2	Drainage Layer on Sidewall				
2.1.2a	Geotextile Filter Fabric				
2.1.2b	Geonet/Geotextile Composite				
2.1.2c	Geomembrane Sidewall Liner				
2.2	Completion of Top Cover				
2.2.1	Infiltration Layer (Compacted Clay)				
2.2.1a	*Soil Placement (Compacted) 18"	3.07 ACRES	\$3.00/YARD	7,513 YARDS	\$22,539.00
2.2.1b	Soil Processing				
2.2.1c	Soil Amendment				
2.2.1d	Soil Purchase				
2.2.1e	Transportation				
2.2.2	Geosynthetic Clay Layer				
2.2.2a	Geosynthetic Clay Installation				
2.2.3	Flexible Membrane Cover				
2.2.3a	Flexible Membrane Installation				
2.2.4	Drainage Layer				
2.2.4a	Geonet/Geotextile				
2.2.4b	Sand Layer				
2.2.4c	*Soil Cover 40" FROST FREE	2.3 ACRES	\$3.00/YARD	12,494 YARDS	\$37,482.00
2.2.4d	Geonet/Geotextile Composite				
2.3	Erosion Layer Placement				
2.4	Revegetation				
2.4.1	Seeding	7.65 ACRES	\$800.00/ACRE	1	\$6,120.00
2.4.2	Fertilize				
	TIRE REMOVAL	34 TON	\$100.00/TON	1	\$3,400.00
2.4.3	Mulch				
2.5	Site Grading and Drainage				
2.6	Site Fencing and Security				
2.7	Leachate Collection System Completion				
	Subtotal				
	10% Contingency				
	Construction Total				

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Solid Waste Program

3.0	Gas Collection System				
3.1	System Design				
3.2	Completion of Gas Collection System				
3.3	Equipment and Installation				
3.3.1	Place Sand				
3.3.2	Install Geonet and Geotextile				
3.3.3	Install Passive Vents				
3.3.4	Install, Rework, or Replace Gas Control Equipment				
	Subtotal				
	10% Contingency				
	Gas Collection Total				

4.0	Monitor Well Installation Cost				
4.1	Ground Water Monitoring Well Installation, Reworking, or Replacement				
4.2	Install, Rework, or Replace Methane Probe(s)				
4.3	Monitor Well, or Methane Probe Plugging				
	Subtotal				
	10% Contingency				
	Monitoring Well Total				
1.0	Engineering Costs				
1.1	Post-Closure Plan				
1.2	Site Inspection and Record keeping (annual)				
1.3	Correctional Plans and Specifications (annual)	Lump Sum	\$1,650.00	Each Year	\$49,500.00
1.4	Site Monitoring				
1.4.1	Ground Water Monitoring				
1.4.1 a	Ground Water Sample Collection				
1.4.1b	Ground Water Sample Analysis				
1.4.1c	Ground Water Sample Analysis, Review and Reporting				
1.4.2	Landfill Gas Monitoring				
1.4.2 a	Gas Monitoring Data Collection				

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Solid Waste Program

1.4.2 b	Gas Monitoring Data Review and Reporting	Lump Sum	\$150.00	Each Year	\$4,500.00
2.0	Maintenance Costs				
2.1	Cover Maintenance Costs				
2.1.1	Soil Replacement				
2.1.2	Vegetation Reseeding				
2.2	Equipment Maintenance				
2.2.1	Ground Water Well Maintenance and Replacement				
2.2.2	Methane Probe Maintenance and Replacement				
2.2.3	Gas Collection System Operation				
2.2.4	Gas Collection Maintenance and Repair				
2.2.5	Leachate Collection System				
2.2.5a	Leachate Collection System Repair and Maintenance				
2.2.5b	Clean Leachate Lines				
3.0	Final Plugging of Methane Wells				
3.1	Final Plugging of Methane Probes				
3.2	Final Plugging of Ground Water Monitoring Wells				
3.3	Gas Control Equipment Removal				
4.0	Leachate Disposal				
5.0	Site Maintenance				
5.1	Repair of Surface Water Diversion Structures				
5.2	Repair of Fences and Gates	Lump Sum	\$250.00	Each Year	\$7,500
5.3	General Maintenance				
	Subtotal				
	10% Contingency				
	Post-Closure Care Total				

Total Closure and Post-Closure Costs

Total Closure Costs:	\$81,915.00	x 1.021 = \$83,635.21
Total Post-Closure Care Costs:	\$67,230.00	x 1.021 = \$68,641.83
Total Cost:	\$149,145.00	\$152,277.04

## **EXHIBITS**

Exhibit 1: General Vicinity Topography Map

Exhibit 2: Landfill Survey Map

Exhibit 3A: Landfill Roads, Drainage and Fencing

Exhibit 3B: Landfill Typical Sections and Details

Exhibit 3C: Landfill Cell Cross Sections

Exhibit 3D: Landfill Site Development Plan

Exhibit 3E: Landfill Overall Site Plan

Exhibit 4: "Weighed on Fairbanks Scale" Receipt

Exhibit 5: Daily Operating Record

Exhibit 6: Waste Load Inspection Form

Exhibit 7: Quarterly Inspection Form

Exhibit 8: On-Site Soil Data

Exhibit 9: Wells and Water Rights

Exhibit 10: Leachate Characteristics

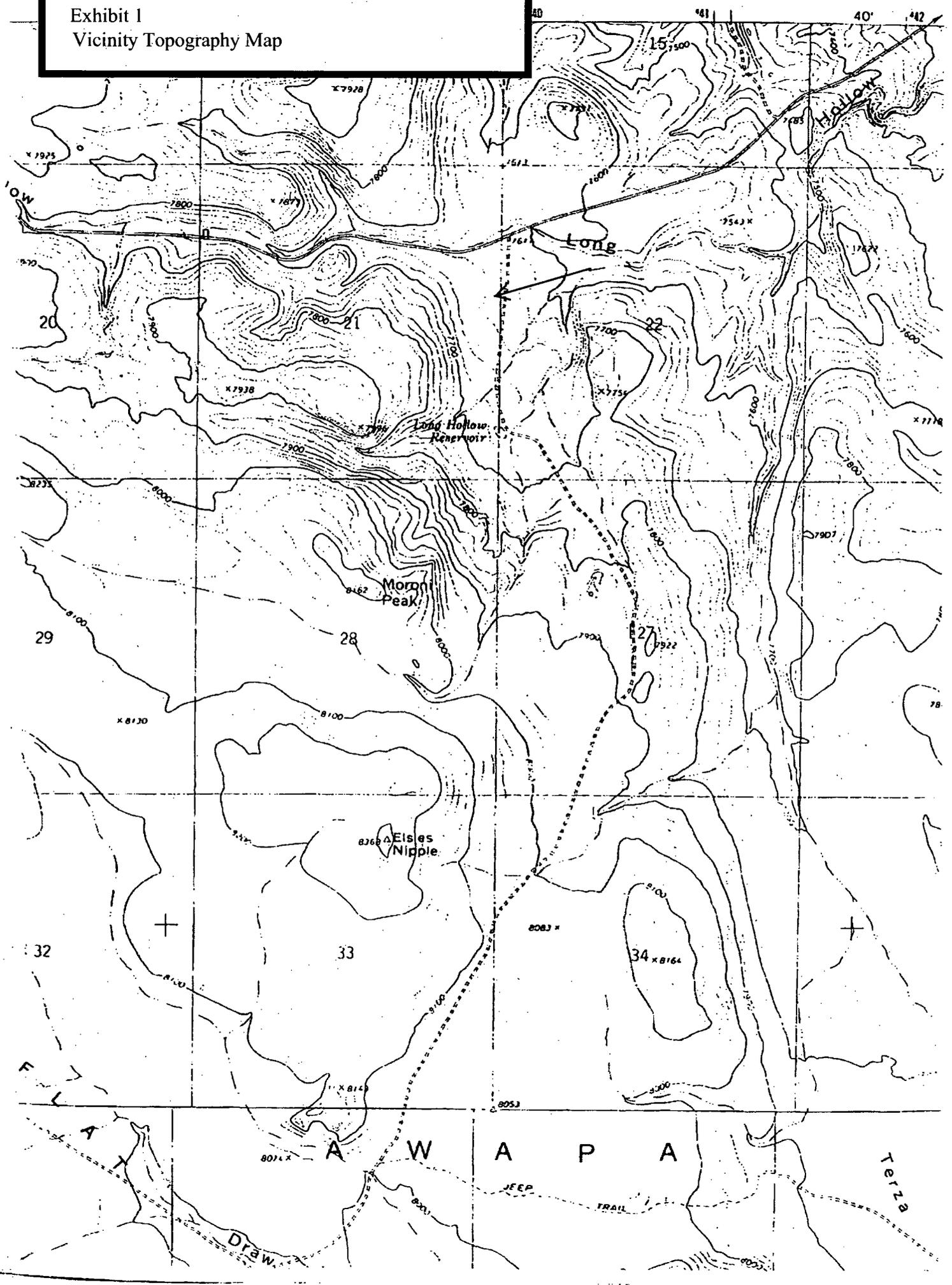
Exhibit 11: Water Balance Calculations

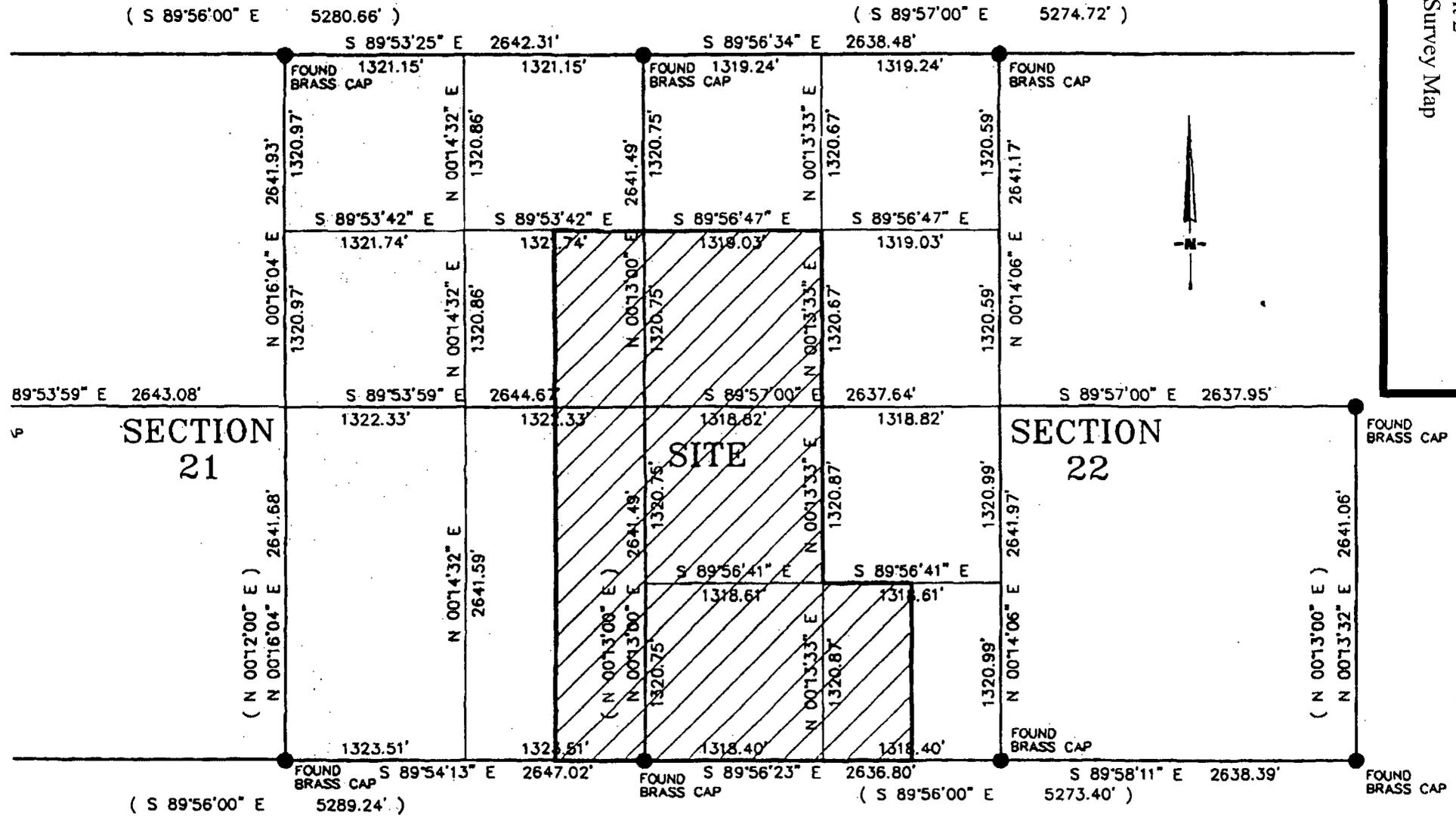
Exhibit 12: Brown Brothers Cost Estimate for Landfill Cover Costs

Exhibit 13: State Treasurer Account Information

Exhibit 14: Estimated Consumptive Use Tables

Exhibit I  
Vicinity Topography Map

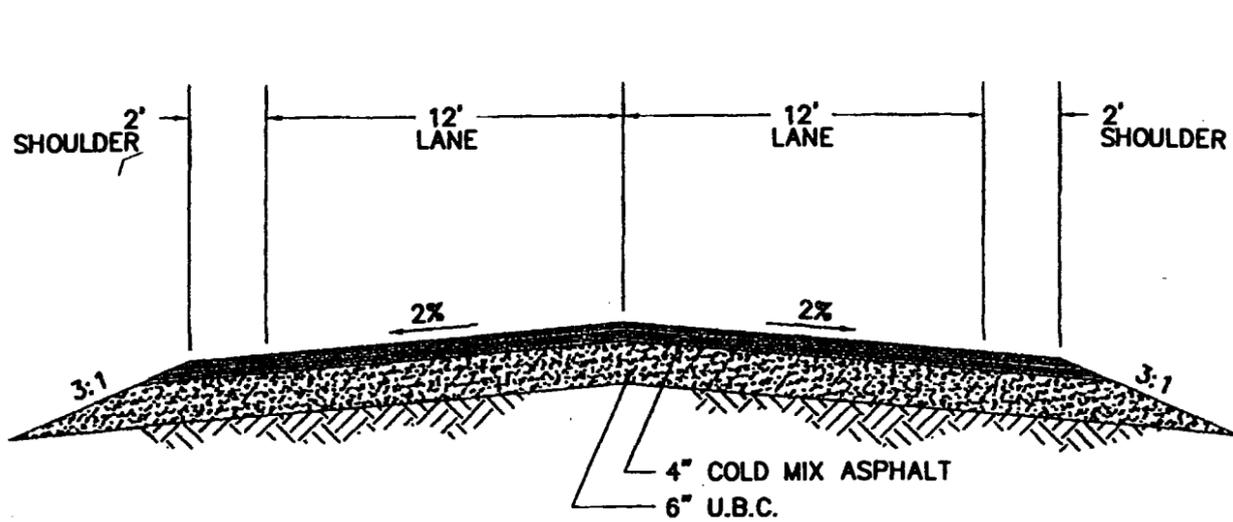




**SECTION BREAKDOWN**

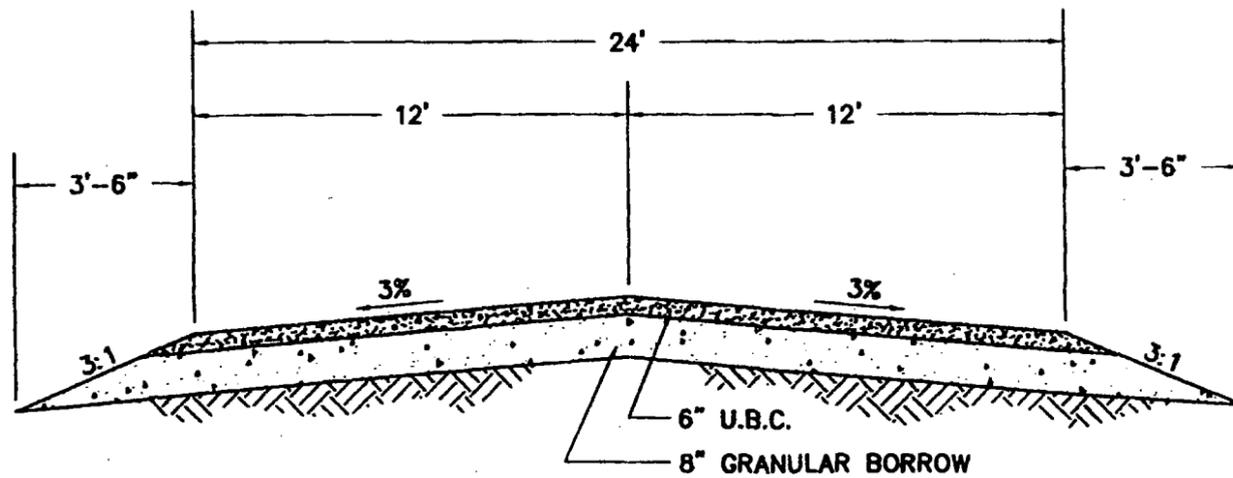
59.30'





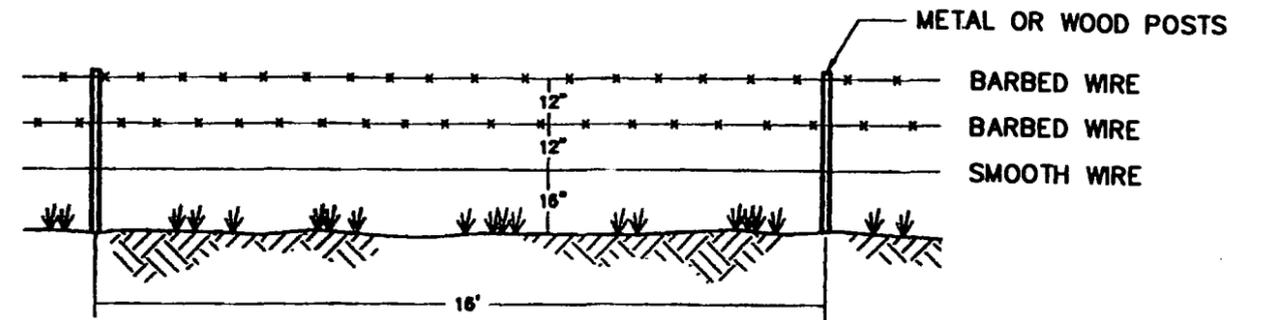
**TYPICAL #1**

LANDFILL ACCESS ROAD  
DESIGN SPEED: 30 mph

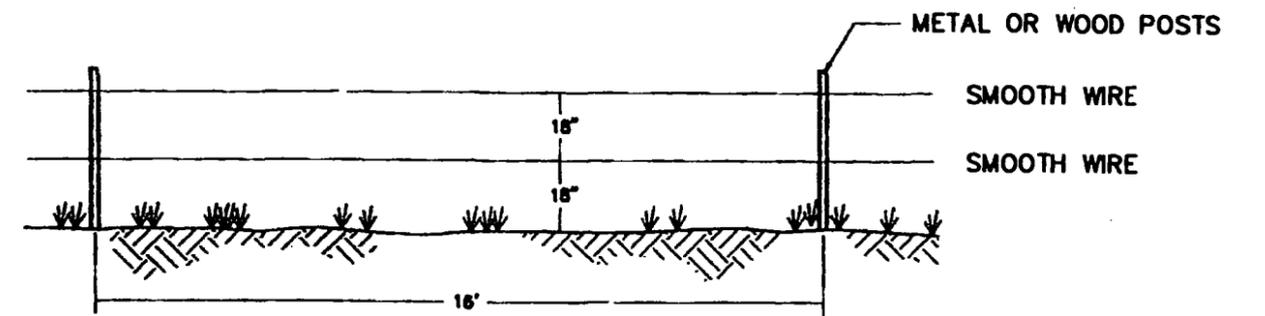


**TYPICAL #2**

LANDFILL ON-SITE ROADWAY

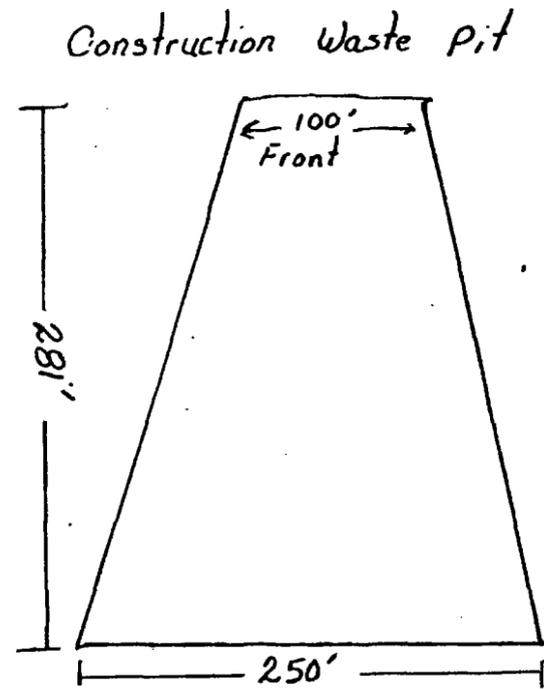


**3-STRAND WIRE  
BIG GAME FENCE**

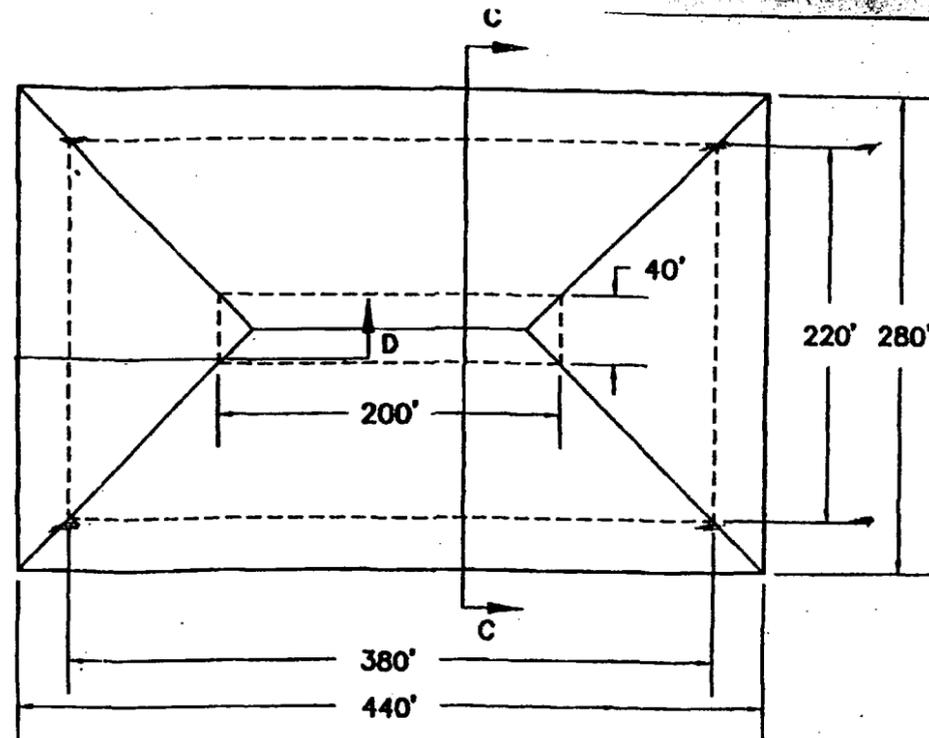


**2-STRAND WIRE FENCE**

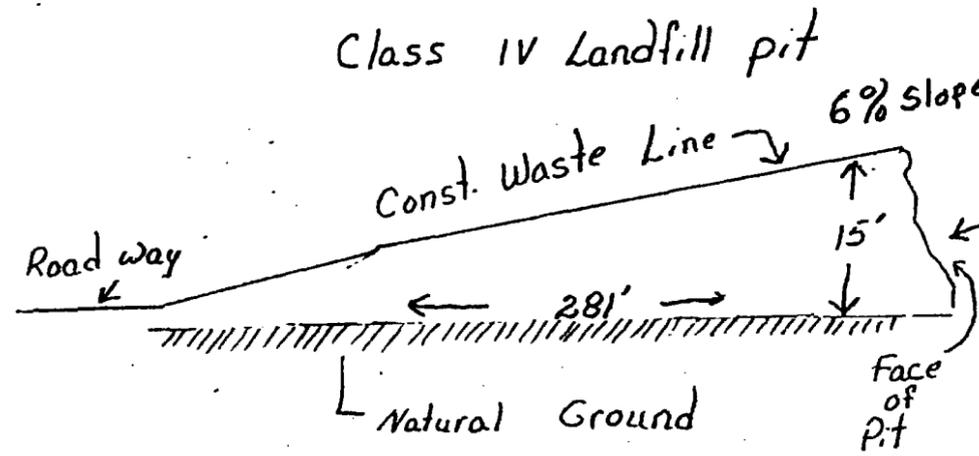
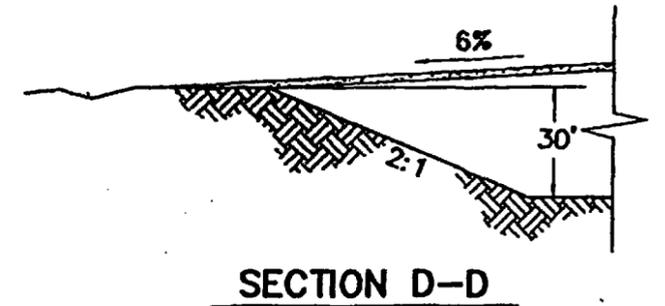
ENGINEER T.D.D.	DRAWN J.L.A.	SHEET NO.  <b>2</b>
CHECKED K.B.M.	PROJ: 0303-041 DWG.NM: TYP-SEC	
SCALE AS NOTED	DATE 03/24/2003	



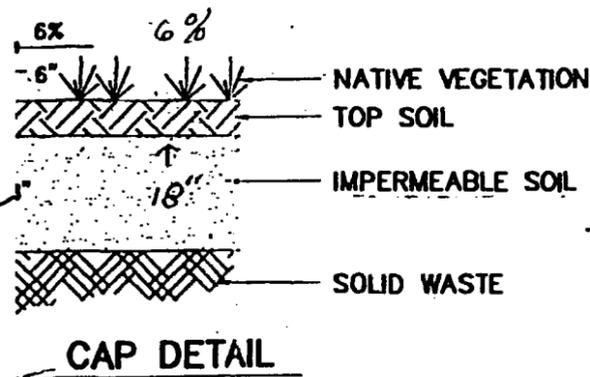
18" Compacted  
Top Soil - 6"



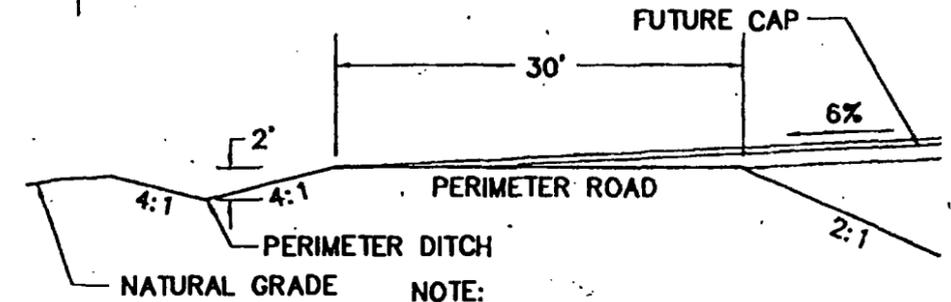
CLASS II LANDFILL PITS



WASTE PIT SECTION

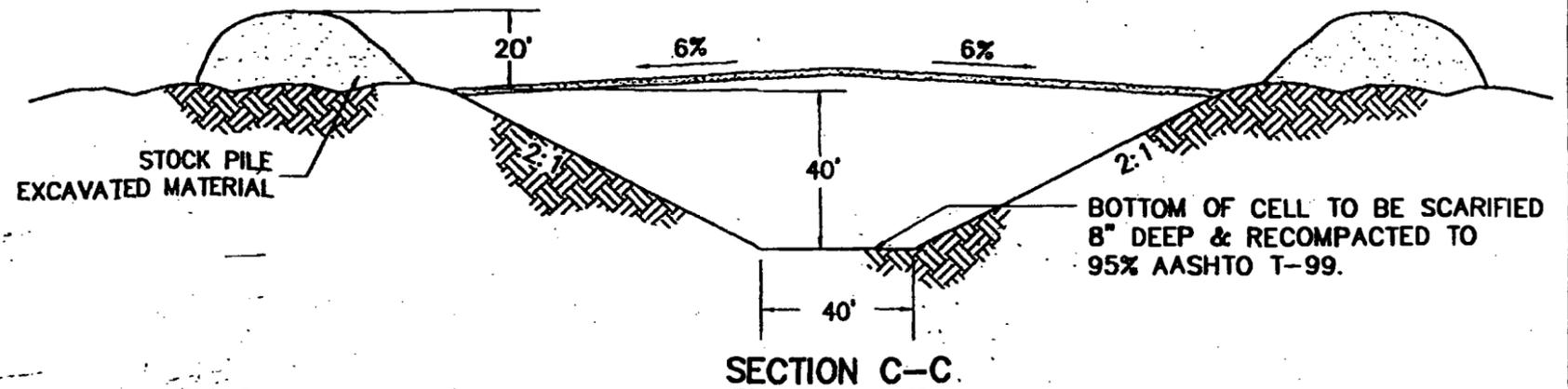


CAP DETAIL



NOTE:  
1. GRADE CELL PERIMETER DITCHES  
TO DRAIN AWAY FROM CELL

**CELL BERM DETAIL**  
(RUN-ON/RUN-OFF CONTROL)



SECTION C-C

Exhibit 3B  
Landfill Cell Cross Sections

WAYNE COUNTY LANDFILL  
CELL CROSS SECTIONS

ENGINEER T.D.D.	DRAWN J.L.A.	SHEET NO. <b>3</b>
CHECKED K.B.M.	PROJ: 0303-041 DWG. NO: CELL-SEC	
SCALE AS NOTED	DATE 03/24/2003	

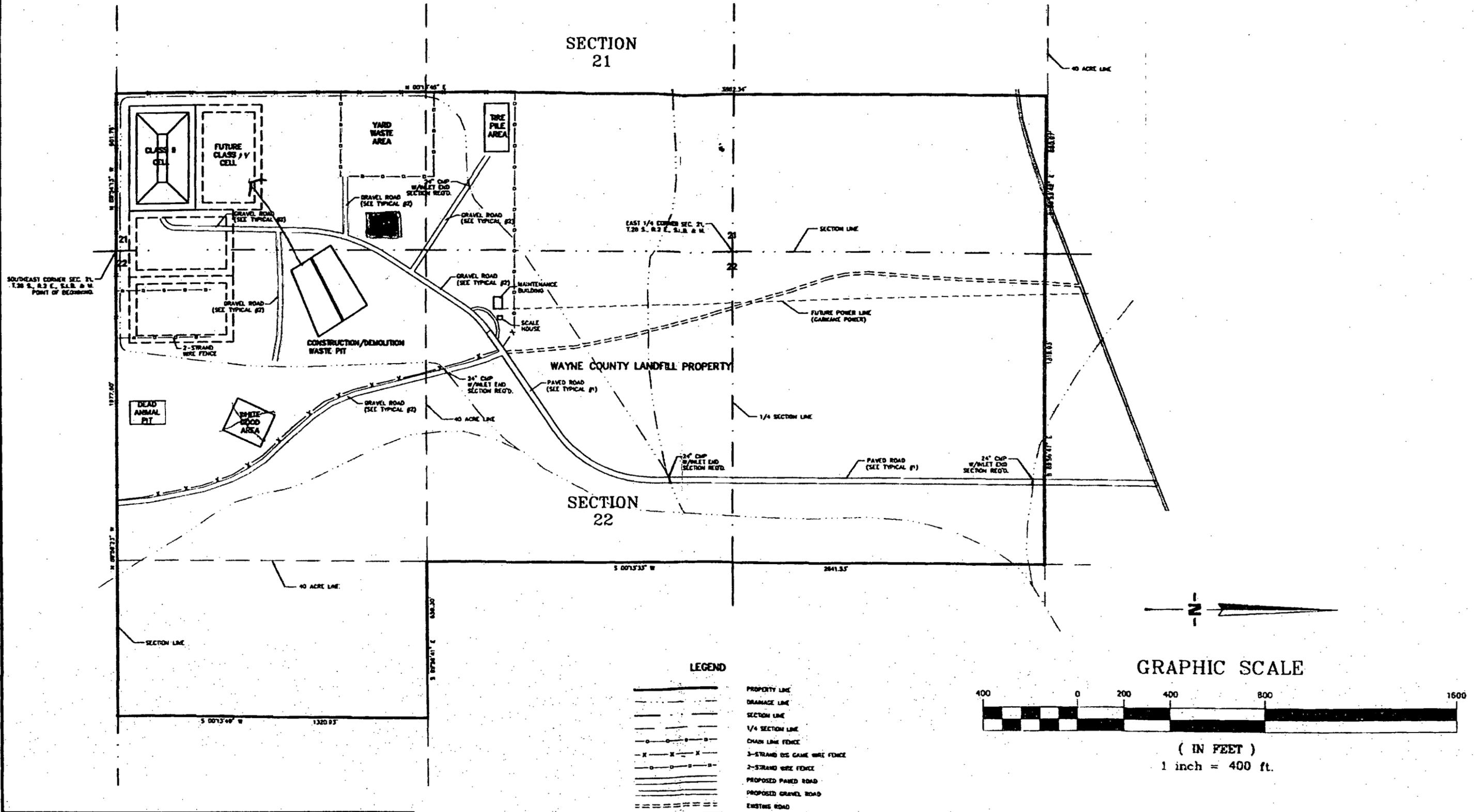


Exhibit 3D  
Landfill Overall Site Plan

## WAYNE COUNTY LANDFILL OVERALL SITE PLAN

ENGINEER T.D.D.	DRAWN J.L.A.	SHEET NO.
CHECKED K.B.M.	PROJ# 0303-041 DWG NM: OVERALL	<b>4</b>
SCALE 1"=400'	DATE 03/25/2003	

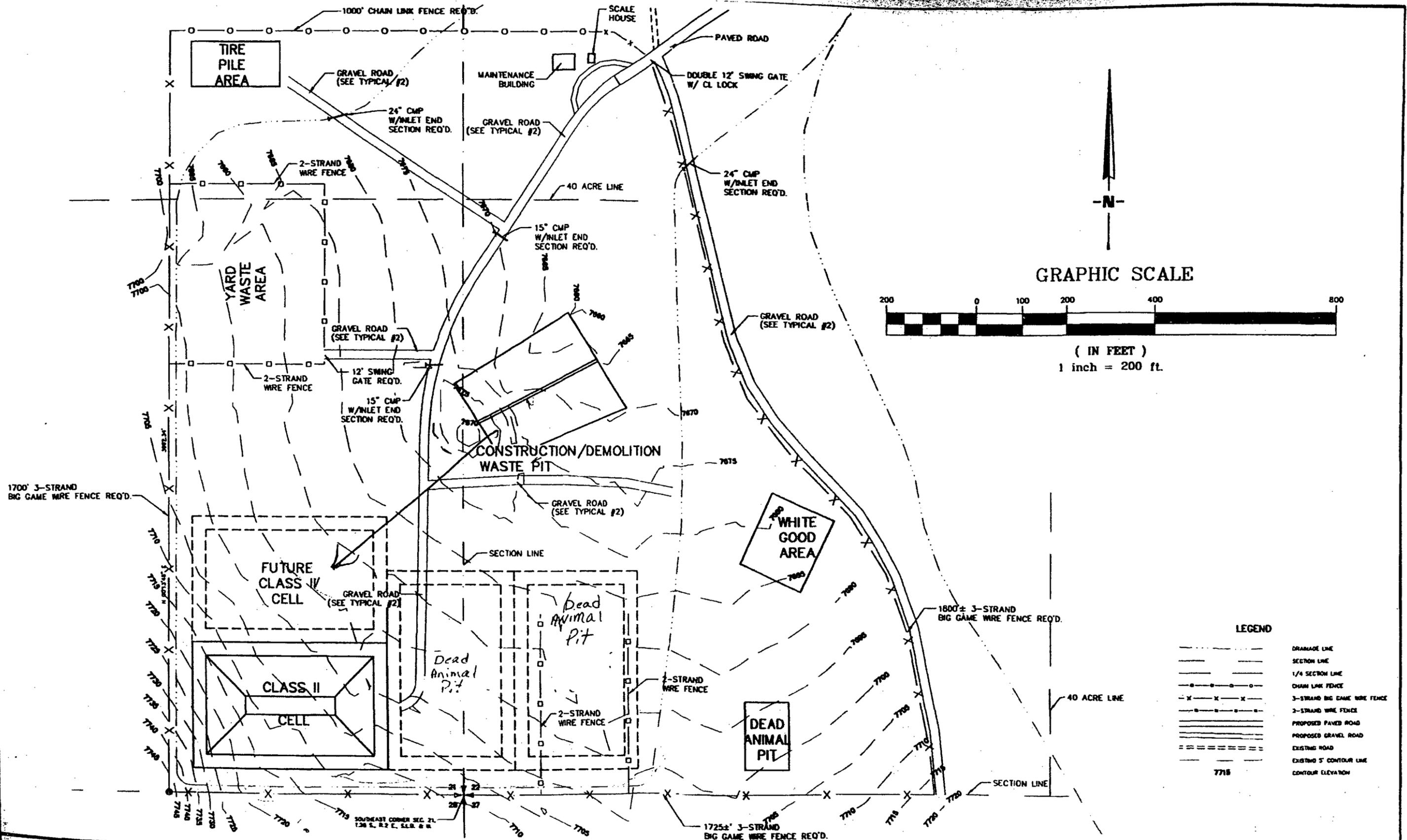


Exhibit 3C  
Landfill Site Development Plan

# WAYNE COUNTY LANDFILL SITE DEVELOPEMENT PLAN

ENGINEER T.D.D.	DRAWN J.L.A.	SHEET NO.  <b>5</b>
CHECKED K.B.M.	PROJ#: 0303-041 DWG. NAME: SITE	
SCALE 1"=200'	DATE 03/25/2003	

Exhibit 4:  
"Weighed on Fairbanks Scale" Receipt

FAIRBANKS SCALES NKC.MO 1-800-821-3322

**WEIGHED ON A FAIRBANKS SCALE**

CUSTOMER'S NAME \_\_\_\_\_

ADDRESS \_\_\_\_\_

COMMODITY \_\_\_\_\_

CARRIER \_\_\_\_\_

INBOUND DATE                      TIME  
OUTBOUND DATE                      TIME

DRIVER ON \_\_\_\_\_ OFF \_\_\_\_\_

SHIPPER \_\_\_\_\_

WEIGHER \_\_\_\_\_

FAIRBANKS SCALE CAT. 16288

**WAYNE COUNTY LONG HOLLOW LANDFILL**

Daily Operating Record:

Date: \_\_\_\_\_

Operator: \_\_\_\_\_

Waste Origin			Total Weight	Total Volume	Waste Type	Total Weight	Total Volume	Total Loads	No Waste Inspection
<b>Loa, Fremont</b>	County Truck				Household				
	No Large Trucks				Construction Debris				
	No Pickups				Yard Waste				
	No Cars				Dead Animals				
					Tires				
				Metals					
<b>Bicknell, Lyman</b>	County Truck				Household				
	No Large Trucks				Construction Debris				
	No Pickups				Yard Waste				
	No Cars				Dead Animals				
					Tires				
				Metals					
<b>Teasdale, Torrey</b>	County Truck				Household				
	No Large Trucks				Construction Debris				
	No Pickups				Yard Waste				
	No Cars				Dead Animals				
					Tires				
				Metals					
<b>Caineville, Haksville</b>	County Truck				Household				
	No Large Trucks				Construction Debris				
	No Pickups				Yard Waste				
	No Cars				Dead Animals				
					Tires				
				Metals					
<b>Capitol Reef National Park</b>	County Truck				Household				
	No Large Trucks				Construction Debris				
	No Pickups				Yard Waste				
	No Cars				Dead Animals				
					Tires				
				Metals					
<b>Other (Fed/State Lands)</b>	County Truck				Household				
	No Large Trucks				Construction Debris				
	No Pickups				Yard Waste				
	No Cars				Dead Animals				
					Tires				
				Metals					

Exhibit 6:  
Waste Load Inspection Form

**WASTE INSPECTION FORM**

WAYNE COUNTY LANDFILL  
SOLID WASTE DISPOSAL SITE  
WASTE INSPECTION FORM

Date \_\_\_\_\_ Time \_\_\_\_\_ Truck \_\_\_\_\_

Hauler \_\_\_\_\_ License Plate # \_\_\_\_\_

Source of Waste (Generator) \_\_\_\_\_

Type of Waste \_\_\_\_\_

Driver's Name \_\_\_\_\_ Driver's Signature \_\_\_\_\_

Type of recyclable material found in load:

- |              |                          |          |                          |           |                          |
|--------------|--------------------------|----------|--------------------------|-----------|--------------------------|
| Cardboard    | <input type="checkbox"/> | Plastics | <input type="checkbox"/> | Newsprint | <input type="checkbox"/> |
| Metal        | <input type="checkbox"/> | Boxboard | <input type="checkbox"/> | Glass     | <input type="checkbox"/> |
| Office Paper | <input type="checkbox"/> | Other    | <input type="checkbox"/> |           |                          |

Is there hazardous waste, dangerous goods or other prohibited waste in the load?

- No - no further action, sign form       Yes - record type of waste

Type of hazardous waste prohibited materials found in load:

- |                      |                          |            |                          |       |                          |
|----------------------|--------------------------|------------|--------------------------|-------|--------------------------|
| Propane Cylinders    | <input type="checkbox"/> | Oil        | <input type="checkbox"/> | Other | <input type="checkbox"/> |
| Automotive Batteries | <input type="checkbox"/> | Paint Cans | <input type="checkbox"/> | Other | <input type="checkbox"/> |

Description of Waste \_\_\_\_\_

\_\_\_\_\_

Actions Taken \_\_\_\_\_

\_\_\_\_\_

Inspector's Signature \_\_\_\_\_ Date \_\_\_\_\_

Any waste suspected to be a regulated hazardous waste will be reported to the Red Deer Regional Health Unit and the Alberta Environment Protection's Pollution Control Division.

## WAYNE COUNTY LANDFILL QUARTERLY INSPECTION FORM

Performed by \_\_\_\_\_ Date \_\_\_\_\_

		Overall Condition	
		Satisfactory	Needs Work*
<b>I. Structures and Roads</b>			
1.	Buildings	<input type="checkbox"/>	<input type="checkbox"/>
2.	Fences	<input type="checkbox"/>	<input type="checkbox"/>
3.	Gates	<input type="checkbox"/>	<input type="checkbox"/>
4.	Road leading to facility	<input type="checkbox"/>	<input type="checkbox"/>
5.	Inside perimeter road	<input type="checkbox"/>	<input type="checkbox"/>
6.	Gas monitor levels	<input type="checkbox"/>	<input type="checkbox"/>

\*Specify recommended repairs and/or list actions taken: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

<b>II. Operations</b>			
1.	Litter and weed control	<input type="checkbox"/>	<input type="checkbox"/>
2.	Excavations	<input type="checkbox"/>	<input type="checkbox"/>
3.	Daily cover	<input type="checkbox"/>	<input type="checkbox"/>
4.	Final cover	<input type="checkbox"/>	<input type="checkbox"/>
5.	Waste Piles		
	A. Appliances	<input type="checkbox"/>	<input type="checkbox"/>
	B. Construction/Demolition	<input type="checkbox"/>	<input type="checkbox"/>
	C. Tires	<input type="checkbox"/>	<input type="checkbox"/>
	D. Inert waste	<input type="checkbox"/>	<input type="checkbox"/>
	E. Car bodies	<input type="checkbox"/>	<input type="checkbox"/>
	F. Yard waste	<input type="checkbox"/>	<input type="checkbox"/>
6.	Recyclables/Furniture storage area	<input type="checkbox"/>	<input type="checkbox"/>

\*Specify recommended repairs and/or list actions taken: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Exhibit 8:  
On-Site Soil Data

**RB&G ENGINEERING, INC.**  
1435 West 820 North, Provo, Utah 84601  
801 374-5771 Provo ■ 801 521-5771 SLC ■ 801 374-5773 Fax  
AASHTO Accredited Laboratory

Project no. 201108-016  
Report no. 1005021  
Sheet 1 of 1

# Project Report

Project WAYNE COUNTY LANDFILL  
Location Wayne County, Utah  
Date/Day of week 10-14-11  
Report by J. Boone  
Staff Position Lab Manager  
Weather N/A

## Description of Work/Observations

Sample No.	Classification uses (AASHTO)	% Gravel >4.75 mm	% Sand 4.75 to 0.075 mm	% Silt 0.075 to 0.002 mm	% Clay <0.002 mm	Plasticity Index	Proctor ASTM D698	Total Porosity	Permeability @ 96% Compaction	
									ft/yr	cm/sec
1	Brown silty sand with gravel, SM (A-1-b(o))	22	64	12	2	NP	115.6 pcf @ 13.2% moisture	30.0	19.84	1.92 x 10 <sup>-5</sup>
2	Red silty sand with gravel, SM (A-2-4(o))	21	58	17	4	NP	91.2 pcf @ 19.6% moisture	28.9	15.98	1.54 x 10 <sup>-5</sup>
3	Light brown silty sand with gravel, SM, (A-1-b(o))	26	55	14	5	NP	109.3 pcf @ 18.5 % moisture	36.1	11.66	1.13 x 10 <sup>-5</sup>
4	Light brown silty sand with gravel, SM (A-1-b(o))	26	52	20	2	NP	120.2 pcf @ 12.2% moisture	27.0	19.12	1.85 x 10 <sup>-5</sup>

NP = Non-plastic

TECHNICAL RESPONSIBILITY: Bradford E. Price, principal; Jacob Boone, materials laboratory manager  
DISTRIBUTION LIST: SAVAGE SURVEYING, INC.  
CLIENT/CLIENT REP: SAVAGE SURVEYING, INC./Ryan Savage  
DATE PRINTED: 10/14/2011

CONTRACT NO. 201108-016.1  
D:\REPORTS\1005021

**RB&G ENGINEERING, INC.**  
1435 West 820 North, Provo, Utah 84601  
801 374-5771 Provo ■ 801 521-5771 SLC ■ 801 374-5773 Fox  
AASHTO Accredited Laboratory

Project no. 201108-016  
Report no. 1005021  
Sheet 1 of 1

# Project Report

Project WAYNE COUNTY LANDFILL  
Location Wayne County, Utah  
Date/Day of week 10-14-11  
Report by J. Boone  
Staff Position Lab Manager  
Weather N/A

## Description of Work/Observations

Sample No.	Classification uses (AASHTO)	% Gravel >4.75 mm	% Sand 4.75 to 0.075 mm	% Silt 0.075 to 0.002 mm	% Clay <0.002 mm	Plasticity Index	Proctor ASTM D698	Total Porosity	Permeability @ 96% Compaction	
									ft/yr	cm/sec
1	Brown silty sand with gravel, SM (A-1-b(0))	22	64	12	2	NP	1.9519 g/cm <sup>3</sup> 115.6 pcf @ 13.2% moisture	30.0	19.84	1.92 x 10 <sup>-5</sup>
2	Red silty sand with gravel, SM (A-2-4(0))	21	58	17	4	NP	1.46 91.2 pcf @ 19.6% moisture	28.9	15.98	1.54 x 10 <sup>-5</sup>
3	Light brown silty sand with gravel, SM, (A-1-b(0))	26	55	14	5	NP	1.751 109.3 pcf @ 18.5% moisture	36.1	11.66	1.13 x 10 <sup>-5</sup>
4	Light brown silty sand with gravel, SM (A-1-b(0))	26	52	20	2	NP	1.9256 120.2 pcf @ 12.2% moisture	27.0	19.12	1.85 x 10 <sup>-5</sup>

NP = Non-plastic

heavy sand LS

sandy loam SL

HYDGRP = A

course sandy loam  
COSH

TECHNICAL RESPONSIBILITY: Bradford E. Price, principal; Jacob Boone, materials laboratory manager  
DISTRIBUTION LIST: SAVAGE SURVEYING, INC  
CLIENT/CLIENT REP. SAVAGE SURVEYING, INC./Ryan Savage  
DATE PRINTED: 10/14/2011

CONTRACT NO. 201108-016.1  
O:\REPORTS\1005021

**Exhibit 8:  
On-Site Soil Data**

**CENTRAL UTAH TESTING & INSPECTION**

**SIEVE ANALYSIS: AGGREGATES (ASTM C136-95 AASHTO T27-93)  
MATERIALS FINER THAN No. 200 SCREEN (ASTM C117-95 AASHTO T11-91)**

CLIENT: SAVAGE SURVEY                      JOB#: 1195                      DATE: 08/10/11  
 PROJECT: WAYNE COUNTY LANDFILL  
 SAMPLE LOCATION: NORTH END TOP  
 MATERIAL TYPE: SM SILTY SAND  
 TESTED BY: JC                      SAMPLED BY: CLIENT                      LAB #: 6432

Sieve Size	Weight Retained	Percent Retained	Percent Passing	Band/Target
6 in. (150mm)		0.0	100	
3 in. (75mm)		0.0	100	
1 1/2 in. (37.5mm)		0.0	100	
1 in. (25mm)		0.0	100	
3/4 in. (19mm)		0.0	100	
1/2 in. (12.5mm)	11.5	1.2	99	
3/8 in. (9.5mm)	13.2	1.3	97	
# 4 (4.75mm)	45.1	4.6	93	
# 8 (2.36mm)	78.1	7.9	85	
# 10 (2.00mm)	28.2	2.9	82	
# 30 (600um)	154.2	15.6	66	
# 40 (425um)	44.2	4.5	62	
#100 (150um)	141.5	14.4	48	
#200 (75um)	133.7	13.6	34.1	
-#200 (-75um)	22.0			

Total Sample Aggregate Weight: 985.7                      After Wash Weight: 671.7

REMARKS: \_\_\_\_\_

I certify that this test was performed in accordance with ASTM C117-95 & C136-95/AASHTO T11-91 & T27-93.

P.O. BOX 427 CENTERFIELD, UT. 84622

(435) 528-5711

(435) 528-5710

**Exhibit 8:  
On-Site Soil Data**

**CENTRAL UTAH TESTING & INSPECTION**

**SIEVE ANALYSIS: AGGREGATES (ASTM C136-95 AASHTO T27-93)  
MATERIALS FINER THAN No. 200 SCREEN (ASTM C117-95 AASHTO T11-91)**

CLIENT: SAVAGE SURVEY \_\_\_\_\_ JOB#: 1195 \_\_\_\_\_ DATE: 08/10/11 \_\_\_\_\_  
 PROJECT: WAYNE COUNTY LANDFILL \_\_\_\_\_  
 SAMPLE LOCATION: SOUTH END TOP \_\_\_\_\_  
 MATERIAL TYPE: SM SILTY SAND \_\_\_\_\_  
 TESTED BY: JC \_\_\_\_\_ SAMPLED BY: CLIENT \_\_\_\_\_ LAB #: 6436 \_\_\_\_\_

Sieve Size	Weight Retained	Percent Retained	Percent Passing	Band/Target
6 in. (150mm)		0.0	100	
3 in. (75mm)		0.0	100	
1 1/2 in. (37.5mm)		0.0	100	
1 in. (25mm)		0.0	100	
3/4 in. (19mm)		0.0	100	
1/2 in. (12.5mm)	30.8	3.1	97	
3/8 in. (9.5mm)	8.5	0.9	96	
# 4 (4.75mm)	78.9	7.9	88	
# 8 (2.36mm)	101.7	10.2	78	
# 10 (2.00mm)	22.6	2.3	76	
# 30 (600um)	97.0	9.7	66	
# 40 (425um)	34.0	3.4	62	
#100 (150um)	188.9	19.0	44	
#200 (75um)	164.8	16.5	27.0	
-#200 (-75um)	18.0			

Total Sample Aggregate Weight: 995.8 \_\_\_\_\_ After Wash Weight: 745.2 \_\_\_\_\_

REMARKS: \_\_\_\_\_

I certify that this test was performed in accordance with ASTM C117-95 & C136-95/AASHTO T11-91 & T27-93. \_\_\_\_\_

P.O. BOX 427 CENTERFIELD, UT. 84622

(435) 528-5711

(435) 528-5710

**Exhibit 8:  
On-Site Soil Data**

**CENTRAL UTAH TESTING & INSPECTION**

**SIEVE ANALYSIS: AGGREGATES (ASTM C136-95 AASHTO T27-93)  
MATERIALS FINER THAN No. 200 SCREEN (ASTM C117-95 AASHTO T11-91)**

CLIENT: SAVAGE SURVEY JOB#: 1195 DATE: 08/10/11  
 PROJECT: WAYNE COUNTY LANDFILL  
 SAMPLE LOCATION: NORTH END 4' DOWN  
 MATERIAL TYPE: SM SILTY SAND  
 TESTED BY: JC SAMPLED BY: CLIENT LAB #: 6434

Sieve Size	Weight Retained	Percent Retained	Percent Passing	Band/Target
6 in. (150mm)		0.0	100	
3 in. (75mm)		0.0	100	
1 1/2 in. (37.5mm)		0.0	100	
1in. (25mm)		0.0	100	
3/4 in. (19mm)		0.0	100	
1/2 in. (12.5mm)	14.4	1.3	99	
3/8 in. (9.5mm)	6.7	0.6	98	
# 4 (4.75mm)	67.4	6.1	92	
# 8 (2.36mm)	119.4	10.9	81	
# 10 (2.00mm)	38.8	3.5	78	
# 30 (600um)	193.2	17.6	60	
# 40 (425um)	46.1	4.2	56	
#100 (150um)	136.2	12.4	43	
#200 (75um)	130.2	11.9	31.5	
#200 (-75um)	22.7			

Total Sample Aggregate Weight: 1098.5 After Wash Weight: 775.1

REMARKS: \_\_\_\_\_

I certify that this test was performed in accordance with ASTM C117-95 & C136-95/AASHTO T11-91 & T27-93. \_\_\_\_\_

P.O. BOX 427 CENTERFIELD, UT. 84622

(435) 528-5711

(435) 528-5710

Output Listing

Version: 2009.05.06.00      Rundate: 07/11/2012 07:15 PM

Search of Section 14, Township 28S, Range 2E, SL b&m Criteria:wrtypes=W,C,E podtypes=S,U,D,Sp,P,R,T status=U,A,P usetypes=all

SW/NE	NE/NE	SW/NE 95-2178	NE/NE
SW/NE	SE/NE	SW/NE	SE/NE 95-2176
SW/SE	NE/SE	SW/SE	NE/SE 95-2191
SW/SE	SE/SE 95-2191	SW/SE	SE/SE

0    350    700    1050    1400 ft

Water Rights

WR Number	Diversion Type/Location	Well Log	Status	Priority	Uses	CFS	ACFT	Owner Name
95-2191	Point to Point N660 W660 S4 14 28S 2E SL		P	18760000	OS	0.000	0.000	RICHFIELD DISTRICT USA BUREAU OF LAND MANAGEMENT 150 EAST 900 NORTH
95-2176	Point to Point N660 W660 E4 14 28S 2E SL		P	18760000	OS	0.000	0.000	RICHFIELD DISTRICT USA BUREAU OF LAND MANAGEMENT 150 EAST 900 NORTH
95-2178	Point to Point S660 E660 N4 14 28S 2E SL		P	18760000	OS	0.000	0.000	RICHFIELD DISTRICT USA BUREAU OF LAND MANAGEMENT 150 EAST 900 NORTH
95-2191	Point to Point S660 W660 E4 14 28S 2E SL		P	18760000	OS	0.000	0.000	RICHFIELD DISTRICT USA BUREAU OF LAND MANAGEMENT 150 EAST 900 NORTH



# Utah Division of Water Rights

Exhibit 9:  
Wells and Water Rights

## Output Listing

Version: 2009.05.06.00 Rundate: 07/11/2012 07:17 PM

Search of Section 15, Township 28S, Range 2E, SL b&m Criteria:wrtypes=W,C,E podtypes=S,U,D,Sp,P,R,T status=U,A,P usetypes=all

N60/W4	NE/W4	NE/NE	NE/NE
SW/W4 95-2179	SE/W4	SW/NE	SE/NE
N60/S4	NE/S4	NW/SE	NE/SE
SW/S4 95-2179	SE/S4	SW/SE 95-2188	SE/SE

0 360 720 1080 1440 ft

## Water Rights

WR Number	Diversion Type/Location	Well Log	Status	Priority	Uses	CFS	ACFT	Owner Name
<u>95-2178</u>	Point to Point N660 E660 W4 15 28S 2E SL		P	18760000	OS	0.000	0.000	RICHFIELD DISTRICT USA BUREAU OF LAND MANAGEMENT 150 EAST 900 NORTH
<u>95-2179</u>	Point to Point N660 E660 SW 15 28S 2E SL		P	18760000	OS	0.000	0.000	RICHFIELD DISTRICT USA BUREAU OF LAND MANAGEMENT 150 EAST 900 NORTH
<u>95-2179</u>	Point to Point N660 E660 W4 15 28S 2E SL		P	18760000	OS	0.000	0.000	RICHFIELD DISTRICT USA BUREAU OF LAND MANAGEMENT 150 EAST 900 NORTH
<u>95-2188</u>	Point to Point N660 E660 S4 15 28S 2E SL		P	18760000	OS	0.000	0.000	RICHFIELD DISTRICT USA BUREAU OF LAND MANAGEMENT 150 EAST 900 NORTH



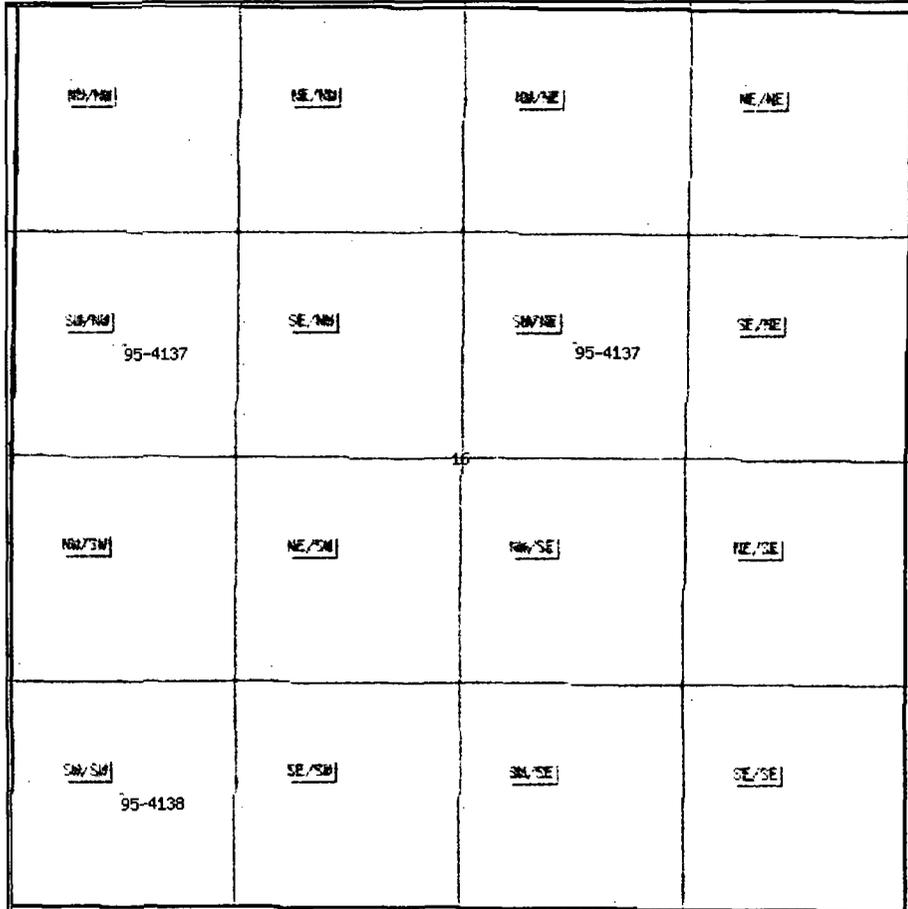
# Utah Division of Water Rights

Exhibit 9:  
Wells and Water Rights

## Output Listing

Version: 2009.05.06.00      Runcdate: 07/11/2012 07:18 PM

Search of Section 16, Township 28S, Range 2E, SL b&m Criteria:wrtypes=W,C,E podtypes=S,U,D,Sp,P,R,T status=U,A,P usetypes=all



0 350 700 1050 1400 ft

## Water Rights

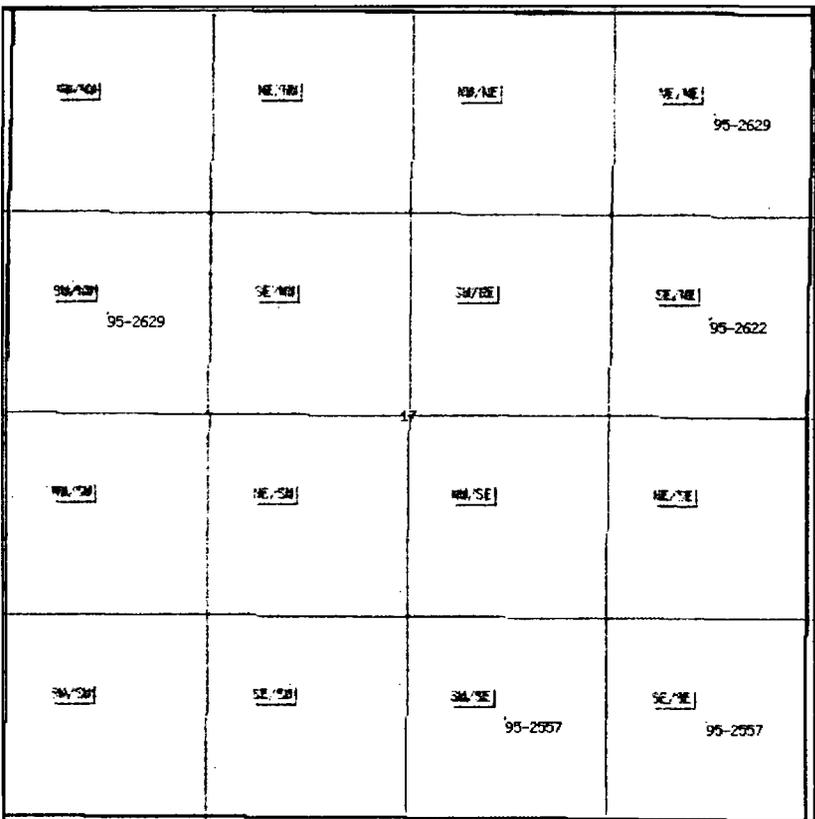
WR Number	Diversion Type/Location	Well Log	Status	Priority	Uses	CFS	ACFT	Owner Name
<u>95-4137</u>	Point to Point N660 E660 W4 16 28S 2E SL		P	18760000	S	0.000	0.000	UTAH SCHOOL AND INSTITUTIONAL TRUST LANDS ADMIN. 675 EAST 500 SOUTH, 5TH FLOOR
<u>95-4138</u>	Point to Point N660 E660 SW 16 28S 2E SL		P	18760000	S	0.000	0.000	UTAH SCHOOL AND INSTITUTIONAL TRUST LANDS ADMIN. 675 EAST 500 SOUTH, 5TH FLOOR
<u>95-4137</u>	Point to Point S1980 E660 N4 16 28S 2E SL		P	18760000	S	0.000	0.000	UTAH SCHOOL AND INSTITUTIONAL TRUST LANDS ADMIN. 675 EAST 500 SOUTH, 5TH FLOOR
<u>95-4138</u>	Point to Point N660 E660 SW 16 28S 2E SL		P	18760000	S	0.000	0.000	UTAH SCHOOL AND INSTITUTIONAL TRUST LANDS ADMIN. 675 EAST 500 SOUTH, 5TH FLOOR



### Output Listing

Version: 2009.05.06.00    Rundate: 07/11/2012 07:20 PM

Search of Section 17, Township 28S, Range 2E, SL b&m Criteria:wrtypes=W,C,E podtypes=S,U,D,Sp,P,R,T status=U,A,P usetypes=all



0 350 700 1050 1400 ft

### Water Rights

WR Number	Diversion Type/Location	Well Log	Status	Priority	Uses	CFS	ACFT	Owner Name
<u>95-2557</u>	Point to Point N660 E660 S4 17 28S 2E SL		P	18760000	S	0.000	0.000	RICHFIELD DISTRICT USA BUREAU OF LAND MANAGEMENT 150 EAST 900 NORTH
<u>95-2629</u>	Point to Point N660 E660 W4 17 28S 2E SL		P	18760000	S	0.000	0.000	RICHFIELD DISTRICT USA BUREAU OF LAND MANAGEMENT 150 EAST 900 NORTH
<u>95-2557</u>	Point to Point N660 W660 SE 17 28S 2E SL		P	18760000	S	0.000	0.000	RICHFIELD DISTRICT USA BUREAU OF LAND MANAGEMENT 150 EAST 900 NORTH
<u>95-2622</u>	Point to Point N660 W660 E4 17 28S 2E SL		P	18760000	S	0.000	0.000	RICHFIELD DISTRICT USA BUREAU OF LAND MANAGEMENT 150 EAST 900 NORTH
<u>95-2629</u>	Point to Point S660 W660 NE 17 28S 2E SL		P	18760000	S	0.000	0.000	RICHFIELD DISTRICT USA BUREAU OF LAND MANAGEMENT 150 EAST 900 NORTH



# Utah Division of Water Rights

Exhibit 9:  
Wells and Water Rights

## Output Listing

Version: 2009.05.06.00      Rupdate: 07/11/2012 07:22 PM

Search of Section 20, Township 28S, Range 2E, SL b&m Criteria: wrtypes=W,C,E podtypes=S,U,D,Sp,P,R,T status=U,A,P  
usetypes=all

<u>NE/NE</u>	<u>NE/NE</u>	<u>NE/NE</u>	<u>NE/NE</u> 95-2545
<u>SE/NE</u>	<u>SE/NE</u>	<u>SE/NE</u>	<u>SE/NE</u>
<u>SW/NE</u>	<u>SW/NE</u>	<u>SW/NE</u>	<u>SW/NE</u>
<u>SE/SE</u>	<u>SE/SE</u>	<u>SE/SE</u>	<u>SE/SE</u>

0 350 700 1050 1400 ft

## Water Rights

WR Number	Diversion Type/Location	Well Log	Status	Priority	Uses	CFS	ACFT	Owner Name
<u>95-2545</u>	Point to Point S660 W660 NE 20 28S 2E SL		P	18760000	S	0.000	0.000	RICHFIELD DISTRICT USA BUREAU OF LAND MANAGEMENT  150 EAST 900 NORTH



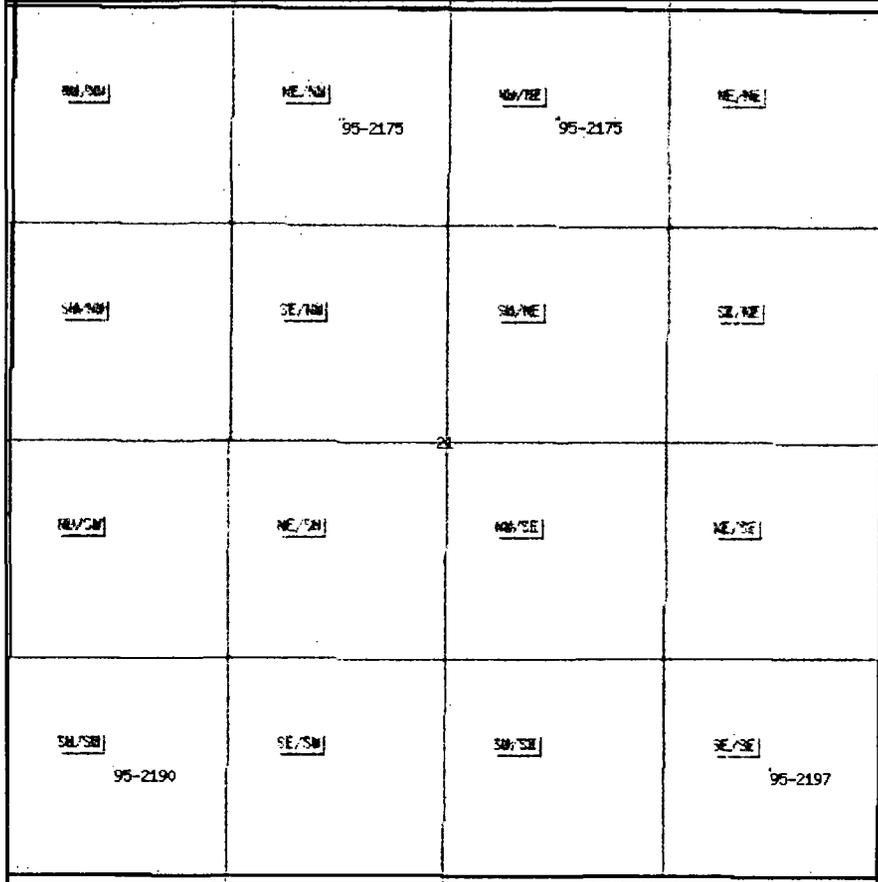
# Utah Division of Water Rights

## Exhibit 9: Wells and Water Rights

### Output Listing

Version: 2009.05.06.00      Rupdate: 07/11/2012 07:05 PM

Search of Section 21, Township 28S, Range 2E, SL b&m Criteria: wrtypes=W,C,E podtypes=S,U,D,Sp,P,R,T status=U,A,P usetypes=all



### Water Rights

WR Number	Diversion Type/Location	Well Log	Status	Priority	Uses	CFS	ACFT	Owner Name
<u>95-2175</u>	Point to Point S660 W660 N4 21 28S 2E SL		P	18760000	OS	0.000	0.000	RICHFIELD DISTRICT USA BUREAU OF LAND MANAGEMENT 150 EAST 900 NORTH
<u>95-2190</u>	Point to Point N660 E660 SW 21 28S 2E SL		P	18760000	OS	0.000	0.000	RICHFIELD DISTRICT USA BUREAU OF LAND MANAGEMENT 150 EAST 900 NORTH
<u>95-2197</u>	Point to Point N660 W660 SE 21 28S 2E SL		P	18760000	OS	0.000	0.000	RICHFIELD DISTRICT USA BUREAU OF LAND MANAGEMENT 150 EAST 900 NORTH
<u>95-2175</u>	Point to Point S660 E660 N4 21 28S 2E SL		P	18760000	OS	0.000	0.000	RICHFIELD DISTRICT USA BUREAU OF LAND MANAGEMENT 150 EAST 900 NORTH

Output Listing

Version: 2009.05.06.00 Rundate: 07/11/2012 07:09 PM

Search of Section 22, Township 28S, Range 2E, SL b&m Criteria:wrtypes=W,C,E podtypes=S,U,D,Sp,P,R,T status=U,A,P usetypes=all

NE/NE 95-2188	NE/NE 95-2188	SE/NE 95-2188	SE/NE 95-2188
SW/NE 95-2190	SE/NE 95-2196	SW/NE 95-2190	SE/NE 95-2189
NW/SE 95-2181	NE/SE 95-2181	NW/SE 95-2181	NE/SE 95-2181
SW/SE 95-2190	SE/SE 95-2196	SW/SE 95-2190	SE/SE 95-2189

0 350 700 1050 1400 ft

Water Rights

WR Number	Diversion Type/Location	Well Log	Status	Priority	Uses	CFS	ACFT	Owner Name
<u>95-2188</u>	Point to Point S660 W660 N4 22 28S 2E SL		P	18760000	OS	0.000	0.000	RICHFIELD DISTRICT USA BUREAU OF LAND MANAGEMENT 150 EAST 900 NORTH
<u>95-2181</u>	Point to Point S660 E660 W4 22 28S 2E SL		P	18760000	OS	0.000	0.000	RICHFIELD DISTRICT USA BUREAU OF LAND MANAGEMENT 150 EAST 900 NORTH
<u>95-2189</u>	Point to Point N660 W660 E4 22 28S 2E SL		P	18760000	OS	0.000	0.000	RICHFIELD DISTRICT USA BUREAU OF LAND MANAGEMENT 150 EAST 900 NORTH
<u>95-2190</u>	Point to Point N660 E660 W4 22 28S 2E SL		P	18760000	OS	0.000	0.000	RICHFIELD DISTRICT USA BUREAU OF LAND MANAGEMENT 150 EAST 900 NORTH
<u>95-2196</u>	Point to Point N660 E1980 W4 22 28S 2E SL		P	18760000	OS	0.000	0.000	RICHFIELD DISTRICT USA BUREAU OF LAND MANAGEMENT 150 EAST 900 NORTH



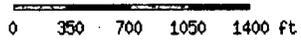
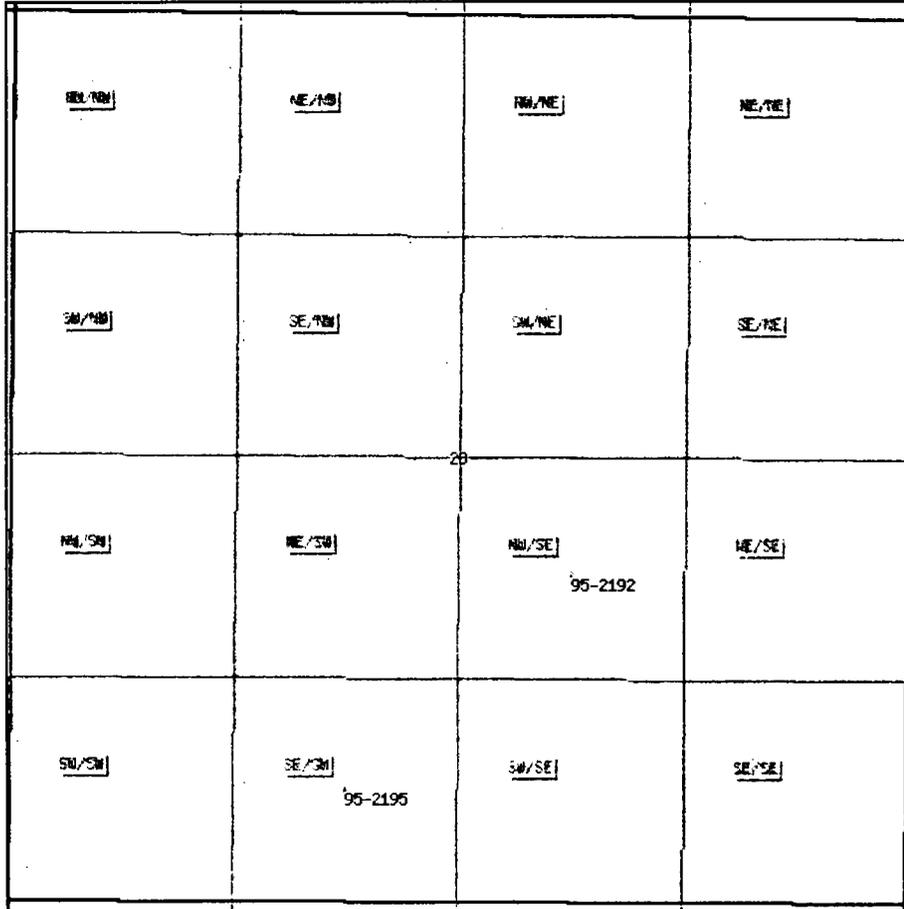
# Utah Division of Water Rights

Exhibit 9:  
Wells and Water Rights

## Output Listing

Version: 2009.05.06.00      Runcdate: 07/11/2012 07:24 PM

Search of Section 23, Township 28S, Range 2E, SL b&m Criteria:wrtypes=W,C,E podtypes=S,U,D,Sp,P,R,T status=U,A,P usetypes=all



## Water Rights

WR Number	Diversion Type/Location	Well Log	Status	Priority	Uses	CFS	ACFT	Owner Name
95-2192	Point to Point S660 W1980 E4 23 28S 2E SL		P	18760000	OS	0.000	0.000	RICHFIELD DISTRICT USA BUREAU OF LAND MANAGEMENT 150 EAST 900 NORTH
95-2195	Point to Point N660 W660 S4 23 28S 2E SL		P	18760000	OS	0.000	0.000	RICHFIELD DISTRICT USA BUREAU OF LAND MANAGEMENT 150 EAST 900 NORTH



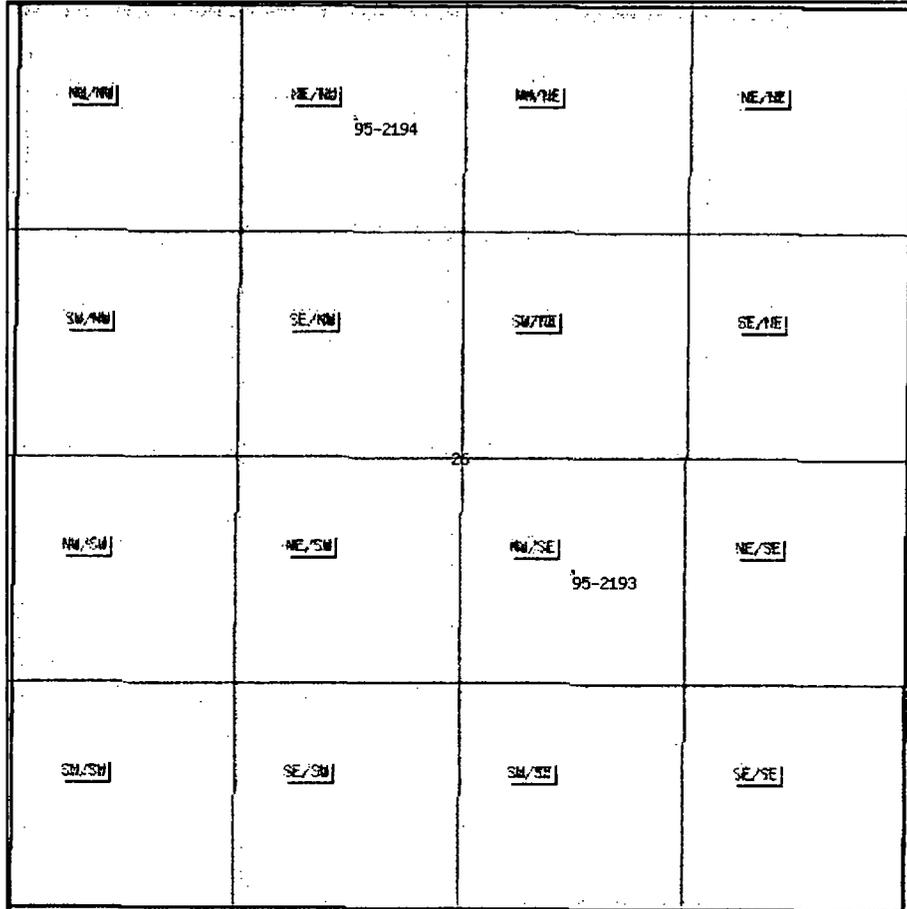
# Utah Division of Water Rights

Exhibit 9:  
Wells and Water Rights

## Output Listing

Version: 2009.05.06.00      Rundate: 07/11/2012 07:27 PM

Search of Section 26, Township 28S, Range 2E, SL b&m Criteria:wrtypes=W,C,E podtypes=S,U,D,Sp,P,R,T status=U,A,P usetypes=all



## Water Rights

WR Number	Diversion Type/Location	Well Log	Status	Priority	Uses	CFS	ACFT	Owner Name
95-2193	Point to Point S660 W1980 E4 26 28S 2E SL		P	18760000	OS	0.000	0.000	RICHFIELD DISTRICT USA BUREAU OF LAND MANAGEMENT 150 EAST 900 NORTH
95-2194	Point to Point S660 W660 N4 26 28S 2E SL		P	18760000	OS	0.000	0.000	RICHFIELD DISTRICT USA BUREAU OF LAND MANAGEMENT 150 EAST 900 NORTH



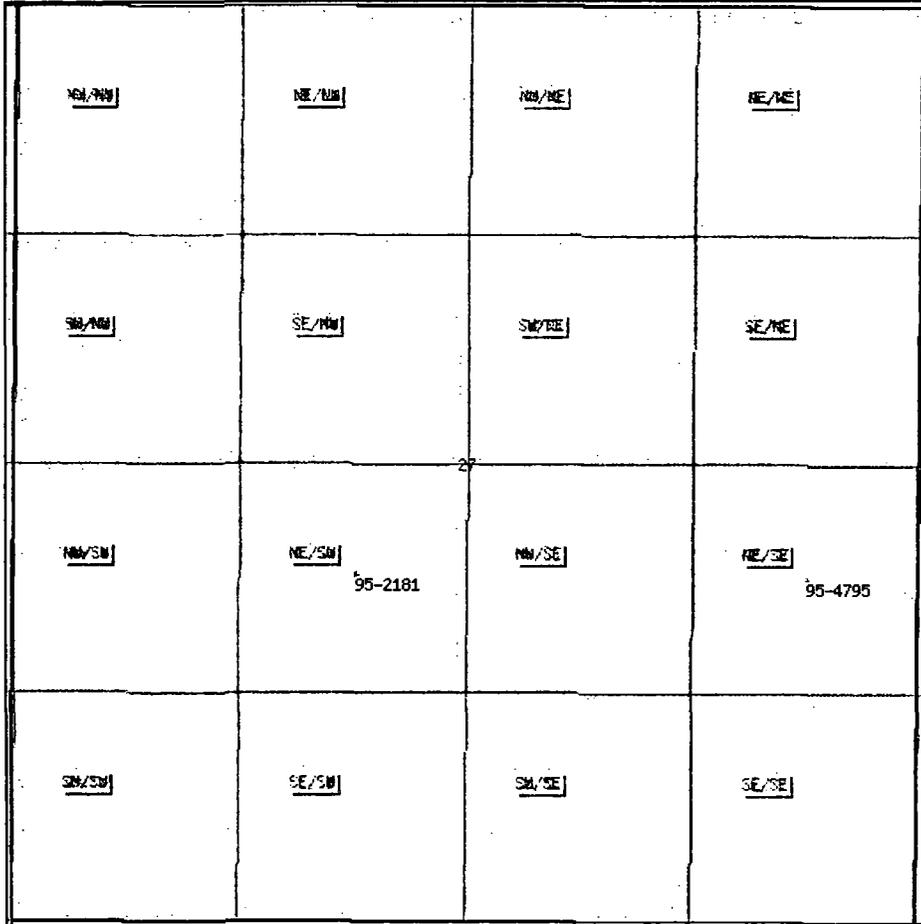
# Utah Division of Water Rights

Exhibit 9:  
Wells and Water Rights

## Output Listing

Version: 2009.05.06.00    Rundate: 07/11/2012 07:29 PM

Search of Section 27, Township 28S, Range 2E, SL b&m Criteria:wrtypes=W,C,E podtypes=S,U,D,Sp,P,R,T status=U,A,P usetypes=all



## Water Rights

WR Number	Diversion Type/Location	Well Log	Status	Priority	Uses	CFS	ACFT	Owner Name
<u>95-2181</u>	Point to Point S660 E1980 W4 27 28S 2E SL		P	18760000	OS	0.000	0.000	RICHFIELD DISTRICT USA BUREAU OF LAND MANAGEMENT 150 EAST 900 NORTH
<u>95-2436</u>	Point to Point S660 W660 E4 27 28S 2E SL		P	18760000	S	0.000	0.000	RICHFIELD DISTRICT USA BUREAU OF LAND MANAGEMENT 150 EAST 900 NORTH
<u>95-4795</u>	Point to Point S660 W660 E4 27 28S 2E SL		P	1876	S	0.000	3.000	USA BUREAU OF LAND MANAGEMENT 150 EAST 900 NORTH



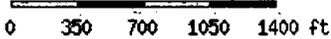
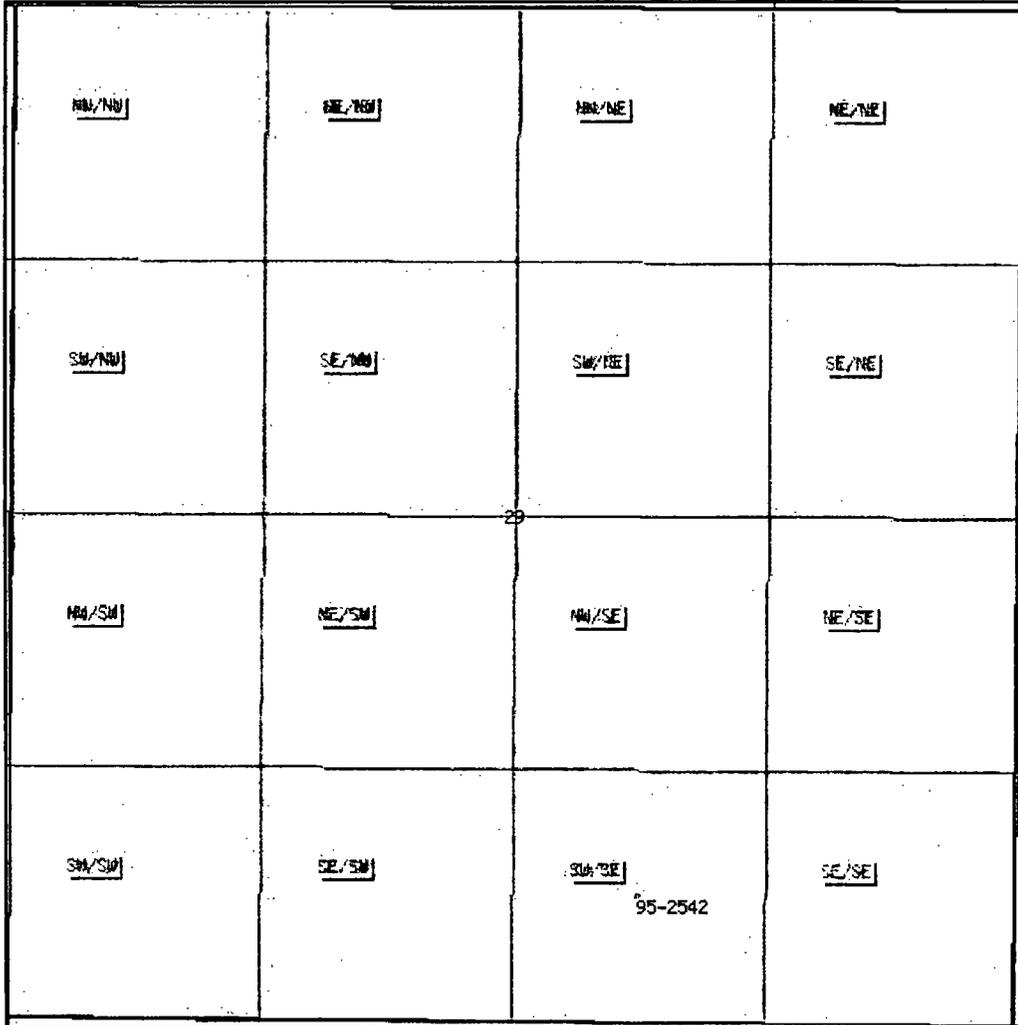
# Utah Division of Water Rights

Exhibit 9:  
Wells and Water Rights

## Output Listing

Version: 2009.05.06.00    Rundate: 07/11/2012 07:31 PM

Search of Section 29, Township 28S, Range 2E, SL b&m Criteria:wrtypes=W,C,E podtypes=S,U,D,Sp,P,R,T status=U,A,P usetypes=all



## Water Rights

WR Number	Diversion Type/Location	Well Log	Status	Priority	Uses	CFS	ACFT	Owner Name
95-2542	Point to Point N660 E660 S4 29 28S 2E SL		P	18760000	S	0.000	0.000	RICHFIELD DISTRICT USA BUREAU OF LAND MANAGEMENT 150 EAST 900 NORTH

Exhibit 10:  
Leachate Characteristics

TABLE 3.14. Typical Leachate Quality of Municipal Waste\*

SI Number	Parameter	Overall Range (mg/liter except as indicated)
1	TDS	584-55,000
2	Specific conductance	480-72,500 $\mu$ mho/cm
3	Total suspended solids	2-140,900
4	BOD	ND-195,000
5	COD	6.6-99,000
6	TOC	ND-40,000
7	pH	3.7-8.9 units
8	Total alkalinity	ND-15,050
9	Hardness	0.1-225,000
10	Chloride	2-11,375
11	Calcium	3.0-2,500
12	Sodium	12-6,010
13	Total Kjeldahl nitrogen	2-3,320
14	Iron	ND-4,000
15	Potassium	ND-3,200
16	Magnesium	4.0-780
17	Ammonia-nitrogen	ND-1,200
18	Sulfate	ND-1,850
19	Aluminum	ND-85
20	Zinc	ND-731
21	Manganese	ND-400
22	Total phosphorus	ND-234
23	Boron	0.87-13
24	Barium	ND-12.5
25	Nickel	ND-7.5
26	Nitrate-nitrogen	ND-250
27	Lead	ND-14.2
28	Chromium	ND-5.6
29	Antimony	ND-3.19
30	Copper	ND-9.0
31	Thallium	ND-0.78
32	Cyanide	ND-6
33	Arsenic	ND-70.2
34	Molybdenum	0.01-1.43
35	Tin	ND-0.16
36	Nitrite-nitrogen	ND-1.46
37	Selenium	ND-1.85
38	Cadmium	ND-0.4
39	Silver	ND-1.96
40	Beryllium	ND-0.36
41	Mercury	ND-3.0
42	Turbidity	40-500 Jackson units

Based on McGinley and Kmetz (1984) and Lu et al. (1981).

\*Several bacteria and fungi species and several priority pollutants are found in the leachate.

LONG HOLLOW SANITARY LANDFILL

Exhibit 10: Leachate Characteristics

Exhibit 10:  
Leachate Characteristics

TABLE 3.14. Typical Leachate Quality of Municipal Waste\*

SI Number	Parameter	Overall Range (mg/liter except as indicated)
1	TDS	584-55,000
2	Specific conductance	480-72,500 $\mu$ mho/cm
3	Total suspended solids	2-140,900
4	BOD	ND-195,000
5	COD	6.6-99,000
6	TOC	ND-40,000
7	pH	3.7-8.9 units
8	Total alkalinity	ND-15,050
9	Hardness	0.1-225,000
10	Chloride	2-11,375
11	Calcium	3.0-2,500
12	Sodium	12-6,010
13	Total Kjeldahl nitrogen	2-3,320
14	Iron	ND-4,000
15	Potassium	ND-3,200
16	Magnesium	4.0-780
17	Ammonia-nitrogen	ND-1,200
18	Sulfate	ND-1,850
19	Aluminum	ND-85
20	Zinc	ND-731
21	Manganese	ND-400
22	Total phosphorus	ND-234
23	Boron	0.87-13
24	Barium	ND-12.5
25	Nickel	ND-7.5
26	Nitrate-nitrogen	ND-250
27	Lead	ND-14.2
28	Chromium	ND-5.6
29	Antimony	ND-3.19
30	Copper	ND-9.0
31	Thallium	ND-0.78
32	Cyanide	ND-6
33	Arsenic	ND-70.2
34	Molybdenum	0.01-1.43
35	Tin	ND-0.16
36	Nitrite-nitrogen	ND-1.46
37	Selenium	ND-1.85
38	Cadmium	ND-0.4
39	Silver	ND-1.96
40	Beryllium	ND-0.36
41	Mercury	ND-3.0
42	Turbidity	40-500 Jackson units

Based on McGinley and Kmet (1984) and Lu et al. (1981).

\*Several bacteria and fungi species and several priority pollutants are found in the leachate.

Exhibit 11  
Landfill Water Balance Calculations

LONG HOLLOW LANDFILL  
WATER BALANCE CALCULATION  
0 - 10 YEARS

BARE GROUND

LAYER 1  
-----

VERTICAL PERCOLATION LAYER

THICKNESS = 3.00 INCHES  
POROSITY = 0.4570 VOL/VOL  
FIELD CAPACITY = 0.0831 VOL/VOL  
WILTING POINT = 0.0326 VOL/VOL  
INITIAL SOIL WATER CONTENT = 0.0340 VOL/VOL  
SATURATED HYDRAULIC CONDUCTIVITY = 0.003100000089 CM/SEC

LAYER 2  
-----

VERTICAL PERCOLATION LAYER

THICKNESS = 3.00 INCHES  
POROSITY = 0.4570 VOL/VOL  
FIELD CAPACITY = 0.0831 VOL/VOL  
WILTING POINT = 0.0326 VOL/VOL  
INITIAL SOIL WATER CONTENT = 0.0340 VOL/VOL  
SATURATED HYDRAULIC CONDUCTIVITY = 0.003100000089 CM/SEC

LAYER 3  
-----

VERTICAL PERCOLATION LAYER

THICKNESS = 6.00 INCHES  
POROSITY = 0.4570 VOL/VOL  
FIELD CAPACITY = 0.0831 VOL/VOL  
WILTING POINT = 0.0326 VOL/VOL  
INITIAL SOIL WATER CONTENT = 0.0340 VOL/VOL  
SATURATED HYDRAULIC CONDUCTIVITY = 0.003100000089 CM/SEC

LAYER 4  
-----

VERTICAL PERCOLATION LAYER

THICKNESS = 120.00 INCHES

POROSITY = 0.5200 VOL/VOL  
FIELD CAPACITY = 0.2942 VOL/VOL  
WILTING POINT = 0.1400 VOL/VOL  
INITIAL SOIL WATER CONTENT = 0.1410 VOL/VOL  
SATURATED HYDRAULIC CONDUCTIVITY = 0.000199999995 CM/SEC

LAYER 5  
-----

VERTICAL PERCOLATION LAYER

THICKNESS = 12.00 INCHES  
POROSITY = 0.4570 VOL/VOL  
FIELD CAPACITY = 0.0831 VOL/VOL  
WILTING POINT = 0.0326 VOL/VOL  
INITIAL SOIL WATER CONTENT = 0.0340 VOL/VOL  
SATURATED HYDRAULIC CONDUCTIVITY = 0.003100000089 CM/SEC

LAYER 6  
-----

VERTICAL PERCOLATION LAYER

THICKNESS = 120.00 INCHES  
POROSITY = 0.5200 VOL/VOL  
FIELD CAPACITY = 0.2942 VOL/VOL  
WILTING POINT = 0.1400 VOL/VOL  
INITIAL SOIL WATER CONTENT = 0.1410 VOL/VOL  
SATURATED HYDRAULIC CONDUCTIVITY = 0.000199999995 CM/SEC

LAYER 7  
-----

VERTICAL PERCOLATION LAYER

THICKNESS = 12.00 INCHES  
POROSITY = 0.4570 VOL/VOL  
FIELD CAPACITY = 0.0831 VOL/VOL  
WILTING POINT = 0.0326 VOL/VOL  
INITIAL SOIL WATER CONTENT = 0.0340 VOL/VOL  
SATURATED HYDRAULIC CONDUCTIVITY = 0.003100000089 CM/SEC

LAYER 8  
-----

VERTICAL PERCOLATION LAYER

THICKNESS = 120.00 INCHES  
POROSITY = 0.5200 VOL/VOL  
FIELD CAPACITY = 0.2942 VOL/VOL  
WILTING POINT = 0.1400 VOL/VOL  
INITIAL SOIL WATER CONTENT = 0.1410 VOL/VOL  
SATURATED HYDRAULIC CONDUCTIVITY = 0.000199999995 CM/SEC

LAYER 9  
-----

VERTICAL PERCOLATION LAYER

THICKNESS = 120.00 INCHES  
POROSITY = 0.3509 VOL/VOL  
FIELD CAPACITY = 0.0705 VOL/VOL  
WILTING POINT = 0.0326 VOL/VOL  
INITIAL SOIL WATER CONTENT = 0.0340 VOL/VOL  
SATURATED HYDRAULIC CONDUCTIVITY = 0.000155000002 CM/SEC

LAYER 10  
-----

VERTICAL PERCOLATION LAYER

THICKNESS = 120.00 INCHES  
POROSITY = 0.3509 VOL/VOL  
FIELD CAPACITY = 0.0705 VOL/VOL  
WILTING POINT = 0.0326 VOL/VOL  
INITIAL SOIL WATER CONTENT = 0.0340 VOL/VOL  
SATURATED HYDRAULIC CONDUCTIVITY = 0.000155000002 CM/SEC

LAYER 11  
-----

VERTICAL PERCOLATION LAYER

THICKNESS = 120.00 INCHES  
POROSITY = 0.3509 VOL/VOL  
FIELD CAPACITY = 0.0705 VOL/VOL  
WILTING POINT = 0.0326 VOL/VOL  
INITIAL SOIL WATER CONTENT = 0.0340 VOL/VOL  
SATURATED HYDRAULIC CONDUCTIVITY = 0.000155000002 CM/SEC

LAYER 12  
-----

VERTICAL PERCOLATION LAYER

THICKNESS = 120.00 INCHES  
POROSITY = 0.3509 VOL/VOL  
FIELD CAPACITY = 0.0705 VOL/VOL  
WILTING POINT = 0.0326 VOL/VOL  
INITIAL SOIL WATER CONTENT = 0.0340 VOL/VOL  
SATURATED HYDRAULIC CONDUCTIVITY = 0.000155000002 CM/SEC

GENERAL SIMULATION DATA  
-----

SCS RUNOFF CURVE NUMBER = 80.26  
TOTAL AREA OF COVER = 60000. SQ FT



EVAPOTRANSPIRATION

TOTALS	0.521	0.479	0.369	0.298	0.302	0.746
	1.094	1.116	0.545	0.425	0.353	0.440
STD. DEVIATIONS	0.239	0.367	0.063	0.143	0.242	0.519
	0.913	0.529	0.425	0.389	0.214	0.204

PERCOLATION FROM LAYER 12

TOTALS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
STD. DEVIATIONS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

\*\*\*\*\*

AVERAGE ANNUAL TOTALS & (STD. DEVIATIONS) FOR YEARS 1 THROUGH 10

	(INCHES)	(CU. FT.)	PERCENT
PRECIPITATION	6.72 ( 1.722)	33605.	100.00
RUNOFF	0.000 ( 0.000)	0.	0.00
EVAPOTRANSPIRATION	6.689 ( 1.797)	33443.	99.52
PERCOLATION FROM LAYER 12	0.0000 ( 0.0000)	0.	0.00
CHANGE IN WATER STORAGE	0.032 ( 0.265)	162.	0.48

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PEAK DAILY VALUES FOR YEARS 1 THROUGH 10

	(INCHES)	(CU. FT.)
PRECIPITATION	1.59	7950.0
RUNOFF	0.000	0.0
PERCOLATION FROM LAYER 12	0.0000	0.0
SNOW WATER	0.96	4789.8
MAXIMUM VEG. SOIL WATER (VOL/VOL.)	0.1546	
MINIMUM VEG. SOIL WATER (VOL/VOL.)	0.0995	

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FINAL WATER STORAGE AT END OF YEAR 10

LAYER	(INCHES)	(VOL/VOL.)
1	0.21	0.0699
2	0.24	0.0790
3	0.41	0.0686
4	16.79	0.1399
5	0.41	0.0341
6	16.92	0.1410
7	0.41	0.0341
8	16.92	0.1410
9	4.08	0.0340
10	4.08	0.0340
11	4.08	0.0340
12	4.08	0.0340
SNOW WATER	0.00	

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Exhibit 11B: Water Balance Calculations

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LONG HOLLOW LANDFILL  
WATER BALANCE CALCULATION  
11 - 30 YEARS

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FAIR GRASS

LAYER 1  
-----

VERTICAL PERCOLATION LAYER

THICKNESS	=	6.00 INCHES
POROSITY	=	0.4730 VOL/VOL
FIELD CAPACITY	=	0.2217 VOL/VOL
WILTING POINT	=	0.1043 VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.1050 VOL/VOL
SATURATED HYDRAULIC CONDUCTIVITY	=	0.001560000004 CM/SEC

LAYER 2  
-----

BARRIER SOIL LINER

THICKNESS	=	18.00 INCHES
POROSITY	=	0.4224 VOL/VOL
FIELD CAPACITY	=	0.3495 VOL/VOL
WILTING POINT	=	0.2648 VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.4224 VOL/VOL
SATURATED HYDRAULIC CONDUCTIVITY	=	0.00000850000 CM/SEC

LAYER 3  
-----

VERTICAL PERCOLATION LAYER

THICKNESS	=	6.00 INCHES
POROSITY	=	0.4570 VOL/VOL
FIELD CAPACITY	=	0.0831 VOL/VOL
WILTING POINT	=	0.0326 VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.0686 VOL/VOL
SATURATED HYDRAULIC CONDUCTIVITY	=	0.003100000089 CM/SEC

LAYER 4  
-----

VERTICAL PERCOLATION LAYER

THICKNESS	=	120.00 INCHES
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POROSITY	=	0.5200 VOL/VOL
FIELD CAPACITY	=	0.2942 VOL/VOL
WILTING POINT	=	0.1400 VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.1399 VOL/VOL
SATURATED HYDRAULIC CONDUCTIVITY	=	0.000199999995 CM/SEC

LAYER 5  
-----

VERTICAL PERCOLATION LAYER

THICKNESS	=	12.00 INCHES
POROSITY	=	0.4570 VOL/VOL
FIELD CAPACITY	=	0.0831 VOL/VOL
WILTING POINT	=	0.0326 VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.0341 VOL/VOL
SATURATED HYDRAULIC CONDUCTIVITY	=	0.003100000089 CM/SEC

LAYER 6  
-----

VERTICAL PERCOLATION LAYER

THICKNESS	=	120.00 INGHES
POROSITY	=	0.5200 VOL/VOL
FIELD CAPACITY	=	0.2942 VOL/VOL
WILTING POINT	=	0.1400 VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.1410 VOL/VOL
SATURATED HYDRAULIC CONDUCTIVITY	=	0.000199999995 CM/SEC

LAYER 7  
-----

VERTICAL PERCOLATION LAYER

THICKNESS	=	12.00 INCHES
POROSITY	=	0.4570 VOL/VOL
FIELD CAPACITY	=	0.0831 VOL/VOL
WILTING POINT	=	0.0326 VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.0341 VOL/VOL
SATURATED HYDRAULIC CONDUCTIVITY	=	0.003100000089 CM/SEC

LAYER 8  
-----

VERTICAL PERCOLATION LAYER

THICKNESS	=	120.00 INCHES
POROSITY	=	0.5200 VOL/VOL
FIELD CAPACITY	=	0.2942 VOL/VOL
WILTING POINT	=	0.1400 VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.1410 VOL/VOL
SATURATED HYDRAULIC CONDUCTIVITY	=	0.000199999995 CM/SEC

LAYER 9

-----

VERTICAL PERCOLATION LAYER

THICKNESS	=	120.00 INCHES
POROSITY	=	0.3509 VOL/VOL
FIELD CAPACITY	=	0.0705 VOL/VOL
WILTING POINT	=	0.0326 VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.0340 VOL/VOL
SATURATED HYDRAULIC CONDUCTIVITY	=	0.000155000002 CM/SEC

LAYER 10

-----

VERTICAL PERCOLATION LAYER

THICKNESS	=	120.00 INCHES
POROSITY	=	0.3509 VOL/VOL
FIELD CAPACITY	=	0.0705 VOL/VOL
WILTING POINT	=	0.0326 VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.0340 VOL/VOL
SATURATED HYDRAULIC CONDUCTIVITY	=	0.000155000002 CM/SEC

LAYER 11

-----

VERTICAL PERCOLATION LAYER

THICKNESS	=	120.00 INCHES
POROSITY	=	0.3509 VOL/VOL
FIELD CAPACITY	=	0.0705 VOL/VOL
WILTING POINT	=	0.0326 VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.0340 VOL/VOL
SATURATED HYDRAULIC CONDUCTIVITY	=	0.000155000002 CM/SEC

LAYER 12

-----

VERTICAL PERCOLATION LAYER

THICKNESS	=	120.00 INCHES
POROSITY	=	0.3509 VOL/VOL
FIELD CAPACITY	=	0.0705 VOL/VOL
WILTING POINT	=	0.0326 VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.0340 VOL/VOL
SATURATED HYDRAULIC CONDUCTIVITY	=	0.000155000002 CM/SEC

GENERAL SIMULATION DATA

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SCS RUNOFF CURVE NUMBER	=	74.26
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EVAPOTRANSPIRATION

TOTALS	0.427	0.403	0.344	0.272	0.271	0.720
	0.998	1.168	0.541	0.425	0.371	0.387
STD. DEVIATIONS	0.225	0.165	0.158	0.077	0.142	0.495
	0.960	0.718	0.442	0.336	0.220	0.210

PERCOLATION FROM LAYER 2

TOTALS	0.0514	0.0228	0.0048	0.0022	0.0424	0.0029
	0.0124	0.0215	0.0106	0.0697	0.0078	0.0228
STD. DEVIATIONS	0.1247	0.0806	0.0154	0.0097	0.0873	0.0072
	0.0313	0.0403	0.0297	0.1287	0.0294	0.0660

PERCOLATION FROM LAYER 12

TOTALS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
STD. DEVIATIONS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

\*\*\*\*\*  
\*\*\*\*\*

AVERAGE ANNUAL TOTALS & (STD. DEVIATIONS) FOR YEARS 1 THROUGH 20

	(INCHES)	(CU. FT.)	PERCENT
PRECIPITATION	6.62 ( 1.972)	33100.	100.00
RUNOFF	0.000 ( 0.000)	0.	0.00
EVAPOTRANSPIRATION	6.326 ( 1.943)	31631.	95.56
PERCOLATION FROM LAYER 2	0.2714 ( 0.3346)	1357.	4.10
PERCOLATION FROM LAYER 12	0.0000 ( 0.0000)	0.	0.00
CHANGE IN WATER STORAGE	0.294 ( 0.244)	1469.	4.44

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PEAK DAILY VALUES FOR YEARS 1 THROUGH 20

	(INCHES)	(CU. FT.)
PRECIPITATION	1.59	7950.0
RUNOFF	0.000	0.0

PERCOLATION FROM LAYER 2	0.0312	156.0
HEAD ON LAYER 2	1.7	
PERCOLATION FROM LAYER 12	0.0000	0.0
SNOW WATER	0.96	1789.2
MAXIMUM VEG. SOIL WATER (VOL/VOL)	0.2813	
MINIMUM VEG. SOIL WATER (VOL/VOL)	0.0971	

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FINAL WATER STORAGE AT END OF YEAR 20

LAYER	(INCHES)	(VOL/VOL)
1	0.88	0.1466
2	7.60	0.4224
3	0.51	0.0844
4	22.10	0.1842
5	0.43	0.0360
6	16.92	0.1410
7	0.41	0.0342
8	16.92	0.1410
9	4.08	0.0340
10	4.08	0.0340
11	4.08	0.0340
12	4.08	0.0340
SNOW WATER	0.20	

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Exhibit 11C: Water Balance Calculations

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LONG HOLLOW LANDFILL  
WATER BALANCE CALCULATION  
31 - 50 YEARS

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FAIR GRASS

LAYER 1  
-----

VERTICAL PERCOLATION LAYER

THICKNESS	=	6.00 INCHES
POROSITY	=	0.4730 VOL/VOL
FIELD CAPACITY	=	0.2217 VOL/VOL
WILTING POINT	=	0.1043 VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.1466 VOL/VOL
SATURATED HYDRAULIC CONDUCTIVITY	=	0.001560000004 CM/SEC

LAYER 2  
-----

BARRIER SOIL LINER

THICKNESS	=	18.00 INCHES
POROSITY	=	0.4224 VOL/VOL
FIELD CAPACITY	=	0.3495 VOL/VOL
WILTING POINT	=	0.2648 VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.4224 VOL/VOL
SATURATED HYDRAULIC CONDUCTIVITY	=	0.000000850000 CM/SEC

LAYER 3  
-----

VERTICAL PERCOLATION LAYER

THICKNESS	=	6.00 INCHES
POROSITY	=	0.4570 VOL/VOL
FIELD CAPACITY	=	0.0831 VOL/VOL
WILTING POINT	=	0.0326 VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.0844 VOL/VOL
SATURATED HYDRAULIC CONDUCTIVITY	=	0.003100000089 CM/SEC

LAYER 4  
-----

VERTICAL PERCOLATION LAYER

THICKNESS = 120.00 INCHES  
 POROSITY = 0.5200 VOL/VOL  
 FIELD CAPACITY = 0.2942 VOL/VOL  
 WILTING POINT = 0.1400 VOL/VOL  
 INITIAL SOIL WATER CONTENT = 0.1842 VOL/VOL  
 SATURATED HYDRAULIC CONDUCTIVITY = 0.000199999995 CM/SEC

LAYER 5  
 -----

VERTICAL PERCOLATION LAYER

THICKNESS = 12.00 INCHES  
 POROSITY = 0.4570 VOL/VOL  
 FIELD CAPACITY = 0.0831 VOL/VOL  
 WILTING POINT = 0.0326 VOL/VOL  
 INITIAL SOIL WATER CONTENT = 0.0360 VOL/VOL  
 SATURATED HYDRAULIC CONDUCTIVITY = 0.003100000089 CM/SEC

LAYER 6  
 -----

VERTICAL PERCOLATION LAYER

THICKNESS = 120.00 INCHES  
 POROSITY = 0.5200 VOL/VOL  
 FIELD CAPACITY = 0.2942 VOL/VOL  
 WILTING POINT = 0.1400 VOL/VOL  
 INITIAL SOIL WATER CONTENT = 0.1410 VOL/VOL  
 SATURATED HYDRAULIC CONDUCTIVITY = 0.000199999995 CM/SEC

LAYER 7  
 -----

VERTICAL PERCOLATION LAYER

THICKNESS = 12.00 INCHES  
 POROSITY = 0.4570 VOL/VOL  
 FIELD CAPACITY = 0.0831 VOL/VOL  
 WILTING POINT = 0.0326 VOL/VOL  
 INITIAL SOIL WATER CONTENT = 0.0342 VOL/VOL  
 SATURATED HYDRAULIC CONDUCTIVITY = 0.003100000089 CM/SEC

LAYER 8  
 -----

VERTICAL PERCOLATION LAYER

THICKNESS = 120.00 INCHES  
 POROSITY = 0.5200 VOL/VOL  
 FIELD CAPACITY = 0.2942 VOL/VOL  
 WILTING POINT = 0.1400 VOL/VOL  
 INITIAL SOIL WATER CONTENT = 0.1410 VOL/VOL

SATURATED HYDRAULIC CONDUCTIVITY = 0.000199999995 CM/SEC

LAYER 9  
-----

VERTICAL PERCOLATION LAYER

THICKNESS = 120.00 INCHES  
POROSITY = 0.3509 VOL/VOL  
FIELD CAPACITY = 0.0705 VOL/VOL  
WILTING POINT = 0.0326 VOL/VOL  
INITIAL SOIL WATER CONTENT = 0.0340 VOL/VOL  
SATURATED HYDRAULIC CONDUCTIVITY = 0.000155000002 CM/SEC

LAYER 10  
-----

VERTICAL PERCOLATION LAYER

THICKNESS = 120.00 INCHES  
POROSITY = 0.3509 VOL/VOL  
FIELD CAPACITY = 0.0705 VOL/VOL  
WILTING POINT = 0.0326 VOL/VOL  
INITIAL SOIL WATER CONTENT = 0.0340 VOL/VOL  
SATURATED HYDRAULIC CONDUCTIVITY = 0.000155000002 CM/SEC

LAYER 11  
-----

VERTICAL PERCOLATION LAYER

THICKNESS = 120.00 INCHES  
POROSITY = 0.3509 VOL/VOL  
FIELD CAPACITY = 0.0705 VOL/VOL  
WILTING POINT = 0.0326 VOL/VOL  
INITIAL SOIL WATER CONTENT = 0.0340 VOL/VOL  
SATURATED HYDRAULIC CONDUCTIVITY = 0.000155000002 CM/SEC

LAYER 12  
-----

VERTICAL PERCOLATION LAYER

THICKNESS = 120.00 INCHES  
POROSITY = 0.3509 VOL/VOL  
FIELD CAPACITY = 0.0705 VOL/VOL  
WILTING POINT = 0.0326 VOL/VOL  
INITIAL SOIL WATER CONTENT = 0.0340 VOL/VOL  
SATURATED HYDRAULIC CONDUCTIVITY = 0.000155000002 CM/SEC

STD. DEVIATIONS	0.000	0.000	0.000	0.000	0.000	0.000
	0.000	0.000	0.000	0.000	0.000	0.000

EVAPOTRANSPIRATION

TOTALS	0.438	0.393	0.314	0.262	0.334	0.677
	1.015	1.160	0.555	0.401	0.364	0.396

STD. DEVIATIONS	0.223	0.178	0.163	0.071	0.304	0.445
	0.990	0.713	0.452	0.314	0.188	0.203

PERCOLATION FROM LAYER 2

TOTALS	0.0524	0.0175	0.0041	0.0039	0.0364	0.0019
	0.0124	0.0269	0.0107	0.0674	0.0137	0.0245

STD. DEVIATIONS	0.1246	0.0543	0.0095	0.0170	0.0894	0.0069
	0.0313	0.0522	0.0297	0.1192	0.0416	0.0655

PERCOLATION FROM LAYER 12

TOTALS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

STD. DEVIATIONS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

\*\*\*\*\*

AVERAGE ANNUAL TOTALS & (STD. DEVIATIONS) FOR YEARS 1 THROUGH 20

	(INCHES)	(CU. FT.)	PERCENT
PRECIPITATION	6.62 ( 1.972)	33100.	100.00
RUNOFF	0.000 ( 0.000)	0.	0.00
EVAPOTRANSPIRATION	6.340 ( 1.909)	31699.	95.77
PERCOLATION FROM LAYER 2	0.2718 ( 0.3216)	1359.	4.11
PERCOLATION FROM LAYER 12	0.0000 ( 0.0000)	0.	0.00
CHANGE IN WATER STORAGE	0.280 ( 0.247)	1401.	4.23

\*\*\*\*\*

PEAK DAILY VALUES FOR YEARS 1 THROUGH 20

	(INCHES)	(CU. FT.)
PRECIPITATION	1.59	7950.0

RUNOFF	0.000	0.0
PERCOLATION FROM LAYER 2	0.0312	155.8
HEAD ON LAYER 2	1.7	
PERCOLATION FROM LAYER 12	0.0000	0.0
SNOW WATER	0.96	4789.0
MAXIMUM VEG. SOIL WATER (VOL/VOL)	0.2825	
MINIMUM VEG. SOIL WATER (VOL/VOL)	0.0972	

\*\*\*\*\*  
\*\*\*\*\*

FINAL WATER STORAGE AT END OF YEAR 20

LAYER	(INCHES)	(VOL/VOL)
1	0.85	0.1416
2	7.60	0.4224
3	0.51	0.0843
4	27.05	0.2254
5	0.91	0.0757
6	16.93	0.1411
7	0.41	0.0343
8	16.92	0.1410
9	4.08	0.0340
10	4.08	0.0340
11	4.08	0.0340
12	4.08	0.0340
SNOW WATER	0.20	

\*\*\*\*\*  
\*\*\*\*\*

Exhibit 12



P.O. Box 249  
90 North 200 East  
Loa, Utah 84747-0249  
Office: 435-836-2685  
Fax # 435-836-2870

September 8, 2003

Division of Solid & Hazardous Waste

Salt Lake City UT

RE: Longhollow Landfill Site

To Whom It May Concern:

Brown Brothers Construction Co. will reclaim landfill for \$3.00 per yard for cover material and \$2.00 per yard for all topsoil.

Sincerely,

A handwritten signature in cursive script that reads 'Ellis Brown'.

Ellis Brown. Secretary

EXHIBIT "12"

ESCROW AGREEMENT

I. SUMMARY

A. Parties to the Agreement:

1. Depositor: \_\_\_\_\_ (the "Entity")  
Address: \_\_\_\_\_  
\_\_\_\_\_

Contact: \_\_\_\_\_ Tel. No. \_\_\_\_\_  
\_\_\_\_\_ Tel. No. \_\_\_\_\_

2. State Agency: Utah Division of Solid & Hazardous Waste (the "State")  
Address: P.O. Box 144880  
Salt Lake City, Utah 84114-4880

Contact: Ralph Bohm, Section Mgr Tel. No. 801-538-6170  
\_\_\_\_\_ Tel. No. \_\_\_\_\_  
\_\_\_\_\_ Tel. No. \_\_\_\_\_

3. Escrow Agent: Utah State Treasurer (the "Treasurer")  
215 State Capitol  
Salt Lake City, Utah 84114

Contact Robert C. Kirk, Financial Manager  
Stephanie Baldes, Accountant

Telephone: (801) 538-1042  
Telefax: (801) 538-1465  
Toll free: 800-395-7665

B. Deposit Amount(s):

1. Principal amount \$ \_\_\_\_\_ (the "Proceeds")

2. Additional amount(s), if any:

\$ \_\_\_\_\_ From: \_\_\_\_\_  
\$ \_\_\_\_\_ From: \_\_\_\_\_  
\$ \_\_\_\_\_ From: \_\_\_\_\_

C. Authorizing Resolution:

\_\_\_\_\_  
\_\_\_\_\_ (the "Instrument")

D. Project Description:

\_\_\_\_\_  
\_\_\_\_\_ (the "Project")

This Summary is an integral part of the Escrow Agreement

II. AGREEMENT

A. The undersigned hereby deliver to the Treasurer, the Proceeds and Additional amount(s) to be held and disposed of by the Treasurer in accordance with the duties, instructions, and upon the terms and conditions hereinafter set forth in this Escrow Agreement to which the undersigned hereby agree:

1. For purposes of this Escrow Agreement and this Escrow Agreement only:
  - (a) The Treasurer shall not incur any liability in acting upon any written authorization and request delivered hereunder and believed by the Treasurer to be genuine and to be signed by the proper parties.
  - (b) The Treasurer may consult with legal counsel in the event of any dispute or question as to the construction of the Treasurer's duties hereunder and shall not be held to any liability for acting in accordance with advice so received.
  - (c) The Treasurer shall have a first lien on the moneys held by it hereunder for its compensation and for any costs, liability or expense or counsel fees it may incur.
2. In the event of any disagreement between the undersigned or any of them, and/or any other person, resulting in adverse claims and demands being made in connection with or for any moneys involved herein or affected hereby, the Treasurer shall be entitled at its option to refuse to comply with any such claim or demand, so long as such disagreement shall continue, and in so refusing the Treasurer may refrain from making any delivery or other disposition of any moneys involved herein or affected hereby and in so doing the Treasurer shall not be or become liable to the undersigned or any of them or to any person or party for its failure or refusal to comply with such conflicting or adverse demands, and the Treasurer shall be entitled to continue so to refrain and refuse so to act until:
  - (a) The rights of the adverse claimants have been finally adjudicated in a court assuming and having jurisdiction of the parties and the moneys involved herein or affected hereby; and/or
  - (b) All differences shall have been adjusted by agreement and the Treasurer shall have been notified thereof in writing signed by all of the persons interested.
3. The fees for the usual services of the Treasurer under the terms of this Escrow agreement are set forth in the schedule attached hereto as **Exhibit A**. It is agreed that additional compensation shall be paid to the Treasurer for any additional or extraordinary service it may be requested to render hereunder, and the Treasurer shall be reimbursed for any out-of-pocket expenses (including, without limitation, fees of counsel) reasonably incurred in connection with additional or extraordinary services.
4. The Entity and the State hereby agree that the deposit of the Proceeds shall constitute compliance with applicable deposit and investment provisions of the Instrument.

5. The duties of the Treasurer under the terms of this Escrow Agreement are as follows:
- (a) The Treasurer shall receive into a separate fund (the "Escrow Account") Proceeds and any additional amounts to be used in connection with the Project.
  - (b) The Treasurer shall reimburse Entity in amounts authorized in writing by the Entity and the State.
  - (c) Each authorization must be signed by one official from both the Entity and the State, except as provided in (i) of this section, and shall be substantially the same as the form attached as Exhibit B. On behalf of the Entity, the written authorization and request shall be signed by any one of the officials of the Entity identified in Section I.A.1 above. On behalf of the State, the written authorization and request shall be signed by anyone of the officials of the State identified in Section I.A.2 above. The Treasurer assumes no responsibility for expenditure of moneys paid out of the Escrow Account pursuant to a written authorization and request properly signed and delivered to the Treasurer as provided herein.
    - (i) If the Entity fails to provide closure, post-closure, or corrective action of the solid waste management facility as required by the *Utah Solid Waste Permitting and Management Rules* and the Entity's solid waste disposal permit, the Executive Secretary will issue an order to close under the authority of Section 19-6-107(7) of the Utah Solid and Hazardous Waste Act. Upon completion of the Administrative process, including the Entity's right to contest and appeal the administrative action, the State may independently request, in writing, reimbursement to a State-approved and authorized third party for the costs related to the third party's activities for closure, post-closure or corrective actions at the facility.
  - (d) If a written authorization and request indicates that an amount (the "Retained Amount") payable to a Provider is to be held for retainage pending completion of the Project or the lapse of time, the Treasurer shall segregate such amount and shall invest the Retained Amount in an interest-bearing account (the "Separate Account"), the interest on which shall accrue for the benefit of the Provider. The Retained Amount and all accrued interest thereon shall be disbursed by the Treasurer in the same manner as provided in paragraph 5(b) hereof. All fees charged or incurred by the Treasurer relating to the establishment, investment and disbursement of the Separate Account shall be borne solely by the Provider and may be withheld by the Treasurer from the Separate Account prior to the disbursement thereof; provided, however, that if such fees are borne by the Separate Account, and if the interest earned on the Separate Account is less than the amount of such fees, then the fees withheld from such Separate Account shall not

exceed the interest earned and the balance of such fees shall be paid by the Entity.

- (e) The funds deposited by the parties hereto in the Escrow Fund and in any Separate Account shall be invested by the Treasurer in the Utah Public Treasurers' Investment Fund established by Section 51-7-5 of the Utah Code. All interest earned on moneys held in the Escrow Account shall be retained therein and disbursed as provided herein.
- (f) The Treasurer shall report at least monthly concerning the receipts, disbursements and status of the Escrow Account. The reports shall be mailed to the Entity and to the State at their respective addresses as shown in Section I.A. above. Notification of changes of address, if any, shall be in writing and mailed to the parties at their respective addresses' as shown in Section I.A above.
- (g) This Escrow Agreement will be terminated after payment of the fees and out-of-pocket expenses of the Treasurer and upon liquidation of the Escrow Account as provided herein. This Escrow Account, upon the earlier to occur of:
  - (i) receipt by the Treasurer of a written authorization and request, signed as provided in paragraph 5(c) hereof, stating that the acquisition, construction, improvement and extension of the Project is complete, that all obligations and costs in connection with the Project which are payable out of the Escrow Account have been paid and discharged, and that the Treasurer is authorized and directed to transfer all moneys in the Escrow Fund to the Entity or such other disposition as may be agreed by the State and the Entity; or
  - (ii) receipt by the Treasurer of a written certificate of the State, signed by the appropriate representatives thereof as identified in paragraph 5(c) hereof, stating that at least months have expired from the date of this Agreement and that all remaining moneys in the Escrow Account are to be transferred to the State as a prepayment on the Bond purchased by the State or such other disposition' as may be specified by the State.

6. This Agreement may be modified or amended only by a written Amendment attached to this Agreement and signed by the parties to this Agreement.

DATED this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_\_

Entity: \_\_\_\_\_

By: \_\_\_\_\_

Title: \_\_\_\_\_

Exhibit 13

State Treasurer Account Information

Attest and Countersign:

By: \_\_\_\_\_

Title: \_\_\_\_\_

STATE: Utah Division of Solid and Hazardous Waste

By: \_\_\_\_\_

Title: Executive Secretary  
Utah Solid & Hazardous Waste Control Board

Accepted:

Utah State Treasurer

By: \_\_\_\_\_

Title: \_\_\_\_\_

Exhibit 13  
State Treasurer Account Information

EXHIBIT A

Fees due to State Treasurer  
as Escrow Agent

Maximum annual fee is 10 basis points (one-tenth of one percent (.001)) applied to the average daily balance in each account. The fee is assessed monthly based on the actual number of days in the month divided by 360 days.

Minimum annual fee is zero.

The Treasurer intends to deduct the administrative fee from gross earnings of each account before crediting earnings to the account(s). The amount of such fees is not reflected on monthly statements to the Entity, and is payable only from gross earnings on the account(s).

Entity shall not be liable to the Treasurer for any other costs or expenses for usual services. Usual services include:

1. Acceptance of funds delivered for deposit.
2. Deposit of funds and issuance of Treasurer's Receipt.
3. Investment of all funds delivered to Treasurer.
4. Credit net interest earnings to designated account(s) on a monthly basis.
5. Reimburse entity for project costs pursuant to receipt of a written authorization and request properly signed and delivered to the Treasurer.
6. Prepare and deliver to Entity and State a monthly accounting showing all deposits, withdrawals, interest credits and rate, ending balance and average balance for each account.

Entity will be liable to the Treasurer for out-of-pocket expenses resulting from any additional or extraordinary service Treasurer is requested to render and reasonably incurs in connection with additional or extraordinary services.

EXHIBIT B-1  
WRITTEN AUTHORIZATION AND REQUEST FOR REIMBURSEMENT  
FROM ESCROW FUND

TO: The Utah State Treasurer, as Escrow Agent (the "Treasurer").

DATE: \_\_\_\_\_

WRITTEN REQUEST NO.: \_\_\_\_\_

I, the undersigned authorized officer of \_\_\_\_\_, (the "Entity"), do hereby certify and request to the Treasurer as follows:

7. Pursuant to the provisions of the Escrow Agreement by and between the Entity, the State and the Treasurer dated \_\_\_\_\_, (the "Escrow Agreement"), the undersigned hereby authorizes and requests a reimbursement from the Escrow Account to pay the amounts shown on the attached Payment Schedule.
8. Each payment proposed to be made as set forth on the Payment Schedule has been incurred and is a proper charge against the Escrow Account.
9. To the extent that the payment of any item set forth on the Payment Schedule is for other than work, materials, equipment or supplies, in connection with this authorization and request, the undersigned certifies that each payment proposed to be made on the Payment Schedules is a proper charge against the Escrow Account, is a reasonable amount and has not been heretofore included in a prior Written Authorization and Request for Reimbursement for the Escrow Account.
10. This Written Authorization and Request, including the Payment Schedule attached hereto, shall be conclusive evidence of the facts and statements set forth herein.
11. A copy of this Written Authorization and Request is being kept on file in the official records of the Entity.

The terms used herein which are defined in the Escrow Agreement shall have the respective meanings therein assigned to them.

By: \_\_\_\_\_

Title: \_\_\_\_\_

Exhibit 13  
State Treasurer Account Information

EXHIBIT B-2

I/we, the undersigned authorized officer(s) of the State, do hereby certify and request to the Treasurer as follows:

1. I/we have reviewed the foregoing statements of the authorized officer of the Entity attached hereto, and on behalf of the State approve the request for payment from the Escrow Fund made therein; provided that the State has not independently verified the statements of such authorized officer of the Entity attached hereto and makes no representations or certifications with respect thereto.
2. A copy of this Written Authorization and Request is being kept on file in the official records of the State.

The terms used herein shall have the same meanings assigned to them in the attached statements of the authorized officer of the Entity.

Dated the date appearing at the top of the attached statements of the authorized officer of the Entity.

STATE:

By: \_\_\_\_\_

Title: \_\_\_\_\_



UTAH STATE TREASURER  
 UTAH PUBLIC TREASURERS' INVESTMENT FUND  
 New Account Application and Change Form

DATE \_\_\_\_\_

A. Title of Account \_\_\_\_\_

B. PTIF Account Number(s) \_\_\_\_\_

**ACTION:**

<input type="checkbox"/> Create New PTIF Account <i>(Sec. A.C.D.E.F)</i>	<input type="checkbox"/> Change Bank/Account <i>(Sec. A.B.E.F)</i>	<input type="checkbox"/> Add Bank/Account <i>(Sec. A.B.E.F)</i>
<input type="checkbox"/> Change Address <i>(Sec. A.B.D.F)</i>	<input type="checkbox"/> Change Authorized Individuals <i>(Sec. A.B. C.F)</i>	<input type="checkbox"/> Change Internet Access <i>(Sec. A.B.C.F)</i>

C. Individuals Authorized to Make Deposits/Withdrawals:

NAME	TITLE	PHONE	INTERNET ACCESS (Y/N)
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____

D. PTIF Statement Mailing Address: \_\_\_\_\_

Attn: \_\_\_\_\_

E. Bank (Depository) Information:

New/Additional Bank

Delete Bank

a. Name of Bank \_\_\_\_\_ Name of Bank \_\_\_\_\_

b. Account Number \_\_\_\_\_ Account Number \_\_\_\_\_

Checking    Savings    Other \_\_\_\_\_

Exhibit 13

State Treasurer Account Information

F. Authorization: In accordance with applicable statutes and procedures established by the Utah State Treasurer, we the undersigned hereby authorize the Utah State Treasurer to make the above changes and/or initiate wire and/or automated clearing house (ACH) credit entries and/or debit entries to our bank indicated above. The depository named above is authorized to credit and/or debit the same to such account. This authorization is to remain in full force and effect until the Utah State Treasurer has received written notification from us of its termination.

Signed \_\_\_\_\_  
(Date)

Signed \_\_\_\_\_  
(Date)

Name \_\_\_\_\_

Name \_\_\_\_\_

Title \_\_\_\_\_

Title \_\_\_\_\_

**TWO SIGNATURES REQUIRED**

Please **attach a deposit slip** and return this form to:

Utah State Treasurer's Office  
215 State Capitol  
Salt Lake City, Utah 84114

\* Must be a registered user, see our website at [www.treasurer.state.ut.us](http://www.treasurer.state.ut.us) Form UPTLF 1/2

Estimated Consumptive Use for the NWS Station at LOA  
 From a Calibrated SCS Blaney-Criddle Equation using data from KOOSHAREM 10-26-1994  
 Years of Data Available: NWS: 1961-1990 KOOSHAREM: 1990-1991 Elev. 7050 ft., Lat. 38.40

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
% Day Light	6.82	6.73	8.29	8.90	9.96	10.02	10.18	9.53	8.39	7.77	6.78	6.63	100.00
Avg Temp F	23.68	28.19	34.04	41.84	50.13	58.64	65.00	62.69	55.01	45.02	33.43	25.02	43.56
Std Dev Temp	3.95	3.34	3.85	3.09	2.34	2.58	1.18	1.64	2.44	2.92	2.82	3.60	1.03
Avg Prec in.	0.42	0.26	0.51	0.43	0.73	0.51	1.11	1.52	0.99	0.64	0.39	0.34	7.85
Std Dev Prec	0.50	0.21	0.46	0.38	0.54	0.48	0.63	1.05	0.76	0.55	0.37	0.28	2.18
SCS-BC f in.	0.48	0.57	0.90	1.54	2.77	4.13	5.37	4.61	2.95	1.64	0.64	0.50	26.15
Std Dev f	0.08	0.07	0.19	0.31	0.33	0.45	0.23	0.29	0.32	0.28	0.06	0.07	1.23
ALFALFA													
Cal SCS-BC k					1.36	1.76	1.11	1.24	1.34				
Cal SCS-BC Et					3.76	7.28	5.95	5.69	3.96				26.64
Std Dev Et					0.45	0.79	0.26	0.36	0.44				1.36
Net Irr in.					3.18	6.87	5.06	4.48	3.16				22.76
PASTURE													
Cal SCS-BC k				0.14	1.21	1.16	0.96	0.98	0.99				
Cal SCS-BC Et				0.22	3.34	4.77	5.17	4.54	2.93				20.98
Std Dev Et				0.04	0.40	0.52	0.22	0.28	0.32				1.05
Net Irr in.					2.76	4.36	4.29	3.32	2.14				16.87
OTHR MAY													
Cal SCS-BC k					1.36	1.83	1.24	0.57	0.37				
Cal SCS-BC Et					3.76	7.56	6.64	2.61	1.09				21.66
Std Dev Et					0.45	0.82	0.29	0.16	0.12				1.18
Net Irr in.					3.18	7.15	5.76	1.39	0.30				17.78
SP GRAIN													
Cal SCS-BC k					0.35	1.00	1.43	1.47	0.45				
Cal SCS-BC Et					0.97	4.14	7.70	6.76	1.34				20.90
Std Dev Et					0.12	0.45	0.33	0.42	0.15				0.88
Net Irr in.					0.39	3.73	6.81	5.55	0.55				17.02
TURF													
Cal SCS-BC k				0.31	1.26	1.00	0.83	0.85	0.86				
Cal SCS-BC Et				0.48	3.50	4.11	4.46	3.91	2.52				18.98
Std Dev Et				0.10	0.42	0.44	0.19	0.25	0.28				0.97
Net Irr in.				0.13	2.91	3.70	3.57	2.70	1.73				14.74
GARDEN													
Cal SCS-BC k					0.13	0.59	1.03	0.98	0.08				
Cal SCS-BC Et					0.35	2.42	5.54	4.52	0.23				13.06
Std Dev Et					0.04	0.26	0.24	0.28	0.03				0.54
Net Irr in.						2.01	4.65	3.31					9.97
E-LAKE													
Cal SCS-BC k	1.78	2.00	2.00	1.77	1.73	1.19	0.94	1.05	1.20	1.78	2.00	2.00	
Cal SCS-BC Evap	0.86	1.14	1.80	2.73	4.79	4.89	5.05	4.84	3.53	2.92	1.39	1.00	34.93
Std Dev Evap	0.14	0.13	0.39	0.55	0.57	0.53	0.22	0.30	0.39	0.50	0.16	0.14	1.75
Net Loss in.	0.44	0.88	1.29	2.29	4.06	4.38	3.94	3.32	2.54	2.28	0.99	0.66	27.08
ET Ref													
Cal SCS-BC k		2.72	3.26	2.03	2.25	1.78	1.48	1.51	1.58	2.21	2.65	2.66	
Estimated Etr		1.55	2.94	3.13	6.24	7.34	7.96	6.98	4.65	3.61	1.84	1.33	47.56
Std Dev Et		0.18	0.63	0.64	0.75	0.79	0.34	0.44	0.51	0.61	0.21	0.19	2.40

All Values are 30 Year Averages. Effective Precipitation is 80 Percent of Total During Growing Season  
 Blank values (if any) of ET Ref in early and late months denotes only seasonal calibration data  
 Adapted from Hill, 1994. Consumptive Use of Irrigated Crops in Utah, Ut Ag Exp Stn Res Rpt #145 Utah State Univ., Logan UT

**Exhibit 14:**  
**Estimated Consumptive Use**