WASTE MANAGEMENT

PERMIT RENEWAL APPLICATION
MOUNTAIN VIEW LANDFILL
SALT LAKE CITY, UTAH

Mountainview Landfill, Inc.

November 2010

I hereby certify that I have reviewed this material and attest that this report has been prepared in accordance with good engineering practices.

Engineer: **Mark Franc**

Signature: _____

Registration Number: **178236-2202**

Date:

REGISTERED PROFESSIONAL ENGINEER
No. 178236
MARK W. FRANC
STATE OF UTAH

11/29/10

Waste Management of Utah
MOUNTAIN VIEW LANDFILL
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SW116
Division of
Solid and Hazardous Waste

JUN - 4 2013
2013-003740

June 3, 2013

Scott T. Anderson, Director
Division of Solid and Hazardous Waste
Department of Environmental Quality
195 North 1950 West
Salt Lake City, UT 84116

RE: Mountain View Landfill – Utah Class IV and VI Landfill Permit Application Form (Revised)

Dear Mr. Anderson;

As requested in your May 14, 2013 letter to us, we are submitting a revised Utah Class IV and VI Landfill Permit Application Form. The person listed as the owner contact and authorized owner representative who signed the original form is no longer employed by Waste Management.

The enclosed form contains the new owner contact and is signed by a currently authorized owner representative.

Please contact me at 801-726-7052 with any additional questions or comments.

Sincerely,

Mark W. Franc

Mark W. Franc, P.E.
Senior Engineer
Waste Management of Utah

Cc: Brad Kloos, WM District Manger
Farid Abuchaibe, WM District Operations Manager
Bruce Clabaugh, WM Environmental Protection Manager

COPY

WASTE MANAGEMENT

MOUNTAIN VIEW

LANDFILL

DESIGN

AND

OPERATIONS

PLAN

Mountainview Landfill, Inc.

Permit Renewal Application

November 2010

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1 INTRODUCTION

This report has been prepared as part of the permit renewal requirements in accordance with Section V.C of Permit 9811 (Class VI Landfill) which is scheduled to expire on May 31, 2011 for the Mountain View Landfill (MVLF).

This report has been prepared in accordance with applicable Salt Lake Valley Health Department (SLVHD) and Utah Department of Environmental Quality (UDEQ) Regulations. The permit renewal application, proof of ownership, and previous permitting correspondence is included in Appendix A. The MVLF is shown on the site location map described as Figure 1. In particular, this report discusses soils testing, final cover design, final grading and drainage, and the site operations.

2 BACKGROUND

MVLF is an existing construction and demolition waste landfill located at 6976 West California Avenue, Salt Lake City, Utah. The site is owned and operated by Mountainview Landfill, Inc. (MLI). MLI is owned by Waste Management of Utah, Inc. MVLF also operates in accordance with Permit 35-017064 , UDEQ Class V Permit, and Conditional Use Permit #410-561 approved by the Salt Lake City Planning Commission.

2.1 Description

The landfill site consists of approximately 76 acres. MVLF is shown on the vicinity map included in this report as Figure 2. The landfill encompasses parcel #14-10-300-011, which is owned by MLI. The legal property description is:

Beginning at a point on the north line of California Avenue (1300 South Street) said point being North 00°20'02" East 33.00 feet along quarter section line from the South quarter corner of Section 10, Township 1 South, Range 2 West, Salt Lake Base & Meridian and running thence North 00°20'02" East 1293.12 feet along said quarter Section line to quarter quarter Section line; Thence North 89°53'54" West 2596.31 feet along quarter quarter Section line to the East line of 7200 West Street; Thence South 00°40'16" West 1269.78 feet along said East line; Thence South 44°37'52" East 35.17 feet to said North line; Thence South 89°56'00" East 2578.93 feet to the point of beginning.

Less and excepting the 100' wide Kennecott right of way described as follows:

Beginning at a point on the East line of 7200 West Street, said point being North 00°40'16" East 1327.81 feet along Section line to quarter quarter Section line and South 89°53'54" East 55.00 feet along said quarter quarter section line and South 00°40'16" West 9.28 feet along said East line from the Southwest corner of Section 10, Township 1 South, Range 2 West, Salt Lake Base and Meridian and running thence South 00°40'16" West 101.49 feet along said East line; Thence North 80°50'46" East 688.67 feet to said quarter quarter Section line; Thence North 89°53'43" West 621.74 feet along said quarter quarter Section line; thence South 80°50'46" West 57.71 to the point of beginning

Contains: 73.370 acres (3,326,687 square feet) net of the 100' wide Kennecott right of way

The ultimate landfill footprint will cover the entire site minus 10-foot setbacks on the north and east sides and 30-foot setbacks for perimeter landscaping (plus additional space for permanent facilities) on the south and west sides. The landfill property is described as the South ½ of the Southwest ¼ of Section 10, Township 1 South, Range 2 West, in Salt Lake County, Utah. The landfill has been in operation since April 1985.

2.2 Soil Conditions

MVLF is located immediately west of the Salt Lake Valley Landfill (SLVLF). MVLF's engineering consultant EMCON/OWT, Inc. (EMCON) previously performed an extensive investigation of subsurface conditions at SLVLF. Because of the proximity of the sites and

consistency of local subsurface conditions, it was EMCON's opinion in the 1998 Design and Operation Plan that subsurface conditions at SLVLF are similar to subsurface conditions at MVLF. EMCON's previous work at SLVLF is documented in *Salt Lake Valley Landfill Master Plan* (EMCON, November 1991), which has been submitted to both the SLVHD and UDEQ.

Based on EMCON's previous work at SLVLF, soils in the area are generally Holocene and Quaternary basin-fill deposits of the Jordan Valley consisting primarily of interbedded silty clays and silty sands. The sediments were deposited on the shore of an ancient lake in the area where streams flowed into the lake from the adjacent mountains. Saturated portions of these fluvio-lacustine sediments are reported to be between approximately 200 to 700 feet thick.

Generally, there are three principal soil horizons beneath the site area, consisting of: 1) surface fine-grained layer; 2) intermediate silty sand horizon, and 3) lower sandy layer. The intermediate silty sand layer and lower sand layer are commonly separated by a clay horizon. The surface fine-grained layer, consisting of silt to clay soils, averages approximately 10 feet thick in the site area. The surface clay layer is punctuated locally by thin stringers of silty and clayey sand. These thin sand and silt stringers are locally saturated, but produce little water. Below the surface fine-grained layer, the intermediate horizon and lower sand layers consist of variably well-graded, silty and poorly graded sands, and gravel and gravely sands at depths from about 3 feet to about 30 feet below the ground surface. These shallow sands are typically water-saturated and form the principal shallow aquifer beneath the site. Groundwater beneath the site is brackish with total dissolved solids in the range of 10,000 milligrams per liter.

Shallow soil samples were obtained from undeveloped areas of the MLVF to obtain more information on the site specific subgrade conditions. Samples were also analyzed for ion-exchange capacity, pH, and metals content, consistent with SLVHD Regulations #1, Section 6.3(f). Testing confirmed that subgrade soils are generally silty clays with some clayey sands. Test results are summarized in Table 1 with data sheets included in Appendix B.

Permeability and consolidation testing was also conducted on relatively undisturbed samples. The permeability of near surface soils, based on one sample, is 3.7×10^{-7} centimeters per second (cm/s), which is generally consistent with permeability test results for clay soils at the SLVLF. The compression index (C_c) was estimated to be 0.13 with a preconsolidation pressure of 9 kips per square foot. The values for C_c correspond well to data from the neighboring SLVLF and empirical equations based on Atterberg limits. Assuming a 10-foot-thick compressible clay layer beneath the landfill and relatively incompressible sand beneath that, estimated average foundation settlements due to maximum fill thickness is less than 6 inches and has been neglected in landfill capacity calculations.

2.3 Hydrogeologic Setting

Information on the hydrogeologic setting of MVLF, summarized from the 2009 Annual Ground Water Monitoring Report and 1998 Design and Operations Plan (Plan), is as follows:

> Soils in the area are generally Holocene and Quaternary basin-fill deposits of the Jordan Valley, consisting primarily of interbedded silty clays and silty sands. Three principal soil horizons occur beneath the site: **1)** a surface fine-grained layer; **2)** an intermediate silty sand layer; and **3)** a lower sandy layer. The intermediate silty sand layer and lower sand layer usually are separated by a clay horizon.
>
> The surface fine-grained layer, consisting of silt and clay, averages approximately 10 feet thick in the site area. The layer locally contains thin stringers of silty and clayey sand, which are locally saturated but produce little water.
>
> The intermediate silty sand layer and lower sand layer consist of 'variably well-graded, silty and poorly-graded sands, and gravel and gravely sands, ' at depths between three and 30 feet below ground surface (bgs). These shallow sands typically are water-saturated and form the principal shallow aquifer beneath the site.
>
> Shallow groundwater occurs between about seven and 12 feet bgs as shown on Figure 2 from the 2009 Groundwater Monitoring Report. Total Dissolved Solids (TDS) concentrations typically are elevated, with concentrations in area wells of 10,000 milligrams per liter (mg/l) or higher.

Groundwater gradients are very low beneath the MVLF, and flow direction can vary as a result of construction activities in the area. The Plan indicates that during earlier years of MVLF operation, groundwater flowed to the north, toward the Great Salt Lake. Following construction of borrow ponds adjacent to and southeast of the MVLF, groundwater flow direction changed to southward. Construction activities including ponds, stockpiling, and drainage ditches continue to influence local groundwater flow direction.

Groundwater level maps for 1996, 1997, and 1998 indicate flow toward the south-southwest. Maps prepared from 1998-2006 indicate flow toward the south-southeast. The change in flow direction from southwest to southeast after 1998 was attributed to construction of a drainage ditch to the east of the MVLF. The drainage ditch located east of MVLF appears to discharge into Lee Ditch, which is southeast of the MVLF. Lee Ditch appears to have been excavated to a depth comparable to the groundwater levels in MVLF wells, thereby intersecting the groundwater surface and, by allowing groundwater discharge, causing groundwater to flow eastward beneath MVLF toward the ditch. Ditch construction activity reportedly was completed before the 2000 monitoring. The 2007 data indicates flow toward the south coverging in the area of MW-BSC-R (differs from previous interpretations due to a measurement point elevation correction) and has been consistent through the 2009 event data.

3 DESIGN

The following sections discuss the final grading plan, final cover design, and provisions for drainage.

3.1 Grading

The landfill site is relatively flat with elevations ranging from about 4,215 to 4,220 feet mean sea level (MSL). As discussed in Section 2.2, the near-surface soil has a permeability of about 4 x 10^{-7} cm/s. Permeability of native clayey soils at the nearby SLVLF are on the order of 10^{-7} to 10^{-8} cm/s.

No excavation occurs before waste is placed in the landfill. Wastes are placed on the native low-permeability soils. The native low-permeability soils serve as a low-permeability liner below the waste. Although the native low-permeability soils beneath the site would impede the downward movement of leachate within the existing landfill, no leachate has been detected.

A liner and leachate collection system are not required for a Class VI landfill, such as MVLF. Accordingly, a liner or leachate collection system is not proposed for the future area at MVLF. However, the native low-permeability soils beneath the landfill serve as a natural low-permeability liner and provide waste containment.

The landfill footprint will eventually cover most of the permitted 76 acre site. As shown on Drawing 1, the landfill footprint will cover approximately 74 acres. The footprint will be set back 10 feet along the north and east boundaries and 30 feet along the south and west boundaries. The proposed final elevation is 4,425 feet MSL with a minimum 50-foot-wide top deck, as shown on Drawing 1. The top deck will have minimum slope of 5 percent. The landfill sideslopes on the north and west will be 2:1 (horzontal:vertical) with 25-foot-wide- benches every 40 vertical feet. A pronounced swale along the south facing slope with a flatter slope of 3:1 has been added to provide more natural variation. A change in slope from 2:1 to 5:1 along the south and east slopes was added to improve the appearance of the ridgeline from the south. Two knolls have replaced the single peak from the 1998 Design and Operation Plan to reduce the pyramid shape.

The total landfill air space (waste) is approximately 10.8 million cubic yards (cy). As of the most recent aerial topographic survey onApril 17, 2010, approximately 9.3 million cubic yards (cy) of air space has been used since beginning operation in 1985. The site has a remaining capacity of 1.5 million cy. Based on an estimated annual air space usage of 95,000 tons, the landfill has a remaining life of approximately 15 years.

3.2 Final Cover Design

3.2.1 Regulatory Requirements

Regulations applicable to the MVLF final cover system are contained in UDEQ Solid Waste Permitting and Management Rules (R315-301 through 320) and the SLVHD's Health Regulations #1, Solid Waste Management Facilities.

UDEQ Rule R315-302-3(2) requires that a landfill be closed in manner that

(a) minimizes the need for further maintenance;
(b) minimizes or eliminates threats to human health and the environment from postclosure escape of solid waste constituents, leachate, landfill gases, contaminated run-off or waste decomposition products to the ground, ground water, surface water, or the atmosphere; and
(c) prepares the facility or unit for the postclosure period

UDEQ Rule R315-305-(5) requires a Class VI landfill, such as MVLF to be closed by leveling the wastes to the extent practicable and placing a minimum of two feet of soil cover, including six inches of topsoil. The landfill cover may be seeded with grass, other shallow rooted vegetation or other native vegetation or covered in another manner approved by the Executive Director.

SLVHD Regulations #1 requires a landfill to have a final cover consisting of a compacted layer of cover material, at least 24 inches thick, with the upper 6 inches of a soil composition suitable to sustain plant growth, and the lower portion of material that restricts infiltration to the equivalent of that achieved by 18 inches of low-permeability (1×10^{-5} cm/sec or less) soil.

3.2.2 Final Cover

The approved final cover consists of a two-foot-thick layer of soil that is an evaporative soil cover. These covers provide sufficient moisture storage so that the soil moisture can be removed by evaporation. Evaporative covers have been designed and constructed on many landfills in arid and semi-arid regions and effectively reduce infiltration without long-term performance concerns that may be associated with geosynthetic materials or compacted clay covers.

The evaporative cover is designed to store moisture and allow for eventual evaporation and plant transpiration. Little moisture is released to flow into the waste and subgrade soils. The prescriptive standard has a lower moisture holding capacity so the soil barrier does little but to delay the inevitable infiltration into the waste. The semi-arid conditions of Salt Lake City, where evaporation well exceeds precipitation, are well suited for evaporative covers. In addition to allowing less infiltration, the evaporative cover is much less susceptible to settlement and cracking than a compacted clay cover.

3.3 Drainage

3.3.1 Existing Site Conditions

The area immediately east of the site is the Salt Lake Valley Landfill. North of the site is a wedge-shaped open area bounded by the northern landfill limits and an earth mound (abandoned rail road) traversing diagonally beginning at the northwest corner of the property. This open area creates additional contributory flow along the northern perimeter of the site. Drainage tributary to the south is minimal due to an existing ditch alongside West California Ave. West of the site is 7200 West and Lee Ditch where most of the site surface runoff will drain.

3.3.2 Design Criteria

The design criteria utilized for determining the surface water runoff is based on the 25-year, 24-hour duration storm event, as required by SLVHD. The proposed drainage system design is based on the final landfill grades shown on Drawing 1.

3.3.3 Hydrologic Analysis

The method used for determining storm runoff is based on Technical Release 55 (TR-55), *Urban Hydrology for Small Watershed,* published by the Natural Resource Conservation (NRCS). Runoff peak flows and storm hydrographs obtained from the hydrologic analysis are based on 25-year, 24-hour frequency storm event and presented in Appendix C.

Precipitation. Rainfall data from the nearest precipitation station (National Weather Service-Salt Lake City Station [SLCS] was used to simulate the storm event at the site. The estimated 25-year, 24-hour precipitation reported from the SLCS is 2.65 inches.

Rainfall Distribution. TR-55 includes four synthetic 24-hour rainfall distributions developed by the NRCS representing various regions of the United States. Based on the geographical location of the site, Type II rainfall distribution was used in the analysis.

Time of Concentration. The time of concentration (T_c) is the time for runoff to travel from the most hydraulically distant point in a drainage subarea to the collection point. Calculation for T_c consists of overland flow or sheet flow, shallow concentrated flow, and open channel flow, or some combination, to the collection point. The T_c calculated for the landfill drainage subareas range from 6 to 8 minutes, approximately 0.1 hour, which is the minimum time concentration allowed by the TR-55 computer program. Open channel flow time is calculated based on flow velocities obtained from Manning's equation.

Overland flow time is determined based on the kinematics equation for sheet flow condition. Travel times for shallow concentrated and open channel flows were calculated based on flow velocities obtained from Manning's equation. Data input for the TR-55 computer analysis are presented in the hydrology calculations.

An approximate T_c for the off-site drainage area was developed based on the topographic features on the US Geological Survey (USGS) map and open channel flow time along the northern perimeter of the site.

Hydrologic Soil Group. Selection of runoff CNs are based on the hydrologic soil classification, cover type, hydrologic conditions, and antecedent moisture condition. The soils at the site are predominately silty clay loam classified under the Type C under the NRCS soil group system. Based on available soil information and land use, the CN values used for the analysis are as follows:

Area Description	CN

Landfill Top Deck	86
Landfill Side Slope	88
Perimeter / Access Road	90
Undeveloped Area	79

3.3.4 Drainage Improvements

Calculations shown in Appendix C support the following drainage structures. The proposed bench and downdrain system isdesigned to handle peak flows (25-year, 24-hour event) for the final closure condition. Benches and downdrains have been conservatively designed assuming that run-off is not conveyed into intermediated downdrains and is directed into downdrains on the western slope. Downdrains on the north and south slopes will actually convey some of the flow and convey water to the perimeter and natural drainage courses. Final improvements are shown on the drainage plan in Appendix C. Calculations included in Appendix C support the following improvements.

Grass-lined Benches. Most of the flow will be collected from side slopes and conveyed via benches. Drop inlets along the benches will be used to convey surface flow to downdrain pipes.

Downdrains. The downdrain system is designed to provide hydraulic capacity of intercepted run-off carried on the bench system. Drop inlets are included as part of the downdrain system. The high velocity flow (average of 30 fps) will be migrated through energy dissipaters or equivalent materials at the bottom of downdrains to minimize erosion.

Perimeter Drainage. Water will be conveyed to the perimeter of the site and into natural drainage courses. The perimeter drainage system will carry some of the run-off and control some run-on.

Culverts. Culverts have been constructed to convey water under 7200 West and 1300 South to Lee Ditch. Flared end sections will intercept flow from ditches and downdrains. The site's point of discharge is the existing Lee Ditch.

3.4 Sequencing

The Above Grade Isopach Map, Drawing 2, presents areas of the facility remaining to be filled. The isopach contour lines on the drawing represent thickness of waste mass remaining to achieve the final landfill grades. The drawing is current as of the date of the most recent aerial survey (April 17, 2010). The plan provides operational guidance as to where additional waste should be placed, the sequence in which it should be placed, and provides information on how access and drainage structures must be implemented during fill placement.

Current Active Area. Drawing 2 also delineates areas on the South side of the facility and on the East and West ends of the facility which have reached final grade and have received final

cap. The capped area encompasses approximately 10.2 acres on the first and second benches of the facility. The drawing also delineates an area on the second bench at the Southeast corner of the facility and on the South side and East end of the facility that have reached final grade. The final cap is not yet completed in these areas, but is under construction as of November 2010 (4.9 acres). The drawing also shows that the third bench is approaching final elevation. Waste placement on the remaining benches occurs in an area fill manner. Sequencing of waste placement is based on operational needs considering access, drainage, and grading.

Landfilling and final grading is currently ongoing in the remaining areas of the facility. The entire permitted footprint of the landfill currently contains waste, so the remaining fill placement and sequence is accomplished to complete the upper benches according to the approved final grading plan.

The worst-case closure costs in 2010 are based on a 63-acre area. This includes the entire waste footprint of the facility with the exception of the area that has completed and approved final cap.

Future Areas. Final cover will be placed after areas reach final grade. Cover soil will not be placed until initial settlement has occurred and enough area is at grade to allow for efficient and cost effective final cover construction.

Soil Cover. Cover will consist of a total of two feet of soil. This material will be taken from on-site stockpiles of clean fill or if necessary, purchased from outside sources. At least 80,000 CY of clean fill is currently stockpiled. Suitable soils (CL or SC) for the final cover will be determined from test parameters established with a test pad constructed for approximately every five acres of final cap placed. A quality assurance plan will be prepared to follow for cap construction. A final construction report for each segment of final cover completed will be submitted to the UDEQ and SLVHD.

3.5 Anticipated Service Life

The site has approximately 1.5 million cubic yards of waste capacity based on a April 2010 aerial survey. At current disposal rates of about 95,000 tons per year, the remaining capacity of the site is 15 years or to 2026. Ongoing engineering reviews will be conducted to continue and monitor the remaining service life.

4 OPERATIONS PLAN

This operations plan has been prepared in fulfillment of SLVHD Health Regulations #1 Solid Waste Management Facilities and UDEQ regulations. Table 2 references the SLVHD Regulations with the applicable sections in this plan.

4.1 Waste Acceptance

MVLF is operated, under this permit, as a construction and demolition waste disposal site (UDEQ Class VI). The current hours of operation are 8 A.M. to 5 P.M., Monday through Friday. Hours of operation may change to accommodate customer projects, seasonally, or for other reasons. Relevant hours are posted at the site entrance.

MVLF accepts, under this permit, only those wastes allowed by the SLVHD/UDEQ Regulations. Acceptable wastes consist of solid waste resulting from construction, remodeling, repair and demolition of structures, and from road building and land clearing. Such wastes include, but are not limited to, bricks, concrete and other masonry materials, soil, rock, wall coverings, gypsum board, plaster, drywall, and other inert material, plumbing fixtures, non-asbestos insulation, roofing shingles, flooring tiles, vinyl flooring, asphaltic pavement, glass, plastics that are not sealed in a way that conceals other wastes, wood, and metals that are incidental to any of the above. Solid wastes that are not construction and demolition waste (even if resulting from the construction, remodeling, repair and demolition of structures, and from road building and land clearing), and which will not be accepted, include, but are not limited to, friable asbestos waste, municipal solid waste, medical waste, putrescible waste, florescent electrical fixtures and transformers containing polychlorinated biphenyl's, tires (although several tires that may inadvertent to a load, or tire chips of 2-inch size or less, are considered acceptable), drums and containers with liquid or unrecognizable wastes, and fuel tanks. Specifically excluded from the definition of construction and demolition waste is solid waste that has been rendered unrecognizable by a process such as pulverizing or shredding or other similar process. No liquid, hazardous, or municipal solid waste (putrescible waste) will be accepted, as defined by SLVHD.

The general service area for the landfill is the Salt Lake City-County metropolitan area. The landfill also receives waste occasionally from Davis, Utah, Weber, and Tooele counties. The population of the service area exceeds 1 million people.

4.2 Landfill Equipment

Landfill operations will be managed with the use of heavy construction equipment which currently includes the following: Track Type Tractors (Dozers), Compactors, Loaders, Excavators, Articulated Trucks, and Water Trucks.

In the event of equipment breakdown, other equipment may be used to manage disposal of construction and demolition wastes.

Equipment on site will be provided with the following safety devices:

1) Rollover protection devices
2) Seat Belts
3) Audible reverse warning devices
4) Fire Extinguishers on all equipment used to spread and compact solid waste or fill cover material
5) Communication equipment

Adequate equipment will be maintained at all times to ensure availability for proper management of the waste material and compliance with SLVHD Section 6.5(k).

4.3 Landfill Personnel

The number of site personnel will be adequate to ensure proper operations and management of the landfill. In addition, an on-site, qualified manager will be present during all hours of operation and will be available to handle emergency situations with facility communications equipment. Landfill Personnel include the following:

Landfill District Manager
6976 West California Avenue
Salt Lake City, Utah 84104
(801) 250-0555

Operations Manager
Equipment Operators
Gatehouse Personnel
Traffic Directors/Laborers

Laborers, mechanics, and related support personnel will be provided as needed. Current operations require a staff of about four full-time employees during any given work shift. All employees will be required to wear the following at all times on site:

1) Hard Hat
2) Gloves
3) Safety Glasses
4) Safety Footwear (Steel toe and steel shank)
5) Safety Vests

4.4 Training

MVLF utilizes internal as well as external training opportunities, and conducts on-the-job training for new employees, and recurring training to refresh existing employees. Training is conducted on landfill operating procedures, equipment operations, identification and inspection of acceptable and unacceptable wastes, health and safety training, record keeping and reporting, and in related areas. Equipment operators are trained in fire protection, and the use of fire

extinguishers, which are mounted on each piece of equipment. Employees are trained on all equipment that they are expected to use in the performance of their jobs. The goal of employee training is to ensure proper and safe operations for employees, and the public users of the site.

4.5 Signage

The landfill entrance gate area has existing signs that indicate the name, permit number, hours of use, penalty for unauthorized use, safety precautions, types of waste accepted and not accepted, and additional information. Signs are used as needed to direct traffic onto roads, control vehicle speed within the landfill, and to indicate unloading areas.

4.6 Waste Inspection Procedures

When vehicles loaded with waste materials arrive at the gate, they must stop at the gatehouse. The gatehouse attendant is trained in waste acceptance procedures. Through a series of questions, the gatehouse attendant determines the nature and general source of the waste materials. A video camera is mounted outside the gatehouse, positioned to allow the attendant to observe the load. A waste receipt ticket is filled out that identifies the account's name, time and date, load description, truck number, and the origin of the waste. This form is included in Appendix D. Acceptable loads are directed to appropriate unloading area.

If the load is deemed unacceptable, it is rejected, and not allowed to proceed into the landfill. A "Load Rejection Report", is included in Appendix D for completion by the landfill and regulatory notification.

Loads accepted for disposal are again viewed/inspected by the Traffic Directors/Laborers and/or equipment operators, as the waste is unloaded/or managed at the disposal area. Any unacceptable wastes will be required to be reloaded by the driver and removed from the site. If unacceptable wastes are later identified by site personnel, they will be removed from the working area and the disposer will be notified to remove them from the site. If the source of the waste cannot be identified, MVLF will be responsible for disposing of the waste at a properly permitted site.

Random load inspections will be conducted at a minimum frequency pf 1% of loads received, but no less than once per week to insure that waste haulers remain cognizant of the types of unacceptable wastes, and to enforce the unacceptable waste regulations. All "suspicious" loads will be inspected. In addition, equipment operators constantly look for suspicious or excluded wastes as they operate the site. A load inspection program is included in Appendix D.

4.7 Disposal Procedures and Contingency Plans for Fire or Explosion

The area fill method of disposal is used at MVLF. The landfill will be developed in stages. Stages at final grades will be closed incrementally after reaching final grade. Daily disposal areas will be kept to the minimum area required to allow safe unloading, while minimizing the area of uncovered waste. Landfill equipment will be used to push, spread, and compact the waste, and to maintain an orderly working area. Scavenging is prohibited by any person(s).

No open burning will be conducted at any time. If a fire should ignite or explosion occurs, soil from designated stockpiles or other areas maintained near the disposal area will be used to cover any burning waste. The water truck may be used to spray water on the fire as necessary. At the same time that site personnel are responding to the fire, emergency response agencies such as the fire department will be called in to assist, as needed.

Verification of grades and elevations will be preformed by certified surveyors on an as needed basis. Typically, this occurs once a year when annual aerial topographic map is prepared.

4.8 Surface Water Management

Run-on and run-off will be controlled through use of berms, ditches, and erosion control efforts. Lee Ditch and Kersey Creek are the nearest surface water bodies and both feed the Great Salt Lake. The active portion of the landfill is maintained at a higher grade than surrounding areas and soil berms are constructed as necessary to direct surface water from the active portion of the landfill. The soil berms and grading techniques employed effectively isolate portion of the landfill where waste may be exposed.

Surface water run-off from the facility is collected in a series of ditches constructed around portions of the perimeter of the facility. These ditches convey surface water to unnamed surface water control ditches.

MVLF manages stormwater consistent with the requirements of the General Industrial stormwater Discharge Permit. As required, a stormwater pollution prevention plan and stormwater monitoring plan have been prepared for MVLF.

The limits of landfill are outside the 100-year flood plan as shown on Figure 4 available from Salt Lake County FEMA Database. The limits of landfill are also outside wetlands as depicted on Figure 5 from the National Wetlands Inventory Database.

4.9 Litter, Odor, Vector, and Dust Control

Temporary litter fencing will be deployed as needed to contain blowing paper and plastics. Litter will be cleaned up by laborers as needed to maintain a safe and orderly appearance. Prevailing winds are from the south.

Odors are not expected, due to the inert nature of the waste. Placement of cover soil over certain types of waste also will act to control any odors. Disease vectors, rats, or flies are not expected to be an issue, due to the inert nature of waste.

Dust will be controlled by watering. Water is pumped into the water truck from an on-site water well. If no water is available from the well an off-site water source will be used. A Fugitive Dust Control Plan reviewed by UDEQ is included in Appendix A-4.

4.10 Noise Levels

All on-site equipment is equipped with mufflers. Noise levels will be minimized to prevent levels beyond the property line exceeding allowable limits set forth in the SLVHD Regulations #1.

4.11 Explosive Gas Monitoring

Although C&D waste disposal sites generally do not generate significant amounts of explosive gas (landfill gas), a monitoring program will continue to be conducted. The monitoring program is in place to ensure that landfill gas, measured as methane, generated by the waste does not create a hazardous condition. Landfill personnel have been trained in the use and calibration of a methane detector for monitoring the surface of the landfill. Gas monitoring at MVLF was started in March 1997 and is performed quarterly by landfill personnel. The methane detector is recalibrated every quarter before monitoring and a minimum of two locations approximately thirty feet up the landfill slope, various locations at the top of landfill, the site buildings, and the corners of the fill are selected for monitoring each quarter. The results of the monitoring program are recorded on a Methane Monitoring Form and are kept on site.

If gas levels do exceed 25 percent of the lower explosive limit (LEL) within any structure or the LEL at the landfill's property line, MVLF shall:

1) Immediately take necessary steps to ensure the immediate protection of human health and safety;
2) Immediately notify the SLVHD of the gas levels detected and the remediation steps which have already been taken;
3) Within 14 days, submit to the SLVHD for approval an ongoing remediation plan for the gas accumulation. The plan will describe the nature and extent of the problem and the proposed remedy. The plan will be implemented upon approval of the SLVHD.

4.12 Groundwater Monitoring

Groundwater from five on-site monitoring wells is sampled annually and analyzed by a Utah Certified Laboratory. Groundwater monitoring since 1985 has not indicated any impact to groundwater from the disposal of waste at this site.

A Groundwater Monitoring Plan dated August 2001 presents the groundwater monitoring program for MVLF. This plan incorporates monitoring elements approved by SLVHD to provide environmental protection during and after development. The plan further uses monitoring locations selected on the basis of hydrogeologic conditions to provide early detection of a potential release from the facility and corrective action programs to be initiated if groundwater is contaminated.

4.13 Spill Prevention

A spill prevention control and countermeasure plan has been prepared for MVLF.

4.14 Recordkeeping Procedures

The landfill will continue to maintain a site Operating Record that will be available for inspection by the SLVHD and UDEQ. The operating record will include at least the following information:

- Amounts and types of waste accepted at the facility
- Unacceptable waste notifications

- Random load inspections
- Survey information regarding the filled areas of the landfill
- Groundwater and gas monitoring results
- Training procedures and documentation of training
- Site Facility Inspections

5 CLOSURE AND POST CLOSURE

This section describes the tasks involved for implementing closure and post-closure maintenance of MVLF.

5.1 Closure

This preliminary plan reviews sequencing cover design, grading, and discusses closure cost and financial assurance.

5.1.1 Sequencing

The landfill will be closed in stages as portions reach final grade. Areas will be closed following the attainment final grade. A Quality Assurance Plan for construction of final cover will be prepared. Upon completion of each segment of final cover, a final construction report will be completed.

5.1.2 Cover Design

The approved final cover consists of a two-foot thick layer of soils. As discussed in Section 3.2, the approved meets the SLVHD Health Regulations and the UDEQ Regulations including:

- Minimizing further maintenance
- Minimizing threats to human health and the environment by minimizing infiltration
- Preparing the facility for post-closure period

The final cover will be vegetated to minimize erosion and maximize evapotranspiration.

5.1.3 Grading

Final grades are 2:1 with 25-foot-wide benches every 40 vertical feet. A pronounced swale along the south facing slope with a flatter slope of 3:1 has been added to provide more natural variation. A change in slope from 2:1 to 5:1 along the south and east slopes is intended to improve the appearance of the ridgeline from the south. Two knolls have replaced the single peak to reduce the pyramid shape. The final elevation is about 4,425 feet MSL. Benches are used to intercept surface water.

5.1.4 Drainage

Run-off is controlled by a system of drainage benches and downdrains as discussed in Section 3.4.4. Drainage improvements include:

- Culverts to convey water to Lee Ditch

The system has been designed for peak flows from the 25-year, 24-hour storm.

5.1.5 Closure Costs

Financial assurance is based on a worst-case closure area. Worst-case closure costs includes two feet of cover soil, ditch and bench grading, and vegetation. The estimated worst-case closure costs are summarized in Table 3. The costs include final features, such as downdrains and culverts, shown on the Final Grading and Drainage Plan (Drawing 1).

5.2 Post Closure Maintenance

The post closure maintenance plan describes the tasks necessary to implement the post closure maintenance requirements. The plan includes:

- Monitoring and control systems operating during the post-closure maintenance period
- Inspection and maintenance procedures for the closed landfill
- Emergency response plan
- Estimated post-closure maintenance costs

5.2.1 Final Cover Integrity

This program will involve making repairs to the cover as necessary to correct the effects of settling, subsidence, erosion, and other events. A post-closure maintenance program will be instituted at the landfill to verify that the final cover retains its integrity. The final cover areas will be routinely evaluated and inspected for:

- Evidence of erosion
- Ponded water
- Odor
- Exposed refuse
- Cracks
- Settlement
- Slope failure
- Leachate seeps

Cracks in the final cover will be repaired. Any erosion damage, which may occur as a result of extremely heavy rainfall, will be repaired. Temporary berms, ditches, and straw mulch will be used as needed to prevent further erosion damage to soil cover areas until site conditions permit replacement of eroded soil and reseeding of vegetation.

5.2.2 Drainage System

Drainage control problems can result in accelerated erosion of a particular area within the landfill. Differential settling of drainage control structures can limit their usefulness and may result in failure to direct storm water properly of the site. A post-closure maintenance program will be implemented so that the integrity of the final drainage system is maintained throughout the post-closure maintenance period. The final drainage system will be routinely evaluated and inspected for

ponded water, and blockage of and damage to drainage structures. In areas where erosion problems are noted or drainage control structures need to be repaired, proper maintenance procedures will be implemented to prevent further damage.

Inspections and any maintenance will be conducted by qualifiedpersonnel.

5.2.3 Vegetative Cover

The condition of vegetation will be monitored annually. Inspections will identify areas of irregular color or growth deficiency. During future inspections, the spread of these conditions will be noted.

5.2.4 Groundwater Monitoring Network

The groundwater monitoring system will remain in service throughout the closure and post-closure periods. Upon determination by local, state, and federal agencies that groundwater monitoring is no longer necessary, the system will be decommissioned. The wells will be decommissioned consistent with applicable local and state regulations.

Groundwater monitoring wells will be inspected for signs of failure or deterioration during each sampling event. If damage is discovered, the nature and extent of the problem will be recorded. A decision will be made to repair or replace the well. Possible repairs include redevelopment, chemical treatment, partial casing replacement or repair, resealing of the annulus, or pumping and testing. If a well needs to be replaced, it will be properly decommissioned. Inspections and maintenance will be performed by qualified personnel.

5.2.5 Post-Closure Cost Estimate

The post-closure maintenance cost estimate shown in Table 3 was prepared based on the post-closure maintenance plan presented in this section. The post-closure maintenance cost estimate includes the cost of materials, equipment, labor, and administration. The post-closure maintenance costs are assumed to continue for at least 30 years after closure.

REFERENCES

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EMCON Associates. June 11, 1998. Design and Operations Plan, Blandfill Landfill.

EMCON Associates. November 1991. Salt Lake Valley Master Plan. Prepared for Salt Lake Valley Waste Management Council. Project 344-02.01.

Natural Resource Conservation Service Technical Release 55. *Urban Hydrology for Small Watersheds.*

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Pipe Culvert analysis computer Program. Version 1.7 Copyright © 1986. Dodson & Associates

Salt Lake County Engineering & Flood Control. (www.slco.org/pn/eng/flood/html/fplains.html)

Salt Lake Valley Health Department Regulations #1, Solid Waste Management Facilities.

Siegel, R.A.August 2001. Groundwater Monitoring Plan for Mountain View Landfill 1975. STABL User Manual. Purdue University, Joint Highway Research Project JHRP-75-9

Utah Department of Environmental Quality Solid Waste Permitting and Management Rules, R315-301 to 320

TABLES

Table 1

Summary of Soils Laboratory Testing

Summary of Soils Laboratory Testing				Grain Size		Atterberg Limits		Compaction Test (ASTM 1557)		Permeability Test	
Sample Number	Dry Inplace Density	USCS Classification	Moisture Content (%)	Percent Passing #4 (%)	Percent Passing #200 (%)	Liquid Limit (LL)	Plasticity Limit (PL)	Maximum Dry Density (pcf)	Optimum Moisture Content (%)	Remolding Criteria	Coefficient of Permeability k (cm/sec)
a. Bucket 2		SC	22.5	80	48	27	18				
b. Bucket 3		CL	28.1	96	84	38	20				
c. Bucket 4		CL	30.3	100	96	44	22				
d. Bucket SK1		SC	21.7	81	47	29	18				
e. Bucket SK2		SC	16.6	77	44	28	17	124.0	9.5		
f. Bucket SK3		CL	25.6	92	68	31	19				
g. Bucket SK4		GC	19.0	64	32	27	17	127.3	7.8	90%RC@OMC+2	5.00E-06
h. Core #1	92.1	CL	28.3								
i. Core #2			17.9								
j. Core #3	89.7	CL or SC	28.3								
k. Core #4	84.8	CL	33.9								3.70E-07
l. Sample #I	104.7	SC	17.8	83.8	46.6	26	18	116.7	13.5		
m. Sample #2	102.6	CL	13.6	85.6	54.9	27	18	114.5	14		
n. Sample #3	106.7	SC	14.1	81.3	46.0	25	17	118.7	12.5		

NOTE:
Samples were sent to EMCON/OWT, Inc.'s Soil Lab. Samples a-k were sampled in March 1998and samples l-n were sampled in November 2004.
Core samples have slightly higher moisture and are probably more accurate.
RC = relative compaction
OMC = optimum moisture content

Table 2

SLVHD Regulations Cross Reference

County Regulation	Description	Operations Plan Section
6.1	Restricted siting locations	N/A
6.2	Department approval and bond requirements	N/A
6.3	Report and approval requirements for permit	N/A
6.4	Plan Approval	N/A
6.5	Minimum design and operating requirements	See Below
6.5.a	Verification of acceptable incoming waste	4.1
6.5.a.1	Inspection of at least 10 percent of incoming loads	4.6
6.5.a.2	Inspection of all suspicious loads	4.6
6.5.a.3	Keeping of records of inspections	4.6
6.5.a.4	Training of personnel to recognize unauthorized waste	4.4
6.5.a.5	Notification of department solid waste not accepted into site	4.6
6.5.b	Shall not accept any hazardous or liquid waste	4.1
6.5.c	Health and safety of individuals	4.4
6.5.c.1	Safety manual	4.4
6.5.c.2	Personal safety devices	4.3, 4.4
6.5.c.3	Safety manual	4.2, 4.4
6.5.c.4	Communication equipment for emergency situations	4.3
6.5.d	Qualified personnel during all hours of operation	4.4
6.5.e	Control of public access	4.5
6.5.f	Signage	4.5
6.5.g	Record keeping	4.14
6.5.h	Vector, dust, and odor control	4.9
6.5.I	Passability of on-site roads	4.5
6.5.j	Designated areas for offloading	4.7
6.5.k	Available equipment for trenching, compaction and covering	4.2
6.5.l	Liner system	3.1
6.5.m	Minimization of working waste face	4.7
6.5.n	Daily cover	4.7
6.5.o	Salvaging	4.7
6.5.p	Noise levels	4.10
6.5.q	Open burning	4.7
6.5.r	Leachate collection	3.1
6.5.s	Waste not deposited on surface water or in groundwater	4.8
6.5.t	Surface water run-off and run-on control	4.8
6.6	Methane monitoring requirements	4.11
6.7	Groundwater and surface water monitoring requirements	4.12

Mountain View Landfill
Worst Case Closure and Post-Closure Maintenance and Care
Financial Assurance Cost Estimate
November-10

Worst Case Exit Closure Cost

Description	Units	Prior Year Unit Cost	Updated Unit Cost	Quantity	Prior Year Cost	Updated Cost
Final Cap Construction – 63 *Acres*						
Contractor Mob/demob	EA	$21,640.40	$21,839.49	1	$21,640.40	$21,839.49
24-inch Cover material (purchase/place/compact)	CY	$5.41	$5.46	*203280*	$1,099,765.26	$1,109,883.10
Hydroseeding		$541.01	$545.99	*63*	$34,083.63	$34,397.20
Grading – Ditches & Swales	ACRE	$13.53	$13.65	6400	$86,561.61	$87,357.98
Surveys	LF	$3,787.07	$3,821.91	1	$3,787.07	$3,821.91
QA/QC and soils testing	LS	$2,705.05	$2,729.94	*63*	$170,418.17	$171,986.02
Closure Report and Certification	ACRE	$10,820.20	$10,919.75	1	$10,820.20	$10,919.75
Deed/Records Filing	EA	$2,705.05	$2,729.94	1	$2,705.05	$2,729.94
Building/Facilities Demobilization	EA	$27,050.50	$27,299.37	1	$27,050.50	$27,299.37
Fencing and Site Security	EA	$5,410.10	$5,459.87	1	$5,410.10	$5,459.87
				Total Exit Closure Site Costs =	$1,462,242.00	**$1,475,694.63**

Notes:

1. Worst case closure assumes *63 acres* of final cap to build at closure or at an intermediate closure condition.
2. Final cap consists of 24-inches of CL or SC soils as determined by ASTM and seeded with native grass seed.
3. Soils for final cover obtained from on-site stockpiles.

Annual Post Closure Maintneance & Care Cost

Description	Units	Prior Year Unit Cost	Updated Unit Cost	Annual Quantity	Prior Year Annual Cost	Updated Cost
Site Maintenance						
Misc. Grading and repair of final cap	HR	$135.25	$136.50	40	$5,410.10	$5,459.87
Reseeding and fertilizing of final cap	ACRE	$973.82	$982.78	1	$973.82	$982.78
Mowing and weed control	ACRE	$135.25	$136.50	63	$8,520.91	$8,599.30
Drainage repair/maintenance	HR	$135.25	$136.50	20	$2,705.05	$2,729.94
Miscellaneous maintenance	HR	$48.69	$49.14	20	$973.82	$982.78
Monitoring						
Annual inspections & report	HR	$91.97	$92.82	40	$3,678.87	$3,712.71
Groundwater sampling	HR	$73.58	$74.25	40	$2,943.09	$2,970.17
Groundwater sample analyses	EA	$324.61	$327.59	*7*	$2,272.24	$2,293.15
Annual reporting	HR	$86.56	$87.36	20	$1,731.23	$1,747.16
Annual surface water sampling	HR	$64.92	$65.52	20	$1,298.42	$1,310.37
Surface water sample analyses	EA	$16.23	$16.38	*4*	$64.92	$65.52
Annual reporting	HR	$91.97	$92.82	20	$1,839.43	$1,856.36
Landfill gas monitoring	HR	$48.69	$49.14	24	$1,168.58	$1,179.33
				Initial Annual Post-Closure Care & Maintenance Costs =	$33,580.49	**$33,889.44**
				Post-Closure Care & Maintenance Period (Years) =	30	
				30-Year Total Post-Closure Care & Maintenance Costs (inflation adjusted) =	$1,007,414.84	**$1,016,683.06**

Notes:

1. Post-Closure assumes a 30-year post-closure period as required by Health Regulation 1, Section 6.9(f) on the completed landfill footprint of 68 acres.
2. A total of seven groundwater sample points (five wells, one field duplicate and one trip blank) are sampled annually for constituents listed in Mountain View Landfill Groundwater Monitoring Plan dated August 2001.
3. Surface water monitoring occurs quarterly.

Prior Year =	$2,469,656.85
Total Required Financial Assurance Bond Amount =	**$2,492,377.69**

FIGURES

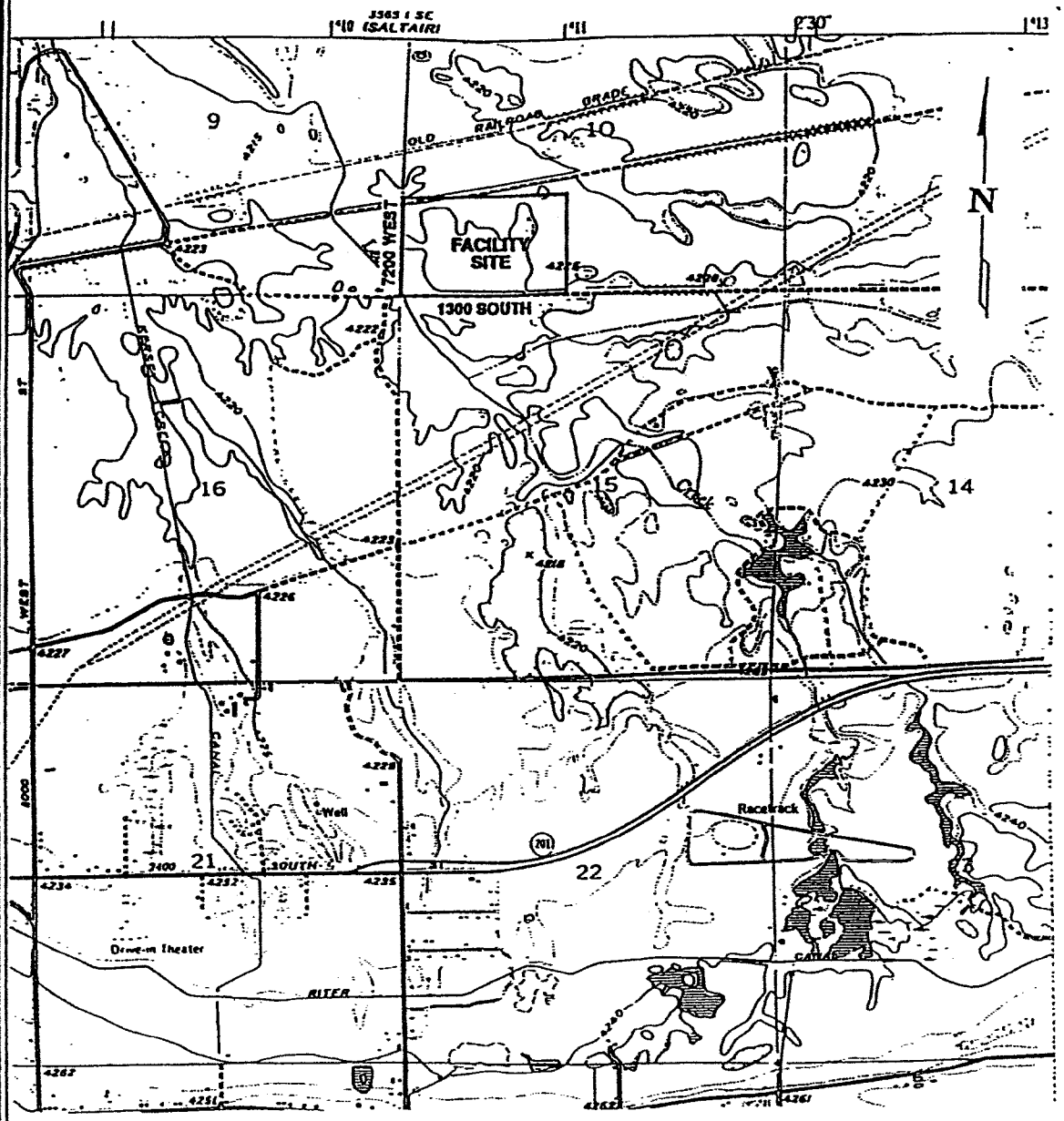
the group
EMCON/OWT Solid Waste Services

0 1 2
SCALE - Miles

DATE	NOV. 2000
DWN	S.E.R.
APPR	
REV	
PROJECT NO	801569

FIGURE 1
WASTE MANAGEMENT, INC.
MOUNTAIN VIEW LANDFILL
SALT LAKE CITY, UTAH

SITE LOCATION MAP



0 1000 2000 4000 6000

APPROXIMATE SCALE IN FEET

Reference: U.S.G.S. Quadrangle Map of Magna, Utah 1975

MOUNTAIN VIEW LANDFILL

VICINITY MAP

Figure 2

DATE:	PROJECT NO.:	DRAWING NO.:
DEC 2000		

Well MW–BNW
(4,218 10)

Well MW–BN2
(4,218 21)

N

NORTH

7200 WEST STREET

4218 00

Well MW–BW
(4,217 87)

Well MW–BSC–R
(4,217 10)

Well MW–BS
(4,218 63)

South West Corner
Section 10

South Quarter Corner
of Section 10

CALIFORNIA AVENUE

4217 75

4217 50

4217 50

4217 75

4218 00

4218 25

0' 200' 400

SCALE

LEGEND

Monitoring Well and Water Elevation (ft)

Well MW–BNW
(4,218 10)

Landfill Footprint (approximate)

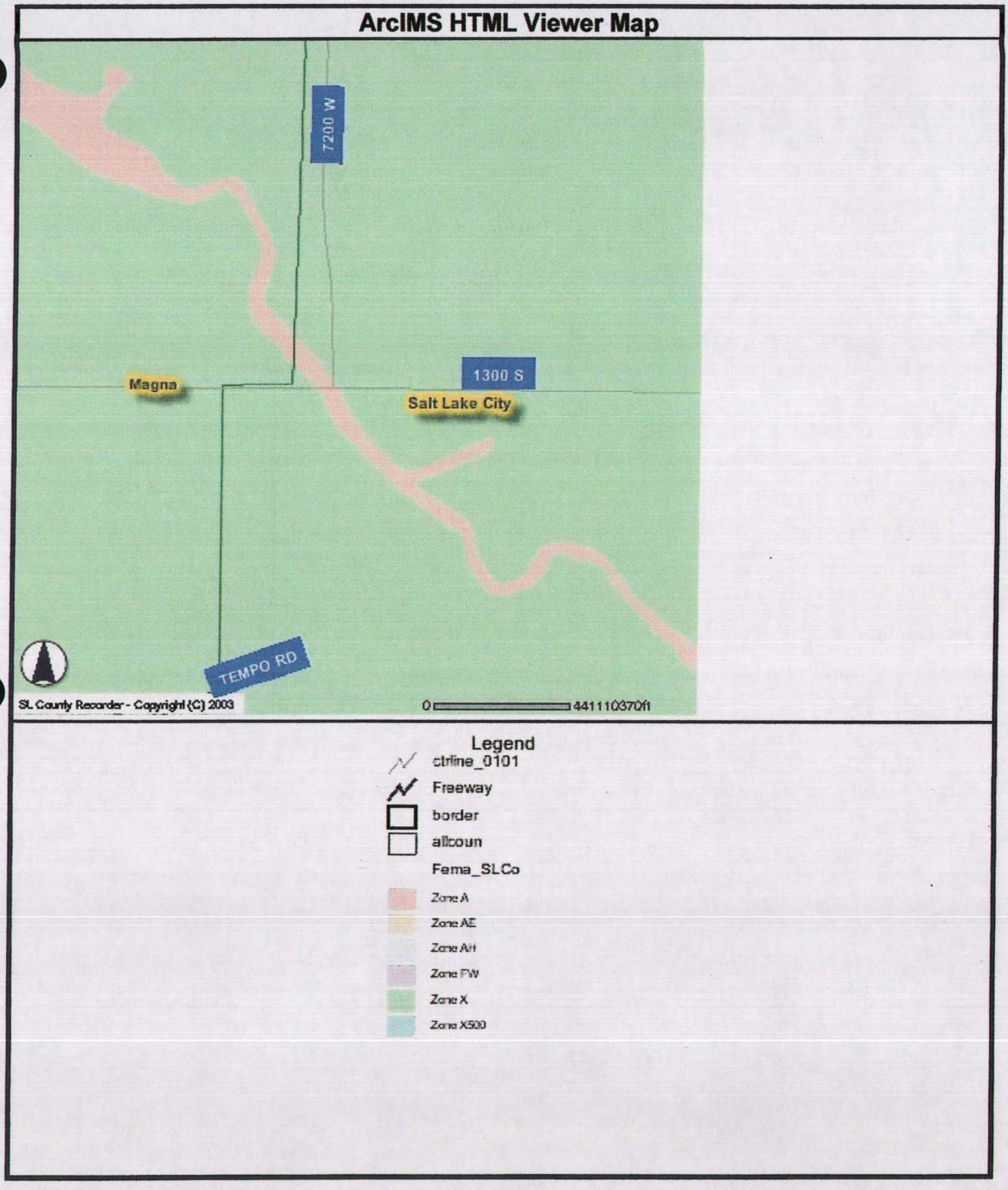
Contour Line

Groundwater Flow Direction

AquAeTer
Optimizing environmental resources ◆ water air earth

FIGURE 3

GROUNDWATER CONTOUR MAP
SEPTEMBER 2009



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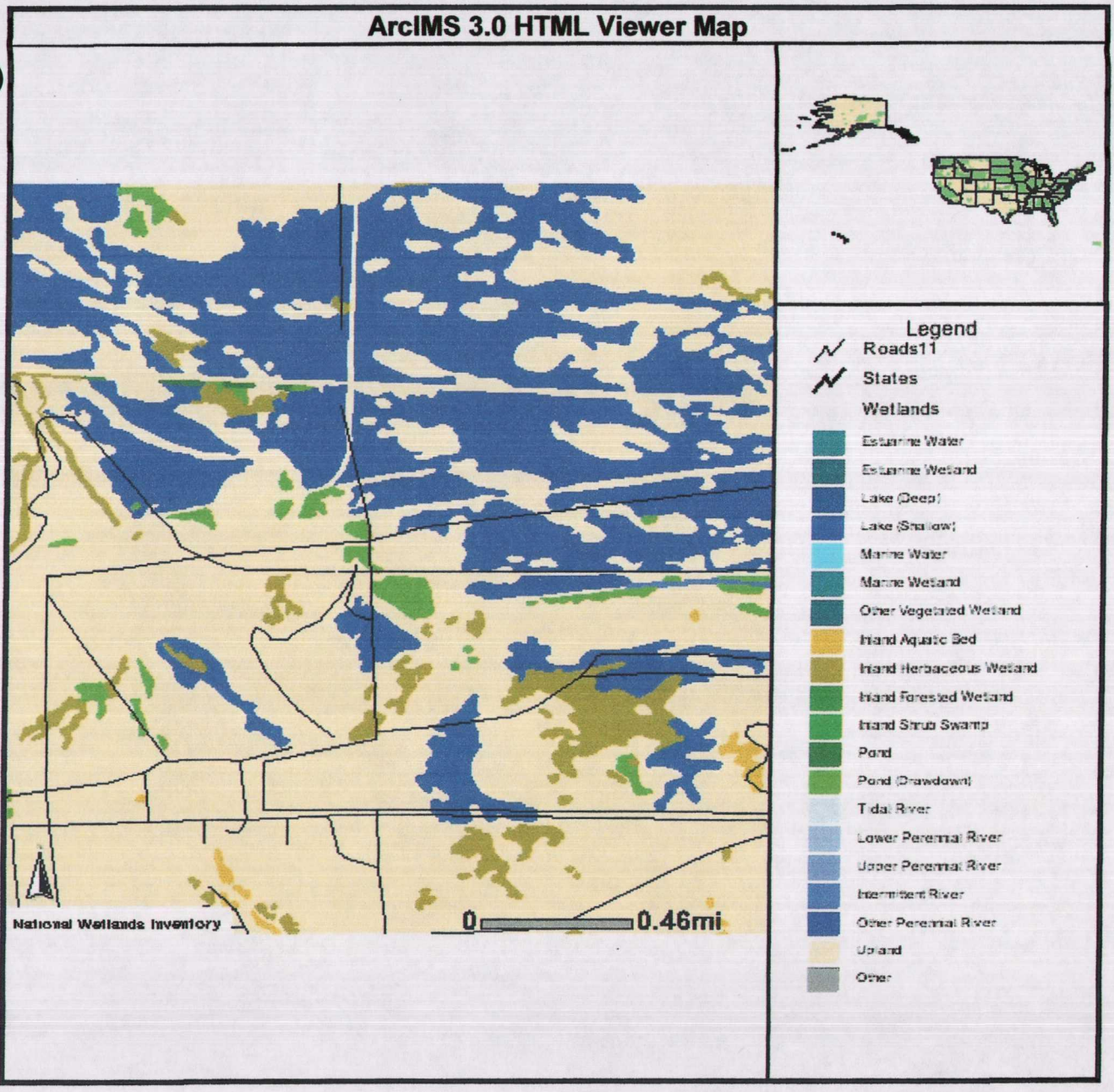
ArcIMS 3.0 HTML Viewer Map
National Wetlands Inventory
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0.46mi
Legend
Roads11
States
Wetlands
Estuarine Water
Estuarine Wetland
Lake (Deep)
Lake (Shallow)
Marine Water
Marine Wetland
Other Vegetated Wetland
Inland Aquatic Bed
Inland Herbaceous Wetland
Inland Forested Wetland
Inland Shrub Swamp
Pond
Pond (Drawdown)
Tidal River
Lower Perennial River
Upper Perennial River
Intermittent River
Other Perennial River
Upland
Other

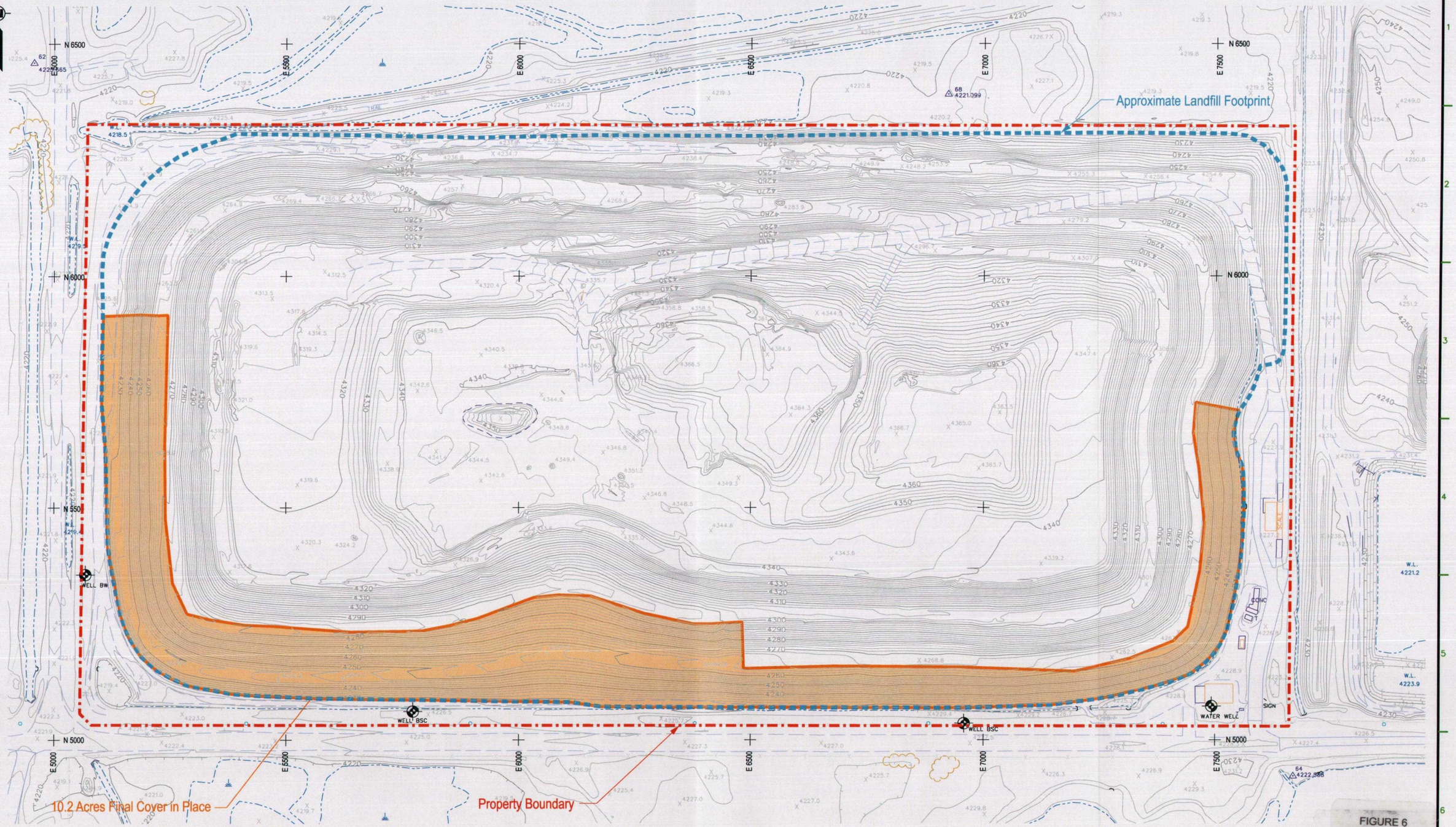

FIGURE 6

100 0 100 200
SCALE 1" = 200'

WASTE MANAGEMENT

Revisions			
No.	Description	Date	By

Approved By:	Marc Franc
Checked By:	Marc Franc
Drawn By:	Corp. CADD

Project Location:
Mountain View Landfill
Salt Lake City, Utah

2010 Topography dated
April 17, 2010

Drawing No.		
Scale:	As Shown	Sheet Number: 1
Date:	Nov. 2010	

...\CAD Files\Ut02a10_4-17-10.dgn 11/23/2010 10:07:02 AM

DRAWINGS

Approximate Landfill Footprint

10.2 Acres Final Cover in Place

Property Boundary

4.9 Acres Filled to Final Waste Elevation

100 0 100 200
SCALE 1" = 200'

WASTE MANAGEMENT

Revisions			
No.	Description	Date	By

Approved By:	Marc Franc
Checked By:	Marc Franc
Drawn By:	Corp. CADD

Project Location:
Mountain View Landfill
Salt Lake City, Utah

Permitted Final Grading Plan By Emcon, Dated July 2003

Drawing No.	UT02-0590-AIR-02	
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Date:	Nov. 2010	

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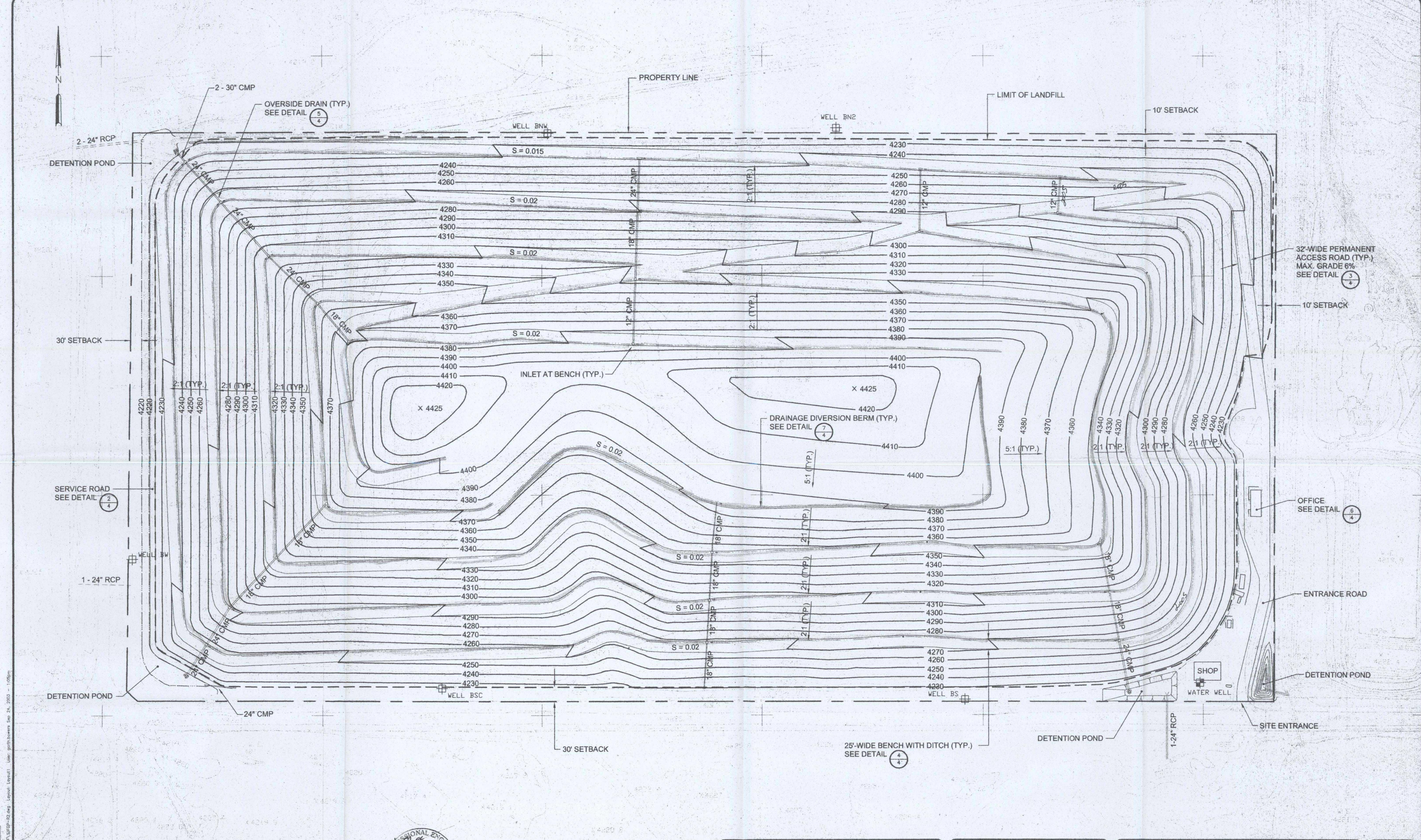


Topographic base compiled using photogrammetric methods by Aero-Metric Inc., Fort Collins, Colorado. Date of photography: June 26, 2003

XREF Files: 8-26-03 IMAGE Files:
File: N:\Cad\DWG\Mountain View LF\SJFGP-R2.dwg Layout: Layout1

PROFESSIONAL ENGINEER
NO. 4865328
GARTH ROBERT BOWERS
STATE OF UTAH
9/29/03
FOR REVISION 1 CHANGES

SCALE
0 100 200 FEET

REV	DATE	DESCRIPTION	DWN BY	DES BY	CHK BY	APP BY
1	9/22/03	REVISED GRADING PLAN BASED ON SLC COMMENTS	KAB	SER	RDH	RDH

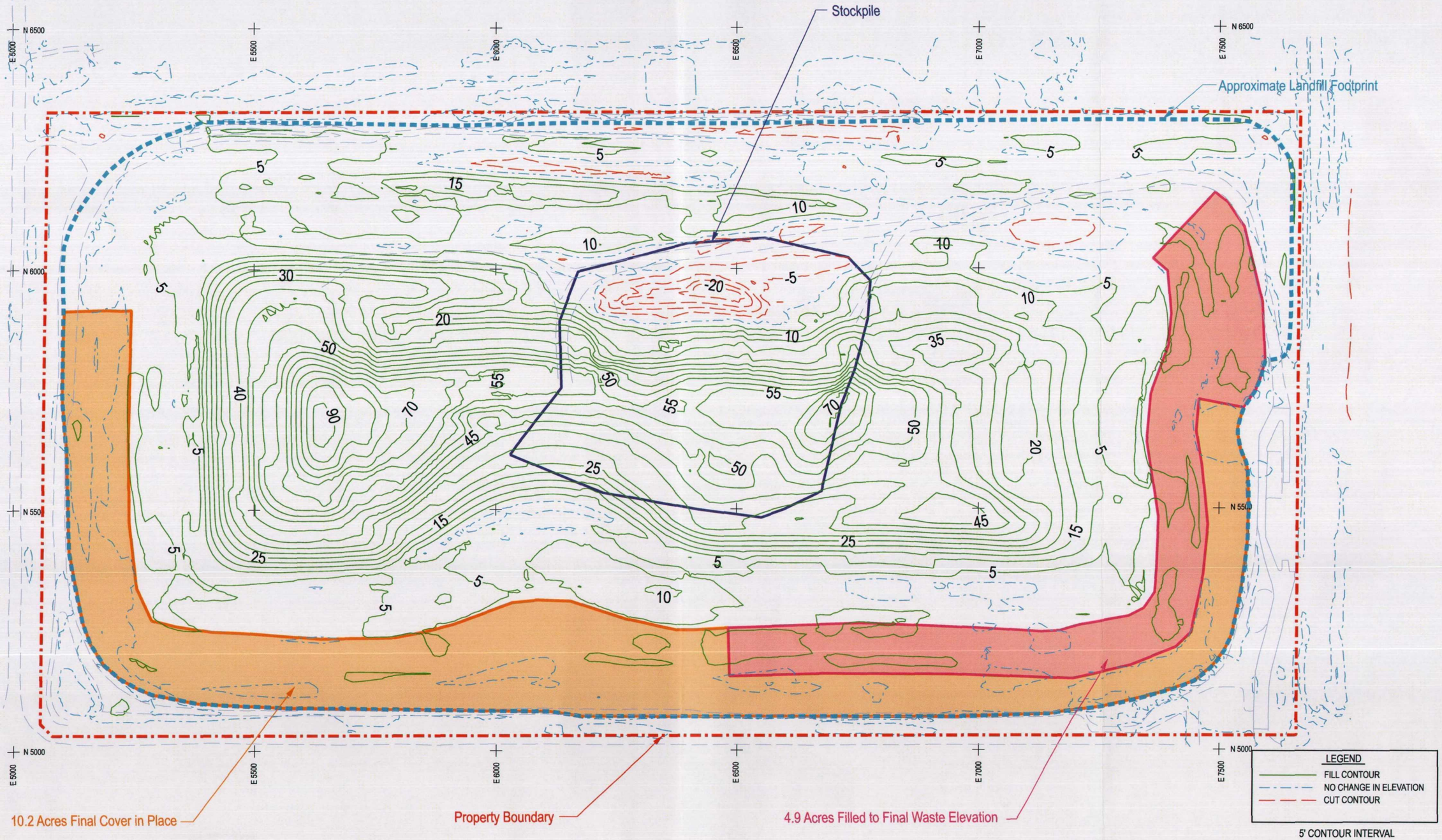
DATE OF ISSUE APR. 1998 DWN BY SER DES BY SER CHK BY RDH APP BY RDH

Shaw™ EMCON/OWT, Inc.

WASTE MANAGEMENT, INC.
MOUNTAIN VIEW LANDFILL
SALT LAKE CITY, UTAH

FINAL GRADING AND DRAINAGE PLAN

DRAWING NO. 1
PROJECT NO. 844008



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SCALE 1" = 200'

WASTE MANAGEMENT

Revisions

No.	Description	Date	By

Approved By:	Marc Franc
Checked By:	Marc Franc
Drawn By:	Corp. CADD

Project Location:
Mountain View Landfill
Salt Lake City, Utah

Isopach Between Topography Dated April 17, 2010 and Permitted Final Grades

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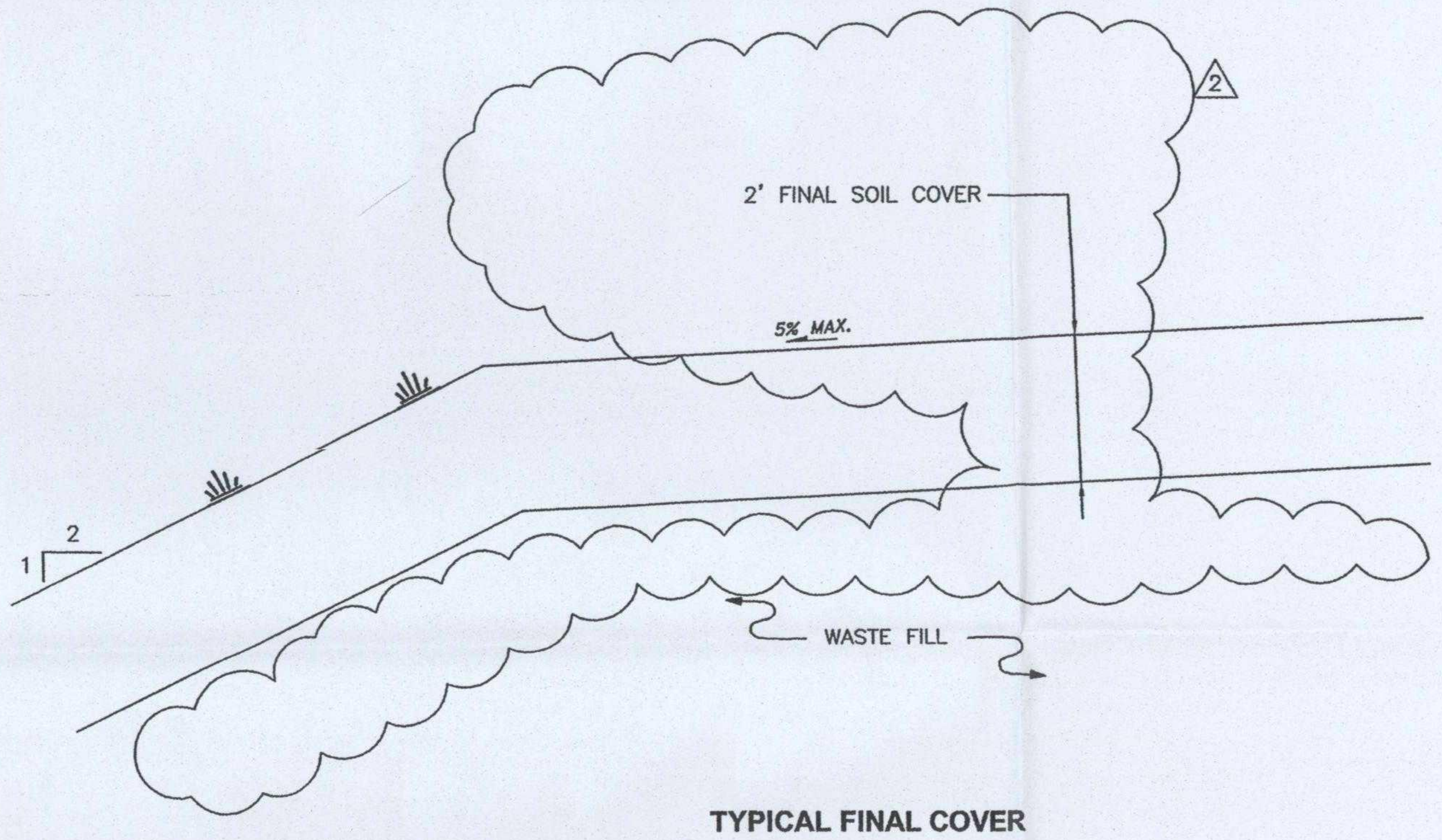
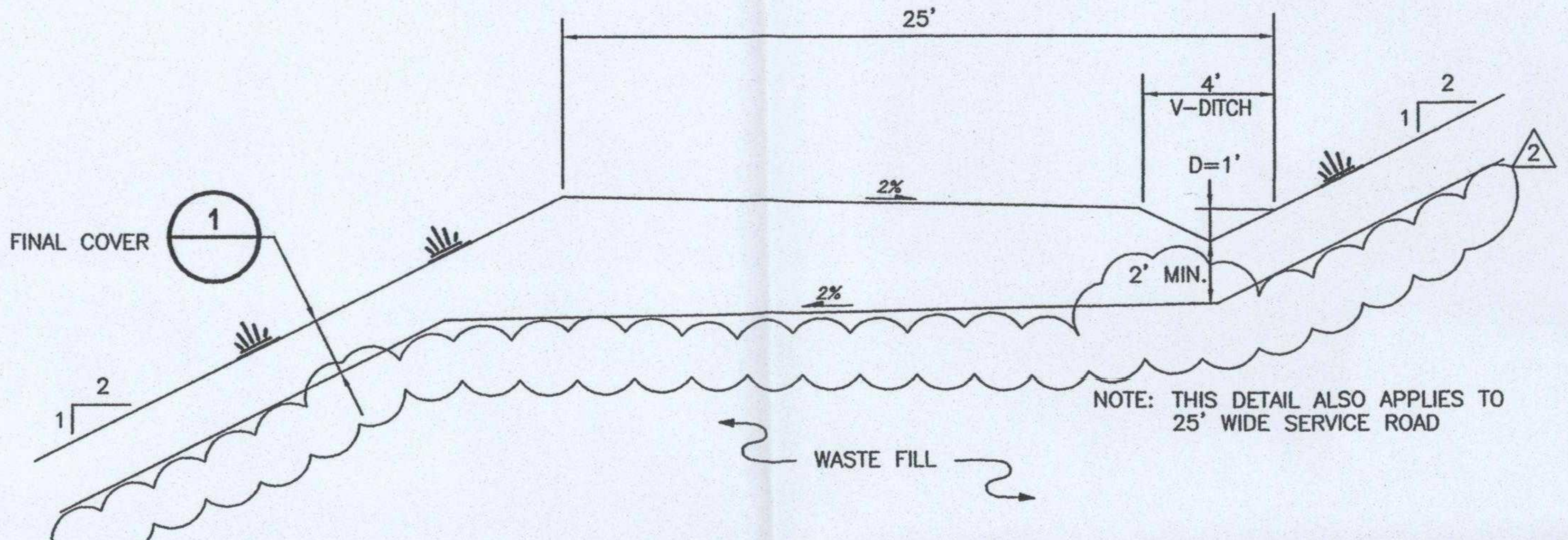
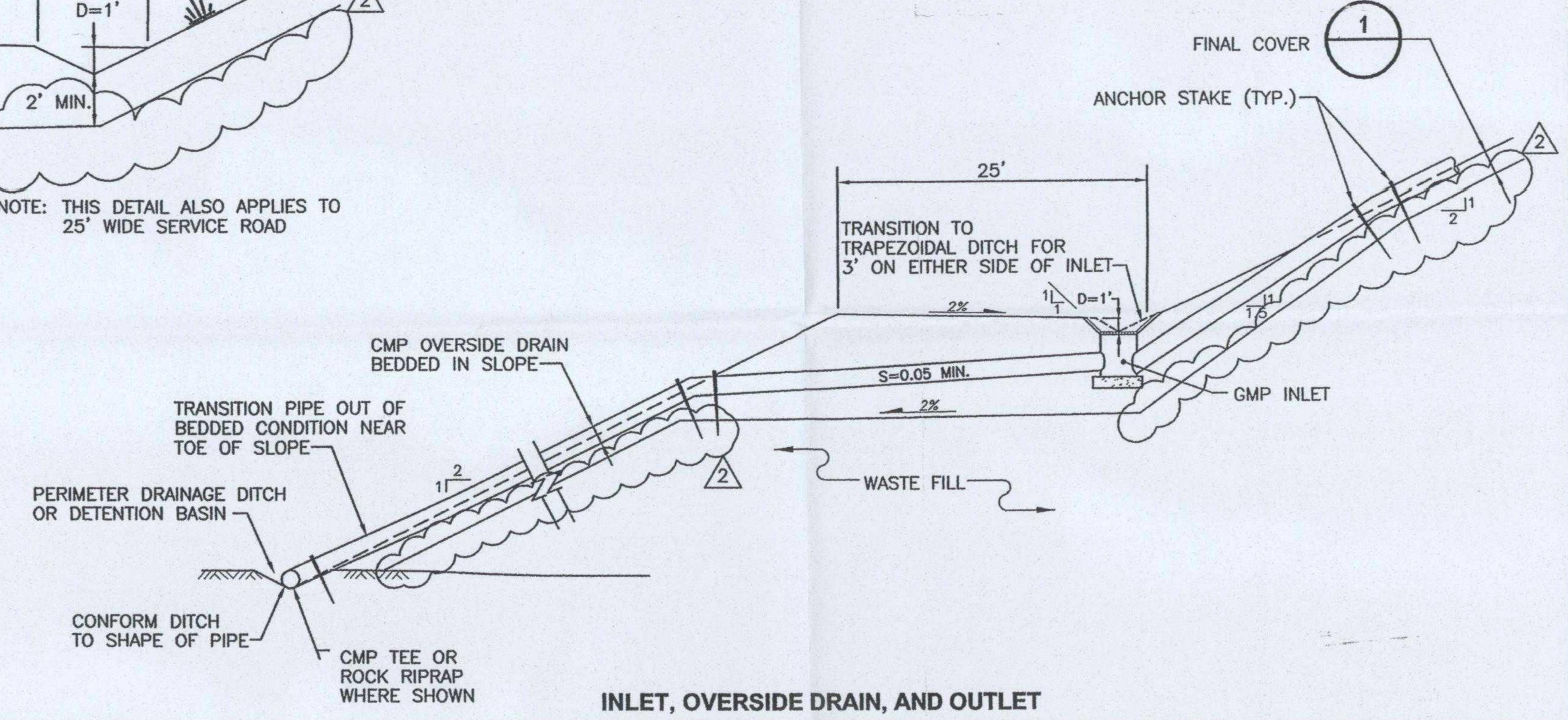


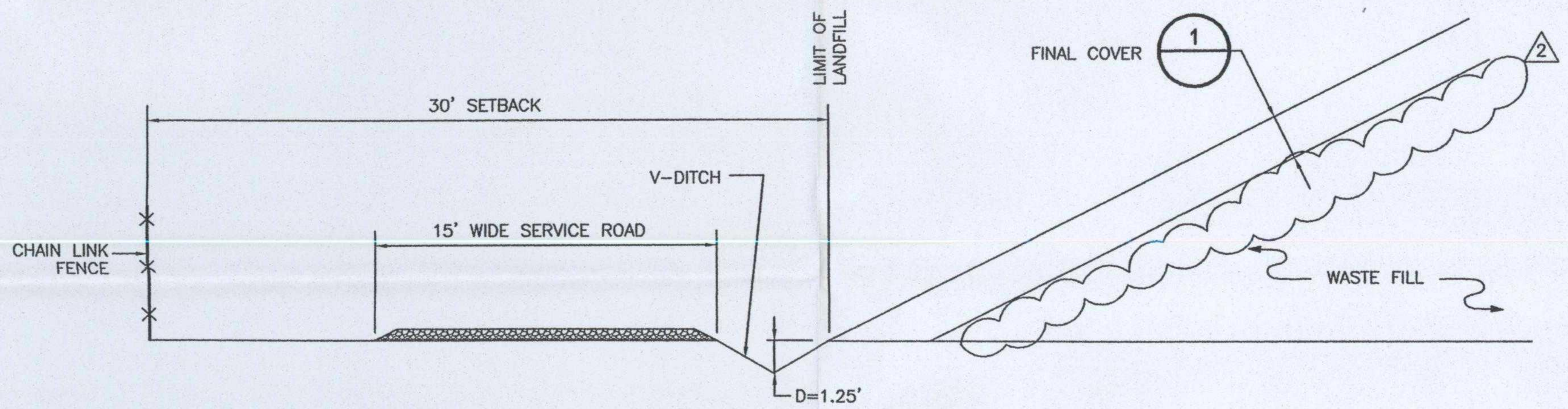
TYPICAL FINAL COVER
DETAIL 1
SCALE: 1" = 2'



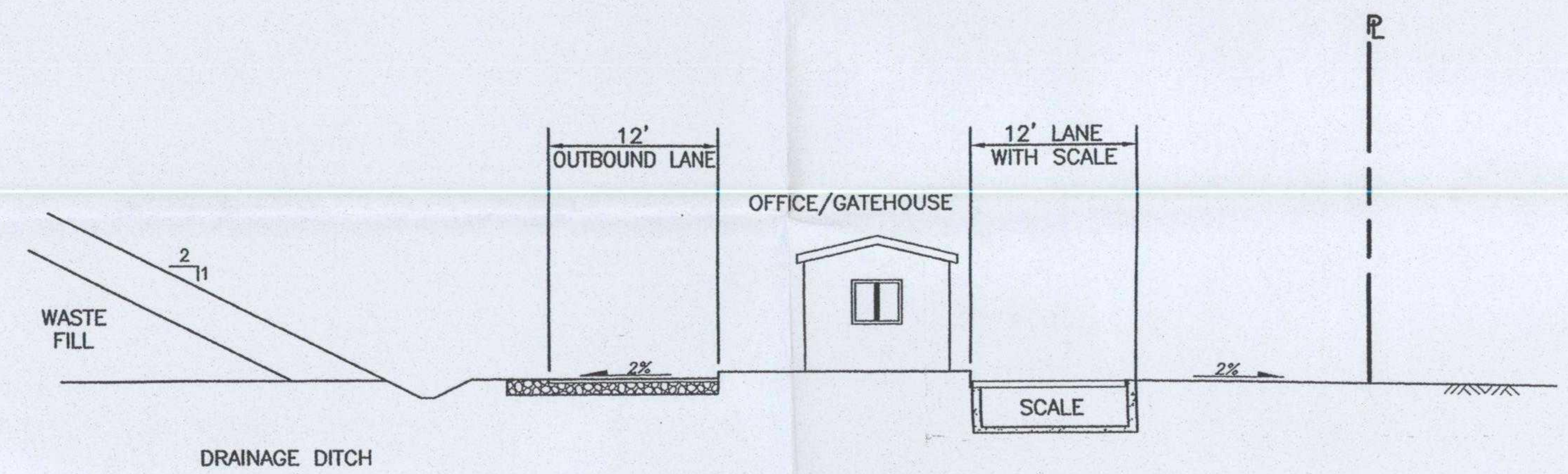
25' WIDE BENCH WITH DITCH
DETAIL 4
SCALE: 1" = 5'



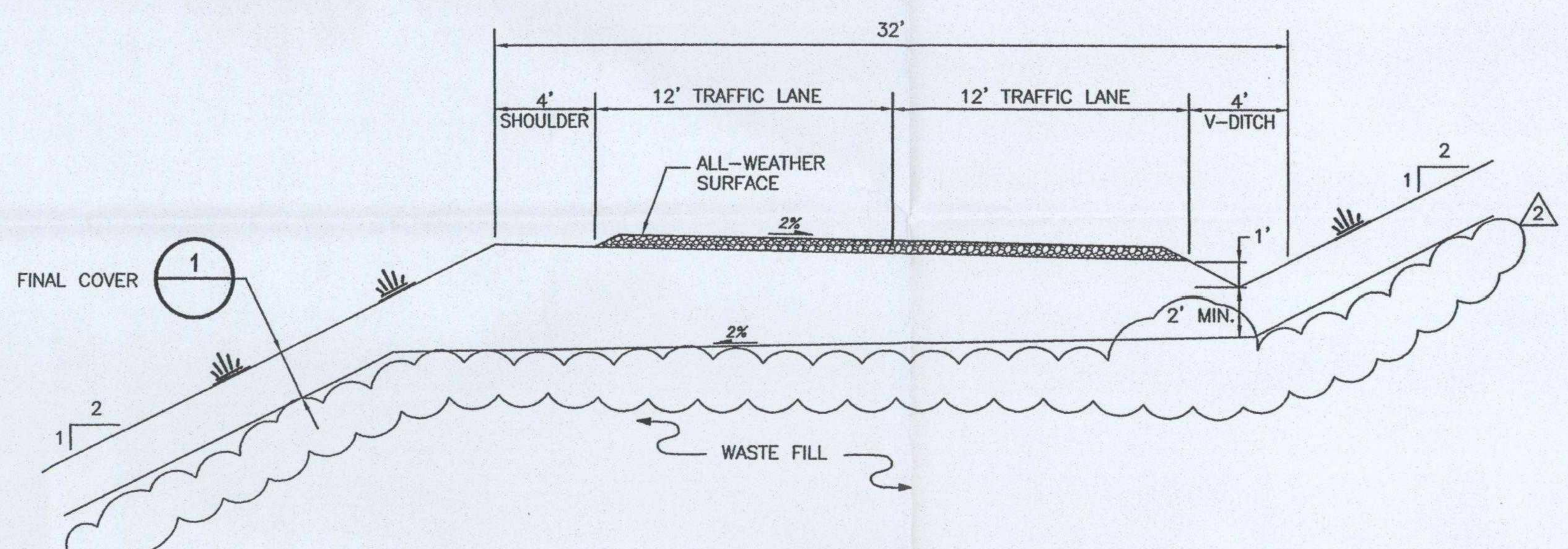
INLET, OVERSIDE DRAIN, AND OUTLET
DETAIL 5
SCALE: 1" = 10'



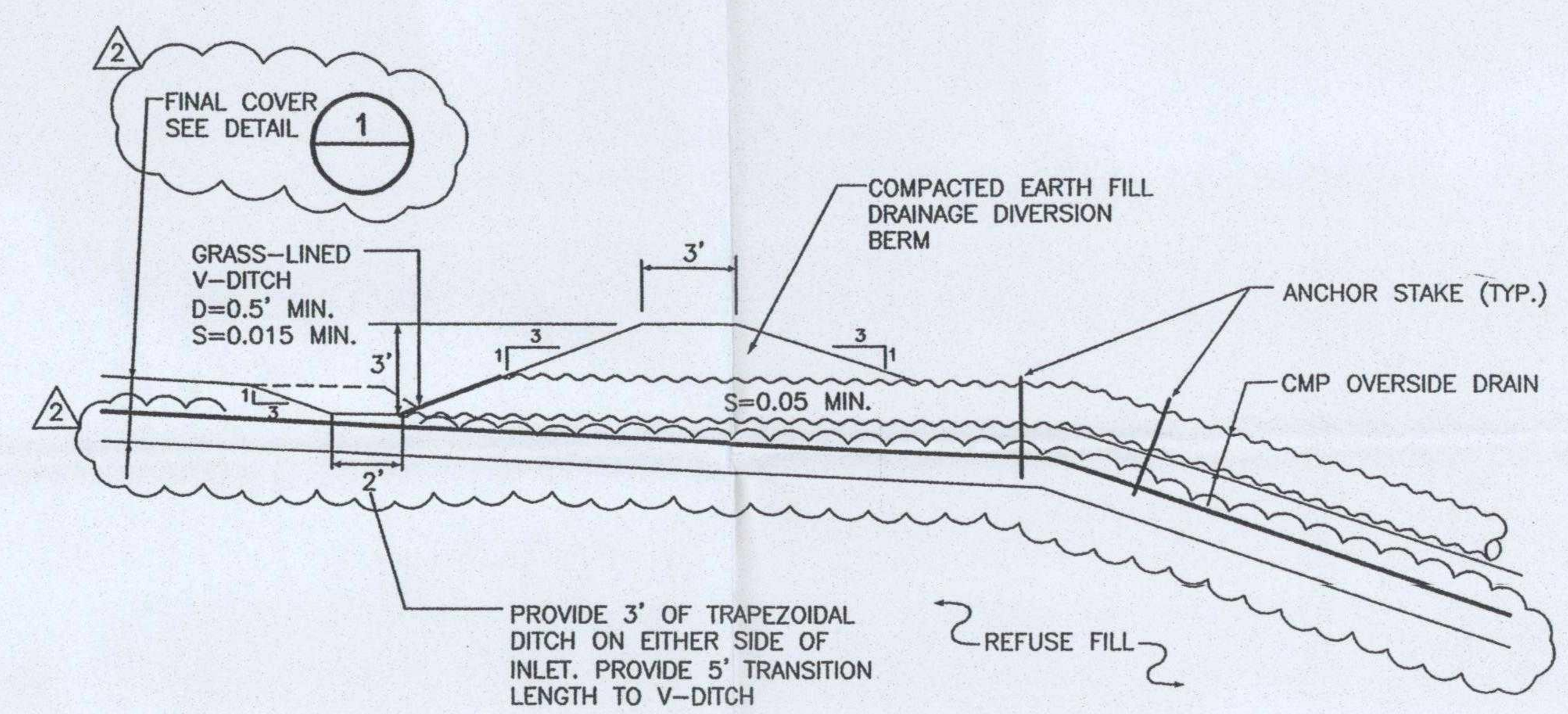
WEST PERIMETER DETAIL
DETAIL 2
SCALE: 1" = 5'



ENTRANCE FACILITIES
DETAIL 6
N.T.S.



ACCESS ROAD
DETAIL 3
SCALE: 1" = 5'



DRAINAGE DIVERSION BERM AND INLET (TOP OF LANDFILL)
DETAIL 7
SCALE: 1" = 5'

PROFESSIONAL ENGINEER NO. 4865328 GARTH ROBERT BOWERS STATE OF UTAH

For revision 1 & 2 changes

REV	DATE	DESCRIPTION	DWN BY	DES BY	CHK BY	APP BY
2	1/10/06	REV. FINAL COVER THICKNESS	KLT	RDH	RDH	RDH
1	9/22/03	REV. DETAILS 5, 6 ADDED DETAIL 7	KLT	RDH	RDH	RDH

DATE OF ISSUE APR 1998 | DWN BY CKF/SER | DES BY DH | CHK BY | APP BY

Shaw EMCON/OWT, Inc.

WASTE MANAGEMENT, INC.
MOUNTAIN VIEW LANDFILL
SALT LAKE CITY, UTAH

DETAILS

DRAWING NO. 4
PROJECT NO. 844008

APPENDIX

A-1

Permit Renewal Application

Utah Division of Solid and Hazardous Waste
Solid Waste Management Program

Mailing Address
P.O. Box 144880
Salt Lake City, Utah 84114-4880

Office Location
195 North 1950 West
Salt Lake City, Utah 84116

Phone (801) 536-0200
Fax (801) 536-0222
www.deq.utah.gov

APPLICATION FOR A PERMIT TO OPERATE A CLASS IV OR VI LANDFILL

Please read the instructions that are found in the document, INSTRUCTIONS FOR APPLICATION FOR A PERMIT TO OPERATE A CLASS IV or VI LANDFILL. This application form shall be used for all Class IV or VI solid waste disposal facility permits and modifications. Part I, GENERAL INFORMATION, must accompany a permit application. Part II, APPLICATION CHECKLIST, is provided to assist applicants and, if included with the application, will assist review. **Please note** the version date of this form found on the lower right of the page; if you have received this form more than six months after this date it is recommended you contact our office at (801) 536-0200 to determine if this form is still current. When completed, please return this form and support documents, forms, drawings, and maps to:

Scott T. Anderson, Director
Division of Solid and Hazardous Waste
Utah Department of Environmental Quality
PO Box 144880
Salt Lake City, Utah 84114-4880

(Note: When the application is determined to be complete, submittal of two copies of the complete application will be required.)

Division of
Solid and Hazardous Waste

Utah Class IV and VI Landfill Permit Application Form

JUN - 4 2013
2013-003740

Part I General Information APPLICANT: PLEASE COMPLETE ALL SECTIONS.

I. Landfill Type	☐ Class IVa ☐ Class IVb ☒ Class VI	**II. Application Type**	☐ New Application ☒ Renewal Application ☐ Facility Expansion ☐ Modification

For Renewal Applications, Facility Expansion Applications and Modifications Enter Current Permit Number 9811

III. Facility Name and Location

Legal Name of Facility
Mountain View Landfill

Site Address (street or directions to site) 6976 West California Avenue			County Salt Lake County
City Salt Lake City		Zip Code 84104	Telephone 801-250-0555
Township 1 S	Range 2 W	Section(s) 10	Quarter/Quarter Section S1/2 — Quarter Section SW
Main Gate Latitude degrees 40 minutes 44 seconds 25		Longitude degrees 112 minutes 3 seconds 14	

IV. Facility Owner(s) Information

Legal Name of Facility Owner
Mountainview Landfill, Inc

Address (mailing)
6976 West California Avenue

City Salt Lake City	State UT	Zip Code 84104	Telephone 801-250-0555

V. Facility Operator(s) Information

Legal Name of Facility Operator
Mountainview Landfill, Inc

Address (mailing)
6976 West California Avenue

y Salt Lake City	State UT	Zip Code 84101	Telephone 801-250-0555

VI. Property Owner(s) Information

Legal Name of Property Owner
Mountainview Landfill, Inc

Address (mailing)
6976 West California Avenue

City Salt Lake City	State UT	Zip Code 84104	Telephone 801-250-0555

VII. Contact Information

Owner Contact ~~Patrick Craig~~ Brad Kloos		Title District Manager	
Address (mailing) 6976 West California Avenue			
City Salt Lake City	State UT	Zip Code 84104	Telephone 801-250-0555
Email Address ~~pcraig2@wm.com~~ bkloos@wm.com		Alternative Telephone (cell or other)	~~8017160244~~ (801) 330-7478
Operator Contact ~~Patrick Craig~~ Brad Kloos		Title District Manager	
Address (mailing) 6976 West California Avenue			
City Salt Lake City	State UT	Zip Code 84104	Telephone 801-250-0555
Email Address ~~pcraig2@wm.com~~ bkloos@wm.com		Alternative Telephone (cell or other)	~~8017160244~~ (801) 330-7478
Property Owner Contact ~~Patrick Craig~~ Brad Kloos		Title District Manager	
Address (mailing) 6976 West California Avenue			
y Salt Lake City	State UT	Zip Code 84104	Telephone 801-250-0555
Email Address ~~pcraig2@wm.com~~ bkloos@wm.com		Alternative Telephone (cell or other)	~~8017160244~~ (801) 330-7478

Utah Class IV and VI Landfill Permit Application Form

Part I General Information (Continued)

III. Waste Types (check all that apply)

☐ Landfill will accept all wastes allowed In Class IV or VI landfills **Or** landfill will accept only the following wastes

Waste Type	Combined Disposal Unit	Monofill Unit
☒ Construction & Demolition	☒	☐
☐ Tires	☐	☐
☐ Yard Waste	☐	☐
☐ Animals	☐	☐
☐ Contaminated Soil	☐	☐
☐ Other _____	☐	☐

Note: Disposal of dead animals must be approved by the Executive Secretary

IX. Facility Area

Facility Area	76	acres
Disposal Area	74	acres
Design Capacity		
Years	15	
Cubic Yards	10,855,000	
Tons	_____	

X. Fee and Application Documents

Indicate Documents Attached To This Application

☒ Application Fee: Amount $100.00

☒ Facility Map or Maps ☒ Facility Legal Description ☒ Plan of Operation ☒ Waste Description
☐ Ground Water Report ☒ Closure Design ☒ Cost Estimates ☒ Financial Assurance

Class VI Special Requirements

☐ Documents required by UCA 19-6-108(9) and (10)

I HEREBY CERTIFY THAT THIS INFORMATION AND ALL ATTACHED PAGES ARE CORRECT AND COMPLETE.

Signature of Authorized Owner Representative Mark W. Franc Mark W. Franc Name typed or printed	Title: Area Engineer	Date: 30 May 2013
	Address: 6976 W. California Av Salt Lake City, UT 84104	
Signature of Authorized Land Owner Representative (if applicable) Name typed or printed	Title	Date
	Address	
Signature of Authorized Operator Representative (if applicable) Name typed or printed	Title	Date
	Address	

Utah Class IV and VI Landfill Permit Application Checklist

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

An application for a permit to construct and operate a landfill is the documentation that the landfill will be located, designed, constructed, and operated to meet the requirements of Rules R315-305 of the *Utah Solid Waste Permitting and Management Rules* and the *Utah Solid and Hazardous Waste Act* (UCA 19-6-101 through 123). The application should be written to be understandable by regulatory agencies, landfill operators, and the general public. The application should also be written so that the landfill operator, after reading it, will be able to operate the landfill according to the requirements with a minimum of additional training.

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

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

Part II **Application Checklist**

I. **Facility General Information**	
Description of Item	Location In Document
Ia. General Information - All Facilities	
Completed Part I General information form above	Appendix A
General description of the facility (R315-310-3(1)(b))	Section 2
Legal description of property (R315-310-3(1)(c))	Section 2.1
Proof of ownership, lease agreement, or other mechanism (R315-310-3(1)(c))	Appendix A
If the permit application is for a Class IV landfill, a demonstration that the landfill is not a commercial facility	N/A
Waste type and anticipated daily volume (R315-310-3(1)(d))	Section 4.1
Intended schedule of construction (R315-302-2(2)(a))	Section 3.4
Ib. General Information - New Or Laterally Expanding Facilities	
Documentation that the Historical Survey requirements of R315-302-1(2)(f) have been met (R315-305-4(1)(b)(vi))	N/A
Name and address of all property owners within 1000 feet of the facility boundary (R315-310-3(2)(i))	N/A
Documentation that a notice of intent to apply for a permit has been sent to all property owners listed above (R315-310-3(2)(ii))	N/A

I. **Facility General Information**	
Description of Item	Location In Document
Name of the local government with jurisdiction over the facility site (R315-310-3(2)(iii))	N/A
Ic. Location Standards - New Or Laterally Expanding Class IVa Landfills (R315-305-4(1)(a))	
Land use compatibility	N/A
Maps showing the existing land use, topography, residences, parks, monuments, recreation areas or wilderness areas within 1000 feet of the site boundary	N/A
Certifications that no ecologically or scientifically significant areas or endangered species are present in site area	N/A
Maps showing the location of dwellings, residential areas, other structures, and historic structures.	N/A
List of airports within five miles of facility and distance to each	N/A
Geology	N/A
Geologic maps showing significant geologic features, faults, and unstable areas	N/A
Maps showing site soils	N/A
Surface water	N/A
Magnitude of 24 hour 25 year and 100 year storm events	N/A
Average annual rainfall	N/A
Maximum elevation of flood waters proximate to the facility	N/A
Maximum elevation of flood water from 100 year flood for waters proximate to the facility	N/A
Wetlands	N/A
Ground water	N/A
Id. Location Standards - New Or Laterally Expanding Class IVb and VI Landfills	
Floodplains as specified in R315-302-1(2)(c)(ii) (R315-305-4(1)(b)(i))	N/A
Wetlands as specified in R315-302-1(2)(d) (R315-305-4(1)(b)(ii))	N/A
The landfill is located so that the lowest level of waste is at least ten feet above the historical high level of ground water (R315-305-4(1)(b)(iii))	N/A
Geology as specified in R315-302-1(2)(b)(i) and (iv) (R315-305-4(1)(b)(iv))	N/A
Ie. Additional Location Standards - New Or Laterally Expanding Class IVb and VI Landfills Or Landfills Requesting That Dead Animals Be Added As A New Waste Stream (R315-305-4(1)(a)(v))	
Maps showing the existing land use, topography, residences, parks, monuments, recreation areas or wilderness areas within 1000 feet of the site boundary	N/A

I. **Facility General Information**	
Description of Item	Location In Document
Certifications that no ecologically or scientifically significant areas or endangered species are present in site area	N/A
Maps showing the location of dwellings, residential areas, other structures, and historic structures.	N/A
List of airports within five miles of facility and distance to each	N/A
If. Plan Of Operations - All Facilities (R315-310-3(1)(e) and R315-302-2(2))	
Description of on-site waste handling procedures and an example of the form that will be used to record the weights or volumes of waste received (R315-302-2(2)(b) And R315-310-3(1)(f))	Section 4.6
Schedule for conducting inspections and monitoring, and examples of the forms that will be used to record the results of the inspections and monitoring (R315-302-2(2)(c), R315-302-2(5)(a), and R315-310-3(1)(g))	Sections 4.11, 4.12, & 4.14
Contingency plans in the event of a fire or explosion (R315-302-2(2)(d))	Section 4.7
Plan to control fugitive dust generated from roads, construction, general operations, and covering the waste (R315-302-2(2)(g))	Section 4.9 & Appendix A
Plan for litter control and collection (R315-302-2(2)(h))	Section 4.9
Procedures for excluding the receipt of prohibited hazardous or PCB containing waste (R315-302-2(2)(j))	Sections 4.1, 4.6, & Appendix D
Procedures for controlling disease vectors (R315-302-2(2)(k))	Section 4.9
A plan for alternative waste handling (R315-302-2(2)(l))	Section 4.2
A general training plan for site operations (R315-302-2(2)(o))	Section 4.4
Any recycling programs planned at the facility (R315-303-4(6))	Section 4.7
Any other site specific information pertaining to the plan of operation required by the Executive Secretary (R315-302-2(2)(p))	N/A
Ig. Additional Plan Of Operation Requirements - Class IVa Facilities	
Corrective action programs to be initiated if ground water is contaminated (R315-302-2(2)(e))	N/A
***II.* Facility Technical Information**	
IIa. Maps - All Facilities	
Topographic map drawn to the required scale with contours showing the boundaries of the landfill unit, ground water monitoring well locations, gas monitoring points, and the borrow and fill areas (R315-310-4(2)(a)(i))	Figure 6
Most recent U.S. Geological Survey topographic map, 7-1/2 minute series, showing the waste facility boundary; the property boundary; surface drainage channels; any existing utilities and structures within one-fourth mile of the site; and the direction of the prevailing winds (R315-310-4(2)(a)(ii))	Figure 6

I. **Facility General Information**	
Description of Item	Location In Document
IIb. Geohydrological Assessment - Class IVa Landfills (R315-310-4(2)(b))	
Local and regional geology and hydrology including faults, unstable slopes and subsidence areas on site (R315-310-4(2)(b)(i))	N/A
Evaluation of bedrock and soil types and properties including permeability rates (R315-310-4(2)(b)(ii))	N/A
Depth to ground water (R315-310-4(2)(b)(iii))	N/A
Quantity, location, and construction of any private or public wells on-site or within 2,000 feet of the facility boundary (R315-310-4(2)(b)(v))	N/A
Tabulation of all water rights for ground water and surface water on-site and within 2,000 feet of the facility boundary (R315-310-4(2)(b)(vi))	N/A
Identification and description of all surface waters on-site and within one mile of the facility boundary (R315-310-4(2)(b)(vii))	N/A
For an existing facility, identification of impacts upon the ground water and surface water from leachate discharges (R315-310-4(2)(b)(viii))	N/A
Calculation of site water balance (R315-310-4(2)(b)(ix))	N/A
IIc. Engineering Report, Plans, Specifications, And Calculations - All Facilities	
Unit design to include cover design; fill methods; and elevation of final cover including plans and drawings signed and sealed by a professional engineer registered in the State of Utah, when required (R315-310-3(1)(b) and R315-310-4(2)(c)(iii))	Attached Documents and Drawings
Design and location of run-on and run-off control systems (R315-310-4(2)(c)(viii))	Section 3.3 & Drawing 4
Anticipated facility life and the basis for calculating the facility's life (R315-310-4(2)(c)(ii))	Section 3.1
Engineering reports required to meet the location standards of R315-305-4 including documentation of any demonstration or exemption made for any location standard (R315-310-4(2)(c)(i))	N/A
Identification of borrow sources for final cover (R315-310-4(2)(c)(iv))	Section 3.4
Run-off collection, treatment, and disposal and documentation to show that any treatment system is being or has been reviewed by the Division of Water Quality (R315-310-4(2)(c)(v) and R315-310-3(1)(i))	Section 3.3 & Drawing 1
IId. Closure Requirements - All Facilities	
CLOSURE PLAN (R315-310-3(1)(h))	Section 5
Closure schedule (R315-310-4(2)(d)(i))	Section 3.2, 3.4, 5
Design of final cover (R315-310-4(2)(c)(iii))	Section 3.2, 5.1

***I.* Facility General Information**	
Description of Item	Location In Document
Capacity of site in volume and tonnage (R315-310-4(2)(d)(ii))	Sec 3.5, App A
Final inspection by regulatory agencies (R315-310-4(2)(d)(iii))	Section 5
***IIe.* Post-Closure Requirements- All Facilities**	
POST-CLOSURE CARE PLAN (R315-310-3(1)(h))	Section 5.2
Changes to record of title, land use, and zoning restrictions (R315-310-4(2)(e)(v))	Section 5
Maintenance activities to maintain cover and run-on/run-off control systems (R315-310-4(2)(e)(iii))	Section 5.2
List the name, address, and telephone number of the person or office to contact about the facility during the post-closure care period (R315-310-4(2)(e)(vi))	Appendix A
***IIf.* Financial Assurance - All Facilities (R315-310-3(1)(j))**	
Identification of closure costs including cost calculations (R315-310-4(2)(d)(iv))	Section 5, Table 3
Identification of post-closure care costs including cost calculations (R315-310-4(2)(e)(iv))	Section 5, Table 3
Identification of the financial assurance mechanism that meets the requirements of Rule R315-309 and the date that the mechanism will become effective (R315-309-1(1) and R315-310-3(1)(j))	Surety Bond, Current

A-2

Proof of Ownership

29 Dec 98

BB Date 1/4/99

ARTICLES OF AMENDMENT
to the
ARTICLES OF INCORPORATION
of
BLANDFILL, INC.

DEC 23 1998

To the Division of Corporation and Commercial Code
State of Utah

Pursuant to the provisions of the Utah Revised Business Corporation Act, BLANDFIL, INC., a Utah business corporation (the "Company"), does hereby adopt the following Article of Amendment:

Article I.

The name of the Company shall be changed to "Mountainview Landfill, Inc." by amending Article I of the Articles of Incorporation to read as follows:

"Article I: The name shall be "Mountainview Landfill, Inc.""

Article II.

The amendment was adopted on December 21, 1998.

Article III.

The total shares outstanding are 100 shares of common stock, all of which were entitled to vote on the amendment, and all of which voted in favor of the amendment.

BLANDFILL, INC.

By: [signature]
Name: BRYAN J. BLANDFIELD
Title: VICE PRESIDENT

::ODMA\PCDOCS\HOUSTON\610539\1

800044606

After Recording Mail To:
Mountainview Landfill
c/o Waste Management Inc.
8310 South Valley Highway, Suite 200
Inglewood, Colorado 80112

QUIT CLAIM DEED

SALT LAKE CITY CORPORATION, 451 South State St., Rm. 245, Salt Lake City, Utah 84111, a Utah municipal corporation, "**GRANTOR**", hereby quit claims to, **MOUNTAINVIEW LANDFILL, INC.**, c/o Waste Management Inc., 8310 South Valley Highway, Suite 200, Inglewood, CO 80112, as "**GRANTEE**", for the sum of TEN AND NO/100THS DOLLARS ($10.00), and other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, all of its right, title and interest in and to the following parcel(s) of land situated in Salt Lake County, State of Utah, more particularly described as follows:

EXHIBIT "A" attached hereto and by this reference made a part hereof.

To intent of this deed is to reconvey to the Grantee, property erroneously conveyed to Grantor by that certain Special Warranty Deed, dated Feburary 5th, 2001, and recorded October 17th, 2001 in Book 8512, Pages 5317 & 18.

DATED 2-2-03

SALT LAKE CITY CORPORATION

BY _____
MAYOR

ATTEST AND COUNTERSIGN:

Beverly Jones
DEPUTY CITY RECORDER

APPROVED AS TO FORM
Salt Lake City Attorney's Office

BY _____

dated 1-23-02

SALT LAKE CITY, UTAH
CORPORATE SEAL

RECORDED

FEB 06 2002

CITY RECORDER

BK8568PG3195

STATE OF UTAH)
)ss
COUNTY OF SALT LAKE)

The foregoing instrument was acknowledged before me this 3 day of Feb, 2002, by ROSS C. ANDERSON, in his capacity as MAYOR of SALT LAKE CITY CORPORATION, a Utah municipal corporation.

NOTARY PUBLIC
CHRISTINE K. CORDWELL
451 SO. STATE ST., RM 306
SALT LAKE CITY, UT 84111
MY COMMISSION EXPIRES
FEBRUARY 15, 2005
STATE OF UTAH

Christine K. Cordwell
NOTARY PUBLIC, residing in
Salt Lake County, Utah

STATE OF UTAH)
)ss
COUNTY OF SALT LAKE)

The foregoing instrument was acknowledged before me this day of Feb. 16th 2002, by Beverly Jones in her capacity as DEPUTY CITY RECORDER of SALT LAKE CITY CORPORATION, a Utah municipal corporation.

Pamela M. Johnson
NOTARY PUBLIC, residing in
Salt Lake County, Utah

NOTARY PUBLIC
STATE OF UTAH
My Commission Expires
April 8, 2002
PAMELA M. JOHNSON
451 S. State Street, Rm. 215
Salt Lake City, Utah 84111

LAND SURVEYORS
505 SOUTH MAIN STREET
BOUNTIFUL, UTAH 84010
(801) 295-7500

JAN.2, 1997

BLANDFILL
COMBINED DESCRIPTION NET OF
1300 SOUTH STREET RIGHT OF WAY AND
7200 WEST STREET RIGHT OF WAY

BEGINNING AT A POINT ON THE NORTH RIGHT OF WAY LINE OF 1300 SOUTH STREET, SAID POINT BEING NORTH 0°20'13" EAST 42.00 FEET ALONG QUARTER SECTION LINE FROM THE SOUTH QUARTER CORNER OF SECTION 10, TOWNSHIP 1 SOUTH, RANGE 2 WEST, SALT LAKE BASE AND MERIDIAN AND RUNNING THENCE NORTH 0°20'13" EAST 1284.27 FEET ALONG SAID QUARTER SECTION LINE TO QUARTER-QUARTER SECTION LINE; THENCE NORTH 89°54'08" WEST 2596.29 FEET ALONG SAID QUARTER-QUARTER SECTION LINE TO A POINT ON THE EAST RIGHT OF WAY LINE OF 7200 WEST STREET, SAID POINT BEING NORTH 0°40'30" EAST 1327.77 FEET ALONG SECTION LINE AND SOUTH 89°54'08" EAST 55.00 FEET ALONG SAID QUARTER-QUARTER SECTION LINE FROM THE SOUTHWEST CORNER OF SAID SECTION 10; THENCE SOUTH 0°40'30" WEST 1260.74 FEET ALONG SAID EAST RIGHT OF WAY LINE; THENCE SOUTH 44°37'45" EAST 35.17 FEET ALONG RIGHT OF WAY LINE TO THE NORTH RIGHT OF WAY LINE OF 1300 SOUTH STREET; THENCE SOUTH 89°56'00" EAST 2578.88 FEET ALONG SAID NORTH RIGHT OF WAY LINE TO THE POINT OF BEGINNING. (BASIS OF BEARING: NORTH 89°56'00" WEST 2659.13 FEET ALONG SECTION LINE)

affects parcel # 14-10-300-011

CONTAINS:76.692 ACRES

REGISTERED LAND SURVEYOR
JOHN W.
FRANCOM
No. 4861
STATE OF UTAH

EXHIBIT "A"

A-3

Previous Permitting Correspondence

AUGUST 12, 1997
APPLICATION FOR LANDFILL PERMIT

APPLICATION FOR A SOLID WASTE LANDFILL PERMIT TO OPERATE

FOR THE

BLANDFILL
CONSTRUCTION AND DEMOLITION (CLASS IV) LANDFILL

Submitted to

Salt Lake City-County Health Department
Division of Environmental Health
Bureau of Water Quality & Hazardous Waste
1954 E. fort Union Blvd., #100
Salt Lake City, Utah

Submitted By

United Waste Landfill of Utah, Inc.
A Division of United Waste Systems, Inc.
c/o D&D Containers, Inc.
2415 West Andrew Avenue
Salt Lake City, Utah 84104

August 12, 1997

United Waste

Local Office:
United Waste Systems, Inc.
1153 Bergen Parkway,
Suite M-237
Evergreen, CO 80439
Tel: 303 674-1320
Fax: 303 674-1706

Corporate Office:
United Waste Systems, Inc.
Four Greenwich Office Park
Greenwich, CT 06830
Tel: 203 622-3131
Fax: 203 622-6080

August 12, 1997

Mary Pat Buckman, Hydrogeologist
Bureau of Water Quality and Hazardous Waste
Salt Lake City-County Health Department
1954 E. Fort Union Blvd. #100
Salt Lake City UT 84121

Re: Application for a Permit to Operate a Construction and Demolition Landfill

Dear Ms. Buckman:

Pursuant to our recent pre-application meeting, United Waste Landfill of Utah, Inc. (UWLOU), a subsidiary of Untied Waste Systems, Inc. (UWS), has executed an Asset Purchase Agreement with Terry and Connie Bland. This Agreement is contingent upon UWLOU obtaining a Permit to Operate for the currently permitted Blandfill Construction and Demolition Waste Landfill from the Salt Lake City-County Health Department, per Health Regulations #1.

Therefore, we will appreciate the Department's cooperation in considering the enclosed application. We have used Section 6 of your Regulations as the outline of the Application. Please contact us if you have questions or comments regarding it.

Sincerely,
On behalf of UWS and UWLOU

Dan Sweeney
V.P., Environmental Management

Enclosure

cc: Terry and Connie Bland

APPLICATION FOR AN OPERATING PERMIT FOR THE BLANDFILL CONSTRUCTION AND DEMOLITION WASTE LANDFILL SALT LAKE CITY, UTAH

Introduction

This document is an application to the Salt Lake City-County Health Department by the proposed new owner/operator, United Waste Landfill of Utah, Inc., for a Permit to Operate the Blandfill Construction and Demolition Waste Landfill. The landfill has been in operation and subject to a Health Department approval to operate since April, 1985. The current permit (No. 253) was issued by the Director on April 10, 1997.

The Blandfill Construction and Demolition (C&D) Landfill also is subject to a Conditional Use, issued by the City Planning Commission, for the entire 77-acre site (issued August 22, 1996). The Health Department, by letter of September 14, 1993, conditionally approved expansion of the landfill to 70 acres (these two approvals are presented in Appendix A). This application requests that the Health Department recognize the site area as all of the 77.4 acres to be owned and operated by the company, consistent with the previous City Planning Commission approval. (Appendix D presents land ownership documentation.)

This Application addresses the requirements of Section 6.0, Solid Waste Landfills, of Health Regulations #1.

APPLICANT

The Applicant is **United Waste Landfill of Utah, Inc. (UWLOU),** which is a wholly-owned subsidiary of United Waste Systems, Inc. (UWS). UWS is a national solid waste management company that currently owns or operates 40 landfills in the U.S. Upon issuance of a Permit to Operate the Blandfill C&D Landfill, located at 7000 West 1300 South, UWLOU will become the owner/operator of the facility. This transaction was executed between UWS/UWLOU and the Blands on July 23, 1997, and is contingent on the issuance of the Permit. When the Permit is issued, operations will be turned over from the Bland's to UWLOU.

APPLICATION INFORMATION

Section 6.1, Restricted Siting Locations.

The Blandfill C&D Landfill has been operational since 1985. Its horizontal expansion has been previously approved by the Health Department and City Planning Commission. Therefore, subsections (a) thru (j) of these regulations previously have been addressed by the company and the agencies. Therefore, this section of the Section 6 regulations are not applicable to this Application process.

Section 6.2 Department Approval and Bond Requirements.

(a) No construction or operation of a landfill shall be initiated until plans and specifications as required in Section 6.3 through 6.5 are approved in writing by the Department.

Plans and specifications for the landfill have been previously approved by the Health Department. The landfill has been approved for operation since April, 1985. The Plans and Specifications are presented in Appendix B and C.

(b) No significant modification shall be made in any landfill or its operation without notifying in writing and receiving the approval of the Department.

The company proposes to continue operations and landfill expansion within the 77-acre footprint in the same manner as has previously been approved by the Health Department. No significant modification will be made without receiving prior approval of the Department.

(c) No person shall operate a landfill without first obtaining a valid permit from the Department and posting a bond in favor of the Department and providing the additional financial assurances required in Section 3.6.

The Blands have posted bonds in favor of the Department. The company will replace these bonds in the appropriate amount as a component of permit issuance (once any revised bond amount and other financial assurances have been addressed by the Health Department).

Section 6.3 Report and Approval Requirements for Permit

Before issuance of approval to construct or a permit to operate a landfill, a report shall be submitted to the Department for review and approval. The report shall be prepared by a registered professional engineer, except this requirement may be waived by the Department if justified by the size, simplicity, or location of the landfill. Unless otherwise directed by the Department, the report shall include the following information:

(a) The names, addresses, and telephone numbers of persons responsible for actual operation and maintenance of the landfill, and the number of personnel to be employed at the site;

The following individual will be responsible for managing actual operations and maintenance of the landfill:

Todd Powell - Operations Manager

Mr. Powell has over 15 years experience as an equipment operator, and has been Operations Manager at Blandfill for more than 2 years. He will report to a UWS Area Manager in Salt Lake City, who in turn will report to a Regional Operations Manager. This chain-of-command will provide many

cumulative years of landfill operations experience to support Mr. Powell.

Additionally, Blandfill will be supported by the following Regional and Corporate specialists:

- Regional landfill operations manager, including equipment procurement and maintenance support
- Regional and Corporate engineering and environmental regulatory and monitoring support
- Regional and Corporate health and safety support
- Regional and Corporate financial management support.

Terry and Connie Bland will continue to serve as a special consultants to UWS, and will be available for consultation on all matters relating to the landfill operation and maintenance. The assistance of the Blands will be important to providing a smooth transition during the change of control from the Blands to UWLOU.

Staffing is not expected to change. The landfill, under the direction of Todd Powell, will continue to employ trained equipment operators, load spotters and checkers, and gatehouse personnel. Based on past practices, it is expected that the staff will consist of two or three alternating gatehouse attendants, depending on the hours of operation, two operators, and one or two spotters. (Note that not all of these positions will be working at once, depending on the hours of operation per week.)

The address and phone number for all landfill staff is:

Blandfill
7000 West 1300 South
Salt Lake City UT 84104
ph: 801-250-0555

(b) The present and future population and area to be served by the proposed landfill;

The Blandfill C&D Landfill has been, and will continue serving the Greater Salt Lake City-County Metro Area. This multi-county Metro area has a population in excess of 1 million. Occasionally, loads are received from Davis, Utah, and Tooele Counties.

(c) Evidence of land ownership, lease agreements, and a copy of agreements or permission to use the property for a landfill;

The entire 77.4-acre site currently is owned by Terry and Connie Bland, but is contracted for purchase by UWS/UWLOU. Upon issuance of a permit to operate to UWLOU by the Health Department, the transaction will be completed. Therefore, for purposes of the issuance of the permit, UWS/UWLOU will be the owner of record of the property. Current land ownership documentation is presented in Appendix D.

(d) The description, site boundaries, and the total area of the proposed landfill.

The landfill property is described as follows:

The South ½ of the Southwest ¼ of Section 10, Township 1 South, Range 2 West, in Salt Lake County, Utah

The site is bounded on the south by 1300 South Street, and on the west by 7200 West Street (see Site Plan in Appendix C). On the east, the property borders property owned by the Salt Lake County Landfill (County Public Works Department, Solid waste Disposal Division). To the north is vacant, undeveloped property in private ownership.

The surveyed area of the landfill site property is 77.43 acres, or 76.92 acres when the street right-of-way is subtracted (see Appendix D). As presented in the Site Plan in Appendix C, the ultimate landfill footprint includes all of this property, less a 10-foot setback on the north and east sides, and a 30-foot setback on the south and west sides.

(e) A plat, map, or aerial photograph that accurately shows the exact location of the proposed landfill, current land use, and zoning within 1/4 mile (402 meters) of the site. The map or aerial photograph shall be sufficient scale to show all homes, industrial buildings, airports, wells, watercourses, surface drainage channels, rock outcroppings, roads, general and irregular topography, and other applicable details. All such details shall be identified and indicated on the plat map or aerial photograph;

See Appendices C and E. The landfill and surrounding properties within ¼ mile of the site all are within an Open Space Landfill Overlay "OS/LO" zoning district (see also Appendix A, Planning Commission information).

(f) A soil description including, pH, metal concentrations for the metals listed in Appendix A, and ion exchange capacity to a depth of at least 5 feet (1.5 meters) below the proposed landfill or proposed excavations and a detailed description of geology of the area. Sample collection shall be obtained by soil borings, trenching, or other Department approved methods;

This site already is permitted and partially developed, and soil borings have been finished as groundwater wells. A description of soils and depth to groundwater is presented in Appendix F. The site has an in situ natural clay soil liner of low permeability, suitable for secure containment of C&D waste.

(g) A description of surface water within 1/4 mile (402 meters) of the landfill, including seasonal variations, and a description of minimum and maximum groundwater elevations throughout the landfill site, groundwater flow pattern, and groundwater quality and quantity. In addition, the Department may require the installation of groundwater monitoring wells and a water quality sampling and analysis program of ground and surface waters prior to construction and operation of the landfill, during its operation, and after closure of the site. If well installation is required,

the following provisions of the program shall be submitted for Department approval:

(1) The number, location, and depth of upgradient and downgradient monitor wells;
(2) The method of construction and configuration of the monitor wells;
(3) The name of the person to perform the sampling, the sampling methods, the sampling frequency, and sampling time period;
(4) The type of analysis that is to be performed;
(5) The method(s) and procedures of analysis;
(6) the construction, sampling, and analytical quality assurance and quality control; and
(7) The name of the laboratory performing the analysis;

Lee's Creek and Kersey Creek to the west of the site are the nearest surface water bodies and both feed the Great Salt Lake. There now are ponds located southeast of the site, which were created by borrow activities adjacent to the County Landfill (see Appendix E). There is a ditch along the north boundary of the landfill, which flows to the west to Lee's Creek. Very little water runs off the landfill property. That which does, drains to this ditch, and thence to Lee's Creek.

The landfill has made notification to the State (i.e., filed a Notice of Intent) and thus is covered by a UPDES General Permit for Storm Water Discharges Associated with Industrial Activity. A Storm Water Pollution Prevention Plan (SPPP) has been developed. UWLOU will update this plan upon the change of control, and initiate a storm water monitoring program.

The average depth to groundwater at the site is about 14 feet below ground surface. There are four groundwater monitoring wells (BSC, BNW, BN2, and BS). The location of these wells is indicated on the Site Plan (Appendix C). These wells are sampled annually by E.T. Technologies, Inc; analysis has been conducted by Enviropro Laboratories, both are located in Salt Lake City.

The most recent sample analysis is for November, 1996 (see Appendix G). The parameter list previously has been agreed to by the Health Department. The VOC scan for each sample did not detect any organics. As can be expected due to the close proximity to the Great Salt Lake, the natural groundwater quality is very high in salts and total dissolved solids. It thus in unfit for human consumption and even most non-potable uses. Notably, there is no indication that the landfill is impacting groundwater. (Historic groundwater quality information is presented in Appendix G.)

Groundwater direction previously had been to the north, towards Salt Lake. The presence of the ponds to the southeast now may be influencing the local water table, changing flow direction. This trend will be evaluated in the future.

(h) A description of liners to be installed to prevent migration of waste, leachate and other contaminants;

The existing, approximately 30-acre disposal footprint is unlined. As previously indicated, the site relies on natural (in situ) clay soils to provide low-permeability containment. No liners are proposed

for the lateral expansion areas (approximately 25 acres on the west side, and 19 acres on the east of the existing disposal area).

(i) The availability, amounts, source, and characteristics of cover material and the cover design, including cover material needed for emergency fire control and closure;

Clean cover soils are received daily at no charge at the landfill. Once inspected at the gatehouse and considered clean, the loads currently are stockpiled in the undeveloped western area of the site for use as daily or final cover. Based on historic practice, adequate soil volumes are expected to be available for cover needs and for much of the closure activity. If necessary, an off-site soil borrow operation will be established or soils will be purchased to provide adequate soil volumes to complete closure.

The cover design is specified as including an 18-inch lift of low-permeability soil, covered by 6 inches of topping soil capable of supporting vegetation. The final cover will be seeded with a native grass mix compatible with the semi-arid environment. The preliminary Closure and Post-Closure Plans are presented in Appendix H. The Plan sheet presented in Appendix C presents a cross-section profile of the proposed final cover grades for the landfill.

(j) Potential leachate and decomposition gas generation, including the amount and physical and chemical characteristics of the leachate and decomposition gas, and the methods of control, monitoring, collection, treatment and disposal;

This is a C&D landfill, which is not expected to generate much leachate or landfill gas due to the inert nature of most of the waste products permitted to be accepted. Thus, no leachate or gas collection, treatment or control systems are proposed. Gas monitoring is addressed in the Operation Plan in Appendix B.

(k) The anticipated present and future type, quantity (daily and total), and source of solid waste to be deposited at the landfill including those sources within Salt Lake County, those sources outside Salt Lake County, and those sources outside the state of Utah;

The service area for this landfill is expected to be the Greater Salt Lake City-County Metro Area, and surrounding counties. No out-of-state waste would be expected to be economical to dispose of at this site.

As a C&D site, the landfill will receive only those wastes permitted by Health Department Regulations. This consists of solid waste resulting from construction, remodeling, repair and demolition of structures, and from road building and land clearing. Such waste includes, but is not limited to, bricks, concrete and other masonry materials, soil, rock, wall coverings, plaster, drywall, and other inert material, plumbing fixtures, non-asbestos insulation, roofing shingles, asphaltic pavement, glass, plastics that are not sealed in a way that conceals other wastes, wood, and metals that are incidental to any of the above. Solid waste that is not construction and demolition waste

(even if resulting from the construction, remodeling, repair and demolition of structures, and from road building and land clearing), and which may not be accepted, includes, but is not limited to, asbestos waste, garbage, flourescent electrical fixtures and transformers containing polychlorinated biphenyls, tires, drums and containers with liquid or un-recognizable wastes, and fuel tanks (although several tires that are inadvertent to a load will be considered acceptable). Specifically excluded from the definition of construction and demolition waste is solid waste that has been rendered unrecognizable by a process such as pulverizing or shredding or other similar process.

As for quantity of waste, this can vary significantly, depending on season. Past experience has indicated that several hundred thousand cubic yards per year of C&D waste likely will continue to be disposed of at this landfill, as demand dictates.

(l) A description of all record keeping to be provided by the facility so that the amount and type of waste to be accepted may be determined;

See Operating Plan section of Appendix B.

(m) The intended operation of the program and procedures including:

(1) The hours and days of operation;

(2) Existing and proposed structures and utilities;

(3) The method and plan of landfilling

(4) The type and availability of equipment for efficient excavating, earth moving, spreading, compaction, and other needs;

(5) Fencing and other provisions made for control of access and the prevention of scattering of waste material by wind;

(6) Provisions for fire, dist, bird, vector and odor control;

(7) A written plan outlining the procedures to be taken to exclude hazardous, liquid, or any other solid waste that is not specifically permitted to enter the facility; The plan shall include the following:

(aa) Random inspections of incoming loads;

(bb) Inspection of suspicious loads;

(cc) Record keeping of inspections;

(dd) Training of facility personnel in recognizing hazardous wastes and non-permitted wastes;

(ee) Procedures for notifying the Department of hazardous or non-permitted waste discovered at the site, or hazardous waste loads rejected; and

(ff) Procedures for isolating and handling hazardous or other non-permitted waste;

See Operating Plan in Appendix B.

Section 6.7 Groundwater and Surface Water Monitoring Requirements.

These programs are previously described under the response to Section 6.1.(g).

Section 6.8 and 6.9 (Requirements Related to Closure and Post-closure)

Appendix H presents a preliminary Closure and Post-Closure Plan for the facility. A revised plan will be prepared once the change of control occurs from the Blands to UWLOU.

(8) Provision for employee training and a description of safety and emergency response and communication procedures;

See Operating Plan in Appendix B.

(9) Provisions made for traffic control and user notification requirements;

Traffic control on these rural, low-traffic roads in not expected to be a problem.

(10) Procedures to handle special waste;

See Operations Plan in Appendix B.

(11) Methods of salvaging or recovering wastes for recycling;

See Operations Plan in Appendix B.

(12) Methods of controlling run-on/run-off waters;

See Operations Plan in Appendix B.

(13) Employee facilities; and

(14) any other pertinent information that clearly indicates the orderly development, operation, and completion of a sanitary landfill;

See Operations Plan in appendix B.

(n) Evidence of year-round accessibility, including an all-weather road to the landfill access roads to the waste unloading areas;

The public roads and on-site haul roads are plowed as needed and kept open. There have been very few days when heavy snows closed the landfill.

(o) The expected life span of the landfill, and the use of the land following its completion;

The landfill capacity is expected to be utilized in approximately 10-12 years. There is no current plan for post-closure use of the property.

(p) A plan meeting the requirements of Section 6.9 that describes the methods, procedures, and processes that will be used for partial (if applicable) and final closure of the landfill; and

See Appendix H.

(q) A description of any other activities necessary to satisfy the closure and post-closure performance standards.

See Appendix H.

Section 6.4 Conditions for Plan Approval

This landfill has been re-permitted annually since its first permit in 1985. It has a good compliance record, which UWLOU plans to maintain. There is a considerable demand in the service area for the disposal capacity provided by this facility. There has been no significant environmental impact realized by the operation of this facility. The company believes that the continued approval of operations at this facility is in the public interest.

Section 6.5 Minimum Design and Operating Requirements.

The Engineering Design and Operating Plan Report presented in Appendix B addresses the requirements of this Section, as they may apply to C&D sites.

Section 6.6 Methane Gas Monitoring Requirements

Although C&D disposal sites generate only minimal amounts of landfill gas containing methane, Blandfill has been, and will continue to monitor explosive gases. The Operating Plan in Appendix B

presents this program.

LIST OF APPENDICES

OCTOBER 1, 1997
HEALTH DEPARTMENT REQUEST
FOR ADDITIONAL INFORMATION

ENVIRONMENTAL HEALTH DIVISION
1954 East Fort Union Boulevard #100
Salt Lake City, UT 84121
801-944-6608 Fax

FILE

OCT -9 1997

Division Director
Terry Sadler
801-944-6600

October 1, 1997

Dan Sweeney, Vice President
Environmental Management
United Waste Systems, Inc.
1153 Bergen Parkway
Suite M-237
Evergreen, Co 80439

Dear Mr. Sweeney:

The following information needs to be submitted to our office prior to issuance of the final permit:

6.2 (c) The calculations to be completed by UWM to determine closure costs and the applicable financial assurance amount.

6.3 (a) What is the name, address and phone number of the UWS Area Manager in Salt Lake City? Are you the Regional Operations Manager? Please provide phone numbers and names for the regional and corporate specialists referenced.

6.3 (e) Which parcel numbers on the Salt Lake County plat map belong to Bland? In Appendix A the descriptions reference 14-10-300-009 however, the map in Appendix E shows a 14-10-300-008 and not a 14-10-300-009. Please clarify. We do not have a complete picture of the watercourses especially Lee Creek's drainage. In the application it is referenced as being NW of the site however the plat shows it to be SW.

6.3 (f) Since the following information is not contained in the file we recommend a soil sample be taken from the undeveloped areas and run for the parameters listed in this section.

6.3 (i) What quantity of clean soils are received daily at the landfill? How will soils be available for closure? Please provide more detailed information on the method of closure and how much soil volume will be needed to accomplish this. What will the source of soil for closure be once the landfill is closed? What is the quantity of soil stockpiled for fire control? The permeability of the cap, source of this material and QA/QA methods of installation must be provided. The Post Closure end use plan refers to various approvals from DEQ, these approvals are also needed from SLCCHD for the same activities referenced. This notation should be changed to reflect this. In

addition 30 years of Post Closure Care and monitoring is now required of Class IV landfills.

6.3 (m) (3) The method and plan for landfilling and incremental closure should be described more fully and/or a map which shows planned filling /closure sequences submitted.

6.5 (t) Describe how conditions (1) and (2) of this section are met including calculations for containing the 24 hour, 25 year storm.

6.7 Surface water monitoring has not been described.

6.9 (b) Has not been specifically addressed

In Appendix B:

Under 2.2 How many spotters will be present during working hours?

Under 2.3 What is the frequency of the random load inspections?

Under 2.6 How frequently will the verification of grades and elevations be performed?

Under 2.7 Please provide on the site plan berms and ditches used for run-on and run-off control. (See comment above)

Under 2.9 This section should be expanded to include the type of monitoring equipment used, and training personnel receive on this equipment. The amount of woody waste accepted does present a significant methane potential. We are currently requiring methane monitoring at the top of the landfill to assess total methane potential currently. Please add locations on the cap to test for methane to your inspection form.

Under 2.10 The statement is made that a revised sampling plan would be submitted prior to the 1997 sampling event. Has the sampling for 1997 been conducted yet? We have not seen a revised plan but if one exists we need to review it. What is the anticipated date for performing the 1997 sampling?

The Site Plan in Appendix C is confusing. What is the difference between the dashed and solid lines? What are the round circular areas on top for? It is unclear how the top will drain with these circular mounds apparently five feet above surrounding grade. What is the point in the center labeled 4305'? This would appear to be 25' below surrounding grade at that particular point.

Please call me if you have any questions on these comments. Please submit your responses as soon as possible to facilitate issuance of the final permit.

Sincerely,

Mary Pat Buckman

Mary Pat Buckman
Hydrogeologist

MPB/mpb

OCTOBER 24, 1997
USA WASTE RESPONSE

USA WASTE
NORTHWEST REGION
A USA WASTE SERVICES COMPANY

155 North Redwood Drive
Suite 250
San Rafael, CA 94903
(415) 479-3700
(415) 479-3737 Fax

FILE

October 24, 1997

Mary Pat Buckman
Hydrogeologist
Salt Lake City-County Health Department
Environmental Health Division
1954 East Fort Union Boulevard #100
Salt Lake City, Utah 84121

Subject: Response to comments on the application for a solid waste landfill permit to operate, Blandfill Construction and Demolition (Class IV) Landfill

Dear Ms. Buckman:

As you know, on August 26, 1997 the acquisition of United Waste Systems, Inc. (United) by USA Waste Services, Inc. (USA Waste Services) was approved by stockholders and the transaction was completed. As of August 26, 1997 all companies owned by United became part of the USA Waste Services family of companies and will operate under the USA Waste Services name, organization and business structure. All assets and liabilities of United's, including United's asset purchase agreement signed with Terry and Connie Bland for the purchase of the Blandfill Construction and Demolition Waste Landfill, are now owned by USA Waste Services.

As a result of the United acquisition, USA Waste Services of Utah, Inc. has become the proponent of the "*Application For A Solid Waste Landfill Permit To Operate For The Blandfill Construction and Demolition (Class IV) Landfill*" submitted by Mr. Dan Sweeney of United on August 12, 1997 and currently under review by your office. All future correspondence and requests relating to this application should be made directly to myself, Mr. Todd Powell of Blandfill, or other USA Waste Services representatives. As defined by the purchase agreement with the Blands, once USA Waste Services obtains the permit to operate the facility the purchase agreement will be executed and USA Waste Services will take over ownership and operation of the facility. At such time, the facility will be known as Blandfill, Inc. a wholly owned subsidiary of USA Waste Services of Utah, Inc..

USA Waste Services has received your October 1, 1997 comment letter sent to Mr. Dan Sweeney of United regarding the permit application submitted to your office on August 12, 1997. We have reviewed these comments and have responded to each. Below, are your information requests and comments (presented in italics) followed by our response.

Comment: *6.2 (c) The calculations to be completed by UWM to determine closure costs and the applicable financial assurance amount.*

Response: Per your USA Waste Services has prepared a closure and post-closure care and maintenance cost estimate for a 30-year post closure period as indicated in your letter. This estimate is included as Attachment A and indicates that $1,192,150 is the required funding for the financial assurance mechanism. The closure/post-closure cost estimate is computed for the maximum area to be closed at any time during the landfills' life. However, it is estimated that at the anticipated closure date only Phase #7 (approximately 11 acres, see Site Plan) will require final cap construction because all other phases (#1-#6) will have been capped during site operation. Currently, there are approximately 30-acres of area that are developed but not yet covered with the final cap. Therefore, the current site development condition is considered the worst case for the closure and post-closure cost estimation. USA Waste Services will provide to your office proof financial assurance for the site in the amount of $1,192,150 when facility purchase agreement with the Blands is complete and USA Waste Services takes over ownership of the facility.

Comment: *6.3 (a) What is the name, address and phone number of the UWS Area Manager in Salt Lake City? Are you the Regional Operations Manager? Please provide phone numbers and names for the regional and corporate specialists referenced.*

Response: The following is the contact information for all regional, operations and engineering managers as appropriate;

Doug Sobey
Region Vice President
USA Waste Services Northwest Region
155 North Redwood Drive, Suite 250
San Rafael, CA 94903
415-479-3700

David M. Hall
Division Vice President
USA Waste Services Rocky Mountain Division
5395 Franklin Street
Denver, Colorado 80216
303-293-2606

Glenn Gardner
District Manager
USA Waste Services of Utah, Salt Lake City District
1434 South 400 West
Salt Lake City, Utah 84115
801-466-0141

Todd Powell
Site Manager
Blandfill, Inc.
6976 West 1300 South
Salt Lake City, Utah 84104
801-250-0555

Richard Von Pein
Region Engineering Manager Northwest Region
USA Waste Services, Inc.
155 North Redwood Drive, Suite 250
San Rafael, California 94903
415-479-3700

Ken Lewis
Region Engineer Northwest Region
USA Waste Services, Inc.
155 North Redwood Drive, Suite 250
San Rafael, California 94903
415-479-3700

Mark Verwiel
Hydrogeologist
USA Waste Services, Inc.
155 North Redwood Drive, Suite 250
San Rafael, California 94903
415-479-3700

Once the transfer of ownership is complete, Todd Powell and myself will be the primary contacts for the site. Other regional specialists which are assigned to the site include Mr. Von Pein and Mr. Verwiel. Mr. Von Pein and I are responsible for permitting and engineering and Mr. Verwiel is responsible for overseeing the groundwater and surface water monitoring programs. All other operational and planning aspects of the facility are the responsibility of the District and Site Managers.

Comment: *6.3 (e) Which parcel numbers on the Salt Lake County plat map belong to Bland? In Appendix A the descriptions reference 14-10-300-008 and not a 14-10-300-009. Please clarify. We do not have a complete picture of the watercourses especially Lee Creek's drainage. In the application it is referenced as being NW of the site however the plat shows it to be SW.*

Response: The parcel numbers which currently belong to the Blands are #14-10-300-001 through #14-10-300-0010. Parcel #14-10-300-008 was renamed by the County as Parcels #14-10-300-009 and #14-10-300-010 and no longer exists. These parcels will become the property of USA Waste Services, Inc. when the purchase agreement with the Blands is executed.

A map indicating Lees Creek and other storm drainage near the facility and a map indicating the parcels owned by the Blands are included to this letter as Attachment B. As shown on the attached map, Lees Creek and other un-named storm drainage drains to the north and west of the facility property.

Comment: *6.3 (f) Since the following information is not contained in the file we recommend a soil sample be taken from the undeveloped areas and run for the parameters listed in this section.*

Response: Based on your recommendation, USA Waste Services will obtain a soil sample from each of the undeveloped phases of the landfill (Phase 4,5, 6, & 7 for a total of 4 samples). These samples will analyzed for the following parameters;

- Soil classification
- pH
- Salt Lake City-County Health Department Health Regulations for Solid Waste Management Facilities (Health Regulations) Appendix A metals concentrations
- Ion exchange capacity

These samples will be grab samples obtained by trenching methods. Analyses will be performed by a State certified laboratory and results will be submitted to your office when completed. We anticipate that these sample will be taken shortly after the purchase agreement with the Blands is completed.

Comment: *6.3 (j) What quantity of clean soils are received daily at the landfill? How will soils be available for closure? Please provide more detailed information on the method of closure and how much soil volume will be needed to accomplish this. What will the source of soil for closure be once the landfill is closed? What is the quantity of soil stockpiled for fire control? The permeability of the cap, source of this material and QA/QA methods of installation must be provided. The post Closure end use plan refers to various approvals from DEQ, these approvals are also needed from SLCCHD for the same activities referenced. This notation should be changed to reflect this. In addition 30 years of Post Closure Care and monitoring is now required of Class IV landfills.*

Response: The landfill has been receiving approximately 130 truck cubic yards of clean fill per day (based on site data 1/1/97 through 9/30/97). However, this is a low estimate of future daily intake rates because the site typically receives larger contracts (50,000 cubic yards or more) which did not occur during the 1/97 to 9/97 time period. Given 263 days per year of operation, the clean fill acceptance rate will provide a minimum of approximately 34,000 truck cubic yards of clean fill annually which may be used in the final cover construction. Assuming a 10-year remaining site life, a minimum of approximately 340,000 truck cubic yards of clean fill is anticipated to be accepted at the site from this date. Actual amounts will like be significantly higher.

Clean fill accepted at the site is segregated from the other materials and stockpiled on-site for later use in constructing final cap. Currently, the clean soil stockpile is located on the west side of the property and contains approximately 40,000 cubic yards of soil. An additional 4,500 cubic yards of soil has already been placed along the existing north side slope for final cover in Phases 1 and 2. Approximately 18-inches of clay has been placed in this area for final cover.

Clean fill will be excavated from the on-site stockpile sources as needed when final cover construction activities commence. The total final cover is estimated to require approximately 265,000 cubic yards soil materials in-place to construct the 18-inch barrier layer and the 6-inch topsoil layer. Considering the amount of clean soil already stockpiled on-site and the amount currently in-place, the remaining soils required to complete the final cover is estimated at approximately 220,500 cubic yards in-place. When considering the "shrinkage" factor due to compaction of soils, the estimated truck cubic yards required is approximately 240,000. This is well below the estimated minimum acceptance rate anticipated for the site. Therefore, USA Waste Services does not anticipate a shortage of soil to use at the site for final cover.

Clean fill stockpile on-site may also be used for fire control as needed. As mentioned, there is approximately 40,000 cubic yards already stockpiled on-site which may be used for this purpose.

Since the clean fill material accepted at the site is generated by various sources within the Salt Lake City and County area the soil properties of these materials vary. However, these materials are generally indicative of the soil materials commonly found in the Salt Lake basin, and are predominantly made up of finer grained materials such as clays and silts. The final cover will be constructed in segments as the landfill is developed. We anticipate each segment will range in size between 10 to 20 acres in size. All construction will be performed in accordance with Section 6.5 (l) of the Health Regulations and other applicable State regulations. USA Waste Services will be selective when determining the specific stockpiled materials to use for final cover construction. We intend to perform soil testing on the specific materials identified prior to commencing of work on final cover. We will select only those materials which meet the requirements of the Health Regulations, are fine grained, and suitable for use in the final cover.

Upon completion of the final cap construction, USA Waste Services will provide for your review any construction plans prepared and a Construction Quality Assurance (CQA) Report. Construction plans typically specify the extent of the project, the moisture conditioning and compaction requirements, the types, quantity and classifications of materials intended for use, and the requirements for soils testing and frequency. The CQA Report will document the "as-built" conditions of the final cover, any design modifications made during construction and certify that the final cover was constructed in accordance with good engineering practice and the construction plans. For your reference, we have included as Attachment C a typical earthwork specification and sections of a CQA Manual used during construction of a project similar to that anticipated at this facility.

Comment: *6.3 (m) (3) The method and plan for landfilling and incremental closure should be described more fully and/or a map which shows planned filling/closure sequences submitted.*

Response: The planned sequencing of filling and closure is indicated on the Site Plan included as Attachment D. The site will be developed in a series of seven phases. Phases #1-#3 are currently active and Phase #4-#7 have not yet been developed. Closure will occur incrementally in each phase as filling progresses and final grades are reached.

Comment: *6.5 (t) Describe how conditions (1) and (2) of this section are met including calculations for containing the 24 hour, 25 year storm.*

Response: Surface water run-on and run-off are prevented from flowing onto the active portion of the landfill by means of grading away from the waste fill slope and working face and by use of soil berms. The active portion of the landfill is maintained at a higher grade than surrounding areas and soil berms are constructed as necessary to direct surface water away from the active portion of the landfill. The soil berms and grading techniques employed effectively isolate the active portion of the landfill where wastes may be exposed.

Surface water run-off from the facility is collected in a series of trenches constructed around the perimeter of the facility. These trenches convey surface water to un-named surface water control ditches and Lees Creek located north and west of the property. At final build-out, the facility will be constructed with a surface water run-off collection ditch which encompasses the entire 7,954 foot property boundary. The proposed drainage will be a "V" type ditch approximately 20-feet wide and 5-feet in depth.

Comment: *6.7 Surface water monitoring has not been described.*

Response: Included with this response as Attachment E is the site's current Storm Water Pollution Prevention Plan employed at the site. Surface water monitoring frequencies and monitoring parameters are detailed in this report. USA Waste Services is intending to maintain the current surface water monitoring program in place after acquisition of the facility is completed. We will review and update the information in this report as necessary. If revisions to the current plan are made an updated report will be submitted to your office.

Comment: *6.9 (b) Has not been specifically addressed*

Response: A written Closure and Post-closure Plan is included in the Operations Manual which is currently in use at the Blandfill. The Operations Manual will continue to be used once the purchase of the site by USA Waste Services is completed. The Operation Manual is included as Attachment F. USA Waste Services anticipates that the Operations Manual will be updated shortly after acquisition to include new or revised information about facility operation that has changed due to the change of ownership.

It is estimated that the maximum portion of the facility open at any time during the active life of the site is currently occurring. Approximately 30 acres of the landfill is currently

open and does not have a completed final cover. Over the next few years final cover in most of this area will be constructed when final grades are met and we anticipate that the active area open will decrease to approximately 11 acres. The closure and post-closure cost estimate for financial assurance assumes that 30 acres of landfill final cover will be constructed as the worst case. We intend to adjust this estimate as the open area not covered and the worst case condition decreases. Updates to the closure and post-closure cost estimate and financial assurance mechanism will be submitted to your office as needed.

USA Waste Services has estimated that the maximum inventory of waste to ever exist of the site will be approximately 8,900,000 cubic yards. This estimate is based on the Site Plan included as Attachment D and does not consider the potential for subgrade settlement.

Closure of the landfill phases will occur in accordance with the Health Regulations. As waste materials are placed, 6-inches of compacted cover will be placed over the fill at the close of each day. For cells which have not had waste placed on them for 30 or more days, 12-inches of compacted cover will be placed. When a landfill cell has reached the final design grades and is ready for closure, additional compacted fill will be placed providing at least 2-feet of compacted fill as the final cover. Final cover material will be constructed of well compacted fine grained soils and will promote free draining run-off conditions. USA Waste Services will notify your office 90 days prior to the intended closure and construction of the final cover in an area of the landfill.

Comment: *Appendix B: Under 2.2 How many spotters will be present during working hours?*

Response: USA Waste Services intends to have 3 spotters present during working hours.

Comment: *Appendix B: Under 2.3 What is the frequency of the random load inspections?*

Response: Random load inspections are performed by spotters every 10 to 15 loads that enter the facility. The operator pushing the material inspects every load as he places the material into the fill.

Comment: *Appendix B: Under 2.6 How frequently will the verification of grades and elevations be performed?*

Response: Grades are verified by certified surveyors on an as needed basis. Typically, this is performed once or twice a season when nearing final grades in specific areas. In addition, USA Waste Services intends to develop detailed aerial topographic mapping of the entire facility (contour intervals of at least 2-feet) every year. The development of detailed aerial topographic maps is a standard procedure for all USA Waste Services sites throughout the county. Also, detailed maps indicating location and extent of fill during the previous year are routinely generated from these topographic surveys.

Comment: *Appendix B: Under 2.7 Please provide on the site plan berms and ditches used for run-on and run-off control. (See comment above)*

Response: The location of perimeter drainage ditches and perimeter landscaped berms are presented on the Site Plan included in this letter as Attachment D. The surface water run-off ditches are shown around the entire property boundary as two solid parallel lines at approximately elevation 4220 feet mean sea level. Berms and landscaping are illustrated in the property off-set area on the south and west sides of the landfill.

Comment: *Appendix B: Under 2.9 This section should be expanded to include the type of monitoring equipment used, and training personnel receive on this equipment. The amount of woody waste accepted does present a significant methane potential. We are currently requiring methane monitoring at the top of the landfill to assess total methane potential. We are currently requiring methane monitoring at the top of the landfill to assess total methane potential currently. Please add locations on the cap to test for methane to your inspection form.*

Response: The landfill personnel currently use a "Gastech GT-105" methane detector for monitoring the surface of the landfill for methane. Monitoring for methane gas was started at the facility in March of 1997 and is now performed quarterly. The Gastech detector is re-calibrated every quarter before monitoring and a minimum of two locations approximately 30-feet up the fill slope, the site buildings, and the corners of the fill are selected for monitoring each quarter. The results of the landfill gas monitoring are recorded on a Methane Monitoring Form and kept on file at the site. This form and additional information relating to methane monitoring is presented in the Operation Manual included as Attachment E. USA Waste Services intends to maintain the current landfill gas monitoring program. If modifications to this program are made a revised landfill gas monitoring program report will be submitted to your office.

Comment: *Appendix B: Under 2.10 The statement is made that a revised sampling plan would be submitted prior to the 1997 sampling event. Has the sampling for 1997 been conducted yet? We have not seen a revised plan but if one exists we need to review it. What is the anticipated date for performing the 1997 sampling?*

Response: A revised sampling plan does not exist. USA Waste Services is beginning the process of reviewing historical groundwater data and monitoring reports. If, as a result of this review process, USA Waste Services identifies a need to modify or revise the current groundwater program we will notify your office and submit new or revised information. Mark Verwiel, the region hydrogeologist, will be organizing our efforts to review the current groundwater program employed at the facility.

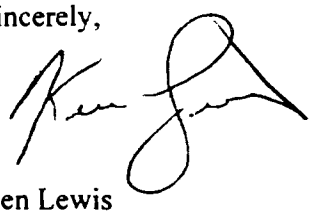
The 1997 groundwater sampling event has not yet occurred. Greg Neville of E.T. Technologies indicated that they are intending to perform the 1997 sampling in late October or early November. Todd Powell indicated that surface water monitoring of the un-named storm water drainage and/or Lees Creek will also occur during the fall 1997 groundwater sampling event.

Comment: *The Site Plan in Appendix C is confusing. What is the difference between the dashed and solid lines? What are the round circular areas on top for? It is unclear how the top will drain with these circular mounds apparently five feet above surrounding grade. What is the point in the center labeled 4305'? This would appear to be 25' below surrounding grade at that particular point.*

Response: Included as Attachment D is the revised Site Plan. On this plan, the notation indicating elevation 4305' mean sea level was removed because it was an error on the previous plan. The circular hills placed at the top of the fill were created to develop a more aesthetically pleasing final surface contour compared to the more typical geometrically symmetrical flat ridge design. These circular mounds can easily be modified to a more uniform shape, but the resulting effect on surface water run-off will be negligible. The solid lines on the site plan were existing fill grades and facilities at the time the plan was prepared. The dashed lines are the proposed final grade of the expanded landfill. Surface water will drain uniformly off the top of the landfill and be collected in the perimeter drainage channel where it will be conveyed to Lees Creek off the property. The revised site plan also indicates, using heavy dashed lines, the seven anticipated phases of landfill construction.

I hope these responses and your discussions with Todd Powell have clarified your understanding of the permit application and resolved any of the deficiencies. Please direct the completed permit and/or associated information to me at my San Rafael office address as soon as possible, or contact me directly at 415-479-3700 if you have any questions or require additional information.

Sincerely,



Ken Lewis
Region Engineer

cc: David M. Hall/USA Waste Services of Utah, Inc. w/o attachments
Rick Von Pein/USA Waste Services, Inc. w/o attachments

OCTOBER 28, 1997
HEALTH DEPARTMENT COMMENTS

ENVIRONMENTAL HEALTH DIVISION
1954 East Fort Union Boulevard #100
Salt Lake City, UT 84121
801-944-6608 Fax

FILE

Division Director
Terry Sadler
801-944-6600

October 28, 1997

Ken Lewis, Region Engineer
USA Waste Services, Inc.
155 North Redwood Drive
Suite 250
San Rafael, CA 94903

Dear Mr. Lewis:

We received and reviewed your response to our comments on October 27, 1997 and have the following comments:

Comment 6.2(c) Your response states that proof of financial assurance for closure/post closure care will be provided once the purchase agreement with the Blands is complete. In our discussions with United Waste we informed them that they would need to have this financial assurance mechanism in place prior to final permit issuance. The temporary permit was issued as an interim measure to allow time to complete these tasks. It is my understanding now that USA Waste is waiting for final permit issuance before finalizing the purchase agreement with the Blands. There are certain items as specified in this letter that must be completed prior to a final permit issuance from our agency.

Comment 6.3(f) The soil sample needs to be taken and results submitted prior to permit issuance.

Comment 6.3(j) Final cover on the north side slope has not been approved by this office. The fire control as well as daily cover needs should be accounted for separately and they have not been included in your soil capping calculations. Please provide information on how you will maintain a soil stockpile available for fire control and the quantities of daily soil and how this is factored into your soil cap availability projections.

Have you done an analysis on the type of projects generating this volume of soil and whether this will remain a steady source based on that information?

The Health Department will need a gradation sieve analysis on the

We have provided this review in an expedient manner to allow the transfer process to proceed as soon as possible. I will be out of the office until November 10. Upon my return I will commit to reviewing your response immediately if you have it in to me by then. Time is of the essence since I believe the temporary permit expires at the end of November.

Sincerely,

Mary Pat Buckman
Hydrogeologist

JANUARY 2, 1998
HEALTH DEPARTMENT COMMENTS

ENVIRONMENTAL HEALTH DIVISION
1954 East Fort Union Boulevard #100
Salt Lake City, UT 84121
801-944-6608 Fax

Division Director
Terry Sadler
801-944-6600

MEMO

To: Ken Lewis, USA Waste
From: Mary Pat Buckman
Subject: Blandfill Permit
Date: January 2, 1998

Ken:

I have not heard any response from you to the voice mail I left you on December 17, 1997 regarding the closure/post-closure cost estimate. We have also not received any bond from the surety bond company to date. Please be advised that the Blandfill permit cannot be issued until we have a bond with the correct amount based on our approval of the closure/post-closure cost estimate. For your review we had the following comments on the cost estimates:

1. The permeability of the cap must be $1x10^{-7}$ cm./sec. The cap can be no more permeable than the base soils.

2. The analysis for groundwater monitoring must be changed to $1000.00 per sample to reflect the average cost we would incur to run these samples. The regulations require that the maximum third party costs be used in the closure/post-closure cost estimates.

3. If groundwater monitoring was not completed in 1997 you will need to sample twice in !998 to catch up.

Please get back to me as soon as possible regarding the status of your permit. You can reach me at (435)647-9813 or you may leave a voice mail at (801) 944-6707.

Mary Pat

JANUARY 13, 1998
HEALTH DEPARTMENT CONDITIONAL PERMIT TRANSMITTAL

ENVIRONMENTAL HEALTH DIVISION
1954 East Fort Union Boulevard #100
Salt Lake City, UT 84121
801-944-6608 Fax

Division Director
Terry Sadler
801-944-6600

January 13, 1998

Ken Lewis, Region Engineer
USA Waste Services, Inc.
155 North Redwood Drive
Suite 250
San Rafael, CA 94903

Dear Mr. Lewis:

Enclosed is a permit for USA Waste Services to operate the Blandfill construction/demolition landfill located at 6976 West 1300 South . This permit is subject to the following conditions which must be satisfied within six months of today's date. The permit is also subject to the conditions as agreed to in the submittals of August 12, 1997 and October 24, 1997 by United Waste and USA Waste.

1. Within sixty days of the date of permit issuance, a sample schedule should be submitted as well as a QA/QC document and sampling plan for sampling on the base materials present on site. The same information should be provided for the cover material testing. The testing frequency for characterizations of cover soils as well as the suite of analysis to be performed and a description of how these soils from many different sources will be characterized adequately should be included in the materials submitted. Will mixing and compositing of samples be performed and if so on what scale?

2. Within sixty days of today's date, the comments responding to our October 28 letter should be submitted.

3. If no sampling took place in 1997, two sampling events must take place in 1998.
In response to your request for 180 days from permit issuance to respond to our requirements for information in our October 28, 1997 letter, we believe that since almost 90 days have elapsed since our October 28 letter, sixty more days (giving you a total of 150) should be enough to respond to these permit requirements.

This permit will expire in one year from the date of issuance. Permit renewals should be submitted sixty days prior to expiration to insure adequate processing time. Failure to comply

with any of the terms and conditions specified above may allow the Department to suspend or revoke this permit. Please call Mary Pat Buckman or Garth Miner of my staff if you have any questions on the permit conditions at 944-6700.

Sincerely,

Brian Bennion, Director
Bureau of Water Quality & Hazardous Waste

enc. Permit #
BWB/mpb

A-4

Fugitive Dust Control Plan

Utah!
Where ideas connect

Department of Environmental Quality
Division of Air Quality

Michael O. Leavitt
Governor

Dianne R. Nielson, Ph.D.
Executive Director

Richard W. Sprott
Director

150 North 1950 West
P.O. Box 144820
Salt Lake City, Utah 84114-4820
(801) 536-4000
(801) 536-4099 Fax
(801) 536-4414 T.D.D.
www.deq.utah.gov

DAQC-428-2003

March 17, 2003

Gary Carter, P.E., Environmental Engineer
Secor International Inc.
308 East 4500 South, Suite 100
Salt Lake City, Utah 84107-3975

Dear Mr. Carter:

Re: Fugitive Dust Control Plan submitted February 24, 2003 - Utah Administrative Code (UAC) R307309-4. Fugitive Emissions and Fugitive Dust – Mountain View Landfill (MVLF)- Salt Lake County

A Fugitive Dust Control Plan (Plan), dated June 24, 2002, was received by the Division of Air Quality from Secor International Inc.(Secor) in behalf of Waste Management of Utah, Inc. for the Mountain View Landfill (MVLF) operation. The site is located on 77 acres at 6976 West California Ave, Salt Lake City, Salt Lake County, Utah. The operation at the MVLF is a permanent project.

It does not appear that MVLF is currently subject to a Notice of Intent and Approval Order according to Utah Administrative Code (UAC) R-307-401. Under the present operation parameters, the emissions from the MVLF can be assumed to be below the five- ton threshold.

The fugitive dust control plan submitted appears to fulfill Waste Management of Utah, Inc.'s requirement to submit a fugitive dust control plan in accordance with UAC R307-309-4 at this time. Please be advised that any track-out from the landfill onto a public, paved road, must also be controlled.

This notice does not relieve Waste Management of Utah, Inc. of its obligations to comply with all other applicable provisions of the UAC.

Failure to fully implement the Fugitive Dust Control Plan and/or failure to comply with the applicable requirements of the UAC or permit conditions may result in compliance actions, notices of violation and associated penalties.

If you have any questions regarding this notice, please contact Gisela Jensen at (801) 536-4406.

When responding refer to the date on this letter.

Sincerely,

Jeff Dean, Compliance Manager
Division of Air Quality

JND:GIJ:aj

cc: Salt Lake Valley Health Department

FUGITIVE DUST CONTROL AT THE MOUNTAIN VIEW LANDFILL

WASTE MANAGEMENT

Mountain View Landfill

6976 West California Avenue
Salt Lake City, Utah

February 19, 2003

SECOR

SECOR
INTERNATIONAL
INCORPORATED

www.secor.com
308 East 4500 South, Suite 100
Murray, Utah 84107-3975
801-268-7100 TEL
801-268-7118 FAX

February 19, 2003

Mr. Richard Sprott
Director, Division of Air Quality
Utah Department of Environmental Quality
150 North 1950 West
Salt Lake City, Utah 84114

Re.: Fugitive Dust Control at the Mountain View Landfill

Dear Mr. Sprott:

This letter is provided to the Division of Air Quality (DAQ) in order to confirm compliance with Title R307-205-2, Fugitive Emissions for the Mountain View Landfill (MVLF). The MVLF is approximately 77 acres located at 6976 West California Avenue, Salt Lake City, Utah. MVLF is a construction and demolition landfill that has been in operation since April 1985 under various owners. Since July 1998 MVLF has been owned and operated by Waste Management of Utah, Inc. The MVLF receives demolition and construction waste as defined by Title R3315-301-2. Wastes that are acceptable for receipt at MVLF include bricks, concrete, other masonry materials, soil, asphalt, rock, untreated lumber, rebar, tree stumps, building materials, packaging, and rubble resulting from construction, remodeling, repair, and demolition operations on pavement, houses, commercial buildings, and other structures. The facility does not receive asbestos, contaminated soils, tanks resulting from remediation or cleanup at any release or spill, waste paints, solvents, sealers, adhesives, or similar hazardous or potentially hazardous materials. The only source of airborne emissions at MVLF is fugitive dust.

Enclosed with this letter is a Fugitive Dust Control Plan for MVLF to meet the requirements of Title R307-205-2. It is our understanding that MVLF is subject to the requirements of Title R307-205, but is not subject to Title R307-401, Notice of Intent and Approval Order. We request a reply from DAQ that confirms MVLF is not subject to Title R307-401 and that the content of the enclosed Fugitive Dust Control Plan meets the requirements of Title R307-205.

Should you have any questions regarding this letter or the Fugitive Dust Control Plan, please feel free to contact me at 327-7821.

Sincerely,
ON BEHALF OF THE MOUNTAIN VIEW LANDFILL
SECOR International Incorporated

Gary A. Carter, P.E.
Environmental Engineer

cc: Stacy Anderson – Waste Management
Patrick Craig – Waste Management
Len Butler – Waste Management
Kevin Bertrand - SECOR International Incorporated

Enclosure

Fugitive Dust Control Plan
Mountain View Landfill
Salt Lake City, Utah

The primary sources of fugitive dust at the MVLF are haul roads, disturbed areas and stockpiles. The following control measures shall be implemented at MVLF to minimize the creation of fugitive dust:

- The vehicle speed limit for paved and unpaved roads and disturbed areas will be 15 miles per hour. Vehicle speed limit signs are posted to control speeds.
- Watering of haul roads shall be conducted as necessary to control fugitive dust.
- Fugitive emissions from land clearing, overburden removal, and disturbed areas at the landfill shall be controlled by watering as necessary.
- Active and inactive landfill material stockpiles shall be watered as necessary to control fugitive emissions.
- Watering of the soil or alternative cover will be done as necessary to control fugitive emissions.
- Vegetation growth will be initiated and maintained on closed landfill areas to minimize fugitive dust emissions.

A-5

Site Facility Inspection Form

MOUNTAIN VIEW LANDFILL
Quarterly Permit Facility Inspection

Signature_____ Date_____

ITEM	YES/NO	COMMENTS
Have wastes been placed in the appropriate locations?		
Have wastes been properly compacted?		
Are wastes being covered to prevent fires?		
Are the facility fences, gates, and other access controls in good condition?		
Are the facility roads maintained to provide safe and reliable access to the disposal area?		
Are the facility run-on/off controls in good condition and not blocked?		
Is final and intermediate cover in good condition?		
Is litter being picked up as necessary?		
Is the daily operating record being completed as required?		

APPENDIX B

SOILS TESTING

Table 1

Summary of Soils Laboratory Testing

Summary of Soils Laboratory Testing				Grain Size		Atterberg Limits		Compaction Test (ASTM 1557)		Permeability Test	
Sample Number	Dry Inplace Density	USCS Classification	Moisture Content (%)	Percent Passing #4 (%)	Percent Passing #200 (%)	Liquid Limit (LL)	Plasticity Limit (PL)	Maximum Dry Density (pcf)	Optimum Moisture Content (%)	Remolding Criteria	Coefficient of Permeability k (cm/sec)
a. Bucket 2		SC	22.5	80	48	27	18				
b. Bucket 3		CL	28.1	96	84	38	20				
c. Bucket 4		CL	30.3	100	96	44	22				
d. Bucket SK1		SC	21.7	81	47	29	18				
e. Bucket SK2		SC	16.6	77	44	28	17	124.0	9.5		
f. Bucket SK3		CL	25.6	92	68	31	19				
g. Bucket SK4		GC	19.0	64	32	27	17	127.3	7.8	90%RC@OMC+2	5.00E-06
h. Core #1	92.1	CL	28.3								
i. Core #2			17.9								
j. Core #3	89.7	CL or SC	28.3								
k. Core #4	84.8	CL	33.9								3.70E-07
l. Sample #1	104.7	SC	17.8	83.8	46.6	26	18	116.7	13.5		
m. Sample #2	102.6	CL	13.6	85.6	54.9	27	18	114.5	14		
n. Sample #3	106.7	SC	14.1	81.3	46.0	25	17	118.7	12.5		

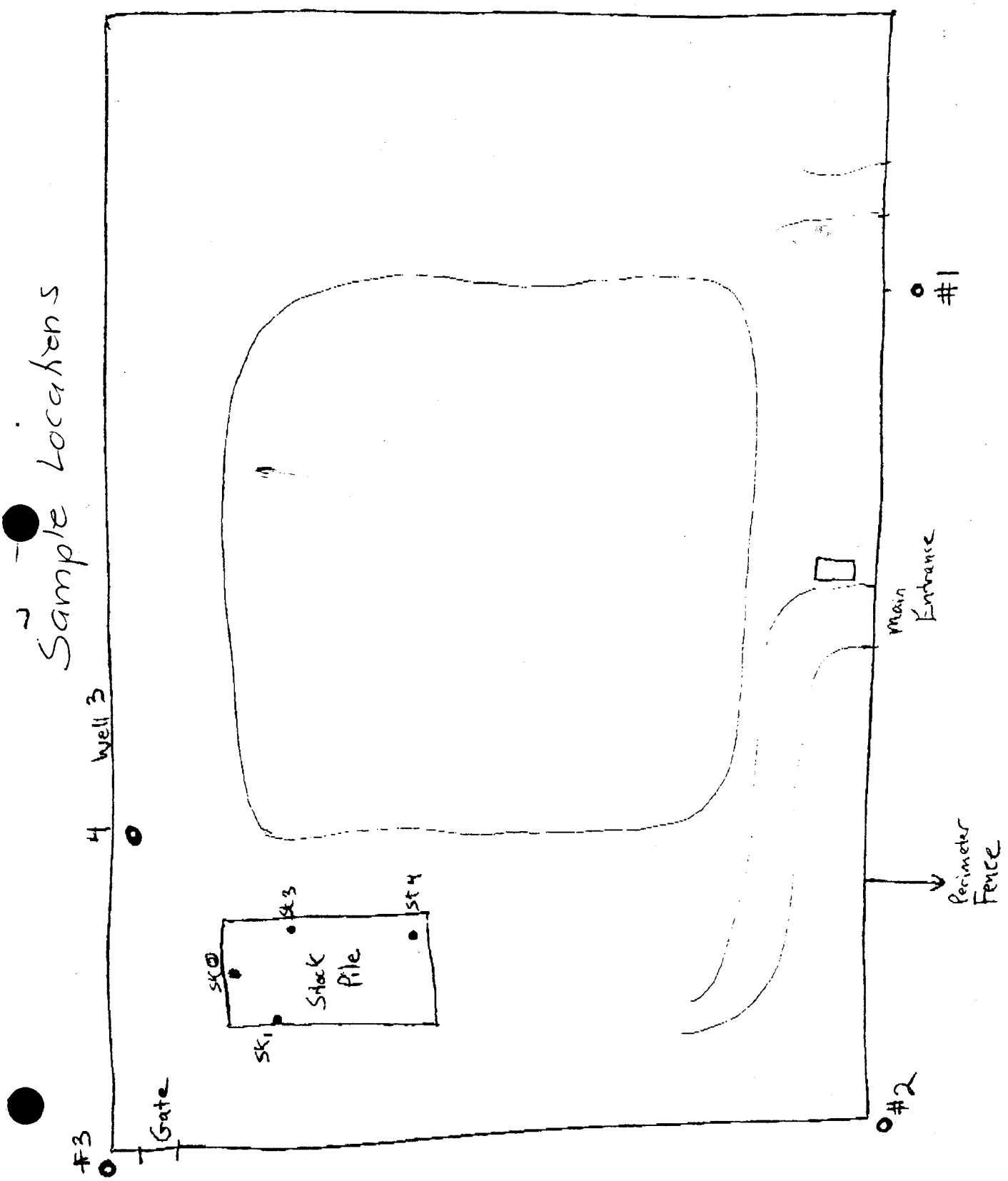
NOTE:
Samples were sent to EMCON/OWT, Inc.'s Soil Lab. Samples a-k were sampled in March 1998and samples l-n were sampled in November 2004.
Core samples have slightly higher moisture and are probably more accurate.
RC = relative compaction
OMC = optimum moisture content

You will receive 11 samples.

No bucket sample for #1.

22045-013.002

To: Don Hollings
Emcon
408-437-9526



TESTING BY EMCON

GRAIN SIZE DISTRIBUTION

ASTM D422

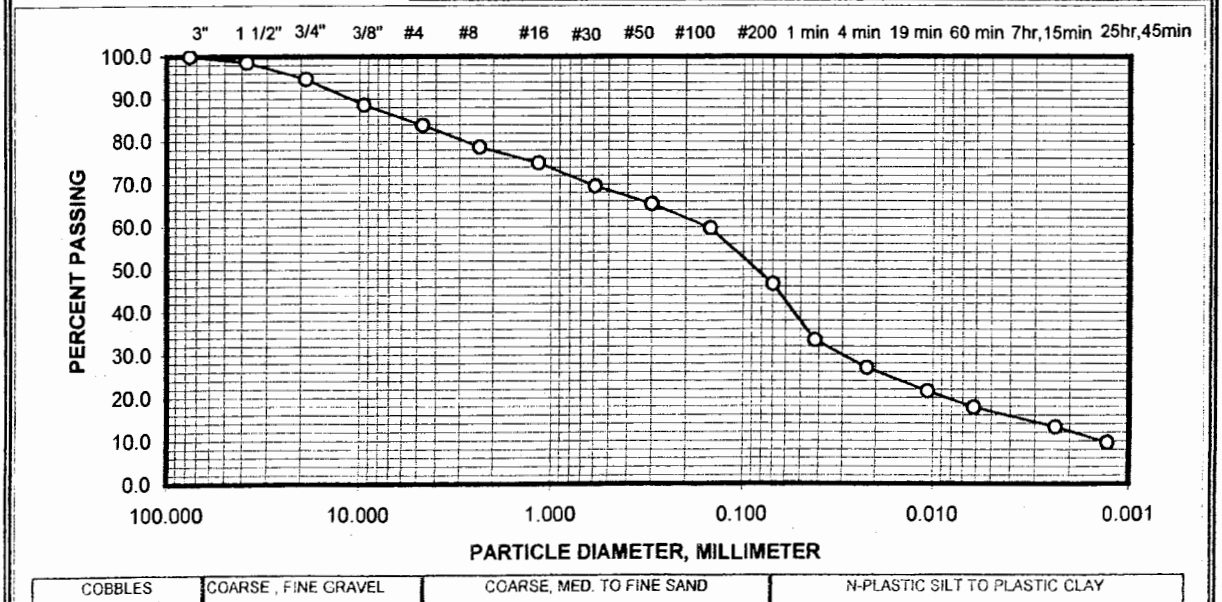
Shaw EMCON/OWT, Inc.

A Shaw Group Company

PROJECT NAME:	MT. VIEW LANDFILL	PROJECT NO.:	102094
SAMPLE NO.:	SAMPLE # I	DATE:	11/09/04
DESCRIPTION:	CLAYEY SAND WITH GRAVEL, BROWN.	TECH.:	DGC

		CORRECTIONS:			
UNIFIED SOIL CLASSIFICATION:	SC				
Moisture Content Determination:		1 1/2"	98.6	Dry Wt Used, Hydrom:	50.9
Pan Number:	#500	3/4"	94.7	Est. Sp. Gr., (2.60-2.80):	2.61
Pan + Wet Soil, gms.	910.9	3/8"	88.6	Temp.,(18-23) °C:	21
Pan + Dry Soil, gms.	787.2	D_{60}	0.155	Zero Correction	5.0
Wt. of Pan, gms.	92.6	D_{30}	0.030	Miniscus Correction:	0.5
Wt. of Dry Soil, gms.	694.6	D_{10}	0.001	Liquid Limit:	26
Wt. of Water, gms.	123.7	C_U	113.04	Plasticity Index:	8
Water content, %.	17.8	C_C	4.20	High; Mod.; Low; NP:	

SIEVE SIZE (U.S. STANDARD)	PARTICLE SIZE, (inches)	PARTICLES DIAMETER, (mm)	WEIGHT RETAINED (gms)	ACCUMULATED WEIGHT RETAINED (gms)	WEIGHT PASSING (gms)	PERCENT PASSING (%)
5"	5.000	127.00		0	694.6	100.0
3"	3.000	76.20		0	694.6	100.0
1 1/2"	1.500	38.10		0	694.6	98.6
3/4"	0.750	18.90		0	694.6	94.7
3/8"	0.375	9.52	0.0	0	694.6	88.6
#4	0.185	4.70	37.4	37.4	657.2	83.8
#8	0.093	2.36	40.3	77.7	616.9	78.7
#16	0.046	1.17	29.4	107.1	587.5	74.9
#30	0.023	0.59	42.5	149.6	545	69.5
#50	0.012	0.30	32.8	182.4	512.2	65.3
#100	0.006	0.15	44.1	226.5	468.1	59.7
#200	0.003	0.07	102.9	329.4	365.2	46.6
		0.0420	1 min.		42	33.4
Bulb 152H HYDROMETER TEST WITH DISPERSING AGENT		0.0223	4 min.		35	27.0
		0.0107	19 min.		29	21.5
		0.0062	60 min.		25	17.8
		0.0024	7hr., 15min.		20	13.3
		0.0013	25hr., 45min.		16	9.6



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ATTERBERG LIMITS

ASTM D4318

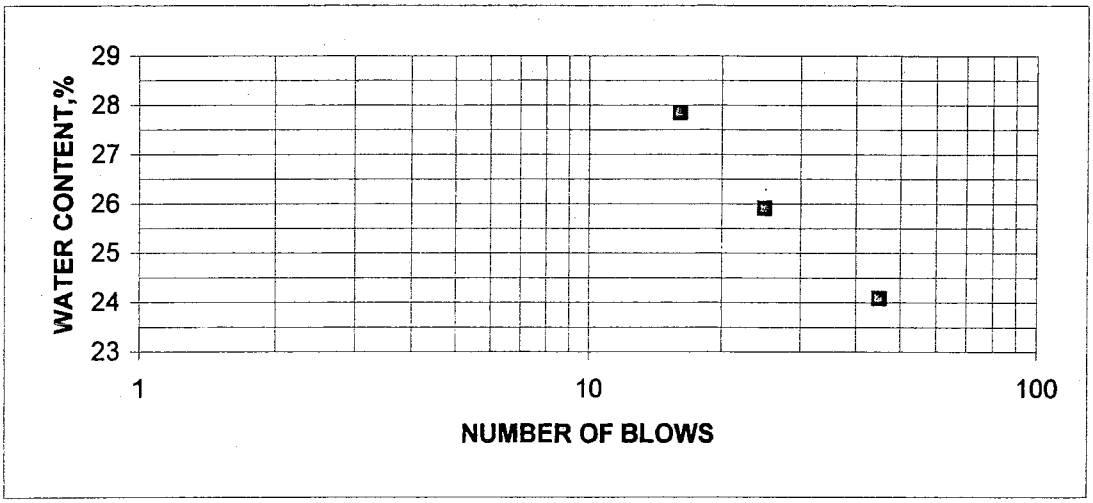
Shaw EMCON/OWT, Inc.

A Shaw Group Company

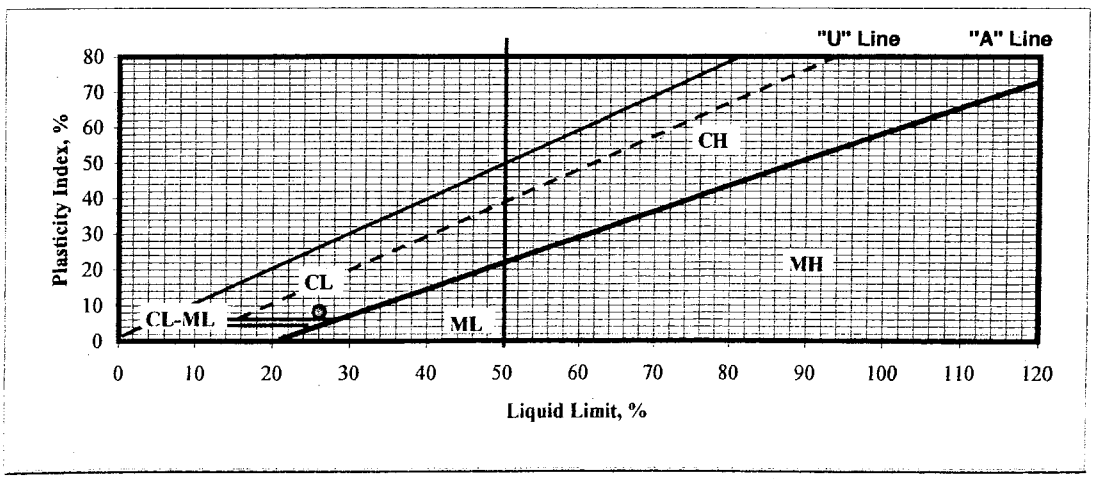
Project Name:	MT. VIEW LANDFILL	**Lab. No.:**	04-076	**Proj. No.:**	102094
Sample No.:	SAMPLE # I	**Depth, ft.:**	BULK	**Date:**	11/10/04
Description:	CLAYEY SAND WITH GRAVEL, BROWN.			**Tested By:**	DGC
				Checked By:	

*/	Liquid Limit			Plastic Limit		
Can Number	D-6	C-1	B-3	A-5	B-1	
Weight of Can + Wet Soil, gms.	68.58	65.03	68.98	47.87	47.44	
Weight of Can + Dry Soil, gms.	61.46	58.24	60.96	45.48	45.13	
Weight of Can, gms.	31.90	32.03	32.16	32.04	32.11	
Weight of Dry Soil, gms.	29.56	26.21	28.80	13.44	13.02	
Weight of Water, gms.	7.12	6.79	8.02	2.39	2.31	
Water Content, %	24.1	25.9	27.8	17.8	17.7	
Number of Blows	45	25	16			

Unified Soil Classification **SC**



LL=	26	PL=	18	PI=	8



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SPECIFIC GRAVITY

ASTM D854

Shaw™ EMCON/OWT, Inc.
A Shaw Group Company

PROJ. NAME:	MT. VIEW LF.	**PROJ. NO.:**	102094	**DATE:**	11/11/04
SAMPLE NO.:	SAMPLE # I	**DEPTH, FT.:**	BULK	**TESTED BY:**	DGC
DESCRIPTION:	CLAYEY SAND WITH GRAVEL, BROWN.			**CORRECTED BY:**	

LABORATORY MEASUREMENTS:

TRIAL NUMBER	1	2	3
FLASK NUMBER	A	A	A
WEIGHT OF FLASK + WATER + SOIL	735.8	734.8	733.8
TEMP., DEGREE C	28.0	35.0	40.0
WEIGHT OF FLASK + WATER	657.3	656.2	655.2
WEIGHT OF DRY SOIL USED, GRAMS	127.04	127.04	127.04

SPECIFIC GRAVITY OF WATER:

C	0	1	2	3	4	5	6	7	8	9
10	0.9997	0.9966	0.9995	0.9994	0.9993	0.9991	0.9990	0.9988	0.9986	0.9984
20	0.9982	0.9980	0.9978	0.9976	0.9973	0.9971	0.9968	0.9965	0.9963	0.9960
30	0.9957	0.9954	0.9951	0.9947	0.9944	0.9941	0.9937	0.9934	0.9930	0.9926
40	0.9922	0.9919	0.9915	0.9911	0.9907	0.9902	0.9898	0.9894	0.9890	0.9885

LABORATORY CALCULATIONS:

TRIAL NUMBER	1	2	3
SPEC. GRAVITY OF WATER @ T	0.9963	0.9941	0.9922
GT* Ws	126.57	126.29	126.05
W1 - W2	78.50	78.60	78.60
Ws - (W1 - W2)	48.54	48.44	48.44
Gs = GT * Ws / Ws - (W1 - W2)	2.61	2.61	2.60

Average Specific Gravity:	2.61

δγχ93σπγ

COMPACTION TEST

Shaw EMCON/OWT, Inc.
A Shaw Group Company

☐ ASTM D1557
■ ASTM D698

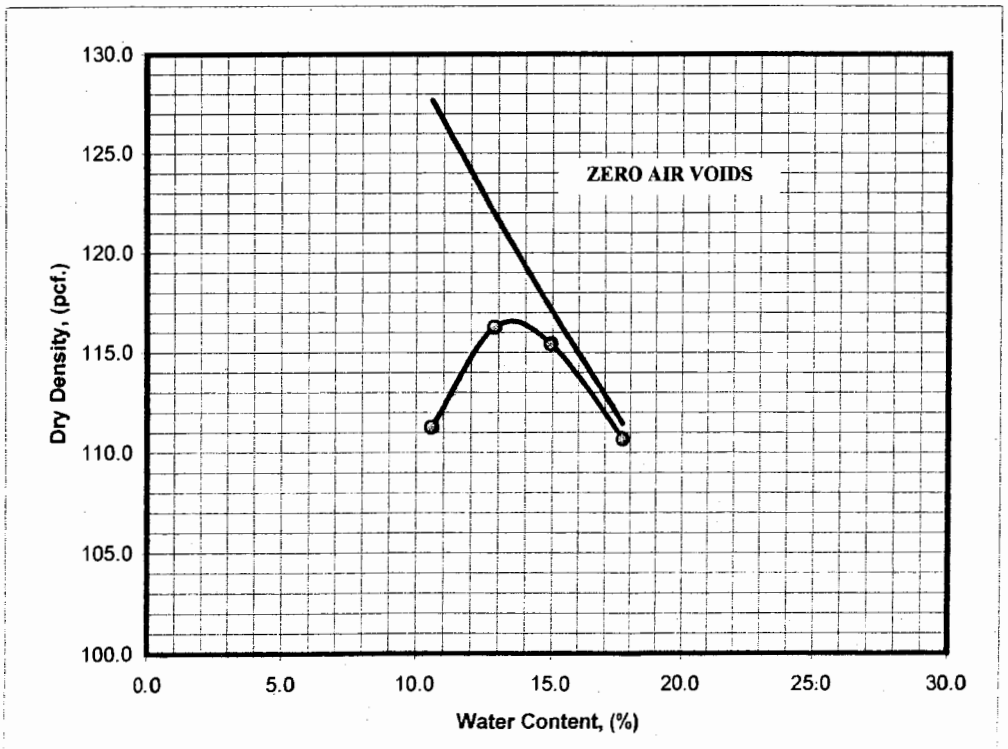
Checked By:

Project Name:	MT. VIEW LF.	**Proj. No.:**	102094	**Lab. No.:**	04-076
Sample No.:	SAMPLE # I	**Depth, ft.:**	BULK	**Tested By:**	DGC
Description:	CLAYEY SAND WITH GRAVEL, BROWN.			**Date:**	11/10/04

Vol., Mold, cf.:	0.03333	**Hammer Weight,:**	5.5 lbs.	**Hammer Drop:**	12"
No. of Layers:	3	**Blows/Layer:**	25	**ASTM Designation:**	
				Method:	"B"

Trial Number		-6	-4	-2	Nat.	
Container Number		Q	#6	Y-5	A-1	
Wet Soil + Container	(gms.)	923.60	953.30	731.70	881.20	
Dry Soil + Container	(gms.)	853.10	868.00	644.00	776.00	
Container Weight	(gms.)	185.50	204.20	56.90	181.00	
Weight of Water	(gms.)	70.50	85.30	87.70	105.20	
Weight of Dry Soil	(gms.)	667.60	663.80	587.10	595.00	
Moisture Content	(%)	10.6	12.9	14.9	17.7	
Wet Soil + Mold	(gms.)	3711	3835	3857	3820	
Weight of Mold	(gms.)	1851	1851	1851	1851	
Wet Weight of Soil	(lbs.)	4.10	4.37	4.42	4.34	
Wet Unit Weight	(pcf.)	123.0	131.2	132.7	130.2	
Dry Unit Weight	(pcf.)	111.3	116.3	115.4	110.7	

Maximum Dry Density, pcf.:	116.7
Opt. Moisture Content, %:	13.5
Est. Specific Gravity:	2.61



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HYDRAULIC CONDUCTIVITY

EMCON/OWT, Inc.
A Shaw Group Company

ASTM D5084

PROJECT NAME:	MOUNTAIN VIEW LANDFILL	LAB. NUMBER:	04-076
SAMPLE NUMBER:	SAMPLE # I	PROJECT NUMBER:	102094
DESCRIPTION:	CLAYEY SAND WITH GRAVEL, BROWN.	SAMPLE DEPTH:	REMOLDED
CHECKED BY:		DATE:	11/19/04
		TESTED BY:	DGC

Remolded to 90% of max. dry density (ASTM D698) at opt. -2% water content.

SAMPLE DATA		BEFORE TEST	AFTER TEST	OVEN DRY		
DIAMETER	(cm)	7.28	7.23	TARE NUMBER		A-1
HEIGHT	(cm)	6.40	6.40	WT. OF TARE+WET SOIL	(gm)	620.90
VOLUME	(cc)	266.264	262.619	WT. OF TARE+DRY SOIL	(gm)	530.30
WT. OF WET SOIL	(gm)	499.0	537.5	WT. OF TARE	(gm)	83.40
WT. OF DRY SOIL	(gm)	446.9	446.9	WT. OF WATER	(gm)	90.60
WT. OF WATER	(gm)	52.1	90.6	WT. OF DRY SOIL	(gm)	446.9
MOISTURE CONTENT	(%)	11.7	20.3	WATER CONTENT	(%)	20.3
DRY DENSITY	(pcf)	104.73	106.19	LAB. MAX. DRY DENSITY	(pcf)	116.7
VOID RATIO	(e)	0.56	0.53	OPT. WATER CONTENT	(%)	13.5
SATURATION	(s)	54.8	99.1	RELATIVE COMPACTION	(%)	90
POROSITY	(h)	0.3569	0.3480	SPECIFIC GRAVITY	(est.)	2.61

PRESSURE DATA DURING PERMEABILITY TEST:

"B" parameter	0.98	Area of Burette:	0.6 sq. cm.
CONFINING PRESS.	55 psi	Temp. Correction:	0.976 21 °C
BACK PRESS. (bot)	50 psi	BACK PRESS. (top)	50 psi.
AVERAGE CONSOL. PRESSURE:	5.0 psi		
PERMEANT:	*TAP WATER*		

DATE	TIME	ELAPSED TIME (sec)	STATUS RESET	BURETTE READING					
				TOP PRESS. (psi.)		BOTTOM PRESS. (psi.)		CHAMBER PRESS.,(psi.)	COMMENTS
SATURATION:									**Skempton's "B"**
11/19/2004	7:30			50.0		50.0		51.0	49.7
11/19/2004	11:54							61.0	59.5
CONSOLIDATION:				TOP (cm)	ΔT (cm.)	BOT. (cm)	ΔB (cm.)	CHAMBER (cm)	
PERMEABILITY:									
11/22/2004	6:04	RESET	R	0.5		39.5		12.7	**Hydraulic Cond., (cm/sec.)**
11/22/2004	6:07	180		10.3		28.6		12.7	1.9E-04
11/22/2004	6:08	RESET	R	0.7		39.6		12.7	Hydraulic Cond., (cm/sec.)
11/22/2004	6:11	180		11.3		28.8		12.7	2.0E-04
11/22/2004	6:12	RESET	R	0.3		39.5		12.7	Hydraulic Cond., (cm/sec.)
11/22/2004	6:15	180		10.8		28.6		12.7	2.0E-04
11/22/2004	6:16	RESET	R	0.6		39.5		12.7	Hydraulic Cond., (cm/sec.)
11/22/2004	6:19	180		11.1		28.8		12.7	2.0E-04
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GRAIN SIZE DISTRIBUTION

ASTM D422

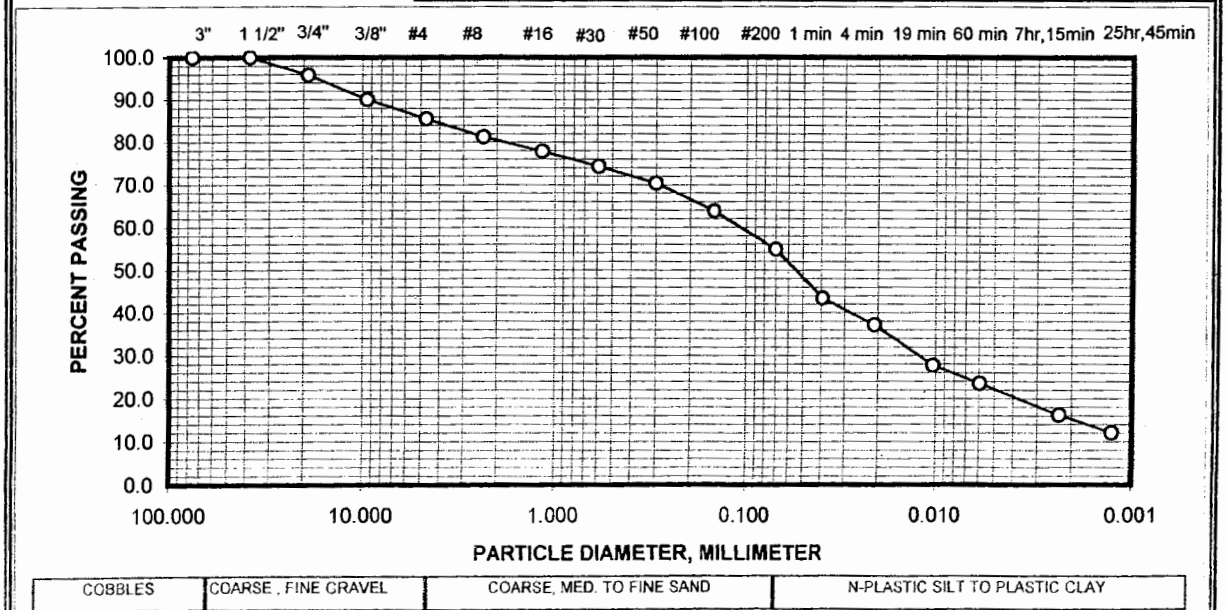
Shaw™ EMCON/OWT, Inc.

A Shaw Group Company

PROJECT NAME:	MT. VIEW LANDFILL	PROJECT NO.:	102094
SAMPLE NO.:	SAMPLE # II	DATE:	11/09/04
DESCRIPTION:	SANDY LEAN CLAY, BROWN.	TECH.:	DGC

UNIFIED SOIL CLASSIFICATION:	CL	CORRECTIONS:			
Moisture Content Determination:		1 1/2"	100.0	Dry Wt Used, Hydrom:	52.4
Pan Number:	#510	3/4"	95.8	Est. Sp. Gr., (2.60-2.80):	2.64
Pan + Wet Soil, gms.	910.5	3/8"	90.1	Temp.,(18-23) °C:	21
Pan + Dry Soil, gms.	812.4	D_{60}	0.108	Zero Correction	5.0
Wt. of Pan, gms.	89.0	D_{30}	0.012	Miniscus Correction:	0.5
Wt. of Dry Soil, gms.	723.4	D_{10}	#DIV/0!	Liquid Limit:	27
Wt. of Water, gms.	98.1	C_U	#DIV/0!	Plasticity Index:	9
Water content, %.	13.6	C_C	#DIV/0!	High; Mod.; Low; NP:	

SIEVE SIZE (U.S. STANDARD)	PARTICLE SIZE, (inches)	PARTICLES DIAMETER, (mm)	WEIGHT RETAINED (gms)	ACCUMULATED WEIGHT RETAINED (gms)	WEIGHT PASSING (gms)	PERCENT PASSING (%)
5"	5.000	127.00		0	723.4	100.0
3"	3.000	76.20		0	723.4	100.0
1 1/2"	1.500	38.10		0	723.4	100.0
3/4"	0.750	18.90		0	723.4	95.8
3/8"	0.375	9.52	0.0	0	723.4	90.1
#4	0.185	4.70	36.5	36.5	686.9	85.6
#8	0.093	2.36	34.5	71	652.4	81.3
#16	0.046	1.17	27.1	98.1	625.3	77.9
#30	0.023	0.59	29.0	127.1	596.3	74.3
#50	0.012	0.30	31.8	158.9	564.5	70.3
#100	0.006	0.15	52.0	210.9	512.5	63.8
#200	0.003	0.07	72.1	283	440.4	54.9
		0.0395	1 min.		47	43.4
Bulb 152H HYDROMETER TEST WITH DISPERSING AGENT		0.0209	4 min.		41	37.2
		0.0103	19 min.		32	27.7
		0.0060	60 min.		28	23.6
		0.0023	7hr., 15min.		21	16.2
		0.0013	25hr., 45min.		17	12.0



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ATTERBERG LIMITS

ASTM D4318

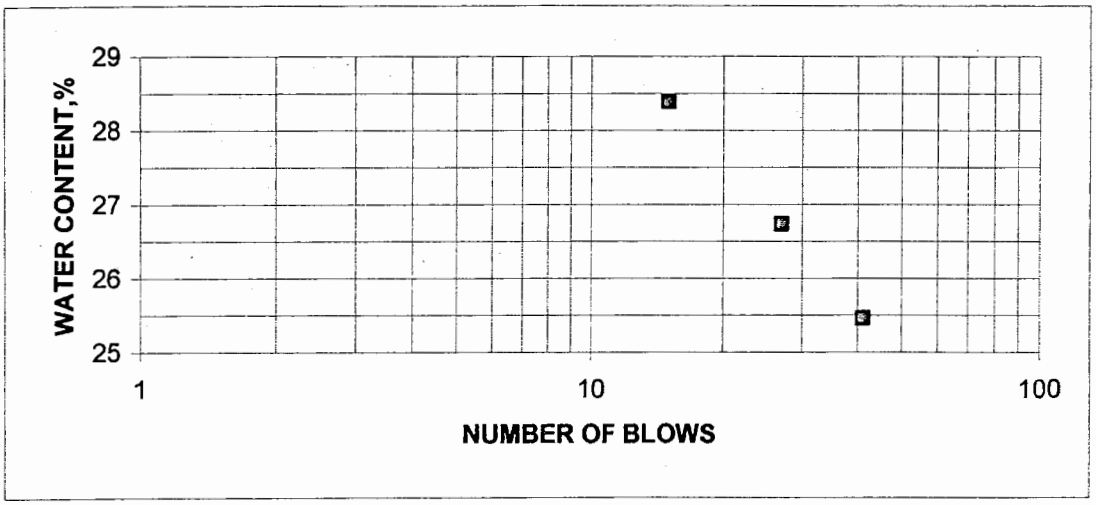
Shaw EMCON/OWT, Inc.

A Shaw Group Company

Project Name:	MT. VIEW LANDFILL	**Lab. No.:**	04-076	**Proj. No.:**	102094
Sample No.:	SAMPLE # II	**Depth, ft.:**	BULK	**Date:**	11/10/04
Description:	SANDY LEAN CLAY, BROWN.			**Tested By:**	DGC
				Checked By:	

*/	Liquid Limit			Plastic Limit		
Can Number	G-6	C-2	B-6	A-8	J-6	
Weight of Can + Wet Soil, gms.	63.65	64.81	68.67	48.58	48.84	
Weight of Can + Dry Soil, gms.	57.22	57.91	60.56	46.03	46.24	
Weight of Can, gms.	31.97	32.10	31.99	31.86	31.92	
Weight of Dry Soil, gms.	25.25	25.81	28.57	14.17	14.32	
Weight of Water, gms.	6.43	6.90	8.11	2.55	2.60	
Water Content, %	25.5	26.7	28.4	18.0	18.2	
Number of Blows	41	27	15			

Unified Soil Classification **CL**



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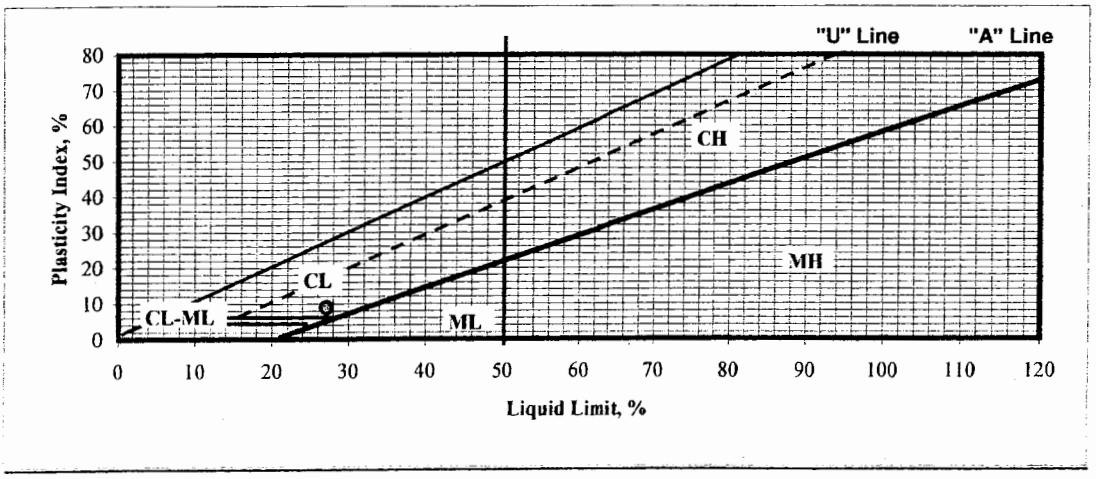

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SPECIFIC GRAVITY

ASTM D854

Shaw EMCON/OWT, Inc.
A Shaw Group Company

PROJ. NAME:	MT. VIEW LF.	**PROJ. NO.:**	102094	**DATE:**	11/11/04
SAMPLE NO.:	SAMPLE # II	**DEPTH, FT.:**	BULK	**TESTED BY:**	DGC
DESCRIPTION:	SANDY LEAN CLAY, BROWN.			**CORRECTED BY:**	

LABORATORY MEASUREMENTS:

TRIAL NUMBER	1	2	3
FLASK NUMBER	C	C	C
WEIGHT OF FLASK + WATER + SOIL	743.0	742.0	741.4
TEMP., DEGREE C	29.0	36.0	41.0
WEIGHT OF FLASK + WATER	662.0	661.0	660.0
WEIGHT OF DRY SOIL USED, GRAMS	130.01	130.01	130.01

SPECIFIC GRAVITY OF WATER:

C	0	1	2	3	4	5	6	7	8	9
10	0.9997	0.9966	0.9995	0.9994	0.9993	0.9991	0.9990	0.9988	0.9986	0.9984
20	0.9982	0.9980	0.9978	0.9976	0.9973	0.9971	0.9968	0.9965	0.9963	0.9960
30	0.9957	0.9954	0.9951	0.9947	0.9944	0.9941	0.9937	0.9934	0.9930	0.9926
40	0.9922	0.9919	0.9915	0.9911	0.9907	0.9902	0.9898	0.9894	0.9890	0.9885

LABORATORY CALCULATIONS:

TRIAL NUMBER	1	2	3
SPEC. GRAVITY OF WATER @ T	0.9960	0.9937	0.9919
GT* Ws	129.49	129.19	128.96
W1 - W2	81.00	81.00	81.40
Ws - (W1 - W2)	49.01	49.01	48.61
Gs = GT * Ws / Ws - (W1 - W2)	2.64	2.64	2.65

Average Specific Gravity:	2.64

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COMPACTION TEST

Shaw EMCON/OWT, Inc.
A Shaw Group Company

☐ ASTM D1557
☒ ASTM D698

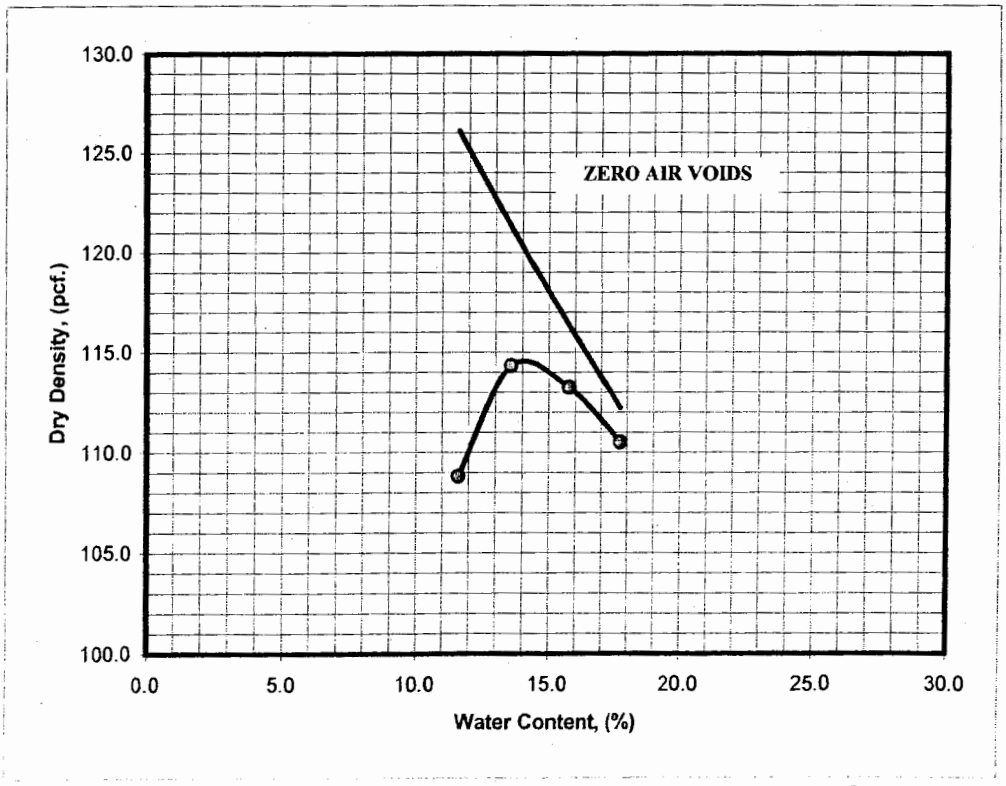
Checked By:

Project Name:	MT. VIEW LF.	Proj. No.:	102094	Lab. No.:	04-076
Sample No.:	SAMPLE # II	Depth, ft.:	BULK	Tested By:	DGC
Description:	SANDY LEAN CLAY, BROWN.			Date:	11/11/04

Vol., Mold, cf.:	0.03333	Hammer Weight,:	5.5 lbs.	Hammer Drop:	12"
No. of Layers:	3	Blows/Layer:	25	ASTM Designation:	
				Method:	"B"

Trial Number		-2	Nat.	2	4	
Container Number		C	D	A	B	
Wet Soil + Container	(gms.)	818.50	766.50	760.20	745.70	
Dry Soil + Container	(gms.)	745.00	688.20	671.80	650.00	
Container Weight	(gms.)	111.50	111.00	110.70	110.20	
Weight of Water	(gms.)	73.50	78.30	88.40	95.70	
Weight of Dry Soil	(gms.)	633.50	577.20	561.10	539.80	
Moisture Content	(%)	11.6	13.6	15.8	17.7	
Wet Soil + Mold	(gms.)	3687	3814	3833	3818	
Weight of Mold	(gms.)	1851	1851	1851	1851	
Wet Weight of Soil	(lbs.)	4.05	4.33	4.37	4.34	
Wet Unit Weight	(pcf.)	121.4	129.8	131.1	130.1	
Dry Unit Weight	(pcf.)	108.8	114.3	113.2	110.5	

Maximum Dry Density, pcf.:	114.5
Opt. Moisture Content, %:	14.0
Est. Specific Gravity:	2.64



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HYDRAULIC CONDUCTIVITY

EMCON/OWT, Inc.
A Shaw Group Company

ASTM D5084

PROJECT NAME:	MOUNTAIN VIEW LANDFILL	LAB. NUMBER:	04-076
SAMPLE NUMBER:	SAMPLE # II	PROJECT NUMBER:	102094
DESCRIPTION:	SANDY LEAN CLAY, BROWN.	SAMPLE DEPTH:	REMOLDED
CHECKED BY:		DATE:	11/19/04
		TESTED BY:	DGC

Remolded to 90% of max. dry density (ASTM D698) at opt. -2% water content.

SAMPLE DATA		BEFORE TEST	AFTER TEST	OVEN DRY		
DIAMETER	(cm)	7.28	7.20	TARE NUMBER		V-7
HEIGHT	(cm)	6.40	6.37	WT. OF TARE+WET SOIL	(gm)	616.10
VOLUME	(cc)	266.264	259.223	WT. OF TARE+DRY SOIL	(gm)	523.40
WT. OF WET SOIL	(gm)	491.7	530.5	WT. OF TARE	(gm)	85.60
WT. OF DRY SOIL	(gm)	437.8	437.8	WT. OF WATER	(gm)	92.70
WT. OF WATER	(gm)	53.9	92.70	WT. OF DRY SOIL	(gm)	437.8
MOISTURE CONTENT	(%)	12.3	21.2	WATER CONTENT	(%)	21.2
DRY DENSITY	(pcf)	102.60	105.39	LAB. MAX. DRY DENSITY	(pcf)	114.5
VOID RATIO	(e)	0.61	0.56	OPT. WATER CONTENT	(%)	14.0
SATURATION	(s)	53.7	99.3	RELATIVE COMPACTION	(%)	90
POROSITY	(h)	0.3772	0.3603	SPECIFIC GRAVITY	(est.)	2.64

PRESSURE DATA DURING PERMEABILITY TEST:

"B" parameter	0.97	Area of Burette:	0.6 sq. cm.
CONFINING PRESS.	55 psi	Temp. Correction:	0.976 21 °C
BACK PRESS. (bot)	50 psi	BACK PRESS. (top)	50 psi.
AVERAGE CONSOL. PRESSURE:	5.0 psi		
PERMEANT:	*TAP WATER*		

DATE	TIME	ELAPSED TIME (sec)	STATUS RESET	BURETTE READING					
				TOP PRESS. (psi.)		BOTTOM PRESS. (psi.)		CHAMBER PRESS.,(psi.)	COMMENTS
SATURATION:									Skempton's "B"
11/19/2004	7:37			50.0		50.0		51.0	49.8
11/19/2004	12:02							61.0	59.5
CONSOLIDATION:				TOP (cm)	ΔT (cm.)	BOT. (cm)	ΔB (cm.)	CHAMBER (cm)	
PERMEABILITY:									
11/22/2004	6:05	RESET	R	1.6		39.5		10.3	**Hydraulic Cond., (cm/sec.)**
11/22/2004	6:27	1320		11.8		29.1		10.2	2.7E-05
11/22/2004	6:28	RESET	R	1.6		39.5		10.2	Hydraulic Cond., (cm/sec.)
11/22/2004	6:50	1320		11.8		29.2		10.2	2.7E-05
11/22/2004	6:52	RESET	R	1.6		39.6		10.2	Hydraulic Cond., (cm/sec.)
11/22/2004	7:14	1320		11.9		29.3		10.2	2.7E-05
11/22/2004	7:15	RESET	R	1.7		39.4		10.2	Hydraulic Cond., (cm/sec.)
11/22/2004	7:37	1320		11.9		29.2		10.2	2.7E-05
									δγχ93πμ

GRAIN SIZE DISTRIBUTION

ASTM D422

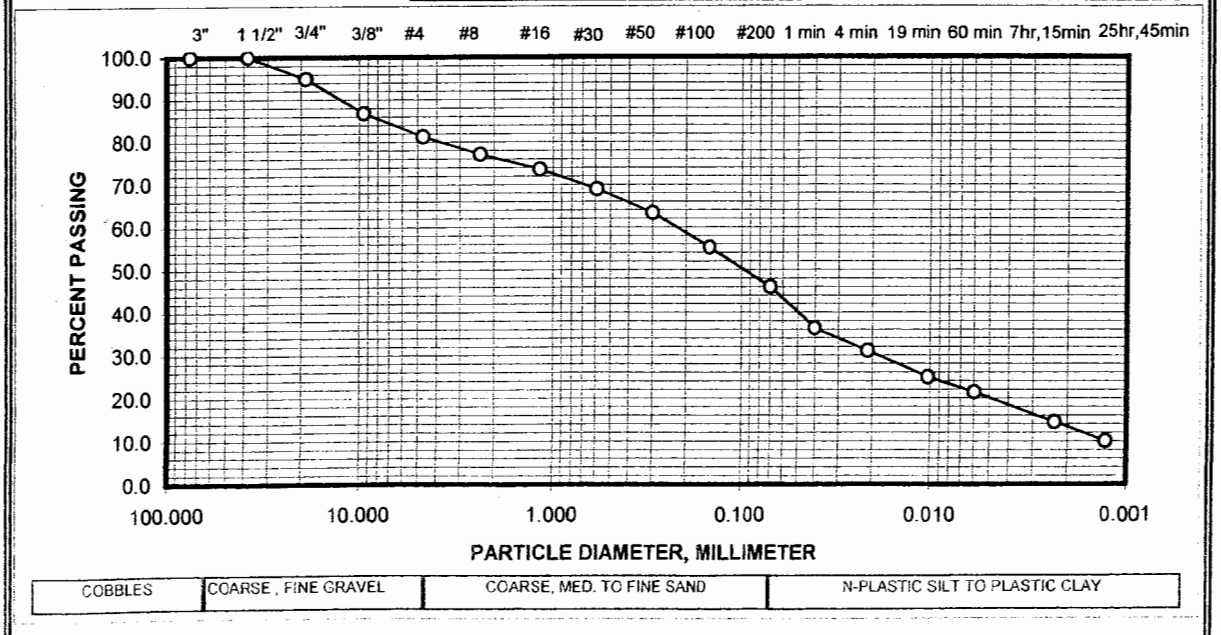
Shaw™ EMCON/OWT, Inc.

A Shaw Group Company

PROJECT NAME:	MT. VIEW LANDFILL	PROJECT NO.:	102094
SAMPLE NO.:	SAMPLE # III	DATE:	11/09/04
DESCRIPTION:	CLAYEY SAND WITH GRAVEL, BROWN.	TECH.:	DGC

UNIFIED SOIL CLASSIFICATION:	SC	CORRECTIONS:			
Moisture Content Determination:		1 1/2"	100.0	Dry Wt Used, Hydrom:	52.6
Pan Number:	#508	3/4"	94.9	Est. Sp. Gr., (2.60-2.80):	2.62
Pan + Wet Soil, gms.	995.8	3/8"	86.8	Temp.,(18-23) °C:	21
Pan + Dry Soil, gms.	883.9	D_{60}	0.225	Zero Correction	5.0
Wt. of Pan, gms.	92.1	D_{30}	0.019	Miniscus Correction:	0.5
Wt. of Dry Soil, gms.	791.8	D_{10}	#DIV/0!	Liquid Limit:	25
Wt. of Water, gms.	111.9	C_U	#DIV/0!	Plasticity Index:	8
Water content, %.	14.1	C_C	#DIV/0!	High; Mod.; Low; NP:	

SIEVE SIZE (U.S. STANDARD)	PARTICLE SIZE, (inches)	PARTICLES DIAMETER, (mm)	WEIGHT RETAINED (gms)	ACCUMULATED WEIGHT RETAINED (gms)	WEIGHT PASSING (gms)	PERCENT PASSING (%)
5"	5.000	127.00		0	791.8	100.0
3"	3.000	76.20		0	791.8	100.0
1 1/2"	1.500	38.10		0	791.8	100.0
3/4"	0.750	18.90		0	791.8	94.9
3/8"	0.375	9.52	0.0	0	791.8	86.8
#4	0.185	4.70	50.1	50.1	741.7	81.3
#8	0.093	2.36	38.2	88.3	703.5	77.1
#16	0.046	1.17	32.0	120.3	671.5	73.6
#30	0.023	0.59	42.5	162.8	629	69.0
#50	0.012	0.30	51.1	213.9	577.9	63.4
#100	0.006	0.15	74.2	288.1	503.7	55.2
#200	0.003	0.07	84.2	372.3	419.5	46.0
		0.0401	1 min.		47	36.3
Bulb 152H HYDROMETER TEST WITH DISPERSING AGENT		0.0212	4 min.		41	31.0
		0.0103	19 min.		34	24.9
		0.0060	60 min.		30	21.4
		0.0023	7hr., 15min.		22	14.4
		0.0013	25hr., 45min.		17	10.1



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ATTERBERG LIMITS

ASTM D4318

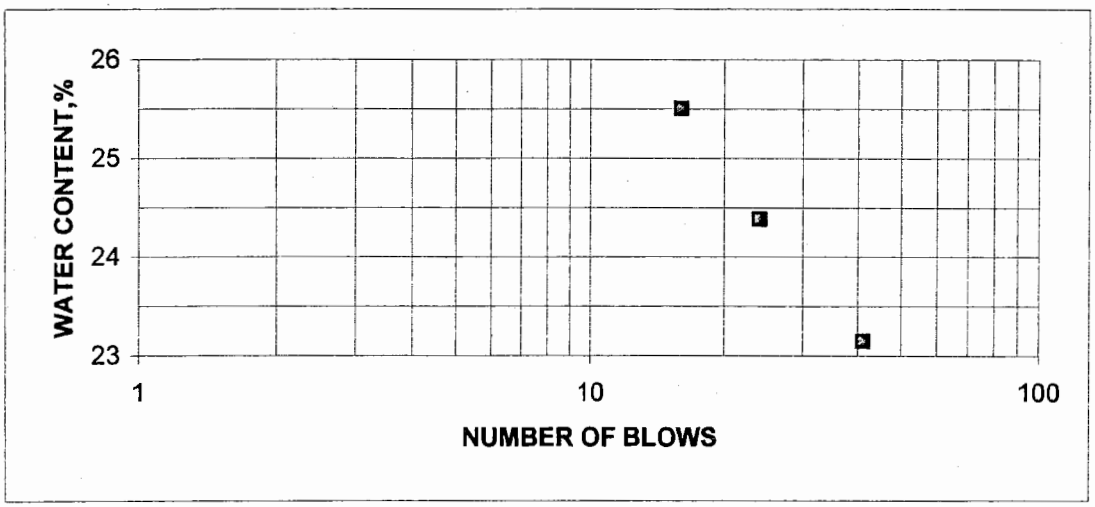
Shaw EMCON/OWT, Inc.

A Shaw Group Company

Project Name:	MT. VIEW LANDFILL	**Lab. No.:**	04-076	**Proj. No.:**	102094
Sample No.:	SAMPLE # III	**Depth, ft.:**	BULK	**Date:**	11/10/04
Description:	CLAYEY SAND WITH GRAVEL, BROWN.			**Tested By:**	DGC
				Checked By:	

*/	Liquid Limit			Plastic Limit		
Can Number	B-8	M-4	B-7	E-4	F-6	
Weight of Can + Wet Soil, gms.	68.52	66.57	67.75	52.80	53.10	
Weight of Can + Dry Soil, gms.	61.67	59.76	60.45	49.74	50.02	
Weight of Can, gms.	32.08	31.83	31.83	31.79	31.92	
Weight of Dry Soil, gms.	29.59	27.93	28.62	17.95	18.10	
Weight of Water, gms.	6.85	6.81	7.30	3.06	3.08	
Water Content, %	23.1	24.4	25.5	17.0	17.0	
Number of Blows	41	24	16			

Unified Soil Classification **SC**



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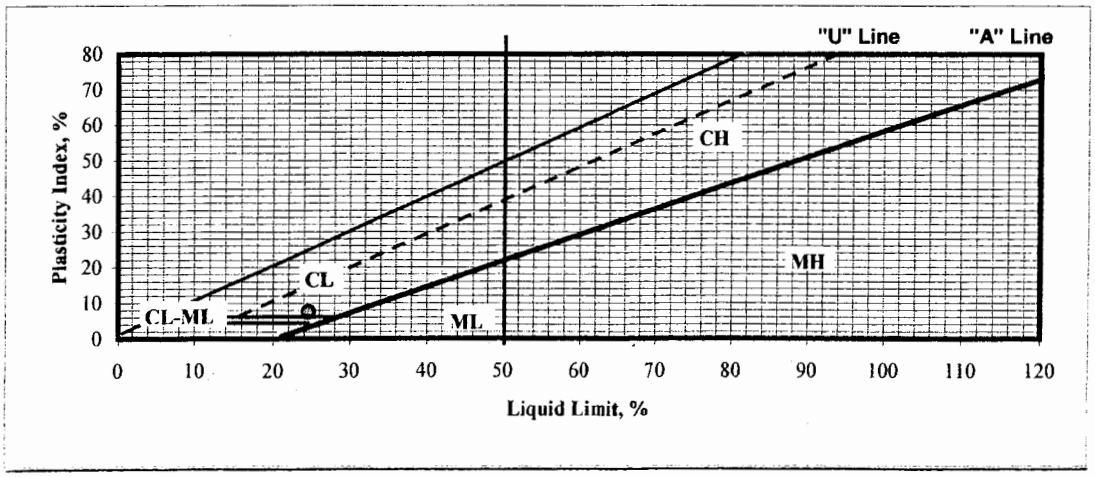

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SPECIFIC GRAVITY

ASTM D854

Shaw EMCON/OWT, Inc.
A Shaw Group Company

PROJ. NAME:	MT. VIEW LF.	**PROJ. NO.:**	102094	**DATE:**	11/11/04
SAMPLE NO.:	SAMPLE # III	**DEPTH, FT.:**	BULK	**TESTED BY:**	DGC
DESCRIPTION:	CLAYEY SAND WITH GRAVEL, BROWN.			**CORRECTED BY:**	

LABORATORY MEASUREMENTS:

TRIAL NUMBER	1	2	3
FLASK NUMBER	A	A	A
WEIGHT OF FLASK + WATER + SOIL	737.8	737.1	734.6
TEMP., DEGREE C	27.0	34.0	47.0
WEIGHT OF FLASK + WATER	657.4	656.4	653.6
WEIGHT OF DRY SOIL USED, GRAMS	130.06	130.06	130.06

SPECIFIC GRAVITY OF WATER:

C	0	1	2	3	4	5	6	7	8	9
10	0.9997	0.9966	0.9995	0.9994	0.9993	0.9991	0.9990	0.9988	0.9986	0.9984
20	0.9982	0.9980	0.9978	0.9976	0.9973	0.9971	0.9968	0.9965	0.9963	0.9960
30	0.9957	0.9954	0.9951	0.9947	0.9944	0.9941	0.9937	0.9934	0.9930	0.9926
40	0.9922	0.9919	0.9915	0.9911	0.9907	0.9902	0.9898	0.9894	0.9890	0.9885

LABORATORY CALCULATIONS:

TRIAL NUMBER	1	2	3
SPEC. GRAVITY OF WATER @ T	0.9965	0.9944	0.9894
GT* Ws	129.60	129.33	128.68
W1 - W2	80.40	80.70	81.00
Ws - (W1 - W2)	49.66	49.36	49.06
Gs = GT * Ws / Ws - (W1 - W2)	2.61	2.62	2.62

Average Specific Gravity:	2.62

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COMPACTION TEST

Shaw EMCON/OWT, Inc.
A Shaw Group Company

☐ ASTM D1557
■ ASTM D698

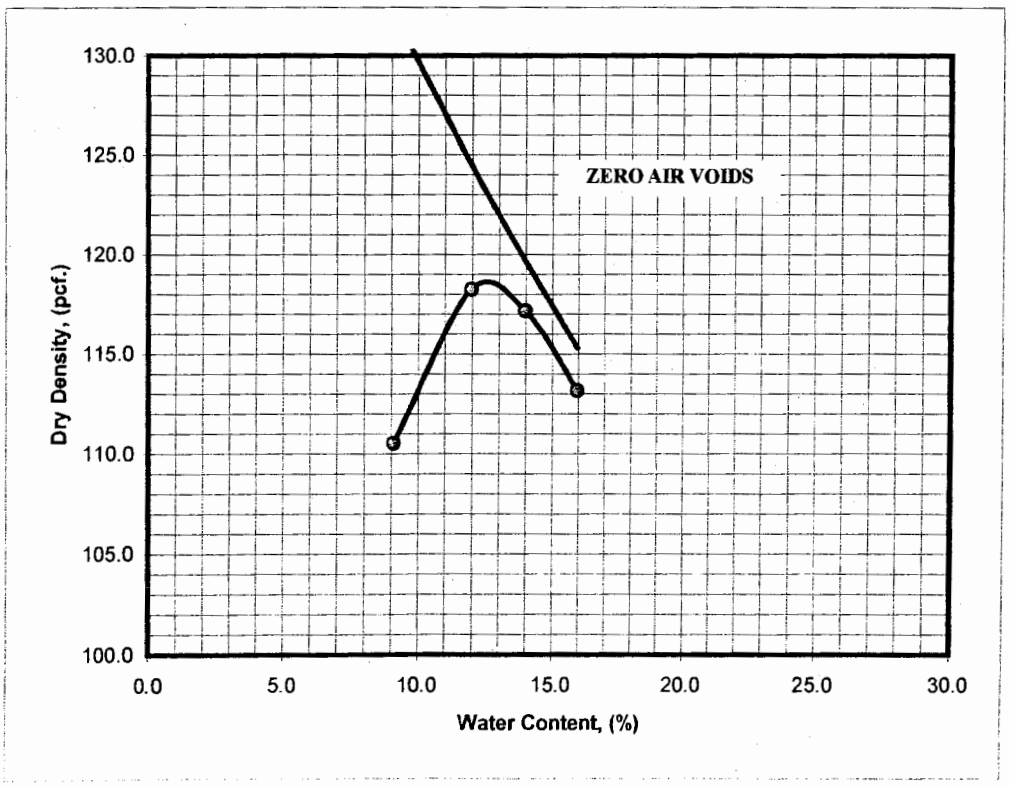
Checked By:

Project Name:	MT. VIEW LF.	**Proj. No.:**	102094	**Lab. No.:**	04-076
Sample No.:	SAMPLE # III	**Depth, ft.:**	BULK	**Tested By:**	DGC
Description:	CLAYEY SAND WITH GRAVEL, BROWN.			**Date:**	11/10/04

Vol., Mold, cf.:	0.03333	**Hammer Weight,:**	5.5 lbs.	**Hammer Drop:**	12"
No. of Layers:	3	**Blows/Layer:**	25	**ASTM Designation:**	
				Method:	"B"

Trial Number		-4	-2	Nat.	2	
Container Number		M-7	C	B	A-1	
Wet Soil + Container	(gms.)	958.40	782.50	777.70	921.50	
Dry Soil + Container	(gms.)	885.80	710.80	695.90	819.70	
Container Weight	(gms.)	85.40	111.50	110.20	181.50	
Weight of Water	(gms.)	72.60	71.70	81.80	101.80	
Weight of Dry Soil	(gms.)	800.40	599.30	585.70	638.20	
Moisture Content	(%)	9.1	12.0	14.0	16.0	
Wet Soil + Mold	(gms.)	3674	3853	3870	3835	
Weight of Mold	(gms.)	1851	1851	1851	1851	
Wet Weight of Soil	(lbs.)	4.02	4.41	4.45	4.37	
Wet Unit Weight	(pcf.)	120.6	132.4	133.5	131.2	
Dry Unit Weight	(pcf.)	110.5	118.3	117.2	113.2	

Maximum Dry Density, pcf.:	118.7
Opt. Moisture Content, %:	12.5
Est. Specific Gravity:	2.62



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HYDRAULIC CONDUCTIVITY

EMCON/OWT, Inc.
A Shaw Group Company

ASTM D5084

PROJECT NAME:	MOUNTAIN VIEW LANDFILL	LAB. NUMBER:	04-076
SAMPLE NUMBER:	SAMPLE # III	PROJECT NUMBER:	102094
DESCRIPTION:	CLAYEY SAND WITH GRAVEL, BROWN.	SAMPLE DEPTH:	REMOLDED
CHECKED BY:		DATE:	11/19/04
		TESTED BY:	DGC

Remolded to 90% of max. dry density (ASTM D698) at opt. -2% water content.

SAMPLE DATA		BEFORE TEST	AFTER TEST	OVEN DRY		
DIAMETER	(cm)	7.28	7.22	TARE NUMBER		D-1
HEIGHT	(cm)	6.40	6.40	WT. OF TARE+WET SOIL	(gm)	623.50
VOLUME	(cc)	266.264	261.893	WT. OF TARE+DRY SOIL	(gm)	536.20
WT. OF WET SOIL	(gm)	503.5	542.5	WT. OF TARE	(gm)	81.00
WT. OF DRY SOIL	(gm)	455.2	455.2	WT. OF WATER	(gm)	87.30
WT. OF WATER	(gm)	48.3	87.30	WT. OF DRY SOIL	(gm)	455.2
MOISTURE CONTENT	(%)	10.6	19.2	WATER CONTENT	(%)	19.2
DRY DENSITY	(pcf)	106.68	108.46	LAB. MAX. DRY DENSITY	(pcf)	118.7
VOID RATIO	(e)	0.53	0.51	OPT. WATER CONTENT	(%)	12.5
SATURATION	(s)	52.2	99.0	RELATIVE COMPACTION	(%)	90
POROSITY	(h)	0.3475	0.3366	SPECIFIC GRAVITY	(est.)	2.62

PRESSURE DATA DURING PERMEABILITY TEST:

"B" parameter	0.98		Area of Burette:	0.6	sq. cm.
CONFINING PRESS.	55	psi	Temp. Correction:	0.976	21 °C
BACK PRESS. (bot)	50	psi	BACK PRESS. (top)	50	psi.
AVERAGE CONSOL. PRESSURE:	5.0	psi			
PERMEANT:	*TAP WATER*				

DATE	TIME	ELAPSED TIME (sec)	STATUS RESET	BURETTE READING					
				TOP PRESS. (psi.)		BOTTOM PRESS. (psi.)		CHAMBER PRESS.,(psi.)	COMMENTS
SATURATION:									Skempton's "B"
11/19/2004	7:43			50.0		50.0		51.0	49.8
11/19/2004	12:17							61.0	59.6
CONSOLIDATION:				TOP (cm)	ΔT (cm.)	BOT. (cm)	ΔB (cm.)	CHAMBER (cm)	
PERMEABILITY:									
11/22/2004	6:06	RESET	R	1.7		39.6		13.6	Hydraulic Cond., (cm/sec.)
11/22/2004	6:17	660		12.4		28.8		13.6	5.8E-05
11/22/2004	6:18	RESET	R	1.7		38.7		13.6	Hydraulic Cond., (cm/sec.)
11/22/2004	6:29	660		12.0		28.5		13.5	5.6E-05
11/22/2004	6:30	RESET	R	1.7		39.6		13.5	Hydraulic Cond., (cm/sec.)
11/22/2004	6:41	660		12.1		29.2		13.5	5.5E-05
11/22/2004	6:42	RESET	R	1.6		39.6		13.5	Hydraulic Cond., (cm/sec.)
11/22/2004	6:53	660		12.0		29.2		13.5	5.5E-05
11/22/2004	6:54	RESET	R	1.7		39.6		13.5	Hydraulic Cond., (cm/sec.)
11/22/2004	7:05	660		12.1		29.2		13.5	5.5E-05
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TESTING BY COOPER

COOPER TESTING LABS, INC.

1951-X Colony Street
Mountain View, CA 94043

fax (415) 968-4228
phone (415) 968-9472

FAX TRANSMITTAL COVER SHEET

TO: Dinka / Don Hennings

FROM: DC

DATE: 3/24

NUMBER OF PAGES (INCLUDING THIS COVER) 2

REMARKS:

Don,

Please send the purchase order (from risk management) to Sacramento office.

Thanks,

Doug

If you do not receive all pages, please call
(415) 968-9472

Falling Head Permeability
ASTM D 5084
Cooper Testing Lab, Inc.

Job No:	104-046	Boring:		Date:	03/24/98
Client:	Emcon	Sample:	SK-4	By:	DC
Project:	22045-013.002	Depth:			
Soil:	brown clayey GRAVEL w/sand				

Sample Pressures: Max. Hydraulic

Cell: 73 psi Bot. Cap: 68 psi Top Cap: 68 psi Gradient: 6

Elapsed Time (min)	Head, (in)	Permeability cm/sec
0	24.0	Start of Test
8	22.4	6.3 x 10E-6
27	20.1	4.8 x 10E-6
130	10.0	4.9 x 10E-6
187	7.2	4.7 x 10E-6
272	3.6	5.1 x 10E-6

Average Permeability: 5 x 10E-6 cm/sec

Sample Data:	Initial		Final
Height, in.:	4.00		3.92
Diameter, in.:	4.00		3.95
Area, in2:	12.57		12.25
Volume, in3:	50.27		48.04
Total Volume, cc:	823.70		787.17
Vol of Solids, cc:	566.57		566.57
Vol. of Voids, cc:	257.13		220.61
Void Ratio:	0.45		0.39
Porosity, %:	31.22		28.03
Saturation, %	60.05		95.24
Sp. Gravity:	2.65	assumed	2.65
Wet Weight, gm:	1655.8		1711.5
Dry Weight, gm:	1501.4		1501.4
Tare, gm:	0.00		0.00
Moisture, %:	10.3		14.0
Dry Density, pcf:	113.7		119.0

Remarks: Remolded to 90% of 127.3 pcf @ 9.6%, (opt +2%)

TESTING BY A & L GREAT LAKES

ACCOUNT NUMB 96994

A & L GREAT LAKES LABORATORIES, INC.

3505 Conestoga Drive • Fort Wayne, Indiana 46808-4413 • Phone (219)483-4759 • FAX (219)483-5274

REPORT OF ANALYSIS

TO: EMCON
P O BOX 340914
SACRAMENTO, CA 95834

DATE RECEIVED: 3/23/98
DATE REPORTED: 3/27/98
PAGE: 1
P.O. NUMBER: 5202100

RE: 22092001009 PROJ #

LAB NO.	SAMPLE ID	ANALYSIS	RESULT	UNIT	METHOD
39518	SK-3	Water Holding Capacity @ 1/3 Bar	27.52	%	MSA Part 1 (1965) pp 273-278
		Water Holding Capacity @ 15 Bar	11.54	%	MSA Part 1 (1965) pp 273-278
39519	SK-4	Water Holding Capacity @ 1/3 Bar	19.52	%	MSA Part 1 (1965) pp 273-278
		Water Holding Capacity @ 15 Bar	7.42	%	MSA Part 1 (1965) pp 273-278

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39519	SK-4	Water Holding Capacity @ 1/3 Bar	19.52	%	MSA Part 1 (1965) pp 273-278
		Water Holding Capacity @ 15 Bar	7.42	%	MSA Part 1 (1965) pp 273-278

TESTING BY COLUMBIA ANALYTICAL

EMCON

ANALYTICAL DATA QC WORKSHEET

PROJECT No. 22045-013.002
CLIENT/PROJECT Blandfill Landfill
EPA METHOD Metals
LABORATORY CAS-S
Reporting limits (check one): MDLs/PQLs_____ MRLs X

LAB No. S9800540
CHEMIST Lisa Fernandez
PROJ. MGR. Don Hellings
OFFICE SJ
DATE 4-15-98

Sample ID	Assoc. QC or Field Sample	Date Sampled	Extraction Holding Time: 180 Days 28 days Hz	Analysis HoldingTime: 180 Days 28 days Hz	Extracted/ Analyzed Within Holding Time		Compounds Detected		Surrogate Recovery Within Limits	
(A) FIELD SAMPLES			Date Extracted	Date Analyzed	Yes	No	Yes	No	Yes	No
BF-2		3-7-98	3/20,23	3/23,24	X		X		NA	
BF-3		↓	↓	↓	↓		↓		↓	
BF-4		↓	↓	↓	↓		↓		↓	

(B) FIELD QC SAMPLES (Field blanks, trip blanks, field duplicates)

(C) LAB QC SAMPLES (Method blanks, matrix spikes, laboratory control samples)

QC Sample ID	Assoc. Field Sample	Date Extracted	Date Analyzed	Compounds Detected		Surrogate Recovery Within Limits		MS/DMS (LCS/DLCS) Within Limits		RPD Within Limits	
				Yes	No	Yes	No	Yes	No	Yes	No
MB		3/20,23	3/20,24		X	NA		NA		NA	

Comments:

ANALYTICAL DATA QC WORKSHEET

EMCON

PROJECT No. 22045-013.002
CLIENT/PROJECT Blandfill landfill
EPA METHOD inorganics
LABORATORY CAS-SF

LAB No. S9800540/K9801545
CHEMIST Lisa Fernandez
PROJ. MGR. Don Hullings
OFFICE SJ
DATE 4-15-98

Reporting limits (check one): MDLs/PQLs_____ MRLs X

Sample ID	Assoc. QC or Field Sample	Date Sampled	Extraction Holding Time: _____ Days CN-only	Analysis HoldingTime: _____ Days	Extracted/ Analyzed Within Holding Time		Compounds Detected		Surrogate Recovery Within Limits	
(A) FIELD SAMPLES			Date Extracted	Date Analyzed	Yes	No	Yes	No	Yes	No
BF-2		3-2-98	3-12-98	3/13-23	X		X		NA	
BF-3		↓	↓	↓	↓		↓		↓	
BF-4		↓	↓	↓	↓		↓		↓	

(B) FIELD QC SAMPLES (Field blanks, trip blanks, field duplicates)

(C) LAB QC SAMPLES (Method blanks, matrix spikes, laboratory control samples)

QC Sample ID	Assoc. Field Sample	Date Extracted	Date Analyzed	Compounds Detected		Surrogate Recovery Within Limits		MS/DMS (LCS/DLCS) Within Limits		RPD Within Limits	
				Yes	No	Yes	No	Yes	No	Yes	No
MB		3-1[illegible]	3/13-18		X	NA		NA		NA	

Comments:

Columbia Analytical Services inc.

March 25, 1998

Service Request No.: S9800540

Rich Haughey
EMCON
1921 Ringwood Avenue
San Jose, CA 95131

RE: Blandfill Landfill/22045-013.002

Dear Mr. Haughey:

The following pages contain analytical results for sample(s) received by the laboratory on March 11, 1998. Results of sample analyses are followed by Appendix A which contains sample custody documentation and quality assurance deliverables requested for this project. The work requested has been assigned the Service Request No. listed above. To help expedite our service, please refer to this number when contacting the laboratory.

Analytical results were produced by procedures consistent with Columbia Analytical Services' (CAS) Quality Assurance Manual (with any deviations noted). Signature of this CAS Analytical Report below confirms that pages 2 through 12, following, have been thoroughly reviewed and approved for release in accord with CAS Standard Operating Procedure ADM-DatRev3.

Please feel welcome to contact me should you have questions or further needs.

Sincerely,

Steven L. Green
Project Chemist

COLUMBIA ANALYTICAL SERVICES, Inc.

Acronyms

A2LA	American Association for Laboratory Accreditation
ASTM	American Society for Testing and Materials
BOD	Biochemical Oxygen Demand
BTEX	Benzene, Toluene, Ethylbenzene, Xylenes
CAM	California Assessment Metals
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
COD	Chemical Oxygen Demand
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DLCS	Duplicate Laboratory Control Sample
DMS	Duplicate Matrix Spike
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
IC	Ion Chromatography
ICB	Initial Calibration Blank sample
ICP	Inductively Coupled Plasma atomic emission spectrometry
ICV	Initial Calibration Verification sample
J	Estimated concentration. The value is less than the MRL, but greater than or equal to the MDL. If the value is equal to the MRL, the result is actually <MRL before rounding.
LCS	Laboratory Control Sample
LUFT	Leaking Underground Fuel Tank
M	Modified
MBAS	Methylene Blue Active Substances
MCL	Maximum Contaminant Level. The highest permissible concentration of a substance allowed in drinking water as established by the U. S. EPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
MS	Matrix Spike
MTBE	Methyl tert-Butyl Ether
NA	Not Applicable
NAN	Not Analyzed
NC	Not Calculated
NCASI	National Council of the paper industry for Air and Stream Improvement
ND	Not Detected at or above the method reporting/detection limit (MRL/MDL)
NIOSH	National Institute for Occupational Safety and Health
NTU	Nephelometric Turbidity Units
ppb	Parts Per Billion
ppm	Parts Per Million
PQL	Practical Quantitation Limit
QA/QC	Quality Assurance/Quality Control
RCRA	Resource Conservation and Recovery Act
RPD	Relative Percent Difference
SIM	Selected Ion Monitoring
SM	Standard Methods for the Examination of Water and Wastewater, 18th Ed., 1992
STLC	Solubility Threshold Limit Concentration
SW	Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846, 3rd Ed., 1986 and as amended by Updates I, II, IIA, and IIB.
TCLP	Toxicity Characteristic Leaching Procedure
TDS	Total Dissolved Solids
TPH	Total Petroleum Hydrocarbons
tr	Trace level. The concentration of an analyte that is less than the PQL but greater than or equal to the MDL. If the value is equal to the PQL, the result is actually <PQL before rounding.
TRPH	Total Recoverable Petroleum Hydrocarbons
TSS	Total Suspended Solids
TTLC	Total Threshold Limit Concentration
VOA	Volatile Organic Analyte(s)

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON	**Service Request:**	S9800540
Project:	Blandfill Landfill/22045-013.002	**Date Collected:**	3/7/98
Sample Matrix:	Soil	**Date Received:**	3/11/98

Total Metals

Sample Name:	BF-2	Units:	mg/Kg (ppm)
Lab Code:	S9800540-001	Basis:	Wet
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Prepared	Date Analyzed	Result	Result Notes
Aluminum	EPA 3050BM	6010A	5	1	3/20/98	3/23/98	8800	
Arsenic	EPA 3050BM	6010A	5	1	3/20/98	3/23/98	ND	
Barium	EPA 3050BM	6010A	1	1	3/20/98	3/23/98	100	
Cadmium	EPA 3050BM	6010A	0.5	1	3/20/98	3/23/98	0.7	
Calcium	EPA 3050BM	6010A	20	1	3/20/98	3/23/98	47000	
Chromium	EPA 3050BM	6010A	1	1	3/20/98	3/23/98	14	
Copper	EPA 3050BM	6010A	1	1	3/20/98	3/23/98	35	
Iron	EPA 3050BM	6010A	5	1	3/20/98	3/23/98	11000	
Lead	EPA 3050BM	6010A	5	1	3/20/98	3/23/98	21	
Magnesium	EPA 3050BM	6010A	20	1	3/20/98	3/23/98	11000	
Manganese	EPA 3050BM	6010A	1	1	3/20/98	3/23/98	270	
Nickel	EPA 3050BM	6010A	2	1	3/20/98	3/23/98	9	
Potassium	EPA 3050BM	6010A	50	1	3/20/98	3/23/98	3300	
Selenium	EPA 3050BM	6010A	5	1	3/20/98	3/23/98	ND	
Silver	EPA 3050BM	6010A	2	1	3/20/98	3/23/98	ND	
Sodium	EPA 3050BM	6010A	50	1	3/20/98	3/23/98	320	
Zinc	EPA 3050BM	6010A	2	1	3/20/98	3/23/98	70	
Mercury	EPA 3050BM	7470	0.4	1	3/23/98	3/24/98	ND	

1S22/020597p

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON	**Service Request:**	S9800540
Project:	Blandfill Landfill/22045-013.002	**Date Collected:**	3/7/98
Sample Matrix:	Soil	**Date Received:**	3/11/98

Total Metals

Sample Name:	BF-3	Units:	mg/Kg (ppm)
Lab Code:	S9800540-002	Basis:	Wet
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Prepared	Date Analyzed	Result	Result Notes
Aluminum	EPA 3050BM	6010A	5	1	3/20/98	3/23/98	9400	
Arsenic	EPA 3050BM	6010A	5	1	3/20/98	3/23/98	ND	
Barium	EPA 3050BM	6010A	1	1	3/20/98	3/23/98	110	
Cadmium	EPA 3050BM	6010A	0.5	1	3/20/98	3/23/98	0.5	
Calcium	EPA 3050BM	6010A	20	1	3/20/98	3/23/98	47000	
Chromium	EPA 3050BM	6010A	1	1	3/20/98	3/23/98	14	
Copper	EPA 3050BM	6010A	1	1	3/20/98	3/23/98	15	
Iron	EPA 3050BM	6010A	5	1	3/20/98	3/23/98	13000	
Lead	EPA 3050BM	6010A	5	1	3/20/98	3/23/98	14	
Magnesium	EPA 3050BM	6010A	20	1	3/20/98	3/23/98	10000	
Manganese	EPA 3050BM	6010A	1	1	3/20/98	3/23/98	290	
Nickel	EPA 3050BM	6010A	2	1	3/20/98	3/23/98	12	
Potassium	EPA 3050BM	6010A	50	1	3/20/98	3/23/98	3700	
Selenium	EPA 3050BM	6010A	5	1	3/20/98	3/23/98	ND	
Silver	EPA 3050BM	6010A	2	1	3/20/98	3/23/98	ND	
Sodium	EPA 3050BM	6010A	50	1	3/20/98	3/23/98	940	
Zinc	EPA 3050BM	6010A	2	1	3/20/98	3/23/98	53	
Mercury	EPA 3050BM	7470	0.4	1	3/23/98	3/24/98	ND	

1S22/020597p

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON	**Service Request:**	S9800540
Project:	Blandfill Landfill/22045-013.002	**Date Collected:**	3/7/98
Sample Matrix:	Soil	**Date Received:**	3/11/98

Total Metals

Sample Name:	BF-4	Units:	mg/Kg (ppm)
Lab Code:	S9800540-003	Basis:	Wet
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Prepared	Date Analyzed	Result	Result Notes
Aluminum	EPA 3050BM	6010A	5	1	3/20/98	3/23/98	8900	
Arsenic	EPA 3050BM	6010A	5	1	3/20/98	3/23/98	ND	
Barium	EPA 3050BM	6010A	1	1	3/20/98	3/23/98	230	
Cadmium	EPA 3050BM	6010A	0.5	1	3/20/98	3/23/98	ND	
Calcium	EPA 3050BM	6010A	20	1	3/20/98	3/23/98	67000	
Chromium	EPA 3050BM	6010A	1	1	3/20/98	3/23/98	11	
Copper	EPA 3050BM	6010A	1	1	3/20/98	3/23/98	15	
Iron	EPA 3050BM	6010A	5	1	3/20/98	3/23/98	10000	
Lead	EPA 3050BM	6010A	5	1	3/20/98	3/23/98	13	
Magnesium	EPA 3050BM	6010A	20	1	3/20/98	3/23/98	15000	
Manganese	EPA 3050BM	6010A	1	1	3/20/98	3/23/98	350	
Nickel	EPA 3050BM	6010A	2	1	3/20/98	3/23/98	11	
Potassium	EPA 3050BM	6010A	50	1	3/20/98	3/23/98	4000	
Selenium	EPA 3050BM	6010A	5	1	3/20/98	3/23/98	ND	
Silver	EPA 3050BM	6010A	2	1	3/20/98	3/23/98	ND	
Sodium	EPA 3050BM	6010A	50	1	3/20/98	3/23/98	470	
Zinc	EPA 3050BM	6010A	2	1	3/20/98	3/23/98	57	
Mercury	EPA 3050BM	7470	0.4	1	3/23/98	3/24/98	ND	

1S22/020597p

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: EMCON
Project: Blandfill Landfill/22045-013.002
Sample Matrix: Soil

Service Request: S9800540
Date Collected: NA
Date Received: NA

Total Metals

Sample Name: Method Blank
Lab Code: S980320-MB
Test Notes:

Units: mg/Kg (ppm)
Basis: Wet

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Prepared	Date Analyzed	Result	Result Notes
Aluminum	EPA 3050BM	6010A	5	1	3/20/98	3/20/98	ND	
Arsenic	EPA 3050BM	6010A	5	1	3/20/98	3/20/98	ND	
Barium	EPA 3050BM	6010A	1	1	3/20/98	3/20/98	ND	
Cadmium	EPA 3050BM	6010A	0.5	1	3/20/98	3/20/98	ND	
Calcium	EPA 3050BM	6010A	20	1	3/20/98	3/20/98	ND	
Chromium	EPA 3050BM	6010A	1	1	3/20/98	3/20/98	ND	
Copper	EPA 3050BM	6010A	1	1	3/20/98	3/20/98	ND	
Iron	EPA 3050BM	6010A	5	1	3/20/98	3/20/98	ND	
Lead	EPA 3050BM	6010A	5	1	3/20/98	3/20/98	ND	
Magnesium	EPA 3050BM	6010A	20	1	3/20/98	3/20/98	ND	
Manganese	EPA 3050BM	6010A	1	1	3/20/98	3/20/98	ND	
Nickel	EPA 3050BM	6010A	2	1	3/20/98	3/20/98	ND	
Potassium	EPA 3050BM	6010A	50	1	3/20/98	3/20/98	ND	
Selenium	EPA 3050BM	6010A	5	1	3/20/98	3/20/98	ND	
Silver	EPA 3050BM	6010A	2	1	3/20/98	3/20/98	ND	
Sodium	EPA 3050BM	6010A	50	1	3/20/98	3/20/98	ND	
Zinc	EPA 3050BM	6010A	2	1	3/20/98	3/20/98	ND	
Mercury	EPA 3050BM	7470	0.4	1	3/23/98	3/24/98	ND	

1S22/020597p

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: EMCON
Project: Blandfill Landfill/22045-013.002
Sample Matrix: Soil

Service Request: K9801545
Date Collected: 3/7/98
Date Received: 3/11/98
Date Extracted: 3/17/98
Date Analyzed: 3/18/98

Cation Exchange Capacity
EPA Method 9081
Units: mEq/100g
As Received Basis

Sample Name	Lab Code	MRL	Result
BF-2	K9801545-001	0.1	18.8
BF-3	K9801545-002	0.1	18.7
BF-4	K9801545-003	0.1	18.0
Method Blank	K9801545-MB	0.1	ND

1AMRL/102594

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON	**Service Request:**	S9800540
Project:	Blandfill Landfill/22045-013.002	**Date Collected:**	3/7/98
Sample Matrix:	Soil	**Date Received:**	3/11/98

Inorganic Parameters

Sample Name: BF-2
Lab Code: S9800540-001 Basis: Wet
Test Notes:

Analyte	Units	Analysis Method	MRL	Dilution Factor	Date Digested	Date Analyzed	Result	Result Notes
Cyanide	mg/Kg (ppm)	335.3	1	1	3/12/98	3/13/98	ND	
pH	pH UNITS	150.1	—	1	NA	3/23/98	4.79	

1S22/020597p

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON	**Service Request:**	S9800540
Project:	Blandfill Landfill/22045-013.002	**Date Collected:**	3/7/98
Sample Matrix:	Soil	**Date Received:**	3/11/98

Inorganic Parameters

Sample Name: BF-3
Lab Code: S9800540-002 Basis: Wet
Test Notes:

Analyte	Units	Analysis Method	MRL	Dilution Factor	Date Digested	Date Analyzed	Result	Result Notes
Cyanide	mg/Kg (ppm)	335.3	1	1	3/12/98	3/13/98	ND	
pH	pH UNITS	150.1	—	1	NA	3/23/98	5.48	

1S22/020597p

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON	**Service Request:**	S9800540
Project:	Blandfill Landfill/22045-013.002	**Date Collected:**	3/7/98
Sample Matrix:	Soil	**Date Received:**	3/11/98

Inorganic Parameters

Sample Name: BF-4
Lab Code: S9800540-003
Test Notes:

Basis: Wet

Analyte	Units	Analysis Method	MRL	Dilution Factor	Date Digested	Date Analyzed	Result	Result Notes
Cyanide	mg/Kg (ppm)	335.3	1	1	3/12/98	3/13/98	ND	
pH	pH UNITS	150.1	—	1	NA	3/23/98	6.38	

1S22/020597p

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON	**Service Request:**	S9800540
Project:	Blandfill Landfill/22045-013.002	**Date Collected:**	NA
Sample Matrix:	Soil	**Date Received:**	NA

Inorganic Parameters

Sample Name: Method Blank
Lab Code: S9800540-MB
Test Notes:

Basis: Wet

Analyte	Units	Analysis Method	MRL	Dilution Factor	Date Digested	Date Analyzed	Result	Result Notes
Cyanide	mg/Kg (ppm)	335.3	1	1	3/12/98	3/13/98	ND	

1S22/020597p

APPENDIX A

EMCON - San Jose

CHAIN OF CUSTODY / LABORATORY ANALYSIS REQUEST FORM

1921 Ringwood Avenue, San Jose, CA 95131 (408) 453-7300 FAX (408) 437-9526

S9800540

Date 3/10/98 Page 1 of 1

Project Name: Blandfill Landfill
Project Number: 22045-013.002
Project Manager: Rich Haughey

Company/Address: EMCON
San Jose, CA

Phone:

Sampler's Signature:

Sample I.D.	Date	Time	LAB I.D.	Sample Matrix	Number of Containers	Analysis Requested: PH	Cation Exchange Capacity	Metals	Cyanide								REMARKS
																	Preservations
BF-2	3/7		1	Soil	1	X	X	X	X								
BF-3	3/7		2	Soil	1	X	X	X	X								
BF-4	3/7		3	Soil	1	X	X	X	X								
				Soil		X	X	X	X								

Relinquished By	Received By
Signature	Signature MOISES ISRAEL
Printed Name	Printed Name CAS
Firm	Firm
Date/Time 3/11/98	Date/Time 3/11/98 1320

Relinquished By	Received By
Signature	Signature
Printed Name	Printed Name
Firm	Firm

TURNAROUND REQUIREMENTS

___ 24 hr ___ 48 hr ___ 5 day
x Standard (~10-15 working days)
___ Provide Verbal Preliminary Results
___ Provide FAX Preliminary Results

Requested Report Date 3/24/98

REPORT REQUIREMENTS

x I. Routine Report
___ II. Report (includes DUP, MS MSD, as required, may be charged as samples)
___ III. Data Validation Report (includes All Raw Data)
___ RWQCB (MDLs/PQLs/TRACE#)

INVOICE INFORMATION

P.O. # ___
Bill to EMCON

SAMPLE RECEIPT

Shipping VIA: ___
Shipping #: ___
Condition: ___
Lab No: ___

Special Instructions/Comments:

Metals to be tested for are as follows; Aluminum, Calcium, Copper, Cyanide, Iron, Manganese Magnesium, Nickel, Potassium, Sodium, Arsenic, Barium, Cadmium, Chromium, Lead, Mercury, Selenium, Silver, and Zinc.

20 g subsampled into 4oz jar for KLAB. KL 3/11/98

R 16

SETTLEMENT CALCULATIONS

COMPUTATION SHEET

PROJECT TITLE: Blandfill PROJECT NO: 22645-013.00

DESCRIPTION: Subgrade Settlement Estimate SHEET ____ OF ____

PREP. BY: D. Hullings DATE: 4-15-98 CHKD BY: ____ DATE: ____

Estimate settlement of underlying subgrade using

$$S = \frac{C_c H}{1+e_o} \log\left(\frac{P_o + \Delta P}{P_o}\right)$$

Assumptions:

- Upper clayey clayey is 10 feet thick (based on Salt Lake valley/Landfill) but also consider 20 feet thick
- $C_c = 0.128$ (based on actual test for Blandfill - matches well with empirical equations and similar SLVL soil)
- $e_o = 1.02$ (from lab data)
- Preconsolidation Pressure is 7 ksf from data. Also consider $P_c = 4.5$ ksf from SLVL data.
- ΔP is based on maximum fill height of 200 feet and a mass unit weight of 115 pcf
- Neglect settlement due to recompression

Calculations:

$$S = \frac{(0.128)(10\,ft)}{(1+1.02)} \log\left[\frac{(200\,ft)(115\,pcf)}{9{,}000\,psf}\right] = 0.23\,ft = 2.7"$$

Thickness (ft)	P_c (ksf)	Settlement (inches)
10	9.0	2.7
10	4.5	4.7
20	9.0	5.5
20	4.5	9.5

Blandfill Settlement Analysis - Christopher Sather

Previous values → from Salt Lake Valley Landfill (Master Plan Volume II November, 1991)

Sample (ST-3) ⇒ P_c = 4.1 ksf
LL = 32 P_o = 1.2 ksf
OCR = 3.4
C_c = 0.162
C_c = .198 (empirical)

Sample (ST-4) ⇒ P_c = 4.7 ksf
LL = 35 P_o = 1.6 ksf
OCR = 2.9
C_c = 0.250
C_c = 0.225 (empirical)

Sample (ST-5) ⇒ P_c = 2.7 ksf
LL = 38 P_o = 1.8 ksf
OCR = 1.5
C_c = 0.350
C_c = .252 (Empirical)

C_c = 0.009(LL - 10)

for normally consol. clays:

$$S = \frac{C_c H}{1+e_o} \log\left(\frac{P_o + \Delta P}{P_o}\right)$$

e_o ↓ initial void ratio

New data

C_c = 0.007(LL - 7) → remolded clays (Rendon-Herrero, 1980)

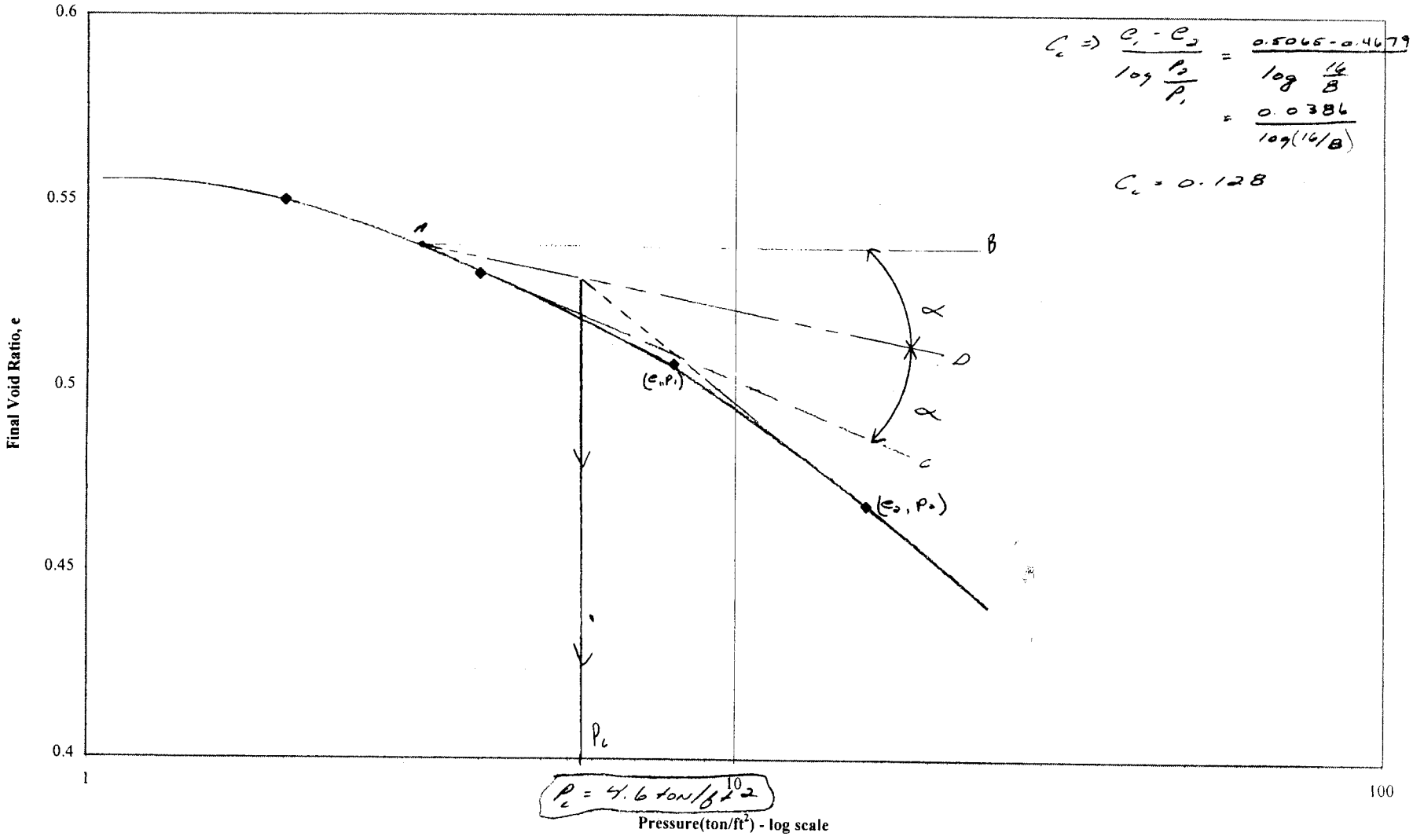
Sample #		LL	C_c (empirical)
Bucket	SA 2	29	0.154
	SA 2	28	0.147
	SA 3	31	0.168
	SA 4	28	0.147

no LL data for core samples → consolidation test was performed on core #4.

$$H_s = W_s / \left(\frac{\pi}{4} D^2\right) G_s \gamma_w = \frac{2.24026\ lb}{\left(\frac{\pi}{4}\right)(2.42)^2 \times \frac{1ft^2}{144in^2}\,(2.70)\,(62.4\ lb/ft^3)}$$

$$= 0.4163\ in.$$

Final Void Ratio Versus Pressure



CONSOLIDATION TEST

(Void ratio-pressure and coefficient of consolidation calculation)

Description of soil Blandfill - silty clay, light brown/gray mottled Location Utah

Specimen diameter 2.42 in. Initial specimen height, $H_{t(i)}$ 1.0 in.

Moisture content: Beginning of test 33.4 (%) End of test 29.4 %

Weight of dry soil specimen 100.89 G_s 2.70 Height of solids, H_s 1.0574 cm = 0.4163 in.

Pressure, p (ton/ft^2) (1)	Final dial reading (in.) (2)	Change in specimen height (in.) (3)	Final specimen height, $H_{t(f)}$ (in.) (4)	Height of void, H_v (in.) (5)	Final void ratio, e (6)	Average height during consolidation, $H_{t(av)}$ (in.) (7)	Fitting time (sec) t_{90} (8)	Fitting time (sec) t_{50} (9)	c_v from $\times 10^3$ (in.^{2}/sec) t_{90} (10)	c_v from $\times 10^3$ (in.^{2}/sec) t_{50} (11)
0	0.000		1.000	0.8698	0.5837					
		0.0333				0.9834	240	1740	0.854	0.027
2	0.0533		0.9667	0.8365	0.5504					
		0.0197				0.9569	303.6		0.639	
4	0.0730		0.9470	0.8168	0.5307					
		0.0242				0.9349	317.4	306	0.583	0.150
8	0.0972		0.9228	0.7926	0.5065					
		0.0386				0.9035	345.6		0.501	
16	0.1358		0.8842	0.754	0.4679					

Consolidation Test

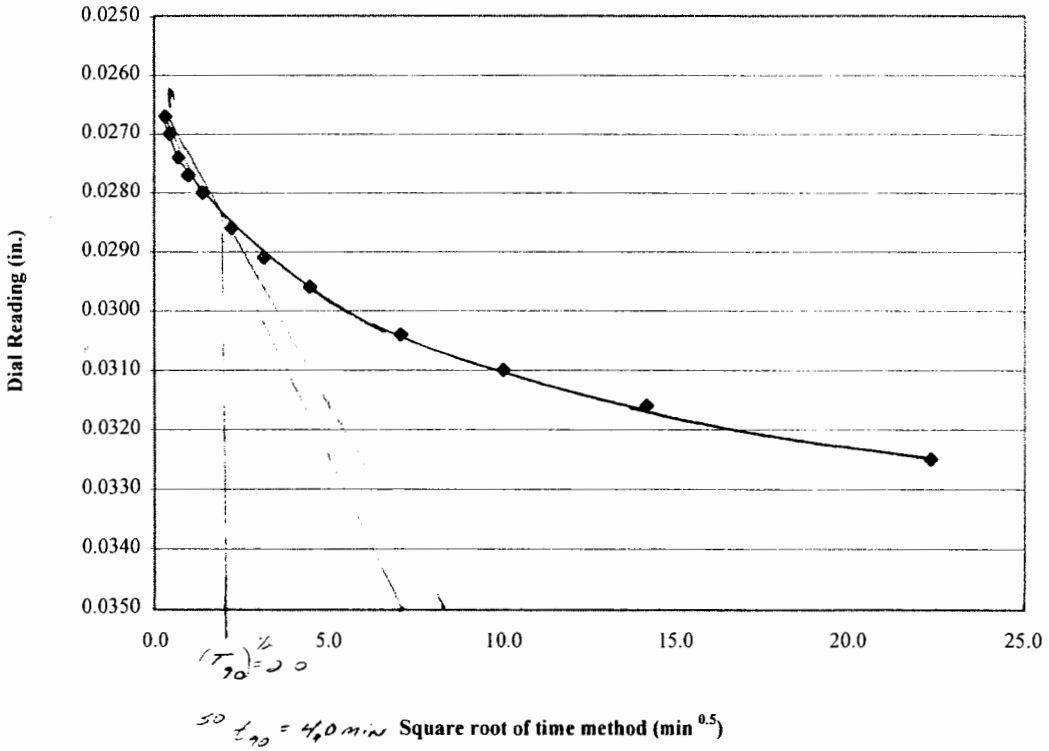
Blandfill

Description of Soil: Silty Clay, Light Brown with Roots

Pressure on Specimen: 2.00 KSF

Time after load application, t(min.)	Square root of time (min.)	Vertical Dial Reading (in.)
0.1	0.3	0.0267
0.2	0.4	0.0270
0.5	0.7	0.0274
1	1.0	0.0277
2	1.4	0.0280
5	2.2	0.0286
10	3.2	0.0291
20	4.5	0.0296
50	7.1	0.0304
100	10.0	0.0310
200	14.1	0.0316
500	22.4	0.0325
1363	36.9	0.0333
1583	39.8	0.0333

T_{90} by square root of time method



Consolidation Test

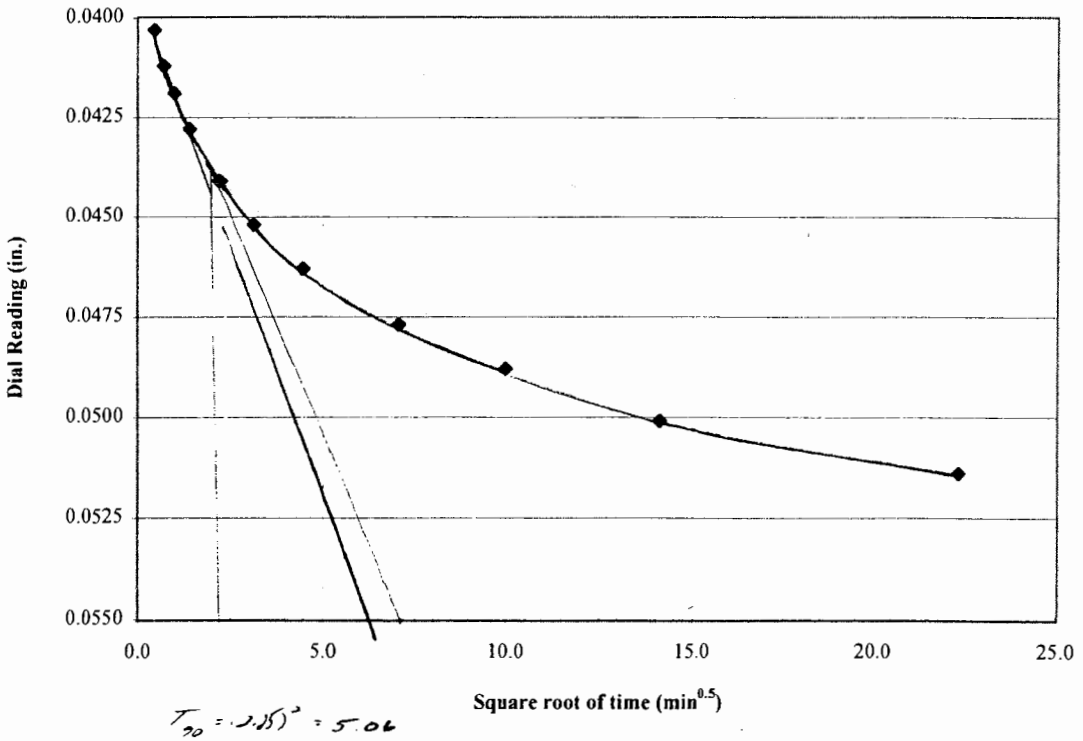
Blandfill

Description of Soil: Silty Clay, Light Brown with Roots

Pressure on Specimen: 4.00 KSF

Time after load application, t(min.)	Square root of time (min.)	Vertical Dial Reading (in.)
0.1	0.3	0.0396
0.2	0.4	0.0403
0.5	0.7	0.0412
1	1.0	0.0419
2	1.4	0.0428
5	2.2	0.0441
10	3.2	0.0452
20	4.5	0.0463
50	7.1	0.0477
100	10.0	0.0488
200	14.1	0.0501
500	22.4	0.0514
1354	36.8	0.0530
1486	38.5	0.0530

T_{90} Method by square root of time method



$T_{90} = (2.85)^2 = 5.06$

Consolidation Test

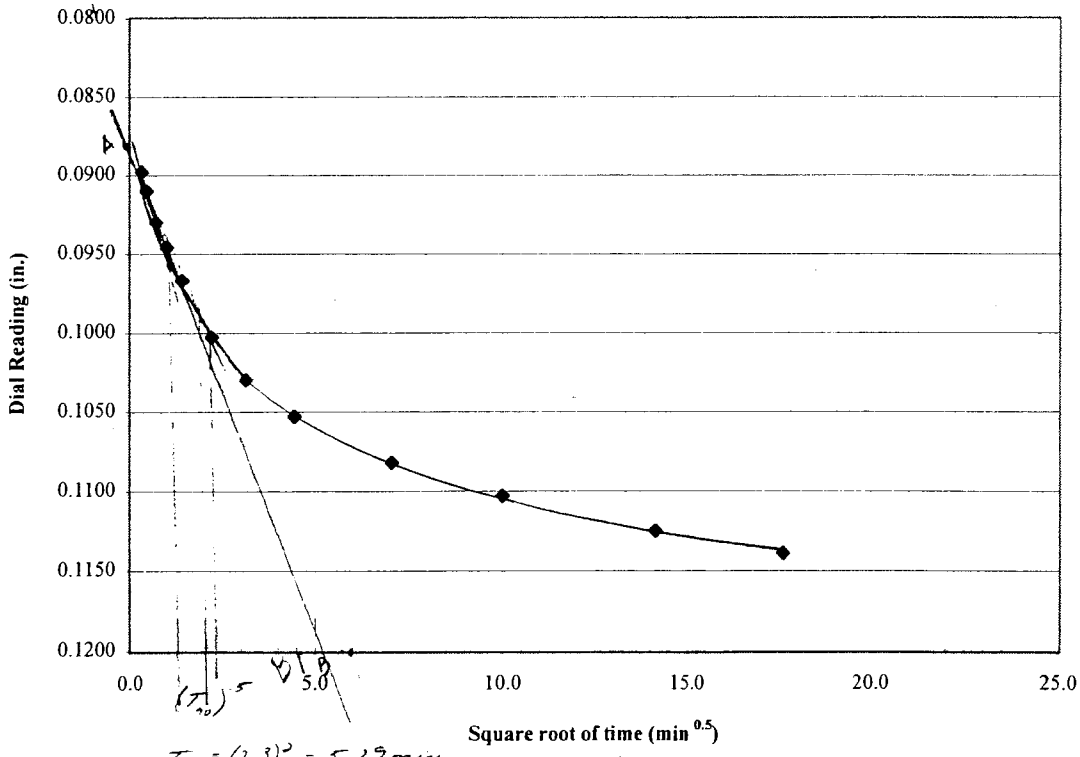
Blandfill

Description of Soil: Silty Clay, Light Brown with Roots

Pressure on Specimen: 8.00 KSF

Time after load application, t(min.)	Square root of time (min.)	Vertical Dial Reading (in.)
0.1	0.3	0.0620
0.2	0.4	0.6260
0.5	0.7	0.0638
1	1.0	0.0648
2	1.4	0.0657
5	2.2	0.0670
10	3.2	0.0684
20	4.5	0.0700
50	7.1	0.0719
100	10.0	0.0733
200	14.1	0.0743
310	17.6	0.0750
1340	36.6	0.0772
1545	39.3	0.0772

T_{90} by square root of time method



$T_{90} = (0.3)^2 = 5.29 min.$

240sec

Consolidation Test

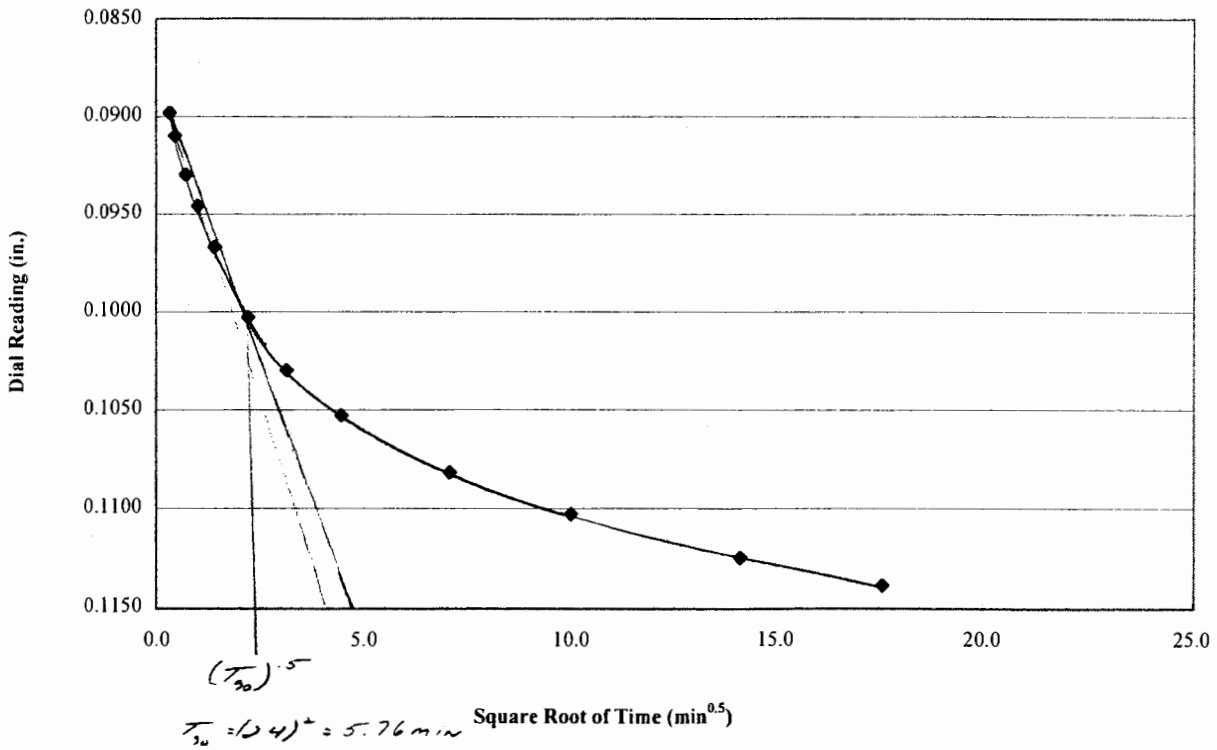
Blandfill

Description of Soil: Silty Clay, Light Brown with Roots

Pressure on Specimen: 16.00 KSF

Time after load application, t(min.)	Square root of time (min.)	Vertical Dial Reading (in.)
0.1	0.3	0.0898
0.2	0.4	0.0910
0.5	0.7	0.0930
1	1.0	0.0946
2	1.4	0.0967
5	2.2	0.1003
10	3.2	0.1030
20	4.5	0.1053
50	7.1	0.1082
100	10.0	0.1103
200	14.1	0.1125
310	17.6	0.1139
1408	37.5	0.1157
1661	40.8	0.1158

T_{90} by square root of time method



Consolidation Test

Blandfill

Description of Soil — Silty Clay, Light Brown with Roots

Pressure on Specimen — 2.00 KSF

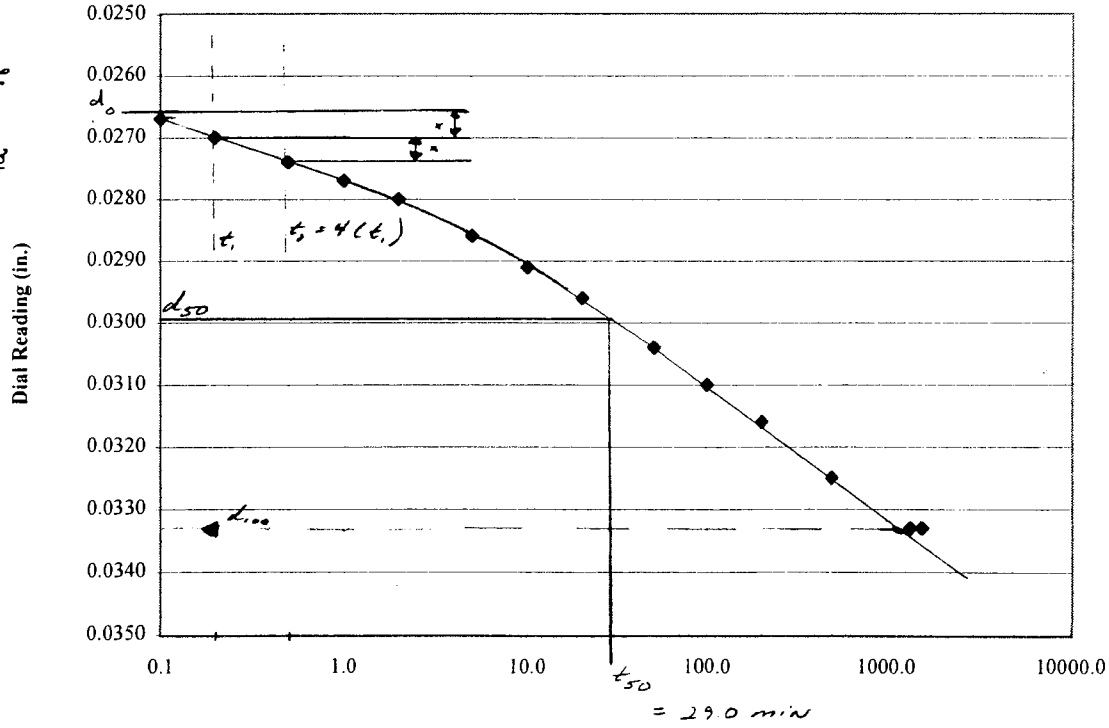
Time after load application, t(min.)	Square root of time (min.)	Vertical Dial Reading (in.)
0.1	0.3	0.0267
0.2	0.4	0.0270
0.5	0.7	0.0274
1	1.0	0.0277
2	1.4	0.0280
5	2.2	0.0286
10	3.2	0.0291
20	4.5	0.0296
50	7.1	0.0304
100	10.0	0.0310
200	14.1	0.0316
500	22.4	0.0325
1363	36.9	0.0333
1583	39.8	0.0333

$= \frac{d_0 + d_{100}}{2}$

$= \frac{.0265 + .1333}{2}$

$= .02995$

T_{50} by logarithm of time method



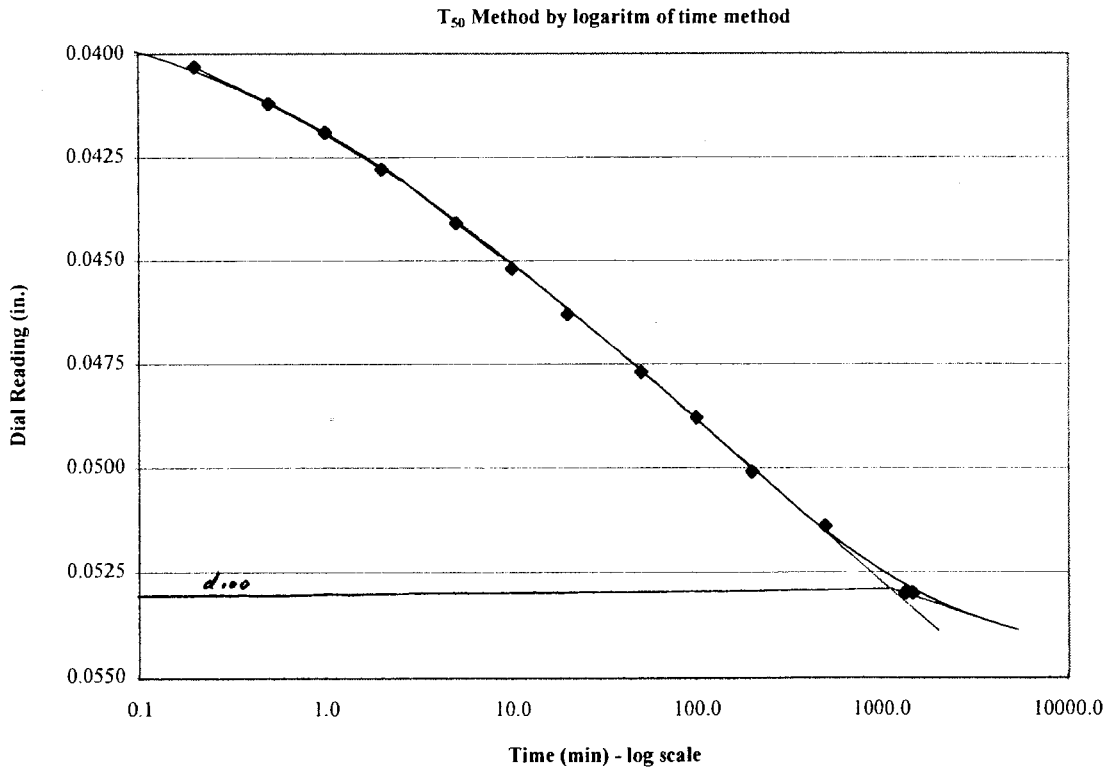
Consolidation Test

Blandfill

Description of Soil: Silty Clay, Light Brown with Roots

Pressure on Specimen: 4.00 KSF

Time after load application, t(min.)	Square root of time (min.)	Vertical Dial Reading (in.)
0.1	0.3	0.0396
0.2	0.4	0.0403
0.5	0.7	0.0412
1	1.0	0.0419
2	1.4	0.0428
5	2.2	0.0441
10	3.2	0.0452
20	4.5	0.0463
50	7.1	0.0477
100	10.0	0.0488
200	14.1	0.0501
500	22.4	0.0514
1354	36.8	0.0530
1486	38.5	0.0530



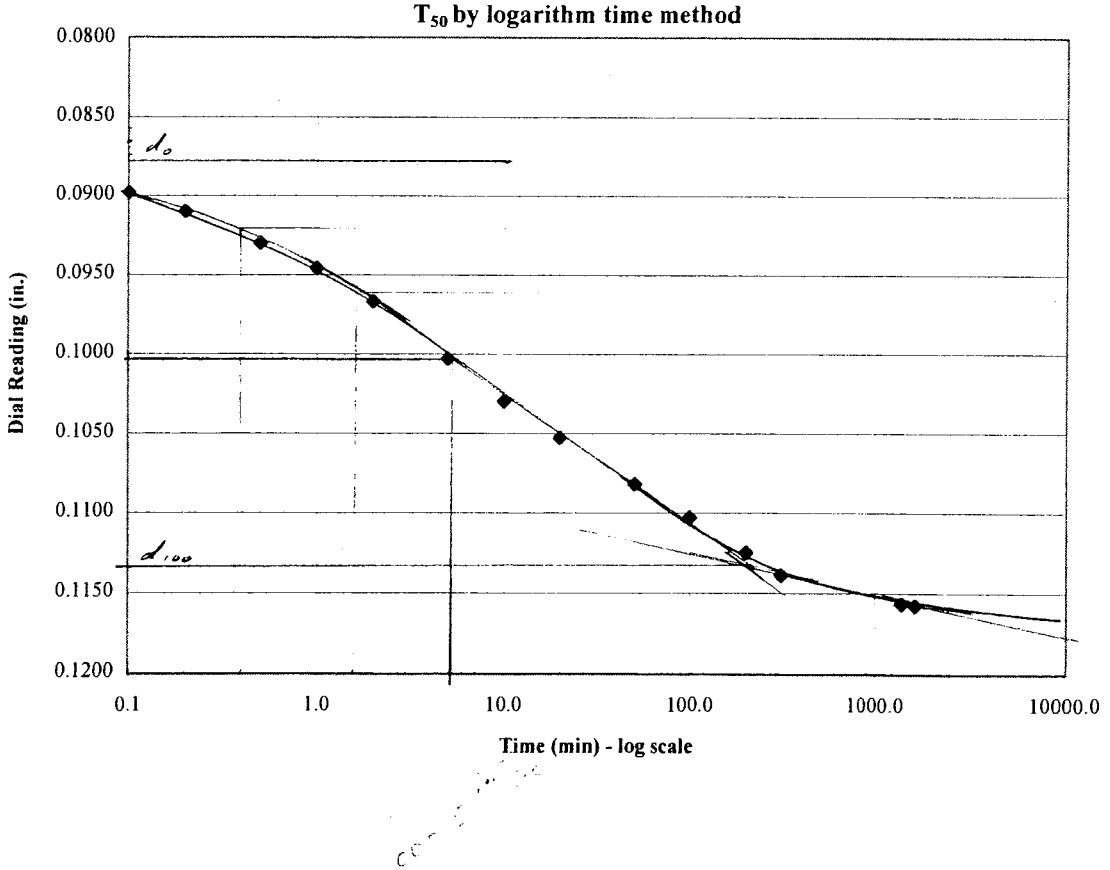
Consolidation Test

Blandfill

Description of Soil: Silty Clay, Light Brown with Roots

Pressure on Specimen: 8.00 KSF

Time after load application, t(min.)	Square root of time (min.)	Vertical Dial Reading (in.)
0.1	0.3	0.0620
0.2	0.4	0.6260
0.5	0.7	0.0638
1	1.0	0.0648
2	1.4	0.0657
5	2.2	0.0670
10	3.2	0.0684
20	4.5	0.0700
50	7.1	0.0719
100	10.0	0.0733
200	14.1	0.0743
310	17.6	0.0750
1340	36.6	0.0772
1545	39.3	0.0772



Consolidation Test

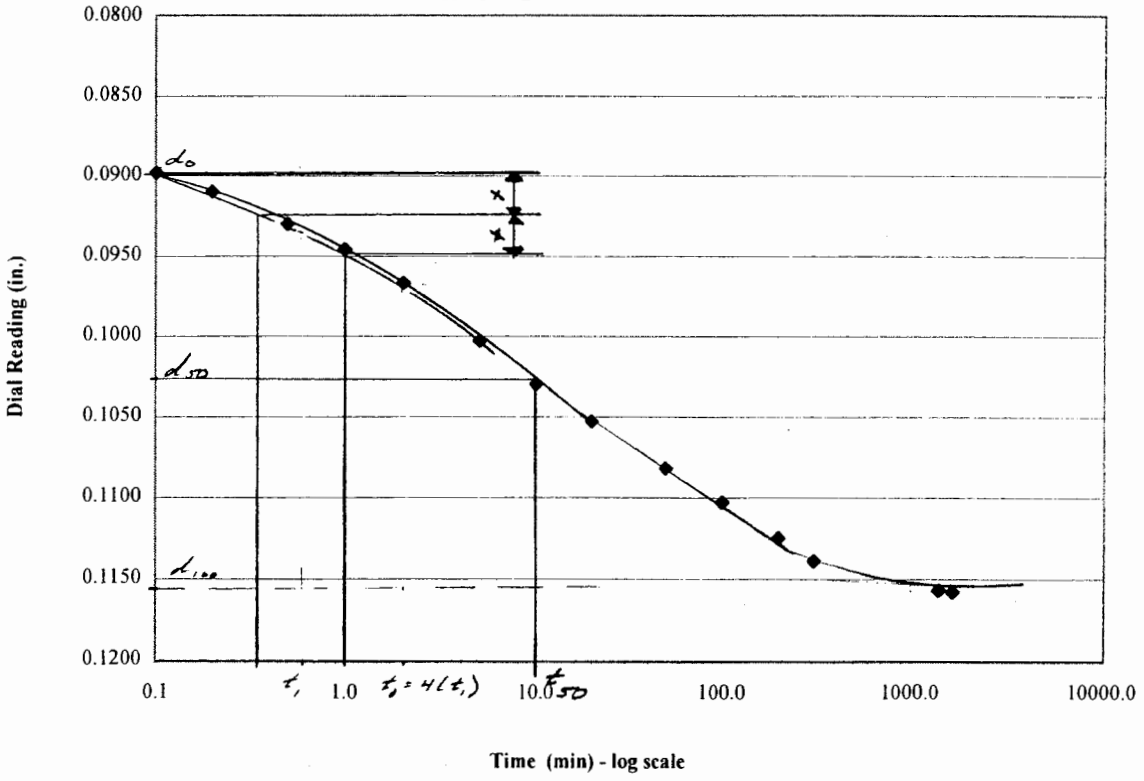
Blandfill

Description of Soil: Silty Clay, Light Brown with Roots

Pressure on Specimen: 16.00 KSF

Time after load application, t(min.)	Square root of time (min.)	Vertical Dial Reading (in.)
0.1	0.3	0.0898
0.2	0.4	0.0910
0.5	0.7	0.0930
1	1.0	0.0946
2	1.4	0.0967
5	2.2	0.1003
10	3.2	0.1030
20	4.5	0.1053
50	7.1	0.1082
100	10.0	0.1103
200	14.1	0.1125
310	17.6	0.1139
1408	37.5	0.1157
1661	40.8	0.1158

T_{50} by logarithm of time method



APPENDIX C

DRAINAGE ANALYSIS

CONTENTS

CONTENTS (Continued)

1 INTRODUCTION

This drainage analysis was prepared in conjunction with the revised grading plan for the Mountain View Landfill (formerly Blandfill Landfill) in Salt Lake County, Utah. The objective of this analysis is to provide a basis for the surface drainage system of the revised landfill configuration that would meet the requirements for the phased development and closure period of the site.

The design criteria and methodology established in the previous Drainage Report prepared by EMCON in November 1997 were also adopted in this drainage analysis.

Existing Site Condition

The Mountain View Landfill site is an existing construction and demolition (Class VI) landfill, see Figure C-1, Vicinity Map. Natural topography of the site and surrounding areas gently slopes towards the northwest. Existing fill at the central portion of the site builds out at elevation 4,350 feet above mean sea level (msl). Surrounding ground is relatively flat ranging from 4,220 feet msl and 4217 feet msl at the north/northwest and southwest of the site, respectively.

The area immediately east of the site is occupied by the Salt Lake Valley Landfill. North of the site is a wedge-shaped open area bound by the northern fill limit and an earth mound (abandoned railroad) traversing diagonally beginning at the northwest corner of the property. This open area creates additional contributory flow along the northern perimeter of the site. Drainage tributary to the south is minimal due to an existing ditch alongside 1300 South Street. West of the site is 7200 West Street and Lee Creek where most of the site surface runoff will drain.

The landfill development will occupy approximately 76 acres of land with a new entrance facility located in the southeast corner of the site. The entrance facility is comprised of an all-weather access road and an entrance area that includes a scalehouse, truck scale, an office trailer with employee parking, and a maintenance shop.

Proposed Development

The landfill development will occupy approximately 74 acres of land with a new entrance facility located in the southeast corner of the site. The entrance facility will have a paved entrance area that includes a scalehouse, two truck scales, an office trailer with employee parking, and a maintenance shop with truck wash pad.

The final landfill slopes will be constructed no steeper than 2:1 (horizontal to vertical) slope ratio, with 25-foot wide benches at 50-foot vertical increments. A minimum final surface slope of 5 percent at the landfill deck area will be used to provide sufficient slope for runoff after landfill settlement. Diversion berms on top deck of the landfill and drainage ditches on landfill benches will be provided to convey runoff to overside drains and drainage ditches along the perimeter of the landfill. Collected runoff will then be routed through detention ponds before being released off-site. Run-on storm flow from an off-site area north of the landfill and a small portion of the northeast corner of the landfill will be diverted away from the site and conveyed through a drainage pipe across 7200 West Street.

Several detention ponds are proposed at the perimeter of the landfill. These ponds will be used for sediment control and runoff detention. Pond outlet structures will drain collected storm water in the ponds to existing drainage facilities along the south and west perimeter of the site. Locations of drainage facilities are shown on the landfill development drawings and drainage map.

2 HYDROLOGY ANALYSIS

The method used for the hydrologic analysis of the proposed landfill development is based on the Technical Release 55 (TR-55), *Urban Hydrology for Small Watershed* published by the Natural Resources Conservation Service (NRCS). Runoff peak flows and storm hydrographs obtained from the hydrologic analysis are based on the 25-year, 24-hour frequency storm event and presented in Appendix C-1.

Precipitation

Rainfall data from the nearest precipitation station (National Weather Service-Salt Lake City Station [SLCS]) was used to simulate the storm event at the site. The estimated 25-year, 24-hour precipitation reported from the SLCS is 2.65 inches.

Rainfall Distribution

TR-55 includes four synthetic 24-hour rainfall distributions developed by the NRCS representing various regions of the United States. Based on the geographical location of the site, Type II rainfall distribution and antecedent moisture condition (AMC) II was used in the analysis.

Time of Concentration

The time of concentration (T_c) is the time for runoff to travel from the most hydraulically distant point in a drainage subarea to reach the collection point. Calculation for T_c consists of overland flow or sheet flow, shallow concentrated flow, and open channel flow, or some combination, to the collection point. The T_c calculated for the landfill drainage subarea ranges from 6 to 8 minutes, approximately 0.1 hour, the minimum time concentration allowed for the TR-55 computer program.

Overland flow times were calculations based on the kinematic equation for sheet flow condition Travel times for shallow concentrated and open channel flows were calculated based on flow velocities obtained from Manning's equation. Data input for the TR-55 computer analysis are presented in the hydrology calculations.

An approximate T_c for the off-site drainage area was developed based on the topographic features shown on the US Geological Survey (USGS) map and open channel flow time along the northern perimeter of the site.

Hydrologic Soil Group

Selection of runoff CNs area based on the hydrologic soil classification, cover type, hydrologic conditions, and antecedent moisture condition. The soils at the site are predominantly silty clay loam classified as Type C under the NRCS soil group system. Based on available soil information and land use, the CN values used for the analysis are

Area Description	CN
Landfill Top Deck	86
Landfill Side Slope	88
Perimeter/Access Road	90
Undeveloped Area	79

Drainage Areas

Tributary areas to drainage ditches/downdrains and detention ponds are divided into subareas as shown on Figure C-2, Drainage Map. Drainage subareas to drainage facilities are as follows:

Subarea Designation	Drainage Facilities	Detention Pond
A & B	North Perimeter Ditch, LF Drainage Benches, Crossdrains and Downdrains	
C	West Perimeter Ditch, LF Drainage Benches, Crossdrains and Downdrains	
A, B, & C		Northwest Detention Pond
D & E	South Perimeter Ditch, LF Drainage Benches, Crossdrains and Downdrains	Southwest Detention Pond
F	East Perimeter Ditch LF Drainage Benches, Crossdrains and Downdrains	Southeast Detention Pond
G	North Diversion Ditch	
K	North Diversion Ditch	

3 HYDRAULIC ANALYSIS

Estimated peak flows obtained from the hydrologic evaluation of drainage subareas were used for designing the proposed storm water drainage system for the landfill development. Drainage control facilities for the landfill consist of diversion berm with drainage ditch on the top deck area, a V-ditch on landfill benches, a trapezoidal ditch on the access road and perimeter bench, pipe downdrains on side slope areas, and pipe crossdrains on landfill benches. Drainage ditches along the perimeter of the landfill were analyzed with erosion control mat lining or equivalent protective material for protection against soil erosion. Drainage conveyance structures were sized or checked for capacity using Manning's equation for open channel.

Proposed detention ponds at the landfill perimeter were analyzed to determine required storage capacity during the design storm event. The combined flows from tributary areas to detention ponds as shown on the drainage map waer analyzed based on the TR-55 computer program. Results of the hydrologic evaluation for inflow to detention ponds are presented in Appendix C-1. Hydraulic analyses of drainage structures and detention ponds are included in Appendix C-2.

The summary of landfill drainage structures and detention ponds is presented in Tables C-1 and 2, respectively.

4 CONCLUSIONS

The drainage facilities proposed for the new landfill development are designed to handle the 25-year, 24-hour frequency storm event. Periodic maintenance and best management practices should be implemented throughout the development phase of the landfill to maintain hydraulic capacities of proposed drainage facilities.

Drainage ditches with flow velocities of 5 fps or less should be lined with grass. Drainage ditches with greater than 5 fps flow velocities should be lined with erosion control mat or equivalent protective material for protection against erosion. Drainage ditches along access road with steep grades should be lined with concrete. Pipe downdrains on the landfill side slopes are designed to convey flow to perimeter drainage facilities and should be provided with energy dissipator or transition section at pipe outlet for protection against erosion. Crossdrains on landfill benches and access road may be metal or concrete pipe with minimum pipe cover for vehicular traffic.

Sediments are expected to be generated during the active phase of landfill development. During the wet season, erosion and sediment control devices such as sediment traps and silt fences should be used to minimize sediment transport to downstream drainage facilities and detention ponds. Sediment production is expected to decline when portions of the landfill are closed and vegetated.

Proposed detention ponds were analyzed for the design storm event and have sufficient capacity to pass the storm runoff volume through the pond. Due to limited pond capacity, all detention ponds should be desilted after storm events to provide maximum storage for the next storm and prevent an overtopping condition. Outlet pipes for the ponds should be inspected and any obstructions should be removed to make certain that outlet structure will properly function.

TABLES

Table C-1

Mountain View Landfill
Salt Lake County, Utah

Summary of Drainage Facilities

Drainage Area	Design Q (cfs)	Drainage Structure	Type
A1	1	LF Bench Ditch	DD-A
	1	LF Access Road	DD-C
	2	Crossdrain/Downdrain	12" CMP-T
A2	5	North Perimeter Ditch	DD-D
A3	3	LF Access Road	DD-C
	3	LF Bench Ditch	DD-A
	6	Crossdrain/Downdrain	12" CMP-T
B1	4	LF Bench Ditch	DD-A
	4	Crossdrain/Downdrain	12" CMP
B2	6	LF Bench Ditch	DD-A
	3	LF Access Road	DD-C
	13	Crossdrain/Downdrain	18" CMP
B3	3	LF Bench Ditch	DD-A
	16	Crossdrain/Downdrain	24" CMP-T
B4	15	North Perimeter Ditch	DD-D
C5b	34	North Perimeter Ditch	DD-E
	34	Crossdrain/Inlet to Northwest Detention Pond	30" CMP-RR
C1	3	Top Deck LF Bench	DD-B
	3	LF Access Road	DD-C
	6	Crossdrain/Downdrain	18" CMP

Table C-1 (continued)

Mountain View Landfill
Salt Lake County, Utah

Summary of Drainage Facilities

Drainage Area	Design Q (cfs)	Drainage Structure	Type
C2	2	LF Bench Ditch	DD-A
	8	Crossdrain/Downdrain	18" CMP
C3	4	North LF Bench Ditch	DD-A
	4	West LF Bench Ditch	DD-A
	16	Crossdrain/Downdrain	24" CMP
C4	6	North LF Bench Ditch	DD-A
	6	West LF Bench Ditch	DD-A
	28	Crossdrain/Downdrain	24" CMP
C5a	6	West Perimeter Ditch	DD-D
	34	Crossdrain/Inlet to Northwest Detention Pond	30" CMP-RR
C6	3	Northwest Detention Pond	
D1	6	Top Deck Diversion Berm	DD-B
	6	Crossdrain/Downdrain	18" CMP
D2	3	LF Bench Ditch	DD-A
	9	Crossdrain/Downdrain	18" CMP
D3	3	LF Bench Ditch	DD-A
	12	Crossdrain/Downdrain	18" CMP
D4	2	LF Bench Ditch	DD-A
	14	Crossdrain/Downdrain	18" CMP-T
D5	17	South Perimeter Ditch	DD-E
E1	7	Top Deck Diversion Berm & LF Bench Ditch	DD-B & DD-A

Table C-1 (continued)

Mountain View Landfill
Salt Lake County, Utah

Summary of Drainage Facilities

Drainage Area	Design Q (cfs)	Drainage Structure	Type
	7	Crossdrain/Downdrain	18" CMP
E2	6	LF Bench Ditch	DD-A
	13	Crossdrain/Downdrain	18" CMP
E3	7	LF Bench Ditch	DD-A
	20	Crossdrain/Downdrain	24" CMP
E4	6	LF Bench Ditch	DD-A
	26	Crossdrain/Inlet to Southwest Detention Pond	24" CMP
E5	24	South Perimeter Ditch	DD-E
	24	Crossdrain/Inlet to Southwest Detention Basin	24" CMP-RR
E6	3	Southwest Detention Pond	
F1	5	East LF Bench Ditch	DD-A
	1	South LF Bench Ditch	DD-A
	6	Crossdrain/Downdrain	18" CMP
F2	4	East LF Bench Ditch	DD-A
	3	South LF Bench Ditch	DD-A
	13	Crossdrain/Downdrain	18" CMP
F3	5	East LF Bench Ditch	DD-A
	3	South LF Bench Ditch	DD-A
	21	Downdrain/Inlet to Southeast Detention Pond	24" CMP-RR
F4	8	East Perimeter Ditch	DD-D
	4	South Perimeter Ditch	DD-D

Table C-1 (continued)

Mountain View Landfill
Salt Lake County, Utah

Summary of Drainage Facilities

Drainage Area	Design Q (cfs)	Drainage Structure	Type
	12	Ditch/Inlet to Southeast Detention Pond	DD-D
G1	4	North Diversion Ditch	
K1[2]	18	North Diversion Ditch	

Notes:

1. Locations of drainage facilities are shown on Drawing 1 - Landfill Final Grading and Drainage Plan.
2. From 1997 Drainage Report.

Abbreviations:

DD-A = Drainage Ditch-Type A, "V"-shaped, grass-lined, d=1.0', z=2:1

DD-B = Drainage Ditch-Type B, Trapezoidal shape, grass-lined, d=1.0', b=1', z=2:1 & 5:1

DD-C = Drainage Ditch-Type C, Trapezoidal shape, concrete-lined, d=1.0', b=1', z=2:1

DD-D = Drainage Ditch-Type D, Trapezoidal shape, grass-lined, d=1.5', b=1', z=2:1

DD-E = Drainage Ditch-Type E, Trapezoidal shape, ECM/grass-lined, d=1.5', b=2', z=2:1

CMP = Corrugated Metal Pipe

CMP-T = Corrugated Metal Pipe with tee outlet

CMP-RR = Corrugated Metal Pipe with rock riprap outlet

cfs = cubic feet per second

Table C-2

Mountain View Landfill
Salt Lake County, Utah

Summary of Detention Ponds

	Northwest Detention Pond	Southwest Detention Pond	Southeast Detention Pond
Peak Inflow (cfs)	77.0	48.0	33.0
Pond Volume (ac-ft)	1.7	1.5	0.6
Dead Storage (ac-ft)	0	0	0
Peak Storm Storage (ac-ft)	1.1	0.9	0.4
Peak Outflow (cfs)	40	25	20
Outlet Structure	2 - 24" RCP	1 - 24" RCP	1 - 24" RCP

Notes:

1. Locations of detention ponds are shown on Drawing 1 - Landfill Final Grading and Drainage Plan.

Abbreviations:

ac-ft = acre feet
cfs = cubic feet per second
RCP = Reinforced Concrete Pipe

FIGURES

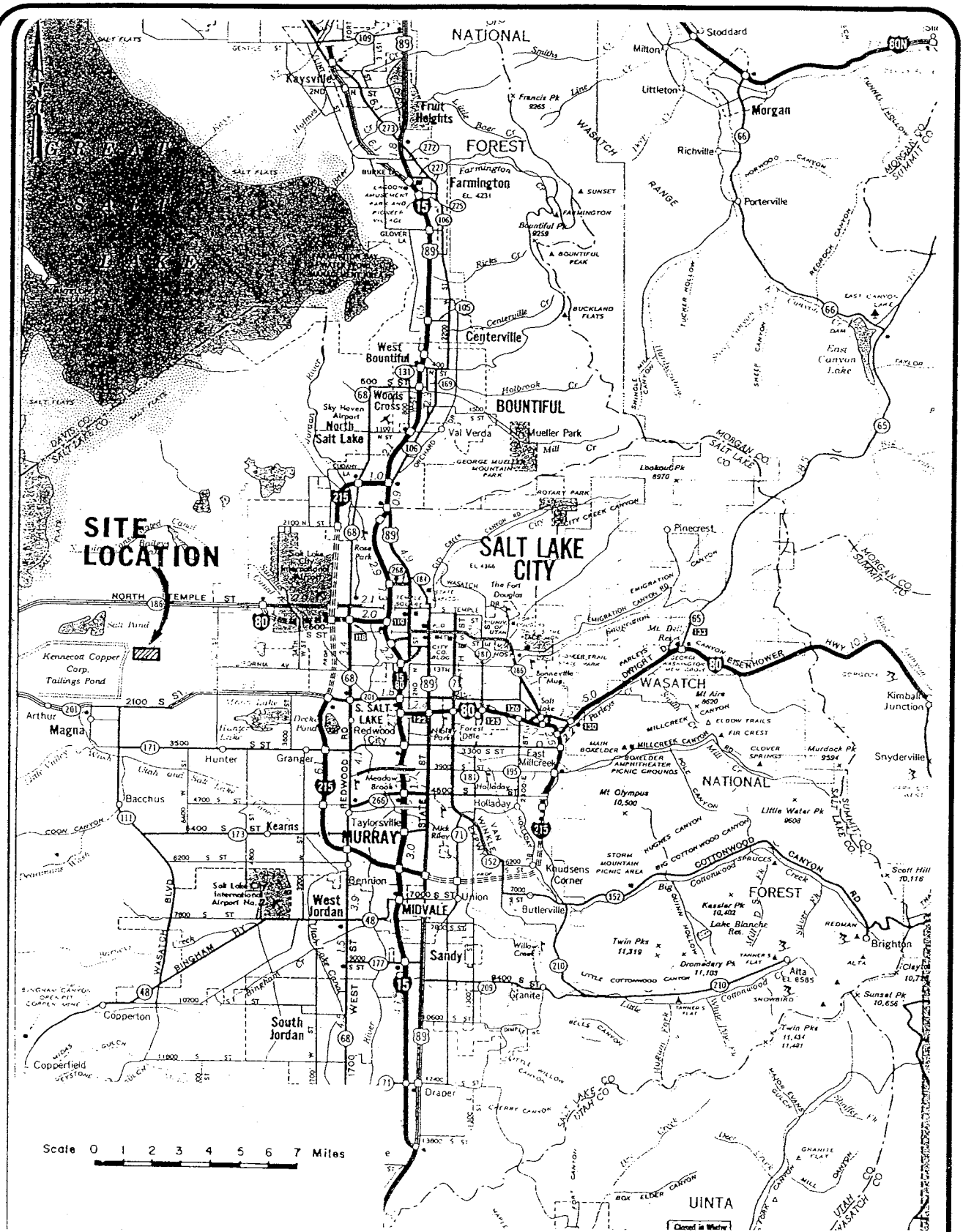


IMAGE Files: <No Images>
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SANJOSE/CADD: N:\cad\DWG\BLANDFIL\TB-VICMAP.dwg Tue, 08/Feb/00 01:55pm ktroyer
Dimscale: 1 Ltscale: 0.5 Psltscale: 1

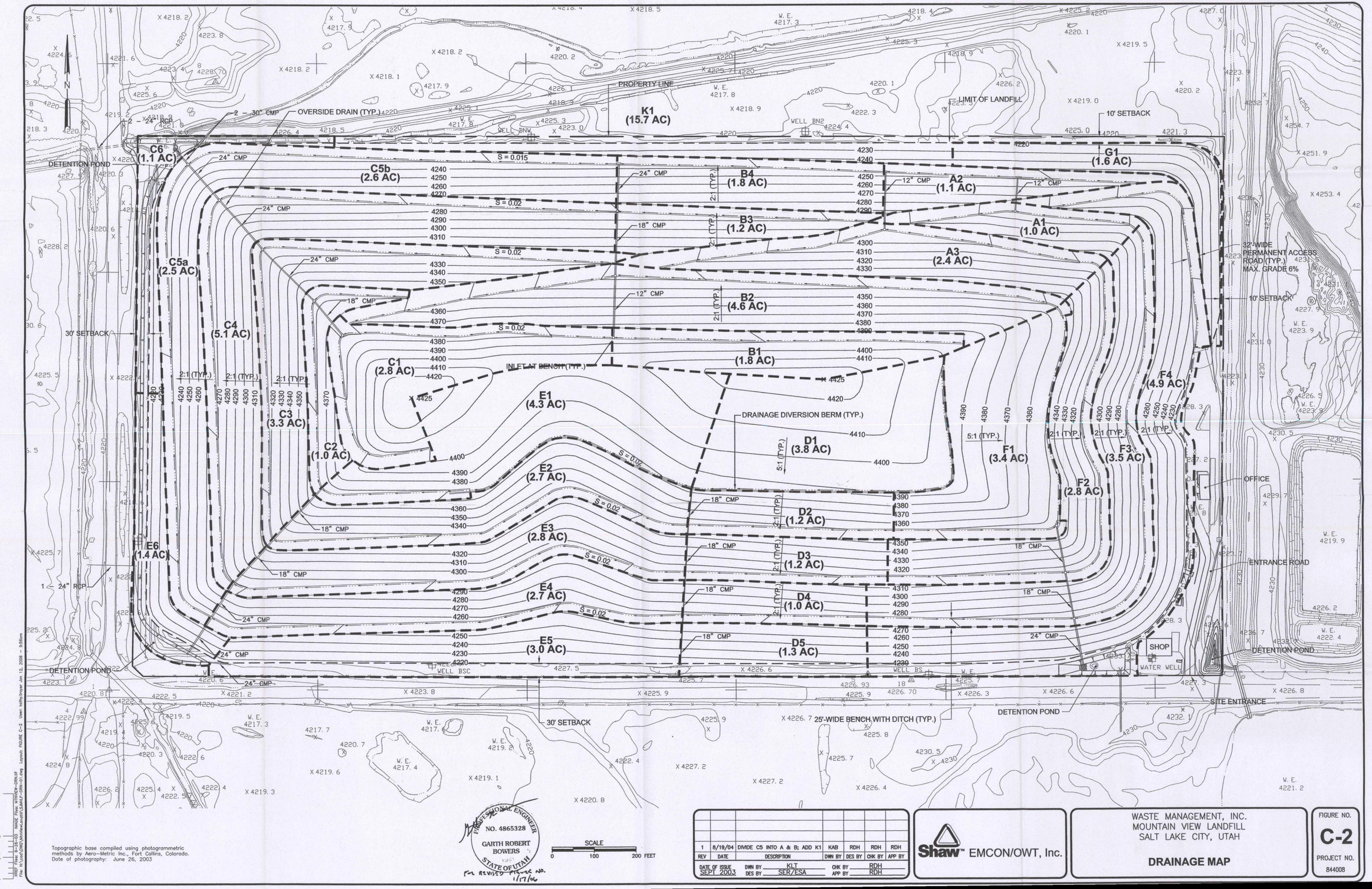
1/2" 0" 1"

Shaw° EMCON/OWT, Inc.

DATE FEB. 2000
DWN KLT
APP ESA
REV 0
PROJECT NO. 801569

FIGURE C-1
MOUNTAIN VIEW LANDFILL
SALT LAKE COUNTY, UTAH

VICINITY MAP



Topographic base compiled using photogrammetric methods by Aero-Metric Inc., Fort Collins, Colorado.
Date of photography: June 26, 2003

PROFESSIONAL ENGINEER
NO. 4865328
GARTH ROBERT BOWERS
STATE OF UTAH

For revised figure no. 1/17/06

SCALE
0 100 200 FEET

REV	DATE	DESCRIPTION	DWN BY	DES BY	CHK BY	APP BY
1	8/19/04	DIVIDE C5 INTO A & B; ADD K1	KAB	RDH	RDH	RDH

DATE OF ISSUE SEPT 2003 | DWN BY KLT | DES BY SER/ESA | CHK BY RDH | APP BY RDH

Shaw EMCON/OWT, Inc.

WASTE MANAGEMENT, INC.
MOUNTAIN VIEW LANDFILL
SALT LAKE CITY, UTAH

DRAINAGE MAP

FIGURE NO. **C-2**
PROJECT NO. 844008

1" 1/2" 0" 1"
REF # Date: 8-Jul-03 IMAGE Files: MVNEW-DRN.tif
File: N:\cad\OWE\MtnView\Land\SALKLF-DRN-01.dwg Layout: FIGURE C-2 User: kathy.troyer Jan 12, 2006 - 9:56cm

APPENDIX C-1

HYDROLOGY CALCULATIONS

APPENDIX C-1

HYDROLOGY CALCULATIONS

ESTIMATED RETURN PERIODS FOR SHORT DURATION PRECIPITATION
(inches)

Station: Saint George Elevation: 2760
Latitude: 37° 07' Longitude: 113° 34'

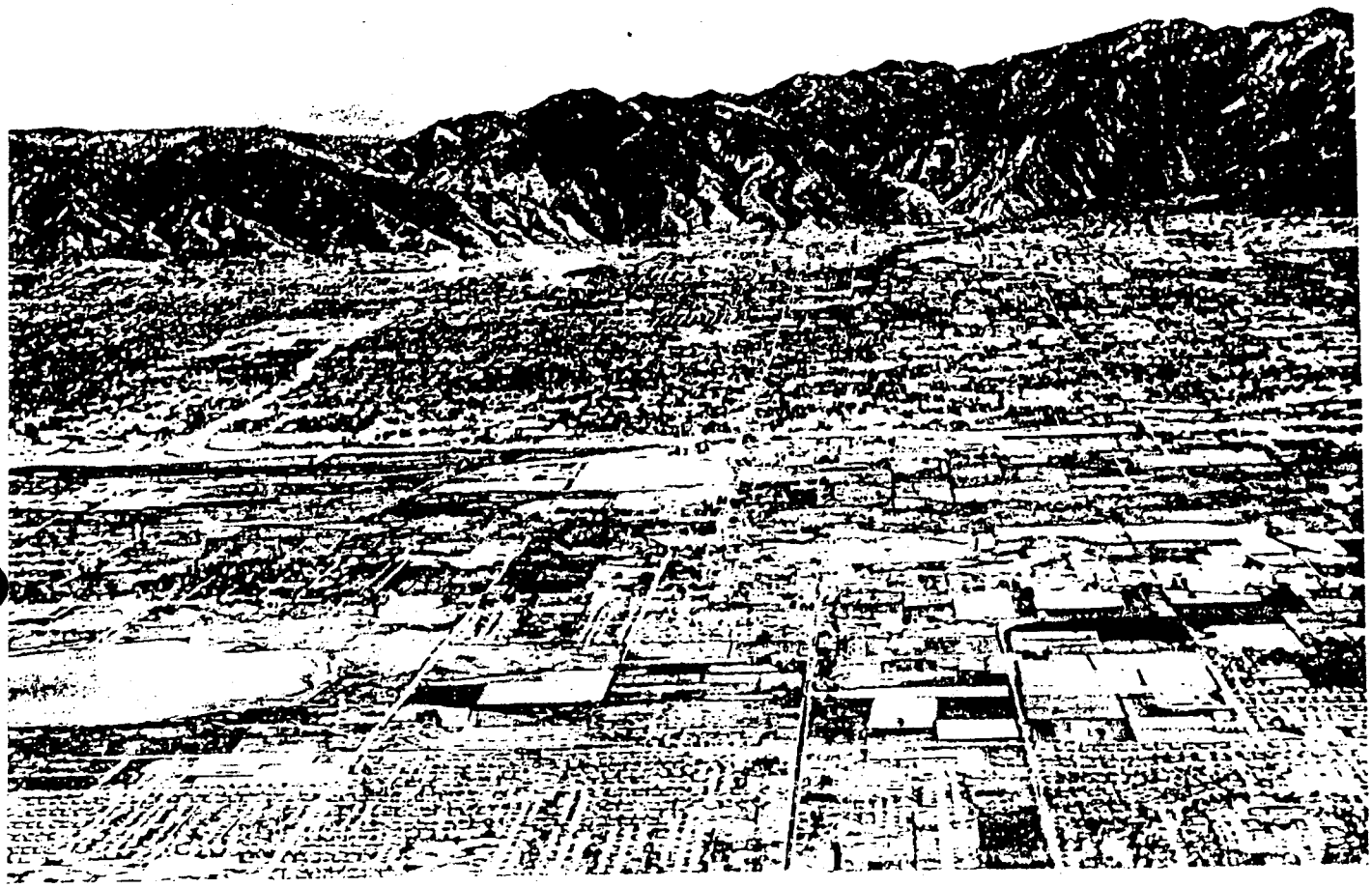
RETURN PERIOD (years)	DURATION 5 Min	10 Min	15 Min	30 Min	1 Hr	2 Hr	3 Hr	6 Hr	12 Hr	24 Hr
1	.17	.26	.32	.45	.57	.58	.60	.63	.66	.69
2	.23	.35	.44	.62	.78	.80	.83	.88	.93	.98
5	.31	.48	.61	.85	1.07	1.12	1.17	1.29	1.40	1.51
10	.37	.58	.74	1.02	1.29	1.35	1.40	1.54	1.66	1.79
25	.46	.72	.91	1.26	1.60	1.67	1.73	1.89	2.03	2.18
50	.55	.85	1.07	1.49	1.88	1.95	2.02	2.18	2.33	2.48
100	.61	.95	1.20	1.67	2.11	2.19	2.26	2.45	2.62	2.79

Station: Salt Lake City Elevation: 4300
Latitude: 40° 46' Longitude: 111° 53'

RETURN PERIOD (years)	DURATION 5 Min	10 Min	15 Min	30 Min	1 Hr	2 Hr	3 Hr	6 Hr	12 Hr	24 Hr
1	.14	.21	.27	.37	.47	.54	.61	.78	.93	1.09
2	.15	.23	.30	.41	.52	.62	.72	.96	1.18	1.40
5	.17	.27	.34	.47	.59	.74	.88	1.23	1.54	1.87
10	.18	.27	.35	.48	.61	.79	.97	1.40	1.79	2.19
25	.20	.31	.39	.55	.69	.92	1.13	1.67	2.15	2.65
50	.22	.34	.43	.60	.76	1.02	1.26	1.88	2.43	3.00
100	.23	.36	.46	.64	.81	1.10	1.38	2.08	2.70	3.35

SOIL SURVEY OF

Salt Lake Area, Utah



United States Department of Agriculture
Soil Conservation Service
In cooperation with
Utah Agricultural Experiment Station

Issued April 1974

MOUNTAIN VIEW LANDFILL
Salt Lake County, Utah

Drainage Analysis
TR-55 Data Input

Subarea Designation	Description	Type of Cover	Area	Weighted CN	Elev Start	Elev End	Δ Elev	Distance	S	To	V	Tt	Tc
			ac		ft	ft	ft	ft	ft/ft	hr	fps	hr	hr
C5a	LF Sideslope, Perimeter Bench	Fair grass, gravel	2.5	88	4275	4239	36.0	80	0.450	0.043			
					4239	4225	14.0	920	0.015		6.8	0.038	0.081
C6	LF Sideslope, Perimeter Bench	Fair grass, gravel	1.1	90	4226	4219	7.0	20	0.350	0.016			
	Northwest Detention Pond				4219	4217	2.0	200	0.010		3.0	0.019	0.034
D1	LF Top Deck	Fair grass	3.8	86	4425	4388	37.0	260	0.142	0.175			
					4388	4382	6.0	300	0.020		3.9	0.021	0.196
D2	LF Sideslope, Bench	Fair grass, gravel	1.2	88	4390	4355	35.0	80	0.438	0.043			
					4355	4342	13.0	490	0.027		4.1	0.033	0.077
D3	LF Sideslope, Bench	Fair grass, gravel	1.2	88	4355	4315	40.0	85	0.471	0.044			
					4315	4302	13.0	490	0.027		4.1	0.033	0.078
D4	LF Sideslope, Bench	Fair grass, gravel	1.0	88	4312	4275	37.0	75	0.493	0.039			
					4275	4266	9.0	450	0.020		3.3	0.038	0.077
D5	LF Sideslope, Perimeter Bench	Fair grass, gravel	1.3	88	4275	4226	49.0	105	0.467	0.053			
					4226	4224	2.0	450	0.004		3.7	0.034	0.086
E1	LF Top Deck	Fair grass	4.3	86	4405	4375	30.0	170	0.176	0.114			
					4375	4364	11.0	640	0.017		4.3	0.041	0.156
E2	LF Sideslope, Bench	Fair grass, gravel	2.7	88	4375	4336	39.0	120	0.325	0.068			
					4336	4322	14.0	740	0.019		4.3	0.048	0.116
E3	LF Sideslope, Bench	Fair grass, gravel	2.8	88	4336	4297	39.0	120	0.325	0.068			
					4297	4280	17.0	830	0.020		4.5	0.051	0.119
E4	LF Sideslope, Bench	Fair grass, gravel	2.7	88	4297	4260	37.0	110	0.336	0.062			
					4260	4243	17.0	870	0.020		4.3	0.056	0.118
E5	LF Sideslope, Perimeter Bench	Fair grass, gravel	3.0	88	4255	4222	33.0	80	0.413	0.044			
					4222	4220	2.0	550	0.004		4.0	0.038	0.083

DRAINAGE SUBAREA CALCULATIONS

Shaw EMCON/OWT, INC

QUANTITY CALCULATIONS

PROJECT TITLE: Mountain View Lanfill, UT | PROJECT NO.: 844008
CALCULATIONS FOR: Drainage Areas | TASK NO.: 1000000
SCALE: 1" = 100' | TOPO DATE: | PAGE: | OF:

AREA OR CONTOUR	PLANIMETER READING (Acres) 1	2	AVERAGE	AREA (Acres)	MID-CONTOUR AVERAGE (Sq. ft.)	CONTOUR INTERVAL (Ft.)	VOLUME (Cu.yd.)
E1	4.298	4.298	4.3				
E2	2.733	2.747	2.7				
E3	2.854	2.840	2.8				
E4	2.740	2.726	2.7				
E5	2.950	2.971	3.0				
E6	1.445	1.445	1.4				
F1	3.434	3.462	3.4				
F2	2.868	2.822	2.8				
F3	3.516	3.498	3.5				
F4	4.850	4.871	4.9				
G1	1.548	1.580	1.6				
TOTAL					TOTAL		

BY: ESA | DATE 8/4/03 | REMARKS
CHKD: | DATE | REMARKS

TABULAR HYDROGRAPH METHOD Version 2.10

ct : Mountain View LF User: Shaw Date: 08-06-2003

y : Salt Lake State: UT Checked: ____ Date: ________
tle: Drainage Analysis

watershed area: 0.026 sq mi Rainfall type: II Frequency: 25 years

	Subareas							
	A1	A2	A3	B1	B2	B3	B4	C5b
(sq mi)	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00
fall(in)	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7
number	88	88	88	86	88	88	88	88
f(in)	1.51	1.51	1.51	1.37	1.51	1.51	1.51	1.51
rs)	0.06	0.05	0.08	0.09	0.10	0.05	0.08	0.09
(Used)	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
ToOutlet	0.06	0.05	0.05	0.05	0.05	0.05	0.00	0.00
(Used)	0.00	0.00	0.00	0.00	0.10	0.00	0.00	0.00
	0.10	0.10	0.10	0.12	0.10	0.10	0.10	0.10

Total Flow	Subarea Contribution to Total Flow (cfs) A1	A2	A3	B1	B2	B3	B4	C5b
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
10	1	1	2	1	1	1	1	2
22	2P	2	4	2	3	2	3	4
34P	2	3P	6P	4P	6	3P	4P	6P
28	2	2	4	2	9P	2	3	4
15	1	1	1	1	8	1	1	1
8	0	0	1	1	4	0	1	1
5	0	0	1	0	2	0	1	1
4	0	0	1	0	2	0	0	1
2	0	0	0	0	1	0	0	1
1	0	0	0	0	1	0	0	0
1	0	0	0	0	1	0	0	0
1	0	0	0	0	1	0	0	0
1	0	0	0	0	1	0	0	0
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0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0

TABULAR HYDROGRAPH METHOD Version 2.10

ect : Mountain View LF User: Shaw Date: 08-06-2003

ty : Salt Lake State: UT Checked: ____ Date: _____
itle: Drainage Analysis

l watershed area: 0.013 sq mi Rainfall type: II Frequency: 25 years

	Subareas				
	D1	D2	D3	D4	D5
(sq mi)	0.01	0.00	0.00	0.00	0.00
fall(in)	2.7	2.7	2.7	2.7	2.7
e number	86	88	88	88	88
ff(in)	1.37	1.51	1.51	1.51	1.51
ırs)	0.20	0.08	0.08	0.08	0.12
(Used)	0.20	0.10	0.10	0.10	0.10
ToOutlet	0.01	0.00	0.00	0.00	0.00
(Used)	0.00	0.00	0.00	0.00	0.00
	0.12	0.10	0.10	0.10	0.10

Total Flow	Subarea Contribution to Total Flow (cfs)				
	D1	D2	D3	D4	D5
0	0	0	0	0	0
0	0	0	0	0	0
0	0	0	0	0	0
6	2	1	1	1	1
11	3	2	2	2P	2
17P	6P	3P	3P	2	3P
14	6	2	2	2	2
8	4	1	1	1	1
2	2	0	0	0	0
1	1	0	0	0	0
1	1	0	0	0	0
1	1	0	0	0	0
1	1	0	0	0	0
1	1	0	0	0	0
1	1	0	0	0	0
0	0	0	0	0	0
0	0	0	0	0	0
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0	0	0	0	0	0
0	0	0	0	0	0
0	0	0	0	0	0
0	0	0	0	0	0
0	0	0	0	0	0
0	0	0	0	0	0

TABULAR HYDROGRAPH METHOD Version 2.10

ect : Mountain View LF User: Shaw Date: 08-06-2003

:y : Salt Lake State: UT Checked: ____ Date: _____
itle: Drainage Analysis

l watershed area: 0.023 sq mi Rainfall type: II Frequency: 25 years

---------- Subareas ----------

	F1	F2	F3	F4
(sq mi)	0.01	0.00	0.01	0.01
:all(in)	2.7	2.7	2.7	2.7
: number	88	88	88	88
:f(in)	1.51	1.51	1.51	1.51
irs)	0.16	0.08	0.09	0.13
(Used)	0.20	0.10	0.10	0.10
ToOutlet	0.00	0.00	0.00	0.00
(Used)	0.00	0.00	0.00	0.00
	0.10	0.10	0.10	0.10

Total Flow	Subarea Contribution to Total Flow (cfs) F1	F2	F3	F4
0	0	0	0	0
0	0	0	0	0
1	0	0	0	1
11	2	2	3	4
20	3	4	5	8
33P	6P	7P	8P	12P
22	6	4	5	7
10	4	1	2	3
6	2	1	1	2
4	1	1	1	1
4	1	1	1	1
4	1	1	1	1
4	1	1	1	1
3	1	0	1	1
1	0	0	0	1
1	0	0	0	1
1	0	0	0	1
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0

COMBINED FLOW TO

NORTHWEST DETENTION POND

COMBINED FLOW TO

SOUTHWEST DETENTION POND

COMBINED FLOW TO SOUTHEAST DETENTION POND

APPENDIX C-2

HYDRAULIC CALCULATIONS

APPENDIX C-2

HYDRAULIC CALCULATIONS

APPENDIX C-2

HYDRAULIC CALCULATIONS

Mountain View Landfill
Salt Lake County, Utah

Detention Pond Volume

	A1	A2	D	V
	(ac)	(ac)	(ac)	(ac-ft)
Northwest Detention Pond	0.235	0.450	5.0	1.68
Southwest Detention Pond	0.203	0.436	5.0	1.56
Southeast Detention Pond	0.068	0.176	5.0	0.59
Notes:				
1. Basin inboard slopes approximately 2:1 (horizontal:vertical).				
2. Pond volume is based on volume formula, $V = ((A1 + A2 + (A1+A2)^{0.5})/3$ (D), where:				
V = volume, in acre-feet				
A1 = base area, in acres				
A2 = top area, in acres				
D = average depth, in feet				
Abbreviations:				
ac-ft = acre-feet				
cfs = cubic per second				
ft = feet				

NORTHWEST DETENTION POND

Circular Channel Analysis & Design
Solved with Manning's Equation

Open Channel - Uniform flow

Worksheet Name: Mtn View LF, UT

Comment: NW Detention Pond - Outlet Pipe

Solve For Actual Depth

Given Input Data:

Diameter.....	2.00 ft
Slope.....	0.0150 ft/ft
Manning's n.....	0.015
Discharge.....	20.00 cfs (x 2 = 40 cfs)

Computed Results:

Depth.....	1.39 ft
Velocity.....	8.55 fps
Flow Area.....	2.34 sf
Critical Depth....	1.61 ft
Critical Slope....	0.0108 ft/ft
Percent Full.....	69.72 %
Full Capacity.....	24.01 cfs
QMAX @.94D.....	25.83 cfs
Froude Number.....	1.34 (flow is Supercritical)

STORAGE VOLUME FOR DETENTION BASINS Version 2.10

ct : Mountain View LF User: Shaw Date: 08-06-2003

y : Salt Lake State: UT Checked: ____ Date: _____

tle: Southwest Detention Pond

Drainage Area: .0397 Sq miles Rainfall Frequency: 25 years
Rainfall-Type: II
Runoff: 1.5 inches
Peak Inflow: 48.00 cfs
Peak Outflow: 25.00 cfs
Detention Basin Storage Volume: 0.41 inches or 0.9 acre feet

SOUTHEAST DETENTION POND

Circular Channel Analysis & Design
Solved with Manning's Equation

Open Channel - Uniform flow

Worksheet Name: Mtn View LF, UT

Comment: SE Detention Pond - Outlet Pipe

Solve For Actual Depth

Given Input Data:

Diameter.....	2.00 ft
Slope.....	0.0100 ft/ft
Manning's n.....	0.015
Discharge.....	20.00 cfs

Computed Results:

Depth.....	1.68 ft
Velocity.....	7.11 fps
Flow Area.....	2.81 sf
Critical Depth....	1.61 ft
Critical Slope....	0.0108 ft/ft
Percent Full.....	83.90 %
Full Capacity.....	19.61 cfs
QMAX @.94D.....	21.09 cfs
Froude Number.....	0.91 (flow is Subcritical)

Trapezoidal Channel Analysis & Design
Open Channel - Uniform flow

Worksheet Name: Mtn View LF, UT

Description: Top Deck Diversion Berm

Solve For Depth

Given Constant Data;

Z-Left.....	5.00
Z-Right.....	2.00
Mannings 'n'.....	0.020

ıble Input Data	Minimum	Maximum	Increment By
;om Width	0.00	1.00	1.00
ınel Slope	0.0100	0.0200	0.0050
ınel Discharge	1.00	10.00	1.00

ıRIABLE ottom idth ft	Z-Left (H:V)	Z-Right (H:V)	Mannings 'n'	VARIABLE COMPUTED Channel Slope ft/ft	VARIABLE COMPUTED Channel Depth ft	Channel Discharge cfs	Velocity fps
.00	5.00	2.00	0.020	0.0200	0.65	7.00	4.79
.00	5.00	2.00	0.020	0.0200	0.52	7.00	4.76
.00	5.00	2.00	0.020	0.0100	0.77	8.00	3.82
.00	5.00	2.00	0.020	0.0100	0.65	8.00	3.81
.00	5.00	2.00	0.020	0.0150	0.72	8.00	4.45
.00	5.00	2.00	0.020	0.0150	0.59	8.00	4.43
.00	5.00	2.00	0.020	0.0200	0.68	8.00	4.96
.00	5.00	2.00	0.020	0.0200	0.55	8.00	4.93
.00	5.00	2.00	0.020	0.0100	0.81	9.00	3.94
.00	5.00	2.00	0.020	0.0100	0.68	9.00	3.92
.00	5.00	2.00	0.020	0.0150	0.75	9.00	4.58
.00	5.00	2.00	0.020	0.0150	0.62	9.00	4.56
.00	5.00	2.00	0.020	0.0200	0.71	9.00	5.11
.00	5.00	2.00	0.020	0.0200	0.58	9.00	5.08
.00	5.00	2.00	0.020	0.0100	0.84	10.00	4.04
.00	5.00	2.00	0.020	0.0100	0.71	10.00	4.03
.00	5.00	2.00	0.020	0.0150	0.78	10.00	4.71
.00	5.00	2.00	0.020	0.0150	0.65	10.00	4.69
.00	5.00	2.00	0.020	0.0200	0.74	10.00	5.24
.00	5.00	2.00	0.020	0.0200	0.61	10.00	5.22

Trapezoidal Channel Analysis & Design
Open Channel - Uniform flow

Worksheet Name: Mtn View LF, UT

Description: LF Bench Drainage Ditch

Solve For Depth

Given Constant Data;

Bottom Width.....	0.00
Z-Left.....	2.00
Z-Right.....	2.00

able Input Data	Minimum	Maximum	Increment By
ings 'n'	0.020	0.030	0.005
nnel Slope	0.0100	0.0300	0.0050
nnel Discharge	1.00	10.00	1.00

ottom idth ft	Z-Left (H:V)	Z-Right (H:V)	VARIABLE Mannings 'n'	VARIABLE Channel Slope ft/ft	COMPUTED Channel Depth ft	VARIABLE Channel Discharge cfs	COMPUTED Velocity fps
.00	2.00	2.00	0.025	0.0250	0.61	3.00	3.97
.00	2.00	2.00	0.030	0.0250	0.66	3.00	3.46
.00	2.00	2.00	0.020	0.0300	0.55	3.00	5.03
.00	2.00	2.00	0.025	0.0300	0.59	3.00	4.25
.00	2.00	2.00	0.030	0.0300	0.64	3.00	3.71
.00	2.00	2.00	0.020	0.0100	0.75	4.00	3.58
.00	2.00	2.00	0.025	0.0100	0.81	4.00	3.03
.00	2.00	2.00	0.030	0.0100	0.87	4.00	2.64
.00	2.00	2.00	0.020	0.0150	0.69	4.00	4.17
.00	2.00	2.00	0.025	0.0150	0.75	4.00	3.52
.00	2.00	2.00	0.030	0.0150	0.81	4.00	3.07
.00	2.00	2.00	0.020	0.0200	0.66	4.00	4.64
.00	2.00	2.00	0.025	0.0200	0.71	4.00	3.93
.00	2.00	2.00	0.030	0.0200	0.76	4.00	3.42
.00	2.00	2.00	0.020	0.0250	0.63	4.00	5.05
.00	2.00	2.00	0.025	0.0250	0.68	4.00	4.27
.00	2.00	2.00	0.030	0.0250	0.73	4.00	3.72
.00	2.00	2.00	0.020	0.0300	0.61	4.00	5.40
.00	2.00	2.00	0.025	0.0300	0.66	4.00	4.57
.00	2.00	2.00	0.030	0.0300	0.71	4.00	3.99
.00	2.00	2.00	0.020	0.0100	0.81	5.00	3.78
.00	2.00	2.00	0.025	0.0100	0.88	5.00	3.20
.00	2.00	2.00	0.030	0.0100	0.95	5.00	2.79
.00	2.00	2.00	0.020	0.0150	0.75	5.00	4.41
.00	2.00	2.00	0.025	0.0150	0.82	5.00	3.73
.00	2.00	2.00	0.030	0.0150	0.88	5.00	3.25
.00	2.00	2.00	0.020	0.0200	0.71	5.00	4.91
.00	2.00	2.00	0.025	0.0200	0.78	5.00	4.15
.00	2.00	2.00	0.030	0.0200	0.83	5.00	3.62
.00	2.00	2.00	0.020	0.0250	0.68	5.00	5.34
.00	2.00	2.00	0.025	0.0250	0.74	5.00	4.51
.00	2.00	2.00	0.030	0.0250	0.80	5.00	3.94
.00	2.00	2.00	0.020	0.0300	0.66	5.00	5.71
00	2.00	2.00	0.025	0.0300	0.72	5.00	4.83
00	2.00	2.00	0.030	0.0300	0.77	5.00	4.22
00	2.00	2.00	0.020	0.0100	0.87	6.00	3.96
00	2.00	2.00	0.025	0.0100	0.95	6.00	3.35
00	2.00	2.00	0.030	0.0100	1.01	6.00	2.92
00	2.00	2.00	0.020	0.0150	0.81	6.00	4.61
00	2.00	2.00	0.025	0.0150	0.88	6.00	3.90

ottom dth ft	Z-Left (H:V)	Z-Right (H:V)	VARIABLE Mannings 'n'	VARIABLE Channel Slope ft/ft	COMPUTED Channel Depth ft	VARIABLE Channel Discharge cfs	COMPUTED Velocity fps
.00	2.00	2.00	0.020	0.0100	1.01	9.00	4.38
.00	2.00	2.00	0.025	0.0100	1.10	9.00	3.71
.00	2.00	2.00	0.030	0.0100	1.18	9.00	3.23
.00	2.00	2.00	0.020	0.0150	0.94	9.00	5.10
.00	2.00	2.00	0.025	0.0150	1.02	9.00	4.32
.00	2.00	2.00	0.030	0.0150	1.09	9.00	3.77
.00	2.00	2.00	0.020	0.0200	0.89	9.00	5.68
.00	2.00	2.00	0.025	0.0200	0.97	9.00	4.81
.00	2.00	2.00	0.030	0.0200	1.04	9.00	4.19
.00	2.00	2.00	0.020	0.0250	0.85	9.00	6.18
.00	2.00	2.00	0.025	0.0250	0.93	9.00	5.23
.00	2.00	2.00	0.030	0.0250	0.99	9.00	4.56
.00	2.00	2.00	0.020	0.0300	0.82	9.00	6.62
.00	2.00	2.00	0.025	0.0300	0.90	9.00	5.60
.00	2.00	2.00	0.030	0.0300	0.96	9.00	4.88
.00	2.00	2.00	0.020	0.0100	1.05	10.00	4.50
.00	2.00	2.00	0.025	0.0100	1.15	10.00	3.81
.00	2.00	2.00	0.030	0.0100	1.23	10.00	3.32
.00	2.00	2.00	0.020	0.0150	0.98	10.00	5.24
.00	2.00	2.00	0.025	0.0150	1.06	10.00	4.43
.00	2.00	2.00	0.030	0.0150	1.14	10.00	3.87
.00	2.00	2.00	0.020	0.0200	0.93	10.00	5.84
.00	2.00	2.00	0.025	0.0200	1.01	10.00	4.94
.00	2.00	2.00	0.030	0.0200	1.08	10.00	4.31
.00	2.00	2.00	0.020	0.0250	0.89	10.00	6.35
.00	2.00	2.00	0.025	0.0250	0.97	10.00	5.37
.00	2.00	2.00	0.030	0.0250	1.03	10.00	4.68
.00	2.00	2.00	0.020	0.0300	0.86	10.00	6.79
.00	2.00	2.00	0.025	0.0300	0.93	10.00	5.75
.00	2.00	2.00	0.030	0.0300	1.00	10.00	5.01

Trapezoidal Channel Analysis & Design
Open Channel - Uniform flow

Worksheet Name: Mtn View LF, UT

Description: LF Access Rd

Solve For Depth

Given Constant Data;

Bottom Width.....	0.00
Z-Left.....	2.00
Z-Right.....	2.00
Channel Slope.....	0.0600

ıble Input Data	Minimum	Maximum	Increment By
ıings 'n'	0.015	0.020	0.005
ınel Discharge	1.00	10.00	1.00

PERIMETER BENCH

DRAINAGE DITCH

RIABLE ottom dth t	Z-Left (H:V)	Z-Right (H:V)	VARIABLE Mannings 'n'	VARIABLE Channel Slope ft/ft	COMPUTED Channel Depth ft	VARIABLE Channel Discharge cfs	COMPUTED Velocity fps
.00	2.00	2.00	0.020	0.0050	0.98	10.00	3.47
.00	2.00	2.00	0.020	0.0050	0.81	10.00	3.41
.00	2.00	2.00	0.025	0.0050	1.08	10.00	2.94
.00	2.00	2.00	0.025	0.0050	0.91	10.00	2.89
.00	2.00	2.00	0.020	0.0100	0.83	10.00	4.49
.00	2.00	2.00	0.020	0.0100	0.68	10.00	4.38
.00	2.00	2.00	0.025	0.0100	0.92	10.00	3.81
.00	2.00	2.00	0.025	0.0100	0.76	10.00	3.73
.00	2.00	2.00	0.020	0.0150	0.76	10.00	5.23
.00	2.00	2.00	0.020	0.0150	0.61	10.00	5.07
.00	2.00	2.00	0.025	0.0150	0.84	10.00	4.43
.00	2.00	2.00	0.025	0.0150	0.69	10.00	4.32
.00	2.00	2.00	0.020	0.0200	0.71	10.00	5.82
.00	2.00	2.00	0.020	0.0200	0.57	10.00	5.63
.00	2.00	2.00	0.025	0.0200	0.79	10.00	4.93
.00	2.00	2.00	0.025	0.0200	0.64	10.00	4.79
.00	2.00	2.00	0.020	0.0050	1.06	12.00	3.64
.00	2.00	2.00	0.020	0.0050	0.89	12.00	3.58
.00	2.00	2.00	0.025	0.0050	1.17	12.00	3.08
.00	2.00	2.00	0.025	0.0050	0.99	12.00	3.04
.00	2.00	2.00	0.020	0.0100	0.91	12.00	4.71
.00	2.00	2.00	0.020	0.0100	0.75	12.00	4.61
.00	2.00	2.00	0.025	0.0100	1.00	12.00	3.99
.00	2.00	2.00	0.025	0.0100	0.84	12.00	3.91
.00	2.00	2.00	0.020	0.0150	0.83	12.00	5.48
.00	2.00	2.00	0.020	0.0150	0.67	12.00	5.34
.00	2.00	2.00	0.025	0.0150	0.91	12.00	4.64
.00	2.00	2.00	0.025	0.0150	0.75	12.00	4.54
.00	2.00	2.00	0.020	0.0200	0.77	12.00	6.09
.00	2.00	2.00	0.020	0.0200	0.62	12.00	5.92
.00	2.00	2.00	0.025	0.0200	0.86	12.00	5.16
.00	2.00	2.00	0.025	0.0200	0.70	12.00	5.04
.00	2.00	2.00	0.020	0.0050	1.13	14.00	3.78
.00	2.00	2.00	0.020	0.0050	0.96	14.00	3.73
.00	2.00	2.00	0.025	0.0050	1.25	14.00	3.20
.00	2.00	2.00	0.025	0.0050	1.07	14.00	3.16
.00	2.00	2.00	0.020	0.0100	0.97	14.00	4.90
.00	2.00	2.00	0.020	0.0100	0.81	14.00	4.80
.00	2.00	2.00	0.025	0.0100	1.07	14.00	4.14
.00	2.00	2.00	0.025	0.0100	0.90	14.00	4.08

\RIABLE			VARIABLE	VARIABLE	COMPUTED	VARIABLE	COMPUTED
ɔttom idth ft	Z-Left (H:V)	Z-Right (H:V)	Mannings 'n'	Channel Slope ft/ft	Channel Depth ft	Channel Discharge cfs	Velocity fps
.00	2.00	2.00	0.020	0.0050	1.33	20.00	4.14
.00	2.00	2.00	0.020	0.0050	1.14	20.00	4.09
.00	2.00	2.00	0.025	0.0050	1.46	20.00	3.50
.00	2.00	2.00	0.025	0.0050	1.27	20.00	3.47
.00	2.00	2.00	0.020	0.0100	1.14	20.00	5.36
.00	2.00	2.00	0.020	0.0100	0.96	20.00	5.28
.00	2.00	2.00	0.025	0.0100	1.26	20.00	4.54
.00	2.00	2.00	0.025	0.0100	1.07	20.00	4.48
.00	2.00	2.00	0.020	0.0150	1.04	20.00	6.24
.00	2.00	2.00	0.020	0.0150	0.87	20.00	6.13
.00	2.00	2.00	0.025	0.0150	1.15	20.00	5.28
.00	2.00	2.00	0.025	0.0150	0.97	20.00	5.21
.00	2.00	2.00	0.020	0.0200	0.98	20.00	6.94
.00	2.00	2.00	0.020	0.0200	0.81	20.00	6.81
.00	2.00	2.00	0.025	0.0200	1.08	20.00	5.88
.00	2.00	2.00	0.025	0.0200	0.91	20.00	5.79
.00	2.00	2.00	0.020	0.0050	1.38	22.00	4.24
.00	2.00	2.00	0.020	0.0050	1.19	22.00	4.20
.00	2.00	2.00	0.025	0.0050	1.52	22.00	3.58
.00	2.00	2.00	0.025	0.0050	1.33	22.00	3.56
.00	2.00	2.00	0.020	0.0100	1.19	22.00	5.49
.00	2.00	2.00	0.020	0.0100	1.01	22.00	5.42
.00	2.00	2.00	0.025	0.0100	1.31	22.00	4.65
.00	2.00	2.00	0.025	0.0100	1.13	22.00	4.60
.00	2.00	2.00	0.020	0.0150	1.09	22.00	6.39
.00	2.00	2.00	0.020	0.0150	0.91	22.00	6.29
.00	2.00	2.00	0.025	0.0150	1.20	22.00	5.41
.00	2.00	2.00	0.025	0.0150	1.02	22.00	5.34
.00	2.00	2.00	0.020	0.0200	1.02	22.00	7.11
.00	2.00	2.00	0.020	0.0200	0.85	22.00	6.99
.00	2.00	2.00	0.025	0.0200	1.12	22.00	6.02
.00	2.00	2.00	0.025	0.0200	0.95	22.00	5.93
.00	2.00	2.00	0.020	0.0050	1.43	24.00	4.33
.00	2.00	2.00	0.020	0.0050	1.25	24.00	4.29
.00	2.00	2.00	0.025	0.0050	1.58	24.00	3.66
.00	2.00	2.00	0.025	0.0050	1.38	24.00	3.64
.00	2.00	2.00	0.020	0.0100	1.23	24.00	5.61
.00	2.00	2.00	0.020	0.0100	1.05	24.00	5.55
.00	2.00	2.00	0.025	0.0100	1.36	24.00	4.75
.00	2.00	2.00	0.025	0.0100	1.17	24.00	4.70

RIABLE			VARIABLE	VARIABLE	COMPUTED	VARIABLE	COMPUTED
ttom dth t	Z-Left (H:V)	Z-Right (H:V)	Mannings 'n'	Channel Slope ft/ft	Channel Depth ft	Channel Discharge cfs	Velocity fps
00	2.00	2.00	0.020	0.0050	1.58	30.00	4.58
00	2.00	2.00	0.020	0.0050	1.38	30.00	4.55
00	2.00	2.00	0.025	0.0050	1.73	30.00	3.87
00	2.00	2.00	0.025	0.0050	1.54	30.00	3.85
00	2.00	2.00	0.020	0.0100	1.36	30.00	5.94
00	2.00	2.00	0.020	0.0100	1.17	30.00	5.88
.00	2.00	2.00	0.025	0.0100	1.50	30.00	5.02
.00	2.00	2.00	0.025	0.0100	1.31	30.00	4.98
.00	2.00	2.00	0.020	0.0150	1.24	30.00	6.91
.00	2.00	2.00	0.020	0.0150	1.06	30.00	6.83
.00	2.00	2.00	0.025	0.0150	1.37	30.00	5.85
.00	2.00	2.00	0.025	0.0150	1.19	30.00	5.79
.00	2.00	2.00	0.020	0.0200	1.17	30.00	7.69
.00	2.00	2.00	0.020	0.0200	0.99	30.00	7.59
.00	2.00	2.00	0.025	0.0200	1.29	30.00	6.51
.00	2.00	2.00	0.025	0.0200	1.11	30.00	6.44

Circular Channel Analysis & Design
Solved with Manning's Equation

Open Channel - Uniform flow

Worksheet Name: Mt View LF, UT

Description: Crossdrain/Downdrain

Solve For Actual Depth

Given Constant Data;

Diameter.....	1.00
Mannings n.....	0.024

ıble Input Data	Minimum	Maximum	Increment By
):harge	0.0500 1.00	0.1000 5.00	0.0100 1.00

Circular Channel Analysis & Design
Solved with Manning's Equation

Open Channel - Uniform flow

Worksheet Name: Mtn View LF, UT

Description: Crossdrain/Downdrain

Solve For Actual Depth

Given Constant Data;

Diameter.....	1.50
Mannings n.....	0.024

able Input Data	Minimum	Maximum	Increment By
pe	0.0500	0.0800	0.0100
charge	5.00	20.00	1.00

ameter ft	VARIABLE Channel Slope ft/ft	Mannings 'n'	VARIABLE Discharge cfs	COMPUTED Depth ft	COMPUTED Velocity fps	COMPUTED Capacity Full cfs
Unable to compute this instance.						
Unable to compute this instance.						
1.50	0.0700	0.024	15.00	1.22	9.71	15.05
1.50	0.0800	0.024	15.00	1.15	10.35	16.09
Unable to compute this instance.						
Unable to compute this instance.						
1.50	0.0700	0.024	16.00	1.34	9.60	15.05
1.50	0.0800	0.024	16.00	1.22	10.38	16.09
Unable to compute this instance.						
Unable to compute this instance.						
Unable to compute this instance.						
1.50	0.0800	0.024	17.00	1.32	10.29	16.09
Unable to compute this instance.						
Unable to compute this instance.						
Unable to compute this instance.						
Unable to compute this instance.						
Unable to compute this instance.						
Unable to compute this instance.						
Unable to compute this instance.						
Unable to compute this instance.						
Unable to compute this instance.						
Unable to compute this instance.						
Unable to compute this instance.						

ameter ft	VARIABLE Channel Slope ft/ft	Mannings 'n'	VARIABLE Discharge cfs	COMPUTED Depth ft	COMPUTED Velocity fps	COMPUTED Capacity Full cfs
2.00	0.0500	0.024	15.00	1.06	8.92	27.40
2.00	0.0600	0.024	15.00	1.00	9.55	30.02
2.00	0.0700	0.024	15.00	0.96	10.12	32.42
2.00	0.0800	0.024	15.00	0.92	10.63	34.66
2.00	0.0500	0.024	16.00	1.10	9.06	27.40
2.00	0.0600	0.024	16.00	1.04	9.71	30.02
2.00	0.0700	0.024	16.00	0.99	10.29	32.42
2.00	0.0800	0.024	16.00	0.95	10.81	34.66
2.00	0.0500	0.024	17.00	1.14	9.19	27.40
2.00	0.0600	0.024	17.00	1.08	9.85	30.02
2.00	0.0700	0.024	17.00	1.03	10.44	32.42
2.00	0.0800	0.024	17.00	0.99	10.98	34.66
2.00	0.0500	0.024	18.00	1.18	9.31	27.40
2.00	0.0600	0.024	18.00	1.12	9.99	30.02
2.00	0.0700	0.024	18.00	1.06	10.59	32.42
2.00	0.0800	0.024	18.00	1.02	11.14	34.66
2.00	0.0500	0.024	19.00	1.23	9.42	27.40
2.00	0.0600	0.024	19.00	1.15	10.11	30.02
2.00	0.0700	0.024	19.00	1.10	10.73	32.42
2.00	0.0800	0.024	19.00	1.06	11.29	34.66
2.00	0.0500	0.024	20.00	1.27	9.52	27.40
2.00	0.0600	0.024	20.00	1.19	10.23	30.02
2.00	0.0700	0.024	20.00	1.14	10.86	32.42
2.00	0.0800	0.024	20.00	1.09	11.43	34.66
2.00	0.0500	0.024	21.00	1.31	9.61	27.40
2.00	0.0600	0.024	21.00	1.23	10.34	30.02
2.00	0.0700	0.024	21.00	1.17	10.98	32.42
2.00	0.0800	0.024	21.00	1.12	11.56	34.66
2.00	0.0500	0.024	22.00	1.36	9.70	27.40
2.00	0.0600	0.024	22.00	1.27	10.44	30.02
2.00	0.0700	0.024	22.00	1.21	11.09	32.42
2.00	0.0800	0.024	22.00	1.16	11.68	34.66
2.00	0.0500	0.024	23.00	1.40	9.77	27.40
2.00	0.0600	0.024	23.00	1.31	10.53	30.02
2.00	0.0700	0.024	23.00	1.24	11.20	32.42
2.00	0.0800	0.024	23.00	1.19	11.80	34.66
2.00	0.0500	0.024	24.00	1.45	9.83	27.40
2.00	0.0600	0.024	24.00	1.35	10.61	30.02
2.00	0.0700	0.024	24.00	1.28	11.30	32.42
2.00	0.0800	0.024	24.00	1.22	11.91	34.66

Circular Channel Analysis & Design
Solved with Manning's Equation

Open Channel - Uniform flow

Worksheet Name: Mtn View LF, UT

Description: Crossdrain/Downdrain

Solve For Actual Depth

Given Constant Data;

Diameter.....	2.50
Mannings n.....	0.024

able Input Data	Minimum	Maximum	Increment By
==========	=======	=======	==========
pe	0.0500	0.0800	0.0100
charge	25.00	40.00	1.00

APPENDIX D

MOUNTAIN VIEW LANDFILL

LOAD INSPECTION PROGRAM

November 2010

Prepared by:
Mountain View Landfill
6976 West California Avenue
Salt Lake City, Utah 84104

I hereby certify that I have reviewed this material and attest that this report has been prepared in accordance with good engineering practices.

Engineer:	**Mark W. Franc**
Signature:	
Registration Number:	**178236-2202**
Date:	**November 29, 2010**

REGISTERED PROFESSIONAL ENGINEER
No. 178236
MARK W. FRANC
STATE OF UTAH
11/29/10

TABLE OF CONTENTS

LOAD INSPECTION PROGRAM

The purpose of the load inspection program is to detect prohibited wastes and discourage attempts to dispose of them at the landfill.

1.0 Customer Notification

A key component of the load inspection program is the notification of customers that certain wastes are unacceptable for disposal at the landfill. Customers will also be notified that they retain responsibility for any prohibited wastes detected in their load. This notification process is accomplished through the use of signs and notices.

A sign will be posted near the entrance of the landfill. The sign will list wastes that are prohibited and also state that a random load inspection program is in place.

Notices with a list of prohibited wastes will be periodically distributed at the gate house as a result of regulatory change.

2.0 Procedures at the Gatehouse

The initial step in the inspection program is to review incoming loads at the gate house. The gatehouse staff will observe incoming loads for any indication of the presence of prohibited wastes. Should the staff encounter suspicious-looking loads, they will summon appropriate landfill personnel for further evaluation of the load. If prohibited wastes are identified during inspection of a load, the prohibited portion will be rejected and not allowed into the disposal area or the entire load will be rejected.

3.0 Random Load Inspection Procedures

The major elements of load inspections are:

- Adequate visual waste examination
- Flag suspicious wastes
- Evaluate waste types
- Maintain proper records

Loads to be inspected will be selected at random. 1% of loads received will be inspected for a minimum of one per week..

The Landfill manager or designee will designate and train an inspector who will be responsible for conducting random load inspections. Back-up personnel will also be trained.

A load to be inspected will be selected at random and the driver will be notified at the working face.

The driver will be instructed to pull forward while discharging the wastes into a windrow. They will, as necessary, tear down the windrow using a shovel or heavy equipment. The material will be carefully observed for any prohibited wastes.

During the inspection, the load inspector will complete a load Inspection Report (Attachment 1.0).

4.0 Identifying Prohibited Wastes

The load inspector will use a variety of methods to detect prohibited wastes including:

- Questioning the driver about the source of the load.
- Examining materials for excluded wastes.
- Searching for special items that have a high probability of containing prohibited wastes such as:

  ⇒ transformers
  ⇒ batteries
  ⇒ filters
  ⇒ compressors (freon)
  ⇒ mechanical equipment (capacitors)
  ⇒ red bags (medical waste)
  ⇒ bags that may contain asbestos

- obvious prohibited wastes such as municipal solid waste.

5.0 Safety

Load inspectors are provided with the following safety equipment:

- Eye protection (safety glasses or goggles)
- Safety boots (steel toe and steel shank)
- Gloves
- Coveralls (if necessary)
- Approved Safety vest
- Hard hat

First aid facilities are readily available. Emergency eyewash are also available.

6.0 Managing Prohibited Wastes

The result of the load inspection will identify wastes as:

- Acceptable
- Prohibited

Acceptable waste can be moved from the inspection area to the active face. The area should be cleaned to the extent that materials from this inspection do not impact the next load to be inspected.

Unknown wastes that are still waiting pick up need to be properly segregated and protected. This means that the waste(s) must be:

- Protected against the elements, rain, wind, etc.
- Secured against unauthorized removal.
- Isolated from other waste activities.

At the Landfill Manager's discretion, unknown wastes may be rejected and removed by the hauler.

Prohibited Wastes detected during the inspection should be returned immediately to the hauler. A Salt Lake City-County Health Department Rejected Waste Shipment Form will be completed and filed for future reference. If the hauler or generator is not available, the wastes will be safely stored for later disposal. The Salt Lake Valley Health Department will be notified immediately in writing (along with the Utah Department of Environmental Quality as necessary) with the Load Rejection Report of waste not accepted at the site. A copy of the report will also be given to the transporter.

7.0 Training

Load inspectors, site managers, equipment operators, and gatehouse staff are trained in the contents of this plan. Training will address the following topics:

- Customer notification and load inspection procedures.
- Identification of hazardous wastes, PCB wastes, MSW, and other prohibited solid wastes.
- Waste handling procedures (acceptable and prohibited wastes).
- Health and safety.
- Record keeping.

Documentation of training will be placed in the landfill's operating record.

8.0 Record Keeping

The following records will be maintained at the landfill:

- Load Inspection Reports.
- Load Rejection Reports.
- Training records.

Load inspection reports will be completed for each load that is inspected. All information on the attached load inspection report will be provided.

Records documenting the successful completion of training will be maintained. Training session records will identify (1) the topics covered, (2) the date of the training session, (3) instructor's name/title, (4) employees signatures.

ATTACHMENT 1

LOAD INSPECTION REPORT

FORM

MOUNTAIN VIEW LANDFILL

Load Inspection Report

Date and Time of Inspection _____

Inspector's Name _____

Name of Hauling Company _____

Driver's name _____ Vehicle License Number _____

Type of Vehicle _____ (i.e., Roll-off, Frontloader, Dump truck)

Size of Load, yards _____ Sources of Wastes _____

Content of Load _____

Inspection Results

Were any of the following Prohibited wastes identified: Hazardous Waste, Batteries, Oil, Ash, Soils with unusual smell or colors, excessive heat or smoke, Medical Waste,

_____

_____

_____

Driver Signature:_____

Load Inspector Signature:_____