- FINAL -

REGULATORY COMPLIANCE AUDIT REPORT

Sunrise Mountain Landfill

Las Vegas, Nevada

ASI Project Manager James D. Shaffer
James D. Shaffer

728

PREFACE

Regulatory Compliance Audits

A regulatory compliance audit of a solid waste landfill consists of an examination based on the requirements of Federal regulations 40 CFR Parts 241 and 257, proposed Federal regulations 40 CFR Part 258, and existing State regulations. Conduct of a regulatory compliance audit includes a review of landfill case file records, supporting documents, and landfill operating practices; interviews with individuals familiar with the operation of the landfill; identification of site conditions; a visual inspection of the facility; and a determination of whether or not hazardous wastes have been or are being disposed of in excess of amounts normally found in household wastes.

TABLE OF CONTENTS

TABLE OF CONTENTS *(Continued)*

LIST OF TABLES

LIST OF FIGURES

EXECUTIVE SUMMARY

A regulatory compliance audit of Sunrise Mountain, Nevada, Landfill was conducted by Advanced Sciences, Incorporated (ASI) during April 2-4, 1990. The audit was authorized by the U.S. Department of the Interior, Bureau of Land Management (BLM) under Contract No. AA852-CT9-35. Sunrise Mountain Landfill is located on public lands administered by BLM. The landfill property is leased to Clark County under the provisions of the Recreation and Public Purposes (R&PP) Act. The purpose of this audit was to determine the degree to which the landfill's design, construction, and operation complies with current and proposed Federal and State solid waste regulations.

The audit conducted at Sunrise Mountain Landfill encompassed the following on-site and off-site activities:

- Reviewing BLM Case File No. NV-046208;
- Reviewing Clark County, Nevada Health District files;
- Conducting investigative interviews with BLM personnel; lessee, Clark County, Nevada Public Works Department; and operator, Silver State Disposal Service; and
- Performing a field inspection of Sunrise Mountain Landfill.

Sunrise Mountain Landfill is a municipal solid waste disposal facility located in Clark County, Nevada, and it is approximately two miles east of the Las Vegas city limits. The landfill property has been leased by Clark County since May 21, 1962. The facility, an area method operation, is operated by Silver State Disposal Service with a Clark County Health District permit.

The landfill is located in the Las Vegas Valley of southern Nevada. The site is located in a canyon two miles east of the Las Vegas city limits. Climate in this region is arid, with less than five inches of annual rainfall. Soils are 20 to 50 feet in thickness, and are composed of cobbles, gravels, sands, silts, clays, gypsite and gypsum. The site contains no unusual biological features or surface water, and is not known to have adversely affected local groundwater. A fault (not

exposed) is located in the bedrock beneath the site, and the site is located in a seismic impact zone.

Based upon the findings of climatological conditions; site accessibility; slope; distance to the nearest airport, with respect to the potential for bird hazards to aircraft; location, with respect to watercourses, floodplains, wetlands, seismic impact zones, mapped geologic faults, and endangered species and their critical habitats, the Sunrise Mountain solid waste landfill site appears to be an environmentally suitable location for landfill operations.

The performance of the regulatory compliance audit at Sunrise Mountain Landfill resulted in the identification of two noncompliant findings pertaining to Design and Construction Criteria and one noncompliant finding within the scope of Operating Criteria. All findings represent items which are in potential noncompliance with the regulations currently proposed under 40 CFR Part 258 that are not duplicated by existing State or Federal regulations. Table 1 summarizes the noncompliant items and their corresponding preliminary cost estimates.

The findings presented in Table 1 do not represent any noncompliances with State of Nevada or or Clark County Health District solid waste regulations. Current facility design and operation plans specifically and adequately address all requirements of 40 CFR Part 241. There are also no noncompliances related to the requirements of 40 CFR Part 257.

Under proposed 40 CFR Part 258, potential items of noncompliance include the lack of a groundwater monitoring program, lack of a financial assurance mechanism, and lack of methane monitoring.

The current design and operations plan specifies groundwater sampling. However, current landfill operations do not include this specified sampling. In addition, the specified groundwater monitoring procedures are not sufficient to meet the requirements of proposed 40 CFR 258.53 and 258.54.

Financial assurance for the closure of the Sunrise Mountain Landfill is available, but is not documented in accordance with the requirements of proposed 40 CFR 258.32.

Table 1. Summary of Findings - Sunrise Mountain Landfill, Nevada (Design and Construction Criteria)

FINDING TITLE (FINDING NUMBER)	REGULATORY CITATION OF NONCOMPLIANCE					PRELIMINARY COST ESTIMATE	
	Federal Regulatory Criteria			State Regulatory Criteria	Permit	One-Time Cost	Annual Cost
	40 CFR Part 241	40 CFR Part 257	Proposed 40 CFR Part 258				
Inadequate Groundwater Monitoring Program (NV 046208-1)	--	--	258.53 and 54	--	--	$ 3,000*	$ 2,585*
Lack of Financial Assurance Mechanism (NV-046208-2)	--	--	258.32	--	--	$ 2,200*	None

* Cost to be incurred with the passage of proposed 40 CFR Part 258.

-- = Not Applicable

Table 1. Summary of Findings - Sunrise Mountain Landfill, Nevada
(Operating Criteria)

FINDING TITLE (FINDING NUMBER)	REGULATORY CITATION OF NONCOMPLIANCE					PRELIMINARY COST ESTIMATE	
	Federal Regulatory Criteria			State Regulatory Criteria	Permit	One-Time Cost	Annual Cost
	40 CFR Part 241	40 CFR Part 257	*Proposed* 40 CFR Part 258				
Lack of Groundwater Monitoring (NV-046208-3)	--	--	258.23(b)	--	--	$ 650*	$ 256*
TOTAL				Total cost to comply with current regulations:		$ 0	$ 0
				Additional cost to comply with proposed 40 CFR Part 258:		$ 5,850	$2,841
				Contingency (20%):		$ 1,170	$ 568
				Grand Total:		$ 7,020	$3,409

* Cost to be incurred with the passage of proposed 40 CFR Part 258.

-- = Not Applicable

Current facility design and operation plans evaluate the potential for explosive gas generation and include specification of monthly monitoring. However, current landfill operations do not include performing of this monitoring as specifically required by 40 CFR Part 258.

The following corrective actions will be required to achieve compliance with the regulations proposed under 40 CFR Part 258.

- Establishing a groundwater monitoring program and providing operational support to implement such a program;
- Documenting a financial assurance mechanism and closure cost estimate; and
- Performing explosive gas monitoring as specified in the current facility design/operation plans.

The one-time and annual preliminary cost estimates for corrective action related to findings of noncompliance with the applicable regulations are $5,850 and $2,841, respectively. Detailed information regarding items of regulatory noncompliance and preliminary cost estimates is provided in Section 3.2 of this report. Summaries of this information are provided in Tables 1 and 2.

Examination of the site, records available to the auditor, and the results of the interviews do not indicate that hazardous wastes, regulated under subtitle C of the Resource Conservation and Recovery Act (RCRA), have been disposed of at the site.

1.0 INTRODUCTION

1.1 Program Purpose, Scope, and Objectives

Under Contract No. AA852-CT9-35, ASI has been retained by BLM to conduct regulatory compliance audits of approximately 220 community solid waste disposal facilities located on public lands. These solid waste disposal facilities have been authorized in accordance with the R&PP Act, as amended. It is the purpose of the audits to collect the data necessary for BLM to determine each facility's degree of compliance with Federal regulations promulgated under subtitle D of RCRA, as amended, and with applicable State regulations. These audits will assist in the identification of facilities that have compliance problems with existing regulations, and those that do not comply with currently proposed regulations. In addition, the audit program will assist in identifying facilities which may have received hazardous wastes in an amount or manner other than that normally associated with household solid waste.

This audit report summarizes audit procedures, site background information, findings, and conclusions, as well as corrective action recommendations including preliminary cost estimates resulting from the regulatory compliance audit conducted at Sunrise Mountain Landfill, located near Las Vegas, Nevada, BLM Case File No. NV-046208 (Figure 1).

The recommendations and conclusions presented in this report are based on the following: 1) visually observing the facility; 2) reviewing background documents, as provided by both BLM and the responsible regulatory agencies; 3) interviewing individuals familiar with the operation of the site; and 4) reviewing operational practices at the time of the site audit, and reviewing written operating procedures (as available). The findings of regulatory noncompliance are based on:

- 40 CFR Part 241 - Guidelines for the Land Disposal of Solid Wastes;
- 40 CFR Part 257 - Criteria for Classification of Solid Waste Disposal Facilities and Practices;
- Proposed 40 CFR Part 258 - Criteria for Municipal Solid Waste Landfills;
- Nevada Administrative Code (NAC) 444.570 through 444.748 - Nevada Solid Waste Disposal Regulations, Department of Conservation and Natural Resources, Division of Environmental Protection (1977); and

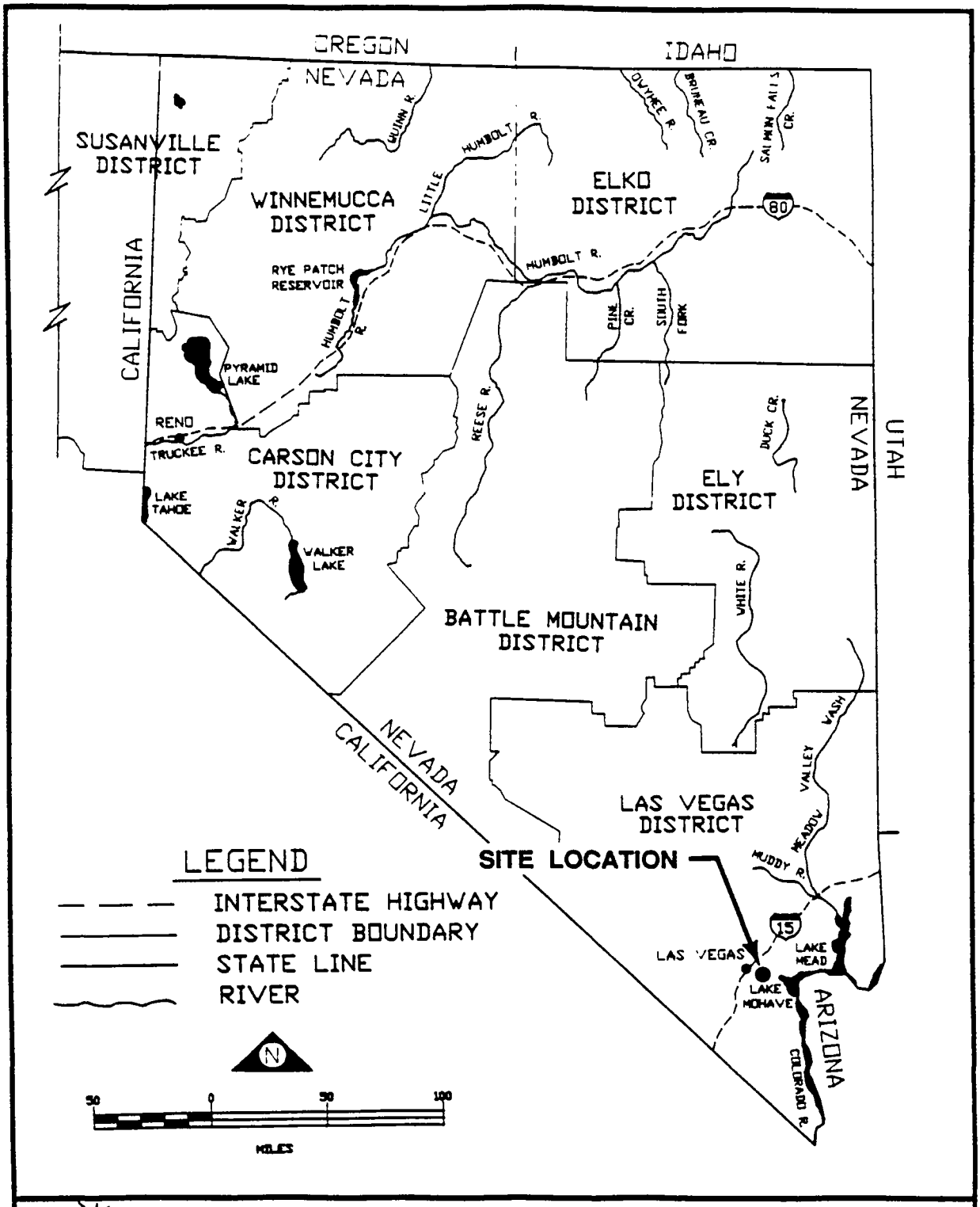

FIGURE 1: GENERAL LOCATION OF SUNRISE MOUNTAIN LANDFILL

SOURCE: RECREATION GUIDE TO BLM PUBLIC LANDS, 1988

002552

002552

- District Board of Health of Clark County - Regulations Governing Solid Waste Disposal Sites and Facilities, 1970.

Environmental sampling and testing of material on or within the property is not within the scope of this contract and was not conducted during the audit.

1.2 Pre-Inspection Activities

On March 7, 1990, Don Hudson and Ben Foard, the ASI primary and secondary auditors, respectively, for the Sunrise Mountain Landfill, initiated correspondence with the BLM Las Vegas District Office in Las Vegas, Nevada and with the Clark County Health District. On March 7, 1990, the ASI secondary auditor established telephone communication with Jerry Wickstrom, the BLM project inspector of the BLM Stateline Resource Area Office. On this same date, C.A. Schmutz, Senior Supervisor of Sanitation of the Clark County Health District was contacted. A brief overview of the upcoming Sunrise Mountain Landfill audit was provided to both parties. Tentative audit dates of April 3 and 4, 1990 were established with the BLM project inspector. The BLM project inspector agreed to contact the lessee, Clark County to schedule an interview for the same dates. Background information for the subject site was briefly reviewed during these conversations. The ASI auditor requested a copy of the BLM Land Status Assessment (LSA) for Sunrise Mountain Landfill. In addition, the Senior Supervisor of Sanitation, of the Clark County Health District was asked to supply 1) a copy of the facility's operating permit; 2) a copy of any violation notice arising as a result of the facility's operations; and 3) a copy of any available inspection reports. No LSA for the landfill has been prepared, and all Sunrise Mountain Landfill case file information was reviewed prior to conduct of the regulatory compliance audit when the ASI auditors arrived at the Las Vegas District Office on April 3, 1990 and conducted a personal interview with Jerry Wickstrom. Information requested from the Clark County Health District was received by mail prior to the audit, and additional information was also reviewed prior to the regulatory compliance audit in a personal interview with C.A. Schmutz and V.H. Uechert in the Health District offices on April 2, 1990.

On April 4, 1990, the ASI auditors arrived at the BLM Las Vegas District Office in Las Vegas, Nevada, to conduct a pre-audit briefing for all interested BLM personnel. Those BLM

representatives in attendance were the BLM Project Inspector, Jerry Wickstrom, and two representatives of the lessee — Director Michael Pullen, Deputy, and Charles Jenner, Manager. Mr. Pullen and Mr. Jenner both are employed by the Clark County Department of Public Works, Environmental Control and Management Division. Topics of discussion included 1) an overview of the compliance checklists; 2) applicable regulations used for conduct of the audit; 3) the purpose of the landfill audit; 4) the lessee's potential sensitivity to any site-related issues; 5) any noteworthy site problems; and 6) ASI's site-specific health and safety plan.

On April 4, 1990, an interview was conducted with the Sunrise Mountain Landfill operator, Tom Isola, Vice President of Silver State Disposal Services, Inc. The BLM project inspector for the facility was also present. The appropriate regulations for conduct of the audit were reviewed, as were the regulatory checklists used during the audit.

The substance of the interview was based primarily on items contained in the Federal and State audit checklists. The following noncompliant items summarize the information obtained from the interview:

- A financial assurance mechanism is not documented for the landfill.
- Methane and groundwater monitoring are not conducted at the landfill.

1.3 On-Site Audit Activities

After arriving at Sunrise Mountain Landfill, a visual reconnaissance of the facility was conducted by the ASI auditors. A health and safety briefing was then held with the BLM project inspector. Following the briefing, ambient air conditions were monitored on the active and inactive portions of the facility. Organic vapor meter (OVM) readings, using an HNu Model PI-101, did not exceed 0.0 parts per million (ppm). Radiation readings taken with a Rad Alert Monitor 4 ranged from 0.0 to 0.04 milliroentgens per hour. These readings did not exceed the action limits established in the health and safety plan for this site.

The detailed field evaluation of the landfill continued, including an assessment of methods of operation, adequacy of cover, litter control, typical waste types, and drainage controls.

Subsequently, an interview was held with the landfill operator, Tom Isola and his staff, to complete unfinished portions of the checklists.

1.4 Post-Inspection Activities

A close-out meeting was conducted by the ASI auditors on April 4, 1990, after the completion of the facility audit, with seven BLM personnel in attendance including Ben Collins, Las Vegas District Manager. Topics of discussion included noncompliant items noted during conduct of the audit, specifics regarding the timeframe of the draft report preparation, and BLM's options for dealing with noncompliant items at the landfill.

2.0 FACILITY ENVIRONMENTAL PROFILE

2.1 Facility Description

The Sunrise Mountain Landfill is a municipal solid waste disposal facility located on public lands administered by the BLM Las Vegas District/ Stateline Resource Area office, Case File No. NV-046208. The site is located in Clark County, Nevada in the First Congressional District.

2.1.1 Facility Location

Sunrise Mountain Landfill is located approximately two miles east of the Las Vegas city limits at the terminus of Vegas Valley Drive. The facility is located within the area shown on the Frenchman Mountain and Las Vegas N.E. Quadrangles, Nevada, United States Geological Survey 7.5 Minute Series (USGS, 1983 and 1984). The original 320-acre parcel is more precisely located within:

Sections:	1, SE¼ and 12, NE¼
Township:	21 South
Range:	62 East
Base Meridian:	Mt. Diablo Meridian, Nevada
Latitude:	N 36° 08' 30"
Longitude:	W 115° 00' 00"

The additional 400-acre parcel added by lease amendment is identified as follows:

Sections:	12, E½ of NW¼ and S½
Township:	21 South
Range:	62 East
Base Meridian:	Mt. Diablo Meridian, Nevada
Latitude:	N 36° 07' 00"
Longitude:	W 115° 00' 30"

2.1.2 Environmental Information

2.1.2.1 Topography

The topography in the vicinity of Sunrise Mountain Landfill consists of an alluvial fan sloping moderately out of a steep canyon along the eastern slopes of Frenchman Mountain. The three to four percent slope is to the south and west (Figure 2). Maximum relief within the lease boundary of the landfill is approximately 608 feet, with elevations ranging from approximately 1,900 feet above mean sea level (MSL) to approximately 2,508 feet above MSL. Erosional features include drainage washes in the southwest area of the site that range in depth from 1 to 20 feet.

2.1.2.2 Land Use

According to the "Sunrise Mountain Landfill Expansion" report, land use in the area is as described below:

> "The undeveloped land surrounding the landfill lease area is also owned by BLM. The nearest residences are approximately 1½ miles to the southwest and northwest of the site. A concrete batch plant, the Sunrise Station Power Plant and the Clark County Wastewater Treatment Plant are located on Vegas Valley Drive approximately two miles west of the site. The area to the north and northwest of the site is BLM property designated as the 'Sunrise Mountain Natural Area'" (EMCON Associates, 1986).

Sunrise Mountain Landfill is located greater than 10,000 feet from a turbojet aircraft runway and over 5,000 feet from any other airport runway. Nellis Air Force Base and McCarran International Airport, the two main aircraft facilities in the area, are both more than five miles away from the site.

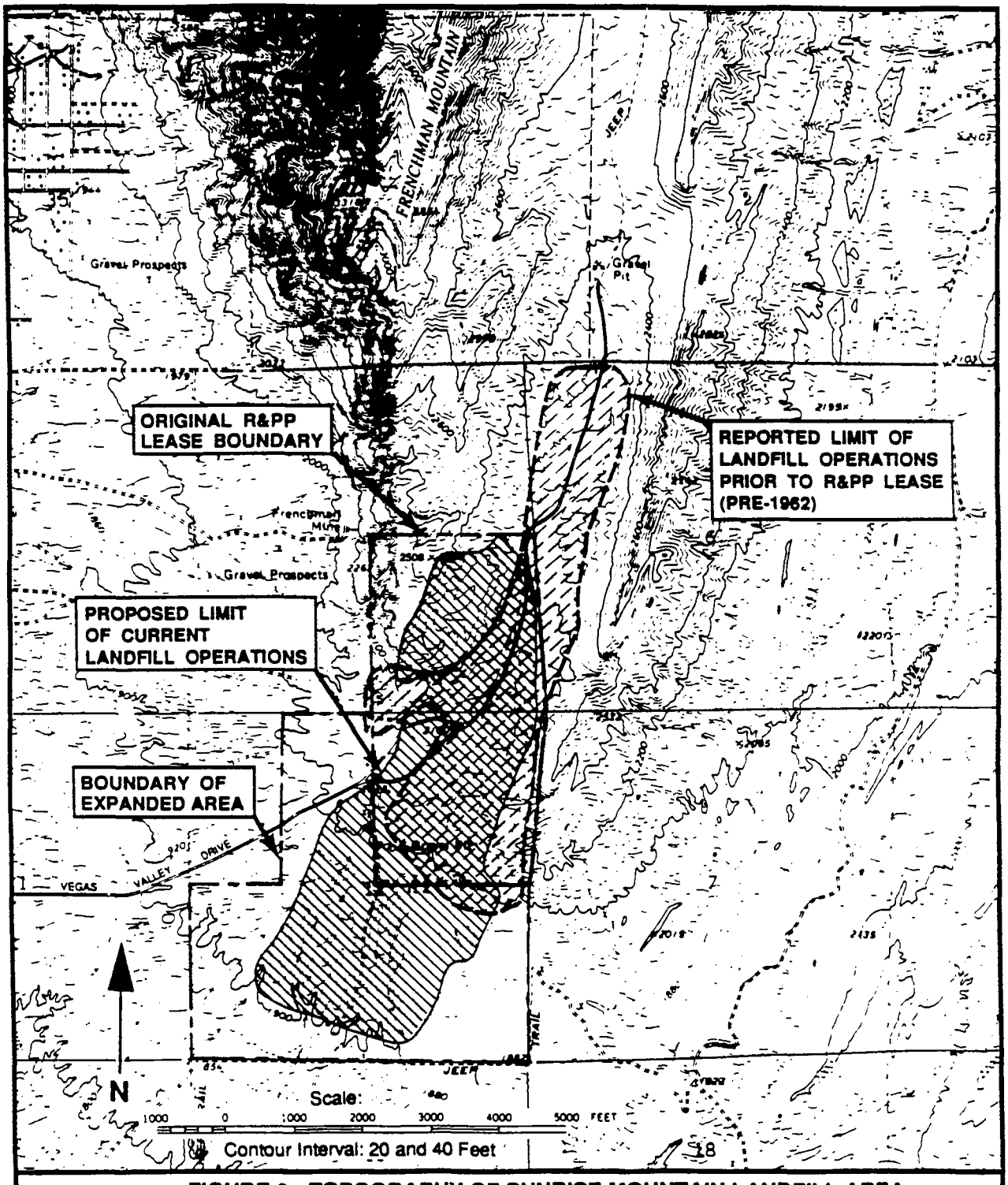

FIGURE 2: TOPOGRAPHY OF SUNRISE MOUNTAIN LANDFILL AREA
SECTIONS 1 and 2, TOWNSHIP 21S, RANGE 62E
CLARK COUNTY, NEVADA

SOURCE: USGS 7.5 MINUTE TOPOGRAPHIC QUADRANGLES, LAS VEGAS, 1984 AND FRENCHMAN MOUNTAIN, NEVADA, 1983

The Frenchman Mine, located near the northwest corner of the lease boundary, shipped small amounts of oxidized copper ores in the early part of the 1900's (Longwell et al, 1965). Small amounts of gravel have been produced in the vicinity.

2.1.2.3 Climate

The climate in the vicinity of Sunrise Mountain Landfill is arid. Average annual precipitation for the period 1933 to 1973 is reported to be less than five inches. These data were obtained from the Water Atlas of the United States (Geraghty, et al, 1973). Average annual pan evaporation (based on the period 1946-1955) is 69 inches (Geraghty, et al, 1973).

2.1.2.4 Biological Features

Biological features of the undisturbed area of the landfill site include plants and animals common to the desert environment of the southwestern United States. No ground-dwelling animals were noted to be present at the site, with seagulls from Lake Mead and black crows being the only animals noted to be present. Disturbed areas contain no vegetation other than sapling trees planted by the landfill operator.

The BLM case file for Sunrise Mountain Landfill contains documentation indicating that the site's potential impact on endangered species or impact on critical habitat is minimal. A land report for the site, prepared by BLM in 1985, states that there are no known threatened or endangered plant and animal species with the site area. Furthermore, this land report goes on to say that, "wildlife and small animal habitation would not be adversely affected by landfill operation" (BLM, 1985b). This statement is based on a BLM study that indicates that *Archtomecon california* (golden bear poppy) is located just outside the site area. According to habitat distribution maps, this species extends into the eastern portion of the site. However, no samples of this species have been found within the site area (BLM, 1984). The desert tortoise (Gopherus agassizii), a threatened species common to the southwest United States, was not identified on the site by any threatened/endangered species evaluation reviewed during this audit or in BLM Case file records.

No wetlands of any kind are evident on or near the Sunrise Mountain Landfill site, including any areas that could be considered a Jurisdictional Wetland as defined in the Federal Manual for Identifying and Delineating Jurisdictional Wetlands, (Interagency Cooperative Publication, 1989).

2.1.2.5 Surface Water

No perennial streams are located on or near Sunrise Mountain Landfill, as observed during the site inspection or as indicated on maps of the area (USGS, 1983 and 1984). Dry washes incise the hillslopes of the landfill and flow intermittently, only during heavy rainstorms. EMCON Associates, in its report "Sunrise Mountain Landfill Expansion," states that "due to the porous nature of the soils at the site, this flow would be expected to be absorbed within a very short distance" (EMCON Associates, 1986). For the landfill to discharge pollutants to a normally flowing body of surface water (Las Vegas Wash), pollutants would have to be washed across more than one mile of normally dry terrain.

Surface water control at the landfill consists of ditches, overside drains, inlets, earthfill berms, energy dissipation structures, cross drains, and sedimentation basins. The locations and design details of these facilities are shown on the landfill plan drawings. Drainage structure design is based on control of surface water flows resulting from a 100-year rainstorm event (EMCON Associates, 1986).

Floodplain information from the Federal Emergency Management Agency (FEMA) indicates that the site is not located within a 100-year floodplain (HUD, 1977).

2.1.2.6 Geology

Soils

Soils at the site which are used in landfill operations originate from deposits in the alluvial fan that spreads west and south from the mouth of the canyon to the east of Frenchman Mountain. This area contains sand and gravel derived from the erosional products of the uplifted sandstone, limestone and dolomite bedrock formations in the hills surrounding the site. A large proportion

of the alluvial material is fines, heavily cemented in some locations (BLM, 1959). The majority of the material ranges from gravelly sand to silty and clayey sand containing up to 30 percent silt and clay fines. Areas further to the south end of the site contain deposits of even finer grain — clay, and sand. Both the coarse and fine-grained soils in the lower areas of the site contain up to 40 percent gypsum (EMCON Associates, 1986).

The landfill site soil composition and soil classification have been determined by BLM geology specialists. Soils at the site are of the Goodsprings Series, being comprised of cobble, cobbley gravel, gravel, gravelly sand, sand, silt, silty clay, clayey silt, gypsite, and gypsum (BLM, 1984 and 1985a). These materials make up formations at the site which have been classified as follows: Alluvium, Frenchman Mountain Alluvial Gravel, Frenchman Mountain Pediment Gravel and Plio-Pleistocene Clayey Silt (BLM, 1985a).

Soil composition has been further investigated and the results documented in a report titled "Sunrise Mountain Landfill Expansion" (EMCON Associates, 1986). This investigation included laboratory testing to determine soil properties significant to the evaluation and design of landfill disposal sites. A summary of the soil properties and evaluation from the text of the EMCON report is provided below:

> "The majority of material can be excavated by conventional earthmoving equipment. The majority of material generated from excavations in the alluvium will range from gravelly sand to silty and clayey sand containing from 15 to 30 percent low plasticity silt and clay fines. This material is suitable for use as cover material. Maximum dry densities range from 120 to 130 pounds per cubic foot with optimum moisture contents ranging from 8 to 12 percent. The permeability of remolded samples ranges from 0.0001 to 0.00002 centimeters per second. The lower portion of the excavation will encounter finer grained deposits: claystone, siltstone and sandstone. These deposits are expected to have permeabilities several orders of magnitude lower than the overlying sands and gravels." (EMCON Associates, 1986).

No excessive erosion or slope failure was observed anywhere at the site during the facility inspection.

Stratigraphy

The EMCON report indicates that "the alluvial sediments (covering the landfill site below the slopes of Frenchman Mountain) consist of a 4-to 6-foot layer of loose gravelly material underlain by more consolidated gravel and cobbles in a silt and fine sand matrix to a depth of 20 to 50 feet (in most locations). These deposits are generally lightly cemented with carbonate and gypsum. Interlayered within these coarse - and fine - grained deposits are 5-to 10-foot-thick beds of tightly cemented sand and gravel" which are horizontally discontinuous. Beneath the sand and gravel matrix are fine-grained deposits of claystone, siltstone, and sandstone bedrock. These are part of a regional formation known as the Muddy Creek Formation (EMCON Associates, 1986).

Geologic Structure

Sunrise Mountain Landfill lies on the boundary between alluvial valley fill sediments of the Las Vegas Basin to the south, and the bedrock of Frenchman Mountain to the north. These two geologic areas are likely separated by a block fault, resulting in the rise of the underlying bedrock, which forms Frenchman Mountain (Figure 3). The northeastern portion of the landfill property, northeast of the fault, is underlain by sandstone and limestone/dolomite bedrock. The center portion of the upper canyon and lower eastern slopes of Frenchman Mountain are underlain by sandstone, while the upper side slopes are limestone. These sedimentary formations are believed to be of Permian age; some being older (BLM, 1959). Soil cover is very thin in these upper areas, typically less than a few feet. The sandstone and adjacent limestone are separated from 20- to 50-foot-thick alluvial deposits (to the south and west) by the fault along the base of Frenchman Mountain.

As indicated above, the landfill is located over a block fault which formed Frenchman Mountain. Although unknown, it is possible that this fault was active in the Holocene period. It is presently covered by at least 30 feet of alluvial sediment. No evidence is present which indicates that the

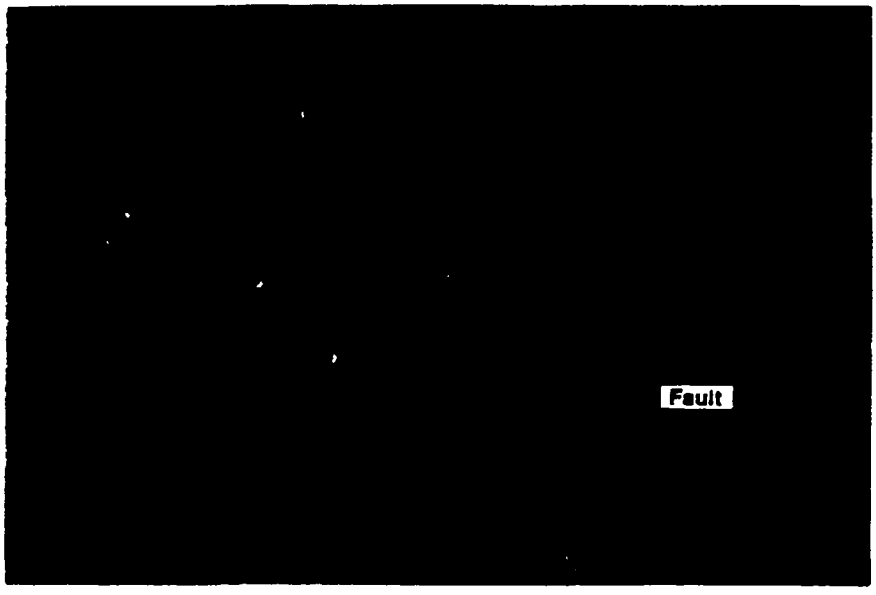

Figure 3. Aerial View of Sunrise Mountain Landfill (Looking North).

most recent Holocene alluvial deposits have been offset by the fault. The fault passes under the landfill site in an east-southeast to west-northwest direction, as shown in Figure 3. Several other fault traces can also be seen in Figure 3 in the general region east and north of the landfill. The geologic and hydrogeologic investigation performed by EMCON Associates indicates that the presence of the fault beneath the site is very unlikely to cause the landfill to have any detrimental environmental effects (EMCON Associates, 1986).

Seismicity

United States Geological Survey (USGS) Open-File Report No. 82-1033 summarizes seismic information for the continental United States. Plate 3 of this report indicates that, within a period of 250 years, Sunrise Mountain Landfill has greater than 10 percent probability of being impacted by an earthquake with a horizontal acceleration which exceeds 20 percent of the force of gravity. Therefore, as proposed in 40 CFR 258.14, Sunrise Mountain Landfill is located within a seismic impact zone.

Groundwater

A thorough hydrogeologic evaluation of the Sunrise Mountain Landfill site has been performed by EMCON Associates as part of the "Sunrise Mountain Landfill Expansion" study and report which provides design and evaluations as required (or recommended) for all sections of 40 CFR 241 pertaining to groundwater. Data for this hydrogeologic evaluation included information derived from existing geological data and ten exploratory soil borings. Additional data was also derived from drilling logs and sampling results from two existing wells in the lower areas of the landfill site (which were originally intended for exploring potential water sources for site operations). The wells are 200 and 600 feet deep, and extend into the Muddy Creek Formation, a regional water-bearing formation.

Conclusions made by the EMCON Associates evaluation indicate that groundwater is present in the upper sand and gravel layers at the landfill only as a result of infiltration from major rain storms. This water disappears quickly due to the underlying fine-grained layers. It is absorbed and returned to the surface through subsurface drainage channels. From there, it flows

downgradient until reabsorbed, or removed by evapotranspiration. During boring activities of the hydrogeological evaluation in the landfill expansion study, groundwater was encountered only in the form of moist pockets and layers to a depth of 110 feet, the maximum depth of any boring constructed (EMCON Associates, 1986).

The depth to groundwater in the bedrock beneath the upper site area is unknown, based on the evaluation done by EMCON Associates. However, it is estimated to be greater than 200 feet. Groundwater within the Muddy Creek Formation (which underlies the lower, active areas of the landfill site) is estimated to be at a depth of 125 feet (BLM, 1984). It is calculated to be moving slowly westward (1 to 10 feet per year) eventually discharging to the Las Vegas Wash, approximately 2 miles west of the landfill (EMCON Associates, 1986). Shallow groundwater found in the soils beneath the landfill is almost entirely related to the occurrence of heavy rain storms and is of short duration, due to the high evapotranspiration rate of the region. Sampling and analysis of total dissolved solids (TDS) in the water from the two wells mentioned above indicates that TDS averaged about 3,500 mg/l; this is typical of groundwater from the Muddy Creek Formation on the east side of the Las Vegas Valley where the landfill is located. Because of the high TDS values, few high-yield or drinking water wells are located in the eastern portion of the Las Vegas Valley. Most major pumping sites are located west of the city of Las Vegas which lies in the mid portion of the Las Vegas Valley. No water supply wells are located within two miles of the landfill site. If the groundwater beneath the site was suitable for drinking, the expansion study indicates that the groundwater would still most likely be unaffected by contaminants from the landfill. Leachate has not been observed at the site (due to dry conditions), and would have to move vertically through at least one hundred feet of soil and/or rock to reach the Muddy Creek Formation. The study further indicates that groundwater migration would be extremely slow. Travel times to the nearest water supply wells are calculated to be about 1,000 years. The EMCON Associates study concludes that groundwater contamination is very unlikely to occur as the result of landfill operations, but recommends that it is prudent to monitor water quality downgradient from the site, utilizing a program based on an initial analysis of a broad range of unspecified parameters and subsequent monitoring for specific, key parameters on an annual basis (EMCON Associates, 1986).

Sunrise Mountain Landfill is not located above a sole-source aquifer, according to the *Fact Sheet and Designated Aquifer List* (EPA, 1990).

2.2 Facility History

2.2.1 History of Owners, Lessees, and Operators

Before issuance of the current R&PP lease, the area which is now the Sunrise Mountain Landfill was utilized as a disposal site by the Southern Nevada Disposal Service Company under mining claims, and by Clark County under a Special Use Permit with BLM (NV-09352). The extent of these operations is believed to be within the area indicated in Figure 2 which includes some areas outside the current R&PP lease boundaries (EMCON Associates, 1986). The Southern Nevada Disposal Service Company mining claims were established on February 13, 1951 for two sections of land under the claim titles of Sanitation No. 1 and Sanitation No. 4. The Special Use Permit was issued to Clark County on July 3, 1952 for dumping use of the same lands. This permit expired on July 1, 1957; Clark County subsequently applied for access to the lands through the R&PP Act on November 12, 1957. The conflict between the mining claims and the Special Use Permit, and the subsequent R&PP Act application, was resolved by a validity determination performed and documented by a mining engineer, Earl Lovejoy (BLM, 1959). In his December 1, 1959 report, Mr. Lovejoy concluded that there was no quantity or quality of minerals present in the land to support mining operations. Therefore, acquisition of lands under the 1872 mining law for the purpose of non-mining use, such as dumping operations were invalid. There is no documentation in the Sunrise BLM case file NV-046208 regarding BLM action taken as the result of the validity determination, but Clark County was granted R&PP lease NV-046208 for the land on May 21, 1962. Another mining-claim-related issue arose when the lease amendment of 1985 provided for an additional 400 acres to be added to the landfill site, excluding approximately 80 acres within T. 21 S., R. 63 E., Sec. 6, NW 1/4. These lands represented a conflict with existing pre-1955 mining claims (BLM, 1985b).

Two lease agreements for the entire 720-acre landfill site area are currently in effect between BLM and Clark County (BLM, 1962). The initial 20-year lease agreement of May 21, 1962 (mentioned above as R&PP lease NV-046208) covers 320 acres of the landfill. This lease has

been extended until May 20, 2002. Per annum rental is $240. The amended portion of the lease for the 400-acre expansion is renewed every two years. Clark County has asked that it be allowed to purchase the entire 720-acre site. In response, BLM has revised the 1985 lease amendment to allow uninterrupted operation of the landfill until BLM policy on sale of the land is decided. The most recent documentation in the BLM case file NV-046208 includes a Renewal of Lease Amendment, effective May 21, 1990, for two years of continued use of the 400-acre expansion area at a rental rate of $180 per year (BLM, 1990).

2.2.2 History of Site Operations

The Sunrise Mountain area was used as an open dump for domestic solid waste from 1951 until 1970. No access controls were in effect at the site until 1970, when it became a sanitary landfill under State of Nevada classification. At that time, the State of Nevada Division of Environmental Protection (NDEP) granted Clark County Health District the authority to enforce approved solid waste disposal regulations. During the open dumping period prior to 1970, trash fires were common as a result of the disposal of unextinguished ashes placed in domestic trash. Burning as a means of trash disposal has not been practiced or allowed at this facility since its conversion to a landfill.

Starting in about 1975, Sunrise Mountain Landfill began accepting septic tank pumpings and wastewater treatment plant sludge in addition to the household and commercial solid waste already being accepted. All dewatered sludge from the Clark County Advanced Waste Water Treatment Plant was deposited at the active face of the landfill starting in 1982 (approximately seven million pounds of sludge per month) until completion of new sludge-handling facilities several years later (Bronken, 1983). Currently, only domestic septic tank pumpings are accepted at the facility and are treated in surface impoundments at the site until oxidized and dry before being mixed with soil and incorporated into the working face of the landfill.

In 1989, the Sunrise Mountain facility was permitted to stockpile and treat hydrocarbon-contaminated soils in a separate unit (NDEP, 1989). The soils may be subsequently incorporated into the landfill after contamination levels are reduced. Only soils containing hydrocarbon fuels or lubricants may be treated and disposed of at Sunrise Mountain Landfill. The soil is not

classified as a hazardous waste in Nevada and no hazardous waste treatment permit is required. Soils containing hazardous contaminants such as solvents or other hazardous compounds are not accepted. Testing must be done (by the parties wishing to dispose of the soils) prior to bringing soils to the landfill treatment facility. This serves to verify that no hazardous materials are present in the soils. Operating procedures and soil treatment unit provisions have been approved by the Clark County Health District (NDEP, 1989).

Operations at Sunrise Mountain Landfill facility have been expanded and approved by regulatory authorities to include acceptance of asbestos, dead animals, and medical wastes in addition to the domestic solid waste, septic tank pumpings, and the contaminated soil disposal units discussed above. This results in a total of six waste units currently in operation at the facility.

Closure and post-closure care activities have not been initiated at the site, since closure may be as far as 30 years in the future. Closure and post-closure is addressed in the current facility design/operations plan by stating that a post-closure maintenance program will be instituted to ensure that the landfill cover retains its structural integrity. Elements of the maintenance program are described in the current plans and will address cover integrity as well as leachate, groundwater, and gas monitoring. The plan also indicates that appropriate programs will be established based on information available on the final state of the landfill shortly before closure. Specific details and design for these programs is premature at this time, since much of the necessary information will not be available until within one to two years of closure. At that time, the specified post-closure maintenance program will be prepared and will include design details and specific program requirements (EMCON Associates, 1986).

No monitoring activities (e.g. for groundwater or explosive gases) are currently performed at the Sunrise Mountain Landfill. Specification of groundwater and methane monitoring is included in current landfill operations plans, but is not conducted by landfill operating staff.

No controls on the use of the facility (e.g. closures, timing, monitors) have been required by BLM, the operator, or any regulatory agency.

2.2.3 Regulatory History

Past BLM lease conditions that were part of the original 1962 R&PP lease are summarized below:

- Lessee to construct on the leased area within two years from the date of the lease such improvements as may be reasonably needed for the use of the lands for the purposes specified in this lease.
- Lessee to pay the lessor the yearly rental three years in advance during the continuance of this lease.
- Lessee will not allow the use of the lands for unlawful purposes, or for any purpose not specified in the lease unless consented to under its terms; nor to prohibit or restrict, directly or indirectly, the use of any part of the leased premises or any of the facilities thereon by any person because of such person's race, creed, color, or national origin.
- Lessee will not assign the lease or change the use of the land, without first receiving the consent of the authorized officer of the BLM.
- The lease may be terminated after due notice to the lessee upon a finding by the authorized officer of the BLM that the lessee has failed to use the leased lands for the purposes specified in the lease for a period of 2 consecutive years; or that all or part of the land is being devoted to some other use not consented to by the authorized officer; or whenever the lessee shall fail to pay the annual rental in advance or otherwise fail to comply with any provisions of the lease.
- Upon the termination of the lease by expiration or cancellation, the lessee shall surrender possession of the premises to the United States in good condition.
- Lessee must take such reasonable steps as may be needed to protect the surface of the leased area and the natural resources and improvements thereon.
- Lessee is not to cut timber on the leased area without the prior permission.

Present R&PP lease amendment stipulations and conditions are summarized below:

- Use of R&PP land for disposal of hazardous wastes is strictly forbidden.
- Septic tank sludge and other sludge containing free moisture will be placed in oxidation ponds until it is reduced to a dry state. The ponds will be lined with bentonite to prevent infiltration, and they will be of adequate size and number to allow suitable drying of septic materials prior to disposal on the working face.
- The lessee shall use the expansion area on a tract-by-tract basis. Each tract must be jointly identified by the lessee and BLM management prior to any surface disturbing activities.

- Lessee will be responsible for ensuring that the operation of the land is in accordance with the county approved Plan of Operation and Development and that the regulatory requirements of 40 CFR Parts 165, 240, and 241 are met.

- Lessee will provide BLM with a plan for closure that includes final contouring and drainage design that will handle surface and subsurface flow through the site as well as revegetation, to such an extent as to control wind and water erosion.

- Basins used during active operation of the landfill will not be used in the final closing design of the landfill.

- The lessee shall comply with all applicable Federal, State and local environmental and public health laws and regulations. The lessee shall reimburse the United States for any expenses it incurs for the purpose of maintaining the landfill's compliance with such laws.

- Prior to the termination of the lease, the lessee shall, if required by the authorized officer, cause a survey of the lands covered by the lease to be made by qualified persons, for the propose of ensuring that there are no "hazardous" or "toxic" wastes, as defined under any provision of Federal, State or local law, present on the land.

- If at any time during or after the period of the lease agreement, any condition on the land covered by this lease is found to be in violation of any Federal, State, or local law, and such condition is legally attributable to activities occurring during the term of the lease, the lessee shall promptly take all remedial actions necessary to terminate any such violation.

- Insofar as the lessee is now or becomes legally authorized to do so, it shall hold the United States, its officers and employees harmless from and indemnify them against any damage, injury, or liability resulting from the construction, operation, or maintenance of the landfill site.

As applicable to landfill operations at this time, the lessee is complying adequately with these lease stipulations and conditions.

Since 1970, NDEP has delegated landfill compliance inspections in Clark County, Nevada to the Clark County Health District. The Operator currently holds a permit issued by the Health District, and the Health District inspects the landfill in accordance with regulations approved and authorized by NDEP (Clark County, 1970).

Clark County Health District inspections are conducted on a twice yearly basis and have consistently indicated the Sunrise Mountain Landfill to be overall in compliance for the 20-year period during which Health District inspections have been conducted. A minor deficiency noted

in several inspection reports has been the presence of windblown litter. Although some windblown litter was noted during the audit inspection, it was not a significant problem; and in-progress efforts to pick up this debris were observed.

BLM has not conducted regular compliance checks (inspections) of the Sunrise Mountain Landfill. BLM relies on inspections that are carried out on a regularly scheduled basis by the Clark County Health District to ensure landfill regulatory compliance.

No outstanding Federal or State regulatory issues (inspections, audits, notice of violation, consent orders, or pending legislation) are currently associated with the Sunrise Mountain Landfill.

2.3 Unit Design and Operating Procedures and Criteria

This section includes a description of the present design and operating procedures and criteria used to control activities at Sunrise Mountain Landfill. The information presented was obtained through review of BLM and facility documents and by observation during the facility inspection.

2.3.1 Facility Characteristics and Design Criteria

This section describes the characteristics and designed features of the landfill that are related to the physical features of the site. Details of the day-to-day operation of the facility are presented in the following four sections. The information presented here has been obtained from landfill development plans, interviews with the operator, and by observation during the facility inspection.

The facility is located on a 720-acre R&PP lease of which approximately 500 acres are capable of supporting landfill operations. Approximately 200 acres are developed.

Sunrise Mountain Landfill serves the needs of the present and projected population of the greater Las Vegas metropolitan area including much of Clark County, Nevada. The current population is approaching one million. The exact number of residences and businesses included in the service area is not known. The facility is a Class I landfill as defined by NAC 444.642 (greater than 2000 people served).

Permanent structures house administrative and maintenance facilities on site. Maintenance facilities exist to service numerous earth-moving and other heavy equipment, as well as other light vehicles permanently assigned to the landfill.

There are no fences surrounding the landfill. However, landfill access by routes other than the established entrance gate is not possible because of the mountainous terrain (to the north and east) and the rough, steep desert terrain dissected by numerous erosion channels to the west and south. Regulations do not require fencing if there are existing natural features that adequately restrict random or intentional access to the site by persons or livestock. No evidence was seen that would indicate that site access controls are not adequate, i.e., no evidence of trespassing, scavenging or access other than the front gate were noted. Signs clearly stating prohibited wastes (including hazardous wastes) and materials are posted at the site entrance. The landfill is open, and the gate attended, 24-hours-a-day and no operating hours are posted.

Site access roads consist of a paved two-lane county road (Vegas Valley Drive) which leads up to the facility entrance gate. Beyond the gate, temporary service roads that lead to the active disposal area are surfaced with gravel. Directional signs are present at several locations along the site roads to direct waste haulers to the active disposal area and away from dangerous areas. All roads and signs were observed to be in good condition.

Waste is logged at the landfill entrance for fee assessment, when applicable, and for waste identification. According to the landfill operator, the landfill accepts approximately 3,500 tons of waste per day. The waste hauler then proceeds to the appropriate active waste unit (solid waste, septic waste, contaminated soil, dead animal, medical waste, or asbestos waste) and dumps the waste as directed by landfill operating personnel. Solid waste, including large, bulky items and tires are typically placed in lifts of up to 20 feet in thickness (Figure 4).

Dried septic tank sludge, medical wastes, hydrocarbon contaminated soils, and asbestos are special wastes accepted at the landfill facility, and the areas (units) designated for treatment or disposal of these wastes are shown in Figures 5 through 8, respectively. Septic tank pumpings are dried and mixed with soil before being incorporated into the working face. Animal carcasses are also accepted for burial at the facility and are disposed of in a specifically designated area.

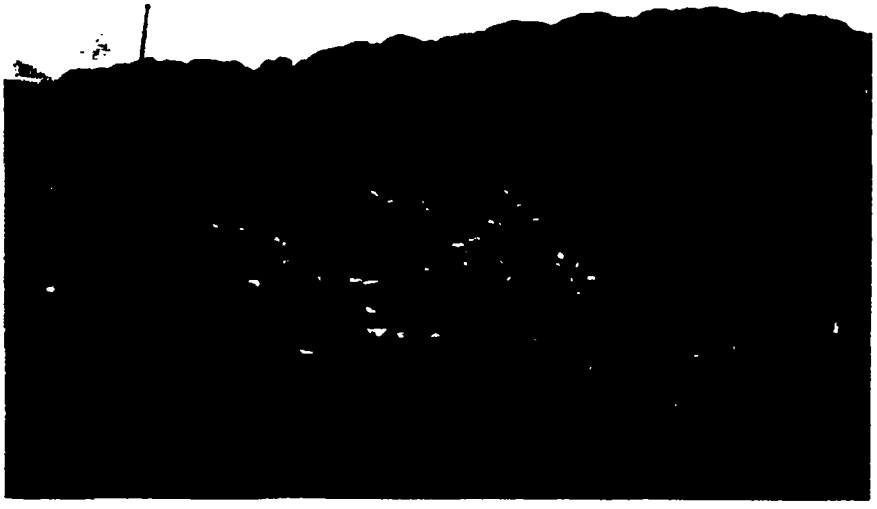

Figure 4. Sunrise Mountain Landfill Active Waste Disposal with Compactor (Looking East).

Figure 5. Septic Tank Pumpings - Surface Impoundment for Drying/Oxidation (View South)

Figure 6. Medical Waste Disposal Area - Uncrushed Containers Awaiting Cover (Looking South).

Figure 7. Hydrocarbon Contaminated Soil Biodegradation Treatment Area (Looking Southwest)

Figure 8. Asbestos Disposal Area - Landfill Entrance and Operations Maintenance Buildings in Background (Looking South).

Provisions and procedures for disposal of special waste materials are specified in operating procedures contained in the "Sunrise Mountain Landfill Expansion" (EMCON Associates, 1986) or, in the case of medical waste and the contaminated soils treatment unit, separate Clark County Health District and NDEP approved the landfill's plans and provisions.

Current design information for Sunrise Mountain Landfill includes all plans, specifications and evaluations necessary to meet the requirements and recommendations of all sections of 40 CFR Part 241. These plans and other design information are contained in a report titled "Sunrise Mountain Landfill Expansion" which describes design, construction, and operating provisions as well as technical and environmental evaluations and management procedures (EMCON Associates, 1986). Original site design information was not available during this audit.

The design of current cover and the anticipated closure cap, run-on/run-off controls, leachate collection/treatment systems, and explosive gas and groundwater monitoring systems are contained in the plans described in the previous paragraph. Evaluations provided as part of these plans determined that there is no need for liners at the facility.

Waste unit sizes at the facility are not well defined. The areas of the active portions of the medical waste, asbestos, and dead animal disposal units and contaminated soil treatment unit are less than one acre each. The septic tank pumpings treatment unit area consists of approximately three acres which include 3 to 5 temporary drying trenches which are approximately 150 feet long by 40 feet wide and 3 feet deep.

Waste is spread and compacted on the solid waste disposal unit in 2-foot-thick layers on the working face, which can be up to 200 feet wide.

Waste units observed during the audit are in good condition. No containment cell breeches, seeps, cracks, odors, desiccation, surface erosion, or slope stability problems were observed.

2.3.2 Access Controls

Access to Sunrise Mountain Landfill is controlled by operating personnel located at the entrance gate and at the working face during the time the landfill is open (24 hours per day). The landfill is also surrounded by large expenses of extremely rough terrain as described in Section 2.3.1 which would make entrance or exit (with any significant amount of scavenged material) very difficult. For these reasons the following items are not problems or issues at the facility: 1) use of locking gates to control access during nonoperating hours; 2) other restrictions during nonoperating hours; 3) control of dumping at gates when the facility is closed; and 4) control of scavenging.

2.3.3 Disposal Methods

Disposal methods as described in operational plans and procedures are described below.

Solid waste is placed in lifts 20 feet thick which have a horizontal to vertical slope of 3:1 or less. Compaction equipment traverses the entire length of the working face and makes sufficient passes to achieve adequate compaction (Figure 4). Large and bulky wastes are separated and placed in the lower portion of the advancing lift, where they are crushed sufficiently to prevent the formation of void spaces in the buried waste by "bridging".

Operating plans indicate that the advancing face is covered with at least 6 inches of cover soil at the end of each working day. However, this requirement is routinely non-applicable because the landfill operates 24-hours-per-day and cover is applied on a continuous basis. Plans also require placement of at least 12 inches of cover soil over waste materials that will not have additional waste placed over them for at least 180 days. Plans mandate the following procedure for constructing the final cover (cap) over perimeter slopes:

1. Intermediate cover is removed from the outermost 50 feet of the lift below the one presently nearing completion.

2. The lift is then completed by placing waste onto the re-exposed waste in the lift below; the final outermost cell of the upper lift is then filled.

3. Final cover is then placed on the outside of the newly completed lift and intermediate cover is placed on the top of it (or final cover on top, if this is the upper most lift in the contour).

Removal of the intermediate cover provides contact between successive lifts, and will promote the downward movement of any leachate originating from the waste or cover material in the landfill. This provides a continuous pathway for the leachate to migrate to the bottom of the landfill where it can be collected at a leachate collection point, rather than exiting the landfill through the final cover flanks at some location above the leachate collection point.

Acceptance, handling and disposal methods for special wastes are also contained in the landfill operational plans, and the special procedures for this are described in the following paragraphs. Actual facility operations were observed being conducted in accordance with these procedures.

Asbestos: All asbestos waste must be double bagged in 20-mil plastic sacks. The wastes are placed in a designated disposal area. Shipments are normally received on a once per week basis. Upon disposition of the materials, 1 foot of soil is placed over the material. When the cell is completed, a final 4-foot cover is placed over the cell.

Septic Tank Pumpings: Septic tank fluids are placed in unlined oxidation ponds and mixed with soil where the combination of oxidation, solar radiation, and evaporation decreases the volume and toxicity of the fluids to acceptable levels. When the fluids are oxidized and dried, the sludge and soil mixture is added to the landfill.

Dead Animals: Dead animals are received on a daily basis, and are placed in a designated disposal area. The area is well posted with signs to eliminate any confusion with other disposal areas. After each daily deposit of dead animals the carcasses are covered with 1 foot of earthen material. When the cell has been completed, a final 4-foot earthen cover is applied.

Medical Wastes: Disposal of medical waste is specified in special Clark County Health District approved procedures that require it to be packaged in bags and placed inside cardboard boxes by waste haulers bringing it to the landfill. The boxes are then placed in trenches and covered without crushing or compacting.

Hydrocarbon Contaminated Soils: Disposal is provided for hydrocarbon contaminated soils after enhanced biodegradation treatment to reduce contamination to acceptable levels. Only soils containing hydrocarbon fuels or lubricants may be treated and disposed of at Sunrise Mountain Landfill. Soils containing hazardous contaminants such as solvents or other hazardous compounds are not accepted. Testing must be done (by the parties wishing to dispose of the soils) prior to bringing soils to the landfill treatment facility. This serves to verify that no hazardous materials are present in the soils. Process and operating procedures and soil treatment unit provisions have been approved by the Clark County Health District.

Frequency of cover material application is continuous over 20-foot lifts of waste and was observed to be adequate, as was the type of cover material (soil, as described in Section 2.1.2.6).

Burning is not allowed at the landfill. Should a fire occur at the landfill active disposal area, in facility structures, or elsewhere at the site, fire protection procedures are specified in the operation plans. Fire protection for the landfill's working face consists of smothering the fire with cover soil. Water from tank trucks that bring water to the site for dust control also can be used for fire control. Fire suppression in the maintenance and office areas of the facility is provided by portable fire extinguishers or by the Las Vegas Fire Department, if necessary.

Equipment necessary for performing all necessary landfill operations is available at the facility and is used appropriately by well-trained site personnel. The operating condition of all equipment was observed to be good and included appropriate safety devices: rollover bars, reverse audible warning signals and fire extinguishers.

2.3.4 Exclusion of Hazardous Waste

The Sunrise Mountain Landfill hazardous waste exclusion program and policy consists of procedures in the site operations plan. These procedures were being implemented adequately as verified during the site inspection. The content of site operating plan procedures related to hazardous waste exclusion are summarized below:

Signs: Signs that clearly indicate the types of wastes that are not accepted at the site are to be posted near the site entrance. In addition to indicating that hazardous wastes are not accepted at the site, examples are to be given in nontechnical language. Such examples include flammable liquids, pesticides, acids, caustics, poisons, and waste chemicals.

Observations by Site Personnel: All site personnel are to be trained and directed to identify hazardous wastes that may be delivered to the site. These personnel include supervisors, weigh station attendants, and equipment operators at the working face. Inspection at the front entrance of all vehicles not operated by Silver State Disposal Service entering the landfill was observed during the site audit inspection.

Known Offenders: Special caution is to be taken when accepting wastes from sources that have previously attempted to deliver hazardous wastes to the site. Precautionary measures include (1) questioning of the driver of the vehicle by the weigh station attendant concerning the contents of the load; (2) visual inspection of the load prior to discharging, when feasible; (3) additional recordkeeping at the weigh station regarding the delivery of wastes from such sources; and (4) additional efforts by site personnel at the working face of the site to observe the wastes discharged from such sources. Repeat offenders are to be banned from the site according to the operations plan.

Procedures for Handling Identified Hazardous Wastes: If hazardous or other unacceptable wastes are detected, landfill site personnel will immediately cordon off the affected area to protect the general public and site personnel not involved in the incident. Site management will notify a State-approved contractor who will be responsible for the cleanup, transport, and disposal of any hazardous wastes that have been discharged or spilled from the vehicle which brought them to the site. The wastes will be disposed of at an approved facility. The incident and response will be recorded in the site records.

If the producer of the waste is known, the producer will be contacted and notified of the incident and the operator's subsequent action. The producer will be billed for all costs incurred in the proper cleanup, transport, and disposal of the waste.

Throughout the waste handling process, site personnel will follow the safety procedures established by the operator for worker protection from hazardous materials. The Clark County Department of Health will be notified of all incidents and the action taken.

Training: Each new employee is given sixteen (16) hours of on the job training which includes instruction on the types of wastes handled and identification of hazardous wastes and materials.

No small quantity generator wastes are accepted at the landfill. Only the small quantities of hazardous waste present in household and commercial wastes are accepted at the landfill. No evidence of unauthorized waste disposal was observed during the site inspection of this audit.

2.3.5 Other Considerations

Dust is controlled at the landfill as specified in the site operating plans by: "Properly maintaining haul road (oiling or watering); applying a fine water spray on soil cover when conditions might cause the formation of fugitive dust; applying water or planting temporary vegetative cover on intermediate soil cover when conditions might cause fugitive dust; and planting and maintaining a vegetative cover on completed fill and excavation slopes." (EMCON Associates, 1986) These procedures, except the planting of vegetative cover, were observed to be adequately implemented for the control of dust and erosion. BLM, as well as State and Clark County regulatory authorities agree that any vegetation established at the site would be very sparse (due to the extremely dry conditions) and would be relatively ineffective with regard to dust and erosion control. All regulatory authorities agree that a practical interpretation must be made with respect to any applicable regulations requiring or recommending the planting of grasses or other vegetation on inactive areas at the landfill.

Litter is controlled by placement of temporary fencing or portable litter screens downwind from the working face. The catch fences and screens, the operational area, and the site are policed regularly to pick up any accumulated litter.

Odor and vectors do not present a problem at Sunrise Mountain Landfill. These are controlled by routine application of cover over the top of each working area. Rats cannot survive in the

desert conditions present at the site. Birds present no problems; those that are present are controlled by automated noise-making devices that scare them away. Explosive gases are not currently monitored at the landfill.

Implementation of a health and safety program at the landfill consists of 16 hours of new-employee on-the-job training, which includes instruction in safety procedures. This training is specified in the site operations plan, as is the requirement that employees be provided with proper safety equipment and safety guidance manuals (which were verified to be available at the site operations office).

Closure and post-closure plan information is available in the site design and operation plans as described in Section 2.2.2. No financial assurance mechanism is documented for the closure and post-closure care of the facility.

Recordkeeping at the site is specified in the site operation plan. These records consist of at minimum the following:

- Total tonnage deposited by the operating company
- Tabulation of all commercial/public depositions
- Equipment in operation
- Equipment on standby
- Equipment down for repair
- Special wastes, if any, accepted for deposit or documentation of hazardous waste related activities
- Other information incidental to daily operation

The existence of these records was verified during the site inspection and is considered adequate with respect to the requirements of applicable regulations.

The operator's relationship and responsiveness with regulatory agencies has been very good in the recent past. No major complaints or notices of violation have been issued or are currently unresolved.

procedures are also outlined, but do not include the specific detail information required by proposed 40 CFR Part 258.53 and 54. This specific information which must be included in sampling and analysis procedures includes techniques for the following:

- Sample collection;
- Sample preservation and shipment;
- Analytical procedures;
- Chain-of-custody control;
- Quality assurance and quality control; and
- Appropriate sampling that accurately measures hazardous constituents in groundwater samples. At a minimum, the monitoring parameters listed in 40 CFR 258.54(b) must be measured.

Preliminary Estimates for Corrective Action: A groundwater monitoring plan specifying procedures for sampling and analysis in accordance with 40 CFR 258.53 and 54 needs to be prepared for Sunrise Mountain Landfill. The preparation of this plan will require an estimated 50 hours of labor. At a rate of $55 per hour, plus $250 in other direct costs, the estimated cost of preparing this plan is $3,000. The cost for collecting and analyzing one sample per year from the two downgradient monitoring wells, as recommended by the current plans, is estimated to be $2,585.

Finding NV-046208-2: Lack of a Financial Assurance Mechanism

Objective: Proposed 40 CFR 258.32 requires that the owner or operator of each municipal solid waste landfill prepare an estimate of the costs of hiring a third-party to conduct closure, post-closure care, and corrective action at the landfill and to establish a mechanism to ensure that funds are available to meet such costs.

Finding: There is no financial assurance mechanism for Sunrise Mountain Landfill that will ensure that funds are available for closure, post-closure care, and corrective action as required by proposed 40 CFR 258.32.

Discussion: The lessee/operator of Sunrise Mountain Landfill has not established and documented a financial assurance mechanism for providing funds for closure, post-closure care, or corrective action at the facility.

Preliminary Estimates for Corrective Action: Since the amount of funding required for financial assurance for Sunrise Mountain Landfill and the available mechanisms to ensure this funding are not known, development of a preliminary estimate for corrective action for establishment of a financial assurance mechanism is not appropriate. However, it is estimated that approximately 40 hours of labor will be required to investigate the amount of funding to be assured and the financial assurance mechanisms available to the landfill lessee and/or operator. At a rate of $55 per hour, the cost of such an investigation is estimated at $2,200.

3.2.2 Operating Criteria

Finding NV-046208-3: Inadequate Methane Monitoring Program

Objective: Proposed 40 CFR 258.23(a) requires that methane concentrations be controlled so they do not exceed the lower explosive limit (LEL) at property boundaries and 25 percent of LEL in facility structures. Implementation of a program specifying that the minimum frequency of this monitoring be quarterly is required by proposed 40 CFR 258.23(b).

Finding: A methane monitoring and control program has been established in facility plans for Sunrise Mountain Landfill, but is not carried out as part of landfill operation as required by proposed 40 CFR 258.23(b).

Discussion: The current requirements of 40 CFR Part 258.23(b), specify that monitoring for LEL be performed at facility property boundaries. Since the facility is not carrying out any such monitoring program at the present time, operations are out of compliance. Compliance with the proposed regulation could be accomplished by carrying out the gas monitoring procedures in the facility operating plan document which specify monthly monitoring. The landfill also has on-site structures which require monitoring for the 25 percent LEL limit. The location of sampling points, sampling techniques, and the appropriate type of instruments to be utilized are specified in the site operation plan. All other requirements of current and proposed regulations are presently being met by the facility. These requirements involve the preparation of studies related to the potential for methane generation, and the physical control, as necessary, of methane gases that are generated.

Preliminary Estimates for Corrective Action: Methane monitoring and associated documentation of the results (including maintenance and calibration of the monitoring instruments) on a quarterly basis will require an estimated 8 hours of labor. At a rate of $8 per hour, the estimated annual labor cost for quarterly methane monitoring is $256. A one-time cost of $650 is required for purchase of the monitoring instruments.

3.3 Preliminary Cost Estimates for Corrective Action Summary

This section provides a summary of the preliminary cost estimates for the corrective action portion of the findings presented in Section 3.2. The general types of corrective actions, more specifically described in the Preliminary Cost Estimate Summary (see Table 2), include the preparation of design plans, equipment purchases, monitoring upgrades, additional personnel, and operational changes.

The preliminary cost estimate for corrective action related to findings of noncompliance with State and Federal regulations is summarized as follows:

	One-Time	Annual
• 40 CFR Parts 241 and 257, and proposed 40 CFR Part 258 (where proposed Federal regulations duplicate existing State and Federal regulations)	NA	NA
• Existing State regulations not duplicated by existing Federal regulations	NA	NA
Total for existing regulations	NA	NA
• 40 CFR Part 258 (where proposed Federal regulations do not duplicate existing State or Federal regulations)	$ 5,850	$ 2,841
Total for existing and proposed regulations	$ 5,850	$ 2,841

Table 2

Preliminary Cost Estimate Summary - Sunrise Mountain Landfill, Nevada — Sheet 1 of 1

Finding Number: Title	Corrective Action	One-time Cost	Annual Cost
NV-046206-1: Inadequate Groundwater Monitoring Program	Prepare expanded groundwater monitoring procedures	$ 3,000	$ 2,585
NV-046206-2: Lack of Financial Assurance Mechanism	Study and document available financial assurance options	$ 2,200	N/A
NV-046206-3: Inadequate Methane Monitoring Program	Perform methane monitoring	$ 650	$ 256
SUBTOTAL		**$ 5,850**	**$ 2,841**
CONTINGENCY (20%)		**$ 1,170**	**$ 568**
TOTAL		**$ 7,020**	**$ 3,409**

4.0 HAZARDOUS MATERIALS

Examination of the site and records available to the auditor and the results of the interviews do not indicate that hazardous wastes, as regulated under subtitle C of RCRA, have been disposed of at the site.

5.0 REFERENCES

5.1 Documents

BLM (Bureau of Land Management), 1959. Earl Lovejoy, "BLM Mineral Report: Validity Determination of Sanitation No. 1 and Sanitation No. 2 Placer Claims," Nev 09352/046208.

BLM (Bureau of Land Management), 1962. "R&PP Lease with Clark County, Las Vegas, Nevada," Serial No. N-046208.

BLM (Bureau of Land Management), 1984. T.S. Cook and K. Learny, "Sunrise Mountain Sanitary Landfill Expansion R&PP NV-046208."

BLM (Bureau of Land Management), 1985a. Cook T.S. "BLM Mineral Report: Evaluation of Mineral Development Potential and Surface Interference on Lands Applied for by Clark County for a Sanitary Landfill Site Pursuant to the R&PP Act of 1926."

BLM (Bureau of Land Management), 1985b. Arellane, E.M., BLM Land Report, EA N. NV-056-5-51, NV-046208.

BLM (Bureau of Land Management), 1989. "Recreation Guide to BLM Public Lands."

BLM (Bureau of Land Management), 1990. "R&PP Lease Amendment Renewal, Serial Number NV-046208."

Bronken, 1983. Letter from K.T. Bronkin, Consulting Engineer, to Clark County Department of Public Works, regarding the study and report of sanitary solid waste landfill operated by Silver State Disposal," February 25.

Clark County, 1970. "Regulations Governing Solid Waste Disposal Sites and Facilities." District Board of Health of Clark County, Nevada.

EMCON Associates, 1986. "Sunrise Mountain Landfill Expansion," Geological and Hydrogeologic Evaluation and Design, Construction and Operating Plans, Clark County, Nevada.

EPA (Environmental Protection Agency), 1990. "Designated Sole Source Aquifers, Nationally, Fact Sheet and Designated Aquifer List," Office of Groundwater Protection, Washington, DC.

Geraghty, et al (J.J. Geraghty, D.W. Miller, F. Van der Leeden, and F.L. Troise), 1973. Water Atlas of the United States - Basic Facts About the Nation's Resources, Water Information Center, Syosset, New York.

HUD (Department of Housing and Urban Development), 1977. "Flood Hazard Boundary Index Map, Big Horn County, Wyoming," Federal Insurance Administration, (Panel 5600870065A).

Interagency Cooperative Publication (U.S. Army Corps of Engineers, U.S. Environmental Protection Agency; U.S. Fish and Wildlife Service; and USDA Soil Conservation Service), 1989. Federal Manual for Identifying and Delineating Jurisdictional Wetlands.

Longwell, et al (C.R. Longwell, E.H. Pampeyan, B. Vowyer, and R.J. Roberts) 1965. Geology and Mineral Deposits of Clark County, Nevada, Bulletin 62 Nevada Bureau of Mines and Geology, Reno, Nevada.

Nevada, Department of Conservation of Natural Resources, Division of Environmental Protection, 1989. Nevada Administrative Code (NAC) Part 444, Solid Waste Disposal Regulations, 1977.

NDEP (Nevada Division of Environmental Protection), 1989. Letter from Allen Biaggi, Environmental Specialist, to John Isola, Vice-President of Environmental Technologies of Nevada, regarding authorization to store and aerate hydrocarbon contaminated soils at Sunrise Mountain Landfill, April 21.

Office of the Federal Register, National Archives and Records Administration, 1979a. "Guidelines for the Land Disposal of Solid Wastes," 40 CFR Part 241.

Office of the Federal Register, National Archives and Records Administration, 1979b. "Criteria For Classification of Solid Waste Disposal Facilities and Practices," 40 CFR Part 257.

Office of the Federal Register, National Archives and Records Administration, 1988. "Criteria For Municipal Solid Waste Landfills," 40 CFR Part 258 (proposed).

USGS (U.S. Geological Survey), 1982, Algermissen, S.T. et al, "Probabilistic Estimates of Maximum Acceleration and Velocity in Rock in the Contiguous United States," U.S. Geological Survey Open File Report 82-1033.

USGS (U.S. Geological Survey), 1983 Frenchman Mountain Quadrangle, Nevada, 7.5 Minute Series.

USGS (U.S. Geological Survey), 1984. Las Vegas N.E. Quadrangle Nevada 7.2 Minute Series.

5.2 Interviews

C.A. Schmutz and V.H. Ueckert Senior Supervisor of Sanitation and Deputy Health Officer for Environmental Health respectively, Clark County Health District, Clark County, Nevada, April 2, 1990 -- Sunrise Mountain Landfill history, operation, and regulatory status dust control.

Jerry Wickstrom Project Inspector, Bureau of Land Management, Las Vegas District Office, April 3, 1990 -- Landfill public use.

Michael Pullen and Charles Jenner, Deputy Director and Manager respectively, Clark County, Nevada, Department of Public Works, April 4, 1990 -- Landfill operation and administration.

Thomas A. Isola Vice President, Silver State Disposal Service, Inc., Las Vegas, Nevada, April 4, 1990 -- Landfill operation, site inspection, and regulatory compliance issues.

Ben Collins, District Manager, Bureau of Land Management, and others, Las Vegas District Office, April 4, 1990 -- Landfill audit close-out issues.