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Disposal Area Removal Action

Lockheed Propulsion Company

Beaumont No. 2 Site

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June 1993

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1.0 INTRODUCTION

This report documents the investigation and subsequent removal of non-hazardous soil and debris from the disposal area at the Lockheed Corporation (Lockheed) Beaumont No. 2 Facility. The objective of the removal was to obtain certification that the site is suitable for unrestricted future land use. The sampling of three groundwater monitoring wells at the site is also reported. The groundwater wells were resampled to document that the groundwater has not been adversely impacted. The work was conducted in accordance with Consent Order No. HSA 88/89 - 034 from the Department of Health Services, Toxic Substance Control Program (Cal/EPA, Department of Toxic Substances Control [DTSC] and the regulatory agency approved Landfill Investigation Work Plan prepared by Radian Corporation (Radian) in July 1992 (Radian, 1992).

1.1 Site Description

The Lockheed Beaumont Facilities are located approximately 70 miles east of Los Angeles near the city of Beaumont, California. The facilities are comprised of the larger No. 1 facility and the smaller No. 2 facility (Figure 1-1). The No. 2 facility, the subject of this report, also known as Jack Rabbit Trail or Laborde Canyon, has an areal extent of approximately 2,500 acres. As shown in Figure 1-2, the Beaumont No. 2 facility is comprised of two portions, the smaller northern parcel and the larger southern parcel. All of the industrial activities at the site took place on the southern parcel. The northern parcel was left vacant with the exception of a single water production well.

The Beaumont No. 2 facility lies in an area known as the "Badlands," aptly named because of its intricate array of steep ridges and erosional gullies. The largest of these channels is now known as Laborde Canyon and bisects the facility in a north-south direction and forms the principal drainage course through the site as shown in Figure 1-3. The disposal area is located in a side canyon on the east side of Laborde Canyon.

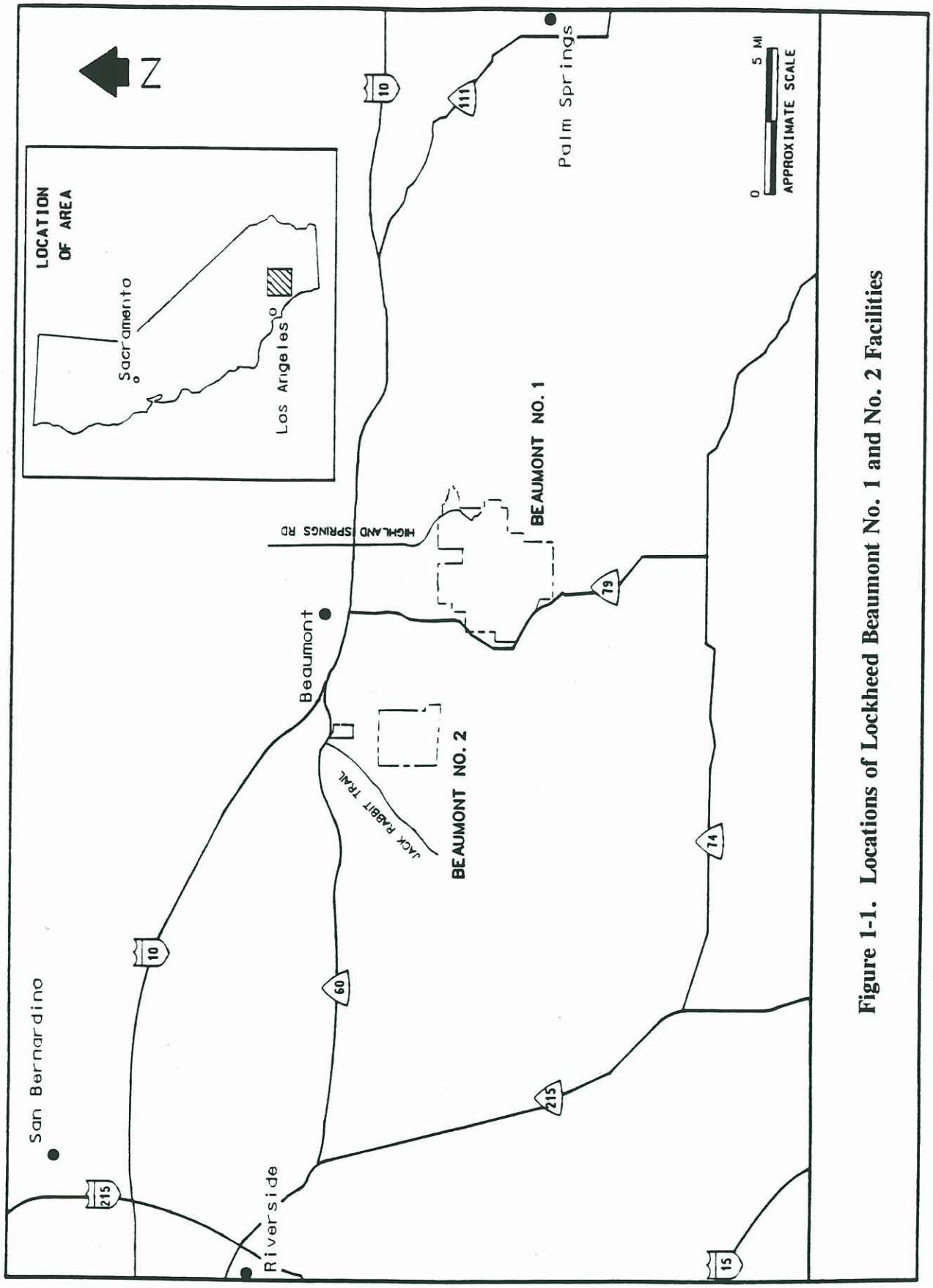

Figure 1-1. Locations of Lockheed Beaumont No. 1 and No. 2 Facilities

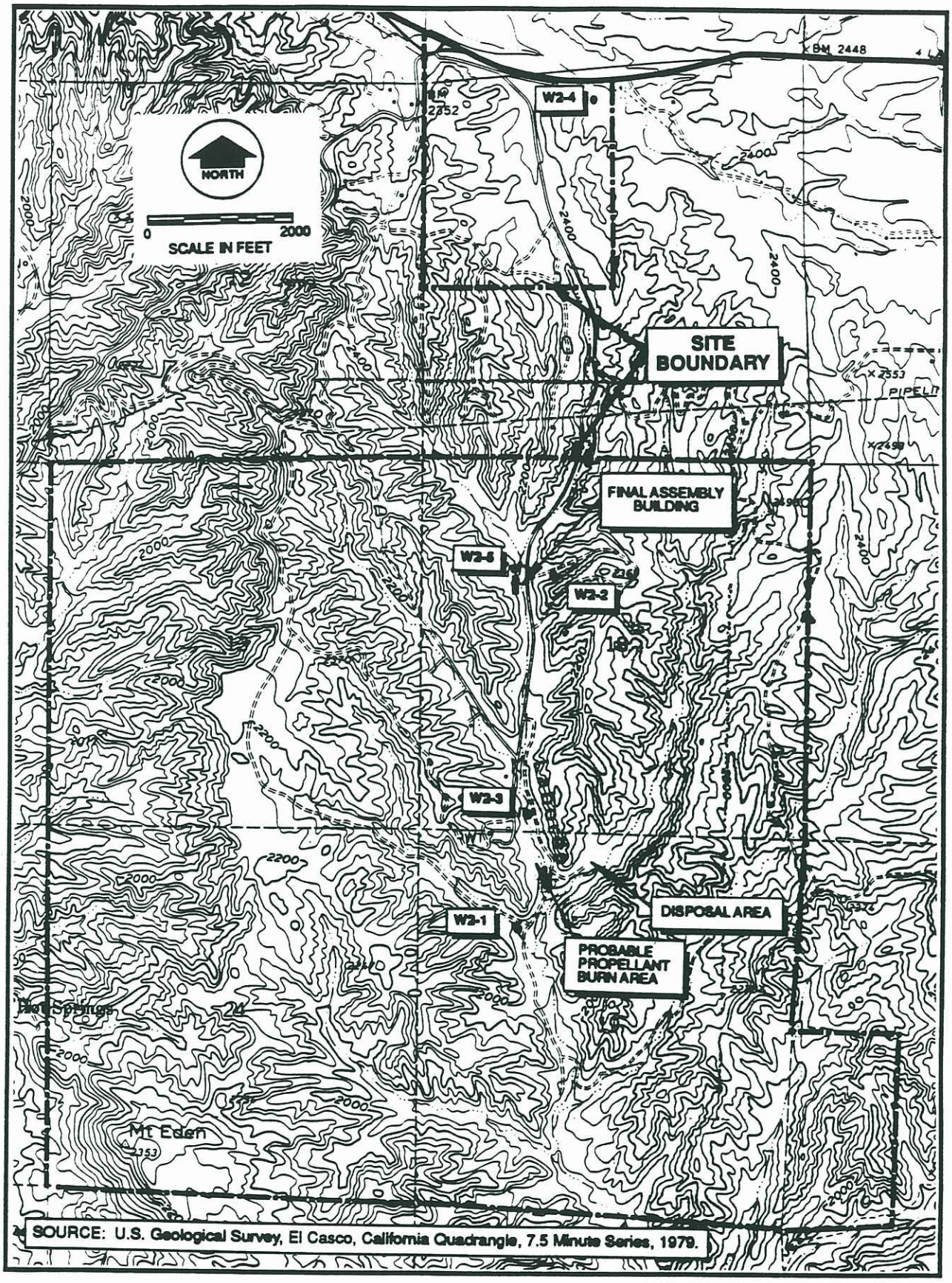

Figure 1-2. Lockheed Beaumont No. 2 Facility

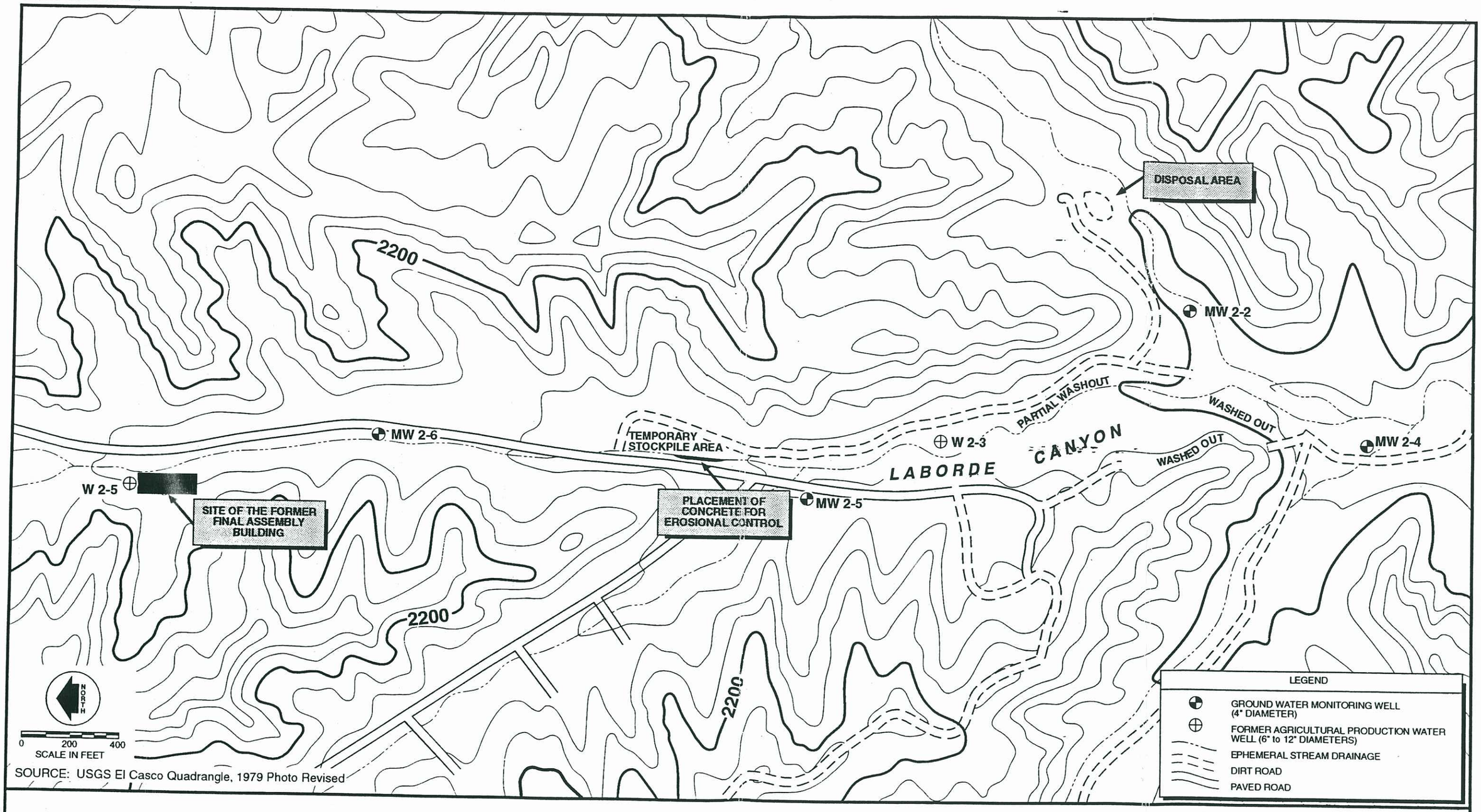

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Figure 1-3. Facility Layout Showing Disposal Area, Temporary Stockpile Area and the Locations where Concrete was Placed for Erosional Control

Ground elevations of the site range from approximately 2,500 feet above mean sea level (MSL) on the ridges at the northern boundary to about 1,800 feet near the mouth of Laborde Canyon to the south. Dominant vegetation consists of chaparral mixed with low-growing sagebrush and local stands of tall trees near creek beds.

The two predominate lithologic units at the site are Quaternary alluvium and the Pliocene to Pleistocene San Timoteo Formation. The alluvium occurs mainly as a narrow strip along the floor of Laborde Canyon and adjacent tributary canyons (like the one in which the disposal area is located). The maximum depth of the alluvium is 60 feet below land surface and chiefly consists of fine silty sands to medium grained poorly sorted sands with interbeds of silts and silty clays. The San Timoteo Formation, which consists of siltstone and fine to medium-grained sand, underlies the alluvium in the valley floors and is exposed in many of the hill slopes and ridges. This formation is poorly cemented, but more indurated than the overlaying alluvial sediments.

The drainage of the Beaumont No. 2 site is primarily through Laborde Canyon, fed by seasonal flow from several small side canyons. Surface runoff only occurs during large storms such as occurred in March of 1991 and January of 1993. These storms have caused considerable erosion, resulting in the roads being washed out on both sides of Laborde Canyon.

Groundwater is first encountered at an average of 60 feet below grade and flows to the south, parallel to the surface drainage and the topography. The average groundwater gradient is calculated at 0.033 feet per foot.

At the time of this investigation, remaining man-made features included three former water supply wells and four groundwater monitoring wells that were installed as part of the *Hydrogeologic Investigation* (Radian, 1992). Remnants of structures (such as walls or foundations) were also present. The last remaining structure, the final assembly building, was torn down under Radian supervision in the fall of 1990.

1.2 Summary of Previous Investigations

The previous investigations at the Beaumont No. 2 facility included a historical investigation, a geophysical investigation, and a hydrogeologic investigation. These investigations are summarized briefly in the following sections.

1.2.1 Historical Investigation

As reported in the *Lockheed Propulsion Company (LPC) Beaumont Facilities Historical Report* (Radian, September 1986), the Beaumont No. 2 facility was used mainly for the assembly of rocket motors in the 1960s and early 1970s. Active operations at the facilities ceased in 1974, and the buildings and facilities were stripped and abandoned.

The disposal area at the Beaumont No. 2 site was located next to a small creek in a side canyon off Laborde Canyon. According to interviews with former Lockheed employees, scrap metal, paper, wood, and concrete materials were disposed of in this area. Lockheed never disposed of hazardous materials, including explosives and propellants, at this disposal area.

Ogden Labs, a company that tested valves and explosive-operated items also occasionally used this disposal area. They were reportedly not as careful about separating their waste material and brought some hazardous waste to this area. Around 1972, a Lockheed Safety Technician, while working at the disposal area, was exposed to unsymmetrical dimethyl hydrazine vapors that leaked from the valve of an "empty" pressurized gas cylinder. The Lockheed safety group was very concerned with this incident, and required Ogden Labs to take measures to remove any potentially hazardous materials from the disposal area. Shortly thereafter, Ogden contracted a disposal company to clean up the area. Details of this cleanup effort are unknown.

Before the Removal Action, metal pipe, several old cars, scrap wood, concrete, and green barrels labeled "non-contaminated" could be seen on the ground surface at the disposal area as shown in Figures 1-4 and 1-5.

1.2.2 Geophysical Investigation

The *Historical Report* (Radian, September 1986) indicated that the disposal area portion of Beaumont No. 2 had the greatest potential for soil and/or groundwater contamination. As a result, additional work including a geophysical investigation of the disposal area, using the magnetic locator geophysical technique, was conducted in late 1986. The purpose of the geophysical investigation, conducted by NORCAL Geophysical Consultants under the direction of Radian, was to locate the boundaries of the disposal area.

Magnetic locator traverses were performed at the Beaumont No. 2 disposal area to determine the lateral extent of buried metal debris. Measuring tapes were laid out along each traverse and followed while scanning with the magnetic locator. The locations of magnetic anomalies were determined from the tape and flagged with survey stakes. Survey stakes were also used to mark the beginning and end of each traverse. The International Union of Operating Engineers surveyed the location of the traverse stakes after the geophysical investigation had been completed.

The distribution of magnetic anomalies at the Beaumont No. 2 disposal area consists of an inner zone of concentrated, closely spaced anomalies surrounded by a zone of widely scattered anomalies as shown in Figure 1-6. The total area was about 250 feet wide by 450 feet long. The interior area of concentrated anomalies was about 100 to 200 feet wide and corresponded with the area where metallic debris was visible on the surface. A linear, northwest projecting segment of the outer zone coincided with a narrow canyon and may have been the site of an old dump that predates the use of the area by Lockheed.

Figure 2-2. Washed Out Portion of Road

Figure 2-3. Regraded Road Surface

Figure 1-4. Debris at the Disposal Area

Figure 1-5. Barrels at the Disposal Area

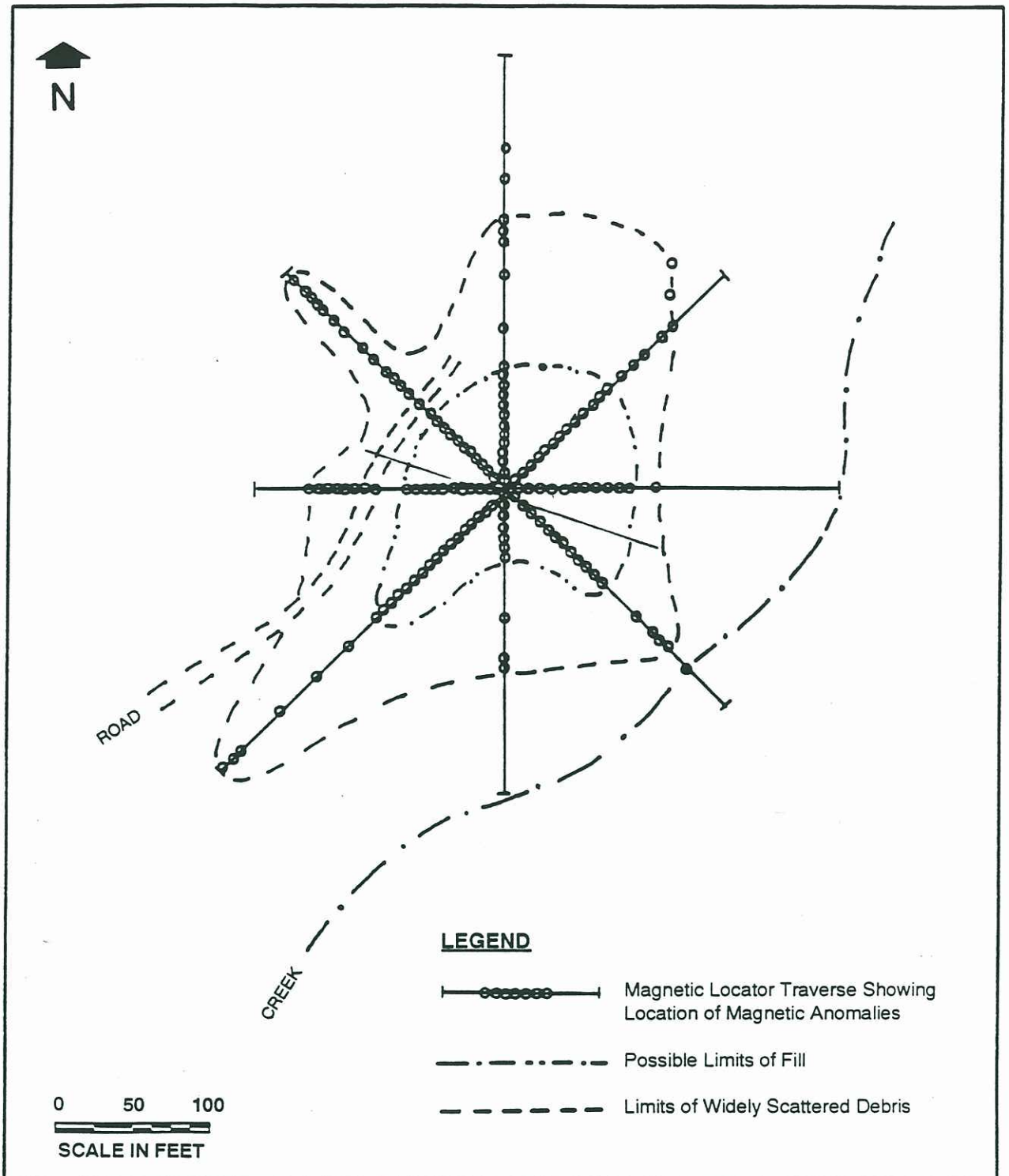

Figure 1-6. Beaumont No. 2 Disposal Area - Magnetic Anomaly Location Map

SOURCE: NORCAL Geophysical Consultants

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100 to 200 feet wide and corresponded with the area where metallic debris was visible on the surface. A linear, northwest projecting segment of the outer zone coincided with a narrow canyon and may have been the site of an old dump that predates the use of the area by Lockheed.

1.2.3 Hydrogeologic Investigation

In early 1990, a hydrogeologic investigation was initiated at the site. Before initiating this work, a survey was conducted for the presence of the Stephens' Kangaroo Rat (SKR) (*Dipodomys stephensi*). The SKR is an endangered species that is currently protected under federal and state laws. Any possible impacts to SKR habitat must first be investigated and shown not to adversely affect the SKR. Results of this survey were used to select investigation areas, which minimized the potential impacts to the rats. The hydrogeologic investigation included a soil and soil vapor survey to determine the presence of volatile organic compound in the soil, and the installation of four groundwater monitoring wells. Analytical results from this investigation indicated that no contaminants were detected in any of the three media (soil, soil vapor, or groundwater) at the site (*LPC Beaumont No. 2 Hydrogeologic Investigation Report* [Radian, 1992]). Results of the SKR survey indicated the density of the SKR as trace to low in the areas selected for hydrogeologic investigation; no adverse effects were noted.

1.3 Report Organization

The remainder of this report is organized as follows. Section 2.0 summarizes the disposal area assessment and the excavation activities. A summary of groundwater sampling methodologies and results are contained in Section 3.0. Section 4.0 presents the conclusions and recommendations of this report. References used in this report are listed in Section 5.0. Analytical data sheets, QA\QC summary, and pertinent regulatory permits are provided in Appendices.

2.0 DISPOSAL AREA ASSESSMENT AND REMOVAL ACIVITIES

The disposal area investigation was divided into two phases. The first phase, the assessment to determine the nature and extent of the waste in the disposal area, is presented Section 2.1. The second phase, the excavation, hauling and final disposal of non-hazardous material at a Class III landfill, is summarized in Section 2.2. A discussion of applicable regulatory requirements and details of compliance with each requirement is contained in Section 2.3.

2.1 Disposal Area Assessment

After all applicable permits and regulatory concurrences were obtained, the assessment of the disposal area was initiated by Radian, at Lockheed's request, using Scrivner Environmental Services (Scrivner) as the excavation contractor.

The assessment activities were performed during January and February 1993 and included the following tasks;

- A field reconnaissance survey for the presence of Stephens' Kangaroo Rat (SKR) burrows;
- A survey of the initial topography and staking of the grid system across the disposal area;
- Hand augering to better define the extent of the disposal area;
- Use of a metal detector to check areas that could not be disturbed due to the presence of SKR;
- Removal of surface debris;
- Completion of three trenches across the disposal area; and
- Collection of waste characterization samples.

2.1.1 Stephens' Kangaroo Rat Survey

Prior to the initiation of field activities, a field reconnaissance survey was conducted for the presence of the SKR in and around the disposal area and the dirt road leading to the disposal area. The SKR are listed as "endangered" by the federal government and "threatened" by the State of California. The applicability of SKR regulations are presented in Section 2.3 of this report.

The survey was conducted by Karen Kirtland of LSA Associates, a biologist certified by the U.S. Fish and Wildlife Service as qualified to conduct SKR assessments. This initial survey located kangaroo rat burrows in small isolated patches in the vicinity of the disposal area. The density of the burrows was low and restricted to open areas around the main piles of concrete. However, a report from LSA Associates pointed out that "due to the highly disturbed nature of the site and the lack of suitable habitat, it was not possible to determine whether these burrows belong to the SKR or the Pacific Kangaroo Rat (PKR)". The PKR is not protected by either state or federal endangered species acts.

Two notable areas which contained numerous burrows were the mounds located at either end of the main concrete piles. These mounds were apparently manmade and somewhat softer than the native soil, thus proving to be ideal burrowing habitat for the kangaroo rat.

Based on the distribution of the SKR\PKR burrows within the area as determined by the survey, it was concluded that surface removal, trenching and the ultimate excavation and disposal of the waste material could proceed without disturbance to SKR\PKR habitat. However, the work would be monitored by the LSA biologist and disturbance to certain areas, such as the mounds mentioned above, would be restricted.

2.1.2 Initial Topographic Survey

The topography of the disposal area and vicinity was surveyed and a grid system with 100-foot centers was staked by Radian personnel. The entire grid system was tied into existing monitoring well MW2-2 which was previously surveyed into the state benchmark located along Highway 60 by Paul Perea and Associates, a California licensed surveyor. All the survey data was plotted on a base map and approved by a Registered Civil Engineer for the Riverside County Grading Permit. The grid system and associated base map was used to aid field personnel in locating sample collection points, trench locations, and areas excavated during removal operations.

2.1.3 Preliminary Field Assessment

A preliminary field assessment was performed to help determine the areal extent of the waste in the disposal area. A total of 12 hand augers (HA-1 to HA-12), as shown on Figure 2-1, were completed to an average depth of 3 feet below grade. A metal detector was used to check areas inhabited by SKR/PKR, such as the two mounds at either end of the disposal area, for presence of buried material. A summary of the hand auger data is found in Table 2-1.

The assessment indicated that the areas around the perimeter of the surface debris and in the mounds appeared to be native material. The soils typically consisted of clayey silts and in a few cases were underlain by coarser grained silty sands. In general, the soil was very soft except for HA-6, located west of the disposal area, which encountered very compact soils. Only the one hand auger placed in the central depression, which is in the central portion of the disposal area, encountered buried material. Thus, it was tentatively concluded that the areas that contained buried material were limited to the areas containing surface debris, which is less than the areal extent indicated during the geophysical survey.

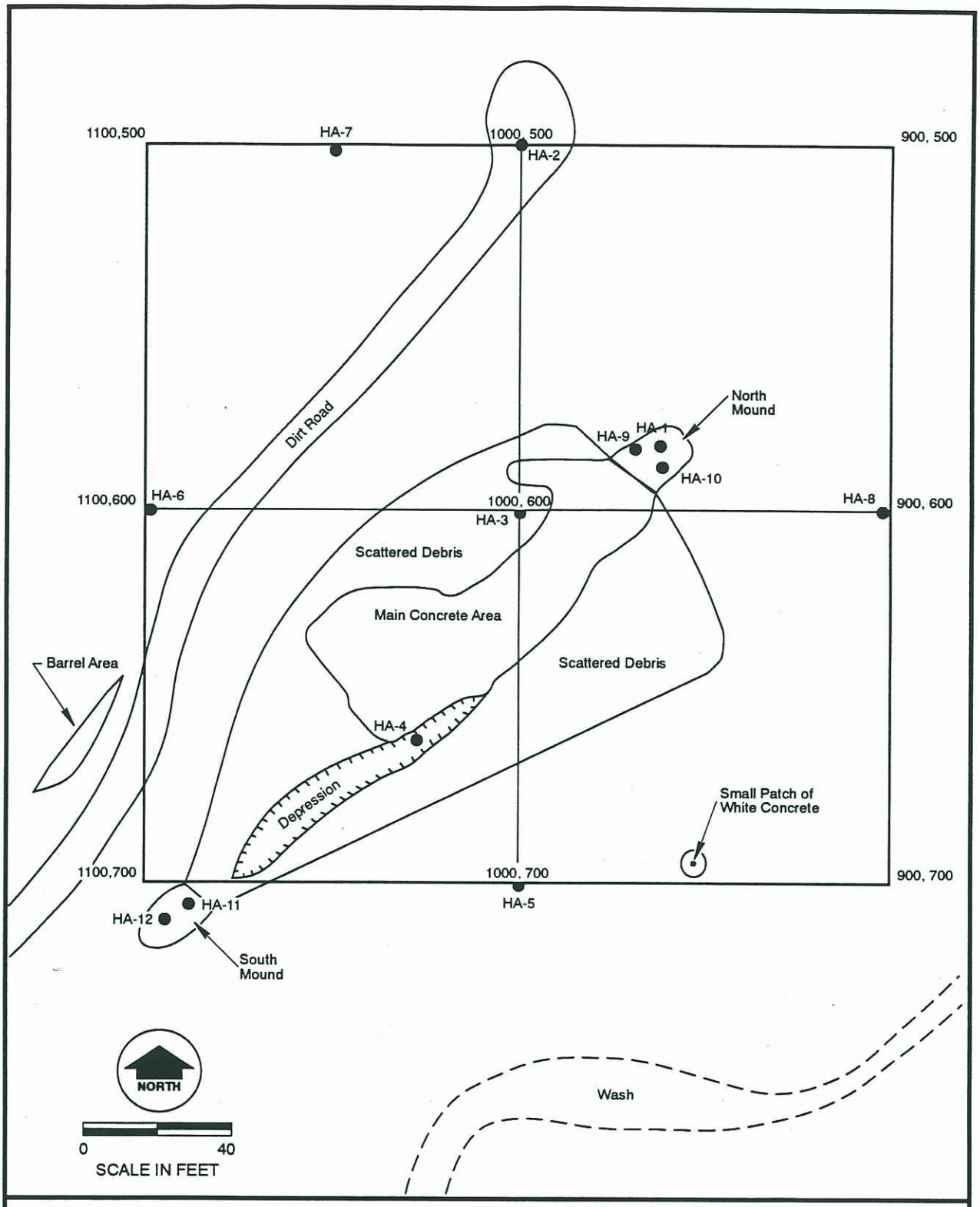

Figure 2-1. Disposal Area Layout and Hand Auger Locations

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Table 2-1

Hand Auger Summary Table

Hand Auger Number	Location	Total Depth[a]	Compaction	Dominant Lithology	Comments
HA-1	North Mound	5.5	Soft	Clayey silt	Clean entire depth
HA-2	North of DA[b]	3.0	Soft	Clayey silt	Clean entire depth
HA-3	Cental part of DA	4.0	Soft	Clayey silt	Clean entire depth
HA-Y	Central Depression	2.0	Soft	Clayey silt	Auger Refusal @ 2'
HA-5	South of DA	3.0	Compact	Silty sand	Clean entire depth
HA-6	West of DA	3.0	Soft	Clayey silt	Clean entire depth
HA-7	Northwest of DA	3.0	Soft	Clayey sand	Clean entire depth
HA-8	East of DA	3.0	Soft	Silty sand	Clean entire depth
HA-9	North Mound	4.0	Soft	Clayey silt	Clean entire depth
HA-10	North Mound	4.0	Soft	Clayey silt	Clean entire depth
HA-11	South Mound	4.0	Soft	Clayey silt	Clean entire depth
HA-12	South Mound	4.0	Soft	Clayey silt	Clean entire depth

[a] Feet below grade
[b] DA = Disposal area

Due to the presence of suspected SKR burrows in the mounds located at both ends of the main body of concrete rubble, a metal detector was used to determine the presence of buried material. A White's Coinmaster 6000-D Series 2 metal detector with a capability of penetrating three-feet in depth, was used to check both mounds; numerous small metallic objects were encountered. When the detector indicated that a metal object was present, careful digging or hand augering was used to remove the object. After completing the removal of debris from the mounds, it became apparent that the soils forming the mounds were those from the excavation of the original trench used for waste disposal at the site.

2.1.4 Surface Debris Removal

Prior to the removal of surface debris from the disposal area, portions of the dirt road damaged during the heavy rains in January had to be regraded (Figure 2-2). To complicate the road grading, several suspect SKR burrows were located in the sediments which had been washed onto the road. With LSA oversight, the road was graded (Figure 2-3) to allow the excavator and front-end loaders to drive to the disposal area. However, the dirt road was not wide enough to allow sufficient turning radius for large transport trucks to travel back into the disposal area.

Surface debris was removed from the disposal area and other accessible portions of the facility. Most of the materials removed consisted of concrete debris, which was removed by a track-driven excavator and brought out by front-end loaders. Other debris removed included several junked cars, barrels labeled "non-contaminated" and miscellaneous metal debris. The scrap metal was collected by a metal salvager for recycling off site.

2.1.5 Investigative Trenching

Once the surface debris was removed and the areal extent of the disposal area was more clearly defined, the locations for three investigative trenches were determined (Figure 2-4). The excavations for the three trenches started at the suspected eastern edge of the disposal area and extended to the dirt road to the west. The trenches generally extended 2 feet below the base of the debris into native soil. In all cases, the middle portion of the trench extended a minimum of 7 feet below grade. Details of each trench are discussed below. After the trenches were excavated, each trench was logged for depth of fill and amount of debris found, then photographed.

Debris encountered in the subsurface was similar to that found on the surface. No suspect hazardous materials were found in any of the trenches. As per the South Coast Air Quality Management District compliance requirements during trenching, the wind speed and direction and the concentrations of any organic vapors were monitored a minimum of every 15 minutes. At no time did the wind speed exceed 20 mph or were organic vapors over ambient levels recorded.

Trench T1 (Figure 2-5) was 100 feet long and ranged in depth from 3 feet to 8 feet below grade. This trench was the cleanest of all three trenches with only sporadic debris found in the top 1 foot of fill along approximately 40 feet of the trench.

Trench T2 (Figure 2-6) was 70 feet long and averaged 7 feet below grade, with a maximum depth of 8 feet below grade. A concentrated mass of scrap metal and piping was located in an area 5 feet wide at a depth of 1 to 4 feet below grade. Elsewhere in the trench, the fill extended an average of 5 feet below grade for the eastern portion and 1 to 2 feet below grade for western part of the trench. No fill was noted in the westernmost 10 feet of the trench. The fill, like in T1, contained only sporadic debris.

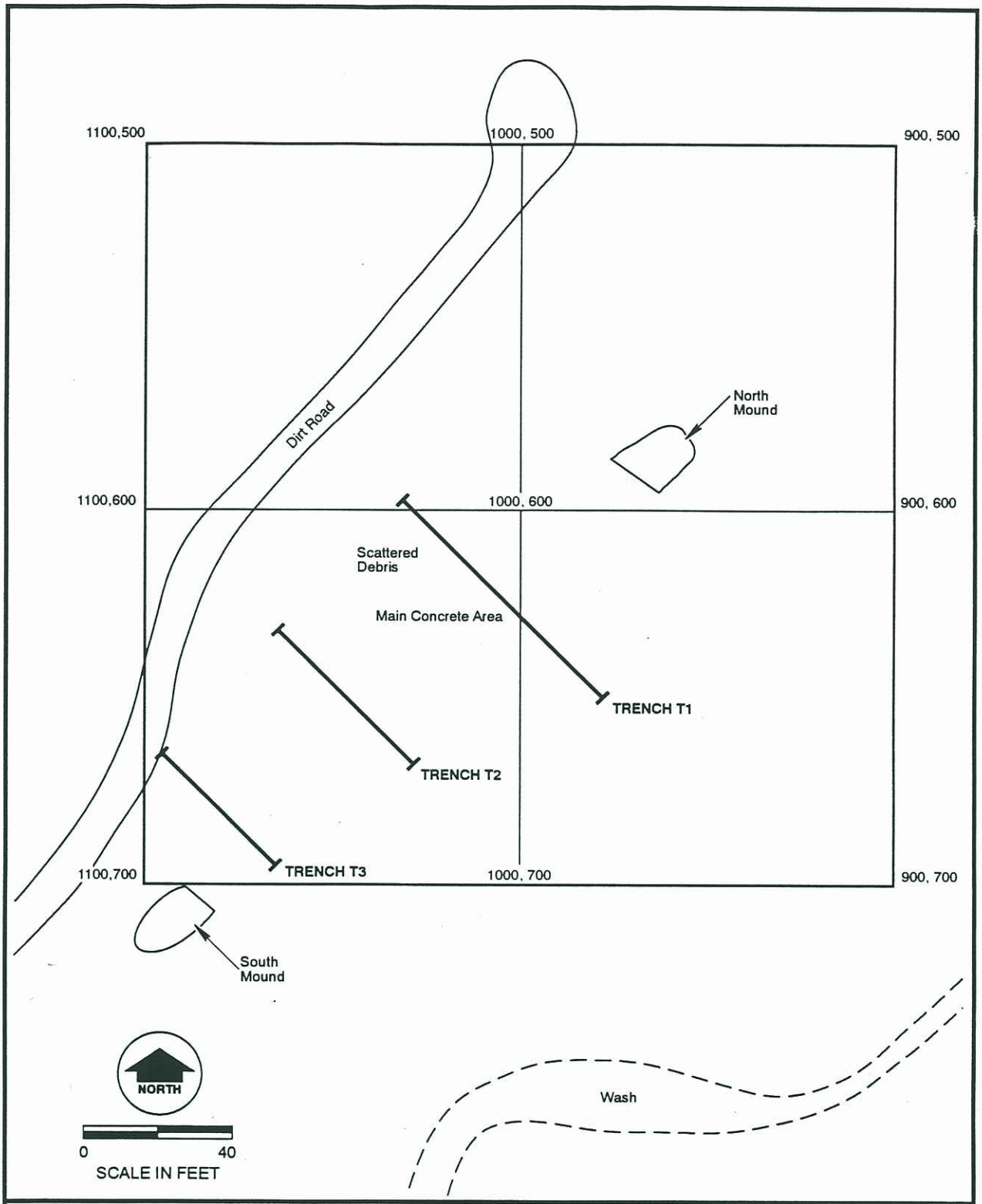

Figure 2-4. Location of Trenches T1, T2 and T3

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Figure 2-5. Trench T1

Figure 2-6. Trench T2

Trench T3 (Figure 2-7) was 40 feet long, with a maximum depth of 7 feet below grade. A small pocket of wire debris was found near the middle portion of the trench. The fill extended to approximately 2 to 3 feet below grade across the entire length of the trench.

Trenching activities were completed in one day and all three trenches (Figure 2-8) were backfilled with excavated material at the end of the day.

2.1.6 Collection of Waste Characterization Samples

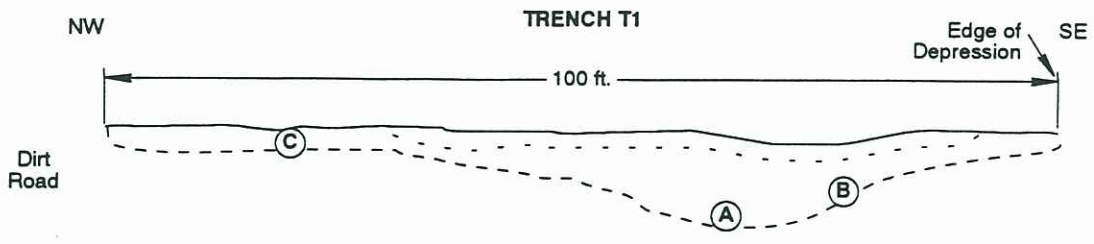
Soil samples were collected from each of the trenches to assess if the waste should be characterized as hazardous materials. Grab samples were collected using a slide hammer fitted with stainless steel sleeves. Prior to being used, the sleeves were cleaned with soapy water, rinsed with potable and deionized water and then baked overnight in an oven.

Three samples were collected from trench T1; one sample was collected at either end of the trench in native material and from the bottom center of the trench, also in native material. Four samples were collected from T2 from the fill zone and underneath the fill zone and at both ends of the trenches. Two samples were collected from trench T3 from the fill zone and underneath the fill zone. The location of samples are shown in Figure 2-9.

All samples were inspected for visible staining or discoloration and screened with an organic vapor monitor (OVM). All the samples were visibly clean except for sample T3-B which was taken from a small pocket of black-stained soil less than 1 cubic foot in size. Head-space measurements by the OVM were reported at ambient levels for all samples.

Figure 2-7. Trench T3

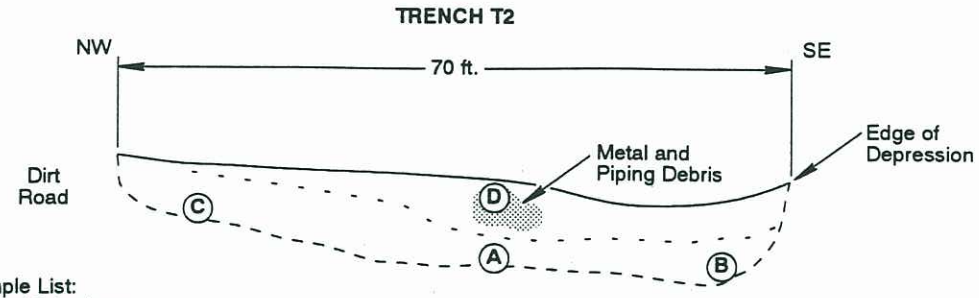
Figure 2-8. Disposal Area with Three Investigative Trenches



Sample List:

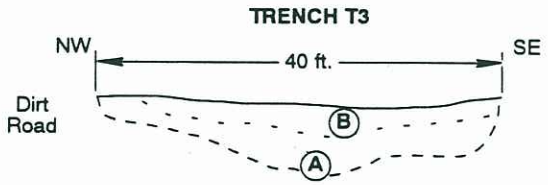
T1-A at 8 ft. clean
T1-B at 6 ft. clean, T1-C at 3 ft. clean

Bag soil samples T1A, T1B, and T1C were measured at ambient levels by the OVM sample. T1-A was submitted for off-site analyses (L7001).



Sample List:
T2-A at 8 ft. clean
T2-B at 7 ft. clean
T2-C at 4 ft. clean
T2-D at 4 ft. debris

Bag soil samples T2-A, T2-B, T2-C and T2-D were measured at ambient levels by the OVM. Sample T2-A was submitted for off-site analyses (L7002).



Sample List:
T3-A at 7 ft. clean at 12:20
T3-B at 2 1/2 ft. sample of black material in place

Bag soil samples T3-A, and T3-B were measured at ambient levels by the OVM. Sample T3-A was submitted for off-site analyses (L7003).

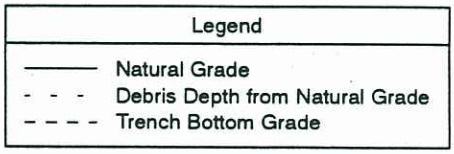


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Figure 2-9. Cross-Sections of Trenches T1, T2 and T3

The bottom sample from each trench was also submitted for analyses to the Radian laboratory in Summit Park, Texas. The samples were analyzed by the methods presented in Table 2-2.

Since the trenches were visibly clean and no organic vapors were detected, creek-bed samples were not collected at this time.

2.1.7 Results of the Waste Characterization Samples

Analytical results for the soil grab samples indicated that the disposal area did not contain hazardous materials. Metals were measured at low levels, less than 10 times their respective Soluble Threshold Limit Concentration (STLC) values, for samples analyzed by EPA Methods 6010, 7060, 7471, 7421, and 7740. Volatile and semi-volatile organics were measured below the limit of detections for all compounds for samples analyzed by EPA Method 8240 and 8270. Analytical results of the sampling are summarized in Tables 2-3, 2-4, and 2-5 for metals, and volatile, and semi-volatile organics, respectively. Analytical data sheets are contained in Appendix A. A quality assurance and quality control (QA/QC) summary is presented in Appendix B.

2.2 Removal Operations

The excavation, transportation, and disposal of the non-hazardous waste was conducted in March 1993 and consisted of the following tasks;

- Excavation of non-hazardous waste material;
- Temporary stockpiling of waste material and loading of the trucks;
- Hauling of material to a Class III landfill for disposal;
- Collection of confirmational perimeter samples;

Table 2-2

Summary of Analytical Methods

U.S. EPA Method[a]	Parameters	Method Type
6010	Metals	ICP[b]
7060	Arsenic	AA, Furnace[c]
7471	Mercury	Cold-Vapor
7421	Lead	AA, Furnace
7740	Selenium	AA, Furnace
8240	Volatile Organics	GC/MS[d]
8270	Semi-Volatile Organics	GC/MS

a U.S. EPA. Test Methods for Evaluating Solid Waste Physical/Chemical Methods, September, 1986
b Inductively Coupled Plasma Atomic Emission Spectroscopy
c Atomic Absorption, Graphite Furnace Technique
d Gas Chromatography/Mass Spectrometry

Table 2-3

Beaumont No. 2 Disposal Area
Waste Characterization and Confirmational
Sample Results for Metals Analysis[a]

Methods SW6010, SW7060, SW7421, SW7471, and SW7740						
Sample ID:	**L7001**	**L7002**	**L7003**	**L8001**	**L8002**	**L8003**
Antimony	21	20	ND(8.9)[b]	ND(8.5)[b]	ND(8.3)[b]	ND(8.5)[b]
Arsenic	1.2	1.7	3.1	2.6	2.9	2.7
Barium	80	64	71	83	78	140
Beryllium	0.36	0.37	0.52	0.41	0.43	0.54
Cadmium	1.1	1.1	1.2	ND(0.42)[b]	ND(0.42)[b]	ND(0.42)[b]
Chromium	16	13	19	17	18	22
Cobalt	4.2	4.0	6.7	6.2	7.1	9.1
Copper	11	19	15	17	20	25
Lead	2.2	2.6	3.5	3.1	4.0	3.8
Mercury	ND(0.047)[b]	ND(0.047)[b]	ND(0.049)[b]	ND(0.047)[b]	ND(0.050)[b]	ND(0.042)[b]
Molybdenum	ND(3.9)[b]	ND(4.0)[b]	ND(4.4)[b]	ND(4.2)[b]	ND(4.2)[b]	ND (4.2)[b]
Nickel	5.0	4.8	11	9.5	12	15
Selenium	ND(0.36)[b]	ND(0.39)[b]	ND(0.40)[b]	ND(0.38)[b]	ND(0.38)[b]	0.62
Silver	0.94	1.1	1.7	ND(0.85)[b]	ND(0.83)[b]	ND(0.85)[b]
Thallium	ND(7.9)[b]	15	ND(8.8)[b]	ND(8.5)[b]	ND(8.3)[b]	ND(8.5)[b]
Vanadium	24	23	34	32	34	46
Zinc	20	27	32	34	36	46

[a] All results are milligrams per killigram (mg/kg).
[b] ND = not detected above stated detection limit, result in parenthesis is the detection limit.

Table 2-4

Beaumont No. 2 Disposal Area
Waste Characterization and Confirmational
Sample Results for Volatile Organics[a]

Method SW8240						
Sample ID:	**L7001**	**L7002**	**L7003**	**L8001**	**L8002**	**L8003**
Acetone	ND(100)[b]	31(100)	ND(110)	11(110)	ND(110)	ND(110)
Acrolein	ND(78)	ND(79)	ND(82)	ND(83)	ND (83)	ND(84)
Acrylonitrile	ND(52)	ND(52)	ND(55)	ND(55)	ND (56)	ND(56)
Benzene	1.2(5.2)	ND(5.2)	ND(5.5)	ND(5.5)	ND (5.6)	ND(5.6)
Bromodichloromethane	ND(5.2)	ND(5.2)	ND(5.5)	ND(5.5)	ND (5.6)	ND(5.6)
Bromomethane	ND(10)	ND(10)	ND(11)	ND(11)	ND(11)	ND(11)
Carbon disulfide	ND(5.2)	ND(5.2)	ND(5.5)	ND(5.5)	ND(5.6)	ND(5.6)
Carbon tetrachloride	ND(5.2)	ND(5.2)	ND(5.5)	ND(5.5)	ND(5.6)	ND(5.6)
Chlorobenzene	1.1(5.2)	ND(5.2)	ND(5.5)	ND(5.5)	ND(5.6)	ND(5.6)
Chloroethane	ND(10)	ND(10)	ND(11)	ND(11)	ND (11)	ND(11)
2-Chloroethyl vinyl ether	ND(10)	ND(10)	ND(11)	ND(11)	ND (11)	ND(11)
Chloroform	ND(5.2)	ND(5.2)	ND(5.5)	ND(5.5)	ND (5.6)	ND(5.6)
Chloromethane	ND(10)	ND(10)	ND(11)	ND(11)	ND (11)	ND(11)
Dibromochloromethane	ND(5.2)	ND(5.2)	ND(5.5)	ND(5.5)	ND (5.6)	ND(5.6)
Dibromomethane	ND(5.2)	ND(5.2)	ND(5.5)	ND(5.5)	ND (5.6)	ND(5.6)
Trans-1,4,-Dichloro-2-butene	ND(10)	ND(10)	ND(11)	ND(11)	ND (11)	ND(11)
Dichlorodifluoromethane	ND(21)	ND(21)	ND(22)	ND(22)	ND (22)	ND(22)
1,1-Dichloroethane	ND(5.2)	ND(5.2)	ND(5.5)	ND(5.5)	ND (5.6)	ND(5.6)
1,2-Dichloroethane	ND(5.2)	ND(5.2)	ND(5.5)	ND(5.5)	ND (5.6)	ND(5.6)
1,1-Dichloroethene	ND(5.2)	ND(5.2)	ND(5.5)	ND(5.5)	ND (5.6)	ND(5.6)
trans-1,2-Dichloroethene	ND(5.2)	ND(5.2)	ND(5.5)	ND(5.5)	ND (5.6)	ND(5.6)
1,2-Dichloropropane	ND(5.2)	ND(5.2)	ND(5.5)	ND(5.5)	ND (5.6)	ND(5.6)
cis-1,3-Dichloropropene	ND(5.2)	ND(5.2)	ND(5.5)	ND(5.5)	ND (5.6)	ND(5.6)
trans-1,3-Dichloropropene	ND(5.2)	ND(5.2)	ND(5.5)	ND(5.5)	ND (5.6)	ND(5.6)

Table 2-4

(Continued)

Method SW8240						
Sample ID:	**L7001**	**L7002**	**L7003**	**L8001**	**L8002**	**L8003**
Ethyl benzene	ND(5.2)	0.71(5.2)	ND(5.5)	0.40(5.5)	ND(5.6)	ND(5.6)
Ethyl methacrylate	ND(16)	ND(16)	ND(16)	ND(17)	ND(17)	ND(17)
2-Hexanone	ND(52)	ND(52)	ND(55)	ND(55)	ND(56)	ND(56)
Iodomethane	ND(5.2)	ND(5.2)	ND(5.5)	ND(5.5)	ND(5.6)	ND(5.6)
Methyl ethyl ketone	ND(100)	ND(100)	ND(110)	14(110)	14(110)	14(110)
4-Methyl-2-pentanone(MIBK)	ND(52)	ND(52)	ND(55)	ND(55)	ND(56)	ND (56)
Methylene chloride	ND(5.2)	ND(5.2)	ND(5.5)	1.1(5.5)	ND(5.6)	ND (5.6)
Styrene	ND(5.2)	ND(5.2)	ND(5.5)	ND(5.5)	ND(5.6)	ND (5.6)
1,1,2,2-Tetrachloroethane	ND(5.2)	ND(5.2)	ND(5.5)	ND(5.5)	ND(5.6)	ND (5.6)
Tetrachloroethene	ND(5.2)	ND(5.2)	ND(5.5)	ND(5.5)	ND(5.6)	ND (5.6)
Toluene	1.2(5.2)	0.54(5.2)	ND(5.5)	0.53(5.5)	ND(5.6)	0.21(5.6)
Tribromomethane(Bromoform)	ND(5.2)	ND(5.2)	ND(5.5)	ND(5.5)	ND(5.6)	ND (5.6)
1,1,1-Trichloroethane	ND(5.2)	ND(5.2)	ND(5.5)	ND(5.5)	ND(5.6)	ND (5.6)
1,1,2-Trichloroethane	ND(5.2)	ND(5.2)	ND(5.5)	ND(5.5)	ND(5.6)	ND (5.6)
Trichloroethene	ND(5.2)	ND(5.2)	ND(5.5)	ND(5.5)	0.32(5.6)	ND (5.6)
Trichlorofluoromethane	ND(10)	ND(10)	ND(11)	ND(11)	ND(11)	ND (11)
1,2,3-Trichloropropane	ND(5.2)	ND(5.2)	ND(5.5)	ND(5.5)	ND(5.6)	ND (5.6)
Vinyl acetate	ND(5.2)	ND(5.2)	ND(5.5)	ND(5.5)	ND(5.6)	ND (5.6)
Vinyl chloride	ND(10)	ND(10)	ND(11)	ND(11)	ND(11)	ND (11)
Xylenes	ND(5.2)	0.97(5.2)	ND(5.5)	0.97(5.5)	ND(5.6)	ND (5.6)

[a] All results are in micrograms per kilogram (μg/kg)
[b] ND - not detected above stated detection limit, result in parenthesis is the detection limit.

Table 2-5

Beaumont No. 2 Disposal Area
Waste Characterization and Confirmational
Sample Results for Semi-Volatile Organics[a]

Method SW8270						
Sample ID:	**L7001**	**L7002**	**L7003**	**L8001**	**L8002**	**L8003**
Acenaphthene	ND(350)[b]	ND(350)	ND(370)	ND(370)	ND(370)	ND(370)
Acenaphthylene	ND(350)	ND(350)	ND(370)	ND(370)	ND(370)	ND(370)
Acetophenone	ND(350)	ND(350)	ND(370)	ND(370)	ND(370)	ND(370)
4-Aminobiphenyl	ND(350)	ND(350)	ND(370)	ND(370)	ND(370)	ND(370)
Aniline	ND(350)	ND(350)	ND(370)	ND(370)	ND(370)	ND(370)
Anthracene	ND(350)	ND(350)	ND(370)	ND(370)	ND(370)	ND(370)
Benzidine	ND(350)	ND(350)	ND(370)	ND(370)	ND(370)	ND(370)
Benzo(a)anthracene	ND(350)	ND(350)	ND(370)	ND(370)	ND(370)	ND(370)
Benzo(a)pyrene	ND(350)	ND(350)	ND(370)	ND(370)	ND(370)	ND(370)
Benzo(b)fluoranthene	ND(350)	ND(350)	ND(370)	ND(370)	ND(370)	ND(370)
Benzo(g,h,i)perylene	ND(350)	ND(350)	ND(370)	ND(370)	ND(370)	ND(370)
Benzo(k)fluoranthene	ND(350)	ND(350)	ND(370)	ND(370)	ND(370)	ND(370)
Benzoic acid	ND(1700)	ND(1700)	ND(1800)	ND(1800)	ND(1900)	ND(1900)
Benzyl alcohol	ND(350)	ND(350)	ND(370)	ND(370)	ND(370)	ND(370)
4-Bromophenyl phenyl ether	ND(350)	ND(350)	ND(370)	ND(370)	ND(370)	ND(370)
Butylbenzylphthalate	ND(350)	ND(350)	ND(370)	ND(370)	ND(370)	ND(370)
4-Chloro-3-methylphenol	ND(350)	ND(350)	ND(370)	ND(370)	ND(370)	ND(370)
p-chloroaniline	ND(350)	ND(350)	ND(370)	ND(370)	ND(370)	ND(370)
bis(2-Chloroethoxy)methane	ND(350)	ND(350)	ND(370)	ND(370)	ND(370)	ND(370)
bis(2-Chloroethyl)ether	ND(350)	ND(350)	ND(370)	ND(370)	ND(370)	ND(370)
bis(2-chloroisopropyl)ether	ND(350)	ND(350)	ND(370)	ND(370)	ND(370)	ND(370)
1-Chloronaphthalene	ND(350)	ND(350)	ND(370)	ND(370)	ND(370)	ND(370)
2-Chloronaphthalene	ND(350)	ND(350)	ND(370)	ND(370)	ND(370)	ND(370)
2-Chlorophenol	ND(350)	ND(350)	ND(370)	ND(370)	ND(370)	ND(370)

Table 2-5

(Continued)

Method SW8270						
Sample ID:	**L7001**	**L7002**	**L7003**	**L8001**	**L8002**	**L8003**
4-Chlorophenyl phenyl ether	ND(350)	ND(350)	ND(370)	ND(370)	ND(370)	ND(370)
Chrysene	ND(350)	ND(350)	ND(370)	ND(370)	ND(370)	ND(370)
Di-n-octylphthalate	ND(350)	ND(350)	ND(370)	ND(370)	ND(370)	ND(370)
Dibenz(a,h)anthracene	ND(350)	ND(350)	ND(370)	ND(370)	ND(370)	ND(370)
Dibenz(a,j)acridine	ND(350)	ND(350)	ND(370)	ND(370)	ND(370)	ND(370)
Dibenzofuran	ND(350)	ND(350)	ND(370)	ND(370)	ND(370)	ND(370)
Dibutylphthalate	ND(350)	ND(350)	ND(370)	ND(370)	ND(370)	ND(370)
1,2-Dichlorobenzene	ND(350)	ND(350)	ND(370)	ND(370)	ND(370)	ND(370)
1,3-Dichlorobenzene	ND(350)	ND(350)	ND(370)	ND(370)	ND(370)	ND(370)
1,4-Dichlorobenzene	ND(350)	ND(350)	ND(370)	ND(370)	ND(370)	ND(370)
3,3'-Dichlorobenzidine	ND(350)	ND(350)	ND(370)	ND(370)	ND(370)	ND(370)
2,4-Dichlorophenol	ND(350)	ND(350)	ND(370)	ND(370)	ND(370)	ND(370)
2,6-Dichlorophenol	ND(350)	ND(350)	ND(370)	ND(370)	ND(370)	ND(370)
Diethylphthalate	ND(350)	ND(350)	ND(370)	ND(370)	ND(370)	ND(370)
p-Dimethylaminoazobenzene	ND(350)	ND(350)	ND(370)	ND(370)	ND(370)	ND(370)
7,12-Dimethylbenz(a)anthrancene	ND(350)	ND(350)	ND(370)	ND(370)	ND(370)	ND(370)
Dimethylphenethylamine	ND(4200)	ND(4200)	ND(4400)	ND(4400)	ND(4400)	ND(4500)
2,4-Dimethylphenol	ND(350)	ND(350)	ND(370)	ND(370)	ND(370)	ND(370)
Dimethylphthalate	ND(350)	ND(350)	ND(370)	ND(370)	ND(370)	ND(370)
4,6-Dinitro-2-methylphenol	ND(350)	ND(350)	ND(370)	ND(370)	ND(370)	ND(370)
2,4-Dinitrophenol	ND(690)	ND(700)	ND(730)	ND(740)	ND(740)	ND(750)
2,4-Dinitrotoluene	ND(350)	ND(350)	ND(370)	ND(370)	ND(370)	ND(370)
2,6-Dinitrotoluene	ND(350)	ND(350)	ND(370)	ND(370)	ND(370)	ND(370)
Diphenylamine	ND(350)	ND(350)	ND(370)	ND(370)	ND(370)	ND(370)
1,2-Diphenylhydrazine	ND(350)	ND(350)	ND(370)	ND(370)	ND(370)	ND(370)

Table 2-5

(Continued)

Method SW8270						
Sample ID:	**L7001**	**L7002**	**L7003**	**L8001**	**L8002**	**L8003**
Ethyl methanesulfonate	ND(350)	ND(350)	ND(370)	ND(370)	ND(370)	ND(370)
Bis(2-Ethylhexyl)phthalate	ND(350)	ND(350)	ND(370)	36(370)	23(370)	ND(370)
Fluoranthene	ND(350)	ND(350)	ND(370)	ND(370)	ND(370)	ND(370)
Fluorene	ND(350)	ND(350)	ND(370)	ND(370)	ND(370)	ND(370)
Hexachlorobenzene	ND(350)	ND(350)	ND(370)	ND(370)	ND(370)	ND(370)
Hexachlorobutadiene	ND(350)	ND(350)	ND(370)	ND(370)	ND(370)	ND(370)
Hexachlorocyclopentadiene	ND(350)	ND(350)	ND(370)	ND(370)	ND(370)	ND(370)
Hexachloroethane	ND(350)	ND(350)	ND(370)	ND(370)	ND(370)	ND(370)
Indeno(1,2,3-cd)pyrene	ND(350)	ND(350)	ND(370)	ND(370)	ND(370)	ND(370)
Isophorone	ND(350)	ND(350)	ND(370)	ND(370)	ND(370)	ND(370)
Methyl methanesul fonate	ND(1700)	ND(1700)	ND(1800)	ND(1800)	ND(1900)	ND(1900)
3-Methylcholanthrene	ND(350)	ND(350)	ND(370)	ND(370)	ND(370)	ND(370)
2-Methylnaphthalene	ND(350)	ND(350)	ND(370)	ND(370)	ND(370)	ND(370)
2-Methylphenol(o-cresol)	ND(350)	ND(350)	ND(370)	ND(370)	ND(370)	ND(370)
4-Methylphenol(p-cresol)	ND(350)	ND(350)	ND(370)	ND(370)	ND(370)	ND(370)
N-Nitroso-di-n-butylamine	ND(350)	ND(350)	ND(370)	ND(370)	ND(370)	ND(370)
N-Nitrosodimethylamine	ND(350)	ND(350)	ND(370)	ND(370)	ND(370)	ND(370)
N-Nitosodiphenylamine	ND(350)	ND(350)	ND(370)	ND(370)	ND(370)	ND(370)
N-Nitosodipropylamine	ND(350)	ND(350)	ND(370)	ND(370)	ND(370)	ND(370)
N-Nitrosopiperidine	ND(350)	ND(350)	ND(370)	ND(370)	ND(370)	ND(370)
Naphthanlene	ND(350)	ND(350)	ND(370)	ND(370)	ND(370)	ND(370)
1-Naphthylamine	ND(350)	ND(350)	ND(370)	ND(370)	ND(370)	ND(370)
2-Naphthylamine	ND(350)	ND(350)	ND(370)	ND(370)	ND(370)	ND(370)
2-Nitroaniline	ND(350)	ND(350)	ND(370)	ND(370)	ND(370)	ND(370)
3-Nitroaniline	ND(690)	ND(700)	ND(730)	ND(740)	ND(740)	ND(730)
4-Nitroaniline	ND(690)	ND(700)	ND(730)	ND(740)	ND(740)	ND(750)

Table 2-5

(Continued)

Method SW8270						
Sample ID:	**L7001**	**L7002**	**L7003**	**L8001**	**L8002**	**L8003**
Nitrobenzene	ND(350)	ND(350)	ND(370)	ND(370)	ND(370)	ND(370)
2-Nitrophenol	ND(350)	ND(350)	ND(370)	ND(370)	ND(370)	ND(370)
4-Nitrophenol	ND(350)	ND(350)	ND(370)	ND(370)	ND(370)	ND(370)
Pentachlorobenzene	ND(350)	ND(350)	ND(370)	ND(370)	ND(370)	ND(370)
Pentachloronitrobenzene	ND(350)	ND(350)	ND(370)	ND(370)	ND(370)	ND(370)
Pentachlorophenol	ND(350)	ND(350)	ND(370)	ND(370)	ND(370)	ND(370)
Phenacetin	ND(350)	ND(350)	ND(370)	ND(370)	ND(370)	ND(370)
Phenanthrene	ND(350)	ND(350)	ND(370)	ND(370)	ND(370)	ND(370)
Phenol	ND(350)	ND(350)	ND(370)	ND(370)	ND(370)	ND(370)
2-picoline	ND(350)	ND(350)	ND(370)	ND(370)	ND(370)	ND(370)
Pronamide	ND(350)	ND(350)	ND(370)	ND(370)	ND(370)	ND(370)
Pyrene	ND(350)	ND(350)	ND(370)	ND(370)	ND(370)	ND(370)
Pyridine	ND(350)	ND(350)	ND(370)	ND(370)	ND(370)	ND(370)
1,2,4,5-Tetrachlorobenzene	ND(350)	ND(350)	ND(370)	ND(370)	ND(370)	ND(370)
2,3,4,6-Tetrachlorophenol	ND(350)	ND(350)	ND(370)	ND(370)	ND(370)	ND(370)
1,2,4-Trichlorobenzene	ND(350)	ND(350)	ND(370)	ND(370)	ND(370)	ND(370)
2,4,5-Trichlorophenol	ND(350)	ND(350)	ND(370)	ND(370)	ND(370)	ND(370)
2,4,6-Trichlorophenol	ND(350)	ND(350)	ND(370)	ND(370)	ND(370)	ND(370)

[a] All results are in micrograms per killogram ($\mu g/kg$)
[b] ND = not detected above stated detections limit, result in parenthesis.

- Backfilling and compaction of soil and final topographic survey; and
- Final SKR habitat assessment.

2.2.1 Transportation and Disposal

The excavation and stockpiling of non-hazardous materials was completed by Scrivner under the direction of Radian. The excavation was conducted with the use of a track-driven excavator (Figure 2-10). At the end of the first day of excavation, it became apparent the waste material had been disposed mainly in an elongated trench situated between the two mounds (Figure 2-11). Debris was found deepest along the east side of the original disposal trench at a depth of 5 feet below grade and became shallower towards the west until only native soil was encountered. The final depression left by the removal activities is illustrated in Figure 2-12 and covered an area approximately 150 feet long by 50 feet wide.

Since large trucks were not able to reach the disposal area, front-end loaders were used to transport the soil and debris to a temporary holding area (Figures 2-13 and 2-14). Trucks were loaded from the holding area over a two-day period. A total of 36 truck loads were used to transport 816.43 tons or approximately 583 cubic yards of debris to BKK Landfill, a Class III facility located in West Covina, California, about 65 miles from the site. Each load was documented and tracked by using a non-hazardous waste data form. Table 2-6 lists the tracking number, weight in tons, and approximate cubic yards for each load.

2.2.2 Confirmational Perimeter Sampling

Once all debris had been removed from the disposal area and the excavation had been completed down to native material, confirmational grab samples were collected to document that all waste had been removed. Three samples were collected, as illustrated in Figure 2-12, and analyzed by the same parameters as the

Figure 2-10. Track-Driven Excavator

Figure 2-11. Excavated Disposal Trench

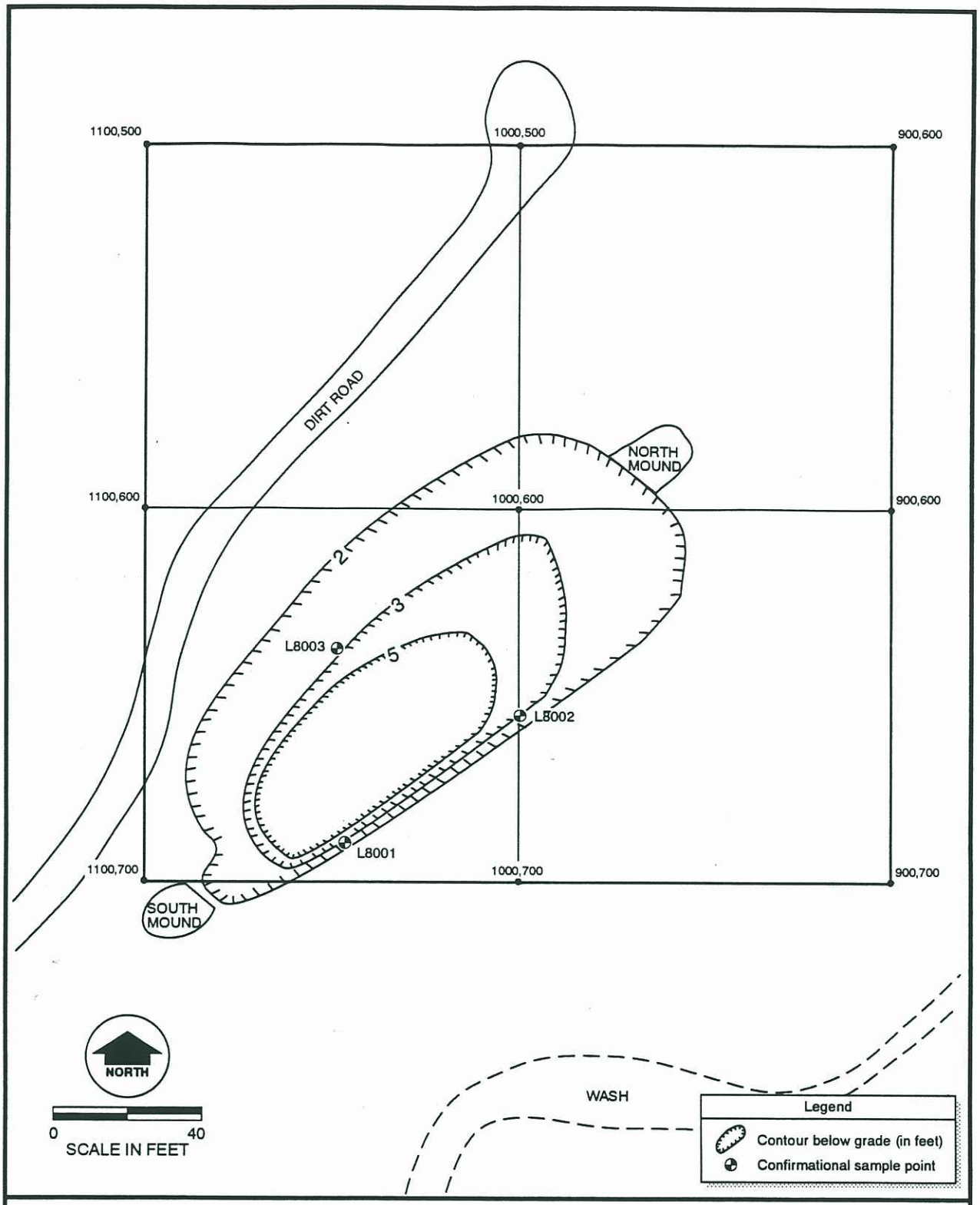

Figure 2-12. Depth of Final Excavations and Location of Confirmational Samples

LOCKF4.FH3 - VMG 6/1/93 SAC

Figure 2-13. Front-End Loader

Figure 2-14. Temporary Holding Area

Table 2-6

Summary for Soil and Non-Hazardous Debris Disposed at BKK Landfill

Data Form Tracking Number	Weight Net (Tons)	Approximate Cubic Yards
28901	27.15	19
28902	26.41	19
28903	25.28	18
28904	24.27	17
28905	24.55	18
28906	23.11	17
28907	25.23	18
28908	23.20	17
28910	25.13	18
28911	24.85	18
28912	26.52	19
28913	26.08	19
28914	23.09	16
28915	25.24	18
28917	24.85	18
28918	24.06	17
28919	25.31	18
28920	25.49	18
28921	21.63	15
28922	21.25	15
28923	25.10	18
28924	24.55	18
28925	24.88	18

Table 2-6

(Continued)

Data Form Tracking Number	Weight Net (Tons)	Approximate Cubic Yards
28926	24.12	17
28927	21.85	16
28928	24.35	17
28929	23.06	16
28930	24.35	17
28931	19.09	14
28933	17.19	12
28934	12.84	9
28935	11.99	9
28936	11.35	8
28937	15.20	11
28938	20.01	14
28954	23.80	17
Totals	816.43	583

waste characterization samples. Analytical results of the confirmational sampling are summarized in Tables 2-3, 2-4, and 2-5 for metal, volatile, and semi-volatile organics, respectively. These results confirmed that the disposal area did not contain hazardous waste and that all waste material had been removed. Metal results for samples analyzed by EPA Method 6010, 7060, 7471, 7421, and 7740 were again only measured at low levels and, in all cases, less than 10 times their respective STLC values. Organic results for samples analyzed by EPA Method 8240 and 8270 for volatile and semi-volatile organics were also measured below the limit of detections for all compounds.

2.2.3 Backfilling and Final Topographic Survey

Following the excavation, the disposal area depression was backfilled with native soil obtained from west of the disposal area and the area was graded to maintain historical drainage patterns. Soil was placed in 8-inch, moisture conditioned lifts, and compacted to a density of not less than 90% of the maximum dry density as determined in accordance with ASTM D-1556-82 and ASTM D-2922-81. Compaction tests were performed by Converse Consultants (Converse) using the Sand Cone and Nuclear Gauge methods. Figure 2-15 shows a nuclear densitometer that was used to perform the tests. Results confirmed compliance with project specifications as stated in Converse's final geotechnical report (provided in Appendix C). All backfilling activities were performed in accordance with the grading permit issued by the Riverside County Department of Building and Safety. Specific grading requirements are discussed in Section 2.3 of this report.

A final topographic survey was conducted as required by Riverside County. Paul Perea and Associates, the same licensed surveyor who performed the original survey, conducted the final survey. The final elevation of the disposal area was about 2 feet lower after the excavations, however the historical drainage patterns were maintained (Figure 2-16).

Figure 2-15. Nuclear Densitometer

Figure 2-16. Disposal Area After Final Grading

2.3 Compliance with Applicable Regulations

All applicable regulations were addressed and complied with during all portions of this work. The regulatory agencies involved in overseeing on-site activities included:

- Cal/EPA Department of Toxic Substances Control (DTSC), which acted as the lead agency;
- South Coast Air Quality Management District (SCAQMD);
- California Regional Water Quality Control Board (CRWQCB), Santa Ana Region 8 and Los Angeles Region 4; and
- Riverside County.

The regulatory requirements stipulated by each of the above regulatory agencies are outlined below. A description of procedures implemented to comply with each requirement then follows. Applicable permits are included in Appendix C.

2.3.1 South Coast Air Quality Management District

Two separate conditional exemptions were obtained for the Rule 1150 Landfill Excavation Permit. These conditional exemptions covered procedures to be followed to limit the amount of emissions created during excavation activities. An initial conditional exemption was obtained on January 5, 1993 for the trenching. Because no organic vapors were encountered above ambient levels and no hazardous materials were found at the disposal area, a second conditional exemption was obtained on March 5, 1993 for the excavation. General compliance requirements contained in both exemptions included:

- Notifying SCAQMD in writing at least 2 days prior to the beginning of excavation and within 5 days after the completion;

- Conducting excavation activities between the hours of 6:00 AM and 6:00 PM;
- Not conducting excavation activities when the SCAQMD forecasts for Area 29 predicted first, second, or third stage episodes, or when the SCAQMD required companies in Area 29 to implement their episode plans (SCAQMD forecasts were checked each day, no episodes were predicted during field activities);
- Monitoring wind speed and direction (as shown in Figure 2-17) to ensure that excavation was not conducted when the average wind speed (over 15 minutes) was greater than 20 mph or when the instantaneous wind speed exceeded 25 mph (no wind speeds greater than 20 mph were measured during the field work);
- Monitoring for volatile organics using an organic vapor analyzer (or an organic vapor monitor/photoionization detector) downwind of the excavation work areas, and recording readings every 15 minutes (at no time during the trenching nor excavation were readings above ambient levels measured); and
- During excavations, all working areas, excavated material and unpaved roadways shall be kept moist to minimize dust and emissions (the trenching and excavations were completed soon after heavy rains and the soil remained moist the entire time).

Specific compliance conditions for the trenching activities included:

- No more than 210 feet of trenching with a maximum depth of 8 feet below grade will be completed with no more than 140 cubic yards of material removed; and
- All trenches would be backfilled with clean soil.

Specific compliance conditions for the removal activities included:

- Excavations will be limited to the removal of 2,000 cubic yards or less;

Figure 2-17. Wind Speed and Direction Monitor

- Material loss will be minimized during transport by loading trucks so that no material extends beyond the sides or rear and so material is securely covered; and

- All excavated material would be covered by heavy-duty plastic.

2.3.2 California Regional Water Quality Control Board

The CRWQCB - Los Angeles Region 4 regulated the disposal of burn pit waste at BKK Landfill. A Waste Discharge Permit, covering procedures to be followed during the transport and disposal of burn pit waste to BKK Landfill was obtained from CRWQCB Los Angeles Region 8 prior to initiating waste disposal activities. This permit was obtained on March 17, 1993, and compliance with the permit included:

- Implementing a monitoring and reporting program upon issuance of the waste discharge requirements. (Program was implemented on March 17, 1993 the day the waste discharge requirements were issued.)

- Providing a Waste Disposal and Monitoring Report following the completion of disposal operations at the final point of disposal. (The completion of disposal was March 25, 1993.)

- Providing the following information in the report: summary of analytical results for grab samples obtained during the program; the quantities and types of materials deposited; location and name of where the materials were deposited; and a certification that all wastes were deposited in compliance with the Regional Board's requirements and that no wastes were deposited outside of the boundaries of the site.

The Waste Disposal and Monitoring Report was submitted to the RWQCB on May 20, 1993.

2.3.3 Riverside County

Riverside County was involved with the site grading, including excavation, and backfilling. A preliminary grading permit covering procedures to be followed during excavation and grading activities to control erosion, drainage, and settling, was obtained from Riverside County Department of Building and Safety before earthmoving activities were initiated. The preliminary permit was obtained on February 1, 1993. Procedures followed to comply with the permit included:

- Performing excavation, backfilling, and grading operations in accordance with UBC Chapters 26 and 70 and County Ordinance 457;
- Ensuring the final geotechnical report confirms compliance with engineering specifications and is certified by a registered engineer (included in Appendix C); and
- Providing County with final site topography and reports documenting site activities.

A final grading report was transmitted to Riverside County on May 17, 1993.

3.0 GROUNDWATER SAMPLING

Three groundwater monitoring wells were sampled to confirm earlier sampling showing that the groundwater has not been impacted by the previous activities at the site. The three wells sampled were wells MW2-2, MW2-5 and MW2-6 as shown in Figure 1-3. Monitoring well MW2-4 was not sampled due to the dirt road leading to this well having been washed out during the heavy rains of January 1993. The former water production wells, W2-3, W2-4, and W2-5 were not sampled due to their large purge volumes. The sampling methodology, including the field and analytical programs, is presented in Section 3.1. Field observations and analytical results are presented in Section 3.2.

3.1 Methodology

This section presents the methodology used to obtain representative groundwater samples from the three monitoring wells. Section 3.1.1 presents the field program methods, including the measurement of groundwater elevations, well purging and sampling, and field QA/QC procedures. Analytical methods and laboratory QA/QC procedures are discussed in Section 3.1.2.

Radian performed this assessment under contract to Lockheed Corporation in accordance with the *Lockheed Propulsion Company, Beaumont Site No. 2, Hydrogeologic Investigation Quality Assurance Project Plan* (QAPP), (September 1990b). The QAPP was prepared by Radian in close cooperation with personnel from Lockheed Corporation, DTSC, and RWQCB. Work was also performed in accordance with the *Lockheed Beaumont No. 2 Health and Safety Plan*, (Radian, September 1990c).

3.1.1 Field Program

The field program included the gauging of water levels, purging wells, and sampling groundwater from the three wells. A Radian geologist was on site and responsible for completion of the sampling activities which were conducted from March 24 through March 25, 1993. As needed, representatives of the RWQCB, DTSC, and Lockheed Corporation were contacted.

Water Level Measurement

The depth to groundwater was measured to determine hydraulic gradients. Groundwater levels were measured with a clean electronic probe to a precision of 0.01 foot. A clean plumb bob attached to a measuring tape measured well depth in order to assess the amount of debris that may have accumulated in the well, and to calculate the amount of water to be purged. Purge volumes were calculated by multiplying the thickness of water in the well by a conversion factor of 0.65 (1 linear foot of water in a four-inch diameter well is equivalent to 0.65 gallons) then by three (three well volumes were the desired amount of water to be purged from each well).

Well Purging

Wells were purged using a Grundfos® Readiflow 2-inch electrical pump. Water was pumped until three well volumes were removed or the well was pumped dry. In each case, sufficient water was removed until temperature, conductivity, pH, water clarity, and color had stabilized to ensure that representative groundwater was sampled. Figure 3-1 shows the sampling pump and associated equipment. Details of purging each well are presented below.

Well MW2-2 was pumped at an average rate of 1.2 gallons per minute (gpm) until the well went dry and then allowed to recover overnight. A total of 71 gallons were

Figure 3-1. Groundwater Sampling Pump

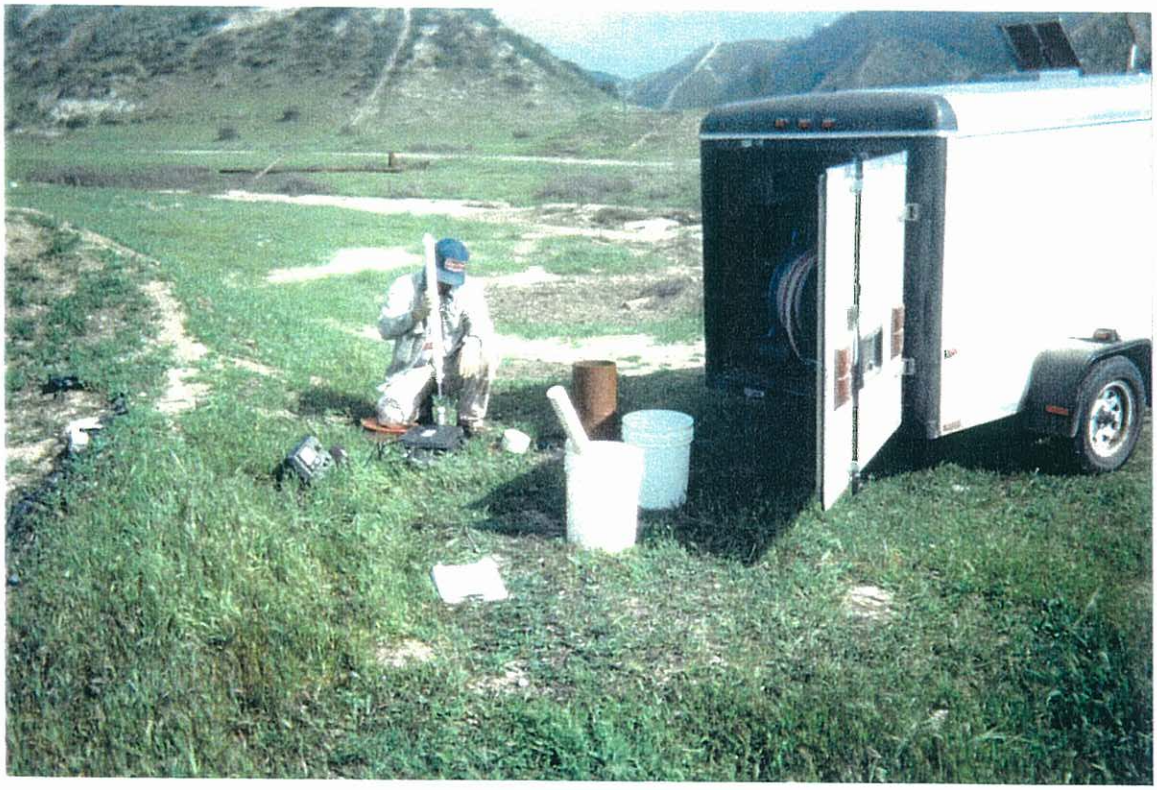

Figure 3-2. Groundwater Sampling

purged, representing 1.34 well volumes, prior to sampling MW2-2 on the second day. Due to the low permeability of the screened formation water levels only recovered to 20% of the initial level.

Well MW2-5 was pumped at an initial rate of 2.7 gpm for the first 10 minutes, but due to the rapid drawdown of the water level in the well the rate was slowed to 1.2 gpm until the well was pumped dry, then allowed to recover overnight. A total of 64 gallons (2 well volumes) were purged. On the second day, MW2-5 was sampled after water levels had fully recovered.

Well MW2-6 was pumped at 3 gpm until 94 gallons were removed (3 well volumes). Drawdown in the well was 5.58 feet during purging.

All groundwater produced during purging was transported to the Beaumont No. 1 facility in a portable 250-gallon polyethylene tank and treated along with groundwater purged as part of the baseline sampling at the No. 1 site. After analytical test results documented that concentrations of VOCs in the treated water were below detection limits and approval was given by the RWQCB, the treated water was injected into IW-1 at Beaumont No. 1 site.

Water Sampling

Following purging at each well, groundwater samples were collected using a Teflon® bottom-entry bailer. To collect samples, a clean bailer was slowly lowered into the well water to minimize possible volatilization of organic compounds. The first bailer volume was discarded to condition the bailer. The second bailer volume was used for conductivity, pH, and temperature measurements. The third bailer volume was used to collect samples. The groundwater was slowly poured from the bailer into pre-cleaned sample containers (see Figure 3-2). Table 3-1 summarizes the sample handing and preservation methods used.

Table 3-1

Groundwater Analytical and Preservation Methods[a]

Parameter	Test Method	Container[b]	Preservation	Maximum Holding Time
Electrical Conductivity	EPA 120.1	Field Test	NA	NA
pH	EPA 150.1	Field Test	NA	NA
Temperature	EPA 170.1	Field Test	NA	NA
Volatile Halogenated Organics	Modified EPA 8010	Three 40 ml glass vials with Teflon® Septa	4°C	7 days
Nitrates	Modified EPA 353.2	One 500 ml plastic bottle	4°C	14 days

[a]Methods used are those specified by the U.S. Environmental Protection Agency.
[b]All sample containers are pretreated and cleaned according to specific protocols prior to purchase.
NA = not applicable.

Field Quality Assurance/Quality Control

Quality control procedures were followed in the field to ensure data quality; these included:

- Use of new surgical-type gloves to avoid sample and bottle contamination.
- Use of standard decontamination procedures for the purge pumps and bailers to prevent cross contamination of samples.
- Storage of all samples at 4°C immediately after collection and until analysis.
- Collection of all samples using procedures that avoid aeration of the groundwater.
- Collection of one set of duplicate samples to estimate the variability in the sampling process.
- Collection of one set of field blank samples to identify potential external sources of contamination. Field blanks consisted of distilled water that was poured through the sampling device (bailer), collected, and submitted blind to the laboratory.
- Use of a Master Sample Tracking Log with unique sample control numbers assigned to each sample for documentation and tracking.

3.1.2 Analytical Program

This section describes the rationale and methods used to analyze groundwater samples followed by laboratory QA/QC procedures.

Analytical Methods

Analytical methods were selected to determine the presence and concentration of chemical compounds that were suspected of being present in the groundwater. The compounds of interest were selected based on the history of operations, wastes potentially produced by those operations, and analytical results for previous groundwater samples collected at or near the facility.

Analyses performed during this round of sampling included volatile halogenated organic compounds by modified EPA Method 8010 and nitrates by modified EPA Method 353.2. Both analyses were performed at the on-site laboratory located at the Beaumont No. 1 facility. Field analyses performed included electrical conductivity (EPA Method 120.1), pH (EPA Method 150.1), and temperature (EPA Method 170.1). Descriptions of these methods are presented in the QAPP (Radian, 1990b).

Laboratory Quality Assurance/Quality Control

Laboratory QA/QC procedures included the following:

- Use of standard operating procedures for all methods;
- Instrument calibration and calibration checks at specified frequencies;
- Reagent blank analyses;
- Analyses of method, matrix, and surrogate spiked samples, where applicable; and
- Matrix spike duplicate analyses, where applicable.

Quality assurance procedures included ongoing review of analytical results to document compliance with specified procedures. The data quality assessment groundwater analyses is summarized in Appendix B.2.

3.2 Observations and Results

General observations and analysis of field data, including groundwater occurrence and movement, and field measured groundwater parameters are presented in Section 3.2.1. Analytical results are contained in Section 3.2.2. Quality assurance/quality control assessments for groundwater analyses are summarized in Appendix B.2.

3.2.1 Field Observations and Calculations

Field observations and estimations, including groundwater levels, potential movement, groundwater quality, and conditions of the wells, are presented below.

Groundwater Occurrence and Movement

Groundwater levels were measured in each monitoring well to evaluate the hydraulic gradient and potential flow direction. Table 3-2 presents water level data for the three wells sampled plus historical data for the fourth groundwater monitoring well not sampled (MW2-4) and for the three former agricultural wells (W2-3, W2-4, and W2-5). Data indicate that over the 2 years since the wells were installed, groundwater levels generally stayed the same the first two years but began to rise after the 1992/1993 winter rains. The deep well MW2-2 showed the greatest groundwater increase since installation which may be due to the very low permeability of formation.

Table 3-2

Water Level Data

Well No.	Reference Point Elevation[a] (feet MSL)	Ground Surface Elevation (feet MSL)	Well Depth (feet BGS) (Screen Interval)	Date	Depth to Water (feet BGS)	Water-Level Elevation (feet MSL)
MW2-2	1996.41	1995	140 (115-135)	12/6/90 1/18/91 7/10/91 3/24/93	103.60 71.84 62.22 56.67	1892.81 1924.57 1934.19 1939.74
MW2-4	1956.36	1955	62 (40-60)	12/3/90 1/18/91 7/10/91	43.96 43.79 42.85	1912.40 1912.57 1913.51
MW2-5	2058.82	2057	100 (78-98)	12/4/90 1/18/91 7/10/91 3/24/93	63.30 63.74 63.31 52.12	1995.50 1995.08 1995.51 2006.70
MW2-6	2111.95	2111	95 (70-90)	12/6/90 1/18/91 7/10/91 3/24/93	66.30 66.27 66.38 46.53	2045.60 2045.68 2045.57 2065.42
W2-3	2028.83	2029	156 (Unknown)	10/86 12/6/90 7/10/91	45.00 53.90 52.23	1984.00 1974.90 1976.60
W2-4	2334.27	2334	107 (None)	12/3/90 7/10/91	12.00 9.50	2332.00 2324.77
W2-5	2140.95	2140	481 (161-467)	11/30/90 7/10/91	96.10 91.36	2044.80 2049.59

Notes:

[a] Reference point is top of well casing.
MSL - Mean sea level
BGS - Below ground surface

The regional groundwater flow direction is southerly, from the San Gorgonio pass toward the San Jacinto Valley. Within the site boundaries, the apparent flow direction is also southerly following the surface drainage and topography of the site. Because of the limited number of monitoring wells and their spacing (generally along a north-south line), hydraulic gradients and flow directions are estimates. The calculated average gradient across the site from MW2-6 to MW2-5 is 0.032 feet per foot which is slightly steeper than the gradient of 0.027 for July 1991. However, the gradient calculated between MW2-6 and MW2-4 (the southernmost well) was 0.033 for July 1991, indicating that gradients have not steepened or declined as a result of the 1992/1993 rains.

Measured Field Parameters

Measured temperature, pH, and conductivity field values are presented in Table 3-3, and described below.

Water temperatures ranged from 22°C in MW2-1 and MW2-5 to 23°C in MW2-6 and are within the normal range for groundwater.

The pH values ranged from 7.87 to 9.54 indicating that the water is moderately alkaline. The California Code of Regulations Title 22, maximum corrosivity criteria is 12.5.

Electrical conductivity values range were 330, 390, and 900 micromhos per centimeter (μmhos/cm) for MW2-2, MW2-5 and MW2-6, respectively, which are similar to previous measurements. The California Code of Regulations Title 22, Secondary Maximum Contaminant Level (MCL) is 900 μmhos (secondary MCLs are based on the aesthetic quality of the water, as opposed to health-based primary MCLs).

Water was clear in MW2-2 and MW2-5 but was transparent in MW2-6. Water was colorless in MW2-2 and MW2-5 but was a very pale orange from MW2-6.

Table 3-3

Groundwater Field Measurement Data

Well	Date	pH	Conductance (μmhos/cm)	Temperature (°C)
MW2-2	1/18/91 3/25/93	NA 9.46	410 330	19 22
MW2-4	12/3/90	7.45	1220	21.2
MW2-5	12/4/90 3/25/93	7.48 9.54	440 390	28.0 22
MW2-6	12/7/90 3/24/93	7.44 7.87	1195 900	22.3 23
W2-3	12/6/90	8.20	290	18.0
W2-5	11/30/90	8.0	700	22.1
W2-4	12/3/90	7.19	690	18.7

NA = Not available
μmhos/cm = micromhos per centimeter

Monitoring Well Conditions

The three monitoring wells sampled remain in proper working order. Since initial well installation, the wells have accumulated less than one foot sediment at the bottom of the casings. Groundwater recharge rates were similar to those of past rounds of sampling, suggesting that the well screens have not been disturbed or clogged. However, the surface monuments in wells MW2-4, MW2-5, and MW2-6 have been broken open as shown in Figures 3-3 through 3-5. Internal locking caps were installed inside the casing of all four monitoring wells but the monuments should be fixed or the wells abandoned.

3.2.2 Groundwater Analytical Results

This section presents a summary of the analytical results for the groundwater samples. The analyses were performed by Radian chemists at the onsite laboratory located at the Beaumont No. 1 facility.

Summary of Data Quality

The results of the data assessment procedures indicate the data are valid and the quality is acceptable, as measured by the analytical accuracy and precision. No discrepancies or systematic problems were detected. All of the data have been verified through the data assessment procedures presented in the QAPP. Further explanation of the quality assurance and quality control results for the groundwater samples is presented in Appendix B.2

Groundwater Analyses for Nitrates

Nitrates were analyzed by modified EPA Method 353.2 with the results presented in Table 3-4. Only nitrates in the sample collected from MW2-6 were

Figure 3-3. MW2-4

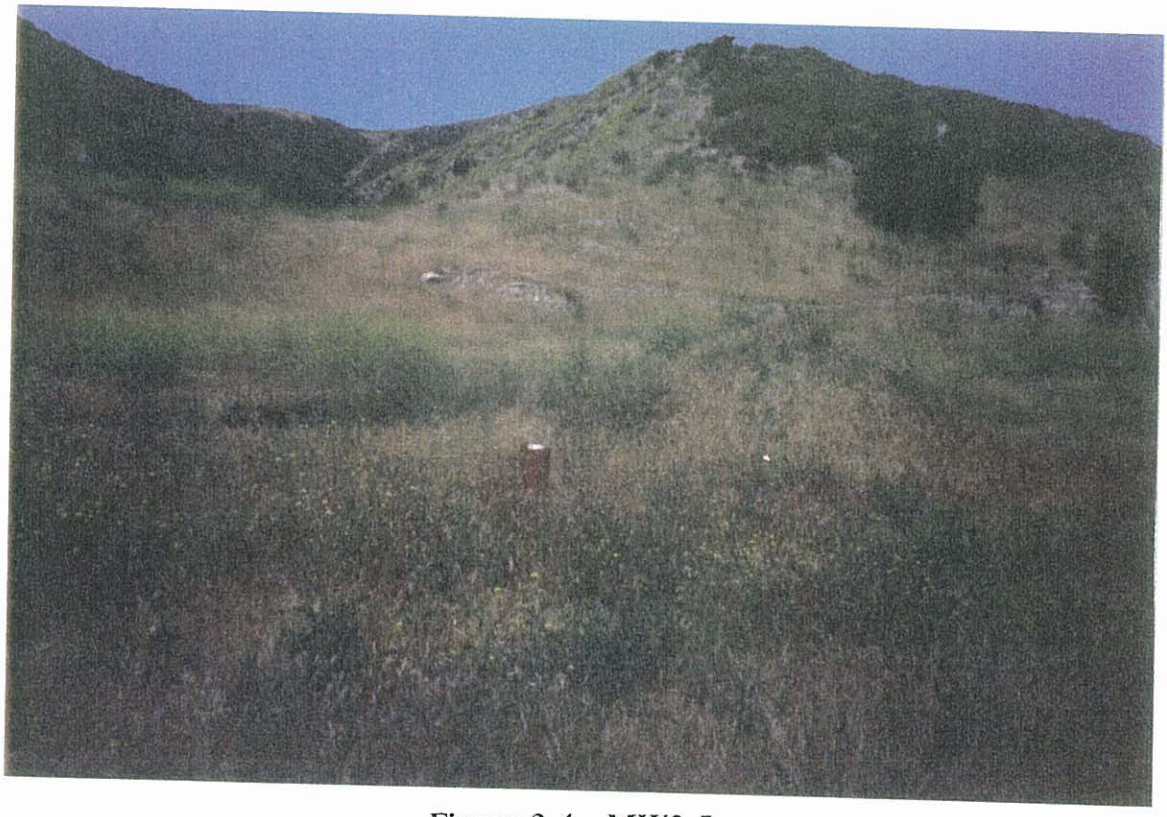

Figure 3-4. MW2-5

Figure 3-5. MW2-6

Table 3-4

Nitrate Results

Location	Depth (ft BGS)	Nitrates (mg/L)	Comments
MW2-2	56.67	0	
MW2-5	52.12	0	
MW2-6	45.55	5.4	Field Dup #1
MW2-6	45.55	7.5	Field Dup #2
EB	0	0	Equipment Blank
BB	0	0	Bailer Blank

ft BGS = Feet below ground surface.
mg/L = Milligrams per liter.

measured above the limit of detection, but was below the drinking water standard. The current U.S. EPA MCL for nitrate nitrogen in drinking water is 10 mg/L (No3 - N). The nitrates are probably a result of sheep grazing and not related to past activities at the site since only well MW2-6 was impacted. MW2-6 is located upgradient of the suspected disposal area.

Groundwater Analyses for Organic Compounds

Samples of groundwater were collected from each of the monitoring wells for volatile organic compound analyses by modified U.S. EPA Method 8010. No compounds were detected as presented in Table 3-5.

Table 3-5

Total Volatile Organics Results

Location	Depth (ft BGS)	1,1-DCE	1,1,1-TCA	TCE	1,2-DCA	PCE	Total VOCS	Comments
MW2-2	56.67	ND[a]	ND	ND	ND	ND	ND	
MW2-5	52.12	ND	ND	ND	ND	ND	ND	
MW2-6	45.55	ND	ND	ND	ND	ND	ND	Field Dup #1
MW2-6	45.55	ND	ND	ND	ND	ND	ND	Field Dup #2
EB	0	ND	ND	ND	ND	ND	ND	Equipment Blank
BB	0	ND	ND	ND	ND	ND	ND	Bailer Blank

[a]Not detected, for specific detection limits refer to Appendix B.2
ft BGS = Feet below ground surface.

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APPENDIX A.1

Analytical Data Sheets for Soil Samples

RADIAN

Radian Work Order 93-02-267

Analytical Report
02/25/93

Lockheed

Radian
Sacramento
CA

Marie Yates

Customer Work Identification #2 Disposal Area
Purchase Order Number 290-063-02-03

Contents:

Radian Analytical Services
14046 Summit Dr., Bldg. B
P. O. Box 201088
Austin, TX 78720-1088

512/244-0855

Client Services Coordinator: JALINDSEY

Certified by: J. Williams

Lockheed
Radian Work Order: 93-02-267

Method:ICP analysis by SW6010 (1)
List:ICP analysis by SW6010

Sample ID:	L7001	L7002	L7003	METHOD BLANK
Factor:	78.74015	80	88.49557	100
Results in:	mg/kg	mg/kg	mg/kg	mg/kg
Matrix:	01A solid	02A solid	03A solid	04A solid

	Result	Det. Limit	Result	Det. Limit	Result	Det. Limit	Result	Det. Limit
Antimony	21 @	7.6	20 @	8.0	ND	8.9	ND	10
Barium	80	0.79	64	0.80	71	0.88	ND	1.0
Beryllium	0.36 @	0.16	0.37 @	0.16	0.52 @	0.18	ND	0.20
Cadmium	1.1 @	0.39	1.1 @	0.40	1.2 @	0.44	ND	0.50
Chromium	16	0.79	13	0.80	19	0.88	ND	1.0
Cobalt	4.2	0.79	4.0	0.80	6.7	0.88	ND	1.0
Copper	11	1.6	19	1.6	15	1.8	ND	2.0
Molybdenum	ND	3.9	ND	4.0	ND	4.4	ND	5.0
Nickel	5.0 @	1.6	4.8 @	1.6	11	1.8	ND	2.0
Silver	0.94 @	0.79	1.1 @	0.80	1.7 @	0.88	ND	1.0
Thallium	ND	7.9	15 @	8.0	ND	8.8	ND	10
Vanadium	24	1.6	23	1.6	34	1.8	ND	2.0
Zinc	20	1.6	27	1.6	32	1.8	ND	2.0

@ Est. result less than 5 times detection limit

ND Not detected at specified detection limit

(1) For a detailed description of flags and technical terms in this report refer to Appendix A in this report.

Lockheed
Radian Work Order: 93-02-267

Method:ICP analysis by SW6010 (1)
List:ICP analysis by SW6010

Sample ID:	LCS	LCS DUP
Factor:	0	0
Results in:	%recvry	%recvry
	05A	06A
Matrix:	solid	solid

	Result	Det. Limit	Result	Det. Limit	Result	Det. Limit	Result	Det. Limit
Antimony	108		103					
Barium	84		84					
Beryllium	93		90					
Cadmium	84		83					
Chromium	107		119					
Cobalt	87		85					
Copper	100		98					
Molybdenum	94		82					
Nickel	90		86					
Silver	91		90					
Thallium	91		80					
Vanadium	95		97					
Zinc	93		95					

(1) For a detailed description of flags and technical terms in this report refer to Appendix A in this report.

RADIAN CORPORATION

Analytical Data Summary

Lockheed
Radian Work Order: 93-02-267

Method/Analyte	Sample Identifications								
	L7001			L7002			L7003		
Matrix	01 solid			02 solid			03 solid		
	Result		Det. Limit	Result		Det. Limit	Result		Det. Limit
Arsenic by SW7060									
Arsenic	1.2 @	mg/kg	0.29	1.7	mg/kg	0.31	3.1	mg/kg	0.33
Mercury, cold vapor SW7471									
Mercury	ND	mg/kg	0.047	ND	mg/kg	0.047	ND	mg/kg	0.049
Percent moisture, SW846									
Percent moisture	3.8	%		4.6	%		9.0	%	
Lead by SW7421									
Lead	2.2	mg/kg	0.22	2.6	mg/kg	0.23	3.5	mg/kg	0.24
Selenium by SW7740									
Selenium	ND	mg/kg	0.36	ND	mg/kg	0.39	ND	mg/kg	0.40

@ Est. result less than 5 times detection limit

ND Not detected at specified detection limit

(1) For a detailed description of flags and technical terms in this report refer to the glossary.

RADIAN CORPORATION

Analytical Data Summary

Lockheed
Radian Work Order: 93-02-267

Method/Analyte	Sample Identifications								
	METHOD BLANK			LCS			LCS DUP		
Matrix	04 solid			05 solid			06 solid		
	Result		Det. Limit	Result		Det. Limit	Result		Det. Limit
Arsenic by SW7060									
Arsenic	ND	mg/kg	0.40	132	%recvry		135	%recvry	
Mercury, cold vapor SW7471									
Mercury	ND	mg/kg	0.045	92	%recvry		96	%recvry	
Lead by SW7421									
Lead	ND	mg/kg	0.30	115	%recvry		115	%recvry	
Selenium by SW7740									
Selenium	ND	mg/kg	0.0050	104	%recvry		107	%recvry	

ND Not detected at specified detection limit

(1) For a detailed description of flags and technical terms in this report refer to the glossary.

Lockheed
Radian Work Order: 93-02-267

Sample Identifications and Dates

Sample ID	L7001	L7002	L7003	METHOD BLANK	LCS	LCS DUP
Date Sampled	02/17/93	02/17/93	02/17/93			
Date Received	02/18/93	02/18/93	02/18/93	02/18/93	02/18/93	02/18/93
Matrix	solid	solid	solid	solid	solid	solid
	01	02	03	04	05	06
Arsenic by SW7060						
Prepared	02/19/93	02/19/93	02/19/93	02/19/93	02/19/93	02/19/93
Analyzed	02/22/93	02/22/93	02/22/93	02/22/93	02/22/93	02/22/93
Analyst	SJM	SJM	SJM	SJM	SJM	SJM
File ID	Z3022209-36	Z3022209-37	Z3022209-38	Z3022209-23	Z3022209-26	Z3022209-27
Blank ID	Z3022209-23	Z3022209-23	Z3022209-23	Z3022209-23	Z3022209-23	Z3022209-23
Instrument	Z3	Z3	Z3	Z3	Z3	Z3
Report as	dry weight	dry weight	dry weight	dry weight	dry weight	dry weight
Mercury, cold vapor SW7471						
Prepared	02/22/93	02/22/93	02/22/93	02/22/93	02/22/93	02/22/93
Analyzed	02/22/93	02/22/93	02/22/93	02/22/93	02/22/93	02/22/93
Analyst	MXZ	MXZ	MXZ	MXZ	MXZ	MXZ
File ID	Z4022221-15	Z4022221-16	Z4022221-17	Z4022221-10	Z4022221-13	Z4022221-14
Blank ID	Z4022221-10	Z4022221-10	Z4022221-10	Z4022221-10	Z4022221-10	Z4022221-10
Instrument	Z4	Z4	Z4	Z4	Z4	Z4
Report as	dry weight	dry weight	dry weight	dry weight	dry weight	dry weight
ICP analysis by SW6010						
Prepared	02/19/93	02/19/93	02/19/93	02/19/93	02/19/93	02/19/93
Analyzed	02/24/93	02/24/93	02/24/93	02/24/93	02/24/93	02/24/93
Analyst	DES	DES	DES	DES	DES	DES
File ID	JA610224-24	JA610224-25	JA610224-26	JA610224-17	JA610224-22	JA610224-23
Blank ID	JA610224-17	JA610224-17	JA610224-17	JA610224-17	JA610224-17	JA610224-17
Instrument	JA61	JA61	JA61	JA61	JA61	JA61
Report as	dry weight	dry weight	dry weight	dry weight	dry weight	dry weight
Percent moisture, SW846						
Prepared	02/18/93	02/18/93	02/18/93			
Analyzed	02/19/93	02/19/93	02/19/93			
Analyst	PLM	PLB	PLB			
File ID						
Blank ID						
Instrument						
Report as	received	received	received			
Lead by SW7421						
Prepared	02/19/93	02/19/93	02/19/93	02/19/93	02/19/93	02/19/93
Analyzed	02/22/93	02/22/93	02/22/93	02/22/93	02/22/93	02/22/93
Analyst	HD	HD	HD	HD	HD	HD
File ID	Z2022216-12	Z2022216-13	Z2022216-14	Z2022216-7	Z2022216-10	Z2022216-11
Blank ID	Z2022216-7	Z2022216-7	Z2022216-7	Z2022216-7	Z2022216-7	Z2022216-7
Instrument	Z2	Z2	Z2	Z2	Z2	Z2
Report as	dry weight	dry weight	dry weight	dry weight	dry weight	dry weight

Lockheed
Radian Work Order: 93-02-267

Sample Identifications and Dates

Sample ID	L7001	L7002	L7003	METHOD BLANK	LCS	LCS DUP
Date Sampled	02/17/93	02/17/93	02/17/93			
Date Received	02/18/93	02/18/93	02/18/93	02/18/93	02/18/93	02/18/93
Matrix	solid	solid	solid	solid	solid	solid
	01	02	03	04	05	06
Selenium by SW7740						
Prepared	02/19/93	02/19/93	02/19/93	02/19/93	02/19/93	02/19/93
Analyzed	02/23/93	02/23/93	02/23/93	02/23/93	02/23/93	02/23/93
Analyst	SJM	SJM	SJM	SJM	SJM	SJM
File ID	Z3022308-16	Z3022308-19	Z3022308-20	Z3022308-7	Z3022308-10	Z3022308-11
Blank ID	Z3022308-7	Z3022308-7	Z3022308-7	Z3022308-7	Z3022308-7	Z3022308-7
Instrument	Z3	Z3	Z3	Z3	Z3	Z3
Report as	dry weight	dry weight	dry weight	dry weight	dry weight	dry weight

Appendix A

Comments, Notes and Definitions

Lockheed
Radian Work Order: 93-02-267

Antimony was reanalyzed in analytical batch EMJA61302251101.

Lockheed
Radian Work Order: 93-02-267

@ ALL METHODS EXCEPT CLP
The results which are less than five times the method specified detection limit.
EXPLANATION
Uncertainty of the analysis will increase as the method detection limit is approached. These results should be considered approximate.

ND ALL METHODS EXCEPT CLP
This flag is used to denote analytes which are not detected at or above the specified detection limit.
EXPLANATION
The value to the right of the < symbol is the method specified detection limit for the analyte.

TERMS USED IN THIS REPORT:

Analyte - A chemical for which a sample is to be analyzed. The analysis will meet EPA method and QC specifications.

Compound - See Analyte.

Detection Limit - The method specified detection limit, which is the lower limit of quantitation specified by EPA for a method. Radian staff regularly assess their laboratories' method detection limits to verify that they meet or are lower than those specified by EPA. Detection limits which are higher than method limits are based on experimental values at the 99% confidence level. The detection limits for EPA CLP (Contract Laboratory Program) methods are CRQLs (contract required quantitation limits) for organics and CRDLs (contract required detection limits) for inorganics. Note, the detection limit may vary from that specified by EPA based on sample size, dilution or cleanup. (Refer to Factor, below)

EPA Method - The EPA specified method used to perform an analysis. EPA has specified standard methods for analysis of environmental samples. Radian will perform its analyses and accompanying QC tests in conformance with EPA methods unless otherwise specified.

Factor - Default method detection limits are based on analysis of clean water samples. A factor is required to calculate sample specific detection limits based on alternate matrices (soil or water), reporting units, use of cleanup procedures, or dilution of extracts/ digestates. For example, extraction or digestion of 10 grams of soil in contrast to 1 liter of water will result in a factor of 100.

Matrix - The sample material. Generally, it will be soil, water, air, oil, or solid waste.

Radian Work Order - The unique Radian identification code assigned to the samples reported in the analytical summary.

Units -	ug/L	micrograms per liter (parts per billion);liquids/water
	ug/kg	micrograms per kilogram (parts per billion); soils/solids
	ug/M3	micrograms per cubic meter; air samples
	mg/L	milligrams per liter (parts per million);liquids/water
	mg/kg	milligrams per kilogram (parts per million);soils/solids
	%	percent; usually used for percent recovery of QC standards
	uS/cm	conductance unit; microSiemans/centimeter
	mL/hr	milliliters per hour; rate of settlement of matter in water
	NTU	turbidity unit; nephelometric turbidity unit
	CU	color unit; equal to 1 mg/L of chloroplatinate salt

RADIAN

Radian Work Order 93-02-268

Analytical Report
03/05/93

Lockheed

Radian
Sacramento
CA

Marie Yates

Customer Work Identification #2 Disposal Area
Purchase Order Number 290-063-02-03

Contents:

Radian Analytical Services
14046 Summit Dr., Bldg. B
P. O. Box 201088
Austin, TX 78720-1088

512/244-0855

Client Services Coordinator: JALINDSEY

Certified by: 

Lockheed
Radian Work Order: 93-02-268

Method:Volatile Organics SW8240 (1)
List:8240 Table 1

Sample ID:	L7001	L7002	L7003	METHOD BLANK
Factor:	1.039501	1.048218	1.098901	1
Results in:	ug/kg	ug/kg	ug/kg	ug/kg
	01A	02A	03A	04A
Matrix:	solid	solid	solid	solid

	Result	Det. Limit	Result	Det. Limit	Result	Det. Limit	Result	Det. Limit
Acetone	ND	100	31 J	100	ND	110	ND	100
Acrolein	ND	78	ND	79	ND	82	ND	75
Acrylonitrile	ND	52	ND	52	ND	55	ND	50
Benzene	1.2 J	5.2	ND	5.2	ND	5.5	ND	5.0
Bromodichloromethane	ND	5.2	ND	5.2	ND	5.5	ND	5.0
Bromomethane	ND	10	ND	10	ND	11	ND	10
Carbon disulfide	ND	5.2	ND	5.2	ND	5.5	ND	5.0
Carbon tetrachloride	ND	5.2	ND	5.2	ND	5.5	ND	5.0
Chlorobenzene	1.1 J	5.2	ND	5.2	ND	5.5	ND	5.0
Chloroethane	ND	10	ND	10	ND	11	ND	10
2-Chloroethyl vinyl ether	ND	10	ND	10	ND	11	ND	10
Chloroform	ND	5.2	ND	5.2	ND	5.5	ND	5.0
Chloromethane	ND	10	ND	10	ND	11	ND	10
Dibromochloromethane	ND	5.2	ND	5.2	ND	5.5	ND	5.0
Dibromomethane	ND	5.2	ND	5.2	ND	5.5	ND	5.0
trans-1,4-Dichloro-2-butene	ND	10	ND	10	ND	11	ND	10
Dichlorodifluoromethane	ND	21	ND	21	ND	22	ND	20
1,1-Dichloroethane	ND	5.2	ND	5.2	ND	5.5	ND	5.0
1,2-Dichloroethane	ND	5.2	ND	5.2	ND	5.5	ND	5.0
1,1-Dichloroethene	ND	5.2	ND	5.2	ND	5.5	ND	5.0
trans-1,2-Dichloroethene	ND	5.2	ND	5.2	ND	5.5	ND	5.0
1,2-Dichloropropane	ND	5.2	ND	5.2	ND	5.5	ND	5.0
cis-1,3-Dichloropropene	ND	5.2	ND	5.2	ND	5.5	ND	5.0
trans-1,3-Dichloropropene	ND	5.2	ND	5.2	ND	5.5	ND	5.0
Ethyl benzene	ND	5.2	0.71 J	5.2	ND	5.5	ND	5.0
Ethyl methacrylate	ND	16	ND	16	ND	16	ND	15
2-Hexanone	ND	52	ND	52	ND	55	ND	50
Iodomethane	ND	5.2	ND	5.2	ND	5.5	ND	5.0
Methyl ethyl ketone	ND	100	ND	100	ND	110	ND	100
4-Methyl-2-pentanone(MIBK)	ND	52	ND	52	ND	55	ND	50

ND Not detected at specified detection limit

J Detected at less than detection limit

(1) For a detailed description of flags and technical terms in this report refer to Appendix A in this report.

Lockheed
Radian Work Order: 93-02-268

Method:Volatile Organics SW8240 (1)
List:8240 Table 1

Sample ID:	L7001	L7002	L7003	METHOD BLANK
Factor:	1.039501	1.048218	1.098901	1
Results in:	ug/kg	ug/kg	ug/kg	ug/kg
Matrix:	01A solid	02A solid	03A solid	04A solid

	Result	Det. Limit	Result	Det. Limit	Result	Det. Limit	Result	Det. Limit
Methylene chloride	ND	5.2	ND	5.2	ND	5.5	ND	5.0
Styrene	ND	5.2	ND	5.2	ND	5.5	ND	5.0
1,1,2,2-Tetrachloroethane	ND	5.2	ND	5.2	ND	5.5	ND	5.0
Tetrachloroethene	ND	5.2	ND	5.2	ND	5.5	ND	5.0
Toluene	1.2 J	5.2	0.54 J	5.2	ND	5.5	ND	5.0
Tribromomethane(Bromoform)	ND	5.2	ND	5.2	ND	5.5	ND	5.0
1,1,1-Trichloroethane	ND	5.2	ND	5.2	ND	5.5	ND	5.0
1,1,2-Trichloroethane	ND	5.2	ND	5.2	ND	5.5	ND	5.0
Trichloroethene	ND	5.2	ND	5.2	ND	5.5	ND	5.0
Trichlorofluoromethane	ND	10	ND	10	ND	11	ND	10
1,2,3-Trichloropropane	ND	5.2	ND	5.2	ND	5.5	ND	5.0
Vinyl acetate	ND	5.2	ND	5.2	ND	5.5	ND	5.0
Vinyl chloride	ND	10	ND	10	ND	11	ND	10
Xylenes	ND	5.2	0.97 J	5.2	ND	5.5	ND	5.0
Surrogate Recovery(%)								
1,4-Bromofluorobenzene	91		91		90		90	
Control Limits: 74 to 121								
1,2-Dichloroethane-d4	109		106		110		98	
Control Limits: 70 to 121								
Toluene-d8	100		101		103		102	
Control Limits: 81 to 117								

ND Not detected at specified detection limit

J Detected at less than detection limit

(1) For a detailed description of flags and technical terms in this report refer to Appendix A in this report.

Lockheed
Radian Work Order: 93-02-268

Method:Volatile Organics SW8240 (1)
List:8240 Table 1

Sample ID:	LCS	LCS DUP
Factor:	0	0
Results in:	%recvry	%recvry
	05A	06A
Matrix:	solid	solid

	Result	Det. Limit	Result	Det. Limit
Acetone	109		96	
Acrolein	115		123	
Acrylonitrile	104		113	
Benzene	112		106	
Bromodichloromethane	110		104	
Bromomethane	60		56	
Carbon disulfide	139		122	
Carbon tetrachloride	112		118	
Chlorobenzene	94		91	
Chloroethane	80		74	
2-Chloroethyl vinyl ether	217		179	
Chloroform	121		117	
Chloromethane	103		94	
Dibromochloromethane	98		95	
Dibromomethane	NS		NS	
trans-1,4-Dichloro-2-butene	NS		NS	
Dichlorodifluoromethane	120		111	
1,1-Dichloroethane	110		108	
1,2-Dichloroethane	104		99	
1,1-Dichloroethene	87		113	
trans-1,2-Dichloroethene	138		121	
1,2-Dichloropropane	94		93	
cis-1,3-Dichloropropene	104		90	
trans-1,3-Dichloropropene	116		118	
Ethyl benzene	107		107	
Ethyl methacrylate	NS		NS	
2-Hexanone	98		80	
Iodomethane	NS		NS	
Methyl ethyl ketone	99		107	
4-Methyl-2-pentanone(MIBK)	89		72	

NS Not spiked

(1) For a detailed description of flags and technical terms in this report refer to Appendix A in this report.

Lockheed
Radian Work Order: 93-02-268

Method:Volatile Organics SW8240 (1)
List:8240 Table 1

Sample ID:	LCS	LCS DUP
Factor:	0	0
Results in:	%recvry	%recvry
	05A	06A
Matrix:	solid	solid

	Result	Det. Limit	Result	Det. Limit
Methylene chloride	137		119	
Styrene	106		102	
1,1,2,2-Tetrachloroethane	108		88	
Tetrachloroethene	100		104	
Toluene	103		85	
Tribromomethane(Bromoform)	98		82	
1,1,1-Trichloroethane	104		109	
1,1,2-Trichloroethane	94		92	
Trichloroethene	101		95	
Trichlorofluoromethane	112		105	
1,2,3-Trichloropropane	NS		NS	
Vinyl acetate	127		115	
Vinyl chloride	122		102	
Xylenes	105		104	
Surrogate Recovery(%)				
1,4-Bromofluorobenzene	92		90	
Control Limits: 74 to 121				
1,2-Dichloroethane-d4	95		101	
Control Limits: 70 to 121				
Toluene-d8	101		86	
Control Limits: 81 to 117				

NS Not spiked

(1) For a detailed description of flags and technical terms in this report refer to Appendix A in this report.

RADIAN CORPORATION

Sample History

Lockheed
Radian Work Order: 93-02-268

Sample Identifications and Dates

Sample ID	L7001	L7002	L7003	METHOD BLANK	LCS	LCS DUP
Date Sampled	02/17/93	02/17/93	02/17/93			
Date Received	02/18/93	02/18/93	02/18/93	02/18/93	02/18/93	02/18/93
Matrix	solid	solid	solid	solid	solid	solid
	01	02	03	04	05	06
Volatile Organics SW8240						
Prepared						
Analyzed	02/20/93	02/20/93	02/20/93	02/20/93	02/20/93	02/20/93
Analyst	JMS	JMS	JMS	JMS	JMS	JMS
File ID	A42629	A42630	A42631	A42623	A42624	A42625
Blank ID	A42623	A42623	A42623	A42623	A42623	A42623
Instrument	4504	4504	4504	4504	4504	4504
Report as	dry weight	dry weight	dry weight	dry weight	dry weight	dry weight

Appendix A

Comments, Notes and Definitions

J ORGANIC METHODS

Indicates an estimated value for GC/MS data.

EXPLANATION

This flag is used either when estimating a concentration for tentatively identified compounds where a response factor of 1 is assumed, or when the mass spectral data indicate the presence of a compound that meets the identification criteria but the result is less than the sample quantitation limit.

ND ALL METHODS EXCEPT CLP

This flag is used to denote analytes which are not detected at or above the specified detection limit.

EXPLANATION

The value to the right of the < symbol is the method specified detection limit for the analyte.

NS ALL METHODS EXCEPT CLP

This analyte or surrogate was not spiked into the sample for this analysis.

Lockheed
Radian Work Order: 93-02-268

TERMS USED IN THIS REPORT:

Analyte - A chemical for which a sample is to be analyzed. The analysis will meet EPA method and QC specifications.

Compound - See Analyte.

Detection Limit - The method specified detection limit, which is the lower limit of quantitation specified by EPA for a method. Radian staff regularly assess their laboratories' method detection limits to verify that they meet or are lower than those specified by EPA. Detection limits which are higher than method limits are based on experimental values at the 99% confidence level. The detection limits for EPA CLP (Contract Laboratory Program) methods are CRQLs (contract required quantitation limits) for organics and CRDLs (contract required detection limits) for inorganics. Note, the detection limit may vary from that specified by EPA based on sample size, dilution or cleanup. (Refer to Factor, below)

EPA Method - The EPA specified method used to perform an analysis. EPA has specified standard methods for analysis of environmental samples. Radian will perform its analyses and accompanying QC tests in conformance with EPA methods unless otherwise specified.

Factor - Default method detection limits are based on analysis of clean water samples. A factor is required to calculate sample specific detection limits based on alternate matrices (soil or water), reporting units, use of cleanup procedures, or dilution of extracts/ digestates. For example, extraction or digestion of 10 grams of soil in contrast to 1 liter of water will result in a factor of 100.

Matrix - The sample material. Generally, it will be soil, water, air, oil, or solid waste.

Radian Work Order - The unique Radian identification code assigned to the samples reported in the analytical summary.

Units -	ug/L	micrograms per liter (parts per billion);liquids/water
	ug/kg	micrograms per kilogram (parts per billion); soils/solids
	ug/M3	micrograms per cubic meter; air samples
	mg/L	milligrams per liter (parts per million);liquids/water
	mg/kg	milligrams per kilogram (parts per million);soils/solids
	%	percent; usually used for percent recovery of QC standards
	uS/cm	conductance unit; microSiemans/centimeter
	mL/hr	milliliters per hour; rate of settlement of matter in water
	NTU	turbidity unit; nephelometric turbidity unit
	CU	color unit; equal to 1 mg/L of chloroplatinate salt

RADIAN

Radian Work Order 93-02-269

Analytical Report
03/05/93

Lockheed

Radian
Sacramento
CA

Marie Yates

Customer Work Identification #2 Disposal Area
Purchase Order Number 290-063-02-03

Contents:

Radian Analytical Services
14046 Summit Dr., Bldg. B
P. O. Box 201088
Austin, TX 78720-1088

512/244-0855

Client Services Coordinator: JALINDSEY

Certified by: _____

Lockheed
Radian Work Order: 93-02-269

Method:Semi-Volatiles by SW8270 (1)
List:Table 1 Analytes

Sample ID:	L7001	L7002	L7003	METHOD BLANK
Factor:	34.65003	34.9406	36.63003	33.33333
Results in:	ug/kg	ug/kg	ug/kg	ug/kg
	01A	02A	03A	04A
Matrix:	solid	solid	solid	solid

	Result	Det. Limit	Result	Det. Limit	Result	Det. Limit	Result	Det. Limit
Acenaphthene	ND	350	ND	350	ND	370	ND	330
Acenaphthylene	ND	350	ND	350	ND	370	ND	330
Acetophenone	ND	350	ND	350	ND	370	ND	330
4-Aminobiphenyl	ND	350	ND	350	ND	370	ND	330
Aniline	ND	350	ND	350	ND	370	ND	330
Anthracene	ND	350	ND	350	ND	370	ND	330
Benzidine	ND	350	ND	350	ND	370	ND	330
Benzo(a)anthracene	ND	350	ND	350	ND	370	ND	330
Benzo(a)pyrene	ND	350	ND	350	ND	370	ND	330
Benzo(b)fluoranthene	ND	350	ND	350	ND	370	ND	330
Benzo(g,h,i)perylene	ND	350	ND	350	ND	370	ND	330
Benzo(k)fluoranthene	ND	350	ND	350	ND	370	ND	330
Benzoic acid	ND	1700	ND	1700	ND	1800	ND	1700
Benzyl alcohol	ND	350	ND	350	ND	370	ND	330
4-Bromophenyl phenyl ether	ND	350	ND	350	ND	370	ND	330
Butylbenzylphthalate	ND	350	ND	350	ND	370	ND	330
4-Chloro-3-methylphenol	ND	350	ND	350	ND	370	ND	330
p-Chloroaniline	ND	350	ND	350	ND	370	ND	330
bis(2-Chloroethoxy)methane	ND	350	ND	350	ND	370	ND	330
bis(2-Chloroethyl)ether	ND	350	ND	350	ND	370	ND	330
bis(2-Chloroisopropyl)ether	ND	350	ND	350	ND	370	ND	330
1-Chloronaphthalene	ND	350	ND	350	ND	370	ND	330
2-Chloronaphthalene	ND	350	ND	350	ND	370	ND	330
2-Chlorophenol	ND	350	ND	350	ND	370	ND	330
4-Chlorophenyl phenyl ether	ND	350	ND	350	ND	370	ND	330
Chrysene	ND	350	ND	350	ND	370	ND	330
Di-n-octylphthalate	ND	350	ND	350	ND	370	ND	330
Dibenz(a,h)anthracene	ND	350	ND	350	ND	370	ND	330
Dibenz(a,j)acridine	ND	350	ND	350	ND	370	ND	330
Dibenzofuran	ND	350	ND	350	ND	370	ND	330

(See next page for tentatively identified compounds.)

ND Not detected at specified detection limit

(1) For a detailed description of flags and technical terms in this report refer to Appendix A in this report.
(2) 4-Methylphenol co-elutes with 3-methylphenol. The value reported is the combined total of the 2 compounds.

Lockheed
Radian Work Order: 93-02-269

Method:Semi-Volatiles by SW8270 (1)
List:Table 1 Analytes

Sample ID:	L7001	L7002	L7003	METHOD BLANK
Factor:	34.65003	34.9406	36.63003	33.33333
Results in:	ug/kg	ug/kg	ug/kg	ug/kg
	01A	02A	03A	04A
Matrix:	solid	solid	solid	solid

	Result	Det. Limit	Result	Det. Limit	Result	Det. Limit	Result	Det. Limit
Dibutylphthalate	ND	350	ND	350	ND	370	ND	330
1,2-Dichlorobenzene	ND	350	ND	350	ND	370	ND	330
1,3-Dichlorobenzene	ND	350	ND	350	ND	370	ND	330
1,4-Dichlorobenzene	ND	350	ND	350	ND	370	ND	330
3,3'-Dichlorobenzidine	ND	350	ND	350	ND	370	ND	330
2,4-Dichlorophenol	ND	350	ND	350	ND	370	ND	330
2,6-Dichlorophenol	ND	350	ND	350	ND	370	ND	330
Diethylphthalate	ND	350	ND	350	ND	370	ND	330
p-Dimethylaminoazobenzene	ND	350	ND	350	ND	370	ND	330
7,12-Dimethylbenz(a)anthracene	ND	350	ND	350	ND	370	ND	330
Dimethylphenethylamine	ND	4200	ND	4200	ND	4400	ND	4000
2,4-Dimethylphenol	ND	350	ND	350	ND	370	ND	330
Dimethylphthalate	ND	350	ND	350	ND	370	ND	330
4,6-Dinitro-2-methylphenol	ND	350	ND	350	ND	370	ND	330
2,4-Dinitrophenol	ND	690	ND	700	ND	730	ND	670
2,4-Dinitrotoluene	ND	350	ND	350	ND	370	ND	330
2,6-Dinitrotoluene	ND	350	ND	350	ND	370	ND	330
Diphenylamine	ND	350	ND	350	ND	370	ND	330
1,2-Diphenylhydrazine	ND	350	ND	350	ND	370	ND	330
Ethyl methanesulfonate	ND	350	ND	350	ND	370	ND	330
bis(2-Ethylhexyl)phthalate	ND	350	ND	350	ND	370	ND	330
Fluoranthene	ND	350	ND	350	ND	370	ND	330
Fluorene	ND	350	ND	350	ND	370	ND	330
Hexachlorobenzene	ND	350	ND	350	ND	370	ND	330
Hexachlorobutadiene	ND	350	ND	350	ND	370	ND	330
Hexachlorocyclopentadiene	ND	350	ND	350	ND	370	ND	330
Hexachloroethane	ND	350	ND	350	ND	370	ND	330
Indeno(1,2,3-cd)pyrene	ND	350	ND	350	ND	370	ND	330
Isophorone	ND	350	ND	350	ND	370	ND	330
Methyl methanesulfonate	ND	1700	ND	1700	ND	1800	ND	1700

(See next page for tentatively identified compounds.)

ND Not detected at specified detection limit

(1) For a detailed description of flags and technical terms in this report refer to Appendix A in this report.
(2) 4-Methylphenol co-elutes with 3-methylphenol. The value reported is the combined total of the 2 compounds.

Lockheed
Radian Work Order: 93-02-269

Method:Semi-Volatiles by SW8270 (1)
List:Table 1 Analytes

Sample ID:	L7001	L7002	L7003	METHOD BLANK
Factor:	34.65003	34.9406	36.63003	33.33333
Results in:	ug/kg	ug/kg	ug/kg	ug/kg
	01A	02A	03A	04A
Matrix:	solid	solid	solid	solid

	Result	Det. Limit	Result	Det. Limit	Result	Det. Limit	Result	Det. Limit
3-Methylcholanthrene	ND	350	ND	350	ND	370	ND	330
2-Methylnaphthalene	ND	350	ND	350	ND	370	ND	330
2-Methylphenol(o-cresol)	ND	350	ND	350	ND	370	ND	330
4-Methylphenol(p-cresol)	ND	350	ND	350	ND	370	ND	330
N-Nitroso-di-n-butylamine	ND	350	ND	350	ND	370	ND	330
N-Nitrosodimethylamine	ND	350	ND	350	ND	370	ND	330
N-Nitrosodiphenylamine	ND	350	ND	350	ND	370	ND	330
N-Nitrosodipropylamine	ND	350	ND	350	ND	370	ND	330
N-Nitrosopiperidine	ND	350	ND	350	ND	370	ND	330
Naphthalene	ND	350	ND	350	ND	370	ND	330
1-Naphthylamine	ND	350	ND	350	ND	370	ND	330
2-Naphthylamine	ND	350	ND	350	ND	370	ND	330
2-Nitroaniline	ND	350	ND	350	ND	370	ND	330
3-Nitroaniline	ND	690	ND	700	ND	730	ND	670
4-Nitroaniline	ND	690	ND	700	ND	730	ND	670
Nitrobenzene	ND	350	ND	350	ND	370	ND	330
2-Nitrophenol	ND	350	ND	350	ND	370	ND	330
4-Nitrophenol	ND	350	ND	350	ND	370	ND	330
Pentachlorobenzene	ND	350	ND	350	ND	370	ND	330
Pentachloronitrobenzene	ND	350	ND	350	ND	370	ND	330
Pentachlorophenol	ND	350	ND	350	ND	370	ND	330
Phenacetin	ND	350	ND	350	ND	370	ND	330
Phenanthrene	ND	350	ND	350	ND	370	ND	330
Phenol	ND	350	ND	350	ND	370	ND	330
2-Picoline	ND	350	ND	350	ND	370	ND	330
Pronamide	ND	350	ND	350	ND	370	ND	330
Pyrene	ND	350	ND	350	ND	370	ND	330
Pyridine	ND	350	ND	350	ND	370	ND	330
1,2,4,5-Tetrachlorobenzene	ND	350	ND	350	ND	370	ND	330
2,3,4,6-Tetrachlorophenol	ND	350	ND	350	ND	370	ND	330

(See next page for tentatively identified compounds.)

ND Not detected at specified detection limit

(1) For a detailed description of flags and technical terms in this report refer to Appendix A in this report.
(2) 4-Methylphenol co-elutes with 3-methylphenol. The value reported is the combined total of the 2 compounds.

RADIAN

Analytical Data Summary

Lockheed
Radian Work Order: 93-02-269

Method:Semi-Volatiles by SW8270 (1)
List:Table 1 Analytes

Sample ID:	L7001	L7002	L7003	METHOD BLANK
Factor:	34.65003	34.9406	36.63003	33.33333
Results in:	ug/kg	ug/kg	ug/kg	ug/kg
	01A	02A	03A	04A
Matrix:	solid	solid	solid	solid

	Result	Det. Limit	Result	Det. Limit	Result	Det. Limit	Result	Det. Limit
1,2,4-Trichlorobenzene	ND	350	ND	350	ND	370	ND	330
2,4,5-Trichlorophenol	ND	350	ND	350	ND	370	ND	330
2,4,6-Trichlorophenol	ND	350	ND	350	ND	370	ND	330
Surrogate Recovery(%)								
2-Fluorobiphenyl	86		84		92		66	
Control Limits: 30 to 115								
2-Fluorophenol	79		72		78		53	
Control Limits: 25 to 121								
Nitrobenzene-d5	79		76		83		59	
Control Limits: 23 to 120								
Phenol-d5	87		84		90		64	
Control Limits: 24 to 113								
Terphenyl-d14	99		94		102		78	
Control Limits: 18 to 137								
2,4,6-Tribromophenol	74		70		76		59	
Control Limits: 19 to 122								

(See next page for tentatively identified compounds.)

ND Not detected at specified detection limit

(1) For a detailed description of flags and technical terms in this report refer to Appendix A in this report.
(2) 4-Methylphenol co-elutes with 3-methylphenol. The value reported is the combined total of the 2 compounds.

Lockheed
Radian Work Order: 93-02-269

Method:Semi-Volatiles by SW8270 (1)
List:Table 1 Analytes

Sample ID:	LCS	LCS DUP
Factor:	0	0
Results in:	%recvry	%recvry
	05A	06A
Matrix:	solid	solid

	Result	Det. Limit	Result	Det. Limit
Acenaphthene	86		84	
Acenaphthylene	96		93	
Acetophenone	NS		NS	
4-Aminobiphenyl	NS		NS	
Aniline	43		43	
Anthracene	96		94	
Benzidine	0		0	
Benzo(a)anthracene	96		95	
Benzo(a)pyrene	94		92	
Benzo(b)fluoranthene	111		97	
Benzo(g,h,i)perylene	95		86	
Benzo(k)fluoranthene	100		104	
Benzoic acid	115		116	
Benzyl alcohol	102		97	
4-Bromophenyl phenyl ether	94		93	
Butylbenzylphthalate	98		95	
4-Chloro-3-methylphenol	88		87	
p-Chloroaniline	77		80	
bis(2-Chloroethoxy)methane	94		92	
bis(2-Chloroethyl)ether	101		96	
bis(2-Chloroisopropyl)ether	70		70	
1-Chloronaphthalene	NS		NS	
2-Chloronaphthalene	78		77	
2-Chlorophenol	98		91	
4-Chlorophenyl phenyl ether	99		96	
Chrysene	96		95	
Di-n-octylphthalate	119		113	
Dibenz(a,h)anthracene	108		99	
Dibenz(a,j)acridine	NS		NS	
Dibenzofuran	96		93	

NS Not spiked

(1) For a detailed description of flags and technical terms in this report refer to Appendix A in this report.
(2) 4-Methylphenol co-elutes with 3-methylphenol. The value reported is the combined total of the 2 compounds.

Lockheed
Radian Work Order: 93-02-269

Method:Semi-Volatiles by SW8270 (1)
List:Table 1 Analytes

Sample ID:	LCS	LCS DUP
Factor:	0	0
Results in:	%recvry	%recvry
	05A	06A
Matrix:	solid	solid

	Result	Det. Limit	Result	Det. Limit
Dibutylphthalate	101		98	
1,2-Dichlorobenzene	95		90	
1,3-Dichlorobenzene	92		88	
1,4-Dichlorobenzene	86		82	
3,3'-Dichlorobenzidine	105		106	
2,4-Dichlorophenol	90		87	
2,6-Dichlorophenol	NS		NS	
Diethylphthalate	93		90	
p-Dimethylaminoazobenzene	NS		NS	
7,12-Dimethylbenz(a)anthracene	NS		NS	
Dimethylphenethylamine	NS		NS	
2,4-Dimethylphenol	49		47	
Dimethylphthalate	93		90	
4,6-Dinitro-2-methylphenol	125		120	
2,4-Dinitrophenol	129		126	
2,4-Dinitrotoluene	90		87	
2,6-Dinitrotoluene	104		100	
Diphenylamine	NS		NS	
1,2-Diphenylhydrazine	NS		NS	
Ethyl methanesulfonate	NS		NS	
bis(2-Ethylhexyl)phthalate	95		93	
Fluoranthene	94		91	
Fluorene	77		75	
Hexachlorobenzene	98		98	
Hexachlorobutadiene	80		78	
Hexachlorocyclopentadiene	7		7	
Hexachloroethane	92		88	
Indeno(1,2,3-cd)pyrene	104		95	
Isophorone	62		62	
Methyl methanesulfonate	NS		NS	

NS Not spiked

(1) For a detailed description of flags and technical terms in this report refer to Appendix A in this report.
(2) 4-Methylphenol co-elutes with 3-methylphenol. The value reported is the combined total of the 2 compounds.

Lockheed
Radian Work Order: 93-02-269

Method:Semi-Volatiles by SW8270 (1)
List:Table 1 Analytes

Sample ID:	LCS	LCS DUP
Factor:	0	0
Results in:	%recvry	%recvry
	05A	06A
Matrix:	solid	solid

	Result	Det. Limit	Result	Det. Limit
3-Methylcholanthrene	NS		NS	
2-Methylnaphthalene	98		96	
2-Methylphenol(o-cresol)	95		88	
4-Methylphenol(p-cresol)	82		78	
N-Nitroso-di-n-butylamine	NS		NS	
N-Nitrosodimethylamine	65		61	
N-Nitrosodiphenylamine	77		76	
N-Nitrosodipropylamine	82		78	
N-Nitrosopiperidine	NS		NS	
Naphthalene	85		83	
1-Naphthylamine	NS		NS	
2-Naphthylamine	NS		NS	
2-Nitroaniline	92		91	
3-Nitroaniline	92		92	
4-Nitroaniline	94		90	
Nitrobenzene	88		85	
2-Nitrophenol	99		95	
4-Nitrophenol	68		66	
Pentachlorobenzene	NS		NS	
Pentachloronitrobenzene	NS		NS	
Pentachlorophenol	86		84	
Phenacetin	NS		NS	
Phenanthrene	88		85	
Phenol	103		98	
2-Picoline	NS		NS	
Pronamide	NS		NS	
Pyrene	100		98	
Pyridine	NS		NS	
1,2,4,5-Tetrachlorobenzene	NS		NS	
2,3,4,6-Tetrachlorophenol	NS		NS	

NS Not spiked

(1) For a detailed description of flags and technical terms in this report refer to Appendix A in this report.
(2) 4-Methylphenol co-elutes with 3-methylphenol. The value reported is the combined total of the 2 compounds.

Lockheed
Radian Work Order: 93-02-269

Method:Semi-Volatiles by SW8270 (1)
List:Table 1 Analytes

Sample ID:	LCS	LCS DUP
Factor:	0	0
Results in:	%recvry	%recvry
	05A	06A
Matrix:	solid	solid

	Result	Det. Limit	Result	Det. Limit
1,2,4-Trichlorobenzene	87		85	
2,4,5-Trichlorophenol	102		98	
2,4,6-Trichlorophenol	83		79	
Surrogate Recovery(%)				
2-Fluorobiphenyl	94		87	
Control Limits: 30 to 115				
2-Fluorophenol	85		75	
Control Limits: 25 to 121				
Nitrobenzene-d5	86		79	
Control Limits: 23 to 120				
Phenol-d5	94		84	
Control Limits: 24 to 113				
Terphenyl-d14	100		95	
Control Limits: 18 to 137				
2,4,6-Tribromophenol	84		78	
Control Limits: 19 to 122				

(1) For a detailed description of flags and technical terms in this report refer to Appendix A in this report.
(2) 4-Methylphenol co-elutes with 3-methylphenol. The value reported is the combined total of the 2 compounds.

Lockheed
Radian Work Order: 93-02-269

Tentatively Identified Compounds
Method: Semi-Volatiles by SW8270 (1)
List: Table 1 Analytes

Sample ID	Analyte	Result	Units	Scan
L7001				
	Unknown B	210	ug/kg	
	Unknown B	350	ug/kg	
	Unknown B	210	ug/kg	
L7002				
	Unknown B	280	ug/kg	
	Unknown B	170	ug/kg	
	Unknown B	310	ug/kg	
L7003				
	Unknown B	510	ug/kg	
	Unknown B	220	ug/kg	
	Unknown B	290	ug/kg	
METHOD BLANK				
	Unknown	400	ug/kg	
	Unknown	200	ug/kg	
	Unknown	130	ug/kg	
	Unknown	200	ug/kg	

RADIAN

Analytical Data Summary

Lockheed
Radian Work Order: 93-02-269

Method:Semi-Volatiles by SW8270 (1)
List:Matrix Spike List

Sample ID:	L7001 MS	L7001 MSD
Factor:	0	0
Results in:	%recvry	%recvry
	07A	08A
Matrix:	solid	solid

	Result	Det. Limit	Result	Det. Limit
Acenaphthene	83		79	
4-Chloro-3-methylphenol	75		69	
2-Chlorophenol	89		83	
1,4-Dichlorobenzene	80		75	
2,4-Dinitrotoluene	82		78	
N-Nitrosodipropylamine	65		59	
4-Nitrophenol	56		52	
Pentachlorophenol	66		61	
Phenol	91		85	
Pyrene	95		97	
1,2,4-Trichlorobenzene	84		78	
Surrogate Recovery(%)				
2-Fluorobiphenyl	92		86	
Control Limits: 30 to 115				
2-Fluorophenol	85		75	
Control Limits: 25 to 121				
Nitrobenzene-d5	87		78	
Control Limits: 23 to 120				
Phenol-d5	93		84	
Control Limits: 24 to 113				
Terphenyl-d14	100		99	
Control Limits: 18 to 137				
2,4,6-Tribromophenol	81		74	
Control Limits: 19 to 122				

(1) For a detailed description of flags and technical terms in this report refer to Appendix A in this report.
(2) 4-Methylphenol co-elutes with 3-methylphenol. The value reported is the combined total of the 2 compounds.

Lockheed
Radian Work Order: 93-02-269

Sample Identifications and Dates

Sample ID	L7001	L7002	L7003	METHOD BLANK	LCS	LCS DUP
Date Sampled	02/17/93	02/17/93	02/17/93			
Date Received	02/18/93	02/18/93	02/18/93	02/18/93	02/18/93	02/18/93
Matrix	solid	solid	solid	solid	solid	solid
	01	02	03	04	05	06
Semi-Volatiles by SW8270						
Prepared	02/25/93	02/25/93	02/25/93	02/25/93	02/25/93	02/25/93
Analyzed	03/03/93	03/03/93	03/03/93	03/03/93	03/03/93	03/03/93
Analyst	MCL	MCL	MCL	MCL	MCL	MCL
File ID	C9619	C9622	C9623	C9618	C9616	C9617
Blank ID	C9618	C9618	C9618	C9618	C9618	C9618
Instrument	MSD2	MSD2	MSD2	MSD2	MSD2	MSD2
Report as	dry weight	dry weight	dry weight	dry weight	dry weight	dry weight

Lockheed
Radian Work Order: 93-02-269

Sample Identifications and Dates

Sample ID	L7001 MS	L7001 MSD
Date Sampled	02/17/93	02/17/93
Date Received	02/18/93	02/18/93
Matrix	solid	solid
	07	08
Semi-Volatiles by SW8270		
Prepared	02/25/93	02/25/93
Analyzed	03/03/93	03/03/93
Analyst	MCL	MCL
File ID	C9620	C9621
Blank ID	C9618	C9618
Instrument	MSD2	MSD2
Report as	dry weight	dry weight

Appendix A

Comments, Notes and Definitions

ND ALL METHODS EXCEPT CLP

This flag is used to denote analytes which are not detected at or above the specified detection limit.

EXPLANATION

The value to the right of the < symbol is the method specified detection limit for the analyte.

NS ALL METHODS EXCEPT CLP

This analyte or surrogate was not spiked into the sample for this analysis.

Lockheed
Radian Work Order: 93-02-269

RMS USED IN THIS REPORT:

alyte - A chemical for which a sample is to be analyzed. The analysis will meet A method and QC specifications.

mpound - See Analyte.

etection Limit - The method specified detection limit, which is the lower limit of quantitation specified by EPA for a method. Radian staff regularly assess their laboratories' method detection limits to verify that they meet or are lower than those specified by EPA. Detection limits which are higher than method limits are based on experimental values at the 99% confidence level. The detection limits for EPA CLP (Contract Laboratory Program) methods are CRQLs (contract required quantitation limits) for organics and CRDLs (contract required detection limits) for inorganics. Note, the detection limit may vary from that specified by EPA based on sample size, dilution or cleanup. (Refer to Factor, below)

EPA Method - The EPA specified method used to perform an analysis. EPA has specified standard methods for analysis of environmental samples. Radian will perform its analyses and accompanying QC tests in conformance with EPA methods unless otherwise specified.

Factor - Default method detection limits are based on analysis of clean water samples. A factor is required to calculate sample specific detection limits based on alternate matrices (soil or water), reporting units, use of cleanup procedures, or dilution of extracts/ digestates. For example, extraction or digestion of 10 grams of soil in contrast to 1 liter of water will result in a factor of 100.

Matrix - The sample material. Generally, it will be soil, water, air, oil, or solid waste.

Radian Work Order - The unique Radian identification code assigned to the samples reported in the analytical summary.

Units -	ug/L	micrograms per liter (parts per billion);liquids/water
	ug/kg	micrograms per kilogram (parts per billion); soils/solids
	ug/M3	micrograms per cubic meter; air samples
	mg/L	milligrams per liter (parts per million);liquids/water
	mg/kg	milligrams per kilogram (parts per million);soils/solids
	%	percent; usually used for percent recovery of QC standards
	uS/cm	conductance unit; microSiemans/centimeter
	mL/hr	milliliters per hour; rate of settlement of matter in water
	NTU	turbidity unit; nephelometric turbidity unit
	CU	color unit; equal to 1 mg/L of chloroplatinate salt

RADIAN
CORPORATION

Radian Work Order 93-03-349

Analytical Report
04/21/93

Lockheed

Radian
Sacramento
CA

Marie Yates

Customer Work Identification #2 Disposal Area
Purchase Order Number 290-063-02-03

Contents:

Radian Analytical Services
14046 Summit Dr., Bldg. B
P. O. Box 201088
Austin, TX 78720-1088

512/244-0855

Client Services Coordinator: JALINDSEY

Certified by: Michael C. Shaffer

Lockheed
Radian Work Order: 93-03-349

Method:ICP analysis by SW6010 (1)
List:ICP analysis by SW6010

Sample ID:	L8001	L8002	L8003	METHOD BLANK
Factor:	84.74576	83.33333	84.74576	100
Results in:	mg/kg	mg/kg	mg/kg	mg/kg
	01A	02A	03A	04A
Matrix:	solid	solid	solid	solid

	Result	Det. Limit	Result	Det. Limit	Result	Det. Limit	Result	Det. Limit
Antimony	ND	8.5	ND	8.3	ND	8.5	ND	10
Barium	83	0.85	78	0.83	140	0.85	ND	1.0
Beryllium	0.41 @	0.17	0.43 @	0.17	0.54 @	0.17	ND	0.20
Cadmium	ND	0.42	ND	0.42	ND	0.42	ND	0.50
Chromium	17	0.85	18	0.83	22	0.85	ND	1.0
Cobalt	6.2	0.85	7.1	0.83	9.1	0.85	ND	1.0
Copper	17	1.7	20	1.7	25	1.7	ND	2.0
Molybdenum	ND	4.2	ND	4.2	ND	4.2	ND	5.0
Nickel	9.5	1.7	12	1.7	15	1.7	ND	2.0
Silver	ND	0.85	ND	0.83	ND	0.85	ND	1.0
Thallium	ND	8.5	ND	8.3	ND	8.5	ND	10
Vanadium	32	1.7	34	1.7	46	1.7	ND	2.0
Zinc	34	1.7	36	1.7	46	1.7	ND	2.0

ND Not detected at specified detection limit @ Est. result less than 5 times detection limit

(1) For a detailed description of flags and technical terms in this report refer to Appendix A in this report.

Lockheed
Radian Work Order: 93-03-349

Method: ICP analysis by SW6010 (1)
List: ICP analysis by SW6010

Sample ID:	LCS	LCS DUP		
Factor:	0	0		
Results in:	%recvry	%recvry		
	05A	06A		
Matrix:	solid	solid		

	Result	Det. Limit	Result	Det. Limit	Result	Det. Limit	Result	Det. Limit
Antimony	107		116					
Barium	85		85					
Beryllium	89		88					
Cadmium	79		80					
Chromium	129		128					
Cobalt	84		84					
Copper	93		92					
Molybdenum	83		83					
Nickel	93		95					
Silver	83		83					
Thallium	82		82					
Vanadium	103		105					
Zinc	93		95					

(1) For a detailed description of flags and technical terms in this report refer to Appendix A in this report.

RADIAN CORPORATION

Analytical Data Summary

Lockheed
Radian Work Order: 93-03-349

Method/Analyte	Sample Identifications								
	L8001			L8002			L8003		
Matrix	01 solid			02 solid			03 solid		
	Result		Det. Limit	Result		Det. Limit	Result		Det. Limit
Arsenic by SW7060									
Arsenic	2.6	mg/kg	0.33	2.9	mg/kg	0.34	2.7	mg/kg	0.34
Mercury, cold vapor SW7471									
Mercury	ND	mg/kg	0.047	ND	mg/kg	0.050	ND	mg/kg	0.042
Percent moisture, SW846									
Percent moisture	9.6	%		10	%		11	%	
Lead by SW7421									
Lead	3.1	mg/kg	0.25	4.0	mg/kg	0.26	3.8	mg/kg	0.26
Selenium by SW7740									
Selenium	ND	mg/kg	0.38	ND	mg/kg	0.38	0.62 @	mg/kg	0.38

ND Not detected at specified detection limit

@ Est. result less than 5 times detection limit

(1) For a detailed description of flags and technical terms in this report refer to the glossary.

Lockheed
Radian Work Order: 93-03-349

Method/Analyte	Sample Identifications								
	METHOD BLANK			LCS			LCS DUP		
Matrix	04 solid			05 solid			06 solid		
	Result		Det. Limit	Result		Det. Limit	Result		Det. Limit
Arsenic by SW7060									
Arsenic	ND	mg/kg	0.40	102	%recvry		99	%recvry	
Mercury, cold vapor SW7471									
Mercury	ND	mg/kg	0.045	90	%recvry		94	%recvry	
Lead by SW7421									
Lead	ND	mg/kg	0.30	96	%recvry		96	%recvry	
Selenium by SW7740									
Selenium	ND	mg/kg	0.50	104	%recvry		104	%recvry	

ND Not detected at specified detection limit

(1) For a detailed description of flags and technical terms in this report refer to the glossary.

Lockheed
Radian Work Order: 93-03-349

Sample Identifications and Dates

Sample ID	L8001	L8002	L8003	METHOD BLANK	LCS	LCS DUP
Date Sampled	03/30/93	03/30/93	03/30/93			
Date Received	03/31/93	03/31/93	03/31/93	03/31/93	03/31/93	03/31/93
Matrix	solid	solid	solid	solid	solid	solid
	01	02	03	04	05	06
Arsenic by SW7060						
Prepared	04/02/93	04/02/93	04/02/93	04/02/93	04/02/93	04/02/93
Analyzed	04/15/93	04/15/93	04/15/93	04/15/93	04/15/93	04/15/93
Analyst	SJM	SJM	SJM	SJM	SJM	SJM
File ID	Z3041509-22	Z3041509-23	Z3041509-24	Z3041509-7	Z3041509-10	Z3041509-11
Blank ID	Z3041509-7	Z3041509-7	Z3041509-7	Z3041509-7	Z3041509-7	Z3041509-7
Instrument	Z3	Z3	Z3	Z3	Z3	Z3
Report as	dry weight	dry weight	dry weight	dry weight	dry weight	dry weight
Mercury, cold vapor SW7471						
Prepared	04/01/93	04/01/93	04/01/93	04/01/93	04/01/93	04/01/93
Analyzed	04/01/93	04/01/93	04/01/93	04/01/93	04/01/93	04/01/93
Analyst	MXZ	MXZ	MXZ	MXZ	MXZ	MXZ
File ID	Z4040118-35	Z4040118-36	Z4040118-37	Z4040118-25	Z4040118-26	Z4040118-27
Blank ID	Z4040118-25	Z4040118-25	Z4040118-25	Z4040118-25	Z4040118-25	Z4040118-25
Instrument	Z4	Z4	Z4	Z4	Z4	Z4
Report as	dry weight	dry weight	dry weight	dry weight	dry weight	dry weight
ICP analysis by SW6010						
Prepared	04/02/93	04/02/93	04/02/93	04/02/93	04/02/93	04/02/93
Analyzed	04/03/93	04/03/93	04/03/93	04/03/93	04/03/93	04/03/93
Analyst	DES	DES	DES	DES	DES	DES
File ID	JA610403-20	JA610403-21	JA610403-22	JA610403-14	JA610403-17	JA610403-18
Blank ID	JA610403-14	JA610403-14	JA610403-14	JA610403-14	JA610403-14	JA610403-14
Instrument	JA61	JA61	JA61	JA61	JA61	JA61
Report as	dry weight	dry weight	dry weight	dry weight	dry weight	dry weight
Percent moisture, SW846						
Prepared	04/01/93	04/01/93	04/01/93			
Analyzed	04/02/93	04/02/93	04/02/93			
Analyst	PLM	PLM	PLM			
File ID						
Blank ID						
Instrument						
Report as	received	received	received			
Lead by SW7421						
Prepared	04/02/93	04/02/93	04/02/93	04/02/93	04/02/93	04/02/93
Analyzed	04/15/93	04/15/93	04/15/93	04/15/93	04/15/93	04/15/93
Analyst	SFM	SFM	SFM	SFM	SFM	SFM
File ID	Z2041509-20	Z2041509-21	Z2041509-22	Z2041509-7	Z2041509-10	Z2041509-11
Blank ID	Z2041509-7	Z2041509-7	Z2041509-7	Z2041509-7	Z2041509-7	Z2041509-7
Instrument	Z2	Z2	Z2	Z2	Z2	Z2
Report as	dry weight	dry weight	dry weight	dry weight	dry weight	dry weight

RADIAN CORPORATION

Sample History

Lockheed
Radian Work Order: 93-03-349

Sample Identifications and Dates

Sample ID	L8001	L8002	L8003	METHOD BLANK	LCS	LCS DUP
Date Sampled	03/30/93	03/30/93	03/30/93			
Date Received	03/31/93	03/31/93	03/31/93	03/31/93	03/31/93	03/31/93
Matrix	solid	solid	solid	solid	solid	solid
	01	02	03	04	05	06
Selenium by SW7740						
Prepared	04/02/93	04/02/93	04/02/93	04/02/93	04/02/93	04/02/93
Analyzed	04/13/93	04/13/93	04/13/93	04/13/93	04/13/93	04/13/93
Analyst	DLC	DLC	DLC	DLC	DLC	DLC
File ID	Z4041313-19	Z4041313-20	Z4041313-21	Z4041313-7	Z4041313-10	Z4041313-11
Blank ID	Z4041313-7	Z4041313-7	Z4041313-7	Z4041313-7	Z4041313-7	Z4041313-7
Instrument	Z4	Z4	Z4	Z4	Z4	Z4
Report as	dry weight	dry weight	dry weight	dry weight	dry weight	dry weight

Appendix A

Comments, Notes and Definitions

RADIAN CORPORATION

Report Comments and Narrative

Lockheed
Radian Work Order: 93-03-349

ICP

The MS and MSD analyzed in analytical batch EMJA61304031501 can be found in workorder 9303344. Antimony was outside the control limits in the MS/MSD. Antimony was within the control limits in the LCS/LCSD. The MS/MSD was reanalysed. Antimony is affected by the matrix.

Lockheed
Radian Work Order: 93-03-349

@ ALL METHODS EXCEPT CLP
The results which are less than five times the method specified detection limit.
EXPLANATION
Uncertainty of the analysis will increase as the method detection limit is approached. These results should be considered approximate.

ND ALL METHODS EXCEPT CLP
This flag is used to denote analytes which are not detected at or above the specified detection limit.
EXPLANATION
The value to the right of the < symbol is the method specified detection limit for the analyte.

Lockheed
Radian Work Order: 93-03-349

TERMS USED IN THIS REPORT:

Analyte - A chemical for which a sample is to be analyzed. The analysis will meet EPA method and QC specifications.

Compound - See Analyte.

Detection Limit - The method specified detection limit, which is the lower limit of quantitation specified by EPA for a method. Radian staff regularly assess their laboratories' method detection limits to verify that they meet or are lower than those specified by EPA. Detection limits which are higher than method limits are based on experimental values at the 99% confidence level. The detection limits for EPA CLP (Contract Laboratory Program) methods are CRQLs (contract required quantitation limits) for organics and CRDLs (contract required detection limits) for inorganics. Note, the detection limit may vary from that specified by EPA based on sample size, dilution or cleanup. (Refer to Factor, below)

EPA Method - The EPA specified method used to perform an analysis. EPA has specified standard methods for analysis of environmental samples. Radian will perform its analyses and accompanying QC tests in conformance with EPA methods unless otherwise specified.

Factor - Default method detection limits are based on analysis of clean water samples. A factor is required to calculate sample specific detection limits based on alternate matrices (soil or water), reporting units, use of cleanup procedures, or dilution of extracts/ digestates. For example, extraction or digestion of 10 grams of soil in contrast to 1 liter of water will result in a factor of 100.

Matrix - The sample material. Generally, it will be soil, water, air, oil, or solid waste.

Radian Work Order - The unique Radian identification code assigned to the samples reported in the analytical summary.

Units -	ug/L	micrograms per liter (parts per billion);liquids/water
	ug/kg	micrograms per kilogram (parts per billion); soils/solids
	ug/M3	micrograms per cubic meter; air samples
	mg/L	milligrams per liter (parts per million);liquids/water
	mg/kg	milligrams per kilogram (parts per million);soils/solids
	%	percent; usually used for percent recovery of QC standards
	uS/cm	conductance unit; microSiemans/centimeter
	mL/hr	milliliters per hour; rate of settlement of matter in water
	NTU	turbidity unit; nephelometric turbidity unit
	CU	color unit; equal to 1 mg/L of chloroplatinate salt

RADIAN
CORPORATION

Radian Work Order 93-03-350

Analytical Report
04/20/93

Lockheed

Radian
Sacramento
CA

Marie Yates

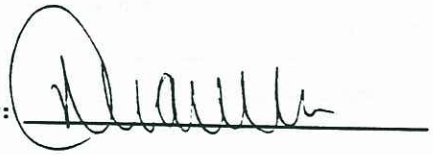
Customer Work Identification #2 Disposal Area
Purchase Order Number 290-063-02-03

Contents:

Radian Analytical Services
14046 Summit Dr., Bldg. B
P. O. Box 201088
Austin, TX 78720-1088

512/244-0855

Client Services Coordinator: JALINDSEY

Certified by: 

RADIAN CORPORATION

Analytical Data Summary

Lockheed
Radian Work Order: 93-03-350

Method:Volatile Organics SW8240 (1)
List:8240 Table 1

Sample ID:	L8001	L8002	L8003	METHOD BLANK
Factor:	1.106194	1.111111	1.123595	1
Results in:	ug/kg	ug/kg	ug/kg	ug/kg
	01A	02A	03A	04A
Matrix:	solid	solid	solid	solid

	Result	Det. Limit	Result	Det. Limit	Result	Det. Limit	Result	Det. Limit
Acetone	11 JB	110	ND	110	ND	110	12 J	100
Acrolein	ND	83	ND	83	ND	84	ND	75
Acrylonitrile	ND	55	ND	56	ND	56	ND	50
Benzene	ND	5.5	ND	5.6	ND	5.6	ND	5.0
Bromodichloromethane	ND	5.5	ND	5.6	ND	5.6	ND	5.0
Bromomethane	ND	11	ND	11	ND	11	ND	10
Carbon disulfide	ND	5.5	ND	5.6	ND	5.6	ND	5.0
Carbon tetrachloride	ND	5.5	ND	5.6	ND	5.6	ND	5.0
Chlorobenzene	ND	5.5	ND	5.6	ND	5.6	ND	5.0
Chloroethane	ND	11	ND	11	ND	11	ND	10
2-Chloroethyl vinyl ether	ND	11	ND	11	ND	11	ND	10
Chloroform	ND	5.5	ND	5.6	ND	5.6	ND	5.0
Chloromethane	ND	11	ND	11	ND	11	ND	10
Dibromochloromethane	ND	5.5	ND	5.6	ND	5.6	ND	5.0
Dibromomethane	ND	5.5	ND	5.6	ND	5.6	ND	5.0
trans-1,4-Dichloro-2-butene	ND	11	ND	11	ND	11	ND	10
Dichlorodifluoromethane	ND	22	ND	22	ND	22	ND	20
1,1-Dichloroethane	ND	5.5	ND	5.6	ND	5.6	ND	5.0
1,2-Dichloroethane	ND	5.5	ND	5.6	ND	5.6	ND	5.0
1,1-Dichloroethene	ND	5.5	ND	5.6	ND	5.6	ND	5.0
trans-1,2-Dichloroethene	ND	5.5	ND	5.6	ND	5.6	ND	5.0
1,2-Dichloropropane	ND	5.5	ND	5.6	ND	5.6	ND	5.0
cis-1,3-Dichloropropene	ND	5.5	ND	5.6	ND	5.6	ND	5.0
trans-1,3-Dichloropropene	ND	5.5	ND	5.6	ND	5.6	ND	5.0
Ethyl benzene	0.40 JB	5.5	ND	5.6	ND	5.6	0.33 J	5.0
Ethyl methacrylate	ND	17	ND	17	ND	17	ND	15
2-Hexanone	ND	55	ND	56	ND	56	ND	50
Iodomethane	ND	5.5	ND	5.6	ND	5.6	ND	5.0
Methyl ethyl ketone	14 JB	110	14 JB	110	14 JB	110	20 J	100
4-Methyl-2-pentanone(MIBK)	ND	55	ND	56	ND	56	ND	50

J Detected at less than detection limit
ND Not detected at specified detection limit

B Inorg CLP-result<CRDL but>than IDL/Org-detected in blank

(1) For a detailed description of flags and technical terms in this report refer to Appendix A in this report.

RADIAN CORPORATION

Analytical Data Summary

Lockheed
Radian Work Order: 93-03-350

Method:Volatile Organics SW8240 (1)
List:8240 Table 1

Sample ID:	L8001	L8002	L8003	METHOD BLANK
Factor:	1.106194	1.111111	1.123595	1
Results in:	ug/kg	ug/kg	ug/kg	ug/kg
Matrix:	01A solid	02A solid	03A solid	04A solid

	Result	Det. Limit	Result	Det. Limit	Result	Det. Limit	Result	Det. Limit
Methylene chloride	1.1 J	5.5	ND	5.6	ND	5.6	ND	5.0
Styrene	ND	5.5	ND	5.6	ND	5.6	ND	5.0
1,1,2,2-Tetrachloroethane	ND	5.5	ND	5.6	ND	5.6	ND	5.0
Tetrachloroethene	ND	5.5	ND	5.6	ND	5.6	ND	5.0
Toluene	0.53 J	5.5	ND	5.6	0.21 J	5.6	ND	5.0
Tribromomethane(Bromoform)	ND	5.5	ND	5.6	ND	5.6	ND	5.0
1,1,1-Trichloroethane	ND	5.5	ND	5.6	ND	5.6	ND	5.0
1,1,2-Trichloroethane	ND	5.5	ND	5.6	ND	5.6	ND	5.0
Trichloroethene	ND	5.5	ND	5.6	ND	5.6	ND	5.0
Trichlorofluoromethane	ND	11	0.32 J	5.6	ND	11	ND	10
1,2,3-Trichloropropane	ND	5.5	ND	11	ND	5.6	ND	5.0
Vinyl acetate	ND	5.5	ND	5.6	ND	5.6	ND	5.0
Vinyl chloride	ND	11	ND	5.6	ND	11	ND	10
Xylenes	0.97 JB	5.5	ND	5.6	ND	5.6	0.80 J	5.0
Surrogate Recovery(%)								
1,4-Bromofluorobenzene	96		94		98		96	
Control Limits: 74 to 121								
1,2-Dichloroethane-d4	119		115		115		120	
Control Limits: 70 to 121								
Toluene-d8	98		91		96		97	
Control Limits: 81 to 117								

J Detected at less than detection limit
ND Not detected at specified detection limit
B Inorg CLP-result<CRDL but>than IDL/Org-detected in blank

(1) For a detailed description of flags and technical terms in this report refer to Appendix A in this report.

Lockheed
Radian Work Order: 93-03-350

Method:Volatile Organics SW8240 (1)
List:8240 Table 1

Sample ID:	LCS	LCS DUP
Factor:	0	0
Results in:	%recvry	%recvry
	05A	06A
Matrix:	solid	solid

	Result	Det. Limit	Result	Det. Limit
Acetone	118		109	
Acrolein	79		67	
Acrylonitrile	86		88	
Benzene	116		101	
Bromodichloromethane	119		99	
Bromomethane	100		88	
Carbon disulfide	NS		NS	
Carbon tetrachloride	129		115	
Chlorobenzene	139		120	
Chloroethane	116		89	
2-Chloroethyl vinyl ether	102		93	
Chloroform	127		111	
Chloromethane	98		58	
Dibromochloromethane	112		95	
Dibromomethane	NS		NS	
trans-1,4-Dichloro-2-butene	NS		NS	
Dichlorodifluoromethane	108		108	
1,1-Dichloroethane	130		117	
1,2-Dichloroethane	128		107	
1,1-Dichloroethene	109		109	
trans-1,2-Dichloroethene	128		105	
1,2-Dichloropropane	112		101	
cis-1,3-Dichloropropene	100		83	
trans-1,3-Dichloropropene	123		100	
Ethyl benzene	110		92	
Ethyl methacrylate	NS		NS	
2-Hexanone	108		96	
Iodomethane	NS		NS	
Methyl ethyl ketone	97		90	
4-Methyl-2-pentanone(MIBK)	88		80	

NS Not spiked

(1) For a detailed description of flags and technical terms in this report refer to Appendix A in this report.

RADIAN CORPORATION

Analytical Data Summary

Lockheed
Radian Work Order: 93-03-350

Method:Volatile Organics SW8240 (1)
List:8240 Table 1

Sample ID:	LCS	LCS DUP		
Factor:	0	0		
Results in:	%recvry	%recvry		
Matrix:	05A solid	06A solid		

	Result	Det. Limit	Result	Det. Limit		
Methylene chloride	124		112			
Styrene	113		101			
1,1,2,2-Tetrachloroethane	114		99			
Tetrachloroethene	105		93			
Toluene	110		91			
Tribromomethane(Bromoform)	102		87			
1,1,1-Trichloroethane	129		117			
1,1,2-Trichloroethane	108		95			
Trichloroethene	104		89			
Trichlorofluoromethane	109		115			
1,2,3-Trichloropropane	NS		NS			
Vinyl acetate	119		102			
Vinyl chloride	85		95			
Xylenes	112		97			
Surrogate Recovery(%)						
1,4-Bromofluorobenzene	100		102			
Control Limits: 74 to 121						
1,2-Dichloroethane-d4	118		119			
Control Limits: 70 to 121						
Toluene-d8	97		96			
Control Limits: 81 to 117						

NS Not spiked

(1) For a detailed description of flags and technical terms in this report refer to Appendix A in this report.

Lockheed
Radian Work Order: 93-03-350

Sample Identifications and Dates

Sample ID	L8001	L8002	L8003	METHOD BLANK	LCS	LCS DUP
Date Sampled	03/30/93	03/30/93	03/30/93			
Date Received	03/31/93	03/31/93	03/31/93	03/31/93	03/31/93	03/31/93
Matrix	solid	solid	solid	solid	solid	solid
	01	02	03	04	05	06
Volatile Organics SW8240						
Prepared						
Analyzed	04/07/93	04/07/93	04/07/93	04/06/93	04/06/93	04/06/93
Analyst	RLC	RLC	RLC	RLC	RLC	RLC
File ID	A0406318	A0406319	A0406320	A0406304	A0406305	A0406306
Blank ID	A0406304	A0406304	A0406304	A0406304	A0406304	A0406304
Instrument	4501	4501	4501	4501	4501	4501
Report as	dry weight	dry weight	dry weight	dry weight	dry weight	dry weight

Appendix A

Comments, Notes and Definitions

B INORGANIC CLP
This flag indicates that a reported value is less than the Contract Required Detection Limit (CRDL), but greater than the Instrument Detection Limit (IDL).
ORGANIC METHODS
This flag indicates that an analyte is found in the associated blank, but the sample results are not corrected for the amount in the blank.

J ORGANIC METHODS
Indicates an estimated value for GC/MS data.
EXPLANATION
This flag is used either when estimating a concentration for tentatively identified compounds where a response factor of 1 is assumed, or when the mass spectral data indicate the presence of a compound that meets the identification criteria but the result is less than the sample quantitation limit.

ND ALL METHODS EXCEPT CLP
This flag is used to denote analytes which are not detected at or above the specified detection limit.
EXPLANATION
The value to the right of the < symbol is the method specified detection limit for the analyte.

NS ALL METHODS EXCEPT CLP
This analyte or surrogate was not spiked into the sample for this analysis.

Lockheed
Radian Work Order: 93-03-350

TERMS USED IN THIS REPORT:

Analyte - A chemical for which a sample is to be analyzed. The analysis will meet EPA method and QC specifications.

Compound - See Analyte.

Detection Limit - The method specified detection limit, which is the lower limit of quantitation specified by EPA for a method. Radian staff regularly assess their laboratories' method detection limits to verify that they meet or are lower than those specified by EPA. Detection limits which are higher than method limits are based on experimental values at the 99% confidence level. The detection limits for EPA CLP (Contract Laboratory Program) methods are CRQLs (contract required quantitation limits) for organics and CRDLs (contract required detection limits) for inorganics. Note, the detection limit may vary from that specified by EPA based on sample size, dilution or cleanup. (Refer to Factor, below)

EPA Method - The EPA specified method used to perform an analysis. EPA has specified standard methods for analysis of environmental samples. Radian will perform its analyses and accompanying QC tests in conformance with EPA methods unless otherwise specified.

Factor - Default method detection limits are based on analysis of clean water samples. A factor is required to calculate sample specific detection limits based on alternate matrices (soil or water), reporting units, use of cleanup procedures, or dilution of extracts/ digestates. For example, extraction or digestion of 10 grams of soil in contrast to 1 liter of water will result in a factor of 100.

Matrix - The sample material. Generally, it will be soil, water, air, oil, or solid waste.

Radian Work Order - The unique Radian identification code assigned to the samples reported in the analytical summary.

Units -	ug/L	micrograms per liter (parts per billion);liquids/water
	ug/kg	micrograms per kilogram (parts per billion); soils/solids
	ug/M3	micrograms per cubic meter; air samples
	mg/L	milligrams per liter (parts per million);liquids/water
	mg/kg	milligrams per kilogram (parts per million);soils/solids
	%	percent; usually used for percent recovery of QC standards
	uS/cm	conductance unit; microSiemans/centimeter
	mL/hr	milliliters per hour; rate of settlement of matter in water
	NTU	turbidity unit; nephelometric turbidity unit
	CU	color unit; equal to 1 mg/L of chloroplatinate salt

RADIAN
CORPORATION

Radian Work Order 93-03-351

Analytical Report
04/19/93

Lockheed

Radian
Sacramento
CA

Marie Yates

Customer Work Identification #2 Disposal Area
Purchase Order Number 290-063-02-03

Contents:

Radian Analytical Services
14046 Summit Dr., Bldg. B
P. O. Box 201088
Austin, TX 78720-1088

512/244-0855

Client Services Coordinator: JALINDSEY

Certified by: Dwayne Hardin

Lockheed
Radian Work Order: 93-03-351

Method:Semi-Volatiles by SW8270 (1)
List:Table 1 Analytes

Sample ID:	L8001	L8002	L8003	METHOD BLANK
Factor:	36.87315	37.03703	37.45318	33.33333
Results in:	ug/kg	ug/kg	ug/kg	ug/kg
	01A	02A	03A	04A
Matrix:	solid	solid	solid	solid

	Result	Det. Limit	Result	Det. Limit	Result	Det. Limit	Result	Det. Limit
Acenaphthene	ND	370	ND	370	ND	370	ND	330
Acenaphthylene	ND	370	ND	370	ND	370	ND	330
Acetophenone	ND	370	ND	370	ND	370	ND	330
4-Aminobiphenyl	ND	370	ND	370	ND	370	ND	330
Aniline	ND	370	ND	370	ND	370	ND	330
Anthracene	ND	370	ND	370	ND	370	ND	330
Benzidine	ND	370	ND	370	ND	370	ND	330
Benzo(a)anthracene	ND	370	ND	370	ND	370	ND	330
Benzo(a)pyrene	ND	370	ND	370	ND	370	ND	330
Benzo(b)fluoranthene	ND	370	ND	370	ND	370	ND	330
Benzo(g,h,i)perylene	ND	370	ND	370	ND	370	ND	330
Benzo(k)fluoranthene	ND	370	ND	370	ND	370	ND	330
Benzoic acid	ND	1800	ND	1900	ND	1900	ND	1700
Benzyl alcohol	ND	370	ND	370	ND	370	ND	330
4-Bromophenyl phenyl ether	ND	370	ND	370	ND	370	ND	330
Butylbenzylphthalate	ND	370	ND	370	ND	370	ND	330
4-Chloro-3-methylphenol	ND	370	ND	370	ND	370	ND	330
p-Chloroaniline	ND	370	ND	370	ND	370	ND	330
bis(2-Chloroethoxy)methane	ND	370	ND	370	ND	370	ND	330
bis(2-Chloroethyl)ether	ND	370	ND	370	ND	370	ND	330
bis(2-Chloroisopropyl)ether	ND	370	ND	370	ND	370	ND	330
1-Chloronaphthalene	ND	370	ND	370	ND	370	ND	330
2-Chloronaphthalene	ND	370	ND	370	ND	370	ND	330
2-Chlorophenol	ND	370	ND	370	ND	370	ND	330
4-Chlorophenyl phenyl ether	ND	370	ND	370	ND	370	ND	330
Chrysene	ND	370	ND	370	ND	370	ND	330
Di-n-octylphthalate	ND	370	ND	370	ND	370	ND	330
Dibenz(a,h)anthracene	ND	370	ND	370	ND	370	ND	330
Dibenz(a,j)acridine	ND	370	ND	370	ND	370	ND	330
Dibenzofuran	ND	370	ND	370	ND	370	ND	330

ND Not detected at specified detection limit

(1) For a detailed description of flags and technical terms in this report refer to Appendix A in this report.
(2) 4-Methylphenol co-elutes with 3-methylphenol. The value reported is the combined total of the 2 compounds.

RADIAN CORPORATION

Analytical Data Summary

Lockheed
Radian Work Order: 93-03-351

Method:Semi-Volatiles by SW8270 (1)
List:Table 1 Analytes

Sample ID:	L8001	L8002	L8003	METHOD BLANK
Factor:	36.87315	37.03703	37.45318	33.33333
Results in:	ug/kg	ug/kg	ug/kg	ug/kg
	01A	02A	03A	04A
Matrix:	solid	solid	solid	solid

	Result	Det. Limit	Result	Det. Limit	Result	Det. Limit	Result	Det. Limit
Dibutylphthalate	ND	370	ND	370	ND	370	ND	330
1,2-Dichlorobenzene	ND	370	ND	370	ND	370	ND	330
1,3-Dichlorobenzene	ND	370	ND	370	ND	370	ND	330
1,4-Dichlorobenzene	ND	370	ND	370	ND	370	ND	330
3,3'-Dichlorobenzidine	ND	370	ND	370	ND	370	ND	330
2,4-Dichlorophenol	ND	370	ND	370	ND	370	ND	330
2,6-Dichlorophenol	ND	370	ND	370	ND	370	ND	330
Diethylphthalate	ND	370	ND	370	ND	370	ND	330
p-Dimethylaminoazobenzene	ND	370	ND	370	ND	370	ND	330
7,12-Dimethylbenz(a)anthracene	ND	370	ND	370	ND	370	ND	330
Dimethylphenethylamine	ND	4400	ND	4400	ND	4500	ND	4000
2,4-Dimethylphenol	ND	370	ND	370	ND	370	ND	330
Dimethylphthalate	ND	370	ND	370	ND	370	ND	330
4,6-Dinitro-2-methylphenol	ND	370	ND	370	ND	370	ND	330
2,4-Dinitrophenol	ND	740	ND	740	ND	750	ND	670
2,4-Dinitrotoluene	ND	370	ND	370	ND	370	ND	330
2,6-Dinitrotoluene	ND	370	ND	370	ND	370	ND	330
Diphenylamine	ND	370	ND	370	ND	370	ND	330
1,2-Diphenylhydrazine	ND	370	ND	370	ND	370	ND	330
Ethyl methanesulfonate	ND	370	ND	370	ND	370	ND	330
bis(2-Ethylhexyl)phthalate	36 J	370	23 J	370	ND	370	ND	330
Fluoranthene	ND	370	ND	370	ND	370	ND	330
Fluorene	ND	370	ND	370	ND	370	ND	330
Hexachlorobenzene	ND	370	ND	370	ND	370	ND	330
Hexachlorobutadiene	ND	370	ND	370	ND	370	ND	330
Hexachlorocyclopentadiene	ND	370	ND	370	ND	370	ND	330
Hexachloroethane	ND	370	ND	370	ND	370	ND	330
Indeno(1,2,3-cd)pyrene	ND	370	ND	370	ND	370	ND	330
Isophorone	ND	370	ND	370	ND	370	ND	330
Methyl methanesulfonate	ND	1800	ND	1900	ND	1900	ND	1700

ND Not detected at specified detection limit

J Detected at less than detection limit

(1) For a detailed description of flags and technical terms in this report refer to Appendix A in this report.
(2) 4-Methylphenol co-elutes with 3-methylphenol. The value reported is the combined total of the 2 compounds.

Lockheed
Radian Work Order: 93-03-351

Method:Semi-Volatiles by SW8270 (1)
List:Table 1 Analytes

Sample ID:	L8001	L8002	L8003	METHOD BLANK
Factor:	36.87315	37.03703	37.45318	33.33333
Results in:	ug/kg	ug/kg	ug/kg	ug/kg
	01A	02A	03A	04A
Matrix:	solid	solid	solid	solid

	Result	Det. Limit	Result	Det. Limit	Result	Det. Limit	Result	Det. Limit
3-Methylcholanthrene	ND	370	ND	370	ND	370	ND	330
2-Methylnaphthalene	ND	370	ND	370	ND	370	ND	330
2-Methylphenol(o-cresol)	ND	370	ND	370	ND	370	ND	330
4-Methylphenol(p-cresol)	ND	370	ND	370	ND	370	ND	330
N-Nitroso-di-n-butylamine	ND	370	ND	370	ND	370	ND	330
N-Nitrosodimethylamine	ND	370	ND	370	ND	370	ND	330
N-Nitrosodiphenylamine	ND	370	ND	370	ND	370	ND	330
N-Nitrosodipropylamine	ND	370	ND	370	ND	370	ND	330
N-Nitrosopiperidine	ND	370	ND	370	ND	370	ND	330
Naphthalene	ND	370	ND	370	ND	370	ND	330
1-Naphthylamine	ND	370	ND	370	ND	370	ND	330
2-Naphthylamine	ND	370	ND	370	ND	370	ND	330
2-Nitroaniline	ND	370	ND	370	ND	370	ND	330
3-Nitroaniline	ND	740	ND	740	ND	750	ND	670
4-Nitroaniline	ND	740	ND	740	ND	750	ND	670
Nitrobenzene	ND	370	ND	370	ND	370	ND	330
2-Nitrophenol	ND	370	ND	370	ND	370	ND	330
4-Nitrophenol	ND	370	ND	370	ND	370	ND	330
Pentachlorobenzene	ND	370	ND	370	ND	370	ND	330
Pentachloronitrobenzene	ND	370	ND	370	ND	370	ND	330
Pentachlorophenol	ND	370	ND	370	ND	370	ND	330
Phenacetin	ND	370	ND	370	ND	370	ND	330
Phenanthrene	ND	370	ND	370	ND	370	ND	330
Phenol	ND	370	ND	370	ND	370	ND	330
2-Picoline	ND	370	ND	370	ND	370	ND	330
Pronamide	ND	370	ND	370	ND	370	ND	330
Pyrene	ND	370	ND	370	ND	370	ND	330
Pyridine	ND	370	ND	370	ND	370	ND	330
1,2,4,5-Tetrachlorobenzene	ND	370	ND	370	ND	370	ND	330
2,3,4,6-Tetrachlorophenol	ND	370	ND	370	ND	370	ND	330

ND Not detected at specified detection limit

(1) For a detailed description of flags and technical terms in this report refer to Appendix A in this report.
(2) 4-Methylphenol co-elutes with 3-methylphenol. The value reported is the combined total of the 2 compounds.

RADIAN CORPORATION

Analytical Data Summary

Lockheed
Radian Work Order: 93-03-351

Method:Semi-Volatiles by SW8270 (1)
List:Table 1 Analytes

Sample ID:	L8001	L8002	L8003	METHOD BLANK
Factor:	36.87315	37.03703	37.45318	33.33333
Results in:	ug/kg	ug/kg	ug/kg	ug/kg
	01A	02A	03A	04A
Matrix:	solid	solid	solid	solid

	Result	Det. Limit	Result	Det. Limit	Result	Det. Limit	Result	Det. Limit
1,2,4-Trichlorobenzene	ND	370	ND	370	ND	370	ND	330
2,4,5-Trichlorophenol	ND	370	ND	370	ND	370	ND	330
2,4,6-Trichlorophenol	ND	370	ND	370	ND	370	ND	330
Surrogate Recovery(%)								
2-Fluorobiphenyl	98		104		95		103	
Control Limits: 30 to 115								
2-Fluorophenol	79		85		77		85	
Control Limits: 25 to 121								
Nitrobenzene-d5	90		91		80		92	
Control Limits: 23 to 120								
Phenol-d5	97		102		91		96	
Control Limits: 24 to 113								
Terphenyl-d14	119		123		112		119	
Control Limits: 18 to 137								
2,4,6-Tribromophenol	112		112		110		112	
Control Limits: 19 to 122								

ND Not detected at specified detection limit

(1) For a detailed description of flags and technical terms in this report refer to Appendix A in this report.
(2) 4-Methylphenol co-elutes with 3-methylphenol. The value reported is the combined total of the 2 compounds.

Lockheed
Radian Work Order: 93-03-351

Method:Semi-Volatiles by SW8270 (1)
List:Table 1 Analytes

Sample ID:	LCS	LCS DUP
Factor:	0	0
Results in:	%recvry	%recvry
	05A	06A
Matrix:	solid	solid

	Result	Det. Limit	Result	Det. Limit
Acenaphthene	90		95	
Acenaphthylene	104		105	
Acetophenone	NS		NS	
4-Aminobiphenyl	NS		NS	
Aniline	66		68	
Anthracene	93		93	
Benzidine	21		38	
Benzo(a)anthracene	100		110	
Benzo(a)pyrene	100		102	
Benzo(b)fluoranthene	99		102	
Benzo(g,h,i)perylene	116		121	
Benzo(k)fluoranthene	120		124	
Benzoic acid	44		56	
Benzyl alcohol	111		119	
4-Bromophenyl phenyl ether	104		111	
Butylbenzylphthalate	82		83	
4-Chloro-3-methylphenol	85		87	
p-Chloroaniline	96		101	
bis(2-Chloroethoxy)methane	93		95	
bis(2-Chloroethyl)ether	93		99	
bis(2-Chloroisopropyl)ether	64		68	
1-Chloronaphthalene	NS		NS	
2-Chloronaphthalene	81		85	
2-Chlorophenol	89		88	
4-Chlorophenyl phenyl ether	119		121	
Chrysene	103		110	
Di-n-octylphthalate	84		88	
Dibenz(a,h)anthracene	110		113	
Dibenz(a,j)acridine	NS		NS	
Dibenzofuran	104		107	

NS Not spiked

(1) For a detailed description of flags and technical terms in this report refer to Appendix A in this report.
(2) 4-Methylphenol co-elutes with 3-methylphenol. The value reported is the combined total of the 2 compounds.

Lockheed
Radian Work Order: 93-03-351

Method:Semi-Volatiles by SW8270 (1)
List:Table 1 Analytes

Sample ID:	LCS	LCS DUP
Factor:	0	0
Results in:	%recvry	%recvry
	05A	06A
Matrix:	solid	solid

	Result	Det. Limit	Result	Det. Limit
Dibutylphthalate	85		86	
1,2-Dichlorobenzene	94		99	
1,3-Dichlorobenzene	94		98	
1,4-Dichlorobenzene	81		83	
3,3'-Dichlorobenzidine	141		147	
2,4-Dichlorophenol	94		92	
2,6-Dichlorophenol	NS		NS	
Diethylphthalate	91		95	
p-Dimethylaminoazobenzene	NS		NS	
7,12-Dimethylbenz(a)anthracene	NS		NS	
Dimethylphenethylamine	NS		NS	
2,4-Dimethylphenol	55		52	
Dimethylphthalate	106		107	
4,6-Dinitro-2-methylphenol	100		98	
2,4-Dinitrophenol	112		119	
2,4-Dinitrotoluene	90		96	
2,6-Dinitrotoluene	109		107	
Diphenylamine	NS		NS	
1,2-Diphenylhydrazine	NS		NS	
Ethyl methanesulfonate	NS		NS	
bis(2-Ethylhexyl)phthalate	78		80	
Fluoranthene	96		96	
Fluorene	81		80	
Hexachlorobenzene	121		118	
Hexachlorobutadiene	100		95	
Hexachlorocyclopentadiene	24		19	
Hexachloroethane	88		92	
Indeno(1,2,3-cd)pyrene	104		110	
Isophorone	72		73	
Methyl methanesulfonate	NS		NS	

NS Not spiked

(1) For a detailed description of flags and technical terms in this report refer to Appendix A in this report.
(2) 4-Methylphenol co-elutes with 3-methylphenol. The value reported is the combined total of the 2 compounds.

Lockheed
Radian Work Order: 93-03-351

Method:Semi-Volatiles by SW8270 (1)
List:Table 1 Analytes

Sample ID:	LCS	LCS DUP
Factor:	0	0
Results in:	%recvry	%recvry
	05A	06A
Matrix:	solid	solid

	Result	Det. Limit	Result	Det. Limit
3-Methylcholanthrene	NS		NS	
2-Methylnaphthalene	104		104	
2-Methylphenol(o-cresol)	71		77	
4-Methylphenol(p-cresol)	66		68	
N-Nitroso-di-n-butylamine	NS		NS	
N-Nitrosodimethylamine	99		103	
N-Nitrosodiphenylamine	82		81	
N-Nitrosodipropylamine	88		96	
N-Nitrosopiperidine	NS		NS	
Naphthalene	87		89	
1-Naphthylamine	NS		NS	
2-Naphthylamine	NS		NS	
2-Nitroaniline	95		101	
3-Nitroaniline	97		100	
4-Nitroaniline	103		106	
Nitrobenzene	92		94	
2-Nitrophenol	89		89	
4-Nitrophenol	79		83	
Pentachlorobenzene	NS		NS	
Pentachloronitrobenzene	NS		NS	
Pentachlorophenol	98		88	
Phenacetin	NS		NS	
Phenanthrene	84		84	
Phenol	85		87	
2-Picoline	NS		NS	
Pronamide	NS		NS	
Pyrene	94		98	
Pyridine	NS		NS	
1,2,4,5-Tetrachlorobenzene	NS		NS	
2,3,4,6-Tetrachlorophenol	NS		NS	

NS Not spiked

(1) For a detailed description of flags and technical terms in this report refer to Appendix A in this report.
(2) 4-Methylphenol co-elutes with 3-methylphenol. The value reported is the combined total of the 2 compounds.

Lockheed
Radian Work Order: 93-03-351

Method:Semi-Volatiles by SW8270 (1)
List:Table 1 Analytes

Sample ID:	LCS	LCS DUP		
Factor:	0	0		
Results in:	%recvry	%recvry		
	05A	06A		
Matrix:	solid	solid		
	Result Det. Limit	Result Det. Limit		
1,2,4-Trichlorobenzene	103	104		
2,4,5-Trichlorophenol	104	107		
2,4,6-Trichlorophenol	88	86		
Surrogate Recovery(%)				
2-Fluorobiphenyl	106	107		
Control Limits: 30 to 115				
2-Fluorophenol	87	84		
Control Limits: 25 to 121				
Nitrobenzene-d5	91	91		
Control Limits: 23 to 120				
Phenol-d5	91	91		
Control Limits: 24 to 113				
Terphenyl-d14	124	124		
Control Limits: 18 to 137				
2,4,6-Tribromophenol	109	115		
Control Limits: 19 to 122				

(1) For a detailed description of flags and technical terms in this report refer to Appendix A in this report.
(2) 4-Methylphenol co-elutes with 3-methylphenol. The value reported is the combined total of the 2 compounds.

Lockheed
Radian Work Order: 93-03-351

Method:Semi-Volatiles by SW8270 (1)
List:Matrix Spike List

Sample ID:	L8002 MS	L8002 MSD
Factor:	0	0
Results in:	%recvry	%recvry
	07A	08A
Matrix:	solid	solid

	Result	Det. Limit	Result	Det. Limit
Acenaphthene	80		78	
4-Chloro-3-methylphenol	75		73	
2-Chlorophenol	84		76	
1,4-Dichlorobenzene	77		69	
2,4-Dinitrotoluene	75		75	
N-Nitrosodipropylamine	85		80	
4-Nitrophenol	66		63	
Pentachlorophenol	91		87	
Phenol	79		72	
Pyrene	80		80	
1,2,4-Trichlorobenzene	91		87	
Surrogate Recovery(%)				
2-Fluorobiphenyl	106		99	
Control Limits: 30 to 115				
2-Fluorophenol	89		80	
Control Limits: 25 to 121				
Nitrobenzene-d5	92		87	
Control Limits: 23 to 120				
Phenol-d5	97		89	
Control Limits: 24 to 113				
Terphenyl-d14	119		115	
Control Limits: 18 to 137				
2,4,6-Tribromophenol	119		114	
Control Limits: 19 to 122				

(1) For a detailed description of flags and technical terms in this report refer to Appendix A in this report.
(2) 4-Methylphenol co-elutes with 3-methylphenol. The value reported is the combined total of the 2 compounds.

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Sample History

Lockheed
Radian Work Order: 93-03-351

Sample Identifications and Dates

Sample ID	L8001	L8002	L8003	METHOD BLANK	LCS	LCS DUP
Date Sampled	03/30/93	03/30/93	03/30/93			
Date Received	03/31/93	03/31/93	03/31/93	03/31/93	03/31/93	03/31/93
Matrix	solid	solid	solid	solid	solid	solid
	01	02	03	04	05	06
Semi-Volatiles by SW8270						
Prepared	04/13/93	04/13/93	04/13/93	04/13/93	04/13/93	04/13/93
Analyzed	04/14/93	04/14/93	04/14/93	04/14/93	04/14/93	04/14/93
Analyst	MCL	MCL	MCL	MCL	MCL	MCL
File ID	D8369	D8366	D8370	D8365	D8363	D8364
Blank ID	D8365	D8365	D8365	D8365	D8365	D8365
Instrument	MSD1	MSD1	MSD1	MSD1	MSD1	MSD1
Report as	dry weight	dry weight	dry weight	dry weight	dry weight	dry weight

Lockheed
Radian Work Order: 93-03-351

Sample Identifications and Dates

Sample ID	L8002 MS	L8002 MSD
Date Sampled	03/30/93	03/30/93
Date Received	03/31/93	03/31/93
Matrix	solid	solid
	07	08

Semi-Volatiles by SW8270						
Prepared	04/13/93	04/13/93				
Analyzed	04/14/93	04/14/93				
Analyst	MCL	MCL				
File ID	D8367	D8368				
Blank ID	D8365	D8365				
Instrument	MSD1	MSD1				
Report as	dry weight	dry weight				

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Appendix A

Comments, Notes and Definitions

J ORGANIC METHODS

Indicates an estimated value for GC/MS data.

EXPLANATION

This flag is used either when estimating a concentration for tentatively identified compounds where a response factor of 1 is assumed, or when the mass spectral data indicate the presence of a compound that meets the identification criteria but the result is less than the sample quantitation limit.

ND ALL METHODS EXCEPT CLP

This flag is used to denote analytes which are not detected at or above the specified detection limit.

EXPLANATION

The value to the right of the < symbol is the method specified detection limit for the analyte.

NS ALL METHODS EXCEPT CLP

This analyte or surrogate was not spiked into the sample for this analysis.

Lockheed
Radian Work Order: 93-03-351

TERMS USED IN THIS REPORT:

Analyte - A chemical for which a sample is to be analyzed. The analysis will meet EPA method and QC specifications.

Compound - See Analyte.

Detection Limit - The method specified detection limit, which is the lower limit of quantitation specified by EPA for a method. Radian staff regularly assess their laboratories' method detection limits to verify that they meet or are lower than those specified by EPA. Detection limits which are higher than method limits are based on experimental values at the 99% confidence level. The detection limits for EPA CLP (Contract Laboratory Program) methods are CRQLs (contract required quantitation limits) for organics and CRDLs (contract required detection limits) for inorganics. Note, the detection limit may vary from that specified by EPA based on sample size, dilution or cleanup. (Refer to Factor, below)

EPA Method - The EPA specified method used to perform an analysis. EPA has specified standard methods for analysis of environmental samples. Radian will perform its analyses and accompanying QC tests in conformance with EPA methods unless otherwise specified.

Factor - Default method detection limits are based on analysis of clean water samples. A factor is required to calculate sample specific detection limits based on alternate matrices (soil or water), reporting units, use of cleanup procedures, or dilution of extracts/ digestates. For example, extraction or digestion of 10 grams of soil in contrast to 1 liter of water will result in a factor of 100.

Matrix - The sample material. Generally, it will be soil, water, air, oil, or solid waste.

Radian Work Order - The unique Radian identification code assigned to the samples reported in the analytical summary.

Units -	ug/L	micrograms per liter (parts per billion);liquids/water
	ug/kg	micrograms per kilogram (parts per billion); soils/solids
	ug/M3	micrograms per cubic meter; air samples
	mg/L	milligrams per liter (parts per million);liquids/water
	mg/kg	milligrams per kilogram (parts per million);soils/solids
	%	percent; usually used for percent recovery of QC standards
	uS/cm	conductance unit; microSiemans/centimeter
	mL/hr	milliliters per hour; rate of settlement of matter in water
	NTU	turbidity unit; nephelometric turbidity unit
	CU	color unit; equal to 1 mg/L of chloroplatinate salt

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APPENDIX A.2

Analytical Data for Groundwater Samples

Table A.2-1

Analytical Data for Groundwater Samples

Location:		MW113[a]	MW114[b]	MW2-6	MW2-6[c]	MW2-5	MW2-2
Depth (ft/BGS):		0	0	45.55	45.55	52.12	56.67
Date Collected:		03/23/93	03/23/93	03/24/93	03/24/93	03/25/93	03/25/93
Sample Control Number:		L6952	L6954	L6965	L6967	L6977	L6975
Matrix:		Water	Water	Water	Water	Water	Water
Analysis:		VOC	VOC	VOC	VOC	VOC	VOC
Samplers Initials:		CED	CED	CED	CED	JJC	JJC
Analyte	MDL (ppb)	Conc. (ppb)	Conc. (ppb)	Conc. (ppb)	Conc. (ppb)	Conc. (ppb)	Conc. (ppb)
Nitrates	N/A	0	0	5.4	7.5	0	0
1,1-DCE	3	ND	ND	ND	ND	ND	ND
1,1,1-TCA	1	ND	ND	ND	ND	ND	ND
TCE	2	ND	ND	ND	ND	ND	ND
1,2-DCA	1.6	ND	ND	ND	ND	ND	ND
PCE	3	ND	ND	ND	ND	ND	ND
Dilution Factor:		1	1	1	1	1	1
Date Analyzed (Nitrates):		03/23/93	03/23/93	03/24/93	03/24/93	03/25/93	03/25/93
Date Analyzed (VOCs):		03/23/93	03/23/93	03/24/93	03/24/93	03/25/93	03/25/93

[a]MW113 is an equipment blank taken at the end of the day on 3/23/93.
[b]MW114 is a bailer blank taken at the end of the day on 3/23/93.
[c]MW2-6 was sampled in duplicate.
BGS = Below Ground Surface.
MDL = Minimum Detection Limit.
ND = Not Detected.
VOC = Volatile Organic Compounds.

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APPENDIX B.1

Summary of QA/QC Data Assessment

Summary of QA/QC Data Assessment

The results of QA/QC data assessment for the six soil samples analyzed by U.S. EPA Method 6010 indicated the data was valid and the quality was within the acceptance criteria. The matrix spike/matrix spike duplicate results for Method 8270 were both accurate and precise. However, hexachlorocyclopentadiene and benzidine recoveries were low in the laboratory control sample/laboratory control sample duplicate (LC/LSD). As a result, the associated field sample results may be biased low. While most of the analyte recoveries in the LCS/LCSD for Method 8240 were acceptable, the recovery of 2-chloroethyl vinyl ether was high. The associated sample results, however, were not affected. Acetone, ethyl benzene, methyl ethyl ketone (MEK) , and xylene were detected in the Method 8240 reagent blanks and field samples, indicating there may be possible false positive results for these analytes in some of the field samples.

QC sample analyses are presented in the following order: reagent blanks; surrogate spikes; laboratory control sample/laboratory control sample duplicates; and matrix/matrix spike duplicates.

Reagent Blanks

Reagent blanks are used to demonstrate that interferences or contamination from the analytical system, including all glassware and reagents used in the analytical procedure, are under control.

For Methods 6010 and 8270, no target analytes were detected above the reporting limits in any of the reagent blanks, indicating the analytical systems were free of contamination. For Method 8240, acetone, ethyl benzene, MEK, and xylene were detected at low levels in one of the two reagent blanks. Methyl ethyl ketone was detected in all associated samples within five times the blank sample. This suggested that associated field sample results for MEK were likely false positive results attributable to contamination. Acetone, ethyl benzene, and xylene were detected in one of the three associated samples within five times the blank sample. This

suggested the associated field sample results for these analytes were likely false positive results attributable to contamination.

Surrogate Spikes

Surrogate spikes are a group of organic compounds, other than target analytes, that have been selected because of their similarity to the target analytes. Surrogate spikes are added to samples to monitor both the performance of the analytical system and the effectiveness of the method in recovering the organic method analytes.

The laboratory used three surrogates for each Method 8240 analysis. Three base/neutral and three acid surrogates were used for each Method 8270 analysis. The spike recoveries were compared to the laboratory-established acceptance limits and were all acceptable.

Laboratory Control Sample/Laboratory Control Samples Duplicates (LCS/LCSD)

Laboratory control samples (LCSs) are method spikes which are performed to demonstrate that the analytical system is in control. LCS recoveries are used to evaluate the laboratory's ability to recover target analytes in a clean matrix and help differentiate between matrix interferences and lack of analytical control when problems arise. LCSs were run in duplicate to provide a measure of analytical precision as well.

Two sets of LCS/LCSDs (i.e., four per method) were analyzed by Method 6010, Method 8240, and Method 8270. For Method 6010, all of the LCS/LCSD results were both accurate and precise, indicating the analytical system was operating in control.

The majority of the Method 8270 and Method 8240 LCS/LCSD recoveries were both accurate and precise. However, for Method 8270, the hexachlorocyclopentadiene and benzidine recoveries were low, indicating a low bias or false negative potential for the hexachlorocylcopentadiene and benzidine in the associated samples. Additionally, a high bias

or false positive potential was indicated by the spike recoveries for 2-chloroethyl vinyl ether in one of the two sets of LCS/LCSD for Method 8240. However, this potential was not realized: the associated results were "not detected", and therefore are not affected by this random inaccuracy.

Matrix Spikes/Matrix Spike Duplicates (MS/MSDs)

A matrix spike is a solution of method analytes (at known concentrations) that is spiked into a field sample. The results of the analysis of the spiked sample are then reported as a percent recovery of each spiked compound.

Two sets of MS/MSDs were analyzed by Method 8270. The spiking solution contained 11 different target compounds. All spike recoveries were accurate and precise.

MS/MSDs were not performed for Methods 8240 or 6010.

Holding Times

U.S. EPA Methods protocol specifies the maximum amount of time a sample can be stored before analysis (i.e., the sample "holding time"). The maximum allowable holding time for U.S. EPA Method 8240 is 14 days, for U.S. EPA Method 8270 is seven days for extraction, and 40 days for analysis, and U.S. EPA Method 6010 is six months. All samples have been analyzed within the required holding times.

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APPENDIX B.2

Data Quality Assessment

DATA QUALITY ASSESSMENT

The objectives of the quality assurance/quality control (QA/QC) efforts associated with the samples taken at Lockheed Beaumont Site No. 2 were to 1) ensure that proper sampling and analytical protocols were followed to eliminate sources of errors affecting the quality of the data, and 2) provide a quantitative assessment of the validity of the measurement data in the groundwater samples.

Quality Assurance/Quality Control Results for Groundwater

This assessment was performed according to EPA guidelines provided in *Methods for Chemical Analysis of Water and Wastes, Environmental Monitoring Services Laboratory*, 1983.

Quality assurance (QA) refers to the activities of planning, implementation, and oversight conducted to ensure that the data produced are valid and complete and can be used for their intended purposes. Quality control (QC) is the overall system of activities that provide feedback and corrective action to control the quality of a product or service within established specification.

Quality control data should be obtained from several types of QC samples, in addition to the environmental samples. Common QC samples include: duplicate environmental samples; equipment blanks; laboratory blanks; and reference (laboratory quality control check) standards. This data set is defined as follows:

- *Duplicate environmental samples* measure the overall precision of the sampling or analytical methods.
- *Equipment blanks* measure interference or contamination from the sampling equipment.
- *Laboratory blanks* are matrices, without the analytes of interest, that are carried through all the steps of the analytical procedures. They are used to assess if internal interferants or contaminants are introduced during the analytical process.

- *Laboratory control standards* (LCS) require certified standards, and are used to measure normal level bias originating from procedural or operator errors or contamination from laboratory sources.

A summary of the QC data available is shown in Table B.2-1. The assessment of the QC data indicated that the duplicate samples were within precision objectives, no bias was present based on the laboratory and equipment blank sample results, and the method was within accuracy objectives and in control based on the LCS recoveries. All samples were analyzed within seven days which is the maximum holding time requirement of the analytes reported.

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Table B.2-1

Summary of QC Data
Lockheed Beaumont On-Site Laboratory

Sample Type:		Lab Blank	QCCS	Lab Blank	QCCS	Lab Blank	QCCS
Matrix:		Water	Water	Water	Water	Water	Water
Analysis:		VOC	VOC	VOC	VOC	VOC	VOC
Analyte	MDL (ppb)	Conc. (ppb)	Percent Recovery	Conc. (ppb)	Percent Recovery	Conc. (ppb)	Percent Recovery
1,1-DCE	3	ND	118	ND	96	ND	71
1,1,1-TCA	1	ND	123	ND	100	ND	127
TCE	2	ND	115	ND	98	ND	119
1,2-DCA	1.6	ND	116	ND	90	ND	111
PCE	3	ND	112	ND	96	ND	123
Dilution Factor:		1	1	1	1	1	1
Date Analyzed:		03/23/93	03/23/93	03/24/93	03/24/93	03/25/93	03/25/93

QCCS = Quality Control, Control Standard.
MDL = Minimum Detection Limit.
VOC = Volatile Organic Compound.
ND = Not Detected.

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APPENDIX C

Permits

STATE OF CALIFORNIA
PETE WILSON, Governor

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD—
LOS ANGELES REGION
101 CENTRE PLAZA DRIVE
MONTEREY PARK, CA 91754-2156
(213) 266-7500

March 17, 1993

Ron N. Helgerson
Program Manager
Lockheed
2550 N. Hollywood Way, Suite 305
Burbank, CA 91505

WASTE DISCHARGE REQUIREMENTS FOR DISCHARGE OF EXCAVATED SOIL - LOCKHEED BEAUMONT AT 36501 JACK RABBIT TRAIL, BEAUMONT - File No. 88-57-061(93)

On March 11, 1993, you filed with this Board a report of waste discharge to discharge up to 2,000 cubic yards of excavated soil at BKK Landfill.

The Executive Officer has reviewed the information provided and has determined that the proposed discharge of this material meets the conditions specified in Order No. 91-93, "General Waste Discharge Requirements for Discharge of Non-Hazardous Contaminated Soils and Other Wastes in Los Angeles River and Santa Clara River Basins", adopted by this Board on July 22, 1991.

Enclosed are Waste Discharge Requirements, comprising:

1. General Waste Discharge Requirements
2. Monitoring and Reporting Program

Please note that the Monitoring and Reporting Program requires that a report be submitted to this Board within 10 days of the completion of disposal operations. The report shall reference the above file number.

If you have any questions, please contact Juan Gonzalez at (213) 266-7555.

for JOHN L. LEWIS, Unit Chief
Technical Support Unit

Enclosures

General Waste Discharge Requirements
Discharge of Non-Hazardous Contaminated Soils

File No. 88-57

B. Monitoring reports shall be signed by:

1. In the case of corporations, by a principal executive officer at least of the level of vice-president or his duly authorized representative, if such representative is responsible for the overall operation of discharge;

2. In the case of a partnership, by a general partner;

3. In the case of a sole proprietorship, by the proprietor;

4. In the case of a municipal, state or other public facility, by either a principal executive officer, ranking elected official, or other duly authorized employee.

C. The report shall contain the following completed declaration:

"I declare under penalty of perjury that the foregoing is true and correct.

Executed on the ___ day of _____ at _____

_____(Signature)

_____(Title)"

D. The discharger shall mail a copy of the monitoring report to the following:

California Regional Water Quality Control Board
Los Angeles Region
101 Centre Plaza Drive
Monterey Park, CA 91754-2156

Attn: Technical Support Unit

Ordered by: _____
ROBERT P. GHIRELLI, D.Env.
Executive Officer

Date: MAR 17 1993

15 March 1993

Mr. Arthur Carbonell
South Coast Air Quality Management District
21865 East Copely Drive
Diamond Bar, CA 91765

Subject: Lockheed Beaumont No. 2 Site Disposal Area
Notification of the Commencement of Work

Dear Mr. Carbonell,

This letter notifies you that the removal of subsurface material at the disposal area investigation at the Lockheed Beaumont No.2 Site is scheduled to begin Thursday, 18 March 1993. The removal will be conducted under the conditions presented in your 5 March 1993 letter granting the Rule 110 exemption. The work is anticipated to take one to two weeks to complete.

Should you have any questions, or require additional information regarding this matter, please contact Gene Matsushita at 818-847-0166.

Very truly yours,

Ron Helgerson
Project Manager
Environmental Technical Services

cc: Cal EPA DTSC (Salloum)
Santa Ana RWQCB (Saremi)
Radian (Koerner)
Radian (Horwath)
Scrivner (Fowler)

South Coast
AIR QUALITY MANAGEMENT DISTRICT
21865 E. Copley Drive. Diamond Bar. CA 91765-4182 (909) 396-2000

March 5, 1993

Lockheed Propulsion Company
2550 N. Hollywood Way Suite 305
Burbank, CA 91505

Attention: Gene Matsushita
Environmental Division

Gentlemen:

Reference is made to your letter dated February 19, 1993. Based on the information provided, please be advised that your proposal to excavate trenches at the Beaumont No. 2 Site disposal area shall be considered exempt from SCAQMD Rule 1150 provided that the following conditions are met:

1. THIS EXCAVATION SHALL BE CONDUCTED IN COMPLIANCE WITH ALL PLANS AND SPECIFICATIONS SUBMITTED WITH THE APPLICATION UNDER WHICH THIS PERMIT IS ISSUED UNLESS OTHERWISE NOTED BELOW.

2. THE EXCAVATION SHALL BE COMPLETED BY MARCH 31, 1993 OR WITHIN 14 CALENDAR DAYS AFTER THE EXCAVATION COMMENCES, WHICHEVER COMES FIRST, UNLESS AN EXTENSION IS OTHERWISE APPROVED IN WRITING BY THE SCAQMD. ANY EXTENSION REQUEST SHALL BE SUBMITTED IN WRITING TO THE SCAQMD AND SHALL INCLUDE THE REASONS THE EXTENSION IS REQUIRED, THE LENGTH OF THE EXTENSION, AND THE STATUS OF THE EXCAVATION TO DATE.

3. THE SCAQMD SHALL BE NOTIFIED IN WRITING AT LEAST TWO (2) DAYS PRIOR TO THE EXCAVATION COMMENCES AND WITHIN FIVE (5) DAYS AFTER IT IS COMPLETED.

4. THIS EXCAVATION PERMIT IS VALID ONLY FOR THE REMOVAL OF APPROXIMATELY 2000 CUBIC YARDS OF SOIL AND SURFACE DEBRIS.

5. EXCAVATION SHALL NOT BE CONDUCTED BETWEEN THE HOURS OF 6:00 PM AND 7:00 AM OR ON SATURDAYS, SUNDAYS AND LEGAL HOLIDAYS.

14. DURING EXCAVATION, MONITORING FOR ORGANICS AS METHANE USING AN ORGANIC VAPOR ANALYZER (OVA) OR OTHER MONITOR APPROVED BY THE SCAQMD SHALL BE CONDUCTED CONTINUOUSLY WITHIN TWENTY FEET AND DIRECTLY DOWNWIND OF THE EXCAVATION WORKING FACE. THE MAXIMUM SUSTAINED READINGS SHALL BE RECORDED EVERY 15 MINUTES.

15. IF THE OVA OR OTHER APPROVED ORGANIC MONITOR SHOWS A SUSTAINED (GREATER THAN 15 SECONDS) READING OF 200 PPMV OR GREATER AT THE WORKING FACE, THE AREA GENERATING THE EMISSIONS SHALL IMMEDIATELY BE COMPLETELY COVERED WITH A MINIMUM OF 6 INCHES OF CLEAN DIRT OR AN APPROVED FOAM AND THE FOLLOWING ACTIONS IMPLEMENTED:

    A. EXCAVATION OF THE AFFECTED AREA SHALL NOT RECOMMENCE UNTIL THE ORGANIC READINGS ARE BELOW 200 PPMV.

    B. EXCAVATION OF THE AFFECTED AREA SHALL BE CONDUCTED IN SUCH A MANNER AS TO LIMIT THE WORKING FACE TO LESS THAN 1000 SQUARE FEET OR OTHER SMALLER AREA DEEMED APPROPRIATE BY SCAQMD PERSONNEL TO REDUCE NUISANCE POTENTIAL.

16. IF A DISTINCT ODOR (LEVEL III OR GREATER) RESULTING FROM THE EXCAVATION IS DETECTED AT OR BEYOND THE PROPERTY LINE, THE EXCAVATION SHALL CEASE AND THE APPROVED MITIGATION MEASURES IMPLEMENTED IMMEDIATELY. ODOR LEVELS WILL BE DETERMINED BY SCAQMD PERSONNEL OR ON-SITE SAFETY COORDINATOR IN THE ABSENCE OF SCAQMD PERSONNEL.

17. ALL MONITORS SHALL BE CALIBRATED DAILY USING A METHOD APPROVED BY THE DISTRICT.

18. ALL RECORDS OF EXCAVATION WORKING HOURS, ANALYTICAL RESULTS, DAILY AMOUNTS OF MATERIALS EXCAVATED AND HAULED OFFSITE, AND OTHER RECORDS REQUIRED BY THIS PERMIT SHALL BE KEPT ON FILE FOR AT LEAST TWO YEARS AND MADE AVAILABLE TO THE DISTRICT UPON REQUEST.

19. MITIGATION MEASURES, OTHER THAN THOSE INDICATED IN THESE CONDITIONS, WHICH ARE DEEMED APPROPRIATE BY SCAQMD PERSONNEL AS NECESSARY TO PROTECT THE COMFORT, REPOSE, HEALTH OR SAFETY OF THE PUBLIC, SHALL BE IMPLEMENTED UPON REQUEST.

2 February 1993

Mr. Arthur Carbonell
South Coast Air Quality Management District
21865 East Copely Drive
Diamond Bar, CA 91765

Subject: Lockheed Beaumont No. 2 Site Disposal Area
Notification of the Commencement of Work

Dear Mr. Carbonell,

This letter notifies you that the subsurface portion of the disposal area investigation at the Lockheed Beaumont No.2 Site is scheduled to begin Friday, 5 February 1993. The work is anticipated to take one to two weeks to complete.

If you have any questions or concerns, please feel free to contact me at (714) 261-8611 or Chris Koerner at (916) 362-5332.

Sincerely,

Robert M. Horwath, REA
Project Director

cc: Haissam Salloum
Gene Matsushita
Rick Beauregard
Chris Koerner
File #290-063-02-01

STATE OF CALIFORNIA — ENVIRONMENTAL PROTECTION AGENCY

Bdn H

PETE WILSON, Governor

DEPARTMENT OF TOXIC SUBSTANCES CONTROL

Region 4
245 West Broadway, Suite 350
Long Beach, CA 90802-4444

May 4, 1993

Mr. Gene Matsushita
Lockheed Environmental Systems
Burbank Program Office
2550 N. Hollywood Way, Suite 305
Burbank, California 91505

REPORT OF COMPLETION OF REMOVAL ACTION FOR LOCKHEED BEAUMONT NO. 2

Dear Mr. Matsushita:

Enclosed please find a copy of the Report of Completion of Removal Action for Lockheed Beaumont site no. 2. If you have any questions please call me at (310)590-4916.

Sincerely,

Haissam Salloum

Haissam Y. Salloum
Project Manager

cc: Chris Koerner
Radian Corporation
10389 Old Placerville Road
Sacramento, CA 95827

DEPARTMENT OF TOXIC SUBSTANCES CONTROL (DTSC)

Report of Completion of Removal Action (RA)

1. Site Name: Lockheed Beaumont No. 2

2. Site Address: Jack Rabbit Trail, Beaumont, California.

3. Type of Site:
   - ☒ Responsible Party Lead
   - ☐ DTSC Lead
   - ☐ EPA Lead
   - ☐ NPL (Listed or proposed)
   - ☐ RWQCB Lead
   - ☐ Local Agency Lead

4. Size of Site:
   - ☐ Small
   - ☐ Large
   - ☒ Medium
   - ☐ Extra Large

5. Names of Responsible Parties: Lockheed Corporation

6. Role of DTSC in RA:
   - ☐ DTSC implemented RA directly.
   - ☒ DTSC provided oversight/guidance to RPs or other state, local or federal agency for RA.

7. Description of RA:

816 tons of non-hazardous waste were removed. The waste, consisting of concrete, wood, tires and metals was transported off site for disposal at the BKK Landfill. Confirmation samples results indicate that metals concentrations were below the applicable total threshold limit concentrations and below 10 times the applicable soluble threshold limit concentrations. Results also indicates that volatile and semivolatile organic compounds are non-detected.

8. Cost of RA:

The approximate cost of the RA was $150,000.00.