LAW/CRANDALL
A DIVISION OF LAW ENGINEERING
AND ENVIRONMENTAL SERVICES, INC.

REPORT OF SOLID WASTE ASSESSMENT TEST (SWAT)

CELERY DUMP—PARCEL A
PLAYA VISTA PROJECT
LOS ANGELES, CALIFORNIA

Prepared For:

MAGUIRE THOMAS PARTNERS

Los Angeles, California

May 7, 1996

Project 70131-5-0514.6005

LAW/CRANDALL, INC.
ENGINEERING AND ENVIRONMENTAL SERVICES

May 7, 1996

Mr. Robert Miller
Maguire Thomas Partners
13250 Jefferson Boulevard
Los Angeles, California 90094

Subject: **Report of Solid Waste Assessment Test (SWAT)**
Celery Dump—Parcel A
Playa Vista Project
Los Angeles, California
Law/Crandall Project 70131-5-0514.6005

Dear Mr. Miller:

We have prepared this Report of Solid Waste Assessment Test (SWAT), Celery Dump, Parcel A, Playa Vista Project, Los Angeles, California, for Maguire Thomas Partners.

This report is a follow-up to a meeting with the RWQCB staff on March 19, 1996. At that meeting, background data gathered to date was presented on the Celery Dump. After looking at the data, a decision was made that the site did not qualify for the Solid Waste Assessment Questionnaire (SWAQ) because the site received waste in volumes greater than 50,000 cubic yards. However, it was tentatively decided that monitoring done at the site to date may provide enough information to satisfy SWAT requirements.

The data presented includes the results of groundwater sampling, groundwater and surface water quality analysis, and water level measurements from the Celery Dump monitoring wells. This report contains information from six field investigations in Parcel A between 1988 and 1996. It contains the results of the investigations, our interpretation of the data, and our conclusions

This report has incorporated comments from you and Camp Dresser & McKee, Inc. (CDM) personnel. Comments to the draft report were received by our office on April 24, 1996, and final comments were received by our office on May 3, 1996.

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It is a pleasure to be of professional service to you on this project. Please call if you have any questions or require additional information.

Sincerely,

LAW/CRANDALL

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cc: (2) Camp, Dresser & McKee, Inc.
Attn: Mr. Brian Kelly

(2) California Regional Water Quality Control Board
Attn: Mr. Rick Vergets

REPORT OF SOLID WASTE ASSESSMENT TEST (SWAT)

CELERY DUMP—PARCEL A
PLAYA VISTA PROJECT
LOS ANGELES, CALIFORNIA

Prepared For:

MAGUIRE THOMAS PARTNERS

Los Angeles, California

Law/Crandall
Los Angeles, California

and

Camp Dresser & McKee
Irvine, California

May 7, 1996

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EXECUTIVE SUMMARY

The former Celery Dump is located in the eastern portion of Parcel A of the proposed Playa Vista Development, in the Marina del Rey District of Los Angeles County, California. The materials disposed of in the dump were packing house waste, consisting of celery leaves and trimmings. The waste was allowed to decompose at the surface before being disced into the soil each year. The waste piles were periodically sprayed with a mixture of the pesticide Lindane and fuel oil for odor and pest control. Multiple investigations have been performed at the former Celery Dump to evaluate whether landfill materials are still present on-site and to evaluate whether the site has adversely impacted soil or groundwater.

Borings were drilled and monitoring wells were installed around the site. Soil and groundwater were sampled during multiple investigations.

Based on these investigations it can be concluded that:

- There is no evidence of celery leaves or trimmings present on the property.
- There is no evidence of adversely impacted soil or groundwater related to activities associated with the former Celery Dump, including contamination from Lindane or fuel oil.
- There is no evidence of leachate or gas production from the former Celery Dump.
- The investigations identified elevated levels of some metals in excess of U.S. Environmental Protection Agency (EPA) and California Department of Health Services (DHS) Maximum Contaminant Levels (MCLs) in groundwater and soil. There is no evidence that the metals identified in the soils and groundwater are attributable to the operation of the former Celery Dump. The presence of metals may be related to disposal of soils from Marina del Rey dredging operations and the brackish environment.

CERTIFICATION

REPORT CERTIFICATION:

I certify that this report is accurate and complete.

Stephen M. McArdle
Project Geologist

REGISTERED GEOLOGIST
STEPHEN MICHAEL McARDLE
NO. 6319
STATE OF CALIFORNIA

Date: May 7, 1996

1.0 INTRODUCTION

This draft report presents the Solid Waste Assessment Test (SWAT Report) for the former Celery Dump in Parcel A of the Playa Vista Development located in the Marina del Rey District of Los Angeles County, California. The site is located within Parcel A of the Playa Vista Master Plan which is bounded by Marina del Rey to the west, Marina del Rey Basin H to the north, Ballona Creek to the south and Lincoln Boulevard Storm Drain to the east. Figure 1, Site and Monitoring Well Location Map, shows the location of the former Celery Dump relative to the surrounding area. The former Celery Dump was used for the disposal of celery cuttings from several former packing houses; there was no hazardous waste or household waste accepted at the site. The former Celery Dump was open for a period of eight years, from 1945 to 1953; the site has been closed for 43 years.

The SWAT Program was added to the California Water Code in 1984 by passage of Assembly Bill 3525 (Calderon Act). The purpose of this Act is to rank solid waste disposal sites on the basis of the potential threat they may pose to ground and surface waters and requires monitoring and testing of waters from the site. The former Celery Dump was originally classified as Rank 5, but as of June, 1989 has been reclassified as Rank 6.

The purpose of this report is to present the results of groundwater sampling, groundwater and surface water quality analysis, and water level measurements from the former Celery Dump monitoring wells and wells in surrounding parcels of the Playa Vista Development. The report also contains results of laboratory chemical analyses of soil samples within the Playa Vista Development. Interpretation of the data and conclusions are also provided.

Our professional services have been performed using that degree of care and skill ordinarily exercised, under similar circumstances, by reputable geotechnical consultants practicing in this or similar localities. No other warranty, expressed or implied, is made as to the professional advice included in this memorandum. This report has been prepared for Maguire Thomas Partners and their design consultants to be used solely in the objective of satisfying regulatory requirements of the SWAT for the former Celery Dump. The report has not been prepared for use by other parties,

and may not contain sufficient information for the purposes of other parties or other uses. This draft report is based on available information from agency files. No warranty as to the completeness or accuracy of these accounts is made.

2.0 GENERAL SITE INFORMATION

The site, known as the Celery Dump, was an unlined, non-hazardous, solid waste-type landfill. The dump reportedly covered approximately 5 acres to 10 acres. Records indicate that the facility was operated from 1945 through 1950 without a permit, but was permitted from 1950 through 1953. There is no information on file for the period after 1953. The file on the Celery Dump was closed by the Los Angeles County Engineer's Department in 1961.

The site was used for the disposal of waste before the enactment of Subchapter 15 requirements by the State of California. As such, there was no liner system, final cover, or groundwater or gas monitoring system installed at the site before its closure. There is no record of the site undergoing formal closure or that formal closure plans were completed. In addition, there is no record that a final cover was installed at the site.

Other pertinent information is listed below:

Site Location	Records show several different coordinates for the landfill location from various inspection reports. Information on a computer database from the Los Angeles County Sanitation District indicates that the Celery Dump was located 800 feet north and either 500 or 800 feet west of the intersection of Lincoln and Culver Boulevards. The site is located in Section 22 of Township 2 South, Range 15 West; Latitude: 118, 26, 00 and Longitude: 33, 58, 45.
Former Site Address	5005 South Lincoln Boulevard
File No./Permit No.	Regional Water Quality Control Board: No file on the site Los Angeles County, Department of Public Works, Waste Management Division: File Number I-625-2 and Industrial Waste Permit Number 75, filed with the County Engineer, dated July 5, 1950.

County Assessor's Parcel No.	APN 4211-16-05
Former Owner	Rancho Del Rey Farms. Two other packing houses also disposed of trimmings at the site. These packing houses were known as D'Arrigo Brothers and Deardroff-Jackson.
Current Owner	Maguire Thomas Partners/Suma Corporation 13250 West Jefferson Boulevard Los Angeles, California 90094 (310) 822-0074
Former Operator	American Fruit Association
Current Permits and/or Regulatory Orders:	None
Waste Type:	Celery Trimmings
Waste Quantities	300 cubic yards a day; seasonal total of 27,000 cubic yards; site operated for 8 years.

2.1 GENERAL OPERATIONS AND SITE HISTORY

The Celery Dump was used for the disposal of vegetable packing house wastes, specifically celery leaves and trimmings, from 1945 through 1953. Except for one report of illegal dumping of approximately 100 cubic yards of trash in 1949, there is no evidence that wastes were deposited at the site other than vegetable refuse. The landfill was operated approximately 90 days per year, from the start of the celery harvest on about April 15 through its end on about July 15. A 1950 inspection report from Los Angeles County Waste Management Division indicates that celery trimmings were trucked to the site seven days a week and were piled up to four feet high. The piles were left to decompose naturally before the remains of the decomposed material were disced into the soil once a year. During decomposition, the piles were sprayed with a mixture of benzene hexachloride (Lindane) and fuel oil to control odor and flies. Figures 2 and 3 show topography surrounding the site in 1950 and 1981, respectively.

We reviewed historic topographical maps from 1942 and 1950 and compared them to maps from 1972 and 1981. Elevations in the vicinity of the former Celery Dump changed approximately 5 to 10 feet during the time period 1950 through 1972. The change in elevation resulted from disposal of dredged sediments in Parcel A, including the area occupied by the former Celery Dump, from excavation of Marina del Rey during 1961 and 1962. The site was covered with water during the dredging operation in 1962; a dike was built around Parcel A to contain the water. Flooding of the former Celery Dump would have hastened the decomposition of any remaining waste in the site.

2.2 CURRENT AND PROPOSED LAND USE

Directly north of the site is Marina del Rey, a district within the City of Los Angeles. Marina del Rey is a commercial marina, surrounded by residential, office, retail, and industrial uses. The land use within a one-half mile radius of the site to the south, east and west is currently undeveloped open space. This area is within the proposed Playa Vista Master Plan. Existing land uses by major category are presented in Figure 4.

Under the proposed Playa Vista Master Plan, the area immediately east and south of the site will be designated for mixed-use development, consisting of a boating facility and high density residential and commercial uses. The area south of Ballona Channel will remain predominately open space, consisting of both salt water and fresh water marshes with some low to high density residential and commercial development.

The former Celery Dump site is located within Parcel A of the Playa Vista Development project, which presently consists of approximately 150 acres of undeveloped open space. As part of the proposed Playa Vista Master Plan, Parcel A will be developed to include a 50-acre boating facility, surrounded by mixed use and low to high density residential development.

2.3 WATER USE

Marina del Rey is the only municipal water user within a half mile radius of the site. According to the Los Angeles County Department of Public Works, the total annual water consumption presented below represents combined industrial, municipal and residential consumption within the community.

Year	1989	1990	1991	1992	1993	1994	1995
Consumption (acre/foot per year)	2,039	1,925	1,705	1,693	1,755	1,850	1,794

While there is some limited extraction for beneficial uses from the system of aquifers underlying and in the general vicinity of the site, there is no such extraction at the site nor in the immediate vicinity. Since the groundwater within the aquifer system is generally considered degraded due to past overproduction of groundwater and the resulting sea water intrusion, no present or future domestic use of groundwater in the vicinity of the former Celery Dump site is anticipated.

3.0 SITE CHARACTERIZATIONS

3.1 GEOLOGY

The site is located in the Los Angeles Coastal Plain within the Peninsular Ranges Geomorphic Province of California. The Peninsular Ranges Province is characterized by northwest trending ranges and valleys which extend south from the Los Angeles Basin into Baja California. The Peninsular Ranges extend approximately 80 miles offshore to the west and are truncated on the north by the Transverse Ranges, an east-west trending series of mountains which include the Santa Monica and San Gabriel Mountains.

The regional geology of the Los Angeles County Coastal Plain reflects both structural and stratigraphic complexities resulting from a long depositional history associated with large-scale earth movements. Both the Peninsular Range and Transverse Range Provinces were affected

simultaneously by large-scale deformation (earth processes resulting in folding and faulting of rock units).

Figure 5, Regional Geology, shows the site relative to the regional geologic features. Figures 6 and 7, Cross Section A to A' and Cross Section B to B', respectively, show the distribution of subsurface geologic material. The site is shown with respect to the local geologic and topographic features in Figure 8, Local Geology.

3.2 GEOLOGIC MATERIALS

Fill

Based on our previous logs, fill soils were encountered throughout the area surrounding the former Celery Dump site, ranging from 5 to 18 feet in thickness. The fill consists primarily of silt, clay, and silty sand. The majority of the fill was apparently placed hydraulically during the dredging of the Marina del Rey harbor. Based on the discovery of trace organic materials near the bottom of the fill layer, the fill material appears to have been placed directly over vegetation on the surface of the natural soils.

Holocene

Beneath the fill material, the area surrounding the site is underlain by Holocene alluvium which is estimated to extend to a depth of 100 feet below ground surface. The site is situated within the Ballona Creek Flood Plain, the ancestral drainage of the Los Angeles River. The deposits of recent age include flood plain sediments, lagoonal marshlands, beach deposits and dune sand. The alluvial deposits appear to be fairly consistent throughout the region. Locally, the upper soils range in depth from 50 to 70 feet below ground surface, consisting of silts, silty sand, clay and occasional minor layers of peat. These upper soils are underlain by dense sand and gravel deposits. These coarser fluvial deposits compose the Ballona Aquifer, which is commonly referred to as the "50-foot gravel."

Pleistocene

The San Pedro Formation underlies the Holocene age deposits. The deposition of heterogeneous sediments, containing interbedded lenses of sand, gravel and silt as long stringers, composes the San Pedro Formation. In the Ballona Gap area (located between Baldwin Hills and Beverly Hills and extending to the ocean) available data indicate that the San Pedro Formation has a thickness of approximately 300 feet. The upper portion of the San Pedro Formation is composed of silty to sandy clay. This zone is referred to as the upper San Pedro Aquiclude which acts as a confining layer between the base of the Ballona Aquifer and the top of the Silverado Aquifer, east of the Charnock fault. The Silverado Aquifer is a coarse grained basal marine deposit in the San Pedro Formation. It is mainly sand and gravel with a small amount of clay. The Silverado Aquifer is estimated to range from 100 to 200 feet beneath the site.

Basement Complex

It is estimated that approximately 6,500 feet of Tertiary age sedimentary rocks underlie the San Pedro Formation. These sedimentary rocks are underlain by metamorphic schist basement rocks of probable Jurassic age.

3.3 GEOLOGIC STRUCTURE

Faults—Regional

The area surrounding the site is characterized by major faults and fault zones which are generally parallel to the San Andreas Fault zone and are characteristically northwest-trending right-lateral strike-slip faults. These faults are the result of major deformational episodes that have occurred throughout the development of the California ranges.

The locations of active faults within the regional area of the site are shown in Figure 9, Regional Seismicity.

Faults—Local

No known active or potentially active faults pass directly beneath the site. The potentially active Charnock fault is located approximately 2.5 miles from the site. The Charnock fault is considered to be potentially active because it apparently displaces Pleistocene age deposits.

The Charnock fault is recognized as a groundwater barrier by the Los Angeles County Flood Control District. The barrier effect reportedly increases along the trace of the fault up to the vicinity of the Ballona Escarpment and then decreases as it continues beyond the Ballona Gap. The Ballona Escarpment is located approximately one mile south of the former Celery Dump.

The California Department of Conservation, Division of Oil and Gas has also mapped six smaller faults within the Playa del Rey Oil Field which appear to be Upper Miocene (approximately 15 million years ago) age or older. Due to their age and the extensive thickness of overlying sediments, these faults are considered to be inactive.

3.4 HYDROLOGY

Regional Hydrogeology

The three aquifer systems in the vicinity of the site, from deepest to shallowest depth, are the Silverado Aquifer, the Gage/Gardena Aquifer and the Ballona Aquifer system (which includes the Ballona Aquifer and the Bellflower Aquitard).

Ballona Aquifer System

Regionally, the recent (Holocene age) sediments extend to depths ranging from approximately 40 to 120 feet thick. Within these recent sediments, sand, ranging from 4 to 20 feet thick, is found at the surface or below fill materials. The Bellflower Aquitard, which consists of clay, silty and sandy clay, clayey silt and fine sand, is found regionally at depths near the surface to about 35 feet below the surface. The sediments in the upper portion of the Bellflower Aquitard are interbedded

with the near surface sand deposits. The basal unit (or lower most unit) of the recent sediments consists of medium to coarse sand and gravel which ranges from a few feet to 40 feet thick, and is known as the Ballona Aquifer. Regionally, the Ballona Aquifer occurs at a depth of 35 to 50 feet and readily transmits water.

The lower, more permeable portion of the Bellflower Aquitard and the Ballona Aquifer together compose a single, hydraulically connected hydrogeologic unit, which is referred to as the Merged Bellflower/Ballona Aquifer, or simply, the Bellflower/Ballona Aquifer. The lower sand and silty sand sediments of the Bellflower Aquitard readily transmit from and to the underlying Ballona Aquifer. Although these two units are indicated to be distinctly different hydrogeologic units in some areas, regionally they function as a single aquifer system.

Silverado Aquifer

The Silverado Aquifer of the lower Pleistocene age San Pedro Formation appears to underlie the Holocene age alluvium, including the Bellflower/Ballona Aquifer. Regionally, the Silverado Aquifer is estimated to range in depth from about 100 to 200 feet. The Silverado Aquifer consists of sand and gravel with some inter-bedded silt and clay. Several distinct sand/gravel zones exist in the Silverado, which are separated by finer-grained units. The sand and gravels of the Silverado Aquifer vary in thickness from 50 to 80 feet.

Limited data from the uppermost part of the Silverado indicate that the Silverado and Bellflower/Ballona Aquifers are in hydraulic communication, and that groundwater levels are similar to those in the Bellflower/Ballona Aquifer. Water level measurements indicate that the groundwater is migrating in an easterly to northeasterly direction under a hydraulic gradient of 15 ft/mile. The Charnock fault is believed to be a barrier to east-west flow in the Silverado Aquifer. The Charnock fault appears to have displaced the lower Silverado by about 80 feet. West of the Charnock fault, an erosional unconformity causes the Bellflower/Ballona Aquifer to overlie the Silverado Aquifer, whereas on the eastern downthrown side of the fault, the Bellflower/ Ballona and Silverado aquifers are separated by a clay unit from 80 to 120 feet thick. This clay unit is referred to as the San Pedro Aquiclude.

Gage/Gardena Aquifer

The Gage/Gardena Aquifer is present only on the east side of the Charnock fault. The Gage/Gardena Aquifer near the Ballona Gap has low to moderate permeabilities, and very few water production wells are known to be extracting from it.

The offset resulting from the east side of the Charnock fault being dropped down relative to the west side causes the Ballona Aquifer to be hydraulically connected with sandy gravel and silt layers of the upper San Pedro Aquiclude and with sandy gravels of the Gage/Gardena Aquifer in a lateral manner. Therefore, groundwater flow from the Gage/Gardena Aquifer beneath the Playa del Rey Bluffs area to the Bellflower/Ballona Aquifer is not impeded.

3.5 GROUNDWATER MOVEMENT

Regional

Regional groundwater level contours suggest that groundwater in the Silverado Aquifer flows in an east to southeast direction toward the Charnock fault. An artificial recharge area, the West Coast Basin Barrier Project (WCBBP), is located about 5.5 miles south of the site. The WCBBP is an injection project to prevent sea water intrusion in the area. According to regional groundwater contours shown in Figure 10, Regional Groundwater Contour Map, groundwater flows out radially from this area for a few miles, but the general trend is away from this recharge area to east and southeast. Both the WCBBP and groundwater extraction in the Inglewood/Hawthorne area influence the regional groundwater flow direction.

Local

Figure 11, Local Groundwater Surface Elevations and Velocity, shows depth to groundwater, groundwater surface elevation, and groundwater contours for Playa Vista Parcel A and the western portion of Parcel C as observed during field activities by Law/Crandall in February 1996. The depth to groundwater varies from approximately 6.0 feet below ground surface in Parcel A to

approximately 10.6 feet below ground surface in the western portion of Parcel C. The direction of groundwater flow is generally from northwest to southeast, away from the ocean and roughly parallel to the Ballona Creek. Throughout the site, there are several factors controlling groundwater elevation and gradient. Seasonal variations in climatic conditions, daily tidal fluctuations and subsurface stratigraphy all influence local groundwater conditions.

3.6 SURFACE WATER

The site is located within the Ballona Creek floodplain which is the ancestral drainage of the Los Angeles River. The former Celery Dump site is approximately 1.4 miles inland from the Pacific Ocean, at an elevation ranging from about 10 to 15 feet above mean sea level.

As previously mentioned, the site is within Parcel A of the proposed Playa Vista Master Plan which is bounded by Marina del Rey to the west, Marina del Rey Basin H to the north, Ballona Creek to the south and Lincoln Boulevard Storm Drain to the east. The Marina Storm Drain crosses the northern perimeter of the site, draining into Marina del Rey Basin H. The Lincoln Boulevard Storm Drain discharges into Ballona Creek. In addition, the Ballona Wetlands are located approximately 0.5 miles from the site, south of Ballona Creek.

4.0 GROUNDWATER MONITORING WELLS

The locations of the monitoring wells in the vicinity of the site are shown in Figure 1. In selecting monitoring well locations, we took into account the direction of groundwater movement, which is approximately northwest to southeast. Eight wells were installed during multiple projects from 1991 to 1996 in the vicinity of the former Celery Dump. Sampling of these wells provides: 1) the background water quality, and 2) the quality of water passing the site.

The groundwater sampling protocol is located in Appendix A. In addition, a groundwater database containing well information for the Playa Vista site is presented in Appendix B in Tables B-1 through B-4. These tables list monitoring well and piezometer information including:

- Well, piezometer, and project numbers;

- Parcel numbers;
- The date groundwater levels were measured;
- Reference point elevations;
- Ground surface elevations;
- Depths to water below ground surface; and
- Groundwater surface elevations.

5.0 PREVIOUS CELERY DUMP SITE INVESTIGATIONS

Law/Crandall performed six field investigations in Parcel A between 1988 and 1996. Soil materials were logged, and soil and groundwater samples were obtained for laboratory analysis. The purpose of these investigations was to gather background and site-specific groundwater quality data from around the former Celery Dump area.

BC Analytical Laboratory performed the chemical analyses for each investigation, except for the Phase II Environmental Site Assessment in December 1991, when testing was done by American Environmental Testing Laboratory Inc. Both labs are certified for such analyses by the State of California Department of Health Services (DHS).

The investigations are described below and locations of borings and monitoring wells from these investigations are shown in Figure 1. Figure 12, Boring and Monitoring Well Location Map (Parcels A, B, C, and D), Playa Vista Project, shows locations of other Playa Vista Project monitoring wells and borings.

A preliminary environmental audit was completed in 1988 on Parcel A of the Playa Vista Development; where the former Celery Dump is located within this parcel. This draft report includes background information in existing files on the site from the Los Angeles County Public Works Department, Waste Management Division, collected during the site audit. The preliminary environmental audit is located in Appendix C.

5.1 INVESTIGATION (1988)

We performed a preliminary geotechnical investigation in 1988 on Parcel A in which 20 soil borings were drilled to depths of up to 60 feet. A copy of this report is located in Appendix D. One boring (B-11) was drilled in the former Celery Dump, while 4 additional borings (6, 10, 15, and 16) were drilled in the vicinity of and to the west and south of B-11. The 5 borings encountered up to 12½ feet of fill, but only trace amounts of organic material were observed. During the investigation, no groundwater or soil samples were obtained for laboratory analysis.

5.2 INVESTIGATION (1990)

We installed two monitoring wells (MW-8 and MW-9) on Parcel A during a 1990 investigation. The investigation was conducted to evaluate background water quality and groundwater gradient in the vicinity of the Ballona Wetlands. MW-9 is located southwest of the former Celery Dump. Approximately 8½ feet of fill was observed, but no organic material was noted. Groundwater samples were obtained and analyzed for volatile and extractable priority pollutants by U.S. Environmental Protection Agency (EPA) Methods 8240 and 8270, respectively; for metals by EPA Method 6010/7000; and for pesticides/PCBs (including Lindane) by EPA Method 8080. A copy of the report for this investigation is located in Appendix E.

5.3 INVESTIGATION (APRIL 1991)

We drilled four additional borings on Parcel A during a supplemental investigation in April 1991. This investigation was conducted to evaluate whether organic materials were present and whether groundwater was adversely affected by the former Celery Dump. Three of these borings (B-22, B-23, and B-24) were drilled east of B-11, at and within the reported location of the former Celery Dump. Only minor amounts of organic materials consisting of rootlets and grass were observed. Groundwater samples were obtained from Borings 21 and 22 and analyzed for pesticides/PCBs (including Lindane) by EPA Method 8080, volatile organic compounds (volatile priority pollutants) by EPA Method 8240, and total petroleum hydrocarbons by modified EPA Method 8015. A copy of the report for this investigation is located in Appendix F.

5.4 INVESTIGATION (DECEMBER 1991)

We proceeded with a Phase II environmental site assessment of the former Celery Dump in December 1991 to further evaluate whether landfill materials were still present on site and to further evaluate whether chemical contaminants associated with the former landfill had adversely impacted soil or groundwater beneath the site. A copy of this report is located in Appendix G. Nine borings (B-17 through B-25) were drilled in the eastern portion of Parcel A. Five of the borings had monitoring wells installed (MW22, MW23, MW24, MW25, and MW26). There was no debris or landfill material observed during drilling. Soil and groundwater samples were taken for laboratory analysis. The groundwater was analyzed for TPH as diesel by modified EPA Method 8015; for aromatic hydrocarbons and volatile halocarbons by EPA Methods 601 and 602, respectively; for pesticides by EPA Method 608 (including Lindane); for nitrate by EPA Method 353.2; for Title 22 metals by EPA Method 6010/7000 series; and for semi-volatile organic compounds by EPA Method 625. Selected soil samples were analyzed for total petroleum hydrocarbons (TPH) as diesel by modified EPA Method 8015, for pesticides (including Lindane) by EPA Method 8080, for Title 22 (CAM) metals by EPA Method 6010/7000 series, and for total lead by EPA Method 7421.

Soil samples from depths of 5 and 10 feet in all of the borings were analyzed for TPH. Soil samples from a depth of 5 feet (from within the fill or just beneath it) in all of the borings were analyzed for pesticides and metals. The 5-foot soil samples from Borings B-17, B-19, B-20, and B-22 were analyzed for Title 22 metals, while the 5-foot soil samples from the remaining borings were analyzed for total lead.

Boring logs for the investigations listed above are located in our Phase II Environmental Site Assessment report presented in Appendix G. In addition, the report contains results of laboratory analyses of soil and groundwater samples from each of the investigations.

5.5 INVESTIGATION (FEBRUARY 1992)

Groundwater samples were obtained from five groundwater monitoring wells on February 5, 1992, in a supplemental investigation. This supplemental investigation was done to assess whether benzene, toluene, ethylene, and total xylenes (BTEX) concentrations detected in samples taken in December 1991, resulted from contamination introduced during drilling. Samples were analyzed for the BTEX by EPA Method 602. A copy of the results of chemical testing is located in Appendix G, in the Phase II report.

5.6 INVESTIGATION (1996)

Groundwater was sampled in eight monitoring wells during February 1996. Wells sampled included: MW-1 (Parcel C) and Parcel A wells MW-8, MW-9, MW-22, MW-23, MW-24, MW-25, and MW-26. Wells were sampled for priority pollutants including volatile organics (EPA Method 8260), semivolatile organics (EPA Method 8270), metals (EPA Method 6010), pesticides (EPA Method 8080), cyanide (EPA Method 9010), phenolics (EPA Method 9065), dioxin screen (EPA Method 8270), and general minerals. Analytical results from this investigation are presented in Appendix H.

6.0 SOIL ANALYSIS FINDINGS

Soil samples taken from MW-8 and MW-9 during 1990 indicated electrical conductivity values ranging from 4,760 to 16,500 micromhos within the upper 6 feet of soil. The results show the site is situated in a brackish environment.

Laboratory results from the December 1991 investigation indicated no concentrations of TPH (as diesel, by modified EPA Method 8015) or pesticides, including Lindane (by EPA Method 8080) were present at or above laboratory detection limits in each of the nine borings drilled.

Laboratory results for Title 22 metals indicated concentrations of these metals within normal ranges in most of the samples analyzed. Elevated lead concentrations were detected in samples

from borings B-20 and B-21, which had lead concentrations of 80 and 83 mg/kg, respectively. All of the metals concentrations detected were well below the total threshold limit concentrations (TTLCs) for hazardous waste characterization, as established by DHS. Based on laboratory analyses, all of the concentrations, except for the lead levels previously mentioned, were less than 10 times greater than the soluble threshold limit concentrations (STLCs); total concentrations greater than 10 times the STLC generally raise concern that sufficient soluble constituents may be present such that the STLC threshold may be exceeded and the material may be hazardous waste.

7.0 WATER QUALITY FINDINGS

We have summarized the findings of chemical testing on ground and surface waters and present the findings below. Table 1 lists a summary of Title 22 metals concentrations found in the groundwater from investigations during 1990, 1991, and 1996, as well as the established MCLs for each metal; Table 2 lists BTEX concentrations in groundwater samples from investigations during 1990, 1991, 1992, and 1996.

7.1 SURFACE WATER

From May 1988 through April 1995, monthly dry flow grab samples were collected by the Los Angeles County Department of Public Works (LACDPW) from Ballona Creek at Sawtelle Boulevard. These samples were analyzed for concentrations of general minerals, heavy metals, bacteria, volatile organics, pesticides, PCBs, oil and grease, and biological oxygen demand. In addition, both composite and grab samples were collected by LACDPW during selected 1994/95 storm events from Ballona Creek at Beloit Avenue. The composite samples were analyzed for general minerals, dissolved and total metals, organics, and semi-volatile organics. The grab samples were analyzed for bacteria, oil and grease, volatile organics, pesticides, PCBs, and herbicides. Analytical results from the samples are presented in Appendix I.

7.2 INVESTIGATION (1990)

None of the priority pollutants or pesticides/PCBs (including Lindane) were present at concentrations at or above the laboratory detection limits in MW-8 and MW-9. Trace concentrations of several metals were detected in groundwater samples from these wells. None of the concentrations detected were in excess of established maximum contaminant levels for drinking water. However, concentrations of copper (90 micrograms per liter [µg/L]) and nickel (110 µg/L) in Well MW-9 exceeded the "instantaneous maximum limiting concentrations" (30 and 50 µg/L, respectively) under the California Ocean Waters Plan (revised March 1990).

7.3 INVESTIGATION (APRIL 1991)

None of the constituents analyzed in groundwater (pesticides/PCBs (including Lindane), volatile organic compounds, and TPH) were present in concentrations at or above laboratory detection limits in B-22, B-23, and B-24. Laboratory analysis of the groundwater samples for general mineral constituents such as total dissolved solids (TDS), chloride, and sulfate indicated elevated concentrations of these constituents. TDS values ranged from 44,000 to 48,000 milligrams per liter (mg/L), chlorides ranged from 19,000 to 25,000 mg/L, and sulfate ranged from 6,500 to 6,600 mg/L. These concentrations confirmed previous field measurements indicating that water beneath the site is brackish or saline.

7.4 INVESTIGATION (DECEMBER 1991)

Laboratory results for groundwater indicated no concentrations of TPH (as diesel, by modified EPA Method 8015), pesticides (including Lindane), nitrate, or semi-volatile organic compounds were present at or above laboratory detection limits in any of the groundwater samples analyzed.

Laboratory results of analyses by EPA Methods 601 and 602 indicated that none of these compounds were detected, except for the aromatic hydrocarbons benzene, toluene, ethylbenzene, and xylenes (BTEX). Relatively consistent concentrations of these compounds were detected in groundwater samples from all of the wells except for Well MW-22 during our initial round of

sampling in December 1991. Laboratory results of analyses for BTEX (by EPA Method 602) on groundwater samples obtained during our additional sampling in February 1992 detected none of these compounds except for toluene, which was present at a trace concentration of 0.8 µg/L in the sample from Well MW-22. It is our opinion that the BTEX concentrations detected in the initial round of sampling were likely induced from drilling equipment at some point during the field activities, and are not indicative of actual groundwater conditions beneath the site.

The results of the Title 22 metals analysis (by EPA Method 6010/7000 series) detected concentrations of antimony, arsenic, barium, cadmium, chromium, cobalt, copper, lead, nickel, silver, thallium, vanadium, and zinc within groundwater samples from some of the wells tested. Levels of several of these metals were above the maximum contaminant levels (MCLs) for drinking water established by the EPA and DHS. Metals detected above the MCLs were: arsenic in Wells MW-22, MW-25, and MW-26; barium in Wells MW-22, MW-24, MW-25, and MW-26; cadmium in all of the wells; chromium in Wells MW-22, MW-24, MW-25, and MW-26; copper in Well MW-22; lead in Wells MW-22 and MW-26; and silver in Wells MW-22, MW-24, and MW-25.

The concentrations of the following metals exceeded the established "instantaneous maximum limiting concentrations" under the California Ocean Waters Plan (SWRCB, 1990) during the 1991 investigation: arsenic in Wells MW-22, MW-25, and MW-26; cadmium, chromium, and copper in all the wells; lead in Wells MW-22, MW-24, and MW-26; nickel and silver in all of the wells; and zinc in Wells MW-22, MW-24, MW-25, and MW-26.

7.5 INVESTIGATION (1996)

There were no laboratory detections of volatile and semivolatile organic compounds, organochlorine pesticides (including Lindane), PCBs, phenolics, or dioxin. Results of laboratory chemical analyses for groundwater from the 1996 investigation indicate that levels of two metals were above the MCLs, including arsenic in Well MW-26 and fluoride in MW-23. Total Dissolved Solids (TDS) exceeded secondary California and EPA MCLs.

Table 1:
Title 22 Metals Concentrations in Groundwater Samples

Title 22 Metals (mg/L)	Date Sampled	Sample I.D. (Boring No. and Depth) MW-8	MW-9	MW-22	MW-23	MW-24	MW-24 (Duplicate)	MW-25	MW-26	Regulatory Standards CA DHS MCL	USEPA MCL	CA Ocean Plan Inst. Max.
Antimony	7/2/90	<0.5	<0.5							NE	0.006	NE
	12/21/91			3.1	2.1	4.2	4.1	2.8	2.0			
	2/2/96	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1			
Arsenic	7/2/90	<0.002	<0.01							0.050	0.050	0.080
	12/21/91			0.34	<0.02	0.029	<0.02	0.088	0.82			
	2/2/96	<0.0077	<0.0034	0.0076	0.0049	0.009	0.009	0.0078	0.14			
Barium	7/2/90	NA	NA							1.0	2.0	NE
	12/21/91			4.1	0.55	1.2	0.88	1.3	1.93			
	2/2/96	0.079	0.027	0.041	0.040	0.053	0.053	0.079	0.028			
Beryllium	7/2/90	<0.001	<0.002							NE	0.004	NE
	12/21/91			<0.04	<0.02	<0.04	<0.04	<0.04	<0.04			
	2/2/96	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001			
Cadmium	7/2/90	<0.001	<0.001							0.010	0.050	0.010
	12/21/91			0.12	0.05	0.12	0.12	0.07	0.04			
	2/2/96	<0.01	<0.0012	0.0099	<0.001	<0.01	<0.01	<0.01	0.0018			
Chromium	7/2/90	<0.005	<0.005							0.050	0.100	0.020
	12/21/91			1.3	0.04	0.22	0.20	0.18	0.10			
	2/2/96	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01			
Cobalt	7/2/90	NA	NA							NE	NE	NE
	12/21/91			0.73	0.2	0.46	0.24	0.33	0.18			
	2/2/96	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04			
Copper	7/2/90	<0.02	0.09							1.00	1.30	0.030
	12/21/91			1.2	0.06	0.28	0.24	0.17	0.18			
	2/2/96	<0.02	<0.02	0.024	<0.02	<0.02	<0.02	<0.02	<0.029			

1. NE = Not Established; 2. < = Less than laboratory detection limit shown; 3. NA = Not Analyzed.

Table 1 (continued):
Title 22 Metals Concentrations in Groundwater Samples

Title 22 Metals (mg/L)	Date Sampled	Sample I.D. (Boring No. and Depth) MW-8	MW-9	MW-22	MW-23	MW-24	MW-24 (Duplicate)	MW-25	MW-26	Regulatory Standards CA DHS MCL	USEPA MCL	CA Ocean Plan Inst. Max.
Lead	7/2/90	<0.01	<0.002							0.050	0.015	0.020
	12/21/91			0.28	<0.005	0.021	0.013	0.008	0.75			
	2/2/96	<0.002	<0.002	0.0035	<0.002	<0.002	<0.002	<0.002	0.010			
Mercury	7/2/90	<0.0005	<0.0005							0.002	0.002	0.0004
	12/21/91			<0.006	<0.002	<0.004	<0.004	<0.004	<0.004			
	2/2/96	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002			
Molybdenum	7/2/90	NA	NA							NE	NE	NE
	12/21/91			<0.6	<0.3	<0.6	<0.6	<0.6	<0.6			
	2/2/96	<0.01	<0.26	0.071	0.14	0.24	0.25	0.073	0.12			
Nickel	7/2/90	<0.05	<0.11							NE	0.100	0.050
	12/21/91			1.4	0.23	0.62	0.6	0.42	0.3			
	2/2/96	<0.044	<0.04	<0.04	<0.04	0.052	0.052	0.061	<0.04			
Selenium	7/2/90	<0.02	<0.004							0.010	0.050	0.150
	12/21/91			<0.02	<0.02	<0.02	<0.02	<0.02	<0.02			
	2/2/96	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004			
Silver	7/2/90	<0.01	<0.01							0.050	0.100	0.007
	12/21/91			0.1	0.006	0.12	0.12	0.09	0.04			
	2/2/96	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.011	<0.01			
Thallium	7/2/90	<0.5	<0.5							NE	0.002	NE
	12/21/91			0.012	<0.03	<0.06	<0.06	<0.06	<0.006			
	2/2/96	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07			
Vanadium	7/2/90	NA	NA							NE	NE	NE
	12/21/91			2.7	<0.2	<0.4	<0.4	<0.4	<0.4			
	2/2/96	<0.04	<0.04	<0.04	<0.04	<0.053	<0.053	<0.04	<0.04			
Zinc	7/2/90	<0.03	0.16							5.00	5.00	0.200
	12/21/91			2.5	0.06	0.51	0.37	0.26	0.21			
	2/2/96	0.032	0.016	0.016	0.015	0.025	0.025	0.030	0.013			

1. NE = Not Established; 2. < = Less than laboratory detection limit shown; 3. NA = Not Analyzed.

Table 2
BTEX Concentrations in Groundwater Samples

Well No.	Date of Sample	Benzene (μg/L)	Toluene (μg/L)	Ethylbenzene (μg/L)	Total Xylenes (μg/L)
MW-8	7/2/90	<1	<1	<1	<5
	2/2/96	<0.5	<0.5	<0.5	<0.5
MW-9	7/2/90	<1	<1	<1	<5
	2/2/96	<0.5	<0.5	<0.5	<0.5
MW-22	12/21/91	<0.5	<0.5	<0.5	<1.5
	2/5/92	<0.5	0.8	<0.5	<1.5
	2/2/96	<0.5	<0.5	<0.5	<0.5
MW-23	12/20/91	18.6	70.4	22.1	109.0
	2/5/92	<0.5	<0.5	<0.5	<1.5
	2/2/96	<0.5	<0.5	<0.5	<0.5
MW-24	12/20/91	15.7	62.4	17.0	86.5
	2/5/92	<0.5	<0.5	<0.5	<1.5
	2/2/96	<0.5	<0.5	<0.5	<0.5
MW-25	12/20/91	2.6	<0.5	<0.5	29.1
	2/5/92	<0.5	<0.5	<0.5	<1.5
	2/2/96	<0.5	<0.5	<0.5	<0.5
MW-25	12/20/91	10.8	16.4	<0.5	86.6
	2/5/92	<0.5	<0.5	<0.5	<1.5
	2/2/96	<0.5	<0.5	<0.5	<0.5

1. (μg/L) = micrograms per liter.
2. < = Less than laboratory detection limit shown.

8.0 LANDFILL GAS SUMMARY

Based on the results of the groundwater data analysis, there is no evidence that hazardous compounds, particularly volatile solvents, have affected groundwater beneath the Celery Dump. It is unlikely that gas is being generated from the former Celery Dump because there was no waste observed during drilling and no solvents have been detected in the groundwater or soil during any of the previous investigations. Therefore, vadose zone monitoring devices were not installed for this SWAT program.

9.0 LEACHATE

Because the site contains no leachate collection system, there was no testing done on leachate. Water analyses from wells surrounding the former Celery Dump show that groundwater quality has not been effected by leachate. High chloride levels appear to be associated with brackish water conditions at the site.

10.0 CONCLUSIONS

10.1 LEAKAGE OF HAZARDOUS MATERIALS

Between 1988 and 1996, six investigations were performed in Parcel A of the Playa Vista Development. These investigations included 20 borings and groundwater samplings from the following wells:

- MW-8 and MW-9 during 1990;
- B-21(MW-25) and B-22 (MW-26) during April 1991;
- MW-22, MW-23, MW-24, MW-25, and MW-26 during December 1991; and
- MW-1(Parcel C), MW-8, MW-9, MW-22, MW-23, MW-24, MW-25, and MW-26 during 1996

Based on the findings of the multiple investigations on Parcel A, there is no evidence of significant amounts of landfill materials present within subsurface fill soils at the former Celery Dump. There is no evidence of debris fill or other probable landfill waste on the eastern portion of Parcel A.

During historical operations, the former Celery Dump was periodically sprayed with a mixture of Lindane and fuel oil. Therefore, TPH and Lindane would be the most likely chemical contaminants present due to the past operational activities at the dump. Moreover, results of laboratory analysis of groundwater indicated no detectable concentrations or semi-volatile organic

compounds present in the groundwater samples analyzed. Laboratory results of chemical analysis of groundwater showed no detectable concentrations of TPH as diesel, or pesticides, including Lindane, in any of the samples analyzed.

Laboratory results of analyses for aromatic hydrocarbons and volatile halocarbons indicated that none of these compounds were detected except for benzene, toluene, ethylbenzene, and xylenes (BTEX), which were detected in groundwater samples collected from MW-23, MW-24, MW-25, and MW-26 during the December 1991 Phase II investigation; BTEX was not detected in MW-22. Laboratory analysis of a second set of groundwater samples obtained in February 1992 detected none of these compounds except for toluene, which was present at a trace concentration of 0.8 μg/L in a sample from MW-22. There was no laboratory detection of BTEX during the 1996 investigation. It is believed that the detection of BTEX during the 1991 and follow-up 1992 sampling and testing was probably induced during field activities.

Groundwater quality met California Drinking Water Standards for the parameters measured in Parcel A monitoring wells and MW-1 in Parcel C during each investigation, except for elevated concentrations of metals. Concentrations of some metals exceeded EPA and DHS drinking water standards in some of the past investigations. However, metal concentrations have dropped over time, as seen from 1996 levels. Elevated levels of TDS and inorganic compounds (Cl, Na, Ca, Mg, HCO_3, SO_4) are related to brackish environment conditions and not the former Celery Dump.

In conclusion, there does not appear to be any evidence of groundwater degradation or threat thereof, resulting from the historical activities at the former Celery Dump.

10.2 GAS MIGRATION

The groundwater quality indicates that there is no landfill gas being generated as a result of decomposition of waste disposed of in the former Celery Dump. Therefore, there is no threat to soil or groundwater from the migration of gas.

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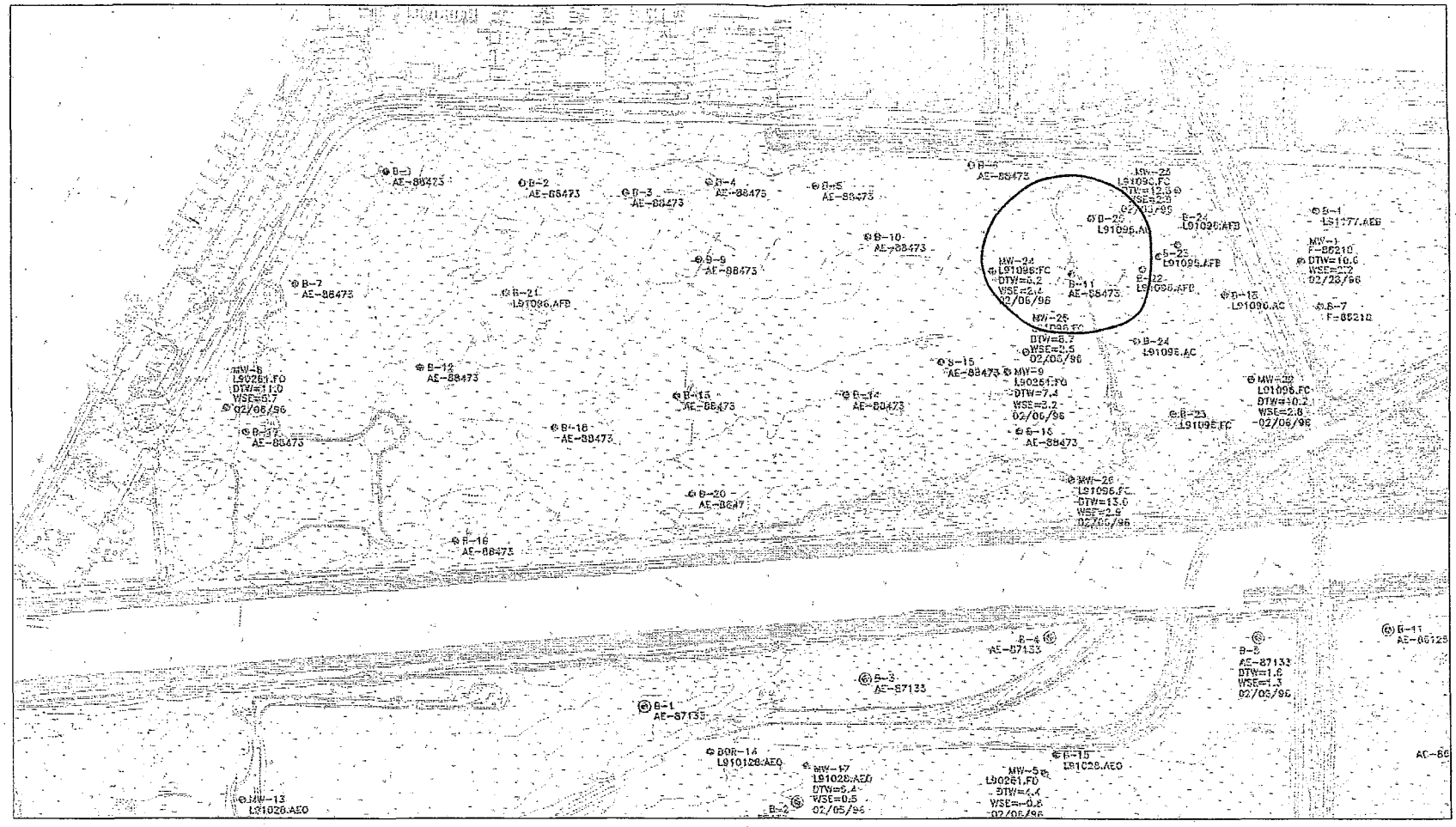
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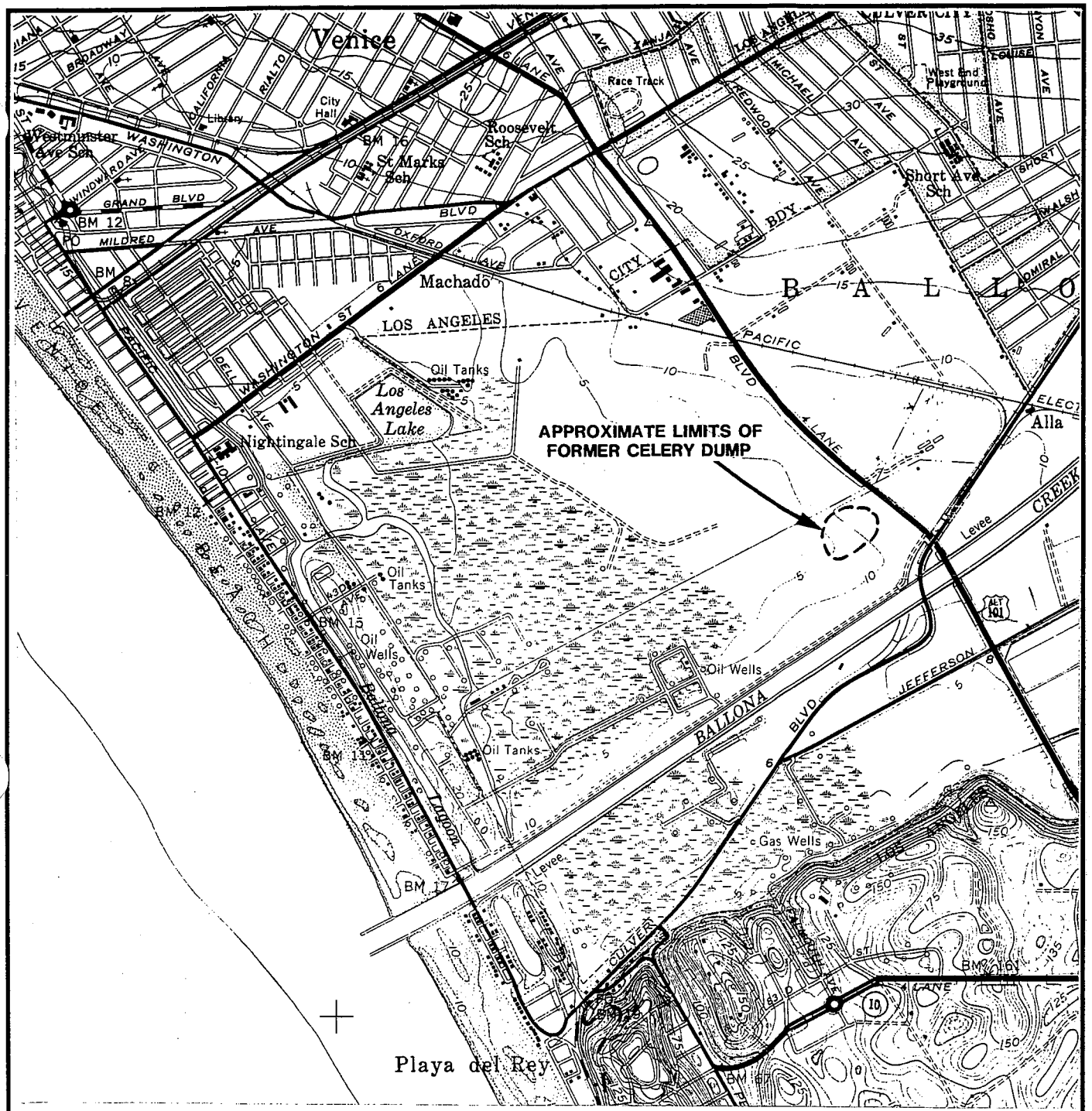


REFERENCE:
BASE MAP ADAPTED FROM U.S.G.S. 7.5-MINUTE VENICE QUADRANGLE (1950).

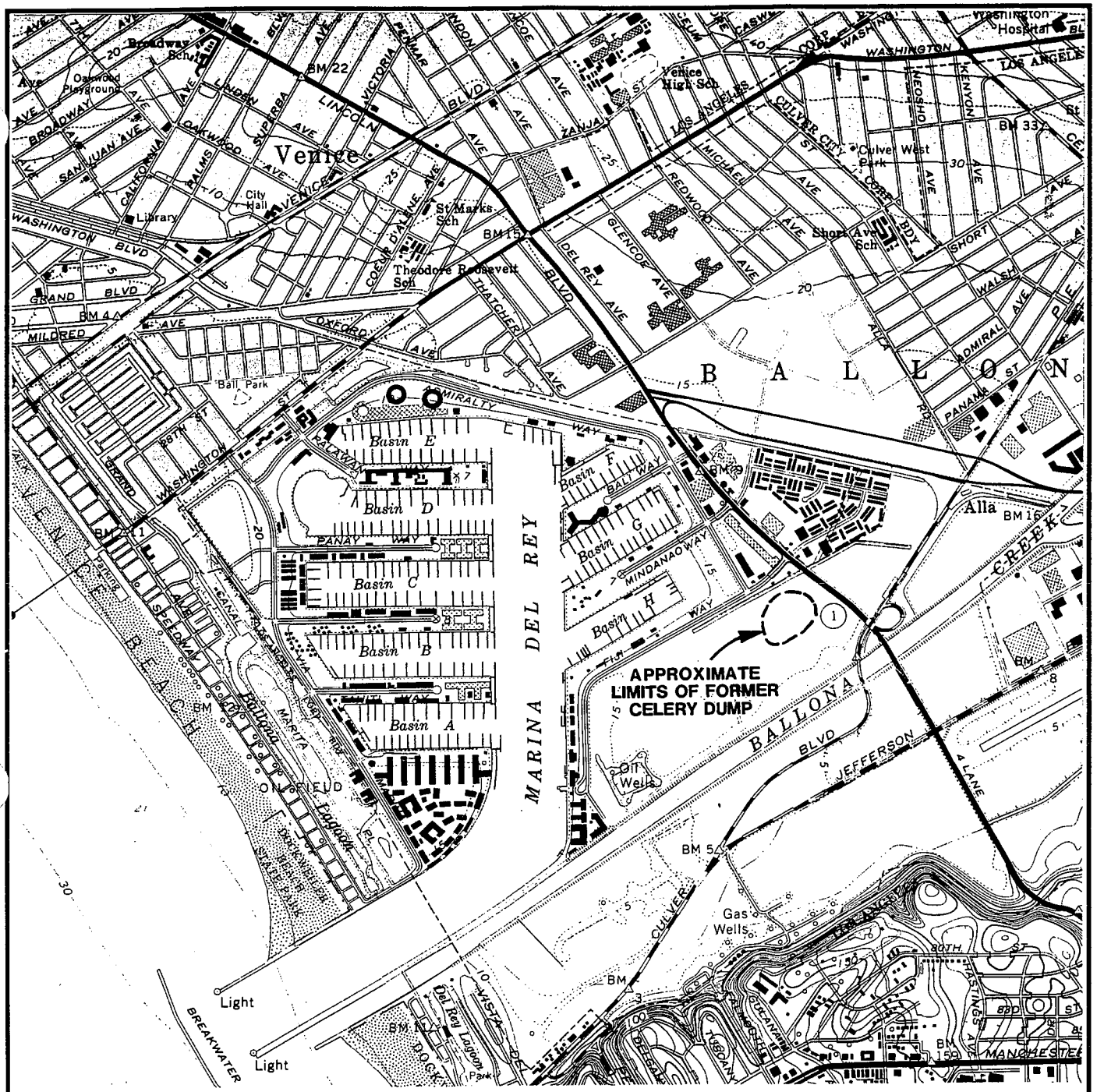
1950 TOPOGRAPHY

SCALE 1" = 2000'

LAW/CRANDALL

FIGURE 2

'0131-5-0514.6005 DATE 4/10/96 F.T. nh S.G. SM W.P. nh CHKD



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BASE MAP ADAPTED FROM
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QUADRANGLE (1981).

1981 TOPOGRAPHY

SCALE 1" = 2000'

LAW/CRANDALL

FIGURE 3

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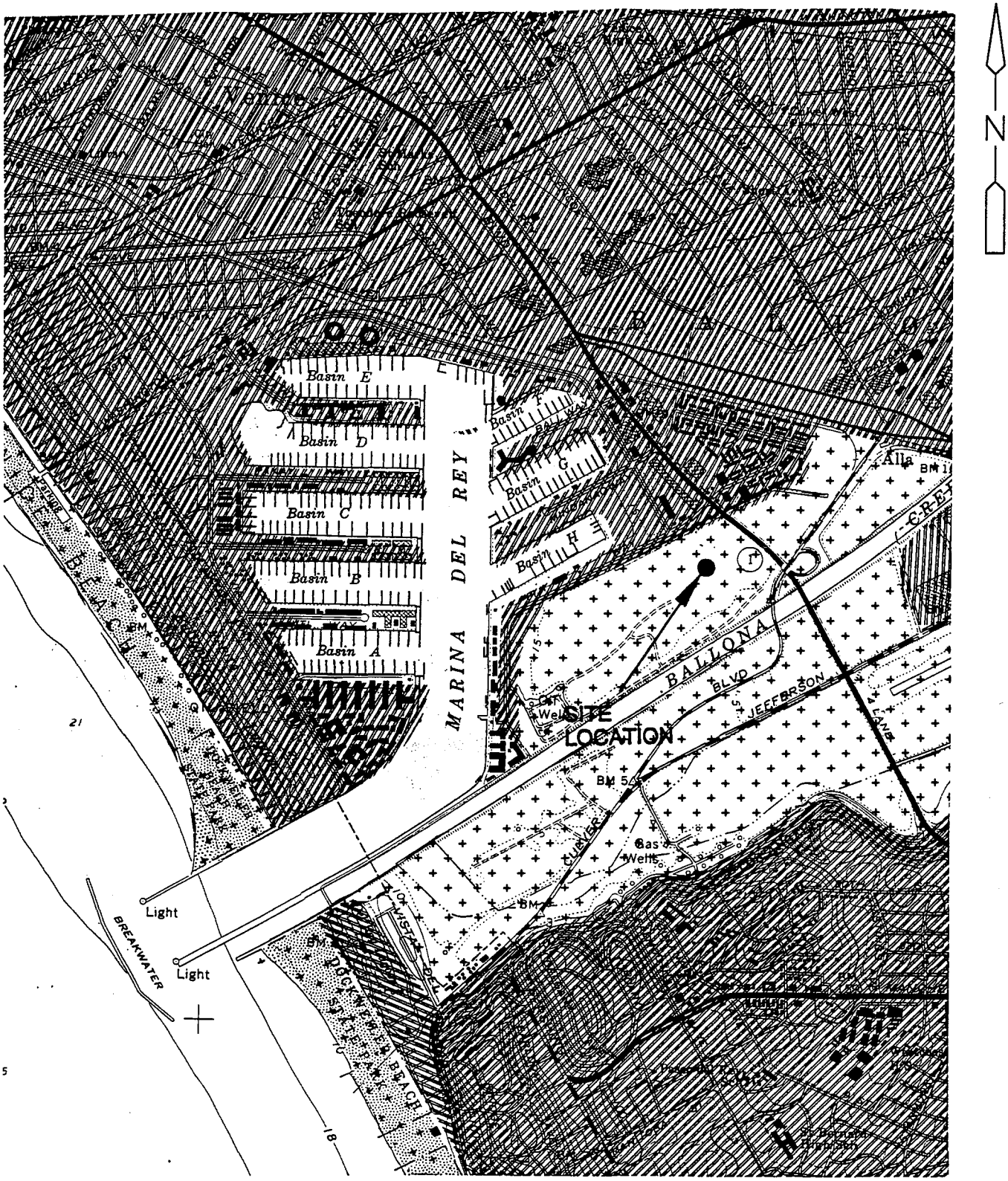


Sources: USGS 7.5 minute Venice Quadrangle Topographic Map

FORMER CELERY DUMP SITE
PLAYA VISTA PARCEL A

REGIONAL LAND USE MAP

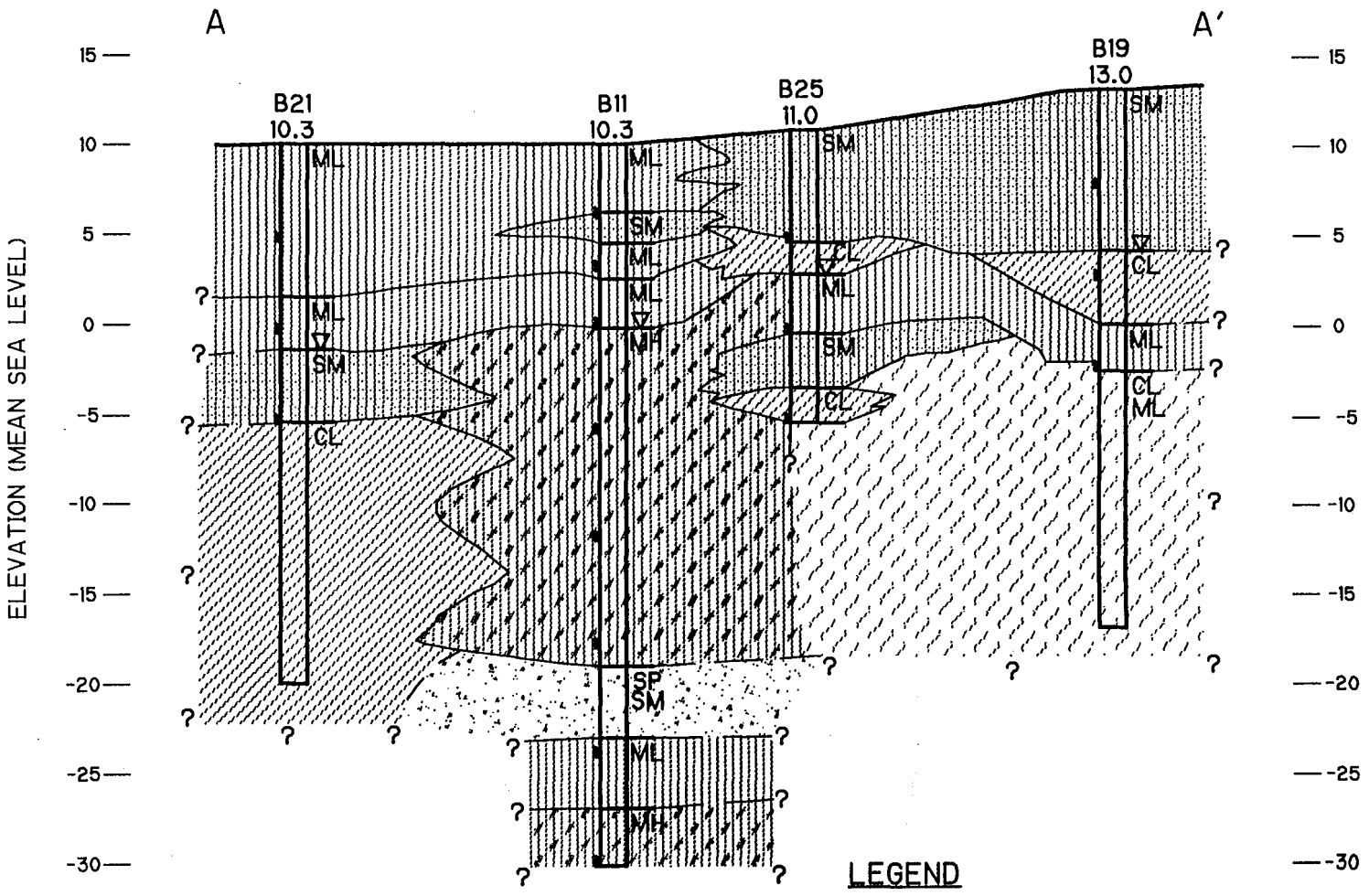
MIXED USE - RESIDENTIAL, COMMERCIAL & INDUSTRIAL

UNDEVELOPED OPEN SPACE

CDM
environmental engineers, scientists, planners, & management consultants

Figure 4

I:\PROJECTS\223\CAD\RLUM 04/09/96 00:22:41 J. La Madrid



SCALE

1" = 10' VERT.
1" = 200' HORIZ.

LEGEND

- ▽ NATURAL SOIL SURFACE
- ML - SILT
- SM - SILTY SAND
- CL - CLAY
- CL/ML - INTERBEDDED CLAY & SILT
- MH - SILT
- SP/SM - INTERBEDDED SAND & SILT

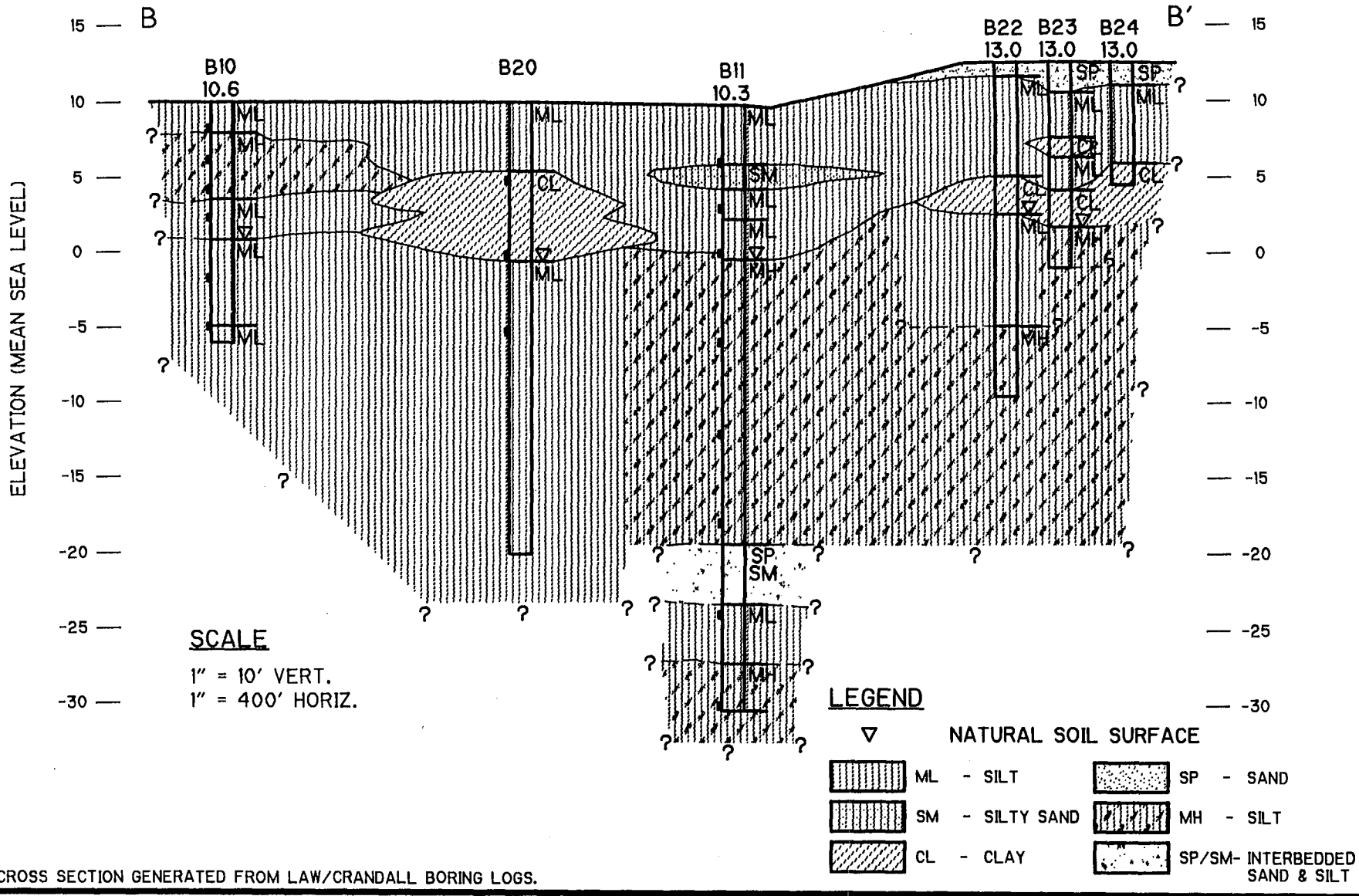
NOTE: CROSS SECTION GENERATED FROM LAW/CRANDALL BORING LOGS.

MAGUIRE THOMAS PARTNERS

CROSS SECTION A TO A'
CELERY DUMP - PLAYA VISTA PARCEL A

CDM
environmental engineers, scientists, planners, & management consultants

Figure 6



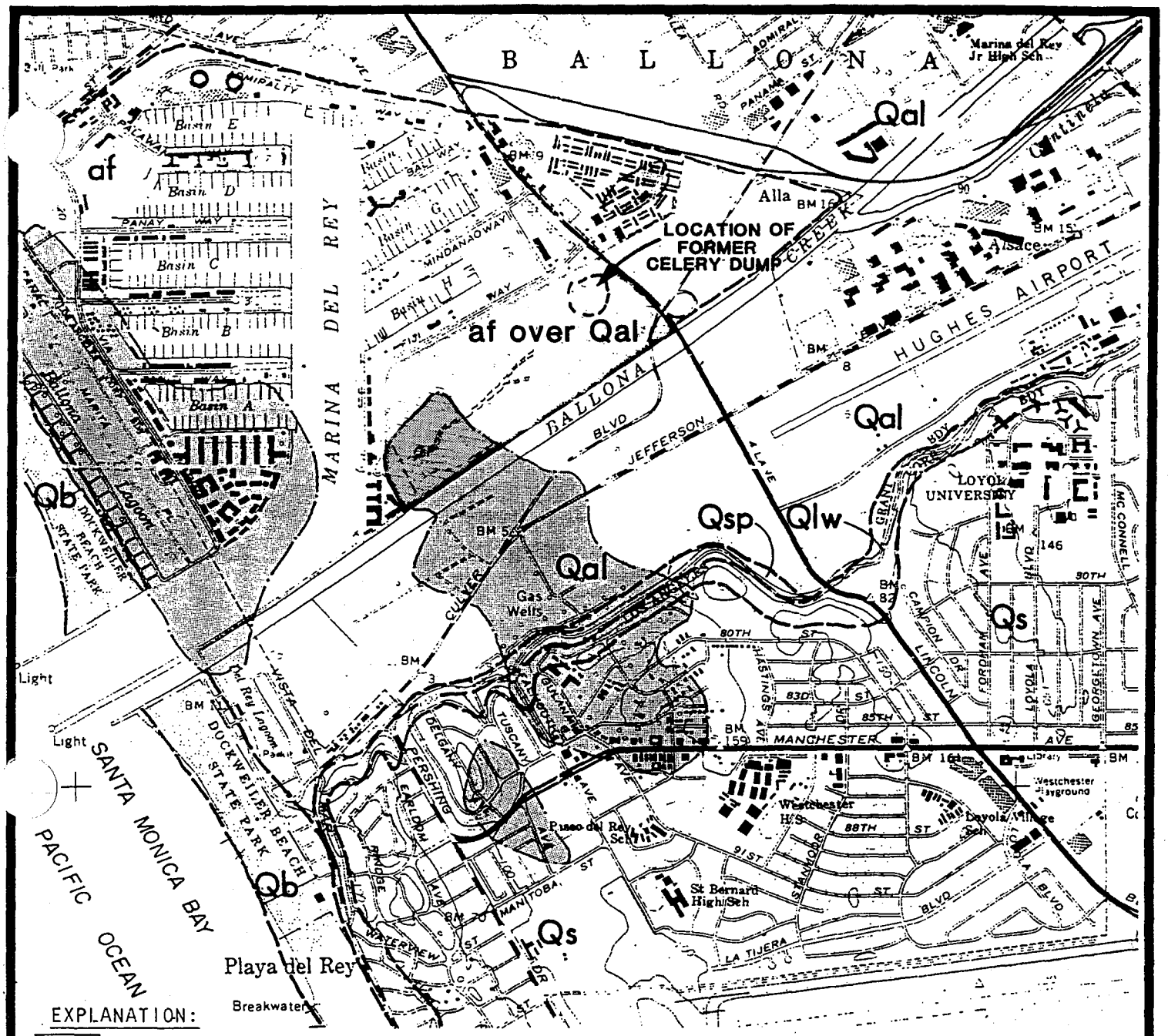
NOTE: CROSS SECTION GENERATED FROM LAW/CRANDALL BORING LOGS.

MAGUIRE THOMAS PARTNERS

CROSS SECTION B TO B'
CELERY DUMP - PLAYA VISTA PARCEL A

CDM
environmental engineers, scientists, planners, & management consultants

Figure 7



EXPLANATION:

af	ARTIFICIAL FILL
Qal	QUATERNARY ALLUVIUM
Qb	QUATERNARY BEACH DEPOSITS
Qs	QUATERNARY DUNE SAND
Qlw	UPPER PLEISTOCENE TERRACE DEPOSITS
Qsp	PREISTOCENE SAND PEDRO FORMATION
	GEOLOGIC CONTACT
	OIL AND GAS FIELD

N

REFERENCE:

BASE MAP FROM U.S.G.S. 7.5' VENICE QUADRANGLE 1964, PHOTOREVISED 1981.

GEOLOGY ADAPTED FROM U.S.G.S. WATER SUPPLY PAPER 1461 (1959), OIL AND GAS FIELDS FROM D.O.G. (1974).

LOCAL GEOLOGY

SCALE 1"= 2000'

LeROY CRANDALL AND ASSOCIATES

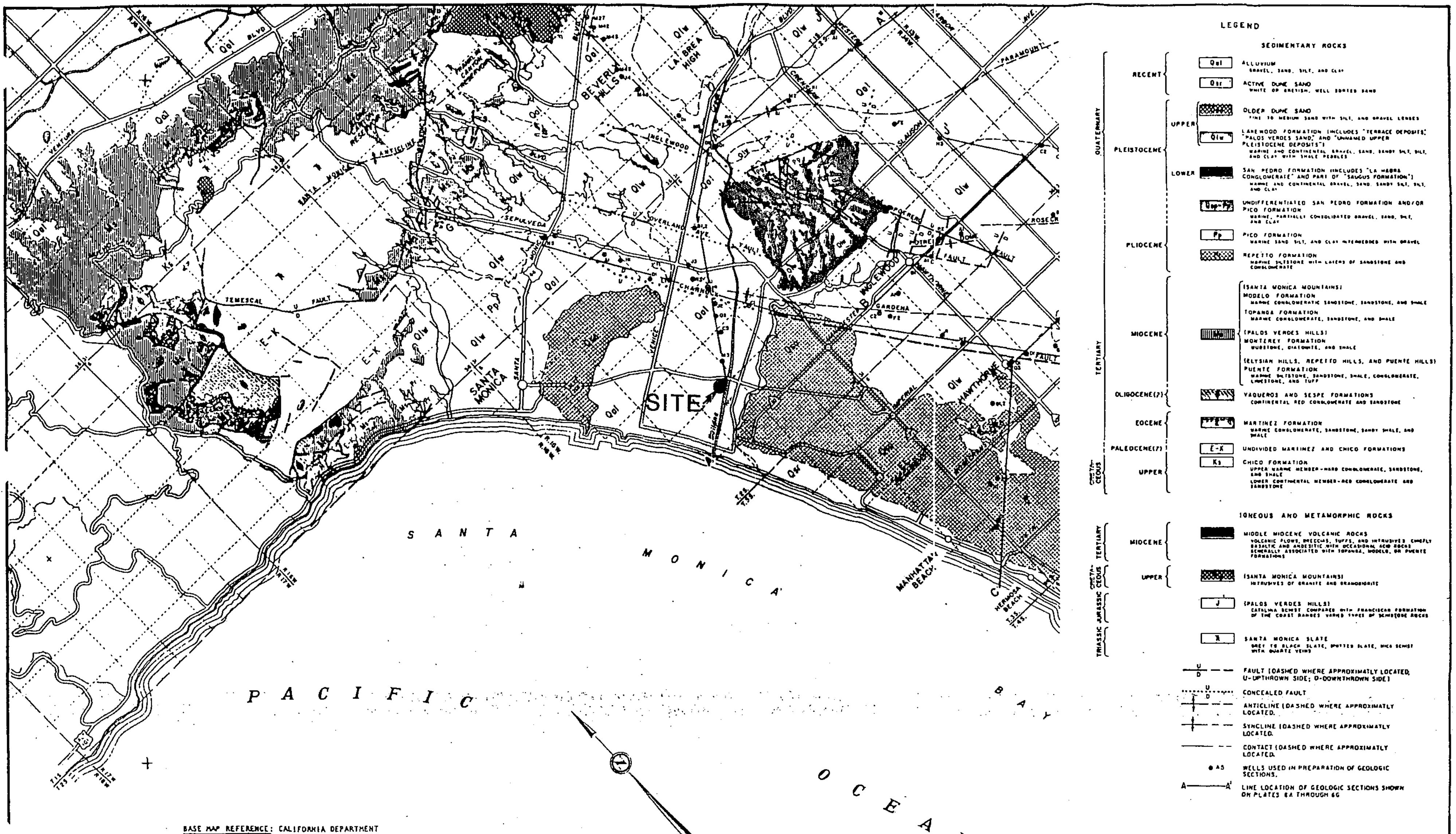
FIGURE 8

JOB 70121-5-0514,6005 DATE 4-26-96 DR. n.h. O.E. CHKD.

FORM 120

Planning Consultants Research

FIGURE 10
REGIONAL GROUND WATER CONTOUR MAP

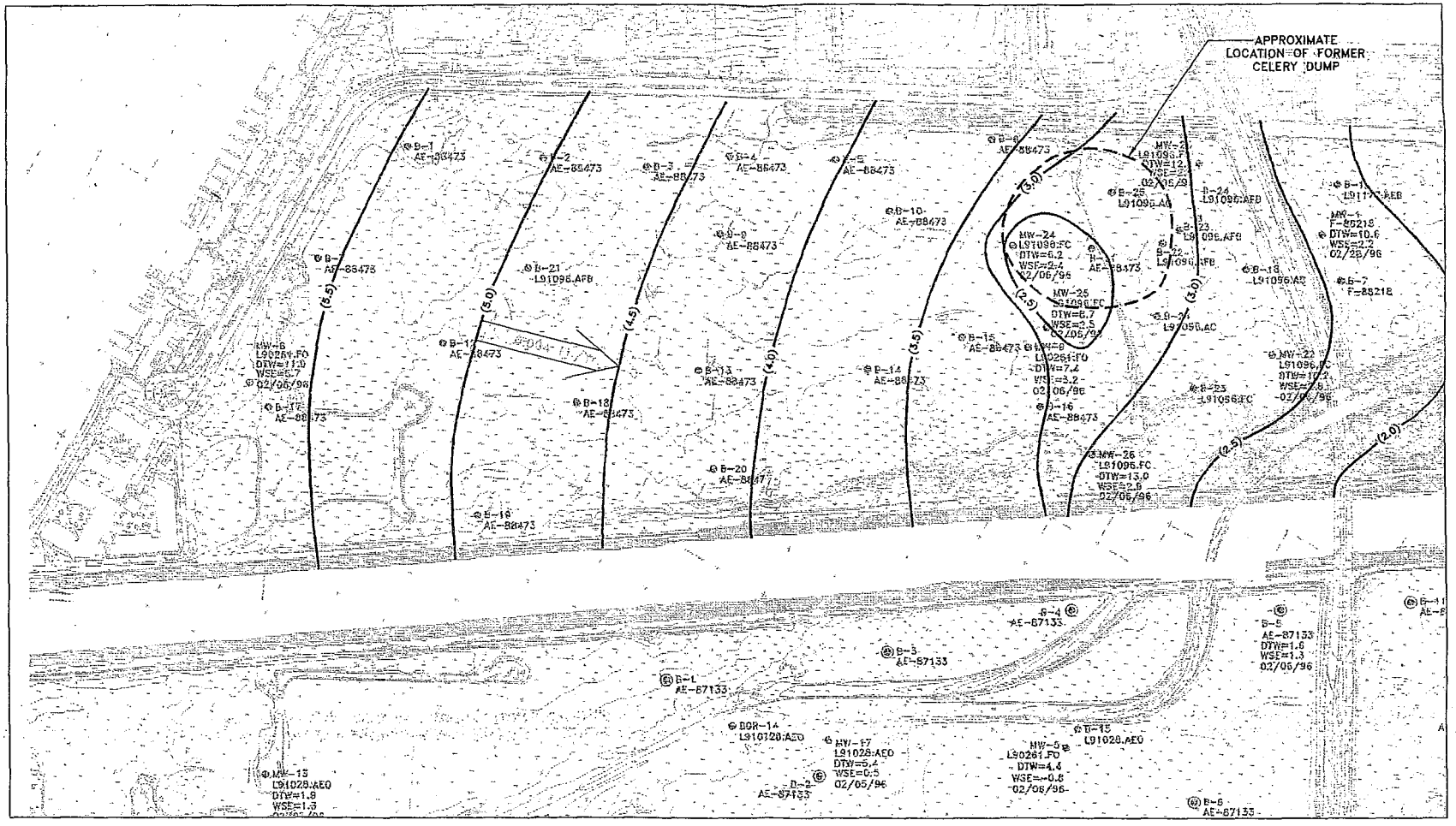


REGIONAL GEOLOGY

LAW/CRANDALL

FIGURE 5

JOB 70131-5-0514-002 DATE 4-16-96 DR. M.G./ah D.E. LN CHKD. LN


APPROXIMATE
LOCATION OF FORMER
CELERY DUMP
(3.5)
(3.0)
(4.5)
(4.0)
(3.5)
(3.0)
(2.5)
(2.5)
(2.0)
B-1
AE-88473
B-2
AE-88473
B-3
AE-88473
B-4
AE-88473
B-5
AE-88473
B-6
AE-88473
B-7
AE-88473
B-8
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B-9
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B-10
AE-88473
B-11
AE-88473
B-12
AE-88473
B-13
AE-88473
B-14
AE-88473
B-15
AE-88473
B-16
AE-88473
B-17
AE-88473
B-18
AE-88473
B-20
AE-88473
B-21
L91096.AFB
B-22
L91096.AFB
B-23
L91096.FC
B-24
L91096.AFB
B-25
L91096.AC
B-26
L91096.AC
MW-15
L91028.AEO
DTW=1.9
WSE=1.3
MW-17
L91028.AEO
DTW=5.4
WSE=0.5
02/05/96
MW-18
L91028.AEO
DTW=4.4
WSE=-0.8
02/06/96
MW-22
L91096.FC
DTW=10.2
WSE=2.8
02/05/96
MW-24
L91096.FC
DTW=6.2
WSE=2.4
02/06/96
MW-25
L91096.FC
DTW=6.7
WSE=2.5
02/05/96
MW-26
L91096.FC
DTW=13.0
WSE=2.8
02/05/96
MW-6
L90264.FO
DTW=7.0
WSE=5.7
02/05/96
B-L
AE-87133
B-2
AE-87133
B-3
AE-87133
B-4
AE-87133
B-5
AE-87133
DTW=1.6
WSE=1.3
02/05/96
B-6
AE-87133
DOR-14
L91028.AEO
B-15
L91028.AEO
MW-5
L90264.FO
DTW=4.4
WSE=-0.8
02/06/96
MW-1
F-88218
DTW=10.6
WSE=2.2
02/28/96
B-7
F-88218

Boring and Monitoring Well location map
Parcels A, B, C, D

Available in original physical file.

APPENDIX A

GROUNDWATER SAMPLING PROTOCOL

APPENDIX A
GROUNDWATER SAMPLING PROTOCOL

This appendix describes procedures to be used for measuring water levels, collecting groundwater samples, sample preservation, identification and delivery to the laboratory.

Water Level Measurements

Before sampling, the water level in the monitoring wells shall be measured and the measurement recorded on appropriate data forms. The water level shall be measured with a calibrated electric water level sensor to the nearest 0.01 foot. The sensor shall be cleaned before each measurement so that cross-contamination between wells cannot occur. The depth to the water level shall be referenced to the top of the well casing or established reference point. Data to be recorded shall include:

- Monitoring well number;
- Date and time of measurement;
- Name of person making the measurement; and
- Any pertinent remarks related to conditions that affect the measured level.

Equipment Cleaning

All equipment must be handled in a manner that will minimize cross-contamination between monitoring wells and between the depth zones to be sampled within the wells. All equipment that comes in contact with well water must be cleaned before and after sample collection. The equipment should be cleaned with a non-phosphate detergent/soap mixture. The first rinse shall be of tap water and the final one of distilled water. The sampling equipment should be thoroughly dried before use so that the residual cleaning agents are not carried over to the sample. Upgradient wells shall be sampled first, and then the downgradient wells.

Sample Containers

Sample containers shall be prepared in advance by the laboratory that will perform sample analyses. If other containers are used, they shall be new and prepared in accordance with the approved EPA procedure. Sample and shipping containers shall be stored in a clean environment before use. Caps shall not be removed until the water sample is to be poured into its appropriate container.

Filling Sample Containers

Groundwater samples shall be collected in the following order of volatilization sensitivity:

1. Volatile organics.
2. Purgeable organics.
3. Chemical oxygen demand.
4. Extractable organics.
5. Dissolved metals.
6. General minerals.

Sample Preservation

Samples shall be preserved in accordance with EPA procedures. The appropriate amount of chemical preservatives, if any, shall be added to the sample containers before delivery to sampling sites. Electrical conductivity, pH, temperature, alkalinity, and CO_2 all change rapidly and must be measured and recorded in the field.

Samples shall be preserved in the field immediately after sample collection by placing the samples in an insulated ice chest containing ice bags. Particular care should be taken so that samples are not damaged by water. The samples must be kept at approximately four degrees Centigrade during transport to the laboratory and must be kept refrigerated in the laboratory until analysis is complete.

Sample Identification and Chain-of-Custody

Each sample shall be identified by attaching a pressure-sensitive gummed laboratory or standardized tag on the container(s), not lids. This laboratory shall contain the sample identification numbers, date, and time of sample collection, source of sample, preservative used, and the collector's initials. Analyses required should be identified. If a laboratory is not available, the same information should be attached to the sample container, not lid, with an indelible, waterproof marking pen.

The field custodian is responsible for properly packaging and dispatching samples to the laboratory for analysis. This responsibility includes filling out, dating, and signing the appropriate portion of the chain-of-custody record. All packages sent to the laboratory shall be accompanied by the chain-of-custody record and other pertinent forms. Copies of these forms shall be retained by the originating office.

Samples to be shipped to the laboratory shall be packed to prevent breakage and the package so sealed or locked that any evidence of tampering may be readily detected.

APPENDIX B

GROUNDWATER DATABASE

Table B-1: Parcel A Groundwater Database

Well and Project No.	Date	GSE (ft MSL)	RPE (ft MSL)	DTW From RP (ft)	DTWBGS (ft)	GWSE (ft MSL)	Well Condition
MW-8	2-Jul-90	16.7	18.52	15.9	14.1	2.6	
L90261.FO	2-Feb-96			12.8	11.0	5.7	
	6-Feb-96			12.8	11.0	5.7	Steel lid and lock rusted, but attached
MW-9	2-Feb-96	10.6	11.95	8.65	7.3	3.3	
L90261.FO	6-Feb-96			8.75	7.4	3.2	Steel lid damaged-not attached; lock rusted
MW-22 (B-17)	20-Dec-91	13.06	15.09	15.75	13.7	-0.7	
L91096.FC	21-Dec-91			14.91	12.9	0.2	
	26-Dec-91			14.84	12.8	0.3	
	2-Feb-96			12.25	10.2	2.8	
	6-Feb-96			12.25	10.2	2.8	Cover and lock ok.
MW-23 (B-19)	20-Dec-91	15.21	17.42	15.86	13.7	1.6	
L91096.FC	21-Dec-91			16.05	13.8	1.4	
	26-Dec-91			15.94	13.7	1.5	
	2-Feb-96			14.55	12.3	2.9	
	6-Feb-96			14.55	12.3	2.9	Cover and lock ok.
MW-24 (B-20)	20-Dec-91	8.6	10.85	11.08	8.8	-0.2	
L91096.FC	21-Dec-91			10.58	8.3	0.3	
	26-Dec-91			10.58	8.3	0.3	
	2-Feb-96			8.46	6.2	2.4	
	6-Feb-96			8.46	6.2	2.4	Cover and lock ok.
MW-25 (B-21)	20-Dec-91	11.19	13.04	12.81	11.0	0.2	
L91096.FC	21-Dec-91			12.98	11.1	0.1	
	26-Dec-91			13.05	11.2	0.0	
	2-Feb-96			10.5	8.7	2.5	
	6-Feb-96			10.5	8.7	2.5	Cover and lock ok.
MW-26 (B-22)	20-Dec-91	15.97	17.43	18.73	17.3	-1.3	
L91096.FC	21-Dec-91			17.19	15.7	0.2	
	26-Dec-91			17.17	15.7	0.3	
	2-Feb-96			14.5	13.0	2.9	
	6-Feb-96			14.5	13.0	2.9	Cover and lock ok.

Legend: Ground Surface Elevation (GSE)
Mean Sea Level (MSL)
Reference Point Elevation (RPE)
Depth to Water (DTW)
Depth to Water Below Ground Surface (DTWBGS)
Groundwater Surface Elevation (GWSE)

Table B-2: Parcel B Groundwater Database

Well and Project No.	Date	GSE (ft MSL)	RPE (ft MSL)	DTW From RP (ft)	DTWBGS (ft)	GSE (ft MSL)	Well Condition
MW-1 L90261.FO	5-Feb-96	2.8	5.01	3.38	1.2	1.6	Steel lid rusted off.
MW-2 L90261.FO	5-Feb-96	2.2	4.04	2.7	0.9	1.3	Steel lid rusted off.
MW-3 L90261.FO	17-Oct-91	1.80	3.67	6.12	4.3	-2.5	
	15-Nov-91			6.33	4.5	-2.7	
	16-Dec-91			6.38	4.5	-2.7	
	16-Jan-92			1.39	-0.5	2.3	
	14-Feb-92			0.47	-1.4	3.2	
	16-Mar-92			1.50	-0.4	2.2	
	16-Apr-92			2.52	0.7	1.2	
	15-May-92			3.79	1.9	-0.1	
	15-Jun-92			4.65	2.8	-1.0	
	15-Jul-92			5.25	3.4	-1.6	
	14-Aug-92			5.76	3.9	-2.1	
	14-Sep-92			6.31	4.4	-2.6	
	15-Oct-92			6.84	5.0	-3.2	
	16-Nov-92			6.20	4.3	-2.5	
	16-Dec-92			1.67	-0.2	2.0	
	15-Jan-93			0.38	-1.5	3.3	
	15-Feb-93			1.08	-0.8	2.6	
	17-Mar-93			1.58	-0.3	2.1	
	5-Feb-96			1.30	-0.6	2.4	Steel lid rusted, but attached; lock rusted.
MW-4 L90261.FO	17-Oct-91	3.20	4.94	7.87	6.1	-2.9	
	17-Oct-91			7.98	6.2	-3.0	
	15-Nov-91			8.12	6.4	-3.2	
	16-Dec-91			8.02	6.3	-3.1	
	16-Jan-92			1.91	0.2	3.0	
	14-Feb-92			1.47	-0.3	3.5	
	16-Mar-92			1.96	0.2	3.0	
	16-Apr-92			3.07	1.3	1.9	
	15-May-92			4.23	2.5	0.7	
	15-Jun-92			4.92	3.2	0.0	
	15-Jul-92			5.63	3.9	-0.7	
	14-Aug-92			6.62	4.9	-1.7	
	14-Sep-92			7.36	5.6	-2.4	
	15-Oct-92			7.76	6.0	-2.8	
	16-Nov-92			7.53	5.8	-2.6	
	16-Dec-92			1.94	0.2	3.0	
	15-Jan-93			1.30	-0.4	3.6	
	15-Feb-93			1.75	0.0	3.2	
	17-Mar-93			2.08	0.3	2.9	
	5-Feb-96			1.57	-0.2	3.4	Steel lid rusted off.
MW-5 L90261.FO	5-Feb-96	3.60	5.43	6.27	4.4	-0.8	Steel lid and lock ok.
MW-10 L91028.AEO	12-Mar-91	3.40	5.34	4.00	2.1	1.3	
	19-Mar-91			3.94	2.0	1.4	
	26-Mar-91			3.68	1.7	1.7	
	2-Apr-91			4.22	2.3	1.1	
	9-Apr-91			4.12	2.2	1.2	

Table B-2: Parcel B Groundwater Database

Well and Project No.	Date	GSE (ft MSL)	RPE (ft MSL)	DTW From RP (ft)	DTWBGS (ft)	GSE (ft MSL)	Well Condition
	16-Apr-91			4.36	2.4	1.0	
	23-Apr-91			4.11	2.2	1.2	
	30-Apr-91			4.41	2.5	0.9	
	7-May-91			4.26	2.3	1.1	
	14-May-91			4.52	2.6	0.8	
	21-May-91			4.26	2.3	1.1	
	28-May-91			4.52	2.6	0.8	
	4-Jun-91			4.25	2.3	1.1	
	11-Jun-91			4.48	2.5	0.9	
	18-Jun-91			4.18	2.2	1.2	
	25-Jun-91			4.30	2.4	1.0	
	2-Jul-91			4.23	2.3	1.1	
	9-Jul-91			4.34	2.4	1.0	
	16-Jul-91			4.00	2.1	1.3	
	23-Jul-91			4.20	2.3	1.1	
	30-Jul-91			3.81	1.9	1.5	
	6-Aug-91			4.01	2.1	1.3	
	13-Aug-91			4.04	2.1	1.3	
	20-Aug-91			4.15	2.2	1.2	
	27-Aug-91			4.14	2.2	1.2	
	3-Sep-91			4.22	2.3	1.1	
	10-Sep-91			4.14	2.2	1.2	
	17-Sep-91			3.99	2.1	1.4	
	17-Oct-91			3.97	2.0	1.4	
	15-Nov-91			3.88	1.9	1.5	
	16-Dec-91			3.89	2.0	1.5	
	16-Jan-92			3.52	1.6	1.8	
	14-Feb-92			2.93	1.0	2.4	
	16-Mar-92			3.45	1.5	1.9	
	16-Apr-92			4.02	2.1	1.3	
	15-May-92			4.38	2.4	1.0	
	15-Jun-92			4.38	2.4	1.0	
	15-Jul-92			4.26	2.3	1.1	
	14-Aug-92			4.24	2.3	1.1	
	14-Sep-92			4.24	2.3	1.1	
	15-Oct-92			3.96	2.0	1.4	
	16-Nov-92			3.90	2.0	1.4	
	16-Dec-92			4.03	2.1	1.3	
	15-Jan-93			3.55	1.6	1.8	
	15-Feb-93			3.80	1.9	1.5	
	17-Mar-93			3.91	2.0	1.4	
	5-Feb-96			3.70	1.8	1.6	Cover and lock ok.
MW-11 L91028.AEO	12-Mar-91	1.80	3.93	1.87	-0.3	2.1	
	19-Mar-91			1.75	-0.4	2.2	
	26-Mar-91			1.67	-0.5	2.3	
	2-Apr-91			1.90	-0.2	2.0	
	9-Apr-91			1.97	-0.2	2.0	
	16-Apr-91			2.00	-0.1	1.9	
	23-Apr-91			1.99	-0.1	1.9	
	30-Apr-91			2.07	-0.1	1.9	
	7-May-91			2.09	0.0	1.8	
	14-May-91			2.10	0.0	1.8	
	21-May-91			2.11	0.0	1.8	
	28-May-91			2.09	0.0	1.8	
	4-Jun-91			2.03	-0.1	1.9	

Table B-2: Parcel B Groundwater Database

Well and Project No.	Date	GSE (ft MSL)	RPE (ft MSL)	DTW From RP (ft)	DTWBGS (ft)	GSE (ft MSL)	Well Condition
	11-Jun-91			2.05	-0.1	1.9	
	18-Jun-91			1.98	-0.2	2.0	
	25-Jun-91			1.96	-0.2	2.0	
	2-Jul-91			1.99	-0.1	1.9	
	9-Jul-91			2.04	-0.1	1.9	
	16-Jul-91			1.87	-0.3	2.1	
	23-Jul-91			1.92	-0.2	2.0	
	30-Jul-91			1.64	-0.5	2.3	
	6-Aug-91			1.77	-0.4	2.2	
	13-Aug-91			1.82	-0.3	2.1	
	20-Aug-91			1.91	-0.2	2.0	
	27-Aug-91			1.89	-0.2	2.0	
	3-Sep-91			2.01	-0.1	1.9	
	10-Sep-91			1.90	-0.2	2.0	
	17-Sep-91			1.85	-0.3	2.1	
	17-Oct-91			1.75	-0.4	2.2	
	15-Nov-91			1.72	-0.4	2.2	
	16-Dec-91			1.76	-0.4	2.2	
	16-Jan-92			1.44	-0.7	2.5	
	14-Feb-92			0.88	-1.3	3.1	
	16-Mar-92			1.37	-0.8	2.6	
	16-Apr-92			1.62	-0.5	2.3	
	15-May-92			1.74	-0.4	2.2	
	15-Jun-92			1.90	-0.2	2.0	
	15-Jul-92			1.80	-0.3	2.1	
	14-Aug-92			1.85	-0.3	2.1	
	14-Sep-92			1.90	-0.2	2.0	
	15-Oct-92			1.68	-0.5	2.3	
	16-Nov-92			1.70	-0.4	2.2	
	16-Dec-92			1.72	-0.4	2.2	
	15-Jan-93			1.24	-0.9	2.7	
	15-Feb-93			1.54	-0.6	2.4	
	17-Mar-93			1.60	-0.5	2.3	
	5-Feb-96			1.55	-0.6	2.4	Cover and lock ok.
MW-12 L91028.AEO	12-Mar-91	3.20	5.05	2.20	0.4	2.9	
	19-Mar-91			2.19	0.3	2.9	
	26-Mar-91			2.00	0.2	3.1	
	2-Apr-91			2.28	0.4	2.8	
	9-Apr-91			2.20	0.4	2.9	
	16-Apr-91			2.30	0.5	2.8	
	23-Apr-91			2.21	0.4	2.8	
	30-Apr-91			2.39	0.5	2.7	
	7-May-91			2.30	0.5	2.8	
	14-May-91			2.43	0.6	2.6	
	21-May-91			2.30	0.5	2.8	
	28-May-91			2.37	0.5	2.7	
	4-Jun-91			2.23	0.4	2.8	
	11-Jun-91			2.33	0.5	2.7	
	18-Jun-91			2.22	0.4	2.8	
	25-Jun-91			2.28	0.4	2.8	
	2-Jul-91			2.27	0.4	2.8	
	9-Jul-91			2.33	0.5	2.7	
	16-Jul-91			2.20	0.4	2.9	
	23-Jul-91			2.27	0.4	2.8	
	30-Jul-91			2.10	0.3	3.0	

Table B-2: Parcel B Groundwater Database

Well and Project No.	Date	GSE (ft MSL)	RPE (ft MSL)	DTW From RP (ft)	DTWBGS (ft)	GSE (ft MSL)	Well Condition
	6-Aug-91			2.16	0.3	2.9	
	13-Aug-91			2.16	0.3	2.9	
	20-Aug-91			2.23	0.4	2.8	
	27-Aug-91			2.22	0.4	2.8	
	3-Sep-91			2.29	0.4	2.8	
	10-Sep-91			2.24	0.4	2.8	
	17-Sep-91			2.18	0.3	2.9	
	17-Oct-91			2.18	0.3	2.9	
	15-Nov-91			2.10	0.3	3.0	
	16-Dec-91			2.08	0.2	3.0	
	16-Jan-92			1.80	0.0	3.3	
	14-Feb-92			1.53	-0.3	3.5	
	16-Mar-92			1.68	-0.2	3.4	
	16-Apr-92			1.83	0.0	3.2	
	15-May-92			2.00	0.2	3.1	
	15-Jun-92			2.08	0.2	3.0	
	15-Jul-92			2.14	0.3	2.9	
	14-Aug-92			2.11	0.3	2.9	
	14-Sep-92			2.13	0.3	2.9	
	15-Oct-92			2.04	0.2	3.0	
	16-Nov-92			2.03	0.2	3.0	
	16-Dec-92			2.04	0.2	3.0	
	15-Jan-93			1.66	-0.2	3.4	
	15-Feb-93			1.80	0.0	3.3	
	17-Mar-93			1.86	0.0	3.2	
	5-Feb-96			1.82	0.0	3.2	Cover and lock ok.
MW-13 L91028.AEO	12-Mar-91	3.20	5.26	3.93	1.9	1.3	
	19-Mar-91			3.80	1.7	1.5	
	26-Mar-91			3.67	1.6	1.6	
	2-Apr-91			3.78	1.7	1.5	
	9-Apr-91			3.77	1.7	1.5	
	16-Apr-91			3.91	1.9	1.4	
	23-Apr-91			3.92	1.9	1.3	
	30-Apr-91			4.03	2.0	1.2	
	7-May-91			4.03	2.0	1.2	
	14-May-91			4.18	2.1	1.1	
	21-May-91			4.13	2.1	1.1	
	28-May-91			4.29	2.2	1.0	
	4-Jun-91			4.20	2.1	1.1	
	11-Jun-91			4.32	2.3	0.9	
	18-Jun-91			4.26	2.2	1.0	
	25-Jun-91			4.36	2.3	0.9	
	2-Jul-91			4.35	2.3	0.9	
	9-Jul-91			4.43	2.4	0.8	
	16-Jul-91			4.36	2.3	0.9	
	23-Jul-91			4.48	2.4	0.8	
	30-Jul-91			4.35	2.3	0.9	
	6-Aug-91			4.38	2.3	0.9	
	13-Aug-91			4.44	2.4	0.8	
	20-Aug-91			4.54	2.5	0.7	
	27-Aug-91			4.53	2.5	0.7	
	3-Sep-91			4.65	2.6	0.6	
	10-Sep-91			4.59	2.5	0.7	
	17-Sep-91			4.59	2.5	0.7	
	17-Oct-91			4.43	2.4	0.8	

Table B-2: Parcel B Groundwater Database

Well and Project No.	Date	GSE (ft MSL)	RPE (ft MSL)	DTW From RP (ft)	DTWBGS (ft)	GSE (ft MSL)	Well Condition
	15-Nov-91			4.42	2.4	0.8	
	16-Dec-91			4.41	2.4	0.9	
	16-Jan-92			3.60	1.5	1.7	
	14-Feb-92			2.88	0.8	2.4	
	16-Mar-92			3.53	1.5	1.7	
	16-Apr-92			3.84	1.8	1.4	
	15-May-92			4.20	2.1	1.1	
	15-Jun-92			4.23	2.2	1.0	
	15-Jul-92			4.34	2.3	0.9	
	14-Aug-92			4.41	2.4	0.9	
	14-Sep-92			4.50	2.4	0.8	
	15-Oct-92			4.54	2.5	0.7	
	16-Nov-92			4.37	2.3	0.9	
	16-Dec-92			4.04	2.0	1.2	
	15-Jan-93			2.82	0.8	2.4	
	15-Feb-93			3.36	1.3	1.9	
	17-Mar-93			3.68	1.6	1.6	
	5-Feb-96			4.09	2.0	1.2	Cover and lock ok.
MW-14 L91028.AEO	12-Mar-91	6.40	8.53	6.55	4.4	2.0	
	19-Mar-91			6.51	4.4	2.0	
	26-Mar-91			6.31	4.2	2.2	
	2-Apr-91			6.32	4.2	2.2	
	9-Apr-91			6.47	4.3	2.1	
	16-Apr-91			6.62	4.5	1.9	
	23-Apr-91			6.74	4.6	1.8	
	30-Apr-91			6.87	4.7	1.7	
	7-May-91			7.00	4.9	1.5	
	14-May-91			7.09	5.0	1.4	
	21-May-91			7.17	5.0	1.4	
	28-May-91			7.25	5.1	1.3	
	4-Jun-91			7.32	5.2	1.2	
	11-Jun-91			7.35	5.2	1.2	
	18-Jun-91			7.39	5.3	1.1	
	25-Jun-91			7.45	5.3	1.1	
	2-Jul-91			7.54	5.4	1.0	
	9-Jul-91			7.56	5.4	1.0	
	16-Jul-91			7.61	5.5	0.9	
	23-Jul-91			7.62	5.5	0.9	
	30-Jul-91			7.60	5.5	0.9	
	6-Aug-91			7.58	5.5	0.9	
	13-Aug-91			7.67	5.5	0.9	
	20-Aug-91			7.74	5.6	0.8	
	27-Aug-91			7.79	5.7	0.7	
	3-Sep-91			7.86	5.7	0.7	
	10-Sep-91			7.90	5.8	0.6	
	17-Sep-91			7.93	5.8	0.6	
	17-Oct-91			7.80	5.7	0.7	
	15-Nov-91			7.89	5.8	0.6	
	16-Dec-91			7.72	5.6	0.8	
	16-Jan-92			6.44	4.3	2.1	
	14-Feb-92			6.52	4.4	2.0	
	16-Mar-92			6.02	3.9	2.5	
	16-Apr-92			6.24	4.1	2.3	
	15-May-92			6.91	4.8	1.6	
	15-Jun-92			7.28	5.2	1.3	

Table B-2: Parcel B Groundwater Database

Well and Project No.	Date	GSE (ft MSL)	RPE (ft MSL)	DTW From RP (ft)	DTWBGS (ft)	GSE (ft MSL)	Well Condition
	15-Jul-92			7.49	5.4	1.0	
	14-Aug-92			7.76	5.6	0.8	
	14-Sep-92			7.98	5.9	0.5	
	15-Oct-92			8.02	5.9	0.5	
	16-Nov-92			7.74	5.6	0.8	
	16-Dec-92			7.00	4.9	1.5	
	15-Jan-93			4.42	2.3	4.1	
	15-Feb-93			5.73	3.6	2.8	
	17-Mar-93			6.10	4.0	2.4	
	5-Feb-96			6.65	4.5	1.9	Cover and lock ok.
MW-15 L91028.AEO	12-Mar-91	2.20	4.09	1.63	-0.3	2.5	
	19-Mar-91			1.52	-0.4	2.6	
	26-Mar-91			1.33	-0.6	2.8	
	2-Apr-91			1.40	-0.5	2.7	
	9-Apr-91			1.59	-0.3	2.5	
	16-Apr-91			1.74	-0.2	2.4	
	23-Apr-91			1.88	0.0	2.2	
	30-Apr-91			2.00	0.1	2.1	
	7-May-91			2.12	0.2	2.0	
	14-May-91			2.21	0.3	1.9	
	21-May-91			2.27	0.4	1.8	
	28-May-91			2.35	0.5	1.7	
	4-Jun-91			2.42	0.5	1.7	
	11-Jun-91			2.41	0.5	1.7	
	18-Jun-91			2.44	0.6	1.7	
	25-Jun-91			2.54	0.7	1.6	
	2-Jul-91			2.63	0.7	1.5	
	9-Jul-91			2.64	0.8	1.5	
	16-Jul-91			2.67	0.8	1.4	
	23-Jul-91			2.67	0.8	1.4	
	30-Jul-91			2.60	0.7	1.5	
	6-Aug-91			2.60	0.7	1.5	
	13-Aug-91			2.67	0.8	1.4	
	20-Aug-91			2.75	0.9	1.3	
	27-Aug-91			2.81	0.9	1.3	
	3-Sep-91			2.89	1.0	1.2	
	10-Sep-91			2.90	1.0	1.2	
	17-Sep-91			2.90	1.0	1.2	
	17-Oct-91			2.82	0.9	1.3	
	15-Nov-91			2.91	1.0	1.2	
	16-Dec-91			2.65	0.8	1.4	
	16-Jan-92			1.52	-0.4	2.6	
	14-Feb-92			0.92	-1.0	3.2	
	16-Mar-92			1.34	-0.6	2.8	
	16-Apr-92			1.56	-0.3	2.5	
	15-May-92			2.17	0.3	1.9	
	15-Jun-92			2.54	0.7	1.6	
	15-Jul-92			2.75	0.9	1.3	
	14-Aug-92			3.09	1.2	1.0	
	14-Sep-92			3.28	1.4	0.8	
	15-Oct-92			3.26	1.4	0.8	
	16-Nov-92			2.74	0.9	1.4	
	16-Dec-92			1.94	0.1	2.2	
	15-Jan-93			0.80	-1.1	3.3	

Table B-2: Parcel B Groundwater Database

Well and Project No.	Date	GSE (ft MSL)	RPE (ft MSL)	DTW From RP (ft)	DTWBGS (ft)	GSE (ft MSL)	Well Condition
	15-Feb-93			1.15	-0.7	2.9	
	17-Mar-93			1.46	-0.4	2.6	
	5-Feb-96			1.56	-0.3	2.5	Cover and lock ok.
MW-16 L91028.AEO	13-Mar-91	3.70	6.13	3.24	0.8	2.9	
	19-Mar-91			3.14	0.7	3.0	
	26-Mar-91			2.93	0.5	3.2	
	2-Apr-91			3.02	0.6	3.1	
	9-Apr-91			3.21	0.8	2.9	
	16-Apr-91			3.37	0.9	2.8	
	23-Apr-91			3.49	1.1	2.6	
	30-Apr-91			3.63	1.2	2.5	
	7-May-91			3.73	1.3	2.4	
	14-May-91			3.81	1.4	2.3	
	21-May-91			3.88	1.5	2.3	
	28-May-91			3.96	1.5	2.2	
	4-Jun-91			4.04	1.6	2.1	
	11-Jun-91			4.07	1.6	2.1	
	18-Jun-91			4.12	1.7	2.0	
	25-Jun-91			4.22	1.8	1.9	
	2-Jul-91			4.29	1.9	1.8	
	9-Jul-91			4.30	1.9	1.8	
	16-Jul-91			4.34	1.9	1.8	
	23-Jul-91			4.35	1.9	1.8	
	30-Jul-91			4.33	1.9	1.8	
	6-Aug-91			4.32	1.9	1.8	
	13-Aug-91			4.40	2.0	1.7	
	20-Aug-91			4.45	2.0	1.7	
	27-Aug-91			4.50	2.1	1.6	
	3-Sep-91			4.55	2.1	1.6	
	10-Sep-91			4.58	2.2	1.6	
	17-Sep-91			4.56	2.1	1.6	
	17-Oct-91			4.48	2.1	1.7	
	15-Nov-91			4.58	2.2	1.6	
	16-Dec-91			4.22	1.8	1.9	
	16-Jan-92			3.22	0.8	2.9	
	14-Feb-92			2.49	0.1	3.6	
	16-Mar-92			2.94	0.5	3.2	
	16-Apr-92			3.16	0.7	3.0	
	15-May-92			3.78	1.4	2.4	
	15-Jun-92			4.12	1.7	2.0	
	15-Jul-92			4.23	1.8	1.9	
	14-Aug-92			4.59	2.2	1.5	
	14-Sep-92			4.84	2.4	1.3	
	15-Oct-92			4.85	2.4	1.3	
	16-Nov-92			4.34	1.9	1.8	
	16-Dec-92			3.62	1.2	2.5	
	15-Jan-93			2.18	-0.3	4.0	
	15-Feb-93			2.57	0.1	3.6	
	17-Mar-93			2.96	0.5	3.2	
	5-Feb-96			3.07	0.6	3.1	Cover and lock ok.
MW-17 L91028.AEO	14-Mar-91	5.90	7.91	6.54	4.5	1.4	
	19-Mar-91			6.56	4.6	1.4	
	26-Mar-91			6.51	4.5	1.4	

Table B-2: Parcel B Groundwater Database

Well and Project No.	Date	GSE (ft MSL)	RPE (ft MSL)	DTW From RP (ft)	DTWBGS (ft)	GSE (ft MSL)	Well Condition
	2-Apr-91			6.62	4.6	1.3	
	9-Apr-91			6.55	4.5	1.4	
	16-Apr-91			6.60	4.6	1.3	
	23-Apr-91			6.57	4.6	1.3	
	30-Apr-91			6.65	4.6	1.3	
	7-May-91			6.59	4.6	1.3	
	14-May-91			6.69	4.7	1.2	
	21-May-91			6.64	4.6	1.3	
	28-May-91			6.74	4.7	1.2	
	4-Jun-91			6.65	4.6	1.3	
	11-Jun-91			6.74	4.7	1.2	
	18-Jun-91			6.72	4.7	1.2	
	25-Jun-91			6.78	4.8	1.1	
	2-Jul-91			6.72	4.7	1.2	
	9-Jul-91			6.75	4.7	1.2	
	16-Jul-91			6.78	4.8	1.1	
	23-Jul-91			6.78	4.8	1.1	
	30-Jul-91			6.75	4.7	1.2	
	6-Aug-91			6.74	4.7	1.2	
	13-Aug-91			6.78	4.8	1.1	
	20-Aug-91			6.80	4.8	1.1	
	27-Aug-91			6.79	4.8	1.1	
	3-Sep-91			7.06	5.1	0.9	
	10-Sep-91			7.03	5.0	0.9	
	17-Sep-91			6.97	5.0	0.9	
	17-Oct-91			6.94	4.9	1.0	
	15-Nov-91			6.90	4.9	1.0	
	16-Dec-91			6.95	4.9	1.0	
	16-Jan-92			6.77	4.8	1.1	
	14-Feb-92			6.45	4.4	1.5	
	16-Mar-92			6.32	4.3	1.6	
	16-Apr-92			5.40	3.4	2.5	
	15-May-92			5.90	3.9	2.0	
	15-Jun-92			6.20	4.2	1.7	
	15-Jul-92			6.31	4.3	1.6	
	14-Aug-92			6.48	4.5	1.4	
	14-Sep-92			6.72	4.7	1.2	
	15-Oct-92			7.04	5.0	0.9	
	16-Nov-92			7.20	5.2	0.7	
	16-Dec-92			7.17	5.2	0.7	
	15-Jan-93			2.22	0.2	5.7	
	15-Feb-93			2.14	0.1	5.8	
	17-Mar-93			2.56	0.6	5.4	
	5-Feb-96			7.44	5.4	0.5	Cover and lock ok.
MW-18 L91028.AEO	14-Mar-91	2.90	4.76	2.20	0.3	2.6	
	19-Mar-91			2.11	0.3	2.7	
	26-Mar-91			2.00	0.1	2.8	
	2-Apr-91			2.03	0.2	2.7	
	9-Apr-91			2.26	0.4	2.5	
	16-Apr-91			3.00	1.1	1.8	
	23-Apr-91			3.42	1.6	1.3	
	30-Apr-91			3.60	1.7	1.2	
	7-May-91			3.69	1.8	1.1	
	14-May-91			3.76	1.9	1.0	
	21-May-91			3.87	2.0	0.9	

Table B-2: Parcel B Groundwater Database

Well and Project No.	Date	GSE (ft MSL)	RPE (ft MSL)	DTW From RP (ft)	DTWBGS (ft)	GSE (ft MSL)	Well Condition
	28-May-91			3.96	2.1	0.8	
	4-Jun-91			4.00	2.1	0.8	
	11-Jun-91			4.10	2.2	0.7	
	18-Jun-91			4.20	2.3	0.6	
	25-Jun-91			4.29	2.4	0.5	
	2-Jul-91			4.31	2.5	0.5	
	9-Jul-91			4.36	2.5	0.4	
	16-Jul-91			4.40	2.5	0.4	
	23-Jul-91			4.40	2.5	0.4	
	30-Jul-91			4.44	2.6	0.3	
	6-Aug-91			4.43	2.6	0.3	
	13-Aug-91			4.43	2.6	0.3	
	20-Aug-91			4.43	2.6	0.3	
	27-Aug-91			4.43	2.6	0.3	
	3-Sep-91			4.46	2.6	0.3	
	10-Sep-91			4.46	2.6	0.3	
	17-Sep-91			4.42	2.6	0.3	
	17-Oct-91			4.46	2.6	0.3	
	15-Nov-91			4.58	2.7	0.2	
	16-Dec-91			4.61	2.8	0.1	
	16-Jan-92			2.24	0.4	2.5	
	14-Feb-92			1.47	-0.4	3.3	
	16-Mar-92			1.98	0.1	2.8	
	16-Apr-92			2.56	0.7	2.2	
	15-May-92			3.21	1.4	1.6	
	15-Jun-92			3.52	1.7	1.2	
	15-Jul-92			3.91	2.1	0.9	
	14-Aug-92			4.17	2.3	0.6	
	14-Sep-92			4.35	2.5	0.4	
	15-Oct-92			4.42	2.6	0.3	
	16-Nov-92			4.39	2.5	0.4	
	16-Dec-92			2.00	0.1	2.8	
	15-Jan-93			1.03	-0.8	3.7	
	15-Feb-93			1.88	0.0	2.9	
	17-Mar-93			1.92	0.1	2.8	
	5-Feb-96			1.73	-0.1	3.0	Cover and lock ok.
MW-19 L91028.AEO	14-Mar-91	2.50	4.36	1.33	-0.5	3.0	
	19-Mar-91			1.25	-0.6	3.1	
	26-Mar-91			1.19	-0.7	3.2	
	2-Apr-91			1.24	-0.6	3.1	
	9-Apr-91			1.47	-0.4	2.9	
	16-Apr-91			2.42	0.6	1.9	
	23-Apr-91			3.12	1.3	1.2	
	30-Apr-91			3.41	1.6	1.0	
	7-May-91			3.57	1.7	0.8	
	14-May-91			3.75	1.9	0.6	
	21-May-91			3.94	2.1	0.4	
	28-May-91			4.14	2.3	0.2	
	4-Jun-91			4.31	2.5	0.1	
	11-Jun-91			4.48	2.6	-0.1	
	18-Jun-91			4.64	2.8	-0.3	
	25-Jun-91			4.82	3.0	-0.5	
	2-Jul-91			5.02	3.2	-0.7	
	9-Jul-91			5.18	3.3	-0.8	
	16-Jul-91			5.36	3.5	-1.0	

Table B-2: Parcel B Groundwater Database

Well and Project No.	Date	GSE (ft MSL)	RPE (ft MSL)	DTW From RP (ft)	DTWBGS (ft)	GSE (ft MSL)	Well Condition
	23-Jul-91			5.50	3.6	-1.1	
	30-Jul-91			5.63	3.8	-1.3	
	6-Aug-91			5.75	3.9	-1.4	
	13-Aug-91			5.88	4.0	-1.5	
	20-Aug-91			6.02	4.2	-1.7	
	27-Aug-91			6.19	4.3	-1.8	
	3-Sep-91			6.40	4.5	-2.0	
	10-Sep-91			6.61	4.8	-2.3	
	17-Sep-91			6.95	5.1	-2.6	
	7-Oct-91			7.44	5.6	-3.1	
	17-Oct-91			7.66	5.8	-3.3	
	15-Nov-91			8.01	6.2	-3.7	
	16-Dec-91			8.16	6.3	-3.8	
	16-Jan-92			1.35	-0.5	3.0	
	14-Feb-92			0.72	-1.1	3.6	
	16-Mar-92			1.38	-0.5	3.0	
	16-Apr-92			1.95	0.1	2.4	
	15-May-92			3.79	1.9	0.6	
	15-Jun-92			4.53	2.7	-0.2	
	15-Jul-92			5.23	3.4	-0.9	
	14-Aug-92			5.86	4.0	-1.5	
	14-Sep-92			6.52	4.7	-2.2	
	15-Oct-92			7.25	5.4	-2.9	
	16-Nov-92			7.32	5.5	-3.0	
	16-Dec-92			1.33	-0.5	3.0	
	15-Jan-93			0.31	-1.6	4.1	
	15-Feb-93			1.51	-0.4	2.9	
	17-Mar-93			1.62	-0.2	2.7	
	5-Feb-96			1.18	-0.7	3.2	Cover and lock ok.
MW-20 L91028.AEO	14-Mar-91	2.70	4.52	1.81	0.0	2.7	
	19-Mar-91			1.53	-0.3	3.0	
	26-Mar-91			1.53	-0.3	3.0	
	2-Apr-91			1.63	-0.2	2.9	
	9-Apr-91			2.30	0.5	2.2	
	16-Apr-91			2.94	1.1	1.6	
	23-Apr-91			3.23	1.4	1.3	
	30-Apr-91			3.38	1.6	1.1	
	7-May-91			3.50	1.7	1.0	
	14-May-91			3.66	1.8	0.9	
	21-May-91			3.84	2.0	0.7	
	28-May-91			4.02	2.2	0.5	
	4-Jun-91			4.23	2.4	0.3	
	11-Jun-91			4.40	2.6	0.1	
	18-Jun-91			4.56	2.7	0.0	
	25-Jun-91			4.75	2.9	-0.2	
	2-Jul-91			4.93	3.1	-0.4	
	9-Jul-91			5.08	3.3	-0.6	
	16-Jul-91			5.27	3.5	-0.8	
	23-Jul-91			5.40	3.6	-0.9	
	30-Jul-91			5.55	3.7	-1.0	
	6-Aug-91			5.65	3.8	-1.1	
	13-Aug-91			5.81	4.0	-1.3	
	20-Aug-91			5.96	4.1	-1.4	
	27-Aug-91			6.18	4.4	-1.7	
	3-Sep-91			6.40	4.6	-1.9	

Table B-2: Parcel B Groundwater Database

Well and Project No.	Date	GSE (ft MSL)	RPE (ft MSL)	DTW From RP (ft)	DTWBGS (ft)	GSE (ft MSL)	Well Condition
	10-Sep-91			6.52	4.7	-2.0	
	17-Sep-91			6.74	4.9	-2.2	
	17-Oct-91			6.80	5.0	-2.3	
	15-Nov-91			6.78	5.0	-2.3	
	16-Dec-91			6.49	4.7	-2.0	
	16-Jan-92			1.95	0.1	2.6	
	14-Feb-92			1.04	-0.8	3.5	
	16-Mar-92			2.19	0.4	2.3	
	16-Apr-92			3.01	1.2	1.5	
	15-May-92			3.72	1.9	0.8	
	15-Jun-92			4.48	2.7	0.0	
	15-Jul-92			5.10	3.3	-0.6	
	14-Aug-92			5.79	4.0	-1.3	
	14-Sep-92			6.54	4.7	-2.0	
	15-Oct-92			6.83	5.0	-2.3	
	16-Nov-92			6.16	4.3	-1.6	
	16-Dec-92			2.80	1.0	1.7	
	15-Jan-93			0.78	-1.0	3.7	
	15-Feb-93			1.74	-0.1	2.8	
	17-Mar-93			1.95	0.1	2.6	
	5-Feb-96			1.78	0.0	2.7	Cover and lock ok.
MW-21 L91028.AEO	13-Mar-91	4.90	6.97	2.65	0.6	4.3	
	19-Mar-91			2.57	0.5	4.4	
	26-Mar-91			2.71	0.6	4.3	
	2-Apr-91			2.75	0.7	4.2	
	9-Apr-91			2.81	0.7	4.2	
	16-Apr-91			2.85	0.8	4.1	
	23-Apr-91			2.90	0.8	4.1	
	30-Apr-91			2.96	0.9	4.0	
	7-May-91			3.00	0.9	4.0	
	14-May-91			3.05	1.0	3.9	
	21-May-91			3.08	1.0	3.9	
	28-May-91			3.11	1.0	3.9	
	4-Jun-91			3.10	1.0	3.9	
	11-Jun-91			3.14	1.1	3.8	
	18-Jun-91			3.20	1.1	3.8	
	25-Jun-91			3.09	1.0	3.9	
	2-Jul-91			3.07	1.0	3.9	
	9-Jul-91			3.08	1.0	3.9	
	16-Jul-91			3.19	1.1	3.8	
	23-Jul-91			3.18	1.1	3.8	
	30-Jul-91			3.19	1.1	3.8	
	6-Aug-91			3.24	1.2	3.7	
	13-Aug-91			3.26	1.2	3.7	
	20-Aug-91			3.25	1.2	3.7	
	27-Aug-91			3.26	1.2	3.7	
	3-Sep-91			3.27	1.2	3.7	
	10-Sep-91			3.28	1.2	3.7	
	17-Sep-91			3.20	1.1	3.8	
	7-Oct-91			3.22	1.2	3.8	
	17-Oct-91			3.28	1.2	3.7	
	15-Nov-91			3.38	1.3	3.6	
	16-Dec-91			3.28	1.2	3.7	
	16-Jan-92			2.82	0.8	4.2	
	14-Feb-92			2.50	0.4	4.5	

Table B-2: Parcel B Groundwater Database

Well and Project No.	Date	GSE (ft MSL)	RPE (ft MSL)	DTW From RP (ft)	DTWBGS (ft)	GSE (ft MSL)	Well Condition
	16-Mar-92			2.54	0.5	4.4	
	16-Apr-92			2.54	0.5	4.4	
	15-May-92			2.82	0.8	4.2	
	15-Jun-92			3.08	1.0	3.9	
	15-Jul-92			3.22	1.2	3.8	
	14-Aug-92			3.46	1.4	3.5	
	14-Sep-92			3.47	1.4	3.5	
	15-Oct-92			3.50	1.4	3.5	
	16-Nov-92			3.38	1.3	3.6	
	16-Dec-92			3.14	1.1	3.8	
	15-Jan-93			2.38	0.3	4.6	
	15-Feb-93			2.34	0.3	4.6	
	17-Mar-93			2.55	0.5	4.4	
	5-Feb-96			2.15	0.1	4.8	Cover and lock ok.
B-5 AE-87133.B	6-Feb-96	4.20	5.50	2.87	1.6	2.6	Ok.
B-6 AE-87133.B	6-Feb-96	3.60					PVC casing plugged with snails.
B-7 AE-87133.B	5-Feb-96	3.90	5.30	3.08	1.7	2.2	Ok.
B-10 AE-87133.B	5-Feb-96	4.00	4.83	1.53	0.7	3.3	Ok.
B-11 AE-87133.B	5-Feb-96	5.80	6.45	2.35	1.7	4.1	Missing slip cap.
B-1	5-Feb-96	4.10	5.50	2.35	1.0	3.2	Ok.

Legend: Ground Surface Elevation (GSE)
Mean Sea Level (MSL)
Reference Point Elevation (RPE)
Depth to Water (DTW)
Depth to Water Below Ground Surface (DTWBGS)
Groundwater Surface Elevation (GWSE)

Table B-3: Parcel C Groundwater Database

Well and Project No.	Date	GSE (ft MSL)	RPE (ft MSL)	DTW From RP (ft)	DTWBGS (ft)	GWSE (ft MSL)	Well Condition
MW-1	5-Jul-88	12.77	14.14	13.47	12.1	0.7	
F-88218	8-Jul-88			13.27	11.9	0.9	
	20-Jul-88			13.11	11.7	1.0	
	2-Jul-90			13.75	12.4	0.4	
	17-Jul-90			13.79	12.4	0.4	
	28-Feb-96			11.99	10.6	2.2	Steel lid rusted; no lock.
MW-2	5-Jul-88	18.21	19.71	21.31	19.8	-1.6	
F-88218	8-Jul-88			21.30	19.8	-1.6	
	20-Jul-88			21.28	19.8	-1.6	
	2-Jul-90			21.43	19.9	-1.7	
	17-Jul-90			21.53	20.0	-1.8	
	28-Feb-96			18.82	17.3	0.9	Lid rusted off; no lock.
MW-3	5-Jul-88	19.73	21.23	21.20	19.7	0.0	
F-88218	8-Jul-88			19.84	18.3	1.4	
	20-Jul-88			20.92	19.4	0.3	
	28-Feb-96			19.86	18.4	1.4	Steel lid missing.
MW-4	5-Jul-88	10.51	11.45	11.52	10.6	-0.1	
F-88218	8-Jul-88			11.73	10.8	-0.3	
	20-Jul-88			11.52	10.6	-0.1	
	28-Feb-96			9.80	8.9	1.7	Steel lid ok; no lock.
MW-5	5-Jul-88	9.40	10.59	11.27	10.1	-0.7	
F88218	8-Jul-88			11.60	10.4	-1.0	
	20-Jul-88			11.38	10.2	-0.8	
	28-Feb-96			10.10	8.91	0.5	Steel lid and lock missing.

Legend: Ground Surface Elevation (GSE)
Mean Sea Level (MSL)
Reference Point Elevation (RPE)
Depth to Water (DTW)
Depth to Water Below Ground Surface (DTWBGS)
Groundwater Surface Elevation (GWSE)

Table B-4: Parcel D Groundwater Database

Well and Project No.	Date	GSE (ft MSL)	RPE (ft MSL)	DTW From RP (ft)	DTWBGS (ft)	GSE (ft MSL)	Well Condition
MW-6 L90261.FO	17-Oct-91	13.40	14.66	13.87	12.6	0.8	
	15-Nov-91			13.91	12.7	0.8	
	16-Dec-91			14.00	12.7	0.7	
	16-Jan-92			13.94	12.7	0.7	
	14-Feb-92			13.54	12.3	1.1	
	16-Mar-92			12.35	11.1	2.3	
	16-Apr-92			11.19	9.9	3.5	
	15-May-92			11.46	10.2	3.2	
	15-Jun-92			11.77	10.5	2.9	
	15-Jul-92			12.20	10.9	2.5	
	14-Aug-92			12.52	11.3	2.1	
	14-Sep-92			12.67	11.4	2.0	
	15-Oct-92			13.05	11.8	1.6	
	16-Nov-92			13.14	11.9	1.5	
	16-Dec-92			13.13	11.9	1.5	
	15-Jan-93			12.71	11.5	2.0	
	15-Feb-93			9.58	8.3	5.1	
	17-Mar-93			9.19	7.9	5.5	
	6-Feb-96			12.83	11.6	1.8	Steel lid and lock ok.
MW-7 L90261.FO	17-Oct-91	15.50	17.04	16.00	14.5	1.0	
	17-Oct-91			16.11	14.6	0.9	
	15-Nov-91			16.22	14.7	0.8	
	16-Dec-91			16.28	14.7	0.8	
	16-Jan-92			14.90	13.4	2.1	
	14-Feb-92			14.05	12.5	3.0	
	16-Mar-92			12.15	10.6	4.9	
	16-Apr-92			11.96	10.4	5.1	
	15-May-92			13.17	11.6	3.9	
	15-Jun-92			13.84	12.3	3.2	
	15-Jul-92			14.36	12.8	2.7	
	14-Aug-92			14.85	13.3	2.2	
	14-Sep-92			15.17	13.6	1.9	
	15-Oct-92			15.52	14.0	1.5	
	16-Nov-92			15.44	13.9	1.6	
	16-Dec-92			15.06	13.5	2.0	
	15-Jan-93			12.76	11.2	4.3	
	15-Feb-93			10.96	9.4	6.1	
	17-Mar-93			11.30	9.8	5.7	
	6-Feb-96			14.32	12.8	2.7	Steel lid and lock ok.
B-2 D-86125.D	7-Feb-96	13.00	13.70	14.75	14.1	-1.1	Ok.
B-12 AE-86125.D1	23-Feb-96	14.10	15.95	14.35	12.5	1.6	Slip cap missing.
B-14 AE-86124.D1	23-Feb-96	16.80	19.27	18.19	15.7	1.1	Slip cap missing.
DPW-1 AE-86125.D2	23-Feb-96	14.11	15.91	14.44	12.6	1.5	Ok.
SPW-1 AE-86125.D2	23-Feb-96	13.76	15.88	15.40	13.3	0.5	Ok.
SOW-1 AE-86125.D2	23-Feb-96	13.50	15.39	14.38	12.5	1.0	Ok.

Table B-4: Parcel D Groundwater Database

Well and Project No.	Date	GSE (ft MSL)	RPE (ft MSL)	DTW From RP (ft)	DTWBGS (ft)	GSE (ft MSL)	Well Condition
DOW-1 AE-86125.D2	23-Feb-96	13.53	15.37	13.66	11.8	1.7	Ok.
DPW-2 AE-86125.D2	23-Feb-96	15.71	18.06	16.58	14.2	1.5	Ok.
DOW-2 AE-86125.D2	23-Feb-96	15.44	17.58	16.09	14.0	1.5	Ok.
DPW-3 AE-86125.D2	23-Feb-96	17.00	19.26	18.97	16.7	0.3	Ok.
SPW-3 AE-86125.D2	23-Feb-96	16.59	19.02	17.15	14.7	1.9	Ok.
SOW-3 AE-86125.D2	23-Feb-96	16.37	18.52	16.56	14.4	2.0	Ok.
DOW-3 AE-86125.D2	23-Feb-96	16.38	18.86	18.69	16.2	0.2	Ok.
B-13 D-86125.F	6-Feb-96	12.9	13.40	10.95	10.5	2.5	Ok.
B-14 D-86125.F	7-Feb-96	11.3	12.15	8.91	8.1	3.2	Ok.
B-16 D-86125.F	16-Feb-96	22.0	22.6	6.84	6.2	15.8	Ok.
B-18 D-86125.F	7-Feb-96	12.3	14.54	10.83	8.6	3.7	Ok.
B-19	7-Feb-96	9.4	11.00	9.43	7.8	1.6	Ok.

Legend: Ground Surface Elevation (GSE)
Mean Sea Level (MSL)
Reference Point Elevation (RPE)
Depth to Water (DTW)
Depth to Water Below Ground Surface (DTWBGS)
Groundwater Surface Elevation (GWSE)

APPENDIX F

APRIL 1991 SUPPLEMENTAL INVESTIGATION—PARCEL A

LAW/CRANDALL

A DIVISION OF LAW ENGINEERING
AND ENVIRONMENTAL SERVICES, INC.

SUPPLEMENTARY INFORMATION

PROPOSED MARINA

PLAYA VISTA PROJECT - PARCEL A

LINCOLN BOULEVARD AND BALLONA CREEK

LOS ANGELES COUNTY, CALIFORNIA

FOR

MAGUIRE THOMAS PARTNERS

(L91096.AFB)

AUGUST 7, 1991

LAW/CRANDALL, INC.
ENGINEERING AND ENVIRONMENTAL SERVICES

August 7, 1991

Maguire Thomas Partners
13250 Jefferson Boulevard
Los Angeles, California 90094

(L91096.AFB)

Attention: Mr. Joel H. Stensby
Vice President

Gentlemen:

Supplementary Information
Proposed Marina
Playa Vista Project - Parcel A
Lincoln Boulevard and Ballona Creek
Los Angeles County, California

SCOPE

Parcel A of the Playa Vista Development, located between Fuji Way, Lincoln Boulevard, and Ballona Creek, is to be developed as a marina with landside uses including residential, office, retail, hotel, and recreation. We performed a preliminary geotechnical investigation for the proposed marina and submitted our findings and recommendations in a draft report on April 4, 1988 (AE-88473). A preliminary environmental audit of the site was performed and the results were submitted in a report dated December 21, 1988 (F-88473). Preliminary design of the marina is proceeding, and we have been requested to provide supplementary information for use in the design and development.

The information in this report represents professional opinions that have been developed using that degree of care and skill ordinarily exercised, under similar circumstances, by reputable geotechnical consultants practicing in this or similar localities. No other warranty, expressed or implied, is made as to the professional advice included in this report.

SUPPLEMENTARY INFORMATION

WATER QUALITY

General

Ground water samples were analyzed to determine if there are detrimental compounds in the water that might preclude discharges of the ground water into the ocean after excavating for the proposed marina.

A review of Los Angeles County Waste Management records revealed the presence of a former dump site, known as the Celery Dump, on the northeast portion of the site that possibly could have affected ground water quality. The Celery Dump is discussed in our previous report dated December 21, 1988 (F-88473). The former dump operated between 1945 and 1953. Celery packing house wastes were reportedly dumped on the site, where they decomposed and were disced into the soil.

Explorations

Two borings, Borings 21 and 22, were drilled to depths of 17 and 22 feet, respectively, to collect ground water samples for laboratory analyses and to explore for organic materials that might be present from the former celery dump. We drilled two additional borings, each less than 10 feet deep, to further explore for organic materials. The locations of the borings are shown on Plate 1. The logs of the borings are presented on Plates 2.1 through 2.4, Log of Boring. The soils are classified in accordance with the Unified Soil Classification System, presented on Plate 3.

The borings encountered up to 11 feet of fill consisting of sand, sandy silt, and elastic silt with only minor amounts of organic material. (Boring 24 was terminated in fill at a depth of 8 feet.) Borings 21 and 22 penetrated the fill and encountered sandy silt and elastic silt. Ground water was encountered at a depth of 14½ feet in Boring 21 and 17 feet in Boring 22, corresponding to Elevations -1½ and -4, respectively.

Ground water samples were collected from Borings 21 and 22 with a clean bailer. The samples were iced for storage and transported to Brown and Caldwell Analytical Laboratories in Glendale for analyses.

Laboratory Analyses

The water samples were analyzed for parameters likely to be required by regulatory agencies for discharging the water to the ocean. In addition, the samples were analyzed for lindane (a pesticide) and fuel oil, because these compounds were reportedly sprayed on the celery waste for pest control. The results of the laboratory analyses are presented on Plates 4.1 through 4.6.

The samples were analyzed for pesticides/PCBs, volatile organic priority pollutants, and total petroleum hydrocarbons. The constituents checked were below detection limits. Analyses for general mineral constituents such as total dissolved solids (TDS), chloride, and sulfate indicate concentrations similar to sea water, as expected.

The results of analyses were compared with limiting concentrations listed in the 1990 California Ocean Plan. Concentrations of settleable solids and total suspended solids in the samples exceeded the limiting concentrations; however, the samples were obtained from uncased borings and were somewhat silty. The ground water that would be discharged from the excavated marina would be likely to contain less solids. Phenolics were detected in the samples, but in concentrations below the Ocean Plan limits.

Concentration of lead in the samples exceeded the Ocean Plan limits for discharge. Lead concentrations were reported as 240 parts per billion (ppb) in Boring 21, and 18 ppb in Boring 22. The Ocean Plan limits concentration of lead to 8 ppb as the daily maximum and 20 ppb as the instantaneous maximum. Based on the results of analyses performed, it appears that the lead concentration may present problems in disposing of the ground water.

Because of the elevated lead concentrations in the samples, we researched the status of lead contamination in the Marina del Rey sediments and water. Analyses of sediments in Marina del Rey and Ballona Creek between 1978 and 1989 show lead concentrations as high as 563 milligrams per kilogram (563,000 ppb), according to a March 1991 report by Dorothy Soule et al, of the University of Southern California entitled "Marine Studies of San Pedro Bay, California Part 20F, the Marine Environment of Marina del Rey." Because published data on metals analyses of sea water were not available, we collected a sample of sea water from Marina del Rey for lead analysis. The analytical report is presented on Plate 4.7 and indicates a lead content of less than 0.01 milligrams per liter (10 ppb).

The Chain-of-Custody records for the ground water samples and the sea water sample are presented on Plates 5.1 and 5.2.

We understand that the permitting for water discharge into the marina is being reviewed by others.

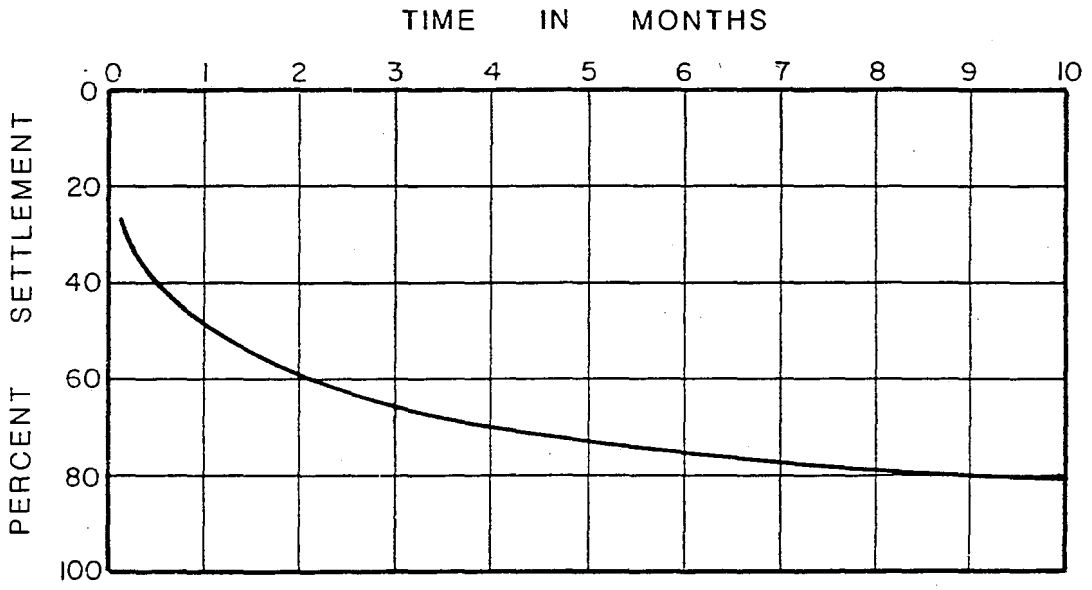
MATERIALS FOR COMPACTED FILLS

The upper soils at the marina site will be excavated to form the basins of the marina. These soils consist of two general types: granular soils (silty sand and sandy silt) and silt soils (clayey silt and elastic silt). The predominantly granular soils are usually light brown to brown and may be used in any required fills, including structural fills. The silt soils are generally grey to dark grey and, because of their current moisture content, are not considered suitable for use in compacted fills. These silt soils would have to be dried significantly to be used in any compacted fills. For either type of soil, significant drying will be required to bring the soils to near optimum moisture content. The actually drying rate will depend on factors such as the weather, thickness of lifts, frequency of discing, and initial moisture content. The predominantly granular soils are expected to dry significantly faster than the silt soils.

Based on the materials encountered in our borings, we estimate that approximately 60% of material will consist of the silt soils.

SURCHARGE REQUIREMENTS

Development of the marina will include the placement of up to 12 feet of compacted fill for street embankments and building pads. We anticipate that the areal settlement due to the placing of the fill could be up to about 2 inches per foot of fill placed. Our estimate of the average rate of settlement is presented below:



To reduce the effects of this settlement, if the settlement is considered excessive, the site could be covered with a temporary surcharge fill after completion of grading. Thickness of the surcharge fill and the time it is left in place will depend on the construction

schedule. The required thicknesses of the surcharge fills (fill thickness in addition to the design height of the embankments) for various time periods are summarized below.

Time Available for Surcharging (Months)	Thickness of Surcharge Fill (% of Height of Embankment Fill)
1	100
3	50
6	35
9	30
12	25

The surcharge fill should be placed after placing compacted fill for the embankments and berms. The compacted fill should be placed at least 1 foot higher than designed. (This will allow settlement to occur and maintain compacted fill above the desired subgrade elevation. The additional thickness of compacted fill may be considered part of the total surcharge thickness.)

The surcharge fill need not be thoroughly compacted, but should be placed in layers not more than 1 foot in thickness and rolled with earth moving equipment. It is expected that the surcharge fill will have a moist density of at least 100 pounds per cubic foot. In general, the top of the surcharge fill should extend beyond the top of the area being surcharged. The sides of the surcharge fill may be sloped down at 1:1. We can provide details on the lateral limits of the surcharge fills when the planned grades are finalized.

Settlement monuments should be placed in the surcharge fill to observe the rate and the magnitude of the actual settlement that occurs. A suggested detail for a typical settlement monument is presented on Plate 6, Settlement Monument Detail. The monuments should be placed in a grid pattern at about 200-foot intervals.

The elevations of the settlement monuments should be determined by surveying the initial position of the monuments. The 2-inch-diameter steel pipe shown on the detail should be attached to the monument to enable elevation readings to be taken after the monument is covered and as the surcharge fill is placed. Additional sections of pipe can be added, as necessary, as the surcharge fill is placed.

The elevations of the settlement monuments should be determined by a licensed surveyor. The elevations should be determined immediately after construction of the monuments and prior to the placing of any surcharge fill. The elevations should be determined at one-week intervals thereafter. Following completion of the surcharge fills, the elevation readings should continue to be taken until the desired time period has elapsed. Our firm should be provided with copies of the elevation data immediately after the data is obtained. The surcharge fill should not be removed until we have verified that the fill has been in place a sufficient period of time.

LATERAL PILE CAPACITIES

The soils are satisfactory for resisting lateral loads. The available lateral resistance of the soils adjacent to a 14-inch-square concrete pile are presented in the following table.

	Lateral Load (Pounds)	
Fixity	¼-inch Deflection	½-inch Deflection
Free Head	3,500	7,000
Fixed Head	10,000	20,000

The lateral resistance of other sizes of piles would be proportional to the width. The presented capacities are based on deflection and intended for total loads, including wind, seismic, and impact loads.

In calculating the maximum bending moment in a pile due to the lateral load applied at the top of the pile, the lateral load may be multiplied by an assumed moment arm of 4 feet. For design, it may be assumed that the maximum bending moment will occur near the pile cap or at the adjacent grade, whichever is lower, and that the bending moment will decrease to zero at a depth of 20 feet below the bottom of the pile cap or adjacent grade.

For piles adjacent to slopes, the lateral capacity of the pile should be ignored where the horizontal distance from the face of the pile to the face of the slope is less than five times the pile width, or 5 feet, whichever is greater.

LATERAL RESISTANCE TO SHEET PILES

At some locations within the marina, it is planned to have slopes at the toes of the sheet piles. The proposed slopes will not contribute significant lateral resistance to the sheet piles. The lateral resistance of the soils should be taken as starting below a point where the level portion of the channel bottom would intersect the sheet pile.

SLOPE STABILITY

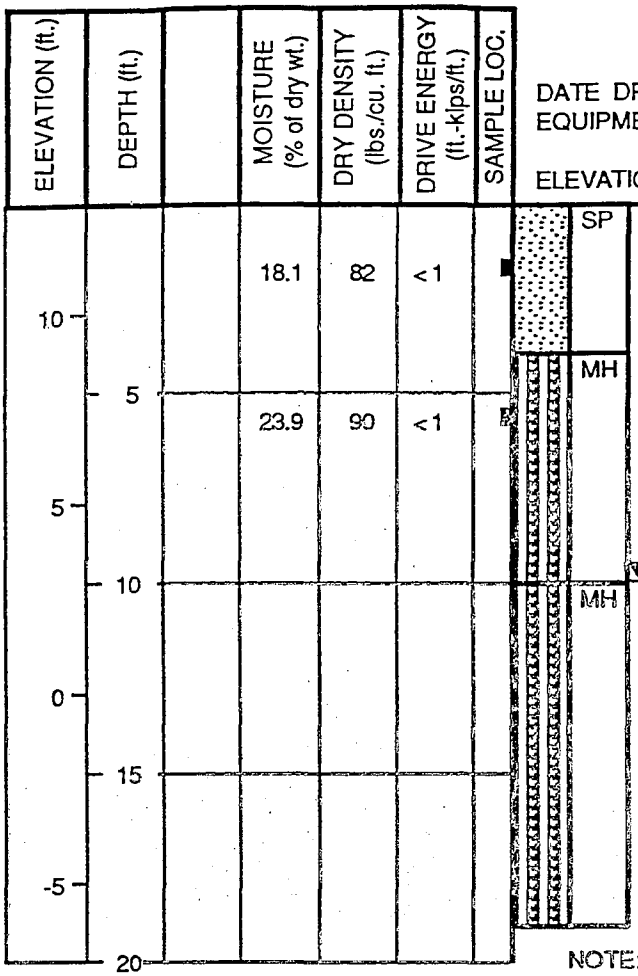
Slopes are proposed at some locations at the toes of sheet pile bulkheads. The maximum inclination of the slopes will depend on the height of the slopes, taken from the level channel bottom to where the slope intersects the sheet pile. The allowable slope inclinations for various slope heights are presented in the following table:

Maximum Total Slope Height (feet)	Slope Inclination (horizontal to vertical)
10	2:1
20	3:1
30	4:1

BORING 21*

DATE DRILLED: April 8, 1991
EQUIPMENT USED: 16" - Diameter Bucket

ELEVATION 13 **



FILL - SAND - few rootlets and seashells, brownish grey

FILL - ELASTIC SILT - some layers of Sand, dark grey

SURFACE OF NATURAL SOIL
ELASTIC SILT - grey

NOTE: Water seepage encountered at 14-1/2'. Water level measured at 14-1/2' 10 minutes after completion of drilling. Water samples taken. Soil squeezing in below 17'.

* Logs of Boring 1 through 20 were presented in a draft report submitted on April 4, 1988 (LCA AE-88473).

** Elevations refer to datum of reference drawing; see Plate 1.

L91096.AEB DATE 5/2/91 F.T. BG

Note : The log of subsurface conditions shown hereon applies only at the specific boring location and at the date indicated. It is not warranted to be representative of subsurface conditions at other locations and times.

O.E. FH W.P. ph CHKD

LOG OF BORING

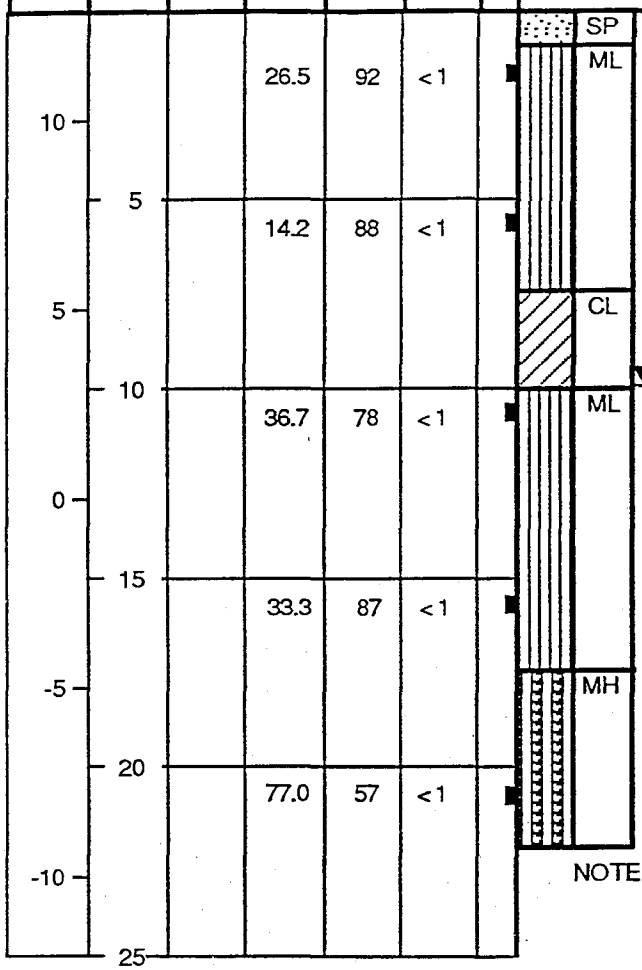
LAW/CRANDALL, INC.

PLATE 2.1

BORING 22

DATE DRILLED: April 8, 1991
EQUIPMENT USED: 16" - Diameter Bucket

ELEVATION 13



FILL - SAND - fine, light grey
FILL - SANDY SILT - some rootlets, grey

FILL - SILTY CLAY - dark grey

Some grass
SURFACE OF NATURAL SOIL
SANDY SILT - some layers of Sand, some organic material, grey

Hydrogen sulfide odor

ELASTIC SILT - some seashells, dark grey

NOTE: Water seepage encountered at 13-1/2'. Water level measured at 17' 10 minutes after completion of drilling. Water samples taken. Soils squeezing in below 18-1/2'.

Note : The log of subsurface conditions shown hereon apply only at the specific boring location and at the date indicated. It is not warranted to be representative of subsurface conditions at other locations and times.

L91096.AEB DATE 5/2/91 F.T. BG Γ O.E. FH W.P. ph CHKD Sml

LOG OF BORING

LAW/CRANDALL, INC.

PLATE 2.2

BORING 23

DATE DRILLED: April 8, 1991
EQUIPMENT USED: 16" - Diameter Bucket

ELEVATION 13

ELEVATION (ft.)	DEPTH (ft.)	MOISTURE (% of dry wt.)	DRY DENSITY (lbs./cu. ft.)	DRIVE ENERGY (ft.-kips/ft.)	SAMPLE LOC.	
10	0					SP FILL - SAND - fine, grey
						ML FILL - SANDY SILT - grey
5	5					Layer of Silty Clay
0	10					CL FILL - SILTY CLAY - dark grey
						SURFACE OF NATURAL SOIL
-5	15					MH ELASTIC SILT - some layers of Sand, dark grey

NOTE: Water not encountered. No caving.

Note : The log of subsurface conditions shown hereon applies only at the specific boring location and at the date indicated. It is not warranted to be representative of subsurface conditions at other locations and times.

L91096.AFB DATE 5/2/91 F.T. BG Γ O.E. FH W.P. ph CHKD

LOG OF BORING

LAW/CRANDALL, INC.

PLATE 2.3

BORING 24

DATE DRILLED: April 8, 1991
EQUIPMENT USED: 16" - Diameter Bucket

ELEVATION 13

ELEVATION (ft.)	DEPTH (ft.)		MOISTURE (% of dry wt.)	DRY DENSITY (lbs./cu. ft.)	DRIVE ENERGY (ft.-kips/ft.)	SAMPLE LOC.
10	0					
5	5					
0	10					
-5	15					

SP FILL - SAND - fine, few seashells, light grey

ML FILL - SANDY SILT - dark grey

Some Clay

CL FILL - SILTY CLAY - dark grey

NOTE: Water not encountered. No caving.

Note : The log of subsurface conditions shown hereon applies only at the specific boring location and at the date indicated. It is not warranted to be representative of subsurface conditions at other locations and times.

✓ L91096.AEB DATE 5/2/91 F.T. BG D O.E. EH W.P. ph CHKD

LOG OF BORING

LAW/CRANDALL, INC.

PLATE 2.4

MAJOR DIVISIONS			GROUP SYMBOLS	TYPICAL NAMES
COARSE GRAINED SOILS (More than 50% of material is LARGER than No. 200 sieve size)	GRAVELS (More than 50% of coarse fraction is LARGER than the No. 4 sieve size)	CLEAN GRAVELS (Little or no fines)	GW	Well graded gravels, gravel-sand mixtures, little or no fines.
			GP	Poorly graded gravels or gravel-sand mixtures, little or no fines.
		GRAVELS WITH FINES (Appreciable amt. of fines)	GM	Silty gravels, gravel-sand-silt mixtures.
			GC	Clayey gravels, gravel-sand-clay mixtures.
	SANDS (More than 50% of coarse fraction is SMALLER than the No. 4 sieve size)	CLEAN SANDS (Little or no fines)	SW	Well graded sands, gravelly sands, little or no fines.
			SP	Poorly graded sands or gravelly sands, little or no fines.
		SANDS WITH FINES (Appreciable amt. of fines)	SM	Silty sands, sand-silt mixtures.
			SC	Clayey sands, sand-clay mixtures.
FINE GRAINED SOILS (More than 50% of material is SMALLER than No. 200 sieve size)	SILTS AND CLAYS (Liquid limit LESS than 50)		ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity.
			CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays.
			OL	Organic silts and organic silty clays of low plasticity.
	SILTS AND CLAYS (Liquid limit GREATER than 50)		MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts.
			CH	Inorganic clays of high plasticity, fat clays.
			OH	Organic clays of medium to high plasticity, organic silts.
HIGHLY ORGANIC SOILS			Pt	Peat and other highly organic soils.

BOUNDARY CLASSIFICATIONS: Soils possessing characteristics of two groups are designated by combinations of group symbols.

PARTICLE SIZE LIMITS

SILT OR CLAY	SAND			GRAVEL		COBBLES	BOULDERS
	FINE	MEDIUM	COARSE	FINE	COARSE		

NO. 200 NO. 40 NO. 10 NO. 4 3/4 in. 3 in. (12 in.)

U. S. STANDARD SIEVE SIZE

UNIFIED SOIL CLASSIFICATION SYSTEM

Reference :
The Unified Soil Classification System, Corps of Engineers, U. S. Army Technical Memorandum No. 3-357, Vol. 1, March, 1953. (Revised April, 1960)

LAW/CRANDALL, INC.

PLATE 3

MAJOR DIVISIONS			GROUP SYMBOLS	TYPICAL NAMES
COARSE GRAINED SOILS (More than 50% of material is LARGER than No. 200 sieve size)	GRAVELS (More than 50% of coarse fraction is LARGER than the No. 4 sieve size)	CLEAN GRAVELS (Little or no fines)	GW	Well graded gravels, gravel-sand mixtures, little or no fines.
			GP	Poorly graded gravels or gravel-sand mixtures, little or no fines.
		GRAVELS WITH FINES (Appreciable amt. of fines)	GM	Silty gravels, gravel-sand-silt mixtures.
			GC	Clayey gravels, gravel-sand-clay mixtures.
	SANDS (More than 50% of coarse fraction is SMALLER than the No. 4 sieve size)	CLEAN SANDS (Little or no fines)	SW	Well graded sands, gravelly sands, little or no fines.
			SP	Poorly graded sands or gravelly sands, little or no fines.
		SANDS WITH FINES (Appreciable amt. of fines)	SM	Silty sands, sand-silt mixtures.
			SC	Clayey sands, sand-clay mixtures.
FINE GRAINED SOILS (More than 50% of material is SMALLER than No. 200 sieve size)	SILTS AND CLAYS (Liquid limit LESS than 50)		ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity.
			CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays.
			OL	Organic silts and organic silty clays of low plasticity.
	SILTS AND CLAYS (Liquid limit GREATER than 50)		MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts.
			CH	Inorganic clays of high plasticity, fat clays.
			OH	Organic clays of medium to high plasticity, organic silts.
HIGHLY ORGANIC SOILS			Pt	Peat and other highly organic soils.

BOUNDARY CLASSIFICATIONS: Soils possessing characteristics of two groups are designated by combinations of group symbols.

PARTICLE SIZE LIMITS

SILT OR CLAY	SAND			GRAVEL		COBBLES	BOULDERS
	FINE	MEDIUM	COARSE	FINE	COARSE		

NO. 200 NO. 40 NO. 10 NO. 4 3/4 in. 3 in. (12 in.)

U. S. STANDARD SIEVE SIZE

UNIFIED SOIL CLASSIFICATION SYSTEM

Reference :
The Unified Soil Classification System, Corps of Engineers, U.S. Army Technical Memorandum No. 3-357, Vol. 1, March, 1953. (Revised April, 1960)

LAW/CRANDALL, INC.

Analytical Report

LOG NO: G91-04-139

Received: 08 APR 91

Mailed: APR 24 1991

Ms. Joan Lundy
LeRoy Crandall & Associates
900 Grand Central Ave.
Glendale, CA 91201-3009

Project: L91096 AFB

REPORT OF ANALYTICAL RESULTS

LOG NO	SAMPLE DESCRIPTION, GROUND WATER SAMPLES	DATE SAMPLED
04-139-1	Boring B-21	08 APR 91
04-139-2	Boring B-22	08 APR 91

PARAMETER	04-139-1	04-139-2
Oil and Grease, gravimetric, mg/L	<5	9
Sulfide, mg/L	<0.1	<0.1
Biochemical Oxygen Demand, mg/L	<7	<7
Nitrate plus nitrite (as N), mg/L	<0.05	0.07
Turbidity, NTU	6.7	6.9
Phenolics, mg/L	0.11	0.20
pH, Units	6.8	7.1
Filterable Residue (TDS), mg/L	48000	44000
Non-filterable Residue (TSS), mg/L	43	26
Settleable Solids, mL/L	40	50
Chloride, mg/L	25000	19000
Sulfate, mg/L	6500	6600
Lead by Graphite Furnace, mg/L	0.24	0.018
Nitric Acid Digestion, Date	04/12/91	04/12/91

801 Western Avenue
Glendale, CA 91201

818/247-5737
Fax: 818/247-9797

BCA *B C Analytical*

Analytical Report

LOG NO: G91-04-139

Received: 08 APR 91

Ms. Joan Lundy
LeRoy Crandall & Associates
900 Grand Central Ave.
Glendale, CA 91201-3009

Project: L91096 AFB

REPORT OF ANALYTICAL RESULTS

LOG NO	SAMPLE DESCRIPTION, GROUND WATER SAMPLES	DATE SAMPLED
04-139-1	Boring B-21	08 APR 91
04-139-2	Boring B-22	08 APR 91

PARAMETER	04-139-1	04-139-2
Pesticides/PCBs (EPA 8080)		
Date Analyzed	04/15/91	04/15/91
Date Extracted	04/12/91	04/12/91
Dilution Factor, Times 1	1	1
Aldrin, ug/L	<0.04	<0.04
Chlordane, ug/L	<0.3	<0.3
p,p'-DDD, ug/L	<0.04	<0.04
p,p'-DDE, ug/L	<0.04	<0.04
p,p'-DDT, ug/L	<0.04	<0.04
Dieldrin, ug/L	<0.04	<0.04
Endosulfan I, ug/L	<0.04	<0.04
Endosulfan II, ug/L	<0.05	<0.05
Endosulfan sulfate, ug/L	<0.05	<0.05
Endrin, ug/L	<0.07	<0.07
Endrin aldehyde, ug/L	<0.04	<0.04
Heptachlor epoxide, ug/L	<0.04	<0.04
Heptachlor, ug/L	<0.04	<0.04
Methoxychlor, ug/L	<0.2	<0.2
Aroclor 1016, ug/L	<0.6	<0.6
Aroclor 1221, ug/L	<0.6	<0.6
Aroclor 1232, ug/L	<0.6	<0.6
Aroclor 1242, ug/L	<0.6	<0.6
Aroclor 1248, ug/L	<0.6	<0.6
Aroclor 1254, ug/L	<0.6	<0.6
Aroclor 1260, ug/L	<0.6	<0.6
Aroclor 1262, ug/L	<0.6	<0.6
Toxaphene, ug/L	<0.5	<0.5

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Ms. Joan Lundy
LeRoy Crandall & Associates
900 Grand Central Ave.
Glendale, CA 91201-3009

Project: L91096 AFB

REPORT OF ANALYTICAL RESULTS

LOG NO	SAMPLE DESCRIPTION, GROUND WATER SAMPLES	DATE SAMPLED
04-139-1	Boring B-21	08 APR 91
04-139-2	Boring B-22	08 APR 91

PARAMETER	04-139-1	04-139-2
BHC, alpha isomer, ug/L	<0.04	<0.04
BHC, beta isomer, ug/L	<0.04	<0.04
BHC, delta isomer, ug/L	<0.04	<0.04
BHC, gamma isomer (Lindane), ug/L	<0.04	<0.04

801 Western Avenue
Glendale, CA 91201

818/247-5737
Fax: 818/247-9797

BCA *B C Analytical*

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LOG NO: G91-04-139

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Ms. Joan Lundy
LeRoy Crandall & Associates
900 Grand Central Ave.
Glendale, CA 91201-3009

Project: L91096 AFB

REPORT OF ANALYTICAL RESULTS

LOG NO	SAMPLE DESCRIPTION, GROUND WATER SAMPLES	DATE SAMPLED
04-139-1	Boring B-21	08 APR 91
04-139-2	Boring B-22	08 APR 91

PARAMETER	04-139-1	04-139-2
Vol.Pri.Poll. (EPA-8240)		
Date Analyzed	04/11/91	04/11/91
Dilution Factor, Times 1	1	1
1,1,1-Trichloroethane, ug/L	<1	<1
1,1,2,2-Tetrachloroethane, ug/L	<1	<1
1,1,2-Trichloroethane, ug/L	<1	<1
1,1-Dichloroethane, ug/L	<1	<1
1,1-Dichloroethene, ug/L	<1	<1
1,2-Dichloroethane, ug/L	<1	<1
1,2-Dichlorobenzene, ug/L	<1	<1
1,2-Dichloropropane, ug/L	<1	<1
1,3-Dichlorobenzene, ug/L	<1	<1
1,4-Dichlorobenzene, ug/L	<1	<1
2-Chloroethylvinylether, ug/L	<1	<1
2-Hexanone, ug/L	<10	<10
Acetone, ug/L	<50	<50
Acrolein, ug/L	<50	<50
Acrylonitrile, ug/L	<20	<20
Bromodichloromethane, ug/L	<1	<1
Bromomethane, ug/L	<1	<1
Benzene, ug/L	<1	<1
Bromoform, ug/L	<1	<1
Chlorobenzene, ug/L	<1	<1
Carbon Tetrachloride, ug/L	<1	<1
Chloroethane, ug/L	<1	<1
Chloroform, ug/L	<1	<1
Chloromethane, ug/L	<2	<2

801 Western Avenue
Glendale, CA 91201

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BCA *B C Analytical*

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LOG NO: G91-04-139

Received: 08 APR 91

Ms. Joan Lundy
LeRoy Crandall & Associates
900 Grand Central Ave.
Glendale, CA 91201-3009

Project: L91096 AFB

REPORT OF ANALYTICAL RESULTS

LOG NO	SAMPLE DESCRIPTION, GROUND WATER SAMPLES	DATE SAMPLED
04-139-1	Boring B-21	08 APR 91
04-139-2	Boring B-22	08 APR 91

PARAMETER	04-139-1	04-139-2
Carbon Disulfide, ug/L	<2	<2
Dibromochloromethane, ug/L	<1	<1
Ethylbenzene, ug/L	<1	<1
Freon 113, ug/L	<1	<1
Methyl ethyl ketone, ug/L	<10	<10
Methyl isobutyl ketone, ug/L	<5	<5
Methylene chloride, ug/L	<2	<2
Styrene, ug/L	<1	<1
Trichloroethene, ug/L	<1	<1
Trichlorofluoromethane, ug/L	<1	<1
Toluene, ug/L	<1	<1
Tetrachloroethene, ug/L	<1	<1
Vinyl acetate, ug/L	<5	<5
Vinyl chloride, ug/L	<1	<1
Total Xylene Isomers, ug/L	<5	<5
cis-1,2-Dichloroethene, ug/L	<1	<1
cis-1,3-Dichloropropene, ug/L	<1	<1
trans-1,2-Dichloroethene, ug/L	<1	<1
trans-1,3-Dichloropropene, ug/L	<1	<1
Other Vol.Pri.Poll. (EPA-8240)	---	---

801 Western Avenue
Glendale, CA 91201

818/247-5737
Fax: 818/247-9797

BCA *B C Analytical*

Analytical Report

LOG NO: G91-04-139

Received: 08 APR 91

Ms. Joan Lundy
LeRoy Crandall & Associates
900 Grand Central Ave.
Glendale, CA 91201-3009

Project: L91096 AFB

REPORT OF ANALYTICAL RESULTS

LOG NO	SAMPLE DESCRIPTION, GROUND WATER SAMPLES	DATE SAMPLED
04-139-3	Boring B-21	08 APR 91
04-139-4	Boring B-22	08 APR 91

PARAMETER	04-139-3	04-139-4
TPH - Modified 8015		
Date Analyzed	04/09/91	04/09/91
Dilution Factor, Times 1	1	1
Total Fuel Hydrocarbons, mg/L	<1	<1
Other TPH - Modified 8015	---	---

Jeffrey A. Erion, Laboratory Manager

801 Western Avenue
Glendale, CA 91201

818/247-5737
Fax: 818/247-9797

B C Analytical

Analytical Report

LOG NO: G91-05-605

Received: 30 MAY 91

Mailed: JUN 13 1991

Ms. Joan Lundy
LeRoy Crandall and Associates
900 Grand Central Avenue
Glendale, California 91201

Project: L91096AFB

REPORT OF ANALYTICAL RESULTS

LOG NO	SAMPLE DESCRIPTION, SEA WATER SAMPLES	DATE SAMPLED
05-605-1	Marina Del Rey Sea Water	29 MAY 91

PARAMETER	05-605-1
Lead by Graphite Furnace, mg/L	<0.01
Nitric Acid Digestion, Date	06/04/91

Jeffrey A. Erion, Laboratory Manager

801 Western Avenue
Glendale, CA 91201

818/247-5737
Fax: 818/247-9797

BCA B C Analytical

CHAIN OF CUSTODY RECORD

BCA Log Number 04-139

Client name: Le Roy Crandall	Project or PO#: L91096 AFB
Address: 900 Grand Central Ave	Phone #:
City, State, Zip: Glendale CA 91201	Report attention: Joan Lunaly

Sampled by: Matt F

Lab Sample number	Date sampled	Time sampled	Type* See key below	Sample description	Number of containers	Suspended Solids 160.2	BOD 405.1	Oil & Grease 413.1	Turbidity 180.1	Settleable Solids 160.5	Sulfides 376.2	TPH 8015	EPA 624 Phenols 420.1	Total Chlorides 325.3	TDS 160.1	Sulfates 375.3	Nitrates + Nitrites 353.2	Hazardous sample Special handling required	Remarks
	4-8-91	0900	grab	Boring B-21	14	X	X	X	X	X	X	X	X	X	X	X	X	No	
	4-8-91	1100	grab	Boring B-22	14	X	X	X	X	X	X	X	X	X	X	X	X	No	
NA																			

	Signature	Print Name	Company	Date	Time
Relinquished by	Matt Haughneaud	Matt Haughneaud	Le Roy Crandall	4-8-91	1:00pm
Received by					
Relinquished by					
Received by					
Relinquished by					
Received by Laboratory	Larry Lem	LARRY LEIM	BCA	04-08-91	1400

B C ANALYTICAL

- ☐ 1255 Powell Street, Emeryville, CA 94608 (415) 428-2300
- ☐ 801 Western Avenue, Glendale, CA 91201 (818) 247-5737
- ☐ 1200 Pacifico Avenue, Anaheim, CA 92805 (714) 978-0113

Note: Samples are discarded 30 days after results are reported unless other arrangements are made. Hazardous samples will be returned to client or disposed of at client's expense.

Disposal arrangements: _____

*KEY: AQ—Aqueous NA—Nonaqueous SL—Sludge GW—Groundwater SO—Soil OT—Other PE—Petroleum

DISTRICT

CHAIN OF CUSTODY RECORD

BCA Log Number 6C 5-605

Client name	Project or PO#
LeNoy Construction	L91096 AF13
Address	**Phone #**
900 Grand Central Ave.	(818) 243-4140
City, State, Zip	**Report attention**
Glendale CA 91201	John Lundy

Analyses required: Lead by Graphite Furnace; Hazardous sample Special handling required

Lab Sample number	Date sampled	Time sampled	Type* See key below	Sampled by / Sample description	Number of containers	Lead by Graphite Furnace	Hazardous sample Special handling required	Remarks
	5/29/91	4:05PM	AQ	Marina Del Rey	1	X		

	Signature	Print Name	Company	Date	Time
Relinquished by	Ray Gruitzmacher	Ray Gruitzmacher	LCA		
Received by		Lee Ingram	BCA	5-30-91	7:45
Relinquished by					
Received by					
Relinquished by					
Received by Laboratory					

B C ANALYTICAL

- ☐ 1255 Powell Street, Emeryville, CA 94608 (415) 428-2300
- ☐ 801 Western Avenue, Glendale, CA 91201 (818) 247-5737
- ☐ 1200 Pacifico Avenue, Anaheim, CA 92805 (714) 978-0113

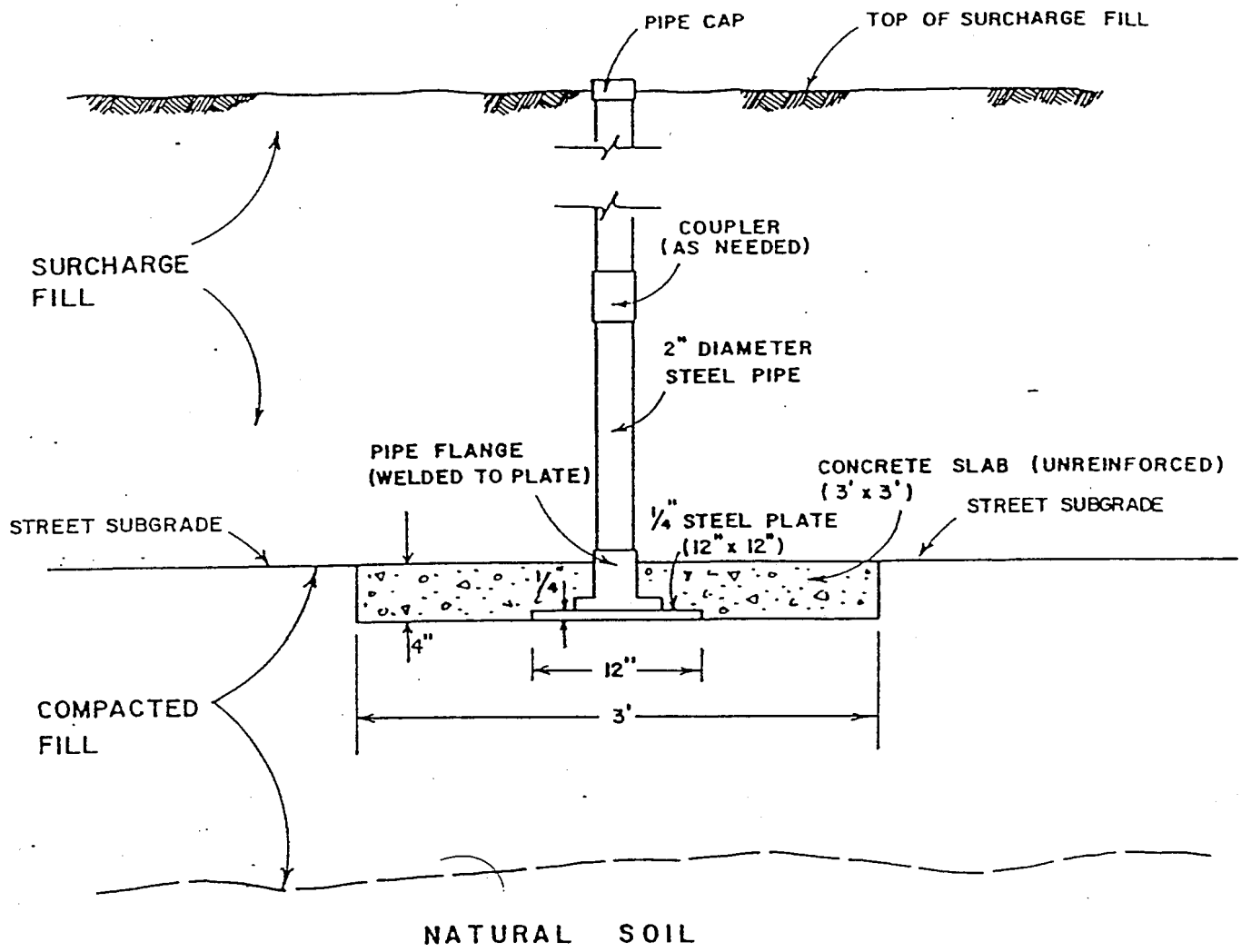
Note: Samples are discarded 30 days after results are reported unless other arrangements are made. Hazardous samples will be returned to client or disposed of at client's expense.

Disposal arrangements: _____

*KEY: AQ—Aqueous NA—Nonaqueous SL—Sludge GW—Groundwater SO—Soil OT—Other PE—Petroleum

DATE 5

JOB L1014.AFB DATE 7-21-91 DR. Vmr - O.E. _____ W.P. _____ CHKD. _____



SETTLEMENT MONUMENT DETAIL

SCALE 1" = 1'

LAW/CRANDALL, INC.

PLATE 6

APPENDIX G

PHASE II ENVIRONMENTAL SITE ASSESSMENT

LAW/CRANDALL, INC.

ENGINEERING AND ENVIRONMENTAL SERVICES

REPORT OF

PHASE II ENVIRONMENTAL SITE ASSESSMENT

FORMER CELERY DUMP SITE

PLAYA VISTA PROJECT – PARCEL A

LINCOLN AND CULVER BOULEVARDS

LOS ANGELES, CALIFORNIA

FOR

MAGUIRE THOMAS PARTNERS

(L91096.FC)

APRIL 7, 1992

LAW/CRANDALL, INC.
ENGINEERING AND ENVIRONMENTAL SERVICES

April 7, 1992

Maguire Thomas Partners
13250 Jefferson Boulevard
Los Angeles, California 90094

Attention: Mr. Joel Stensby
Vice President

Ladies/Gentlemen:

We are please to submit our "report of Phase II Environmental Site Assessment, Former Celery Dump Site, Playa Vista Project - Parcel A, Lincoln and Culver Boulevard, Los Angeles, California, for Maguire Thomas Partners." The scope of our assessment was authorized by you Task Order Number 1227, dated November 13, 1991.

The assessment was performed to evaluate whether landfill materials are still present on site, and to evaluate whether chemical contaminants associated with the former landfill have adversely impacted soil or groundwater beneath the site. We did not find any evidence that the former dump or dump materials still exist on the property. The findings of our assessment and our conclusions and recommendations regarding the site are presented in the report.

We appreciate the opportunity to provide this service for you, and look forward to continuing as your environmental consultants on this project. Please call if you have any questions or need questions or need additional information.

Respectfully submitted,

LAW/CRANDALL, INC.

Herbert M. Spitz, C.E.G. 1603
Senior Geologist

James Van Beveren
Vice President
Director of Engineering Services

H:/MTP.ltr:kz
(3 copies submitted)

REGISTERED GEOLOGIST HERBERT M. SPITZ No. 1603 CERTIFIED ENGINEERING GEOLOGIST STATE OF CALIFORNIA

REGISTERED PROFESSIONAL ENGINEER JAMES L. VAN BEVEREN No. 852 Exp. 6-30-97 GEOTECHNICAL STATE OF CALIFORNIA

200 CITADEL DRIVE • LOS ANGELES, CA 90040
(213) 889-5300 • FAX (213) 721-6700

TABLE OF CONTENTS

REPORT OF

PHASE II ENVIRONMENTAL SITE ASSESSMENT

FORMER CELERY DUMP SITE

PLAYA VISTA PROJECT – PARCEL A

LINCOLN AND CULVER BOULEVARDS

LOS ANGELES, CALIFORNIA

FOR

MAGUIRE THOMAS PARTNERS

EXECUTIVE SUMMARY

Law/Crandall, Inc. has performed a Phase II environmental assessment at the site of a former landfill known as the Celery Dump, located on the eastern portion on Parcel A of the proposed Playa Vista Development, in the Marina Del Rey district of Los Angeles County. The purpose of our assessment was to evaluate whether landfill materials are still present on site, and to evaluate whether chemical contaminants associated with the former landfill have adversely impacted the soil or ground water beneath the site. The assessment included reviewing previous investigation reports and available historical records for information pertinent to the Celery Dump, drilling and sampling nine exploratory soil borings, installing five ground water monitoring wells, and laboratory analysis of soil and ground water samples.

Information reviewed for this assessment indicates the Celery Dump was operated on the eastern portion of Parcel A from approximately 1945 through 1953. The material disposed of in the landfill was packing house waste, consisting of celery leaves and trimmings, that was allowed to decompose at the surface prior to being annually disced into the soil. The refuse was periodically sprayed with a mixture of fuel oil and the pesticide Lindate (benzene hexachloride) for insect control.

Based on the findings of our assessment, there is no evidence that substantial amounts of landfill materials are currently present within subsurface soils at the site as the result of operation of the Celery Dump. No evidence of debris fill or other probable landfill material was encountered in our current borings or in 11 borings previously drilled on the eastern portion of Parcel A at or in the vicinity of the reported Celery Dump location.

Our assessment found no evidence that chemical contaminants known to be associated with the landfill have adversely impacted the soil or ground water beneath the site. Laboratory analyses of soil and ground water samples indicated no detected concentrations of total petroleum hydrocarbons or the pesticide Lindane in the samples analyzed.

Laboratory analysis of ground water samples indicated no detected concentrations of nitrate or semi-volatile organic compounds in the samples. No concentrations of aromatic hydrocarbons or volatile halocarbons were detected in the ground water samples except for BTEX (benzene, toulene, ethylbenzene, and xylenes), which was detected in four of the five water samples during our initial ground water sampling; however, resampling these wells detected none of these compounds except for trace level of toluene in one sample. It is our opinion that the BTEX concentrations detected were probably induced during the field activities, and are not indicative of ground water conditions beneath the site.

Elevated lead concentrations were detected in two soil samples and elevated concentrations of several metals (arsenic, barium, cadmium, chromium, copper, lead, nickel, silver, and zinc) were detected in ground water samples from several of the monitoring wells during our investigation. The origin of these elevated metal concentrations is unknown; however, our investigation found no evidence that materials likely to have been the source of this contamination were disposed of in the Celery Dump landfill. The elevated metal levels in the ground water samples may have resulted from the leaching of metals from hydraulic fill placed on the site during the dredging of Marina Del Rey to the north.

SCOPE

This report presents the results of our Phase II environmental assessment of the site of a former landfill known as the Celery Dump, located on the eastern portion of Parcel A of the proposed Playa Vista Development. The purpose of our investigation was to evaluate whether landfill materials are still present on site, and to evaluate whether chemical contaminants associated with the former landfill have adversely impacted the soil or ground water beneath the site.

We previously performed a preliminary Phase I environmental assessment of Parcel A and submitted our report on December 21, 1988 (F-88473). We performed a preliminary geotechnical investigation on Parcel A in 1988 and submitted our report in draft form on April 4, 1988; a final version of this report was submitted on August 6, 1991 (L91096.AFB). We performed ground water monitoring well installation and a water quality study on Parcels A, B, C, and D of the proposed Playa Vista project in 1990, and submitted a report of our findings on August 21, 1990 (L90261.FO). A supplemental report presenting additional findings on soil and ground water conditions and additional geotechnical recommendations for Parcel A was submitted on August 7, 1991 (L91096.AFB).

The scope of this Phase II assessment included a review of the findings of our previous investigation reports, available historical records, and historical aerial photographs and maps for information pertinent to the Celery Dump. The field investigation portion of our assessment included drilling and sampling nine approximately 15-foot-deep soil borings. The borings were drilled in areas previously uninvestigated on the eastern portion of Parcel A, on a grid with about 400-foot spacing. Five of the borings were deepened to approximately 30 feet and completed as ground water monitoring wells. Selected soil samples from the borings were analyzed for total petroleum hydrocarbons, pesticides, Title 22 metals, and for total lead. Ground water samples from the

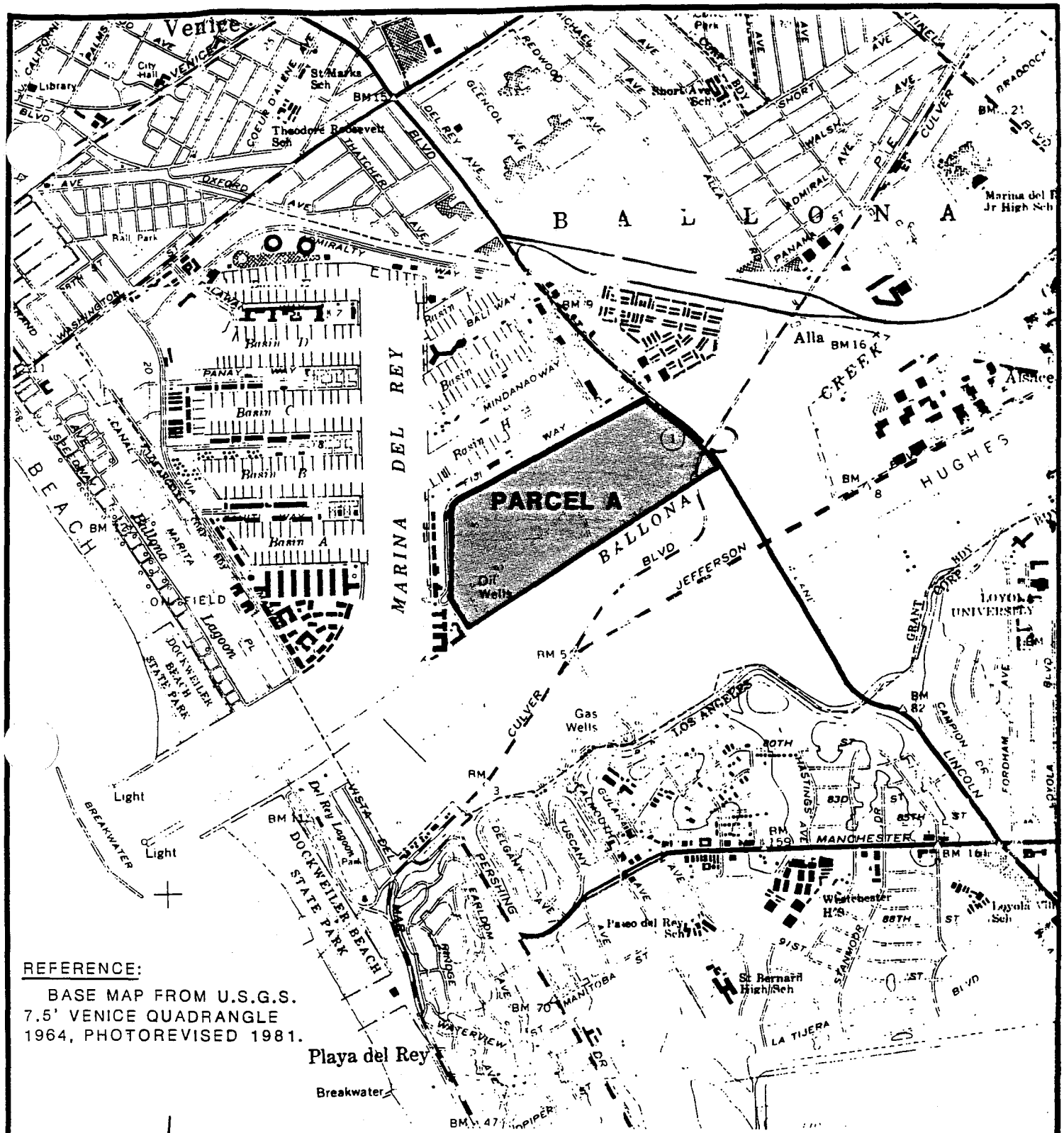
monitoring wells were analyzed for total petroleum hydrocarbons, aromatic hydrocarbons, volatile halocarbons, pesticides, Title 22 metals, nitrate, and for semi-volatile priority pollutants.

Parcel A is shown in relation to surrounding features on Plate 1, Vicinity Map. The approximate former location of the Celery Dump and the locations of borings and monitoring wells from our current and previous investigations on Parcel A are shown on Plate 2, Site Plan. A Spence aerial photograph showing site conditions in 1952 is attached as Plate 3.

The professional opinions presented in this report have been developed using that degree of care and skill ordinarily exercised, under similar circumstances, by reputable geotechnical consultants practicing in this or similar localities. No other warranty, expressed or implied, is made as to the professional advice included in this report. This report has been prepared for Maguire Thomas Partners and their consultants to be used solely in evaluating potential environmental implications at the subject site. The report has not been prepared for use by other parties, and may not contain sufficient information for purposes of other parties or other uses.

SITE CONDITIONS

The site is located on the eastern portion of Parcel A, which is located northwest of Lincoln and Culver Boulevards in the Marina Del Rey district of Los Angeles County. Parcel A is bordered on the north and northwest by Fiji Way and on the southeast by the Ballona Creek channel. Seven oil wells are located on the western portion of Parcel A. One of these wells is currently abandoned; the remaining six wells are used by Southern California Gas Company for monitoring and withdrawal of natural gas from a subterranean storage reservoir.



REFERENCE:

BASE MAP FROM U.S.G.S. 7.5' VENICE QUADRANGLE 1964, PHOTOREVISED 1981.

VICINITY MAP

SCALE 1"= 2000'

LAW/CRANDALL, INC.

PLATE 1

FORM 120-A

The site is currently covered with weeds and is vacant, except for various dirt roads and paths that cross the site. The site is fenced to restrict access.

SITE HISTORY REVIEW

REVIEW OF PREVIOUS INVESTIGATION REPORTS

General

We reviewed the findings of our previous investigations, including boring logs and laboratory analytical results, for historical information regarding the Celery Dump and for general information on the soil and ground water conditions in the vicinity. The boring logs and monitoring well details from our previous investigations are presented in Appendix A. The analytical results and Chain-of-Custody documentation from our previous investigations are presented in Appendix B.

Preliminary Phase I Environmental Assessment (F-88473)

The findings of our previous preliminary Phase I investigation indicated that a landfill known as the Celery Dump was located on the eastern portion of Parcel A from 1945 through 1953. The location of this facility was reported in various regulatory agency records as 800 feet north and either 500 or 800 feet west of the intersections of Lincoln and Culver Boulevards. The landfill, which reportedly covered between 5 and 10 acres, was used for the disposal of packing house wastes, primarily vegetable refuse consisting of celery leaves and trimmings, that were placed on site in piles up to 4 feet high and periodically sprayed with a mixture of benzene hexachloride (Lindane) and fuel oil for insect control. The decomposed refuse was annually disced into the soil.

Preliminary Geotechnical Investigation (L91096.AFB)

Our preliminary geotechnical investigation in 1988 included 20 soil borings drilled on Parcel A to depths of up to about 60 feet below ground surface. One of these borings, Boring 11, was drilled near the reported center of the former location of the Celery

Dump, while four additional borings, Borings 6, 10, 15, and 16, were drilled in the vicinity west and south of Boring 11. These five borings encountered up to 12.5 feet of artificial fill overlying natural soil; however, only traces of organic material were encountered in these soils, which generally consisted of silt, clay, and silty sand. No evidence of debris fill or other substantial amounts of probable landfill material was encountered in the borings drilled on the eastern portion of Parcel A.

Ground Water Monitoring Well Installation and Water Quality Study (L90261.FO)

Our ground water monitoring well installation and water quality study conducted in 1990 included the installation of two ground water monitoring wells on Parcel A. Well MW-8 was installed on the western portion of the parcel and Well MW-9 was installed on the eastern portion of the parcel, just southwest of the former Celery Dump location. Boring MW-9 encountered about 8.5 feet of fill soils; no organic materials were noted within these soils. Laboratory analysis of soil samples to determine electrical conductivity indicated values ranging from 4,760 to 16,500 micromhos (μmhos) within the upper 6 feet of soil, generally indicative of brackish water conditions. Field measurements of electrical conductivity in ground water samples from the wells indicated conductivity values greater than 10,000 μmhos, also indicative of brackish or saline water. Ground water samples from Wells MW-8 and MW-9 were analyzed for volatile and extractable priority pollutants by EPA Methods 8240 and 8270, respectively; for metals by EPA Method 6010/7000; and for pesticides/PCBs by EPA Method 8080. None of the priority pollutants or pesticides/PCBs were present at concentrations at or above the laboratory detection limits. Trace concentrations of several metals were detected in ground water samples from these wells. None of the concentrations detected were in excess of established maximum contaminant levels for drinking water. However, concentrations of copper (90 micrograms per liter [μg/L]) and nickel (110 μg/L) in Well MW-9 exceeded the "instantaneous maximum limiting concentrations" (30 and 50 μg/L, respectively) under the California Ocean Plan (revised March 1990).

Supplemental Investigation (L91096.AFB)

Our supplemental investigation in 1991 included four additional borings drilled on Parcel A. One of the borings, Boring 21, was drilled on the western portion of Parcel A. Three of these borings, Borings 22 through 24, were drilled east of Boring 11, at and adjacent to the reported location of the Celery Dump. These borings encountered up to about 11 feet of fill soils with only minor amounts of organic materials, which consisted primarily of rootlets and grass. Ground water samples obtained from Borings 21 and 22 were analyzed for pesticides/PCBs by EPA Method 8080, volatile organic compounds (volatile priority pollutants) by EPA Method 8240, and total petroleum hydrocarbons by modified EPA Method 8015. None of these constituents were present in concentrations at or above laboratory detection limits. Laboratory analysis of the ground water samples for general mineral constituents such as total dissolved solids (TDS), chloride, and sulfate indicated elevated concentrations of these constituents. TDS values ranged from 44,000 to 48,000 milligrams per liter (mg/L), chlorides ranged from 19,000 to 25,000 mg/L, and sulfate ranged from 6,500 to 6,600 mg/L. These concentrations confirmed previous field measurements indicating that water beneath the site is brackish or saline.

REVIEW OF RECORDS

Regulatory Agency Records

The Celery Dump is listed in Rank 5 of the "Ranked List of Solid Waste Disposal Sites," dated December 18, 1987 by the State Water Resources Control Board. We reviewed available regulatory agency records regarding the former Celery Dump. Information obtained from the Los Angeles County Sanitation District's computer database indicates that the Celery Dump was located 800 feet north of Culver Boulevard and 500 feet west of Lincoln Boulevard. No additional information about this facility was available on the data base.

We reviewed a file on the Celery Dump (File No. I-625-2) at the Los Angeles County Public Works Department, Waste Management Division. According to information in

the file, the address of the landfill was 5005 South Lincoln Boulevard. The owner of the property was indicated to be Rancho Del Rey, and the operator of the landfill was the American Fruit Association. Two additional packing houses, D'Arrigo Brothers and Deardroff-Jackson Company, also disposed of trimmings at the site. File information indicated the Celery Dump operated from 1945 through at least 1952, the last year in which the records indicate dumping occurred. The records indicate that the facility was operated from 1945 through 1950 without a permit, but was permitted from 1950 through 1953. No records more recent than 1953 are in the file, and no information is available as to exactly when operations ceased. The file on the Celery Dump was closed by the Los Angeles County Engineer's Department in 1961.

The location of the Celery Dump was reported on various County inspection reports from 1950 through 1953 as 800 feet north of Culver Boulevard and either 500 or 800 feet west of Lincoln Boulevard. The landfill reportedly covered from 5 to 10 acres. A permit in the file dated 1950 indicated that the land area to be used for the Celery Dump was located between 600 and 1,200 feet west of Lincoln Boulevard and between about 500 and 1,100 feet north of the intersection of Lincoln and Culver Boulevards. Inspection reports and memoranda from 1949 reported several different coordinates for the location of the landfill; these included 1,000 feet west of Culver Boulevard and 600 feet south of Lincoln Boulevard, within 300 feet of Lincoln Boulevard, 100 feet west of the intersection of Lincoln and Culver Boulevards, and 1,000 feet west of Culver and 600 feet south of Sepulveda Boulevard. It was not noted in the file whether these coordinates were all known historic locations of dumping, or whether they were reported locations obtained from various sources. No records prior to 1949 were on file.

Available records from 1949 indicate that the landfill was operated for approximately 90 days per year, from the start of the celery season on April 15 through its end on July 15th. Celery trimmings were trucked to the site seven days a week and piled to a depth of 4 feet. It was estimated that an average of approximately 300 cubic yards of

trimmings were dumped at the site each day, for a seasonal total of 27,000 cubic yards. An inspection report from December 1949 indicated that decomposition of the trimmings was fairly complete, as an area that was observed to have been covered by 4-foot-high piles of trimmings in June was observed to be covered by a residual layer approximately 1 inch thick in December. Following decomposition, the residual material was annually disced into the soil.

The reports indicated that the dump was periodically sprayed during the dumping season to control flies and odor. Inspection reports indicate that the possibility was considered that the dump might contaminate the underlying ground water, estimated at that time to be at a depth of approximately 10 feet. It was concluded that the only potential for adverse impact was from the "fly spray," a mixture of benzene hexachloride (Lindane) and fuel oil, that was used for insect control; however, it was further concluded that "it is not believed that any degree of pollution would result," because of the small quantities used. The amount of Lindane applied during each use or the frequency of application was not specified.

None of the file information indicated that substantial amounts of material other than packing house waste was placed on the site. A note from one inspection report from 1949 indicated that 75 to 100 cubic yards of trash was observed to have been "bootlegged" onto the site. No other reports of trash dumping were on file.

Aerial Photographs

Historic aerial photographs from the Spence Collection at UCLA were reviewed for additional information regarding landfill activities at the Celery Dump facility. Coverage of the site vicinity was available from 1928 through 1970; photographs of Parcel A were found dated 1928, 1930, 1933, 1934, 1937, 1938, 1941, 1947-1949, 1951-1953, 1957-1962, 1964, 1966, and 1968-1970. No identifiable landfill activities were discernable on the photographs reviewed. In the 1937 photograph, the southern portion of Parcel A appears

to be covered with fill soil, apparently from the recently excavated Ballona Creek channel to the south. The eastern portion of Parcel A, within approximately 600 feet of Lincoln Boulevard, was observed to be covered with what appear to be numerous piles of fill in photographs from February 1938 and March 1941. These photographs were taken at least 4 years prior to the reported start of dumping at the Celery Dump, so the piles observed may have been imported fill soils, rather than vegetable refuse or other landfill materials. This area appears to have been disced or possibly cultivated in photographs from 1947 through 1959; a photograph from 1952 is shown on Plate 3. Since this time period includes the years of operation of the Celery Dump, it is possible that the apparent discing of the eastern portion of Parcel A observed in the photographs may have been the discing referred to in records of the dump's operation (see previous section). The eastern portion of the site no longer has this disced appearance in a 1961 photograph, but appears to be covered with brush. In 1962 photographs, Parcel A is surrounded by a dike and completely covered with water during the dredging of Marina Del Rey to the north. Photographs from 1964 through 1970 show site conditions similar to at present.

Topographic Maps

We reviewed historic topographic maps for information regarding changes in topographic or cultural features in the site vicinity. Maps reviewed were dated 1942, 1950, 1972, and 1981. The maps from 1942 and 1950 indicated that during that time, the 10-foot elevation contour (10 feet above mean sea level) ran north-south through the approximate center of the reported Celery Dump location, about 600 feet west of Lincoln Boulevard, while the 5-foot elevation contour was 300 feet further to the west, about 900 feet west of Lincoln Boulevard. The 1972 and 1981 maps indicate a relatively uniform elevation of slightly less than 15 feet above sea level for the eastern portion of Parcel A. This suggests that an average of about 5 feet of fill has been placed on the central portion of the former Celery Dump site since 1950, with about 10 feet having been

placed to the west. The majority of this fill was probably placed hydraulically during the dredging of Marina Del Rey during the early 1960s.

HYDROGEOLOGIC CONDITIONS

The site is located within the Santa Monica Hydrologic Subarea of the Los Angeles Coastal Plain in Section 22 of Township 2 South, Range 15 West, of the San Bernardino Base Meridian. The site is approximately 1.4 miles inland from the Pacific Ocean, at an elevation ranging from about 10 to 15 feet above sea level (U.S. Geological Survey datum). Local artificial fill deposits composed of sandy to clayey silt, silty sand, sand, and silty to sandy clay ranging from 5 to 10.5 feet in thickness were encountered in borings drilled during our current investigation. Beneath the artificial fill, the site is underlain by Holocene age alluvium that constitutes a portion of the underlying ground water reservoir. The Holocene alluvium is estimated to extend to a depth of approximately 100 feet below ground surface (DWR Bulletin No. 104, 1961). The upper section of the alluvium consists predominantly of silty clay and silt and extends to depths of about 50 to 70 feet. The lower section consists of a sand and gravel zone composing the Ballona aquifer, which is commonly known to as the "50-foot gravel" (Poland, 1959). The Silverado Aquifer of the lower Pleistocene age San Pedro Formation is thought to directly underlie the Holocene age alluvium, including the Ballona Aquifer. The Silverado Aquifer is one of the most important ground water-producing zones in the coastal plain, and is estimated to range from 100 to 200 feet beneath the site.

Ground water occurs near sea level in the site vicinity. Regional ground water movement is locally influenced by pumping, with the gradient generally towards ground water pumping depressions. Ground water quality in the site vicinity is generally considered degraded because of past overproduction of ground water and resulting sea water intrusion. Water quality data obtained by our previous investigations indicated brackish or saline water beneath the site. South of the site is Ballona Creek, which is channelized,

and is locally fed by Centinela Creek and the Sepulveda Channel, located 0.5 and 1.8 miles northeast of the Lincoln Boulevard overpass at Ballona Creek, respectively.

Ground water movement beneath Parcel A was observed to be to the southeast during our water quality study in 1990.

INVESTIGATION

GENERAL

Drilling, soil sampling, and ground water monitoring well installation were conducted from December 16 through 19, 1991. Well development and ground water sampling were performed on December 20 and 21, 1991. Ground water elevations in the monitoring wells were monitored on December 20, 21, and 26, 1991. The monitoring well locations and elevations were surveyed on December 26, 1991 by Psomas and Associates. A second round of ground water sampling was conducted on February 5, 1992.

DRILLING AND SOIL SAMPLING

Nine borings, designated B-17 through B-25, were drilled on the eastern portion of Parcel A to explore for organic materials that might be present from the former Celery Dump and to obtain soil samples for chemical analysis. The borings were drilled by Great Sierra Exploration, under the observation of a Law/Crandall field geologist. The borings were drilled to depths of approximately 15 feet using a truck mounted drill rig equipped with an 8-inch-diameter hollow-stem flight auger. Five of the borings, Borings B-17, B-19, and B-20 through B-22, were subsequently reamed and deepened using 12-inch-diameter augers to total depths of approximately 30 feet for monitoring well installation. The locations of the borings are shown on Plate 2.

Discrete soil samples were obtained from the borings at 5-foot intervals to a depths of approximately 15 feet. Additional samples from depths of 20 and 30 feet were obtained

from Boring B-17 for soil classification purposes. The samples were obtained using a 2.5-inch-diameter split-spoon sampler lined with three clean brass sleeves. The sampler was driven 18 inches into undisturbed soils at each sample interval. When the sampler was retrieved, the lowest sample sleeve was removed from the sampler, sealed with Teflon-lined plastic caps and tape, labeled, and placed into a blue-ice chilled ice chest for transport to the laboratory. Soil in the second brass sleeve from each sampling interval was used for headspace monitoring using a Gastechtor Model No. 1238 organic vapor analyzer (OVA) calibrated to 50 parts per million (ppm) of hexane. All drill cuttings and samples were inspected, classified, and logged by our field geologist during the drilling operations. Soil classifications, field observations and OVA readings are presented on the boring logs in Appendix C.

All of the downhole drilling equipment was steam-cleaned prior to use in each boring to minimize the potential of cross-contamination between borings. The sampling equipment was decontaminated between use at each sampling interval by washing in a residue-free detergent solution, followed by a clean water and distilled water rinse.

WELL INSTALLATION AND DEVELOPMENT

The five borings drilled to approximately 30 feet were completed as ground water monitoring wells. The boring numbers and their corresponding well numbers (designated with the prefix "MW") are as follows: B-17 (MW-22); B-19 (MW-23); B-20 (MW-24); B-21 (MW-25); and B-22 (MW-26). The borings were converted to wells by installing flush-threaded, Schedule 40, 4-inch-diameter PVC well casing and screen through the augers. A well screen length of 25 feet was used in all five wells. The screen was placed to bracket the current water level to accommodate future water level fluctuations.

A filter pack consisting of Monterey #3 sand was carefully placed into the annular space surrounding the well screen while the augers were slowly withdrawn from the boring. The filter pack was extended above the screened interval to compensate for potential

settlement of the sand. Following filter pack placement and auger removal, the wells were bailed using a rig-operated bailer to settle the sand pack. Approximately 10 to 15 gallons of water were removed from each well during this procedure. A bentonite seal was then placed above the filter pack, and the remaining annular space was sealed to the ground surface with bentonite-cement grout. The bailer was decontaminated by steam-cleaning prior to use in each well.

The wells were completed at the surface with locking monument-style well vaults that were cemented in the ground within a concrete well pad constructed using ready-mix concrete. The wells were capped with PVC slip caps. The well construction details are presented with the boring logs in Appendix C.

Each well was subsequently developed by removing approximately 55 gallons of water. Wells MW-22 and MW-26 were developed by hand bailing with a 3.5-inch-diameter hand-bailer; the remaining wells were developed using an electric submersible pump. The bailer was decontaminated prior to use in each well by washing in a residue-free detergent solution followed by tap water and distilled water rinses. The pump was decontaminated prior to use in each well by pumping a residue-free detergent solution through it followed by pumping tap-water and distilled water rinses.

GROUND WATER MONITORING AND SAMPLING

Static water levels were monitored in all of the wells on December 20 and 21, 1991, prior to starting well development activities on each of these days. Water levels were measured using an electric water level indicator. Water levels were also measured on December 26, 1991, during surveying activities.

Ground water sampling was conducted on December 20 and 21, 1991, immediately following well development. Samples were obtained using disposable polyethylene bailers. A new bailer was used in each well and discarded after use. Ground water

samples from each well were carefully transferred from the bailer to the appropriate laboratory-supplied containers that were then sealed, labeled, and placed into blue-ice chilled ice chest for transport to the laboratory for analysis.

An additional round of ground water sampling was conducted on February 5, 1992. Prior to sampling, each well was purged of approximately 50 gallons by pumping with an electric submersible pump. Ground water samples were obtained immediately following purging using disposable bailers; a new bailer was used in each well. Decontamination and sample handling procedures were performed as previously described.

ANALYTICAL PROGRAM

The soil and ground water samples were transported in chilled ice chests under chain-of-custody control to American Environmental Testing Laboratory, Inc. (AETL) for analysis. Selected soil samples were analyzed for total petroleum hydrocarbons (TPH) as diesel by modified EPA Method 8015, for pesticides (including Lindane) by EPA Method 8080, for Title 22 (CAM) metals by EPA Method 6010/7000 series, and for total lead by EPA Method 7421. Soil samples from depths of 5 and 10 feet in all of the borings were analyzed for TPH. Soil samples from a depth of 5 feet (from within the fill or just beneath it) in all of the borings were analyzed for pesticides and for metals. The 5-foot soil samples from Borings B-17, B-19, B-20, and B-22 were analyzed for Title 22 metals, while the 5-foot soil samples from the remaining borings were analyzed for total lead.

Five ground water samples, one obtained from each well during sampling activities on December 20 and 21, 1991, were analyzed for TPH as diesel by modified EPA Method 8015; for aromatic hydrocarbons and volatile halocarbons by EPA Methods 602 and 601, respectively; for pesticides by EPA Method 608; for nitrate by EPA Method 353.2; for Title 22 metals by EPA Method 6010/7000 series; and for semi-volatile organic compounds by EPA Method 625. A duplicate water sample from Well MW-24 (Boring

B-20) was also analyzed for these parameters as a check on quality control/quality assurance (QA/QC), in addition to the standard QA/QC procedures conducted in-house by the testing laboratory.

Ground water samples obtained from the five ground water monitoring wells on February 5, 1992 were analyzed for the aromatic hydrocarbons benzene, toluene, ethylene, and total xylenes by EPA Method 602.

The complete laboratory results and Chain-of-Custody documentation are presented in Appendix D.

FINDINGS

GEOLOGIC MATERIALS

The borings encountered up to 10.5 feet of artificial fill consisting of silty sand, sand, sandy and clayey silt, sandy clay, and clay with only minor amounts of organic material noted, consisting of apparent tree roots. Shell fragments were noted in fill soils in several borings. The fill was underlain by natural soils consisting predominantly of clays and silts.

The only elevated OVA reading observed was a reading of 5 ppm in the 5-foot sample from Boring B-17, in fill soils. A slight apparent hydrocarbon odor was noted in a sample from a depth of 6 feet, in fill soils in Boring B-22. No other field evidence of contamination, such as soil staining, unusual odors, or elevated OVA readings, was noted in soils from these borings or from the other borings.

GROUND WATER OCCURRENCE

Ground water was encountered during drilling at depths ranging from 7 to 18 feet below ground surface. Ground water was measured in ground water monitoring wells installed during our current investigation at depths ranging from approximately 8.5 to 17.5 feet below ground surface. Calculated ground water elevations in the monitoring wells on December 26, 1991 ranged from 1.48 feet above to 0.01 feet below mean sea level (MSL). Ground water movement beneath the site was observed to be to the southwest, at a gradient of 0.0018 (9.42 feet per mile). Water level data are presented on the following page in Table 1, Ground Water Monitoring Data. Ground water elevation contours developed from the December 26, 1991 data are shown on Plate 2.

No field evidence of contamination, such as odors or sheen, was noted in the ground water during well development or ground water sampling activities.

LABORATORY RESULTS

Soil Samples

Laboratory results indicated no concentrations of TPH (as diesel, by modified EPA Method 8015) or pesticides, including Lindane, (by EPA Method 8080) were present at or above laboratory detection limits in any of the samples analyzed. The laboratory detection limit for TPH in soil was 10 milligrams per kilogram (mg/kg, approximately equivalent to ppm). The laboratory detection limit for Lindane (gamma benzene hexachloride, or gamma-BHC) in soil was 2 micrograms per kilogram (μg/kg, approximately equivalent to parts per billion).

TABLE 1

GROUND WATER MONITORING DATA

Well Number (Boring Number)	Ground Surface Elevation[1]	Reference Point Elevation[2]	Date Monitored	Depth to Water From Ground Surface	Depth to Water From Reference Point	Ground Water Elevation
MW-22 (B-17)	13.06	15.09	12/20/91 12/21/91 12/26/91	13.72 12.88 12.81	15.75 14.91 14.84	-0.66 0.18 0.25
MW-23 (B-19)	15.21	17.42	12/20/91 12/21/91 12/26/91	13.65 13.84 13.73	15.86 16.05 15.94	1.56 1.37 1.48
MW-24 (B-20)	8.60	10.85	12/20/91 12/21/91 12/26/91	8.83 8.33 8.33	11.08 10.58 10.58	-0.23 0.27 0.27
MW-25 (B-21)	11.19	13.04	12/20/91 12/21/91 12/26/91	10.96 11.13 11.20	12.81 12.98 13.05	0.23 0.06 -0.01
MW-26 (B-22)	15.97	17.43	12/20/91 12/21/91 12/26/91	17.27 15.73 15.71	18.73 17.19 17.17	-1.30 0.24 0.26

Notes: [1] All measurements are in feet. Elevations are referenced to mean sea level (U.S.G.S. datum).
[2] Reference points established at top of well casings on north side. Elevations surveyed on 12/26/91 by Psomas and Associates.

Laboratory results for Title 22 metals (by EPA Method 6010/7000 series) and total lead (by EPA Method 7421) are summarized in Table 2, Title 22 Metals Concentrations in Soil Samples. These results indicated concentrations of these metals within normal ranges in most of the samples analyzed. Elevated lead concentrations were detected in samples from Borings B-20 and B-21, which had lead concentrations of 80 and 83 mg/kg, respectively. All of the metals concentrations detected were well below the total threshold limit concentrations (TTLCs) for hazardous waste characterization, as established by the California Department of Health Services. All of the concentrations, except for the lead levels previously mentioned, were less than 10 times greater than the soluble threshold limit concentrations (STLCs); total concentrations greater than 10 times the STLC generally raise concern that sufficient soluble constituents may be present such that the STLC threshold may be exceeded and the material may be hazardous waste.

The complete analytical results are presented on the laboratory data sheets in Appendix D. The Chain-of-Custody documentation is also included in Appendix D.

Ground Water Samples

Laboratory results indicated no concentrations of TPH (as diesel, by modified EPA Method 8015) were present at or above laboratory detection limits in any of the ground water samples analyzed.

Laboratory results of analyses for aromatic hydrocarbons and volatile halocarbons by EPA Methods 602 and 601, respectively, indicated that none of these compounds were detected except for the aromatic hydrocarbons benzene, toluene, ethylbenzene, and xylenes (BTEX). Relatively consistent concentrations of these compounds were detected in ground water samples from all of the wells except for Well MW-22 during our initial round of sampling in December 1991. Laboratory results of analyses for BTEX (by EPA Method 602) on ground water samples obtained during our additional sampling in February 1992 detected none of these compounds except for toluene, which was present

TABLE 2

TITLE 22 METALS CONCENTRATIONS IN SOIL SAMPLES

Title 22 Metals (mg/kg)	Sample I.D. (Boring No. and Depth)										
	B-17 @ 5	B-18 @ 5	B-19 @ 5	B-20 @ 5	B-21 @ 5	B-22 @ 5	B-23 @ 5	B-24 @ 5	B-25 @ 5	TTLC	STLC
Antimony	<30	- -	<30	<30	- -	<30	- -	- -	- -	500	15
Arsenic	6.2	- -	2	9.3	- -	6.9	- -	- -	- -	500	5.0
Barium	100	- -	15	190	- -	120	- -	- -	- -	10,000	100
Beryllium	<1	- -	<1	<1	- -	<1	- -	- -	- -	75	0.75
Cadmium	1	- -	<0.5	1.6	- -	0.7	- -	- -	- -	100	1.0
Chromium	28	- -	4.5	34	- -	18	- -	- -	- -	500	5.0
Cobalt	14	- -	4.6	18	- -	13	- -	- -	- -	8,000	80
Copper	31	- -	6.3	60	- -	20	- -	- -	- -	2,500	25
Lead	7.6	9.9	3.0	80	83	21	9.7	21	2.2	1,000	5.0
Mercury	<0.1	- -	<0.1	0.3	- -	<0.1	- -	- -	- -	20	0.2
Molybdenum	<15	- -	<15	<15	- -	<15	- -	- -	- -	3,500	350
Nickel	29	- -	6.2	38	- -	20	- -	- -	- -	2,000	20
Selenium	<0.5	- -	<0.5	<0.5	- -	<0.5	- -	- -	- -	100	1.0
Silver	1.9	- -	1	1.8	- -	2.5	- -	- -	- -	500	5.0
Thallium	<1.0	- -	<1.0	<1.0	- -	<1.0	- -	- -	- -	700	7.0

L91096.FC

TABLE 2

TITLE 22 METALS CONCENTRATIONS IN SOIL SAMPLES

Title 22 Metals (mg/kg)	Sample I.D. (Boring No. and Depth)										
	B-17 @ 5	B-18 @ 5	B-19 @ 5	B-20 @ 5	B-21 @ 5	B-22 @ 5	B-23 @ 5	B-24 @ 5	B-25 @ 5	TTLC	STLC
Vanadium	57	- -	<10	66	- -	41	- -	- -	- -	2,400	24
Zinc	70	- -	16	260	- -	81	- -	- -	- -	5,000	250

Notes:
1. mg/kg = milligrams per kilogram.
2. < = less than laboratory detection limit shown.
3. - - = sample not analyzed for this parameter.
4. TTLC = Total Threshold Limit Concentration for Hazardous Waste, established by California Department of Health Services (DHS).
5. STLC = Soluble Threshold Limit Concentration for Hazardous Waste, established by California DHS.

at a trace concentration of 0.8 μg/L in the sample from Well MW-22. It is our opinion that the BTEX concentrations detected in the initial round of sampling were likely induced at some point during the field activities, and are not indicative of actual ground water conditions beneath the site. Laboratory results from analyses for BTEX during both initial sampling and resampling are summarized in Table 3, BTEX Concentrations in Ground Water Samples.

Laboratory results indicated no concentrations of pesticides (by EPA Method 608) or nitrate (by EPA Method 353.2) were present at or above laboratory detection limits in any of the ground water samples analyzed. The laboratory detection limit for the pesticide Lindane in water was 1 μg/L.

The results of the Title 22 metals analysis (by EPA Method 6010/7000 series) detected concentrations of antimony, arsenic, barium, cadmium, chromium, cobalt, copper, lead, nickel, silver, thallium, and vanadium within ground water samples from some of the wells tested. Levels of several of these metals were above the maximum contaminant levels (MCLs) established for these metals within drinking water by the U.S. Environmental Protection Agency (EPA) and the California Department of Health Services (DHS). Metals detected above the MCLs were: arsenic in Wells MW-22, MW-25, and MW-26; barium in Wells MW-22, MW-24, MW-25, and MW-26; cadmium in all of the wells; chromium in Wells MW-22, MW-24, MW-25, and MW-26; copper in Well MW-22; lead in Wells MW-22 and MW-26; and silver in Wells MW-22, MW-23, MW-24, and MW-25. The laboratory results of the metals analyses are summarized along with the established MCL for each metal in Table 4, Title 22 Metals Concentrations in Ground Water Samples.

TABLE 3

BTEX CONCENTRATIONS IN GROUND WATER SAMPLES

Well Number	Date Sample	Benzene (μg/L)	Toluene (μg/L)	Ethylbenzene (μg/L)	Total Xylenes (μg/L)
MW-22	12/21/91 02/05/92	<0.5 <0.5	<0.5 0.8	<0.5 <0.5	<1.5 <1.5
MW-23	12/20/91 02/05/92	18.6 <0.5	70.4 <0.5	22.1 <0.5	109.0 <1.5
MW-24	12/20/91 02/05/92	15.7 <0.5	62.4 <0.5	17.0 <0.5	86.5 <1.5
MW-25	12/20/91 02/05/92	2.6 <0.5	<0.5 <0.5	<0.5 <0.5	29.1 <1.5
MW-26	12/21/91 02/05/92	10.8 <0.5	16.4 <0.5	<0.5 <0.5	86.6 <1.5

Notes:
1. Results from MW-24 on 12/20/91 are an average of the concentrations detected in the original and duplicate samples.
2. μg/L = micrograms per liter.
3. < = less than laboratory detection limit shown.

TABLE 4

TITLE 22 METALS CONCENTRATIONS IN GROUND WATER SAMPLES

Title 22 Metals (mg/L)	Sample I.D. (Boring No. and Depth)						Regulatory Standards		
	MW-22	MW-23	MW-24	MW-24 (Duplicate)	MW-25	MW-26	Calif. DHS MCL	U.S. EPA MCL	Calif. Ocean Plan Inst. Max.
Antimony	3.1	2.1	4.2	4.1	2.8	2.0	NE	.005 - .010 (proposed)	NE
Arsenic	0.34	<0.02	0.029	<0.02	0.088	0.82	0.050	0.050	0.080
Barium	4.1	0.55	1.2	0.88	1.3	1.93	1.0	1.0	NE
Beryllium	<0.04	<0.02	<0.04	<0.04	<0.04	<0.04	NE	0.001 (proposed)	NE
Cadmium	0.12	0.05	0.12	0.12	0.07	0.04	0.010	0.010	0.010
Chromium	1.3	0.04	0.22	0.20	0.18	0.10	0.050	0.050	0.020
Cobalt	0.73	0.2	0.46	0.48	0.33	0.18	NE	NE	NE
Copper	1.2	0.06	0.28	0.24	0.17	0.18	1.00	1.30	0.030
Lead	0.28	<0.005	0.021	0.013	0.008	0.75	0.050	0.050	0.020
Mercury	<0.006	<0.002	<0.004	<0.004	<0.004	<0.004	0.002	0.002	0.0004
Molybdenum	<0.6	<0.3	<0.6	<0.6	<0.6	<0.6	NE	NE	NE
Nickel	1.4	0.23	0.62	0.6	0.42	0.3	NE	0.100 (proposed)	0.050
Selenium	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.010	0.010	0.150

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TABLE 4

TITLE 22 METALS CONCENTRATIONS IN GROUND WATER SAMPLES

Title 22 Metals (mg/L)	Sample I.D. (Boring No. and Depth)						Regulatory Standards		
	MW-22	MW-23	MW-24	MW-24 (Duplicate)	MW-25	MW-26	Calif. DHS MCL	U.S. EPA MCL	Calif. Ocean Plan Inst. Max.
Silver	0.1	0.06	0.12	0.12	0.09	0.04	0.050	0.050	0.007
Thallium	0.012	<0.03	<0.06	<0.06	<0.06	<0.006	NE	0.002 (proposed)	NE
Vanadium	2.7	<0.2	<0.4	<0.4	<0.4	<0.4	NE	NE	NE
Zinc	2.5	0.06	0.51	0.37	0.26	0.21	5.00	5.00	0.20

Notes:
1. mg/L = milligrams per liter.
2. < = concentration less than laboratory detection limit shown.
3. Calif. DHS MCL = California Department of Health Services Maximum Contaminant Level (MCL) for drinking water.
4. U.S. EPA MCL = U.S. Environmental Protection Agency Maximum Contaminant Level (MCL) for drinking water.
5. Calif. Ocean Plan Inst. Max. = California Ocean Plan Instantaneous Maximum Limiting Concentration.

The following metals concentrations exceeded the established "instantaneous maximum limiting concentrations" under the California Ocean Plan (SWRCB, 1990): arsenic in Wells MW-22, MW-25, and MW-26; cadmium, chromium, and copper in all the wells; lead in Wells MW-22, MW-24, and MW-26; nickel and silver in all of the wells; and zinc in Wells MW-22, MW-24, MW-25, and MW-26. The maximum limiting concentrations are listed in Table 4.

Laboratory results indicated no concentrations of semi-volatile organic compounds (by EPA Method 625) were present at or above laboratory detection limits in any of the ground water samples analyzed.

The complete analytical results are presented on the laboratory data sheets in Appendix D. The Chain-of-Custody documentation is also included in Appendix D.

CONCLUSIONS

LANDFILL MATERIALS

Based on the findings of this investigation and a review of the results of our previous investigations on Parcel A, there is no evidence that substantial amounts of landfill materials are currently present within subsurface soils at the site. No evidence of debris fill or other probable landfill material was encountered in 9 borings drilled on site during this investigation, or in 11 borings drilled on the eastern portion of Parcel A during our previous investigations.

A review of available historical records on the operation of the Celery Dump landfill indicates the materials disposed of in the landfill consisted of packing house wastes, primarily celery leaves and trimmings. These materials were allowed to decompose at the surface prior to being annually disced into the soil. Except for one report of illegal dumping of approximately 100 cubic yards of trash on the site in 1949, no evidence was found that materials other than vegetable refuse were disposed of in the landfill.

Given the reported relatively thorough decomposition of the vegetable refuse prior to burial of the residue by discing, the absence of less decomposable materials in the landfill, and the length of time since of operations ceased (approximately 40 years), it is not unexpected that identifiable landfill materials have not been found during recent exploration.

CHEMICAL ANALYSES

Laboratory results of chemical analyses of soil samples from our current investigation indicated no detected concentrations of total petroleum hydrocarbons (TPH) as diesel, or pesticides including Lindane (benzene hexachloride) in the samples analyzed. A mixture of fuel oil and Lindane was known to have been regularly used on the vegetable refuse that was disposed of into the Celery Dump; accordingly, TPH and Lindane were

the most likely chemical contaminants that would be present as the result of the operation of the former landfill. The results of metals analysis of selected soil samples indicated no unusually elevated concentrations of metals were detected in the soil samples analyzed except for lead, which was present in concentrations of 80 and 83 mg/kg in samples from Borings B-20 and B-21, drilled on the western portion of the site.

Laboratory results of chemical analysis of ground water samples from this investigation indicated no detected concentrations of TPH as diesel, pesticides including Lindane, nitrate, or semi-volatile organic compounds were present in the ground water samples analyzed. Laboratory results of analyses for aromatic hydrocarbons and volatile halocarbons indicated that none of these compounds were detected except for benzene, toluene, ethylbenzene, and xylenes (BTEX), which were detected in ground water samples from all of the wells except for Well MW-22 during our initial round of sampling in December 1991. Laboratory analysis of a second set of ground water samples obtained in February 1992 detected none of these compounds except for toluene, which was present at a trace concentration of 0.8 μg/L in the sample from Well MW-22. It is our opinion that the BTEX concentrations detected in the initial round of sampling were probably induced at some point during the field activities, and are not indicative of actual ground water conditions beneath the site.

Elevated concentrations of metals including arsenic, barium, cadmium, chromium, copper, lead, nickel, silver and zinc were detected in ground water samples from several of the monitoring wells installed during this investigation. The origin of these elevated metals concentrations is unknown; however, our investigation found no evidence that materials likely to have been the source of this contamination were disposed of in the Celery Dump landfill. The elevated metals levels may have resulted from the leaching of metals from hydraulic fill placed on the site during the dredging of Marina Del Rey to the north. Elevated concentrations of copper and nickel were previously detected in a well installed on site during a previous water quality study in 1990.

RECOMMENDATIONS

We recommend that this report be submitted, along with a request for delisting the Celery Dump from the State Water Resources Control Board's SWAT list, to the Landfills Division of the Los Angeles Regional Water Quality Control Board (RWQCB). The RWQCB may request that additional copies be submitted to the Solid Waste Division of the Los Angeles County Public Works Department and to the Landfill Division of the Los Angeles County Department of Health Services for their review and comment prior to any action regarding delisting.

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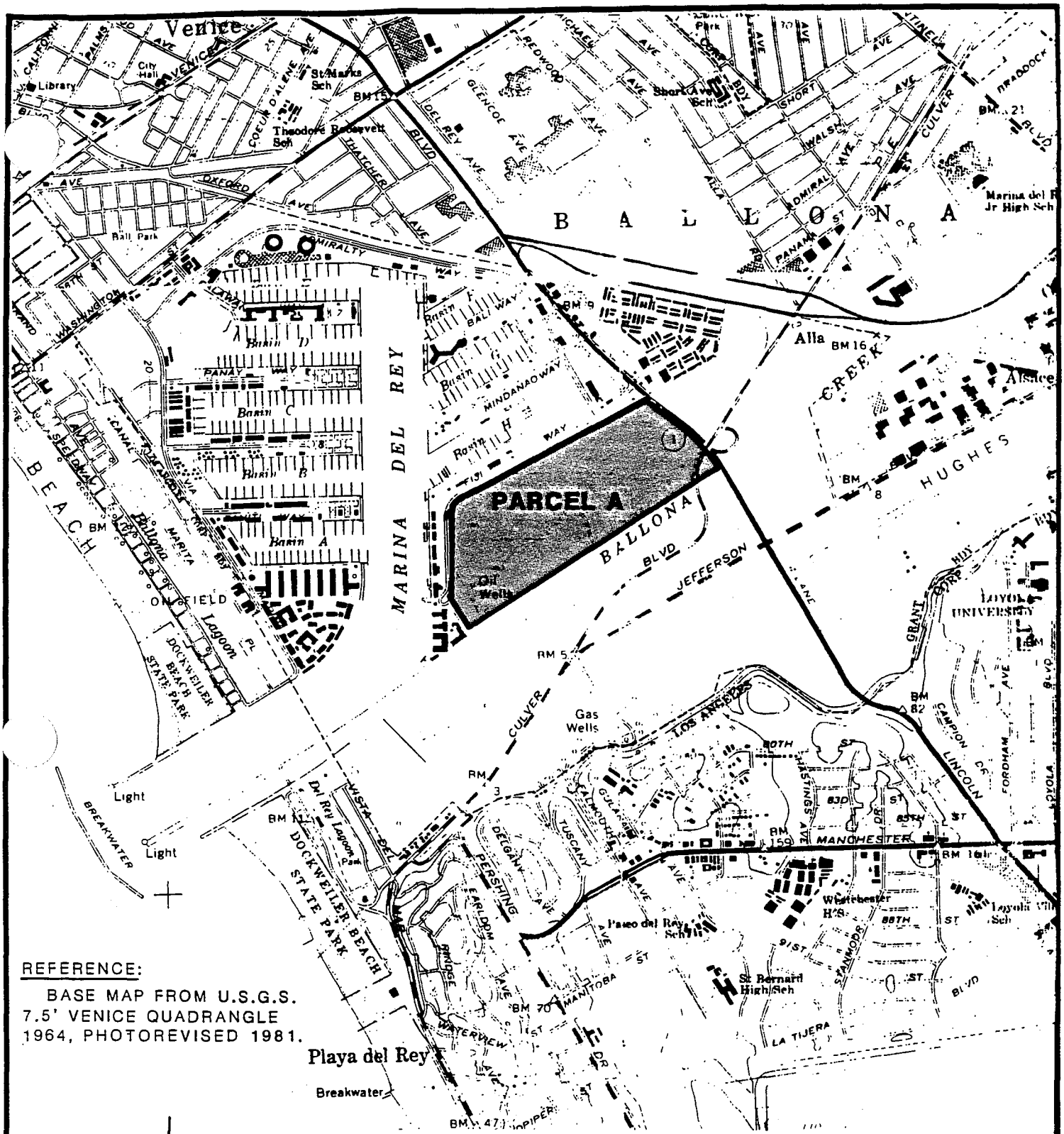


REFERENCE:

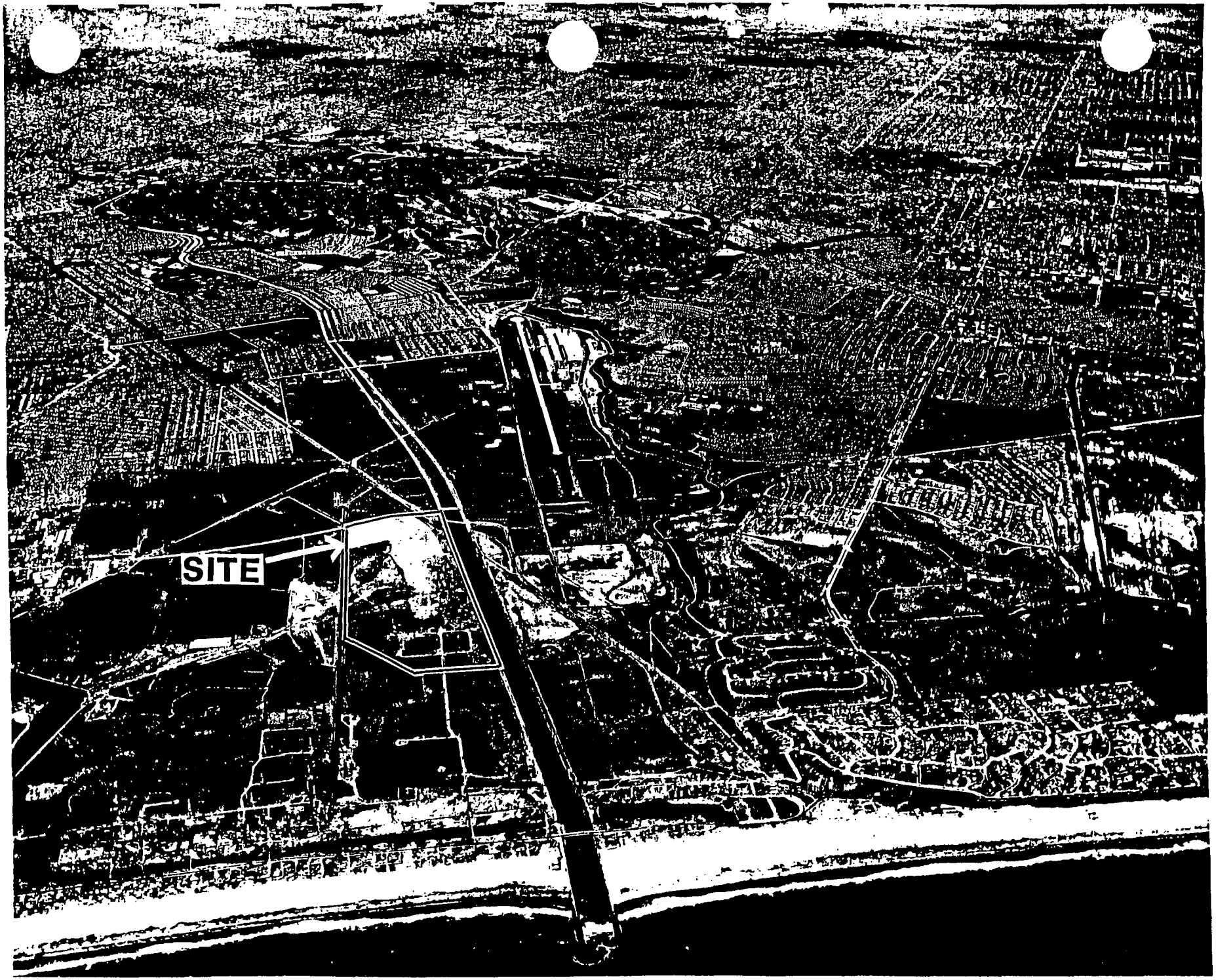
BASE MAP FROM U.S.G.S.
7.5' VENICE QUADRANGLE
1964, PHOTOREVISED 1981.

VICINITY MAP

SCALE 1"= 2000'

LAW/CRANDALL, INC.

PLATE 1



SPENCE AERIAL PHOTOGRAPH

DATED 11-16-52

PLATE 3