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INSTALLATION RESTORATION PROGRAM
PHASE I: RECORDS SEARCH
LAWNDALE ANNEX, CALIFORNIA

FINAL REPORT

PREPARED FOR
DEPARTMENT OF THE AIR FORCE
HQ SPACE DIVISION (DEV)
P.O. BOX 92960, WORLDWAY POSTAL CENTER
LOS ANGELES, CALIFORNIA 90009

APRIL 1986

ENVIRONMENTAL SCIENCE AND ENGINEERING, INC.
P.O. BOX ESE
GAINESVILLE, FLORIDA 32602

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PREFACE

The Installation Restoration Program Phase I: Records Search, Lawndale Annex, California was prepared by Environmental Science and Engineering, Inc., Gainesville, Florida.

It describes the installation missions, environment including geology and hydrology, findings of the records search for past hazardous material disposal sites, conclusions and recommendations. It will be used to identify and control the migration of hazardous contaminants, and to control hazards to health or welfare that may result from past disposal practices.

This work was initiated in July, 1985 and was completed in April 1986. Mr Robert C. Mason, Headquarters Space Division was the Project Manager.

This report has been reviewed by the office of Public Affairs (PA) and is releasable to the National Technical Information Service (NTIS). At the NTIS, it will be available to the general public, including foreign nations.

Robert C Mason

ROBERT C. MASON
Community Planner

R O Roig

RAPHAEL O. ROIG
Chief, Environmental Planning Div.

RAYMOND E. RODGERS, Jr., Colonel, USAF
Director of Acquisition Civil Engineering

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This program was conducted with the assistance of AFESC/DEVP, Tyndall AFB, Florida, and AFSC/DEMV, Andres AFB, Maryland. It will be used by the U.S. Air Force Occupational and Environmental Health Laboratory to conduct Phase II actions. Point of contact was Mr. Tom Sisson, Pacifica Services, Inc.

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20. ABSTRACT *(Continue on reverse side if necessary and identify by block number)*

An Installation Restoration Program Phase I records Search was conducted of Lawndale Annex from Aug. 12 to Aug. 16, 1985. Past and current employees were interviewed, records were reviewed, regulatory agencies were contacted, and a ground reconnaissance was conducted. Past waste handling and disposal practices were evaluated, and five past waste disposal or spill sites were identified. The sites were evaluated using a decision tree process. Both Sites were found to have no potential for contaminant migration or endangerment of human health or environmental quality; therefore no Phase II actions are

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20. Abstract *(Continued)*

recommended. Both sites were referred to the base environmental program for investigation.

INSTALLATION RESTORATION PROGRAM

PHASE I: RECORDS SEARCH

LAWNDALE ANNEX, CALIFORNIA

Prepared for:

UNITED STATES AIR FORCE
HQ SD/DEV
Los Angeles AFB, California

Submitted by:

ENVIRONMENTAL SCIENCE AND ENGINEERING, INC.
Gainesville, Florida

April 1986

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EXECUTIVE SUMMARY

INTRODUCTION

The Department of Defense (DOD) has developed a program to identify and evaluate past hazardous material disposal sites on DOD property, to control the migration of hazardous contaminants, and to control hazards to health or welfare that may result from these past disposal operations. This program is known as the Installation Restoration Program (IRP) and consists of four phases: Phase I--Initial Assessment/Records Search, Phase II--Confirmation and Quantification, Phase III--Technology Base Development, and Phase IV--Operations/Remedial Actions. Environmental Science and Engineering (ESE), Inc. conducted the Phase I study of Lawndale Annex, with funds provided by the Air Force Systems Command (AFSC). This volume contains the Initial Assessment/Records Search of Lawndale Annex.

INSTALLATION DESCRIPTION

The installation occupies 13.34 acres in the city of Hawthorne, Calif., in an industrial park at 14724 South Aviation Blvd. The facility, originally consisting of two major buildings (Bldgs. 80 and 81) and 22.73 acres of land, was constructed for Douglas Aircraft Co. in 1958 and was used initially for production of aluminum parts.

In 1964, the buildings and land were transferred to the Los Angeles District, U.S. Army Corps of Engineers, and was designated as the Lawndale Army Missile Plant (LAMP) and was used until 1971 for manufacture of the Shillelagh Anti-Tank Missile. The facility was declared excess in 1971 and all missile production equipment was removed.

In 1973, the government transferred 9.39 acres, including Bldg. 81 to the State of California. In 1985, the Space Division of the U.S. Air

Force Systems Command acquired the remaining 13.34 acres, including Bldg. 80. This is currently designated as Lawndale Annex and is a subinstallation of Los Angeles Air Force Station (LAAFS).

ENVIRONMENTAL SETTING

Lawndale Annex is situated on 13.34 acres in a developed area of Los Angeles dominated by aerospace industries. The annex consists of one building (Bldg. 80), a large paved parking area, and an open area used for recreation. The small amount of natural soils exposed on the installation is cultivated for use as a softball field or used for ornamental landscaping. The annex is relatively flat, with surface elevations ranging from 68 to 71 feet above mean sea level (ft MSL).

Stormwater runoff is collected in open concrete gutters and routed through a system of reinforced concrete pipes to an open drainage canal along the eastern boundary of the annex that empties into the Los Angeles County Flood Control District storm drainage system along Compton Blvd. Because the site consists of approximately 70-percent impervious areas or either parking lot or Bldg. 80, most rainfall leaves the installation in the form of stormwater runoff. Additionally, because net precipitation for this areas is 33.9 inches per year, little infiltration of rainfall is expected to occur on the annex.

The climate of the area is mild, with temperatures moderated by the Pacific Ocean. The average monthly temperature ranges from a low of 56.0°F in January to a high of 70.3°F in August. The average annual rainfall is 12.08 inches, 87 percent of which occurs in the winter months (November through March). Net precipitation is -33.92 inches per year and the 1-year, 24-hour rainfall event is 3 inches. The low value for net precipitation indicates a low potential for significant infiltration or the formation of permanent surface water features. The 1-year, 24-hour rainfall event of 3 inches indicates a moderate potential for runoff and erosion. The majority of the installation, however, is asphalt-paved and contains stormwater drainage systems to control runoff, thus eliminating any significant potential for flooding and soil erosion.

The near-surface soils on Lawndale Annex are clayey, silty sands with predominantly silty, fine sands occurring approximately 10 ft below land surface. Due to the large amount of paved areas, most surface infiltration is restricted because surface drainage enters the storm sewer system.

Ground water occurrences can be divided into four general classes, depending on the formation in which the aquifer occurs. The Monterey and Pico Formations contain connate ground water with high salinity, therefore eliminating the units as a potable water aquifer. The overlying San Pedro Formation contains two productive potable aquifer systems, the Silverado and Lynwood Aquifers. The third formation containing potable ground water is the Lakewood Formation. This formation consists of two productive systems termed the Gage and Gardena Aquifers. The shallowest ground water occurrence is found as a localized semiperched system in the basal section of the older dune sand. Depth to this uppermost ground water is greater than 50 ft in the vicinity of Lawndale Annex. Due to limited quantities, the shallow ground water is not used as a potable, industrial, or municipal source. The deeper aquifers are separated from the shallow, semiperched aquifer by aquicludes.

As a result of the urban setting and associated lack of available habitat, few wildlife species occur on Lawndale Annex. Various urban bird species forage in the open area, and common rodents (e.g., mice) would be expected to occur on the annex. No threatened or endangered species are present.

METHODOLOGY

During the course of the Phase I investigation of Lawndale Annex, interviews were conducted with personnel familiar with past waste disposal practices; file searches were performed for past hazardous waste activities; interviews were held with local, state, and Federal agencies; and ground reconnaissance inspections were conducted at past hazardous waste activity sites.

The review of past operation and maintenance functions and past waste management practices at Lawndale Annex resulted in the identification of two sites that were initially considered areas of concern, with potential for contamination.

FINDINGS AND CONCLUSIONS

The goals of the IRP Phase I study were to identify sites where there is potential for environmental contamination resulting from past waste disposal practices and to assess the potential for contaminant migration from these sites and endangerment to human health or environmental quality.

Two sites were initially considered areas of concern with potential for contamination. Information and evaluations of these sites are summarized in Table 1, and the locations of these sites are shown on Fig. 1. Both sites, while having a potential for residual contamination, do not present a potential for migration or for endangerment of human health or environmental quality. These sites, therefore, were not evaluated using the Hazardous Assessment Rating Methodology (HARM).

RECOMMENDATIONS

No sites were identified as having potential for contamination and contaminant migration or endangerment of human health or environmental quality; therefore, no Phase II actions are recommended.

Site No. 1 is the location of two abandoned underground waste petroleum, oils, and lubricants (POL) storage tanks used during the operation of LAMP. Since these tanks have not had their contents tested and it is not known if any leakage has occurred, this site was deemed to warrant

Table 1. Summary of Evaluations and Conclusions for the Potential Contamination Sites

Site No.	Site Description	Date of Operation	Waste Description	Site Evaluation
1	Underground Waste POL Tanks	1964-1971	Waste POL products and waste solvents	Potential for residual contamination. No potential for contaminant migration or endangerment of human health or environmental quality. Refer to LAAFS Environmental Program. Coordinate any action with Los Angeles County and the City of Hawthorne. No Phase II recommendations.
2	Underground Plating Wastewater Neutralization Chambers	1964-1971	Plating shop wastewater containing chromium, nickel, copper, cyanide, irridite, and acid and alkaline solutions	Potential for residual contamination. No potential for contaminant migration or endangerment of human health or environmental quality. Refer to LAAFS Environmental Program. No Phase II recommendations.

Source: ESE, 1985.

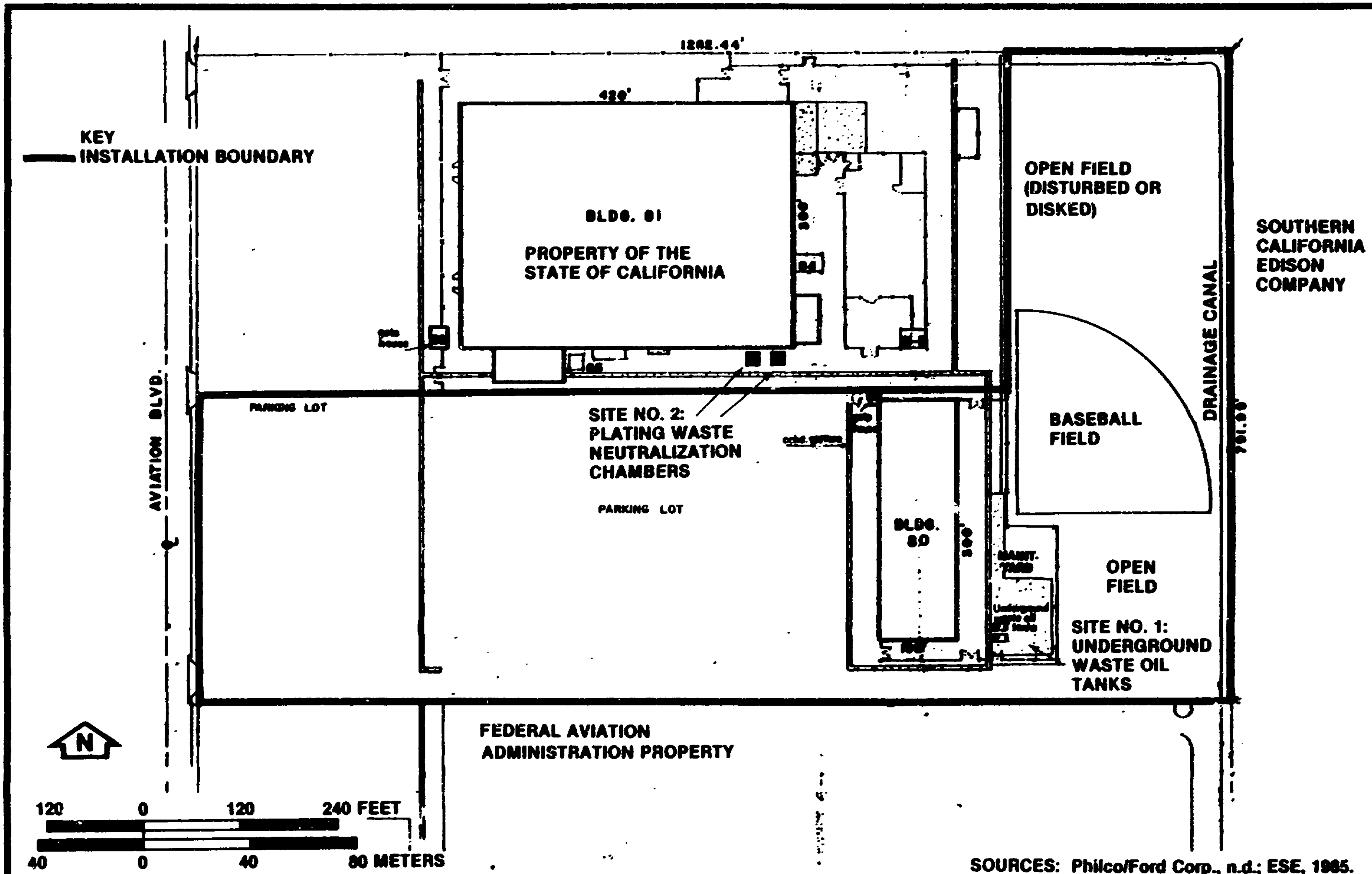


Figure 1
POTENTIAL CONTAMINATION SITES

INSTALLATION RESTORATION PROGRAM
LAWNDALE ANNEX

investigation under the LAAFS Environmental Program. Abandoned underground POL storage tanks should either be removed or inspected, cleaned, and closed in accordance with applicable regulations. Los Angeles County has a Leaking Underground Storage Tank (LUST) program; therefore, coordination should be made with Los Angeles County and the city of Hawthorne prior to initiation of any work associated with these underground tanks.

Site No. 2, located on State of California property, consists of two underground plating waste neutralization chambers that were used during the operation of LAMP. Since it is unknown if any residual contaminated sludges remain in the neutralization chambers, LAAFS environmental personnel should notify the State of California, Los Angeles County, and the City of Hawthorne to determine the need for an investigation of this site. If residual sludges still remain, these chambers should be cleaned, the contents tested to determine hazardous characteristics, and the sludges disposed of accordingly.

1.0 INTRODUCTION

1.1 BACKGROUND

Due to its primary mission, the U.S. Air Force (USAF) has long been engaged in operations dealing with toxic and hazardous materials. Federal, state, and local governments have developed strict regulations to require that disposers identify the locations and contents of disposal sites and take action to eliminate the hazards in an environmentally responsible manner. The primary Federal legislation governing disposal of hazardous waste is the Resource Conservation and Recovery Act (RCRA) of 1976, as amended. Under Sec. 6003 of the Act, Federal agencies are directed to assist the U.S. Environmental Protection Agency (EPA), and under Sec. 3012, state agencies are required to inventory past disposal sites and make the information available to the requesting agencies. To assure compliance with these hazardous waste regulations, the Department of Defense (DOD) developed the Installation Restoration Program (IRP). The current DOD IRP policy is contained in Defense Environmental Quality Program Policy Memorandum (DEQPPM) 81-5, dated Dec. 11, 1981, and implemented by USAF message dated Jan. 21, 1982. DEQPPM 81-5 reissued and amplified all previous directives and memoranda on the IRP. DOD policy is to identify and fully evaluate suspected problems associated with past waste disposal practices and to control hazards to health and welfare that resulted from these past operations. The IRP will be the basis for response actions on USAF installations under the provisions of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, as clarified by Executive Order 12316. CERCLA is the primary Federal legislation governing remedial action at the past hazardous waste disposal sites.

1.2 PURPOSE, AUTHORITY, AND SCOPE OF THE ASSESSMENT

The IRP has been developed as a 4-phase program, as follows:

Phase I--Initial Assessment/Records Search

Phase II--Confirmation and Quantification

Phase III--Technology Base Development

Phase IV--Operations/Remedial Actions

Environmental Science and Engineering, Inc. (ESE) conducted the records search at Lawndale Annex, a subinstallation of Los Angeles Air Force Station (LAAFS), with funds provided by the Air Force Systems Command (AFSC). This report contains a summary and evaluation of the information collected during Phase I of the IRP and recommendations for any necessary Phase II action.

The objective of Phase I was to identify the potential for environmental contamination from past waste disposal practices at Lawndale Annex and to assess the potential for contaminant migration. Activities performed in the Phase I study included the following:

1. Review of site records;
2. Interviews with personnel familiar with past generation and disposal activities;
3. Inventory of wastes;
4. Determination of estimated quantities and locations of current and past hazardous waste treatment, storage, and disposal;
5. Definition of the environmental setting at the base;
6. Review of past disposal practices and methods;
7. Performance of field and aerial inspections;
8. Gathering of pertinent information from Federal, state, and local agencies;
9. Assessment of potential for contaminant migration; and
10. Development of conclusions and recommendations for any necessary Phase II action.

ESE performed the onsite portion of the records search during August 1985. The following team of professionals was involved:

- o Charles D. Hendry, Jr., Ph.D., Staff Chemist and Project Manager; 11 years of professional experience.
- o Warren Pandorf, P.E., Engineer; 10 years of professional experience.
- o Jack D. Doolittle, Environmental Scientist, 10 years of professional experience.
- o Donald F. McNeill, Geologist, 3 years of professional experience.

Detailed information on these individuals is presented in App. B.

1.3 METHODOLOGY

The methodology utilized in the Lawndale Annex records search began with a review of past and current industrial operations conducted at the base. Information was obtained from available records such as shop files and real property files, as well as interviews with past and current base employees from the various operating areas. Interviewees included current and former personnel associated with the mission of LA and tenant organizations onbase. A list of interviewees, by position and approximate years of service, is presented in App. C.

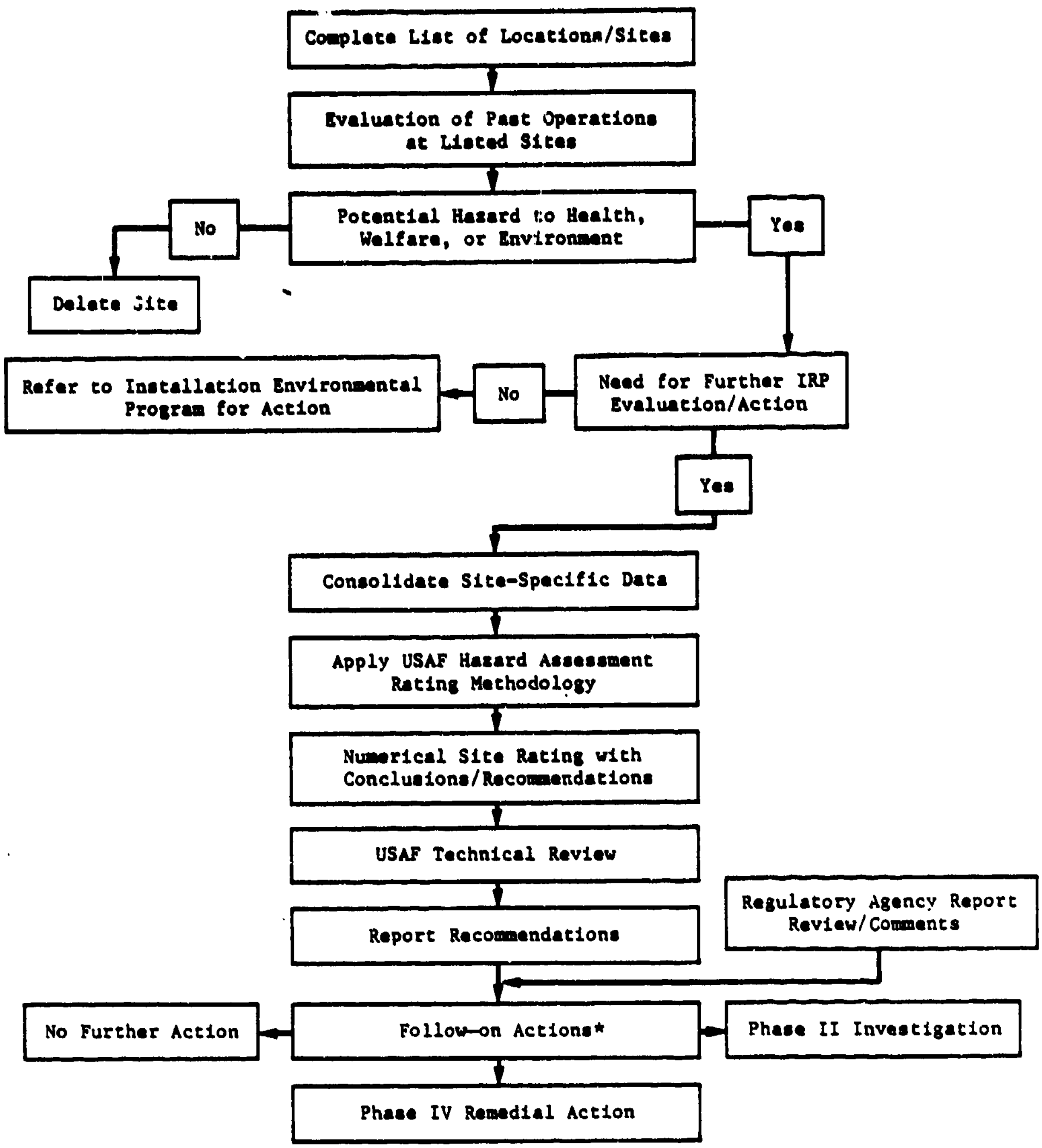
Concurrent with the base interviews, the applicable Federal, state, and local agencies were contacted for pertinent base-related environmental data. The outside records centers and agencies contacted and personnel interviewed are listed in App. C.

The next step in the activity review was to determine the past management practices regarding the use, storage, treatment, and disposal of hazardous materials from the various operations on the base. Included in this part of the activities review was the identification of all known past disposal sites and other possible sources of contamination such as spill areas.

A general ground tour of the identified sites was then made by the ESE Project Team to gather site-specific information including: (1) visual evidence of environmental stress, (2) the presence of drainage ditches and systems, and (3) visual inspection for any obvious signs of contamination or leachate migration. Due to the relatively small size of the installation, a helicopter overflight was not included as part of the onsite visit.

Using the process shown in Fig. 1.3-1, a decision was then made, based on all of the above information, regarding the potential for hazardous material contamination at any of the identified sites. If no potential existed, the site was deleted from further consideration. If potential for contamination was identified, the potential for migration of the contaminant was assessed based on site-specific conditions. If there were no further environmental concerns, the site was deleted. If the potential for contaminant migration was considered significant, the site was evaluated and prioritized using the Hazard Assessment Rating Methodology (HARM). A discussion of the HARM system is presented in App. G.

PHASE I INSTALLATION RESTORATION PROGRAM
RECORDS SEARCH FLOWCHART



*Beyond scope of Phase I.

SOURCES: HQ AFESC, 1983.
ESE, 1985.

Figure 1.3-1
DECISION PROCESS

INSTALLATION RESTORATION PROGRAM LAWNDALE ANNEX

2.0 INSTALLATION DESCRIPTION

2.1 LOCATION, SIZE, AND BOUNDARIES

Lawndale Annex, a subinstallation of LAAFS, is located in the city of Hawthorne, Calif., in Los Angeles County (see Fig. 2.1-1). The installation occupies 13.34 acres in an industrial park at 14724 South Aviation Blvd., located approximately 1 mile (mi) south of LAAFS near the intersection of Aviation and Compton Blvd. A vicinity map showing the relationship of the Lawndale Annex subinstallation and LAAFS is presented in Fig. 2.1-2. A site map of the installation is shown in Fig. 2.1-3. As shown, the annex is bordered to the north by property owned by the State of California, to the south by Federal Aviation Administration (FAA) property, and to the east by the Southern California Edison Co. Electric right-of-way.

2.2 HISTORY

The facility was constructed for Douglas Aircraft in 1958 and was used initially for production of aluminum parts. The plant, consisting of two major buildings (Bldgs. 80 and 81) and 22.73 acres of land, was accepted as partial payment by the General Services Administration (GSA) for DOD Plant No. 15, formerly controlled by USAF. Bldg. 81 was later used by the Douglas Aircraft Co. Publications Dept. for production of various publications, and Bldg. 80 housed a flight simulator for the DC-8 aircraft. The simulator was used for pilot training, engineers, and customer demonstrations. A cafeteria also was located in Bldg. 80 (Dept. of the Army, 1970; U.S. Army Environmental Hygiene Agency, 1969).

In 1964, the facility was transferred to the Los Angeles District, U.S. Army Corps of Engineers and was designated as the Lawndale Army Missile Plant (LAMP) under control of the U.S. Army Missile Command (MICOM). The facility was rehabilitated for production of the

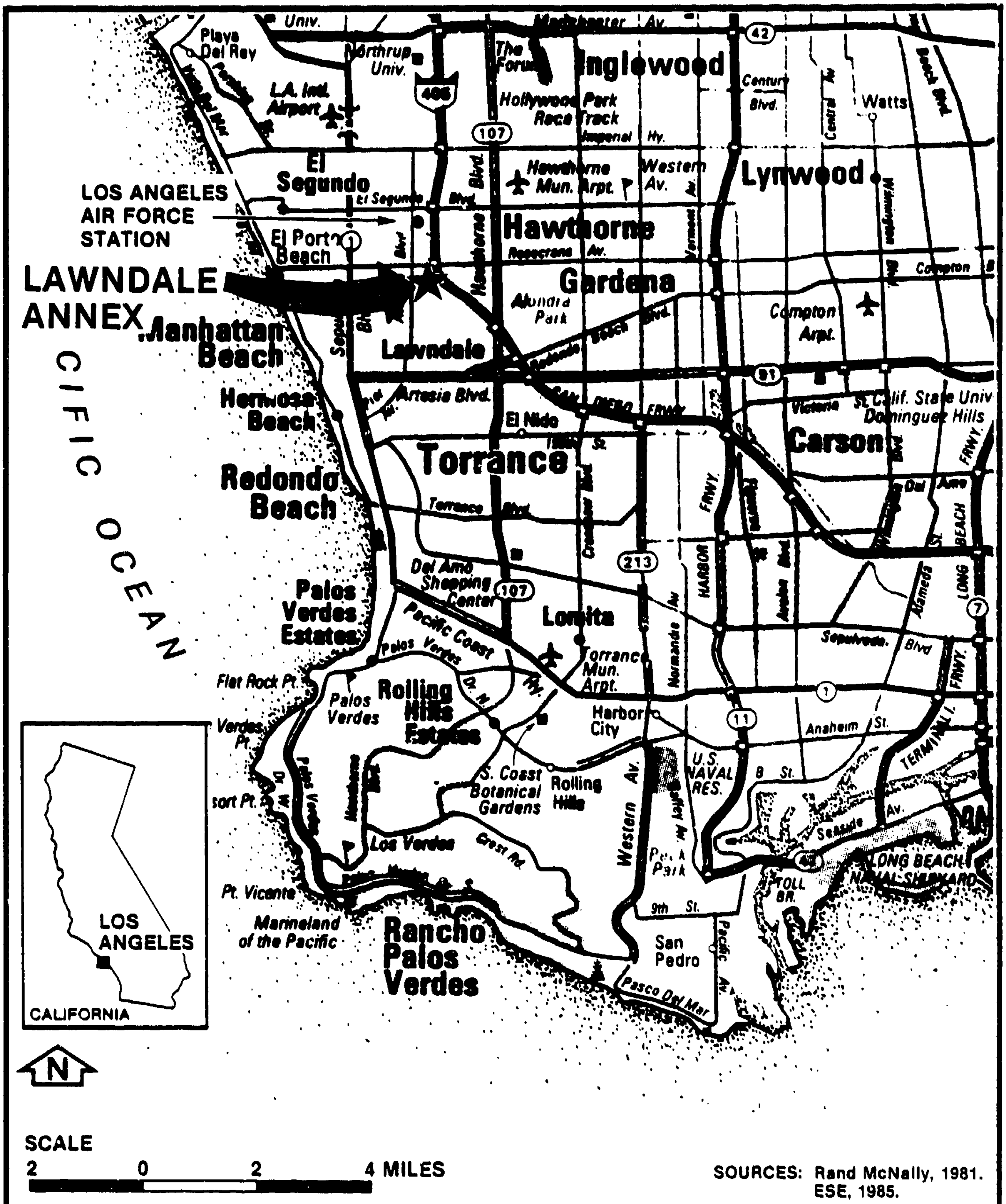


Figure 2.1-1
LOCATION MAP

INSTALLATION
RESTORATION PROGRAM
LAWNDALE ANNEX

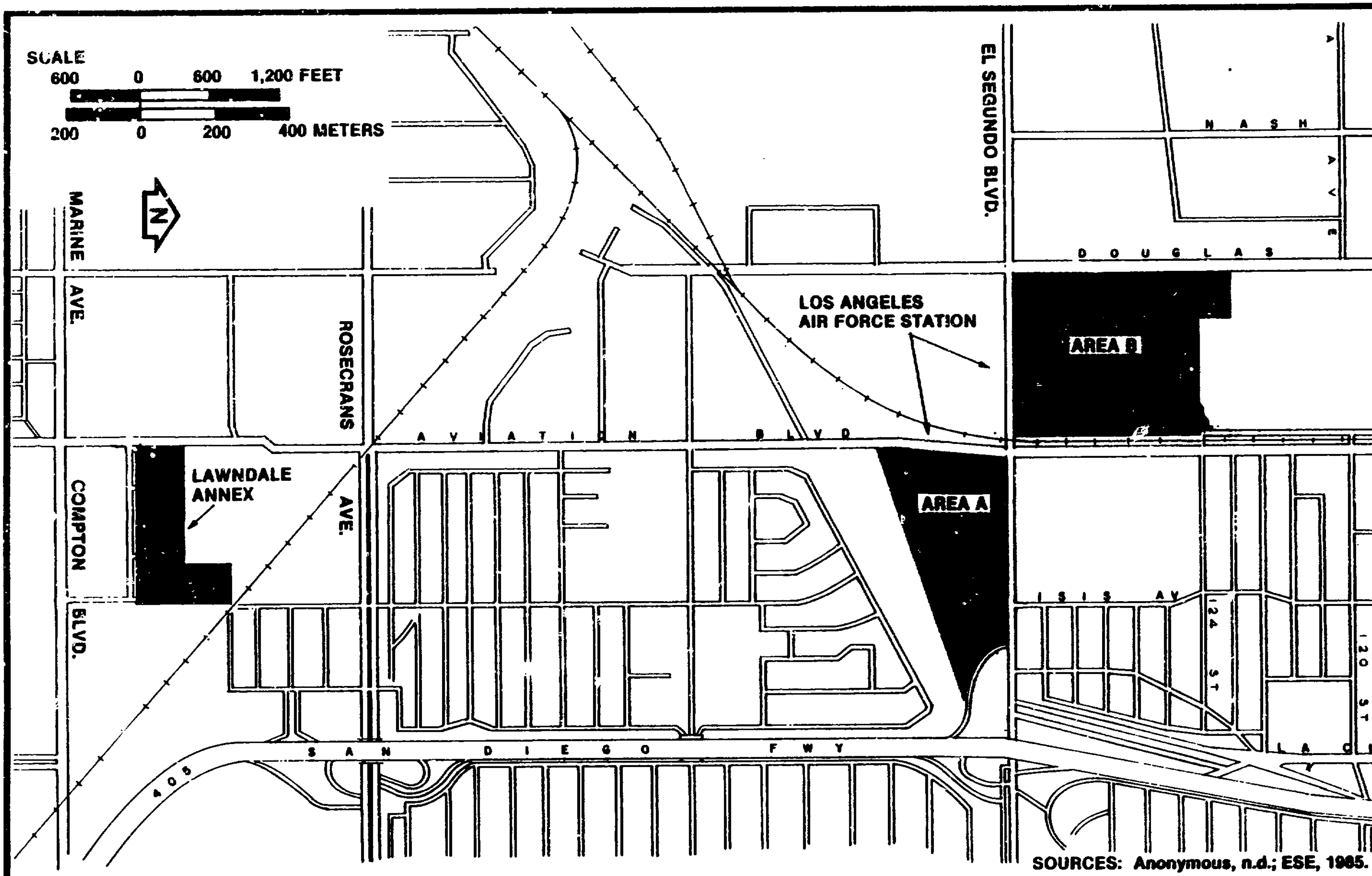
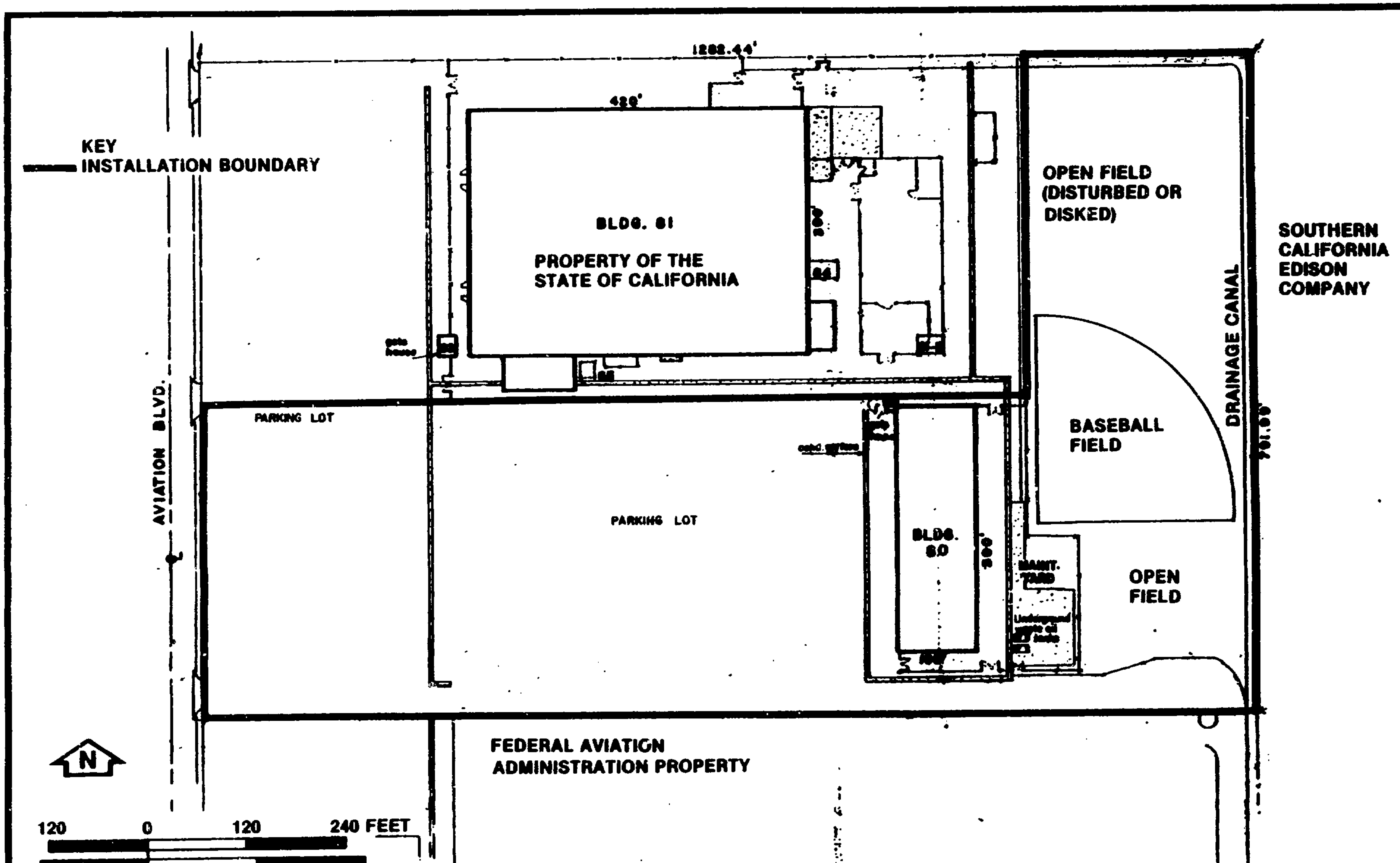


Figure 2.1-2
VICINITY MAP - LAWNDALE ANNEX

INSTALLATION RESTORATION PROGRAM LAWNDALE ANNEX



SOURCES: Philco/Ford Corp., n.d.; ESE, 1985.

Figure 2.1-3
SITE MAP — LAWNDALE ANNEX

INSTALLATION RESTORATION PROGRAM
LAWNDALE ANNEX

Shillelagh Anti-Tank Guided Missile and was operated as a government-owned, contractor-operated (GOCO) facility with the Aeronutronic Division of Philco-Ford Corp., a subsidiary of the Ford Motor Co., as the operating contractor. Aeronutronic Division took partial acceptance of the facility on Mar. 12, 1965, and initial production commenced on or about July 1, 1965. The first production missile was delivered to the Army in January, 1966 (U.S. Army Environmental Hygiene Agency, 1969; Philco-Ford Corp., 1971a; 1971b).

Fabrication and initial assembly of the missiles, excluding propellant and warhead, were carried out at LAMP, with final assembly and acceptance testing at the Iowa Army Ammunition Plant in Burlington, Iowa. The operations at LAMP included manufacture and assembly of the guidance and control systems and the engine. Bldg. 81 housed all production operations, and Bldg. 80 was used for administrative offices, a cafeteria, and a small medical clinic. Peak employment at LAMP was approximately 2,300 Philco-Ford Co. and government personnel. The last missile was produced in March 1971.

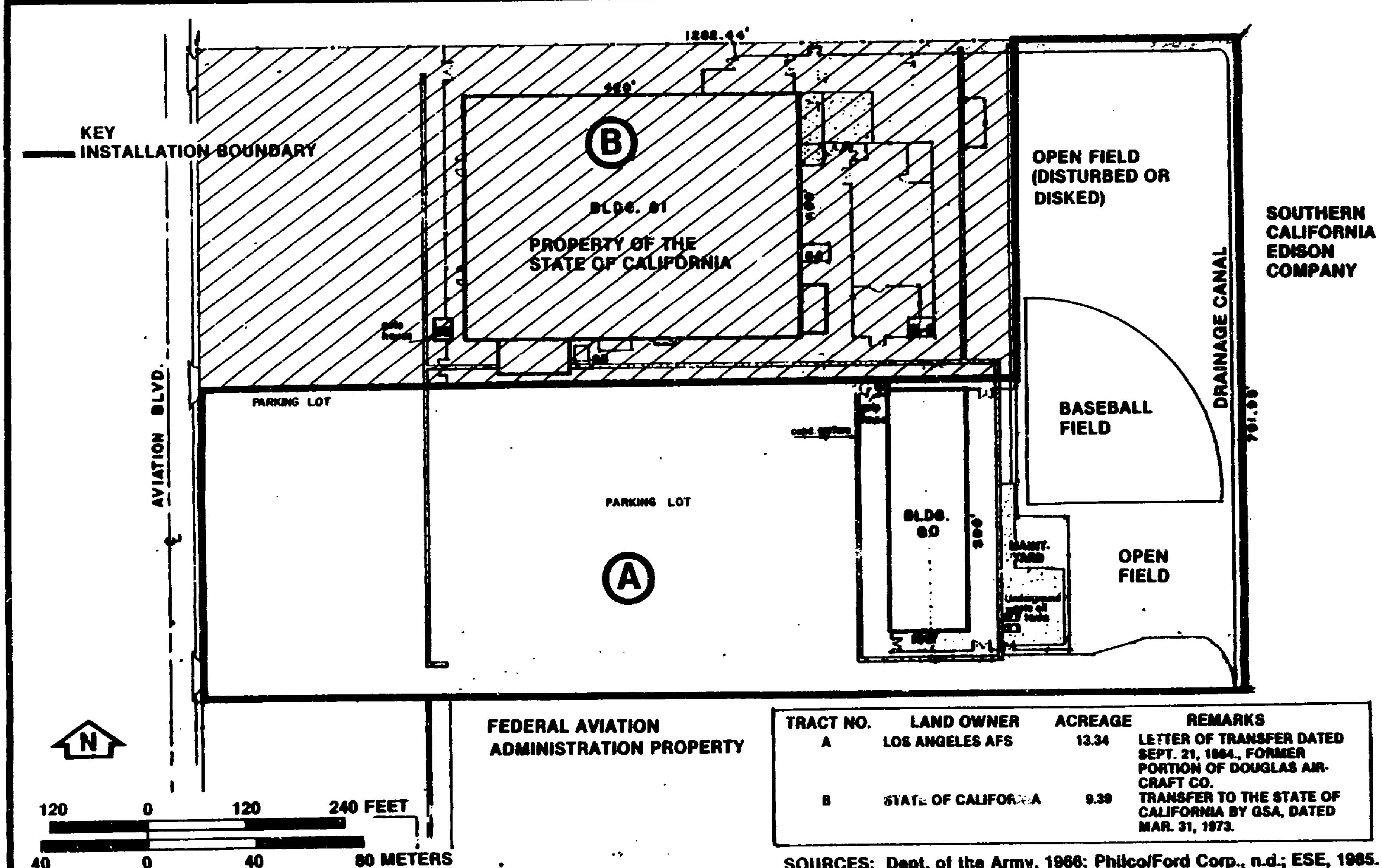
On Mar. 4, 1971, Headquarters, U.S. Army Materiel Command announced the termination of missile production operations at LAMP. All government-owned production equipment was returned to the Defense Industrial Plant Equipment Center at Memphis, Tenn., for storage, and the plant was declared excess to the needs of the Army and transferred to GSA in December 1971 (Philco-Ford Corp., 1971a; 1971b; Dept. of the Army, 1972).

On Mar. 31, 1973, the GSA transferred 9.39 acres including Bldg. 81 to the State of California (Dept. of the Army, 1966). The State of California currently uses Bldg. 81 for storage of state records and office equipment.

The Space Division of the U.S. Air Force Systems Command, headquartered at LAAFS, acquired the remaining 13.34 acres of the original parcel, including Bldg. 80, for construction of administrative offices. This is currently designated as Lawndale Annex. The original parcel of land and current ownership is shown in Fig. 2.2-1. The proposed building construction at Lawndale Annex that will commence in fiscal year 1987 and be phased over a 10-year period is shown in Fig. 2.2-2. An Environmental Impact Assessment (EIA) currently is being prepared to identify and analyze any environmental issues associated with the proposed construction at Lawndale Annex.

2.3 MISSION AND ORGANIZATION

Lawndale Annex is a subinstallation of LAAFS. The mission of LAAFS is to provide administrative, facility, logistic, transportation, and medical support for all organizations and personnel assigned or attached to the installation. Planned development of the Lawndale Annex includes the construction of administrative office facilities in support of the LAAFS mission.

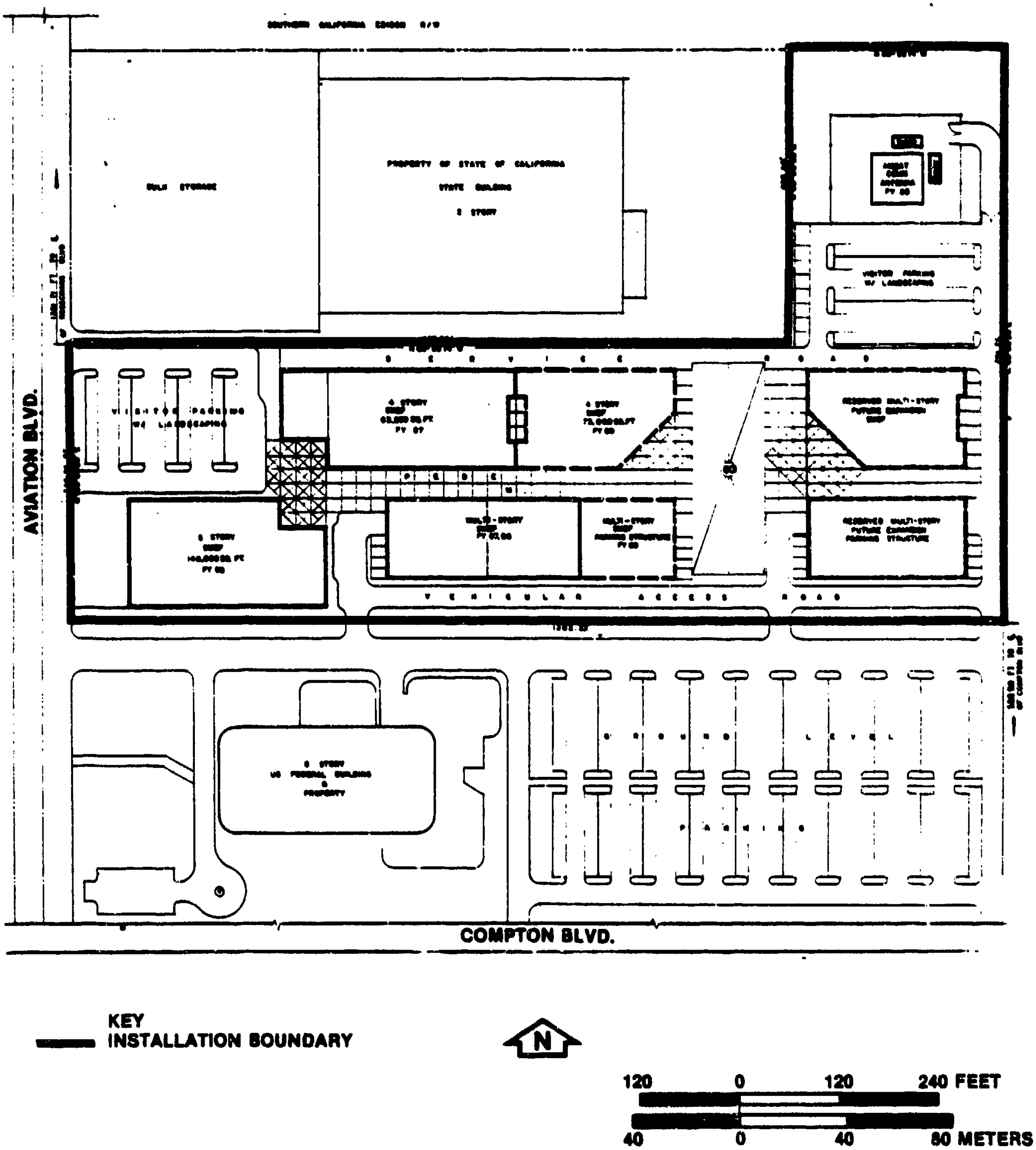


TRACT NO.	LAND OWNER	ACREAGE	REMARKS
A	LOS ANGELES AFS	13.34	LETTER OF TRANSFER DATED SEPT. 21, 1964., FORMER PORTION OF DOUGLAS AIRCRAFT CO.
B	STATE OF CALIFORNIA	9.39	TRANSFER TO THE STATE OF CALIFORNIA BY GSA, DATED MAR. 31, 1973.

SOURCES: Dept. of the Army, 1966; Philco/Ford Corp., n.d.; ESE, 1985.

Figure 2.2-1
REAL ESTATE MAP - LAWNDALE ANNEX

INSTALLATION RESTORATION PROGRAM
LAWNDALE ANNEX



SOURCES: Dept. of the Air Force, 1984; ESE, 1985.

Figure 2.2-2 **MASTER PLAN - LAWNDALE ANNEX**	**INSTALLATION RESTORATION PROGRAM LAWNDALE ANNEX**

3.0 ENVIRONMENTAL SETTING

This section describes the environmental conditions at Lawndale Annex, including specific site data for meteorology, geology, soils, surface hydrology, geohydrology, and biota. These data subsequently are used in the HARM scoring system to numerically assess the pollutant transport mechanisms and potential receptors present at the site. App. G describes the factors used in the HARM system.

3.1 METEOROLOGY

Climatological data for Lawndale Annex are summarized in Table 3.1-1. These data were collected at the National Weather Service meteorological station at Los Angeles International Airport, which is located approximately 3 mi north of Lawndale Annex. The period of record for the data is 29 years (1951 to 1980).

The climate of the Los Angeles area is mild with temperatures moderated by the Pacific Ocean. As shown in Table 3.1-1, the average monthly temperature ranges from a low of 56.0°F in January to a high of 70.3°F in August. The average annual temperature is 62.6°F.

Based on the data in Table 3.1-1, the average annual rainfall for the area is 12.08 inches, 87 percent of which occurs in the winter months (November through March) at the rate of approximately 2.1 inches per month. In contrast, the summer (April to October) is dry, with rainfall rates ranging from 0.01 to 0.93 inch per month.

The pathways category of the HARM scoring system includes surface water migration, flooding, and ground water migration routes. Numerical evaluation of these routes involves factors associated with the particular migration route (see App. G). Two meteorological factors used in this evaluation are net precipitation and the 1-year, 24-hour rainfall event. Mean annual evaporation for Los Angeles is 46 inches

Table 3.1-1. Climatological Data for Lawndale Annex

Month	Average Temperature (°F)	Average Precipitation (inches)
January	56.0	3.06
February	57.1	2.49
March	57.4	1.76
April	59.5	0.93
May	62.4	0.14
June	65.6	0.04
July	69.0	0.01
August	70.3	0.10
September	69.5	0.15
October	66.3	0.26
November	61.2	1.52
December	57.0	1.62
Annual	62.6	12.08
Period of Record	1951-1980	1951-1980

NOTE: Data are for Los Angeles International Airport, Calif.; Station Index No. 5114; Los Angeles Co.; 33°56'N 118°23'W; Elevation = 100 ft above mean sea level (MSL).

Sources: National Climatic Data Center, 1983.
ESE, 1985.

per year (U.S. Dept. of Commerce, 1968); therefore, net precipitation, which is the difference between annual precipitation and evaporation, is -33.92 inches per year. The 1-year, 24-hour rainfall event is 3 inches (U.S. Dept. of Commerce, 1961). The low value for net precipitation indicates a low potential for significant infiltration or the formation of permanent surface water features. The 1-year, 24-hour rainfall event of 3 inches indicates a moderate potential for runoff and erosion. The majority of the installation, however, is asphalt-paved and contains stormwater drainage systems to control runoff, thus eliminating any significant potential for flooding and soil erosion.

3.2 GEOGRAPHY

3.2.1 PHYSIOGRAPHY

Lawndale Annex is located in a developed area of the city of Hawthorne dominated by administrative offices and light industry. The land immediately adjacent to Lawndale Annex is used for offices (the FAA Bldg.), for storage of state records and office equipment (the State of California Records Center), and as an electric switching station and transmission corridor (Southern California Edison Co.). One permanent structure currently is situated on Lawndale Annex (Bldg. 80). The area west of Bldg. 80 to Aviation Blvd. consists of asphalt-paved parking, and the area behind Bldg. 80 to the drainage canal is a recreational area, including a picnic area and softball field.

The parcel of land is relatively flat. Surface elevations range from 70.94 feet (ft) above mean sea level (MSL) at Aviation Blvd. to 68.30 ft above MSL at the southern edge of Bldg. 80. The topographic gradient is approximately-1 ft per 300 ft from west to east.

3.2.2 SURFACE HYDROLOGY

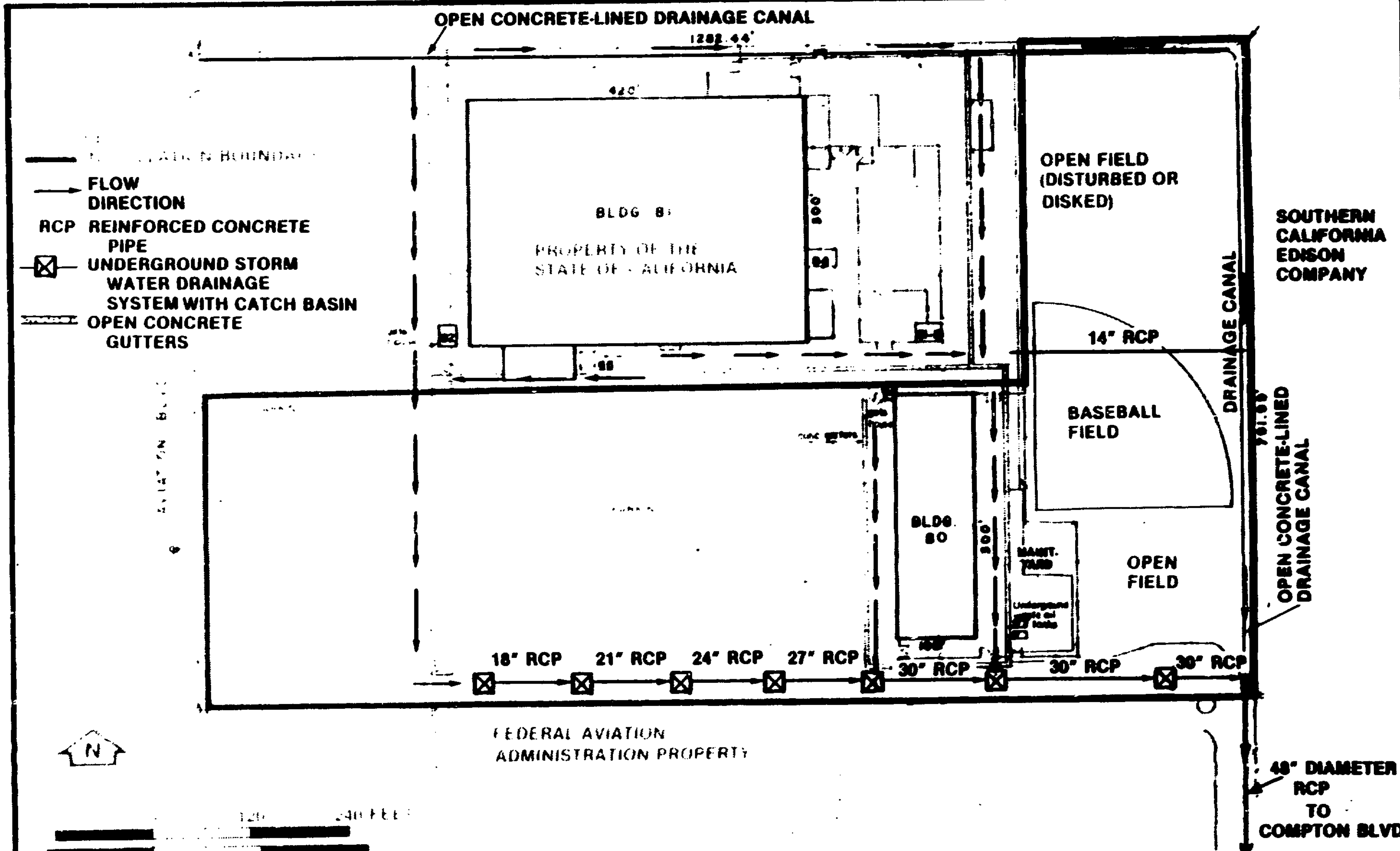
The stormwater drainage system on Lawndale Annex consists of open concrete gutters that transmit parking lot runoff and rain water collected on the roof of Bldg. 80 to the southern boundary of the site where it is collected in a series of concrete catch basins and transmitted via underground concrete pipes to the drainage canal at the southeast corner of the installation. The surface drainage system is shown in Fig. 3.2-1.

The drainage canal along the northern and eastern boundaries transports surface runoff to a 48-inch-diameter reinforced concrete pipe that connects to the Los Angeles County Flood Control District storm drain system along Compton Blvd. Stormwater runoff for this area eventually drains into the Dominguez Channel located approximately 2 mi east of the site. The Dominguez Channel empties into Los Angeles Harbor to the south. Due to extensive paved areas on Lawndale Annex, a majority of the rainfall (minus evaporation) leaves the installation as stormwater runoff. Little infiltration of rainfall is expected to occur on the site.

3.3 GEOLOGY

3.3.1 GEOLOGIC SETTING

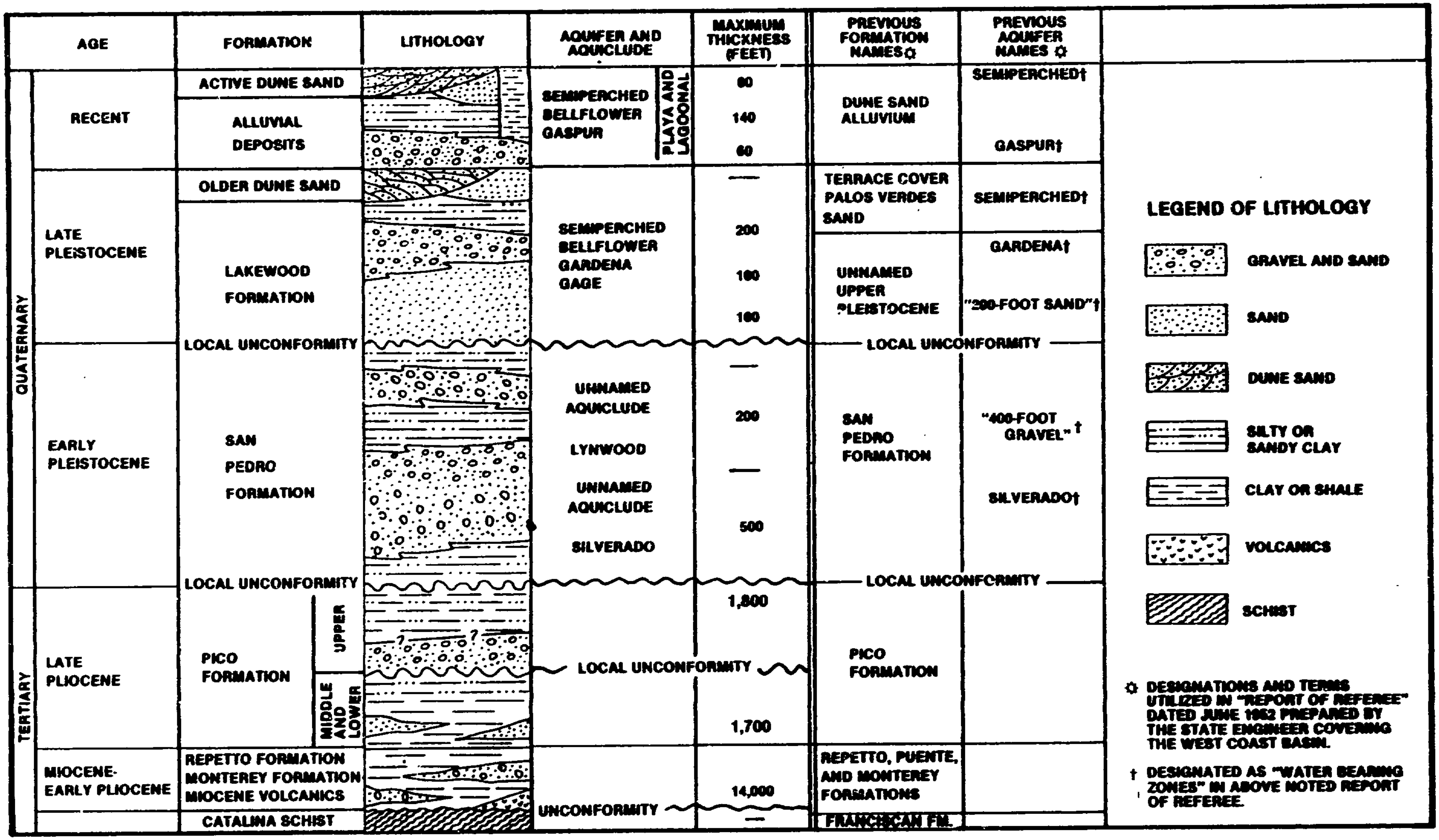
Lawndale Annex lies within the Los Angeles Basin, a topographic lowland plain with a northwest trending axis approximately 50 mi in length and 20 mi wide. The stratigraphy of the Los Angeles Basin is characterized by both unconsolidated and indurated sediments ranging in age from Jurassic to Recent (see Fig. 3.3-1). Bedrock in the vicinity of Lawndale Annex consists of metamorphic rocks of the Franciscan Formation and Catalina Schist. These units are impervious and non-water-bearing and are overlain unconformably by rocks of Miocene age. The Miocene Monterey Formation consists of massive shale and claystone units. The bottom section of the Monterey exhibits coarse pebbly sandstone and schist-bearing conglomerate. The upper units of the formation are predominantly shale and micaceous siltstone. Fine- to medium-grained sandstone units also occur within the upper section; however, these units are discontinuous and contain connate water with salinity near that of seawater. Overlying the Miocene units is a Pliocene age unit of the Pico Formation. This unit is divided into three subdivisions based on water-bearing characteristics and separated by local unconformities.



SOURCES: Philco/Ford Corp., n.d.; Dept. of the Army, COE, 1966; ESE, 1985.

Figure 3.2-1
STORMWATER DRAINAGE ON LAWNDALE ANNEX

INSTALLATION RESTORATION PROGRAM LAWNDALE ANNEX



SOURCES: California Dept. of Water Resources, 1962.
ESE, 1985.

Figure 3.3-1
GENERALIZED STRATIGRAPHY OF THE LOS ANGELES BASIN IN THE VICINITY OF LAWNDALE ANNEX

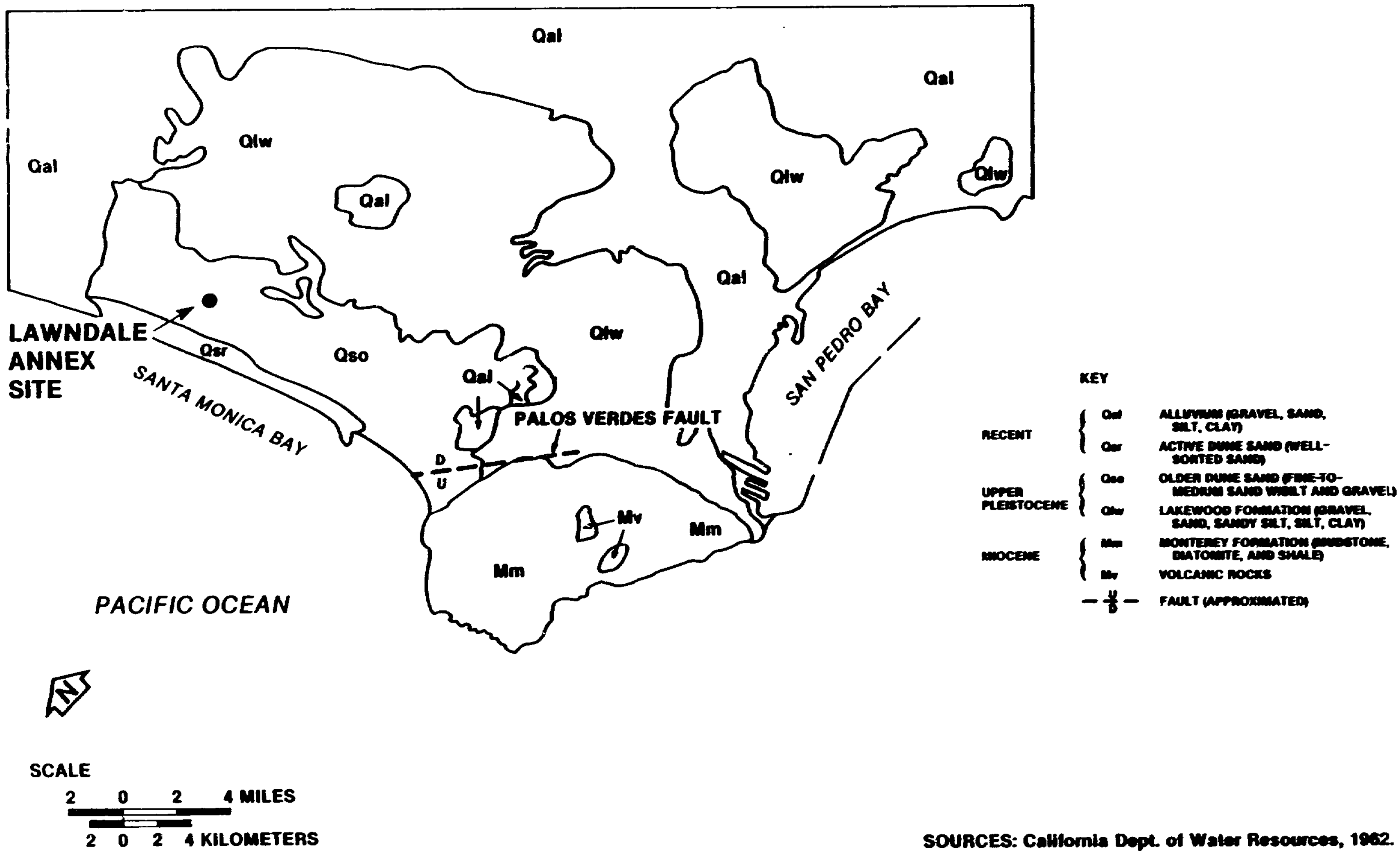
INSTALLATION RESTORATION PROGRAM LAWNDALE ANNEX

The Lower Division, also referred to as the Repetto Formation, consists of fine to coarse sand with pebbly brown sandy siltstone and clay (California Dept. of Water Resources, 1977b). The Middle Division is predominantly massive marine siltstone with lesser amounts of fine to coarse sand. Both the Lower and Middle Divisions are largely impervious and contain saline water. The Upper Division of the Pico Formation averages 1,000 ft in thickness and consists of interbedded, semiconsolidated sand, micaceous silt with lesser marine clay, and gravel members.

Overlying the Pico Formation are Early Pleistocene deposits forming the San Pedro Formation. The San Pedro consists of unconsolidated to semiconsolidated gravel, sand, silt, and clay of marine origin with partial influence and reworking by fluvial processes. The coarser sands and gravels are usually found in the lower two-thirds of the deposit. In the vicinity of Lawndale Annex, lower Pleistocene deposits of the Lakewood Formation overlie the San Pedro Formation. The lower section of the Lakewood Formation consists of fluvial gravel, sand, silt, and clay with an approximate thickness of 200 to 300 ft. The upper section of the Lakewood grades into a fossiliferous marine sand and gravel overlain by a nonmarine sand and silt deposit. The youngest deposits underlying Lawndale Annex consist of a thin veneer of late Pleistocene quartz dune sand. These deposits are mapped as the "Older Dune Sand" deposits (see Fig. 3.3-2). The older dune sand consists of fine to medium-grained sands with minor amounts of gravel, sandy silt, and clay. These eolian deposits range up to 200 ft in thickness and exhibit thin, irregular, relatively dense cemented layers near the surface (Poland _et al._, 1956).

3.3.2 SOILS

Subsurface soil conditions at Lawndale Annex were compiled from existing soil boring records collected at the FAA Bldg. adjacent to the southern boundary of the annex. The borings were taken for subsurface investigation prior to construction of the FAA Bldg. (Daniel, Mann,



SOURCES: California Dept. of Water Resources, 1962.
ESE, 1985.

Figure 3.3-2
SURFICIAL GEOLOGY IN THE VICINITY OF LAWNDALE ANNEX

INSTALLATION
RESTORATION PROGRAM
LAWNDALE ANNEX

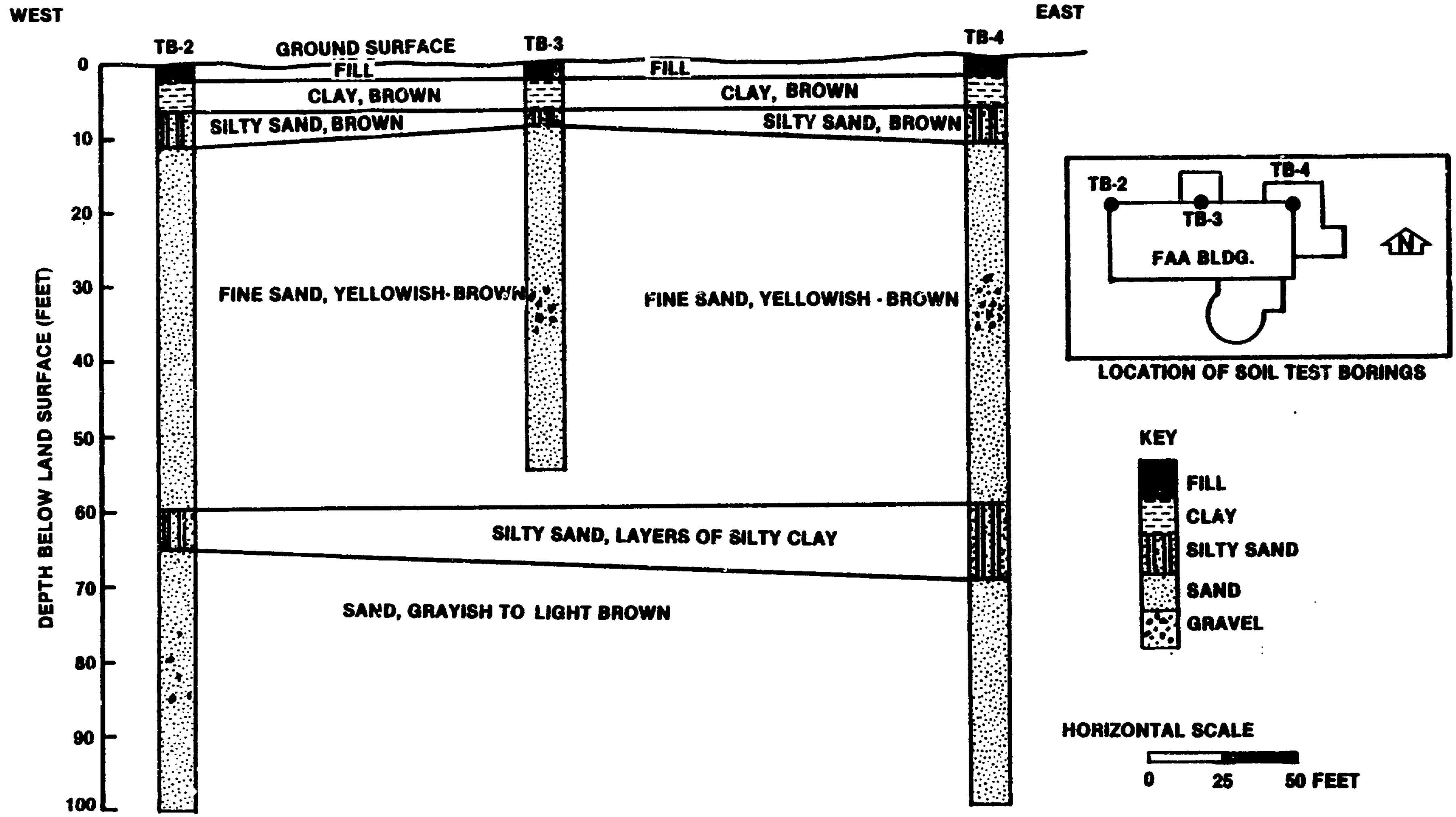
Johnson, and Mendenhall, Architects-Engineers-Planners, 1970). As shown in Fig. 3.3-3, the soil boring indicates 1 to 3 ft of fill material overlying natural soil. The top 10 ft of the soil profile consists of clay and silty sand. The remaining section, to approximately 60 ft, consists of fine sand with thin layers of gravel. No indication of ground water was encountered during the soil boring investigation.

The clayey, silty soils in the top 10 ft of the section at Lawndale Annex are characterized by low permeability and low infiltration ratios, based on the soil grain size. Infiltration through this upper clayey unit would be relatively slow. However, after infiltration through the clay, any contaminants would move fairly rapidly within the sand and gravel units.

3.3.3 GEOHYDROLOGY

Lawndale Annex is located in the West Coast Basin, which underlies 160 square mi of the Coastal Plain in the southwestern corner of the County of Los Angeles. The basin is bounded on the west and south by the Pacific Ocean. The basin's eastern boundary consists of a series of faults and folds, with the northern boundary formed by a structural uplift to the north of Los Angeles International Airport (Los Angeles County Flood Control District, 1970).

Ground water occurrences in the Lawndale Annex region can be divided into four general classes, depending on the formation in which the aquifer occurs. As mentioned previously, the Monterey and Pico Formations contain connate ground water with high salinity, therefore eliminating the units as a potable water aquifer. The overlying San Pedro Formation contains two productive potable aquifer systems, the Silverado and Lynwood Aquifers. The third formation containing potable ground water is the Lakewood Formation. This formation consists of two productive systems termed the Gage and Gardena Aquifers. The shallowest ground water occurrence is found as a localized semiperched system in the basal section of the older dune sand. A geologic cross section



SOURCES: Daniel, Mann, Johnson & Mendenhall, 1970; ESE, 1985.

Figure 3.3-3
SHALLOW SOIL PROFILE
AT LAWNDALE ANNEX

INSTALLATION
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LAWNDALE ANNEX

along the southern boundary (Compton Blvd.) of the installation (see Fig. 3.3-4) presents the hydrologic units and their approximate thickness in the vicinity of Lawndale Annex (California Dept. of Public Works, 1948). A generalized cross section of ground water flow directions in the vicinity of Lawndale Annex is presented in Fig. 3.3-5.

Monterey and Pico Formations

The Miocene and Pliocene deposits underlying Lawndale Annex are generally characterized as impervious shales, siltstone, and clay. Localized lenses of porous sandstone contain connate water with extremely high salinity. These water-bearing units are not used for potable supply due to the poor water quality. The Upper Division of the Pico Formation contains gravel in the top part of the deposit; water in this gravel exhibits low total dissolved solids but is not used for potable supply.

San Pedro Formation

The lowermost water-bearing zone in the San Pedro Formation is the Silverado Aquifer. This aquifer is the most extensive ground water reservoir in the West Coast Basin, with an estimated storage capacity of 6.5 million acre-feet (Los Angeles County Flood Control District, 1970). The aquifer has an area of approximately 120 square mi, and 90 percent of the basin's ground water is withdrawn from this aquifer. Recharge to the system occurs through artificial injection of state project water and Colorado River water, downward leakage, and infiltration in the outcrop area near the Palos Verdes Hills. The aquifer is confined by an unnamed aquiclude in the vicinity of Lawndale Annex; however, the system is often in direct hydraulic continuity with the overlying Lynwood and Gage Aquifers. The Silverado Aquifer underlies Lawndale Annex and has a thickness of approximately 200 ft. Regional ground water flow direction is shown to be east-southeast in a recent potentiometric map (see Fig. 3.3-6). However, older potentiometric maps (see Fig. 3.3-7) show the flow direction influenced by ground water pumping. In this case,

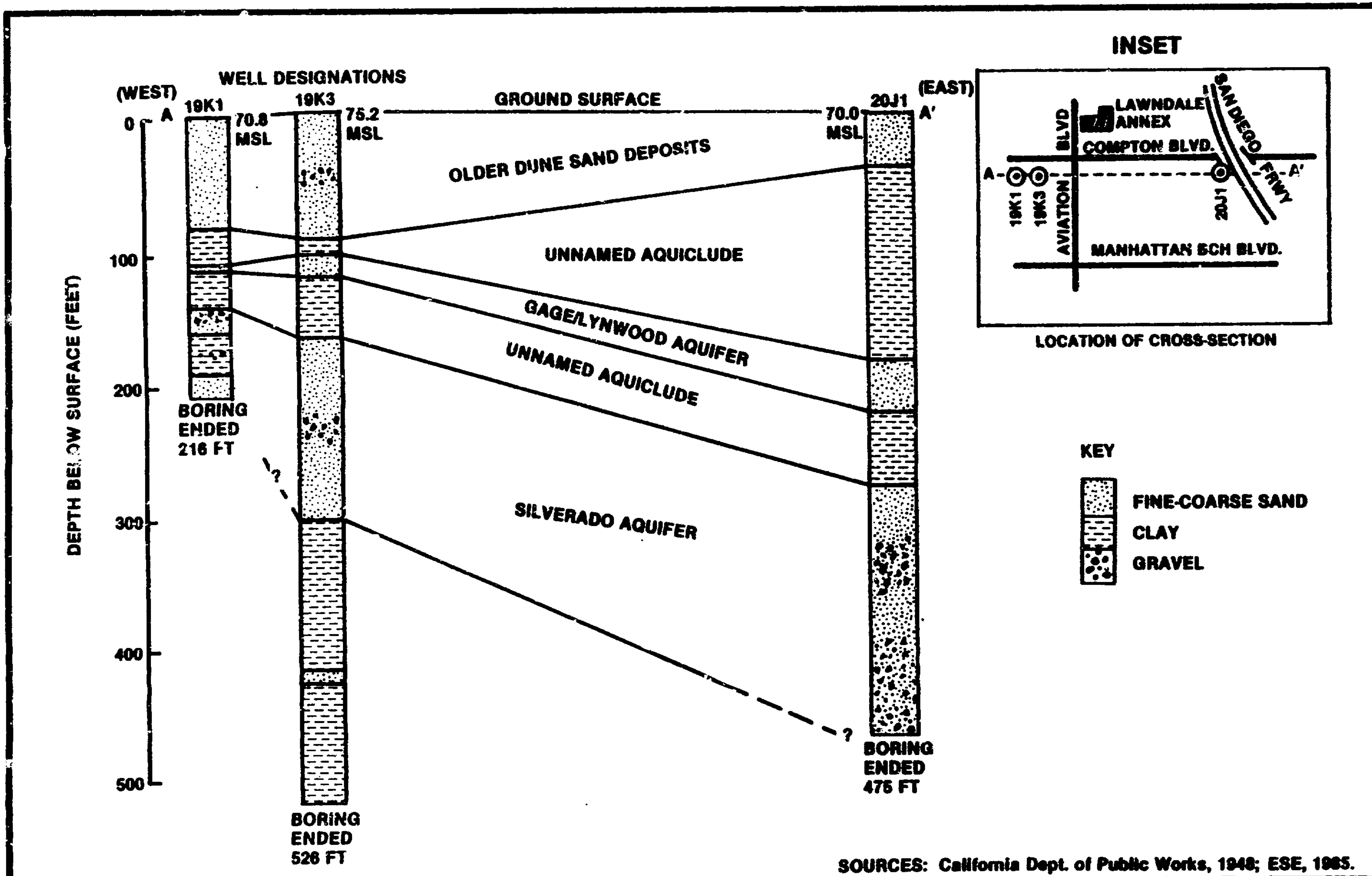

Figure 3.3-4
HYDROGEOLOGIC CROSS SECTION
SOUTH OF LAWNDALE ANNEX (COMPTON BLVD.)

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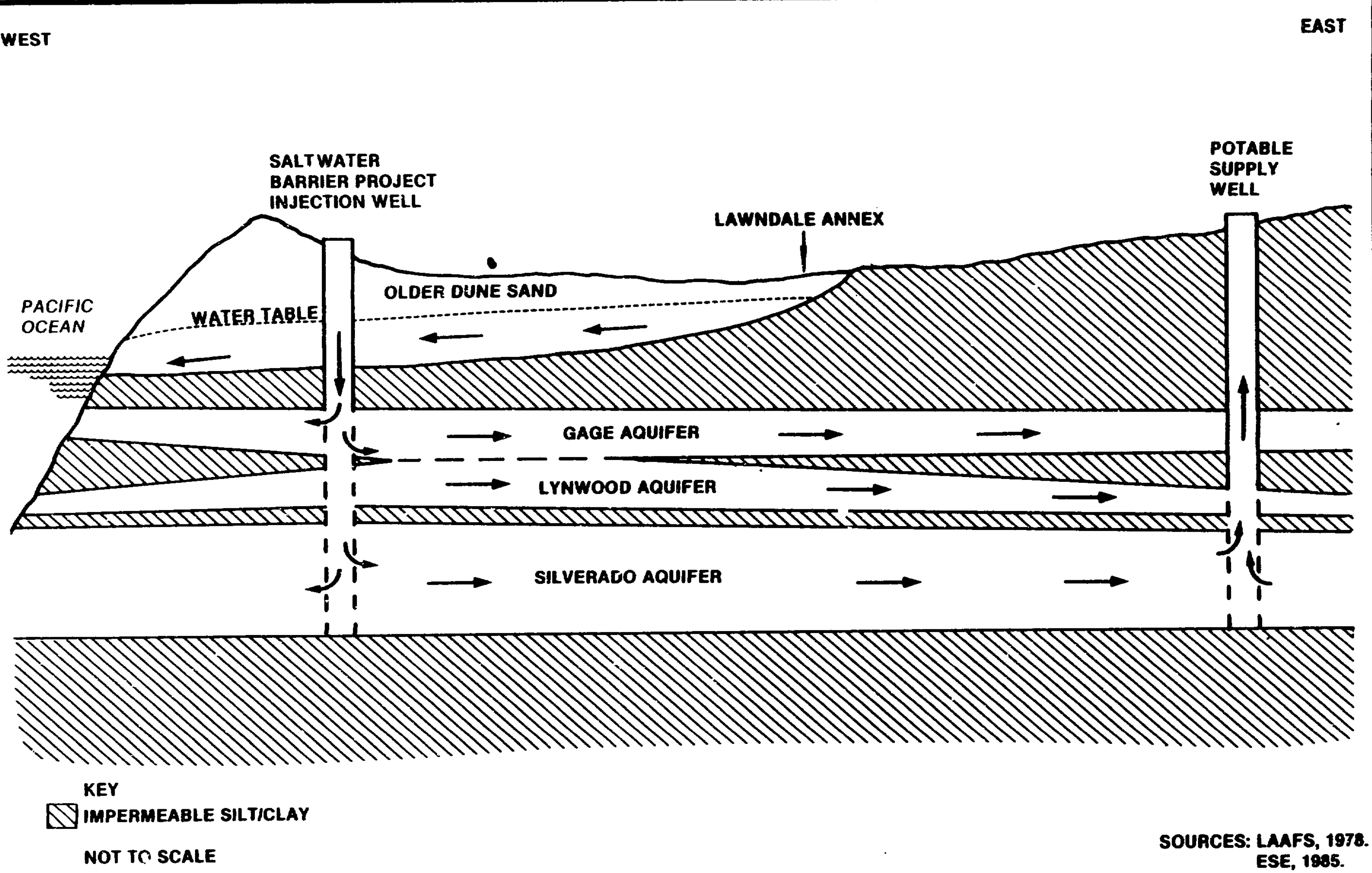

Figure 3.3-5
GENERALIZED GROUND WATER FLOW DIRECTION
IN THE VICINITY OF LAWNDALE ANNEX

INSTALLATION
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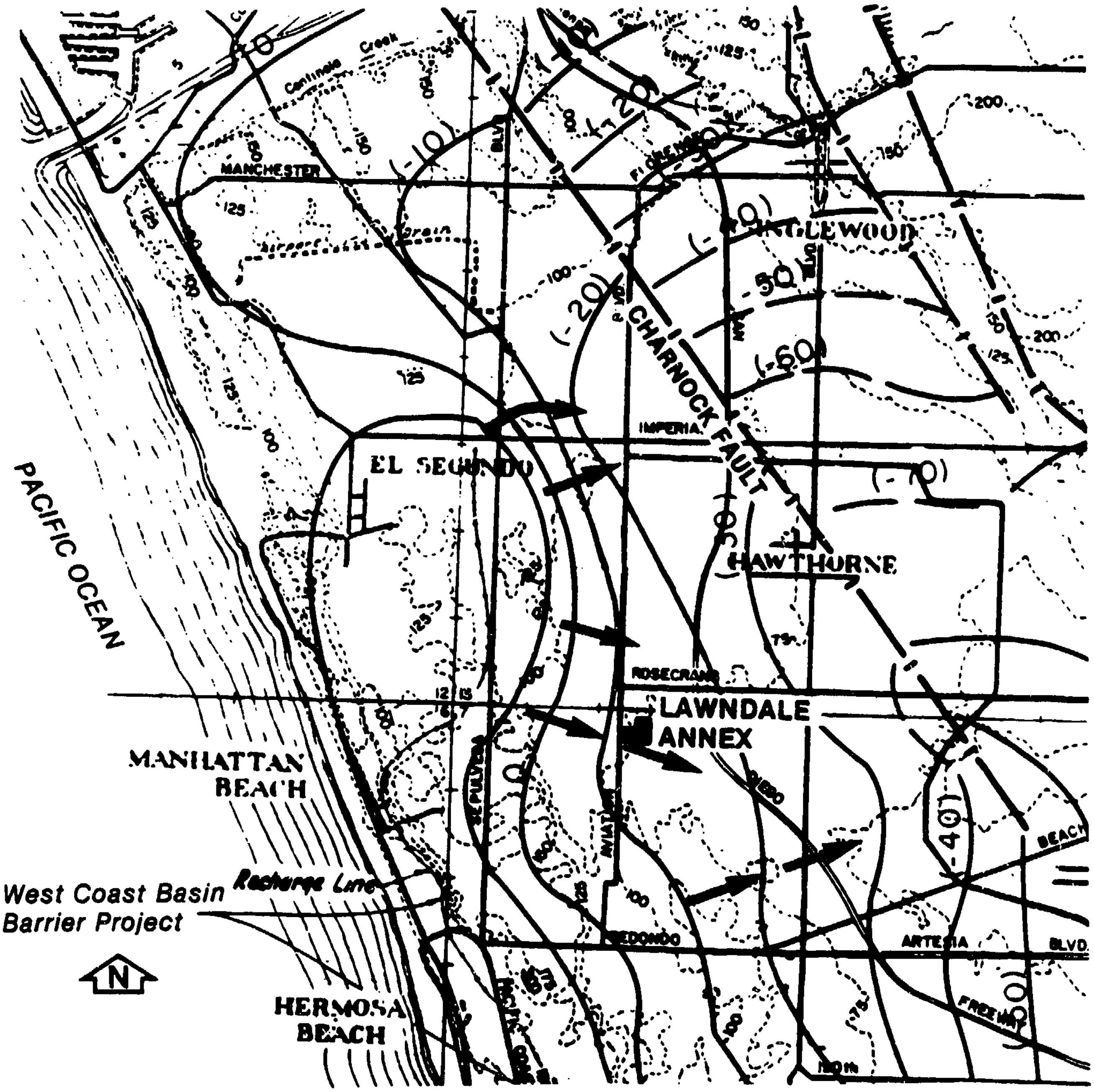


KEY

GROUND WATER ELEVATION CONTOUR (ft MSL)

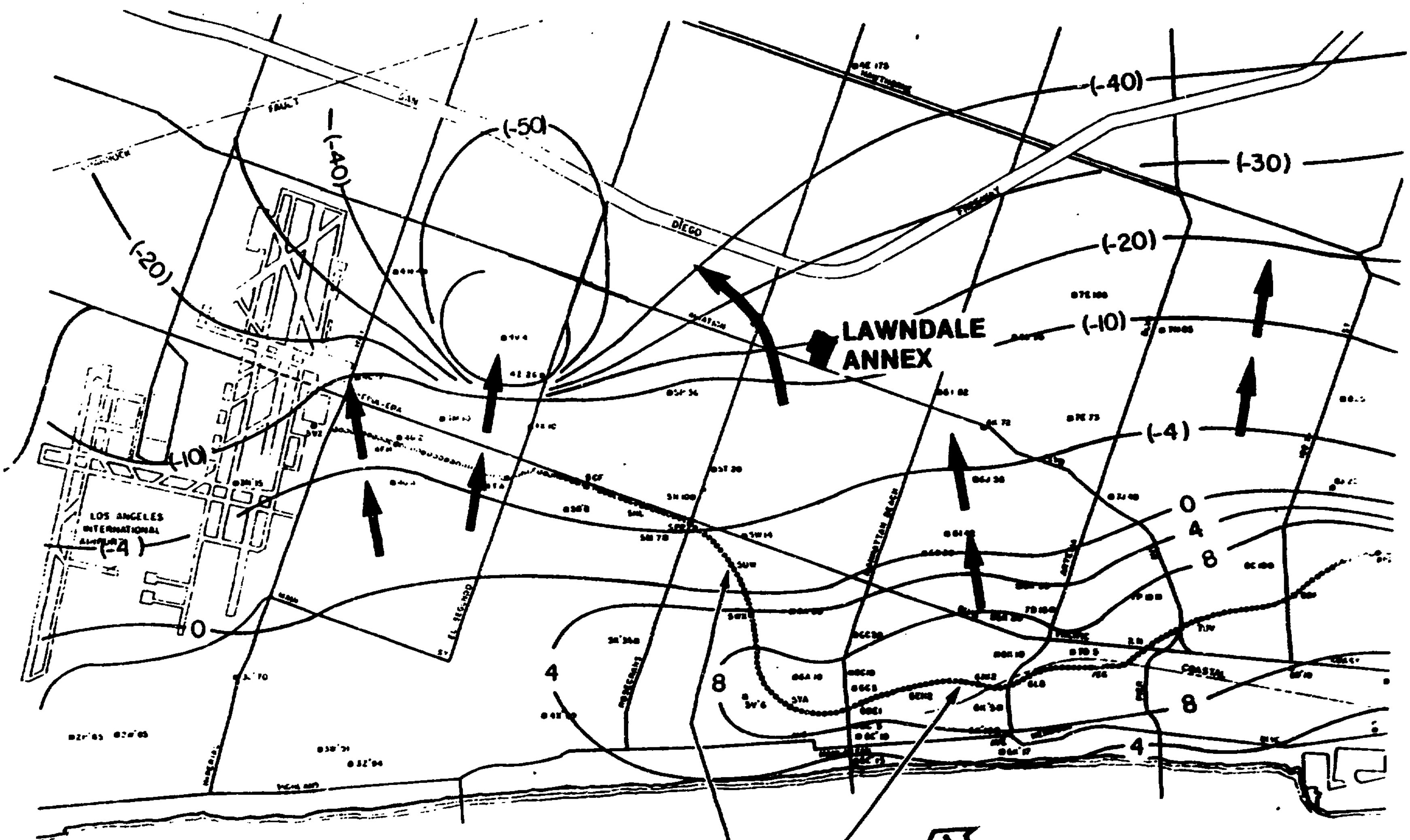
GROUND WATER FLOW DIRECTION

GEOLOGIC FAULT

SOURCES: Los Angeles County Flood Control District, 1983.
ESE, 1985.

Figure 3.3-6
POTENTIOMETRIC SURFACE OF SILVERADO AQUIFER (ft MSL) NEAR LAWNDALE ANNEX, FALL 1983

INSTALLATION RESTORATION PROGRAM
LAWNDALE ANNEX



KEY

(-10) GROUND WATER ELEVATION CONTOUR (ft MSL)

GROUND WATER FLOW DIRECTION

SOURCES: California Dept. of Water Resources, 1980. ESE, 1985.

Figure 3.3-7
POTENTIOMETRIC MAP OF THE SILVERADO AQUIFER (ft MSL), SPRING 1968

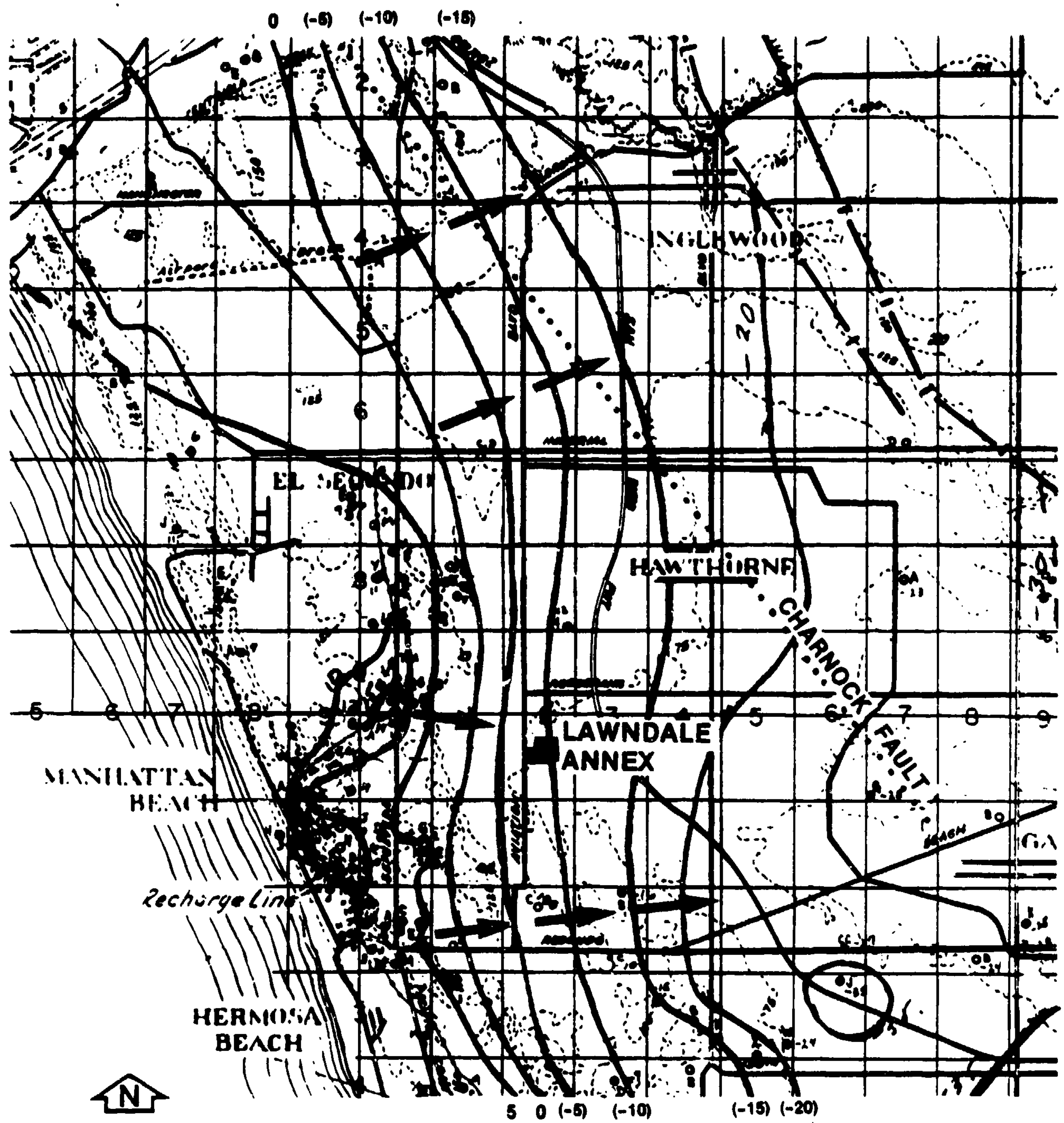
INSTALLATION RESTORATION PROGRAM LAWNDALE ANNEX

flow direction is reversed to the northeast in the direction of the pumping well field. The potentiometric maps represent ground water elevation contours in a specific subsurface aquifer. In each aquifer, flow is perpendicular to the contours from areas of higher elevation (feet, mean sea level) to areas of lower elevation, as indicated by the flow direction arrows. Well yields from the Silverado Aquifer range from 200 to 4,000 gallons per minute (gpm).

Overlying the Silverado Aquifer, and separated by an unnamed aquiclude, is the Lynwood Aquifer (see Fig. 3.3-4). This aquifer occurs throughout most of the West Coast Basin and is composed primarily of sand and gravel with localized lenses of sandy silt and fine sand. The aquifer has a thickness of between 20 and 80 ft in the vicinity of Lawndale Annex. The Lynwood Aquifer exhibits a high transmissivity with yields of 500 to 600 gpm and higher. This aquifer was previously termed the "400-ft gravel." Flow gradients in this permeable unit are believed similar to that of the Silverado, with flow in an east-northeast direction.

Lakewood Formation

The Gage Aquifer is the lowest and oldest water-bearing zone in the Lakewood Formation. The aquifer or its lithologic equivalent extends throughout most of the West Coast Basin. This aquifer has also been referred to as the "200-ft sand" in other reports. The Gage Aquifer is composed primarily of sand with some gravel and thin beds of silt and clay. Beneath Lawndale Annex, the Gage has a thickness of between 50 and 120 ft. Recharge to the aquifer occurs by artificial injection and downward leakage. Ground water flow direction in this aquifer at Lawndale Annex is from west to east across the site (see Figs. 3.3-8 and 3.3-9). In general, the Gage Aquifer is a semiconfined aquifer with moderate permeability. Yields from this unit are variable and usually less than other aquifers in the vicinity.



KEY

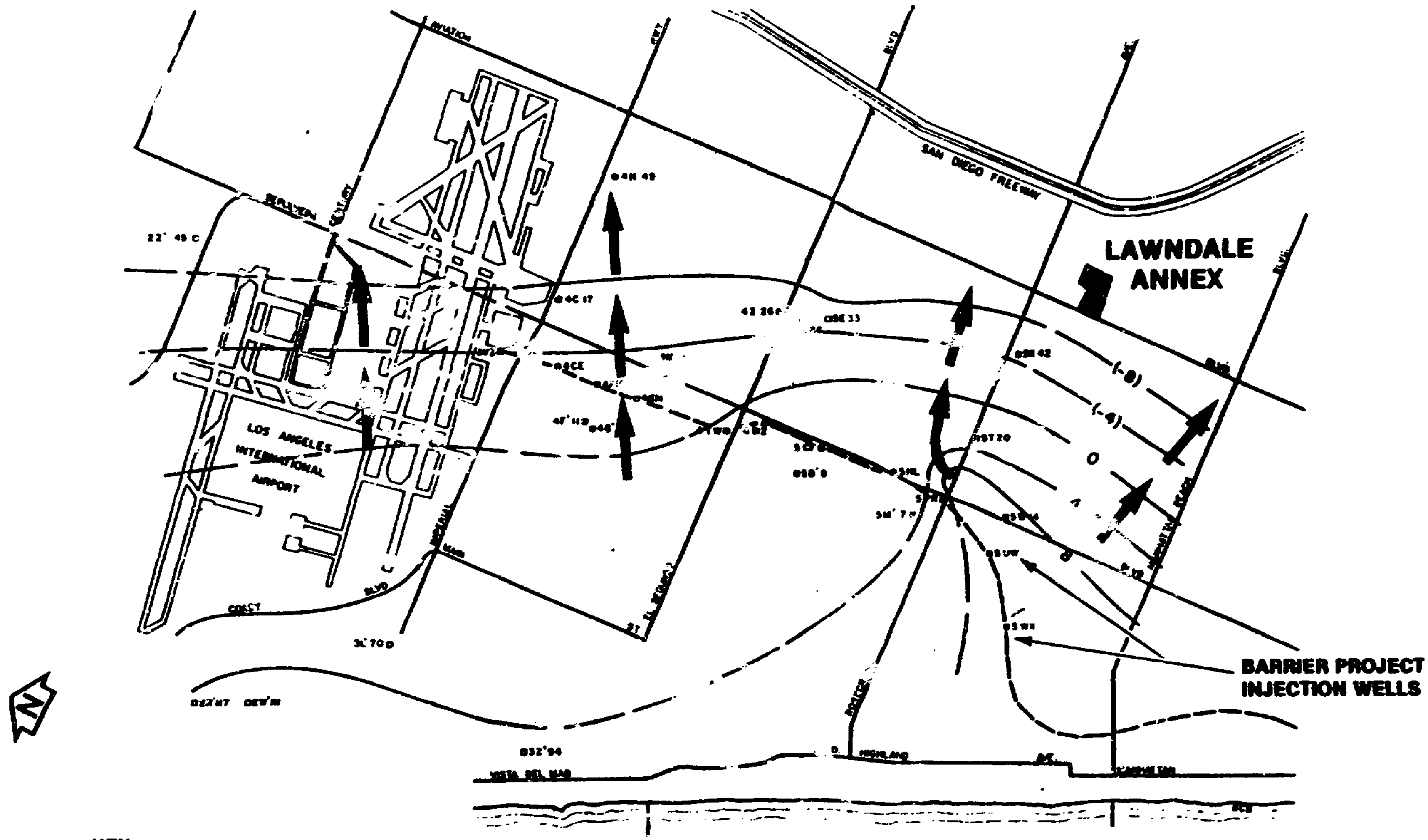
—— -10 GROUND WATER ELEVATION CONTOUR (ft MSL)

➡ GROUND WATER FLOW DIRECTION

• • • • • GEOLOGIC FAULT

SOURCES: Los Angeles County Flood Control District, 1978. ESE, 1985.

Figure 3.3-8 POTENTIOMETRIC SURFACE OF THE GAGE AQUIFER (ft MSL), FALL 1978	INSTALLATION RESTORATION PROGRAM LAWNDALE ANNEX



KEY

GROUND WATER ELEVATION CONTOUR (ft MSL)

GROUND WATER FLOW DIRECTION

SOURCES: California Dept. of Water Resources, 1968.
ESE, 1985.

Figure 3.3-9
POTENTIOMETRIC MAP OF THE GAGE AQUIFER (ft MSL), FALL 1967

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Older Dune Sand

The uppermost water-bearing unit underlying Lawndale Annex occurs as a semiperched, unconfined aquifer which is discontinuous over much of the West Coast Basin. The semiperched aquifer contains little available ground water in the vicinity of Lawndale Annex. The existence of a clay and silty clay aquiclude controls the areal distribution of the semiperched aquifer. Examination of lithologic logs near Lawndale Annex (see Fig. 3.3-4) reveals no aquiclude occurring in the older dune sand deposits. Ground water flow in this aquifer is generally in an east to west direction toward the Pacific Ocean.

Installation Wells

No potable water wells are located on Lawndale Annex. All potable water is supplied by municipal sources.

3.4 WATER QUALITY

3.4.1 SURFACE WATER QUALITY

No surface water features exist on Lawndale Annex; thus, no surface water quality data are available. Stormwater drainage from the site enters the Los Angeles County Flood Control District storm drainage system. While no specific data exist to quantify the quality of stormwater runoff from Lawndale Annex, it likely is typical of stormwater drainage from the parking areas, streets, and other facilities in the area. No industrial discharges occur to the stormwater system.

3.4.2 GROUND WATER QUALITY

As described in Sec. 3.3, Lawndale Annex is underlain by various geological formations, principally consisting of marine sand, gravel, and silt deposits. Several of these formations contain ground water and are used for regional water supply. No potable water supply wells are located on Lawndale Annex. All potable water is supplied to the installation by connection to municipal sources.

Ground water quality data were obtained (EPA, 1985) for two wells located approximately 1 mi south of Lawndale Annex. These data are presented in Table 3.4-1. As shown by the data, ground water in the vicinity of Lawndale Annex is slightly alkaline, with moderate to high levels of hardness and dissolved solids. The mineral composition of the ground water reflects the marine origin of the aquifers. For example, the cationic component is dominated by sodium, calcium, and magnesium, whereas the dominant anions are bicarbonate, chloride, and sulfate. Sodium chloride and sodium sulfate arise from seawater; calcium and magnesium bicarbonate result from dissolution of marine fossiliferous materials.

The National Interim Primary Drinking Water Regulations (NIPDWR) (EPA, 1982a) contain a maximum contaminant level (MCL) of 10 milligrams per liter (mg/L) for nitrate-nitrogen. The chemical data indicate the ground water is well below the MCL.

The National Secondary Drinking Water Regulations (NSDWR) (EPA, 1982b) contain MCLs for dissolved solids (500 mg/L), chloride (250 mg/L), sulfate (250 mg/L), iron [300 micrograms per liter (ug/L)], manganese (50 ug/L) and pH (6.5-8.5). As shown by the data in Table 3.4-1, the ground water quality is well within the NSDWR MCLs for these parameters, with the exception of Well No. 29F1, which contained 880 mg/L of dissolved solids and 67 ug/L of manganese. The NSDWR MCLs were established for aesthetic characteristics and are not primarily health-related.

3.4.3 POTABLE WATER QUALITY

Potable water is supplied to Lawndale Annex by the Southern California Water Co. No potable wells have been installed on Lawndale Annex. A 12-inch-diameter supply main is located adjacent to and parallel with the eastern boundary of Lawndale Annex (see Fig. 3.4-1).

Table 3.4-1. Water Quality Data for Ground Water in the Vicinity of Lawndale Annex

Parameter	Well Identification Number		Federal Drinking Water Maximum Contaminant Level
	3S/14W-29F1	3S/14W-21M1	
Temperature (°C)	22.8	23.9	--
pH (Units)	8.0	8.0	6.5-8.5*
Specific Conductance (umhos/cm)	1,320	555	--
Total Dissolved Solids (mg/L)	880	324	500*
Total Hardness (mg/L as calcium carbonate)	354	142	--
Calcium (mg/L)	97.7	38.0	--
Magnesium (mg/L)	26.8	11.5	--
Sodium (mg/L)	89.5	47.9	--
Potassium (mg/L)	6.8	6.0	--
Bicarbonate (mg/L)	339.0	248	--
Sulfate (mg/L)	95	1.0	250*
Chloride (mg/L)	229	32.0	250*
Nitrate (mg-N/L)	0.660	0.17	10†
Fluoride (mg/L)	0.34	0.23	2†
Ammonia (mg-N/L)	<0.1	0.51	--
Orthophosphorus (mg-P/L)	0.040	0.020	--
Boron (ug/L)	230	185	--
Iron (ug/L)	41	22	300*
Manganese (ug/L)	67	44	50†

*NSDWR (EPA, 1982b).
†NIPDWR (EPA, 1982a).

Note: -- = not applicable.
umhos/cm = micromhos per centimeter.
mg/L = milligrams per liter.
ug/L = micrograms per liter.
The NIPDWR MCL for fluoride is based on an average temperature of 62.6°F.

Sources: EPA, 1985; ESE, 1985.

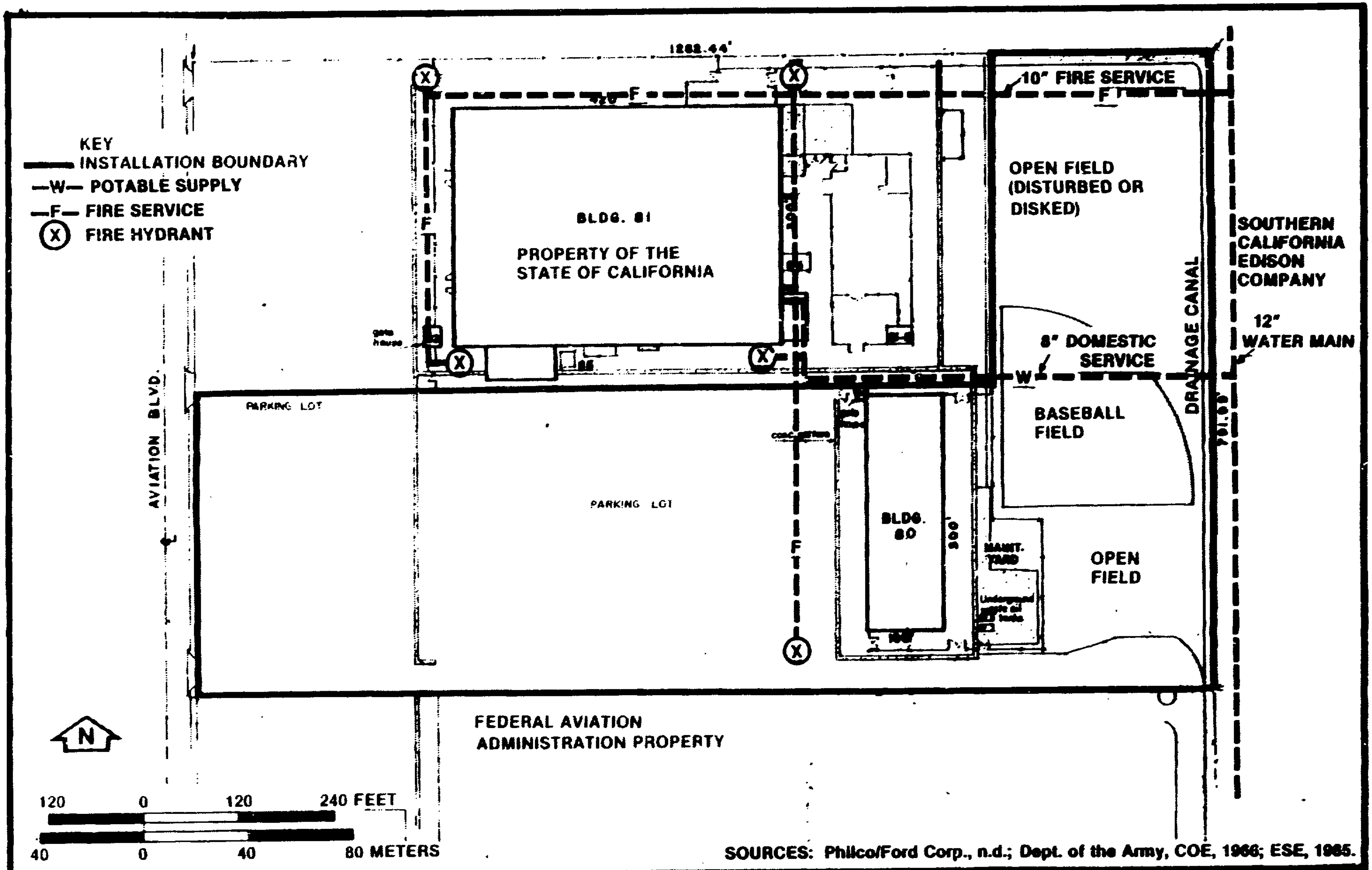

Figure 3.4-1
WATER SUPPLY SYSTEM TO LAWNDALE ANNEX

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Fire service is supplied via a 10-inch-diameter main traversing the northern portion of Lawndale Annex and providing service to hydrants located adjacent to Bldgs. 80 and 81 (Fig. 3.4-1). Potable water supply is via an 8-inch-diameter main that connects to the north end of Bldg. 80 with service to the east end of Bldg. 81 (Fig. 3.4-1).

Water supplied to Lawndale Annex by the Southern California Water Co. is within the NIPDWR and NSDWR MCLs. Water analysis data provided by the water company are presented in App. J. Water is purchased by the Southern California Water Co. from the metropolitan water district of southern California. Water supplied to the area originates from the Weymouth or Jensen Treatment Plants (see App. J).

3.5 BIOTIC COMMUNITIES

Lawndale Annex is situated in an area of light industrial activity. The installation is almost entirely used for buildings and associated, paved parking areas. No natural vegetation communities and only scattered plantings of ornamental grasses, trees, and shrubs occur on the installation. As a result of the urban setting and lack of available habitat, wildlife diversity is low. No wildlife surveys or species counts have been conducted for the installation. The following paragraphs describe species which generally occur in urban areas of southern California.

Birds that may occur on the annex include the mourning dove (Zenaidura macroura), raven (Corvus corax), robin (Turdus migratorius), yellow-rumped warbler (Dendroica coronata), flicker (Colaptes auratus), and downy woodpecker (Dendrocopus pubescens) (Yocom and Dasmann, 1965). Although these birds may forage in the open areas, few places are suitable for nesting.

Due to the human activity and lack of habitat on the base, few mammalian wildlife species are expected to occur. Mammalian species would be limited to cottontail rabbits (Syvilagus audubonii), mice (e.g., Peromyscus maniculatus), and possibly moles (e.g., Scapanus townsendi). Herpetiles would be limited to the western garter snake (Thamnophis sirtalis), western skink (Eumeces skiltoniamus), and western toad (Bufo boreas) (Yocom and Dasmann, 1965).

No threatened or endangered species are expected to occur due to the absence of required habitat.

3.6 ENVIRONMENTAL SETTING SUMMARY

Lawndale Annex is situated on 13.34 acres in a developed area of Los Angeles dominated by aerospace industries. The annex consists of one building (Bldg. 80), a large paved parking area, and an open area used is recreation. The small amount of natural soils exposed on the installation is cultivated for use as a softball field or used for ornamental landscaping. The annex is relatively flat, with surface elevations ranging from 68 to 71 ft above MSL.

Stormwater runoff is collected in open concrete gutters and routed through a system of reinforced concrete pipes to an open drainage canal along the eastern boundary of the annex that empties into the Los Angeles County Flood Control District storm drainage system along Compton Blvd. Because the site consists of approximately 70-percent impervious areas of either parking lot or Bldg. 80, most rainfall leaves the installation in the form of stormwater runoff. Additionally, because net precipitation for this area is 33.9 inches per year, little infiltration of rainfall is expected to occur on the annex.

The climate of the area is mild, with temperatures moderated by the Pacific Ocean. The average monthly temperature ranges from a low of 56.0°F in January to a high of 70.3°F in August. The average annual rainfall is 12.08 inches, 87 percent of which occurs in the winter months (November through March). Net precipitation is -33.92 inches per year and the 1-year, 24-hour rainfall event is 3 inches. The low value for net precipitation indicates a low potential for significant infiltration or the formation of permanent surface water features. The 1-year, 24-hour rainfall event of 3 inches indicates a moderate potential for runoff and erosion. The majority of the installation, however, is asphalt-paved and contains stormwater drainage systems to control runoff, thus eliminating any significant potential for flooding and soil erosion.

The near-surface soils on Lawndale Annex are clayey, silty sands with predominantly silty, fine sands below about 10 ft. Due to the large amount of paved areas, most surface infiltration is restricted because surface drainage enters the storm sewer system.

Ground water occurrences can be divided into four general classes, depending on the formation in which the aquifer occurs. The Monterey and Pico Formations contain connate ground water with high salinity, therefore eliminating the units as a potable water aquifer. The overlying San Pedro Formation contains two productive potable aquifer systems, the Silverado and Lynwood Aquifers. The third formation containing potable ground water is the Lakewood Formation. This formation consists of two productive systems termed the Gage and Gardena Aquifers. The shallowest ground water occurrence is found as a localized semiperched system in the basal section of the older dune sand. Depth to this uppermost ground water is greater than 50 ft in the vicinity of Lawndale Annex. Due to limited quantities, the shallow ground water is not used as a potable, industrial, or municipal source. The deeper aquifers are separated from the shallow, semiperched aquifer by aquicludes.

As a result of the urban setting and associated lack of available habitat, few wildlife species occur on Lawndale Annex. Various urban bird species forage in the open area, and common rodents (e.g., mice) would be expected to occur on the annex. No threatened or endangered species are present.

4.0 FINDINGS

To assess the past hazardous waste management at Lawndale Annex, past activities of waste generation and disposal methods were reviewed. This section contains a summary of hazardous wastes generated, descriptions of waste disposal methods, identification of onsite disposal or treatment sites, and evaluation of the potential for environmental contamination.

4.1 CURRENT AND PAST ACTIVITY REVIEW

To identify past activities that resulted in generation and disposal of hazardous waste, past waste generation and disposal methods were reviewed. This activity consisted of a review of files and records, examination of engineering diagrams for buildings and sanitary and storm sewer systems, interviews with former employees, and site inspections.

Past operations described in this section are those which handled, stored, or disposed of potentially toxic or hazardous materials. These operations included industrial and laboratory operations and activities in which pesticides; polychlorinated biphenyls (PCB); petroleum, oils, and lubricants (POL); radiological materials; and explosives were handled.

Prior to DOD's acquisition of the facility in the early 1960s, Douglas Aircraft Co. occupied the facility and produced aluminum aircraft parts and operated a publications center (see Sec. 2.2). Specific information on waste generation types, quantities, and disposal practices associated with the Douglas Co. operations is unknown. Discussions with former employees suggest that no waste materials were disposed of onsite; instead, solid wastes were disposed of at offsite landfills, and liquid wastes were discharged to the sanitary sewer system. Examination of engineering diagrams for Bldgs. 80 and 81 did not indicate that sumps, septic tanks, or dry wells were used for waste disposal. Historical aerial photographs of the site do not indicate that any type of landfill disposal activities were located on Lawndale Annex.

Subsequent to DOD's acquisition of the property in 1964, the U.S. Army produced anti-tank missiles in the facility and the facility was designated LAMP. LAMP was a major product manufacturing facility from 1964 until 1971, when production ceased and the facility was declared excess property. All missile manufacturing operations occurred in Bldg. 81. These operations included metal machining, welding, metal cleaning, metal plating, X-raying, and painting. Storage areas, assembly lines, and a chemistry laboratory were also located in Bldg. 81. A cafeteria, medical clinic, and administrative offices were housed in Bldg. 80.

After the facility was declared excess property, the State of California, in March 1983, acquired Bldg. 81 (the former manufacturing facility). State records and surplus office equipment are currently stored in Bldg. 81. Bldg. 80 has remained vacant since 1981 and was used for a short period by the Hawthorne disaster wing (Christian Pilots Association) as a storage site for clothing, food, and other emergency supplies. As described in Sec. 2.0, the Space Division of USAF has recently acquired the remaining 13.34 acres of the facility, including Bldg. 80, and is preparing to build administrative offices on the site.

A summary of historical waste generation from former industrial operations is presented in Table 4.1-1. Industrial shops; activities; and waste treatment, storage, and disposal are described in the following paragraphs.

Table 4.1-1. Summary of Waste Generation and Disposal Practices at Lawndale Annex

	Shop Name	Building Number	Waste Material	Waste Quantity (Gal/Month)	1955 — 1960 — 1965 — 1970 — 1975
I.	DOUGLAS AIRCRAFT CO.				
A.	Aluminum Parts Manufacturing	Bldg. 81	Metal cuttings, floor sweepings, rags, containers	Unknown	Contract Hauled to Municipal Landfill
			Machine oils, coolants lubricants		Discharge to Sanitary Sewer
B.	Publications Dept.	Bldg. 81	Rags, containers	Unknown	Contract Hauled to Municipal Landfill
			Cleaning solvents	Unknown	Discharge to Sanitary Sewer
			Inks, dyes, photographic solutions	Unknown	Discharge to Sanitary Sewer
C.	Cafeteria	Bldg. 80	Putrescible solid wastes	Unknown	Contract Hauled to Municipal Landfill
II.	LAWNDALE ARMY MISSILE PLANT (LAMP)				
A.	Machine and Welding Shop	Bldg. 81	Metal cuttings, floor sweepings	Variable	Contract Hauled to Municipal Landfill

Table 4.1-1. Summary of Waste Generation and Disposal Practices at Lawndale Annex (Continued, Page 2 of 5)

Shop Name	Building Number	Waste Material	Waste Quantity (Gal/Month)	1955	1960	1965	1970	1975
		Machine oils, lubricants	Variable			Contract Hauled for Offsite Reclamation		
		Machining coolants	Variable			Discharge to Sanitary Sewer		
B. Metal Cleaning Shop	Bldg. 81	Sand blasting residue	Variable			Contract Hauled to Municipal Landfill		
		Vapor degreasing solvent (TCA)	Variable			Contract Hauled for Offsite Reclamation		
		Degreaser sludge	Variable			Contract Disposal Offsite		
		Soap Solution	Variable			Discharge to Sanitary Sewer		
C. Metal Plating Shop	Bldg. 81 Dichromate Dip Tank	Chromic acid from drag-out	160			Neutralization and Discharge to Sanitary Sewer		
	Chromic Acid Dip Tank	Chromic acid from drag-out	160			Neutralization and Discharge to Sanitary Sewer		

Table 4.1-1. Summary of Waste Generation and Disposal Practices at Lawndale Annex (Continued, Page 3 of 5)

Shop Name	Building Number	Waste Material	Waste Quantity (Gal/Month)	1955	1960	1965	1970	1975
	Phosphoric Acid Sensitize Tank	Acidic wastewater	96			Neutralization and Discharge to Sanitary Sewer		
	Nickel Acetate Tank	Nickel solution from drag-out	96			Neutralization and Discharge to Sanitary Sewer		
	Dye Tank	Dye solution	96			Neutralization and Discharge to Sanitary Sewer		
	Chromic Chemical Conversion Treatment	Chormate waste from drag-out	160			Neutralization and Discharge to Sanitary Sewer		
	Dichromate Seal Tank	Chromate waste from drag-out	160			Neutralization and Discharge to Sanitary Sewer		
	Sulfuric Acid Anodize Tank	Acidic waste from drag-out	160			Neutralization and Discharge to Sanitary Sewer		
	Deoxidizer Tank	Acidic waste from drag-out	160			Neutralization and Discharge to Sanitary Sewer		

Table 4.1-1. Summary of Waste Generation and Disposal Practices at Lawndale Annex (Continued, Page 4 of 5)

Shop Name	Building Number	Waste Material	Waste Quantity (Gal/Month)	1955	1960	1965	1970	1975
	Electroless Nickel Plate Tank	Nickel solution from drag-out	96			Neutralization and Discharge to Sanitary Sewer		
	Copper Plate Tank	Copper solution from drag-out	96			Neutralization and Discharge to Sanitary Sewer		
	Nitric Acid Dip Tank	Acidic wastes from drag-out	96			Neutralization and Discharge to Sanitary Sewer		
	Magnesium Anodize Tank	Acidic wastes from drag-out	96			Neutralization and Discharge to Sanitary Sewer		
	Dichromate Seal Tank	Chromate waste from drag-out	640			Neutralization and Discharge to Sanitary Sewer		
		Concentrated acids and plating solutions from tank replenishment	Variable			Contract Hauled for Offsite Disposal		
	Flume Scrubbers	Wastewater from flume scrubbers	Variable			Neutralization and Discharge to Sanitary Sewer		

Table 4.1-1. Summary of Waste Generation and Disposal Practices at Lawndale Annex (Continued, Page 5 of 5)

	Shop Name	Building Number	Waste Material	Waste Quantity (Gal/Month)	1955	1960	1965	1970	1975
D.	Process Water Treatment	Bldg. 81	Cooling tower blow-down containing corrosion and scale inhibitors	Variable			Discharge to Sanitary Sewer		
			Deionizer regeneration solutions	Variable			Contract Hauled for Offsite Disposal		
E.	Chemistry Laboratory	Bldg. 81	Concentrated plating solution	Variable Small Volumes			Contract Hauled for Offsite Disposal		
F.	Photographic Laboratory	Bldg. 81	Spent photographic developing solutions	Variable			Discharge to Sanitary Sewer Following Silver Recovery		
G.	Paint Shop	Bldg. 81	Paint solids from spray booth skimmings	Variable			Contract Hauled for Offsite Disposal		
H.	Boiler Shop	Bldg. 80	Boiler blow-down containing descaling and defoaming chemicals and corrosion inhibitors	Variable			Discharge to Sanitary Sewer		

Sources: U.S. Army Environmental Hygiene Agency, 1969;
Philco/Ford Corporation, 1964;
ESE, 1985.

4.1.1 INDUSTRIAL OPERATIONS

4.1.1.1 DOUGLAS AIRCRAFT CO.

As described previously, Douglas Aircraft Co. used Bldg. 81 from 1958 to 1962 for production of aluminum parts and as a publications center. During this period, a flight simulator for the DC8 aircraft, a cafeteria, and administrative offices were housed in Bldg. 80. Wastes generated from the aluminum parts production consisted of metal cuttings, floor sweepings, oils and lubricants, whereas the publications operation generated printing solvents, spent photographic solutions, inks, and dyes. No information was available concerning waste volumes from these operations. Discussions with former employees indicated that no wastes were disposed of on the facility. Solid wastes (metal cuttings, rags, empty containers) were collected for pickup and disposal at municipal landfills in the area and liquid wastes (photographic solutions, dyes, inks, cleaning solutions) were discharged to the sanitary sewer system.

4.1.1.2 LAMP

The U.S. Army used the facility from 1964 to 1971 for manufacture of the Shillelagh Anti-Tank Missile. The missile, excluding propellant and warhead, was manufactured and assembled at LAMP. This included manufacture and assembly of the guidance and control systems and the engine. All manufacturing operations occurred in Bldg. 81. These operations included metal machining, welding, metal cleaning, metal plating, X-raying, and painting.

Machine and Welding Shop

The machine and welding shop generated wastes including metal cuttings, floor sweepings, oils, and lubricants. These wastes were collected in barrels and hauled away by a subcontractor. Water soluble coolants were used for metal working and machining. These waters were discharged to the sanitary sewer system. All welding operations utilized a closed-loop cooling system, and no liquid wastes were discharged.

Metal Cleaning Shop

The metal cleaning shop included sand blasting equipment, a vapor degreaser, and a soap bath. The vapor degreaser utilized 1,1,1-trichloroethane (TCA) as a solvent. The spent solvent was collected by a subcontractor and taken offsite to be reclaimed as fresh solvent. Sludge from the vapor degreaser was also collected by a subcontractor and hauled away for disposal. Spent soap solution from the soap bath was discharged to the sanitary sewer. Sand blasting residues were disposed of with other solid wastes to municipal landfills.

Metal Plating Shop

The plating shop was located in the southeast corner of Bldg. 81 (Fig. 4.1-1). Approximately 50 vats, ranging in capacity from 185 to 420 gallons, were in operation. These vats contained solutions of acids, alkalies, heavy metals, cyanides, and organic dyes. All concentrated solutions, with the exception of the alkaline soap and dye solutions, were collected by a subcontractor and disposed of offsite. Dilute acidic wastes were neutralized with caustic soda (NaOH) in either or both of two neutralization pits. One of these neutralization pits was batch operated, and the other was continuous. Batch neutralized acidic wastes received further treatment along with alkaline soap solutions and dye solutions in the continuous neutralization pit before being discharged to the county sanitary sewer system (Fig. 4.1-1).

All plating shop rinse tanks were of the continuous overflow variety and utilized either deionized water or potable water, depending upon the plating operation. Rinse tanks utilizing deionized water overflowed into a closed-loop collection system to be regenerated by ion exchange. Those utilizing potable water discharged to floor drains and were neutralized with caustic soda in the continuous neutralization pit.

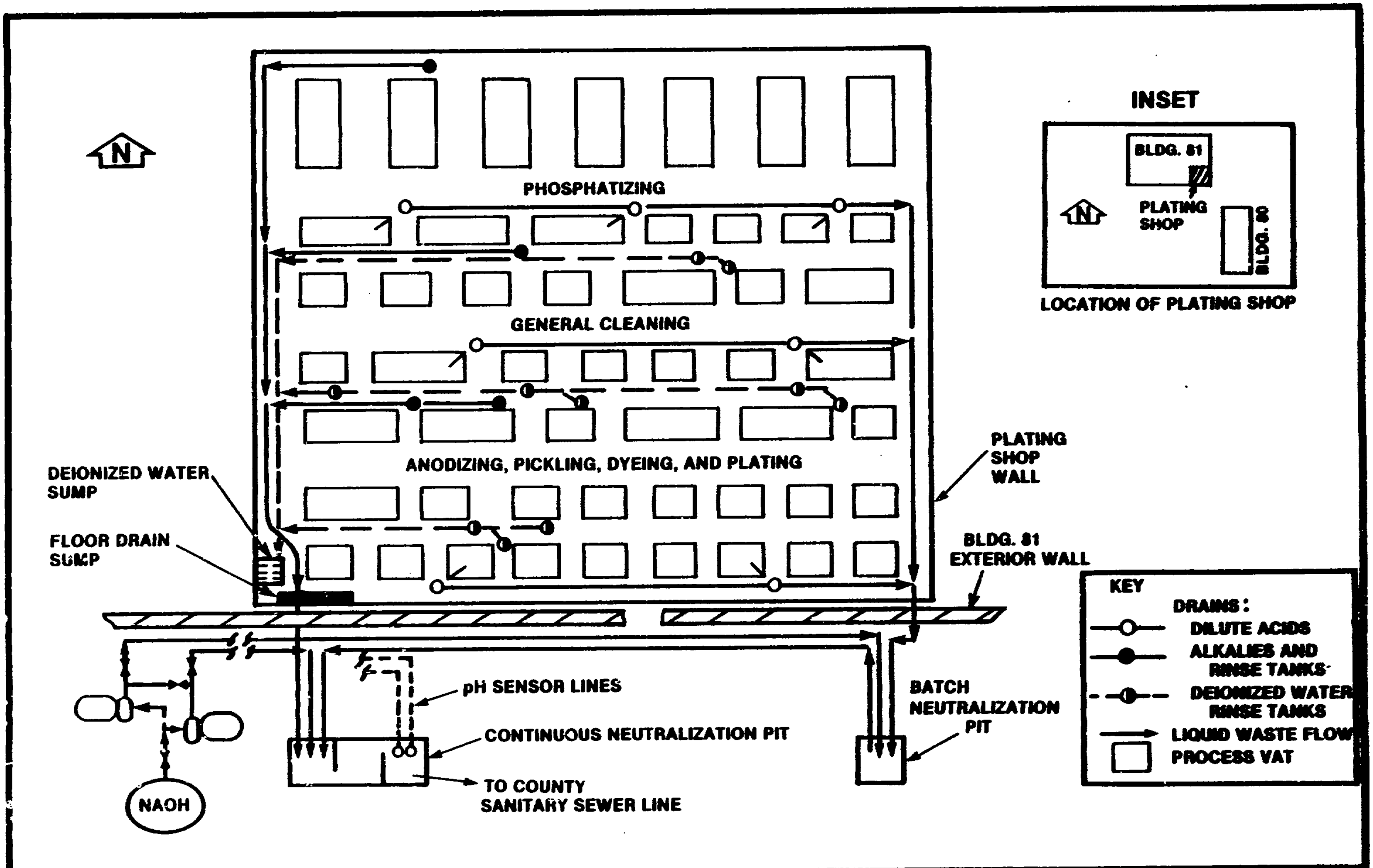

Figure 4.1-1
LAMP PLATING SHOP SCHEMATIC DIAGRAM

SOURCE: U.S. Army Environmental Hygiene Agency, 1969; ESE, 1985.

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Dilute acid wastes from material drag-out drained to the batch neutralization pit (Fig. 4.1-1). These wastes contained phosphates, chromates, and cyanides. The wastes were neutralized by manually pumping concentrated caustic soda solution into the pit. Samples from the pit were tested for pH in the plant chemistry laboratory. Mixing of the pit contents was by air agitation. When the pit contents were sufficiently neutralized, they were manually pumped to the continuous neutralization pit.

Batch dumps of alkaline solutions and organic dyes, together with continuous overflows from some of the rinse tanks, discharged to floor drains and then flowed by gravity to a collecting sump and then into a baffled, continuous neutralization pit. The continuous neutralization pit received all floor drainage from the plating shop as well as neutralized wastes from the batch neutralization pit. Concentrated caustic soda solution was automatically added to the continuous neutralization pit to maintain a pH of 7.0 in the effluent. Mixing was by air agitation. Control was attained by two pH sensors mounted near the effluent from the continuous neutralization pit. One sensor served as a pump control for caustic soda; the other was connected to a high-low audible alarm. There was a detention time of approximately 95 minutes (based upon design flow rates) in the continuous neutralization pit prior to discharge to the sanitary sewer.

Two fume scrubbers utilizing water as the contact medium removed impurities from fumes vented to hoods within the plating shop. This scrubbing water was discharged to the plating shop floor drain where it drained to the continuous neutralization pit.

At plant closure in 1971, all production equipment was removed from Bldg. 81, including the plating shop equipment. Government-owned equipment was shipped to the Defense Industrial Plant Equipment Center at Memphis, Tenn., for storage. Acids, etchants, metal plating, and alkali solutions (7,200 gallons) from the plating shop were picked up by a contractor for offsite disposal.

Process Water Treatment

As described in Sec. 3.4, all water used by LAMP was supplied by Southern California Water Co., from a main running along Rosecrans Blvd. and continuing within a strip easement along the eastern property boundary. An 8-inch lateral from this line provided drinking water for LAMP, and a 12-inch lateral was available for fire service (see Sec. 3.4.3).

All process water used at LAMP was obtained from a closed-loop process water system. Makeup water to the system was supplied from the drinking water lateral. The process water was recirculated through cooling towers for reuse and was treated with corrosion and scale inhibitors and a slimicide. The cooling towers were manually blown down approximately twice per year, and the discharged water entered the sanitary sewer.

Deionized water was used as solution and rinse water in many of the metal plating shop vats. This was a closed-loop system with makeup water supplied from the drinking water lateral. Water was deionized in a portable ion exchange unit operated by a subcontractor. The deionized water used in plating shop rinse tanks was recirculated through the deionizer unit and then stored in holding tanks for reuse. The ion exchange resins were regenerated using solutions of caustic soda and sulfuric acid. These regeneration solutions, which accumulate heavy metal ions and other anions and cations, were reused until they became too dilute. They were then collected by a subcontractor and disposed of offsite.

Chemistry Laboratory

During the operation of LAMP, a small chemistry laboratory was located in Bldg. 81. The laboratory housed process control personnel that monitored the chemical solutions in the plating shop. Chemical laboratory personnel also monitored the pretreatment neutralization process for the dilute acids and acidic wastewater from the plating shop (see discussion in the plating shop section). Small metal plating vats located in the chemistry laboratory contained concentrated plating solutions. Each vat contained approximately 2 gallons of solution. The solutions were disposed of by placing them in cans for removal by a subcontractor. Other chemistry laboratory wastes were diluted and/or chemically treated before being discharged to the sanitary sewer.

Photographic Laboratory

X-ray film was developed in a photographic laboratory adjoining the chemistry laboratory. Wastes were discharged to the sanitary sewer, but these wastes were small in quantity and presented no pollution problem. Silver from the film development wastes was reclaimed.

Paint Shop

A paint spray booth located in the northeast portion of Bldg. 81 utilized a closed-loop recirculated water system. Paint solids were skimmed from the water and removed by a subcontractor for disposal offsite.

Boiler Shop

Feed water for the two LAMP boilers was treated with descaling and defoaming chemicals and corrosion inhibitors. The boiler steam drums were blown down once per day, and the water was discharged to the sanitary sewer.

4.1.2 PESTICIDE HANDLING, STORAGE, AND DISPOSAL

Pest control services were conducted under contract during the past operation of the facility. Routine monthly applications were made by contractor personnel in Bldgs. 80 and 81. Ready-mixed formulations were brought onsite for application. Storage and mixing of pesticide formulations were conducted at the contractor's facility. Reportedly, no storage or disposal of pesticides occurred on Lawndale Annex.

4.1.3 PCB HANDLING, STORAGE, AND DISPOSAL

During the operation of LAMP, electrical equipment maintenance was handled through a contract with electrical equipment companies. Annual maintenance, including cleaning and checks for leaks, was conducted on all LAMP transformers and other electrical equipment.

Two primary transformers were located on LAMP, one on the south side of Bldg. 81 (now State of California property) and the other on the east side of Bldg. 80. Subsequent to the USAF's aquisition of Bldg. 80 the dielectric fluid in the transformer at Bldg. 80 was tested and found to be 49-percent PCB [490,000 parts per million (ppm)]. This transformer [750 kilovoltamperes (kVA)] recently was drained and cleaned by Hampton-Tedder Co., under contract to USAF, producing 10 drums (500 gallons) of PCB fluid and 12 drums of solvent wash containing between 3,450 and 135,000 ppm PCBs. At the time of the site visit, these wastes and the empty transformer had been shipped offsite to Defense Property Disposal Office (DPDO)-El Toro in East Irvine, Calif. and were awaiting pick-up by the DPDO hazardous waste contractor.

Currently, no PCB-containing electrical equipment is located on Lawndale Annex.

4.1.4 POL HANDLING, STORAGE, AND DISPOSAL

During the operation of LAMP, POL was stored in underground tanks at two locations, both of which were located adjacent to Bldg. 80, now owned by USAF (see Fig. 4.1-2). Fuel oil (No. 2 grade) was stored in a 4,000-gallon underground tank located on the east side of Bldg. 80, adjacent to the boiler room. The fuel oil was used to fire a boiler that supplied steam and heat to LAMP. Subsequent to USAF's aquisition of the facility, the boiler was removed and the fuel tank was excavated. During removal, inspection of the tank and soils beneath the tank revealed no evidence of fuel leakage. App. K contains a copy of the closure application for this underground tank.

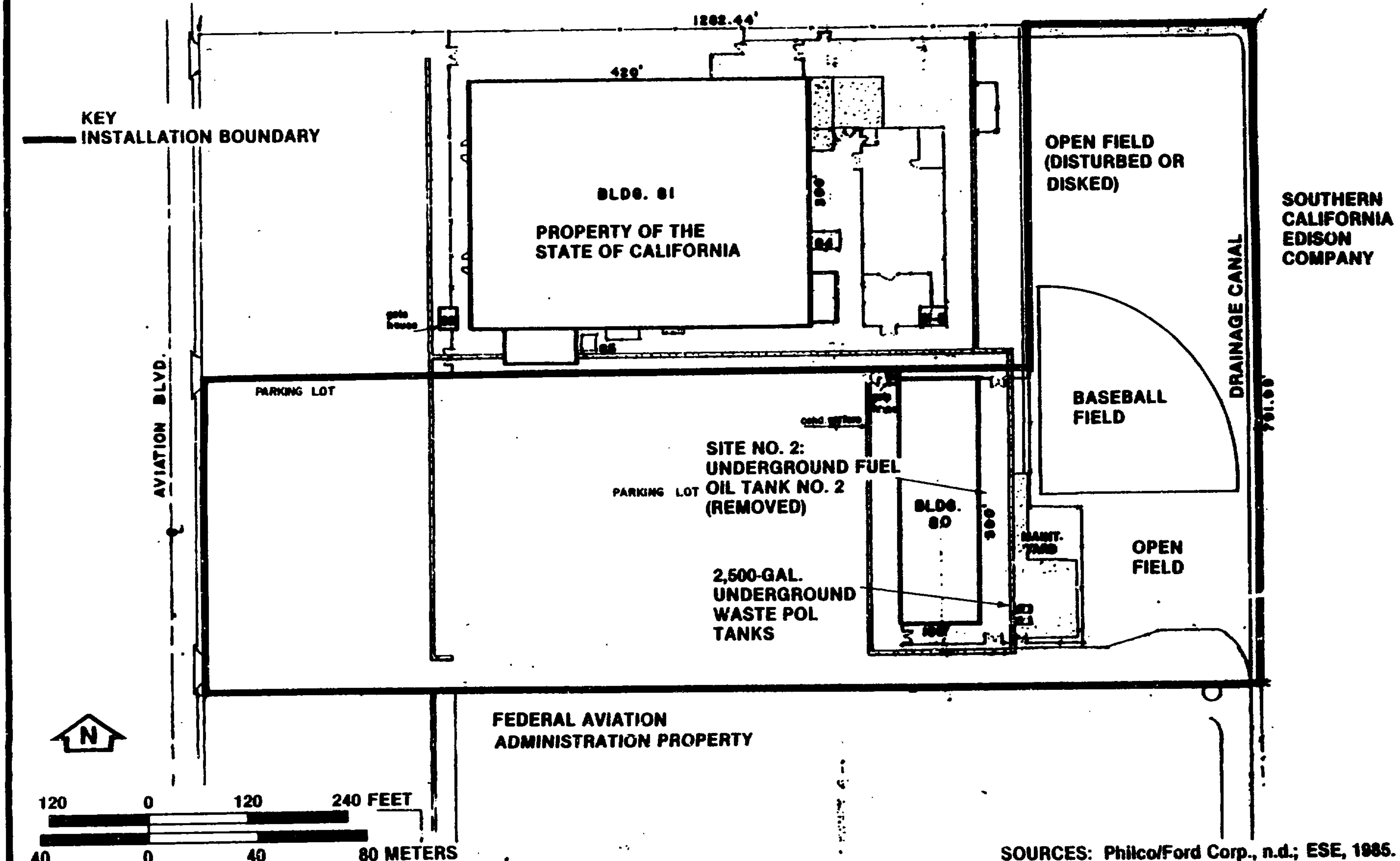

Figure 4.1-2
POL STORAGE – LAWNDALE ANNEX

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Waste POL was stored in two 500-gallon underground tanks located at the southeast corner of Bldg. 80. POL wastes generated by LAMP included machining lubricants, generator lubricants, and solvents. These wastes were stored in the two underground tanks until picked up by the waste POL contractor. During the site visit, the location of these tanks was verified by locating the fill caps and vent pipes. No testing of the contents of these tanks has been performed. It is not known if past leakage has occurred from these tanks. App. F contains photographs showing the locations of the underground POL storage tanks.

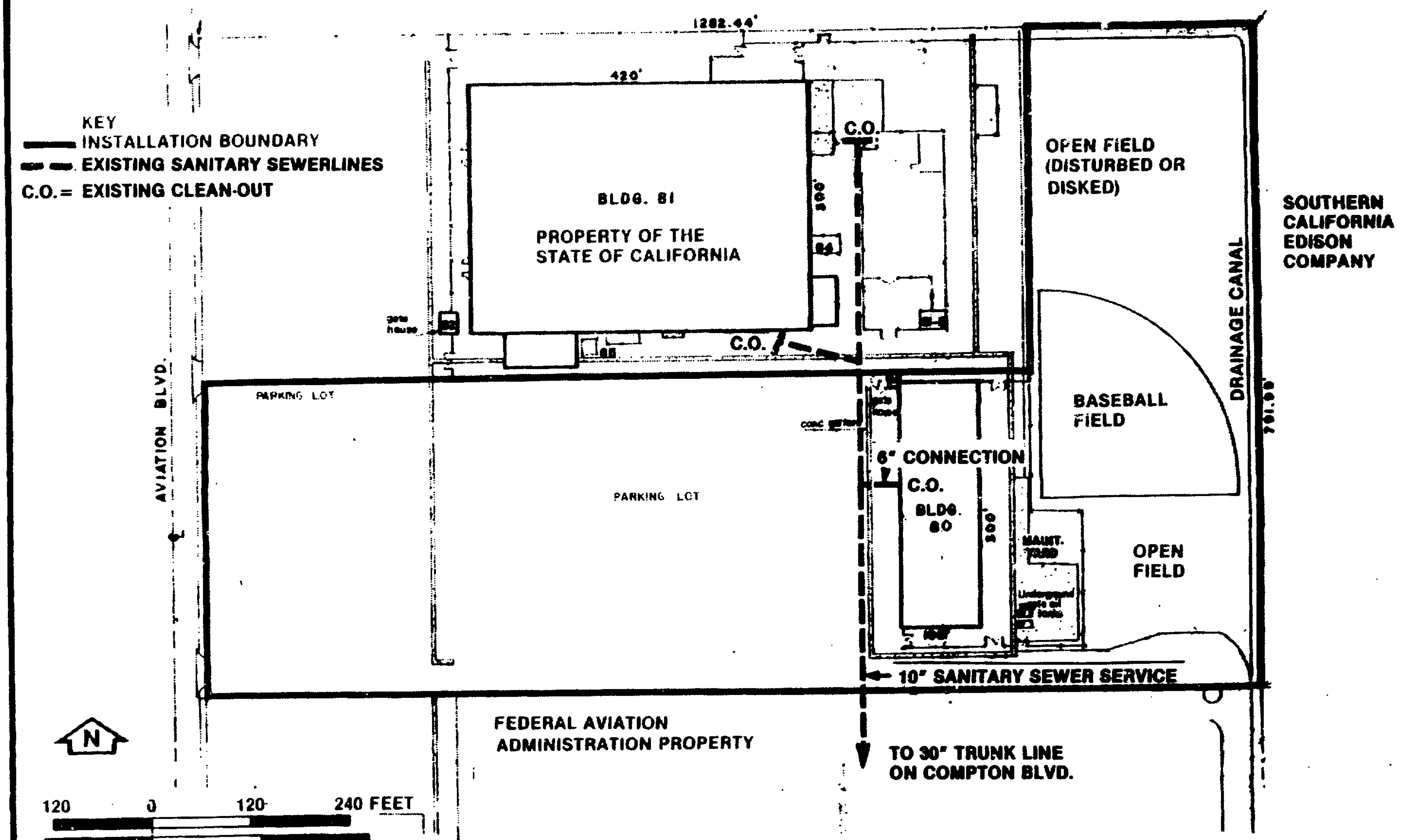
4.1.5 SANITARY WASTEWATER DISPOSAL

All domestic and industrial waterborne wastes discharged from previous operations on the facility (e.g., LAMP) entered the sanitary sewer system. A 10-inch-diameter sanitary sewer services the site (Bldgs. 80 and 81) and connects into a trunk sewer along Compton Blvd. (see Fig. 4.1-3). A 6-inch diameter, lateral line services Bldg. 80. Sewer discharge is by gravity flow.

The site is located within Sanitation District 5 of Los Angeles County. Following treatment at the municipal wastewater treatment plant, the effluent is discharged through a diffuser pipeline approximately 2 mi offshore in the Pacific Ocean.

4.1.6 INDUSTRIAL WASTE HANDLING AND DISPOSAL

During the operation of LAMP, all manufacturing operations were conducted in Bldg. 81. All concentrated liquid wastes were hauled from the plant site by disposal contractors (see discussion in next paragraph). Dilute aqueous wastes, with the exception of the plating shop wastes, were discharged to the sanitary sewer system without pretreatment. Dilute aqueous wastes from the plating shop were treated in one or both of two neutralization pits (see Fig. 4.1-1) prior to being discharged to the sanitary sewer system.



SOURCES: Philco/Ford Corp., n.d.; Dept. of the Army, COE, 1986; ESE, 1986.

Figure 4.1-3
SANITARY SEWER SYSTEM

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All concentrated industrial wastes were hauled from the plant site for disposal by contract waste disposal companies. Industrial wastes were segregated into three categories depending on type, and a separate waste disposal contract was established for each category. The three categories were: (1) waste acids and concentrated plating wastes, (2) magnesium and sludges, and (3) waste coolants and POL. Waste material storage (accumulation) areas were used for each waste material. POL wastes were stored in two 500-gallon underground storage tanks located at the southeast corner of Bldg. 80 until picked up by POL recycling/disposal contractors (see Sec. 4.1.4).

Following the USAF's acquisition of Bldg. 80 in August 1985, renovation operations were initiated. This renovation included the removal of asbestos-insulation along steam lines and around the former boiler in the building. This asbestos insulation was removed, containerized, and disposed of by landfilling in the BKK Landfill, West Covina, CA. The removal contractor was P.W. Stevens Co., El Monte, CA. Approximately 200 bags [capacity 2 cubic feet (ft^3) each] were used during this disposal operation.

4.2 WASTE DISPOSAL METHODS AND DISPOSAL SITE IDENTIFICATION, EVALUATION, AND HAZARD ASSESSMENT

As described in the current and past activity review (Sec. 4.1), various methods have been used for disposal of wastes generated by past operations on Lawndale Annex. Because of the small size and urban location of the facility, no large-scale onsite disposal methods (e.g., landfilling, open burning, or landspreading) have been used. Additionally, sanitary wastewater always has been discharged to the municipal system for treatment. No wastewater treatment facilities or effluent disposal operations have been located on Lawndale Annex.

Depending on type, wastes either have been transported to offsite municipal landfills, contract disposed by waste disposal or recycling companies, or discharged to the sanitary sewer system. In each case, the wastes ultimately are transported offsite, leaving little potential for residual onsite contamination. Two sites, however, were identified as having a potential for residual contamination. These are the underground waste POL storage tanks located on USAF property at the southeast corner of Bldg. 80 and the former plating waste neutralization chambers located adjacent to the south side of Bldg. 81 on State of California property. These sites are shown in Fig. 4.2-1 and the site descriptions, dates of operation, and waste descriptions are listed in Table 4.2-1. These sites are described in detail in Secs. 4.2.3 and 4.2.5, respectively.

4.2.1 STORMWATER DRAINAGE DISPOSAL SITES

No stormwater drainage disposal sites were identified on Lawndale Annex. Liquid wastes were either discharged to the sanitary wastewater disposal system or transported offsite by contract waste disposal companies.

4.2.2 LANDFILLS

No sanitary or debris landfills were identified on Lawndale Annex. Solid waste generated in the past had been disposed of through offsite service contracts and disposed of in municipal landfills. Contract collection occurred once per day, 5 days per week. Solid waste consisted primarily of office trash and cafeteria refuse.

4.2.3 FUEL SPILL SITES

Available records indicate that no fuel spills have occurred on Lawndale Annex. Storage of POL products occurred in two areas adjacent to Bldg. 80. Fuel oil for the boiler was stored in an underground tank on the east side of Bldg. 80. This tank was recently removed and inspecton of the tank and soils did not indicate that any leakage had occurred.

Two 500-gallon underground tanks located at the southeast corner of Bldg. 80 were used for storage of waste POL and solvents. These are listed as Site No. 1 in Table 4.2-1. Since the contents of these tanks has not been tested and it is not known if any leakage has occurred, an investigation of these former storage tanks should be conducted under the LAAFS Environmental Program.

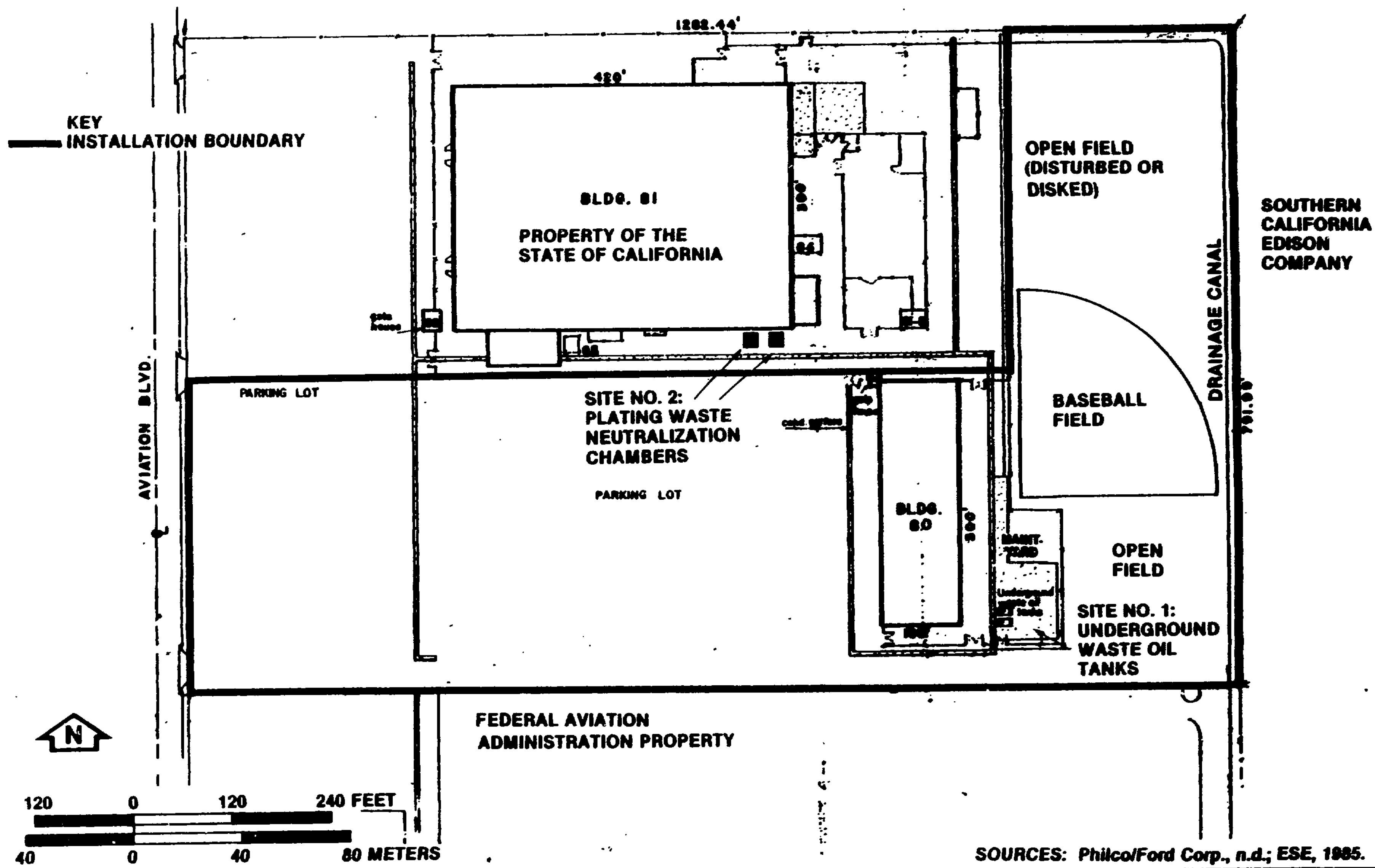

Figure 4.2-1
POTENITAL CONTAMINATION SITES

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Table 4.2-1. Summary of Information on Potential Contamination Sites

Site No.	Site Description	Date of Operation	Waste Description
1	Underground waste POL tanks	1964-1971	POL products and waste solvents
2	Underground plating wastewater neutralization chambers	1964-1971	Plating shop wastewater containing chromium, nickel, copper, cyanide, irridite, and acid and alkaline solutions

Source: ESE, 1985.

4.2.4 FIREFIGHTER TRAINING AREAS

No firefighter training areas were identified on Lawndale Annex. No burn pits or other training facilities have been used by the U.S. Army or Air Force due to the installation mission and location.

4.2.5 CHEMICAL DISPOSAL SITES

During the review of past operations and the examination of engineering drawings, two chemical neutralization chambers were identified. These are listed as Site No. 2 in Table 4.2-1. These underground chambers were located adjacent to the southeast corner of Bldg. 81 and were used to neutralize plating wastewater from the LAMP plating shop. Wastes from the plating operations consisted of electroplating and anodizing wastewater containing chromium, nickel, copper, cyanide, irridite, and acid and alkaline solutions. Following the neutralization of these wastes, the wastewater was discharged to the sanitary sewer system.

Following the cessation of LAMP operations, Bldg. 81 and adjacent property was acquired by the State of California. Examination of engineering diagrams of Bldg. 81 indicated that the underground neutralization chambers still exist. Since it is unknown if any sludges remain in the chambers or the extent to which residual contamination remains, LAAFS environmental personnel should notify the State of California to determine the need for an investigation of these former neutralization chambers.

4.2.6 HAZARD EVALUATION ASSESSMENT

The review of past operation and maintenance functions and past waste management practices at Lawndale Annex has resulted in the identification of two sites that were intially considered areas with potential for contamination. These sites, described in Secs. 4.2.3 and 4.2.5, were evaluated using the decision process presented in Fig. 1.3-1 (see Sec. 1.3). The results of this decision process are summarized in Table 4.2-2. Both sites were determined to have a potential for residual contamination; however, because no documented spillage has

Table 4.2-2. Summary of Decision Process Logic for Areas of Initial Environmental Concern at Lawndale Annex

Site No.	Site Description	Potential For Contamination	Potential For Contaminant Migration	Potential For Other Environmental Concern*	Refer to Base Environmental Programs	HARM Rating
1	Underground Waste POL Tanks	Yes	No	No	Yes	No
2	Underground Plating Wastewater Neutralization Chambers	Yes	No	No	Yes	No

*Other environmental concerns include environmental problems that are not within the scope of this study (e.g., air pollution, occupational safety requirements).

Source: ESE, 1985.

occurred from the underground tanks or chambers, no potential exists for contaminant migration. Therefore, these sites were not evaluated using the HARM system. The underground waste POL storage tanks (Site No. 1) were deemed to warrant investigation under the LAAFS Environmental Program. To determine the need for an investigation of these chambers, LAAFS environmental personnel should notify the State of California regarding the potential for residual contamination associated with the underground neutralization chambers (Site No. 2).

5.0 CONCLUSIONS

The goal of the IRP Phase I study is to identify sites where there is potential for environmental contamination resulting from past waste disposal practices and to assess the potential for contaminant migration from these sites. The conclusions are based on the assessment of the information collected from the project team's field inspection, review of records and files, review of the environmental setting, and interviews with base personnel, past employees, and state and local government employees.

Two sites were initially considered areas of concern with potential for containing residual contamination. The evaluation and conclusions regarding these sites are summarized in Table 5.0-1; site locations are shown in Fig. 5.0-1. Both sites, while having a potential for residual contamination, do not present a potential for contaminant migration or for endangerment of human health or environmental quality. These sites, therefore, were not evaluated using the HARM System.

Table 5.0-1. Summary of Evaluations and Conclusions for the Potential Contamination Sites

Site No.	Site Description	Date of Operation	Waste Description	Site Evaluation
1	Underground Waste POL Tanks	1964-1971	Waste POL products and waste solvents	Potential for residual contamination. No potential for contaminant migration or endangerment of human health or environmental quality. Refer to LAAFS Environmental Program. Coordinate any tank closure actions with Los Angeles County and the city of Hawthorne. No Phase II recommendations.
2	Underground Plating Wastewater Neutralization Chambers	1964-1971	Plating shop wastewater containing chromium, nickel, copper, cyanide, irridite, and acid and alkaline solutions	Potential for residual contamination. No potential for contaminant migration or endangerment of human health or environmental quality. Refer to LAAFS Environmental Program. No Phase II recommendations.

Source: ESE, 1985.

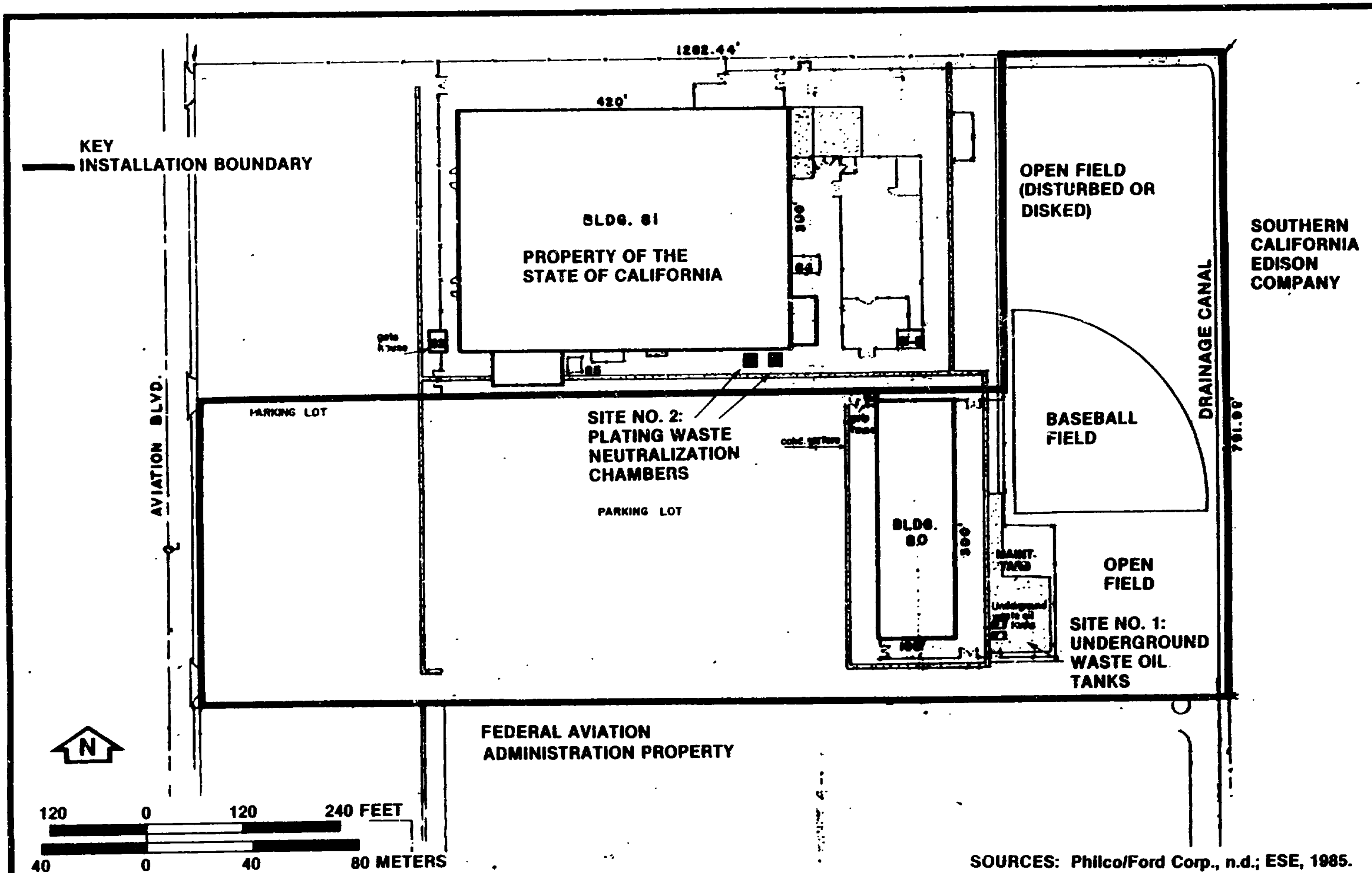

Figure 5.0-1
POTENTIAL CONTAMINATION SITES

INSTALLATION RESTORATION PROGRAM
LAWNDALE ANNEX

6.0 RECOMMENDATIONS

Two sites were identified as having potential for containing residual contamination; however, neither site presents a potential for contaminant migration or endangerment of human health or environmental quality; therefore, no Phase II actions are recommended.

Site No. 1 is the location of two abandoned underground waste POL storage tanks used during the operation of LAMP. Since these tanks have not had their contents tested and it is not known if any leakage has occurred, this site was deemed to warrant investigation under the LAAFS Environmental Program. Abandoned underground POL storage tanks should either be removed or inspected, cleaned, and closed in accordance with applicable regulations. Because Los Angeles County has a LUST program, coordination should be made with Los Angeles County and the city of Hawthorne prior to initiation of any work associated with these underground tanks.

Site No. 2, located on State of California property, consists of two underground plating waste neutralization chambers that were used during the operation of LAMP. Since it is unknown if any residual contaminated sludges remain in the neutralization chambers, LAAFS environmental personnel should notify the State of California, Los Angeles County, and the city of Hawthorne to determine the need for an investigation of this site. If residual sludges still remain, these chambers should be cleaned, the contents tested to determine hazardous characteristics, and the sludges disposed of accordingly.

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Philco/Ford Corporation. 1971b. News Release: May 26th - Production of the U.S. Army/Philco - Ford Shillelagh Anti-Tank Guided Missile System has Been Completed. Newport Beach, CA. (LA-42).

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APPENDIX A

GLOSSARY OF TERMINOLOGY, ABBREVIATIONS, AND ACRONYMS

APPENDIX A
GLOSSARY OF TERMINOLOGY, ABBREVIATIONS, AND ACRONYMS

AFSC	Air Force Systems Command
Aquifer	A geologic formation, group of formations, or part of a formation capable of yielding water to a well or spring
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
Contamination	Degradation of natural water quality to the extent that its usefulness is impaired; degree of permissible contamination depends on intended use of water
DEQPPM	Defense Environmental Quality Program Policy Memorandum
Disposal of hazardous waste	Discharge, deposit, injection, dumping, spilling, or placing of any hazardous waste into or on land or water so that such waste, or any constituent thereof, may enter the environment, be emitted into the air, or be discharged into any waters, including ground water
DOD	Department of Defense
Downgradient	In the direction of decreasing hydraulic static head; the direction in which ground water flows
DPDO	Defense Property Disposal Office
Effluent	Liquid waste discharged in its natural state or partially or completed treated, from a manufacturing or treatment process
EIA	Environmental Impact Assessment
EPA	U.S. Environmental Protection Agency
ESE	Environmental Science and Engineering, Inc.
FAA	Federal Aviation Administration
ft	feet
ft^3	cubic feet

GOCO	Government-owned, Contractor Operated
gpm	gallon(s) per minute
Ground water	Water beneath the land surface in the saturated zone that is under atmospheric or artesian pressure
GSA	General Services Administration
HARM	Hazard Assessment Rating Methodology
Hazardous waste	As defined in RCRA, a solid waste or combination of solid wastes which because of its quantity, concentration, or physical, chemical, or infectious characteristics may cause or significantly contribute to an increase in mortality or an increase in serious, irreversible, or incapacitating reversible illness; or pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, disposed of, or otherwise managed
Infiltration	Movement of water through the soil surface into the ground
IRP	Installation Restoration Program
kVA	kilovoltampere
LAMP	Lawndale Army Missile Plant
LAAFS	Los Angeles Air Force Station
LUST	Leaking Underground Storage Tank
MCL	Maximum contaminant level
mg/L	milligram(s) per liter
mi	mile
MICOM	U.S. Army Missile Command
MSL	Mean sea level
NaOH	caustic soda
NIPDWR	National Interim Primary Drinking Water Regulation

NSDWR	National Secondary Drinking Water Regulation
PCB	Polychlorinated biphenyl--liquid used as a dielectric in electrical equipment; suspected human carcinogen; bioaccumulates in the food chain and causes toxicity to higher trophic levels
POL	Petroleum, oils, and lubricants
ppm	parts per million
RCRA	Resource Conservation and Recovery Act
SMEF	Systems Management Engineering Facility
TCA	1,1,1-trichloroethane
ug/L	micrograms per liter
umhos/cm	micromhos per centimeter
Upgradient	In the direction of increasing hydraulic static head; the direction opposite to the prevailing flow of ground water
USAF	U.S. Air Force
Water table	Surface of a body of unconfined ground water at which the pressure is equal to that of the atmosphere

APPENDIX B

TEAM MEMBER BIOGRAPHICAL DATA

ESE

PROFESSIONAL RESUME

CHARLES D. HENDRY, JR , Ph.D.
Water Quality Chemist

SPECIALIZATION

Water Quality Chemistry, Atmospheric Chemistry, Physical-Chemical Transport of Toxic/Hazardous Substances, Environmental Fate of Toxic Substances

RECENT EXPERIENCE

Toxic/Hazardous Materials, Handling and Disposal, USATHAMA and NEESA, Project Manager--Assessment of present and past handling and disposal practices for toxic/hazardous materials on 32 U.S. Army and Navy installations conducted for USATHAMA and NEESA. Includes evaluation of the potential for off-post migration of toxic materials, recommendations for sampling and analysis, and compliance with existing federal and state regulations.

Toxic Substances--Fate in the Environment, U.S. Environmental Protection Agency, Subproject Manager--Assessment of the release transport and fate of toxic organic and inorganic substances in the environment. This assessment is based upon physical and chemical properties (e.g., volatility, solubility, photolysis, hydrolysis, sorption, and biodegradation) of the compounds and evaluation of predicted environmental concentrations using computer models.

Toxic/Hazardous Materials Sampling and Analysis-Quality Assurance/Control--Analytical chemistry QA/QC for project involving sampling and analysis of soils, waters, and biota at a U.S. Army ammunition manufacturing plant, Alabama Army Ammunitions Plant, Alabama.

Florida Power Coordinating Group, Atmospheric Deposition Study, Technical Consultant--Three-year study measuring deposition of chemical substances by atmospheric precipitation. Includes monitoring, source attribution studies, and ecological effects evaluation. Emphasis placed upon water quality impacts.

EDUCATION

Ph.D.	1983	Environmental Engineering	University of Florida
M.S.	1977	Environmental Engineering	University of Florida
B.S.	1974	Chemistry	University of Florida

ASSOCIATIONS

American Chemical Society
Water Pollution Control Federation
Air Pollution Control Association

REPORTS

Installation Assessment of Ft. Lee, Va. 1982.
Installation Assessment of Ft. Pickett, Va. 1982.
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Installation Assessment of Ft. Lewis, WA. 1982.
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USATHAMA—Assessments Division, Aberdeen Proving Ground, MD
Installation Assessment of Ft. Benning, GA. 1981.
USATHAMA—Assessments Division, Aberdeen Proving Ground, MD.
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Installation Assessment of Ft. McCoy, WI. 1983.
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Environmental Assessment for Acrylamide. 1981. U.S. Environmental Protection Agency. Office of Toxic Substances. Washington, D.C.

WARREN PANDORF, B.S., P.E.
Water Resources Engineer

ESE PROFESSIONAL RESUME

SPECIALIZATION

Surface Water Hydrology and Water Quality, Assessment of Impacts of Pollutant Dischargers

RECENT EXPERIENCE

Installation Assessment of Headquarters, U.S. Army Garrison, Project Engineer--Conducted onsite installation assessment at Fitzsimons Army Medical Center in Aurora, Colorado, for U.S. Army Toxic and Hazardous Materials Agency (USATHAMA). Responsibilities included the determination of any toxic or hazardous materials in industrial waste, landfills, solid waste, sanitary waste, and petroleum, oil, and lubricant waste. Problem areas were identified, and methods to correct problems were recommended.

Monitoring Studies for Priority Pollutants on Proposed 23,000-Acre Phosphate Mine, Subproject Manager--Developed sampling scheme to provide background data on heavy metals, organic compounds (including volatile organics), and pesticides/herbicides in surface water and ground water at proposed industrial site. Ground water potentiometric surface maps of shallow aquifer were developed to predict direction of possible pollutant plumes from industrial activities. Sampling frequency was designed to measure wet and dry seasons and seasonal variations.

Runoff Assessment and Assessment of Heavy Metal Contamination for Proposed 15,000-Acre Mine Site, Subproject Manager--Prepared runoff assessment for NPDES permit application for proposed 15,000-acre mine site. Representative land uses were monitored for heavy metals along with other pollutants to determine impacts of proposed mining activities. Field activities included collection of over 900 storm event samples for heavy metal analyses. Water quality assessments were made by using statistical analyses of both concentration data and calculated mass loadings for each site and storm. SWMM computer model was used to simulate 20 years of continuous rainfall data in order to predict impact of runoff for each of 8 phases of development on tidal receiving streams.

Installation Assessment of U.S. Army Garrison, Project Engineer--Conducted installation assessment for determining the presence of any toxic or hazardous materials for USATHAMA at U.S. Army Garrison in Arlington, Virginia. Onsite installation assessment was conducted, and responsibilities included identification of toxic and hazardous materials in petroleum, oil, and lubricant wastes, industrial wastes, and solid waste/landfills. Also assessed were compliance of NPDES and RCRA permits. Quantities and disposal methods of all hazardous wastes generated were identified and evaluated.

Site-Specific Alternative Criteria and Variance Analyses for Pollutants in Proposed Phosphate Mine Effluent, Assistant Project Manager--Conducted field studies at 9 surface water quantity and quality stations. Simulated beneficiation process with on-site matrix samples in order to predict proposed plant discharge water quality characteristics including heavy metals, organic compounds, and pesticides. Used results of plant discharge simulation and receiving stream quality to characterize relief needed for water quality parameters violating state standards.

Alternative Criteria in Receiving Stream of Proposed Phosphate Mine Discharge, Project Manager--Prepared alternative criteria for Peace River based on historical water quality data. Impact assessment included modeling of point and nonpoint source loads to determine impact of each on Peace River. Alternative criteria for Peace River were recommended based on modeling and statistical analyses of site-specific data.

EDUCATION

B.S.	1977	Civil Engineering	University of Florida

REGISTRATIONS

Registered Civil Engineer, Florida
American Water Resources Association, Florida Chapter

JACK D. DOOLITTLE, B.A.
Vice President

ESE PROFESSIONAL RESUME

SPECIALIZATION

Environmental Impact Statements, Environmental Economics and Management, Econometrics, Demography, Statistics and Socioeconomic Impact Assessments

RECENT EXPERIENCE

Environmental Impact Statement and Associated Permit Acquisition, Project Director-- Supervised and conducted environmental assessment studies and documentation of impacts of proposed expansion of a mine. Study emphasizes assessment of aquatic and terrestrial ecology, hydrology, social and economic impacts, and water quality and involved extensive coordination with regulatory agencies.

Environmental Impact Statement Preparation, Subproject Manager--Responsible for socioeconomic and ecological portions of two Environmental Impact Statements for a proposed major cement manufacturing plant and quarry for Ideal Basic Industries.

Site Selection and Identification of Potential Impacts, Project Director--Statewide site selection study for three coal-fired power plant sites and associated transmission corridors in Illinois.

Environmental Impact Statement, Project Manager--Supervised field data gathering to establish environmental baseline concerning hydrology, water quality, aquatic ecology, terrestrial ecology, and geology. These data will be used in preparation of an EIS for proposed mine and beneficiation plant for AMAX Chemical Corporation.

Environmental Impact Statement, Project Director--Environmental licensing of coal-fired power plant in Southern New Jersey.

Third Party EIS, Assistant Project Manager--Responsible for project description, impact analysis, alternative analysis, and socioeconomic sections for proposed 1200-MW electric generating plant.

EAS/EIS for Proposed Coal Strip Mine, Subproject Manager--Project included NPDES permitting requirements for EPA, dredge and fill permitting requirements for U.S. Army Corps of Engineers, and compliance with Surface Mining Control and Reclamation Act of 1977.

Water Quality Management Plan, Task Manager--Responsible for collection and analysis of data for socioeconomic and land use data sets to fulfill P.L. 208 requirements.

EDUCATION

B.A.	1970	Economics	Baldwin Wallace College

PUBLICATIONS

Twelve articles in economic and population periodicals.

DONALD F. McNEILL, M.S.
Associate Scientist

ESE PROFESSIONAL RESUME

SPECIALIZATION

Hydrogeology, Ground Water Monitoring and Evaluation, Clastic Sedimentology, Carbonate Sedimentology, Peat and Organic Sediment Analysis, Geomorphology, Stratigraphy, Field Mapping, and Sampling Techniques

RECENT EXPERIENCE

U.S. Army Toxic and Hazardous Materials Agency, Project Geologist--Installation assessment of Ft. Riley, Kansas. Geohydrologic assessment of present and past waste disposal methods, responsible for evaluation of the potential for migration of contaminants in the subsurface.

U.S. Army Toxic and Hazardous Materials Agency, Project Geologist--Installation assessment of Military District of Washington. Geohydrologic assessment of present and past waste disposal methods, responsible for evaluation of the potential for migration of contaminants in the subsurface.

U.S. Army Toxic and Hazardous Materials Agency, Project Geologist--Installation assessment of West Virginia Ordnance Works. Geologic and ground water investigation of past waste disposal methods. Responsible for evaluation of ground water contamination and off-post contaminants migration.

Florida Department of Environmental Regulation, Site Contamination Assessment, Project Hydrogeologist--Investigated organic and inorganic contamination at City Chemical Company, Orlando, Florida. Assessment of shallow aquifer with respect to contaminant migration.

EDB Contamination Investigation, Project Hydrogeologist--Investigated EDB contamination of drinking water wells at Sanford, Florida, including drilling and field sampling, installation of piezometers, measuring water levels and sampling wells, evaluating alternatives, and preparing report.

Adcom Wire Company, Project Hydrogeologist--Development of a ground water monitoring plan for a wire galvanizing plant including site analysis, geohydrology, and proposed ground water monitoring network.

Orange County, Project Hydrogeologist--Development of a ground water monitoring plan for a sanitary landfill near Orange, Florida. Project consisted of monitor well installation, measuring water levels, geohydrologic evaluation and report preparation.

U.S. Air Force Installation Restoration Program, Project Geologist--Installation assessment of Columbus, Andersen, and Vandenburg Air Force Bases. Responsible for geohydrologic evaluation of sanitary and solid waste disposal areas, and the potential for off-post migration.

Minerals Management Service, Project Geologist--Responsible for sediment core and sediment trap analysis for evaluation of sediment transport in selected areas of the Gulf of Mexico.

University of Florida, Research Associate--Texaco U.S.A.- funded research grant involving the development of a method of increasing BTU values in autochthonous mineral-rich peats and organic sediments.

Department of Energy and Governor's Energy Office, State of Florida, Research Assistant--Florida fuel grade peat assessment program conducted through the University of Florida; involved sampling, mapping, and analysis of Florida fuel peat resources.

EDUCATION

M.S.	1983	Geology	University of Florida
B.S.	1981	Geology	State University of New York

AFFILIATIONS

American Association of Petroleum Geologists--Energy Minerals Division
Geological Society of America
Southeastern Geological Society
Society of Economic Paleontologists and Mineralogists

APPENDIX C

LIST OF INTERVIEWERS AND OUTSIDE AGENCIES

APPENDIX C

OUTSIDE AGENCY CONTACTS

1. Los Angeles County Flood Control District
   2250 Alcazar Street
   Los Angeles, CA 90033
   213/226-4382

2. California Dept. of Water Resources, Los Angeles, CA.

3. South Coast Air Quality Management District, Los Angeles, CA.

4. California Division of Mines and Geology, Sacramento, CA.

5. Albert F. Simpson Historical Research Center, Maxwell AFB, AL.

6. U.S. Geological Survey, Alexandria, VA, and Denver, CO.

7. California Dept. of Fish and Game, Sacramento, CA.

8. California Dept. of Water Resources, Sacramento, CA.

9. Central and West Basin Water Replenishment District, Downey, CA.

10. National Archives, Modern Military Branch, Washington, DC.

11. DOD Explosives Safety Board, Alexandria, VA.

12. USAEHA, Aberdeen Proving Ground, MD.

APPENDIX C

LIST OF INTERVIEWEES

Interviewee	Years of Service at the Installation
1. Facilities Manager, Philco-Ford Aeronutronic Div.	5
2. Public Affairs Director, Philco-Ford Aeronutronic Div.	7
3. Document Production, Douglas Aircraft Co.	5
4. Real Property Manager, Pacifica Services, Inc.	1
5. Environmental Engineer, Pacifica Services, Inc.	1
6. Foreman, Operations and Maintenance, Pacifica Services, Inc.	1
7. Architect, Pacifica Services, Inc.	1
8. Environmental Planning, Space Division, USAF Systems Command	1
9. Planner, Pacifica Services, Inc.	1

APPENDIX D

ORGANIZATIONS, MISSIONS, AND TENANT ACTIVITIES

APPENDIX D

ORGANIZATIONS, MISSIONS, AND TENANT ACTIVITIES

The annex is a subinstallation of LAAFS. Headquarters, SD (U.S. Air Force Systems Command) is located at LAAFS.

PRIMARY ORGANIZATIONS

SPACE DIVISION

The SD is responsible for the research, development, procurement, production, test, and delivery of most DOD space systems.

6592ND AIR BASE GROUP

The 6592nd ABG provides the facilities and administrative, logistical, and transportation support for all organizations and personnel assigned or attached to LAAFS. Also, this group develops and administers ground safety programs and base support contracts for LAAFS. The 6592nd ABG also has special court-martial and Article 15, Uniform Code of Military Justice jurisdiction over officers and airmen assigned to the group and over airmen assigned or attached to LAAFS.

APPENDIX E

MASTER LIST OF SHOPS AND LABORATORIES

APPENDIX E

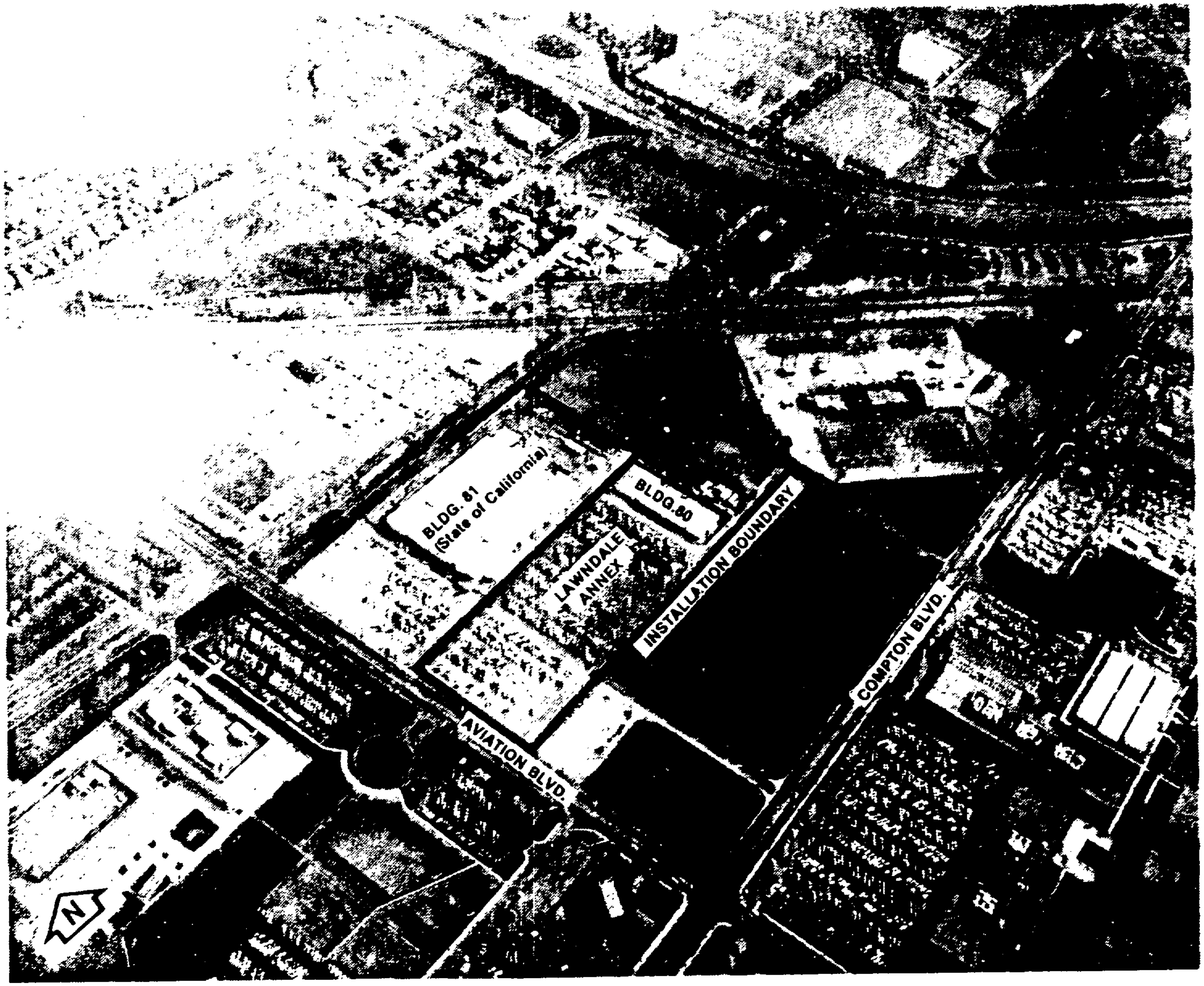
MASTER LIST OF SHOPS AND LABORATORIES

The installation is not currently active; therefore, there are no current shops or laboratories. Former shops and laboratories that existed during the operation of LAMP are as follows:

1. Machine and Welding Shop;
2. Metal Cleaning Shop;
3. Metal Plating Shop;
4. Water Treatment Facilities;
5. Chemistry Laboratory;
6. Photographic Laboratory;
7. Paint Shop; and
8. Boiler Shop.

APPENDIX F

PHOTOGRAPHS OF SITE AND POL STORAGE LOCATIONS



AERIAL PHOTOGRAPH OF LAWNDALE ANNEX SITE

INSTALLATION RESTORATION PROGRAM LAWNDALE ANNEX

POL STORAGE LOCATIONS

INSTALLATION
RESTORATION PROGRAM
LAWNDALE ANNEX

APPENDIX G

USAF IRP HAZARD ASSESSMENT RATING METHODOLOGY

APPENDIX G

USAF INSTALLATION RESTORATION PROGRAM
HAZARD ASSESSMENT RATING METHODOLOGY

BACKGROUND

The Department of Defense (DOD) has established a comprehensive program to identify, evaluate, and control problems associated with past disposal practices at DOD facilities. One of the actions required under this program is to:

> "develop and maintain a priority listing of contaminated installations and facilities for remedial action based on potential hazard to public health, welfare, and environmental impacts." (Reference: DEQPPM 81-5, 11 December 1981).

Accordingly, the United States Air Force (USAF) has sought to establish a system to set priorities for taking further actions at sites based upon information gathered during the Records Search phase of its Installation Restoration Program (IRP).

The first site rating model was developed in June 1981 at a meeting with representatives from USAF Occupational Environmental Health Laboratory (OEHL), Air Force Engineering Services Center (AFESC), Engineering-Science (ES) and CH_2M Hill. The basis for this model was a system developed for EPA by JRB Associates of McLean, Virginia. The JRB model was modified to meet Air Force needs.

After using this model for 6 months at over 20 Air Force installations, certain inadequacies became apparent. Therefore, on January 26 and 27, 1982, representatives of USAF OEHL, AFESC, various major commands, Engineering Science, and CH_2M Hill met to address the inadequacies. The result of the meeting was a new site rating model designed to present a better picture of the hazards posed by sites at Air Force installations. The new rating model described in this presentation is referred to as the Hazard Assessment Rating Methodology.

PURPOSE

The purpose of the site rating model is to provide a relative ranking of sites of suspected contamination from hazardous substances. This model will assist the Air Force in setting priorities for follow-on site investigations and confirmation work under Phase II of IRP.

This rating system is used only after it has been determined that (1) potential for contamination exists (hazardous wastes present in sufficient quantity), and (2) potential for migration exists. A site can be deleted from consideration for rating on either basis.

DESCRIPTION OF MODEL

Like the other hazardous waste site ranking models, the U.S. Air Force's site rating model uses a scoring system to rank sites for priority attention. However, in developing this model, the designers incorporated some special features to meet specific DOD program needs.

The model uses data readily obtained during the Record Search portion (Phase I) of the IRP. Scoring judgments and computations are easily made. In assessing the hazards at a given site, the model develops a score based on the most likely routes of contamination and the worst hazards at the site. Sites are given low scores only if there are clearly no hazards at the site. This approach meshes well with the policy for evaluating and setting restrictions on excess DOD properties.

As with the previous model, this model considers four aspects of the hazard posed by a specific site: the possible receptors of the contamination, the waste and its characteristics, potential pathways for waste contaminant migration, and any efforts to contain the contaminants. Each of these categories contains a number of rating factors that are used in the overall hazard rating.

The receptors category rating is calculated by scoring each factor, multiplying by a factor weighting constant and adding the weighted scores to obtain a total category score.

The pathways category rating is based on evidence of contaminant migration or an evaluation of the highest potential (worst case) for contaminant migration along one of three pathways. If evidence of contaminant migration exists, the category is given a subscore of 80 to 100 points. For indirect evidence, 80 points are assigned and for direct evidence 100 points are assigned. If no evidence is found, the highest score among three possible routes is used. These routes are surface water migration, flooding, and ground-water migration. Evaluation of each route involves factors associated with the particular migration route. The three pathways are evaluated and the highest score among all four of the potential scores is used.

The waste characteristics category is scored in three steps. First, a point rating is assigned based on an assessment of the waste quantity and the hazard (worst case) associated with the site. The level of confidence in the information is also factored into the assessment. Next, the score is multiplied by a waste persistence factor, which acts to reduce the score if the waste is not very persistent. Finally, the score is further modified by the physical state of the waste. Liquid wastes receive the maximum score, while scores for sludges and solids are reduced.

The scores for each of the three categories are then added together and normalized to a maximum possible score of 100. Then the waste management practice category is scored. Sites at which there is no containment are not reduced in score. Scores for sites with limited containment can be reduced by 5 percent. If a site is contained and well managed, its score can be reduced by 90 percent. The final site score is calculated by applying the waste management practices category factor to the sum of the scores for the other three categories.

HAZARD ASSESSMENT RATING METHODOLOGY FLOW CHART

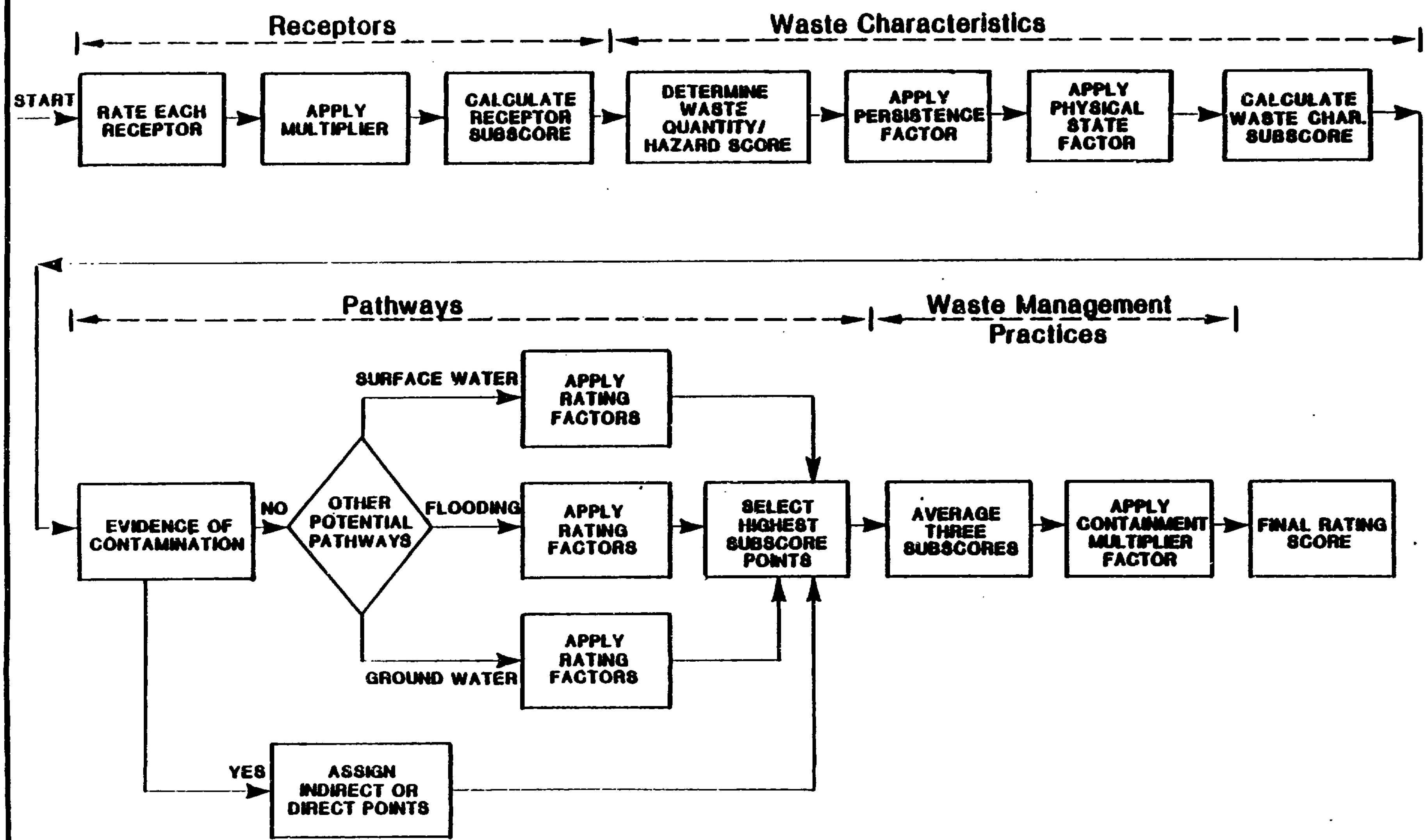


FIGURE 1

FIGURE 2

HAZARD ASSESSMENT RATING METHODOLOGY FORM

NAME OF SITE ______

LOCATION ______

DATE OF OPERATION OR OCCURRENCE ______

OWNER/OPERATOR ______

COMMENTS/DESCRIPTION ______

SITE RATED BY ______

I. RECEPTORS

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
A. Population within 1,000 feet of site		4		
B. Distance to nearest well		10		
C. Land use/zoning within 1 mile radius		3		
D. Distance to reservation boundary		6		
E. Critical environments within 1 mile radius of site		10		
F. Water quality of nearest surface water body		6		
G. Ground water use of uppermost aquifer		9		
H. Population served by surface water supply within 3 miles downstream of site		6		
I. Population served by ground-water supply within 3 miles of site		6		
		Subtotals	______	______

Receptors subscore (100 X factor score subtotal/maximum score subtotal) ______

II. WASTE CHARACTERISTICS

A. Select the factor score based on the estimated quantity, the degree of hazard, and the confidence level of the information.

1. Waste quantity (S = small, M = medium, L = large) ______
2. Confidence level (C = confirmed, S = suspected) ______
3. Hazard rating (H = high, M = medium, L = low) ______

Factor Subscore A (from 20 to 100 based on factor score matrix) ______

B. Apply persistence factor
Factor Subscore A X Persistence Factor = Subscore B

______ X ______ = ______

C. Apply physical state multiplier

Subscore B X Physical State Multiplier = Waste Characteristics Subscore

______ X ______ = ______

III. PATHWAYS

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score

A. If there is evidence of migration of hazardous contaminants, assign maximum factor subscore of 100 points for direct evidence or 80 points for indirect evidence. If direct evidence exists then proceed to C. If no evidence or indirect evidence exists, proceed to B.

Subscore ______

B. Rate the migration potential for 3 potential pathways: surface water migration, flooding, and ground-water migration. Select the highest rating, and proceed to C.

1. Surface water migration

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
Distance to nearest surface water		8		
Net precipitation		6		
Surface erosion		8		
Surface permeability		6		
Rainfall intensity		8		
		Subtotals	______	______

Subscore (100 X factor score subtotal/maximum score subtotal) ______

2. Flooding

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
Flooding		1		

Subscore (100 x factor score/3) ______

3. Ground-water migration

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
Depth to ground water		8		
Net precipitation		6		
Soil permeability		8		
Subsurface flows		8		
Direct access to ground water		8		
		Subtotals	______	______

Subscore (100 x factor score subtotal/maximum score subtotal) ______

C. Highest pathway subscore.

Enter the highest subscore value from A, B-1, B-2 or B-3 above.

Pathways Subscore ______

IV. WASTE MANAGEMENT PRACTICES

A. Average the three subscores for receptors, waste characteristics, and pathways.

Receptors ______
Waste Characteristics ______
Pathways ______

Total ______ divided by 3 = ______
Gross Total Score

B. Apply factor for waste containment from waste management practices

Gross Total Score X Waste Management Practices Factor = Final Score ______

______ X ______ = ______

TABLE 1

HAZARD ASSESSMENT RATING METHODOLOGY GUIDELINES

I. RECEPTORS CATEGORY

Rating Factors	Rating Scale Levels 0	1	2	3	Multiplier
A. Population within 1,000 feet (includes on-base facilities)	0	1 - 25	26 - 100	Greater than 100	4
B. Distance to nearest water well	Greater than 3 miles	1 to 3 miles	3,001 feet to 1 mile	0 to 3,000 feet	10
C. Land Use/Zoning (within 1 mile radius)	Completely remote (zoning not applicable)	Agricultural	Commercial or industrial	Residential	3
D. Distance to installation boundary	Greater than 2 miles	1 to 2 miles	1,001 feet to 1 mile	0 to 1,000 feet	6
E. Critical environments (within 1 mile radius)	Not a critical environment	Natural areas	Pristine natural areas; minor wetlands; preserved areas; presence of economically important natural resources susceptible to contamination.	Major habitat of an endangered or threatened species; presence of recharge area; major wetlands.	10
F. Water quality/use designation of nearest surface water body	Agricultural or industrial use.	Recreation, propagation and management of fish and wildlife.	Shellfish propagation and harvesting.	Potable water supplies	6
G. Ground-Water use of uppermost aquifer	Not used, other sources readily available.	Commercial, industrial, or irrigation, very limited other water sources.	Drinking water, municipal water available.	Drinking water, no municipal water available; commercial, industrial, or irrigation, no other water source available.	9
H. Population served by surface water supplies within 3 miles downstream of site	0	1 - 50	51 - 1,000	Greater than 1,000	6
I. Population served by aquifer supplies within 3 miles of site	0	1 - 50	51 - 1,000	Greater than 1, 000	6

TABLE 1 (Continued)

HAZARD ASSESSMENT RATING METHODOLOGY GUIDELINES

II. WASTE CHARACTERISTICS

A-1 Hazardous Waste Quantity

S = Small quantity (<5 tons or 20 drums of liquid)
M = Moderate quantity (5 to 20 tons or 21 to 85 drums of liquid)
L = Large quantity (>20 tons or 85 drums of liquid)

A-2 Confidence Level of Information

C = Confirmed confidence level (minimum criteria below)

- o Verbal reports from interviewer (at least 2) or written information from the records.
- o Knowledge of types and quantities of wastes generated by shops and other areas on base.
- o Based on the above, a determination of the types and quantities of waste disposed of at the site.

S = Suspected confidence level

- o No verbal reports or conflicting verbal reports and no written information from the records.
- o Logic based on a knowledge of the types and quantities of hazardous wastes generated at the base, and a history of past waste disposal practices indicate that these wastes were disposed of at a site.

A-3 Hazard Rating

Hazard Category	Rating Scale Levels 0	1	2	3
Toxicity	Sax's Level 0	Sax's Level 1	Sax's Level 2	Sax's Level 3
Ignitability	Flash point greater than 200°F	Flash point at 140°F to 200°F	Flash point at 80°F to 140°F	Flash point less than 80°F
Radioactivity	At or below background levels	1 to 3 times background levels	3 to 5 times background levels	Over 5 times background levels

Use the highest individual rating based on toxicity, ignitability and radioactivity and determine the hazard rating.

Hazard Rating	Points
High (H)	3
Medium (M)	2
Low (L)	1

TABLE 1 (Continued)

HAZARD ASSESSMENT RATING METHODOLOGY GUIDELINES

II. WASTE CHARACTERISTICS (Continued)

Waste Characteristics Matrix

Point Rating	Hazardous Waste Quantity	Confidence Level of Information	Hazard Rating
100	L	C	H
80	L	C	H
	M	C	H
70	L	S	H
60	S	C	H
	M	C	M
50	L	S	H
	L	C	L
	M	S	H
	S	C	M
40	S	S	H
	M	S	M
	M	C	L
	L	S	L
30	S	C	L
	M	S	L
	S	S	M
20	S	S	L

Notes:
For a site with more than one hazardous waste, the waste quantities may be added using the following rules:
Confidence Level
- o Confirmed confidence levels (C) can be added
- o Suspected confidence levels (S) can be added
- o Confirmed confidence levels cannot be added with suspected confidence levels

Waste Hazard Rating
- o Wastes with the same hazard rating can be added
- o Wastes with different hazard ratings can only be added in a downgrade mode, e.g., MCM + SCH = LCM if the total quantity is greater than 20 tons.

Example: Several wastes may be present at a site, each having an MCM designation (60 points). By adding the quantities of each waste, the designation may change to LCM (80 points). In this case, the correct point rating for the waste is 80.

B. Persistence Multiplier for Point Rating

Persistence Criteria	Multiply Point Rating From Part A by the Following
Metals, polycyclic compounds, and halogenated hydrocarbons	1.0
Substituted and other ring compounds	0.9
Straight chain hydrocarbons	0.8
Easily biodegradable compounds	0.4

C. Physical State Multiplier

Physical State	Multiply Point Total From Parts A and B by the Following
Liquid	1.0
Sludge	0.75
Solid	0.50

TABLE 1 (Continued)

HAZARD ASSESSMENT RATING METHODOLOGY GUIDELINES,

III. PATHWAYS CATEGORY

A. Evidence of Contamination

Direct evidence is obtained from laboratory analyses of hazardous contaminants present above natural background levels in surface water, ground water, or air. Evidence should confirm that the source of contamination is the site being evaluated.

Indirect evidence might be from visual observation (i.e., leachate), vegetation stress, sludge deposits, presence of taste and odors in drinking water, or reported discharges that cannot be directly confirmed as resulting from the site, but the site is greatly suspected of being a source of contamination.

B-1 POTENTIAL FOR SURFACE WATER CONTAMINATION

Rating Factor	Rating Scale Levels 0	1	2	3	Multiplier
Distance to nearest surface water (includes drainage ditches and storm sewers)	Greater than 1 mile	2,001 feet to 1 mile	501 feet to 2,000 feet	0 to 500 feet	8
Net precipitation	Less than -10 in.	-10 to + 5 in.	+5 to +20 in.	Greater than +20 in.	6
Surface erosion	None	Slight	Moderate	Severe	8
Surface permeability	0% to 15% clay ($>10^{-2}$ cm/sec)	15% to 30% clay (10^{-2} to 10^{-4} cm/sec)	30% to 50% clay (10^{-4} to 10^{-6} cm/sec)	Greater than 50% clay ($<10^{-6}$ cm/sec)	6
Rainfall intensity based on 1 year 24-hr rainfall	<1.0 inch	1.0-2.0 inches	2.1-3.0 inches	>3.0 inches	8

B-2 POTENTIAL FOR FLOODING

Rating Factor	0	1	2	3	Multiplier
Floodplain	Beyond 100-year floodplain	In 25-year flood-plain	In 10-year flood-plain	Floods annually	1

B-3 POTENTIAL FOR GROUND-WATER CONTAMINATION

Rating Factor	0	1	2	3	Multiplier
Depth to ground water	Greater than 500 ft	50 to 500 feet	11 to 50 feet	0 to 10 feet	8
Net precipitation	Less than -10 in.	-10 to +5 in.	+5 to +20 in.	Greater than +20 in.	6
Soil permeability	Greater than 50% clay ($>10^{-6}$ cm/sec)	30% to 50% clay (10^{-4} to 10^{-6} cm/sec)	15% to 30% clay (10^{-2} to 10^{-4} cm/sec)	0% to 15% clay ($<10^{-2}$ cm/sec)	8
Subsurface flows	Bottom of site greater than 5 feet above high ground-water level	Bottom of site occasionally submerged	Bottom of site frequently submerged	Bottom of site located below mean ground-water level	8
Direct access to ground water (through faults, fractures, faulty well casings, subsurface features, etc.)	No evidence of risk	Low risk	Moderate risk	High risk	8

TABLE 1 (Continued)

HAZARD ASSESSMENT RATING METHODOLOGY GUIDELINES

IV. WASTE MANAGEMENT PRACTICES CATEGORY

A. This category adjusts the total risk as determined from the receptors, pathways, and waste characteristics categories for waste management practices and engineering controls designed to reduce this risk. The total risk is determined by first averaging the receptors, pathways, and waste characteristics subscores.

B. WASTE MANAGEMENT PRACTICES FACTOR

The following multipliers are then applied to the total risk points (from A):

Waste Management Practice	Multiplier
No containment	1.0
Limited containment	0.95
Fully contained and in full compliance	0.10

Guidelines for fully contained:

Landfills:

- o Clay cap or other impermeable cover
- o Leachate collection system
- o Liners in good condition
- o Adequate monitoring wells

Spills:

- o Quick spill cleanup action taken
- o Contaminated soil removed
- o Soil and/or water samples confirm total cleanup of the spill

Surface Impoundments:

- o Liners in good condition
- o Sound dikes and adequate freeboard
- o Adequate monitoring wells

Fire Proection Training Areas:

- o Concrete surface and berms
- o Oil/water separator for pretreatment of runoff
- o Effluent from oil/water separator to treatment plant

General Note: If data are not available or known to be complete the factor ratings under items I-A through I, III-B-1 or III-B-3, then leave blank for calculation of factor score and maximum possible score.

APPENDIX H

INDEX OF REFERENCES TO POTENTIAL CONTAMINATION SOURCES

Index of References to Potential Contamination Sources

Site No.	Description	References (Page Numbers)
1	Underground Waste POL Storage Tanks	Ex. Sum., Table 1, Fig. 1, Sec. 4.1.4, Fig. 4.1-2, Table 4.2-1, Sec. 4.2.3, Table 4.2-2, Sec. 4.2.6, Sec. 5.0, Table 5.0-1, Sec. 6.0
2	Underground Plating Waste Neutralization Chambers	Ex. Sum., Table 1, Fig. 1, Sec. 4.1 (Plating Shop), Fig. 4.1-1, Table 4.2-1, Sec. 4.2.5, Table 4.2-2, Sec. 4.2.6, Sec. 5.0, Table 5.1-1, Sec. 6.0

APPENDIX I

WELL LOGS AND WATER ELEVATION DATA

3S/14W-19K1

FORM 115 INVESTIGATION

DIVISION OF WATER RESOURCES

DEPARTMENT OF PUBLIC WORKS
STATE OF CALIFORNIA

WELL LOG

SHEET 1

NUMBER B.-84j

LOCAL DESIGNATION Loc. #710 -

LA-55

LOCATION Manhattan Beach - Approximately 100' ~~N.~~ 120 S. from the ℄ of Marine Ave. & 35' 30 E. from ℄ of Peck Ave.

OWNER Arnold Mueller

DATE COMPLETED January 29, 1947

DIAMETER OF CASING 12" (Hard red steel casing)

DRILLED BY O. A. Martin 1064 Valley Street Newhall, California

SOURCE OF INFORMATION O. Gierlich, City Engineer, Manhattan Beach, California LACoFCD

INSPECTED WHILE DRILLING ______ SEE FILE NO. ______

SURFACE ELEVATION 70.8' ✗

SKETCH

DEPTH	ELEVATION OF BOTTOM OF STRATUM	MATERIAL	THICKNESS FEET	% VOIDS	ABSOLUTE VOIDS FEET	TOTAL VOIDS FEET
0- 2		Top soil				
2- 3		Hard red sand				
3- 8		Joint clay				
8- 70		Yellow sand				
70- 73		Shells				
73- 86		Quicksand				
86-106		Soft blue clay				
106-108		Medium fine sand				
108-114		Sandy clay				
114-119		Coarse sand (cut)				
119-147		Sandy clay				
147-158		Coarse gravel (cut)				
158-166		Fine sand				
166-171		Sandy blue clay				
171-173		Dirty gravel (cut)				
173-196		Black sandy clay				
196-200		Sand - redwood (no sample obtained - driller states large quantity of solid pieces)				
200-202		Oil sand				
202-216		Quicksand, bottom of strata if fine gravel.				
		Perforations: 114 - 119				
		147 - 158				
		171 - 173				

Note: (a) Well stopped in gravel, bottom cemented 12" casing cement plug below 198'.
(b) Struck water while drilling at approx. 70'
(c) Water level after bailing - 80'
(d) Water level after perforating - 83.5 below ground surface or 85.0 below casing.

FOR FIELD COPIES USE ALTERNATE LINES

LOG OBTAINED BY ______ DATE ______

FORM 8-31 1M CALIFORNIA STATE PRINTING OFFICE

FORM 115-A. 85410 6-31 3M
INVESTIGATION

DIVISION OF WATER RESOURCES

DEPARTMENT OF PUBLIC WORKS
STATE OF CALIFORNIA

SHEET 2

NUMBER B - 84j

WELL LOG

LOCAL DESIGNATION

FOR FIELD COPIES USE ALTERNATE LINES

DEPTH	ELEVATION OF BOTTOM OF STRATUM	MATERIAL	THICKNESS FEET	% VOIDS	ABSOLUTE VOIDS FEET	TOTAL VOIDS FEET
		(e) Elevation top of casing 72.27				
		(f) Chloride content bottom of hole 191 ppm.				

35/14W-19K3

FORM 115 INVESTIGATION

SHEET 1

DIVISION OF WATER RESOURCES
DEPARTMENT OF PUBLIC WORKS
STATE OF CALIFORNIA

NUMBER

WELL LOG

LOCAL DESIGNATION #12

Loc. 710C

LOCATION Approx. ½ mile East of Sepulveda Blvd.,
1 block S. of Marine Ave.

OWNER City of Manhattan Beach

DATE COMPLETED March 12, 1948

DIAMETER OF CASING 16"

DRILLED BY Frank Coon

SOURCE OF INFORMATION Driller's log

INSPECTED WHILE DRILLING SEE FILE NO.

SURFACE ELEVATION 75.2

SKETCH

FOR FIELD COPIES USE ALTERNATE LINES

DEPTH	ELEVATION OF BOTTOM OF STRATUM	MATERIAL	THICKNESS FEET	% VOIDS	ABSOLUTE VOIDS FEET	TOTAL VOIDS FEET
Surface to 62'		Soil and fine yellow sand				
62 to 68'		Fine yellow sand and small gravel				
68 to 84'		Fine yellow muddy sand				
84 to 86'		Fine yellow sand and small gravel				
86 to 88'		Coarse gravel 2 to 4" yellow sand				
88 to 92'		Gravel and yellow clay				
92 to 96'		Fine gray sand and shells				
96 to 98'		Yellow clay				
98 to 108'		Blue clay				
108 to 114'		Fine gray sand (WATER LEVEL -- after perforation)				
114 to 126'		Fine yellow sand				
126 to 134'		Yellow sandy clay				
134 to 138'		Blue clay and shells				
138 to 168'		Blue sandy clay				
168 to 176'		Coarse yellow sand and gravel 1½"				
176 to 180'		Blue sandy clay				
180 to 200'		Fine yellow sand				
200 to 232'		Fine gray sand				
232 to 236'		Coarse gray sand				
236 to 246'		Coarse gray sand and gravel 1"				
246 to 260'		Fine gray sand and small gravel ½"				
260 to 286'		Fine grey sand				
286 to 288'		Fine gray sand, shells, and a little gravel				
288 to 292'		Gravel ½"				
292 to 308'		Fine muddy blue sand				
308 to 346'		Blue sandy clay				
346 to 350'		Blue sandy clay and shells				
350 to 416'		Blue sandy clay				
416 to 424'		Sandy blue clay and sandstone				
424 to 436'		Fine muddy blue sand and sandstone				
436 to 526'		Blue sandy clay				

LOG OBTAINED BY DATE

FORM 115-A
INVESTIGATION

SHEET 2

DIVISION OF WATER RESOURCES

DEPARTMENT OF PUBLIC WORKS
STATE OF CALIFORNIA

NUMBER Loc. 7100

WELL LOG

LOCAL DESIGNATION #12

DEPTH	ELEVATION OF BOTTOM OF STRATUM	MATERIAL	THICKNESS FEET	% VOIDS	ABSOLUTE VOIDS FEET	TOTAL VOIDS FEET
		Perforated with a Hydraulic Perforator				
		From 168 ft. down to 176 ft. ¼ x 1-3/4"				
		234 ft. " " 246 " 3/16" x 1-3/4"				
		246 " " " 260 " 1/8" x 3/16" x 1-3/4"				
		288 " " " 292 " ¼" x 1-3/4"				
		8 holes per 4 inches				
		Water Level Datum Elev. - 30' below Sea Level				

FOR FIELD COPIES USE ALTERNATE LINES

FORM 119 INVESTIGATION

South Coastal Basin

DIVISION OF WATER RESOURCES

DEPARTMENT OF PUBLIC WORKS
STATE OF CALIFORNIA

3S/14W-20 J1

SHEET 1

NUMBER B-29f-

WELL LOG

LOCAL DESIGNATION

LOCATION ~~Soil Test, 2[illegible] S. of center line of intersection of Inglewood Ave. and Chicago St.~~ 135' S. of ℄ COMPTON BLVD., 590' W. of ℄ INGLEWOOD AV.

Loc. -730A

USGS [illegible]

OWNER Mr. Durand

DATE COMPLETED

DIAMETER OF CASING

DRILLED BY Fish

SOURCE OF INFORMATION Graphic log

INSPECTED WHILE DRILLING No SEE FILE NO.

SURFACE ELEVATION 70'

SKETCH

DEPTH	ELEVATION OF BOTTOM OF STRATUM	MATERIAL	THICKNESS FEET	% VOIDS	ABSOLUTE VOIDS FEET	TOTAL VOIDS FEET
0-[illegible]	62	Soil				
[illegible]-42	28	Sand				
[illegible]2-120	-50	Blue clay				
120-19[illegible]	-120	Yellow clay				
1[illegible]-220	-150	Sand				
2[illegible]-230	-160	Blue sediment				
230-285	-215	Sandy clay				
285-325	-255	Sand - fine				
325-341	-271	Coarse sand				
341-352	-282	Sediment				
352-370	-300	Coarse sand				
370-391	-321	Gravel				
391-420	-350	Sand				
420-475	-405	Gravel				

FOR FIELD COPIES USE ALTERNATE LINES

I-5

LOG OBTAINED BY DATE

CALIFORNIA STATE PRINTING OFFICE

APPENDIX J

WATER ANALYSIS DATA

731 3S/14W-29F01
33 52 58.0 118 22 09.0 2
COASTAL PLAIN
06037 CALIFORNIA LOS ANGELES
CALIFORNIA 140600
LOS ANGELES
21CALAFD ::::::::
790721 DEPTH 0
/TYPA/AMBNT/WELL

INITIAL DATE 80/07/14
INITIAL TIME-DEPTH-BOTTOM 1015 0000

00010	WATER	TEMP	CENT	22.8
00011	WATER	TEMP	FAHN	73.0
00095	CNDUCTVY	AT 25C	MICROMHO	1320
00403	LAB	PH	SU	8.0
00440	HCO3 ION	HCO3	MG/L	204
00608	NH3+NH4-	N DISS	MG/L	0.100 K
00615	NO2-N	TOTAL	MG/L	0.060
00620	NO3-N	TOTAL	MG/L	0.660
00900	TOT HARD	CACO3	MG/L	354
00916	CALCIUM	CA-TOT	MG/L	97.7
00927	MGNSIUM	MG,TOT	MG/L	26.8
00929	SODIUM	NA,TOT	MG/L	89.50
00937	PTSSIUM	K,TOT	MG/L	6.80
00940	CHLORIDE	CL	MG/L	229
00945	SULFATE	SO4-TOT	MG/L	95
00951	FLUORIDE	F,TOTAL	MG/L	0.34
01022	BORON	B,TOT	UG/L	230
01045	IRON	FE,TOT	UG/L	41
01055	MANGNESE	MN	UG/L	67.0
70300	RESIDUE	DISS-180 C	MG/L	880
70507	PHOS-T	ORTHO	MG/L P	0.040

STORET RETRIEVAL DATE 80/08/02
740 3S/14W-21M01
33 53 39.0 118 21 27.0 2
COASTAL PLAIN
06037 CALIFORNIA LOS ANGELES
CALIFORNIA 140600
LOS ANGELES
21CALAFD
790721 DEPTH 0
/TYPA/AMBNT/WELL

	INITIAL DATE			80/04/18
	INITIAL TIME-DEPTH-BOTTOM			0947
00010	WATER	TEMP	CENT	23.9
00011	WATER	TEMP	FAHN	75.0
00095	CNDUCTVY	AT 25C	MICROMHO	555
00403	LAB	PH	SU	8.0
00440	HCO3 ION	HCO3	MG/L	249
00608	NH3+NH4-	N DISS	MG/L	0.510
00615	NO2-N	TOTAL	MG/L	0.010 K
00620	NO3-N	TOTAL	MG/L	0.170
00900	TOT HARD	CACO3	MG/L	142
00916	CALCIUM	CA-TOT	MG/L	38.0
00927	MGNSIUM	MG,TOT	MG/L	11.5
00929	SODIUM	NA,TOT	MG/L	47.90
00937	PTSSIUM	K,TOT	MG/L	6.00
00940	CHLORIDE	CL	MG/L	32
00945	SULFATE	SO4-TOT	MG/L	1
00951	FLUORIDE	F,TOTAL	MG/L	0.23
01022	BORON	B,TOT	UG/L	185
01045	IRON	FE,TOT	UG/L	22
01055	MANGNESE	MN	UG/L	44.0
70300	RESIDUE	DISS-180 C	MG/L	324
70507	PHOS-T	ORTHO	MG/L P	0.020

REC[illegible]
AUG 01 1985
ENGRING DEPT.

THE METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA

TABLE B

ANALYSES OF THE DISTRICT WATER SUPPLIES

CONSTITUENT	SYMBOLS AND UNITS	SOURCE WATER RESERVOIRS				TREATED WATER				
		LAKE MATHEWS GRAB SAMPLE	SILVERWOOD LAKE GRAB SAMPLE	CASTAIC LAKE MONTHLY COMPOSITE	LAKE SKINNER MONTHLY COMPOSITE	WEYMOUTH PLANT MONTHLY COMPOSITE	DIEMER PLANT MONTHLY COMPOSITE	JENSEN PLANT MONTHLY COMPOSITE	SKINNER PLANT MONTHLY COMPOSITE	MILLS PLANT MONTHLY COMPOSITE
		6/5/85	6/5/85	June 1985	June 1985	June 1985	June 1985	June 1985	June 1985	June 1985
SILICA	SiO_2 mg/l	8.5	3.2	13.6	7.5	8.0	7.8	13.6	7.5	4.6
CALCIUM	Ca mg/l	78	22	34	45	63	63	34	45	21
MAGNESIUM	Mg mg/l	25.5	8.5	13.5	17.5	22.5	22.0	13.5	17.5	9.0
SODIUM	Na mg/l	90	35	34	56	70	70	36	56	36
POTASSIUM	K mg/l	3.9	1.7	1.7	2.7	3.2	3.2	1.8	2.7	1.7
CARBONATE	CO_3 mg/l	5	8	0	2	1	0	0	0	1
BICARBONATE	HCO_3 mg/l	157	82	105	117	144	144	106	122	95
SULFATE	SO_4 mg/l	245	35	76	132	194	194	76	135	37
CHLORIDE	Cl mg/l	73	34	32	48	59	59	33	49	36
NITRATE	NO_3 mg/l	1.05	0.60	2.20	0.55	0.95	0.90	2.20	0.50	0.60
FLUORIDE	F mg/l	0.29	0.20	0.21	0.22	0.26	0.25	0.22	0.22	0.18
BORON	B mg/l									
TOTAL DISSOLVED SOLIDS	mg/l	609	189	260	370	494	492	263	374	195
TOTAL HARDNESS-$CaCO_3$	mg/l	300	90	140	184	250	248	140	184	89
TOTAL ALKALINITY-$CaCO_3$	mg/l	137	81	86	100	120	118	87	100	80
FREE CARBON DIOXIDE	CO_2 mg/l	1.1	0.2	2.6	0.7	1.5	1.4	1.3	1.6	0.8
H^+ CONCENTRATION	pH	8.40	9.00	7.82	8.49	8.20	8.24	8.15	8.11	8.29
SPECIFIC CONDUCTANCE	µmho/cm	934	342	443	627	809	804	449	634	357
TURBIDITY	NTU	1.6	3.3	1.07	3.2	0.10	0.10	0.34	0.17	0.14
TEMPERATURE	°C	18	20	15	22	19	20	15	22	21
PERCENT STATE PROJECT WATER		0	100	100	50	24	25	100	49	100

APPENDIX K

APPLICATION FOR CLOSURE OF THE 4,000-GALLON UNDERGROUND OIL STORAGE TANK

00415 B

APPLICATION FOR CLOSURE
HAZARDOUS MATERIALS UNDERGROUND STORAGE

COUNTY OF LOS ANGELES
DEPARTMENT OF COUNTY ENGINEER-FACILITIES SANITATION DIVISION
550 SOUTH VERMONT LOS ANGELES, CALIFORNIA 90020

OWNER:
NAME US AIR FORCE/BASE CIVIL ENGINEER
ADDRESS L.A. AIR FORCE STA./P O Box 92960 CITY LOS ANGELES STATE CA ZIP 90009-2960

FACILITY:
NAME BLDG 80/LOS ANGELES AIR FORCE ANNEX #3
SITE ADDRESS 14800 AVIATION BLVD CITY HAWTHORNE ZIP 90250
MAILING ADDRESS P O BOX 92960 CITY LOS ANGELES STATE CA ZIP 90009-2960
CONTACT PERSON RICHARD MANN TITLE PROJECT ENGINEER PHONE (213) 643-0930

CLOSURE REQUESTED:

☐ TEMPORARY (REFER TO CONDITIONS A AND B ON BACK OF THIS FORM)
EFFECTIVE DATE OF CLOSURE ____________
DATE OPERATION WILL RESUME ____________

☒ PERMANENT, TANK(S) REMOVAL DISPOSAL DESTINATION PROPERTY DISPOSAL LONG BEACH, NAVSTA
(REFER TO CONDITIONS A AND C ON BACK OF THIS FORM)

☐ PERMANENT, TANK(S) IN PLACE
(REFER TO CONDITIONS A AND D ON BACK OF THIS FORM)

TANK(S) DESCRIPTION: (ATTACH ADDITIONAL LIST IF NECESSARY.)

TANK NO.	MATERIAL	AGE (YEARS)	CAPACITY (GAL)	MATERIALS STORED (PAST AND PRESENT)
	STEEL	27	4000	HEATING OIL #2

	YES	NO
HAS ANY UNAUTHORIZED DISCHARGE EVER OCCURRED AT THIS SITE?	☐	☒
HAVE STRUCTURAL REPAIRS EVER BEEN MADE ON THESE TANKS?	☐	☒
WILL NEW UNDERGROUND TANKS BE INSTALLED FOLLOWING CLOSURE?	☐	☒
WILL ANY WELLS, INCLUDING MONITORING WELLS, BE ABANDONED?	☐	☒

IF THE RESPONSE TO ANY OF THE ABOVE QUESTIONS IS YES, ATTACH EXPLANATION.

BY SIGNATURE BELOW THE APPLICANT CERTIFIES THAT HE/SHE HAS READ AND UNDERSTANDS THE CONDITIONS ON THE REVERSE SIDE OF THIS FORM AND THAT THE STATEMENTS AND DISCLOSURES ABOVE ARE TRUE AND CORRECT.

APPLICANT'S SIGNATURE Richard Mann DATE 08 AUG 85
OWNER ☐ OPERATOR ☐ CONTRACTOR
STATE LICENSE NO. ____________

TO BE COMPLETED BY THE COUNTY ENGINEER

BY SIGNATURE BELOW APPLICANT IS GRANTED APPROVAL TO PROCEED WITH THE CLOSURE.

FEE COLLECTED $38.00
PERMIT NO 00415 B
FILE NO – R/C 2C

[signature] DATE 8/9/85

TO ARRANGE FOR AN INSPECTION, TELEPHONE 534-4867

CONDITIONS A -- GENERAL

1. Closures shall be carried out such that all applicable regulations from the following agencies are complied with: Los Angeles County, Department of County Engineer-Facilities; Los Angeles County Fire Department, Fire Prevention Division or the appropriate City Fire Department; South Coast Air Quality Management District; and Los Angeles County Department of Health Services.

2. The County Engineer and Fire Departments shall be notified in advance of any closure in accordance with the following:

   a. Removal of tank shall require a three (3) business day advance notification.

   b. Permanent closure of a tank in place or a temporary closure shall require a 30 day written notification.

3. A fee of $38 per tank shall accompany this application.

4. All abandoned wells shall be destroyed in such a way that they will not produce water or act as a channel for interchange of water, when such interchange may result in deterioration of the quality of water in any or all water bearing formations penetrated, or present a hazard to the safety and well-being of people and animals.

5. A well destruction permit issued by the Los Angeles Department of Health Services shall be required for all wells requiring a permit for their initial construction.

6. Well destruction shall be accomplished according to methods described in the latest "Water Well Standards: State of California" by the Department of Water Resources, contained in Bulletin 74-81, December 1981, or any other methods that will provide equivalent or better protection.

7. Plans for the decontamination of a facility shall be submitted to the County Engineer for approval no later than 30 days before the commencement of such operations. Other agencies having jurisdiction shall also be notified. These agencies include the California Regional Water Quality Board, the Los Angeles County Department of Health Services, and the South Coast Air Quality Management District.

8. Decontamination shall require the following, as a minimum:

   a. Cleaning operation shall be done under the supervision of persons who understand the hazardous potential of the original liquid stored and its components.

   b. The personnel shall be sufficiently skilled to safely carry out such operation.

   c. Contaminated materials removed from such facility shall be disposed of at legal point of discharge.

   d. The operation shall be carried out in a manner that will not endanger the health of the public and the environment.

CONDITIONS B -- TEMPORARY

1. All temporary closures shall be carried out as indicated in Los Angeles County Fire Department, Fire Prevention Division, Supplement #A -- Inspection Guide #6, "Abandonment or Removal of Underground Tanks," Part A and any other applicable Parts.

2. A temporary closure shall not exceed 90 days.

CONDITIONS C -- PERMANENT, TANK(S) REMOVAL

1. All tank removals shall be carried out as indicated in Los Angeles County Fire Department, Fire Prevention Division, Supplement #A -- Inspection Guide #6, Part D and any other applicable Parts.

2. Owners/operators shall notify the Building Department having jurisdiction at the place of removal if a grading permit is necessary.

3. Removed tanks shall not be transported away from the site until an inspection to establish site integrity is carried by the County Engineer.

4. If an appointment has been arranged with a County Engineer inspector to inspect the removal of a tank, the inspector will only wait at the site a reasonable amount of time (approximately one hour) after arriving for the removal to commence. Another closure fee may be charged if the inspector has to return to the site.

5. After inspection, tanks shall be transported to a legal disposal point.

6. If the tank had stored materials other than motor fuel, fuel oil, or waste oil, site integrity shall be demonstrated using the soil sampling and analysis procedures described in CONDITIONS D below.

7. The site shall be backfilled and recompacted to a relative compaction of 90%.

CONDITIONS D -- PERMANENT, TANK(S) IN PLACE

1. All permanent closures of tanks in place shall comply with Los Angeles County Fire Department, Fire Prevention Division, Supplement #A -- Inspection Guide #6, Parts B or C, and any other applicable Parts.

2. Owners/operators shall demonstrate part site integrity as follows:

   a. Test borings shall be slant drilled to intercept a point beneath the center of the tank, if possible. If slant drilling is not feasible, the test borings may be drilled vertically and the reason stated in the report in 2.h. below.

   b. For single tanks, a minimum of two test borings will be required, each located on opposite sides of the tank along the major axis of the tank.

   c. For multiple tanks, as a minimum, borings shall be placed at 2 foot intervals around the tank cluster. The actual number an location of borings shall be evaluated on a case-by-case basis. Tanks separated by 20 feet or more shall be considered single tank for the purposes of test location and placement.

   d. Soil samples shall be taken at depths of 5, 10, 20, 30 and 40 fee below grade level.

   e. A Shelby Tube or a Modified California Sampler shall be utilize for taking all soil samples.

   f. Soil samples shall be capped immediately with teflon or aluminum.

   g. Soil samples shall not be extruded in the field but are to b immediately placed in a refrigerated ice chest and transported to state certified laboratory for analysis, using suitable methods.

   h. A report containing the results of the above analysis shall t submitted to the County Engineer.

3. If the soil analysis in 2. above indicates the presence c contaminants, the County Engineer shall require a site investigation a described in Chapter V of the County's "Underground Storage c Hazardous Materials -- Guidelines."

4. A report shall be submitted to the County Engineer contai-ing t: results of the site investigation.