

APPENDIX J-12:

**McLAREN ENVIRONMENTAL ENGINEERING, "SITE
INVESTIGATION AND EVALUATION OF REMEDIAL
MEASURES REPORT, HOWARD HUGHES PROPERTY
PLANT SITE, LOS ANGELES, CALIFORNIA,"
MAY 8, 1987**

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SITE INVESTIGATION AND
EVALUATION OF REMEDIAL MEASURES REPORT
HOWARD HUGHES PROPERTIES PLANT SITE
LOS ANGELES, CALIFORNIA

MAY 8, 1987



McLaren Environmental Engineering



McLaren Environmental Engineering

May 8, 1987

Mr. Hank H. Yacoub
Supervising Water Resources Control Engineer
California Regional Water Quality Control Board
Los Angeles Region
107 South Broadway, Room 4022
Los Angeles, CA 90012-4596

Dear Mr. Yacoub:

**HOWARD HUGHES PROPERTIES
SITE INVESTIGATION AND EVALUATION OF REMEDIAL ALTERNATIVES**

As we discussed on May 7, 1987, the enclosed Site Investigation and Evaluation of Remedial Alternatives Report has been completed for the Howard Hughes Properties site at Centinela Avenue and Jefferson Boulevard in Los Angeles.

The report describes site investigations conducted in 1986 and 1987, includes data from prior investigations, evaluates applicable remedial technologies, and recommends a program for remediation of soils and groundwater at the site. Supporting data and technical details for the report are included as appendices.

As you suggested, we will make a brief presentation of the report in your office on May 18, 19, or 20, 1987. I will telephone you as soon as we are able to confirm a date.

Very truly yours,

Thomas F. Cudde
Douglas W. Jones
Vice President

mas

Enclosures

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SECTION I

INTRODUCTION

This Draft Site Investigation and Evaluation of Remedial Measures Report has been prepared to evaluate existing soils and groundwater conditions at the 350-acre Howard Hughes Properties Plant Site in Los Angeles, California, identify potential adverse impacts associated with the presence of chemicals in soils and groundwater at the site, define those areas which require remediation, assess remedial alternatives, and recommend specific remedial actions.

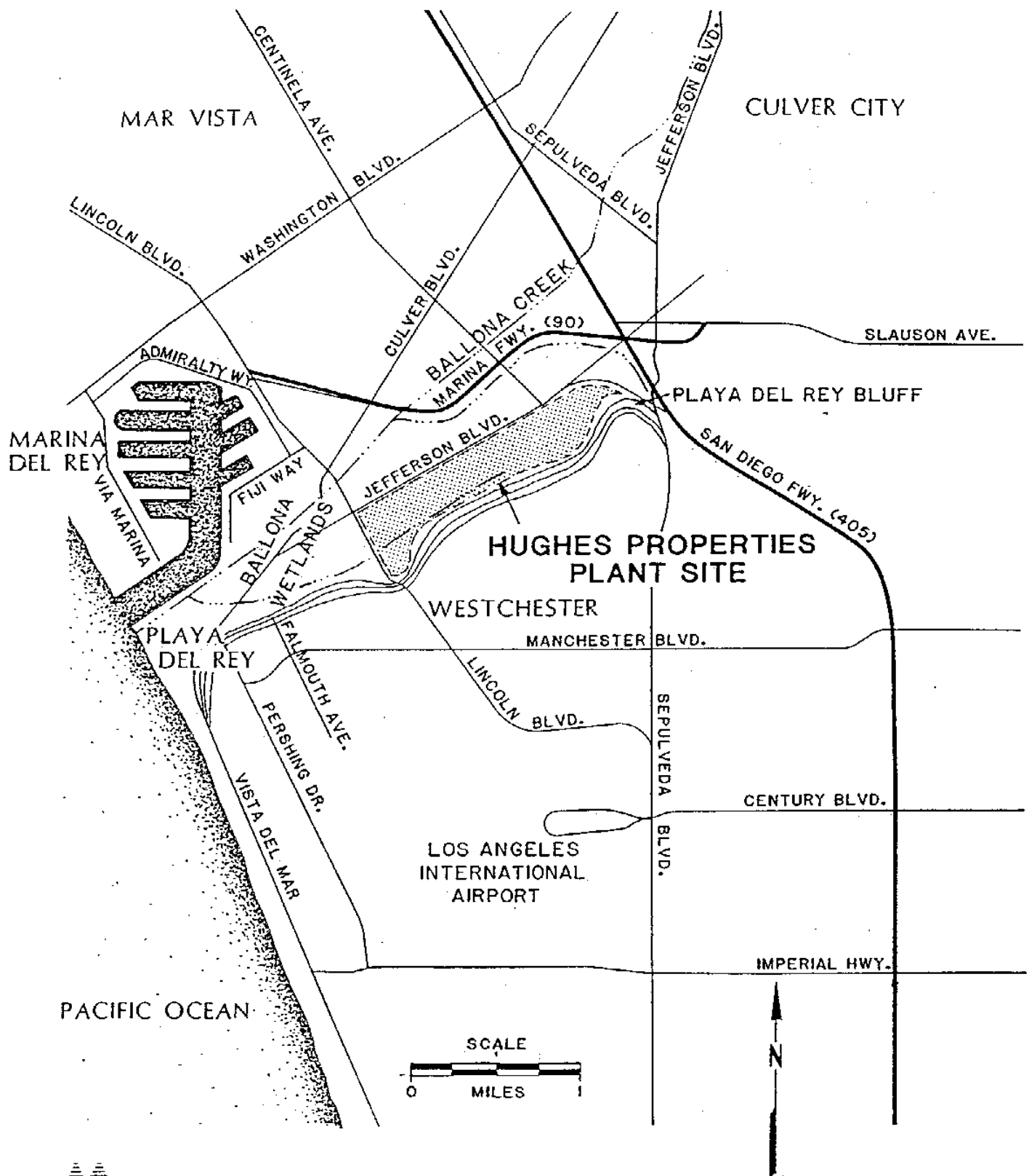
Included in this report are:

- . a description of activities at the site,
- . a summary of regional land use, physiography, and hydrogeology,
- . a discussion of site-specific hydrogeologic conditions,
- . a description of potential chemical source areas,
- . a summary of investigations conducted to date to characterize the distribution of chemicals in soils and groundwater,
- . an identification of migration pathways, potential receptors, and an exposure assessment for chemicals identified in soils and groundwater,
- . a description of remedial actions performed to date,
- . a statement of the objectives of remedial action,
- . an initial screening of remedial technologies and selection of applicable alternatives,
- . an evaluation of remedial action alternatives for source area control and management of chemical migration in groundwater, and
- . a presentation of the recommended remedial action including an implementation schedule.

SITE DESCRIPTION

The Howard Hughes Properties Plant Site is located in the western portion of the City of Los Angeles between the communities of Mar Vista, Culver City, Westchester, Playa del Rey, and Marina del Rey, as shown in Figure I-1. The site consists of approximately 350 acres

FIGURE 1-1
LOCATION MAP



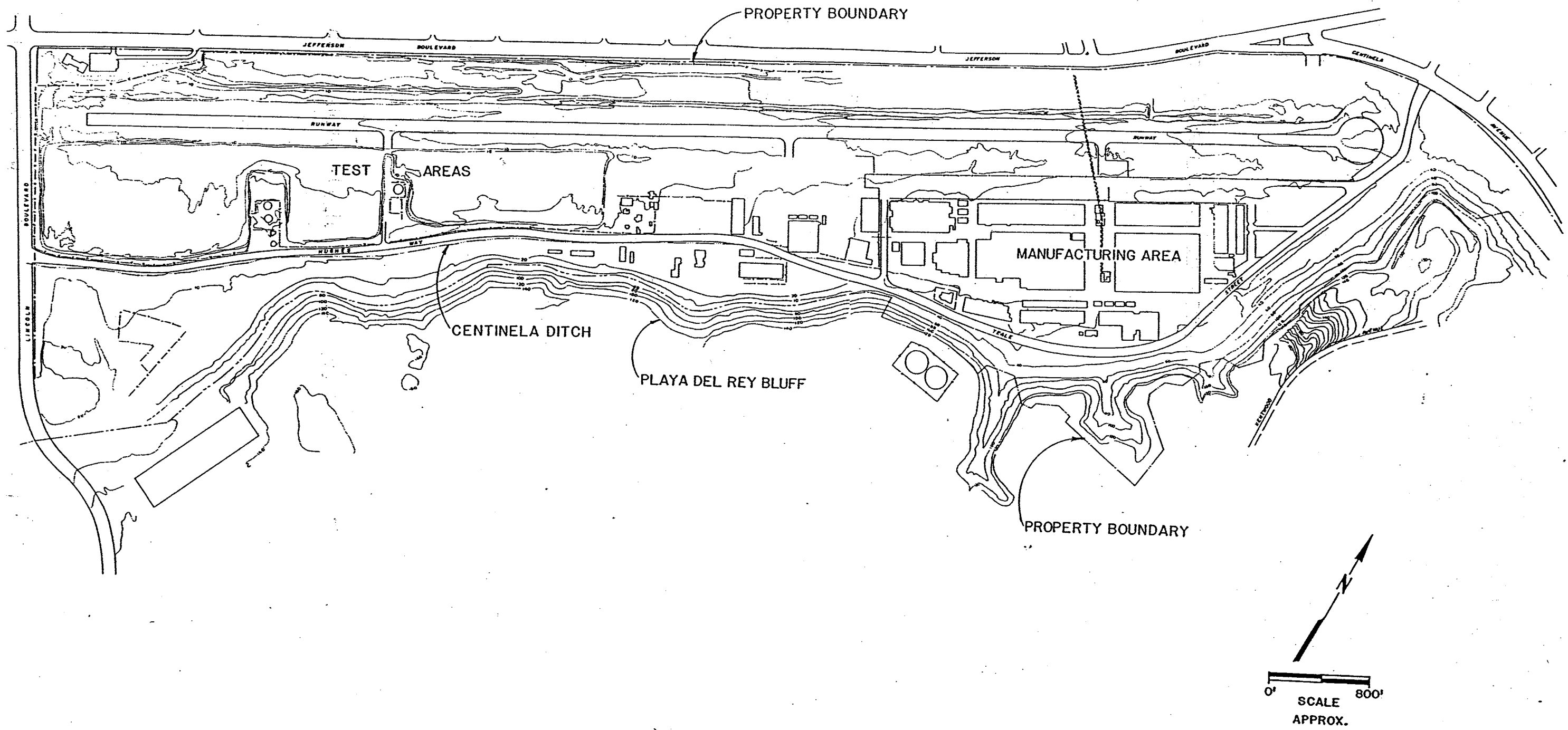
bounded by Centinela Avenue on the east, Lincoln Boulevard on the west, Jefferson Boulevard on the north, and the Playa del Rey Bluff on the south. Figure I-2 shows the layout of the Plant Site.

Since the early 1940's aircraft research, development, and manufacturing activities have been conducted at the Plant Site. Industrial activities have included aircraft manufacturing, metal plating, painting, and machining, aircraft cleaning and maintenance, small armament development and manufacturing, and associated testing. A portion of the site is currently leased by McDonnell Douglas Helicopter Company (formerly Hughes Helicopter Company) and is in use for helicopter manufacturing and testing activities. A portion of the site is also leased by Hughes Aircraft Company and is in use for aerospace research. Until 1954, when Hughes Aircraft Company became a separate company, the property, Hughes Aircraft Company, and Hughes Helicopter Company were all under one ownership. The helicopter company was sold to McDonnell-Douglas in 1984.

Approximately 40 percent of the site is covered by structures, asphalt roads and parking lots, aircraft taxiways, and an aircraft runway. Structures on the Plant Site include 36 buildings used for offices, manufacturing, research, and testing and approximately 15 sheds and covered storage areas. The 5,000 foot long runway, located just south of Jefferson Boulevard, traverses the Plant Site from northeast to southwest. Certain undeveloped areas, particularly in the western portion of the site, have been farmed during the past 40 years. Much of the western portion of the Plant Site has been deactivated and in some areas structures and testing facilities have been removed. Industrial activities are scheduled to continue on the eastern portion of the Plant Site for approximately ten years.

Investigations conducted by the property owner identified the presence of solvents and fuel hydrocarbons in soil and groundwater beneath the Plant Site. A number of interim remedial measures have been completed at the Plant Site to insure against any continuing discharge of chemicals from suspected sources.

FIGURE I-2
PROPERTY MAP



SCOPE AND OBJECTIVES OF REPORT

Several environmental investigations have been conducted at the Plant Site by Hargis & Associates, Inc. and McLaren Environmental Engineering, Inc. These investigations identified areas where historic activities at the facility resulted in on-site soil and groundwater conditions which might warrant remedial actions. This report:

1. summarizes the results of previous site investigations;
2. identifies those areas where remedial activities might be appropriate;
3. screens the types of potentially appropriate remedial actions;
4. analyzes in detail selected remedial alternatives; and,
5. recommends a site remedial action program which will provide a permanent remedy to existing on-site conditions.

SECTION II

REGIONAL SETTING

This section of the report presents a summary of regional land use and demography, physiography, hydrogeology, and climate and air quality in the project area.

LAND USE AND DEMOGRAPHY

The project site lies within the Los Angeles metropolitan area. Land use in the vicinity of the Plant Site includes residential, commercial, business/professional, and light industrial development. The Los Angeles International Airport is located approximately 12.5 miles south of the site. Loyola Marymount University is located just south of the site at the top of the Playa del Rey Bluff. U.S. Census data indicate that roughly 144,000 persons resided within an approximate 2 mile radius of the site in 1980.

PHYSIOGRAPHY

The project site lies within the alluvial floodplain of the ancestral Los Angeles River. The plain is well-defined topographically, being bounded on the north by the Santa Monica Mountains and on the south by the Playa del Rey Bluff which is also known as the Ballona Escarpment, an erosional feature created by the ancestral Los Angeles River. Surface drainage in the vicinity of the site is primarily directed through Ballona Creek, which discharges to the Pacific Ocean via the Ballona Wetlands.

HYDROGEOLOGY

Geologic Setting

The Plant Site lies within the western part of the Coastal Plain of the Pacific Border Province in Los Angeles County in southern California. More specifically, the Plant Site is located in the Ballona Gap, a tongue of fluvial sediments deposited in an erosional gap cut by a stream into older deposits. The south side of the Plant Site is bounded by the Ballona Escarpment, locally named the Playa del Rey Bluff. The bluff rises 100 to 120 feet in elevation above ground surface on the Plant Site. The erosion which formed the Ballona Gap and the escarpment occurred during the late Pleistocene period when

much greater annual precipitation in the mountains east of the Coastal Plain caused major streams to flow across the plain to the ocean. Regional geologic features are shown on Figure II-1. A cross section of regional geologic features is shown on Figure II-2.

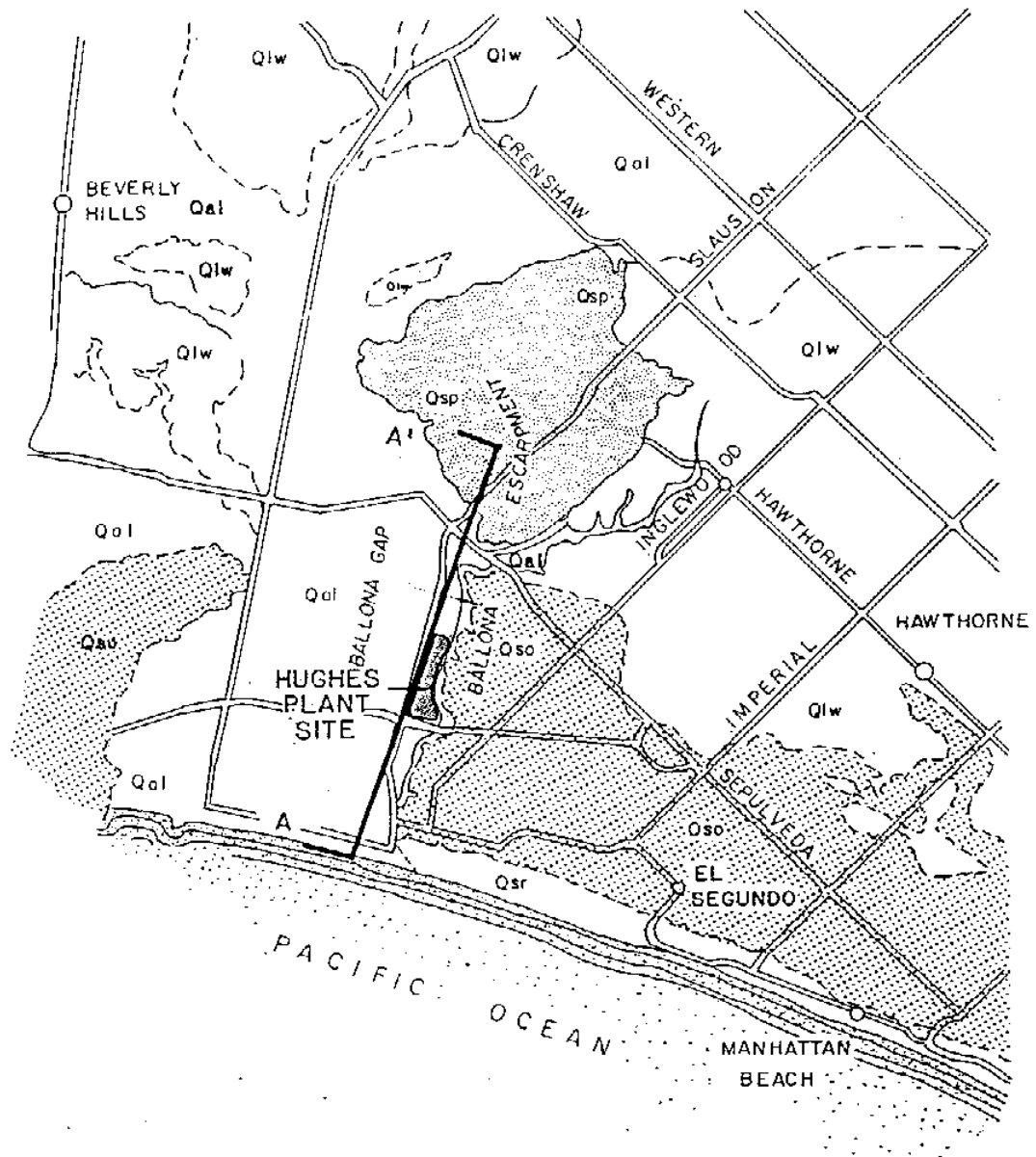
At depths of 1,000 feet or more beneath the Plant Site lie crystalline igneous and metamorphic rocks which are not aquifers and have little effect on the present hydrologic regime in the local area. Lying over the crystalline basement rocks are Pliocene marine deposits of the Pico Formation. The top of this formation occurs at approximately 200 feet below surface. The Pico Formation contains water of high salinity and the lower boundary of the West Coast groundwater basin lies within the formation at depths of 200 to 400 feet beneath the Plant Site.

Overlying the Pico Formation are deposits of Pleistocene age which contain most of the groundwater tapped by wells in the Coastal Plain. The Pleistocene deposits of interest near the Plant Site are: from oldest to youngest, the San Pedro Formation, the Lakewood Formation, and the Older Dune Sand. The San Pedro Formation is the principal water bearing formation beneath the Coastal Plain, and it contains as many as five aquifer zones. In the area of the Plant Site the principal aquifer in the San Pedro Formation is the Silverado Aquifer (California Department of Water Resources, 1961). The Silverado Aquifer consists of marine, blue to gray sand, gravel, silt and clay layers and continental deposits with black sands, gravels, peat, and wood fragments. Three San Pedro Formation Aquifer zones which occur above the Silverado Aquifer in other areas of the Coastal Plain have apparently been removed by structural uplift and erosion in the West Coast basin that includes the Plant Site. Occurrence of the Silverado Aquifer near the Plant Site is shown on Figure II-2.

The Lakewood Formation is the geologic unit which overlies the San Pedro Formation beneath most of the Coastal Plain. However, the Lakewood Formation is not present beneath the Plant Site, because it has been stripped away by erosion in the Ballona Gap. A 60 to 80 foot thickness of Lakewood Formation occurs in the Playa del Rey Bluff adjacent to the Plant Site, as shown in Figure II-2.

Beneath the Coastal Plain, the Lakewood Formation is reported to contain three aquifer zones, but in the West Coast basin near the Plant Site, only one aquifer is known. The Lakewood Formation aquifer zone which does occur near the site may be called the Gage Aquifer or the Gardena Aquifer. The name of the aquifer zone varies with its lithology. Where the aquifer is made up of fine to medium sand with minor gravel, it is called Gage Aquifer. Where the aquifer is coarse sand and gravel with minor sandy silt and clay lenses, it is the

FIGURE II-1
REGIONAL GEOLOGIC MAP



LEGEND

Qal	ALLUVIUM
Qso	OLDER DUNE SAND
Qlw	LAKEWOOD FORMATION
Qsp	SAN PEDRO FORMATION
A — A'	LINE OF GEOLOGIC CROSS SECTION
---	CONTACT (DASHED WHERE APPROXIMATELY LOCATED)

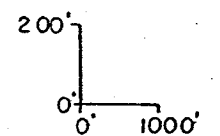
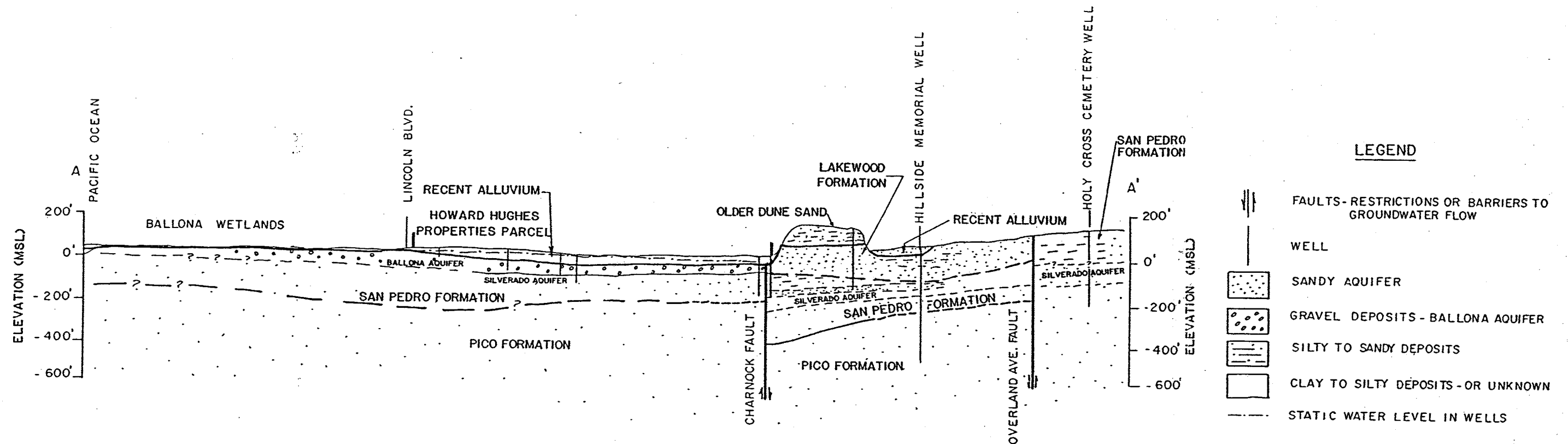
BASE MAP REFERENCE:
CALIFORNIA DEPARTMENT OF
WATER RESOURCES,
BULLETIN 104, 1961.

N.T.S.



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FIGURE II-2
REGIONAL GEOLOGIC
CROSS SECTION



VERTICAL EXAGGERATION = 5X

Gardena Aquifer. The Department of Water Resources (1961) has projected the Gage Aquifer into the Playa del Rey Bluff, but deposits occurring within the Lakewood Formation in the bluff are predominantly sandy gravels. Throughout this report, the aquifer zone in the Lakewood Formation in the Playa del Rey Bluff will be referred to as the Gage/Gardena Aquifer.

Overlying the Lakewood Formation in a small area of the western part of the Coastal Plain is the upper Pleistocene deposit, Older Dune Sand. The deposit is not reported to contain any aquifer zones, and most of the sand lies above the water table in the Playa del Rey Bluff. The occurrence of the Older Dune Sand in the bluff near the Plant Site is shown in Figures II-1 and II-2.

Gravels, sands, silts, and clays of Recent age which underlie the Plant Site were deposited on the San Pedro Formation in the Ballona Gap after a stream valley was cut through the older dune deposits. The gravel deposits under the Plant Site have been called the "Fifty-foot Gravel" and are now named the Ballona Aquifer (DWR, 1961). The gravels of this aquifer were deposited by fast moving streams in the channel called the Ballona Gap. Overlying the Ballona Aquifer in the Ballona Gap are deposits of sand, silt, and clay which are locally quite variable in thickness. These sand, silt, and clay lenses were deposited in or adjacent to the stream channel as water flow in the stream subsided over time, and lagoons, ponds, and marshes were formed. The sands, silts, and clays deposited over the gravels in the Ballona Gap have been referred to as the Bellflower Aquiclude because they conform to the regional description for the Bellflower Aquiclude lying between surface soils or semiperched aquifers and the first aquifer. The deposits above the Ballona Aquifer are more appropriately called the Bellflower Aquitard as they are semiconfining layers and transmit water into the regional aquifer. In Figure II-2 the Ballona Aquifer is identified, and the Bellflower Aquitard is shown as Recent Alluvium.

Across the Coastal Plain, recent alluvial deposits and active dune sands have been and are continuing to be deposited over the Bellflower Aquitard. A silty sand deposit which forms much of the soil zone in the Ballona Gap along the Playa del Rey Bluff has been deposited on the Bellflower Aquitard by water and wind erosion from the deposits in the bluff.

The major structural feature in the western part of the Coastal Plain is the Newport-Inglewood fault system which consists of a series of faults trending northwest to southeast across the Coastal Plain. These faults impede east-west groundwater flow, and they dissect the Coastal Plain groundwater basin into Central and West Coast parts. The westernmost fault in the Newport-Inglewood system is called the Charnock Fault. The Charnock Fault is not traceable on the ground surface, but evidence from deep water well drilling indicates that it crosses the eastern side of the Plant Site (Poland and others, 1959;

DWR, 1961). The Charnock Fault is thought to cut the San Pedro Formation beneath the Plant Site, possibly forming a groundwater barrier, but it is not known to cut the Lakewood Formation in the Playa del Rey Bluff or the Recent deposits in the Ballona Gap. The estimated location of the Charnock Fault beneath the Plant Site is shown on Figure II-2. Other faults in the Newport-Inglewood fault system occur further east of the Charnock Fault, but there are no other structural features known near the Plant Site.

Regional Hydrology

The Silverado Aquifer is the deepest aquifer zone in the area of the Plant Site. It lies at depths of 80 to 100 feet below surface in the Ballona Gap and 200 to 250 feet below surface under the Playa del Rey Bluff. The Silverado Aquifer consists of 50 to 75 feet of fine to medium grained sands and silty sands with discontinuous, thin, sandy gravel layers. Beneath the sands and gravels of the Silverado Aquifer a sandy blue clay with a minimum thickness of 50 to 80 feet has been penetrated in deep water wells. Aquifer zones beneath the clay have not been identified in the Ballona Gap or in the Playa del Rey Bluff.

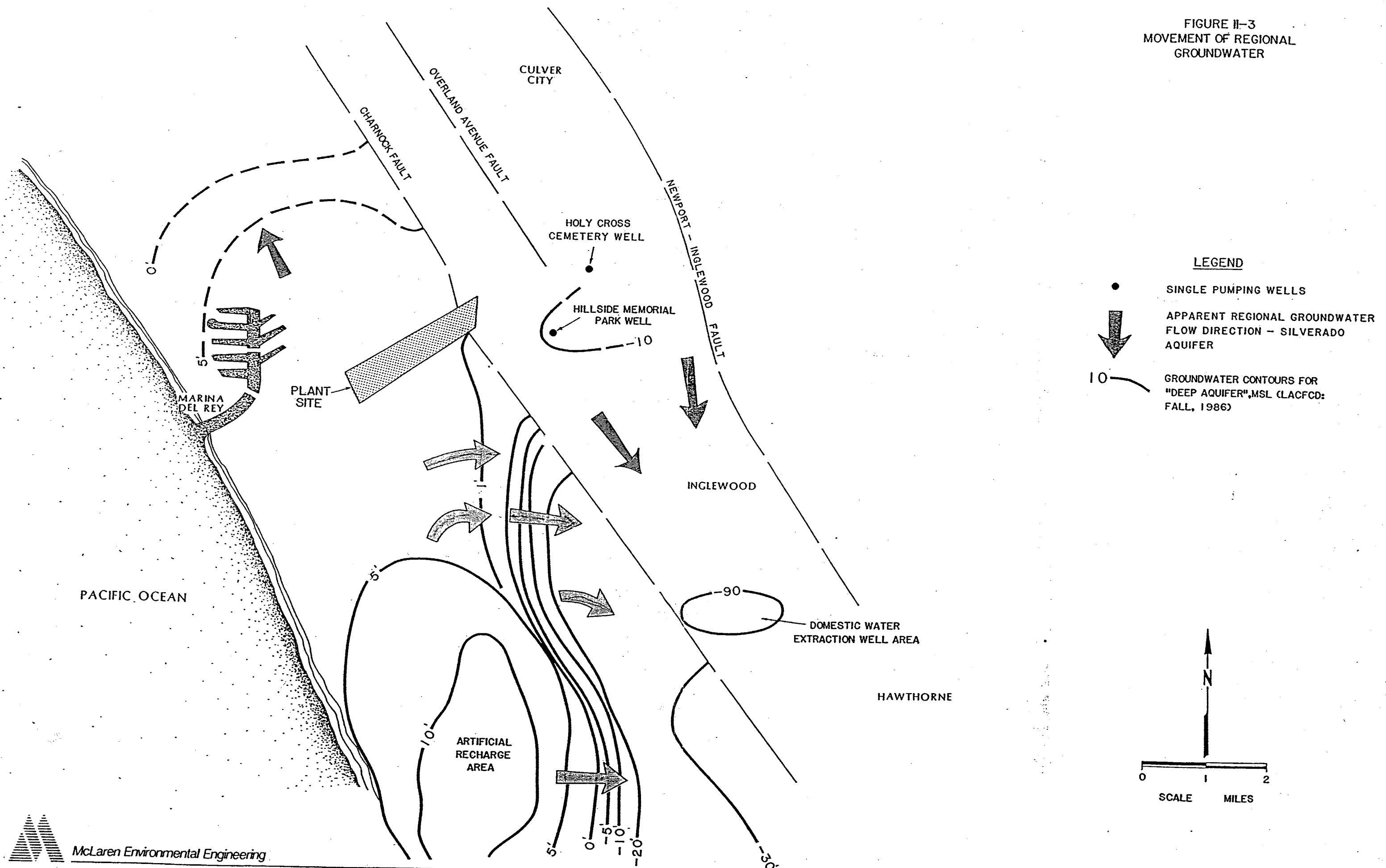
Groundwater flow directions for the Silverado Aquifer near the Plant Site are shown in Figure II-3. The flow directions are derived from a Fall 1986, groundwater contour map for the "Deep Aquifer" from the Los Angeles County Flood Control District. The regional contours suggest that groundwater in the Silverado Aquifer flows in a southeasterly direction toward the trace of the Charnock Fault. The contours also suggest that the fault impedes flow but is not a barrier to flow toward the domestic well fields in the Inglewood-Hawthorne area.

In the Ballona Gap the Silverado Aquifer is overlain by the Ballona Aquifer. There is no aquitard separating the Ballona Aquifer and Silverado Aquifer, and they appear to be hydraulically connected west of the Charnock Fault in the Ballona Gap. East of the Charnock Fault the Ballona Aquifer is underlain by 50 to 75 feet of silty to sandy clay, and the Silverado Aquifer is deeper because it has been dropped down possibly as much as 140 feet by movement on the Charnock Fault. The silty to sandy clay under the Ballona gravels east of the fault is reported to be upper San Pedro Aquiclude (DWR, 1961). Offset along the Charnock Fault is shown in Figure II-2.

The offset resulting from the east side of the fault being dropped down relative to the west side causes the Ballona Aquifer to have lateral hydraulic continuity with sandy gravel and silt layers of the upper San Pedro Aquiclude and with sandy gravels of the Gage/Gardena Aquifer.

Water level measurements from the Ballona Aquifer in the Ballona Gap indicate that groundwater flows generally easterly. Groundwater in the Ballona Aquifer flows over the trace of the Charnock Fault, across the

FIGURE II-3
MOVEMENT OF REGIONAL
GROUNDWATER



erosional contact along the face of the bluff, and into the sandy gravels of the Gage/Gardena Aquifer and the underlying silty clays of the upper San Pedro Aquiclude.

Water flow direction in the Gage/Gardena Aquifer east of the Ballona Gap is not well documented. The Gage/Gardena Aquifer near the Ballona Gap has moderate to low permeability, and very few wells are known to be extracting water from it (DWR, 1961).

Beneficial Uses of Groundwater

Most of the groundwater currently being pumped for municipal use in the Coastal Plain is extracted from the deeper San Pedro Formation aquifers, principally the Silverado Aquifer. The largest municipal well field in the western part of the Coastal Plain is in the Inglewood-Hawthorne area, approximately five to seven miles southeast of the Plant Site. Water level contours measured by the Los Angeles County Flood Control District in each of the last four years (1982 to 1986) indicate that the Hawthorne well field is producing hydraulic gradients in the Silverado Aquifer which affect flow seven to eight miles north of the well field. The Hawthorne well field, the Plant Site, and regional flow directions for the Silverado Aquifer are shown in Figure II-3.

Chemical analyses of water from the Silverado Aquifer beneath the Plant Site indicate that the aquifer has a total dissolved solids (TDS) concentration which averages 2,000 parts per million. Drinking water standards (MCL's) for TDS are 1,000 parts per million. Therefore, Silverado Aquifer water beneath the site is not suitable for drinking due to high TDS.

There are no large well fields extracting water from the Gage/Gardena Aquifer near the Plant Site. The Gage Aquifer generally has low transmissivity and is considered a groundwater producer of secondary importance (DWR, 1961). The Hillside Memorial Park Well which is located approximately 4000 feet east of the Plant Site may be extracting groundwater from the Gage Aquifer for irrigation. The well is screened in five intervals from 188 feet down to 590 feet below surface. One of the shallow screened intervals could draw water from the Gage Aquifer. This well may be located in a downgradient direction from the Plant Site in the Gage Aquifer. It does not, however, appear to be downgradient in the Silverado Aquifer zone where the direction of flow is more southeasterly.

Another irrigation well is located approximately 7000 feet east-northeast of the Plant Site. That well is 350 feet deep. Its screened intervals and lithologic information have not been reviewed. The well could be drawing water from the Gage/Gardena Aquifer zone, but the well lies east of the Overland Avenue Fault which may restrict east-west flow in the Gage/Gardena Aquifer.

There are no wells extracting water from the Ballona Aquifer for domestic uses or irrigation near the Plant Site. The Ballona Aquifer has a high total dissolved solids (TDS) content which ranges from 1000 to 4800 parts per million. Water with TDS concentrations of 1,000 or greater parts per million may be used for irrigation if the constituents of the water are not deleterious to plants or equipment. Groundwater from the Ballona Aquifer generally contains high concentrations of sodium and sulfate which could be harmful to plants.

Groundwater contained in the aquifers beneath the Plant Site is of poor quality for domestic use due to high TDS concentrations. Water samples taken from the Ballona, Gage/Gardena, and Silverado Aquifers in this area have average TDS concentrations of 2000 mg/l. The EPA Secondary Drinking Water Standard for TDS is 1000 mg/l. Groundwater beneath the Plant Site is not being used for domestic supply. The aquifers beneath the Plant Site are, however, contiguous with downgradient aquifers which are utilized for domestic water supply.

CLIMATE AND AIR QUALITY

The project area has a mild, semi-tropical, mediterranean climate with warm, dry summers and cool winters. About 14 inches of rain per year falls on the site during the winter months. Project area daytime winds are predominantly off the ocean, from the southwest, while at night offshore breezes are generally from the north or northeast.

Recorded air temperatures in the vicinity of the project area range from the low 60s to mid 80s in the summer, and from the high 40s to high 60s in the winter. Peak hourly temperatures greater than 95 degrees have been recorded during the late summer, and minimum hourly temperatures of 35 degrees have been recorded during the winter.

The project area is located within the South Coast Air Basin. This air basin has been designated as a non-attainment area for ozone, carbon monoxide, nitrogen dioxide, particulates, non-methane hydrocarbons, and lead. In addition, pollution in the South Coast Air Basin has exceeded State standards for sulfates, vinyl chloride, and visibility-reducing particulates, for which there are no Federal standards. The South Coast Air Quality Management District (SCAQMD) and the Southern California Association of Governments (SCAG) have prepared an Air Quality Management Plan which specifies measures to achieve State and Federal standards.

Air monitoring stations are maintained near the Plant Site in West Los Angeles to the north, and in Lennox about 4 miles to the southeast. In the most recent year for which published monitoring data is available (1983), Federal and State standards were exceeded for ozone, carbon monoxide, nitrogen dioxide, and particulates at these stations. The vast majority of emissions generated in the project area are produced

by automobile travel associated with adjacent development and through traffic movements in the project vicinity. Emissions of particulates are produced by undeveloped and agricultural land within the coastal area. In addition, the existing light industrial and aircraft operation activities in the project area contribute minor amounts of particulate emissions.

SECTION III

SITE CHARACTERISTICS

This section of the report presents a description of site-specific physiography, drainage, soils, and hydrogeologic conditions at the Plant Site.

PHYSIOGRAPHY AND DRAINAGE

The ground surface on the Plant Site slopes gently from an elevation of 20 feet at the east end to 6 feet at the west end. The south side of the site is dominated by the Playa del Rey Bluff which rises from an elevation of 25 feet at the edge of the site to 130 feet over a horizontal distance of 250 feet.

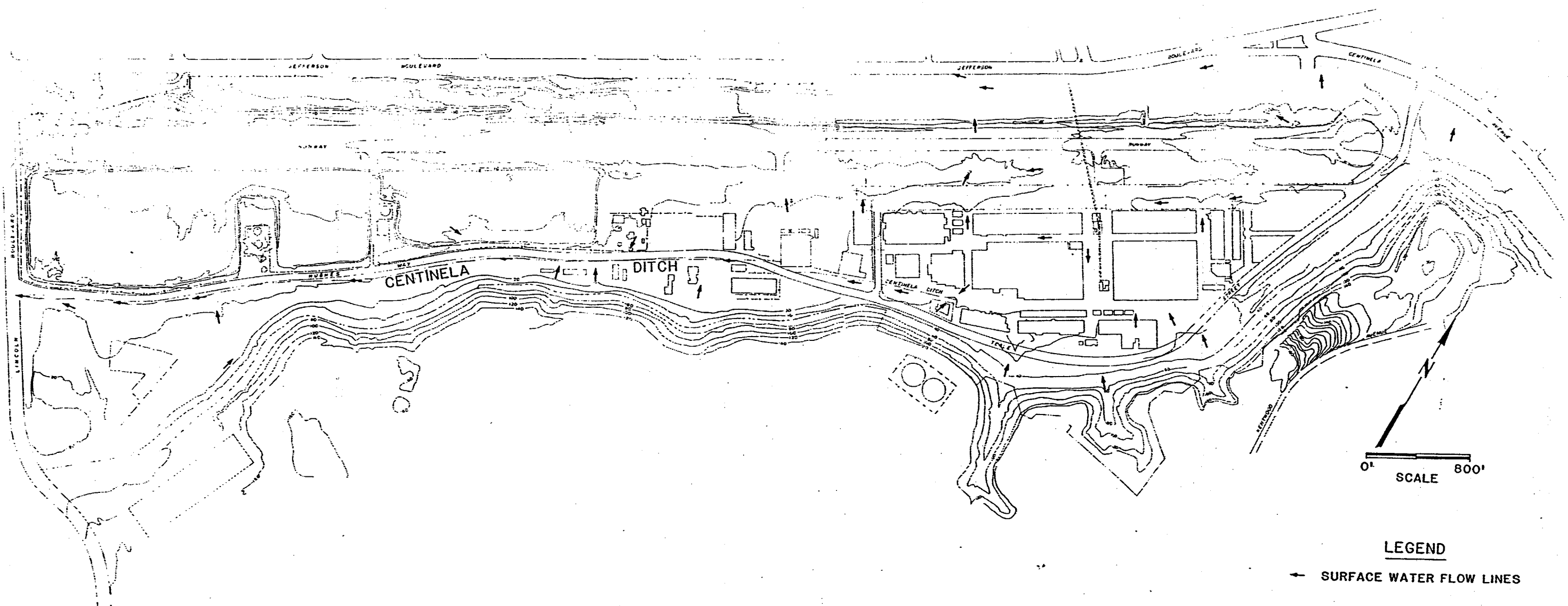
Figure III-1 shows the surface drainage flow pattern at the Plant Site. Running roughly parallel to the Playa del Rey Bluff on the western two-thirds of the Plant Site, Centinela Ditch is an uncovered, unlined storm drain three feet to eight feet deep. The ditch occupies the channel of Centinela Creek as it existed prior to development of the Plant Site and diversion of the Centinela Creek to the Ballona Channel. From the easternmost point at which it is an uncovered ditch, Centinela Ditch continues as a covered storm drain 1,500 feet east under the manufacturing area of the Plant Site. Centinela Ditch and its storm drain extension collect storm runoff from the Playa del Rey Bluff, from the southern two thirds of the manufacturing area, and from the paved areas at buildings and test sites along its course to the west. On the northern third of the manufacturing area of the Plant Site, runoff drains across asphalt parking lots and roadways to a large, low, weeded area south of the runway where it collects until it infiltrates the soil or evaporates. Storm runoff from the extreme east side of the Plant Site and from the area north of the runway drains toward the Jefferson Boulevard storm drain which parallels the north side of the site. The Jefferson Boulevard drain is covered and lined.

Both Centinela Ditch and the Jefferson Boulevard storm drain carry runoff beyond Lincoln Boulevard to discharge points on undeveloped areas west of the Plant Site. From the undeveloped area the combined runoff from Centinela Ditch and the Jefferson storm drain flows into the Ballona Wetlands area near the Pacific Ocean.

SOILS

Soils at the Plant Site consist primarily of sands with intermittent, discontinuous layers of finer textured silts and clays. The sandy materials were deposited by wind and water erosion from the Ballona

FIGURE III-1
SURFACE DRAINAGE MAP



0' SCALE 800'

LEGEND

← SURFACE WATER FLOW LINES

Escarpment. The finer textured materials were deposited by streamflow in Ballona Creek. These materials are of Recent age and were deposited after the valley was cut through the older dunes and terraces.

Sandy soils such as those found at the site are characterized by rapid permeability (2 to 20 inches per hour), low organic matter content (less than 0.5 percent), and low cation exchange capacity (less than 10 milliequivalents per 100 grams). The finer textured strata would be expected to have moderately slow to very slow permeability (0.2 to 0.06 inches per hour) and higher cation exchange capacity (20 to 50 milliequivalents per 100 grams). Localized deposits of organic matter associated with ponds and marshes adjacent to old stream channels may be found in the alluvial deposits.

HYDROGEOLOGY

Geologic and hydrologic conditions on the Plant Site have been determined from lithologic logs for 86 monitor wells and 155 soil borings, groundwater level measurements, short and long term aquifer pumping tests, and published reports of regional geology and groundwater level contours. Monitor well locations on the Plant Site are shown in Figure III-2, and soil borings are shown in individual maps prepared for each potential source area (see Source Area Investigations).

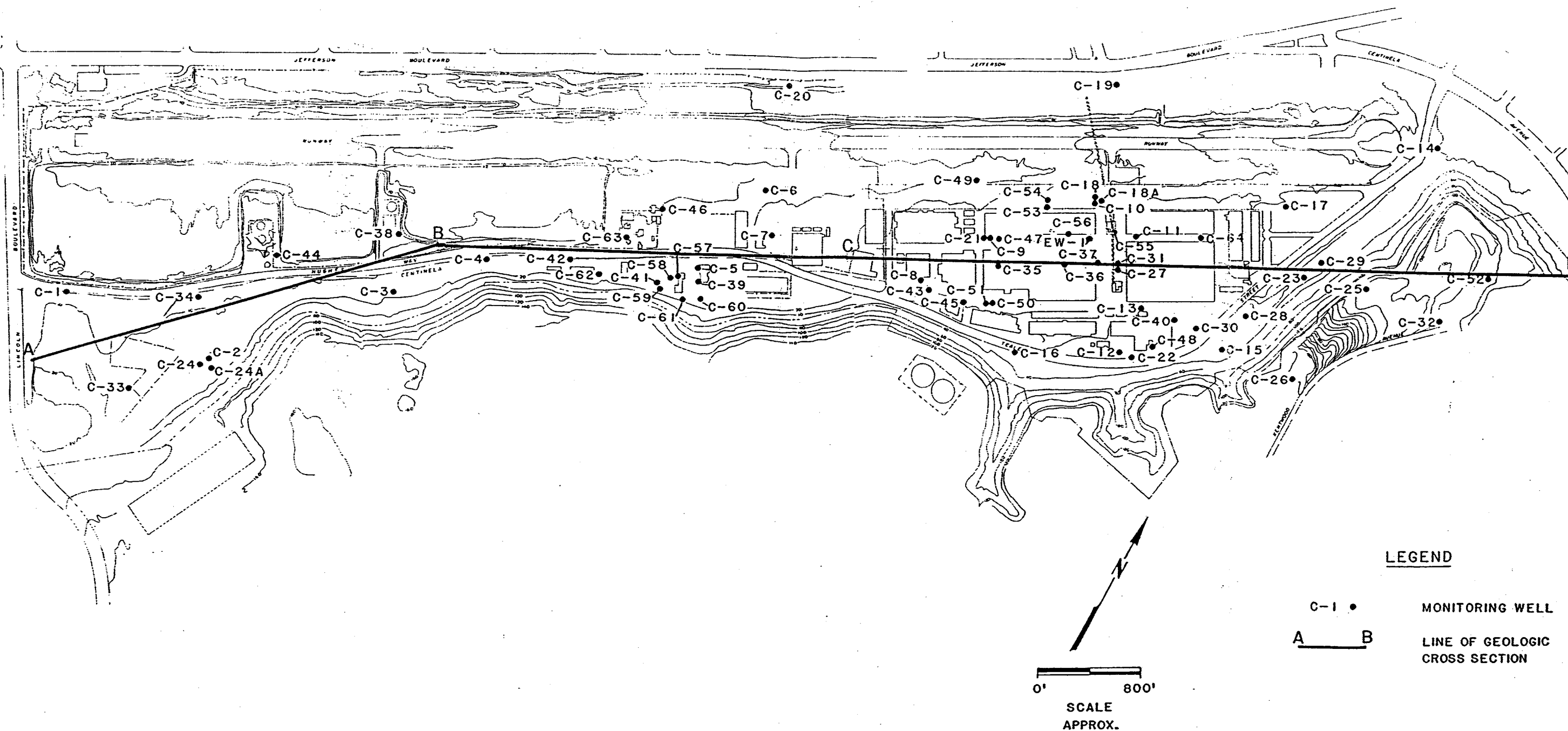
Lithologic logs and construction details for soil borings and monitoring wells drilled by McLaren Engineering are presented in Appendix A. Construction details for monitoring wells C-1 through C-32 have been presented in previous reports prepared by Hargis and Associates. (Investigations of Groundwater Quality and Hydrogeologic Conditions; Summa Corporation Facility; Culver City, California; Phase I, March 27, 1984; Phase II, January 15, 1985; Phase III, April 15, 1986.)

Geologic Setting

Soil borings ranging from 2 feet to 30 feet in depth show that the shallow soil zone under most of the Plant Site consists of silty, fine to medium grained sand. The sand is derived from water and wind erosion of the sand deposits on the Playa del Rey Bluff, and it varies locally from 2 feet to 20 feet in thickness. The sandy soil deposits are thickest at the base of the Playa del Rey Bluff, and they thin to the north. The sand is generally not cemented and not compacted. It is permeable and allows downward percolation of fluids. The silty sand is shown in cross section in Figures III-3 and III-4.

Beneath the surficial sands, the Bellflower Aquitard underlies most of the Plant Site. The aquitard, consisting of clay, silty and sandy clay, and clayey silt layers, varies in thickness from 10 to 50 feet. The Bellflower Aquitard is shown as "clay" in Figures III-3 and III-4.

FIGURE III-2
LOCATION OF MONITORING
WELLS AND GEOLOGIC
CROSS SECTIONS



LEGEND

- C-1 • MONITORING WELL
A B LINE OF GEOLOGIC CROSS SECTION

0' 800'
SCALE
APPROX.

FIGURE III-3
GENERALIZED GEOLOGIC
CROSS SECTION A-B-C

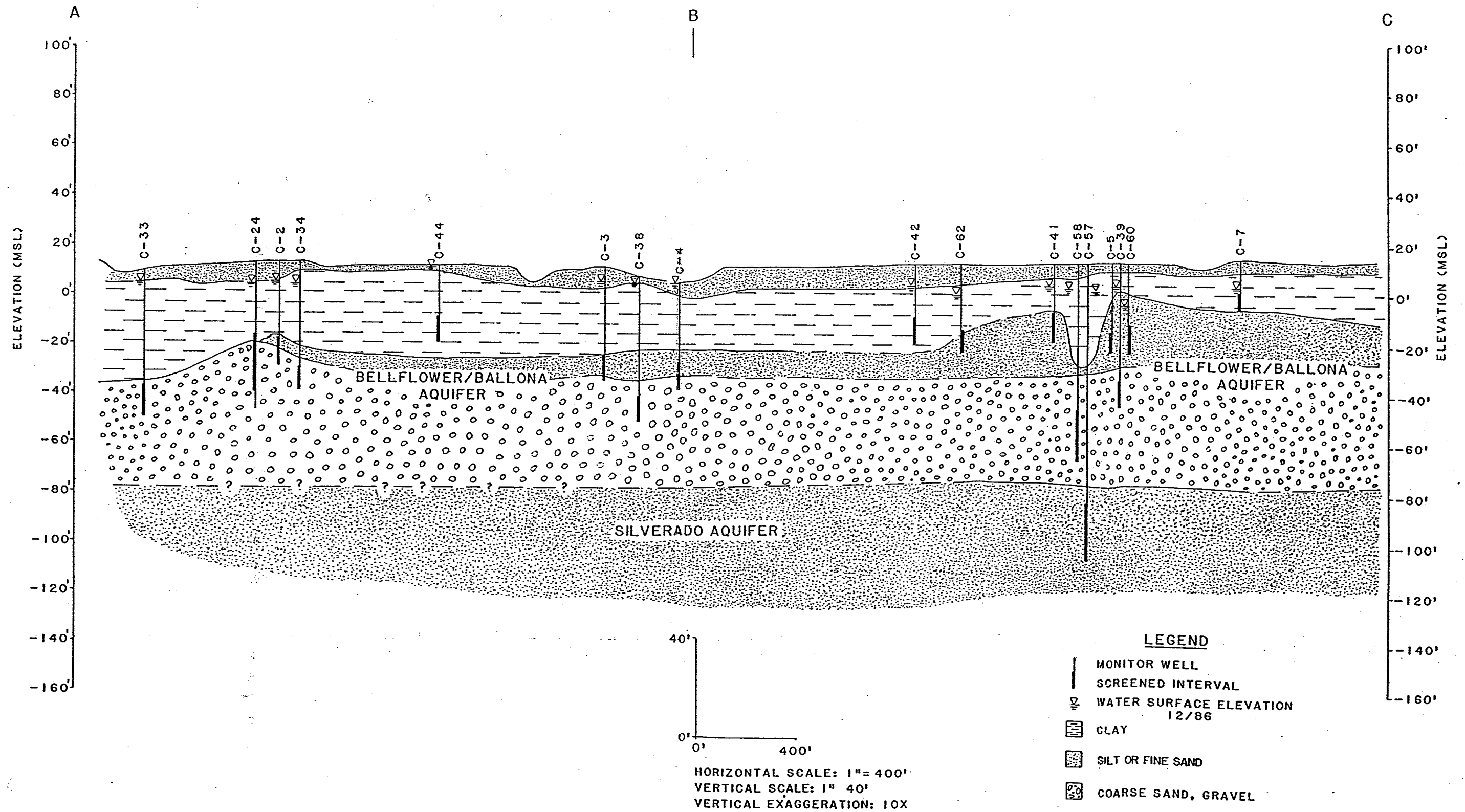
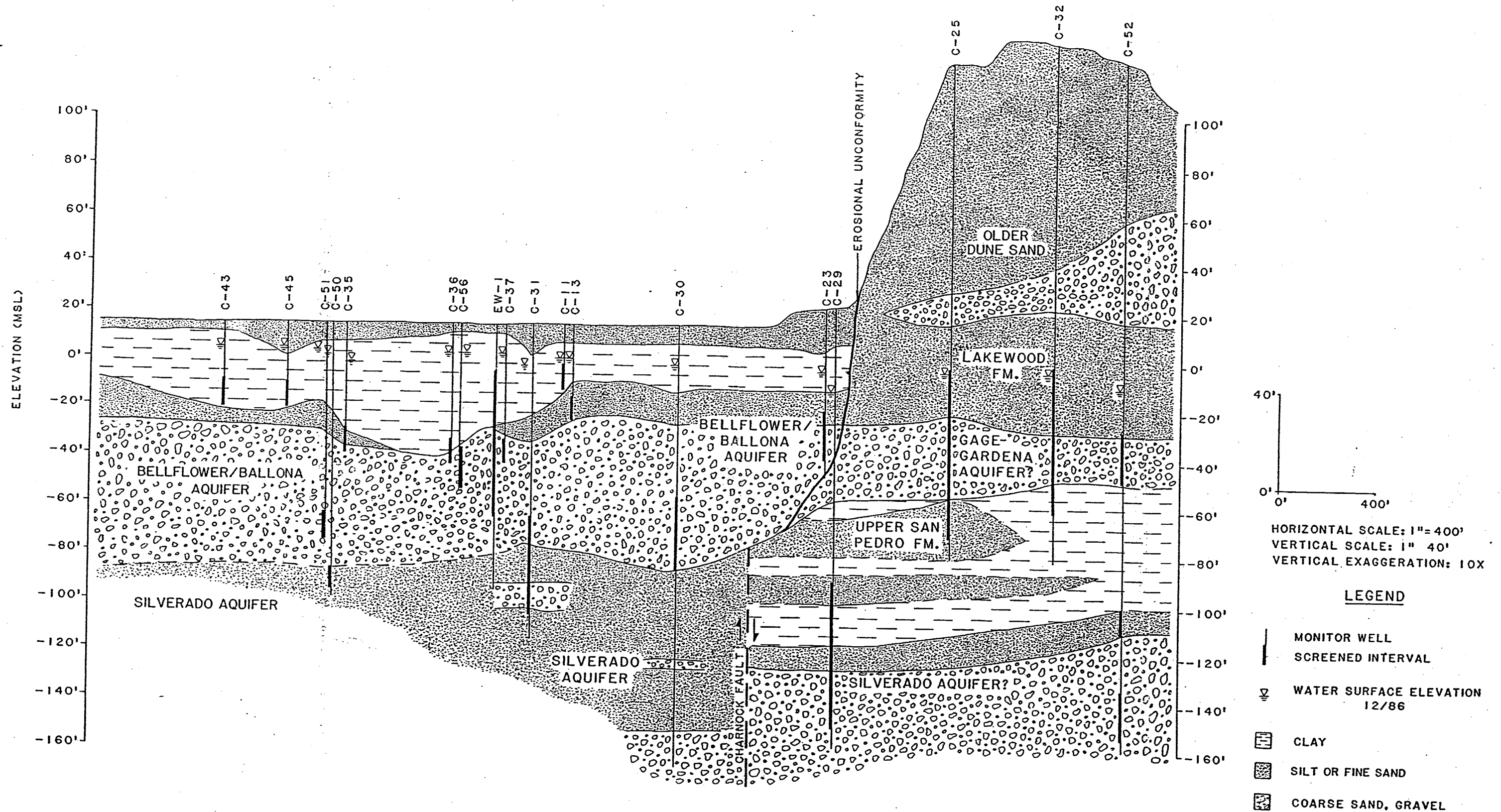


FIGURE III-4
GENERALIZED GEOLOGIC
CROSS SECTION C-D



Clays are the most widespread deposits in the Bellflower Aquitard, but the clay layers do not occur everywhere on the site. The clay layer is thin or absent in Wells C-15, C-16, C-23, and C-41, along the southeast edge of the Plant Site.

Where clay layers underlie the shallow sandy soil downward movement of fluids is impeded, and fluids may spread horizontally or become mounded above the clay. A shallow groundwater zone in the western portion of the Plant Site, in the area of the Fire Training Burn Pit, appears to be mounded above a 20 foot thick, low permeability clay layer.

Layers of silt, fine sand, and clayey sand within the Bellflower Aquitard are interlayered with the clay on most of the Plant Site. Water migrating slowly downward through the clay may increase in horizontal velocity through the silts and fine sands above the aquifer zone.

The shallowest aquifer beneath the Plant Site is referred to here as the Bellflower/Ballona Aquifer. The top of the aquifer lies at depths of 15 to 40 feet below surface, and it consists of silty sand, sandy gravel, and coarse gravel. The gravel deposits have been previously named the Ballona Aquifer, and the silty sand has been considered to be part of the Bellflower Aquitard. However, monitor well logs and water level measurements indicate that the silty sand is part of the aquifer. Therefore, the name Bellflower/Ballona Aquifer is applied to this unit at this locality. The merged aquifer zone ranges from 40 to 75 feet thick on the Plant Site. The Bellflower/Ballona Aquifer is shown in cross section in Figure III-3 and III-4.

Groundwater entering the Bellflower/Ballona Aquifer from the overlying aquitard acquires a strong horizontal direction of movement. The aquifer has been shown to be strongly anisotropic on the basis of water quality data and computer analysis of pump test data. Because the Bellflower/Ballona Aquifer is anisotropic, chemicals carried by water from the Bellflower Aquitard tend to remain in the upper part of the aquifer and move greater distances horizontally than vertically. The direction of horizontal movement in the aquifer is controlled by the hydraulic gradient.

The relationship between horizontal and vertical movement of water in the Bellflower/Ballona Aquifer may be locally affected by the thickness of the Bellflower clays overlying the aquifer. Where the clays are thick enough to reduce the thickness of the underlying sand and gravel (e.g. at Monitor Wells C-57 and C-58, Figure III-3 or at Monitor Wells C-35 and C-36, Figure III-4), water moving in the upper part of the aquifer will be forced to move vertically or horizontally in a localized non-downgradient direction to bypass the less permeable clay. If there is less resistance to vertical movement than to lateral non-

downgradient movement in the aquifer where it is thin, water from the shallow part of the aquifer may move vertically to deeper parts of the aquifer to bypass the clay.

The Silverado Aquifer zone of the San Pedro Formation underlies the Plant Site and adjacent Playa del Rey Bluff. The Silverado Aquifer under the site consists of silty and fine grained sands interlayered with thin, gravelly zones. The top of the Silverado Aquifer occurs at depths of 85 to 100 feet below surface. Sands and gravels in the Silverado Aquifer are 50 to 80 feet thick beneath the Plant Site and are underlain by a blue marine clay that is at least 50 feet thick. Sand and gravel layers of the Silverado Aquifer are shown in cross section in Figures III-3 and III-4. No aquitard is known to exist between the Bellflower/Ballona gravels and the Silverado sands. Therefore, there is hydraulic continuity between the Bellflower/Ballona Aquifer and the Silverado Aquifer, and they form one aquifer zone under most of the Plant Site.

Previous investigations (Poland and others, 1959; DWR, 1961) indicate that the trace of the Charnock Fault cuts through the east side of the Plant Site. The fault is not apparent at the ground surface, but deep water well logs provide evidence of its presence. Data from Monitor Wells C-30 and C-29 on the Plant Site suggest that the Charnock Fault cuts the San Pedro Formation between those two wells. The fault has dropped the Silverado Aquifer downward on the east side relative to the west side, and it has brought silty clays and clayey silts of the San Pedro Formation into fault contact with the Silverado Aquifer under the site. This is depicted in Figure III-4.

The California Department of Water Resources (1961) stated that the Charnock Fault is a barrier to east-west flow in the Silverado Aquifer near the Ballona Gap. This statement is supported by water level measurements and water quality data collected from Wells C-29, C-30, C-31, and C-52. Water from the Silverado Aquifer east of the fault is of better quality than water from the aquifer west of the fault.

The layers of the Bellflower/Ballona Aquifer were deposited after the Charnock Fault ceased to be active. The Bellflower/Ballona Aquifer continues eastward over the trace of the fault but ends at an erosion surface along the Ballona Escarpment marked by the face of the Playa del Rey Bluff. In the bluff east of the erosional surface the Gage/Gardena Aquifer of the Lakewood Formation lies at approximately the same elevation as the Bellflower/Ballona Aquifer. This relationship is shown in Figure III-4.

The position of the sandy gravels in the Gage/Gardena Aquifer in the bluff allows groundwater flowing from the Bellflower/Ballona Aquifer beneath the Plant Site to continue eastward beneath the bluff and off

of the site. The Gage/Gardena Aquifer beneath the bluff apparently has transmissivity equal to or greater than the Bellflower/Ballona Aquifer as groundwater flow from one aquifer into the other is not impeded. The spacing of groundwater contour lines from the Plant Site into the bluff supports this conclusion. Water level contours are shown in Figure III-5.

Hydrology

Hydrologic data are derived in part from monitor wells drilled from 1983 through 1986. Of the 86 monitor wells constructed 43 monitor water quality and water levels in the upper part of the Bellflower/Ballona Aquifer, 6 monitor the Silverado Aquifer, 4 monitor the Gage/Gardena Aquifer, 4 monitor the shallow groundwater zone above the aquitard, and the remainder monitor the first water zone in the clays of the aquitard. All monitor wells except 4 monitor wells in the shallow groundwater zone (WP-1 through WP-4) and 17 wells in the aquitard (TB-1 through TB-17) are shown in Figure III-2. Table III-1 shows the screened interval and total depth of monitoring wells at the site. Water level measurements taken during 1986 and 1987 are listed in Table III-2.

Contours derived from March 1987 water levels are shown in Figure III-5. In preparing the contour maps, water levels from wells screened in the Bellflower/Ballona and Gage/Gardena Aquifers were used. Data from wells screened within the Bellflower Aquitard or the Silverado Aquifer were not used. In areas where several closely spaced wells in the Bellflower/Ballona Aquifer showed similar water levels, the water level from one representative well was used in preparing the contours.

Groundwater levels range from 2 feet to 35 feet below surface on the Plant Site, and 125 to 135 feet below surface in the Playa del Rey Bluff. The upper water level surface is normally detected in the clays of the Bellflower Aquitard. In some wells on the west side of the site the upper groundwater surface is above the clays in the silty sand of the soil zone. Monitor Wells C-2, C-24, C-33, C-3, C-4, and C-5 have water levels at the highest elevations on the site, 3.5 to 4.5 feet above Mean Sea Level. Each of these wells is located on the west side of the Plant Site near the Playa del Rey Bluff, and each is completed in the upper part of the Bellflower/Ballona Aquifer. The higher water levels along the bluff on the west side of the Plant Site indicate that groundwater is flowing from beneath the bluff into the Bellflower/Ballona Aquifer. Groundwater recharge from the bluff may be derived from the Silverado or Gage/Gardena Aquifers.

TABLE III-1
MONITORING WELL SCREENED INTERVALS

<u>Well</u>	<u>Top of Screen (feet, msl)</u>	<u>Bottom of Screen (feet/, msl)</u>	<u>Total Depth (feet below ground surface)</u>
C-1	-22.67	-32.67	40
C-2	-19.38	-29.38	41
C-3	-22.57	-32.57	45.5
C-4	-21.52	-31.52	43
C-5	-10.91	-20.91	35.5
C-6	-12.81	-22.81	32.5
C-7	0.57	- 9.43	21.5
C-8	-8.78	-18.78	32.5
C-9	-10.99	-20.99	35.5
C-10	-4.32	-16.32	32
C-11	0.59	- 9.41	27
C-12	3.98	-6.02	30
C-13	-13.27	-23.27	40
C-14	- 3.29	-13.29	35.5
C-15	- 7.62	-27.62	55
C-16	- 1.93	-31.93	54
C-17	- 7.8	-27.8	46
C-18	- 8.74	-38.74	54
C-18A	5.42	0.42	15
C-19	- 9.65	-39.65	56.5
C-20	-20.05	-40.05	55
C-21	-24.34	-34.34	49
C-22	4.78	-25.22	50
C-23	-20.8	-40.8	63
C-24	-17.01	-40.01	53
C-24A	8.72	-1.28	12.5
C-25	4.99	-63.01	194
C-26	37.78	-30.22	194
C-27	4.63	-45.37	63
C-28	-17.91	-37.91	64
C-29	-91.51	-151.51	175
C-30	-48.24	-78.24	102.5
C-31	-62.62	-102.62	120
C-32	-9.35	-69.35	215
C-33	-33.11	-43.11	58
C-34	-35.15	-45.15	52
C-35	-27.5	-37.5	54
C-36	-32.04	-42.04	58
C-37	-32.09	-42.09	58

TABLE III-1

MONITORING WELL SCREENED INTERVALS
(Continued)

<u>Well</u>	<u>Top of Screen (feet, msl)</u>	<u>Bottom of Screen (feet/, msl)</u>	<u>Total Depth (feet below ground surface)</u>
C-38	-41.98	-51.98	58
C-39	-34.32	-44.32	58
C-40	-23.4	-33.4	56
C-41	- 5.49	-15.49	30
C-42	- 8.59	-18.59	30
C-43	-10.63	-20.63	35
C-44	-15.78	-25.78	30
C-45	- 8.69	-18.69	35
C-46	-10.9	-20.9	30
C-47	-16.22	26.22	40
C-48	-12.92	-22.92	45
C-49	- 8.11	-18.11	30
C-50	-86.28	-96.28	115
C-51	-61.28	-71.28	90
C-52A	-31.32	-52.32	174
C-52B	-103.19	-113.19	236
C-52C	-136.95	-156.95	290
C-53	-94.91	-104.91	125
C-54	-30.49	-50.49	65
C-55	-34.73	-54.73	71
C-56	-34.57	-54.57	70
C-57	-84.17	-104.17	120
C-58	-46.87	-66.87	82
C-59	-9.61	-19.61	38
C-60	-9.63	-19.63	38
C-61	-8.78	-18.78	38
C-62	-10.07	-20.07	38
C-63	-15.38	-25.38	38
C-64	-7.15	-17.15	38
WP-1	1.52	- 0.48	12
WP-2	0.79	- 1.21	12
WP-3	1.38	- 0.62	12
WP-4	1.88	- 0.12	12

TABLE III-2
WATER SURFACE ELEVATION MEASUREMENTS
MEAN SEA LEVEL

Well Number	5-14-86	6-24-86	7-14-86	8-4-86	9-8-86	12-18-86	3-26-87
C-1	3.72	3.50	--	3.33	3.19	3.59	3.52
C-2	4.51	4.44	4.42	4.39	4.34	4.35	4.46
C-3	3.83	3.74	3.69	3.62	3.64	3.55	3.67
C-4	3.47	3.34	3.27	3.17	3.20	3.14	3.22
C-5	5.20	4.25	4.12	3.88	3.51	2.52	2.54
C-6	4.09	2.94	2.52	2.24	2.02	2.29	3.02
C-7	2.90	2.59	2.43	2.39	2.16	2.07	^c
C-8	2.27	2.04	2.00	1.99	1.82	1.77	^c
C-9	1.74	1.50	1.44	1.40	1.25	1.07	1.09
C-10	1.21	0.62	0.39	0.34	-0.01	-0.18	0.17
C-11	-2.21	-2.53	-2.71	-2.46	-2.83	-3.09	-2.91
C-12	-3.77	-4.12	-- ^a	-- ^a	-- ^a	-- ^a	-- ^a
C-13	-1.48	-1.68	-1.78	-1.81	-1.85	-2.02	-1.91
C-14	-7.99	-8.08	-8.23	-7.97	-8.32	-8.36	-8.09
C-15	-4.54	-4.83	-4.82	-4.80	-5.08	-5.09	-4.75
C-16	1.15	0.96	--	0.94	0.84	0.63	0.80
C-17	-5.07	-5.32	-5.55	-5.21	-5.64	-5.86	-5.70
C-18	-0.30	-0.54	--	-0.61	-0.67	-1.00	^c
C-19	-0.38	-0.68	--	-0.80	-0.82	-1.06	-0.97
C-20	-- ^b	-- ^b	-- ^b	-- ^b	-- ^b	-- ^b	-- ^b
C-21	1.38	1.21	1.10	1.04	0.96	0.80	0.85
C-22	-2.76	-2.95	--	-3.06	-3.20	-3.31	-3.02
C-23	-6.45	-6.56	--	-6.71	-6.85	-6.85	-6.57
C-24	4.53	4.46	4.32	4.37	4.33	4.34	4.48
C-25	-6.83	-6.97	-7.02	-6.81	--	--	^c
C-26	-5.97	-6.31	-6.30	-6.37	-6.34	-6.40	-6.12
C-27	-0.45	-0.57	-0.71	-0.75	-0.69	-1.11	-0.92
C-28	-5.59	-5.46	-5.56	-5.52	-5.72	-5.74	-5.40
C-29	-14.92	-14.82	-14.88	-14.84	-14.77	-14.06	-13.59
C-30	-4.58	-4.29	-4.40	-4.37	-4.53	-4.49	-4.31

^a Immisible layer of gasoline floating on water surface. Unable to sound water surface elevation.

^b Unable to locate well.

^c No sounding this date.

TABLE III-2
WATER SURFACE ELEVATION MEASUREMENTS
MEAN SEA LEVEL
(Continued)

<u>Well Number</u>	<u>5-14-86</u>	<u>6-24-86</u>	<u>7-14-86</u>	<u>8-4-86</u>	<u>9-8-86</u>	<u>12-18-86</u>	<u>3-26-87</u>
C-31	-0.92	-1.03	-1.09	-1.15	-0.97	-1.33	-1.27
C-32	-7.27	-7.45	-7.44	-7.13	-7.19	-7.35	^c
C-33	--	4.79	4.69	4.55	4.53	4.57	4.76
C-34	--	4.17	4.06	4.04	3.98	3.99	^c
C-35	--	0.96	1.03	--	--	--	0.58
C-36	--	0.15	0.07	-0.07	-0.13	-0.26	-0.30
C-37	--	-0.47	-0.58	-0.57	-0.60	-0.84	-0.81
C-38	--	3.34	--	3.23	3.12	-- ^b	3.22
C-39	--	2.63	2.56	2.63	2.34	2.27	2.29
C-40	--	5.86	--	-4.25	-4.34	-4.44	-4.29
C-41	--	2.72	2.76	2.64	2.67	2.48	2.57
C-42	--	3.06	2.94	2.85	2.89	2.89	3.11
C-43	--	1.82	1.67	1.59	1.59	1.45	1.45
C-44	--	3.25	3.00	2.74	2.69	-- ^b	3.34
C-45	--	2.24	1.21	1.13	1.12	1.52	1.53
C-46	--	3.37	2.26	2.29	1.98	2.54	3.05
C-47	--	1.35	1.18	1.15	1.05	0.87	.94
C-48	--	-3.41	--	-3.54	-3.61	-3.79	-3.69
C-49	--	1.55	1.19	0.97	0.67	1.60	1.73
C-50	--	--	--	0.69	0.60	0.42	^c
C-51	--	--	--	1.23	1.15	0.94	0.77
C-52 A	--	--	-6.53	-8.01	-8.35	-6.82	-8.51
C-52 B	--	--	-12.08	-13.75	-13.86	-13.08	-12.64
C-52 C	--	--	-13.07	-14.58	-14.58	-13.91	-13.24
C-53	--	--	--	0.12	-0.19	-0.41	-0.34
C-54	--	--	--	0.34	0.08	0.02	0.01
C-55	--	--	--	-0.82	-0.81	-1.08	-1.02
C-56	--	--	--	-0.07	-0.14	-0.29	-0.25
C-57	--	--	--	--	--	2.31	2.40
C-58	--	--	--	--	--	2.38	2.49

^b Unable to locate well.

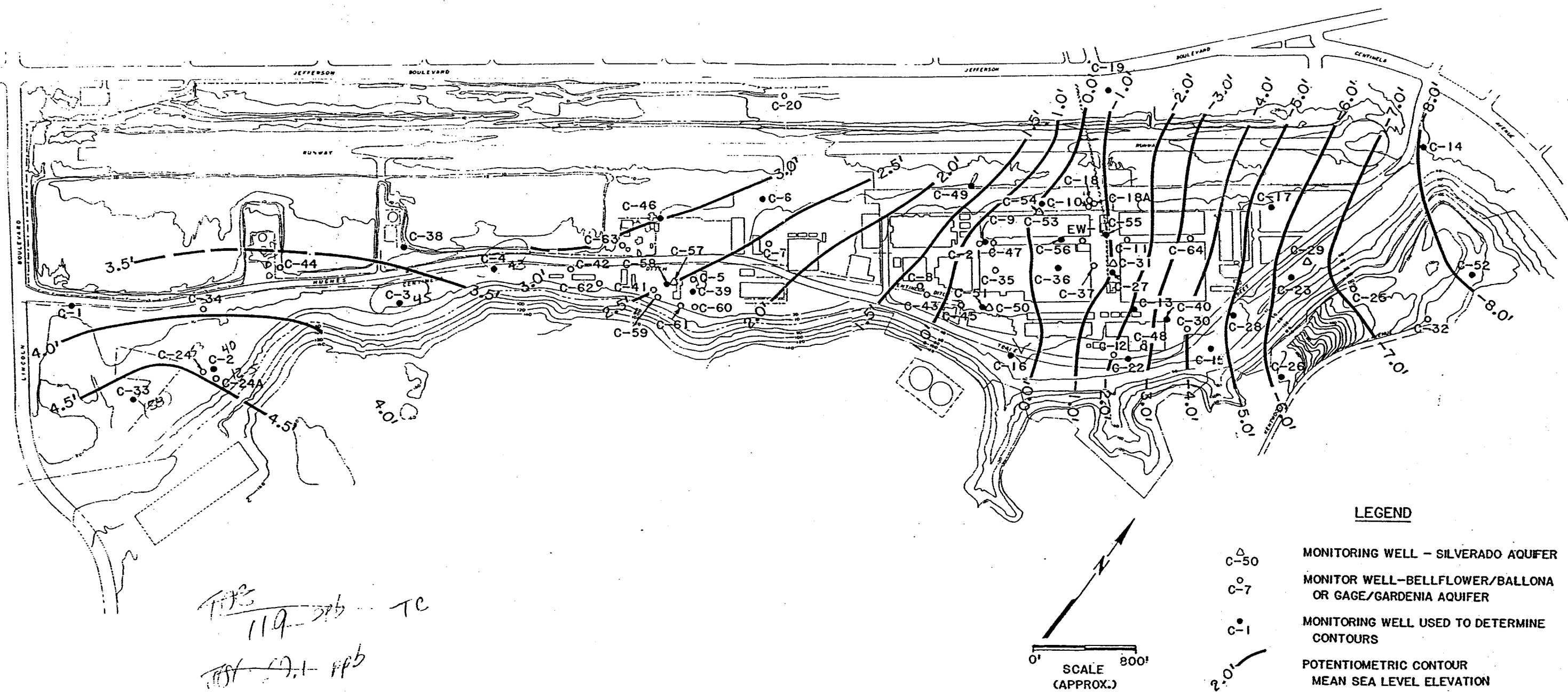
^c No sounding this date.

TABLE III-2
WATER SURFACE ELEVATION MEASUREMENTS
MEAN SEA LEVEL
(Continued)

<u>Well Number</u>	<u>5-14-86</u>	<u>6-24-86</u>	<u>7-14-86</u>	<u>8-4-86</u>	<u>9-8-86</u>	<u>12-18-86</u>	<u>3-26-87</u>
C-59	--	--	--	--	--	2.52	2.71
C-60	--	--	--	--	--	2.45	2.57
C-61	--	--	--	--	--	2.48	2.69
C-62	--	--	--	--	--	2.10	2.70
C-63	--	--	--	--	--	2.42	2.46
C-64	--	--	--	--	--	-3.99	-3.82

<u>Well Number</u>	<u>1-13-87am</u>	<u>1-13-87am</u>	<u>1-14-87am</u>	<u>1-14-87am</u>
C-24	4.46	4.45	4.43	4.46
C-2	4.44	4.44	4.41	4.43
WP-1	4.10	4.08	4.04	4.09
WP-2	4.05	4.02	3.99	4.04
WP-3	4.08	4.04	4.03	4.08
WP-4	4.02	4.04	4.04	4.05

FIGURE III-5
GROUNDWATER CONTOURS
MARCH 1987



Some of the water flow from the Playa del Rey Bluff enters the shallow soil zone above the Bellflower Aquitard and locally becomes mounded or perched above thick clays. Shallow groundwater is mounded in the soil zone in the area of the Wells C-2 and C-24. Four shallow monitor wells (WP-1, WP-2, WP-3, and WP-4), not shown in the figures, were completed in the upper part of the Bellflower Aquitard between C-2 and C-24. Water levels in the shallow monitor wells indicate that a shallow groundwater zone is mounded above the clay in the sandy soil zone. Comparison of January 1987, static water levels in the clay with static water levels in the underlying aquifer indicate that there was a water elevation difference of 0.25 to 0.35 feet between the shallow and deeper water zones. The comparative data are presented at the end of Table III-2. Because water elevations in the upper zone were lower, a pressure differential existed that caused water in the lower aquifer to be forced upward toward the surface. The clay above the aquifer has a low hydraulic conductivity, and aquifer water cannot move rapidly upward. A persistent upward pressure would prevent downward movement of the shallow groundwater through the clay to the aquifer. This upward pressure was documented for the area of Wells C-2 and C-24 during January 1987. It cannot be confirmed that this upward pressure differential has prevailed in the past or at any other location on the site.

Contours shown in Figure III-5, derived from March 1987 measurements, indicate that a groundwater divide exists on the west side of the Plant Site. Monitor Well C-33 is located on or near the crest of the divide. Contours indicate that from the area of Well C-33 groundwater in the Bellflower/Ballona Aquifer may flow northwesterly toward C-1, northerly or northeasterly toward C-2 and C-24.

Continuing east from Wells C-2 and C-24, the contours indicate that groundwater flow in the Bellflower/Ballona Aquifer turns northeasterly. Recharge from the Playa del Rey Bluff is indicated by the contours near Wells C-3, C-4, C-38, C-44, and C-42.

Near Wells C-6 and C-7 groundwater flow in the aquifer acquires a strong easterly component which prevails across most of the Plant Site. Water level measurements and resulting contours for wells in the Playa del Rey Bluff indicate that groundwater flow from the Bellflower/Ballona Aquifer continues easterly into the Gage/Gardena Aquifer. On the east end of the site near Wells C-14, C-32, and C-52, the contours indicate that the groundwater flow in the Gage/Gardena Aquifer turns slightly northeasterly as it leaves the Plant Site.

Water levels measured in six wells completed in the Silverado Aquifer are not contoured separately. In four of the wells west of the fault, C-31, C-50, C-53, and C-57, flow directions in the Silverado Aquifer parallel flow in the Bellflower/Ballona Aquifer. East of the Charnock Fault, Wells C-29 and C-52C completed in the downfaulted Silverado Aquifer have water levels 6.5 to 7 feet lower than nearby wells in the

Bellflower/Ballona or Gage/Gardena Aquifers. The difference in water levels between the Silverado, Bellflower/Ballona, and Gage/Gardena Aquifers east of the fault suggest that the Silverado Aquifer east of the fault is isolated and confined by the silty clay layers overlying it and the Charnock Fault on its western boundary.

Aquifer Tests

Short Term Tests

To estimate parameters for the aquifers under the Plant Site, short term pumping tests were conducted in monitoring wells during 1984 and 1985. The monitor wells tested were C-15 through C-32.

The tests were conducted with the use of submersible pumps of 1/3 or 1/2 horsepower. Monitor wells were pumped for 40 to 410 minute time periods. Well discharges varied from 1.7 to 45.3 gallons per minute. Drawdown was measured in the pumped well with an electrical sounder, and discharge was estimated with a 5 gallon container and a stop watch. A listing of short term pump test data is given in Table III-3.

The water level in each pumped well was measured before pumping began and during the period of recovery after the pump was turned off. Transmissivity for each pumped well was calculated using the Jacob straight-line method. Use of the Jacob straight-line method of transmissivity calculation calls for the assumptions that the aquifer is homogeneous, isotropic, and fully confined. Transmissivity estimates obtained from those calculations are listed in Table III-3.

The transmissivity estimates range from 100 to 32,000 gallons per day per foot (gpd/ft) suggesting large differences in the aquifer characteristics across the site and with depth. The monitor wells pumped to estimate transmissivity were completed in several different aquifers and at different depths within the Bellflower/Ballona Aquifer. A few of the pumped wells are screened partly within aquitards.

Monitor Wells C-18, C-19, C-20, C-21, C-23, C-24, C-27, C-28, and C-30 are screened only within the Bellflower/Ballona Aquifer. Taken together these wells yield an average transmissivity estimate of 19,000 gpd/ft for the Bellflower/Ballona Aquifer on the site.

Monitor Wells C-15, C-16, C-17, and C-22 have estimated transmissivities of 100 to 4,600 gpd/ft, much lower than the individual estimates and the average for Bellflower/Ballona wells, because they are screened partly in the Bellflower Aquitard and are affected by the low permeability of the aquitard. Monitor Wells C-25, C-26, and C-32 were screened through the Gage/Gardena Aquifer beneath the Playa del Rey Bluff, and their average transmissivity is approximately 8,000 gpd/ft. Well C-25 has an estimated transmissivity of 18,000 gpd/ft,

TABLE III-3
SHORT-TERM PUMP TEST DATA SUMMARY

Well Number	Date of Test	Static Depth to Water (Feet)	Test Duration (Minutes)	Average Pumping Rate (gpm)	Maximum Drawdown (Feet)	Estimated Transmissivity (gpd/ft)
C-15	08-23-84	32.42	100	3.3	5.78	2,800
C-16	08-23-84	21.55	130	7.4	7.65	4,500
C-17	08-22-84	23.35	85	4.9	6.9	4,600
C-18	08-24-84	16.28	130	31.3	8.79	25,000
C-19	08-21-84	17.67	167	45.3	12.46	18,000
C-20	08-21-84	13.43	128	16.8	15.31	20,000
C-21	08-23-84	13.91	215	14.7	15.13	25,000
C-22	08-24-84	27.83	40	2.6	14.52	100
C-23	08-22-84	28.97	240	25.8	9.51	12,500
C-24	08-22-84	7.91	210	39.1	15.82	32,000
C-25	05-14-85	140.06	400	41	27	18,000
C-26	06-07-85	169.64	133	4.7	2.23	3,800
C-27	05-12-85	18.2	360	71	7.45	14,000
C-28	05-12-85	31.8	380	29	6.17	8,000
C-29	05-09-85	35.91	350	44	32.88	31,000
C-30	05-10-85	28.94	410	28	43.66	19,000
C-31	05-11-85	18.6	360	23	50.60	10,000
C-32	08-05-85	132.54	200	1.7	51.67	<1,000

much greater than the other Gage/Gardena wells, and that may be the result of a thicker saturated aquifer zone and less screen within aquitard zones in C-25. Transmissivity for the Gage/Gardena Aquifer is in the range of 8,000 to 18,000 gpd/ft depending on the thickness of the saturated zones within the aquifer.

Wells C-29 and C-31 are screened within the Silverado Aquifer. Well C-31 is located west of the Charnock Fault zone, and it has an estimated transmissivity of 10,000 gpd/ft. Well C-29 was drilled into the Silverado Aquifer east of the fault, and it has an estimated transmissivity of 31,000 gpd/ft. The difference between the estimated transmissivities for the Silverado Aquifer suggests that the properties of the aquifer east of the fault differ from those west of the fault.

Thirty-Six Day Test

To verify the parameters derived from the short term pumping tests for the Bellflower/Ballona Aquifer under the Plant Site, a 36-day pumping test was conducted. A site for a pump test well was chosen so the aquifer zone around the well would be generally representative of the whole aquifer and so the well after the test could be utilized in a groundwater extraction system. The location chosen for the pump test well is shown in Figure III-2. It is designated EW-1.

Seven monitor wells near EW-1 were chosen as observation wells during the 36-day test. The observation wells for the test were C-18, C-36, C-37, C-53, C-54, C-55, and C-56. All observation wells except C-53 are screened in the Bellflower/Ballona Aquifer. C-53 is screened in the Silverado Aquifer. All observation wells are shown in Figure III-2.

The 36-day aquifer test was designed to obtain the data necessary to better define the hydrogeologic parameters of the aquifer underlying the Plant Site and to allow use of computer models to project the aquifer response to pumping. Horizontal hydraulic conductivity (K_H) and storativity (S_g) are among the hydrogeologic parameters required in the analysis and design of an extraction system. Information gathered from the pumping test resulted in:

- a) determination of the impact of pumping on the Bellflower/Ballona aquifer and the underlying Silverado Aquifer;
- b) calculation of a storativity (storage coefficient) value for an aquifer overlain by a leaky aquitard;
- c) refinement of the estimate of horizontal hydraulic conductivity for the Bellflower/Ballona aquifer; and

- d) determination that there are no groundwater barriers, either recharging or with low permeability, that would affect drawdown after long time periods.

The aquifer test consisted of a step drawdown test to determine the pumping rate for the 36-day pumping test, background water level and barometric pressure monitoring, the pumping test, and aquifer recovery monitoring.

Step Drawdown Test

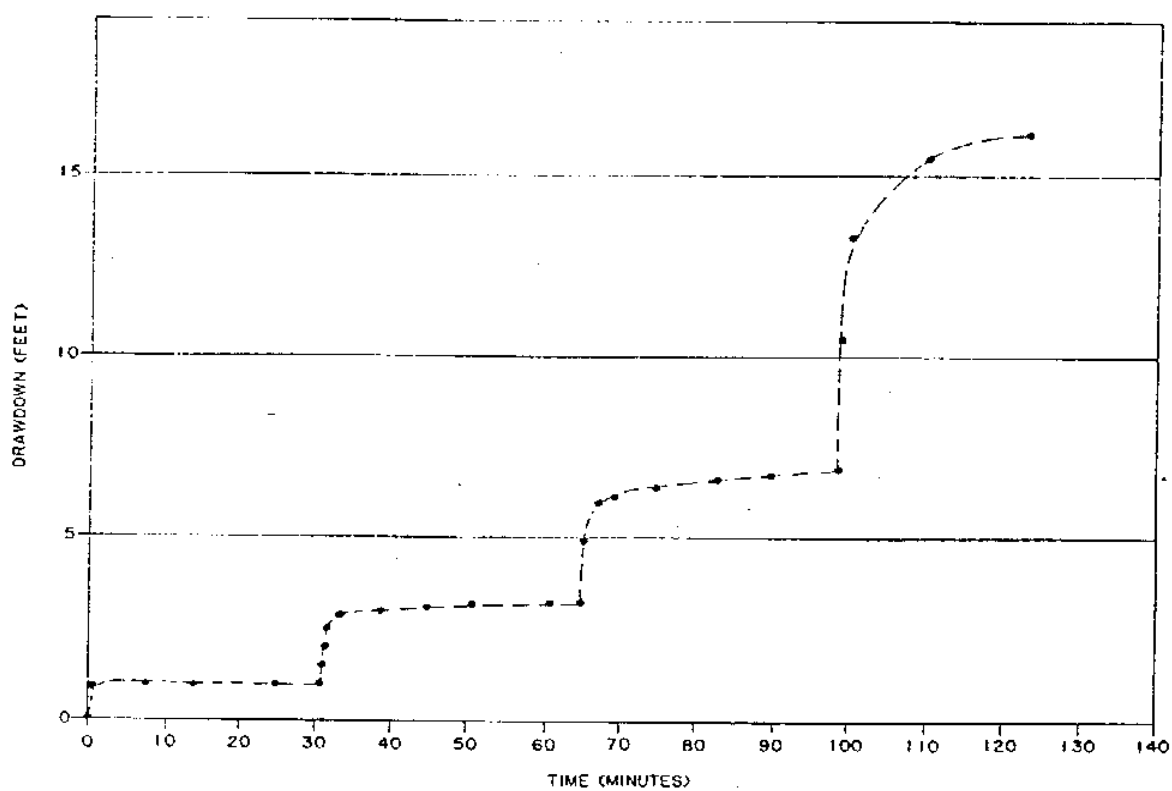
The step drawdown test was conducted at EW-1 on August 21, 1986, to assist in determining the pumping rate for the 36-day pumping test. The purpose for the step drawdown test was to assure that the selected pumping rate was adequate to hydraulically stress the aquifer so that the hydrogeologic parameters could be determined without excessive drawdown. Pumping at too high a discharge could lead to the aquifer behaving as confined in certain areas and unconfined in other areas during the 36-day pumping test period. Inconsistent aquifer behavior caused by heavy pumping could have nullified the data collected during the 36-day test.

Pumping rates of 130 gpm, 90 gpm, 60 gpm, and 20 gpm were selected for the step drawdown test. The well was pumped at 20 gpm for about 30 minutes and at other rates for about 35 minutes each. During the test, water-level measurements were taken at predetermined time intervals that vary from 15 seconds to 5 minutes.

Pumpage at the rate of 20 gpm resulted in a drawdown of 0.96 feet at the end of the 30-minute interval. The flow rate was then increased to 60 gpm for 35 minutes resulting in the water level dropping an additional 2.25 feet (3.21 feet cumulative). Additional water level decreases for the 90 gpm and 130 gpm rates are 3.58 feet (6.79 feet cumulative) and 9.49 feet (16.28 feet cumulative), respectively. The data for the step drawdown test are plotted on Figure III-6.

After 135 minutes of pumping with a total drawdown of 16.28 feet, the step drawdown test was discontinued because sufficient data had been obtained to select a pumping rate for the 36-day pumping test. In reviewing the data, it was assumed that at the end of the 36-day pumping test period, the drawdown in EW-1 would be double that of the drawdowns observed for a pumping interval at a given rate during the step drawdown test. The assumption is based on a conservative estimate of drawdown that would be expected to occur in a 36-day period if the aquifer were unconfined and drawdown followed a two-step curve. Based on this assumption, the projected drawdowns in EW-1 after 36 days of pumping at 20, 60, 90, and 130 gpm would be about 2, 6, 14, and 33 feet, respectively.

FIGURE III-6
DRAWDOWN VERSUS TIME
FOR STEP DRAWDOWN TEST



In selecting a pumping rate for the 36-day pumping test, the projected drawdowns were used to assure that the water table would not fall more than 50 percent of the difference in elevations between the water table prior to pumping and the lower surface of the Bellflower Aquitard. This criterion was included to assure that the water table remained within the aquitard everywhere during the 36-day pumping test, preventing the aquifer from becoming unconfined. The difference in the static water level and bottom of aquitard elevations at EW-1 is about 25 feet. Thus, the 130 gpm rate would most likely result in portions of the aquifer becoming unconfined. The 90 gpm rate would produce a drawdown that is 1.5 feet below the 50 percent difference in the elevations. It was believed that the 60 gpm rate might have resulted in drawdowns at monitoring wells that would be inadequate for the pumping test analysis. Thus, a pumping rate of 100 gpm was selected for the 36-day pumping test.

Procedures

The aquifer test was conducted for 36 days and was begun September 11, 1986, and ended October 16, 1986. Well EW-1 was pumped at a rate of 100 gallons per minute with a 6-inch Berkeley pump containing a 4-inch, 3 horsepower motor. Discharge rate was controlled with a Rockwell 2-inch flowmeter.

Drawdown in the pumping well and seven observation wells was recorded with a programmed, eight channel Data Logger, Model DL200 manufactured by Enviro-Labs. Water level changes were measured by pressure transducers suspended in each of the wells and connected to the data logger by 4-20 ma shielded cable. The data logger was programmed to collect readings from all eight wells every 10 seconds for the first 2 minutes, every 30 seconds for the next 6 minutes, every 60 seconds for the next 7 hours, and every 60 minutes for the remainder of the test.

In addition to the programmed recording of measurements, the pumping well and two monitor wells were monitored manually for the first 90 minutes of the test. Closely spaced manual readings on the pumping and extraction wells were terminated after it was verified that the transducers and recorders were functioning properly. Manual readings on one monitor, C-23, were continued at a frequency of one approximately every 24 hours during much of the test. Well C-23 is approximately 1,700 feet away from EW-1, out of the radius of influence during pumping, and it was monitored to determine if barometric pressure variations were influencing observed drawdowns.

After 10 days of pumping and automated recording of data, the data logger malfunctioned and required repair. Drawdown data for the first nine days of pumping had been retrieved from the logger prior to its malfunction. Plots of the data retrieved from the logger indicated that the drawdown curve had flattened. Manual readings were gathered from the pumping and observation wells until the data logger was

replaced. Daily manual and automated readings were taken through the end of the test and into the recovery period. Manual readings were plotted on the same curve as automated readings to verify manual and automatic measurements. Drawdown curves from the observation wells are shown in Appendix B.

Barometric data for the entire pump test period were obtained from the National Weather Service barometer at the Los Angeles Airport located approximately 6,000 feet south of the site. The barometric data were compared with readings from Well C-23 which was not influenced by the pumping. The curves of barometric data and water level readings for Well C-23 are shown in Figure III-7. Comparison of the curves indicates that a barometric pressure low, on September 25 (19,680 minutes into the test), probably caused an increase in the water level of C-23 and other wells. A barometric pressure high on September 26, caused water levels in C-23 to fall. Then on October 1 (29,000 minutes into the test) a barometric low caused the water level in C-23 to rise to its shallowest level of the entire test period. Although the curves depicted in Figure III-7 illustrate barometric influence on water levels, the largest change in water levels in the Bellflower/Ballona Aquifer outside of the radius of influence of the pump test on the site was 0.25 feet from September 25 through October 1. Comparable water level changes that may have occurred in the pumping test wells would not be large enough to affect drawdown curve interpretation. The largest water level variation would have been reflected in the data 19,000 to 29,000 minutes into the test, well after the drawdown curve had risen and flattened out. Therefore, the effect of barometric changes on the aquifer test data was small enough to have no effect on the analysis.

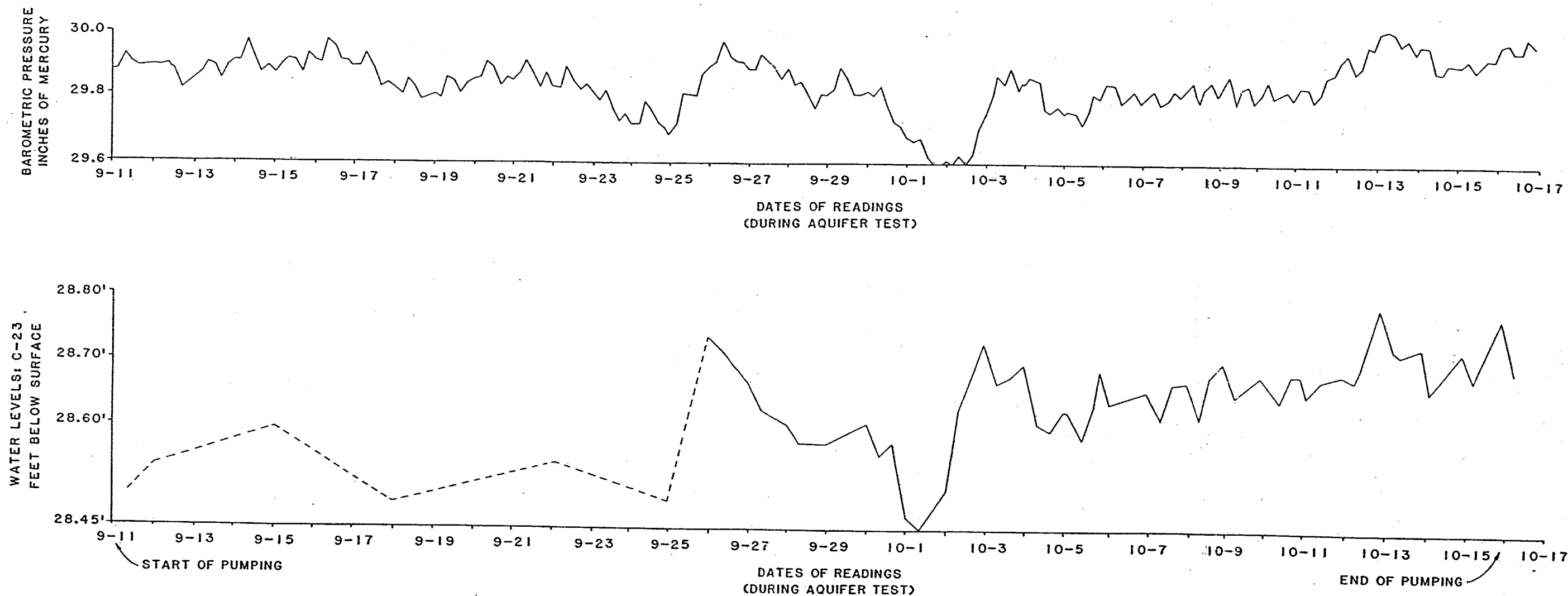
Pumping Test Analysis by Curve Matching

Drawdown (s) and time (t) for each monitoring well (C-18, C-36, C-37, C-53, C-54, C-55, C-56) are plotted on double logarithmic paper (Appendix B). The curves confirm that the pumped aquifer is confined as the rapid rise, flat portion, and then a second rapid rise with time, characteristic of unconfined aquifers, is not seen in the plots.

Curves derived from the pump test data for each observation well were compared to a variety of drawdown curves, including Theis type curves, on double logarithmic plots. The best fit was achieved when the pumping test curves were compared to curves for a leaky confined aquifer. A procedure for evaluating transmissivity (t) and storativity (storage coefficient) in a leaky confined aquifer has been presented by Hantush (Lohman, 1979, p. 32). Assumptions on which the procedure is based include (Reed, 1980, p. 25; Bouwer, 1978 p. 108):

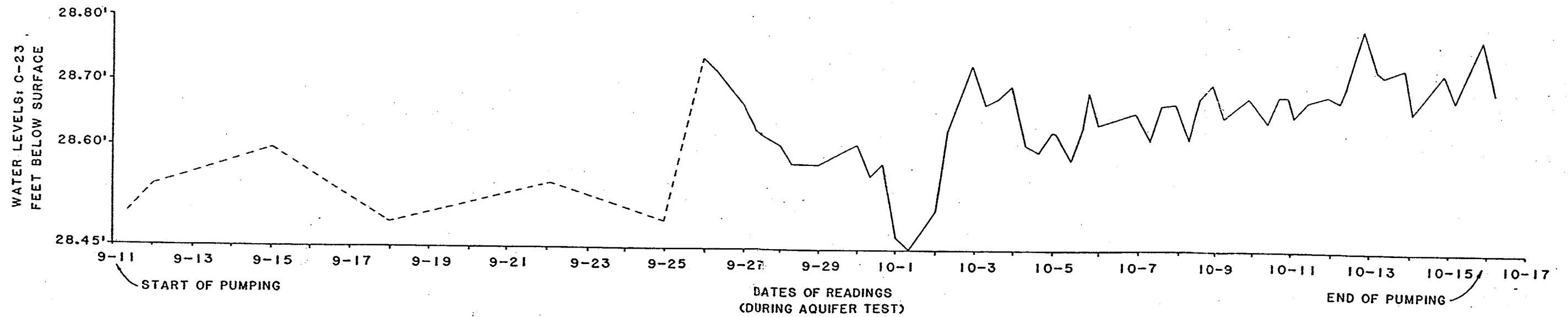
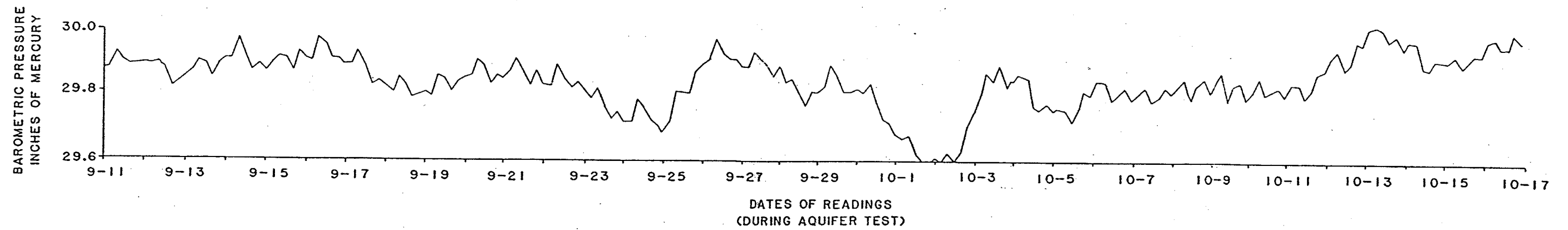
- a) The aquifer is homogeneous, isotropic and of infinite horizontal extent.

FIGURE III-7
BAROMETRIC PRESSURE
CURVE AND WATER
LEVELS IN C-23



NOTE: DASHED LINE INDICATES FEWER DATA POINTS

FIGURE III-7
BAROMETRIC PRESSURE
CURVE AND WATER
LEVELS IN C-23



NOTE: DASHED LINE INDICATES FEWER DATA POINTS

- b) There is no flow in the aquifer other than the flow caused by the extraction well.
- c) The well is of infinitesimal diameter and fully penetrates the aquifer.
- d) The aquifer is overlain and underlain everywhere by confining beds having hydraulic conductivities and storage coefficients which are constant in space and time.
- e) Flow in the aquifer is two dimensional and radial in the horizontal plane and flow in the confining beds is vertical. This assumption is approximated closely where the hydraulic conductivity of the aquifer is sufficiently greater than that of the confining beds.
- f) A constant head plane source lies above the upper confining layer and an impermeable bed lies below the aquifer.

Hantush's solution is

$$T = \frac{Q}{4\pi s} H(\mu, \beta) \quad (1)$$

where

$$u = \frac{r^2 S}{4 T t} \quad ; \quad (2)$$

$$\beta = \frac{r}{4b} \left(\sqrt{\frac{K' S'_f}{K S_s}} + \sqrt{\frac{K'' S''_f}{K S_s}} \right) \quad (3)$$

s is the drawdown (L); Q is the extraction well discharge ($L^3 T^{-1}$); T is the transmissivity ($L^2 T^{-1}$); r is the radial distance from the extraction well (L); t is the time since the start of, pumping (T); $S = bs_s$ is the storage coefficient of the aquifer; S_s , S'_s , and S''_s are the values of specific storage (storage coefficient per vertical unit of depth) of the aquifer and the confining layers, respectively; and b, b' and b'' are the thicknesses of the aquifer and the confining layers, respectively.

The solution procedure consists of plotting a drawdown curve for a monitoring well and type curves on separate double logarithmic papers. Type curves are depicted on Figure III-8. The plots are superimposed and moved so that most of the drawdown curve falls on one of the type curves. The value of β for the type curve that coincides with the drawdown curve is noted.



A match point is selected on the coinciding curves, and the coordinates of the match point are read in both plots. This yields corresponding values of s , t , u , and H which are substituted in equations (1) and (2) to compute estimates of T and S . Results of the analysis of T and S for the various monitoring wells are presented in Table III-4. Estimates of T range from 18,000 gpd/ft ($2,400 \text{ ft}^2/\text{day}$) to 34,000 gpd/ft ($4,500 \text{ ft}^2/\text{day}$), and of S range from 2×10^{-4} to 6×10^{-4} . The average parameters are 29,000 gpd/ft ($3,900 \text{ ft}^2/\text{day}$) for T and 4×10^{-4} for S . The results for Monitoring Well C-53 were not included in computation of estimates of the average parameters of the Bellflower/Ballona Aquifer as it is wholly screened in the Silverado Aquifer.

Results for the Monitoring Well C-53 indicate existence of hydraulic communication between the Bellflower/Ballona Aquifer and the Silverado Aquifer. C-53 and C-54 are constructed 10 feet apart laterally. C-53 is screened in the Silverado Aquifer at a depth of 110 to 120 feet, while C-54 is screened in the Bellflower/Ballona Aquifer at the depth of 45 to 65 feet. The total drawdown during the pumping test period is 2.2 feet for C-53 and 1.7 feet for C-54. The reaction of these wells to the effect of pumpage at the extraction well is about the same. It is however noted from the drawdown curves that C-54 responds to the influence of pumpage at EW-1 a few minutes before C-53 does. Drawdown at C-53 increases faster than drawdown at C-54 for the first 100 minutes after the start of pumping.

Hydraulic Conductivity

Hydraulic conductivity is equal to transmissivity divided by the aquifer thickness. Thickness of the saturated zone in the Bellflower/Ballona Aquifer is estimated to be 70 feet. Thus, effective thickness of the aquifer is set equal to 70 feet. Considering only the monitoring wells that are screened within the Bellflower/Ballona Aquifer, hydraulic conductivity for this aquifer is in the range of 43.8 to 65.6 $\text{ft}^3/\text{ft}^2/\text{day}$, with the average of 55.5 $\text{ft}^3/\text{ft}^2/\text{day}$.

Values of K calculated by the curve matching method for all observation wells in the Bellflower/Ballona Aquifer are consistent and vary over a small range. This suggests that the method used is appropriate, even though all of the assumptions made in applying the curve matching techniques are not fully satisfied. Assumptions which may not be fully satisfied are that the aquifer is homogeneous and that the pumped well is fully penetrating.

TABLE III-4
RESULTS OF CURVE MATCHING ANALYSIS

Data From Drawdown Curves							Computations	
Well	Distance From EW-1 (feet)	B	s (feet)	t (minutes)	u	h	T (gpd/ft)	s
C-18	255	0.05	2.1	1100	10^{-3}	6.0	34,377	0.00022
C-36	237	0.20	1.6	220	10^{-2}	3.9	27,932	0.00040
C-37	171	0.05	1.7	70	10^{-2}	4.2	28,310	0.00025
C-53*	370	0.20	1.1	95	10^{-1}	1.8	18,230	0.00047
C-54	375	0.15	1.4	600	10^{-2}	4.0	32,740	0.00052
C-55	141	0.10	2.0	140	10^{-2}	3.8	22,918	0.00060
C-56	146	0.10	1.7	92	10^{-2}	4.2	28,310	0.00045

* Screened in Silverado Aquifer.

Recovery Test

Water level data in the pumped well were collected for 14 days after the end of the pumping test. The drawdown(s) and time (t/t') data were plotted on semilog paper for analysis by Jacob straight line method for recovery. The transmissivity value calculated from the Jacob equation was 39,000 gpd/ft. This value is slightly higher but still consistent with the transmissivities calculated by the curve matching method.

SECTION IV

DESCRIPTION OF POTENTIAL SOURCE AREAS

This section of the report presents a description of the potential source areas of chemicals which have been identified at the Plant Site, chemicals which were handled or suspected to have been handled at the site, physical characteristics and behavior of the chemicals identified, and the approach taken to source area investigations.

IDENTIFICATION OF POTENTIAL SOURCE AREAS

On March 5 and 6, 1986, McLaren Environmental Engineering staff met with employees of Howard Hughes Properties, McDonnell-Douglas Helicopter Company, and Hughes Aircraft Company to review past and present industrial practices at the Plant Site and to tour the site. During this initial site review ninety-nine individual tanks, sumps, and surface storage sites were identified as potential chemical source areas. As a result of further site review it was determined that 43 of the original 99 areas identified warranted investigation. Those sites not considered for investigation were eliminated because site reconnaissance showed that the potential for chemical discharge was nonexistent or insignificant, the site had been adequately assessed by prior investigations and found to not be contributing chemicals to groundwater, or because the site was an underground fuel storage tank which will be addressed by the McDonnell Douglas Helicopter Company tank testing program. The 43 individual sites where investigations were deemed prudent were grouped into 21 potential source areas. Table IV-1 provides a description of each of the original 99 sites, the rationale for inclusion in or exclusion from the site investigations, and the potential source area designation for those included sites. Figure IV-1 shows building numbers which are used as references to locate the sites.

FIGURE IV-1
SURFACE FEATURES AND
PLANT SITE
BUILDING NUMBERS

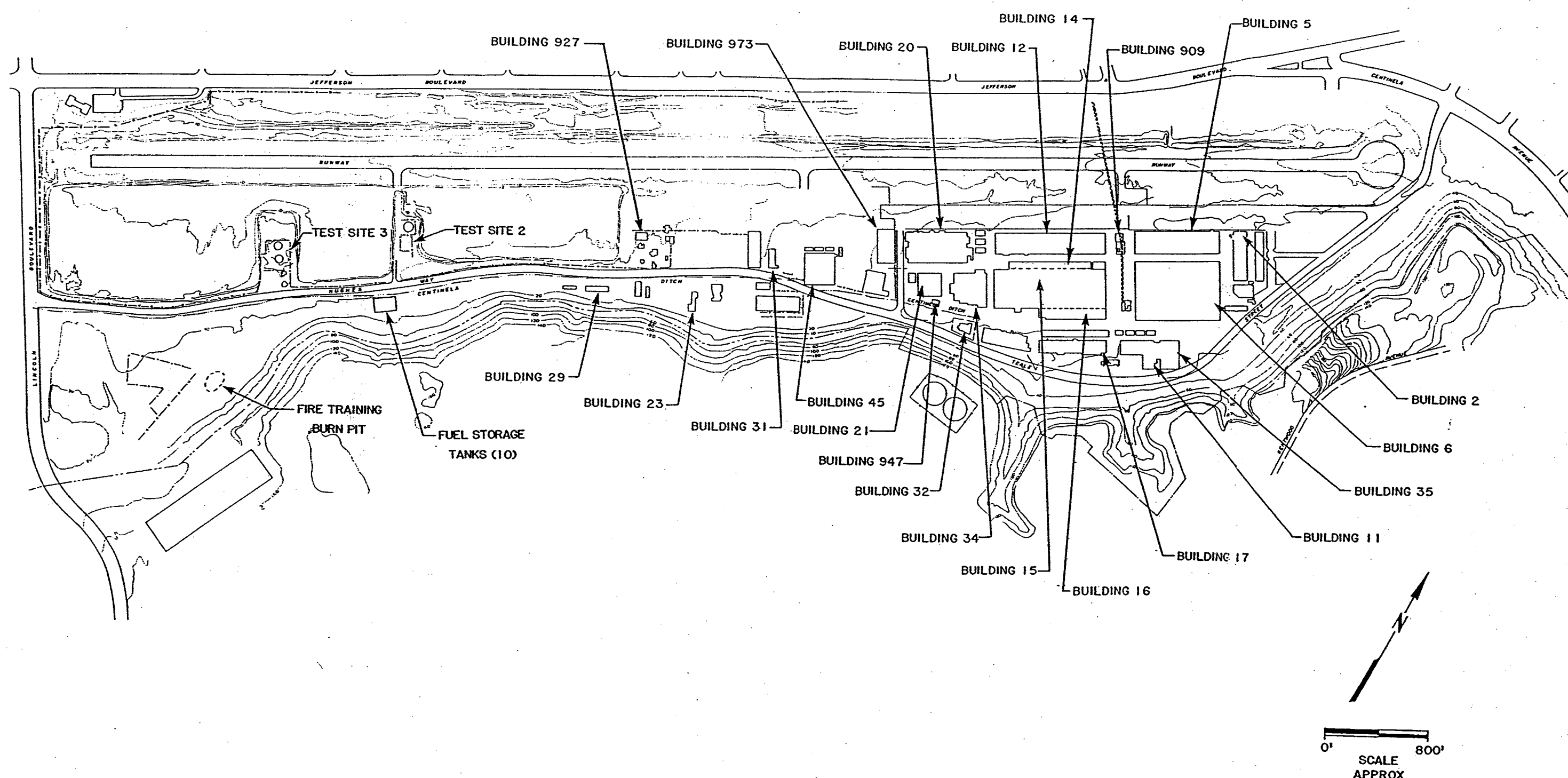


TABLE IV-1
POTENTIAL SOURCE AREAS

Location	Site Description	Area Designation	Inclusion/Exclusion From Investigations	Rationale For
Building 2	Pit inside basement. Received photo processing chemical discharge. Out of service.	---	Excluded from investigations. Sump contained small quantities of liquid. Frequently pumped out. No evidence of deterioration. Not considered a significant potential source area.	
Southwest Corner of Building 5	3-stage clarifier/chemical sump.	---	Addressed by Well C-11. C-11 is free of chemicals. Site is therefore not considered a potential source area.	
Building 6	Two sumps in basement. Previously received discharge from laboratories in basement.	---	Excluded from investigations. Sumps contain small quantities of fluids and are not considered a significant potential source. Frequently pumped out. No evidence of deterioration.	
Southwest Corner of Building 6	Concrete liquid waste neutralization pit/clarifier pit. Photo-processing, plating, and laboratories in Bldg. 6 may have discharged to this pit. Out of service.	Liquid Waste Neutralization Pit	Included in investigations.	
Southeast Corner of Building 6	East lift station. Pumping station for wastes from Bldgs. 35, 11, and 12.	---	Excluded from investigations. Pumps sanitary and treated industrial wastes. No evidence of leakage from exposed piping or pumps.	
Sumps Northeast of Building 35	3-stage concrete clarifier, fiberglass-lined.	Building 35 Sumps	Included in investigations.	
Sumps Northeast of Building 35	Concrete sampling sump.	---	Excluded from investigations. Above ground sump. Not considered a potential source area.	
Sumps Northeast of Building 35	Fiberglass-lined concrete general waste interceptor sump.	---	Excluded from investigations. Above ground sump. Not considered a potential source area.	

TABLE IV-1
POTENTIAL SOURCE AREAS
(Continued)

Location	Site Description	Area Designation	Rationale For Inclusion/Exclusion From Investigations
Sumps Northeast of Building 35	Fiberglass-lined concrete chromate waste sump.	Building 35 Organic Sump	Included in investigations.
Building 35	Four paint booths with floor drains to paint booth sludge sump (S-12).	---	Not considered a significant source. Investigations conducted at S-12.
Area Between Buildings 11 and 35	1,000 gallon organics and paint sludge holding tank.	Building 35 Organics Sump	Included in investigations.
Area Between Buildings 11 and 35	Solvent storage area.	---	Excluded from investigations. Minor amounts of fluids contained. Area runoff flows to storm drain.
West of Building 11	Waste oil and grease pit.	Oil and Grease Pit Area	Included in investigations.
East End of Building 14	Concrete sump.	---	Excluded from investigations. Sump only collects cooling water.
East End of Building 14	Concrete sump outside of building. Last stage of inside to outside clarifier.	Building 14 Clarifiers	Included in investigations.
South of Building 12	Concrete 3-stage clarifier.	---	Excluded from investigations. Built in 1982. Handles only saline solutions with trace metals.
South of Building 12	Backfilled concrete clarifier.	Building 12 Backfilled Clarifiers and Test Sump	Included in investigations.
Southwest Corner of Building 12	Concrete clarifier and test sump.	Building 12 Backfilled Clarifiers and Test Sump	Included in investigations.

TABLE IV-1
POTENTIAL SOURCE AREAS
(Continued)

Location	Site Description	Area Designation	Rationale For Inclusion/Exclusion From Investigations
Southwest Corner of Building 12	Backfilled concrete clarifier.	Building 12 Backfilled Clarifiers and Test Sump	Included in investigations.
Building 14	Sump. Approximately 30 years old. Probably received small quantities of cutting oil and metal cuttings.	---	Excluded from investigation. Received only small quantities of fluid. Cleaned frequently.
Building 14	Secondary containment for cutting oil.	---	Excluded from investigations. Secondary containment sump built in 1984. Small quantities of fluid. Cleaned frequently.
Building 14	Floor sumps. This is the inside clarifier.	Building 14 Clarifiers	Included in investigations.
Building 15 North Bay	Floor drain, north end of building. Used as a utility trench since 1942. Cutting oils and solvents appear to have collected in bottom. System modified to prevent future accumu- lation in trenches.	Building 15 Utility Trenches and Clarifier	Included in investigations.
Building 15 North Bay	Floor drain, south end of building. Used as a utility trench since 1942. Cutting oils appear to collect in bottom.	Building 15 Utility Trenches and Clarifier	Included in investigations.
Building 15 South Bay	Utility trench, mostly dry. One 800-gallon hydraulic oil spill in late 1970's. Oil pumped out and trench cleaned.	---	Excluded from investigations. Evidence indicated that only small quantities of fluids ever enter trench. Fluids quickly removed.
Building 15 South Bay	Concrete steam condensate collector.	---	Excluded from investigations. Only discharge is neutral water.

TABLE IV-1
POTENTIAL SOURCE AREAS
(Continued)

Location	Site Description	Area Designation	Rationale For Inclusion/Exclusion From Investigations
Southwest Outside Corner of Building 15	Concrete oil containment sump. Above ground.	---	Excluded from investigations. Evidence indicated limited fluid entered sump and it is above ground.
Southeast Corner of Building 21	Concrete sump.	Clarifier Southeast of Building 21	Previously investigated by Well C-8.
Southeast Corner of Building 20	Transmission test sump. Used to contain hydraulic fluid.	---	Excluded from investigations. Built in 1983.
East of Building 973	Paint booth sludge sump.	---	Not investigated. Will be cleaned and inspected to determine if it is a potential source area.
Area North of Building 31 and South of Runway	Abandoned and backfilled pits, former engine cleaning stations. Pits backfilled with concrete.	Engine Cleaning Pits Area	Included in investigations.
Area North of Building 31 and South of Runway	Concrete utility pits.	---	Excluded from investigations. Utility pits not considered a potential source area.
East of Building 31	Concrete engine cleaning pit.	---	Excluded from further investigations. Addressed by Well C-7. Site is not considered a potential source area.
Salvage Yard Northeast of Building 23	Steel-lined spent solvent sump.	Salvage Yard	Included in investigations.

TABLE IV-1
POTENTIAL SOURCE AREAS
(Continued)

Location	Site Description	Area Designation	Inclusion/Exclusion From Investigations	Rationale For
Salvage Yard East of Building 23	Surface drain and sump in middle of salvage yard.	Salvage Yard	Included in investigations.	
Salvage Yard Southeast of Building 23	Concrete salvage yard oil sump.	Salvage Yard	Included in investigations.	
Salvage Yard South of Building 23	Concrete salvage yard oil sump.	Salvage Yard	Included in investigations.	
Salvage Yard East of Building 23	Steel-lined concrete salvage yard oil sump.	Salvage Yard	Included in investigations.	
Salvage Yard West of Building 23	Salvage yard sump.	Salvage Yard	Included in investigations.	
East of Building 927	Abandoned concrete sewer pit. Out of service.	---	Excluded from investigations. Evidence indicates only domestic sewage entered pit.	
South of Building 927	Abandoned concrete pits. Out of service.	Remote Test Site	Included in investigations.	
North of Building 12	Sewage pit.	---	Excluded from investigations. No evidence that it contained anything but domestic sewage.	
Building 12	Floor drain in west end of building and sump in floor drain.	---	Drain discharged to sump and clarifiers outside building. Sump and clarifiers investigated.	
Northeast Corner of Building 15	Concrete pit.	Building 15 Utility Trenches	Included in investigations.	

TABLE IV-1
POTENTIAL SOURCE AREAS
(Continued)

Location	Site Description	Area Designation	Rationale For Inclusion/Exclusion From Investigations
Building 12	Floor drains in northwest corner of building.	---	Excluded from investigations. Limited amounts of fluid enter drains.
South of Building 5	Underground cutting oils tank.	Underground Tank South of Building 5	Included in investigations.
South of Building 5	500-gallon underground diesel tank.	---	Not included in investigations. Will be addressed by a separate tank testing program.
Gas Pump Island and Underground Fuel Tanks West of Building 11	9,950-gallon underground unleaded gasoline tank. Out of service.	Underground Tanks West of Building 11	Included in investigations.
Gas Pump Island and Underground Fuel Tanks West of Building 11	9,950-gallon underground regular gasoline tank. Out of service.	Underground Tanks West of Building 11	Included in investigations.
Gas Pump Island and Underground Fuel Tanks West of Building 11	Two 5,000-gallon underground diesel tanks.	---	Will be addressed by a separate tank program.
East of Building 16	Two 20,000-gallon underground diesel tanks.	---	Will be addressed by a separate tank program.
East of Building 16	10,000-gallon underground diesel tank.	---	Will be addressed by a separate tank program.
East of Building 15	Three 15,000-gallon underground storage tanks. Out of service.	---	Will be addressed by a separate tank program.

TABLE IV-1
POTENTIAL SOURCE AREAS
(Continued)

Location	Site Description	Area Designation	Inclusion/Exclusion From Investigations	Rationale For
Helipad North of Building 5 and South of Runway	5,000-gallon underground JP-5 tank. Out of service.	---	Will be addressed by a separate tank program.	
Office Trailers Between Buildings 5 and 12	10,000-gallon underground JP-5 fuel tank. Out of service.	---	Will be addressed by a separate tank program.	
North of Building 12	Two 5,000-gallon underground diesel tanks. Out of service.	Underground Tanks North of Building 12	Included in investigations.	
North of Building 909	Two 500-gallon underground diesel tanks.	---	Will be addressed by a separate tank program.	
East of Building 973	300-gallon underground JP-4 fuel tank. Out of service.	---	Will be addressed by a separate tank program.	
West (south) of Building 45	Jet fuel tank. Out of service.	---	Will be addressed by a separate tank program.	
West End of Property	Five 10,000-gallon underground fuel tanks.	---	Tanks have been removed.	
West End of Property	Five 11,800-gallon underground fuel tanks.	---	Tanks have been removed.	
West End of Building 17	Former barrel storage area.	---	Excluded from investigations. Site review indicated not a potential source area.	

TABLE IV-1
POTENTIAL SOURCE AREAS
(Continued)

Location	Site Description	Area Designation	Rationale For Inclusion/Exclusion From Investigations
Northeast Corner of Building 32	Hydraulic test area inside Building 32.	Building 32 Surface Runoff Area	Included in investigations.
In Field South of Runway; North of Northwest Corner of Building 12	Storm drainage discharge with historic clarifier overflow.	Storm Drainage Discharge Site	Included in investigations.
Southwest Corner of Building 34	Above ground hazardous waste tank.	---	Excluded from investigations. Above ground tank. No evidence of leakage. Not considered a potential source area.
West (South) of Building 45	Fuel storage area for fuel purged from aircraft engines. Out of service.	Purged Fuel Storage Area	Included in investigations.
Salvage Yard West of Building 23	Barrel storage racks.	Salvage Yard	Included in investigations.
Southeast of Building 29	Former drum storage area, southeast side of Building 29. Out of service.	Temporary Drum Storage Area	Included in investigations.
West of Building 29	Former drum storage area, west side of Building 29. Out of service.	Temporary Drum Storage Area	Included in investigations.
Test Site 3	Drum storage racks. Out of service.	Test Site 2	Included in investigations.
Test Site 3	Barrel storage area. Out of service.	Test Site 3	Included in investigations.

TABLE IV-1
POTENTIAL SOURCE AREAS
(Continued)

Location	Site Description	Area Designation	Inclusion/Exclusion From Investigations	Rationale For
West End of Property	Fire training burn pit area. Out of service.	Fire Training Burn Pit	Included in investigations.	
West of Building 947	Below ground concrete waste sumps in former drum storage area. Some on unpaved areas. Out of service.	Former Drum Storage Area	Included in investigations.	
West of Building 17	Former drum storage area. Not in use.	---	Excluded from investigations. Asphalt covered. No evidence of surface deterioration.	
North of Fire Training Burn Pit	Landfill area. Not in use.	---	Excluded from investigations. Received only waste concrete and asphalt from historic demolition activities.	

CHEMICALS PRESENT OR USED ON THE PROPERTY

Chemicals present or used on the property are described below.

- . Halogenated Volatile Organic Compounds (VOC's) were used as solvents and for degreasing metal parts. These compounds include commonly used degreasing agents such as trichloroethylene, 1,1,1-trichloroethane, and methylene chloride.
- . Aromatic Volatile Organic Compounds (VOC's) were used as solvents and as additives in petroleum based fuels. These compounds include benzene, toluene, and xylene.
- . Petroleum Hydrocarbons (TPH) were used as fuels and lubricants. These compounds include lower molecular weight hydrocarbons in the gasoline range, intermediate molecular weight hydrocarbons in the diesel range, and higher molecular weight hydrocarbons in the motor oil range.
- . Heavy Metals were used in metal plating operations and were present in paints. Organic lead (tetraethyl lead) was present as an additive in leaded gasoline.
- . Pesticides were used in conjunction with agricultural activities on the west end of the property.
- . Polynucleated aromatic compounds (PNA's) are naturally occurring compounds and are also combustion products of burned organic matter, such as petroleum hydrocarbons.
- . Polychlorinated biphenyls (PCB's) were present as additives in hydraulic oils and other oils.

Chemicals were stored and handled at the Plant Site but disposal is not known to have occurred on the property. Chemicals present in soils and groundwater at various locations on the property could be a result of leakage from chemical drums, from concrete sumps and trenches, and from underground storage tanks as well as surface infiltration from activities related to fire training burns and agricultural use. Chemicals may also have migrated onto the site from unidentified off-site sources or by atmospheric deposition.

CHEMICAL CHARACTERISTICS AND BEHAVIOR

The distribution and persistence of chemicals in soil and groundwater are a function of soil conditions and physical-chemical characteristics of the compound. Soil conditions that affect chemical distribution are discussed in the section on migration pathways. The physical-chemical characteristics of chemicals at the Plant Site are described below.

Volatile Organic Compounds

Volatile organic compounds (VOC's) include both halogenated and aromatic compounds. Halogenated VOC's are one to three carbon compounds with one or more hydrogens replaced by chlorine or bromine. In general, halogenated VOC's are soluble, slightly polar, denser than water, and have a high vapor pressure. Aromatic VOC's include benzene (C_6H_6) and related compounds with one or more hydrogens replaced by chlorine, methyl, or ethyl groups. Aromatic VOC's are soluble, slightly polar, and have relatively high vapor pressures. Chlorinated aromatic VOC's are denser than water while non-chlorinated aromatic VOC's are less dense than water. Table IV-2 lists important physical-chemical characteristics of VOC's.

When VOC concentrations are less than the limits of solubility in the unsaturated soil, VOC's are present as dissolved phase chemicals in the soil moisture and as vapor phase chemicals in the void spaces between soil particles. When VOC concentrations exceed the limits of solubility, VOC's are present in the dissolved phase, the vapor phase, and as pure (neat) solvent. In saturated soils vapor phase VOC's are absent. Where VOC's exceed the limits of solubility in saturated soils, liquid (neat) phase halogenated VOC's would accumulate below the water and non-chlorinated aromatic VOC's would float on the water.

The high vapor pressure of VOC's results in substantial losses of VOC's to the atmosphere and gaseous diffusion in unsaturated soil pore spaces. The low polarity of VOC's results in minimal interaction with the negatively charged soil colloids. Bonding between VOC's and soil is limited to the relatively weak hydrogen bonds between slightly polar VOC's and soil organic matter.

Halogenated VOC's are not naturally occurring compounds and are not rapidly recycled in the environment. Chemical and microbial alteration and degradation of VOC's have been reported in both aerobic and anaerobic conditions but the kinetics and other details of degradation in the environment are not well established. Photochemical degradation of VOC's has also been reported, but because of volatilization from the soil surface the importance of surface degradation in volatile compounds is insignificant.

TABLE IV-2

PHYSICAL-CHEMICAL CHARACTERISTICS
OF VOLATILE ORGANIC COMPOUNDS

Compound	Formula	Molecular Weight	Vapor Pressure (mmHg at 20°C)	Vapor Density	Specific Gravity (at 20°C)	Solubility (mg/l at 20°C)	Vapor Concentration Conversion (mg/m ³ to ppm)
Benzene	C ₆ H ₆	78.11	76	2.77	0.8786	1780	0.31
Chlorobenzene	C ₆ H ₅ Cl	112.56	8.8	3.88	1.1056	500	0.217
o-Dichlorobenzene	C ₆ H ₄ Cl ₂	147.01	1	5.07	1.305	100	0.166
m-Dichlorobenzene	C ₆ H ₄ Cl ₂	147.01	---	---	1.288	123	---
p-Dichlorobenzene	C ₆ H ₄ Cl ₂	147.01	0.6	5.07	1.458	79	0.166
Ethylbenzene	C ₆ H ₅ C ₂ H ₅	106.17	7	3.66	0.867	152	0.23
Toluene	C ₆ H ₅ CH ₃	92.1	22	3.14	0.867	515	0.26
o-Xylene	(CH ₃) ₂ C ₆ H ₄	106.17	5	3.7	0.88	175	0.23
m-Xylene	(CH ₃) ₂ C ₆ H ₄	106.16	6	3.66	0.864	---	0.23
p-Xylene	(CH ₃) ₂ C ₆ H ₄	106.17	6.5	3.7	0.86	198	0.23
Bromodichloromethane	CHBrCl ₂	163.8	---	---	1.971 ¹⁾	---	---
Bromoform	CHBr ₃	252.77	5.6 ¹⁾	8.7	2.89	3190	0.0966
Carbon Tetrachloride	CCl ₄	153.82	90	5.5	1.59	800	0.16
Chloroform	CHCl ₃	119.38	160	4.12	1.489	8000	0.20

Source: Handbook of Environmental Data on Organic Chemicals, 1977, Karel Verschueren, Van Nostrand Reinhold Company, New York.

1) At 25°C

TABLE IV-2
(Continued)

PHYSICAL-CHEMICAL CHARACTERISTICS
OF VOLATILE ORGANIC COMPOUNDS

Compound	Formula	Molecular Weight	Vapor Pressure (mmHg at 20°C)	Vapor Density	Specific Gravity (at 20°C)	Solubility (mg/l at 20°C)	Vapor Concentration Conversion (ppm ₃ to ppm)
Dibromochloromethane	CHBr ₂ Cl	208.3	---	---	2.38	---	---
1,1-Dichloroethane	CHCl ₂ CH ₃	98.96	180	3.42	1.174	5500	0.24
1,2-Dichloroethane	CH ₂ ClCH ₂ Cl	99	61	---	1.25	8690	0.24
1,1-Dichloroethylene	CH ₂ CCl ₂	96.95	500	3.25	1.218	---	0.25
Dichloromethane	CH ₂ Cl ₂	84.93	349	2.93	---	20000	0.28
1,2-Dichloropropane	CH ₂ ClCHClCH ₃	112.99	42	3.9	1.16	2700	0.21
Freon 113	C ₂ Cl ₃ F ₃	187.38	---	---	1.565	---	---
1,1,2,2-Tetrachloroethane	CHCl ₂ CHCl ₂	167.86	5	5.79	1.60	2900	0.14
Tetrachloroethylene	CCl ₂ CCl ₂	165.83	14	5.83	1.626	150 ¹⁾	0.15
1,1,1-Trichloroethane	CCl ₃ CH ₃	133.41	100	4.63	---	4400	0.18
Trichloroethylene	CCl ₂ =CHCl	131.5	60	4.54	1.46	1100 ¹⁾	0.18
Trichlorofluoromethane	CCl ₃ F	137.4	.90atm ³⁾	---	1.494 ²⁾	1100 ¹⁾	0.18
trans-1,2-Dichloroethylene	CHClCHCl	96.95	200 ⁴⁾	3.34	1.26	600	0.25
Vinyl Chloride	CH ₂ CHCl	62.5	2660 ¹⁾	2.15	0.912 ⁵⁾	1100 ¹⁾ *	0.39

Source: Handbook of Environmental Data on Organic Chemicals, 1977, Karel Verschueren, Van Nostrand Reinhold Company, New York.

- 1) At 25°C
- 2) At 17°C
- 3) At 0°C
- 4) At 14°C
- 5) At 15°C

Total Petroleum Hydrocarbons

Total petroleum hydrocarbons (TPH) range from gasoline to diesel to motor oil. Petroleum hydrocarbons are very slightly soluble, non-polar, and less dense than water. Petroleum hydrocarbons in the gasoline range have a higher vapor pressure and are therefore more volatile than longer chain hydrocarbons such as diesel and motor oils.

When petroleum hydrocarbons are present in saturated soils above the limits of solubility, they will float on the water. Petroleum hydrocarbons in the gasoline range will be present in the vapor phase in unsaturated soil. The relatively high vapor pressure of gasoline results in substantial losses of gasoline to the atmosphere and gaseous diffusion in unsaturated soil pore spaces. The non-polarity of petroleum hydrocarbons results in minimal interaction with the negatively charged soil colloids and soil organic matter.

Because petroleum hydrocarbons provide a readily available source of energy to soil microorganisms, biological degradation occurs in aerobic environments. Biological degradation of petroleum hydrocarbons in the environment is limited when availability of oxygen, nitrogen, or phosphorus decreases or when toxic chemicals inhibit soil microorganisms.

Heavy Metals

In soils, heavy metals may occur in the following forms:

- . On ion exchange sites;
- . as part of or on the surface of crystalline or noncrystalline inorganic precipitates;
- . incorporated in organic compounds; and
- . in solution.

In general, heavy metals are sparingly soluble occurring primarily in a sorbed state or as part of insoluble organic or inorganic compounds. Because of their low solubility, movement of heavy metals in soils is generally considered to be minimal.

Behavior of heavy metals in soils depends on soil parameters, especially pH, cation exchange capacity, and ionic strength. Soil pH and ionic strength affect the solubility of metals in the soil solution. In general, solubility increases as pH and/or ionic strength decrease. Cation exchange capacity affects the attenuation of heavy metals in solution as surface water passes through the soil profile.

Greater exchange capacity results in greater attenuation of heavy metals in the soil solution. Soil organic matter affects behavior of heavy metals in soils by increasing the cation exchange capacity and by increasing heavy metal solubility by chelation.

Chlorinated Pesticides

Organochlorine pesticides include compounds such as DDT (dichloro-diphenyl-trichloroethane), endrin, and lindane (benzene hexachloride, also known as BHC). Organochlorine behavior in soil-water systems can be categorized into three major groupings:

- . Volatilization and diffusion,
- . adsorption, plant uptake, and microbiological degradation, and
- . leaching (mass flow).

Volatilization accounts for the bulk of pesticide loss from soil surfaces. Pesticides are most apt to volatilize immediately after application. Pesticide loss due to volatilization ranges from a few percent to more than 50 percent of the amount applied. Organochlorine pesticides have relatively low vapor pressures (3×10^{-14} to 0.6 mmHg) but still undergo some volatilization. Diffusion of volatilized pesticides is probably significant for distances of only a few centimeters.

Adsorption is generally the most important process affecting pesticide behavior in soils. Hydrophobic organochlorine pesticides strongly adsorb on clay, sand, and humic acid surfaces in soil. Plant uptake is an important pathway of pesticide loss in surface soils. Microbiological degradation often results in the transformation of applied pesticides to partially degraded metabolites.

When the capacity of a soil to adsorb pesticides is exceeded, leaching of pesticides into deeper soil and groundwater will occur. Leaching may also occur by movement of ultra-fine soil particles with sorbed pesticides through large soil pores. Movement of pesticides by leaching is parallel to water movement in soils. Movement is primarily downward but will also be upward when surface soils are dry (the wick effect) and laterally from wetter soils to drier soils.

Polynucleated Aromatics

Polynucleated aromatic compounds (PNA's) consist of three or more fused benzene rings in linear, angular, or cluster arrangements that contain only carbon and hydrogen. Polynucleated aromatics are formed when

organic substances are exposed to high temperatures and may also be synthesized by some plants and bacteria, although naturally occurring concentrations of individual PNA's (eg: benzo-(a)-pyrene) do not generally exceed 10 ppb.

Polynucleated aromatics are practically insoluble and are slightly volatile. Adsorption to clay, sand, and humic acids in surface soils generally results in the retention of PNA's near the surface. Migration away from the surface would occur when the concentrations exceed the adsorptive capacity of the soil.

Polychlorinated Biphenyls

Polychlorinated biphenyls (PCB's) are volatile (vapor pressure 50 mmHg), practically insoluble in water, and soluble in lipids and oils. Because of their volatility, they are widespread in the environment. Because of their solubility in lipids, they are bioaccumulative. Because they are generally resistant to microbial degradation, they are present in the environment.

PCB's have strong affinities for soils. Retention of PCB's in soils is greatest for soils high in clays and organic matter. PCB isomers with highest hydrophobicity are most strongly adsorbed to soil particles. PCB's dissolved in oils will remain in solution and will migrate along with oils in soil. Since isolated oil deposits are not likely to migrate in most soils, PCB's dissolved in oils will remain localized.

RATIONALE FOR SOILS INVESTIGATIONS

Soils investigations were conducted to characterize the chemical distribution in soils at each of the identified potential source areas. Two levels of site characterization were selected for the soils investigations:

1. The first level of site characterization was determination of a site's potential as a chemical source area and characterization of any chemical distribution immediately adjacent to and beneath source areas;
2. The second level of site characterization was delineation of the extent of chemical migration away from each identified potential source area.

The first level site characterization goals were met by collecting soil samples from at least one soil boring located near the center or near the low point of drainage at a site. If the site consisted of an underground tank, sump, or trench, the soil borings were located as close as possible to the structure, since this is the area where chemicals would most likely be present. If the tank, sump, or trench

were larger than five to ten feet, two borings were frequently constructed to address possible leakage from opposite sides of the structure. If the site consisted of a surface storage area, the soil borings were located at the low point of surface drainage from the site, since this is the area where chemicals would most likely accumulate. If a site had more than one low point of drainage, more than one soil boring was frequently constructed to meet the first level site characterization goals.

Soil samples were collected to a depth of approximately 30 feet below the low point of drainage or below the suspected tank, sump, or trench at each site. Samples were collected throughout the profile at regular intervals and to a depth of approximately five feet into any low permeability stratum encountered. Collecting samples in the lower permeability stratum is necessary because chemicals tend to accumulate in the zone of lowest permeability, especially when the overlying material is sandy with rapid permeability and minimal attenuation of chemicals passing through the profile. For chemicals that do not readily migrate into the subsurface (i.e., heavy metals, pesticides, PCB's, and PNA's), samples collected to a depth of five feet or less provide worst case characterization.

The second level site characterization goals were met by collecting soil samples from soil borings located away from the identified source. The depth of soil borings defining the extent of chemical distribution corresponded to the depth at which chemicals were detected in Step 1 borings.

Analyses performed were determined by available information on chemical usage at each individual site. Analyses for VOC's and TPH were performed at every site because of the widespread use of these chemicals. Heavy metals were analyzed at plating and painting operation facilities. Analyses for PCB's were performed in soils where PCB's were detected in tanks and at random locations throughout the property where various chemicals, which may have included PCB's were used or stored. Polynucleated aromatics were analyzed at one site where burning of hydrocarbons may have resulted in the formation of PNA's.

Table IV-3 lists the analytical methods used for soil and water analyses and the groups of chemicals identified by each method. Chemical analyses were completed by laboratories with Hazardous Waste Certification from the California Department of Health Services.

TABLE IV-3

ANALYTICAL METHODS USED FOR SOIL AND WATER ANALYSES

Soil Analysis Method	Water Analysis Method	Chemicals Identified
EPA 418.1 (Modified)	GCFID	Total Petroleum Hydrocarbons
EPA 6010	EPA 6010 EPA 245.1	Inorganics Inorganics
EPA 8010 (Modified)	EPA 601 (Modified)	Purgeable Halogenated Volatile Organic Compounds
EPA 8020	EPA 602	Purgeable Aromatic Volatile Organic Compounds
EPA 8080	EPA 608	Organochlorine Pesticide and PCB's
EPA 8100	EPA 625	Polynucleated Aromatics
EPA 8140	EPA 614	Organophosphorus Pesticides
---	EPA 624	Purgeable Volatile Organic Compounds
EPA 8270	EPA 625	Base Neutral Extractable Organic Compounds, Semivolatile Compounds
---	General Minerals	Inorganic Minerals

SECTION V

INVESTIGATION OF POTENTIAL SOURCE AREAS

This section of the report presents the soil investigations conducted at potential source areas identified at the Plant Site. Figure V-1 shows the locations of the 21 potential source areas which are addressed in this report. Industrial activities conducted at each site and the results of soil boring analyses are discussed below. The discussion of analytical results at each site focuses on those compounds detected in highest concentrations and those compounds which are of particular concern due to their potential adverse effects in relatively low concentrations. Table V-1 shows the chemical name acronyms used in this report. Water quality beneath potential source areas is discussed in Section VI.

Soil investigations at potential source areas had three objectives:

- 1) To determine whether soils at a site should be classified as hazardous waste;
- 2) To determine whether a site is a potential source for volatile organic chemicals in groundwater; and
- 3) To provide data necessary for development of accurate engineering specifications in the evaluation of cost-effective remediation.

The basis used for determining whether a soil should be classified as hazardous waste was the "Criteria for Identification of Hazardous or Extremely Hazardous Wastes," Title 22, California Administrative Code, Article 11. Although soils are not normally considered wastes, they may be considered hazardous waste if sufficient quantities of chemicals have entered and remained in the soil volume such that the concentrations meet or exceed the criteria of Article 11. Article 11 consists of:

- . Toxicity criteria
- . Total Threshold Limit Concentrations (TTLC) and Soluble Threshold Limit Concentrations (STLC)
- . Ignitability criteria
- . Reactivity criteria
- . Corrosivity criteria

FIGURE V-1
POTENTIAL
SOURCE AREAS

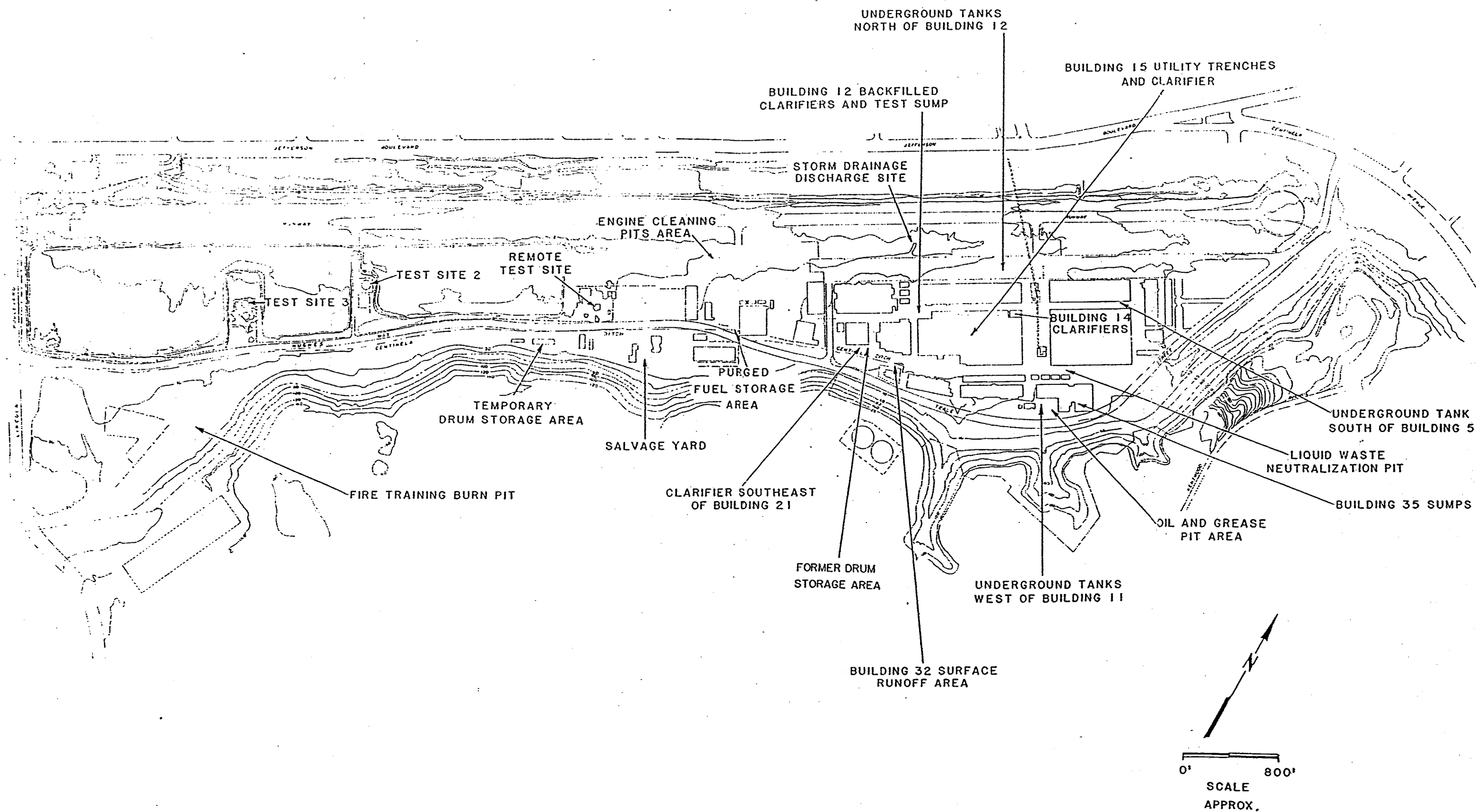


TABLE V-1

CHEMICAL NAME ACRONYMS

Trans-1,2-Dichloroethylene	=	Trans
1,1,2,2-Tetrachloroethane	=	1,1,2,2 TCA
1,1,1 Trichloroethane	=	TCA
Trichloroethylene	=	TCE
Bromodichloromethane	=	BDCM
Dichloromethane (Methylene Chloride)	=	DCM
Chloroform	=	CHCl ₃
Freon 113	=	Freon
1,1 Dichloroethylene	=	1,1 DCE
1,1 Dichloroethane	=	1,1 DCA
Dibromochloromethane	=	DBCM
1,2 Dichlorobenzene	=	1,2 DCB
1,3 Dichlorobenzene	=	1,3 DCB
1,4 Dichlorobenzene	=	1,4 DCB
Chlorobenzene	=	C. Benzene
Bromoform	=	CHBr ₃
Ethylbenzene	=	E. Benzene
Tetrachloroethylene	=	PCE
1,2 Dichloropropane	=	1,2 DCP
Carbon Tetrachloride	=	CCl ₄
Trichlorofluoromethane	=	TCFM
Vinyl Chloride	=	VC
1,2 Dichloroethane	=	1,2 DCA
1,1,2-Trichloroethane	=	1,1,2 TCA
meta-xylene	=	m-xylene
ortho-xylene	=	o-xylene
para-xylene	=	p-xylene
Total Petroleum Hydrocarbons	=	TPH
Polychlorinated Biphenyls	=	PCBs
Polynucleated Aromatics	=	PNAs
Antimony	=	Sb
Barium	=	Ba
Beryllium	=	Be
Chromium	=	Cr
Cobalt	=	Co
Copper	=	Cu
Iron	=	Fe
Manganese	=	Mn
Arsenic	=	As
Cadmium	=	Cd
Mercury	=	Hg
Molybdenum	=	Mo
Nickel	=	Ni
Lead	=	Pb
Selenium	=	Se
Silver	=	Ag
Thallium	=	Tl

TABLE V-1
(Continued)

CHEMICAL NAME ACRONYMS

Vanadium	=	V
Zinc	=	Zn
Methyl Ethyl Ketone	=	MEK
Tetrahydrofuran	=	THF
2,4 Dimethylphenol	=	2,4 D.M.phenol

Complete soil testing for all of the hazardous waste criteria set forth in Article 11 has been conducted at two locations on the Plant Site, the Fire Training Burn Pit and the Salvage Yard. None of the soil volumes which were tested for all of the hazardous waste criteria were found to be corrosive, reactive, ignitable, toxic, or exceed the TLIC values set forth in Article 11. Testing for compounds for which TLIC criteria apply was also conducted at several other locations on the Plant Site. Only one soil volume has been found which meets or exceeds TLIC values that define hazardous wastes.

The potential for VOC movement from soils into groundwater was evaluated on a site by site basis. The draft guidance document "Waste Classification and Cleanup Level Determination", prepared by the staff of the California Regional Water Quality Control Board, Central Valley Region, was used as a reference document in our evaluation. The "Designated Levels to Protect Groundwater" (DLPs) set forth in this document are intended to be indicators of the potential for VOCs which are present in soil to degrade groundwater quality. The DLPs are generally 1,000 times the State Department of Health Services Recommended Drinking Water Action Levels. Based on site specific conditions, higher or lower criteria for concentrations of VOCs in soil may be considered appropriate for protection of groundwater quality.

A cleanup level of 100 ppm was used for TPH in soil. This is the level commonly used by agencies for remediation of hydrocarbon leakage from underground tanks. Specific cleanup criteria used at the Plant Site are outlined in Section X.

In order to evaluate soil remediation technologies that are most cost effective and applicable to the site, it was necessary to develop engineering specifications relating to the extent of chemical migration. The basis for the specifications was a reasonably complete characterization of the vertical and lateral extent of chemicals in soils and an assessment of migration potential from unsaturated soils into groundwater. Given the criteria discussed above, some conceptual remediation guidelines were developed to assist in determining the extent of site characterization required, as follows:

- . Where concentrations of chemicals in soil result in the soil being classified as a hazardous waste or where TPH exceeds 100 ppm, excavation would be recommended.
- . Where concentrations of VOCs in soil do not exceed 1,000 times the State Action Levels, no remediation would be necessary.
- . Where concentrations of VOCs in soil exceed 1,000 times the State Action Levels, excavation would be required based on site specific conditions.

Table V-2 shows the soil quality criteria which have been used in this evaluation.

TABLE V-2
SOIL QUALITY CRITERIA

CHEMICAL	TTLIC (ppm)	1000 X DHS ACTION LEVEL (ppm)
Carbon Tetrachloride	-	5.0
1,2-Dichloroethane	-	1.0
1,1-Dichloroethylene	-	6.0
Methylene Chloride	-	40.0
Tetrachloroethylene	-	4.0
1,1,1-Trichloroethane	-	200.0
Trichloroethylene	2,040.0	5.0
Vinyl Chloride	10.0	2.0
1,1-Dichloroethane	-	20.0
Trichlorofluoromethane	-	3,400.0
Freon 113	-	18,000.0
1,1,2-Trichloroethane	-	100.0
Cis-1,2-Dichloroethylene	-	16.0
Trans-1,2-Dichloroethylene	-	16.0
Chloroform	-	100.0 ¹
Benzene	-	0.7
1,2-Dichlorobenzene	-	130.0
1,3-Dichlorobenzene	-	130.0
1,4-Dichlorobenzene	-	0.5
Ethylbenzene	-	680.0
Toluene	-	100.0
Total Xylenes	-	620.0
1,2-Dichloropropane	-	10.0

¹ No DHS Action Level has been established. Value shown is 1000 X EPA Primary Drinking Water Standard for TTHM (Total Trihalomethanes) which includes chloroform.

TABLE V-2
SOIL QUALITY CRITERIA
(Continued)

<u>CHEMICAL</u>	<u>TTL</u> <u>(ppm)</u>	<u>1000 X</u> <u>DHS</u> <u>ACTION LEVEL</u> <u>(ppm)</u>
Antimony	500.0	
Arsenic	500.0	
Barium	10,000.0	
Beryllium	75.0	
Cadmium	100.0	
Chromium III	2,500.0	
Chromium VI (or total)	500.0	
Cobalt	8,000.0	
Copper	2,500.0	
Lead (inorganic)	1,000.0	
Mercury	20.0	
Molybdenum	3,500.0	
Nickel	2,000.0	
Selenium	100.0	
Silver	500.0	
Thallium	700.0	
Vanadium	2,400.0	
Zinc	5,000.0	
Polychlorinated biphenyls	50.0	
DDT, DDE, DDD	1.0	
Endrin	0.2	

FIRE TRAINING BURN PIT

Figure V-2 shows soil boring and groundwater monitoring well locations at the Fire Training Burn Pit. The Fire Training Burn Pit was used several times a year for training fire fighters in the handling of chemical and fuel fires. The "pit" consisted of nearly level ground surrounded by a one-foot high soil berm. A mock-up of an aircraft located within the berm was doused with flammable chemicals and ignited. Chemicals present at this site are presumed to have resulted from fire training activities within and adjacent to the berm. Chemicals identified in soils at this site were VOC's, petroleum hydrocarbons, heavy metals, PCB's, and PNA compounds.

Soil samples were collected from 20 soil borings and one soil boring converted to a well point in and around the site to define the vertical and lateral extent of chemical migration in soils. In addition, three well points and two monitoring wells were installed to determine if chemicals have migrated into the groundwater at this site. Physical characteristics of soil borings and monitoring wells at this site are given in Table V-3. Soils data are presented in Tables V-4, V-5, and V-6.

The soils at this site consist of eight to ten feet of coarse textured silty sand of rapid permeability overlying approximately 20 feet of finer-textured silty clay of low permeability. Beneath the silty clay, at a depth of approximately 30 feet below ground, there are permeable sands and gravels. Groundwater within the bermed area was observed at six to eight feet below ground surface in the silty sand. At points away from the berm, groundwater was observed at 10 to 12 feet below ground surface.

As shown in Table V-4, the highest concentrations of chemicals at this site were found in soil samples taken from SB-69 and WP-1, located within the bermed area of the Fire Training Burn Pit. The primary VOC's detected in the bermed area were trans-1,2-dichloroethylene, in concentrations of 450 to 5,300 ppb, and trichloroethylene, in concentrations of 300 to 2,700 ppb. Other VOC's were detected within the bermed area in lower concentrations, including chloroform at 30 to 200 ppb and benzene at 70 to 180 ppb. For the most part, VOC concentrations decrease significantly outside of the bermed area.

Petroleum hydrocarbons were detected in the upper five feet at various locations around the site. Maximum TPH (280 to 840 ppm) was detected within the bermed area.

One sample taken from the surface at SB-24 showed PNA's; 1,600 ppb benzo-(a)-pyrene, 1,700 ppb fluoranthene, 1,000 ppb pyrene, and 900 ppb acenaphthene. No PNA's were detected in twenty-four samples taken from ten other soil borings at this site. Six soil samples from five borings showed very low levels of PCB's, ranging from 0.2 to 2.0 ppm.

As shown in Table V-5, heavy metals were detected in soil samples taken from SB-50 and SB-51. The metals detected in samples from these borings are within the range which can be considered naturally occurring and are not believed to reflect activities at the site.

As shown in Table V-6, additional analyses were conducted on samples taken from SB-50, SB-51, SB-115, and a backhoe trench near SB-69 to evaluate hazardous waste criteria. Representative soil samples from two depths in the backhoe trench were submitted for 96-hour LC₅₀ fish bioassay, and samples from SB-50 and SB-51, within the bermed area, were analyzed for ignitability and corrosivity. A sample from SB-115 was analyzed for EP Toxicity Criteria (RCRA Hazardous Waste Characteristics). Results of these analyses showed that soils at the Fire Training Burn Pit do not warrant classification as hazardous waste. In a letter dated February 26, 1987, from the State Department of Health Services, it is stated that soils at this site are nonhazardous according to standards and methods contained in the California Administrative Code (CAC), Division 4, Title 22 regulations.

Chemical concentrations in soils at the Fire Training Burn Pit were greatest in the center of the bermed area, extending to a depth of 19.5 feet. At the edge of the bermed area and in soil borings outside of the bermed area, concentrations of VOC's show a decreasing trend. Some surface soils south of the bermed area contained elevated levels of petroleum hydrocarbons and surface soils east of the berm had detectable concentrations of PNA's. Soils at this site do not exceed TTLC criteria for hazardous waste and VOCs are not present in concentrations which exceed 1,000 times the DHS Action Levels. TPH concentrations exceed 100 ppm in isolated locations at this site.

FIGURE V-2
FIRE TRAINING
BURN PIT

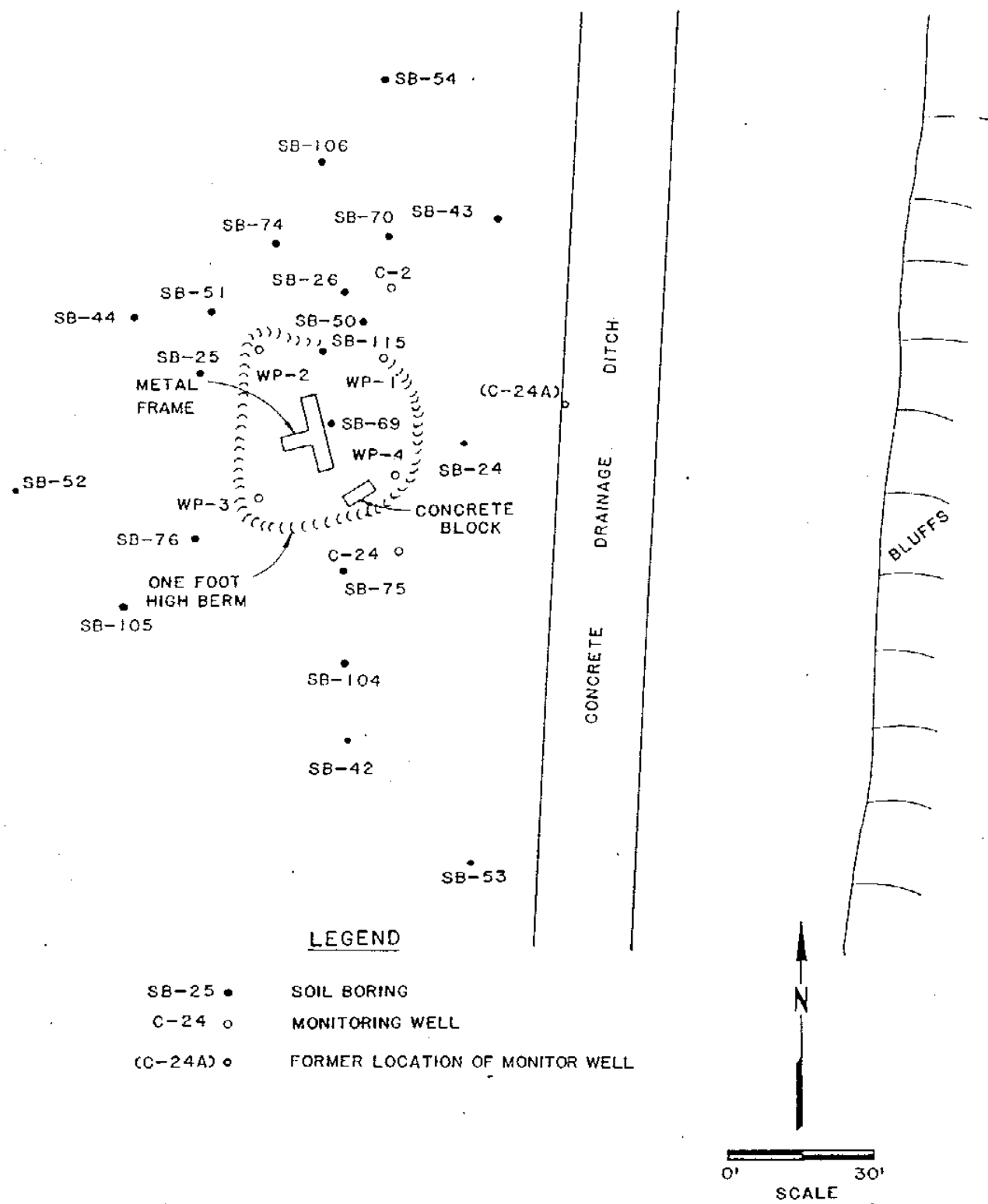


TABLE V-3

PHYSICAL CHARACTERISTICS OF SOIL BORINGS AND MONITORING WELLS
AT THE FIRE TRAINING BURN PIT

Location	Total Depth (feet)	Soil Sampling Depths (feet)	Analyses				Screened Interval (feet)
			VOC	TPH	PCB	PNA	
WP-1	10	0, 2.5, 4.5, 6.0	X	X			8 - 10
WP-2	12	---					10 - 12
WP-3	12	---					10 - 12
WP-4	12	---					10 - 12
SB-24	10	0.5 ^a , 2.5 ^b , 4.5 ^{ab}	X	X	X	X	---
SB-25	10	0, 2.5 ^b , 4.5 ^b	X	X		X	---
SB-26	10	0, 2.5, 4.5 ^a	X	X	X		---
SB-42	15	0, 4.5, 9.5, 14.5	X	X			---
SB-43	10	0, 4.5 ^{ab} , 9.5 ^{ab}	X	X	X	X	---
SB-44	15	0, 4.5, 9.5, 14.5 ^{ac}	X	X	X		---
SB-50	6	2.5 ^d , 5.5 ^d					---
SB-51	6	2.5 ^d , 5.5 ^d					---
SB-52	6	2.5, 5.5	X				---
SB-53	6	2.5, 5.5	X	X			---
SB-54	6	2.5, 5.5	X	X			---

^a Not analyzed for PCB

^b Not analyzed for PNA

^c Not analyzed for TPH

^d Only analyzed for heavy metals, corrosivity, and ignitability.

TABLE V-3

**PHYSICAL CHARACTERISTICS OF SOIL BORINGS
AND MONITORING WELLS AT THE FIRE TRAINING BURN PIT**
(Continued)

<u>Location</u>	<u>Total Depth (feet)</u>	<u>Soil Sampling Depths (feet)</u>	<u>Analyses</u>				<u>Screened Interval (feet)</u>
			<u>VOC</u>	<u>TPH</u>	<u>PCB</u>	<u>PNA</u>	
SB-69	25	0.5, 4.5, 6.5, 9.5, 14.5, 19.5, 24.5	X	X	X	X	---
SB-70	15	0.5, 4.5, 9.5, 14.5	X	X	X	X	---
SB-74	15	0.5, 4.5, 9.5, 14.5	X	X	X	X	---
SB-75	15	0.5, 4.5, 9.5, 14.5	X	X	X	X	---
SB-76	15	0.5, 4.5, 9.5, 14.5	X	X	X	X	---
SB-104	20	0.5, 4.5, 9.5, 14.5, 19.5	X	X	X	X	---
SB-105	20	0.5, 4.5, 9.5, 14.5, 19.5	X	X	X	X	---
SB-106	20	0.5, 4.5, 9.5, 14.5, 19.5	X	X	X	X	---
SB-115	4.0	3.5 ^e					---
C-2	41	---					31 - 41
C-24	53	---					29 - 52
C-24A	15	---					2.5 - 12.5

^e Analyzed for EP Toxicity criteria only.

TABLE V-4
FIRE TRAINING BURN PIT
SOIL SAMPLE ANALYTICAL RESULTS¹
(ppb)

Boring	Depth (ft.)	TPH (ppm)	1,1 DCA	Trans	CHCl ₃	TCA	ICE	Benzene	Toluene	DCH	E. Benzene	Xylenes	1,2 DCB	1,3 DCB	1,4 DCB	P ₁
WP-1	0.0			553				181								
	2.5			454		8	636	133								
	4.5			600		16	900	109								
	6.0			724		24	902	70								
SB-24	0.5					2	2	69								
	2.5			18			28	43		11						
	4.5			20		3	20	22								
SB-25	0.5							272								
	2.5			138		3	3	69								
	4.5			59			2	58								
SB-26	0.0							57		55						
	2.5			5		5	23	36								
	4.5			3			11	66								
SB-42	0.0	100			20											
	4.5	11		5			9		6							
	9.5		12	40	6		300									
	14.5		14				120									

blank = not detected
 # = not analyzed
 X = positive analysis
 { = Where duplicate analyses were conducted the higher value is shown.

TABLE Y-4
 FIRE TRAINING BURN PIT
 (Continued)
 SOIL SAMPLE ANALYTICAL RESULTS¹
 (ppb)

Boring	Depth (ft)	1,1 DCE	1,2 DCA	DECM	1,1,2,2 TCA	C Benzene	CCl ₄	EDCM	CHBr ₃	1,2-DCP	1,1,2-ICA	Vinyl Chloride	TCFH	PCB	PNA	Heavy Metals	Pesticides
WP-1	0.0																*
	2.5				11												*
	4.5				17												*
	6.0				19												*
SB-24	0.5																*
	2.5													200			*
	4.5																*
SB-25	0.5				18												*
	2.5				3												*
	4.5																*
SB-26	0.0													700			*
	2.5																*
	4.5																*
SB-42	0.0																*
	4.5																*
	9.5																*
	14.5																*

9187

blank = not detected
 * = not analyzed
 x = positive analysis
 } = Where duplicate analyses were conducted the higher value is shown.

TABLE V-4

FIRE TRAINING BURN PIT
(Continued)SOIL SAMPLE ANALYTICAL RESULTS¹
(ppb)

Boring	Depth (ft.)	TPH (ppm)	1,1 DCA	Trans	CHCl ₃	TCa	TCE	Benzene	Toluene	DCM	E Benzene	Xylenes	1,2 DCG	1,3 DCG	1,4 DCG	P
SB-43	0.0	50			30					10			9			
	4.5	23					10									
	9.5		20	30	40		220	30	50	10						
SB-44	0.0	130			90			20	10							
	4.5	30		6			8									
	9.5			6			12						40	20		
	14.5															
SB-50 ^a																
SB-51 ^a																
SB-52	2.5			70			30									
	5.5			60	8		20									
SB-53	2.5	70														5
	5.5															
SB-54	2.5	55		20												
	5.5															
SB-69	0.5	840			30											
	4.5	280		1300			300									
	6.5		200	5300	200		2300						230		80	30
	9.5			3900			1400									
	14.5		200	800	100		2700									1
	19.5									370						
	24.5				30											

blank = not detected

* = not analyzed

a = no sample collected for VOC or TPH

x = positive analysis

1 = Where duplicate analyses were conducted the higher value is shown.

TABLE V-4

FIRE TRAINING BURN PIT
(Continued)SOIL SAMPLE ANALYTICAL RESULTS¹
(ppb)

Boring	Depth (ft)	1,1 DCE	1,2 DCA	DBCM	1,1,1,2,2 TCA	C Benzene	CCl ₄	DDCM	CHBr ₃	1,2-DCP	1,1,2-TCA	Vinyl Chloride	ICFM	PCB	PNA	Heavy Metals	Pesticides
SB-43	0.0													200		*	*
	4.5													*		*	*
	9.5													*		*	*
SB-44	0.0															*	*
	4.5															*	*
	9.5													*		*	*
	14.5													*		*	*
SB-50a																*	*
SB-51a																*	*
SB-52	2.5													*		*	*
	5.5													*		*	*
SB-53	2.5													*		*	*
	5.5													*		*	*
SB-54	2.5													*		*	*
	5.5													*		*	*
SB-69	0.5													2000		*	*
	4.5													*		*	*
	6.5													*		*	*
	9.5													*		*	*
	14.5													200		*	*
	19.5													200		*	*
	24.5													*		*	*

blank = not detected

* = not analyzed

a = no sample collected For VOC or TPH

x = positive analysis

| = Where duplicate analyses were conducted the higher value is shown.

TABLE V-4

FIRE TRAINING BURN PIT
(Continued)SOIL SAMPLE ANALYTICAL RESULTS¹
(ppb)

Boring	Depth (ft.)	TPH (ppm)	1,1-DCA	Trans	CHCl ₃	TCa	TCB	Benzene	Toluene	DCH	E Benzene	Xylenes	1,2 DCB	1,3 DCB	1,4 DCB	F
SB-70	0.5	15					70				40	20				
	4.5				60		30				20					
	9.5				10		10				50				30	
	14.5						700				40					
SB-74	0.5	70			90		300						20			
	4.5	53			60		60			460						
	9.5				90		100			420						
	14.5						70									
SB-75	0.5	190					20									3
	4.5						750									2
	9.5			260			2000									
	14.5		100	330	30											.1
SB-76	0.5	17		200			100									1
	4.5			420	40		110									
	9.5			100			80									
	14.5						220									
SB-104	0.5	11							30			50				
	4.5						200		30			50				
	9.5			100			420		40			70	30		40	
	14.5						670		50			30				
	19.5								50			30				
SB-105	0.5															
	4.5															
	9.5															
	14.5															
	19.5															
SB-106	0.5						40									
	4.5															
	9.5															
	14.5	11														
	19.5	12														

blank = not detected

* = not analyzed

= positive analysis

= Where duplicate analyses were conducted the higher value is shown.

TABLE V-4

FIRE TRAINING BURN PIT
(Continued)SOIL SAMPLE ANALYTICAL RESULTS¹
(ppb)

Boring	Depth (ft)	1,1 DCE	1,2 DCA	DECH	1,1,2,2 ICA	C Benzene	CCl ₄	EDCH	CHBr ₃	1,2-DCP	1,1,2-ICA	Vinyl Chloride	TCFH	PCB	PNA	Heavy Metals	Pesticides
SB-70	0.5																
	4.5																
	9.5																
	14.5																
SB-74	0.5																
	4.5																
	9.5																
	14.5																
SB-75	0.5																
	4.5																
	9.5																
	14.5																
		220															
SB-76	0.5																
	4.5																
	9.5																
	14.5																
			100														
SB-104	0.5																
	4.5																
	9.5																
	14.5																
	19.5																
SB-105	0.5																
	4.5																
	9.5																
	14.5																
	19.5																
SB-106	0.5																
	4.5																
	9.5																
	14.5																
	19.5																

blank = not detected
 ■ = not analyzed
 * = positive analysis
 † = Where duplicate analyses were conducted the higher value is shown.

TABLE V-5

FIRE TRAINING BURN PIT
HEAVY METAL RESULTS¹
(ppm)

Boring	Depth (ft)	Ag	As	Ba	Be	Cd	Co	Cr	Cu	Hg	Mo	Mn	Pb	Sb	Se	Tl	V	Zn
SB-50	2.5		6.3	39	0.2	0.3	4.6	13.0	9.5	0.9	0.6	6.7	8.3	1.5		11.0	20.0	38
	5.5		4.1	39	0.1	0.3	3.3	9.3	5.3	0.9	0.3	4.8	3.5	0.5		9.3	15.6	25
SB-51	2.5		2.9	47	0.18	0.06	2.5	6.4	4.7	0.29	0.19	2.6	1.3			6.8	11.0	12
	5.5	0.23	69.0	74	0.30	1.10	5.6	8.2	5.9	0.82	0.62	4.7	6.1	1.9	1.9	5.6	19.0	23

¹ Where duplicate analyses were conducted the higher value is shown.

TABLE V-6

FIRE TRAINING BURN PIT
SOIL SAMPLE ANALYTICAL RESULTS

<u>BORING</u>	<u>DEPTH (FT)</u>	<u>EP TOXICITY LEACHATE CONCENTRATIONS</u>			
SB-115	3.5	<u>Metals (mg/l)</u>			
		Chromium	Arsenic	Selenium	Silver
		0.01	0.01	-- ^a	--
		Cadmium	Barium	Mercury	Lead
		--	0.30	--	0.002
		<u>Pesticides/PCBs (ug/l)</u>			
		All below detection limits			
		<u>Herbicides (ug/l)</u>			
		All below detection limits			
		<u>IGNITABILITY (Flash Point)</u>		<u>CORROSIVITY (ph)</u>	
SB-50	2.5	Not observed at 300°F		8.2	
	5.5	Not observed at 300°F		8.1	
		<u>IGNITABILITY (Flash Point)</u>		<u>CORROSIVITY (ph)</u>	
SB-51	2.5	Not observed at 300°F		7.3	
	5.5	Not observed at 300°F		8.0	
		<u>96 HOUR LC₅₀ FISH BIOASSAY</u>			
BACKHOE					
TRENCH	2.5	LC ₅₀ greater than 750 mg/l			
(NEAR SB-69)	2.5 (dup)	LC ₅₀ greater than 750 mg/l			
	7.5	LC ₅₀ greater than 750 mg/l			
	7.5 (dup)	LC ₅₀ greater than 750 mg/l			

TEST SITE 3

Figure V-3 shows soil boring and monitoring well locations at Test Site 3. Test Site 3 was used for helicopter engine testing. Drums were stored on a level asphalt pad in the eastern corner of the site. Runoff from the asphalt drum storage area was primarily toward the northeast. Runoff that did not drain to the northeast tended to flow west to a 2-inch by 4-inch drainage trough cut into the paved helicopter test area which directed drainage northward. A shed west of Test Site 3 was used for storage of gardening implements and agricultural chemicals. All facilities at Test Site 3, including pavement, were demolished and removed in November 1986.

Soil samples were collected from six soil borings along the northeastern edge of the pavement. One of the soil borings was completed as a monitoring well to determine whether chemicals have migrated to the groundwater at this site. Following site demolition, soil samples were taken from ten additional shallow hand auger borings beneath the asphalt drum storage area. Physical characteristics of soil borings and the monitoring well at this site are given in Table V-7. Soils data are presented in Table V-8.

The soils at this site consist mostly of coarse textured sandy soils of rapid permeability. A 3-foot stratum of low permeability clayey soils was observed near the surface at SB-77, SB-13, and C-44. Groundwater at this site was observed at three to five feet below ground surface.

As shown in Table V-8 the chemical most frequently identified in samples from this site was benzene. Benzene was detected in soil borings SB-10 through SB-13, along the edge of the pavement, in concentrations ranging from 130 to 430 ppb. Other VOC's were detected at lower concentrations, including 1,1,1-trichloroethane in concentrations of 6 to 160 ppb.

Petroleum hydrocarbons were identified in SB-11 at 1900 ppm in the surface soil sample. Very low levels of PCB's (0.2 to 0.6 ppm) were detected in C-44 at 3.0 feet and in SB-11 at 0.5 feet.

The area of the gardening shed was investigated by collecting hand auger samples for pesticide and VOC analyses. Soil samples from six hand augers were analyzed using EPA Methods 8140 and 8080. The results of these analyses showed 11 ppb 4,4'-DDE in HA-10, and 15 ppb 4,4'-DDE and 32 ppb endrin aldehyde in HA-11. These compounds are breakdown products of DDT and endrin.

Soils at Test Site 3 do not exceed TTLC criteria for hazardous waste and VOCs are not present in concentrations which exceed 1,000 times the DHS Action Levels. TPH concentrations exceed 100 ppm in one isolated location at this site.

FIGURE V-3
TEST SITE 3

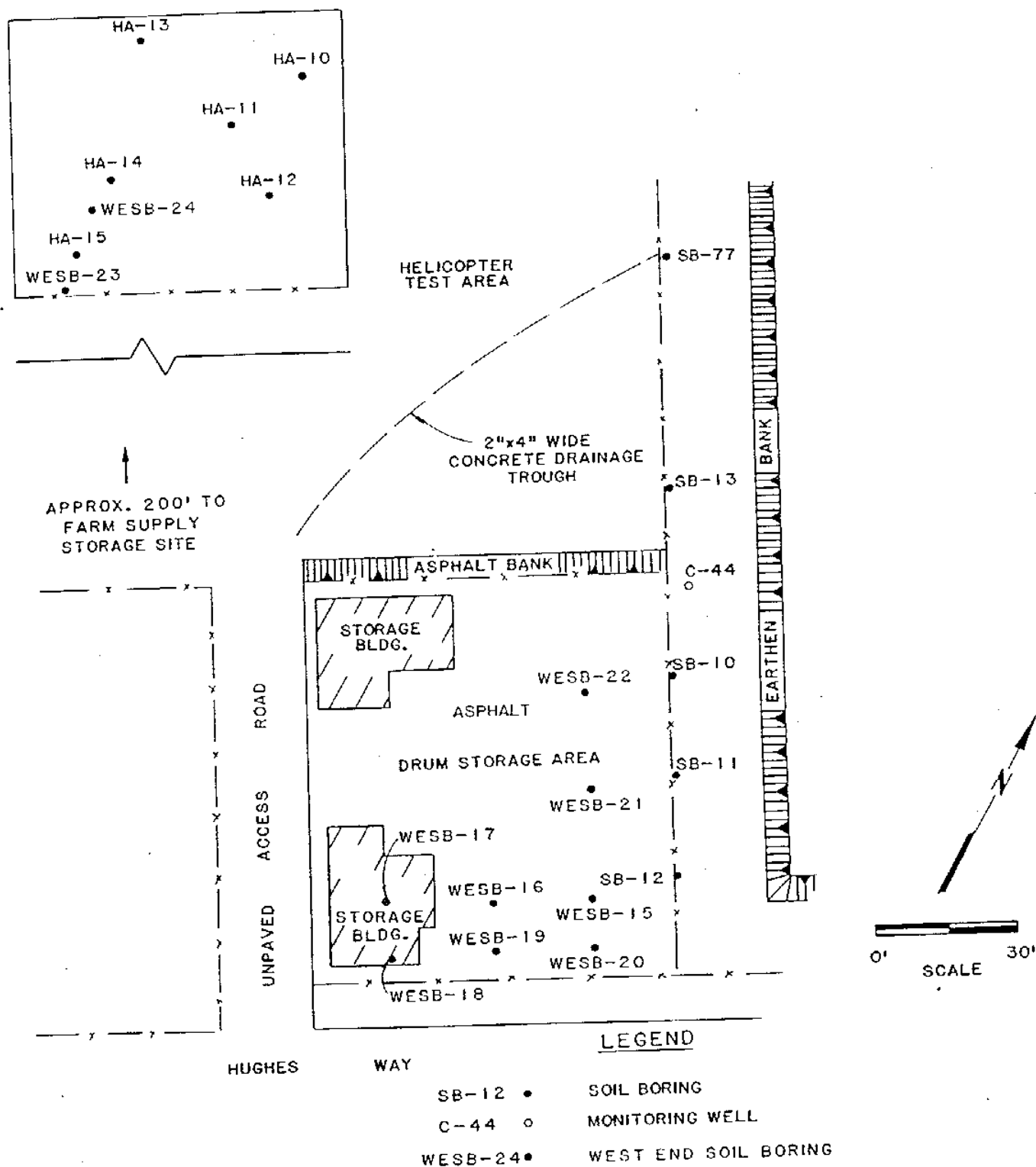


TABLE V-7

PHYSICAL CHARACTERISTICS OF SOIL BORINGS
AND MONITORING WELLS AT TEST SITE 3

<u>Location</u>	<u>Total Depth (feet)</u>	<u>Soil Sampling Depths (feet)</u>	<u>Analyses</u>				<u>Screened Interval (feet)</u>
			<u>VOC</u>	<u>TPH</u>	<u>PCB</u>	<u>Pesticides</u>	
SB-10	2.5	0.5, 2.0	X	X			---
SB-11	2.5	0.5, 2.0 ^a	X	X	X		---
SB-12	2.5	0.5, 2.0 ^a	X	X	X		---
SB-13	2.5	0.5, 2.0	X	X			---
SB-77	5.0	0.5, 2.5, 4.5	X	X			---
HA-10	1.0	0.5	X	X		X	---
HA-11	1.0	0.5	X	X		X	---
HA-12	1.0	0.5	X	X		X	---
HA-13	1.0	0.5	X	X		X	---
HA-14	1.0	0.5	X	X		X	---
HA-15	1.0	0.5	X	X		X	---
WESB-15	2.5	2.0	X	X			---
WESB-16	2.5	2.0	X	X			---
WESB-17	2.5	2.0	X	X			---
WESB-18	2.5	2.0	X	X			---
WESB-19	2.5	2.0	X	X			---

^a Not analyzed for PCB

TABLE V-7

PHYSICAL CHARACTERISTICS OF SOIL BORINGS
AND MONITORING WELLS AT TEST SITE 3
(CONTINUED)

<u>Location</u>	<u>Total Depth (feet)</u>	<u>Soil Sampling Depths (feet)</u>	<u>Analyses</u>				<u>Screened Interval (feet)</u>
			<u>VOC</u>	<u>TPH</u>	<u>PCB</u>	<u>Pesticides</u>	
WESB-20	2.5	2.0	X	X			---
WESB-21	2.5	2.0	X	X			---
WESB-22	2.5	2.0	X	X			---
WESB-23	2.5	2.0	X	X			---
WESB-24	2.5	2.0	X	X			---
C-44	30.0	0 ^a , 2.5, 4.5 ^a	X	X	X		20 - 30

^a Not analyzed for PCB

TABLE V-8
TEST SITE 3
SOIL SAMPLE ANALYTICAL RESULTS¹
(ppb)

Boring	Depth (ft.)	TPH (ppm)	1,1-DCA	Trans CHCl ₃	TCF	TCB	Benzene	Toluene	DCM	E. Benzene	Xylenes	1,2 DCP	1,3 DCP	1,4 DCP
HA-10	0.5													
HA-11	0.5													
HA-12	0.5													
HA-13	0.5													
HA-14	0.5													
HA-15	0.5								400					
SB-10	0.5 2.0				39		356 130							
SB-11	0.5 2.0	1852			11		434 176							
SB-12	0.5 2.0				66 6		338							
SB-13	0.5 2.0						187 188							
SB-77	0.5 2.5 4.5													
C-44	0.0 2.5 4.5													

30

blank = not detected
* = not analyzed
x = positive analysis
} = Where duplicate analyses were conducted the higher value is shown.

TABLE V-8

TEST SITE 3
(Continued)SOIL SAMPLE ANALYTICAL RESULTS¹
(ppb)

Borings	Depth (ft)	1,1 DCE	1,2 DCA	DECM	1,1,2,2-TCA	C-Benzene	CCl ₄	EDCM	CHBr ₃	1,2-DCP	1,1,2-TCA	Vinyl Chloride	TCFH	PCB	PNA	Heavy Metals	Pesticides
HA-10	0.5																x
HA-11	0.5																x
HA-12	0.5																
HA-13	0.5																
HA-14	0.5																
HA-15	0.5																
SB-10	0.5 2.0																
SB-11	0.5 2.0	6												200			
SB-12	0.5 2.0																
SB-13	0.5 2.0																
SB-77	0.5 2.5 4.5																
C-114	0.0 2.5 4.5																

Blank = not detected

■ = not analyzed

x = positive analysis

1 = Where duplicate analyses were conducted the higher value is shown.

TABLE V-8

TEST SITE 3
(Continued)SOIL SAMPLE ANALYTICAL RESULTS¹
(ppb)

Boring	Depth (ft)	TPH (ppm)	1,1 DCA	Trans CHCl ₃	TCA	TCE	Benzene	Toluene	DCM	E. Benzene	Xylenes	1,2 DCB	1,3 DCB	1,4 DCB
WESB-15	2.0	54												
WESB-16	2.0													
WESB-17	2.0													
WESB-18	2.0	24												
WESB-19	2.0	28												
WESB-20	2.0	14												
WESB-21	2.0	18												
WESB-22	2.0	22												
WESB-23	2.0													
WESB-24	2.0													

30

10

blank = not detected
 • = not analyzed
 x = positive analysis
 = Where duplicate analyses were conducted the higher value is shown.

TABLE V-8

TEST SITE 3
(Continued)SOIL SAMPLE ANALYTICAL RESULTS¹
(ppb)

Boring	Depth (ft)	1,1,1 DCE	1,1,2 DCA	DECM	1,1,1,2,2 TCA	C Benzene	CCl ₄	DDCM	CHCl ₃	1,2-DCE	1,1,2-TCA	Vinyl Chloride	TCFH	PCB	PNA	Heavy Metals	Pesticides
					160												
WESB-15	2.0																
WESB-16	2.0																
WESB-17	2.0																
WESB-18	2.0																
WESB-19	2.0																
WESB-20	2.0																
WESB-21	2.0																
WESB-22	2.0																
WESB-23	2.0																
WESB-24	2.0																

blank = not detected

= not analyzed

x = positive analysis

| = Where duplicate analyses were conducted the higher value is shown.

TEST SITE 2

Figure V-4 shows soil boring and monitoring well locations at Test Site 2. Test Site 2 was used for testing of aircraft equipment. Drums containing chemicals were stored on racks and on the level asphalt in the drum storage area south of the testing area. Since the asphalt was nearly level and no cracks in the pavement were observed, any leakage from drums which may have occurred would have infiltrated the soil northeast and south of the paved area. The areas adjacent to the other two sides of the drum storage area were paved. All facilities at Test Site 2, including pavement, were demolished and removed in November 1986.

Soil samples were collected from five soil borings along the northeast and south edge of the pavement. One of the soil borings was completed as a monitoring well to determine whether chemicals have migrated to the groundwater at this site. Following site demolition, soil samples were taken from eight additional shallow hand auger borings beneath the paved drum storage area. The physical characteristics of the soil borings and the monitoring well at this site are shown on Table V-9. Soils data are presented in Table V-10.

The soils at this site consist largely of low permeability clayey soils to a depth of 20 feet with strata of coarser textured sandy soils from ground surface to three feet and from seven to ten feet. Groundwater at this site was observed at three to five feet below ground surface.

As shown in Table V-10, the VOC most frequently identified in soils at this site was benzene, which was reported in the upper two feet at concentrations from 22 to 410 ppb. Benzene concentrations below two feet were less than 40 ppb. Very low levels of PCB's (0.2 ppm) were detected in one soil sample from soil boring C-38 at 0.5 feet. TPH was detected in the shallow soil samples taken from beneath the paved area in concentrations of 11 to 47 ppm.

Soils at Test Site 2 do not exceed TTLC criteria for hazardous waste, VOCs are not present in concentrations which exceed 1,000 times the DHS Action Levels, and TPH is not present in concentrations greater than 100 ppm.

FIGURE V-4
TEST SITE 2

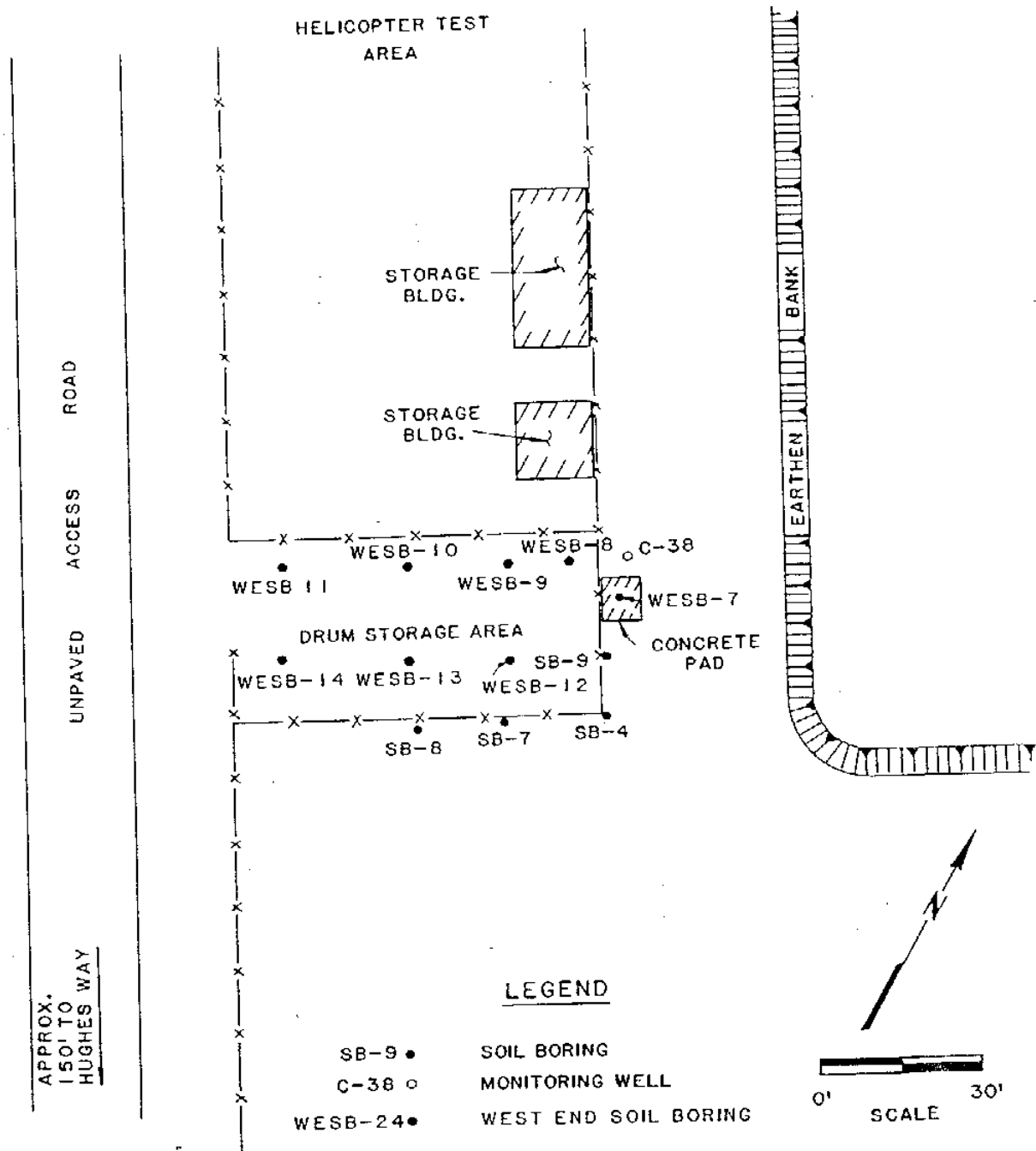


TABLE V-9

PHYSICAL CHARACTERISTICS OF SOIL BORINGS AND MONITORING WELLS
AT TEST SITE 2

Location	Total Depth (feet)	Soil Sampling Depths (feet)	Analyses			Screened Interval (feet)
			VOC	TPH	PCB	
SB-4	5.5	0.5, 4.5	X	X		---
SB-7	2.5	0.5, 2.0 ^a	X	X	X	---
SB-8	2.5	0.5, 2.0	X	X		---
SB-9	2.5	0.5, 2.0	X	X		---
WESB-7	2.5	2.0	X	X		---
WESB-8	2.5	2.0	X	X		---
WESB-9	2.5	2.0	X	X		---
WESB-10	2.5	2.0	X	X		---
WESB-11	2.5	2.0	X	X		---
WESB-12	2.5	2.0	X	X		---
WESB-13	2.5	2.0	X	X		---
WESB-14	2.5	2.0	X	X		---
C-38	58.0	0.5, 4.5 ^a , 9.5 ^a	X	X	X	48 - 58

^a Not analyzed for PCB

TABLE V-10

TEST SITE 2

SOIL SAMPLE ANALYTICAL RESULTS¹
(ppb)

Boring	Depth (ft)	pH (ppm)	1,1 DCA	Trans CHCl ₃	TCA	ICE	Benzene	Toluene	DCM	E. Benzene	Xylenes	1,2 DCB	1,3 DCB	1,4 DCB	PCE
SB-4	0.5 4.5				3		22 25								
SD-7	0.5 2.0						406 319								
SB-8	0.5 2.0						271 274								
SB-9	0.5 2.0						262 290		45						
C-38	0.5 4.5 9.5						34 35 38								
WESB-7	2.0														
WESB-8	2.0														
WESB-9	2.0	47													
WESB-10	2.0	11													
WESB-11	2.0	17		60											
WESB-12	2.0	16													
WESB-13	2.0	16										80			
WESB-14	2.0	15		80				40							

blank = not detected

* = not analyzed

x = positive analysis

† = where duplicate analyses were conducted the higher value is shown.

TABLE V-10

TEST SITE 2
(Continued)SOIL SAMPLE ANALYTICAL RESULTS¹
(ppb)

Boring	Depth (ft)	1,1 DCE	1,2 DCA	DBCH	1,1,2,2 TCA	C. Benzene	CCl ₄	BDCH	CHCl ₃	1,2-DCP	1,1,2-TCA	Vinyl Chloride	ICFH	PCB	PNA	Heavy Metals	Pesticides
SB-4	0.5 4.5																
SB-7	0.5 2.0	2															
SB-8	0.5 2.0																
SB-9	0.5 2.0																
C-38	0.5 4.5 9.5													200			
WESB-7	2.0																
WESB-8	2.0																
WESB-9	2.0																
WESB-10	2.0																
WESB-11	2.0																
WESB-12	2.0																
WESB-13	2.0																
WESB-14	2.0																

blank = not detected

* = not analyzed

x = positive analysis

† = Where duplicate analyses were conducted the higher value is shown.

TEMPORARY DRUM STORAGE AREA

Figure V-5 shows soil boring and monitoring well locations at the Temporary Drum Storage Area. The Temporary Drum Storage Area consists of an asphalt area south of Building 29 and an unpaved area east of the building. The paved storage area slopes toward the north. A soil boring was located down-drainage from the paved area in the path of surface runoff. The unpaved storage area is fairly level, although shallow drainage gullies were observed in the vicinity of the shallow soil borings. Soil borings were located in the unpaved area where gullies collected drainage from the area.

Soil samples were collected from one boring down drainage from the paved storage area, and also from five soil borings in the unpaved area to determine whether leakage from drums would have infiltrated into the soil. Two soil borings were completed as monitoring wells to determine whether chemicals have migrated to the groundwater at this site. The physical characteristics of soil borings and monitoring wells at this site are presented in Table V-11. Soils data are presented in Table V-12.

Soils in the unpaved storage area consist of coarse textured sandy soils of high permeability. Soils in the paved storage area include a low permeability clayey layer from 8 to 17 feet. Groundwater was observed at 9 to 13 feet below ground surface.

As shown in Table V-12, benzene was detected at 140 to 250 ppb and dichloromethane at 43 ppb in soil samples taken from C-42, located downslope from the paved area. In the unpaved area, low levels of VOC's were detected including chloroform, at 60 to 100 ppb, 1,1,1-trichloroethane, at 120 to 200 ppb, and trichloroethylene at 70 ppb.

Total petroleum hydrocarbons were below 100 ppm in all samples except for one surface sample at SB-48, which had 2600 ppm. One surface soil sample from SB-45 contained a very low level of PCB's (2 ppm).

Soils at the Temporary Drum Storage Area do not exceed TTLC criteria for hazardous waste and VOCs are not present in concentrations which exceed 1,000 times the DHS Action Levels. TPH concentrations exceed 100 ppm in one isolated location at this site.

FIGURE V-5
TEMPORARY DRUM
STORAGE AREA

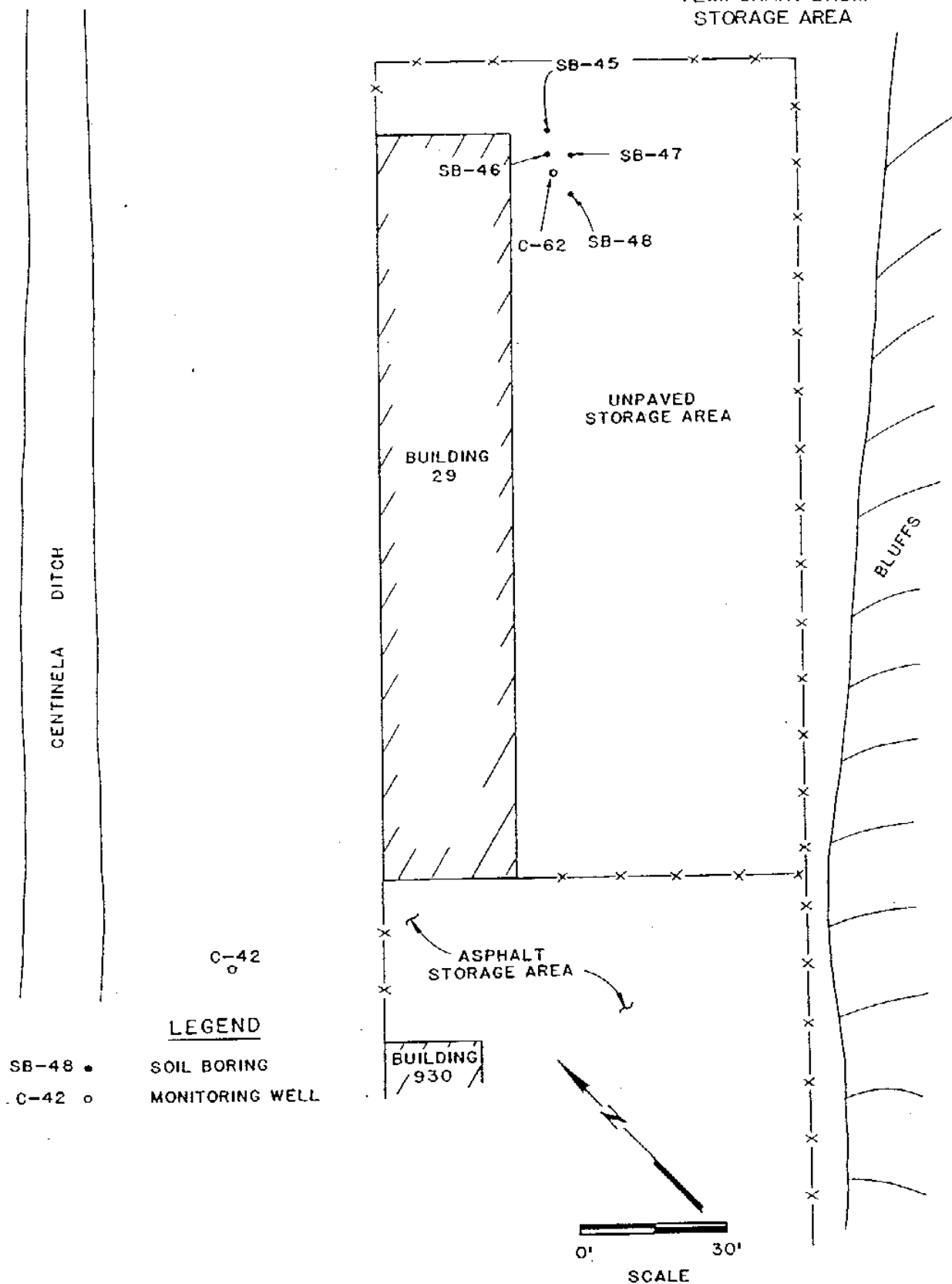


TABLE V-11

PHYSICAL CHARACTERISTICS OF SOIL BORINGS AND MONITORING WELLS
AT THE TEMPORARY DRUM STORAGE AREA

<u>Location</u>	<u>Total Depth (feet)</u>	<u>Soil Sampling Depths (feet)</u>	<u>Analyses</u>			<u>Screened Interval (feet)</u>
			<u>VOC</u>	<u>TPH</u>	<u>PCB</u>	
SB-45	2.5	0, 1.0, 2.0	X	X	X	---
SB-46	2.0	0, 1.0	X	X	X	---
SB-47	1.0	0	X	X		---
SB-48	3.5	0, 1.0, 2.0, 3.0	X	X		---
C-42	30.0	0.5, 4.5, 9.5	X	X		20 - 30
C-62	38.0	0.5, 4.5, 9.5, 14.5, 19.5, 24.5, 29.5	X	X		25 - 35

TABLE V-12

TEMPORARY CHEMICAL DRUM STORAGE AREA

SOIL SAMPLE ANALYTICAL RESULTS¹
(ppb)

Boring	Depth (ft.)	TPH (ppm)	1,1 DCA	Trans	CHCl ₃	ICA	TCF	Benzene	Toluene	DCM	E Benzene	Xylenes	1,2 DCB	1,3 DCB	1,4 DCB
SB-45	0.0	76			100										
	1.0	22													
	2.0														
SB-46	0.0	18													
	1.0														
SB-47	0.0	84													
SB-48	0.0	2600													
	1.0														
	2.0														
	3.0														
C-12	0.5														
	4.5														
	9.5														
C-62	0.5														
	4.5														
	9.5														
	14.5														
	19.5														
	24.5														
	29.5														

blank = not detected

" = not analyzed

X = positive analysis

1 = Where duplicate analyses were conducted the higher value is the shown.

TABLE V-12

TEMPORARY CHEMICAL DRUM STORAGE AREA
(Continued)SOIL SAMPLE ANALYTICAL RESULTS¹
(ppb)

Boring	Depth (ft)	1,1 DCE	1,2 DCA	DECM	1,1,2,2-TCA	C. Benzene	CCl ₄	BDCM	CHBr ₃	1,2-DCP	1,1,2-TCA	Vinyl Chloride	TCFM	PCB	PNA	Heavy Metals	Pesticides
SB-45	0.0													200			
	1.0																
	2.0																
SB-46	0.0																
	1.0																
SB-47	0.0																
SB-48	0.0																
	1.0																
	2.0																
	3.0																
C-42	0.5																
	4.5																
	9.5																
C-62	0.5																
	4.5																
	9.5																
	14.5																
	19.5																
	24.5																
	29.5																

Blank = not detected

* = not analyzed

x = positive analysis

1 = Where duplicate analyses were conducted the higher value is shown.

REMOTE TEST SITE

Figure V-6 shows soil boring and monitoring well locations at the Remote Test Site. The Remote Test Site was used for testing of aircraft components and engines. Three sumps were formerly located at the site. Most facilities at the Remote Test Site, including pavement, were demolished and removed in November 1986.

Soil samples were collected from fourteen soil borings at the Remote Test Site and from a small burn area at the site. Two soil borings were completed as monitoring wells to determine whether chemicals have migrated into the groundwater beneath this site. Physical characteristics of soil borings and monitoring wells at this site are given in Table V-13. Soils data are presented in Tables V-14 and V-15.

The soils at this site consist of coarse textured soils of rapid permeability with discontinuous, two to five foot thick strata of finer textured soils of low permeability in the upper ten feet of soil. Groundwater at this site was observed at six to eight feet below ground surface.

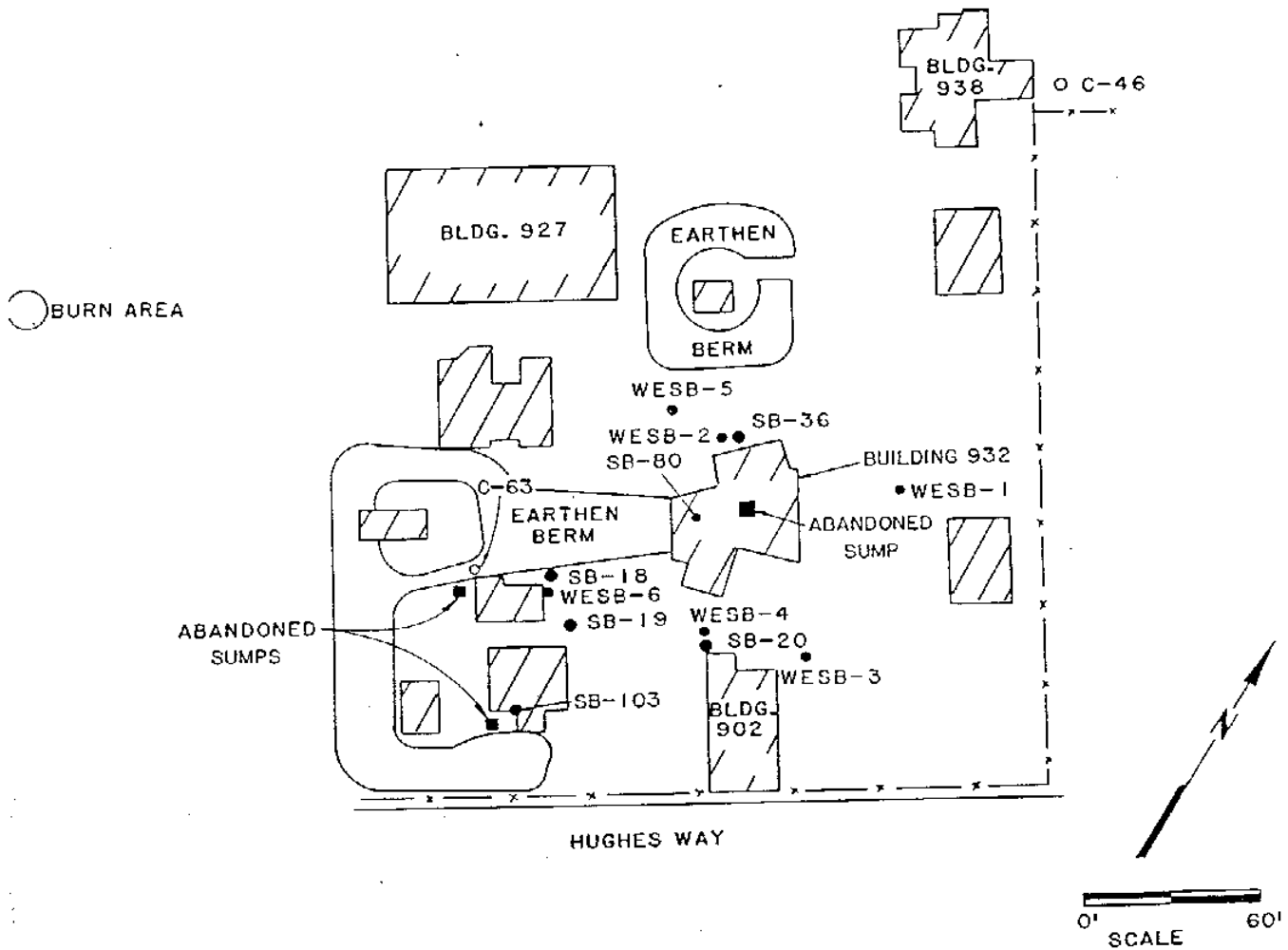
As shown in Table V-14, low concentrations of VOC's were found in several borings at this site. The most frequently detected VOC was benzene, in concentrations ranging from 25 to 340 ppb. Dichloromethane was detected in approximately one-third of the samples at concentrations ranging from 10 to 890 ppb. Other VOC's detected at lower concentrations at this site included 1,3-dichlorobenzene, 1,1-dichloroethylene, and chloroform.

Total petroleum hydrocarbons were detected above 100 ppm in one sample from the saturated zone in soil boring C-63. One very low level of PCB (1.0 ppm) was detected in C-46 at 0.5 feet.

There is a small burn area southwest of Building 927 which is approximately three feet in diameter. One sample of surface soil was collected from the burn area and analyzed for metals, semi-volatile compounds, pesticides, and VOC's. No VOC's or other organics were detected. One pesticide, 3-BHC, was detected at 20 ppb. Elevated concentrations of copper, 7,000 ppb, were detected, as shown in Table V-15.

Soils at the burn area southwest of Building 927 are classified as hazardous waste because the copper concentration exceeds TTLC. Because copper is nearly immobile in soils, elevated copper concentrations are assumed to be confined to the surface soils. Other soils at the Remote Test Site do not exceed TTLC criteria for hazardous waste and VOCs are not present in concentrations which exceed 1,000 times the DHS Action Levels. TPH concentrations only exceed 100 ppm in a single soil sample taken from the saturated zone.

FIGURE V-6
REMOTE TEST SITE



LEGEND

- SB-20 ● SOIL BORING
- C-46 ○ MONITORING WELL
- WESB-24 ● WEST END SOIL BORING



TABLE V-13

PHYSICAL CHARACTERISTICS OF SOIL BORINGS AND MONITORING WELLS
AT THE REMOTE TEST SITE

Location	Total Depth (feet)	Soil Sampling Depths (feet)	Analyses			Screened Interval (feet)
			VOC	TPH	PCB	
SB-18	8.5	0.5, 2.5, 4.5	X	X		---
SB-19	8.0	0.5 ^a , 2.5, 4.5 ^a	X	X	X	---
SB-20	7.0	0.5, 2.5, 4.5	X	X		---
SB-36	10.0	0.5, 4.5	X	X		---
SB-80	20.0	0.5, 2.5, 4.5, 6.5, 14.5, 19.5	X	X		---
SB-103	20.0	0.5, 4.5, 9.5, 14.5, 19.5	X	X		---
WESB-1	2.5	2.0	X	X		---
WESB-2	4.0	2.0, 3.5	X	X		---
WESB-3	2.5	2.0	X	X		---
WESB-4	4.0	2.0, 3.5	X	X		---
WESB-5	2.5	2.0	X	X		---
WESB-6	4.0	2.0, 3.5	X	X		---
C-46	30.0	0, 2.5 ^a , 4.5 ^a	X	X	X	20 - 30
C-63	38.0	0.5, 4.5, 9.5, 14.5, 19.5, 24.5	X	X		25 - 35
Burn Area	0	0 ^b	X	X		---

^a Not analyzed for PCB

^b Also analyzed for heavy metals, pesticides, and semi-volatile organics

TABLE V-14

REMOTE TEST SITE

SOIL SAMPLE ANALYTICAL RESULTS¹

Boring	Depth (ft)	TPH (ppm)	1,1-DCA	Trans CHCl ₃	TCA	ICE	Benzene	Toluene	DCM	E. Benzene	Xylenes	1,2-DCB	1,3-DCB	1,4-DCB	PCE
SB-18	0.5				5		25		10						
	2.5				11		36								
	4.5				13		28		130						
SB-19	0.5		4		7		24		10						
	2.5				26		160	8	890						
	4.5				18		81								
SB-20	0.5				3		150		14				500		
	2.5				6		190	4	100						
	4.5				4	6	80		75						
SB-36	0.5	*					330								
	4.5	*				5	340								
SB-80	0.5							40		20	90				
	2.5							50			60				
	4.5	11													
	14.5	20													
	19.5	62													
SB-103	0.5							30	200		100				50
	4.5							20			20	60			100
C-46	0.0				4		100		12						
	2.5				5		100		260						
	4.5				3	6	76		290				2		
C-63	0.5			30											
	4.5														
	9.5														
	14.5														
	19.5	200													
	24.5														
Burn ² Area	0.0	24													
										20				100	
										30				40	

blank = not detected

* = not analyzed

x = positive analysis

2 = Analyzed for semi-volatile organics, none detected

1 = Where duplicate analyses were conducted the higher value is shown.

TABLE V-14

REMOTE TEST SITE
(Continued)SOIL SAMPLE ANALYTICAL RESULTS¹
(ppb)

Boring	Depth (ft.)	1,1 DCE	1,2 DCA	DECH	1,1,2,2 TCA	C Benzene	CCl ₄	BDCM	CHBr ₃	1,2-DOP	1,1,2-ICA	Vinyl Chloride	TCFM	PCB	PNA	Heavy Metals	Pesticides
SB-18	0.5																
	2.5				2												
	4.5																
SB-19	0.5																
	2.5	6			3												
	4.5	8															
SB-20	0.5																
	2.5																
	4.5																
SB-36	0.5																
	4.5																
SB-80	0.5																
	2.5																
	4.5																
	6.5																
	14.5																
	19.5																
SB-103	0.5																
	4.5																
	9.5																
	14.5																
	19.5																
C-46	0.0													1000			
	2.5																
	4.5																
C-63	0.5																
	4.5																
	9.5																
	14.5																
	19.5																
	24.5																
Burn Area	C.0																

blank = not detected

not analyzed

positive analysis

Where duplicate analyses were conducted the higher value is shown.

TABLE V-14

 REMOTE TEST SITE
 (Continued)
 SOIL SAMPLE ANALYTICAL RESULTS¹
 (ppb)

Depth (ft)	TPH (ppm)	1,1 DCA	Trans	CHCl ₃	TCa	TCF	Benzene	Toluene	DCM	E. Denezene	Xylenes	1,2 DCB	1,3 DCB	1,4 DCB	PCB
WESB-1	2.0	14													
WESB-2	2.0														
	3.5														
WESB-3	2.0	15													
WESB-4	2.0	10													
	3.5	14													
WESB-5	2.0														
WESB-6	2.0														
	3.5														

30

blank = not detected

* = not analyzed

† = positive analysis

‡ = Where duplicate analyses were conducted the higher value is shown.

TABLE V-14

REMOTE TEST SITE
(Continued)SOIL SAMPLE ANALYTICAL RESULTS¹
(ppb)

Boring	Depth (ft)	1,1 DCE	1,2 DCA	DBCH	1,1,2,2 TCA	C Benzene	CCl ₄	BDCH	CHCl ₃	1,2-DCE	1,1,2-ICA	Vinyl Chloride	TCFM	PCB	PNA	Heavy Metals	Pesticides
WESB-1	2.0																
WESB-2	2.0																
	3.5																
WESD-3	2.0																
WESB-4	2.0																
	3.5																
WESB-5	2.0																
WESD-6	2.0																
	3.5																

blank = not detected

* = not analyzed

x = positive analysis

| = Where duplicate analyses were conducted the higher value is shown.

TABLE V-15

REMOTE TEST SITE
HEAVY METAL RESULTS¹
(ppm)

<u>Boring</u>	<u>Depth (ft.)</u>	<u>Ag</u>	<u>As</u>	<u>Ba</u>	<u>Be</u>	<u>Cd</u>	<u>Co</u>	<u>Cr</u>	<u>Cu</u>	<u>Hg</u>	<u>Mo</u>	<u>Ni</u>	<u>Pb</u>	<u>Sb</u>	<u>Se</u>	<u>Tl</u>	<u>V</u>	<u>Zn</u>
Burn Area	0.0	4.9	31	43	0.13	12	4.6	30	7000		13	37	710	15				870

¹ Where duplicate analyses were conducted the higher value is shown.

SALVAGE YARD

Figure V-7 shows soil boring and monitoring well locations at the Salvage Yard. The Salvage Yard has been used for storage of chemicals and wastes from manufacturing as well as for salvaging used process equipment and supplies. Facilities at the Salvage Yard include three waste solvent sumps, one waste oil sump, chemical drum storage racks, a leakage collection tray and sump, and a surface drain and sump.

Soil samples were collected from 35 soil borings at the Salvage Yard. Six soil borings were completed as monitoring wells and two additional monitoring wells were drilled to determine whether chemicals have migrated into the groundwater at this site. Physical characteristics of soil borings and monitoring wells at this site are given in Table V-16. Soils data are presented in Tables V-17, V-18, and V-19.

The soil in the Salvage Yard consists mostly of coarse textured sandy soils of rapid permeability with a discontinuous stratum of finer textured clayey soils of low permeability beginning approximately five feet from ground surface. This low permeability stratum is absent at the south of the site at SB-6, approximately two feet thick in the center of the site at C-39, and approximately 25 feet thick on the north side of the site at C-5. Groundwater was observed at 12 to 13 feet below ground surface on the south side of the site and approximately 7 feet below ground surface on the north side.

Liquid from the leakage sump, the solvent sump, and the sump south of Building 23 was sampled and analyzed for VOC's, TPH, PCB's, and heavy metals. The leakage sump contained low levels of VOC's (100 ppb 1,1,1-trichloroethane, 40 ppb 1,1-dichloroethane, and 1 ppb toluene), 1.6 ppm TPH, and low levels of metals (0.06 ppm barium, 0.04 ppm chromium, 0.10 ppm copper, 0.03 ppm molybdenum, 0.08 ppm antimony, 0.02 ppm vanadium, and 0.21 ppm zinc). The solvent sump contained 4.2 ppm TPH and low levels of metals (0.01 ppm silver, 0.35 ppm barium, 0.24 ppm cobalt, 0.07 ppm chromium, 0.12 ppm copper, 0.02 ppm molybdenum, 1.2 ppm nickel, 0.05 ppm vanadium, and 1.0 ppm zinc). The sump south of Building 23 contained low levels of heavy metals (0.23 ppm barium and 0.04 ppm zinc). PCB's were not detected in any sump.

As shown in Table V-17, the highest concentrations of VOC's in soils at the Salvage Yard were detected near the leakage collection sump. Soil samples from C-41, adjacent to the sump, had VOC's in the range of 1000 to 100,000 parts per billion. VOC's with the highest concentrations at C-41 were xylenes (1,320 to 140,000 ppb), 1,1,1-trichloroethane (335 to 54,000 ppb), ethylbenzene (35 to 25,000 ppb), and trichloroethylene (163 to 20,000 ppb). Other VOC's were detected around the leakage collection sump including dichloromethane, 1,1-dichloroethylene, chloroform, bromoform, 1,2-dichloroethane, 1,1,2,2-tetrachloroethane, carbon tetrachloride, and bromodichloromethane. Petroleum hydrocarbons exceeding 100 ppm were detected in C-41 at 11.5 feet. Volatile organic

chemicals were detected at concentrations exceeding 1000 ppb at distances of up to 40 feet from the leakage collection sump at soil borings SB-61, SB-73, SB-78, SB-79, and SB-108.

Chemicals extend from the surface down to the water table beneath the leakage collection tray and sump. Chemicals in the unsaturated soils have migrated laterally to the north of the leakage collection area at soil borings SB-73, SB-78, SB-56, and SB-61. Beyond this area, VOC concentrations in unsaturated soils decrease.

VOC's above 1000 ppb were also detected in soil samples taken near the solvent sump northeast of Building 23. TCE was detected in concentrations of 3,000 ppb adjacent to the sump at soil boring C-5. Dichloromethane was measured in the unsaturated zone from 250 to 390 ppb northeast of the sump at soil boring SB-98. Other VOC's detected in this area include trichloroethylene, 1,1-dichloroethylene, chloroform, and bromoform. Soils in the vicinity of other sumps in the Salvage Yard showed VOCs below 200 ppb.

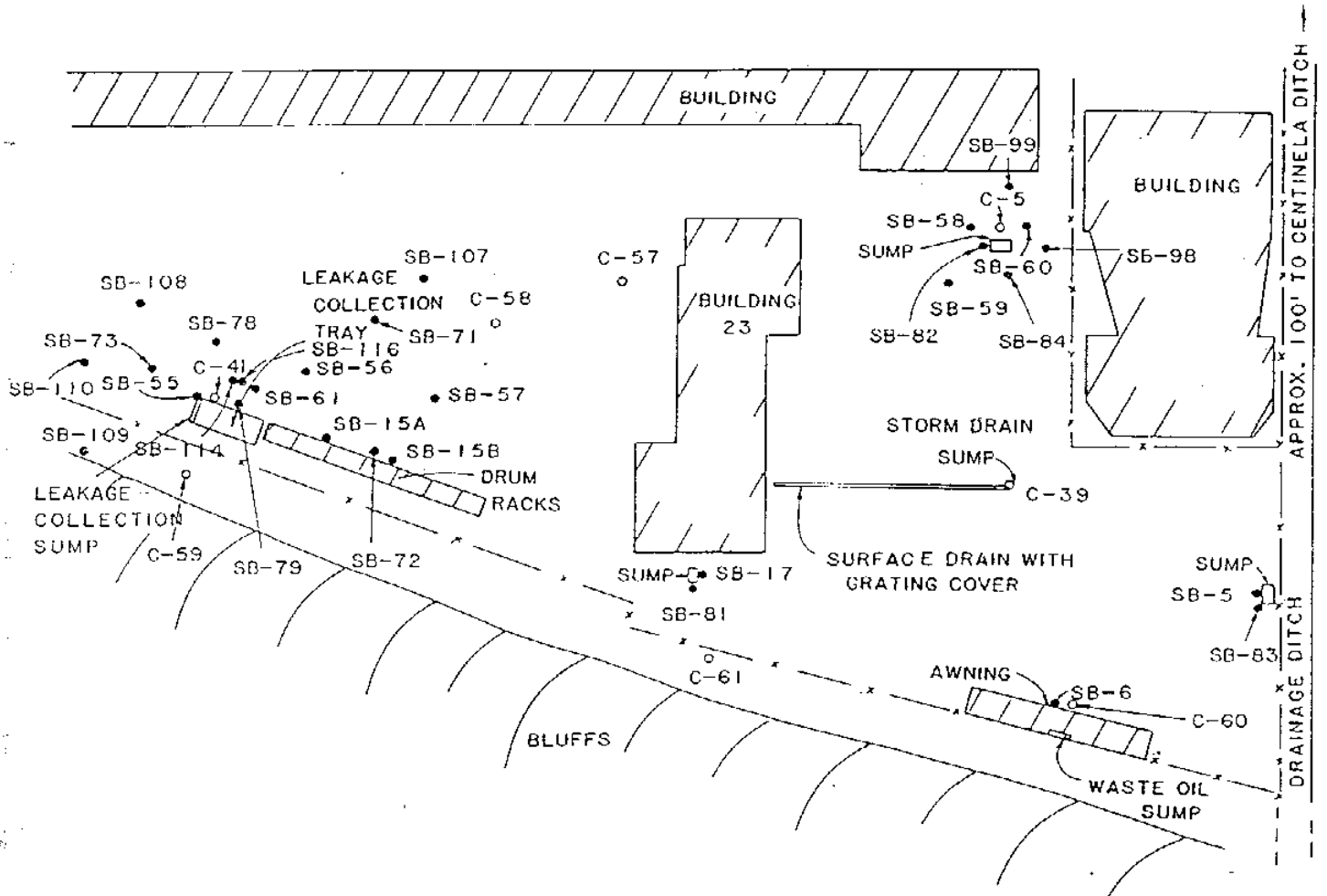
Soils with greater than 100 ppm TPH were detected in surface samples at the waste solvent sump northeast of Building 23, the surface drain sump, and the waste oil sump.

PCB's were detected in two samples from C-60; 29,000 ppb at 0.5 feet and 7,000 ppb at 9.5 feet. As shown in Table V-18, several heavy metals were detected in soil samples taken from SB-114. The metals detected are within the range which can be considered naturally occurring and are not believed to reflect activities at the site.

As shown in Table V-19, samples from SB-114 were analyzed for EP Toxicity Criteria (RCRA Hazardous Waste criteria), a sample from SB-116 had ignitability and corrosivity tests performed to demonstrate the nonhazardous nature of the soils, and samples from SB-55 and SB-58 were subjected to 96-hour LC₅₀ fish bioassays. Results of these analyses showed that these soils do not warrant classification as hazardous waste. In a letter dated February 26, 1987, from the State Department of Health Services, it is stated that these soils are nonhazardous according to standards and methods contained in the California Administrative Code (CAC), Division 4, Title 22 regulations.

Toxicity determinations using fish bioassays were not conducted on soil samples from beneath the sumps or on soils with the highest chemical concentrations. Soils immediately beneath the leakage collection tray sump, the sump northeast of Building 23, and the waste oil sump are presumed to be classified as hazardous according to the fish bioassay criterion. VOCs detected in soils in the vicinity of the leakage tray collection sump, at boring C-41, exceed 1,000 times the DHS Action Levels. TPH concentrations exceed 100 ppm in surface and near surface soils adjacent to several of the Salvage Yard sumps.

FIGURE V-7
SALVAGE YARD



LEGEND

- SB-17 • SOIL BORING
- C-39 ○ MONITORING WELL

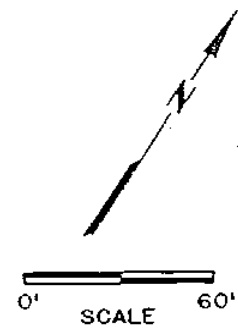


TABLE V-16

PHYSICAL CHARACTERISTICS OF SOIL BORINGS AND MONITORING WELLS
AT THE SALVAGE YARD

Location	Total Depth (feet)	Soil Sampling Depths (feet)	Analyses			Screened Interval (feet)
			VOC	TPH	PCB	
SB-5	15	0.5, 4.5, 9.5, 14.5	X	X		---
SB-6	15	0.5 ^a , 4.5 ^a , 9.5, 14.5 ^a	X	X	X	---
SB-15A	5	0.5, 2.5, 4.5	X	X		---
SB-15B	5	0.5, 2.5, 4.5	X	X		---
SB-17	15	0.5 ^a , 2.5, 4.5 ^a , 9.5 ^a , 14.5 ^a	X	X	X	---
SB-55	10	2.5, 5.5, 9.5	X	X		---
SB-56	10	3.5, 5.5, 9.5	X	X		---
SB-57	10	2.5, 5.5, 9.5	X	X		---
SB-58	10	2.5, 5.5, 9.5	X	X		---
SB-59	10	4.5, 9.5	X	X		---
SB-60	10	4.5, 9.5	X	X		---
SB-61	30	4.5, 9.5, 14.5, 19.5	X	X		---
SB-71	15	0.5, 4.5, 9.5, 14.5	X	X		---
SB-72	20	0.5, 4.5, 9.5, 14.5, 19.5	X	X		---

^a Not analyzed for PCB

TABLE V-16

PHYSICAL CHARACTERISTICS OF SOIL BORINGS AND MONITORING WELLS
AT THE SALVAGE YARD
(Continued)

<u>Location</u>	<u>Total Depth (feet)</u>	<u>Soil Sampling Depths (feet)</u>	<u>Analyses</u>			<u>Screened Interval (feet)</u>
			<u>VOC</u>	<u>TPH</u>	<u>PCB</u>	
SB-73	12	0.5, 4.5, 9.5	X	X		---
SB-78	15	0.5, 4.5, 9.5, 14.5	X	X		---
SB-79	30	0.5, 4.5, 9.5, 16.0, 19.5, 24.5, 29.5	X	X		---
SB-81	25	0.5, 3.0, 6.5, 9.5, 14.5, 19.5, 24.5	X	X	X	---
SB-82	30	0.5, 4.5, 12.0, 14.5, 19.5, 24.5, 29.5	X	X	X	---
SB-83	30	0.5, 3.0, 6.5, 9.5, 14.5, 19.5, 24.5	X	X	X	---
SB-84	15	0.5, 3.0, 6.5, 9.5, 14.5	X	X		---
SB-98	15	0.5, 2.5, 4.5, 6.5, 9.5, 14.5	X	X	X	---
SB-99	15	0.5, 2.5, 4.5, 6.5, 9.5, 14.5	X	X	X	---
SB-107	30	0.5, 4.5, 9.5, 14.5, 19.5, 24.5, 29.5	X	X		---

TABLE V-16

PHYSICAL CHARACTERISTICS OF SOIL BORINGS AND MONITORING WELLS
AT THE SALVAGE YARD
(Continued)

Location	Total Depth (feet)	Soil Sampling Depths (feet)	Analyses			Screened Interval (feet)
			VOC	TPH	PCB	
SB-108	25	0.5, 4.5, 9.5, 14.5, 19.5, 24.5	X	X		---
SB-109	25	0.5, 4.5, 9.5, 14.5, 19.5, 24.5	X	X		---
SB-110	20	0.5, 4.5, 9.5, 14.5, 19.5	X	X		---
SB-114	4.5	4.0 ^c				---
SB-116	4.0	3.5 ^d				---
C-5	35.5	8.0 ^b	X	X		25.5-35.5
C-39	58	0.5, 4.5, 9.5, 14.5	X	X		48 - 58
C-41	30	0.5, 2.0, 4.5, 6.5, 9.5, 11.5, 14.5, 16.0	X	X		20 - 30
C-57	120	---				97 - 117
C-58	82	---				60 - 80
C-59	38	0.5, 4.5, 9.5, 14.5, 19.5, 24.5, 29.5, 34.5	X	X		25 - 35
C-60	38	0.5, 6.0, 9.5, 14.5	X	X	X	25 - 35
C-61	38	0.5, 4.5, 9.5, 14.5, 19.5, 24.5, 29.5	X	X		25 - 35

^b Also analyzed for pesticides and organic acid/base/neutral compounds.

^c Analyzed for EP Toxicity Criteria and heavy metals only.

^d Analyzed for ignitability and corrosivity only.

TABLE V-17

SALVAGE YARD

SOIL SAMPLE ANALYTICAL RESULTS¹
(ppb)

Borings	Depth (ft.)	TPH (ppm)	1,1 DCA	Trans	CHCl ₃	TCF	TCF	Benzene	Toluene	DCM	E. Benzene	Xylenes	1,2 DCB	1,3 DCB	1,4 DCB	PCB
SB-5	0.5							197								
	4.5							66								
	9.5							125		43						
	14.5							81								
SB-6	0.5	9409														
	4.5		4			5	17	52								
	9.5		24				7	106								
	14.5						14	69								
SB-15A	0.5															
	2.5					85	211	201			2	23				
	4.5					25	79	138	14		138	841				
			6			507	852	221								
SB-15B	0.5					15	41	159	3		11	20				
	2.5					117	238	171	4		63	757				
	4.5					13	7	147	3		32	68				
SB-17	0.5															
	2.5					3	99	43		70						
	4.5						10	26		39						
	9.5					6	5	32		8						
	14.5		5			9	2	25		10						
SB-55	2.5	13		30		190	110		10							
	5.5		200	270	80	820	230	10	110				40		70	
	9.5		80	120	50	350	110	7	110		87	110	11		15	
SB-56	3.5	14	100			340	860									
	5.5		100			100										
	9.5	12	270	30		560	1300									
SB-57	2.5					60	50									
	5.5	93				90	50				50					
	9.5					40										
SB-58	2.5					100	30									
	4.5					20										
	9.5		20	30		60	30									
SB-59	4.5					20										
	9.5		50			40										

blank = not detected

* = not analyzed

= positive analysis

Where duplicate analyses were conducted the higher value is shown.

TABLE V-17

SALVAGE YARD
(Continued)

SOIL SAMPLE ANALYTICAL RESULTS ¹													
Boring	Depth (ft)	1,1 DCE	1,2 DCA	DECH	1,1,2,2 TCA	C. Benzene	CCl ₄	EDCH	CHC ₃	1,2-DCP	1,1,2-TCA	Chloride	TCDF
SB-5	0.5												
	4.5												
	9.5												
	14.5												
SB-6	0.5				5					43			
	4.5	46								85			
	9.5												
	14.5												
SB-15A	0.5				10								
	2.5				6	2							
	4.5	20		1		2							
SB-15B	0.5				3								
	2.5				15								
	4.5												
SB-17	0.5		160										
	2.5						9						
	4.5												
	9.5												
	14.5												
SB-55	2.5				30								
	5.5												
	9.5		110					50		20			
SB-56	3.5			100									
	5.5												
	9.5	100											
SB-57	2.5												
	5.5												
	9.5												
SB-58	2.5			15									
	5.5												
	9.5												
SB-59	4.5		50										
	9.5												

blank = not detected

x = not analyzed

✓ = positive analysis

1 = Where duplicate analyses were conducted the higher value is shown.

TABLE V-17

SALVAGE YARD
(Continued)SOIL SAMPLE ANALYTICAL RESULTS¹
(ppb)

Boring	Depth (ft.)	TFH (ppm)	1,1 DCA	Trans	CHCl ₃	TCA	ICE	Benzene	Toluene	DCM	E. Benzene	Xylenes	1,2 DCB	1,3 DCB	1,4 DCB	Pt
SB-60	4.5	68	40	20	30	100	490		20							70
	9.5	18	140	370	20	100	450		80		30	40	20	20	50	1
SB-61	4.5		200	100	100	1200	1400		150							
	9.5		140	60	50	1000	1100			290	140	225				
	14.5		210	80	90	1500	2300		410	4200	10	10			30	
	19.5		230	50	60	560	2500		680	6900	230	590				
SB-71	0.5				40						530	1400				50
	4.5				340			20			30	20				
	9.5				30						20	20				
	14.5				60				60	890	10	10				
SB-72	0.5				60		80		10		30	10			90	
	4.5	31													20	
	9.5				60		90				20					
	19.5				30		110		10		10		10			
SB-73	0.5		70	100	20	560	400				40					
	4.5		100	200	100	560	580		60	720	30	30			30	
	9.5		220	250	140	1500	1100	20	50	840	70	250				
SB-78	0.5		100	100	100	580	1000			100					10	
	4.5		300	100	100	1800	2300			100	40	20				
	9.5		200	40	80	820	2200		20	200	40	40				
	14.5		100	200	100	1700	1500		200	80	80	300				
SB-79	0.5		100	200	100	1800	1700		20	80	80	40	20			
	4.5	19	200	300	200	1800	2000			50	50	20	20			
	9.5		100	80	100	680	520		50	250	200	520			30	
	16.0		110	70	60	1800	2300		1100	2400	590	1530			30	
	19.5		80	20	90	250	1000		70	650	110	240				
	24.5		70	100	100	320				40	100	190				
	29.5		50		70	60	370		30	370	60	120				

blank = not detected

* = not analyzed

X = positive analysis

} = Where duplicate analyses were conducted the higher value is shown.

TABLE V-17

SALVAGE YARD
(Continued)SOIL SAMPLE ANALYTICAL RESULTS¹
(ppb)

Boring	Depth (ft.)	1,1-DCE	1,2-DCE	BCH	1,1,2,2-TCA	C Benzene	CCl ₄	BCH	CHCl ₃	1,2-DCE	1,1,2-TCA	Vinyl Chloride	TCFH	PCB	PNA	Heavy Metals	Pesticides
SB-60	4.5																
	9.5	20															
SB-61	4.5	80		100													
	9.5	120		80													
	14.5	1600	120	100													
	19.5	1700	70														
SB-71	0.5																
	4.5																
	9.5																
	14.5																
SB-72	0.5			60													
	4.5																
	9.5	210	50														
SB-73	0.5																
	4.5																
	9.5																
SB-78	0.5																
	4.5	200															
	9.5	600	100										80				
	14.5	80		200									60				
SB-79	0.5	80															
	4.5			300													
	9.5			100													
	16.0	1100	40														
	19.5	310															
	24.5	100															
	29.5	50															

blank = not detected

* = not analyzed

X = positive analysis

¹ = Where duplicate analyses were conducted the higher value is shown.

SALVAGE YARD
(Continued)

SOIL SAMPLE ANALYTICAL RESULTS
(ppb)

Boring	Depth (ft.)	TPH (ppm)	L,1 DCA	Trans	CHCl ₃	TCA	TCE	Benzene	Toluene	DCM	E Benzene	Xylenes	L,2 DCB	L,3 DCB	L,4 DCB	P
SB-81	0.5															
	3.0							30								
	6.5							20								
	9.5			50												
	14.5															
	19.5															
	24.5															
SB-82	0.5					80	70									
	4.5															
	12.0															
	14.5							20								
	19.5															
	24.5															
	29.5															
SB-83	0.5	53														
	3.0	1400					80									
	6.5	62					20									
	9.5						30									
	14.5															
	19.5						90									
	24.5						40									
SB-84	0.5															
	3.0															
	6.5															
	9.5		100													
	14.5						30									
SB-98	0.5	220														
	2.5															
	4.5										10					
	6.5		300							250						
	9.5		100				810			390						
	14.5				30		40			300						30

blank = not detected

■ = not analyzed

X = positive analysis

1 = Where duplicate analyses were conducted the higher value is shown.

TABLE V-17

SALVAGE YARD
(Continued)SOIL SAMPLE ANALYTICAL RESULTS¹
(ppb)

Boring	Depth (ft)	1,1 DCE	1,2 DCA	DCEM	1,1,2,2-TCA	C-Benzene	CCl ₄	BDCM	CHBr ₃	1,2-DCP	1,1,2-TCA	Vinyl Chloride	TCFM	PCB	PNA	Heavy Metals	Pesticides
SB-81	0.5																
	3.0																
	6.5																
	9.5																
	14.5																
SB-82	19.5																
	24.5																
	0.5																
	4.5																
	12.0																
SB-83	14.5																
	19.5																
	24.5																
	29.5																
	0.5																
SB-84	3.0																
	6.5																
	9.5																
	14.5																
	19.5																
SB-98	24.5																
	0.5																
	3.0																
	6.5																
	9.5																
SB-98	14.5																
	80																
	0.5																
	2.5																
	4.5																
SB-98	6.5																
	9.5																
	14.5																
	80																
	0.5																

blank = not detected

- = not analyzed

+ = positive analysis

1 = Where duplicate analyses were conducted the higher value is shown.

TABLE V-17

SALVAGE YARD
(Continued)SOIL SAMPLE ANALYTICAL RESULTS¹
(ppb)

Boring	Depth (ft.)	TPH (ppm)	1,1 DCA	Trans CHCl ₃	TCA	TCF	Benzene	Toluene	DCM	E Benzene	Xylenes	1,2 DCB	1,3 DCB	1,4 DCB	PC
SB-99	0.5					30		20		20					
	2.5			30											
	4.5														
	6.5		100	410		40									
	9.5	14	200	490		200									
SB-107	14.5		100		100	50								40	
	0.5														
	4.5			240		100									
	9.5														
	14.5	16										10			
SB-108	19.5														
	24.5														
	0.5				30	100		30						40	
	4.5				880	2100									
	9.5			50	200	750									
SB-109	14.5				200	1200		30			20			30	
	19.5				440	100									
	24.5														
	0.5					80									
	4.5														
SB-110	9.5														
	14.5		220	100	50	380		50	100						
	19.5				200	40									
						20									
															20

blank = not detected

* = not analyzed

X = positive analysis

= Where duplicate analyses were conducted the higher value is shown.

TABLE V-17

SALVAGE YARD
(Continued)

SOIL SAMPLE ANALYTICAL RESULTS 1

Boring	Depth (ft.)	1,1 DCE	1,2 DCA	DBCM	1,1,1,2,2 TCA	C-Benzene	CCl ₄	BDCM	CHBr ₃	1,2-DOP	1,1,2-TCA	Vinyl Chloride	TCFM	PCB	PNA	Heavy Metals	Pesticides
SB-99	0.5																
	2.5																
	4.5																
	6.5																
	9.5																
SB-107	14.5																
	0.5																
	4.5																
	9.5																
	14.5																
SB-108	19.5																
	24.5																
	29.5																
	50																
	100																
SB-109	0.5																
	4.5																
	9.5																
	14.5																
	19.5																
SB-110	24.5																
	0.5																
	4.5																
	9.5																
	14.5																
SB-110	19.5																
	200																
	200																
	200																
	200																

blank = not detected

■ = not analyzed

X = positive analysis

1 = Where duplicate analyses were conducted the higher value is shown.

TABLE V-17

SALVAGE YARD
(Continued)SOIL SAMPLE ANALYTICAL RESULTS¹
(ppb)

Boring	Depth (ft.)	TPH (ppm)	1,1 DCA	Irany	CHCl ₃	ICA	ICP	Benzene	Toluene	DCM	E. Benzene	Xylenes	1,2 DCP	1,3 DCP	1,4 DCP	PC
C-5	8.0		160	1	2		3000	16	33							58
C-39	0.5	2787					50	155								
	4.5						83	219		31						
	9.5						70	136								
	14.5						8	47		31						
C-41	0.5		121	457	8	7100	17000	8255	300							
	2.0		6	33		335	163	249	11		35	214				
	4.5		900	2100	5	8500	5000	118	1700	24	433				200	40
	6.5		406	1053	9	6745	1661	264	874	262	119	1320				
	9.5		620	1600		6600	3400	111	500	900	895	5902			250	20
	11.5	1305	356	419	16	4816	3039	7374	2734	309	417	2641			200	40
	14.5		900	400	19	54000	20000	23	3900	5800	24735	142055	11	25	9	
	16.0		71	324	11	1971		74	318	823	9800	26500		11	750	330
C-59	0.5				50	230	620									10
	4.5						40									
	9.5						60									
	14.5															
	19.5															
	24.5															
	29.5															
	34.5															
C-60	0.5	670					200									
	6.0						40									10
	9.5						60									
	14.5															
C-61	0.5	1800														
	4.5															
	9.5															
	14.5															
	19.5															
	24.5															
	29.5															

blank = not detected

X = not analyzed

X = positive analysis

X = Where duplicate analyses were conducted the higher value is shown.

TABLE V-17

SALVAGE YARD
(Continued)SOIL SAMPLE ANALYTICAL RESULTS¹
(ppb)

Boring	Depth (ft)	1,1-DCE	1,2-DCE	DECM	1,1,2,2-TCA	C-Benzene	CCl ₄	BDCH	CHBr ₃	1,2-DCP	1,1,2-TCA	Vinyl Chloride	ICPH	PCB	PNA	Heavy Metals	Pesticides
C-5	8.0				15	110											
C-39	0.5																
	4.5																
	9.5																
	14.5																
C-41	0.5	161		7	118												
	2.0				4												
	4.5	143		2	22												
	6.5	77	9	25	21												
	9.5	53		2	10												
	11.5	426	25	50	1423	43			4								
	14.5	4200	111	33	571	6	2938		9								
	16.0	1451	111	22	571	14		5	11								
C-59	0.5		200	200				90	100	60							
	4.5																
	9.5																
	14.5																
	19.5																
	24.5																
	29.5																
	34.5																
C-60	0.5													29,000			
	6.0																
	9.5	130												7,000			
	14.5																
C-61	0.5																
	4.5																
	9.5																
	14.5																
	19.5		73														
	24.5																
	29.5																

blank = not detected.

= not analyzed

X = positive analysis

! = Where duplicate analyses were conducted the higher value is shown.

TABLE V-18

SALVAGE YARD
HEAVY METAL RESULTS¹
(ppm)

<u>Boring</u>	<u>Depth (ft)</u>	<u>Ag</u>	<u>As</u>	<u>Ba</u>	<u>Be</u>	<u>Cd</u>	<u>Co</u>	<u>Cr</u>	<u>Cu</u>	<u>Hg</u>	<u>Mo</u>	<u>Ni</u>	<u>Pb</u>	<u>Sb</u>	<u>Se</u>	<u>Tl</u>	<u>V</u>	<u>Zn</u>
SB-114	4.0			176	0.3		6.9	14.9	14.2			10.7	2.4			0.1	28.5	43.6

¹ Where duplicate analyses were conducted the higher value is shown.

TABLE V-19

SALVAGE YARD
SOIL SAMPLE ANALYTICAL RESULTS

<u>BORING</u>	<u>DEPTH (FT)</u>	<u>EP TOXICITY LEACHATE CONCENTRATIONS</u>			
SB-114	4.0	<u>Metals (mg/l)</u>			
		Chromium 0.06	Arsenic 0.04	Selenium -- ^a	Silver --
		Cadmium 0.004	Barium 1.2	Mercury --	Lead 0.007
		<u>Pesticides/PCBs</u>			
		All below detection limits			
		<u>Herbicides</u>			
		All below detection limits			
		<u>IGNITABILITY (Flash Point)</u>		<u>CORROSIVITY (ph)</u>	
SB-116	3.5	115°F		9.0	
		<u>96 HOUR LC₅₀ FISH BIOASSAY</u>			
SB-55	2.5	Greater than 750 mg/l			
	5.5	Greater than 750 mg/l			
	9.5	Greater than 750 mg/l			
SB-58	2.5	Greater than 750 mg/l			
	5.5	Greater than 750 mg/l			
	9.5	Greater than 750 mg/l			

^a Less than detection limit

ENGINE CLEANING PITS AREA

Figure V-8 shows soil boring and monitoring well locations at the Engine Cleaning Pits Area. The site of the former engine cleaning pits is located south of the runway. This area was covered with asphalt in the early 1960's.

Soil samples were collected from 13 soil borings at the Engine Cleaning Pits Area. One monitoring well was constructed to determine water quality near this site. Physical characteristics of soil borings and the monitoring well near this site are given in Table V-20. Soils data are presented in Table V-21.

The soils at this site consist of coarse textured soils of rapid permeability with discontinuous strata of finer textured clayey soils of low permeability. Groundwater at this site was observed at approximately 6 feet below ground surface.

Benzene was detected in the Engine Cleaning Pits Area in four borings at low concentrations that ranged from non-detectable up to 360 ppb, with the exception of one sample from 0.5 feet at SB-35, where benzene was measured at 23 ppm. Dichloromethane and trichloroethylene were detected at 1.5 feet in SB-66 at concentrations of 1,800 ppb and 520 ppb, respectively. Other VOC's including chloroform and 1,1-dichloroethylene were measured at this site at concentrations ranging from non-detected up to 300 ppb. Total petroleum hydrocarbons were detected above 100 ppm in one surface sample at this site taken at SB-87.

Soils at the Engine Cleaning Pits Area do not exceed TTLC criteria for hazardous waste and with the exception of one soil sample, which showed 23 ppm benzene, VOCs are not present in concentrations which exceed 1,000 times the DHS Action Levels. The single high concentration of benzene at SB-35 does not appear to have migrated to deeper soils because the sample immediately beneath it contained only 110 ppb benzene. Soils with anomalously high levels of benzene have not been tested against the fish bioassay standard for toxicity but are presumed to be hazardous waste. TPH concentrations exceed 100 ppm in one isolated sample taken at this site.

FIGURE V-8
ENGINE CLEANING
PITS AREA

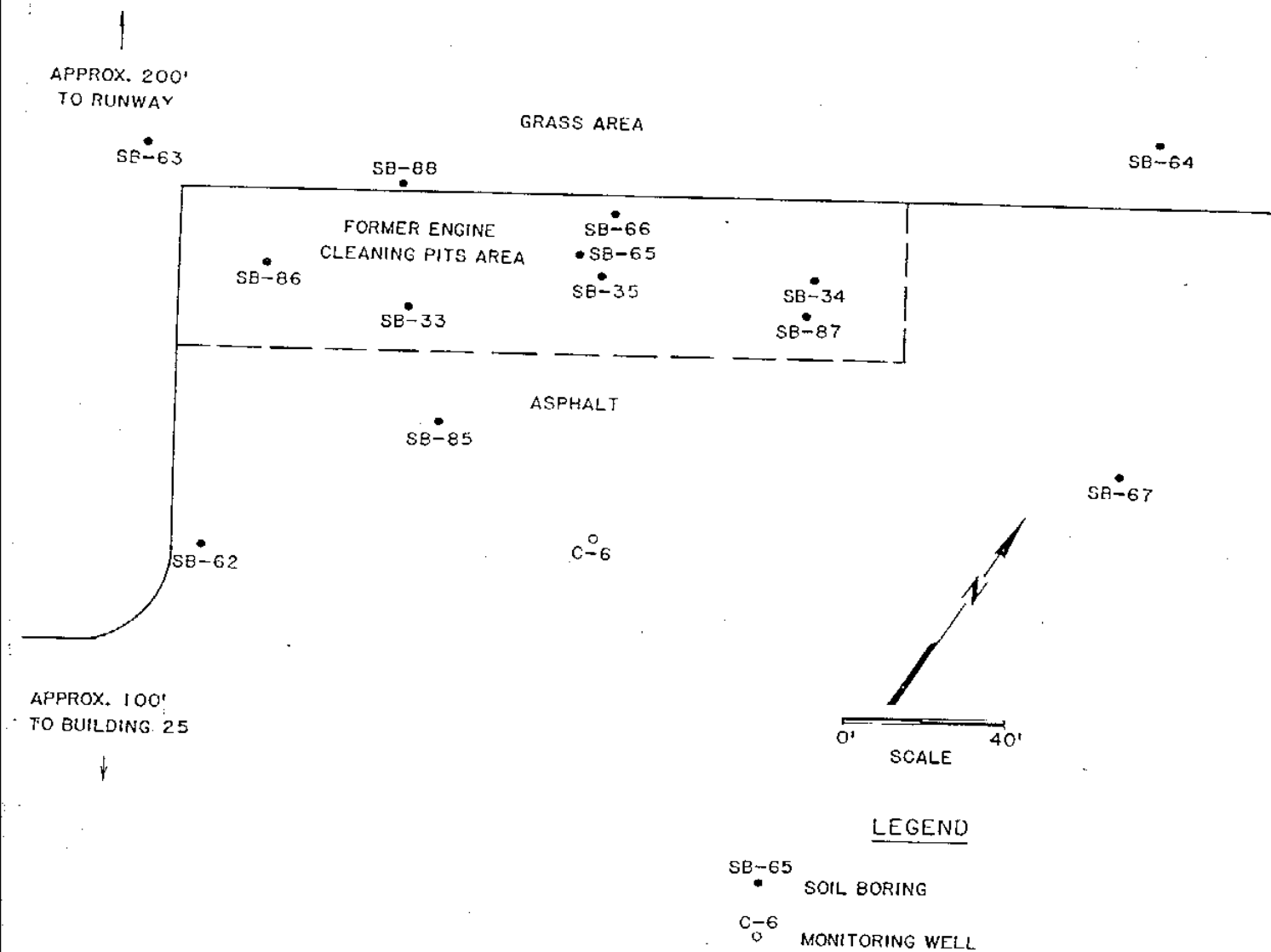


TABLE V-20

PHYSICAL CHARACTERISTICS OF SOIL BORINGS AND MONITORING WELLS
AT THE ENGINE CLEANING PITS AREA

<u>Location</u>	<u>Total Depth (feet)</u>	<u>Soil Sampling Depths (feet)</u>	<u>Analyses</u>		<u>Screened Interval (feet)</u>
			<u>VOC</u>	<u>TPH</u>	
SB-33	10	0.5, 4.5	X		---
SB-34	10	0.5, 4.5	X		---
SB-35	10	0.5, 4.5	X		---
SB-62	6	0.5, 4.5	X	X	---
SB-63	6	0.5, 4.5	X	X	---
SB-64	6	0.5, 4.5	X	X	---
SB-65	25	9.5, 14.5, 19.5	X	X	---
SB-66	6	1.5, 4.5	X	X	---
SB-67	6	1.0, 4.5	X	X	---
SB-85	10	0.5, 3.5, 6.5, 9.5	X	X	---
SB-86	10	1.0, 3.5, 6.5, 9.5	X	X	---
SB-87	10	0.5, 3.5, 6.5, 9.5	X	X	---
SB-88	10	0.5, 3.5, 6.5, 9.5	X	X	---
C-6	32.5	---			22.5-32.5

TABLE V-21

ENGINE CLEANING PITS AREA

SOIL SAMPLE ANALYTICAL RESULTS¹
(ppb)

Boring	Depth (ft)	TPH (ppm)	1,1 DCA	Trans	CHCl ₃	TCA	ICE	Benzene	Toluene	DCM	E Benzene	Xylenes	1,2 DCB	1,3 DCB	1,4 DCB	Pct
SB-33	0.5 4.5	* *						190 200		110 140						
SB-34	0.5 4.5	* *				26 15		360 190								
SB-35	0.5 4.5	* *				6		23000 110	55		140	190		46		
SB-62	0.5 4.5								20				10			
SB-63	0.5 4.5	11							30							
SB-64	0.5 4.5				300 70			10			40	10			10	
SB-65	9.5 14.5 19.5				20 30	10					7					
SB-66	1.5 4.5		60		60	80	520		20	1800	30 40	6 50	10			
SB-67	1.0 4.5				20						40 9	9	8			
SB-85	0.5 3.5 6.5 9.5	15			60		300				30					
					40											

blank = not detected

* = not analyzed

† = positive analysis

‡ = Where duplicate analyses were conducted the higher value is shown.

TABLE V-21

ENGINE CLEANING PITS AREA
(Continued)SOIL SAMPLE ANALYTICAL RESULTS¹
(ppb)

Boring	Depth (ft)	1,1 DCE	1,2 DCA	DBCM	1,1,1,2,2 TCA	C Benzene	CCl ₄	BDCM	CHBr ₃	1,2-DCEP	1,1,2-TCA	Vinyl Chloride	TCFH	PCB	PNA	Heavy Metals	Pestfoides
SB-33	0.5 4.5	43 17	440														
SB-34	0.5 4.5	38 15															
SB-35	0.5 4.5	7															
SB-62	0.5 4.5																
SB-63	0.5 4.5																
SB-64	0.5 4.5												90				
SB-65	9.5 14.5 19.5																
SB-66	1.5 4.5	260															
SB-67	1.0 4.5																
SB-85	0.5 3.5 6.5 9.5																

blank = not detected

■ = not analyzed

x = positive analysis

} = Where duplicate analyses were conducted the higher value is shown.

TABLE V-21

ENGINE CLEANING PITS AREA
(Continued)SOIL SAMPLE ANALYTICAL RESULTS¹
(ppb)

Depth	TPH	1,1 DCA	Trans	CHCl ₃	TCA	TCE	Benzene	Toluene	DCM	E. Benzene	Xylenes	1,2 DCE	1,3 DCE	1,4 DCE	PCE
Drilling	(ft)	(ppm)													
SB-86	1.0			70						30					
	3.5									20					
	6.5			50						30	50				
	9.5			50						40					
SB-87	0.5	320		50						10					
	3.5			80						50	90				
	6.5			70						30					
	9.5			60											
SB-88	0.5	11		200						50					
	3.5			40											
	6.5			80											
	9.5			50						40		20			

blank = not detected

* = not analyzed

x = positive analysis

1. = Where duplicate analyses were conducted the higher value is shown.

TABLE V-21

ENGINE CLEANING PITS AREA
(Continued)SOIL SAMPLE ANALYTICAL RESULTS
(ppb)

Borings	Depth (ft)	1,1 DCE	1,2 DCA	DECM	1,1,1,2,2 TCA	C Benzene	CCl ₄	DDCM	CHBr ₃	1,2-DCP	1,1,1,2-TCA	Vinyl Chloride	TCFM	PCB	PNA	Heavy Metals	Pesticides
SB-86	1.0																
	3.5																
	6.5																
	9.5		100														
SB-87	0.5																
	3.5																
	6.5																
	9.5																
SB-88	0.5																
	3.5																
	6.5																
	9.5																

blank = not detected

■ = not analyzed

x = positive analysis

† = Where duplicate analyses were conducted the higher value is shown.

PURGED FUEL STORAGE AREA

Figure V-9 shows soil boring locations at the Purged Fuel Storage Area. The Purged Fuel Storage Area is an asphalt paved site previously used to store drums of fuel and oils which had been purged from aircraft undergoing maintenance or repair.

Soil samples were collected from 13 soil borings at the Purged Fuel Storage Area to define the lateral extent of chemicals at this site. Physical characteristics of soil borings at this site are given in Table V-22. Soils data are presented in Table V-23.

Surface soils at this site consist of fine textured soils of low permeability. Groundwater was observed at approximately 13 feet below ground surface.

The most frequently detected VOC at this site is toluene, which was found at concentrations ranging from 10 to 100 ppb. The compound 1,1,1-trichloroethane was detected in three borings at concentrations ranging from 51 to 2,600 ppb. Other VOC's detected at this site included benzene, dichloromethane, and 1,1,2,2-tetrachloroethane. Petroleum hydrocarbons greater than 100 ppm were detected in one sample from SB-91 at a depth of 4.5 feet.

Three soil borings, SB-111, SB-112, and SB-113 were augured to depths of 2.5 feet in Centinella Ditch adjacent to the site. Very low levels of VOC's were detected at 0.5 feet in SB-113.

Soils at the Purged Fuel Storage Area do not exceed TTLC criteria for hazardous waste and VOCs are not present in concentrations which exceed 1,000 times the DHS Action Levels. TPH concentrations exceed 100 ppm in one isolated location at this site. Additional soil sampling will be conducted at this site during facility demolition in 1987 to verify soil quality conditions.

FIGURE V-9
PURGED FUEL
STORAGE AREA

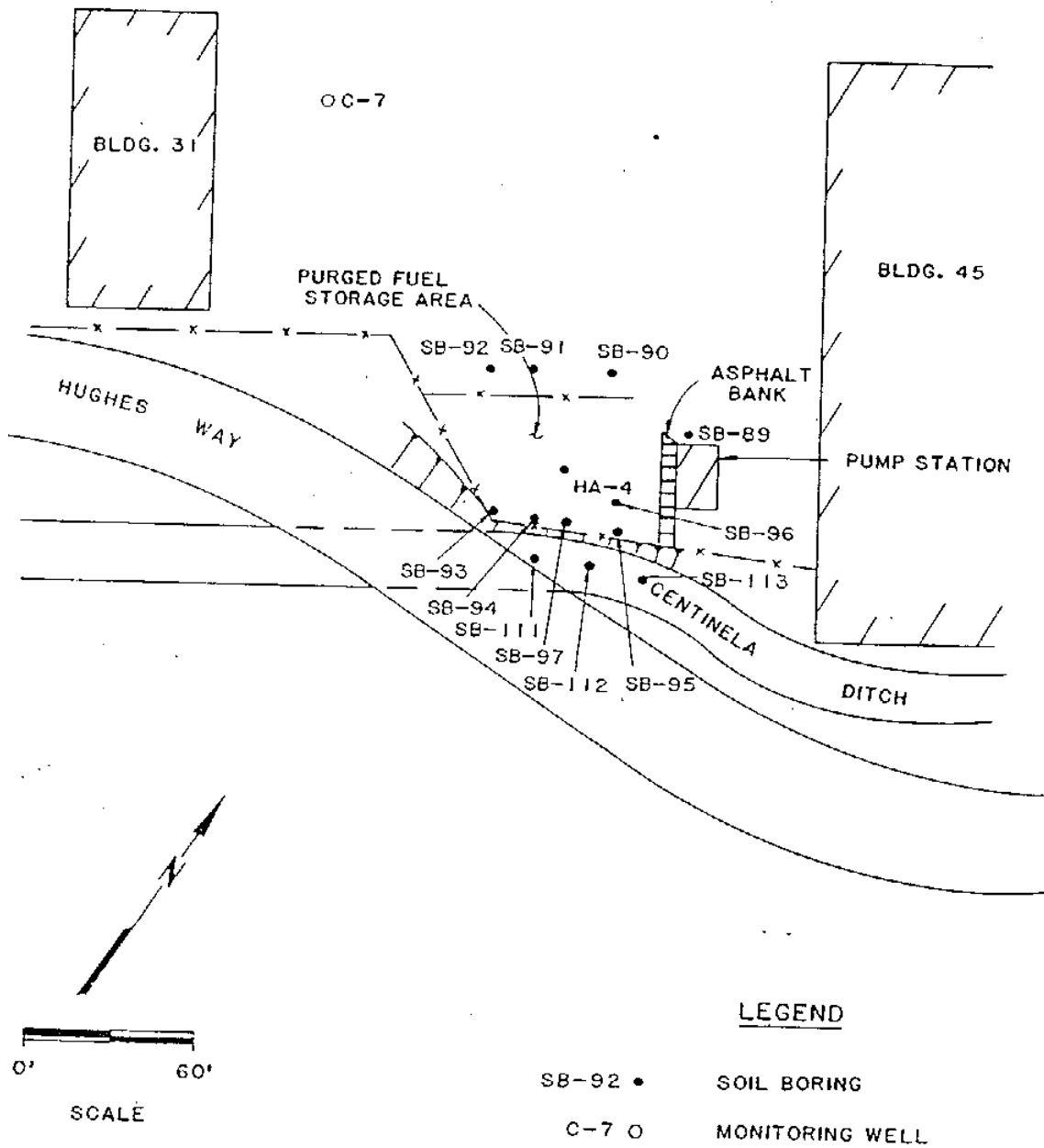


TABLE V-22

PHYSICAL CHARACTERISTICS OF SOIL BORINGS
AT THE PURGED FUEL STORAGE AREA

<u>Location</u>	<u>Total Depth (feet)</u>	<u>Soil Sampling Depths (feet)</u>	<u>Analyses</u>		<u>Screened Interval (feet)</u>
			<u>VOC</u>	<u>TPH</u>	
HA-4	2	0, 1.5	X	X	---
SB-89	5	0.5, 4.5	X	X	---
SB-90	5	0.5, 4.5	X	X	---
SB-91	5	0.5, 4.5	X	X	---
SB-92	4	0.5, 3.5	X	X	---
SB-93	5	0.5, 4.5	X	X	---
SB-94	5	0.5, 4.5	X	X	---
SB-95	5	0.5, 4.5	X	X	---
SB-96	5	0.5, 4.5	X	X	---
SB-97	25	0.5, 4.5, 9.5, 14.5, 19.5	X	X	---
SB-111	3	0.5, 2.5	X	X	---
SB-112	3	0.5, 2.5	X	X	---
SB-113	3	0.5, 2.5	X	X	---

TABLE V-23
PURGED FUEL STORAGE AREA
(Continued)

SOIL SAMPLE ANALYTICAL RESULTS,
(ppb)

Depth Horizg (ft)	1,1 DCE	1,2 DCA	DECH	1,1,2,2 TCA	C. Benzene	CCl ₄	BDCM	CHBr ₃	1,2-DCP	1,1,2-ICA	Vinyl Chloride	TCFM	PCB	PNA	Heavy Metals	Pesticide:
HA-4	0.0 1.5	3		9 8												
SB-89	0.5 4.5			200												
SB-90	0.5 4.5															
SB-91	0.5 4.5															
SB-92	0.5 3.5															
SB-93	0.5 4.5															
SB-94	0.5 4.5															
SB-95	0.5 4.5															
SB-96	0.5 4.5															
SB-97	0.5 4.5 9.5 14.5 19.5															
SB-111	0.5 2.5															
SB-112	0.5 2.5															
SB-113	0.5 2.5															

blank = not detected
= not analyzed
x = positive analysis

Where duplicate analyses were conducted the higher value is shown.

TABLE V-23
PURGED FUEL STORAGE AREA

SOIL SAMPLE ANALYTICAL RESULTS¹
(ppb)

Borings	Depth (ft.)	TMH (ppm)	1,1 DCA	Trans	CHCl ₃	ICA	TCF	Benzene	Toluene	DCM	E Benzene	Xylenes	1,2 DCB	1,3 DCB	1,4 DCB	PCE
HA-4	0.0					500	2	89		13	680	380				
	1.5					51	4	80		110						
SD-89	0.5								100							
	4.5	20														
SB-90	0.5	40							60							
	4.5	13							60			20				
SB-91	0.5	40							50			20				
	4.5	330				2600			50							
SB-92	0.5	39														
	3.5	28														
SB-93	0.5								60							
	4.5															200
SB-94	0.5								80			30				
	4.5															
SB-95	0.5	18							50			20				
	4.5								40							
SB-96	0.5	38														
	4.5	10														
SB-97	0.5	52							50							
	4.5								50							
	9.5	10		100		620	100		60					300	700	
	14.5		200													
	19.5	11		200												
SD-111	0.5															
	2.5															
SD-112	0.5															
	2.5															
SB-113	0.5			120					10			20		30	20	
	2.5															

blank = not detected
= not analyzed
X = positive analysis
} = where duplicate analyses were conducted the higher value is shown.

FORMER DRUM STORAGE AREA

Figure V-10 shows soil boring and monitoring well locations at the Former Drum Storage Area. The Former Drum Storage Area was used for at least 25 years for the storage of kerosene, lubricating oils, cutting oils, hydraulic oils, degreasers, solvents, and antifreeze. Drums of chemicals were stored on an asphalt covered area, on five gravel covered spill traps, and on a leakage collection tray that drains into an underground sump.

Soil samples were collected from eleven soil borings at the Former Drum Storage Area to define the vertical and lateral extent of chemicals in soils. One soil boring was completed as a monitoring well to determine whether chemicals have migrated into the groundwater at this site. Physical characteristics of soil borings and the monitoring well at this site are given in Table V-24. Soils data are presented in Table V-25.

The soils in the Former Drum Storage Area consist of fine textured clayey soils of low permeability that begin approximately three feet below ground surface. These soils are overlain by coarse textured sandy soils of rapid permeability. Groundwater was observed 13 feet below ground surface.

As shown in Table V-25, high levels of VOC's were detected in soil borings from the surface down to 19.5 feet. The chemicals with the highest concentrations included bromoform (2 to 1,300,000 ppb), 1,1,1-trichloroethane (370 to 870,000 ppb), ethylbenzene (40 to 350,000 ppb), perchloroethylene, (90 to 340,000 ppb), 1,1-dichloroethylene, (5 to 340,000 ppb) and carbon tetrachloride (240 to 340,000 ppb). Other VOC's detected at this site include trans-1,2-dichloroethylene, chloroform, trichloroethylene, benzene, toluene, dichloromethane, 1,1-dichloroethane, 1,1,2,2-tetrachloroethane, and bromodichloromethane. TPH concentrations up to 370,000 ppm were measured at this site.

One very low level of PCB's (0.2 ppm) was detected at the surface of SB-38.

Soils at the Former Drum Storage Area do not exceed TTLC criteria for hazardous waste. The soils at this site have not been tested against the fish bioassay but are presumed to be hazardous waste because of the high VOC concentrations. VOCs exceed 1,000 times the DHS Action Levels and TPH exceeds 100 ppm in the area. In preparation for site remediation, additional soil borings will be conducted around the perimeter of the area to define the lateral extent of chemicals at this site.

CLARIFIER SOUTHEAST OF BUILDING 21

Figure V-10 shows the monitoring well location by the Clarifier Southeast of Building 21. No soil samples have been collected from this site and no hazard classification is possible. The presence of 1,1 dichloroethane (200 ppb), 1,1 dichloroethylene (200 ppb), trans-1,2-dichloroethylene (100 ppb), trichloroethylene (10 ppb), and vinyl chloride (4 ppb) in water samples taken from Well C-8 at this site raises the question of the clarifier being a chemical source area.

This clarifier will be removed as part of the underground storage tank compliance program. Associated soil sampling will determine if the clarifier is a potential source of chemicals detected in Well C-8.

FIGURE V-10
FORMER DRUM STORAGE
AREA AND CLARIFIER
SOUTHEAST OF BUILDING 21

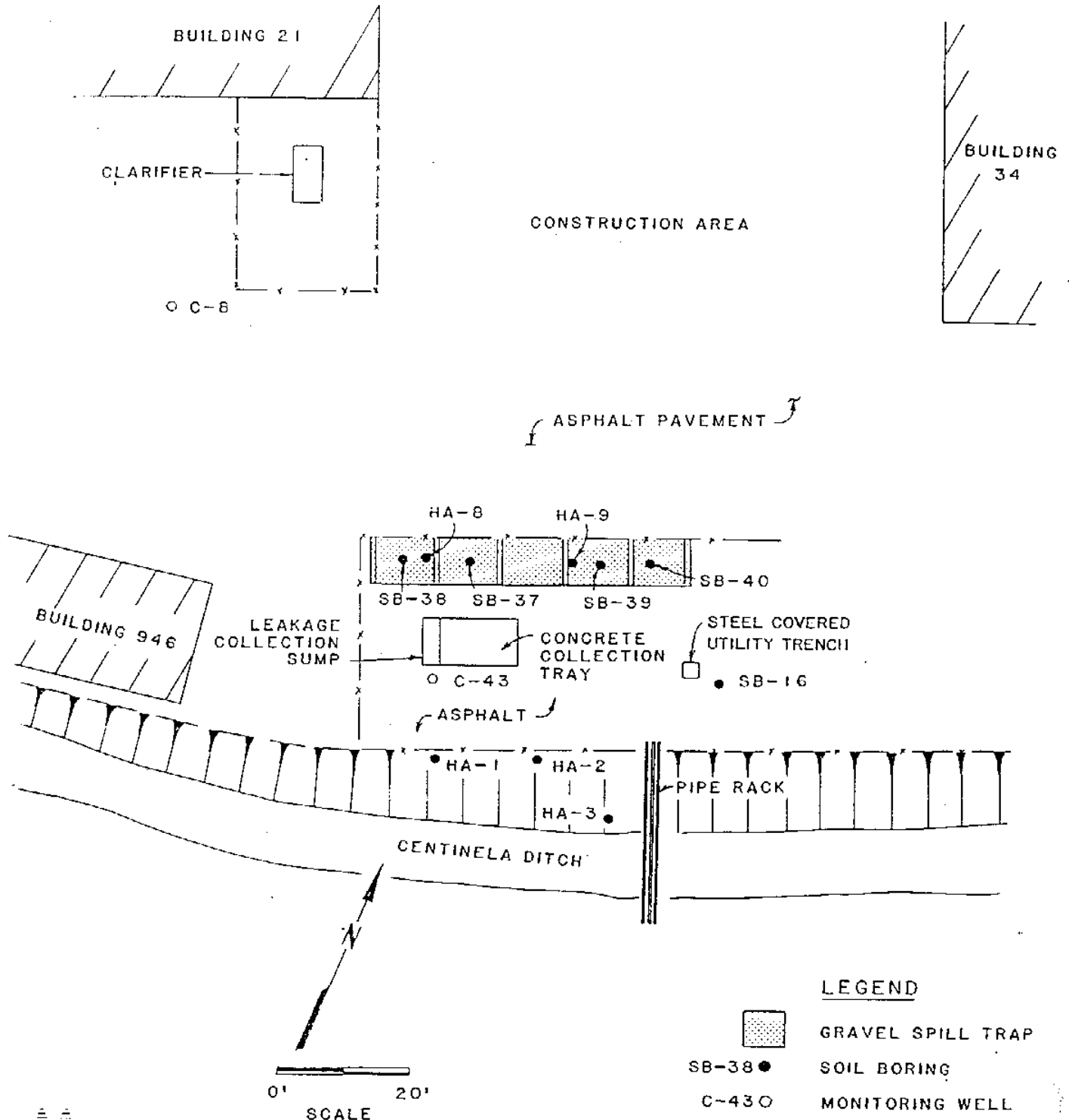


TABLE V-24

PHYSICAL CHARACTERISTICS OF SOIL BORINGS AND MONITORING WELL
AT THE FORMER DRUM STORAGE AREA

<u>Location</u>	<u>Total Depth (feet)</u>	<u>Soil Sampling Depths (feet)</u>	<u>Analyses</u>			<u>Screened Interval (feet)</u>
			<u>VOC</u>	<u>TPH</u>	<u>PCB</u>	
HA-1	2.5	0.5, 2.0	X	X		---
HA-2	2.5	0.5, 2.0	X	X		---
HA-3	2.5	0.5, 2.0	X	X		---
HA-8	0.5	0.0	X	X		---
HA-9	1.5	1.0	X	X		---
SB-16	20	0.5, 2.5, 4.5, 9.5, 14.5, 19.5	X	X		---
SB-37	3	0, 2.5 ^a	X		X	---
SB-38	3	0, 2.5 ^a	X		X	---
SB-39	3	0, 2.5	X			---
SB-40	3	0, 2.5	X			---
C-43	35	0, 2.5, 4.5, 6.5, 8.0, 9.5, 14.5, 19.5	X	X		25 - 35

^a Not analyzed for PCB.

TABLE V-25

FORMER DRUM STORAGE AREA

SOIL SAMPLE ANALYTICAL RESULTS¹
(ppb)

Boring	Depth (ft.)	TPH (ppm)	L,L DCA	Trans	CHCl ₃	ICA	ICE	Benzene	Toluene	DCH	E Benzene	Xylenes	1,2 DCB	1,3 DCB	1,4 DCB	P
HA-1	0.5	10800	10		170	18000	73	110		42						
	2.0	39500	130	33		4300		33	16	33		110	160			
HA-2	0.5	367100	7			6500	4	120		34						
	2.0	23100	22000		14	15000	5300	150	11000	900	120	850	42			
HA-3	0.5	9300	4	2	5	2500	1500	74		44						
	2.0	23600	400	2100		57000	41000		7400			380	49			
HA-8	0.0	150				2900										20
HA-9	1.0	7200	90			26000	500		30		40	60	380	290		61
SB-16	0.5					1000		350	3	14						
	2.5					370		200		11						
	4.5			10		740		290	6	85						
	9.5		23			2300	30	250		17						
	14.5		1700	390		1100	470	470	500	11						
	19.5		97	240				250	14	45						
SB-37	0.0	*	27		28	13000	18000	41								31
	2.5	*	300		15	370000	21000	100	1800	80	2600	19000	220	19	20	570
SB-38	0.0	*			150	710000		150	820	560	3500	1100				
	2.5	*	121000	1000	27	830000	5500	110	24000	110	2000	2700	2500	4200	6900	3400
SB-39	0.0	*	2100			500		28	5900		600	2900	300	1800	70	120
	2.5	*	1100	2000		94000	33000	110	32000	830	790	4900	2000	2400	2500	1900
SB-40	0.0	*	4400		50	9800				43						
	2.5	*	740		50	2000		110	3500	1000	170	1600	560	1100	20	
C-43	0.0	58				8000	66			100	350000	15000	450	35000		21
	2.5		960	2		33000	700	130	25	3800		110				300
	4.5	81	2000	12	8	81000	3000	70	1400	9700		4400	1200	9800		41
	6.5		3800	420		8600	1600	490	500	35000	230	1400	420	370		42
	8.0		140	45		48000	2000	190	810	69000		310	29	420		43
	9.5		1900	800	100	80000	4500	400	2100	94000	80	690	58	890		120
	14.5		3700	890		7500	240	350	1500	20000	120	160		79		7
	19.5		57000	6000	400	130000	3000	370	6600	49000		1200	97	1900		140

blank = not detected

* = not analyzed

X = positive analysis

1 = Where duplicate analyses were conducted the higher value is shown.

TABLE V-25
FORMER DRUM STORAGE AREA
(Continued)

SOIL SAMPLE ANALYTICAL RESULTS¹
(ppb)

Boring	Depth (ft.)	1,1 DCE	1,2 DCA	DBCH	1,1,2,2 TCA	C. Benzene	CCl ₄	DBCH	CHBr ₃	1,2-DCP	1,1,2-TCA	Vinyl Chloride	ICFM	PCB	PNA	Heavy Metals	Pesticides
HA-1	0.5	270			2000	110	32000		3								
	2.0	3600	770	80	16000				33	22							
HA-2	0.5	9	23		200	4											
	2.0	18000	1800	560		3	53000										
HA-3	0.5	5			4600	39											
	2.0	2200			29000	940											
HA-8	0.0																
HA-9	1.0	300	26000	600													
SB-16	0.5				17												
	2.5																
	4.5			3	45												
	9.5	99		6	500												
	14.5	580				510											
	19.5																
SB-37	0.0	80			1600	46		34	2	170							
	2.5	2390	100	630	3000	25	24000			200							
SB-38	0.0	150			5900	50								200			
	2.5	20000	2000	6000	19000	24				100							
SB-39	0.0	44000	1700	380	50000	34	340000	630									
	2.5	16000	1200			50	260000										
SB-40	0.0	340000		1600	6300		100000		1300000								
	2.5	25000		330	19000	15	220000										
C-43	0.0	420			570	250											
	2.5	1100	440	560		5											
	4.5	2500	800	1000	3600	54			20								
	6.5	1700	1400	1000	710	840			45								
	8.0	1800		2000	190												
	9.5	7300	1200	2200													
	14.5	83	500	490													
	19.5	2000		2000		230											

blank = not detected

* = not analyzed

X = positive analysis

{} = Where duplicate analyses were conducted the higher value is shown.

BUILDING 32 SURFACE RUNOFF AREA

Figure V-11 shows the monitoring well location at the Building 32 Surface Runoff Area. Building 32 is used for hydraulic testing. Surface runoff is directed to the north side of the building where the storm drain system for the plant discharges to Centinella Ditch. Since the entire area around Building 32 is paved, all surface runoff would flow to the ditch.

Soil samples were collected from one soil boring located near the point of discharge from the culvert into Centinella Ditch to determine whether chemicals were present in the soil. This boring was completed as a monitoring well to determine the water quality at this site. Physical characteristics of the monitoring well are given in Table V-26. Soils data are presented in Table V-27.

The soils at this site consist of sandy soils of rapid permeability with discontinuous strata of fine textured clayey soil of low permeability. Groundwater at this site was observed at 15 feet below ground surface.

As shown in Table V-27, VOC's detected at this site throughout the soil profile included benzene, ranging from 73 ppb to 160 ppb and dichloromethane, ranging from 13 ppb to 110 ppb. Trans-1,2-dichloroethylene, trichloroethylene, and 1,1-dichloroethylene were detected in saturated soils.

Soils at the Building 32 Surface Runoff Area do not exceed TTLC criteria for hazardous waste, VOCs are not present in concentrations which exceed 1,000 times the DHS Action Levels, and TPH is not present in concentrations greater than 100 ppm.

FIGURE V-11
BUILDING 32
SURFACE RUNOFF AREA

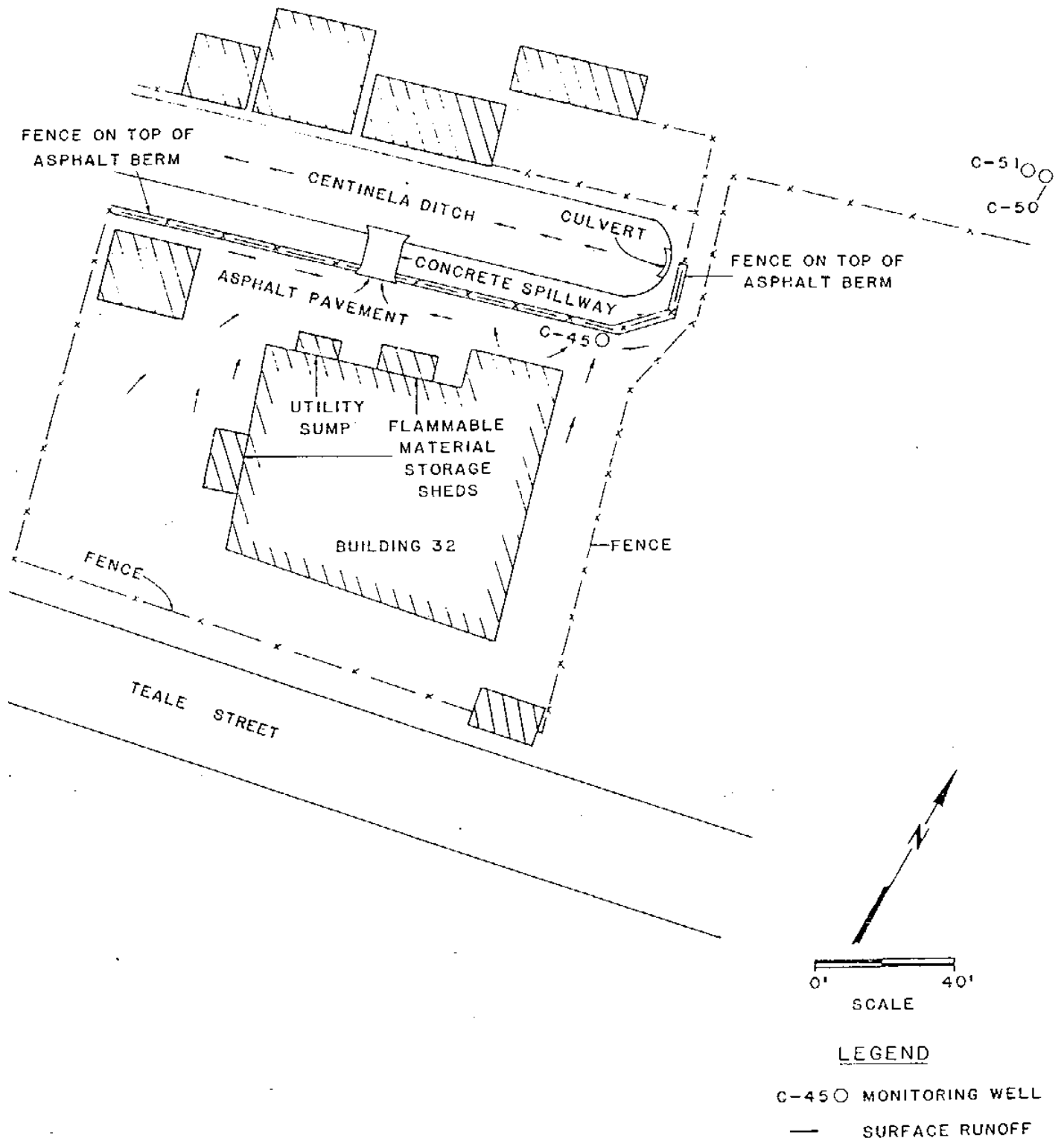


TABLE V-26

PHYSICAL CHARACTERISTICS OF SOIL BORINGS AT
THE BUILDING 32 SURFACE RUNOFF AREA

<u>Location</u>	<u>Total Depth (feet)</u>	<u>Soil Sampling Depths (feet)</u>	<u>Analyses</u>		<u>Screened Interval (feet)</u>
			<u>VOC</u>	<u>TPH</u>	
C-45	35	0.5, 2.5, 4.5, 9.5, 14.5, 19.5	X	X	25 - 35

TABLE V-27
BUILDING 32 SURFACE RUNOFF AREA
SOIL SAMPLE ANALYTICAL RESULTS¹
(ppb)

Boring	Depth (ft.)	TPH (ppm)	1,1 DCA	Trans	CHCl ₃	TCA	TCE	Benzene	Toluene	DCM	E. Benzene	Xylenes	1,2 DCB	1,3 DCB	1,4 DCB	PCE
C-45	0.5				4			73	3	100						
	2.5					4		130		22						
	4.5				6			84		21						
	9.5				6	6		75		110						
	14.5			330			250	160		22						
	19.5				5	8		84		13						

blank = not detected
= not analyzed
B = analysis not received
X = positive analysis
! = Where duplicate analyses were conducted the higher value is shown.

TABLE V-27

BUILDING 32 SURFACE RUNOFF AREA
(Continued)SOIL SAMPLE ANALYTICAL RESULTS¹
(ppb)

Boring	Depth (ft.)	1,1 DCE	1,2 DCA	DBCM	1,1,1,2,2 TCA	C Benzene	CCl ₄	BDCM	CHCl ₃	1,2-DCP	1,1,1,2-TCA	Vinyl Chloride	ICFM	PCB	PNA	Heavy Metals	Pesticides
C-45	0.5													*	*	*	*
	2.5													*	*	*	*
	4.5													*	*	*	*
	9.5													*	*	*	*
	14.5													*	*	*	*
	19.5													*	*	*	*

12

blank = not detected

* = not analyzed

X = positive analysis

† = Where duplicate analyses were conducted the higher value is shown.

STORM DRAINAGE DISCHARGE SITE

Figure V-12 shows soil boring and monitor well locations at the Storm Drainage Discharge Site. Prior to 1954, treated industrial wastewater from several industrial waste clarifiers and neutralization sumps on the north side of the Plant Site was discharged into this area. A shallow drainage ditch in this area directed runoff in a northerly direction to the soil adjacent to the parking lot. Overflow from these clarifiers and sumps is now directed to the sanitary sewer system.

Soil samples were collected from nine soil borings at the Storm Drainage Discharge Site to determine the vertical and lateral extent of chemicals in the soils at this site. One soil boring was completed as a monitoring well to determine the water quality at this site. Physical characteristics of the soil borings and monitoring well are given in Table V-28. Soils data are presented in Table V-29.

The soils at this site are fine textured clayey soils of low permeability with discontinuous strata of sandy soil with greater permeability. Groundwater at this site was observed at approximately 11 feet below ground surface.

As shown in Table V-29, VOC's detected in highest concentrations at this site include dichloromethane (98 to 1,200 ppb), benzene (70 to 700 ppb), and 1,1,1-trichloroethylene (43 to 1,600 ppb). Other VOC's detected at this site included 1,1-dichloroethylene, 1,1,2,2,-tetrachloroethane and chloroform.

Soils at the Storm Drainage Discharge Site do not exceed TLC criteria for hazardous waste. Benzene was detected at 1,000 times the DHS Action Levels in one surface soil sample taken from SB-30. TPH was detected in concentrations which exceed 100 ppm in three of the five samples analyzed for TPH.

FIGURE V-12
STORM DRAINAGE
DISCHARGE SITE

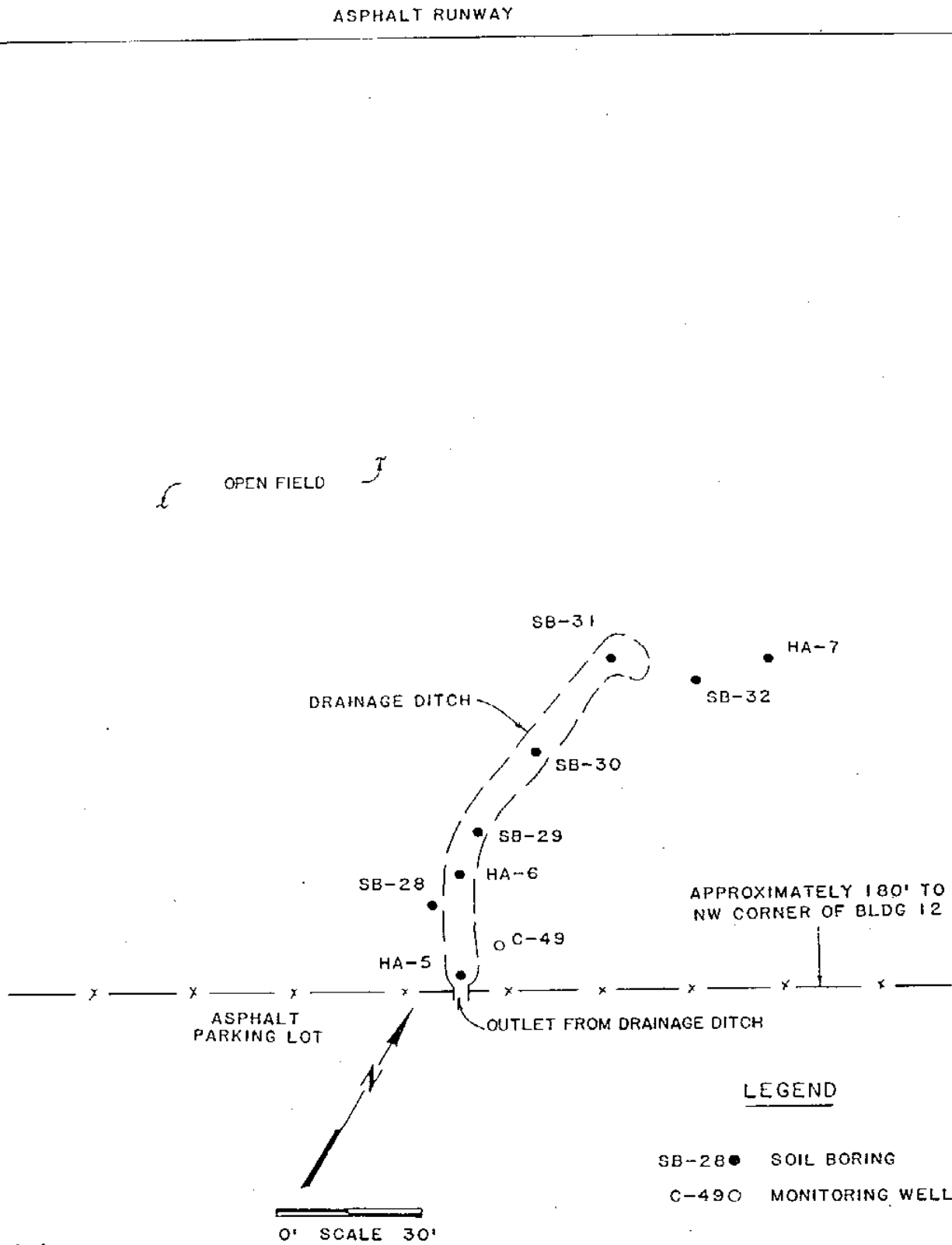


TABLE V-28

PHYSICAL CHARACTERISTICS OF SOIL BORINGS AND MONITORING WELL
AT THE STORM DRAINAGE DISCHARGE SITE

<u>Location</u>	<u>Total Depth (feet)</u>	<u>Soil Sampling Depths (feet)</u>	<u>Analyses</u>		<u>Screened Interval (feet)</u>
			<u>VOC</u>	<u>TPH</u>	
HA-5	0.5	0.0	X	X	---
HA-6	1.5	1.0	X	X	---
HA-7	1.5	1.0	X	X	---
SB-28	2.5	0, 2.0	X	X	---
SB-29	2.5	0, 2.0	X		---
SB-30	2.5	0, 2.0	X		---
SB-31	2.5	0, 2.0	X		---
SB-32	15.0	0.5, 4.5, 9.5, 14.5	X		---
C-49	30.0	0, 4.5, 9.5, 14.5	X		20 - 30

TABLE V-29
STORM DRAINAGE DISCHARGE SITE
SOIL SAMPLE ANALYTICAL RESULTS¹
(ppb)

Boring	Depth (ft.)	TPH (ppm)	1,1 DCA	Trans	CHCl ₃	ICA	TCB	Benzene	Toluene	DCM	E Benzene	Xylenes	1,2 DCB	1,3 DCB	1,4 DCB
HA-5	0.0	1000													
HA-6	1.0	130	200	250	300							30			
HA-7	1.0														
SD-28	0.0	8600	5												
	2.0		100	130		230	53	170						32	
SD-29	0.0		25	390		110	64	650	10						
	2.0		41	320		140	11	70							
SD-30	0.0		5	32		120	11	700							
	2.0		50	210		1600	8	320			38				
SD-31	0.0		6	5			3	310							
	2.0			3			4	630							
SD-32	0.5			5			9	250		98					
	4.5		8	32		75	5	330							
	9.5		12	42		50	4	660							
	14.5		9	33		24	2	220							
C-49	0.0		58	400	20	560	98	66	160	1200	120	150			
	4.5					43		330	5	140	86	100			
	9.5		550	160	20	560	98	100	130	1200	8	31			39
	14.5					43		90		140					

blank = not detected
= not analyzed
X = positive analysis
1 = Where duplicate analyses were conducted the higher value is shown.

TABLE V-29

STORM DRAINAGE DISCHARGE SITE
(Continued)SOIL SAMPLE ANALYTICAL RESULTS¹
(ppb)

Boring	Depth (ft)	Vinyl										Heavy					
		1,1 DCE	1,2 DCA	DBCM	1,1,2,2 TCA	C Benzene	CCl ₄	BDCM	CHBr ₃	1,2-DCP	1,1,2-TCB	Chloride	TCFH	PCB	PMA	Metals	Pesticides
HA-5	0.0																
HA-6	1.0																
HA-7	1.0																
SB-28	0.0																
	2.0	23															
SB-29	0.0	22															
	2.0																
SB-30	0.0	21															
	2.0																
SB-31	0.0	9															
	2.0	21															
SB-32	0.5	31															
	4.5																
	9.5	59															
	14.5	23															
C-49	0.0	55															
	4.5																
	9.5	55															
	14.5																

blank = not detected

- = not analyzed

X = positive analysis

- = Where duplicate analyses were conducted the higher value is shown.

BUILDING 12 BACKFILLED CLARIFIERS AND TEST SUMP

Figure V-13 shows soil boring and monitoring well locations at the Building 12 Backfilled Clarifiers and Test Sump. This site consists of two backfilled clarifiers and one test sump located at the southwest corner of Building 12. The test sump, constructed in 1956, was inspected in 1983 and found to have eroded concrete walls. Over the period of use, this sump received waste 1,1,1-trichloroethane, acetone, and other solvents and cleaning agents.

Soil samples were collected from two soil borings at this site to determine whether chemicals were present in the soils and their vertical and lateral distribution. Both borings were completed as monitoring wells to determine water quality around this site. A third monitoring well was also completed at this location. Physical characteristics of soil borings and monitoring wells at this site are given in Table V-30. Soils data are presented in Table V-31.

The soils at this site consist of sandy soils of moderate permeability with discontinuous strata of finer clayey soils of low permeability. Groundwater at this site was observed at approximately 13 feet.

As shown in Table V-31, VOC's were detected continuously from the bottom of the sump to the water table. VOC's detected at concentrations between 1,000 ppb and 7,900 ppb were trans-1,2-dichloroethylene, 1,1,1-trichloroethane, 1,1-dichloroethane, 1,1,2,2-tetrachloroethane, and trichloroethylene. Other VOC's detected in concentrations less than 1,000 ppb include dichloromethane (54 to 430 ppb) and 1,1-dichloroethylene (30 to 650 ppb).

Soils at the Building 12 Backfilled Clarifiers and Test Sump do not exceed TTLC criteria for hazardous waste. TCE was detected in concentrations which exceed 1,000 times the DHS Action Levels in samples taken at 6.5 feet and 9.5 feet below ground surface at C-47. TPH was not detected in concentrations which exceed 100 ppm.

Prior to site remediation, additional soil sampling will be conducted to determine the extent of chemicals in soils at this site.

FIGURE V-13
BUILDING 12
BACKFILLED CLARIFIERS
AND TEST SUMP

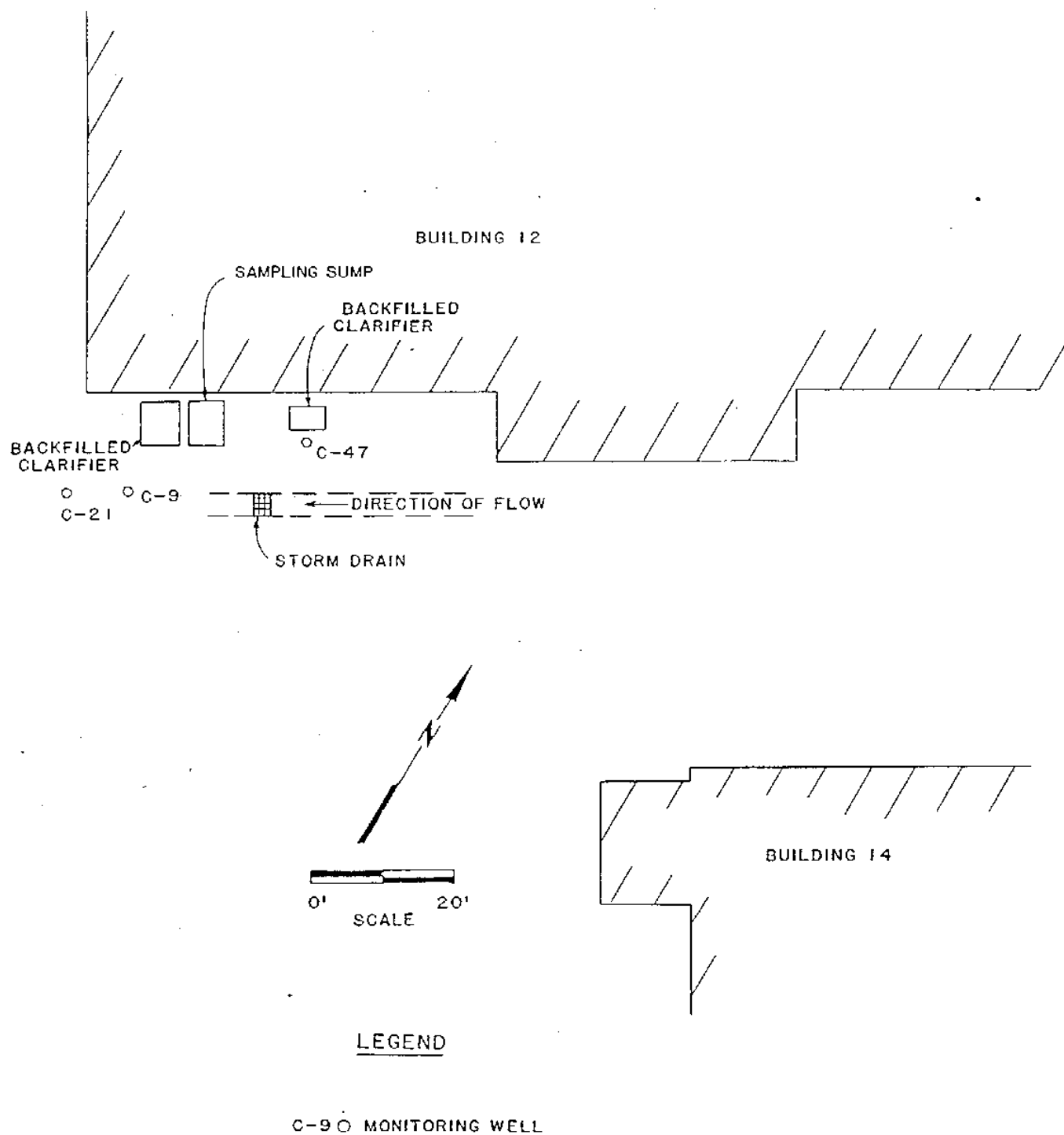


TABLE V-30

PHYSICAL CHARACTERISTICS OF
SOIL BORINGS AND MONITORING WELLS AT BUILDING 12
BACKFILLED CLARIFIERS AND TEST SUMP

<u>Location</u>	<u>Total Depth (feet)</u>	<u>Soil Sampling Depths (feet)</u>	<u>Analyses</u>		<u>Screened Interval (feet)</u>
			<u>VOC</u>	<u>TPH</u>	
C-9	35.5	13 ^a	X		25.5 - 35.5
C-21	57	---			39 - 49
C-47	40	0.5, 2.5, 4.5, 6.5, 9.5, 14.5, 19.5	X	X	30 - 40

^a Also analyzed for organic acid/base/neutral compounds and pesticides.

TABLE V-31
BUILDING 12 BACKFILLED CLARIFIERS & TEST SUMP
SOIL SAMPLE ANALYTICAL RESULTS¹
(ppb)

Boring	Depth (ft.)	TPH (ppm)	1,1 DCA	Trans	CHCl ₃	ICA	TCF	Benzene	Toluene	DCM	E Benzene	Xylenes	1,2 DCB	1,3 DCB	1,4 DCB	PCB
C-9	13.0	■							1							1
C-47	0.5				6	7	26			15						
	2.5		2400	300		8	100		19	54						
	4.5		290	740	4	150	1000	28	7	430						
	6.5		2500	2800	5	1800	7900	150		58						
	9.5		2900	1800		3100	5600	160	9	170						
	14.5		1300	1800		11	960	170	5	350						
	19.5		1200	3300	4	4	1500	71	3	320						

blank = not detected
* = not analyzed
X = positive analysis
} = Where duplicate analyses were conducted the higher value is shown.

TABLE V-31
BUILDING 12 BACKFILLED CLARIFIERS & TEST SUMP
(Continued)

SOIL SAMPLE ANALYTICAL RESULTS
(ppb)

Boring	Depth (ft)	1,1 DCE	1,2 DCA	DBCM	1,1,1,2,2 TCA	C Benzene	CCl ₄	EDCM	CHBr ₃	1,2-DCP	1,1,2-TCA	Viny1 Chloride	ICFM	PCB	PNA	Heavy Metals	Pesticide
C-9	13.0																
C-47	0.5				4												X
	2.5	30			16												
	4.5				270												
	6.5	650			1700												
	9.5	450			1600	18		6									
	14.5				480	58		B									
	19.5			6		200											

blank = not detected
 * = not analyzed
 X = positive analysis
 I = Where duplicate analyses were conducted the higher value is shown.

BUILDING 15 UTILITY TRENCHES AND CLARIFIER

Figure V-14 shows the soil boring and monitoring well locations at the Building 15 Utility Trenches and Clarifier. This site has two east-west trending concrete utility trenches, one clarifier, and a concrete pit. Liquid, including cutting oils and solvents, has been observed in the bottom of the trenches. The trenches are drained regularly and measures have been taken to assure that no chemicals enter the trenches in the future.

Soil samples were collected from seven soil borings adjacent to the potential sources in Building 15 to define the vertical and lateral extent of the chemicals in soils. Three of these borings were completed as monitoring wells to determine the quality of groundwater at this site. The physical characteristics of the soil borings and the monitoring wells at this site are given in Table V-32. Soils data are presented in Tables V-33 and V-34.

The soils at this site consist of fine sandy soils of moderate permeability with stratum of finer clayey soils of low permeability. At the west end of Building 15 this stratum is 12 feet thick and begins at 7 feet and at the east end, it begins at 3.5 feet and is 27 feet thick. The groundwater at this site was observed at 16 feet below ground surface to the east.

As shown in Table V-33, the VOC's detected in highest concentrations at this site were trichloroethylene (300 to 9,200 ppb) and trans-1,2-dichloroethylene (80 to 2,800 ppb). Other VOC's detected at Building 15 included chloroform (60 to 130 ppb), benzene (10 to 200 ppb), dichloromethane (10 to 600 ppb), and 1,2-dichloroethane (8 to 900 ppb).

Samples taken adjacent to the north trench, the concrete pit, and the sump northeast of Building 15 between ground surface and the water table had VOC concentrations less than 70 ppb with the exception of one sample with a maximum concentration of 300 ppb of trans-1,2-dichloroethylene. Samples taken at soil boring C-36 had moderately high levels of VOC's throughout the profile with 500 to 900 ppb 1,2-dichloroethane and 260 ppb dichloromethane. VOC concentrations were highest throughout the profiles at soil borings C-35, along the south trench, and SB-49, adjacent to the clarifier. VOC concentrations in these borings included 300 to 9,200 ppb trichloroethylene, 80 to 2,800 ppb trans-1,2-dichloroethylene, 80 to 600 ppb dichloromethane, and 80 ppb 1,1-dichloroethylene.

As shown in Table V-34, heavy metals were detected in soil samples taken from SB-49. The concentrations of metals detected in these samples do not exceed TILC criteria for hazardous waste.

Soils at the Building 15 Utility Trenches and Clarifier do not exceed TTLC criteria for hazardous waste and TPH is not present in concentrations which exceed 100 ppm. TCE is, however, present in concentrations which exceed 1,000 times the DHS Action Levels at C-35 and SB-49.

FIGURE V-14
BUILDING 15
UTILITY TRENCHES AND CLARIFIER

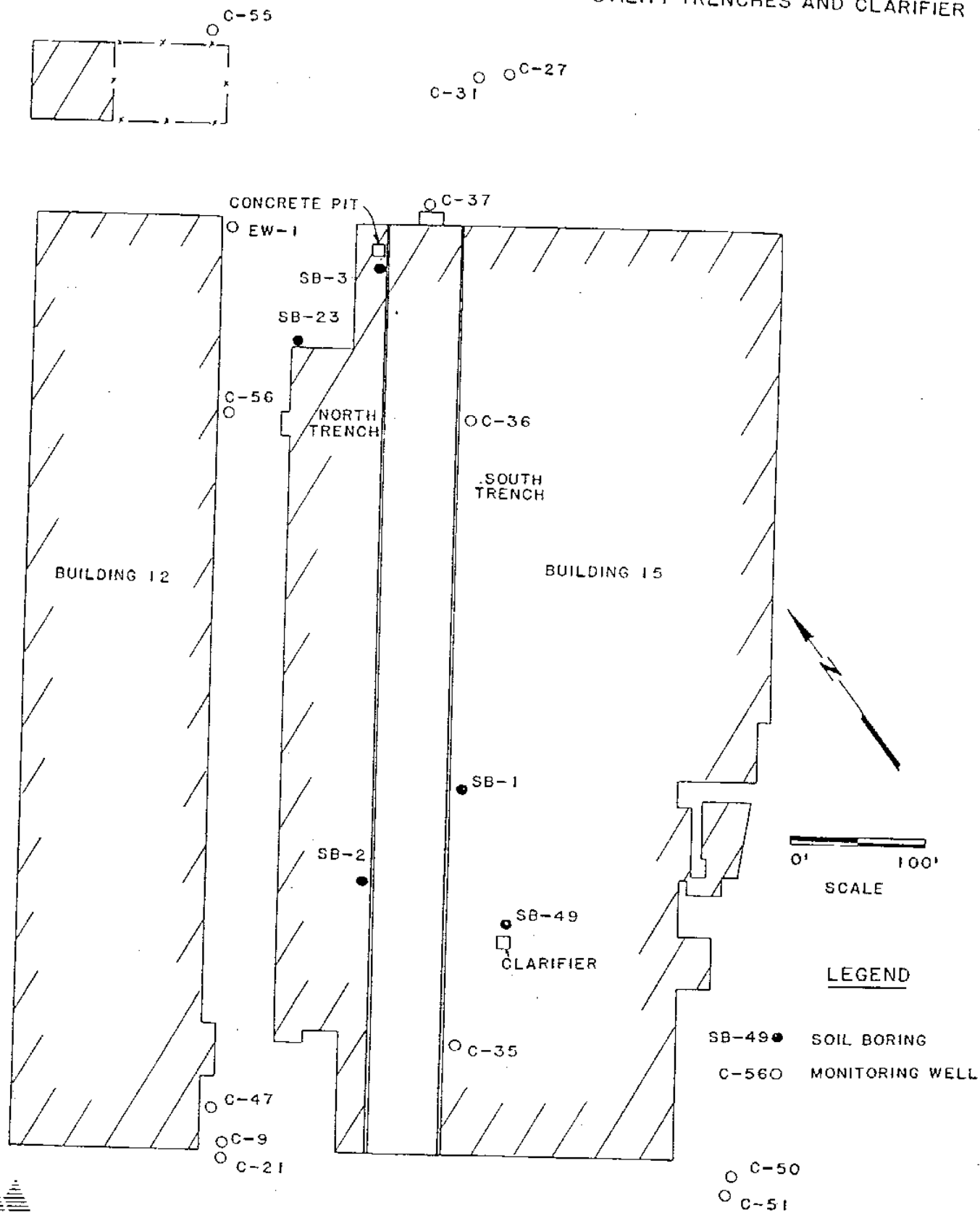


TABLE V-32

PHYSICAL CHARACTERISTICS OF
SOIL BORINGS AND MONITORING WELLS
AT THE BUILDING 15 UTILITY TRENCHES AND CLARIFIER

<u>Location</u>	<u>Total Depth (feet)</u>	<u>Soil Sampling Depths (feet)</u>	<u>Analyses</u>				<u>Screened Interval (feet)</u>
			<u>VOC</u>	<u>TPH</u>	<u>PCB</u>	<u>Heavy Metals</u>	
SB-1	18	4.5	X	X			---
SB-2	15	0.5, 4.5, 9.5, 14.5	X	X			---
SB-3	16	0.5, 4.5, 9.5, 14.5	X	X			---
SB-49	9	0, 2.5, 4.5, 7.0, 8.5	X	X		X	---
C-35	54	4.5, 9.5, 14.5	X				44 - 54
C-36	58	0.5, 4.5, 9.5, 14.5	X	X			48 - 58
C-37	58	0.5, 4.5, 9.5, 14.5	X	X			48 - 58

TABLE V-33

BUILDING 15 UTILITY TRENCHES AND CLARIFIER

SOIL SAMPLE ANALYTICAL RESULTS 1
(ppb)

Boring	Depth (ft.)	TPH (ppm)	1,1 DCA	Trans	CHCl ₃	ICA	ICE	Benzene	Toluene	DCM	E Benzene	Xylenes	1,2 DCB	1,3 DCB	1,4 DCB	PCB
SB-1	4.5							27								
SB-2	0.5					16		22		27	2					
	4.5							24								
	9.5							65								
	14.5							61			2					
SB-3	0.5							27								
	4.5			300	130			54			5					
	9.5							12								
	14.5					5		24			2					
SB-49	0.0															
	2.5						570									
	4.5						560									
	7.0						850	8								
	8.5						9100			80			20	10	6	400
			80	80	80	300	9200			600						200
C-35	4.5	*	200	200			300									
	9.5	*	2000	2000			5000									
	14.5	*	2800	2800			4500									
C-36	0.5															
	4.5			400				22	6		5					
	9.5							25								
	14.5							49	6							
								73		260						
C-37	0.5															
	4.5							25		56						
	9.5							29								
	14.5							30								
								23								

Blank = not detected

* = not analyzed

X = positive analysis

1 = Where duplicate analyses were conducted the higher value is shown.

TABLE Y-33
BUILDING 15 UTILITY TRENCHES AND CLARIFIER
(Continued)

SOIL SAMPLE ANALYTICAL RESULTS¹
(ppb)

Borings	Depth (ft)	1,1-DCE	1,2-DCA	DHCH	1,1,2,2-TCA	C-Benzene	CCl ₄	BDCM	CHBr ₃	1,2-DCP	1,1,2-TCA	Vinyl Chloride	TCDF	PCB	PNA	Heavy Metals	Pesticide
SD-1	4.5																
SD-2	0.5																
	4.5																
	9.5																
	14.5																
SD-3	0.5																
	4.5																
	9.5																
	14.5																
SD-49	0.0																
	2.5																
	4.5																
	7.0																
	8.5																
C-35	4.5																
	9.5																
	14.5																
C-36	0.5																
	4.5																
	9.5																
	14.5																
C-37	0.5																
	4.5																
	9.5																
	14.5																

blank = not detected
• = not analyzed
X = positive analysis
1 = Where duplicate analyses were conducted the higher value is shown.

TABLE V-34

BUILDING 15 UTILITY TRENCHES
HEAVY METAL RESULTS¹
(ppm)

Boring	Depth (ft)	As	Ba	Be	Cd	Co	Cr	Cu	Hg	Mn	Pb	Sb	Se	Tl	V	Zn
SB-49	0.0		24.19	0.20	0.02	2.38	12.26	5.77	0.13	2.91	0.65			4.08	12.31	9.81
	2.5		20.35	0.20		2.02	8.84	4.99	0.12	2.19	1.94			3.23	13.52	10.18
	4.5		13.76	0.11		1.52	7.19	3.56	0.15	1.51	0.80	0.28		1.39	7.45	5.37
	7.0	1.29	214.00	0.72		3.36	10.60	19.67							46.35	55.82
	8.5	1.41	206.5	0.67		3.82	10.05	17.17							48.19	52.22

¹ Where duplicate analyses were conducted the higher value is shown.

BUILDING 14 CLARIFIERS

Figure V-15 shows the soil boring location at the Building 14 Clarifiers. The clarifier system handled cutting oils and solvents from machining operations.

One soil boring was drilled adjacent to the last stage of the clarifier system. The soil at this site consists of moderate to low permeability clayey soils overlain by two feet of sands. The physical characteristics of the soil boring are given in Table V-35. Soils data are presented in Table V-36.

Liquid from the clarifier outside of Building 14 was sampled and analyzed for VOC's, TPH, PCB's, and heavy metals. The clarifier contained trace levels of VOC's (1 ppb of tetrachloroethylene and/or 1,1,2,2-tetrachloroethane), 380 ppm TPH, 15 ppm PCB's, and low levels of metals (0.03 ppm barium, 0.02 ppm chromium, 0.35 ppm copper, 0.05 ppm molybdenum, and 0.45 ppm zinc).

The compound 1,1,2,2-tetrachloroethane was detected in soils from the sump bottom to the water table at concentrations ranging from 72 ppb to 2,200 ppb. Trichloroethylene was detected in concentrations ranging from 5 to 420 ppb in the unsaturated soil at this site and other VOC's were detected at 200 ppb or less.

One very low level of PCB's (0.4 ppm) was detected at 14.5 feet.

Soils at the Building 14 Clarifiers do not exceed TTLC criteria for hazardous waste, VOC's are not present in concentrations which exceed 1,000 times the DHS Action Levels, and TPH is not present in concentrations greater than 100 ppm. During site demolition and removal of the clarifiers additional soil sampling will be conducted.

FIGURE V-15
BUILDING 14 CLARIFIERS

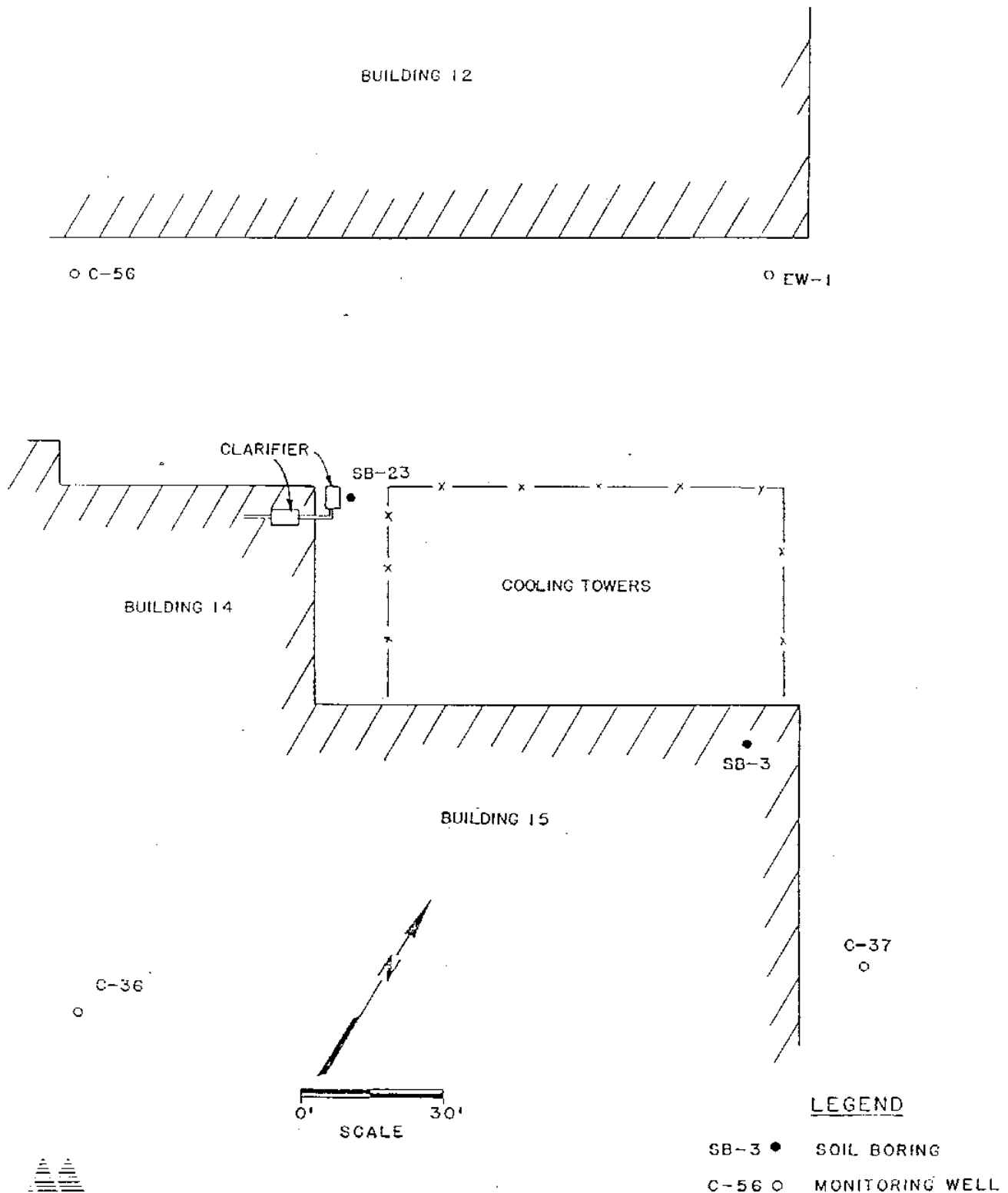


TABLE V-35

PHYSICAL CHARACTERISTICS OF THE
SOIL BORING AT THE BUILDING 14 CLARIFIERS

<u>Location</u>	<u>Total Depth (feet)</u>	<u>Soil Sampling Depths (feet)</u>	<u>Analyses</u>		
			<u>VOC</u>	<u>TPH</u>	<u>PCB</u>
SB-23	25	0.0 ^a , 2.5 ^a , 4.5, 9.5, 14.5, 19.5 ^a	X	X	X

^a Not analyzed for PCB

TABLE V-36
BUILDING 14 CLARIFIERS
SOIL SAMPLE ANALYTICAL RESULTS¹
(ppb)

Boring	Depth (ft.)	TPH (ppm)	1,1 DCA	Trans	CHCl ₃	ICA	ICE	Benzene	Toluene	DCM	E. Benzene	Xylenes	1,2 DCB	1,3 DCB	1,4 DCB	PCE
SB-23	0.0					4		112		12						
	2.5			5		3		200	3		2					
	4.5			155		7	420	57	4	15		46				
	9.5			6			5	18								
	14.5			124			310	42				52				
	19.5			117		6	499	49								

blank = not detected.

* = not analyzed

✓ = positive analysis

† = Where duplicate analyses were conducted the higher value is shown.

TABLE V-36

BUILDING 14 CLARIFIERS
(Continued)SOIL SAMPLE ANALYTICAL RESULTS¹
(ppb)

Boring	Depth (ft)	1,1-DCE	1,2-DCA	DECM	1,1,2,2-TCA	C-Benzene	CCl ₄	BDCM	CHBr ₃	1,2-DCF	1,1,2-TCA	Vinyl Chloride	TCDF	PCB	PNA	Heavy Metals	Pesticide
SB-23	0.0																
	2.5																
	4.5																
	9.5		8		441												
	14.5				72												
	19.5				2242									400			
					1444												

blank = not detected

- = not analyzed

X = positive analysis

† = Where duplicate analyses were conducted the higher value is shown.

LIQUID WASTE NEUTRALIZATION PIT

Figure V-16 shows the soil boring and monitoring well locations at the Liquid Waste Neutralization Pit. This site consists of a clarifier south of Building 6.

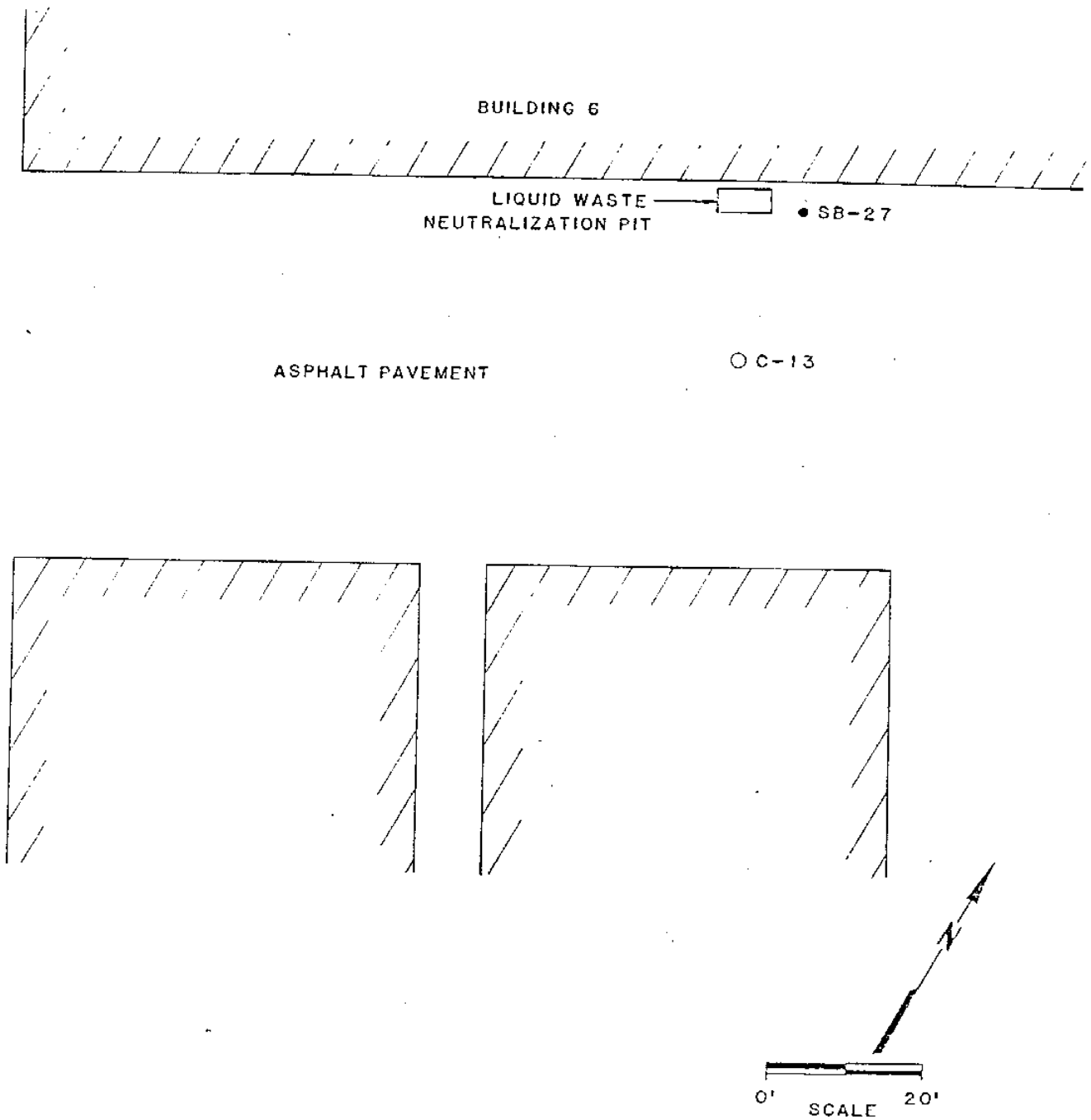
Soil samples were collected from SB-27 to evaluate the presence and vertical distribution of chemicals in the soils at this site. Monitoring Well C-13 was constructed to determine the water quality near this site. The physical characteristics of the soil boring and monitoring well are given in Table V-37. Soils data are presented in Table V-38.

The soils at this site consist of clayey soils of low permeability. The groundwater was observed at approximately 19 feet below ground surface.

As shown in Table V-38, VOC's detected at this site included benzene, ranging from 60 ppb to 190 ppb, and dichloromethane, ranging from 5 ppb to 180 ppb.

Soils at the Liquid Waste Neutralization Pit do not exceed TLC criteria for hazardous waste and VOC's are not present in concentrations which exceed 1,000 times the DHS Action Levels.

FIGURE V-16
LIQUID WASTE
NEUTRALIZATION PIT



LEGEND

SB-27 • SOIL BORING

C-13 ○ MONITORING WELL



McLaren Environmental Engineering

TABLE V-37

PHYSICAL CHARACTERISTICS OF THE
SOIL BORING AND MONITORING WELL AT THE
LIQUID WASTE NEUTRALIZATION PIT

<u>Location</u>	<u>Total Depth (feet)</u>	<u>Soil Sampling Depths (feet)</u>	<u>Analyses</u>	<u>Screened Interval (feet)</u>
			<u>VOC</u>	
SB-27	20	0.5, 2.5, 4.5, 9.5, 14.5, 19.5	X	---
C-13	40	---		30 - 40

TABLE V-38

LIQUID WASTE NEUTRALIZATION PIT

SOIL SAMPLE ANALYTICAL RESULTS¹
(ppb)

Boring	Depth (ft.)	TPH (ppm)	1,1-DCA	Trans- CHCl ₃	TCA	TCE	Benzene	Toluene	DCM	E. Benzene	Xylenes	1,2-DCB	1,3-DCB	1,4-DCB	PC
SB-27	0.5	*			22		124								
	2.5	*			13	2	71		32						
	4.5	*			7		60		30						
	9.5	*					73		84						
	14.5	*	5	14	6	8	192		5						
	19.5	*		63	3	115	82	2	182						

blank = not detected

* = not analyzed

X = positive analysis

† = Where duplicate analyses are conducted the higher value is shown.

TABLE Y-38

LIQUID WASTE NEUTRALIZATION PIT
(Continued)SOIL SAMPLE ANALYTICAL RESULTS¹
(ppb)

Boring	Depth (ft.)	1,1-DCE	1,2-DCA	DBCM	1,1,1,2,2-ICA	C Benzene	CCl ₄	EDCM	CHBr ₃	1,2-DCP	1,1,1,2-TCA	Vinyl Chloride	TCM	PCB	PNA	Heavy Metals	Pesticides
SB-27	0.5																
	2.5																
	4.5																
	9.5																
	14.5																
	19.5																

blank = not detected

* = not analyzed

X = positive analysis

1 = Where duplicate analyses were conducted the higher value is shown.

OIL AND GREASE PIT AREA

Figure V-17 shows the soil boring locations at the Oil and Grease Pit Area. The waste oil and grease pit at this site is used to service and clean automobile and truck engines.

Soil samples were collected from two soil borings to define the vertical and lateral extent of any chemicals in soils. Physical characteristics of the soil borings are presented in Table V-39. Soils data are presented in Table V-40.

The soil at this site consists of fine sandy soils of rapid permeability with discontinuous strata of finer clayey soils of low permeability. The groundwater was observed at 28 feet below ground surface near this site (C-22).

As shown in Table V-40, VOC concentrations from ground surface to 19.5 feet ranged from non-detected up to 390 ppb. Samples collected from the saturated zone at 24.5 feet had 11 to 450 ppb dichloromethane and 240 to 1100 ppb benzene. Petroleum hydrocarbons were not detected in the soil.

Soils at the Oil and Grease Pit Area do not exceed TTLC criteria for hazardous waste and TPH is not present in concentrations greater than 100 ppm. VOCs do not exceed 1000 times the DHS Action Levels in the unsaturated zone. One sample from the saturated zone showed benzene exceeding 1000 times the DHS Action Levels.

UNDERGROUND TANKS WEST OF BUILDING 11

Figure V-17 shows the locations of the underground tanks west of the Oil and Grease Pit Area. During the drilling program in 1983, gasoline was found to be floating on the groundwater in the vicinity of the underground tanks. Further investigations conducted by Hargis and Associates in this area are described in the October 15, 1985 report, "Investigation of Gasoline Contamination, Summa Corporation Facility, Culver City, California".

No soil samples have been collected at this site and no hazard classification is possible. The presence of the floating gasoline at this site has, however, identified this as a source area of chemicals to the groundwater. This site is discussed in more detail in Section VI.

FIGURE V-17
OIL AND GREASE PIT AREA
AND UNDERGROUND TANKS
WEST OF BUILDING 11

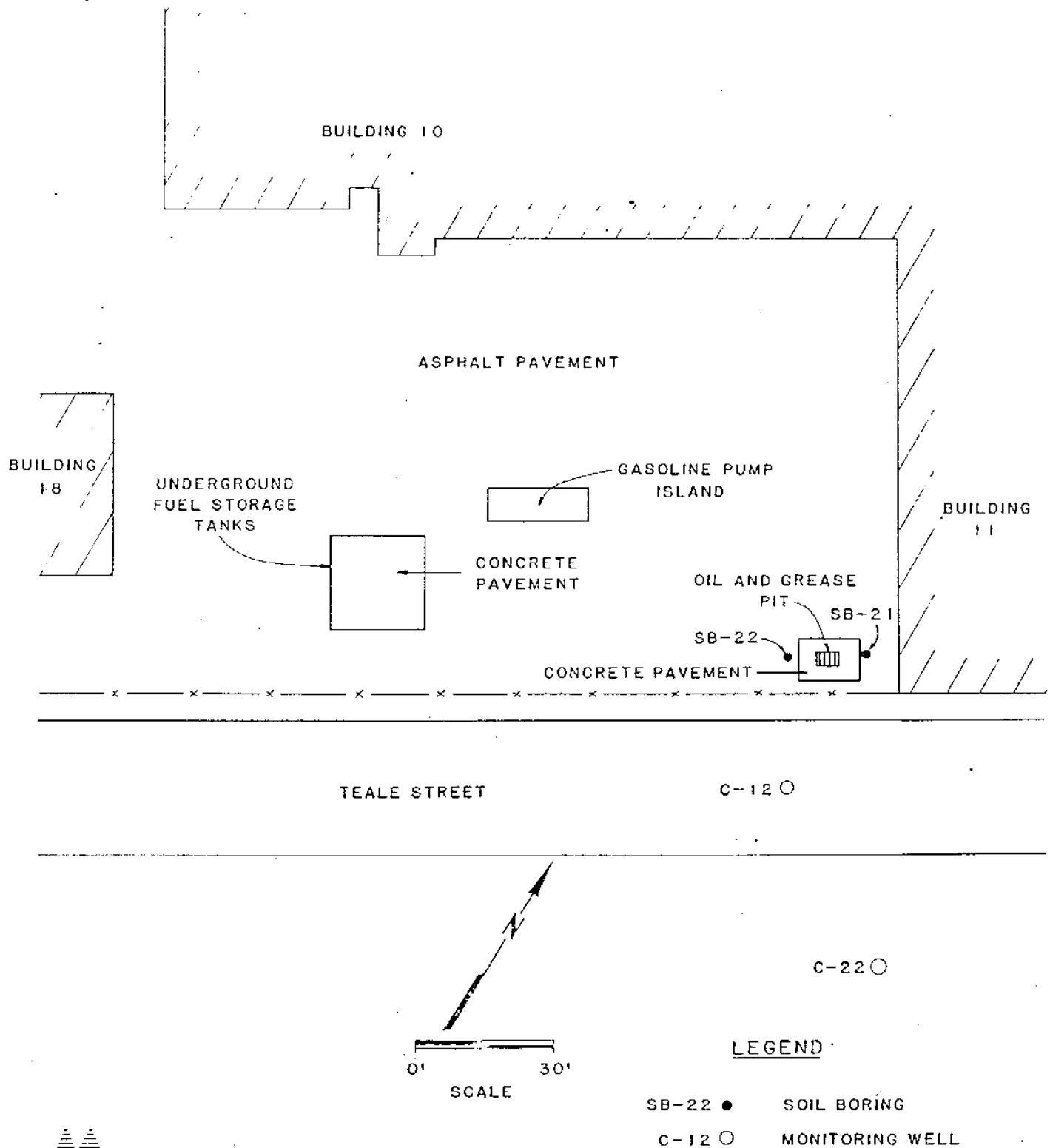


TABLE V-39

PHYSICAL CHARACTERISTICS OF
SOIL BORINGS AT THE OIL AND GREASE
PIT AREA

<u>Location</u>	<u>Total Depth (feet)</u>	<u>Soil Sampling Depths (feet)</u>	<u>Analyses</u>	
			<u>VOC</u>	<u>TPH</u>
SB-21	25	0.5, 2.5, 4.5, 9.5, 14.5, 19.5, 24.5	X	X
SB-22	25	0.5, 2.5, 4.5, 9.5, 14.5, 19.5, 24.5	X	

TABLE V-40

OIL AND GREASE PIT AREA

SOIL SAMPLE ANALYTICAL RESULTS¹
(ppb)

Boring	Depth (ft.)	TPH (ppm)	1,1-DCA	Trans	CHCl ₃	TCA	TCE	Benzene	Toluene	DCM	E-Benzene	Xylenes	1,2-DCB	1,3-DCB	1,4-DCB	PCE
SB-21	0.5	*			10		16	34	4	36						
	2.5	*			4	8	2	110								
	4.5	*					8	97		9						
	9.5	*			3			97		12						
	14.5	*			3		9	73		20						
	19.5	*			6	5	9	80		18						
SB-22	24.5	*			11	10	53	240	600	450	100	680		110		
	0.5	*		233		4	130	391	86							
	2.5	*		14		21		65								
	4.5	*		5		6		92								
	9.5	*		2				95								
	14.5	*						84								
	19.5	*		25		6	9	62	283	11		862				
	24.5	*						106 ⁴								

blank = not detected

* = not analyzed

X = positive analysis

1 = Where duplicate analyses were conducted the higher value is shown.

TABLE V-20
OIL AND GREASE PIT AREA
(Continued)
SOIL SAMPLE ANALYTICAL RESULTS¹
(ppb)

Boring	Depth (ft)	1,1 DCE	1,2 DCA	DBCM	1,1,2,2 TCA	C Benzene	CCl ₄	EDCM	CHBr ₃	1,2-DCP	1,1,2-TCA	Vinyl Chloride	TCFH	PCB	PNA	Heavy Metals	Pesticide
SB-21	0.5				26												
	2.5	17			22												
	4.5				40												
	9.5				2												
	14.5				5												
	19.5				6												
SB-22	24.5				11												
	0.5				30												
	2.5				26												
	4.5				11												
	9.5																
	14.5																
	19.5																
	24.5																

blank = not detected
 ■ = not analyzed
 X = positive analysis
 | = where duplicate analyses were conducted the higher value is shown.

BUILDING 35 SUMPS

Figure V-18 shows the soil boring and monitor well locations at the Building 35 Sumps. There are three sumps surrounding Building 35; a concrete, fiberglass-lined clarifier, a concrete chromate waste sump, and an organic sump. The organic sump reportedly received waste solvents and paint sludge from the paint booths inside Building 35.

Soil samples were collected from three soil borings at the Building 35 sumps. Two soil borings were completed as monitoring wells to determine water quality near this site. Physical characteristics of the soil boring and monitoring wells are presented in Table V-41. Soils data are presented in Tables V-42 and V-43.

The soils at this site consist of sandy soils of rapid permeability with discontinuous strata of finer clayey soils of low permeability at the south side. To the north, the soils are predominantly low permeability clayey soils to 40 feet. The groundwater was observed at 26 feet below surface on the south side and 27 feet below surface on the north side.

As shown in Table V-42, several VOC's were measured in soils at the chromate waste sump and the clarifier north of the building, including benzene, ranging from 64 ppb to 510 ppb throughout the profile, and 1,1,2,2-tetrachloroethane, ranging from non-detected up to 200 ppb. VOC's measured at the organic sump included dichloromethane, ranging from non-detected up to 990 ppb, benzene from 110 ppb to 440 ppb, and 1,1,2,2-tetrachloroethylene from non-detected up to 280 ppb.

As shown in Table V-43, heavy metal analyses showed low concentrations for 16 of 17 metals at the chromate waste sump and for 15 of 17 metals at the clarifier. All metals were below the TTLC criteria for hazardous waste.

Soils at the Building 35 Sumps do not exceed TTLC criteria for hazardous waste, VOCs are not present in concentrations which exceed 1000 times the DHS Action Levels, and TPH is not present in concentrations which exceed 100 ppm. Heavy metal analyses from soils at the organic sump will be conducted when the sump is removed to determine heavy metal concentrations at the sump.

FIGURE V-18
BUILDING 35 SUMPS

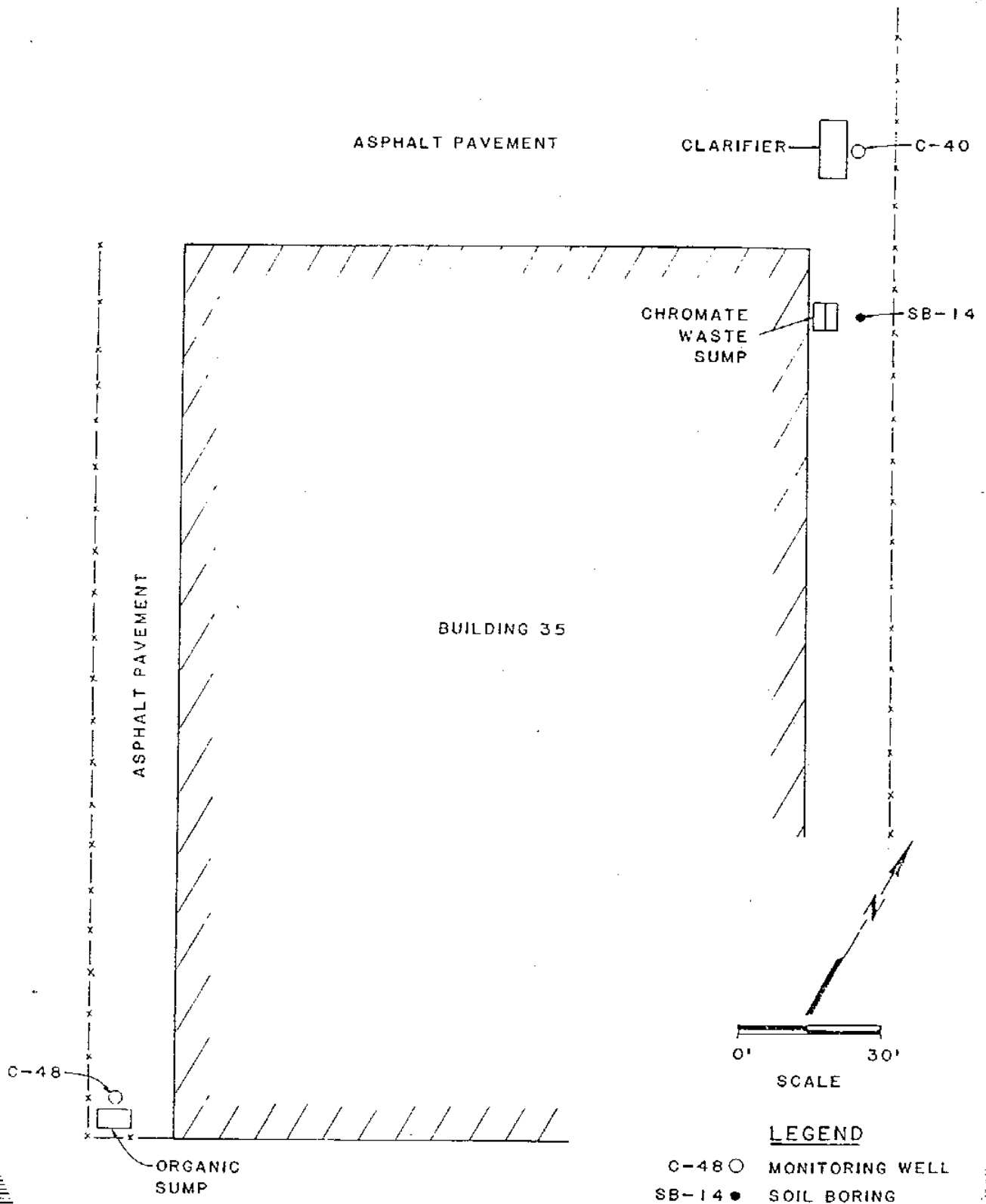


TABLE V-41

PHYSICAL CHARACTERISTICS OF SOIL BORINGS AND MONITORING WELLS
AT THE BUILDING 35 SUMPS

<u>Location</u>	<u>Total Depth (feet)</u>	<u>Soil Sampling Depths (feet)</u>	<u>Analyses</u>			<u>Screened Interval (feet)</u>
			<u>VOC</u>	<u>TPH</u>	<u>Heavy Metals</u>	
SB-14	25	0, 4.5 ^a , 9.5, 14.5, 19.5	X		X	---
C-40	56	0.5, 4.5, 9.5, 14.5, 19.5, 24.5	X	X	X	46 - 56
C-48	45	0, 2.5, 4.5, 9.5, 14.5, 19.5, 24.5, 29.5	X	X		35 - 45

^a Not analyzed for Heavy Metals.

TABLE V-42

BUILDING 35 SUMPS

SOIL SAMPLE ANALYTICAL RESULTS¹
(ppb)

Boring	Depth (ft.)	TPH (ppm)	1,1 DCA	Trans	CHCl ₃	ICA	TCE	Benzene	Toluene	DCM	E-Benzene	Xylenes	1,2 DCB	1,3 DCB	1,4 DCB	PC
SB-14	0.0	■						246								
	4.5	■				5		196								
	9.5	■				36		512								
	14.5	■				32		246								
	19.5	■				45		342								
C-40	0.5					21		64								
	4.5					49		207								
	9.5						5	220	133							
	14.5							128								
	19.5							138								
	24.5							249								
C-48	0.0					3		120	76	11						
	2.5				4	8		140		12						
	4.5				3	9		140		18						
	9.5				4	27		180		560						
	14.5				3			120		52						
	19.5				3	7		110								
	24.5				8	5		250	1800	990	270	1600	430			
	29.5				9		7	440	37	30	190	500	13			

blank = not detected

■ = not analyzed

X = positive analysis

} = Where duplicate analyses were conducted the higher value is shown.

TADUR V-42

BUILDING 35 SUMPS
(Continued)SOIL SAMPLE ANALYTICAL RESULTS¹
(ppb)

Boring	Depth (ft)	1,1 DCE	1,2 DCA	DECH	1,1,2,2 TCA	C Benzene	CCl ₄	BDCM	CHBr ₃	1,2-DCP	1,1,2-TCA	Vinyl Chloride	TCDF	PCB	PMA	Heavy Metals	Pesticide ²
SB-14	0.0															X	
	4.5															X	
	9.5															X	
	14.5	8														X	
	19.5															X	
C-10	0.5															X	
	4.5															X	
	9.5															X	
	14.5															X	
	19.5															X	
	24.5															X	
C-48	0.0																
	2.5																
	4.5																
	9.5																
	14.5																
	19.5																
	24.5																
	29.5																

blank = not detected

■ = not analyzed

X = positive analysis

1 = Where duplicate analyses were conducted the higher value is shown.

TABLE V-43
BUILDING 35 SUMPS
HEAVY METAL RESULTS¹
(ppm)

Boring	Depth (ft)	Ag	As	Ba	Be	Cd	Co	Cr	Cu	Hg	Hq	Ni	Pb	Sb	Se	Tl	V	Zn
SD-14	0.0		4.04	29.22	0.22	0.06	2.83	10.65	1.31		0.20	3.82	3.32	1.51	2.73	9.20	6.76	12.56
	4.5			84.79	0.42	0.22	6.59	11.75	0.84		0.22	4.22	3.65	1.86	3.01	10.16	7.39	11.99
	9.5		3.83	142.10	0.84		8.75	24.41	14.25			10.38	1.95	1.31			21.98	43.75
	14.5	1.74	10.11	132.60	0.51	0.14	10.27	12.94	6.41		0.74	10.65	5.51	4.83	7.53	28.81	18.62	46.12
	19.5	0.79	0.12	1745.00	0.46	0.83	6.52	9.60	10.83		1.97	8.36	12.79	6.61	10.32	25.54	16.15	25.83
C-40	0.5	1.40		120.00	0.29		7.10	6.90	19.00	0.40	0.35	5.40	4.10	2.20		2.10	26.00	38.00
	4.5	0.95		37.00	0.25	0.05	3.10	11.00	4.20	0.43	0.35	3.60	4.50	2.10	1.20		16.00	17.00
	9.5	1.70		170.00	0.82		8.50	19.00	21.00		1.01	13.00	6.30	0.32		2.20	48.00	66.00
	14.5	2.30		210.00	1.10	0.09	18.00	24.00	40.00		1.10	17.00	9.30	0.19		3.71	56.00	86.00
	19.5	2.50		218.00	0.46	1.00	6.80	8.40	18.00		2.60	9.30	15.00	6.70	1.10	2.00	33.00	28.00
	24.5	1.50		124.00	0.66		1.70	12.00	11.00								29.00	33.00

¹ Where duplicate analyses were conducted the higher value is shown.

UNDERGROUND TANK SOUTH OF BUILDING 5

Figure V-19 shows the soil boring and monitoring well locations at the Underground Tank South of Building 5. The bottom of the tank sat approximately 28 feet below ground surface. This tank contained cutting oils, but was pumped and cleaned in August, 1986. Samples of liquid from the sump were analyzed and found to contain 29 ppm PCB's.

Soil samples were collected from four soil borings at the Underground Tank South of Building 5. One soil boring was completed as a monitoring well to determine whether chemicals have migrated into the groundwater at this site. The physical characteristics of the soil borings and monitoring well at this site are given in Table V-44. Soils data are presented in Table V-45.

The soils at this site consist of fine sandy soils of high permeability with discontinuous strata of finer clayey soil of low permeability. The groundwater was observed at 22 feet below ground surface.

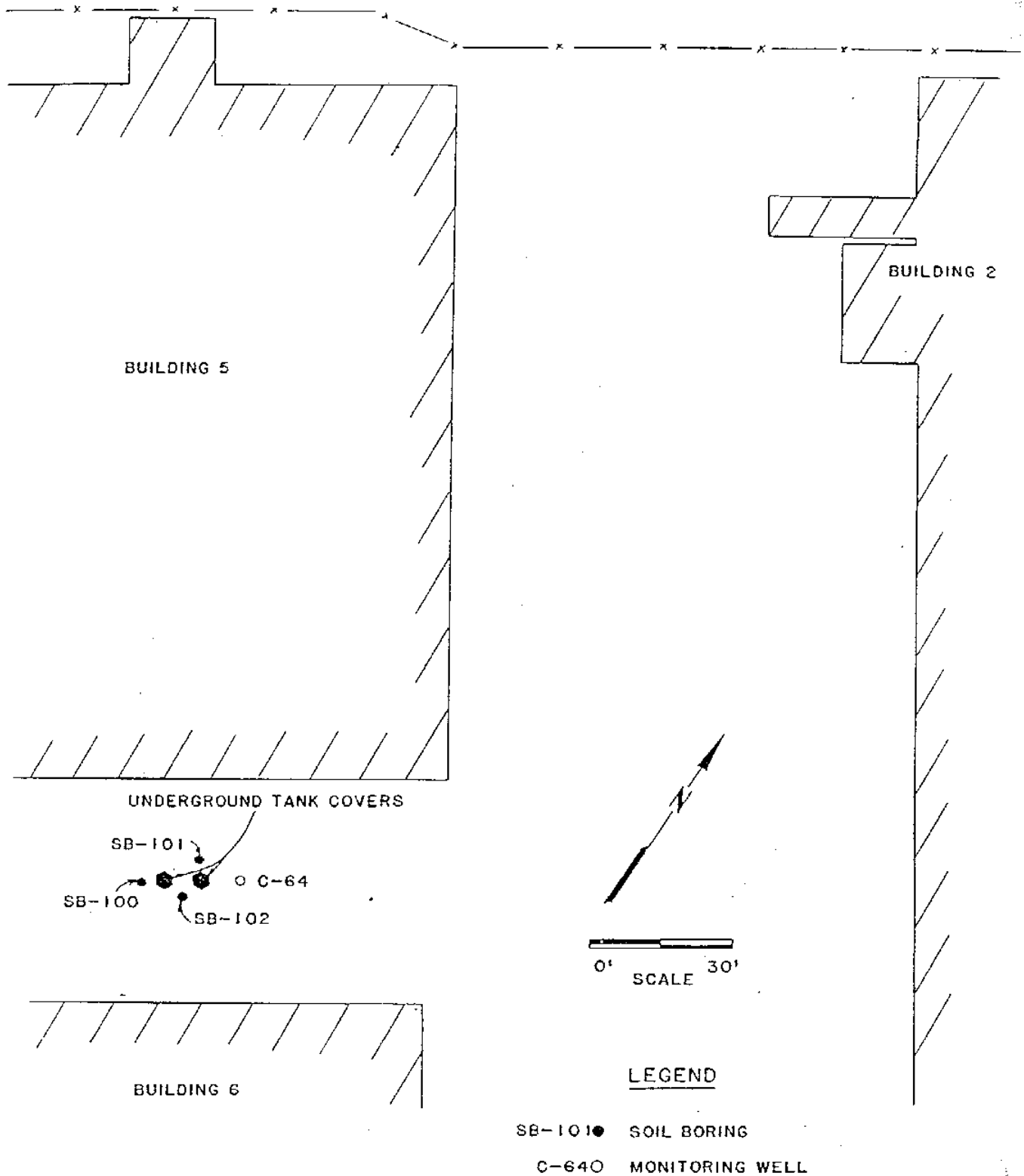
As shown in Table V-45, VOC's were detected at highest concentrations between 9.5 and 29.5 feet below ground surface. Tetrachloroethylene was detected in concentrations ranging from 30 to 48,000 ppb, trichloroethylene from 70 to 39,000 ppb, and 1,1,1-trichloroethane from 80 to 12,000 ppb. Other VOC's detected at this site included chloroform, from 250 to 5,900 ppb, dichloromethane, from 100 to 430 ppb, and benzene, 880 ppb.

TPH was detected from the surface down to 29.5 feet, with concentrations ranging from 13 to 17,000 ppm.

PCB's were detected in six samples from 4.5 feet to 29.5 feet. Concentrations ranged from 400 to 40,000 ppb.

Soils at the Underground Tank South of Building 5 do not exceed TTC criteria for hazardous waste. The soils at this site have not been tested against the fish bioassay but are presumed to be potentially hazardous waste because of the high VOC concentrations. TCE was detected in concentrations which exceed 1000 times the DHS Action Levels at SB-100, SB-101, and SB-102 and benzene was detected in concentrations which exceed 1000 times the DHS Action Levels in one isolated sample taken from SB-101. TPH was detected in concentrations which exceed 100 ppm in SB-101 and SB-102. Although PCB's were detected in soils at this site in concentrations up to 40,000 ppb, no PCB's were found in water samples taken from Well C-64, adjacent to the tank.

FIGURE V-19
UNDERGROUND TANK
SOUTH OF BUILDING 5



[illegible]

D	8	UCL	range	1.3	Tolu	Benz	Tolu	DCM	Xyl	: Benz	: OCB	1,4-E	PCE

D	8	UCL	Tolu	Benz	Tolu	DCB	Xyl	Benz	OCB	1,4-E	PCE
		range	at 3								

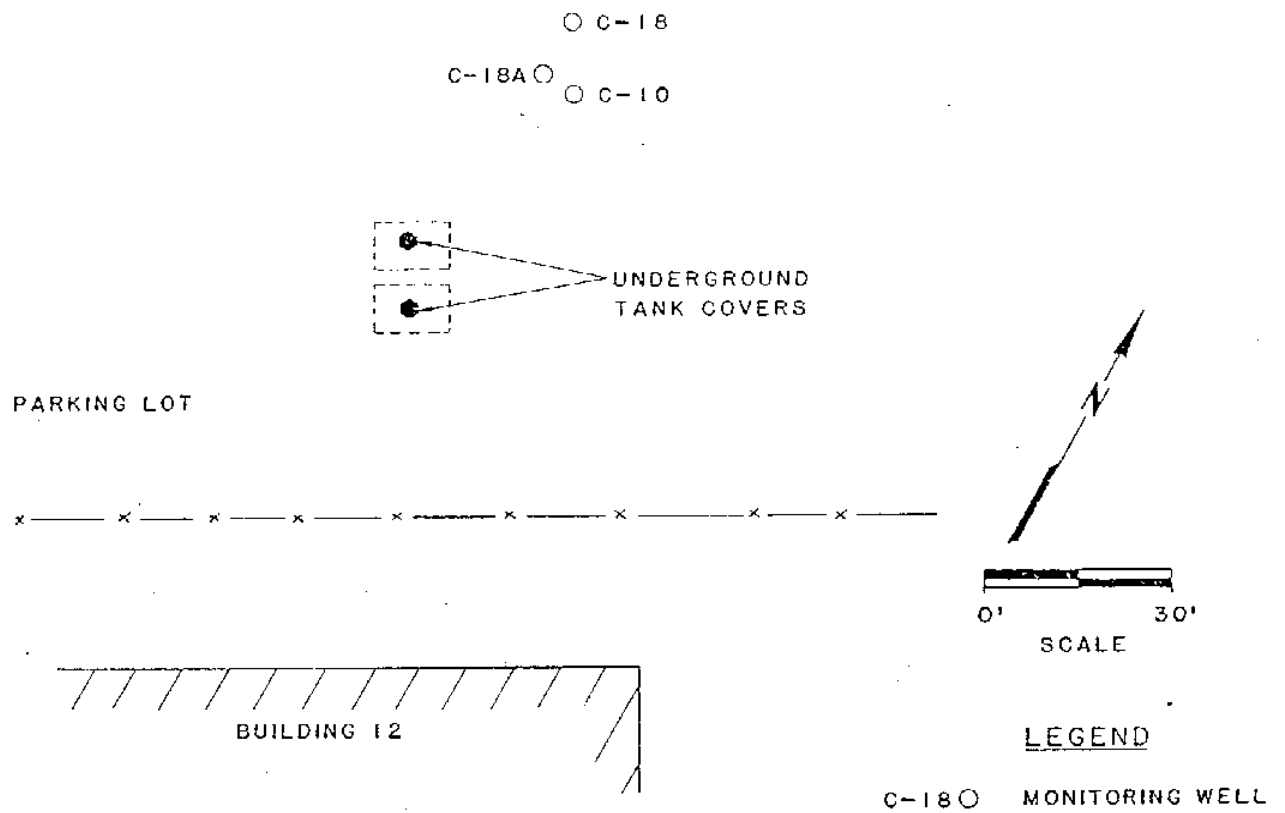
D	8	UCL	Tolu	Benz	Tolu	DCB	Xyl	Benz	OCB	1,4-E	PCE
		range	at 3								

UNDERGROUND TANKS NORTH OF BUILDING 12

Figure V-20 shows the location of two underground 5,000-gallon motor fuel tanks located north of the northeast corner of Building 12. High concentrations (up to 18,000 ppb) of fuel-related hydrocarbons detected in groundwater at monitoring wells C-10 and C-18 raises the question as to whether these tanks are a potential source of chemicals in groundwater. No soil samples have been collected at this site and no hazard classification is possible.

These tanks will be removed as part of the underground storage tank compliance program. Associated soil sampling will determine if the tanks are a potential source of chemicals detected in Wells C-10 and C-18.

FIGURE V-20
UNDERGROUND TANKS
NORTH OF BUILDING 12



SECTION VI

GROUNDWATER QUALITY INVESTIGATIONS

This section of the report summarizes the distribution of organic and inorganic constituents which have been detected in groundwater beneath the Plant Site. Chemical analyses performed on samples taken from 33 monitoring wells drilled by Hargis and Associates in the period from 1983 to 1985 and 36 monitoring wells drilled by McLaren Engineering in 1986 have indicated the presence of volatile organic chemicals, petroleum hydrocarbons, metals, pesticides, and other compounds which exceed DHS Action Levels or EPA Primary Drinking Water Standards. Representative data for groundwater constituents in each monitor well are summarized in Tables VI-1 and VI-2. All analytical data compiled for groundwater are given in Appendix C. A listing of analyses performed on each well is given in Table VI-3.

Some of the constituents detected in groundwater are probably attributable to historic releases resulting from approximately 60 years of agricultural activities and 35 years of industrial activities conducted on the site. Other constituents, such as some heavy metals, cannot be attributed to human activity and may occur naturally. There appear to be a number of source areas which have contributed chemicals to groundwater as confirmed by potential source area soil investigations (Section V). However, the uses of specific areas on the site has varied with time, and the sources of specific chemical constituents are not readily defined. An additional factor which complicates the identification of groundwater constituent sources is the probable change in regional groundwater flow direction in the last 35 to 50 years. Flow directions in the Bellflower/Ballona Aquifer derived from monthly potentiometric measurements in 1986 and 1987 show slight seasonal changes. Larger, long term variations in flow direction within the aquifer would have been affected by: the increase in groundwater pumping for irrigation and domestic uses in the Culver City area from 1920 to 1950; the cessation of that pumping as aquifer water increased in salinity and water imports increased; the increased withdrawal of water from deeper aquifers in Culver City and the Inglewood/Hawthorne area east and southeast of the site; the termination of use of the Loyola/Marymount Well south of the site; and the artificial recharge from the seawater barrier project southwest of the site. The groundwater flow directions which currently prevail in the Bellflower/Ballona Aquifer beneath the site can be determined from the potentiometric contours shown in Figure III-5. Currently, flow directions are northwesterly to northerly on the western one-third of the site and easterly to northeasterly on the eastern two-thirds of the site.

Figures VI-1 through VI-4 depict the known lateral and vertical distribution of volatile organic chemicals which occur in groundwater at concentrations greater than the Action Levels listed in Table VI-4.

TABLE VI-1

MOST REPRESENTATIVE CHEMICAL CONCENTRATIONS IN GROUNDWATER

VOLATILE ORGANIC COMPOUNDS (ppb)	C-1 ¹	C-2	C-3 ¹	C-4 ¹	C-5 ¹	C-6	C-7 ²	C-8	C-9	C-10	C-11 ²
Benzene											
C. Benzene				0.6	1					3	
1,2 DCB											
1,3 DCB									10	1	
1,4 DCB											
CCl ₄			5								
DCM											
CHCl ₃					20		3	200	3000		4
1,1 DCA											
1,2 DCA					5			200	400		
1,1 DCE		80	3	30	20		2	100	10000		
Trans							3				
1,2 DCP											
E. Benzene											
PCE										40	
TCA											
1,1,2 TCA											
1,1,2,2 TCA		20	3		3			10	3000	3	
TCE									20		
Toluene								4	20		
VC									7		
Total Xylenes											
						0.4				4.5	0.3
TOTAL PETROLEUM HYDROCARBONS (ppm)											
HEAVY METALS WHICH EXCEED REGULATORY STANDARDS (ppb)											
Arsenic											
Barium											
Cadmium											
Iron											
Lead											
Manganese							500				
Mercury											
Nickel											
Selenium											
Thallium											
	140	210	350	630	200	160		160	330	1300	600

1 Other compounds detected (see Table VI-2).

2 Volatile organic compounds not consistently detected. Most recent analysis reported.

TABLE VI-1

MOST REPRESENTATIVE CHEMICAL CONCENTRATIONS IN GROUNDWATER
(Continued)

VOLATILE ORGANIC COMPOUNDS (ppb)	C-12	C-13	C-14	C-15	C-16	C-17 ²	C-18 ²	C-19	C-20	C-21	C-22
Benzene	6000			3		0.9	10				
C. Benzene							0.9				0.9
1,2 DCB							1				0.9
1,3 DCB	300000						1				0.7
1,4 DCB	400000										
CCl ₄						10					
DCM											
CHCl ₃		30				5	3	2		70	
1,1 DCA											
1,2 DCA		10								10	
1,1 DCE		600		20	8	0.9	30	2		100	2
Trans	8										
1,2 DCP											
E. Benzene	30000						2			2	3
PCE	50					20		8			
TCA											
1,1,2 TCA											
1,1,2,2 TCA		5		2			5			20	
TCE	40			5	3	4	10			5	
Toluene	60000						20				
VC		2000				3	10				10
Total Xylenes	300000										
TOTAL PETROLEUM HYDROCARBONS (ppm)	1000	0.2			0.6			0.7			
HEAVY METALS WHICH EXCEED REGULATORY STANDARDS (ppb)											
Arsenic		160									
Barium											
Cadmium											
Iron											
Lead	30000	230	6400	1000	2000	750	200	550	200	200	500
Manganese	1600										
Mercury											
Nickel											
Selenium											
Thallium											

VI-3

1 Other compounds detected (see Table VI-2).

2 Volatile organic compounds not consistently detected. Most recent analysis reported.

TABLE VI-1

MOST REPRESENTATIVE CHEMICAL CONCENTRATIONS IN GROUNDWATER
(Continued)

VOLATILE ORGANIC COMPOUNDS (ppb)	C-23	C-24	C-24A ¹	C-25	C-26	C-27	C-28	C-29 ¹	C-30	C-31	C-32
Benzene											
C. Benzene			8								
1,2 DCE			2								
1,3 DCE											
1,4 DCE											
CCl ₄											
DCM											
CHCl ₃			10								3
1,1 DCA	5	3	40			50					
1,2 DCA											
1,1 DCE			30			2					
Trans	200	20	1000	40		10	100		4	10	
1,2 DCF											
E. Benzene											
PCE		1	10								
TCA			100								
1,1,2 TCA											
1,1,2,2 TCA											
TCE	40	20	1000	10		2	10				10
Toluene		10	2								
VC											
Total Xylenes											
TOTAL PETROLEUM HYDROCARBONS (ppm)	0.5			0.4					0.8		
HEAVY METALS WHICH EXCEED REGULATORY STANDARDS (ppb)											
Arsenic											
Barium											
Cadmium											
Iron											
Lead											
Manganese											
Mercury ³	200	1000		90	120	340	320	130	280	220	110
Nickel						80					
Selenium											
Thallium									100		

¹ Other compounds detected (see Table VI-2).² Volatile organic compounds not consistently detected. Most recent analysis reported.³ Data may be too high due to inaccuracy of analytical technique used.

TABLE VI-1

MOST REPRESENTATIVE CHEMICAL CONCENTRATIONS IN GROUNDWATER
(Continued)

VOLATILE ORGANIC COMPOUNDS (ppb)	C-32	C-34	C-35 ¹	C-36 ¹	C-37	C-38 ²	C-39	C-40 ¹	C-41 ¹	C-42	C-43 ¹
Benzene			20	20					15		50
C. Benzene											
1,2 DCB		8	5								
1,3 DCB			1								
1,4 DCB			20								
CCl ₄				20					40		100
DCM			5000								
CHCl ₃									40000		300000
1,1 DCA			9000	900	200			20	300	2	1000
1,2 DCA									1000		100000
1,1 DCE			4000	300					8000	10	3000
Trans			200	100	50	5	2	10	5000	5	20000
1,2 DCP											70
E. Benzene			100				1		3000		
PCE			2000	20					200		10000
TCA		6	3000	30			5		30000	10	400000
1,1,2 TCA											1200
1,1,2,2 TCA											
TCE		2	800	200	30	2	6		5000	2	5000
Toluene			30						3000		8000
VC					4				7		5000
Total Xylenes			300						6000		100
TOTAL PETROLEUM HYDROCARBONS (ppm)				0.4					1.1		
HEAVY METALS WHICH EXCEED REGULATORY STANDARDS (ppb)											
Arsenic ³								300	410		
Barium											
Cadmium			10	30				10		30	
Iron		8500			1500			600	11000	3600	
Lead											
Manganese											
Mercury ³	190	280		210	260	50	NA	310	1200	300	
Nickel				110	110			150	170		
Selenium ³											
Thallium								200	200		

¹ Other compounds detected (see Table VI-2).² Volatile organic compounds not consistently detected. Most recent analysis reported.³ Data may be too high due to inaccuracy of analytical technique used.

TABLE VI-1

MOST REPRESENTATIVE CHEMICAL CONCENTRATIONS IN GROUNDWATER
(Continued)

VOLATILE ORGANIC COMPOUNDS (ppb)	C-44	C-45	C-46	C-47	C-48	C-49	C-50	C-51	C-52A ¹	C-52B	C-52C
Benzene											
C. Benzene					300						
1,2 DCB			0.5		10	10					
1,3 DCB			0.7	3	20	2					
1,4 DCB											
CCl ₄											
DCM			10			10					
CHCl ₃	6	200		700		200	10	100			
1,1 DCA											
1,2 DCA				100			2	7			
1,1 DCE		10		3000	20	2	10				
Trans											
1,2 DCP			0.6		70		2	20			
E. Benzene							2	10			
PCE		20		80		10	2	2			
TCA									2		
1,1,2 TCA											
1,1,1,2,2 TCA											
TCE			0.6	700	7	2		8			
Toluene				5	10	3					
VC		10	2	3	10	80					
Total Xylenes											
TOTAL PETROLEUM HYDROCARBONS (ppm)		0.4					0.5	0.1	0.3		
HEAVY METALS WHICH EXCEED REGULATORY STANDARDS (ppb)											
Arsenic					400						3000
Barium											
Cadmium		10	30		10						
Iron		1500	3300	3200	8500	600					
Lead					530						
Manganese	400	80	120			130 ²					
Mercury					180	50					
Nickel		100			220						
Selenium											
Thallium	100									100	

1 Other compounds detected (see Table VI-2).

2 Volatile organic compounds not consistently detected. Most recent analysis reported.

TABLE VI-1

MOST REPRESENTATIVE CHEMICAL CONCENTRATIONS IN GROUNDWATER
(Continued)

VOLATILE ORGANIC COMPOUNDS (ppb)	C-53	C-54	C-55	C-56	C-57	C-58 ²	C-59	C-60	C-61	C-62 ¹	C-63
Benzene											
C. Benzene							2		2		
1,2 DCE		2							1		
1,3 DCE							1				
1,4 DCE							2		1		
CCl ₄											
DCE											
CHCl ₃	1										
1,1 DCA		40	300	200			7	100	10	5	10
1,2 DCA								50		7	
1,1 DCE			30	30			6				
Trans		100	200	30			2		9	10	10
1,2 DCP											
E. Benzene							3		2	1	
PCE			4								
TCA			5				3				
1,1,2 TCA						1					
1,1,2,2 TCA											
TCE		8	50	10			30	2000	20	4	
Toluene							20		10		
VC		200					20	1	10	6	
Total Xylenes											
TOTAL PETROLEUM HYDROCARBONS (ppm)								1.9	0.9		0.8
HEAVY METALS WHICH EXCEED REGULATORY STANDARDS (ppb)											
Arsenic ³			200								
Barium											
Cadmium			10	10							
Iron		300	1000								
Lead											
Manganese		200	220	210	140	150					
Mercury ³		60	110	90							
Nickel				40							
Selenium ³											
Thallium	100										

¹ Other compounds detected (see Table VI-2).² Volatile organic compounds not consistently detected. Most recent analysis reported.³ D. may be too high due to inaccuracy of analytical technique used.

TABLE VI-1
MOST REPRESENTATIVE CHEMICAL CONCENTRATIONS IN GROUNDWATER
(Continued)

VOLATILE ORGANIC COMPOUNDS (ppb)

	C-54 ¹	WP-1	WP-2	WP-3	WP-4
Benzene	200				
C. Benzene					
1,2 DCB	9		4	300	50
1,3 DCB	5			40	
1,4 DCB	30			40	6
CCl ₄	500				
DCM	10,000	500			
CHCl ₃	600	200	70		1,000
1,1 DCA					
1,2 DCA					
1,1 DCE					
Trans	700	3,000	2,000	20,000	20,000
1,2 DCP	600				
E. Benzene	100	80			
PCE	300		80	500	
TCA	200	60	40		
1,1,2 TCA					
1,1,2,2 TCA	10,000	2,000	100	1,000	1,000
ICE	300			6	8
Toluene	4			10	30
VC				10	10
Total Xylenes	400				

TOTAL PETROLEUM HYDROCARBONS (ppm)

HEAVY METALS WHICH EXCEEDED
REGULATORY STANDARDS (ppb)

Arsenic					
Barium					
Cadmium	10			20	
Iron					
Lead					
Manganese					
Mercury ³					
Nickel					
Selenium					
Thallium				60	

- 1 Other compounds detected (see Table VI-2).
- 2 Volatile organic compounds not consistently detected. Most recent analysis reported.
- 3 Data may be too high due to inaccuracy of analytical technique used.

TABLE VI-2
MOST REPRESENTATIVE CHEMICAL CONCENTRATIONS IN GROUNDWATER

WELL NUMBER	C-1	C-3	C-4	C-5	C-18	C-24A	C-29	C-35	C-36	C-40	C-41	C-43	C-52A	C-62	C-64
Pesticides and Herbicides (ppb)															
Alpha or a-BHC											0.14			0.55	
Beta or b-BHC											0.13			0.02	0.06
Delta or d-BHC															
Gamma or g-BHC															
4,4'DDD									0.25	0.21					
4,4'DDE										0.06					
4,4'DDT										0.31					
Heptachlor Epoxide												0.35			11
Endrin															
Organic Acid Extractions (ppb)															
2,4-D.M. Phenol											30	300			
Phenol												20,000			
Base/Neutral Extractions (ppb)															
Bis(2-ethylhexyl) Phthalate															
Di-n-octyl Phthalate															
Phthalate Matrix															
Other Compounds															
Acetone			20	20	10		10				30,000		80		
MEK											20,000		10,000		
Isopropanol											8,000				
Iso-Butanol											3,000				
Butyl Cellosolve													600		
Cresol Isomers													800		

TABLE VI-3
GROUNDWATER QUALITY ANALYSES

<u>Well Number</u>	<u>VOC'S</u>	<u>Fuel Hydrocarbons</u>	<u>Metals</u>	<u>Common Ions</u>	<u>EPA Priority Pollutants</u>	<u>PCB's</u>
C-1	X	X	X	X		
C-2	X	X	X	X	X	X
C-3	X	X	X	X		
C-4	X	X	X	X		
C-5	X	X	X	X	X	X
C-6	X	X	X	X		
C-7	X	X	X	X		
C-8	X	X	X	X	X	X
C-9	X	X	X	X		
C-10	X	X	X	X	X	X
C-11	X	X	X	X	X	X
C-12	X	X	X	X		
C-13	X	X	X	X	X	X
C-14	X	X		X	X	X
C-15	X	X	X	X		
C-16	X	X	X	X		
C-17	X	X	X	X		
C-18	X	X	X	X	X	X
C-19	X	X	X	X		
C-20	X	X	X	X		
C-21	X	X	X	X	X	X
C-22	X	X	X	X	X	X
C-23	X	X	X	X		
C-24	X	X	X	X		
C-24A	X	X	X	X	X ^a	
C-25	X	X	X	X		
C-26	X	X	X	X		
C-27	X	X	X	X	X ^a	
C-28	X	X	X	X	X ^a	
C-29	X	X	X	X		
C-30	X	X	X	X		
C-31	X	X	X	X		
C-32	X	X	X	X		
C-33	X	X	X	X		
C-34	X	X	X	X	X	X
C-35	X	X	X	X	X	
C-36	X	X	X	X	X	X

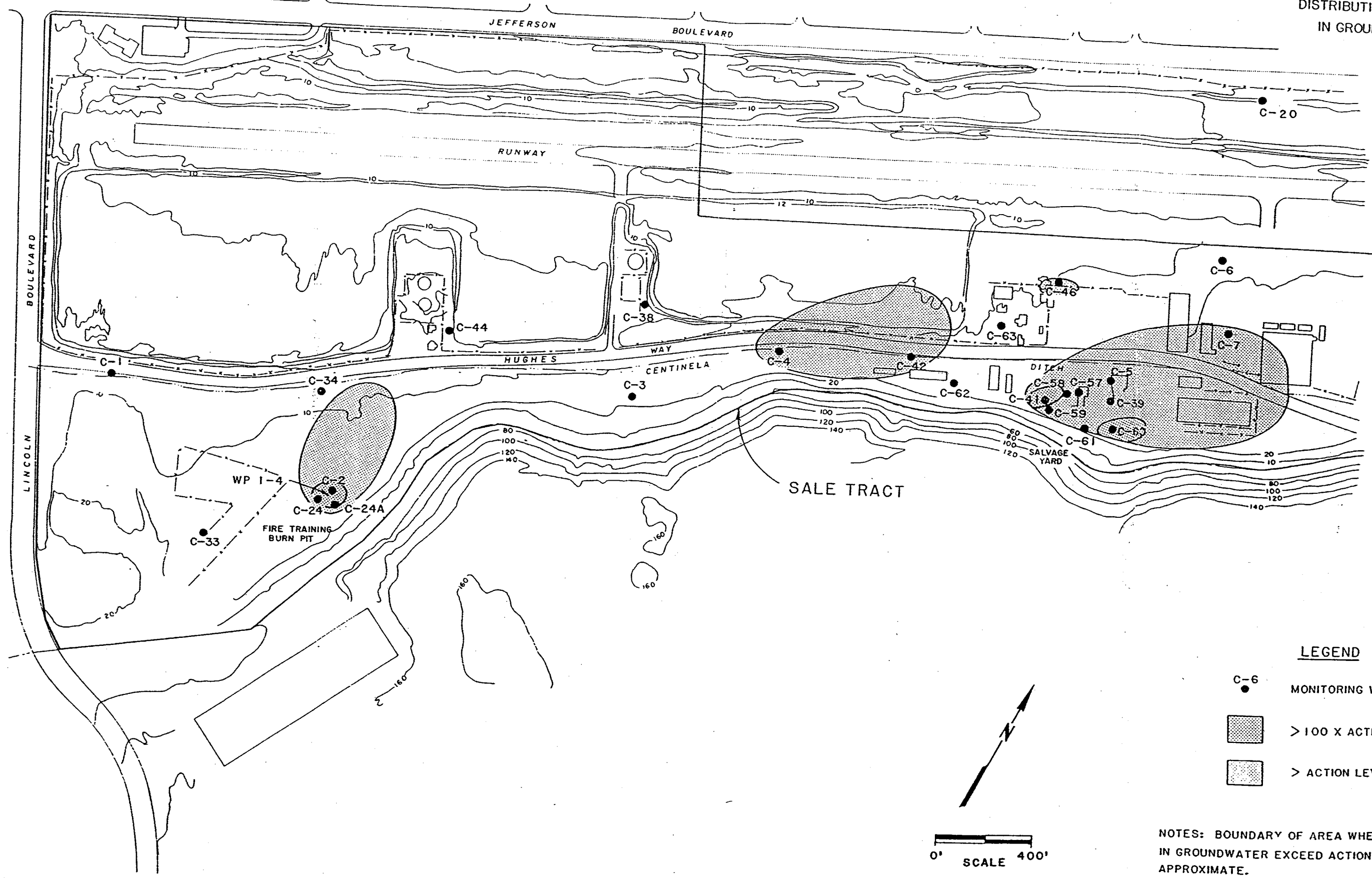
^a Analyses conducted for base/neutral and acid organics which includes EPA Priority Pollutants with the exception of pesticides.

TABLE VI-3
GROUNDWATER QUALITY ANALYSES
(Continued)

<u>Well Number</u>	<u>VOC'S</u>	<u>Fuel Hydrocarbons</u>	<u>Metals</u>	<u>Common Ions</u>	<u>EPA Priority Pollutants</u>	<u>PCB's</u>
C-37	X	X	X	X		
C-38	X	X	X	X		
C-39	X	X	X	X		
C-40	X	X	X	X	X	X
C-41	X	X	X	X	X	X
C-42	X	X	X	X		
C-43	X	X	X	X	X	X
C-44	X	X	X	X		
C-45	X	X	X	X		
C-46	X	X	X	X	X	X
C-47	X	X	X	X	X	X
C-48	X	X	X	X		
C-49	X	X	X	X	X	X
C-50	X	X	X			
C-51	X	X	X		X	X
C-52A	X	X	X	X		
C-52B	X	X	X	X		
C-52C	X	X	X	X		
C-53	X	X	X			
C-54	X	X	X	X		
C-55	X	X	X	X		
C-56	X	X	X	X		
C-57	X	X	X	X		
C-58	X	X	X	X		
C-59	X	X	X	X	X	X
C-60	X	X				
C-61	X	X				
C-62	X	X		X	X	X
C-63	X	X		X	X	X
C-64	X	X			X	X
WP-1	X	X	X			
WP-2	X	X		X	X	X
WP-3	X	X	X			
WP-4	X	X	X		X	X
EW-1	X	X	X	X	X	X

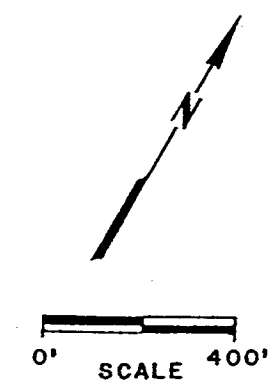
^a Analyses conducted for base/neutral and acid organics which includes EPA Priority Pollutants with the exception of pesticides.

FIGURE VI-1
DISTRIBUTION OF VOC's
IN GROUNDWATER



LEGEND

- C-6
MONITORING WELL
- > 100 X ACTION LEVELS
- > ACTION LEVELS



NOTES: BOUNDARY OF AREA WHERE CHEMICALS
IN GROUNDWATER EXCEED ACTION LEVELS IS
APPROXIMATE.

IDENTIFIED POTENTIAL SOURCE AREAS ARE SHOWN.

FIGURE VI-2
DISTRIBUTION OF VOC's
IN GROUNDWATER

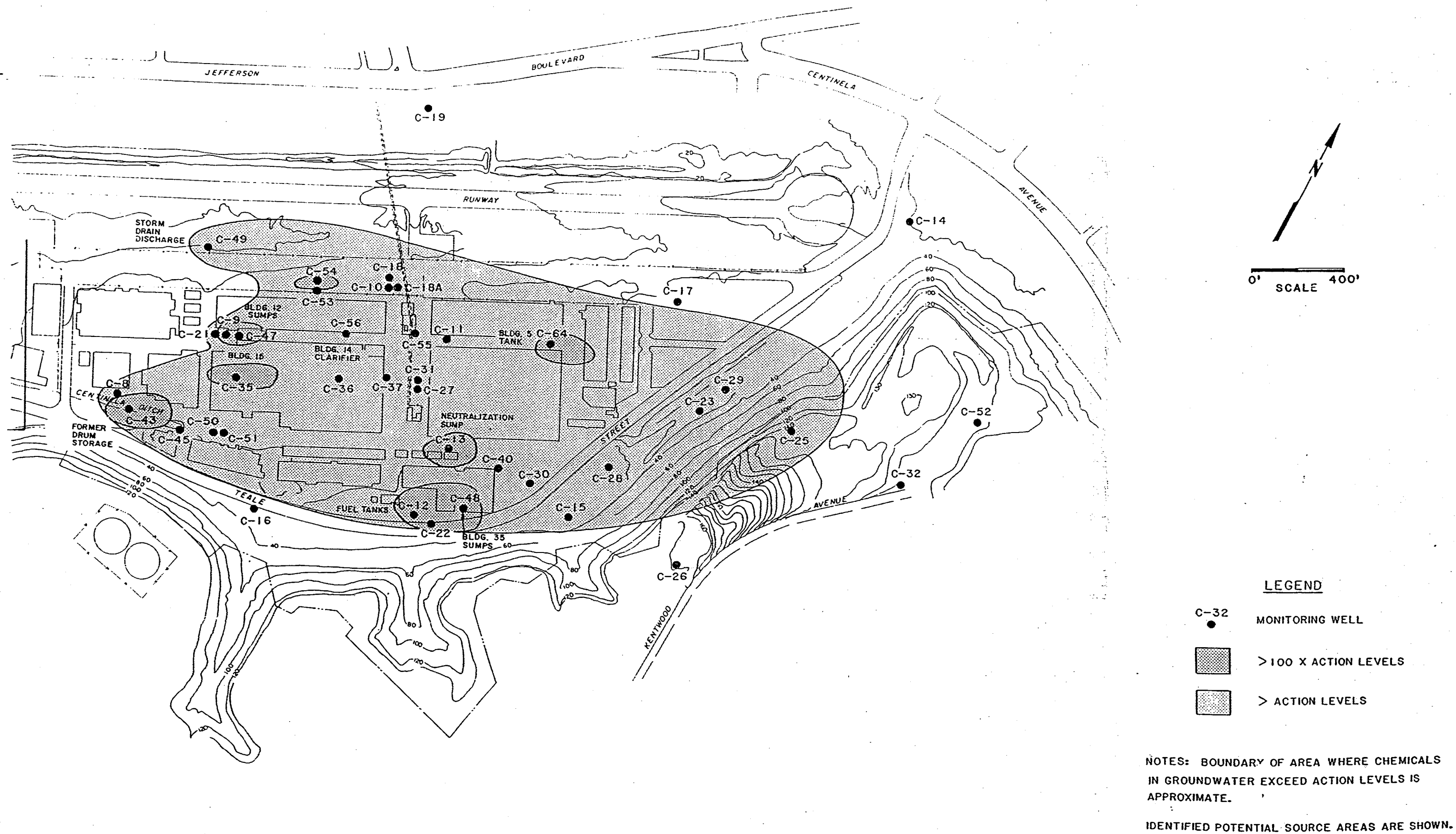


FIGURE VI-3
SCHEMATIC DISTRIBUTION OF
VOC's IN GROUNDWATER
ALONG GENERALIZED CROSS SECTION A-B-C

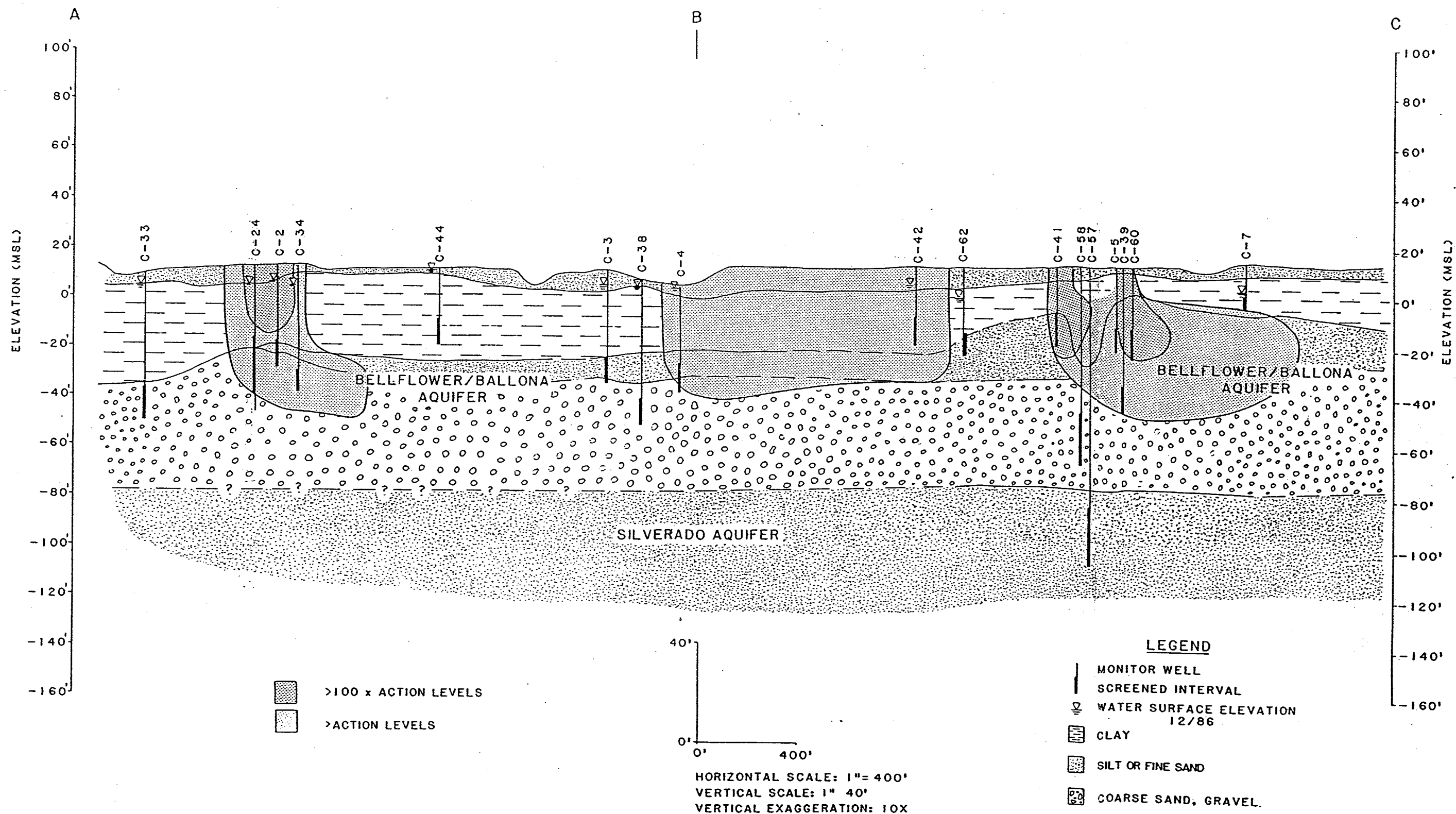
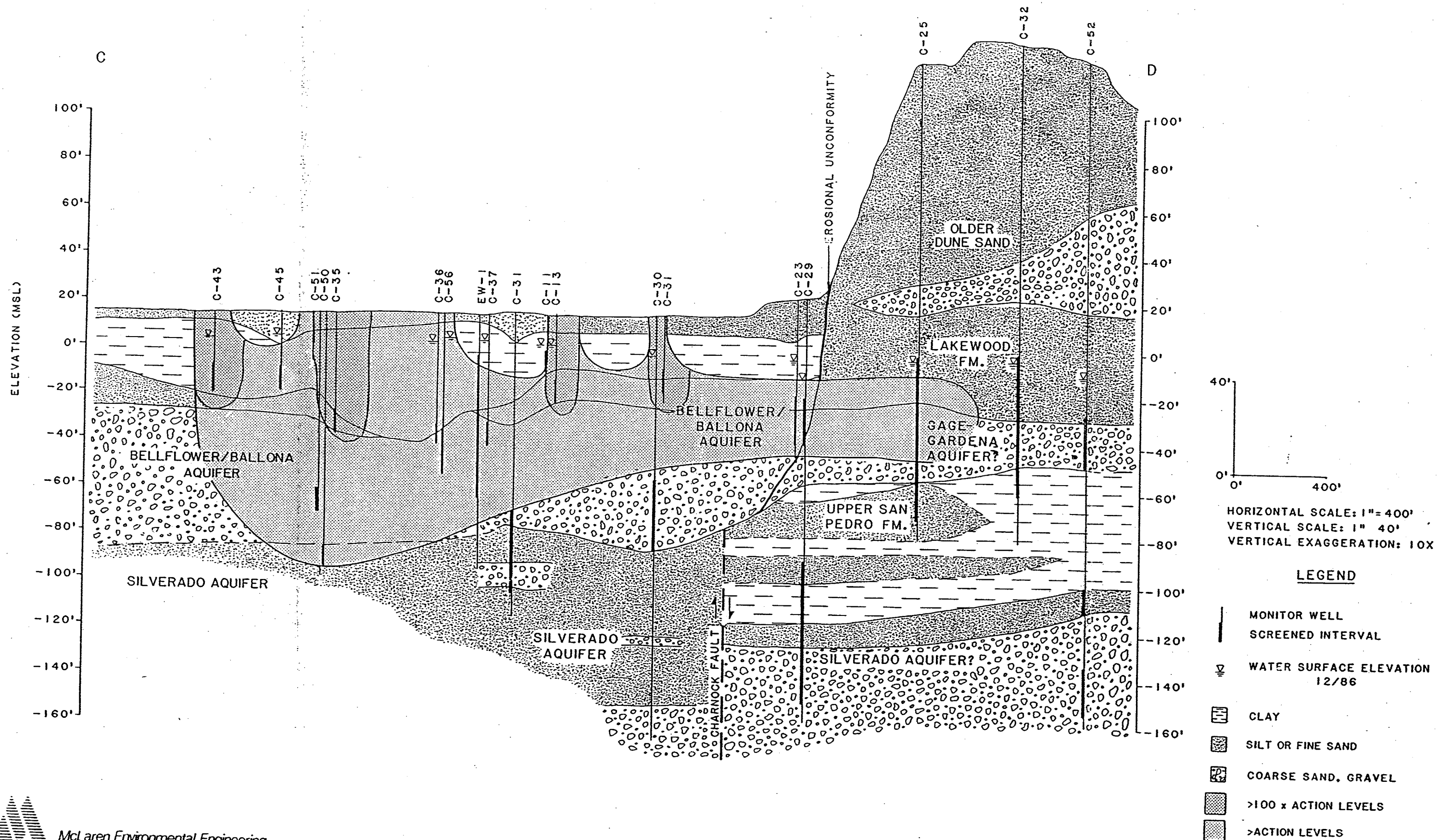


FIGURE VI-4
SCHEMATIC DISTRIBUTION OF
VOC's IN GROUNDWATER
ALONG GENERALIZED CROSS SECTION C-D



Figures VI-5 and VI-6 depict the known distribution of metals at concentrations greater than those listed in Table VI-4. Chemicals, hydrocarbons or dissolved metals may occur in groundwater outside of the shaded areas shown in the figures, but concentrations are lower than those listed in Table VI-4. Figures VI-1 through VI-6 were compiled from a review of all water quality data collected through January 1, 1987, for saturated zones in the Bellflower Aquitard, the Bellflower/Ballona Aquifer, the Silverado Aquifer, and the Gage/Gardena Aquifer. In Figures VI-1 through VI-4 the downgradient spreading shown for chemical distributions from source areas is based on downgradient well control, recent flow direction data, probable anisotropy, and estimated hydrodynamic dispersion in the Bellflower/Ballona Aquifer.

Wells C-1 through C-32, constructed by Hargis and Associates, have been sampled 5 to 7 times since 1983, providing a data base for evaluation of chemical distribution and trends with time. In addition to analyses conducted for VOC's, at least 1 sample from each of these wells has been analyzed for fuel hydrocarbons, metals, and common ions. Selected wells in this group were also sampled for all EPA Priority Pollutants, pesticides, and PCB's. Wells C-33 through C-64 and WP-1 through WP-4, constructed by McLaren Engineering, have, for the most part, been sampled twice for VOC's and total petroleum hydrocarbons (TPH). Selected wells in this group were also sampled for metals, common ions, EPA Priority Pollutants, and PCB's. Table VI-3 shows the analyses which have been performed for each well on the Plant Site.

All data reported for water quality samples were obtained from laboratories which use analytical methods recommended by the U.S. Environmental Protection Agency (see Table IV-3). Some U.S. EPA recommended methods yield more accurate data for certain compounds and ions than do other recommended methods. For example, EPA Method 6010, the Inductively Coupled Argon Plasma (ICAP) technique, was used for most of the inorganic analyses in 1986 including mercury analyses, whereas, EPA method 245.1, manual cold vapor analysis, a more accurate analytical method for mercury, was used in most of the pre-1986 and only a few 1986 analyses. More accurate analytical techniques for arsenic and other metals are also available. It became evident when mercury data from the two techniques were compared that the ICAP method yielded mercury values three or four orders of magnitude higher than the manual cold vapor analysis for several water samples (C-27, C-36, C-41, C-43, C-54 in Appendix C). The lack of agreement between methods causes most of the 1986 mercury, arsenic, and other metal data to be questioned. The 1986 ICAP data for metals are reported in this section, but the reported arsenic and metals concentrations may be too high.

The bases for discussion of chemical occurrence in groundwater are the most representative concentrations shown in Tables VI-1 and VI-2 which reflect our best judgment of current concentrations of chemicals at each well. Estimation of the representative values was based on engineering judgment and the following general guidelines:

TABLE VI-4
GROUNDWATER ACTION LEVELS

CHEMICAL	DHS ACTION LEVEL (ppb)
Carbon Tetrachloride	5.0
1,2-Dichloroethane	1.0
1,1-Dichloroethylene	6.0
Methylene Chloride	40.0
Tetrachloroethylene	4.0
1,1,1-Trichloroethane	200.0
Trichloroethylene	5.0
Vinyl Chloride	2.0
1,1-Dichloroethane	20.0
Trichlorofluoromethane	3,400.0
Freon 113	18,000.0
1,1,2-Trichloroethane	100.0
Cis-1,2-Dichloroethylene	16.0
Trans-1,2-Dichloroethylene	16.0
Chloroform	100.0 ¹
Benzene	0.7
1,2-Dichlorobenzene	130.0
1,3-Dichlorobenzene	130.0
1,4-Dichlorobenzene	0.5
Ethylbenzene	680.0
Toluene	100.0
Total Xylenes	620.0
1,2-Dichloropropane	10.0
a-BHC	0.7
b-BHC	0.3
Heptachlor Epoxide	0.1
Phenol	1.0 ²
Arsenic	50.0 ³
Barium	1,000.0 ³
Cadmium	10.0 ³
Lead	50.0 ³
Mercury	2.0 ³
Selenium	10.0 ³

¹ No DHS Action Level has been established. Value shown is EPA Primary Drinking Water Standard for TTHM (Total Trihalomethanes) which includes chloroform.

² Taste and odor threshold for chlorinated water systems.

³ No DHS Action Level has been established. Value shown is EPA Primary Drinking Water Standard.

FIGURE VI-5
DISTRIBUTION OF
HEAVY METALS THAT EXCEED
DRINKING WATER STANDARDS

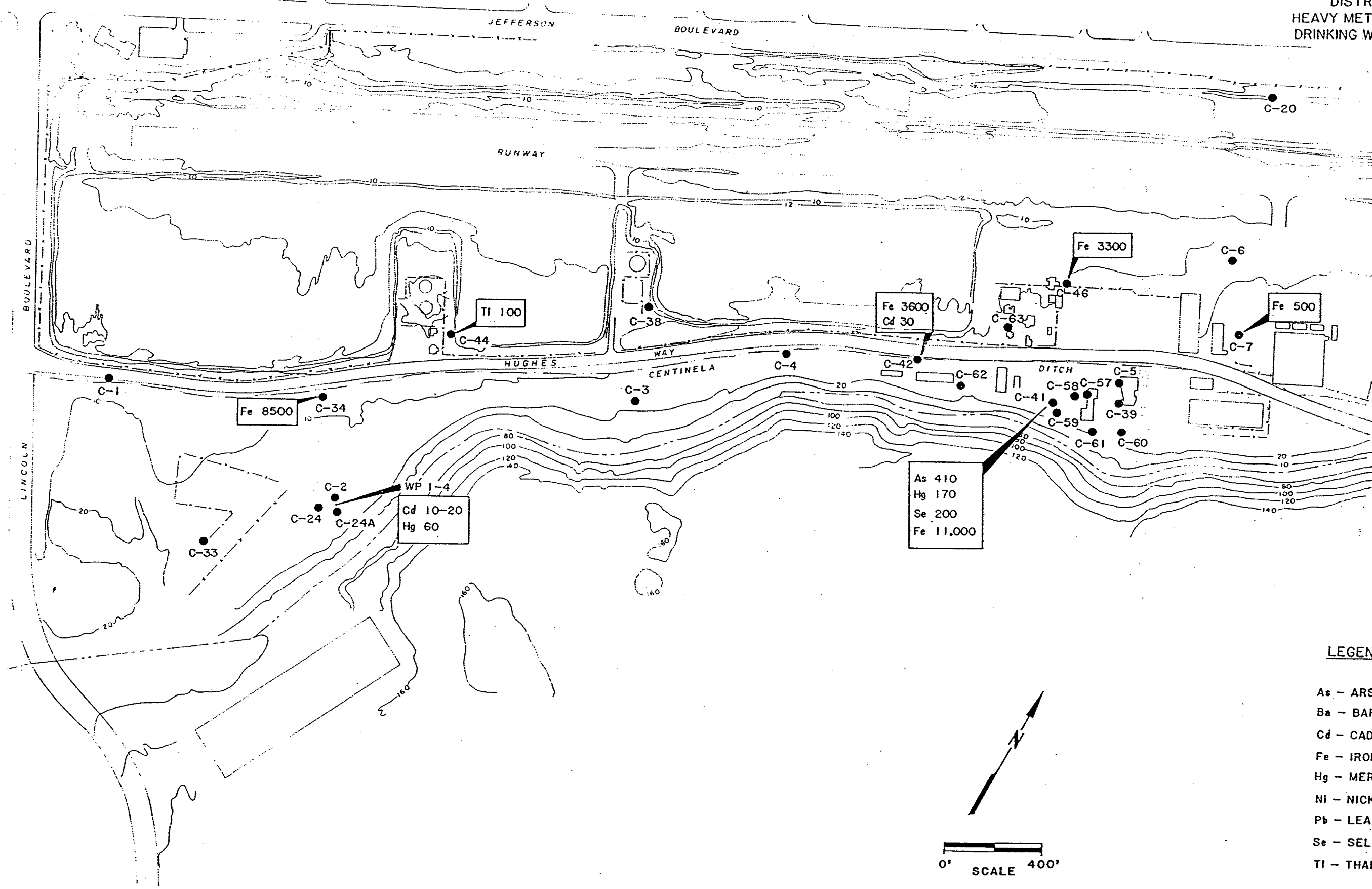
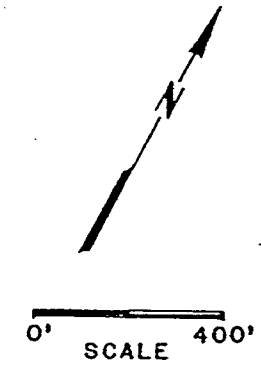
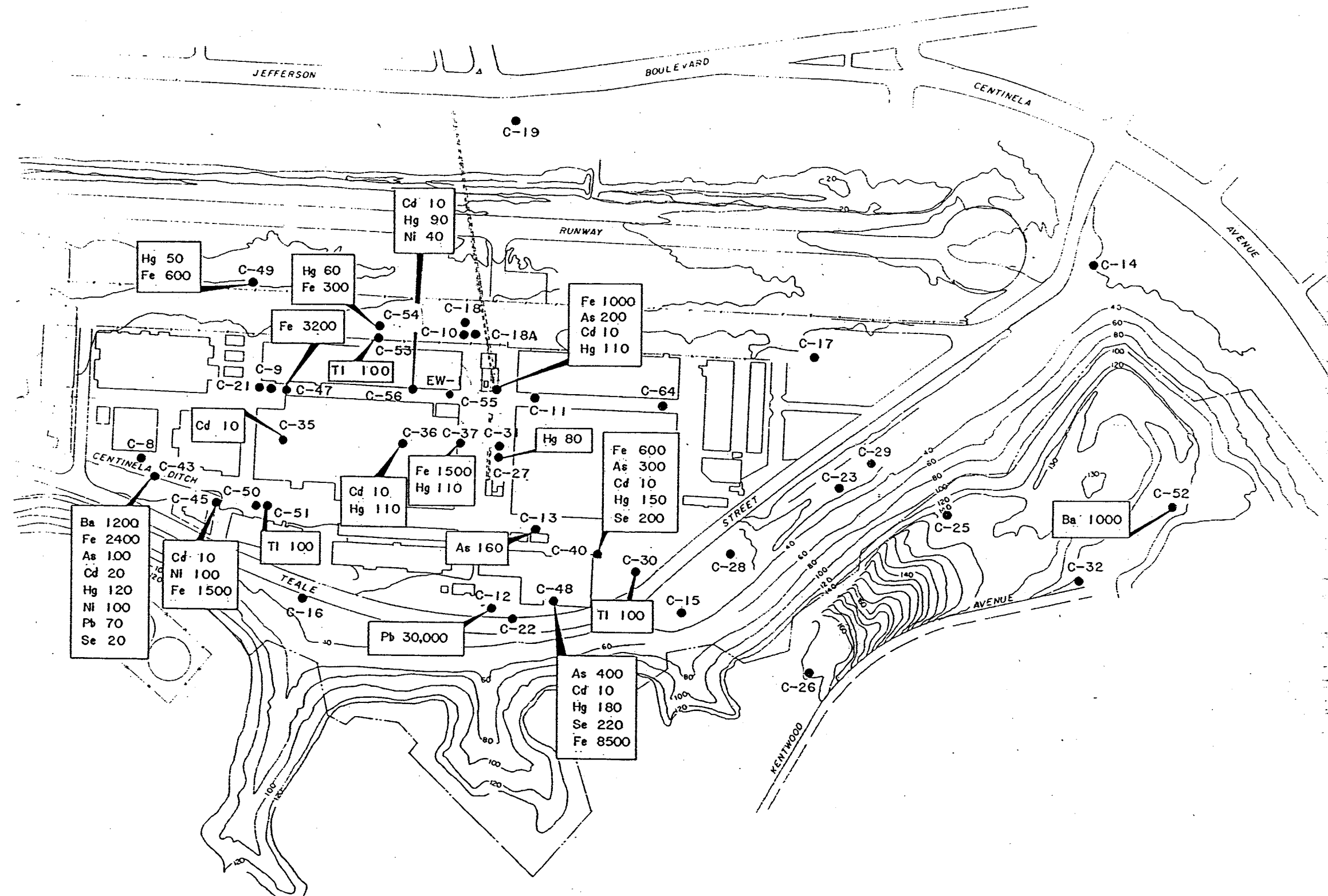


FIGURE VI-6
DISTRIBUTION OF
HEAVY METALS THAT EXCEED
DRINKING WATER STANDARDS



- LEGEND**
- As - ARSENIC
 - Ba - BARIUM
 - Cd - CADMIUM
 - Fe - IRON
 - Hg - MERCURY
 - Ni - NICKEL
 - Pb - LEAD
 - Se - SELENIUM
 - TI - THALLIUM

NOTE: CONCENTRATIONS IN ppb

- . A number of samples were arithmetically averaged if fluctuations in observed concentrations were such that no distinct trend could be defined;
- . When averaging, an attempt was made to avoid allowing a significant bias in the estimated value by deletion of any suspected anomalous reported concentrations;
- . Where data over a period of a few years indicated that a well-defined trend was developing, only the most recent measurements were averaged;
- . Average values for VOC's were rounded to one significant figure; and
- . Average values for TPH and metals were rounded to two significant figures.

Appendix C presents the water quality data for all sampling conducted through January 1, 1987.

Not shown in Figures VI-1 through VI-6 nor shown in Table VI-4 are concentrations of iron, manganese, and total dissolved solids (TDS) for which there are no Action Levels, but which render much of the Bellflower/Ballona and Silverado Aquifers unsuitable as a drinking water supply. Manganese was detected in concentrations exceeding EPA Secondary Drinking Water Standards in nearly every well where heavy metals were analyzed. Many of the wells containing manganese showed no other constituents above Action Levels. The widespread occurrence of manganese in the range 200 to 2,000 parts per billion (ppb) suggests that the metal is a natural constituent in the groundwater. Iron generally occurs with and exceeds the concentration of manganese in natural waters, but iron is less widely reported and frequently in lower concentrations than manganese in groundwater beneath the Plant Site. However, natural groundwaters with manganese concentrations exceeding iron concentrations have been reported in other aquifers. The conclusion that high manganese concentrations in the Bellflower/Ballona Aquifer are a natural phenomenon is supported by the apparent correlation of high TDS concentrations with high manganese concentrations in water samples. TDS concentrations of 2,500 ppm or greater are reported in most samples with manganese concentrations of 700 ppm or greater.

High concentrations of dissolved solids (e.g., sodium, calcium, chloride, and sulfate) characterize groundwater beneath the Plant Site. Total dissolved solids (TDS) concentrations of 720 to 4800 ppm in the Bellflower/Ballona Aquifer and 800 to 2,000 ppm in the Silverado Aquifer reflect seawater intrusion which probably occurred between 1920 and 1950 when there was extensive groundwater pumpage for irrigation in the Ballona Gap - Culver City area. Contamination of groundwater due to seawater intrusion in the Ballona and other aquifers within the

Coastal Plain area of Southern California has been recognized for a number of years and is not attributable to any activities which have been conducted at the Plant Site.

Figures VI-1 through VI-6 show that there are four areas on the Plant Site where chemicals in groundwater exceed action level concentrations. From west to east the areas may be referred to as:

- . The Fire Training Burn Pit Area in the vicinity of wells C-2 and C-24 and down gradient from them in Figures VI-1, VI-3, and VI-5;
- . The West Storage and Test Area near Monitor Wells C-4, C-42, C-62, C-63, and C-46 in Figures VI-1, VI-3, and VI-5;
- . The Salvage Yard Area including Monitor Wells C-5, C-39, C-41, C-59, C-60, and C-61 in Figures VI-1, VI-3, and VI-5; and
- . The East Manufacturing Area which includes most of the wells on the east half of the site in Figures VI-2, VI-4, and VI-6.

Within the East Manufacturing Area an immiscible layer of gasoline floating on the groundwater surface has been identified west of Building 11. A discussion of each of these areas is presented below.

FIRE TRAINING BURN PIT AREA

At the far west end of the Plant Site, the Fire Training Burn Pit has been identified as an area where chemicals are present in soils. Table VI-5 summarizes the chemicals present and the range of representative concentrations in wells at and downgradient from the Fire Training Burn Pit.

The major VOC's present in wells WP-1 through WP-4 and C-24A, screened in a shallow groundwater zone within the Bellflower Aquitard at this site, are Trans and TCE in concentrations up to 20,000 ppb and 2,000 ppb respectively. 1,1-DCA was detected in concentrations up to 1,000 ppb, and PCE and chloroform were detected in concentrations of a few hundred ppb at these wells. A thick clay layer below this shallow zone impedes the vertical movement of chemicals to the underlying aquifer. Concentrations of VOC's in wells C-2 and C-24, located adjacent to the shallow groundwater zone wells but screened in the underlying Bellflower/Ballona Aquifer, are about 20 ppb. Reported concentrations of Trans and TCE at C-24 have increased from 14 ppb and 2 ppb, respectively in 1984 to 36 ppb and 18 ppm, respectively in the most recent sampling conducted in December, 1986. Reported concentrations of Trans and TCE at C-2 have similarly increased from about 10 ppb and 5 ppb, respectively in 1983 to about 100 ppb and 10 ppb, respectively in the December, 1986 sampling round. This apparently increasing trend suggests a gradual downward migration of chemicals from the shallow

TABLE VI-5

MOST REPRESENTATIVE CHEMICAL CONCENTRATIONS
IN THE FIRE TRAINING BURN PIT AREA

Chemical (ppb)	Wells WP-1, WP-2, WP-3 WP-4, & C-24A ¹		Wells C-2 & C-24 ²		Wells C-3, C-34, C-38 & C-44 ³	
Vinyl Chloride	ND	- 30	ND		ND	
DCM	ND		ND		ND - 3	
1,1-DCE	ND	- 30	ND		ND	
1,1-DCA	ND	- 1,000	ND - 3		ND - 6	
Trans	1,000	- 20,000	10 - 20		ND - 5	
Chloroform	ND	- 500	ND		ND	
TCA	ND	- 100	ND		ND - 6	
TCE	100	- 2,000	10 - 20		ND - 3	
PCE	10	- 500	ND - 2		ND	
Benzene	ND	- 8	ND		ND	
Toluene	ND	- 8	ND - 10		ND	
Total Xylenes	ND	- 10	ND		ND	
Chlorobenzene	ND	- 2	ND		ND	
1,2-DCB	ND	- 300	ND		ND - 8	
1,3-DCB	ND	- 40	ND		ND	
1,4-DCB	ND	- 40	ND		ND	
Fe	<DWS's		<DWS's		<DWS's - 8500	
Mn	<DWS's		210 - 1000		50 - 400	
Cd	<DWS's -	20	<DWS's		<DWS's	
Hg	<DWS's -	60	<DWS's		<DWS's	
Tl	<DWS's		<DWS's		<DWS's - 100	
Bis (2-ethylhexal)						
Phthalate	ND	- 100	ND		ND	
Bi-n-octyl						
Phthalate	ND	- 10	ND		ND	

1 - Source area, zone above Bellflower Aquitard

2 - Source area, Bellflower/Ballona Aquifer

3 - Downgradient, Bellflower/Ballona Aquifer and Bellflower Aquitard

ND - not detected

<DWS's - Not detected in concentrations which exceed EPA Drinking Water Standards

groundwater zone beneath the source area through the clay zone to the underlying aquifer. Additional sampling of Wells C-2 and C-24 will be necessary to confirm any trend in chemical concentrations at these wells.

The low concentrations of chemicals in groundwater beneath the aquitard at this site suggest that concentrations of VOC's above Action Levels have probably not migrated to the deeper portions of the Bellflower/Ballona Aquifer. The absence of a downward gradient and the predominantly horizontal groundwater flow in the aquifer suggest that chemicals reaching the top of the aquifer would probably be transported horizontally rather than vertically. The estimated depth of vertical chemical migration is shown in Figure VI-3 by wells C-24, C-2, and C-34.

Wells C-34, C-38, and C-3 are screened in the Bellflower/Ballona Aquifer and are located in a generally downgradient direction from the Fire Training Burn Pit. Well C-44 is screened in the Bellflower Aquitard downgradient from the Fire Training Burn Pit. Concentrations of VOC's at these wells are less than 10 ppb. The similarity in chemicals detected at these wells with those present at the Fire Training Burn Pit suggest lateral transport from that area. Wells C-1 and C-33, located west of the Fire Training Burn Pit, show no VOC's or TPH detected.

The Fire Training Burn Pit is located just east of a groundwater divide which exists at the west end of the Plant Site. Groundwater contours suggest a north and northeasterly flow path from the Fire Training Burn Pit in Figure III-5. In Figure VI-1, the elongated shape of the VOC distribution in a northeasterly direction is consistent with the current groundwater flow path.

Mercury and cadmium were detected in the shallow groundwater zone WP wells at concentrations of 60 ppb and 20 ppb, respectively, which exceed levels listed in Table VI-4. Samples taken from the Bellflower/Ballona Aquifer wells within this area have not shown similar concentrations of mercury or cadmium. This suggests that the occurrence of these metals in groundwater is limited to the shallow zone immediately beneath the Fire Training Burn Pit. Thallium was detected at 100 ppb concentrations in Well C-44 and iron was detected at Well C-34 (8500 ppb). Neither thallium nor iron have been detected in soil or groundwater at the Fire Training Burn Pit. The presence of these metals in Wells C-44 and C-34 cannot, therefore, be attributed to activities at the burn pit.

Analyses for EPA Priority Pollutants at C-24A, screened in the shallow groundwater zone, reported the presence of Bis (2-ethyl hexyl) phthalate (100 ppb), and Di-n-octyl phthalate (10 ppb). These compounds have not been detected in other wells on the site where Priority Pollutant analyses were performed.

WEST STORAGE AND TEST AREA

Groundwater containing chemicals has been identified in the general area which includes the Temporary Drum Storage Area and the Remote Test Site. Soils data from borings at these potential source areas indicate that chemicals present in soils are not entering the groundwater. Table IV-6 summarizes the chemicals present and the range of representative concentrations in the wells located within the West Storage and Test Area. The areal distribution of VOC's in groundwater is shown in Figure VI-1. Wells C-4, C-62, and C-63 are screened in the Bellflower/Ballona Aquifer and Wells C-42 and C-46 are screened in the Bellflower Aquitard.

Trans has been reported throughout the area in concentrations up to 30 ppb. Other VOC's, including 1,1 DCE, 1,1 DCA, TCA, and chloroform, have also been detected at wells within this area. The most recent analysis conducted at Well C-4, in November 1986, shows several VOC's detected which have not been reported in prior sampling. In particular, TCA was reported at 84 ppb.

Petroleum hydrocarbons, detected at 0.8 ppm at Well C-63, have not been detected elsewhere within this area. Iron was detected in concentrations exceeding Secondary Drinking Water Standards at C-42 and C-46, and cadmium exceeded the Primary Drinking Water Standard at C-42. Other compounds detected at specific wells within this area are 2-butanone (20 ppb at C-4), a-BHC (0.65 ppb at C-62), and d-BHC (0.02 ppb at C-62).

The estimated vertical distribution of VOC's between wells C-4 and C-42 in the West Storage and Test Area is shown on Figure VI-3. The depth of vertical chemical migration is estimated from the occurrence of Trans, 1,1 DCE, and TCA within the Bellflower Aquitard at Well C-42, and TCA and Trans within the Bellflower/Ballona Aquifer at C-4. The deepest monitor well penetrates the first five to ten feet of the Bellflower/Ballona Aquifer, but significant vertical migration deeper in the aquifer is not anticipated because the groundwater flow direction is dominantly horizontal.

Well C-6 is located about 600 feet downgradient from the West Storage and Test Area. No VOC's have consistently been detected in Well C-6, and no heavy metal compounds other than manganese are present above Drinking Water Standards. TPH was reported at the detection limit of 0.4 ppm in this well.

Well C-20 was constructed approximately 1,100 feet north of the West Storage and Test Area in 1984. The well was last sampled in 1985, but it could not be located for monitor well sounding or sampling in 1986. It may have inadvertently been covered during recent additions of fill dirt on the Plant Site.

TABLE VI-6

MOST REPRESENTATIVE CHEMICAL CONCENTRATIONS
IN THE WEST STORAGE AND TEST AREA

<u>Chemical (ppb)</u>	<u>Well C-4¹</u>	<u>Wells C-42 & C-62²</u>	<u>Wells C-63 & C-46³</u>
1,1-DCE	ND	ND - 10	ND
1,1-DCA	ND	ND - 7	ND - 10
Trans	30	5 - 10	ND - 10
Chloroform	ND	2 - 5	ND - 10
TCA	ND	ND - 10	ND
TCE	ND	ND - 2	ND
Toluene	ND	ND - 4	ND - 0.6
E. Benzene	ND	ND - 1	ND - 0.6
Total Xylenes	ND	ND - 6	ND - 2
1,2-DCB	0.6	ND	ND
1,3-DCB	ND	ND	ND - 0.5
1,4-DCB	ND	ND	ND - 0.7
TPH (ppm)	ND	ND	ND - 0.8
Fe	<DWS's	<DWS's - 3600	<DWS's - 3300
Mn	630	300	130
Cd	<DWS's	30	<DWS's
2-Butanone	20	NM	ND
BHC	NM	0.65	ND
BHC	NM	0.02	ND

1 - Upgradient, Bellflower/Ballona Aquifer

2 - Midgradient, Bellflower/Ballona Aquifer and Bellflower Aquitard

3 - Downgradient, Bellflower/Ballona Aquifer and Bellflower Aquitard

ND - Not Detected

NM - Not Measured

<DWS's - Not detected in concentrations which exceed EPA Drinking Water Standards

Well C-20 may be too far north to be considered downgradient from the West Storage and Test Area under the current groundwater flow regime beneath the Plant Site. The well is evaluated here because the West Storage and Test Area is the area most likely to have affected water quality at C-20.

Each time C-20 was sampled and analyzed in 1984 and 1985, no VOC's or TPH were detected. No metals other than manganese have been detected above Action Levels or Drinking Water Standards in the well.

The distribution of chemicals in groundwater within the West Storage and Test Area is difficult to identify with any upgradient potential source areas. Some chemicals detected at individual monitor wells within the area are not detected in higher concentrations upgradient nor in lower concentrations downgradient, for example the 2-Butanone (MEK) at C-4 and the BHC pesticides at C-62. Although VOC's above Action Levels have been detected in the groundwater beneath the West Storage and Test Area, there is no indication of a major chemical source.

SALVAGE YARD AREA

The Salvage Yard has been identified as an area where chemicals are present in soils. Table VI-7 summarizes the chemicals present in groundwater and the range of representative concentrations in wells at and downgradient from the Salvage Yard. The areal distribution of VOC's is shown in Figure VI-1.

The major VOC's present at Well C-41, screened in the upper portion of the Bellflower/ Ballona Aquifer are DCM, 1,1-DCE, 1,1-DCA, Trans, TCA, TCE, toluene, E.benzene, and xylenes. Total petroleum hydrocarbons were detected in C-41 at a concentration of 1.1 ppm. Arsenic, mercury, and selenium were detected at this well in concentrations which exceed Action Levels. Other chemicals detected at C-41 are phenol (30 ppb), acetone (30,000 ppb), MEK (20,000 ppb) isopropanol (8,000 ppb), isobutanol (3,000 ppb), beta-BHC (0.14 ppb), and delta BHC (0.13).

Wells C-5, C-39, C-59, and C-61 are screened in the upper portion of the Bellflower/Ballona Aquifer. Water quality data from these wells show total VOC's present in concentrations from 20 to 80 ppb. TPH has been detected at 0.9 ppm in Well C-61 but was not detected in C-5, C-39, or C-59. No metals other than manganese have been detected in concentrations which exceed Action Levels in these wells. Well C-58, screened in the lower portion of the Bellflower/Ballona Aquifer has shown traces of 1,1,2-TCA and benzene (1 ppb and 4 ppb respectively) in the most recent sampling, conducted in October 1986. Well C-57, screened in the Silverado Aquifer in this area, shows no VOC's detected. TPH has not been detected at C-57 or C-58, and no heavy metals were detected above levels listed in Table VI-4.

TABLE VI-7

MOST REPRESENTATIVE CHEMICAL CONCENTRATIONS
IN THE SALVAGE YARD AREA

Chemical (ppb)	Wells			
	Well C-41 ¹	C-5, C-39, C-59, C-61 ²	Well C-60 ³	Well C-7 ⁴
Vinyl Chloride	7	ND	ND	ND
DCM	40,000	ND	ND	ND
1,1-DCE	8,000	5 - 6	ND	ND
1,1-DCA	1,000	ND - 20	ND	ND
Trans	5,000	2 - 20	ND	2
Chloroform	300	7 - 10	100	ND
1,2-DCA	ND	ND	50	3
TCA	30,000	3 - 5	ND	ND
1,2-DCP	ND	ND	ND	3
TCE	5,000	3 - 30	2,000	ND
1,1,2-TCA	ND	ND	ND	ND
PCE	200	ND	ND	ND
Benzene	15	1 - 2	ND	ND
Toluene	3,000	10 - 20	ND	ND
E. Benzene	3,000	1 - 3	ND	ND
Total Xylenes	6,000	10 - 20	1	ND
1,2-DCB	ND	ND - 1	ND	ND
1,3-DCB	ND	ND - 1	ND	ND
1,4-DCB	40	1 - 4	ND	ND
TPH (ppm)	1.1	ND	1.9	ND
Fe	11,000	<DWS's	NM	500
Mn	1,200	<DWS's - 200	<DWS's	<DWS's
As	410	<DWS's	NM	<DWS's
Hg	170	<DWS's	NM	<DWS's
Se	200	<DWS's	NM	<DWS's
BHC	0.14	ND	NM	NM
BHC	0.13	ND	NM	NM
MEK	20,000	20	NM	NM
Phenol	30	ND	NM	NM
Acetone	30,000	ND	NM	NM
Iso-Butanol	3,000	ND	NM	NM
Isopropyl Alcohol	8,000	ND	NM	NM
2-Butanone	ND	20	NM	NM

1 - Leakage collection sump area, upper Bellflower/Ballona Aquifer

2 - Downgradient from leakage collection sump, upper Bellflower/Ballona Aquifer

3 - Waste oil sump area, Bellflower/Ballona Aquifer

4 - Downgradient from Salvage Yard, Bellflower Aquitard

ND - Not Detected

NM - Not Measured

<DWS's - Not detected in concentrations which exceed EPA Drinking Water Standards.

Data from Well C-57 indicates that chemicals have not migrated deeply into the Silverado Aquifer near the Salvage Yard. Wells C-39 and C-58 monitor groundwater downgradient and at a greater depth than the shallow upgradient Monitoring Well C-41. Chemical concentrations detected in C-39 and C-58 are less than 10 ppb indicating that low concentrations of VOC's have migrated vertically into the Bellflower/Ballona Aquifer (Figure VI-3).

The presence of relatively low concentration of VOC's in Well C-5, C-39, C-59, and C-61 and the presence of only traces of VOC's in Well C-58 suggest that higher chemical concentrations upgradient from these wells has not migrated very far horizontally or vertically from the source area. The low mobility of VOC's in this area may be attributable to the presence of a localized thick, low permeability layer of silty sand which forms the upper boundary of the Bellflower/Ballona Aquifer beneath the Salvage Yard and to the relatively flat hydraulic gradient in this area.

Well C-60, screened in the upper Bellflower/Ballona Aquifer, and located in the southeast part of the Salvage Yard, has shown 2,000 ppb VOC's and 1.9 ppm TPH in one chemical analysis. Movement of chemicals from C-60 is estimated to be limited as a result of low permeability and a low gradient.

Well C-7 is screened primarily in the Bellflower Aquitard, with the bottom two feet of screen in the Bellflower/Ballona Aquifer. It is located in a general downgradient direction from the Salvage Yard. Water quality data from this well show 8 ppb total VOC's. Because this well is screened in the shallow portion of the Bellflower/Ballona Aquifer, low levels of chemicals detected at this well may reflect the upper edge of chemicals moving downgradient from the Salvage Yard.

The downgradient distribution of chemicals from the Salvage Yard, as shown in Figure VI-1, is approximate and is based on the current flow path inferred by the groundwater contours. Groundwater levels may, however, have fluctuated throughout time resulting in varying flow paths and a lateral spreading of chemicals.

EAST MANUFACTURING AREA

Groundwater containing chemicals has been identified beneath a portion of the east side of the Plant Site. Soils and groundwater quality data from a number of sites within the East Manufacturing Area suggest that the areas beneath which chemicals occur in groundwater are:

- . Former Drum Storage Area,
- . Building 15 Utility Trenches and Clarifier,

- . Building 12 Backfilled Clarifiers and Test Sump,
- . Storm Drainage Discharge Site,
- . Underground Tanks North of Building 12,
- . Building 14 Clarifiers,
- . Underground Tanks West of Building 11,
- . Building 35 Sumps, and
- . Underground Tank South of Building 5.

A summary of the chemicals present and the range of representative concentrations in wells at and downgradient from each of these suspected source areas is presented below.

Former Drum Storage Area

Well C-43, screened in the Bellflower Aquitard, is located at the Former Drum Storage Area. As shown in Table VI-8, the major VOC's present at C-43 are: DCM, 1,1,-DCA, and TCA, each in concentrations of a few hundred thousand ppb; 1,1-DCE, Trans, and PCE in concentrations of ten thousand ppb; several heavy metals in concentrations exceeding levels in Table VI-4; several other compounds present including methyl ethyl ketone, butyl cellosolve, and phenol. TPH was detected at a concentration of 5 ppm at this site. Areal distribution of VOC's is shown in Figure VI-1.

Well C-8, screened in the Bellflower/Ballona Aquifer, is located upgradient from the Former Drum Storage Area, in the vicinity of the Clarifier Southeast of Building 21. VOC's which are present in high concentrations of a few hundred ppb at C-8 are those which are present in high concentrations at C-43. The presence of VOC's in this well may reflect a shallow, lateral spreading of chemicals from the Former Drum Storage Area prior to entry into the Bellflower/Ballona Aquifer system where transport would be in the direction of groundwater flow. Another possible explanation is that chemicals present in C-8 reflect a separate source area at the clarifier southeast of Building 21. TPH has not been detected above levels listed in Table VI-4.

Wells C-45 and C-51, located downgradient from the Former Drum Storage Area, are screened in the Bellflower Aquitard and the Bellflower/Ballona Aquifer, respectively. Total VOC's were detected in concentrations of several hundred ppb in these wells, and several heavy metals were detected in concentrations which exceed levels listed in Table VI-4. Well C-50, screened in the Silverado Aquifer and located adjacent to C-51, has had detectable concentrations of 20 ppb

TABLE VI-8

MOST REPRESENTATIVE CHEMICAL CONCENTRATIONS AT AND DOWNGRADIENT
FROM THE FORMER DRUM STORAGE AREA

Chemical (ppb)	Well C-43 ¹	Well C-8 ²	Wells C-45, C-51 ³	Well C-50 ⁴	Well C-13 ⁵
Vinyl Chloride	5,000	4	ND - 10	ND	2,000
DCM	300,000	ND	ND	ND	ND
1,1-DCE	20,000	200	ND - 7	2	10
1,1-DCA	100,000	200	100 - 200	10	30
Trans	20,000	100	10	ND	600
CHCl ₃	1,000	ND	ND	ND	ND
1,2-DCA	3,000	ND	ND	ND	ND
TCA	400,000	ND	10 - 20	2	ND
TCE	6,000	10	ND - 8	ND	5
1,1,2-TCA	1,200	ND	ND	ND	ND
PCE	10,000	ND	ND - 20	2	ND
Benzene	50	ND	ND - 2	4	ND
Toluene	8,000	ND	ND	ND	ND
Total Xylenes	100	ND	ND	ND	ND
E.Benzene	70	ND	ND	ND	ND
1,4-DCB	100	ND	ND	ND	ND
Phenol	20,000	ND	ND	NM	ND
TPH (ppm)	5	<0.6	0.1 - 0.4	0.5	0.2
Ba	1,200	<DWS's	<DWS's	<DWS's	<DWS's
Fe	2,400	<DWS's	1,500	<DWS's	<DWS's
Mn	560	160	80	<DWS's	230
As	100	<DWS's	<DWS's	<DWS's	160
Cd	20	<DWS's	10	<DWS's	<DWS's
Hg	120	<DWS's	<DWS's	<DWS's	<DWS's
Ni	100	<DWS's	100	<DWS's	<DWS's
Pb	70	<DWS's	<DWS's	<DWS's	<DWS's
Se	20	<DWS's	<DWS's	<DWS's	<DWS's
MEK	10,000	ND	ND	NM	ND
C4 Chlorinated Compound	200	ND	ND	NM	ND
Butyl Cellosolve	600	ND	ND	NM	ND
Cresol Isomers	800	ND	ND	NM	ND
2,4 D.M.phenol	300	ND	ND	NM	ND
Heptachlor expoxide	0.35	ND	ND	NM	ND

1 Source area, Bellflower Aquitard.

2 Edge of source area, Bellflower/Ballona Aquifer.

3 Downgradient, Bellflower/Ballona Aquifer and Bellflower Aquitard.

4 Downgradient, Silverado Aquifer

5 Farther downgradient, Bellflower Aquitard.

ND - Not Detected

NM - Not Measured

<DWS's - Not detected in concentrations which exceed EPA Drinking Water Standards.

total VOC's and 0.5 ppm TPH. The chemicals detected in Wells C-45, C-51, and C-50 are those present in highest concentrations at C-43, suggesting lateral and vertical migration to these wells from the Former Drum Storage Area. Further downgradient, chemicals in the groundwater beneath the Former Drum Storage Area merge with those originating at several other source areas which are discussed below. The estimated vertical extent of chemical migration in this area is shown in Figure VI-4. The concentrations of VOC's in C-50, screened in the Silverado Aquifer, are about one order of magnitude less than in C-51, screened in the Bellflower/Ballona Aquifer. Chemicals in the Silverado Aquifer at elevations similar to those monitored at C-50 are below Action Levels at C-30 and C-31 located about 900 and 1,400 feet, respectively, downgradient of C-50. These data indicate that significant concentrations of VOC's have not migrated downgradient in the Silverado Aquifer.

Well C-13, screened in the uppermost part of the Bellflower/Ballona Aquifer, is located approximately 1,300 feet directly downgradient from the Former Drum Storage Area under the current groundwater flow pattern. VOC's detected in Well C-13, Trans, vinyl chloride, TCE, 1,1-DCA, and 1,1-DCE, indicate downgradient flow in the upper part of the Bellflower/Ballona Aquifer from Well C-43 to C-13. The occurrence of higher concentrations of vinyl chloride (2,000 ppb) and Trans (600 ppb) at C-13 than at C-45 or C-51 which are closer to the Former Drum Storage Area allow for two reasonable explanations: 1) Wells C-45 and C-51 sample a part of the aquifer which has been slightly south of the flow path between C-43 and C-13, and therefore, do not show the higher chemicals values that occur within the flowpath; or 2) Well C-13 is in the downgradient flow path of more than other source area, each of which contributes chlorinated solvents which break down chemically to vinyl chloride or Trans. Contributions of solvents from the Former Drum Storage Area and from the Building 15 Utility Trenches, described below, could account for vinyl chloride and Trans concentrations detected at C-13.

The detection of arsenic in C-13 at a concentration of 160 ppb is not explained by flow from either of the source areas in a upgradient direction. None of the wells upgradient from C-13 have had detectable arsenic. However, arsenic is not as mobile as organic compounds in groundwater. Arsenic at C-13 has probably entered the groundwater very near C-13, for example, from the liquid waste neutralization pit just north of C-13.

Building 15 Utility Trenches and Clarifier

Wells C-35 and C-36, screened in the Bellflower/Ballona Aquifer, are located within Building 15. As shown in Table VI-9, the major VOC's present in these wells are 1,1-DCA, 1,1-DCE, DCM, PCE, and TCA. Total

TABLE VI-9

**MOST REPRESENTATIVE CHEMICAL CONCENTRATIONS AT AND DOWNGRADIENT
FROM THE BUILDING 15 UTILITY TRENCHES AND CLARIFIER**

<u>Chemical (ppb)</u>	<u>Wells C-35 & C-36¹</u>	<u>Wells C-37 & C-27²</u>	<u>Well C-31³</u>
Vinyl Chloride	ND	ND - 4	ND
DCM	ND - 5000	ND	ND
1,1-DCE	300 - 4000	ND - 2	ND
1,1-DCA	900 - 9000	50 - 200	ND
Trans	100 - 200	10 - 50	10
TCA	30 - 3000	ND	ND
CCl ₄	ND - 20	ND	ND
TCE	200 - 800	2 - 30	ND
PCE	20 - 2000	ND	ND
Benzene	20	ND	ND
Toluene	ND - 30	ND	ND
E.Benzene	ND - 100	ND	ND
Total Xylenes	ND - 300	ND	ND
1,2-DCB	ND - 5	ND	ND
1,3-DCB	ND - 1	ND	ND
1,4-DCB	ND - 20	ND	ND
TPH (ppm)	<0.3 - 0.4	<0.3	<0.3
Fe	<DWS's	<DWS's - 1500	<DWS's
Mn	<DWS's - 210	260 - 340	220
Cd	10 - 30	<DWS's	<DWS's
Hg	<DWS's - 110	80 - 110	<DWS's
-BHC	ND - 0.14	ND	NM
-BHC-Lindane	ND - 0.25	ND	NM
Molecular Sulfur S ₈	ND	ND - 70	NM

1 Source area, Bellflower/Ballona Aquifer

2 Downgradient, Bellflower/Ballona Aquifer

3 Downgradient, lower Bellflower/Ballona ; upper Silverado Aquifers

ND - Not Detected

NM - Not Measured

<DWS's - Not detected in concentrations which exceed EPA Drinking Water Standards

VOC concentrations exceed 20,000 ppb at C-35 and several hundred ppb at C-36. Heavy metals were detected in concentrations exceeding levels listed in Table VI-4 at these wells, and TPH was detected at 0.4 ppm at C-36.

Wells C-37 and C-27, screened in the Bellflower/Ballona Aquifer downgradient from this site, have 200 ppb and 50 ppb total VOC's respectively. Mercury was detected in Wells C-37 and C-27 at concentrations which exceed the Action Level. Well C-31, screened in the lower Bellflower/Ballona Aquifer and the upper Silverado Aquifer and located adjacent to C-27, has 10 ppb VOC's. No heavy metals other than manganese exceeded levels listed in Table VI-4 in this well.

The chemicals detected in Wells C-37, C-27, and C-31 are those detected in the highest concentrations at C-35 and C-36 suggesting lateral migration from the Building 15 Utility Trenches and Clarifier. Further downgradient chemicals in the groundwater beneath Building 15 merge with those originating at other source areas discussed in this section.

Building 12 Backfilled Clarifiers and Test Sump

Wells C-9 and C-47, screened in the Bellflower/Ballona Aquifer, are located adjacent to the clarifiers and test sump south of Building 12. As shown in Table VI-10, the Major VOC's present in these wells are Trans, 1,1-DCA, and TCE in concentrations up to 10,000 ppb, 3,000 ppb, and 3,000 ppb, respectively. Iron was detected in concentrations greater than Secondary Drinking Water Standards at C-47.

Well C-21, screened in the Bellflower/Ballona Aquifer and located just west of C-9 and C-47, has 100 ppb Trans with lower concentrations of 1,1-DCA and TCE. The presence of much lower concentrations of VOC's at this well may be attributable to its location upgradient from the source area. Chemicals present in C-21 may reflect a shallow lateral spreading of chemicals prior to entry into the Bellflower/Ballona Aquifer or dispersion of chemicals in the aquifer.

Well C-54, C-55, and C-56, screened in the Bellflower/Ballona Aquifer downgradient from the Building 12 Backfilled Clarifiers and Test Sump, have concentrations of 300 to 500 ppb total VOC's. The major VOC's present in these wells are those which are detected in higher concentrations at C-9 and C-47. However, vinyl chloride, detected at 200 ppb in C-54, is present in concentrations of 20 ppb at C-9. In addition to VOC's, heavy metals were detected in C-54, C-55, and C-56. These metals were not detected in Wells C-9 and C-47, but the metals were detected in Well C-49 at the Storm Drain Discharge Area. The similarity in VOC content between Wells C-9, C-21, C-54, C-55 and C-56 and the similarity in metal content between C-49, C-55, and C-56 suggests the possibility of coalescing groundwater plumes containing chemicals from two source areas.

TABLE VI-10

**MOST REPRESENTATIVE CHEMICAL CONCENTRATIONS AT AND DOWNGRADIENT
FROM THE BUILDING 12 BACKFILLED CLARIFIERS AND TEST SUMP**

<u>Chemical (ppb)</u>	<u>Wells C-9 & C-47¹</u>	<u>Well C-21²</u>	<u>Wells C-54, C-55, & C-56³</u>
Vinyl Chloride	ND - 20	ND	ND - 200
1,1-DCE	100 - 400	10	ND - 30
1,1-DCA	700 - 3000	70	40 - 300
Trans	3000 - 10,000	100	30 - 200
TCA	ND - 80	ND	ND - 5
TCE	700 - 3000	20	8 - 50
PCE	ND	2	ND - 4
Toluene	5 - 20	5	ND
Total Xylenes	3 - 17	ND	ND
1,2-DCB	ND	ND	ND - 2
1,4-DCB	3 - 10	ND	ND
TPH (ppm)	<0.5	<0.5	<0.3
Fe	<DWS's - 3200	<DWS's	<DWS's - 1000
Mn	<DWS's - 330	200	200 - 220
As	<DWS's	<DWS's	<DWS's - 200
Cd	<DWS's	<DWS's	<DWS's - 10
Hg	<DWS's	<DWS's	60 - 110
Ni	<DWS's	<DWS's	<DWS's - 40

1 Source area, Bellflower/Ballona Aquifer

2 Upgradient, Bellflower/Ballona Aquifer

3 Downgradient, Bellflower/Ballona Aquifer

ND - Not Detected

NM - Not Measured

<DWS's - Not detected in concentrations which exceed EPA Drinking Water Standards

Well C-53, screened in the Silverado Aquifer and located adjacent to C-54, has only a trace of VOC's. This suggests that significant concentrations of chemicals originating at the Building 12 Backfilled Clarifiers and Test Sump and the Storm Drain Discharge Site have not migrated vertically into the Silverado Aquifer.

Well C-11, located downgradient from this site, is screened in the Bellflower Aquitard and shows only traces of VOC's detected. Because this well is screened in the shallow, low permeability zone, the trace amounts of chemicals do not necessarily indicate the arrival of the leading edge of the chemical plume which appears to originate at Building 12. The plume may continue further downgradient within the aquifer and merge with the other source area plumes discussed in this section.

Storm Drain Discharge

Well C-49, screened in the Bellflower/Ballona Aquifer, is located at the Storm Drainage Discharge Site. As shown in Table VI-11, VOC's detected at this well include 1,1 DCA, vinyl chloride, and Trans. Mercury and iron were reported in concentrations which exceed Drinking Water Standards. The Storm Drainage Discharge Site is considered a minor source area of chemicals in groundwater. The flow path inferred by groundwater contours suggests that chemicals originating at this site merge downgradient with the other plumes discussed in this section.

Well C-19, screened in the Bellflower/Ballona Aquifer, is located northeast of this site. As shown in Table VI-11, low levels of VOC's detected in C-19 are those which are present in the highest concentrations at C-49. The source of chemicals at C-19 is not apparent. It is possible that under a different flow regime chemicals in C-19 may have originated from the Storm Drain Discharge Site or other areas further west. Chemicals may have been largely flushed from C-49 by recharge from infiltrating rainwater. Chemical discharges have been stopped but discharge from storm runoff continues.

Underground Tanks North of Building 12

Wells C-10 and C-18A, screened in the Bellflower Aquitard, and Well C-18, screened in the Bellflower/Ballona Aquifer, are located in the vicinity of the Underground Tanks North of Building 12, which have been identified as a possible source area of fuel hydrocarbons. As shown in Table VI-12, 4.5 ppm TPH has been detected at C-10 and 0.7 ppm TPH at C-18. TPH has been detected in four of five samples taken from C-10 and one of three samples taken from C-18. However, in the most recent sampling in September 1986, TPH was not detected at either of these wells. Additional sampling will confirm whether TPH is currently present. Well C-18A has not been sampled because it has always been dry when sampling was attempted. A number of individual fuel-related

TABLE VI-11

MOST REPRESENTATIVE CHEMICAL CONCENTRATIONS AT
THE STORM DRAINAGE DISCHARGE SITE

<u>Chemical (ppb)</u>	<u>Well C-49¹</u>	<u>Well C-19²</u>
Vinyl Chloride	80	ND
1,1-DCA	200	2
Trans	20	2
Chloroform	10	ND
1,2-DCP	2	ND
TCA	10	8
TCE	2	ND
Toluene	3	ND
1,2-DCB	10	ND
1,3-DCB	0.5	ND
1,4-DCB	2	ND
TPH (ppm)	<0.5	<0.5
Mn	<DWS's	550

1 Source Area, Bellflower/Ballona Aquifer

2 Bellflower/Ballona Aquifer

ND - Not Detected

<DWS's - Not detected in concentrations which exceed EPA Drinking Water Standards

TABLE VI-12

MOST REPRESENTATIVE CHEMICAL CONCENTRATIONS AT AND DOWNGRADIENT
FROM THE UNDERGROUND TANKS NORTH OF BUILDING 12

<u>Chemical (ppb)</u>	<u>Well C-10¹</u>	<u>Well C-18²</u>
Vinyl Chloride	ND	20
1,1-DCA	ND	3
Trans	ND	30
TCE	ND	5
Benzene	3	10
Toluene	3	10
E.Benzene	10	2
Total Xylenes	ND	10
1,2-DCB	ND	0.9
1,3-DCB	1	1
1,4-DCB	ND	1
TPH (ppm)	4.5	0.7
Mn	1300	200
2-M.butane	1000	ND
2,3-D.M.butane	1000	ND
D.M.pentane Isomers	1000	ND
T.M.pentane Isomers	3000	ND
D.M.hexane Isomers	300	ND
2-Butanone	ND	10
M.butane	ND	90
2,4-D.M.pentane	ND	50
D.M.pentane	ND	60
T.M.pentane Isomer	ND	50

1 Bellflower Aquitard
2 Bellflower/Ballona Aquifer
ND - Not Detected

hydrocarbons have been detected at C-10 and C-18. Samples from C-18 have shown concentrations of VOC's such as Trans, vinyl chloride, and TCE which are not fuel hydrocarbons. Because this well is screened within the Bellflower/Ballona Aquifer, the presence of these VOC's appears to reflect transport from one of the upgradient source areas.

Building 14 Clarifiers

There are no monitoring wells located at or immediately downgradient from the Building 14 Clarifiers. However, as discussed in Section V, soils data show the presence of relatively high concentrations of 1,1,2,2 TCA (up to 1,400 ppb) in unsaturated and saturated zone soils at this site. This suggests that the Building 14 Clarifiers may be a source area for chemicals entering the East Manufacturing Area groundwater plume.

Underground Tanks West of Building 11

Well C-12, screened in the Bellflower Aquitard, is located in the area of Underground Tanks West of Building 11. An immiscible layer of floating gasoline has been identified in this area and is described in detail in a separate part of this section. Water quality data presented in Table VI-13 show high concentrations of TPH and fuel-hydrocarbon related VOC's at C-12. Lead has been detected in concentrations of 30,000 ppb in this well. This high level of lead in a well with high TPH concentrations suggests that there is a leaded gasoline component. The layer of floating gasoline has been previously thought to be unleaded gasoline.

Wells C-22 and C-48, screened in the Bellflower/Ballona Aquifer downgradient from the site, show no TPH detected. The presence of benzene and ethylbenzene, in concentrations of 300 ppb and 70 ppb, respectively at C-48, suggests lateral migration of chemicals associated with the occurrence of gasoline from the area west of Building 11. Further downgradient, Well C-15, screened in the Bellflower/Ballona Aquifer, shows 0.6 ppm TPH, several individual fuel related hydrocarbons, and traces of toluene and benzene. The presence of these chemicals at C-15 may reflect the leading edge of the fuel hydrocarbon plume. Other VOC's detected in Wells C-48 and C-15, and heavy metals detected in Well C-48 are believed to be associated with the Building 35 Sumps source area which is discussed below.

Building 35 Sumps

Soils data suggest that there are chemicals in soil at two sumps near Building 35. Well C-48, screened in the Bellflower/Ballona Aquifer, is located adjacent to the organic sump at the southwest corner of Building 35. Table VI-14 shows the chemicals detected in wells at and downgradient from Building 35. As previously discussed, most of the VOC's detected at C-48 are believed to be associated with lateral

TABLE VI-13

**MOST REPRESENTATIVE CHEMICAL CONCENTRATIONS AT AND DOWNGRADIENT
FROM THE UNDERGROUND TANKS WEST OF BUILDING 11**

<u>Chemical (ppb)</u>	<u>Well C-12¹</u>	<u>Well C-22 & C-48²</u>	<u>Well C-15³</u>
Trans	8	2 - 10	20
TCE	40	ND - 7	2
PCE	60	ND - 3	ND
Benzene	6,000	ND - 300	3
Toluene	60,000	5 - 10	5
E.Benzene	30,000	ND - 70	ND
Total Xylenes	300,000	10	ND
1,2-DCB	ND	ND - 0.9	ND
1,3-DCB	300,000	0.9 - 10	ND
1,4-DCB	400,000	0.7 - 20	ND
TPH (ppm)	1,000	<1	0.6
Fe	<DWS's	<DWS's - 8500	<DWS's
Mn	1,600	500 - 530	1,000
As	<DWS's	<DWS's - 400	<DWS's
Cd	<DWS's	<DWS's - 10	<DWS's
Hg	<DWS's	<DWS's - 180	<DWS's
Pb	30,000	<DWS's	<DWS's
Se	<DWS's	<DWS's - 220	<DWS's
2-M.butane	2,000	ND	40
Butane	800	ND - 30	20
Pentane	600	ND - 10	ND
M.hexane	14,000	ND	ND
M.cyclopentane	5,000	ND	20
M.butane Isomer	ND	ND - 70	ND
Isopropyl Ether	ND	ND	40

1 Source area, Bellflower Aquitard

2 Downgradient, Bellflower/Ballona Aquifer

3 Farther downgradient, Bellflower/Ballona Aquifer

ND - Not Detected

<DWS's - Not detected in concentrations which exceed EPA Drinking Water Standards

TABLE VI-14

**MOST REPRESENTATIVE CHEMICAL CONCENTRATIONS AT AND DOWNGRADIENT
FROM THE BUILDING 35 SUMPS**

Chemical (ppb)	Well C-48 ¹	Well C-40 ²	Wells C-15, C-28, & C-30 ³
1,1-DCA	ND	20	ND
Trans	10	10	4 - 100
TCE	7	ND	ND - 10
Benzene	300	ND	ND - 40
Toluene	10	ND	ND - 5
E.Benzene	70	ND	ND
Total Xylenes	10	ND	ND
1,3-DCB	10	ND	ND
1,4-DCB	20	ND	ND
TPH (ppm)	<0.5	<0.5	<0.3 - 0.8
Fe	8500	600	<DWS's
Mn	530	310	280 - 1000
As	400	300	<DWS's
Cd	10	10	<DWS's
Hg	180	150	<DWS's
Se	220	200	<DWS's
Tl	<DWS's	<DWS's	<DWS's - 100
4,4'-DDD	NM	0.21	ND
4,4'-DDE	NM	0.06	ND
2-M.butane	ND	ND	ND - 40
M.butane	ND	ND	ND - 60
Butane	ND	ND	ND - 30
Pentane	ND	ND	ND - 30
Isopropyl Ether	ND	ND	ND - 40
M.cyclopentane	ND	ND	ND - 30
D.M.butane	ND	ND	ND - 20
M.cyclobutane	ND	ND	ND - 20
cyclopentane	ND	ND	ND - 10
Isopentane	ND	ND	ND - 20
Carbon Disulfide	ND	ND	ND - 10
Molecular Sulfur	ND	ND	ND - 80

1 Organic sump source area, Bellflower/Ballona Aquifer

2 Chromate waste sump area, Bellflower/Ballona Aquifer

3 Downgradient, Bellflower/Ballona Aquifer

ND - Not Detected

NM - Not Measured

<DWS's - Not detected in concentrations which exceed EPA Drinking Water Standards

migration from the upgradient Underground Tanks West of Building 11. Several heavy metals, however, detected in concentrations which exceed Drinking Water Standards at C-48 have not been detected at upgradient wells. Since the organic sump handled waste solvents and paint sludge, which would have included heavy metals, the presence of metals at C-48 may be attributed to the sump.

Well C-40, screened in the Bellflower/Ballona Aquifer, is located adjacent to a wastewater effluent clarifier and northeast of a chromate waste sump at the northeast corner of Building 35. The presence of high concentrations of heavy metals at this well appears to be associated with effluent from the chromate waste sump. Two pesticide compounds were also detected at C-40. Pesticides were used in several areas on the Plant Site for agricultural purposes. The pesticide presence in Well C-40 cannot, however, be attributed to activities conducted in Building 35.

Wells C-15, C-28, and C-30, screened in the Bellflower/Ballona Aquifer, are located downgradient from Building 35. VOC's detected in these wells are believed to reflect lateral transport from a number of upgradient source areas which have been discussed in this section.

Heavy metals detected at C-40 and C-48 are not present in C-15, C-28, and C-30. The absence of metals in water from these wells suggests that heavy metals which may have entered the groundwater at Building 35 have not moved downgradient in the groundwater from C-40 and C-48.

Underground Tank South of Building 5

Well C-64, screened in the Bellflower/Ballona Aquifer, is located adjacent to the Underground Tank South of Building 5. As shown in Table VI-15, the major VOC's detected in groundwater at this well are chloroform and TCE, present in concentrations of 10,000 ppb; and Trans, DCM, 1,1-DCA and 1,2-DCP, in concentrations of several hundred ppb. TPH was detected at 2 ppm and two pesticide compounds, delta-BHC (0.06 ppb) and Endrin (11 ppb) were detected at C-64.

Well C-23, screened in the Bellflower/Ballona Aquifer downgradient from C-64, shows several VOC's present in concentrations up to 200 ppb and TPH at 0.5 ppm. Farther downgradient, across the erosional unconformity between the Bellflower/Ballona Aquifer on the west and the Lakewood Formation on the east, Well C-25 is screened in the Gage/Gardena Aquifer. Trans and TCE have been detected in relatively low concentrations at C-25, and TPH has been detected at 0.4 ppm. Chemicals detected at Wells C-23 and C-25 are those present in highest concentration at C-64, suggesting lateral migration from the source area.

TABLE VI-15

MOST REPRESENTATIVE CHEMICAL CONCENTRATIONS AT AND DOWNGRADIENT
FROM THE UNDERGROUND TANK SOUTH OF BUILDING 5

<u>Chemical (ppb)</u>	<u>Well C-64¹</u>	<u>Well C-23²</u>	<u>Well C-25³</u>
Vinyl Chloride	4	ND	ND
DCM	500	ND	ND
1,1-DCA	600	5	ND
Trans	700	200	40
Chloroform	10,000	ND	ND
TCA	200	ND	ND
1,2-DCP	600	ND	ND
TCE	10,000	40	10
PCE	300	ND	ND
Benzene	200	ND	ND
Toluene	300	ND	ND
E.Benzene	100	ND	ND
Total Xylenes	400	ND	ND
1,2-DCB	9	ND	ND
1,3-DCB	5	ND	ND
1,4-DCB	30	ND	ND
TPH (ppm)	2	0.5	0.4
BHC	0.06	NM	NM
Endrin	11	NM	NM
Mn	<DWS's	200	90

1 Source area, Bellflower/Ballona Aquifer

2 Downgradient, Bellflower/Ballona Aquifer

3 Downgradient Gage/Gardena Aquifer

ND - Not Detected

NM - Not Measured

<DWS's - Not detected in concentrations which exceed EPA Drinking Water Standards

Well C-29, located east of the Charnock Fault, is screened in the Silverado Aquifer. VOC's have not been detected in C-29. However, MEK was analyzed and detected once at a concentration of 10 ppb. Additional sampling confirmed that MEK is not present in C-29. The apparent absence of VOC's in C-29 is consistent with the hydrogeologic interpretation set forth in this report which states that groundwater in the Silverado Aquifer beneath the Plant Site does not have hydraulic continuity with the Silverado Aquifer east of the fault.

Eastern Extent of Chemical Distribution from East Manufacturing

Well C-14, screened in the Bellflower/Ballona Aquifer, is located northeast of the East Manufacturing Area. VOC's have not consistently been detected at this well. Traces of Trans have, however, been reported in two of ten samples. TPH has not been detected at C-14, and no metals other than manganese were detected above Drinking Water Standards. Because chemicals have not consistently been detected at C-14, it apparently is beyond the northeastern limits of the chemical plume originating at the East Manufacturing Area.

Well C-26, screened in the Gage/Gardena Aquifer, is located south of the East Manufacturing Area. VOC's have not consistently been detected at this well. Traces of Trans have, however, been reported in two of five samples and several fuel hydrocarbons, butane (10 ppb), cyclopentane (10 ppb), and isopropyl ether (20 ppb), have been detected. No metals other than manganese were detected above levels listed in Table VI-4. Because only low levels of fuel hydrocarbons have been detected at C-26, it is evident that the chemical distribution which exceeds Action Levels has not reached this well.

Well C-32, screened in the Gage/Gardena Aquifer, is located east of the East Manufacturing Area. Traces of chloroform (3 ppb) have consistently been detected at this well. Toluene, reported in concentrations of about 10 ppb in sampling conducted in August 1985, has not been detected in three more recent sampling rounds at this well. TPH has not been detected, and no heavy metals other than manganese are present above Drinking Water Standards.

Well C-52, located farther downgradient, is a multiple completion well, consisting of three individual two-inch piezometers constructed within the same borehole and separated by grout seals. The uppermost piezometer is screened in the Gage/Gardena Aquifer; the second piezometer is screened in the upper portion of the Silverado Aquifer; and the third is screened lower in the Silverado Aquifer. C-52A, the shallow zone piezometer, has shown traces of toluene (1 ppb), TCA (2 ppb), TCE (1 ppb), and acetone at 80 ppb. However, none of these compounds have been consistently detected. Barium has been detected in concentrations which are above Secondary Drinking Water Standards in C-52A.

The inconsistent occurrence of most VOC's at Wells C-32 and C-52A suggests that chemicals have not migrated in groundwater beyond the site boundary, east of Well 52, and if any chemical has migrated beyond the boundary, its concentration would be well below DHS Action Levels. The occurrence of acetone at 80 ppb in Well C-52A is problematic.

Acetone is not a commonly detected constituent in groundwater under the site, and it has not been detected in wells upgradient from C-52A. The acetone occurrence is being evaluated with respect to laboratory QA/QC and the sampling procedure, but it is probably not an accurate indication of water quality beneath the site at Well 52A. Wells C-32 and C-52A are located and screened such that chemicals moving downgradient from the Plant Site would pass through the aquifer at one or both of these wells. The traces of VOC's probably reflect the dilute leading edge of a chemical plume.

FLOATING GASOLINE WEST OF BUILDING 11

During the Phase I investigation by Hargis & Associates, Inc., Free gasoline was detected floating on the water table surface at Monitor Well C-12. Subsequent investigation indicated that the gasoline was reaching the water surface from the soil zone beneath two tanks located in a gasoline service area west of Building 11.

The gasoline tanks were drained of fuel, refilled with water, and subjected to tightness tests. Results of the test indicated that the fuel service line from one of the tanks, used to store unleaded gasoline, had been leaking at a rate of 0.4 gallons per hour. In order to delineate the extent of gasoline floating on the groundwater surface, 17 monitor wells, TB-1 through TB-17, were constructed within a 125 foot radius of the fuel tanks in 1985. Locations of the monitor wells near the tanks are shown in Figure VI-7.

Lithologic logs from the monitor wells show that the upper surface of a continuous clay layer occurs 22 to 25 feet below surface. Above the clay layer, the soil consists of clayey to silty sand with locally developed sand lenses. Groundwater occurs at about 22 feet below ground. Eight of the monitor wells were completed above or within the clay layer at total depths of 24 to 27.5 feet below surface. Nine monitor wells were completed below the clay layer at depths ranging from 29 to 33 feet.

After completion of the monitor wells in June 1985, fuel and water level readings were taken in Wells C-12, C-22, and TB-1 through TB-17. Six of the wells had gasoline floating on the groundwater surface, ten wells contained no floating gasoline, and three were dry. On October 21, 1986, measurements were made in six wells, and on December 15, 1986, measurements were made in 19 wells near the underground tanks. Measured depths to the gasoline surface and to the water surface were used to estimate the thickness of floating gasoline at each well.

Table VI-16 shows the thickness of gasoline measured in October and December 1986, and in June 1985. Comparison of data in the table indicated that two wells, TB-4 and TB-16, which had no floating gasoline in 1985 now have 0.8 feet and 5.2 feet, respectively. The thickness of floating gasoline has also increased in Wells TB-6 and C-12. Well TB-2 was suspected of having floating gasoline in October 1986 that had not been detected in 1985, but the December 1986, measurement showed no gasoline. The 1986 data for TB-2 is ambiguous. The increasing levels of gasoline in several wells since 1985 can probably be attributed to downward migration of gasoline from shallow soil zones.

TABLE VI-16

WATER LEVEL AND PETROLEUM PRODUCT THICKNESS MEASURED IN WELLS WEST OF BUILDING 11

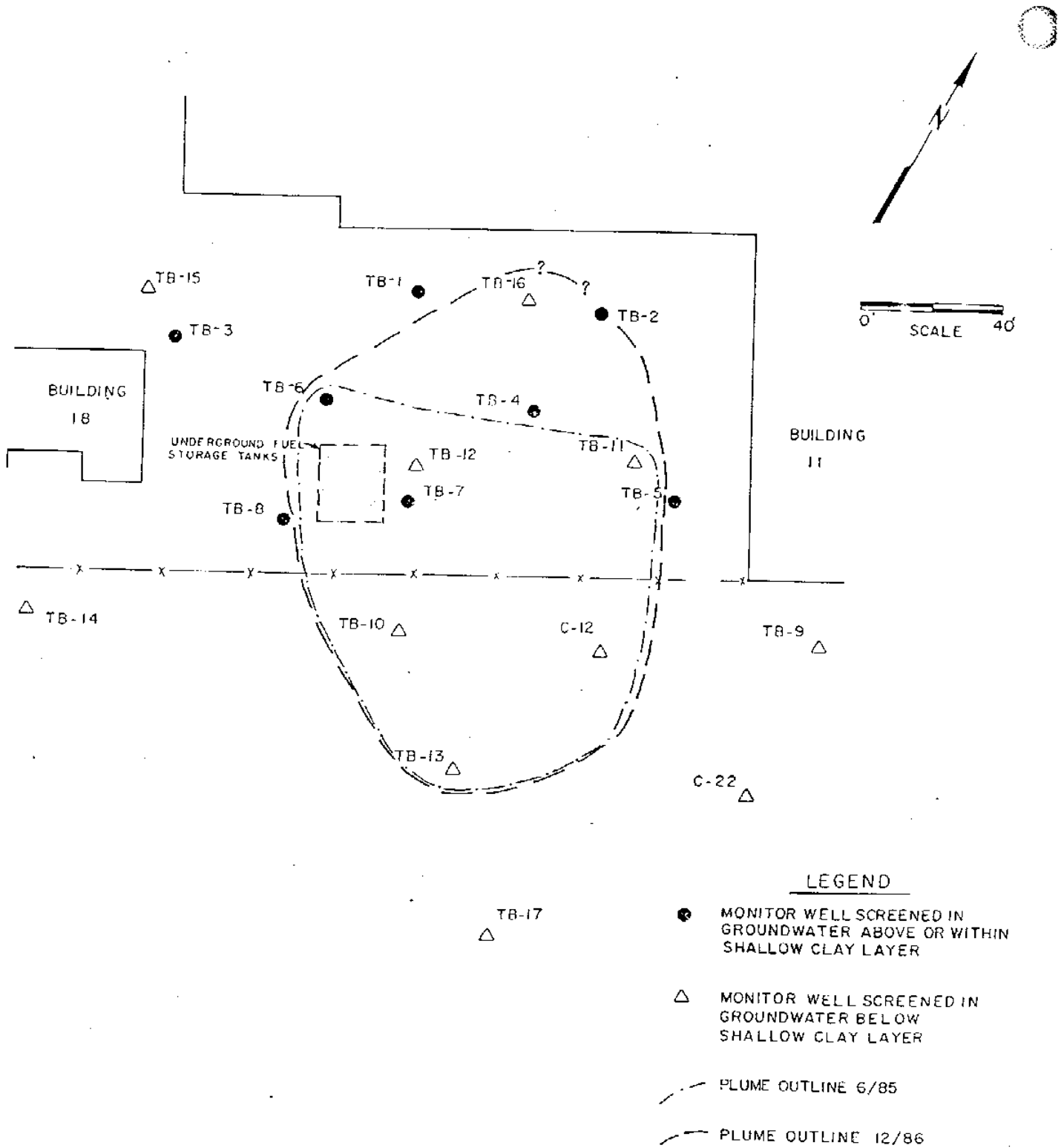
Well No.	June 5, 1985			October 21, 1985			December 15, 1986		
	Depth to Petroleum Product (ft)	Depth to Water (ft)	Thickness of Petroleum Product (ft)	Depth to Petroleum Product (ft)	Depth to Water (ft)	Thickness of Petroleum Product (ft)	Depth to Petroleum Product (ft)	Depth to Water (ft)	Thickness of Petroleum Product (ft)
TB-1	NP	22.35	0	NM	NM	---	NP	21.75	0
TB-2	NP	24.59	0	25.4	DRY	1.10	NP	25.21	0
TB-3	NP	22.54	0	NM	NM	---	NP	23.51	0
TB-4	NP	DRY	0	21.55	24.5	.95	NP	24.51	.81
TB-5	NP	22.53	0	NM	NM	---	NP	22.97	0
TB-6	20.67	20.72	.05	20.4	23.8	3.4	NP	23.78	3.3
TB-7	NP	DRY	0	NM	NM	---	NP	DRY	0
TB-8	NP	DRY	0	NM	NM	---	NP	DRY	0
TB-9	NP	26.58	0	NM	NM	---	NP	27.06	0
TB-10	25.72	27.40	1.68	NM	NM	---	NP	27.86	1.29
TB-11	25.44	27.46	2.02	25.6	27.85	2.25	26.57	27.54	1.81
TB-12	24.30	26.22	1.92	25.3	27.0	1.7	25.73	26.55	1.81
TB-13	26.84	28.23	1.39	NM	NM	---	25.14	28.81	1.28
TB-14	NP	28.44	0	NM	NM	---	27.73	24.78	0
TB-15	NP	22.35	0	NM	NM	---	NP	23.2	0
TB-16	NP	24.78	0	25.55	29.5	3.95	NP	NW	5.18
TB-17	NP	27.26	0	NM	NM	---	25.22	27.81	0
C-12	26.65	27.41	.76	NM	NM	---	NP	28.25	1.27
C-22	NP	27.67	0	NM	NM	---	NP	27.93	0

NP - No Petroleum Product encountered

NM - Not Measured

NW - No Water encountered

FIGURE VI-7
SHALLOW MONITOR WELLS
IN AREA OF
GASOLINE LEAK



SECTION VII

PUBLIC HEALTH AND ENVIRONMENTAL ISSUES

This section of the report evaluates public health and environmental issues related to the presence of chemicals in soils and groundwater at the Plant Site. Described in this section are migration pathways, potential receptors of chemicals found on the property, and comparisons of chemical concentrations projected at receptors to government standards.

MIGRATION PATHWAYS

Potential migration pathways for chemicals present at the Plant Site are through soil, groundwater, air, and surface water. Each of these pathways and their significance in relation to specific chemicals detected at the site are discussed below.

Soil

Possible chemical migration pathways through unsaturated soil at the Plant Site are:

- . Downward infiltration from the source area;
- . Lateral migration where strata of lower permeability impede downward migration;
- . Volatilization in all directions in response to a concentration gradient; and
- . Migration of surface soil particles as dust or erosion.

Migration pathways are site specific and chemical specific. Once in the soil, chemical migration away from the point of infiltration depends on a number factors, including:

- . Chemical volatility,
- . Chemical solubility in water,
- . Chemical density relative to water,
- . Electrical charge of the chemical or its degree of polarity,

- . Chemical concentration,
- . Chemical stability to light, chemical, and biological alteration,
- . Permeability of the soil to water or to organic solvents,
- . Soil moisture content,
- . Soil cation exchange capacity, and
- . Soil organic matter content.

For chemicals detected at the Plant Site, these factors and their influence on migration through soil are discussed below.

VOC's

Volatile organic compounds infiltrate the soil by mass flow, either as a solution of VOC's dissolved in water or gasoline or as neat VOC's. VOC's migrate rapidly through high permeability sandy soils and slowly through low permeability clays. Throughout much of the Plant Site, soil profiles consist of both sandy and clayey strata. Where clays are discontinuous, infiltrating VOC's will migrate around the clays via the more permeable sands. Where clays are continuous over a large area, such as at the Fire Training Burn Pit, the lower permeability clays create an aquitard, causing dissolved VOC's to accumulate above the clays. VOC's will then migrate slowly into the underlying clays.

Interactions of VOC's passing through a soil are limited to fairly weak hydrogen and van der Waals bonding with soil organic matter and hydrophobic sorption to soil surfaces. Attenuation of VOC's infiltrating a soil is lowest in sandy soils with low organic matter because of the small surface area in sands available for sorption. Attenuation of VOC's is highest in clay soils with a high organic matter contact because of the large surface area of clays. VOC's measured in bulk soil samples are a summation of VOC's sorbed to soil particles, VOC's in the soil solution, and vapor phase or neat VOC's in soil pore space.

VOC's will migrate through soil until the driving forces are exhausted or until all VOC's are removed from the solution by soil attenuation. In most of the source areas at the Plant Site, there is little attenuation by soils and the water table is relatively close to the surface, approximately 4 to 26 feet below ground surface. Consequently, some VOC's infiltrating the soil at the Plant Site migrated to the groundwater.

Those VOC's that remain at higher concentrations in the unsaturated zone after infiltration represent a long-term source of VOC's to groundwater. These VOC's can migrate slowly into the groundwater by unsaturated flow, by diffusion, or by mixing with the groundwater as the water table rises into previously unsaturated soils.

VOC's in unsaturated soils may also migrate to groundwater as rainfall passing through the unsaturated zone flushes the VOC's downward. Source areas that are not paved or covered by a building foundation represent less of a long-term threat to groundwater than do covered source areas. This is because years of rainfall have already flushed many of the VOC's into the groundwater and diluted those VOC's remaining in the unsaturated soils at these sites. Covered areas would be expected to contribute a pulse of VOC's to the groundwater as the site is flushed by rainfall after the covering has been removed.

VOC's in the unsaturated soil can also migrate upward into the atmosphere by diffusion in response to a concentration gradient. Diffusion of VOC's from soils into the atmosphere was evaluated for the eight potential source areas located on the west side of the Plant Site using a computer model incorporating VOC partitioning within the soil and a flux model of VOC's to the soil surface. Partitioning between soil solids and soil solution was described using the Freundlich adsorption isotherm with the adsorption coefficient, K , derived from the octanol-water partitioning coefficient, K_{oc} , commonly used for dissolved organic chemicals. Partitioning between the soil solution and the soil pore space was described using Henry's Law. Diffusion of VOC's to the soil surface was described using Fick's Law. Fluxes from individual source areas were calculated on the order of 10^{-12} to 10^{-8} mg/cm²/sec. Appendix D presents the derivation of soil flux values for the eight westernmost potential source areas.

Petroleum Hydrocarbons

Petroleum hydrocarbons infiltrate soil by mass flow. The depth of infiltration is primarily a function of soil permeability, petroleum concentration, and viscosity. Petroleum hydrocarbons occur in soils at the Plant Site as either isolated surface deposits or subsurface deposits associated with migration from a source area.

Migration from surface deposits is negligible because the hydrocarbons which are present at the Plant Site are either non-volatile or they are present at concentrations too low to pose a threat to air or groundwater. Migration from subsurface deposits to groundwater is significant only with high concentrations. Migration into the groundwater is of particular concern in high permeability sand or where concentrations are relatively high.

Heavy Metals

Heavy metals present in soils at the Plant Site may have infiltrated the soil as dilute solutions. However, because heavy metals are naturally occurring geologic materials, detection of metals in soil does not imply that the chemicals resulted from human activities. Most levels of metals detected in soil at the Plant Site are well within the range of heavy metals known to occur naturally in soils in the contiguous United States. Only copper in surface and near-surface soils in the burn area at the Remote Test Site exceeded this range.

In clay soils or in soils high in organic matter, soluble heavy metals are retained by cation exchange. Soluble metals present at concentrations exceeding the soil's exchange capacity migrate by mass flow with the soil solution. Insoluble metals precipitate out of solution and remain in place.

Vapor pressure and Henry's Law constant for heavy metals are negligible. Consequently, volatilization of metals from soil surfaces is not a migration pathway. Metals may migrate with airborne dust or as particulates through large soil pores. However, because of the low concentrations of metals detected at the Plant Site, these pathways are considered insignificant.

Chlorinated Pesticides

Pesticide degradation products were detected at very low concentrations (less than 35 ppb) in a few samples taken at the site. Chlorinated pesticides are strongly sorbed to soil solids and migrate only in soils with low surface area (i.e., sands) where concentrations exceed the sorptive capacity of the soil.

Because of the sandy nature of the soil at much of the site, low levels of pesticides or pesticide residues may migrate to groundwater by mass flow in the soil solution. Volatilization of pesticides is not considered a migration pathway at the Plant Site because of the very low concentrations present and because of the low vapor pressure of organochlorine pesticides.

Polynucleated Aromatics

Polynucleated aromatics were detected in only one sample at the site. Migration pathways for these compounds are not considered significant at the site because of the very low concentrations present and because PNA's sorb tightly to soil particles.

Polychlorinated Biphenyls

Polychlorinated biphenyls were detected at low levels (less than 2 ppm) at isolated locations at the site, at higher concentrations at the Waste Oil Sump, at the Salvage Yard, and at the Underground Tank South of Building 5 (29 ppm and 40 ppm).

Because PCB's are tightly sorbed to soil solids and because PCB's are practically insoluble in water, migration of PCB's by mass flow into groundwater is not a likely pathway. At the Underground Tank South of Building 5 PCB's were measured in concentrations up to 40 ppm in saturated soil; however, no PCB's were detected in groundwater (Monitoring Well C-64) at the same location at a detection limit of 0.002 ppm.

Migration of PCB's through air is not a significant pathway. PCB's are not highly volatile (vapor pressure of Arochlor 1242 is 50 mmHg at 225°C); they are strongly adsorbed to soil and are very soluble in oils. Thus, the tendency to volatilize from the low concentrations found at the Plant Site is negligible.

Groundwater

Those chemicals which migrate downward through the unsaturated soil will enter the groundwater at the Plant Site. Once in the groundwater, chemical migration is characterized by both a continued downward movement and a strong lateral movement in the direction of groundwater flow. Chemical distribution in groundwater is site specific, determined by migration phenomena discussed below.

The velocity of chemical movement in saturated material is equivalent to the velocity of groundwater in which the chemicals are dissolved. Velocity, in turn, depends on the hydraulic conductivity of the geologic materials and the hydraulic gradient. Chemicals in groundwater undergo dispersion as they migrate away from a source area. In an ideal homogeneous and isotropic granular medium, lateral dispersion is in the shape of a cone about 6° wide. Chemical concentration in this ideal system can be represented as a bell-shaped curve over a plane at any given distance from the source area with maximum concentrations in the center of the cone. Dispersion in aquifers is generally greater than the ideal because of factors such as lithologic variability and variations in hydraulic gradient with time.

Chemicals can migrate from groundwater to unsaturated soil at some distance away from the source area by capillary movement up from the groundwater. Capillary rise, the molecular attraction between soil solids and water in small diameter soil pores, operates over a distance of a few centimeters in sand to several meters in clays. Movement of

chemicals from groundwater to unsaturated soil by capillary rise is a particularly important phenomenon where groundwater contains an immiscible layer of gasoline or other low-density liquid floating on the surface of the water table.

Chemicals can also migrate from groundwater to unsaturated soil near the water table as a result of changes in groundwater levels. As groundwater levels drop from winter to summer or from wet years to dry years or in response to pumping, chemicals may remain in the unsaturated soil by mechanisms described earlier in the discussion of migration pathways through soil.

A third possible pathway for migration from groundwater to unsaturated soil at some distance from a source area is by volatilization. This pathway is insignificant compared to the other two mechanisms discussed above.

Migration pathways in groundwater are also affected by attenuation mechanisms. Attenuation processes include sorption of chemicals to geologic materials, precipitation, ion complexing, and biological degradation. Attenuation of chemicals by sorption to geologic materials at the Plant Site is most likely in the low permeability clays which have the highest specific surface area and is least likely in the gravels of the Bellflower/Ballona Aquifer. Attenuation of chemicals by biological degradation is most likely for petroleum hydrocarbons and aromatic VOC's and less likely for chlorinated compounds.

Chemicals detected in groundwater at the Plant Site include VOC's, petroleum hydrocarbons, pesticides, heavy metals, and various organic compounds. These compounds are dissolved in the groundwater and will migrate with groundwater as described above. Petroleum hydrocarbons at one site (Underground Tank West of Building 11) were found to be floating on the groundwater surface. Upward migration from groundwater by capillary action is especially likely above the floating product.

The wells closest to the Plant Site which are known to be active are owned by Hillside Memorial Park and the Roman Catholic Archbishop of Los Angeles. These wells (Figure II-3) are 4,000 feet east and 7,000 feet northeast of the Plant Site, respectively. The wells are reportedly producing water from the Gage or Silverado Aquifers. Reported annual pumping from the two active wells in the year 1981 to 1982 was 56 acre-feet from the Hillside Memorial Well and 65 acre-feet from the Archbishop of Los Angeles Well (DWR, 1982). The discharge from the 2 wells totals about 40 million gallons per year. Assuming irrigation occurs 300 days per year for 12 hours per day, the combined extraction rate of the 2 wells would be approximately 200 gallons per minute.

Active municipal well fields are located approximately five miles southeast of the Plant Site in Inglewood. The wells in these fields are pumping about 8,100 acre-feet of water per year (2.6 billion gallons per year) from aquifers 280 to 325 feet deep in the Silverado water-bearing zone. Assuming continuous operation of the wells, their production rate is about 5,000 gallons per minute.

A well which has not been abandoned but which is not active is located approximately 1,000 feet south of the Plant Site at the Loyola Marymount University. The well was completed in an aquifer of the Silverado water-bearing zone, but it has not been pumped since 1961. The University has leased its water right to Dominguez Water Corporation. The Dominguez Water Corporation has transferred the well's water rights to another portion of the groundwater basin, and the Loyola well is not connected to the Dominguez water distribution system.

Chemicals and fuel hydrocarbons are detected in their highest concentrations in the shallow groundwater beneath the Plant Site, but trace amounts of solvents are found in the Silverado Aquifer below the site and in sands and gravels of the Gage/Gardena Aquifer beneath the bluff east of the site. Evidence indicates that chemicals originating at the site have not migrated off-site.

Hydrogeologic data and assumed regional groundwater flow paths raise the question of whether groundwater containing chemicals from the Plant Site might migrate over time to active off-site pumping wells. The nearest well in the apparent downgradient direction is the Hillside Memorial Park irrigation well. The closest domestic wells in the downgradient direction of regional groundwater flow are the wells in the Inglewood-Hawthorne area.

Groundwater from the Plant Site moves east in the shallow aquifer zones over the Charnock Fault into the Gage/Gardena Aquifer, and then may flow to the east or to the southeast in the direction of regional groundwater flow. Groundwater contours for the Plant Site suggest that the flow path in the Gage/Gardena Aquifer does not turn to the southeast for more than 1,000 feet beyond the fault. The Hillside Memorial Park well is 4,000 feet east of the fault and may be in the downgradient flow path of shallow groundwater from the Plant Site.

Regional patterns suggest the flow direction of groundwater in the Silverado Aquifer beneath the east end of the Plant Site is southeast.

For purposes of estimating if the chemicals at the Plant Site have the potential to reach the closest irrigation or domestic supply wells, the following paragraphs estimate groundwater velocities based on generalized regional hydrologic conditions. The calculations used

provide order-of-magnitude estimates of flow conditions. The actual velocities will depend on the gradients in the Gage/Gardena and Silverado Aquifers east and south of the Plant Site and on changes in the geologic conditions within these aquifers.

Analysis of the 30-day pump test of the Bellflower/Ballona Aquifer yielded an average hydraulic conductivity value of $55 \text{ ft}^3/\text{d.ft}^2$ for the Bellflower/Ballona Aquifer. Assuming that the same conductivity value, a gradient of five feet per mile, and an effective porosity of 0.25 can be applied to the Gage/Gardena Aquifer, its lateral groundwater pore space velocity would be approximately 70 ft/yr. Solvents such as trans-1,2-dichloroethylene and trichloroethylene are known to be present 700 feet east of the Charnock Fault in Well C-25. Well C-25 is approximately 3,500 feet horizontally from the Hillside Memorial Park well. At a velocity of 70 feet per year, the chemicals found in Well C-25 could travel the distance to the Hillside well in approximately 50 years if groundwater in the Gage/Gardena Aquifer flows directly east toward the well. The California Department of Water Resources (DWR, 1961) estimated horizontal conductivity of $1,500 \text{ gpd/ft}^2$ ($200 \text{ ft}^3/\text{d.ft}^2$) for sands and gravels of the San Pedro Formation. Applying this higher value and a gradient of five feet per mile to the Gage/Gardena Aquifer, the calculated groundwater pore space velocity is estimated to be 260 feet per year, and the travel time for chemicals to reach the Hillside well would be approximately 13 years. If groundwater from the Plant Site reached the well, the concentration of chemicals in the groundwater reaching the well would be greatly reduced due to sorption of chemicals onto soil particles within the aquifer, dilution due to dispersion, and losses due to volatilization into overlying unsaturated soils. The concentration of chemicals extracted at the well would be much lower than the concentration in the groundwater originating from the site due to dilution by fresh water drawn to the well from other directions and depths.

A similar analysis was completed to evaluate movement of groundwater from the Plant Site to the southeast in the Upper San Pedro Formation, assuming that the potential exists to carry chemicals toward domestic wells in the Hawthorne area. The wells in the Hawthorne area are approximately 7 to 9 miles (36,000 to 47,000 feet) from the Plant Site. Using the values from the 1961 DWR report for hydraulic conductivity of $1,500 \text{ gpd/ft}^2$ and horizontal gradient of 15 feet per mile with a formation porosity of 0.25, the horizontal groundwater pore space velocity would be 800 feet per year. With the assumptions discussed above, the chemicals found at the Plant Site could travel the distance to the Hawthorne area wells in approximately 45 to 60 years at a velocity of 800 feet per year. If groundwater from the Plant Site reached the wells, the concentration of chemicals in the groundwater reaching the wells would be greatly reduced due to sorption of chemicals onto soil particles within the aquifer, dilution due to dispersion, and losses due to volatilization into overlying unsaturated soils. The concentration of chemicals extracted at the well would be

much lower than the concentration in the groundwater originating from the site due to dilution by fresh water drawn to the well from other directions and depths.

Based on the above analyses, there appears to be no short-term significant potential threat to water quality of irrigation or domestic supply wells.

Air

Volatile chemicals from soils at the Plant Site could potentially enter the atmosphere. The tendency of a chemical to volatilize is given by its vapor pressure. The tendency of a dissolved chemical to volatilize from water is given by its Henry's Law constant. Those chemicals that are not volatile can migrate in air as airborne dust particles. Migration of chemicals through airborne dust is only a significant pathway when chemicals are present in the surface soil and vegetation or cover are absent, or when the soil is subject to mechanical or vehicular disturbance.

Because of the low concentrations and isolated occurrences of pesticides, PNA's, heavy metals, and PCB's in surface soils at the Plant Site, migration of these chemicals by volatilization or by airborne particulates is considered insignificant.

Chemical migration through air was evaluated in detail for VOC's by modeling the predicted ambient air concentrations downwind from eight source areas on the west side of the property. The evaluation is presented in Appendix D and summarized in the following paragraphs.

VOC fluxes from individual source areas on the west side were calculated on the order of 10^{-12} to 10^{-18} mg/cm²/sec. Once in the air, chemicals are subjected to atmospheric dispersion. Atmospheric dispersion depends on wind speed and direction, mixing height, and atmospheric stability as a function of cloud cover, surface temperature, and ambient air temperature.

Atmospheric parameters from weather stations in the vicinity of the Plant Site and soil flux calculations based on the six VOC's detected at highest concentrations on the west side of the Plant Site were incorporated into the computer model utilized by the South Coast Air Quality Management District (SCAQMD) and the U.S. EPA. The model, called the Industrial Source Complex Long-Term Dispersion Model (ISCLT), evaluates annual average concentrations for VOC's at a downwind receptor site.

Maximum ambient air concentrations for individual VOC's were modeled on the order of 10^{-12} to 10^{-11} ppm. The model was designed to overestimate VOC concentrations, so these represent conservative predictions, i.e., actual concentrations resulting from soil on the

west side will probably be lower. East side sources were not modeled because of the very low values obtained for the western sites and because many of the eastern sites are covered with pavement. Even if the flux of VOC's from east side sources were ten times the flux from the west side, predicted annual average air concentrations would still be 10,000 to 100,000 times lower than measurable atmospheric concentrations. Migration of VOC's on airborne dust is considered insignificant because surface soil concentrations of VOC's are usually very close to zero due to volatilization and photodegradation.

Surface Water

At the Plant Site, Centinela Ditch is the only surface water body. Surface runoff from the southern two-thirds of the property is directed to Centinela Ditch. The Temporary Drum Storage Area, Salvage Yard, Purged Fuel Storage Area, Former Drum Storage Area, and Building 32 Surface Runoff Area are in the area tributary to the ditch. Any chemicals which may have entered the ditch from historic activities at these sites would flow downstream, volatilize, precipitate, or adsorb to creek sediments. The downstream distance at which soluble chemicals may have been detected is a function of the concentration of chemicals if they were present in runoff would have precipitated at or immediately downstream from the point of discharge if the occurred. Since current operational practices do not allow for any discharge of chemicals to Centinela Ditch, surface water is not considered an active migration pathway.

Soil samples were collected from the ditch at the Purged Fuel Storage Area and Former Drum Storage Area and analyzed for VOC's. Two of the three soil samples from the ditch bottom at the Purged Fuel Storage Area showed no detectable VOC's; the third showed 120 ppb of Trans, trace levels of toluene, xylenes, and dichlorobenzenes at a depth of 0.5 feet, and no detectable VOC's at 2.5 feet. At the Former Drum Storage Area which is upstream from the Purged Fuel Storage Area, soil samples from the ditch bank showed up to 367,100 ppm TPH and 100,000 ppb VOC's. Downstream of the site in the Ballona Wetlands, an investigation of water, drainage channel sediment, and soil quality was completed by the National Audubon Society in November of 1986. (Ballona Wetlands Enhancement, Restoration and Management Plan, Appendix I: Biology, Shapira, and Associates.)

The objective of the Ballona Wetlands investigation was to determine the levels of contaminants in the wetlands project area and whether those levels would be toxic to marine or freshwater organisms in Centinela Creek, soils of Ballona Wetlands, and marine waters. Analyses included heavy metals, pesticides, VOC's extractable organics, nutrients, chemical oxygen demand, biological oxygen demand, and oil and grease. The report conclusions included a finding that levels of contamination would not hinder development of the Wetlands;

specifically, levels of contamination in Centinela Creek did not exceed State and Federal quality criteria for water, that the soils in the Ballona Wetlands do not need to be removed for wetlands development, that contamination levels are at similar or lower levels than those of Marina del Rey, and organisms currently found there should survive when introduced or enticed to the Ballona Wetlands.

POTENTIAL RECEPTORS

Persons working at the Plant Site, persons who will be living and working at the site under future land use, and persons utilizing groundwater from wells located downgradient of the site were considered to determine if they are potential receptors of chemicals migrating through the pathways previously discussed. Potential exposure to chemicals detected in soils and groundwater at the Plant Site could be by way of:

- . Dermal contact with soil containing chemicals;
- . Ingestion of soil containing chemicals;
- . Inhalation of air containing volatile chemicals;
- . Dermal contact with groundwater containing chemicals; and
- . Ingestion of groundwater containing chemicals.

EXPOSURE ASSESSMENT

Potential human exposure to chemicals at the Plant Site listed in the previous section are described below. Details of evaluation of dermal and airborne chemical exposure are presented in Appendix D.

Title 22 standards refer to acute dermal toxicity standards, based on lethal dosages of dermally applied chemicals to rabbits. Concentrations of chemicals at the Plant Site for which acute dermal toxicity standards exist are far below the acutely toxic concentrations. Standards regulating long-term dermal contact hazards have not been promulgated. Since sites will be covered with fill dirt, building foundations, roads, or landscaping, dermal contact with soils is, practically speaking, not an exposure route.

A conservative estimate of exposure resulting from ingestion of soil can be made by using the EPA estimate of 0.0001 kg of soil ingested per day for the average person and assuming that the effects of ingesting chemicals in soil are physiologically equivalent to ingesting chemicals in water. Chemical dosages developed through drinking water criteria can then be related to ingestion of soil with specific chemical

concentrations. The soil chemicals that have the greatest impact on the ingestion exposure route are chemicals in surface soils. Since sites will be covered with fill dirt, building foundations, roads, or landscaping, contact with soils by ingestion is, practically speaking, not an exposure route. Appendix D shows that even if an exposure route existed, the concentrations of chemicals in soil are below that which would result in significant risk.

Specific regulations have not been adopted for long-term exposure to most VOC's in air. However, the Air Resources Board (ARB) has suggested Unit Risk Values (URV's) for chemicals in air as guidance values to Air Quality Management Districts.

Migration of VOC's from soils on the west side of the Plant Site was modeled to evaluate exposure via inhalation. The modeled lifetime cancer risk from both airborne VOC's and ingested VOC's (based on ingestion of 0.0001 kg soil/day) was one million times less than the allowable "one-in-a-million" cancer risk used by regulatory agencies. Thus, the resultant potential risk is considered de minimus. Even if the soil concentrations from east side sites were ten times greater and included in the model, the risk associated with VOC's at the Plant Site would be up to 100,000 times less than the acceptable risk, as defined by regulatory agencies. A detailed description of the model is presented in Appendix D.

The last two exposure routes discussed in the previous section deal with dermal contact with and ingestion of groundwater. Acute dermal contact standards refer to hazardous waste and are orders of magnitude higher than levels that would result from contact with groundwater. Also, there will be no exposure route for dermal contact with groundwater except during construction activities. Action Levels have been adopted for ingestion of water. Exposure by ingestion of groundwater beneath the Plant Site is not an exposure route due to the absence of groundwater extraction in the area. The potential for future exposure was addressed in a previous portion of this report which showed that the nearest active domestic water supply well is projected not to be affected by chemicals from the site for about 40 years.

The site remediation program, discussed in the following sections of this report, includes groundwater remediation to eliminate the future potential exposure via ingestion of groundwater and soils remediation to eliminate possible exposure via contact with surface soils which meet the DHS definition of "hazardous waste". Other soil remediation recommendations are made with respect to enhancing the cost effectiveness of the groundwater remediation program rather than because of direct human exposure to these soils.

SECTION VIII

OBJECTIVES OF THE EVALUATION OF REMEDIAL ALTERNATIVES

The objective of the evaluation of remedial alternatives is to identify the best alternative to remediate chemical occurrence in groundwater and soils. The best alternative for remediation is identified by comparing the effectiveness, feasibility, cost, and institutional issues for each alternative. Remedial alternatives are comprised of one or more remedial technologies which are identified and screened in the course of the evaluation.

There are a variety of remedial technologies which should be considered to clean up and mitigate conditions at the site. Because some technologies are not feasible due to site conditions or because they would cost much more than others without a significant increase in benefit to human health, safety, or the environment, a complete evaluation of all potential remedial technologies is not warranted. As part of the evaluation of alternatives, proposed future use of the site is considered, and alternatives must be compatible with future uses of the site.

The process of selecting alternatives for detailed evaluation is called the initial screening. The effects of alternatives on public health and the environment are evaluated with regard to public health and environmental standards. Feasibility of alternatives includes consideration of reliability, demonstrated performance, and implementability. Institutional issues and requirements are also defined and evaluated for each alternative.

The overall goal of the program at the Plant Site is to remediate chemical occurrence in groundwater to meet regulatory requirements and in soils to facilitate groundwater cleanup. To achieve this goal, preliminary design drawings and an implementation plan for the recommended alternative have been prepared.

SECTION IX

INITIAL SCREENING OF REMEDIAL TECHNOLOGIES

The initial screening of remedial technologies identifies general source control and groundwater remediation technologies that are appropriate for remediation of the site. The initial screening is performed to identify and select remedial technologies that will be further evaluated on the basis of effectiveness, feasibility, cost, and institutional issues. The screening of remedial technologies is presented in Table IX-1, which follows this section.

DESCRIPTION OF TECHNOLOGIES

General descriptions of technologies considered for remediation of soils and groundwater contamination are provided below. The technologies are grouped into six categories:

- . Surface controls
- . Subsurface controls
- . Groundwater extraction
- . Source treatment
- . Treatment of extracted groundwater
- . Discharge of treated groundwater

Surface Controls

Surface control technologies such as cap-covers, surface contouring, and revegetation reduce infiltration to prevent the leaching of contaminant materials from the unsaturated soil zone into the groundwater and reduce the potential for direct contact with contaminants. At the Plant Site, unsaturated soil zones are known to contain volatile organic chemicals and fuel hydrocarbons. The volatile organic chemicals and the fuel are migrating downward into the groundwater at some sites. Surface controls might be effective in slowing the rate at which volatile organic chemicals (VOC's) and fuels are percolating downward through the soil.

Surface controls at sources on the Plant Site would not provide for either the removal or treatment of contaminated soil and/or groundwater. Because surface controls would slow down the rate at

which chemicals move from soils to groundwater, surface controls could extend duration of groundwater cleanup operations. For these reasons, surface control technologies are not recommended for remedial action at the Plant Site.

Subsurface Controls

Subsurface controls include barrier walls, bottom sealing, and permeable treatment beds. Subsurface controls can be used to encapsulate source areas and, on a larger scale, can be used to control groundwater movement.

Barrier Walls

Contaminated groundwater or source areas may be isolated from the environment by a number of perimeter control techniques. These techniques involve creating a physical barrier to chemical movement. Techniques for constructing a barrier wall include: injecting grout into the subsurface to form an impermeable subsurface curtain, constructing an impermeable barrier by backfilling a trench with a thick bentonite slurry, driving interlocking sheet piles to create a subsurface barrier wall, or installing synthetic impermeable membranes in trenches which are backfilled to stabilize placement.

In general, static barriers provide only temporary pollution containment. Groundwater will in time flow around, under, or over all barriers. Thus, groundwater extraction wells are required in conjunction with most barrier systems. Monitoring wells are required upgradient and downgradient of barriers to verify hydrologic and water quality effectiveness.

Due to the spread of the contamination under the site, for barriers to be used effectively, they would be implemented as regional groundwater controls to prevent water from moving off the site. A downgradient barrier constructed west of the bluffs to contain groundwater flowing east off the site would need to be approximately 2,000 feet long by 80 feet deep (160,000 square feet). Such a barrier wall would require construction of several extraction wells to assure water would not flow beneath or around the barrier. A treatment plant and disposal facility would be required to treat the extracted groundwater. Given that a system of extraction wells with a treatment and disposal facility is an effective alternative for site restoration, inclusion of a barrier wall for groundwater control is not cost effective, as no additional benefit will be realized.

For source area control, barrier walls can be used to prevent high concentrations of contaminants from migrating away from source areas. The existence of areas of high chemical concentration, even if effectively contained by barrier systems, will adversely affect and restrict future uses of the site. Although barrier systems might

provide cost savings in comparison with excavation and removal of contaminated soils, the effect on value of the site due to restrictions on future use outweigh the savings.

Bottom Sealing

Bottom sealing is a source area remedial measure. Bottom sealing is designed to prevent the vertical migration of chemicals by injecting grout through closely spaced wells to form a grout blanket beneath the contamination. This technology is generally suited for small source areas confined to the unsaturated soil zone. Bottom sealing requires many wells for grout injection. Also, it is difficult to insure that a complete seal is formed. This technique is an experimental technology and needs further development to verify effectiveness. This remedial technique would also impact future use of the site.

Permeable Treatment Beds

Permeable treatment beds are typically a source control remedial measure. Permeable treatment beds consist of a trench across the migration path of contaminated groundwater backfilled with a media for removal of chemicals. Permeable treatment beds can be constructed of either activated granular carbon (AGC) or ion exchange resins. Contaminated groundwater flows through treatment beds where chemicals are captured by reactions with the exchange resins or by sorbtion on the AGC.

The advantage of treatment beds is that contaminated groundwater does not need to be extracted for treatment. The disadvantages of permeable treatment beds are technical uncertainties and costs. Under field conditions, it is uncertain what the chemical saturation characteristics of the beds will be. Under certain circumstances, desorption of chemicals from the beds may occur. Silting of the beds is also a concern. Consequently, to ascertain the effectiveness of permeable treatment beds, extensive monitoring is required. This would consist of monitor wells in the permeable bed to monitor for contaminant breakthrough, and upgradient and downgradient water quality monitoring.

A permeable treatment bed to control the overall chemical plume at the Plant Site would be approximately 1,200 feet long along the bluffs east of the Plant Site and approximately 80 feet deep. With a 10-foot bed thickness and a 20-foot depth to groundwater, the bed volume would be 720,000 cubic feet. The capital and operation and maintenance costs for a permeable treatment bed of adequate size would be unreasonably high due to the cost of constructing a trench of the required size and carbon costs.

Groundwater Extraction

Aquifer restoration can be achieved by installing a system of groundwater extraction wells or interception trenches to capture and remove groundwater containing chemicals. The natural flow regime of an aquifer can be altered by pumping a number of extraction wells. Groundwater extraction systems must be combined with appropriate treatment and discharge alternatives, which are described later.

Redirecting the flow of water in an aquifer can be done in such a manner as to direct groundwater to flow towards the points of extraction, thus preventing water containing chemicals from migrating into adjacent unaffected areas. Extraction technologies have been used extensively in the field with satisfactory results. Three basic approaches to chemical control are possible: 1) a downgradient extraction barrier placed across the path of chemical migration, 2) a series of source area extraction wells or interception trenches, and 3) a series of wells placed within a plume along its longitudinal axis.

Downgradient Extraction Barrier

A downgradient barrier extracts groundwater downgradient of a known area of chemical distribution. This type of system consists of a series of extraction wells designed to create a zone of capture to keep the chemicals from moving further downgradient. Extraction wells are aligned perpendicular to the direction of groundwater flow. The wells need to be screened to capture the entire zone of significant chemical concentration. The extraction rate is determined by the amount of water moving through the area of the plume.

Downgradient extraction barriers extract chemicals after they have traveled from their source through the aquifer to the downgradient edge of the plume. Depending on flow velocities, it may take several years for chemicals to flow this distance. If a chemical source is still active, such as a leaking tank or a reservoir of chemicals in the unsaturated soil zone, a downgradient extraction barrier may require operation for an indefinite period of time.

Source Area Extraction Wells

Source area extraction wells are designed to capture and remove chemicals in shallow groundwater near the chemical source. This technology prevents groundwater containing chemicals from migrating from the source into the regional aquifer. By extracting the shallowest groundwater beneath a site, the transport pathway from unsaturated soils to shallow groundwater to regional groundwater is broken. Source area extraction wells are thus a source area control and are not intended to extract groundwater which has already migrated away from the source.

There are areas on-site where source area extraction wells could potentially be applicable. An example of an area where source area extraction wells may be applicable is near an area of Well C-12, west of Building 11, where fuel hydrocarbons have been found floating on groundwater adjacent to an underground fuel storage facility. Shallow wells for extracting and separating the fuel and the groundwater would stop the spread of the fuel hydrocarbons and serve to clean up floating petroleum product west of Building 11. Recovered fuel hydrocarbons would be stored on-site and transported to an oil recycler or disposal facility.

Source control extraction wells may also be applicable at the Fire Training Burn Pit. Relatively high chemical concentrations have been found in shallow groundwater at this source area.

Collection Drains

The movement of groundwater containing chemicals can be managed using interception trenches of coarse backfill material as a passive collection system. Groundwater enters the trench and is pumped from drains and/or sumps for treatment. Collection drains are best suited as source control measures where all contaminated groundwater is within 20 feet of ground surface. As source control measures, collection drains work similarly to shallow extraction wells.

The use of interception trenches is a source control measure generally applicable to sites where chemicals are confined near the surface under shallow water table conditions. This is true of several areas on-site where groundwater containing chemicals is perched above the underlying clay layer. A shallow collection drain system around selected areas would capture chemicals in the perched groundwater.

Longitudinal Extraction System

A longitudinal extraction system consists of a series of wells placed along the longitudinal axis of a chemical plume. For this type of system, wells are placed throughout the plume from the source to the downgradient edge. This system draws clean water from areas adjacent to the plume towards the axis of the plume and minimizes the distance and time that groundwater containing chemicals travels to extraction.

The advantages of longitudinal extraction systems are that aquifer restoration can be accomplished more quickly and with more operational flexibility than for other types of extraction systems. The disadvantage of longitudinal extraction systems is that they require more wells than other extraction systems.

Source Treatment

Source treatment technologies are intended to facilitate aquifer restoration by assuring that chemicals do not continue to enter the hydrologic system prolonging site cleanup operations. Source treatment technologies include isolating source areas in place, in-situ treatment such as devolatilization or flushing the chemicals into underlying groundwater for subsequent extraction and treatment, and removing sources by excavation.

Flushing

Flushing can be used to leach pollutants from unsaturated soils to the groundwater for subsequent extraction. Water is the most cost-effective flushing agent. This procedure may not be economical if another flushing agent is used. This technology would be most applicable for use in areas which could be surcharged with water to flush chemicals from unsaturated soils into the groundwater. Chemicals would then be collected from the groundwater using an extraction well, followed by treatment of the groundwater for chemical removal. This procedure is effective at reducing high concentrations of VOC's and other mobile chemicals in the soil.

This technology cannot be used effectively in areas of shallow clay layering as beneath the Fire Training Burn Pit Area. The clay layer would slow the vertical migration of flushing water and would cause lateral spreading of chemicals unless soils above the clay layer were continuously dewatered. Flushing by injection may be applicable in suspected source areas that are covered by asphalt or buildings. However, injection flushing has not been demonstrated to the extent that surface flushing has been.

Solidification

Solidification of chemicals in-situ can be accomplished by grout injection. Solidification by grout injection entails immobilizing zones containing chemicals by injecting grout into the subsurface where it hardens in place. The trapped chemicals are then isolated from the environment. Solidification by grout injection is in the developmental stage and has many technical uncertainties. Solidification does not remove chemicals from the environment and may limit potential land uses. Solidification by grout injection is not considered applicable to the Plant Site.

Excavation of Source Areas

The elimination of potential source areas contributing chemicals to the groundwater can be accomplished by excavating and disposing of soils containing significant concentrations of chemical residue. Source treatment by excavation is an acceptable technology which provides a positive control of source areas in the unsaturated soil zone.

Associated with excavation are several options for disposing of excavated material. Depending upon chemical concentrations, excavated material may be classified as hazardous waste, and require disposal at a Class I disposal facility. Soils with lesser chemical concentrations may be disposed at Class II or Class III facilities at lower cost.

Devolatilization

Devolatilization by capture of VOC's from the vadose zone is a treatment technique which entails the removal of volatile organics from the unsaturated or dewatered portions of a contaminated soil matrix by the forced injection of air or steam. The stripped volatiles are subsequently recovered at extraction wells specifically designed to remove volatile-laden air or steam from the subsurface. The technology is still in the developmental stage. This technology is applicable at sites where there are relatively thick unsaturated zones containing high concentrations of VOC's.

Devolatilization can also be conducted on stockpiled materials. This procedure involves spreading excavated materials over a suitable contained area. The materials are then tilled and ripped with earth moving equipment. This procedure is effective for reducing VOC's in soil, but results in uncontrolled VOC release to the atmosphere.

Chemical Separation

Chemical separation of some chemicals from groundwater can be achieved utilizing phase separation or chemical solvent extraction. Phase separation is used primarily where the chemicals are essentially insoluble in water. Thus, with minimal energy inputs, chemicals can be recovered and disposed of.

An example of this technology is for oil recovery where an oil extraction well pumps hydrocarbons floating at the surface of the groundwater to the ground surface. There is one area on-site where this technology is applicable, west of Building 11 adjacent to an underground fuel storage facility.

A second separation method, chemical extraction using solvents, is experimental at this time and may prove to have negative environmental impacts. Chemical solvent extraction is not recommended for the Plant Site.

Biological Degradation

Biological degradation of fuel hydrocarbons can be accomplished by injecting acclimated bacteria and nutrients into the soil matrix. The moisture and pH levels of the soil are controlled and the soil is aerated through tilling or injection of oxygen, air, or hydrogen peroxide. Surfactants can be added to enhance the solubility of the fuel hydrocarbon. The microorganisms break down and consume chemicals in the soil. Products of the reaction include carbon oxides and water. After the chemicals have been consumed, the microorganism population decreases to natural background levels due to the lack of a food source.

This technology is generally applied to contamination problems where concentrations are much higher than found at the Plant Site, such as oil sludge or organic concentrations in groundwater in the parts per thousands. However, residual petroleum products in the soils at the Plant Site could be reduced using in-situ biological degradation.

Groundwater Treatment Technologies

An inventory and screening of remedial technologies for groundwater treatment potentially applicable to the Hughes Plant Site is presented in Table IX-2, which follows this section. Fourteen technologies have been considered, including:

- . Aeration
- . Adsorption
- . Precipitation/Filtration
- . Reverse Osmosis
- . Photolysis
- . Ion Exchange
- . Wet Air Oxidation
- . Chemical Oxidation
- . Chemical Reduction
- . Catalysis-Free Radical Oxidation

- . Chemical Extraction
- . Biological/Plant Uptake Treatment
- . Evaporation

Low concentrations of VOC's, fuel hydrocarbons, and base/neutral extractable organics are present in groundwater beneath the site. With the exception of base/neutral extractables, chemicals in these groups have been found in the groundwater in excess of regulatory standards. The groundwater treatment technology, or combinations of technologies selected, must be able to treat VOC's and fuel hydrocarbons. It is estimated that the groundwater to be treated will have VOC concentrations of about 15,000 ppb, fuel hydrocarbon concentrations up to approximately 250 ppb, and base/neutral extractable compound concentrations up to about 1,000 ppb. Precipitation/filtration, ion exchange, and chemical extraction do not remove volatile organics, which are the main chemicals of concern; therefore, these technologies have been eliminated from further consideration.

Aeration is a viable technique for removal of VOC's. This technology will remove VOC's with up to 99.9 percent efficiency. This method discharges the VOC's to the atmosphere. An air discharge incinerator or vapor phase carbon adsorption system could be coupled with this technology if the discharge from the aeration system would exceed air discharge limits.

Adsorption is a viable technique for removal of all chemicals of concern. This technology will remove all chemicals to 99.9 percent efficiency. Adsorption would discharge no chemicals to the air. Treatment by this technology would reduce the concentrations of VOC's and base/neutral extractables to below detection limits. Annual operation and maintenance costs can be high if the influent VOC concentrations are high and if the adsorption media is not recycled.

Land application is a viable technique for removal of VOC's. This technology would remove about 85 percent of the volatiles. Land treatment results in discharge of VOC's to the atmosphere.

Reverse osmosis is a viable method for treating all the chemicals of concern. This technology will remove all chemicals of concern to about 99.9 percent efficiency. Annual operation and maintenance costs are much higher than for other methods that achieve the same efficiency and treat all the chemicals of concern.

Photolysis treats contaminated groundwater by exposure to ultraviolet light (UV). This method will oxidize VOC's and some acid and base/neutral extractable compounds. The duration of treatment is much

longer than other methods due to the slow reaction kinetics of this method. Thus, it is difficult to treat large low concentration flows by this method.

Wet air oxidation is a viable technique for removal of organic compounds. This technology removes organics by methods similar to land application. Water is misted in a tower that has a constant forced air flow source at the bottom of the tower. The organics degas from the water and are transported out of the tower by the forced air system. This method is about 75 percent efficient at removing organics. This method would not remove the volatiles sufficiently.

Chemical oxidation is used to chemically alter a compound to a less or nontoxic compound. Using this method, waste products from the oxidation would need to be disposed of. Trichloroethylene and tetrachloroethylene are not easily oxidized without an additional energy source such as ultraviolet light. Thus, this process is not applicable to the Plant Site.

Chemical reduction is similar to chemical oxidation. Compounds are chemically altered to produce less or nontoxic compounds. Application of this technique has not been documented for VOC's. Generally, this technique is used for the removal of metals from wastewater. Therefore, this method is not considered applicable to the Plant Site.

Catalysis-free radical oxidation, an example of which is UV light oxidation, breaks down VOC's to less or nontoxic carbon and hydrogen compounds. This method is very effective at treating organics. This technique is energy intensive and is normally used in conjunction with another treatment technology. For example, contaminated steam from a carbon adsorption regeneration process is treated with UV light and hydrogen peroxide to break down the organics to hydrogen and carbon compounds. Catalysis-free radial oxidation is energy intensive for stand-alone treatment when compared to other technologies that only treat organics.

Biological/plant uptake and treatment is a viable technology for treating organic compounds. Organic compounds are used as a food source by plants. Plants break down complex organic compounds into simple compounds and incorporate the compounds into the plant structure. The concentrations of organics in Plant Site groundwater are lower than can be treated using this methodology. Additionally, plant uptake is very sensitive to operating conditions.

Evaporation is a viable technology for removal of organics. Sunlight is used for a heat source to degas organics from the fluid. Creation of a surface impoundment to be used as an evaporating pond would have to comply with Federal regulations for surface impoundments used to manage a hazardous waste. A groundwater monitoring program would have to be installed upgradient and downgradient from the evaporation pond.

Water quality would have to be sampled quarterly from the monitor well system. This technology would result in discharge of VOC's to the atmosphere.

Only two technologies are viable for treatment of groundwater on the Plant Site: 1) aeration (air stripping), and 2) adsorption (activated carbon adsorption). Table IX-2 summarizes the rationale for rating treatment technologies.

Off-site treatment of contaminated groundwater is not considered viable for the Plant Site due to the large volumes of groundwater which will require extraction. The main disadvantages of off-site treatment are the high costs for transportation of contaminated liquids and related environmental liabilities associated with potential spillage and the ultimate disposal of chemicals. Off-site treatment for oil recovered from oil recovery wells is a viable alternative.

Discharge Technologies

If an extraction technology is selected to restore the aquifer beneath the Plant Site, an appropriate treated water discharge system will be required. Treatment technologies being considered are proven treatment systems capable of reducing the chemicals of concern to below levels of detection or below Drinking Water Standards. In evaluating disposal options, it should be recognized that the discharge will be reclaimed water, not a waste product. Four disposal options are available: 1) discharge to surface water, 2) discharge to ground, 3) discharge to sewer, and 4) injection into the aquifer beneath the site.

Surface waters to which treated effluent might be discharged are the Centinela Ditch storm drain and the Jefferson storm drain, both of which drain into the Ballona Channel.

There is limited land surface at the Plant Site for discharge of treated groundwater to ground. Development plans for the site limit the use of land for spray irrigation. Prior experience in design and operation of irrigation discharge systems has shown that effluent disposal rates of 10-20 gallons per minute per acre are possible with spray irrigation. Surface irrigation would be an option for disposal of treated groundwater to landscaping around the research facilities. This irrigation would require holding ponds for some periods of the year unless combined with discharge to Centinela Ditch during high rainfall winter months. In addition, care would need to be taken with irrigation cycles and volumes due to the high salt content of the groundwater.

Treated effluent could be discharged to the Los Angeles wastewater sewer system. Operations on the Plant Site currently discharge approximately 295,000 gallons per day (gpd) to the sewer. Wastewater discharge from the Plant Site is treated at Hyperion Treatment Plant

and is ultimately discharged to the Pacific Ocean. The volume of treated effluent from a groundwater extraction/treatment system at the Plant Site is estimated to approximately 500,000 gpd. Discharge of treated effluent to the treatment plant would reduce the available capacity of the Plant in order to treat already reclaimed groundwater. This option would be costly and would result in unnecessary utilization of the sewage treatment plant capacity.

Treated groundwater could be injected into the aquifer from which it was extracted. This is a technically difficult option compared to the other disposal methods being considered and has significantly higher capital, operation, and maintenance costs. In some cases, injection wells may accelerate the clean-up effort by improving hydraulic control of the aquifer flow conditions. However, in this case, due to the shallow depth to the groundwater table, injection wells would be impractical.

SUMMARY OF APPLICABLE TECHNOLOGIES

Applicable technologies which will be evaluated for source area remediation include the no action alternative, excavation and disposal, soil flushing, in-situ devolatilization, and biological treatment. Soil remediation alternatives are evaluated in Section X. Technologies which will be evaluated for groundwater remediation include the no action alternative, oil recovery, and groundwater extraction and treatment by air stripping or carbon adsorption. Alternatives for discharging treated water include discharge to Centinela Ditch and injection wells. Groundwater remediation alternatives are evaluated in Section XI.

TABLE IX-1

INITIAL SCREENING OF REMEDIAL TECHNOLOGIES

SURFACE CONTROLS	TECHNOLOGY OPTIONS	APPLICABILITY TO THE PLANT SITE
1. Cap-Cover	a. Native Soil Cover: Apply and compact native soils in layers to a total cover depth of 18" to 24". b. Native Clay or Bentonite Admixture: Apply and compact native clays or native soil with admixture of bentonite in layers. c. Synthetic Membranes: To a prepared surface apply joined sheets of flexible synthetic membrane made of such materials as high density polyethylene (HDPE) or polyvinyl chloride (PVC); provide a protective cover with compacted native soils.	a. Cap-covers are generally not applicable to the site because a major component of site remediation is a groundwater extraction system and cap-covers are not generally a compatible technology with groundwater extraction. On-site soils generally have high permeability and could not effectively be used for infiltration control. b. The quantity of native clay material readily available on-site is limited. Therefore, the use of on-site native clay soils for a cap-cover material is not generally applicable on the site. In addition, the climatic condition in the Los Angeles basin could lead to seasonal wetting and drying of the clay, which in turn could cause cracking and damage to the clay integrity. Protection of the clay would be required in any cover-cap system to prevent damage due to wetting-drying-cracking. In lieu of using native clay, an admixture (i.e. bentonite) to native soils could be viable using native soils. c. Membranes would be subject to possible damage due to weathering, sunlight exposure, root penetration, seam failure, or puncture from underlying or overburden material and differential settlement. Chemical compatibility of the synthetic membrane and chemicals which may be in contact with the membrane must be verified to ensure long-term integrity.

TABLE IX-1

INITIAL SCREENING OF REMEDIAL TECHNOLOGIES
(Continued)

SURFACE CONTROLS	TECHNOLOGY OPTIONS	APPLICABILITY TO THE PLANT SITE
1. Cap-Cover (Cont.)	d. Constructed Membranes: To a smooth graded base construct an asphalt or concrete membrane using road paving type of equipment.	d. Constructed membranes may consist of asphalt or concrete material to function as a cap. Unless properly protected, these materials are subject to weathering or damage due to cracking, root penetration, differential settlement, or impact. The cost for a constructed membrane such as asphalt or concrete would be significantly higher than other alternatives.
2. Infiltration Controls	a. Surface Contouring and Drainage: Regrade existing ground surface to promote runoff and control drainage.	a. The technology of surface contouring is used to promote surface runoff and drainage. Surface contouring may be implemented in conjunction with other technologies as part of an overall remedial alternative. Most of the suspected source areas located near production facilities are paved and drain freely. Infiltration controls may be applicable at unpaved sites, such as the Fire Training Burn Pit area, or if pavement is removed from other sites.
3. Surface Stabilization	a. Revegetation: Plant native vegetation on disturbed soil cover for stabilization and protection from erosion.	a. Revegetation is a source control technology which could be applied in conjunction with a native soil cover or in areas of steep slopes. The primary objectives of revegetation include erosion control, cover stabilization/protection, infiltration reduction through evapotranspiration losses, and aesthetics. The applicability to the Plant Site is low due to the low applicability of cap-covers.

TABLE IX-1
INITIAL SCREENING OF REMEDIAL TECHNOLOGIES
(Continued)

SUBSURFACE CONTROLS	TECHNOLOGY OPTIONS	APPLICABILITY TO THE PLANT SITE
1. Barrier Wall (Perimeter)	a. Slurry Trench Cut-Off Wall: Create a low permeability subsurface barrier wall, typically three feet thick, by pumping a thick bentonite slurry into an excavated trench.	a. Cut-off walls are used to contain or divert groundwater. This technology is generally applied in an area which is underlain by a very low permeability soil layer (confining layer). This technique is not applicable to the Plant Site due to the absence of a continuous underlying confining layer. These types of subsurface barriers serve to contain or divert groundwater and do not provide treatment of chemicals in groundwater. Additionally, all barrier technologies would require either complete envelopment of the chemically affected areas (including bottom sealing and cap covers) or an extraction system to prevent contaminated groundwater from evading containment.
	b. Grout Curtain: Create an impermeable subsurface barrier wall by pressure-injecting grout through closely spaced bore holes.	b. Grout curtains are used to contain or divert groundwater. This technology is generally applied in an area which is underlain by a very low permeability soil layer (confining layer) which provides bottom containment.
	c. Sheet Pile: Create a subsurface wall by pile driving interlocking steel sheets.	Grout curtains as a subsurface barrier system are not considered applicable to the Plant Site due to the absence of a continuous underlying confining layer. The main disadvantage is similar to that described for the cut-off wall: The grout curtain provides containment and diversion but not treatment of groundwater. c. Sheet piles are used to contain or divert groundwater. This technology is generally applied in an area which is underlain by a very low permeability soil layer (confining layer) which provides bottom containment.

TABLE IX-1

INITIAL SCREENING OF REMEDIAL TECHNOLOGIES
(Continued)

SUBSURFACE CONTROLS	TECHNOLOGY OPTIONS	APPLICABILITY TO THE PLANT SITE
1. Barrier Wall (Perimeter) (Cont.)	c. Sheet Pile (Cont.)	c. Sheet piling technology is not applicable to the Plant Site facility due to the absence of a continuous underlying confining layer. Sheet piling do not serve as a technology for extraction and treatment of groundwater.
	d. Membrane: Install a subsurface wall of joined synthetic membrane sheet in a trench and backfill to stabilize in place.	d. A subsurface membrane barrier utilizes a synthetic membrane which is installed in a vertical plane into the ground to serve as a barrier to groundwater flow. As with the other subsurface barrier systems, this technology must be tied into an underlying confining layer to be effective. As discussed, there is no identified underlying confining layer at the Plant Site, therefore installation of this type of membrane is not applicable. Additionally, like the other barrier wall technologies, synthetic membranes provide containment and diversion, not extraction and treatment of groundwater.
2. Bottom Sealing	a. Grout Injection: Create a subsurface impermeable liner through pressure injecting grout at the bottom of closely spaced bore holes.	a. This technology is similar to that of grout curtain installation, however, grout is injected into the soils below a source area for bottom sealing. This technology is considered experimental at the present time and will not be considered as a candidate for application at the Plant Site.
	b. Block Displacement: Inject grout through closely spaced bore holes to achieve a grout layer around the perimeter and bottom of a source area.	b. The technology of block displacement is a similar control technique to that described for grout injection. This technology is not proven and is not applicable to controlling chemicals in the saturated soils, therefore it is not considered applicable to the Plant Site.

TABLE IX-1

INITIAL SCREENING OF REMEDIAL TECHNOLOGIES
(Continued)

SUBSURFACE CONDITIONS	TECHNOLOGY OPTIONS	APPLICABILITY TO THE PLANT SITE
3. Permeable Treatment Beds	a. Carbon Adsorption: Allow the natural flow of groundwater to pass through a prepared bed of carbon for in-place removal of organics.	a. In concept, a permeable treatment bed is a passive system which is installed below grade for a means of treating groundwater which flows through the treatment bed. Activated carbon could be considered as a treatment media primarily for treating VOC's and non-volatile organics using a "passive system". Technical uncertainties associated with this technology involve total expected service life and plugging concerns. Further, documentation of large-scale applications of this technology have not been found. Due to the unproven nature of this technology in addition to its technical uncertainties/limitations, this technology will not be considered for the Plant Site.
	b. Ion Exchange: Allow the natural flow of groundwater to pass through a prepared bed of exchange resins for removal of select cations and anions.	b. A permeable treatment bed may include the use of a material with high ion exchange capacity in lieu of activated carbon. Ion exchange is mainly used on chemicals with moderate to high electric charge. VOC's have very little charge and therefore are not effectively removed by ion exchange. Because of its unproven status, along with the lack of effectiveness at removing VOC's and high cost, this technology is not considered for use at the Plant Site.

TABLE IX-1

INITIAL SCREENING OF REMEDIAL TECHNOLOGIES
(Continued)

GROUNDWATER EXTRACTION	TECHNOLOGY OPTIONS	APPLICABILITY TO THE PLANT SITE
1. Groundwater Pumping	a. Downgradient Extraction Barrier: Place wells downgradient from sources and extract and treat groundwater preventing contamination from moving past boundary of facility. b. Source Area Extraction Wells: Wells are placed to capture and remove contaminated groundwater near its source. c. Longitudinal Extraction Wells: Wells are constructed in the plume from a contaminant source to extract downgradient from and close to the source.	a. Extraction barriers on the downgradient end of a regional aquifer are an effective way to treat groundwater and prevent contaminated water from moving off the site. At the Plant Site, where local contamination in the soil has migrated to the groundwater, this is an effective remedial method. Groundwater that is removed using this method must be treated in an above-grade groundwater treatment plant. b. Source area extraction wells are designed to prevent additional contaminated groundwater from migrating from the source into a regional aquifer. Wells are generally screened at first water. Source area extraction wells are potentially applicable to the Plant Site: 1. West of Building 11 where fuel hydrocarbons have been reported in the aquitard and in the first aquifer (Ballona/Bellflower). 2. At the Fire Training Burn Pit where high chemical concentrations have been reported in shallow groundwater. c. Wells extract water along the longitudinal axis of a contaminant plume. Because the wells are in the source area of contamination, pumping is very efficient in extracting the contaminant.

TABLE IX-1

INITIAL SCREENING OF REMEDIAL TECHNOLOGIES
(Continued)

GROUNDWATER EXTRACTION	TECHNOLOGY OPTIONS	APPLICABILITY TO THE PLANT SITE
2. Collection Drains	a. Interception Trench/French Drains: Intercept groundwater through a trench or buried perforated pipe with a gravel overpack and gravity drain to collection sumps.	a. The use of an interception trench/French drain is generally applicable to shallow water table conditions. A collection drain system could be completed to the depth of perched contamination, but costs of a trench up to 20 feet deep to act as a groundwater barrier at the site would be prohibitive. Therefore, this technique is not effective for collection of the deeper flow at the Plant Site. French drains could be considered for possible use in areas of perched water which are underlain by a low permeability layer in localized areas.
3. Groundwater Treatment	a. On-Site Treatment: Construct a treatment system on-site to remove chemicals from extracted groundwater. b. Off-Site Treatment: Transport extracted groundwater to an off-site commercial treatment facility.	a. On-site treatment of groundwater represents a technology which is applicable for the Plant Site. The types of technologies which may be available for groundwater treatment are presented in Table IX-2. On Table IX-2 technologies are screened according to the type of chemicals for which they would be applicable at the Plant Site. b. The treatment of groundwater containing chemicals at an off-site commercial facility is also applicable to the site. The drawbacks to this technology are that it is not cost-effective for the large quantities of groundwater which must be handled. In addition, the liabilities of transportation and waste disposal for an off-site commercial facility are not desirable.

TABLE IX-1

INITIAL SCREENING OF REMEDIAL TECHNOLOGIES
(Continued)

SOURCE TREATMENT	TECHNOLOGY OPTIONS	APPLICABILITY TO THE PLANT SITE
1. Solidification	a. Grout Injection: Inject a prepared grout mix into the localized area for in-place hardening.	a. Grout injection to immobilize chemicals in the soil matrix is a technology which is considered experimental at the present time. The concept involves injecting a grout mixture into the matrix. Due to the experimental nature of this technology, it will not be considered further for possible use at the Plant Site.
2. Devolatilization	a. In-Situ Vadose Zone Capture with Air or Steam: Inject air or steam into soil to strip volatile organics from the soil matrix.	a. The in-situ capture of chemicals from the unsaturated zone soil matrix using air or steam is a developmental technology for use with VOC's.
3. Physical-Chemical Treatment	a. Phase Separation: Remove insoluble chemicals via separation/skimming in the liquid phase.	a. In-situ treatment using phase separation is primarily applicable to groundwater where the chemicals of concern are insoluble in water. This technology typically involves skimming of the separated chemical from the surface of the groundwater and has been primarily applied to the recovery of oils from shallow groundwater. This is applicable to the Plant Site at locations where fuel hydrocarbons have been reported in the groundwater.
b. Chemical Extraction:	Extract select chemicals through the addition of non-hazardous chemicals.	b. This technology is considered experimental at this time. In addition, the chemical extraction of solvents from soils using another solvent material involves significant uncertainties regarding net environmental benefit achieved. Due to these uncertainties, high costs, and environmental concerns, this technology will not be considered for application at the Plant Site.

TABLE IX-1

INITIAL SCREENING OF REMEDIAL TECHNOLOGIES
(Continued)

SOURCE TREATMENT	TECHNOLOGY OPTIONS	APPLICABILITY TO THE PLANT SITE
4. Biological Treatment	a. Biological: Inject acclimated bacteria under controlled conditions with nutrient addition to enhance biological degradation of organics.	a. Test cases have shown the technology of in-situ biodegradation of chemicals in the soil or groundwater matrix to be cost-effective and reliable when used in the reduction of fuel hydrocarbons. This technology will be evaluated for source cleanup of fuel hydrocarbons held in the soil layers at the Plant Site, if source cleanup is desired.
5. Removal	a. Contaminated Material Removal: Transport waste off-site to an approved landfill.	a. The excavation and removal of small volumes of contaminated material is a cost-effective means of treating a source. Soil quality sampling during excavation can minimize the amount of soil removed. In small areas of isolated contamination, this is a very effective measure for eliminating contaminated soil that may be contributing chemicals to the groundwater.
6. Flushing	a. Soil Flushing: Apply water to the ground surface in low areas and inactive ponds to permeate through shallow soil layers and extract chemicals.	a. This method could be used to leach volatile organic compounds out of the soil beneath the Plant Site. Flushing may require shallow dewatering wells to prevent lateral movement of contaminated groundwater on clay layers away from source areas.

TABLE IX-1

INITIAL SCREENING OF REMEDIAL TECHNOLOGIES
(Continued)

DISCHARGE	TECHNOLOGY OPTIONS	APPLICABILITY TO THE PLANT SITE
1. Surface Water	a. Disposal of treated groundwater via the on-site storm drain system.	a. Discharge of treated groundwater to surface waters is an accepted low-cost discharge option when water can be treated to levels established by regulators. Storm drain and creek systems on-site appear to have adequate capacity to receive treated groundwater.
2. Discharge to Ground	a. Discharge to Ground: Infiltration/evaporation via irrigation.	a. This technology could be implemented with irrigation sprinklers or a gated piping system. Sufficient undeveloped land is currently available on-site, but this technology would conflict with development plans.
3. Discharge to Sewer	a. Discharge to the Hyperion Wastewater Treatment Plant and to Los Angeles North Outfall.	a. This technology is not recommended due to the volume and quality of groundwater that would be discharged to the sewer and due to the high cost of sewer discharge. The effluent volume (approximately 500,000 gpd) would use part of the available capacity of the Hyperion Treatment Plant.
Injection Wells	a. Injection of treated groundwater into the regional aquifer.	a. This is a proven technology. Injection well systems are significantly more costly to implement and maintain than the other discharge technologies. Injection can be coordinated with extraction to provide quicker groundwater cleanup where chemical plumes are well defined.

TABLE IX-2

INVENTORY OF REMEDIAL TECHNOLOGIES FOR GROUNDWATER TREATMENT

TECHNOLOGY	STATUS OF TECHNOLOGY	KNOWN REMOVAL CAPABILITY				POTENTIAL APPLICABILITY TO PLANT SITE	
		Volatile Organics	Nonvolatile Organics	Heavy Metals	Other Inorganics	Rating	Rationale for Rating
1. Aeration (Air Stripping) . Packed towers . Lagoon system	Proven	x				High	Existing treatment facilities have demonstrated cost-effective reduction of volatiles.
2. Adsorption . Activated carbon . Synthetic resin	Proven	x	x	x		High	Adsorption can remove organics to low levels.
3. Land Treatment . Spray irrigation . Overland flow . Rapid infiltration	Proven	x	x			Low	Land is available to design low technology alternative through recycling water to the land surface, but this method alone would not remove VOC's to below regulatory standards.
4. Precipitation/Filtration	Proven			x	x	Low	Chemicals that can be treated with this method are not those of concern.
5. Reverse Osmosis	Proven	x	x	x	x TDS	Low	It is not cost-effective to treat large volumes of water which may require pretreatment.
6. Photolysis	Developmental	x	x			Low	Exposure of groundwater to available ultraviolet light may provide effective treatment, but reaction kinetics could be slow and photolysis is best suited for low volumes.
7. Ion Exchange	Proven			x	x	Low	This technology can control heavy metals and certain inorganics but not those chemicals of concern.
8. Wet Air Oxidation	Proven	x	x			Low	This is effective for a much higher concentration of organics. Discharge of VOC's to atmosphere may not be acceptable.

TABLE IX-2

INVENTORY OF REMEDIAL TECHNOLOGIES FOR GROUNDWATER TREATMENT
(Continued)

TECHNOLOGY	STATUS OF TECHNOLOGY	KNOWN REMOVAL CAPABILITY				POTENTIAL APPLICABILITY TO PLANT SITE	
		Volatile Organics	Nonvolatile Organics	Heavy Metals	Other Inorganics	Rating	Rationale For Rating
9. Chemical Oxidation With catalyst Without catalyst	Proven	x	x	x	S, CN	Low	VOC's cannot be treated using this method without an additional energy source, such as UV light.
10. Chemical Reduction	Proven	x	x	x Ag, Cr Hg		Low	Application of this technology is not documented for treatment of VOC's at high volumes, therefore is unproven.
11. Catalysis-Free Radical Oxidation including UV	Proven	x	x			Low	It has been demonstrated for certain organics. Normally not a stand-alone treatment technology due to excessive energy requirements.
12. Chemical Extraction	Developmental		Phenol			Low	Chemicals which can be treated effectively are not those of concern.
13. Biological/Plant Uptake	Proven	x	x			Low	Chemicals of concern are at much lower concentrations than can be treated through conventional means. Also plant uptake is sensitive to weather conditions.
14. Evaporation	Proven	x	x	x	x	Low	Chemicals which do not evaporate can be concentrated and removed from low volume flows. Discharge of VOC's to atmosphere cannot be controlled and therefore may not be acceptable.

SECTION I

EVALUATION OF ALTERNATIVES FOR SOILS REMEDIATION

Although specific regulations stipulating soils cleanup standards do not exist, Title 22 hazardous waste criteria do exist for solid waste, and guidance levels exist for acceptable levels of chemicals in soil for the protection of groundwater. Title 22 provides criteria for defining a waste as hazardous but does not provide guidance regarding the need for remediation of low chemical concentrations in soil. A draft guidance document prepared by the Regional Water Quality Control Board (RWQCB) Central Valley Region staff, "Appendix IV - Water Quality Objectives and Hazardous and Designated Levels for Chemical Constituents", July 1985, provides guidance regarding the potential for migration of chemicals into groundwater, but these levels assume that the groundwater is to be utilized for domestic purposes. Groundwater at the Plant Site is not and will not be utilized for domestic purposes and will be subject to extraction and treatment prior to moving off-site. Consequently, the guidance values from the Draft Regional Board document are not directly applicable. Furthermore, the Plant Site is within the jurisdiction of the Los Angeles RWQCB rather than the Central Valley RWQCB.

The goal of soil remediation on the site is to remove any soil containing concentrations of chemicals which would cause it to be classified as hazardous waste and any soil that could impact groundwater with significant concentrations of chemicals. Since the groundwater extraction system will intercept groundwater containing chemicals before it leaves the site, soils remediation other than hazardous waste removal will be recommended only where it is cost effective to remediate at the source rather than downstream at the point of extraction. As presented earlier in this report and in Appendix D, soils remediation other than removal of soils properly classified or considered hazardous waste by DHS regulations is not necessary for protection of the public health and welfare or the environment.

Remediation recommendations are based on the following criteria:

- 1) Soils which are classified as hazardous waste by the criteria set forth in the California Administrative Code, Title 22, Article 11, Chapter 30 (e.g., Total Threshold Limit Concentrations [TTL's]), will be remediated.

- 2) Unsaturated soils contiguous with defined source areas containing VOC's which have the potential to affect cost effectiveness of groundwater remediation will be remediated. Soils cleanup criteria for VOC's imposed by regulators for other sites have been 1,000 times the Action Level in water for the compound. This cleanup criterion is only a guidance value used in some cases and is indicated as such in a draft document which has been prepared by the Central Valley RWQCB. For VOC's, a factor of 1,000 times Action Levels will provide a guideline for assessing a soil's potential for affecting the cost effectiveness of groundwater remediation. This reflects the Central Valley RWQCB's approach to establishing values which they refer to as Designated Levels to Protect Groundwater (DLPG), and accounts for changes to Action Levels since preparation of their document.
- 3) Unsaturated soils containing TPH above 100 ppm will be remediated. The value of 100 ppm is a cleanup value frequently imposed by regulators for soil remediation. Some regulatory agencies use the value of 100 ppm as the lower limit working guideline for determining whether soil excavations are required around underground fuel tanks.
- 4) Soils will be remediated which contain greater than 50 ppm polychlorinated biphenyls (PCB's), the Title 22 TTLC value for determining if a waste containing PCB's is hazardous. Data from the Underground Tank South of Building 5 and the waste oil sump at the Salvage Yard support the use of the TTLC as the remediation criterion at the Plant Site. At these sites, PCB's in soil were detected at 40 ppm and 29 ppm, respectively. No PCB's were detected in the underlying groundwater at a detection limit of 0.002 ppm.
- 5) Saturated soils will be remediated through the groundwater extraction system. Saturated soil removal will only occur if soils remediation is cost effective relative to remediation of groundwater at the point of extraction.
- 6) Anomalous reported positive values of chemical concentrations in unsaturated soil will be remediated only if sampling at a specific site during other planned remediation verifies the anomalous data or if the values appear valid and remediation is cost effective relative to remediation of groundwater at the point of extraction.

Hazardous waste criteria for Title 22 (TTLC's), guidance values from the Regional Board document (DLPG's), and the cleanup levels recommended for soils at the Plant Site are presented in Table X-1.

Potential source areas at the Plant Site are shown in Figure X-1. Results of soils investigations conducted at these sites are summarized in Table X-2.

TABLE X-1

SOIL QUALITY CRITERIA

Chemical	TCLC (ppm)	DHS Action Level for Water (ppm)	Designated Levels to Protect Groundwater (ppm)	Recommended Cleanup Levels (ppm)
Antimony	500	---	1,460	500
Arsenic	500	---	500	500
Barium	10,000	---	10,000	10,000
Benzene	---	0.0007	0.7	0.7
Beryllium	75	---	0.068	75
Bromodichloromethane	---	---	0.19	---
Bromoform	---	---	0.19	---
Cadmium	100	---	100	100
Carbon Tetrachloride	---	0.005	0.4	5
Chlorobenzene	---	---	20	---
Chloroform	---	0.100(1)	0.19	100
Chromium III	2,500	---	---	2,500
Chromium VI (or total)	500	---	100	500
Cobalt	8,000	---	---	8,000
Copper	2,500	---	100,000	2,500
Dibromochloromethane	---	---	100	---
1,2-Dichlorobenzene	---	0.130	130	130
1,3-Dichlorobenzene	---	0.130	130	130
1,4-Dichlorobenzene	---	0.0005	0.5(2)	0.5
1,1-Dichloroethane	---	0.020	---	20
1,2-Dichloroethane	---	0.001	1	1
1,1-Dichloroethylene	---	0.006	6(2)	6
T-1,2-Dichloroethylene	---	0.016	16(2)	16
Dichloromethane	---	0.040	0.19	40
1,2-Dichloropropane	---	0.010	10	10

(1) No DHS Action Level has been established. Value shown is EPA Primary Drinking Water Standard for total Trihalomethane, which includes chloroform.

(2) Changed to reflect Action Levels adopted since establishment of DLPG.

TABLE X-1

SOIL QUALITY CRITERIA
(Continued)

Chemical	TCLC (ppm)	DHS Action Level for Water (ppm)	Designated Levels to Protect Groundwater (ppm)	Recommended Cleanup Levels (ppm)
Diesel Oil (Fuel Oil #2)	---	---	10	100 (TPH)
Ethylbenzene	---	0.680	680 (2)	680
Freon 113	---	18,000	---	18,000
Kerosene (Fuel Oil #1)	---	---	10	100 (TPH)
Lead (Inorganic)	1,000	---	500	1,000
Mercury	20	---	20	20
Molybdenum	3,500	---	---	3,500
Nickel	2,000	---	134	2,000
Polychlorinated Biphenyls	50	---	0.00008	50
Polynuclear Aromatic Hydrocarbons	---	---	0.003	---
Selenium	100	---	100	100
Silver	500	---	500	500
Tetrachloroethylene	---	0.004	4	4
1,1,2,2-Tetrachloroethane	---	---	0.17	---
Thallium	700	---	130	700
Toluene	---	0.100	100	100
1,1,1-Trichloroethane	---	0.200	200	200
1,1,2-Trichloroethane	---	0.100	0.6	100
Trichloroethylene	2,040	0.005	5	5
Trichlorofluoromethane	---	3,400	0.19	3,400
Vanadium	2,400	---	---	2,400
Vinyl Chloride	10	0.002	2	2
Xylenes	---	0.620	620	620
Zinc	5,000	---	500,000	5,000

(1) No DHS Action Level has been established. Value shown is EPA Primary Drinking Water Standard for total Trihalomethane, which includes chloroform.

(2) Changed to reflect Action Levels adopted since establishment of DLPG.

FIGURE X-1
POTENTIAL
SOURCE AREAS

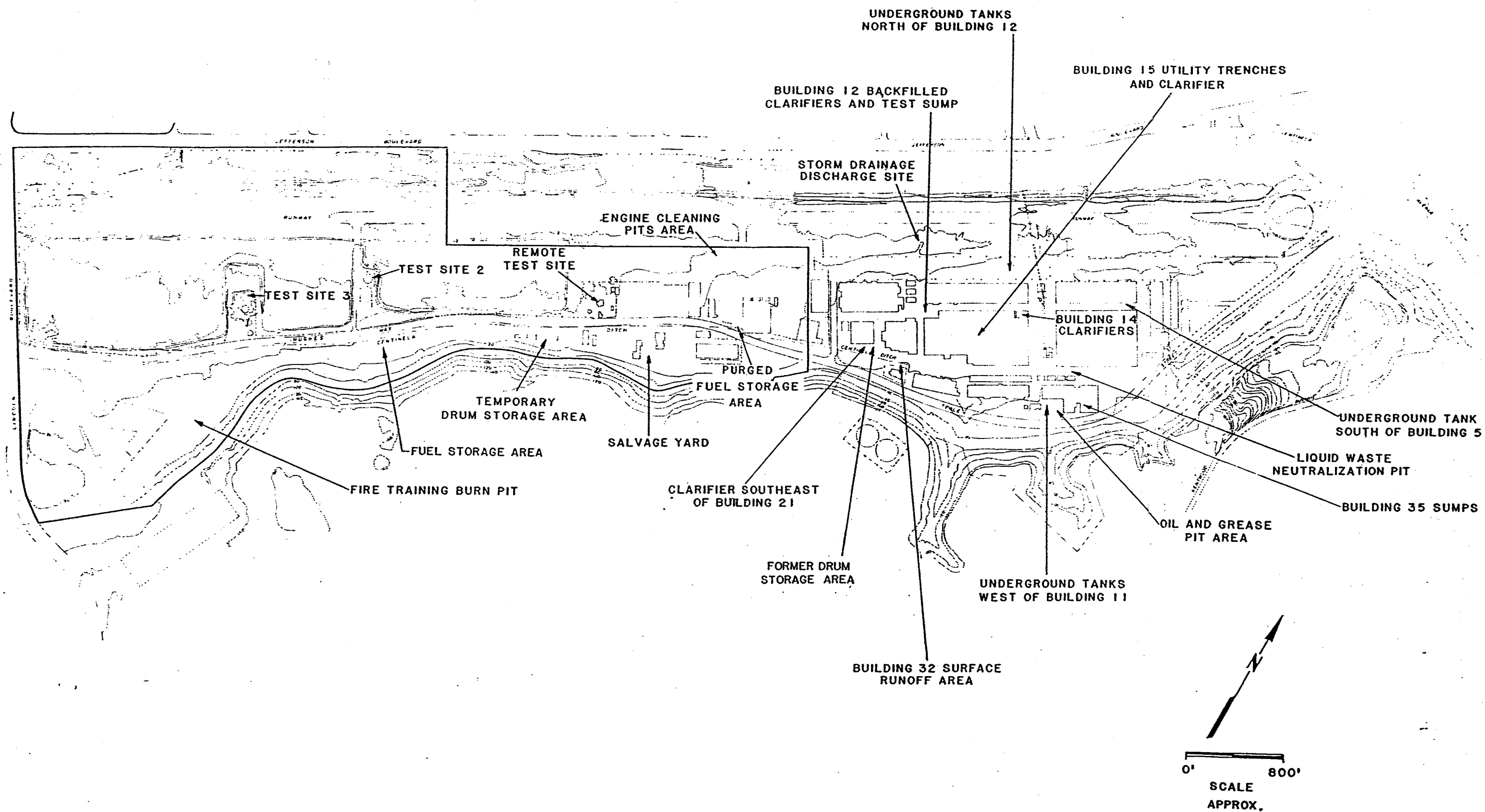


TABLE I-2

SUMMARY OF SOILS RESULTS AND REMEDIAL ALTERNATIVES

Identified Potential Source Area	Chemical Results					Applicable Alternatives
	VOC's	TPH	Heavy Metals	Pesticides	PCB's	
Fire Training Burn Pit	A	B	A	E	A	NA, ED, Fl, Dv, Bio
Test Site 3	A	B	E	A	A	NA, ED
Test Site 2	A	A	E	E	A	NA
Temporary Drum Storage Area	A	B	E	E	A	NA, ED
Remote Test Site	A	A	C	E	A	ED
Salvage Yard	B	B	A	E	A	NA, ED, Fl, Dv
Engine Cleaning Pits Area	B	B	E	E	A	NA, ED, Fl, Dv, Bio
Purged Fuel Storage Area	A	B	E	E	A	NA, ED, Bio
Former Drum Storage Area	B	B	E	E	A	NA, ED, Fl, Dv
Building 32 Surface Runoff	A	A	E	E	E	NA
Storm Drainage Discharge Site	B	B	E	E	E	NA, ED
Building 12 Backfilled Clarifiers and Test Sump	B	A	E	E	E	NA, ED, Fl, Dv

A - Soils analyzed for this compound.

B - Concentrations below recommended cleanup level.

C - Soils analyzed for this compound.

D - Concentrations above recommended cleanup level.

E - Soils analyzed for this compound. Concentrations above TLIC.

F - Soils not completely characterized for this compound.

G - Not a chemical of concern; no analysis performed.

NA - No Action

ED - Excavate and Dispose

Fl - Soil Flushing

Dv - Devolatilization

Bio - Biological Treatment

TABLE I-2

SUMMARY OF SOILS RESULTS AND REMEDIAL ALTERNATIVES
(Continued)

Identified Potential Source Area	Chemical Results					Applicable Alternatives
	VOC's	TPH	Heavy Metals	Pesticides	PCB's	
Building 15 Utility Trenches and Clarifier	B	A	A	E	A	NA, ED, F1, DV
Building 14 Clarifiers	A	A	E	E	A	NA, ED
Liquid Waste Neutralization Pit	A	E	E	E	E	NA, ED
Oil and Grease Pit Area	A*	A	E	E	E	NA, ED
Underground Tanks West of Building 11	D	B	E	E	E	---
Building 35 Sumps	A	A	A	E	E	NA, ED
Underground Tank South of Building 5	B	B	E	E	A	NA, ED
Underground Tanks North of Building 12	D	D	E	E	E	---
Clarifier Southeast of Building 21	D	D	E	E	D	---

A - Soils analyzed for this compound.

Concentrations below recommended cleanup level.

B - Soils analyzed for this compound.

Concentrations above recommended cleanup level.

C - Soils analyzed for this compound. Concentrations above TLC.

D - Soils not completely characterized for this compound.

E - Not a chemical of concern; no analysis performed.

* - One sample from saturated soil exceeds recommended soil cleanup criteria,
but reflects groundwater quality from upgradient gasoline spill.

NA - No Action

ED - Excavate and Dispose

F1 - Soil Flushing

DV - Devolatilization

Bio - Biological Treatment

Through initial screening of remedial technologies, the following alternatives for remediating sites with elevated chemical concentrations were selected:

- . No Action
- . Excavation and Disposal
- . Soil Flushing
- . Devolatilization
- . Biological Treatment

Applicability of remedial alternatives for each site is dependent upon chemical types and concentrations present in the soil, and is indicated on Table X-2. To select the best alternative for remediating each site, technical feasibility, environmental effectiveness, institutional issues, and costs for each alternative are evaluated herein.

NO ACTION

As seen in Table X-2, the no action alternative is applicable for all sites except the Remote Test Site. No action is considered not applicable for the Remote Test Site because chemical concentrations at that site exceed TTLC's, and it is appropriate to remediate soils which exceed hazardous waste criteria. The no action alternative is feasible for subsurface soils that may exceed Title 22 LC₅₀ criteria because direct contact with these soils by humans, mammals, birds, and fish is not possible.

The no action alternative is feasible even at those sites where soils contain chemicals with the potential to enter groundwater. Because the groundwater already contains chemicals and a groundwater remediation system is planned, direct application of groundwater protection criteria is not warranted to determine the need for soil remediation.

The no action alternative for soils remediation has no directly associated costs. However, no action would result in some soils continuing to be a source of chemicals to groundwater in the future. As a result, groundwater remediation activities would continue much longer if soils were not remediated.

Environmental Effectiveness

The no action alternative would consist of removal of sumps and pavement during site demolition activities and removal of underground storage facilities in conformance with City of Los Angeles ordinances.

This will eliminate all potential sources of chemicals to soil. The concentration of volatile organic and petroleum chemicals which would remain in soil would decrease in time due to leaching to groundwater, biodegradation, and volatilization to the atmosphere, especially after pavement is removed from soils containing VOC's.

No action would result in some soils continuing to input chemicals to groundwater. The rate of chemical input to groundwater would be reduced due to removal of potential sources of chemicals to soil and due to reduced infiltration of surface water when pavement and buildings planned for much of the site are constructed. Monitor wells constructed in the vicinity of all investigated sites indicate which sites may have contributed chemicals to groundwater and which sites have not. Investigations of 21 sites eliminated 11 of the 21 as potential sources of chemicals to groundwater and show no significant effects for 8 sites. Soil quality data or groundwater quality data are inconclusive for three sites. The sites and their impacts on groundwater are identified in Table X-3. Use of the no action alternative at those sites impacting water quality will result in extended operation of groundwater remediation facilities.

Institutional Issues

Designated chemical levels to protect groundwater (DLPG's) are criteria suggested by the Central Valley RWQCB staff as part of its draft guidance document. DLPG's were established on the bases of State Action Level criteria and Environmental Protection Agency (EPA) Maximum Contaminant Levels (MCL's). DLPG's were established by estimating the transport of chemicals from soils to groundwater using a number of assumptions.

The Los Angeles RWQCB has not developed a guidance document similar to the draft DLPG's established by the Central Valley RWQCB, but the DLPG's are an indication of criteria which could be applied to the site. Water quality data are available which show that some sites containing chemicals have not impacted groundwater quality. The Los Angeles RWQCB may find the no action alternative to be acceptable for those sites regardless of the soil cleanup guidance values particularly because groundwater remediation is planned.

Department of Health Services approval of the classification of soils as hazardous and non-hazardous waste may be required. City of Los Angeles Fire Department must issue closure permits for removal of underground tanks and certain sumps.

TABLE X-3

RELATIONSHIP OF SITES AND WATER QUALITY

<u>Sites Which Potentially Impact Groundwater Quality</u>	<u>Sites Which Do Not Significantly Impact Groundwater Quality</u>	<u>Sites At Which Additional Data Will Be Obtained During Demolition or Remediation*</u>
Fire Training Burn Pit	Test Site 3	Purged Fuel Storage Area
Salvage Yard	Test Site 2	Underground Tanks North of Building 12
Former Drum Storage Area	Temporary Drum Storage Area	Clarifier Southeast of Building 21
Storm Drainage Discharge Site	Remote Test Site	
Building 12 Backfilled Clarifiers and Test Sump	Engine Cleaning Pits Area	
Building 15 Utility Trenches and Clarifier	Building 32 Surface Runoff	
Building 14 Clarifiers	Oil and Grease Pit Area	
Building 35 Sumps	Liquid Waste Neutralization Pit	
Underground Tank South of Building 5		
Underground Tanks West of Building 11		

* See Section XII

EXCAVATION

Excavation consists of the removal of soils which contain chemicals at concentrations selected for remediation. Once soils are excavated, they require disposal. Excavation is normally only considered for the unsaturated soil zone above the groundwater table. Chemicals in soils within the saturated zone are either immobile or can be controlled by groundwater extraction. Figure X-2 presents a possible excavation plan. Disposal alternatives are evaluated later in this section. To evaluate excavation, estimates of soil quantities exceeding recommended cleanup criteria have been prepared. Soil quantities are tabulated in Table X-4 based on the soil cleanup criteria for the Plant Site. Soils have been excavated at Test Site 3, the Remote Test Site, the Engine Cleaning Pits and Temporary Drum Storage Area, and have been removed from the site. Selected excavation has taken place at the Salvage Yard, but excavation is not complete.

Technical Feasibility

Excavation can be performed using conventional earth moving equipment including backhoes, scrapers, end loaders, track excavators or bucket excavators. Shoring would be required where excavations are deeper than five feet, and walls of the excavation cannot be adequately sloped. Dewatering is required at the Fire Training Burn Pit where groundwater is approximately eight feet below ground surface. As excavation proceeds, soil samples would be collected. Results of soil sampling would characterize excavated material for disposal and indicate the required extent of excavation. Completed excavations will be filled with clean soil. The dewatering system which would be required during excavation at the Fire Training Burn Pit is shown on Figure X-3. The dewatering well system will be developed using a pilot well to determine the most effective well configuration. The total number of dewatering wells is projected to be 15. Pretreatment of the discharge waters will be required for discharge to the sewer. The pretreatment system is diagrammed on Figure X-4.

Excavation is a reliable method of remediating chemicals in soils and eliminating soils as a continuing source of chemicals to groundwater. Once the excavation is completed, there will be no ongoing operation and maintenance requirements for soils remediation. There is no technical reason why excavation cannot be implemented. Excavation involves standard engineering practices.

Sampling would be performed during site excavation to assure that soils containing chemicals in concentrations over selected cleanup levels are removed and to minimize the amount of material removed by eliminating unnecessary excavations. Soil sampling would be conducted during and

FIGURE X-2
SOIL EXCAVATION SITE
ALTERNATIVE PLAN

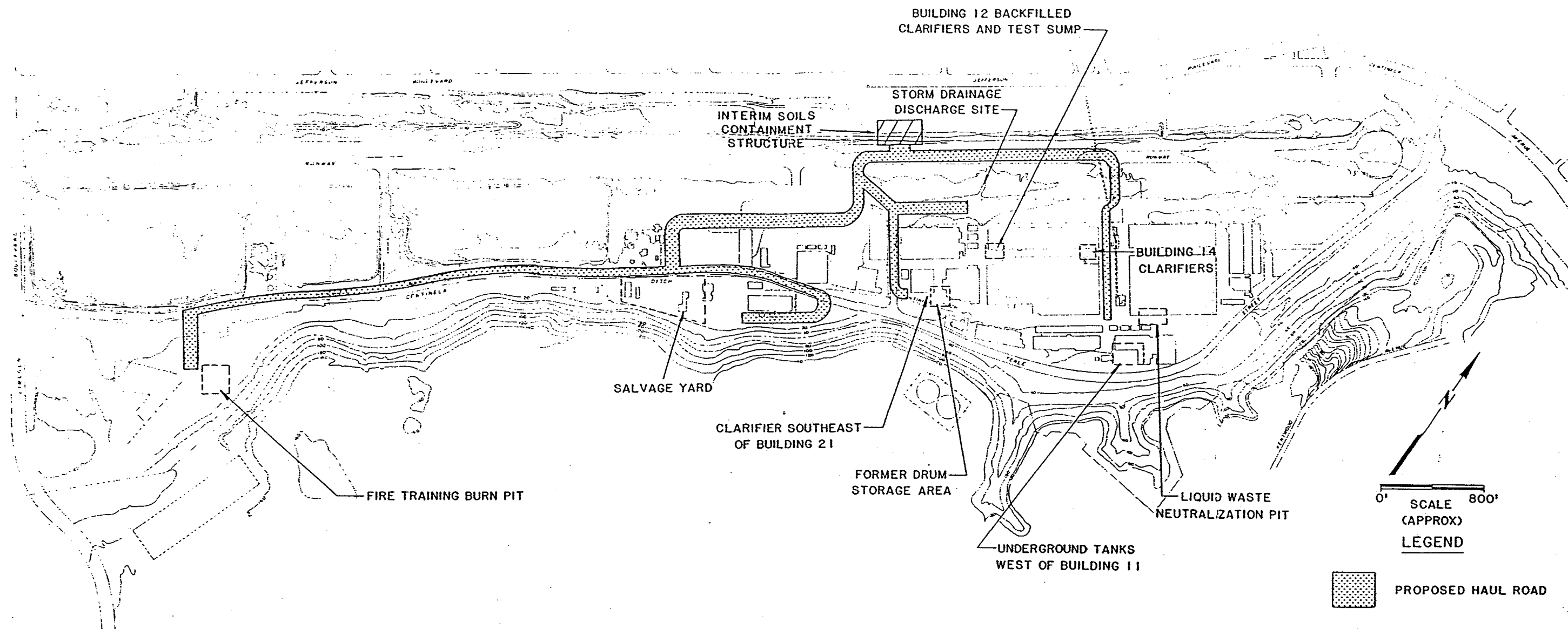


TABLE X-4

SOIL QUANTITIES ESTIMATED FOR EVALUATION OF
EXCAVATION AND DISPOSAL ALTERNATIVE

<u>Identified Potential Source Area</u>	<u>Volume of Soil (cubic yards)</u>
Fire Training Burn Pit	1,600
Test Site 3	Completed
Temporary Drum Storage Area	Completed
Remote Test Site	Completed
Salvage Yard	1,332
Engine Cleaning Pits Area	Completed
Purged Fuel Storage Area	---(1)
Former Drum Storage Area	1,700
Clarifier Southeast of Building 21	---(2)
Storm Drainage Discharge Site	100
Building 12 Backfilled Clarifiers and Test Sump	150
Building 15 Utility Trenches and Clarifier	---(1)
Building 14 Clarifiers	180

-
- (1) Need for excavation and projected volume of soil to be determined during demolition at site.
- (2) Need for excavation and projected volume of soil to be determined during removal of sump or tank.
- (3) Additional soil testing will be completed when sumps are taken out of service.

TABLE X-4
SOIL QUANTITIES ESTIMATED FOR EVALUATION OF
EXCAVATION AND DISPOSAL ALTERNATIVE
(Continued)

<u>Identified Potential Source Area</u>	<u>Volume of Soil (cubic yards)</u>
Underground Tanks West of Building 11	25
Building 35 Sumps	---(3)
Underground Tank South of Building 5	970
Underground Tanks North of Building 12	---(2)

-
- (1) Need for excavation and projected volume of soil to be determined during demolition at site.
 - (2) Need for excavation and projected volume of soil to be determined during removal of sump or tank.
 - (3) Additional soil testing will be completed when sumps are taken out of service.

FIGURE X-3
FIRE TRAINING BURN PIT
DEWATERING SYSTEM

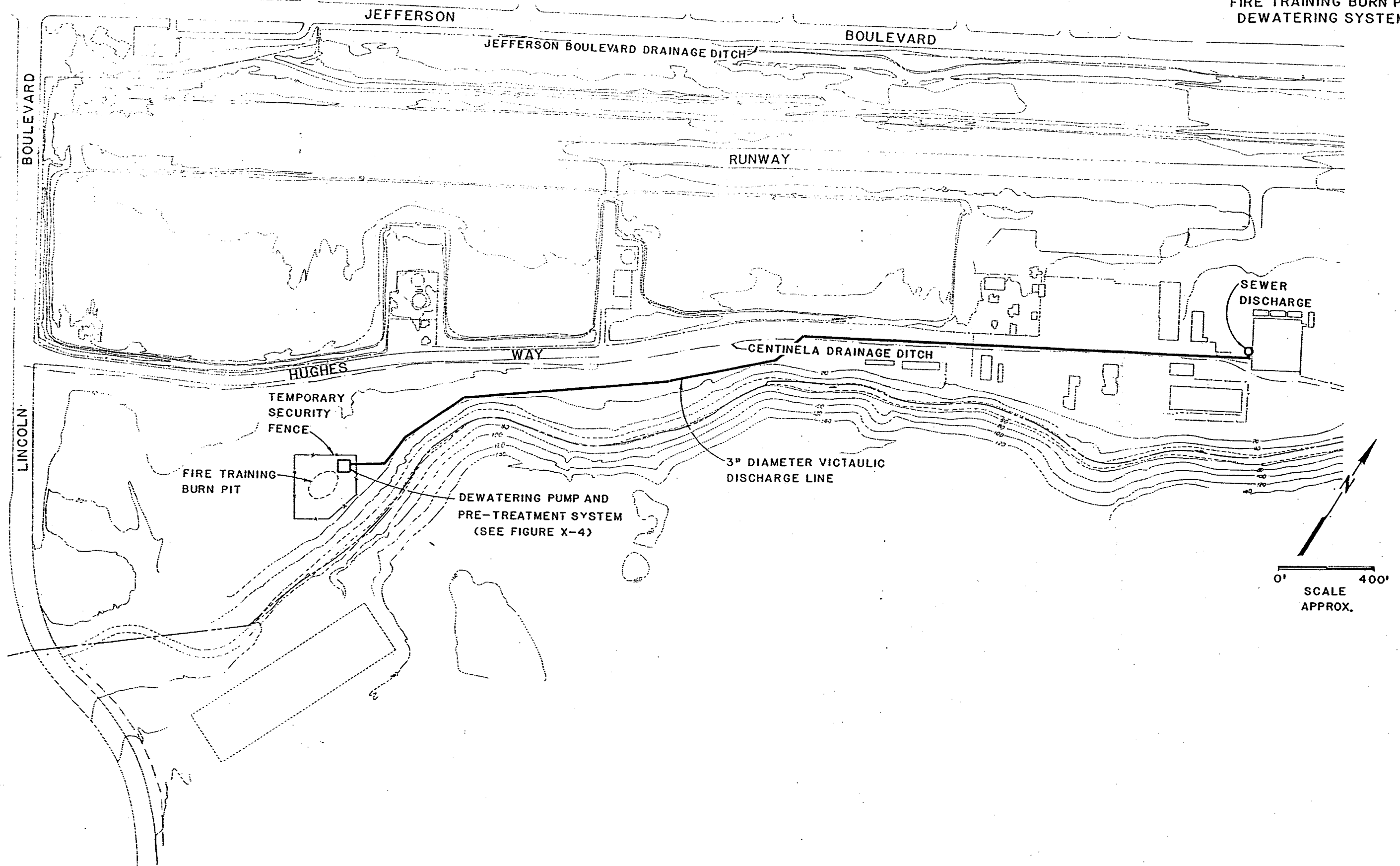
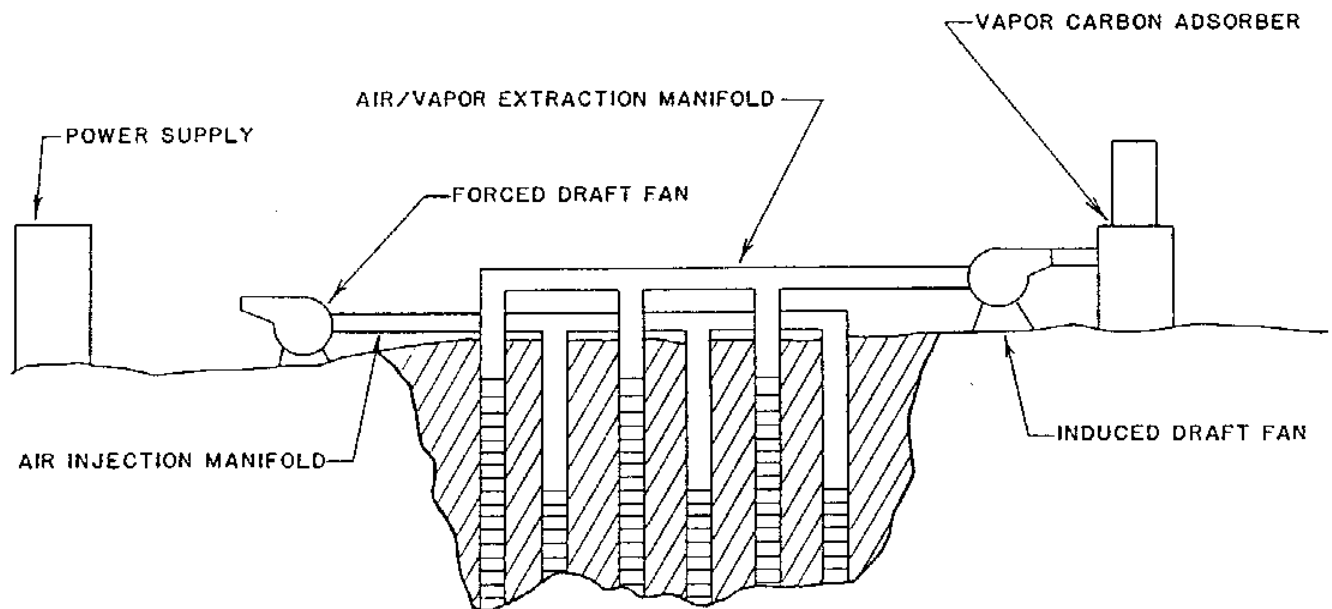


FIGURE X-6
SOILS REMEDIATION
DEVOLATIZATION
(VAPOR CAPTURE SYSTEM)



In-situ devolatilization has been demonstrated by the U.S. Army Toxic and Hazardous Materials Agency (USATHMA) and was reported to remove 75 to 99 percent of the TCE from a site with average TCE concentrations of 5 ppm in a period of 10 weeks. At a site with TCE concentrations up to 5,000 ppm, 25 percent of the TCE was removed in 14 weeks. These data indicate that in-situ devolatilization is a reliable treatment technology where site conditions are favorable to its application.

In-situ devolatilization is most applicable at sites with loose, sandy soils, where chemical occurrence is well above the water table.

In-situ devolatilization is only effective for removal of volatile chemicals. In-situ devolatilization is not compatible with proposed land uses on the west side of the property. On the east side of the property, because of interference with ongoing operations, in-situ devolatilization is feasible only at the Former Drum Storage Area. A conceptual design for an in-situ devolatilization system is shown on Figure X-7. The system includes seven vapor extraction wells and four air injection wells.

Institutional Issues

If extracted air is discharged directly to the atmosphere, a permit from the South Coast Air Quality Management District might be required. For this preliminary evaluation, it is assumed that extracted air would be treated.

BIOLOGICAL TREATMENT

Biological treatment has been demonstrated to reduce concentrations of biodegradable substances such as oil and PCB's in soils. Indicated in Table X-2 are three sites where biological treatment is an applicable treatment technology.

Technical Feasibility

Biological treatment is depicted on Figure X-8. This process has been demonstrated by the chemical industry for treatment of high concentration oil and chemical wastes. It takes advantage of in-situ soil bacteria to degrade biodegradable organic molecules like oil and PCB's to carbon dioxide and water. The basic elements of biological treatment are:

FIGURE X-7
VAPOR CAPTURE AT
FORMER DRUM STORAGE
AREA

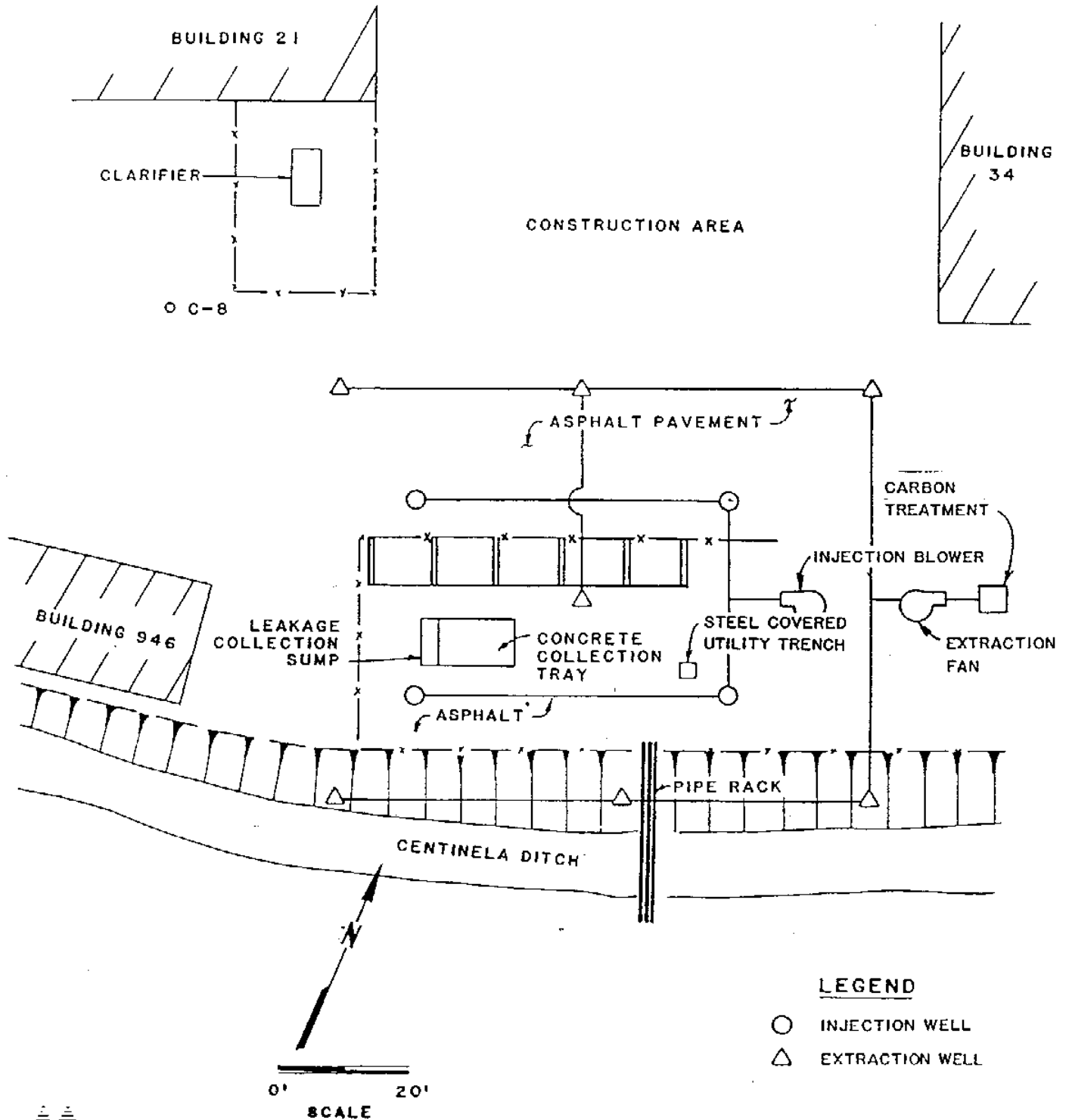
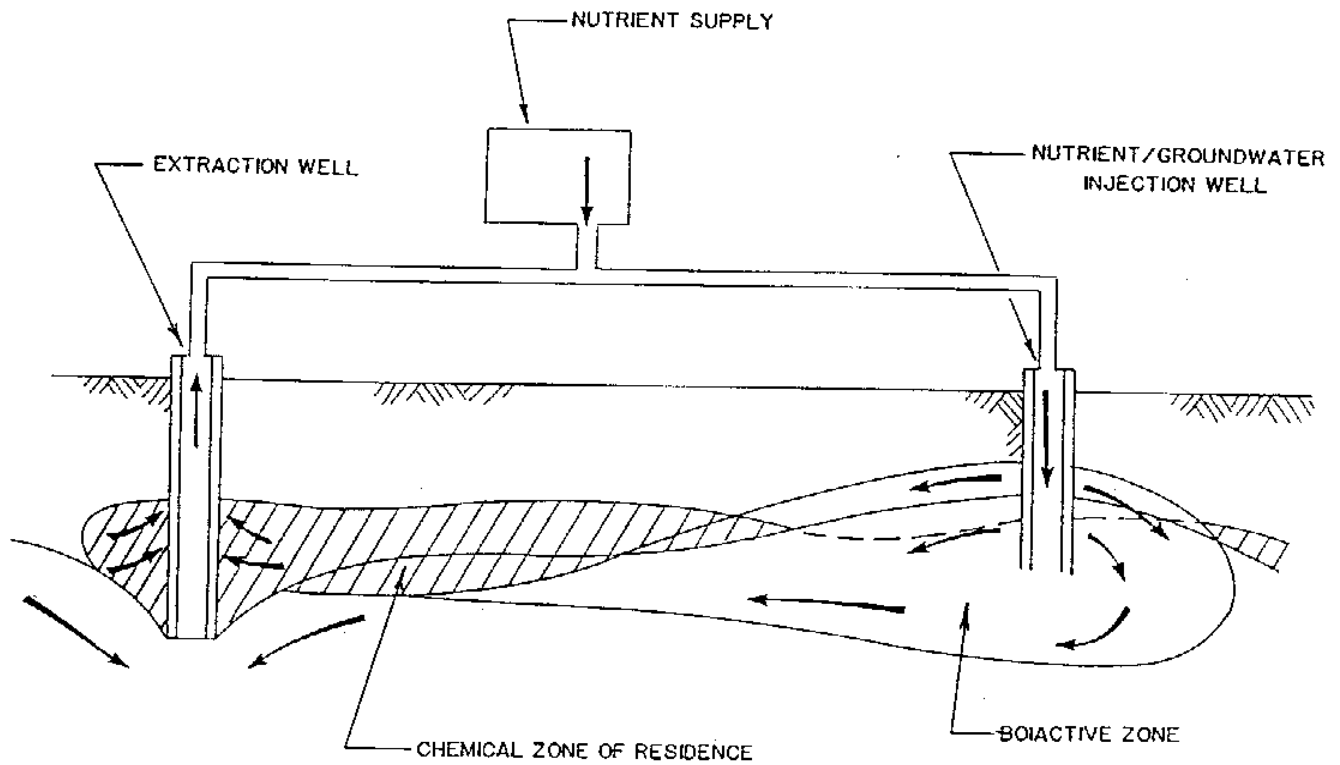


FIGURE A-6
IN SITU-BIORECLAMATION
SYSTEM



- . A groundwater circulation system to sweep the contaminated area; in this case, a system of injection and recovery wells;
- . Addition of nutrients and oxygen into the underground formation;
- . Maintenance of nutrient and oxygen levels for controlled growth and optimum response of the bacteria to the contamination; and
- . A monitoring program to determine the correct nutrient level and to determine when the desired level of remediation has been accomplished.

Biological treatment is a versatile soil treatment method potentially applicable to the Fire Training Burn Pit, Engine Cleaning Pits Area and Purged Fuel Storage Area. Its reliability depends on local site microbiology, hydrogeology and chemistry. For the treatment to be successful, the contaminant must be biodegradable (e.g., petroleum hydrocarbons) and the geology must allow for the controlled transport of nutrients (e.g., loose sandy soils). Soil and water chemistry must also be compatible with the introduction of nutrients and must allow for the stimulation of the microbial community.

The Fire Training Burn Pit has been eliminated from consideration for biological treatment on the basis of these criteria because of the occurrence of relatively nondegradable VOC's and high groundwater. Implementation may be impossible if the recommended injection and recovery well locations conflict with existing structures or utilities. The Purged Fuel Storage Area has been eliminated for this reason.

Critical technical factors in implementing this treatment include determining the extent of the site and the hydrogeology of the area. Sampling would be conducted on a weekly basis to determine levels of remaining contamination. This technique uses readily available equipment and technology for sampling and determining biological activity.

The Engine Cleaning Pits area would require temporary power, security fences and other appurtenances. Once set up, the treatment system requires little daily maintenance. Treatment duration can vary from several months to a year, depending on the extent of contamination.

No unusual health and safety precautions are required during treatment. Work would be accomplished in accordance with Cal OSHA requirements.

Environmental Effectiveness

Past experience has shown biological treatment to be an effective remediation process with high removal efficiencies under ideal conditions. However, problems can arise with getting nutrient fluids into the ground. Clogging of injection wells and the presence of low

permeability zones that impede or divert groundwater flow around areas which are contaminated (short circuiting) are sometimes encountered when using this treatment method.

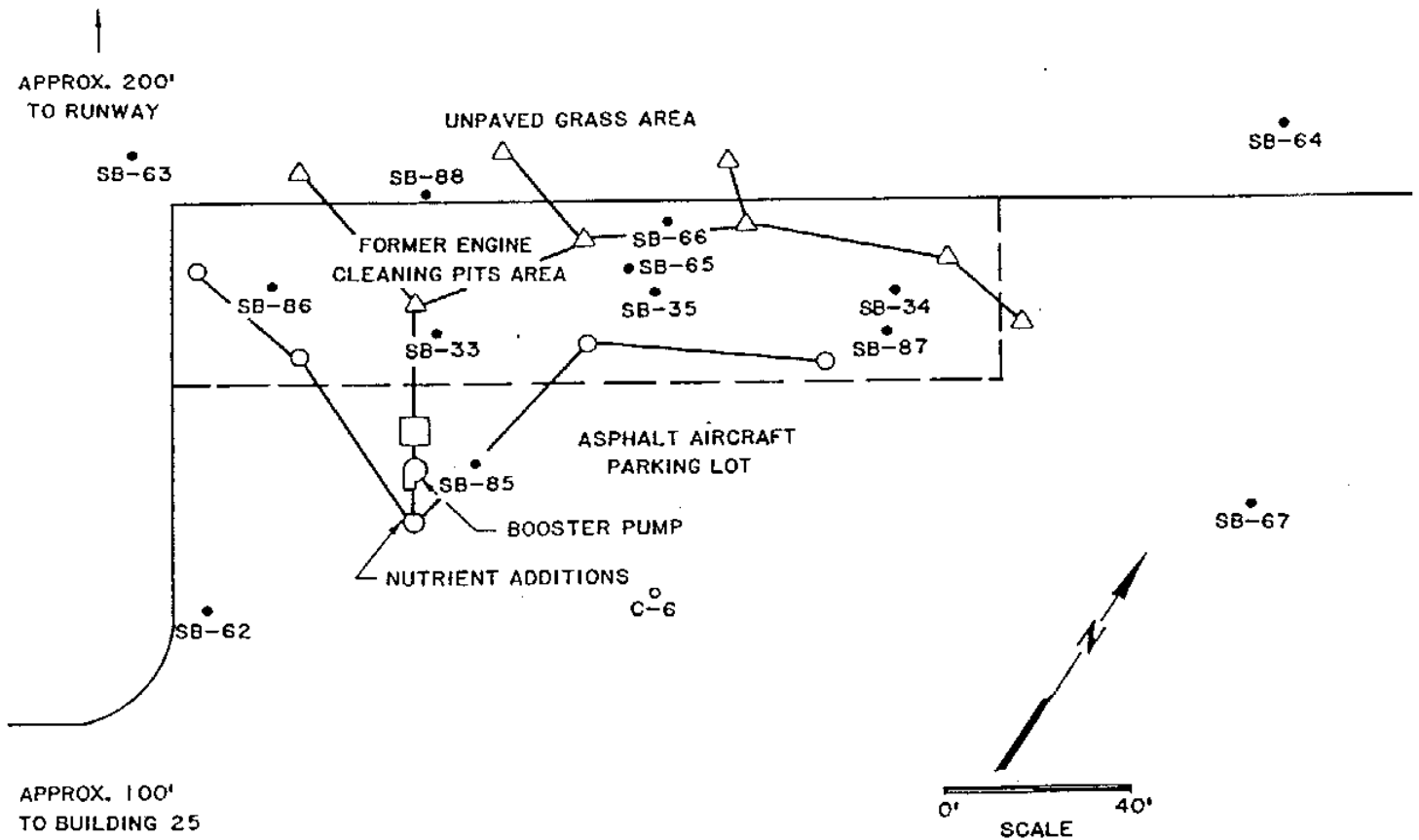
Another area of difficulty is in shallow groundwater recovery wells. Shallow groundwater systems are often discontinuous, with poorly defined hydraulic properties that require conservative designs in the extraction system. As a result, problems arise in attempting to get the in-situ treatment fluid into contact with all the contaminated soil. There are four common problems: 1) a decline in water table elevation which leaves a layer of contaminated soil in the unsaturated zone where the treatment fluid is not free to flow; 2) short circuiting; 3) changes in groundwater flow direction since the contamination occurred; and, 4) contamination within the unsaturated zone or perched water tables within the unsaturated zone beneath the source area.

Under ideal conditions with well-defined hydrogeology, use of bioreclamation is reasonable for certain compounds, but in other situations it is considered developmental. The Engine Cleaning Pits Area is the only site that is suitable for further consideration of this treatment method. The cost of a bioreclamation project is significantly affected by the amount of nutrients needed to degrade the contaminant and by the rate at which the nutrient solution can be introduced into the formation. The conceptual design for biological treatment at the Engine Cleaning Pits Area would be a system of five injection and eight recovery wells, as depicted in Figure X-9.

Institutional Issues

The primary institutional issue regarding biological treatment will be to obtain well permits for injection wells and recovery wells.

FIGURE X-9
BIOLOGICAL TREATMENT
AT ENGINE CLEANING
PITS AREA



SECTION XI

EVALUATION OF ALTERNATIVES FOR GROUNDWATER REMEDIATION

Site characterization activities have provided the basis for defining areas of chemical occurrence in groundwater where concentrations were found to be above Action Levels presented on Figures XI-1 and XI-2. Principal chemicals found in the groundwater include fuel hydrocarbons and volatile organic chemicals (VOC's). Relatively low concentrations of other chemicals such as pesticides and heavy metals have also been detected.

Chemicals in groundwater at the Plant Site can be divided into two components. The first component is fuel occurring as pure product floating on top of the groundwater. Special recovery techniques will be required.

The second component of chemical occurrence are chemicals mixed or dissolved in groundwater. The first groundwater zone is composed of sandy clays which have lower permeability than the lower zones. Chemical concentrations in this shallow groundwater are much higher than in the lower zones. Groundwater from the first groundwater zone will be directly extracted and treated at the Fire Training Burn Pit prior to excavation there, as described in Section X.

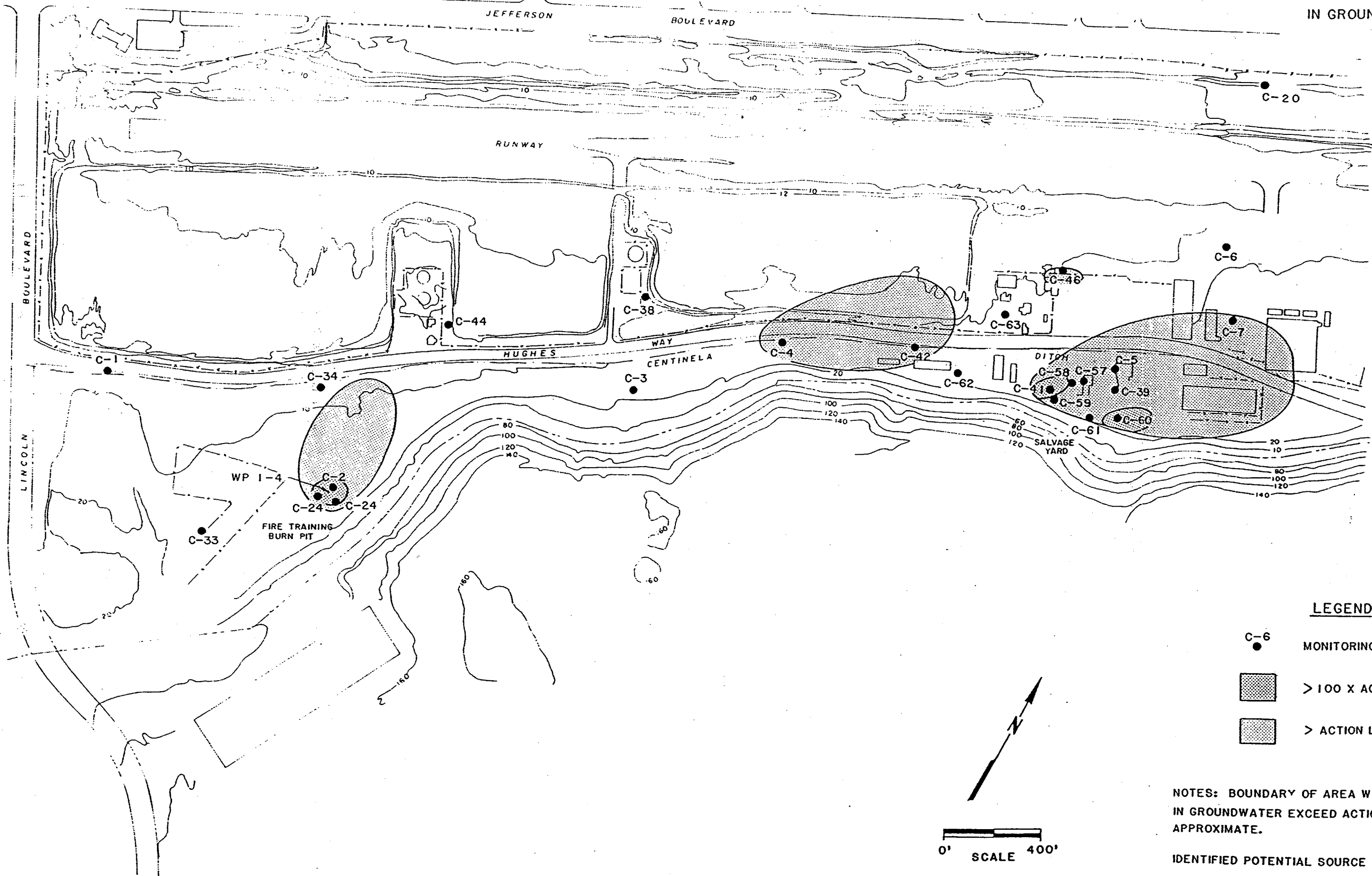
Beneath the upper zone are higher permeability sands and gravels of the Bellflower/Ballona, Gage and Silverado Aquifers. Transport of groundwater through the Gage and Silverado Aquifers is the potential pathway by which chemicals could move to receptors.

Screening of remedial technologies indicates that groundwater extraction is the only practical technology for remediating chemical occurrence in groundwater. Evaluation of alternatives, therefore, compares no action with groundwater extraction. Several alternatives exist for treating groundwater after extraction. There are also several options for disposing of treated water. Alternatives are evaluated to identify the best treatment and disposal alternative.

REMEDIATION OF FUEL OCCURRENCE

Petroleum products (i.e. unleaded gasoline) floating on top of groundwater have been encountered west of Building 11. Floating fuel hydrocarbons were initially encountered in Well C-12. A series of

FIGURE XI-1
DISTRIBUTION OF VOC's
IN GROUNDWATER



LEGEND

- C-6
MONITORING WELL
- > 100 X ACTION LEVELS
- > ACTION LEVELS

NOTES: BOUNDARY OF AREA WHERE CHEMICALS
IN GROUNDWATER EXCEED ACTION LEVELS IS
APPROXIMATE.

IDENTIFIED POTENTIAL SOURCE AREAS ARE SHOWN.

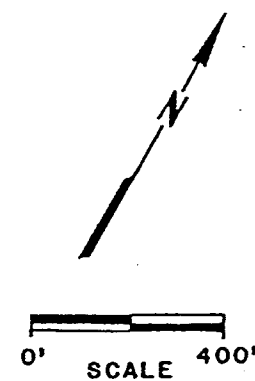
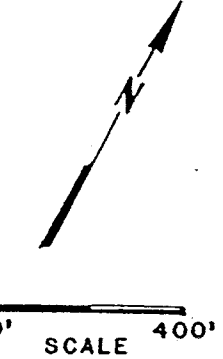
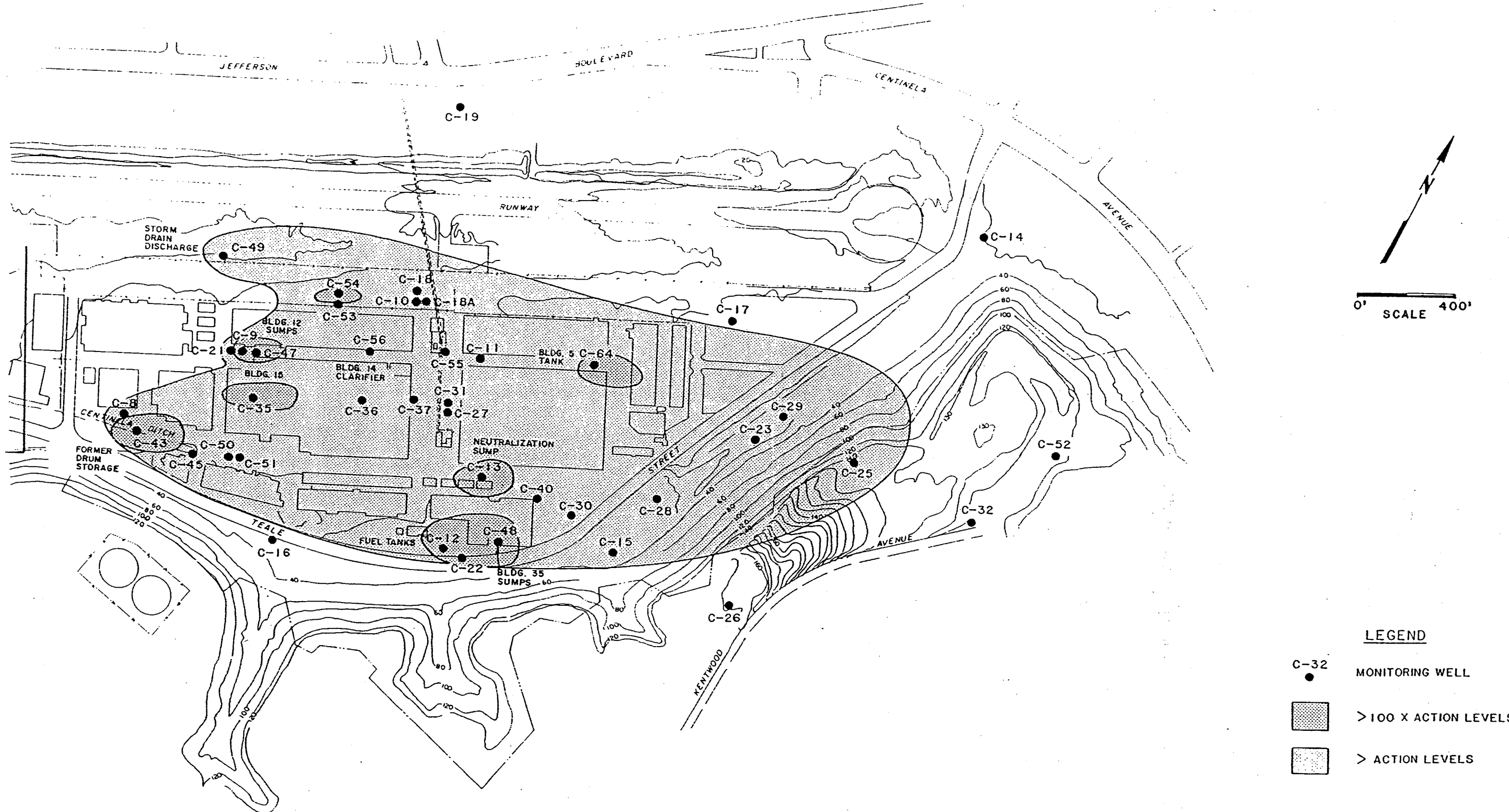


FIGURE XI-2
DISTRIBUTION OF VOC's
IN GROUNDWATER



LEGEND

- C-32 ● MONITORING WELL
- [Dark Shaded Box] > 100 X ACTION LEVELS
- [Light Shaded Box] > ACTION LEVELS

NOTES: BOUNDARY OF AREA WHERE CHEMICALS
IN GROUNDWATER EXCEED ACTION LEVELS IS
APPROXIMATE.

IDENTIFIED POTENTIAL SOURCE AREAS ARE SHOWN.

monitor wells (TB-1 to TB-17) were constructed to define the extent of hydrocarbon occurrence at this location. Up to five feet of floating product has accumulated in these borings.

No Action

West of Building 11, occurrence of floating fuel product is confirmed over an area of about 0.3 acres, and petroleum hydrocarbons detected in monitor wells show the effects of gasoline on groundwater quality downgradient of the area of floating product.

Environmental Effectiveness

West of Building 11, a plume of dissolved petroleum hydrocarbons extends approximately 800 feet to the northeast from its source. The plume is characterized by benzene, toluene and xylenes. If no action is taken to remediate the floating gasoline which is the source of the plume, chemicals will continue to dissolve into the groundwater for many years. The plume can be captured and treated by a regional groundwater extraction system, however, a no action alternative with respect to remediation of the floating gasoline would extend the required duration of regional system operation. In addition, occurrence of fuel hydrocarbons poses operational difficulties for treatment systems. Dissolved fuel hydrocarbons are difficult to remove, resulting in discharge of trace quantities of chemicals, and fuel hydrocarbons foul filters, injection wells, and activated carbon systems.

Institutional Issues

Closure and associated cleanups of spills from underground storage tanks is regulated by the City of Los Angeles Fire Prevention Bureau and the Los Angeles RWQCB. No action for remediation of the gasoline spill may be unacceptable to these agencies because of the potential fire risk associated with gasoline, because TPH concentrations in soil exceed values at which cleanup is normally required, and because the gasoline is a continuing source of benzene, toluene and xylenes to the groundwater.

Gasoline Recovery

Recovery of floating gasoline is a demonstrated technology. Although it is difficult to accurately predict the benefits of gasoline recovery in reducing duration of regional groundwater extraction and treatment, capture and removal of gasoline is almost certainly cost effective in comparison to extended operation of a groundwater treatment system and potential operation problems associated with high petroleum product concentrations in the groundwater treatment system.

Technical Feasibility

A recovery system to remediate gasoline west of Building 11 is shown schematically on Figure XI-3. Recovery extraction wells contain two pumps, a lower water table depression pump and an upper pump to remove gasoline. The lower pump forms a cone of depression in the water table which fills with gasoline. The gasoline is then pumped out by the upper pump. A typical gasoline recovery extraction well is shown on Figure XI-4. The gasoline pump discharge is conveyed to a storage tank. The accumulated gasoline is sold to an oil recycler or disposed of. Water from the lower pump often contains small quantities of emulsified gasoline. Emulsified gasoline should be removed from the water before it is conveyed to the regional treatment system. A gasoline removal system, as shown on Figure XI-5, is included for this purpose and consists of filter media which selectively adsorb emulsified gasoline.

The components described above have been included in the gasoline recovery system to obtain maximum reliability. A floating scavenger pump is utilized in the design because it does not require the constant adjustment that a submersible gasoline pump requires. A gasoline removal system is included on the water discharge line because emulsified gasoline can occur in these systems and cause operational difficulties for groundwater treatment systems. The maintenance required for this type of gasoline recovery system is replacement of the filter media and disposal of recovered gasoline.

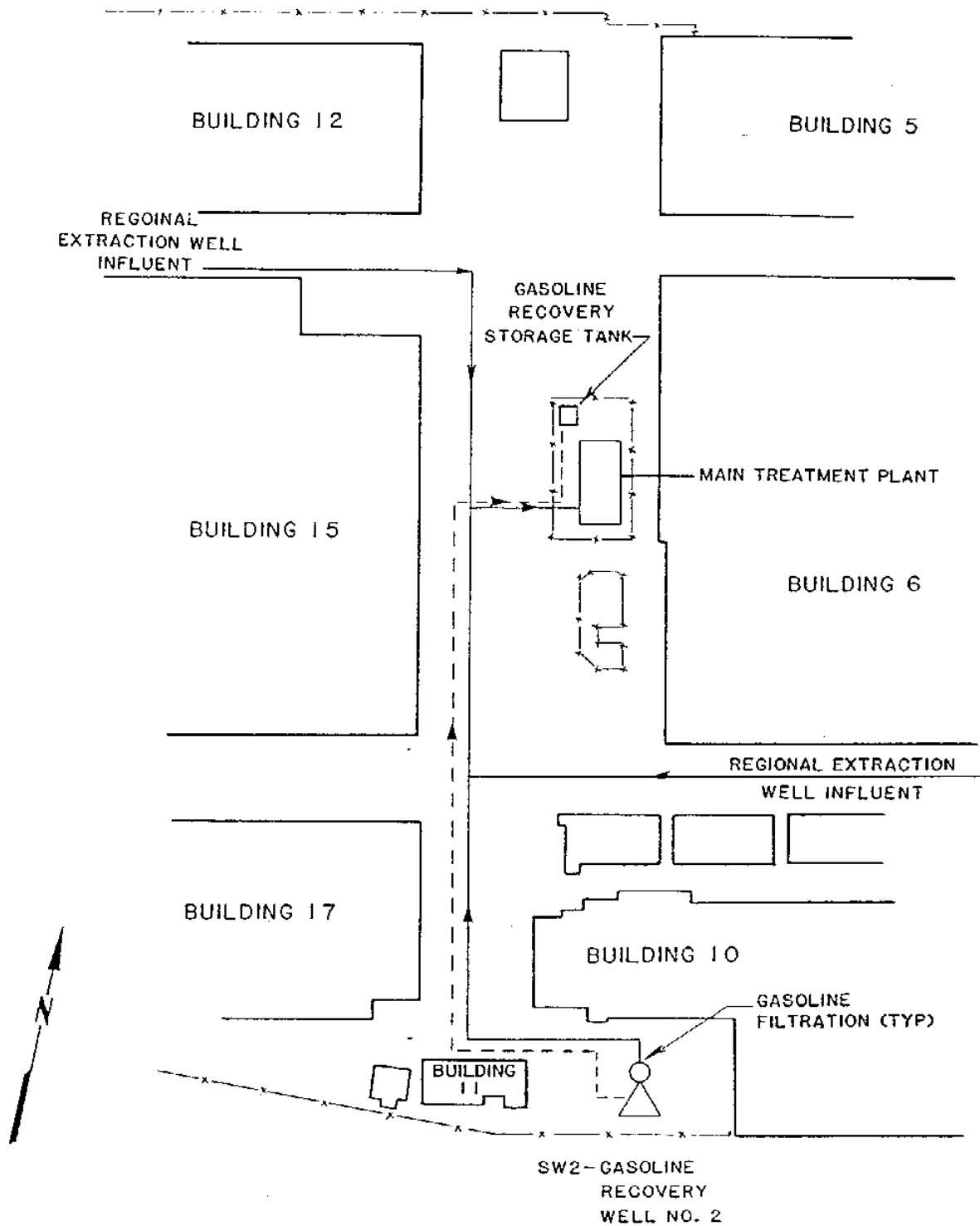
Special design and construction safety requirements for fuel recovery and handling systems are required. The gasoline recovery system would be constructed in compliance with National Fire Protection Agency (NFPA) and Los Angeles Fire Department guidelines and requirements. The system would utilize explosion-proof pumps and controls, double-wall pipes and an above-ground storage tank with secondary containment.

A specific safety plan would be developed and implemented during construction.

Environmental Effectiveness

The gasoline recovery system would remove gasoline from the groundwater table west of Building 11. The water table depression pump would remove groundwater with highest concentrations of emulsified gasoline. By eliminating floating gasoline as a continuing source of dissolved petroleum hydrocarbons, the gasoline recovery system would significantly reduce duration of regional groundwater extraction and treatment, and reduce subsurface accumulation of petroleum products.

FIGURE XI-3
GASOLINE RECOVERY SYSTEM



TYPICAL DUAL PUMP GASOLINE RECOVERY SYSTEM

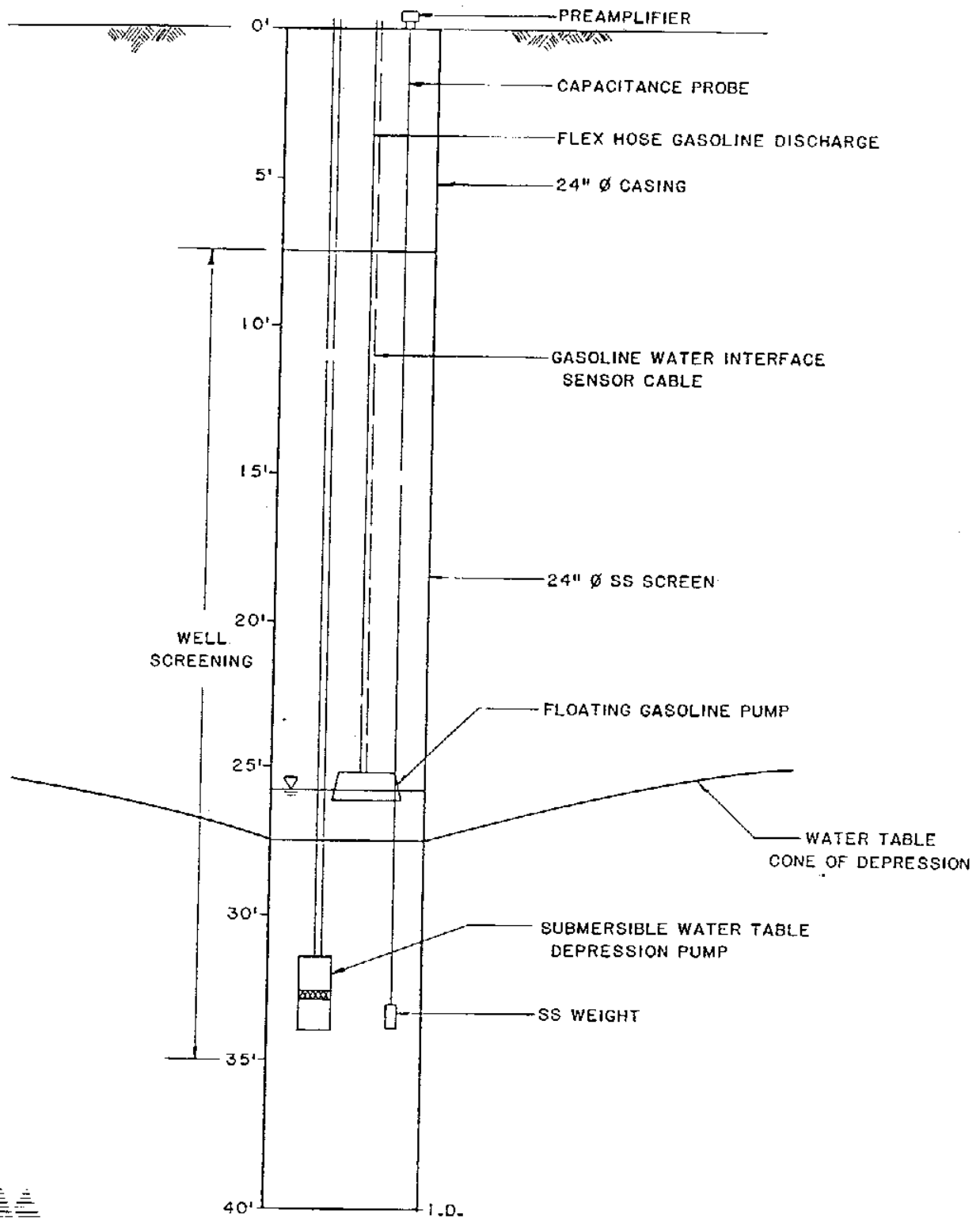
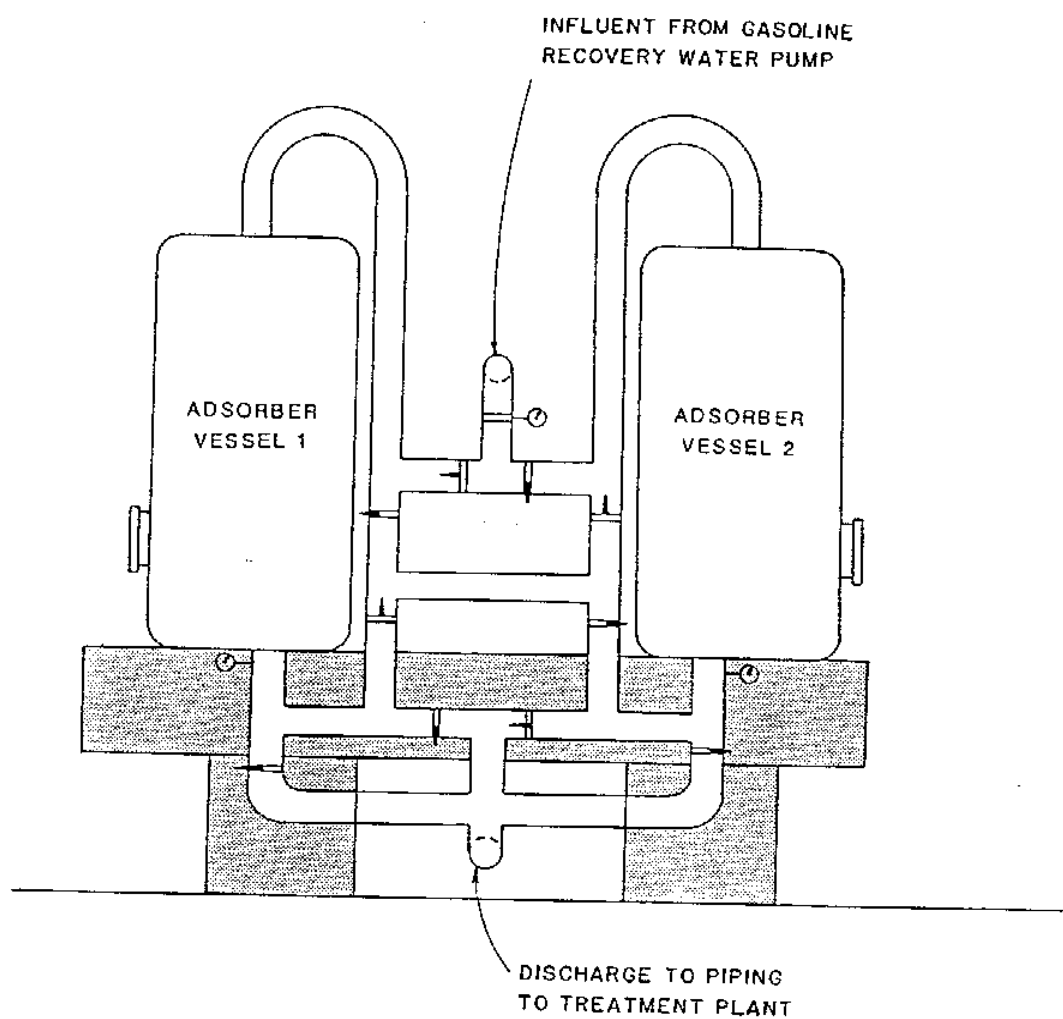


FIGURE XI-5
SCHEMATIC OF GASOLINE
REMOVAL SYSTEM



Institutional Issues

Approval from the Los Angeles Fire Department will be required for implementation of the gasoline recovery system. If a temporary treatment system is implemented, a RWQCB permit to discharge treated water will be required. A gasoline recycler or other disposal option for recovered gasoline will be required.

REGIONAL GROUNDWATER EXTRACTION

For this evaluation, the regional groundwater system is considered to include the Silverado Aquifer, the Bellflower/Ballona Aquifer under the Plant Site and the Gage/Gardena Aquifer beneath the Playa del Rey Bluff. Chemicals found in this groundwater system include solvents, petroleum-related hydrocarbons, pesticides and heavy metals. Remedial alternatives to be evaluated for the regional system include no action and groundwater extraction.

No Action

If no action is taken to remediate chemicals in the regional system, the chemical plume would continue to expand as groundwater moves to the east and chemicals disperse. Depending upon the degree of soils and source area remediation implemented at the site, chemicals would continue to migrate from soils to shallow groundwater and thence to the regional groundwater system. Eventually, chemicals contained in the regional groundwater would migrate off the Plant Site.

Environmental Effectiveness

Approximately 4,000 feet east of the Plant Site, a cemetery irrigation well is extracting groundwater from five screened intervals from 188 feet to 590 feet below surface. One of those intervals may be drawing water from the Gage/Gardena Aquifer downgradient from the east edge of the Plant Site. If no action is taken to remediate the groundwater beneath the site, groundwater containing chemicals may reach this well through the Gage/Gardena Aquifer, but concentrations of those chemicals would be lower than on the Plant Site.

Five to seven miles south of the site, municipal water wells in the Inglewood-Hawthorne area are pumping water from aquifers which are hydraulically connected to the Silverado Aquifer east of the Plant Site. Chemicals contained in groundwater from the site may be drawn toward the municipal wells after flowing off-site if no action is taken to control chemical migration. However, the concentration of chemicals that would eventually reach the municipal wells would be substantially less than concentrations on the site. The concentrations of chemicals in the groundwater reaching the wells would be greatly reduced due to sorption of chemicals onto soil particles within the aquifer, dilution

due to dispersion, and losses due to volatilization into overlying unsaturated soils. The concentration of chemicals extracted at the wells would be much lower than the concentrations in the groundwater originating from the site due to dilution by fresh water drawn to the wells from other direction and depths. There are no wells within three miles of the site extracting water for drinking because groundwater in the Bellflower/Ballona and Silverado Aquifers near the site is not good quality. The groundwater has a salinity estimated from total dissolved solids concentrations that averages approximately 2,000 parts per million (ppm). This concentration is two times the EPA secondary drinking water standard of 1,000 ppm.

Groundwater Extraction

Groundwater extraction and treatment is a demonstrated technology for control of groundwater movement and remediation of chemical occurrence. Groundwater movement beneath the Plant Site has been modeled to provide a mathematical base for the evaluation of alternative extraction well locations and pumping rates. To determine the most effective groundwater extraction system for the site downgradient extraction barriers, source area extraction wells and longitudinal extraction wells were evaluated in terms of their effectiveness compared to the aquifer response predicted by the mathematical model and the hydrogeologic conditions on the site. It should be noted that the hydrogeologic conditions everywhere on the site are not accurately known and that mathematical models are tools which can only approximate aquifer behavior on the site. Theoretical effectiveness of extraction well systems was determined by computer and should be a good approximation, but field effectiveness would be determined during construction and field testing.

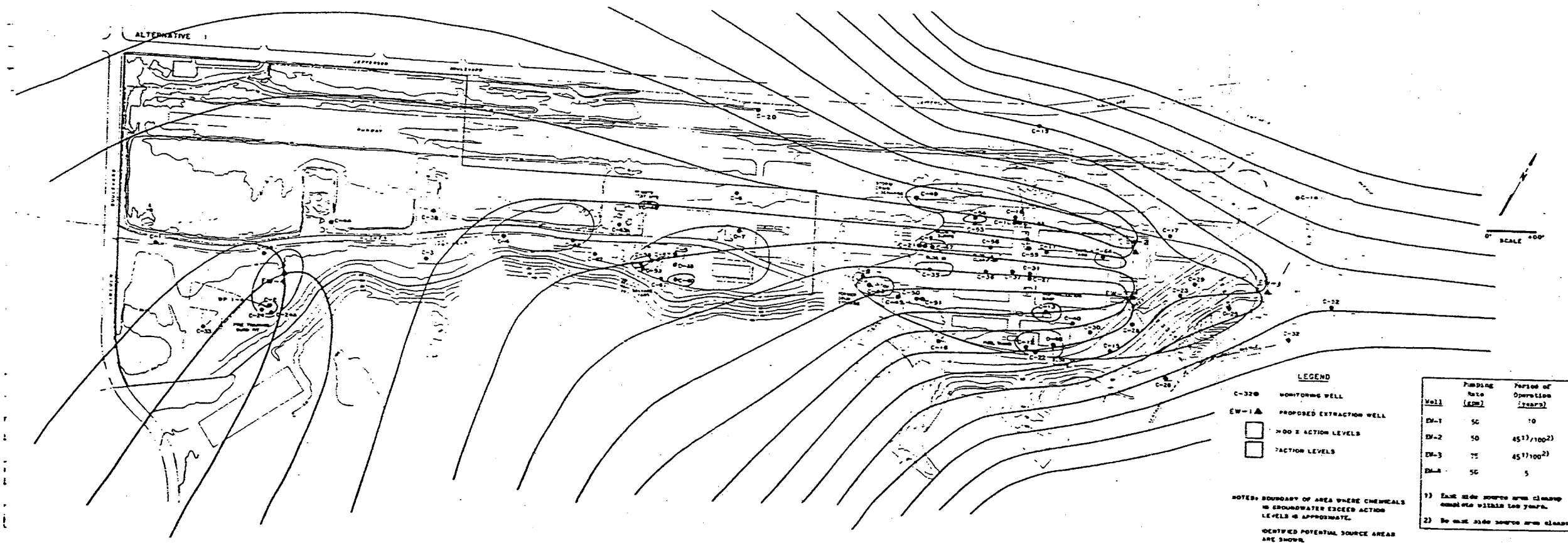
Three alternative extraction systems were found to be effective within the constraints of the groundwater flow regime. The alternative extraction systems differ primarily in the time required to remediate the groundwater.

Extraction Well Alternatives

Evaluation of well siting alternatives by comparison with the aquifer response predicted by the groundwater model has indicated that the flow of groundwater containing chemicals can be controlled and remediated with each of three extraction well systems which include either four, five, or six wells.

Alternative 1, shown on Figure XI-6, includes four extraction wells. Three of the wells in this alternative are sited to form a downgradient barrier on the east side of the Plant Site, and the fourth well is sited to control groundwater flow on the west side near the Fire Training Burn Pit. The siting and pumping rates for the three wells on the east end, EW-1, EW-2, and EW-3, were determined by the requirement

FIGURE XI-6
ALTERNATIVE 1
FOUR EXTRACTION WELLS



of capturing groundwater containing chemicals before it could flow downgradient, off the site. The streamtubes drawn on Figure XI-6 show that the three wells would effectively capture and extract all groundwater containing chemicals from the east end of the site. In this and each of the other alternatives, Well EW-1 would be screened to extract groundwater from the full thickness of the Gage/Gardena Aquifer which is the downgradient receptor of flow from the Bellflower/Ballona Aquifer, the principal aquifer under the Plant Site. Wells EW-2 and EW-3 are sited west of the Charnock Fault so that groundwater in the Silverado Aquifer containing trace amounts of chemicals would be captured by the wells upgradient from the fault. Wells EW-2 and EW-3 in each alternative would be screened from the upper groundwater surface, through the Bellflower/Ballona Aquifer, and at least 20 feet into the Silverado Aquifer to extract groundwater from the entire groundwater zone that may contain chemicals.

Well EW-4 in Alternative 1 is a longitudinal extraction well located downgradient from a source area on the west end of the site to insure that flow of groundwater containing chemicals is controlled and captured. Groundwater in the Bellflower/Ballona Aquifer on the west end of the site has a northerly component of flow and a very low gradient, which would make capture of chemicals from a source on the west end of the site less certain with only the downgradient barrier wells in operation. The preliminary design of the extraction well field indicates the construction of extraction well EW-4 to a total depth of about 120 feet, which would penetrate approximately the upper 20 feet of the Silverado Aquifer. If additional data collected prior to construction of the extraction well indicate that the vertical extent of chemical migration in the aquifer is above the Silverado Aquifer, the total depth of extraction well EW-4 will be decreased accordingly. On Figure XI-6, the approximate areal distribution of chemicals exceeding California State Action Levels for drinking water is indicated by shading. Each of those figures show the chemical distribution based on the water quality data summarized in Table VI-1. Figure XI-7 shows the estimated distribution of chemicals in groundwater after 15 years of extraction with the Alternative 1 well system. Figure XI-8 shows the estimated distribution of chemicals after 25 years of extraction with the Alternative 1 well system. Distribution of chemicals on Figures XI-7 and XI-8 are estimated from groundwater flow directions and flow velocities resulting from the operation of wells in Alternative 1 for time periods indicated on Figure XI-6.

Alternative 2 is based on a system of five extraction wells shown on Figure XI-9. This alternative has the same downgradient barrier (EW-1, EW-2, and EW-3) and west side longitudinal extraction well (EW-5) siting as in Alternative 1, but it also includes a longitudinal well, EW-4, located downgradient from the Salvage Yard. The preliminary design of the extraction well field indicates the construction of extraction wells EW-4 and EW-5 to a total depth of about 120 feet,

FIGURE XI-7
ALTERNATIVE 1
AFTER 15 YEARS

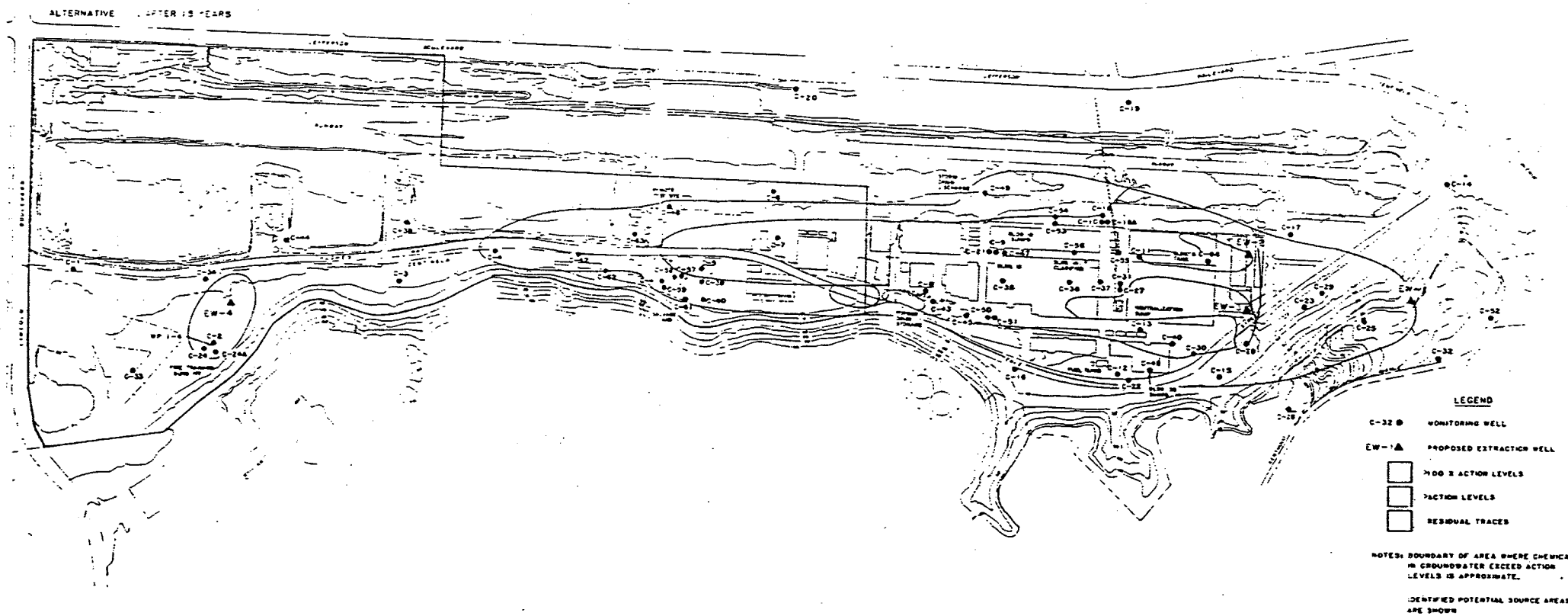


FIGURE XI-8
ALTERNATIVE 1
AFTER 25 YEARS

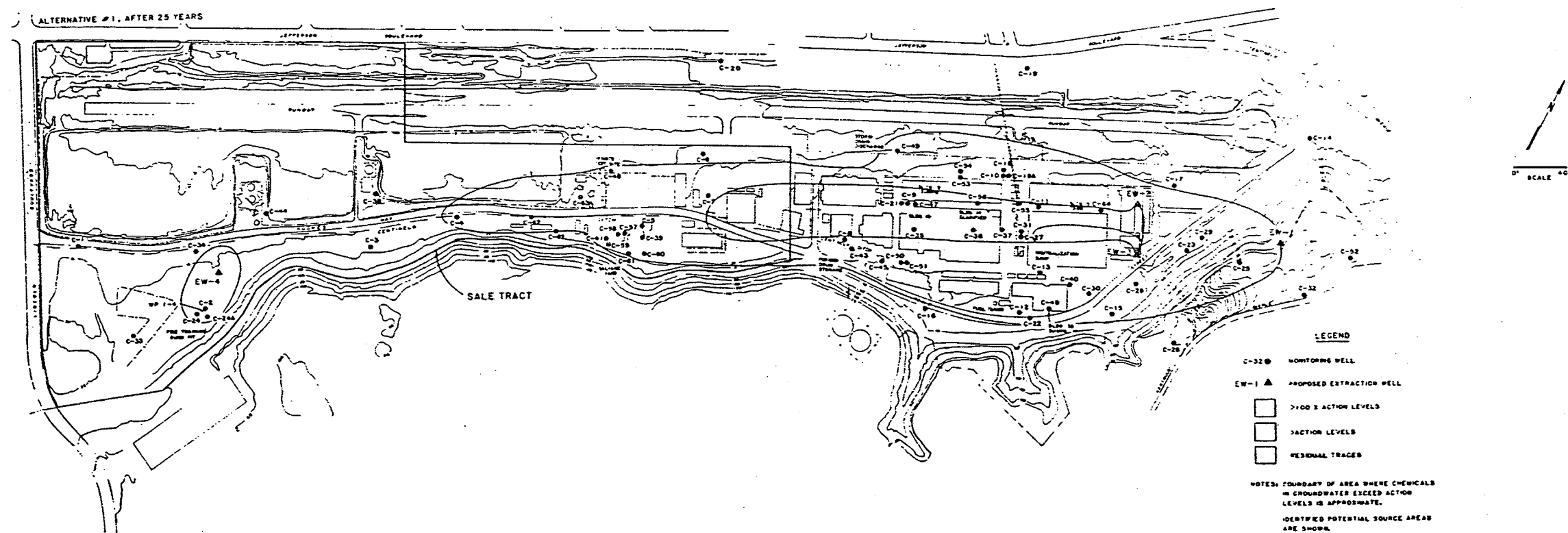
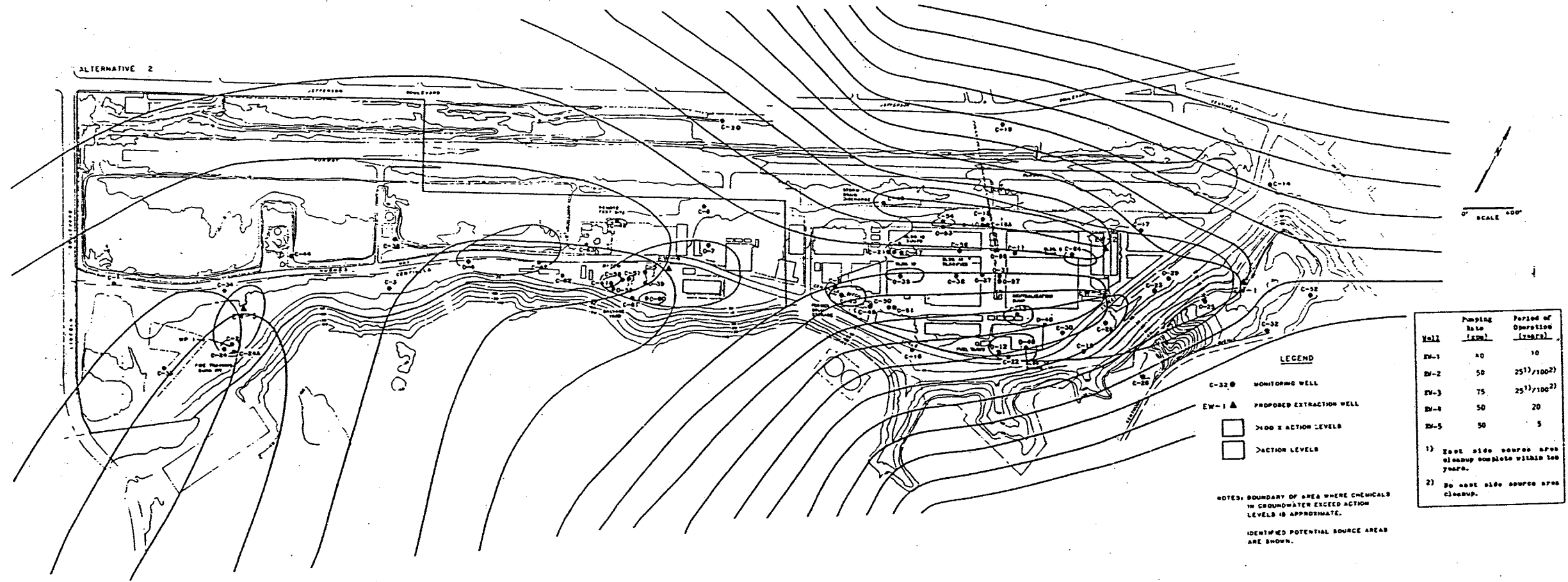


FIGURE XI-9
 ALTERNATIVE 2
 FIVE EXTRACTION WELLS



which would penetrate approximately the upper 20 feet of the Silverado Aquifer. If additional data collected prior to construction of the extractions wells indicate that the vertical extent of chemical migration in the aquifer is above the Silverado Aquifer, the total depth of extraction wells EW-4 and EW-5 will be decreased accordingly.

Alternative 2 provides control of groundwater flow on the east and west ends of the site, and it shortens the anticipated duration of groundwater extraction by shortening the travel time for groundwater containing chemicals from a source area to an extraction well. Control of groundwater flow by the five-well alternative is illustrated by the streamtubes which represent the zone of groundwater capture for each extraction well.

On Figure XI-10, the areal distribution of chemicals in groundwater after 15 years of extraction by Alternative 2 is estimated. Figure XI-11 shows the estimated chemical distribution after 25 years of operation. Approximate time periods of operation for each well in Alternative 2 are listed on Figure XI-9.

Alternative 3 includes six wells, and is shown on Figure XI-12. This alternative has the same downgradient barrier wells (EW-1, EW-2, and EW-3) and west side longitudinal wells (EW-4 and EW-6) as Alternative 2, but it also includes an additional longitudinal extraction well, EW-5, between Wells EW-4 and EW-6, to shorten the travel time on the west side of the property. Well EW-5 would shorten the travel time by inducing a higher gradient in an area with very low natural gradients. The zones of groundwater capture for each well in Alternative 3 is shown by the streamtubes ending at each well. The preliminary design of the extraction well field indicates the construction of extraction wells EW-4, EW-5, and EW-6 to a total depth of about 120 feet, which would penetrate approximately the upper 20 feet of the Silverado Aquifer. If additional data collected prior to construction of the extraction wells indicate that the vertical extent of chemical migration in the aquifer is above the Silverado Aquifer, the total depth of extraction wells EW-4, EW-5, and EW-6 will be decreased accordingly.

The present areal distribution of chemicals exceeding action levels is shown on Figure XI-12. The estimated distribution of chemicals after 15 years of operation of Alternative 3 is shown on Figure XI-13, and the estimated distribution after 25 years is shown on Figure XI-14.

The principal difference between Alternatives 1, 2, and 3 is the estimated length of time that wells would be required to operate to reduce chemical concentrations to less than Action Levels. With Alternative 1, the four-well system, two wells would continue to extract water for at least 45 years. With Alternative 2, three wells would be turned off after about 20 years or less, and two remaining wells would operate for approximately 25 years. With Alternative 3, four wells would be turned off after 10 years or less of operation, and

FIGURE XI-10
ALTERNATIVE 2
AFTER 15 YEARS

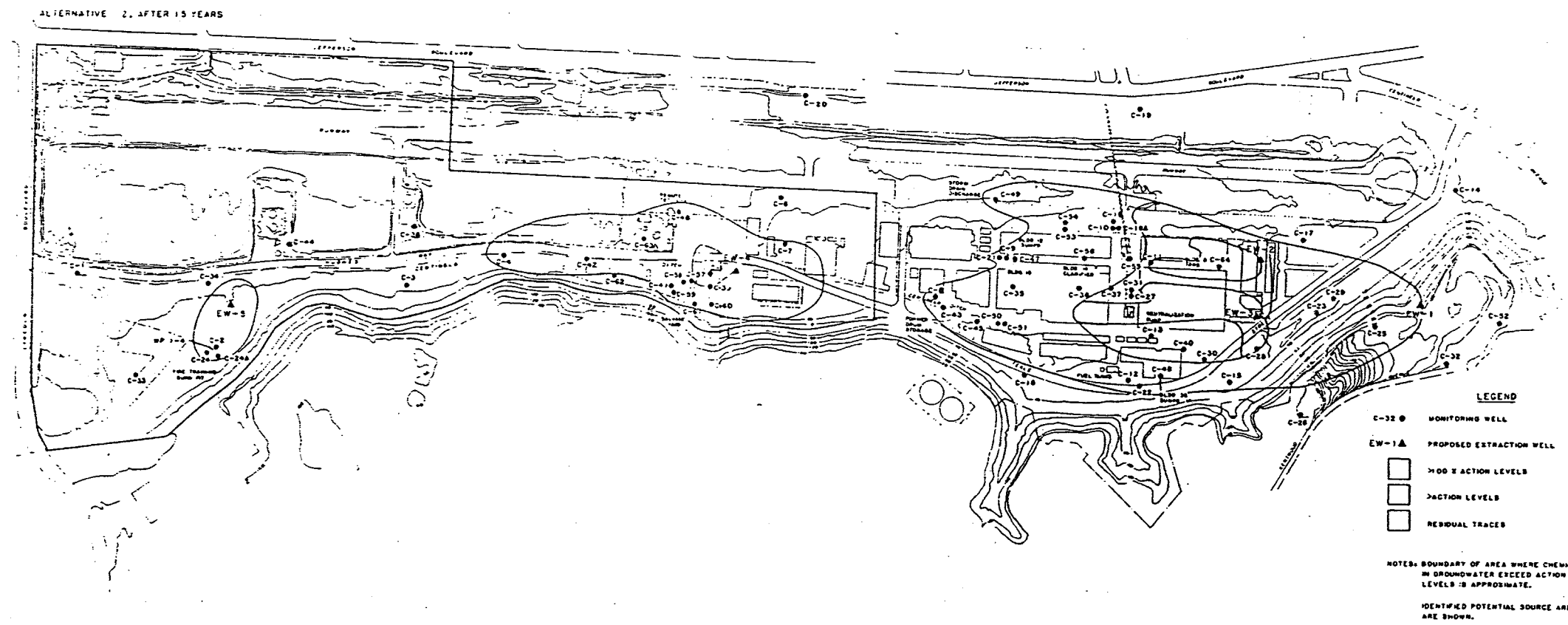


FIGURE XI-11
ALTERNATIVE 2
AFTER 25 YEARS

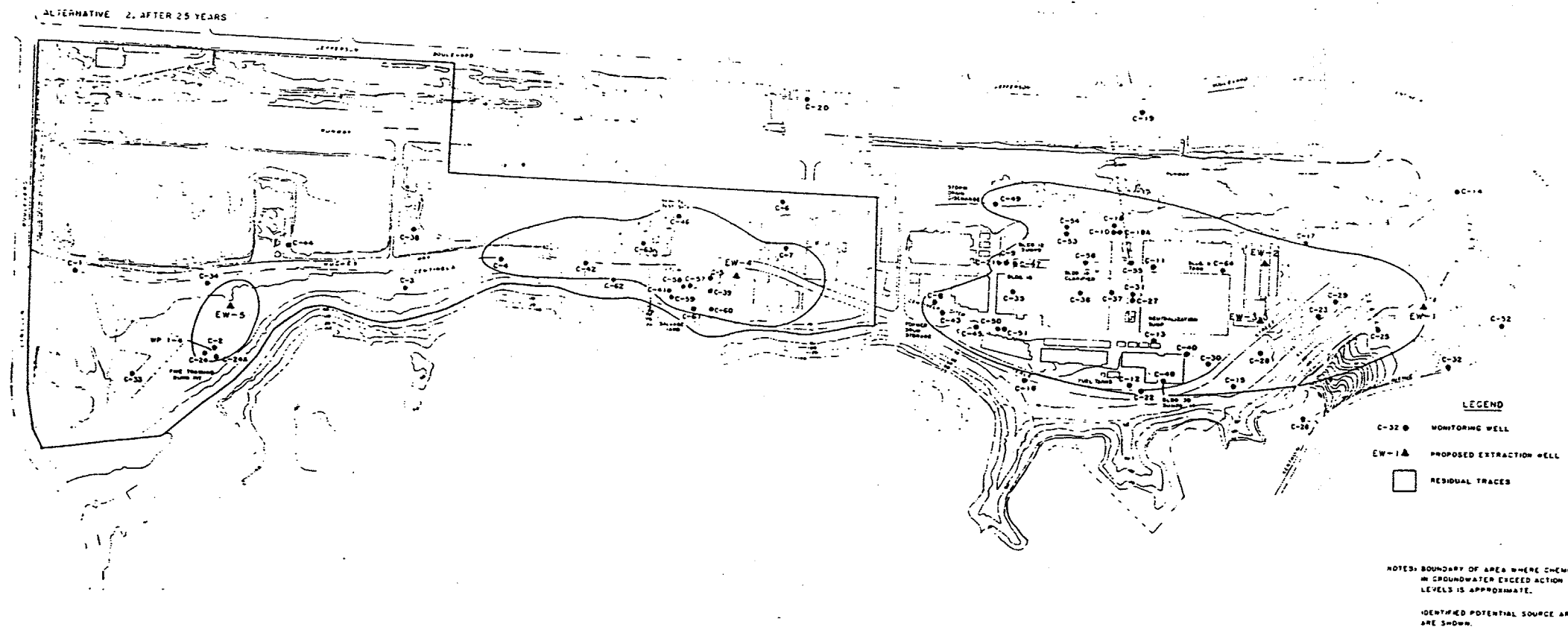


FIGURE XI-12
ALTERNATIVE 3
SIX EXTRACTION WELLS

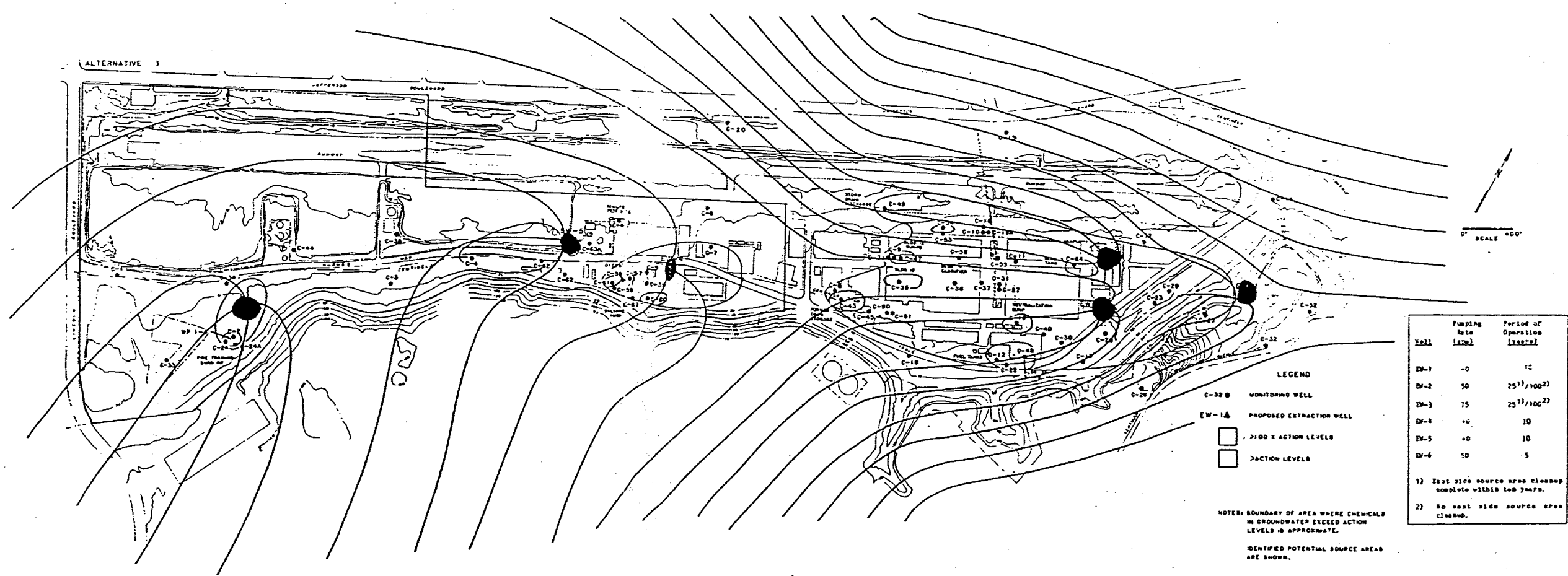


FIGURE XI-13
ALTERNATIVE 3
AFTER 15 YEARS

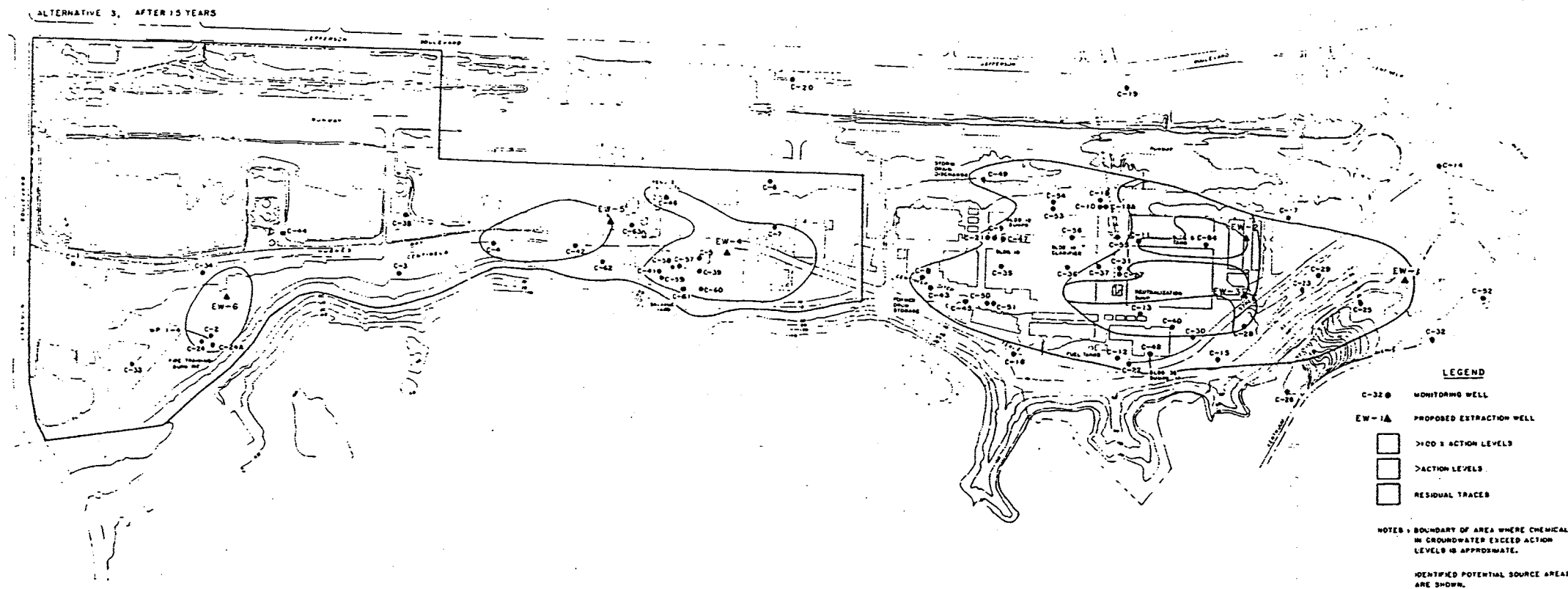
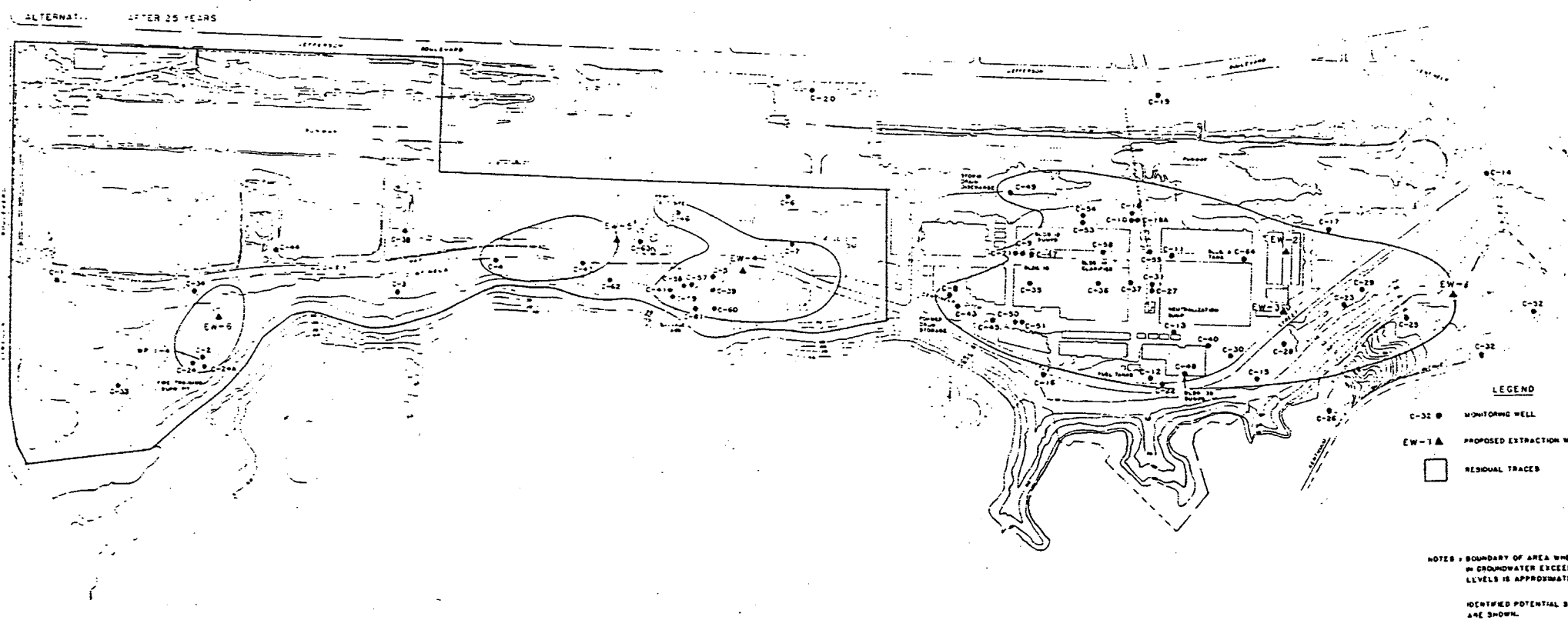


FIGURE XI-14
ALTERNATIVE 3
AFTER 25 YEARS



the two remaining wells would be turned off after approximately 25 years. All of the estimated extraction times of 45 years or less assume that soils at chemical source areas are remediated in a period of ten years or less after pumping begins. Non-remediation of some source areas would lengthen the estimated groundwater extraction time. Actual operational period without source cleanup is unknown, but for comparison of alternatives, we have assumed it to be approximately 100 years.

Other alternatives with additional wells on the Plant Site were considered to reduce estimated groundwater extraction times to less than 25 years, but the reduction in travel time to additional wells would be outweighed by losses in the effectiveness of the groundwater extraction from the flow domain of the aquifer. Additional wells would reduce chemical concentrations rapidly in local areas, but they would influence a much larger volume of flow in the regional aquifer without reducing the estimated extraction time to much less than 25 years.

Computer models used in evaluating extraction well site options are summarized in the following paragraphs. A detailed description of the modeling effort is given in Appendix E.

Groundwater modeling and extraction system design proceeded as follows:

- 1) Siting of an initial extraction well and completion of a 36-day aquifer pumping test to determine hydraulic parameters for system modeling and design;
- 2) Development of a finite element groundwater model to first reproduce conditions monitored during the 36-day test and then project future conditions based on alternative well designs;
- 3) Development of a zone of capture groundwater model to facilitate predicting groundwater responses to pumping under a range of conditions in analysis of alternatives;
- 4) Verification of the alternative selected from the zone of capture model by the finite element model; and
- 5) Design of alternative extraction well systems.

A 36-day aquifer pumping test provided values for hydraulic conductivity and storage coefficient which are required for computer modeling. The average hydraulic conductivity (K_h) based on the pumping-test data analysis and effective thickness of the Bellflower/Ballona Aquifer is about $55 \text{ ft}^3/\text{day-ft}^2$. The storage coefficient derived from the aquifer test was 0.0004.

The finite element model works by dividing the area modeled into horizontal and vertical grids resulting in hexahedrons representing portions of the aquifer system modeled. Hydrologic parameter values are assigned to each hexahedron based on site conditions and assumptions regarding the surrounding areas. The model is then operated (calibrated) to simulate measured field conditions. During calibration, input values are adjusted until modeled and measured conditions match. Adjusting input parameters is required because assumptions made in modeling do not always represent field conditions.

The hydraulic conductivity calibration of the finite element model is $12 \text{ ft}^3/\text{day-ft}^2$. A number of factors have contributed to the difference between the value of hydraulic conductivity obtained by the pumping-test data analysis and the value obtained in calibration. The scale (size) of the flow domain associated with the pumping test is smaller than that used in the calibration process. In the calibration process, a large scale is required such that the influence of the extraction well will not reach the boundary of the flow domain. In order to maintain computer modeling expenditures at reasonable levels, the scale used in calibrating flow towards the extraction well in the pumping test is the same as that required for a remedial well system. The large scale used in the calibration process results in a smaller value of hydraulic conductivity representing the average value over a large area.

In addition to effects of scale on calibration, another factor affecting hydraulic conductivity values is the accuracy of calculated values derived from the pumping-test analysis (curve-matching techniques). Some of the assumptions made in the analysis do not fully apply to the flow regime considered. For instance, the analysis is based on the aquifer being isotropic and homogeneous and site conditions do not fully support this conclusion.

The calibration process involves solution of the flow equation by applying a finite element model. The solution depends on specified initial and boundary conditions. As a consequence, the estimate of hydraulic conductivity based on the calibration process may not be precise since the actual boundary conditions have not been measured and the specified initial and boundary conditions may not closely approximate existing flow conditions.

Both the pumping-test analysis and the calibration process resulted in a storage coefficient of 0.0004. Results of the calibration process indicate that the aquifer beneath the Plant Site is practically isotropic in the horizontal direction and strongly anisotropic in the vertical direction.

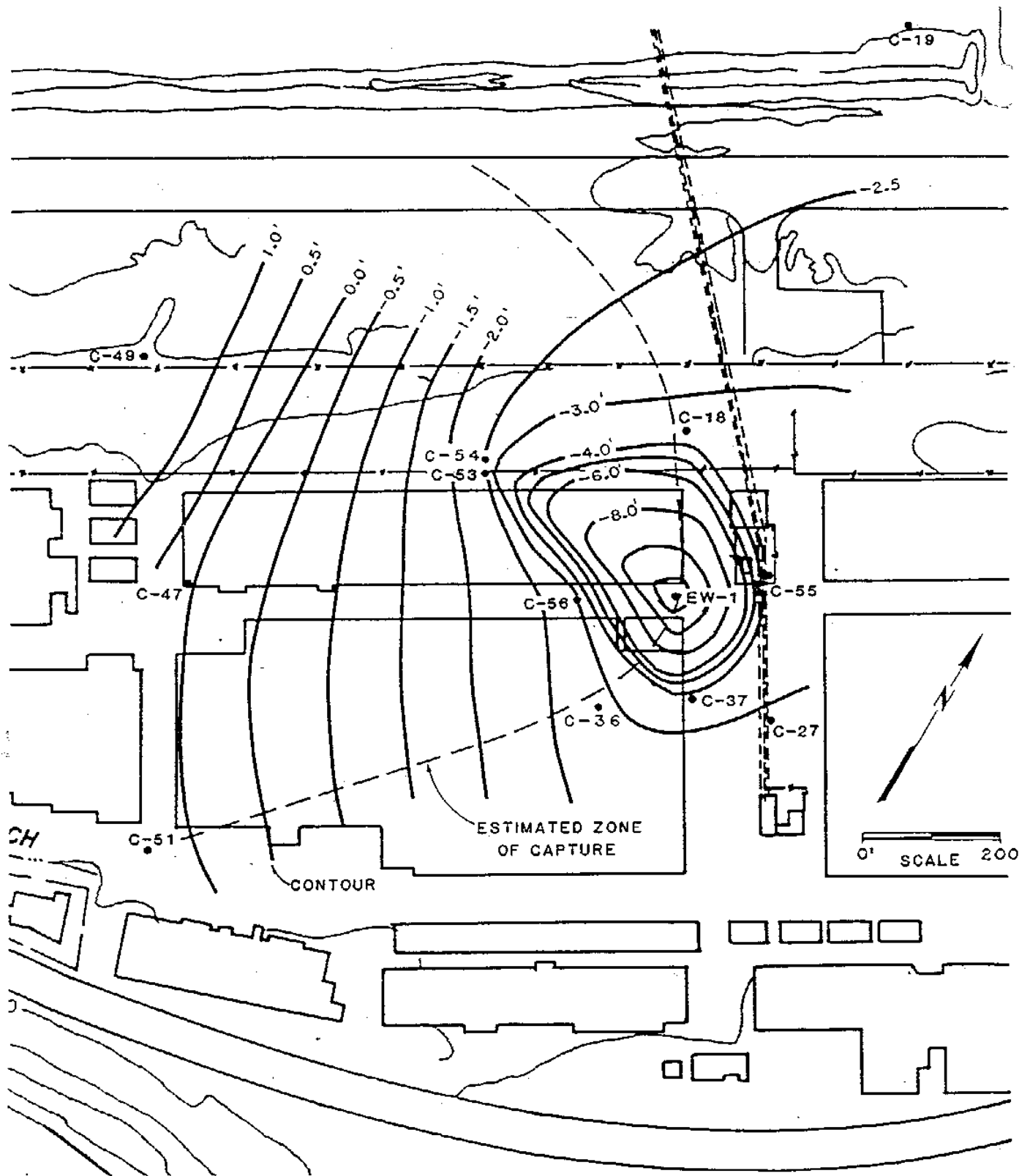
The strong anisotropy in the vertical direction implies that, in the absence of heavy pumpage, flow through the Bellflower/Ballona and Gage/Gardena Aquifers is essentially horizontal. Thus, chemicals introduced on the top of the aquifer will advectively move near the top of the aquifer. Vertical movement of chemicals in groundwater is primarily due to the effects of gravity, diffusion, and dispersion. If the effects of these processes are weaker than the effect of advective transport, the chemical plume in the vicinity of sources will be thin and lie very close to the top surface of the aquifer. As the chemicals move away from the sources, the plume will spread downward. The spread will reach the bottom surface of the Bellflower/Ballona Aquifer at relatively great distances from the sources, and plumes will thus be mainly confined within the Bellflower/Ballona or Gage/Gardena Aquifers. This is confirmed by the small concentrations of chemicals detected in the Silverado Aquifer.

The minor amount of vertical flow expected in the Bellflower/Ballona and Gage/Gardena Aquifers is markedly different from the strong vertical flow component in the saturated clays and silts of the overlying aquitard. The clay and silt layers have lower horizontal conductivities than the aquifers, and chemicals will move preferentially with groundwater in the vertical or slightly less than vertical direction toward the upper surface of the Bellflower/Ballona Aquifer.

Location of the extraction wells at short distances from the sources and screening of the wells over the depth of the Bellflower/Ballona and Gage/Gardena Aquifers would result in capture of most chemicals in the aquifer beneath the site. In addition to capture of chemicals in the vertical direction, it is necessary that the extraction wells be located such that chemicals will be captured in the horizontal direction. The zone of capture in the horizontal direction depends on the value of hydraulic conductivity. A large value of hydraulic conductivity results in a narrower and more conservative zone of capture than a small value. For the finite element computer model, a hydraulic conductivity value of $12 \text{ ft}^3/\text{day-ft}^2$ was used in determining the effect of pumping the extraction wells. To examine a number of extraction well configurations, a zone of capture computer model was operated using hydraulic conductivity values ranging from 12 to $55 \text{ ft}^3/\text{day-ft}^2$. Because the higher values of conductivity result in smaller zones of capture, a value of $55 \text{ ft}^3/\text{day-ft}^2$ was used most extensively in zone of capture modeling to determine the number, location, and discharge of the extraction wells required to capture chemicals in the aquifer beneath the Plant Site.

To verify the zone of capture model, water level measurements taken on the 30th day after the start of the pumping test were used to construct contours near the pumping well. Contours shown on Figure XI-15 indicate the combined effects of normal horizontal flow through the aquifer and pumpage. The zone of capture associated with the

FIGURE XI-15
HYDRAULIC HEAD CONTOURS
MEASURED DURING 30-DAY PUMPING TEST



extraction well used in the pumping test can be compared to the computed zone associated with the extraction well EW-4 in Figure XI-9. A comparison is made with the zone of capture of EW-4 since this zone is not significantly affected by the pumpage at the other wells. Comparing the computed and contoured zones of capture, it is obvious that the zone of capture for the pumped well is larger than the computer derived zone. The comparison indicates that design of the well system based on the value of hydraulic conductivity of $55 \text{ ft}^3/\text{day-ft}^2$ results in a system that is adequate to capture chemicals in the aquifer beneath the Plant Site.

The 36-day pumping test evaluated aquifer parameters in one part of the Bellflower/Ballona Aquifer, and the calculated parameters from the test may not completely represent the aquifer beneath the site. If the actual hydraulic conductivity of the Bellflower/Ballona Aquifer varies locally to greater than $55 \text{ ft}^3/\text{day-ft}^2$, some wells in the alternative well systems may fail to capture groundwater containing chemicals at the designed pumping rate because the predicted zone of capture would be narrower than that indicated by streamtube plots in Figures XI-6, XI-9, and XI-12. However, each extraction well in the alternative selected would be constructed and tested at the designed pumping rate. If the hydraulic conductivity determined from a pumping test on the well were higher than $55 \text{ ft}^3/\text{day-ft}^2$, the pumping rate could be increased to increase the required zone of capture.

Technical Feasibility

Preliminary design parameters for extraction wells are listed in Table XI-1. Water quality from the extraction wells has been predicted by evaluating flow patterns and capture zones for each well. The quality of water to be discharged at each extraction well was estimated for Alternative 3 by evaluating the water quality of each computer modeled flow tube within the zone of capture for the well. Each flow tube in the zone of capture represents a proportional volume of flow to the well.

Water quality in each extraction well flow tube was estimated on the basis of the chemical concentration at monitor wells or in chemical plumes occurring in the flow tube upgradient from the extraction well. The chemical behavior and depth of occurrence of chemicals were also considered in estimating influent concentrations to each well. Chemicals which will degrade to other compounds as they move downward through the aquitard and horizontally in the aquifer were decreased in concentration for the purpose of estimating influent. Chemical concentrations were proportionally diluted for the mixing of adjoining flow tubes at the extraction well. Some flow tubes will contain no chemicals or only low concentrations, and dilution will result from mixing in the well.

TABLE XI-1
CONSTRUCTION DETAILS OF RECOMMENDED EXTRACTION WELLS¹

Well No.	Total Depth (ft.)	Screened Interval (ft.)	Diameter (in.)
EW-1	110	20 - 80	8
EW-2	135	35 - 125	8
EW-3	135	35 - 125	8
Alternative 1			
EW-4	120	10 - 120	8
Alternative 2			
EW-4, 5	120	10 - 120	8
Alternative 3			
EW-4, 5, 6	120	10 - 120	8

¹ All wells will be constructed with galvanized steel piping and stainless steel screens.

The average concentration values for the flow tubes reaching each well were reduced by 50 percent because the lower portion of the Bellflower/Ballona Aquifer and the upper portion of the Silverado Aquifer which represent about 50 percent of the screened intervals of the extraction wells contain very low concentrations of chemicals compared to the upper portion of the Bellflower/Ballona Aquifer which is the source of the majority of the chemical data.

Table XI-2 lists the maximum anticipated influent at each extraction well in Alternative 3 based on the flow tube concentration averaging described above. The flow weighted maximum anticipated influent concentrations to the treatment plant for Alternative 3 are a summation of the influent concentrations to each well. The values in Table XI-2 were used to design the treatment system.

Some analytical data for lead and mercury were not used in the calculation of flow tube concentrations. Data for mercury analyses performed with EPA Method 6010 were not used because they appear to be incorrect. When the Method 6010 mercury data are compared with Method 245.1 data, the 6010 data are 1,000 times greater. One very high analysis (31,000 ppb) for lead was not used in calculation. The lead analysis was performed on a sample that was mostly gasoline. The lead value represents the gasoline which will be removed by a separate recovery system.

Extraction well locations and pumping rates for all alternatives were determined with the use of mathematical models described in a previous section. To optimize groundwater remediation, extraction wells would be constructed sequentially with one or two wells pump tested while nearby wells are monitored. Analysis of test results would then be used to refine the placement, pumping rate and design of the remaining extraction wells.

Most extraction wells would be screened from static water elevation through the Bellflower Aquitard, the Bellflower/Ballona Aquifer and approximately 20 feet into the Silverado Aquifer. Wells on the Playa del Rey Bluff would be screened from water level through the Gage/Gardena Aquifer. This design allows for extraction of water containing chemicals from all water-bearing zones in which chemicals have been detected.

There are no significant health or safety risks associated with extraction well construction. Work would be done in accordance with applicable Cal OSHA regulations and a site health and safety plan.

Environmental Effectiveness

Hydrologic simulation using the zone of capture and finite element models predicts that each alternative extraction well configuration would effectively capture groundwater containing chemicals from the

TABLE XI-2

**MAXIMUM ANTICIPATED INFLUENT CONCENTRATIONS
AT EXTRACTION WELLS (ug/l)**

Constituent	EW-1	EW-2	EW-3	EW-4	EW-5	EW-6	Flow Weighted Maximum Anticipated Influent Concentrations at Treatment Plant
Volatile Organic Compounds							
Benzene*	ND	8	12	0.5	25	0.13	10
Carbon Tetrachloride*	ND	ND	0.3	ND	ND	ND	0.1
Chlorobenzene	ND	ND	ND	ND	ND	0.2	0.1
Chloroform*	ND	315	20	11	0.2	9	60
1,1-DCA*	1	45	2,300	25	1	50	600
1,2-DCA*	ND	0.2	63	1	ND	ND	20
m-DCB*	ND	2	0.1	0.4	0.05	7	2
p-DCB*	ND	2	14	1	2	1	5
o-DCB*	ND	0.3	9	0.05	1	0.5	3
1,1-DCE*	ND	ND	490	190	ND	0.5	150
DCM*	1	16	6,300	1,000	0.5	ND	1,700
1,2 DCP*	ND	20	ND	0.3	ND	ND	4
Ethyl Benzene*	0.1	4	6	73	6	ND	13
PCE*	ND	10	240	5	ND	12	70
Toluene*	ND	10	170	75	1	0.5	60
Trans*	20	30	600	15	5	850	300
TCA*	2	8	8,400	720	ND	4	2,200
1,1,2-TCA*	ND	ND	25	0.02	ND	ND	7
TCE*	4	320	460	170	ND	93	200
Vinyl Chloride*	ND	18	190	ND	ND	0.5	50
Xylenes*	0.3	13	15	480	1	0.5	70

* - Compounds with DHS Action Level for drinking water or EPA Primary Drinking Water Standard.

- No detectable influent concentration anticipated.

TABLE XI-2

MAXIMUM ANTICIPATED INFLUENT CONCENTRATIONS
AT EXTRACTION WELLS (ug/l)
(Continued)

Constituent	EW-1	EW-2	EW-3	EW-4	EW-5	EW-6	Flow Weighted Maximum Anticipated Influent Concentrations at Treatment Plant
Petroleum Hydrocarbons							
2,3-Dimethylbutane	ND	32	3	ND	ND	ND	7
Dimethyl Hexane	ND	10	ND	ND	ND	ND	2
Dimethyl Pentane	ND	32	ND	ND	ND	ND	6
2,3-Dimethyl Pentane	ND	2	ND	ND	ND	ND	ND
2,4-Dimethyl Pentane	ND	2	7	ND	ND	ND	2
Isobutanol	ND	ND	ND	70	ND	ND	10
Isopentane	ND	ND	1	ND	ND	ND	ND
2-Methyl Butane	ND	34	5	ND	ND	ND	7
Methyl Cyclobutane	ND	ND	1	ND	ND	ND	ND
Methyl Cyclopentane	ND	ND	3	ND	ND	ND	1
Methyl Hexane	ND	ND	0.5	ND	ND	ND	ND
Pentane	ND	ND	2	ND	ND	ND	ND
Trimethyl Pentane	ND	100	ND	ND	1	ND	17
TPH	130	310	340	240	220	90	240

* - Compounds with DHS Action Level for drinking water or EPA Primary Drinking Water Standard.

ND - No detectable influent concentration anticipated.

TABLE XI-2

MAXIMUM ANTICIPATED INFLUENT CONCENTRATIONS
AT EXTRACTION WELLS (ug/l)
(Continued)

Constituent	EW-1	EW-2	EW-3	EW-4	EW-5	EW-6	Flow Weighted Maximum Anticipated Influent Concentrations at Treatment Plant
Metals							
Antimony	ND	ND	8	3	9	ND	4
Arsenic*	ND	ND	27	0.3	25	ND	10
Barium*	ND	18	50	13	35	25	30
Cadmium*	ND	ND	2	3	1	ND	1
Cobalt	ND	ND	2	ND	2	0.13	1
Chromium*	ND	ND	4	ND	2	ND	2
Copper	ND	4	3	18	ND	3	4
Iron	ND	86	400	600	710	530	400
Lead*	ND	ND	ND	0.1	ND	ND	(0.01)
Manganese	100	60	250	60	165	85	130
Mercury*	ND	ND	ND	ND	ND	ND	ND
Molybdenum	ND	3	10	3	5	2	5
Nickel	ND	ND	3	ND	ND	ND	1
Selenium*	ND	15	5	20	ND	ND	7
Silver*	ND	ND	0.2	ND	ND	ND	0.05
Thallium	ND	ND	2	ND	9	.07	2
Vanadium	ND	ND	3	2	3	1	2
Zinc	ND	15	30	75	20	33	30

* - Compounds with DHS Action Level for drinking water or EPA Primary Drinking Water Standard.

ND - No detectable influent concentration anticipated.

TABLE XI-2

MAXIMUM ANTICIPATED INFLUENT CONCENTRATIONS
AT EXTRACTION WELLS (ug/l)
(Continued)

Constituent	EW-1	EW-2	EW-3	EW-4	EW-5	EW-6	Flow Weighted Maximum Anticipated Influent Concentrations at Treatment Plant
Other Organic Compounds							
Acetone	ND	ND	ND	720	ND	ND	100
gamma-BHC (Lindane)*	ND	ND	ND	ND	ND	ND	ND
delta-BHC	ND	0.002	0.004	0.003	ND	ND	0.001
beta-BHC*	ND	ND	ND	ND	ND	ND	ND
Bis (2-ethyl hexyl) Phthalate	ND	ND	4	ND	ND	ND	2
Butane	1	ND	210	480	2	ND	120
2-Butanone (MEK)	ND	0.3	13	ND	ND	ND	4
Butyl Cellosolve	ND	ND	0.5	ND	ND	ND	0.2
Carbon Disulfide	ND	ND	18	ND	ND	ND	5
Cresol Isomers	ND	ND	ND	ND	ND	ND	ND
4,4'-DDD	ND	ND	ND	ND	ND	ND	ND
4,4'-DDE	ND	ND	ND	ND	ND	ND	ND
4,4'-DDT	ND	ND	ND	ND	ND	ND	ND
Di-n-octyl Phthalate	ND	0.04	ND	ND	ND	ND	ND
Endrin	ND	ND	ND	ND	ND	ND	ND
Heptachlor Epoxide*	ND	ND	ND	ND	ND	ND	ND
Isopropyl Alcohol	ND	ND	ND	200	ND	ND	30
Isopropyl Ether	2	ND	2	ND	ND	ND	1
Phenol**	ND	ND	100	0.5	ND	ND	20

* - Compounds with DHS Action Level for drinking water or EPA Primary Drinking Water Standard.

** - Action Level of 1 ppb - Taste and odor threshold for chlorinated systems.

*** - Detectable Influent concentration anticipated.

affected aquifers. Each alternative includes a three-well downgradient barrier which would prevent eastward movement of chemicals off-site in the Gage/Gardena, Bellflower/Ballona or Silverado Aquifers. Each alternative also includes an extraction well on the west side of the site which would control flow in an area of flat groundwater gradients and prevent any possibility of chemicals spreading off-site to the north or west.

The predicted zones of capture indicated by the streamtube configuration in Figures XI-6, XI-9, and XI-12 show in two dimensions that all chemicals which occur in groundwater at concentrations greater than Action Levels would flow to an extraction well in any alternative. Predicted aquifer response from the finite element model confirms that with extraction wells screened at appropriate depths, chemicals above Action Levels would also be captured in the vertical direction by each alternative. Therefore, each of the proposed groundwater extraction alternatives appears to be capable of preventing chemicals above Action Levels from moving toward off-site irrigation or domestic use wells.

Each alternative is designed to allow shutdown of wells beginning in approximately five to ten years after the start of pumping. In each alternative, groundwater flow and chemicals would be controlled to the extent that only two wells would be required to extract groundwater containing chemicals for the entire duration of remediation. Figures XI-11 and XI-14 indicate that in 25 years, when all wells in Alternatives 2 and 3 are turned off, there would be residual trace amounts of chemicals remaining in the groundwater beneath the site. Residual chemicals would also remain after 45 years of pumping with the Alternative 1 well configuration. The low levels of residual chemicals would be the result of the slow release of chemical molecules which adhered to soil particles, adsorbed on natural organic constituents or were trapped in soil voids above the saturated zone when the extraction well system was started. Chemical molecules could leak from soils at a very slow rate for an indefinite time period and have no significant impact on the quality of the aquifer because concentrations of the residual chemicals would be less than current Action Levels or EPA Drinking Water Standards.

Institutional Issues

Los Angeles County well construction permits will be required for well construction.

TREATMENT ALTERNATIVES

If a groundwater extraction system is constructed, the groundwater would have to be treated. Air stripping and activated carbon water treatment systems have been evaluated for groundwater treatment. For

the evaluation, an average flow rate of 300 gpm has been used for the total treatment capacity requirement, and all treatment alternatives would use the same conveyance piping layout.

Air Stripping Treatment

Air stripping is an effective treatment technique widely used for VOC removal and less costly than carbon adsorption. Air stripping transfers VOC's from water to air, and when VOC emissions are high, vapor control systems may be required. Air stripping is less effective than carbon treatment for low volatility chemicals such as chloroform and methyl ethyl ketone (2-butanone) and is not effective in removing non-volatile compounds such as heavy metals. Activated carbon can be used to polish air stripping effluent to remove less volatile chemicals or as an alternative to air stripping. Alternative air stripping treatment configurations are depicted on Figure XI-16.

Technical Feasibility

The air stripping process typically consists of pairs of towers operated in series as shown on Figure XI-17. Water is pumped to the top of the first tower and flows down the tower through high-volume packing. Air is blown up through the packing, and volatile chemicals are transferred from the water to the air. Water is collected at the bottom of the first tower and is pumped to the top of the second tower. Ducting conveys exhausted air from the top of the second tower to the bottom of the first tower in each series; thus, water and air flow countercurrent through each series.

Maximum estimated influent and effluent concentrations in water for the air stripping process are tabulated in Table XI-3. Predicted effluent water quality is based on two 38-foot high, 5-foot diameter stripping towers operated in series. Such towers would contain 25 feet of packing and have a hydraulic capacity of approximately 600 gpm.

Air stripping towers would remove volatile organic chemicals from groundwater such that effluent water would have no detectable concentrations. Non-volatile constituents in the groundwater would not be removed by air stripping. Of the non-volatile constituents remaining in the stripping tower effluent, only phenol at its maximum effluent concentration would remain above DHS Action Levels for chlorinated systems. During most of the duration of extraction and treatment, phenol in the effluent would be lower than effluent values in the table due to its high estimated rate of biodegradation in groundwater.

Air stripping has relatively low operation and maintenance requirements and is therefore a very reliable treatment technology. The air stripping treatment process can be automated and no chemical additions or supplies are necessary.

FIGURE XI-16
AIR STRIPPING ALTERNATIVES

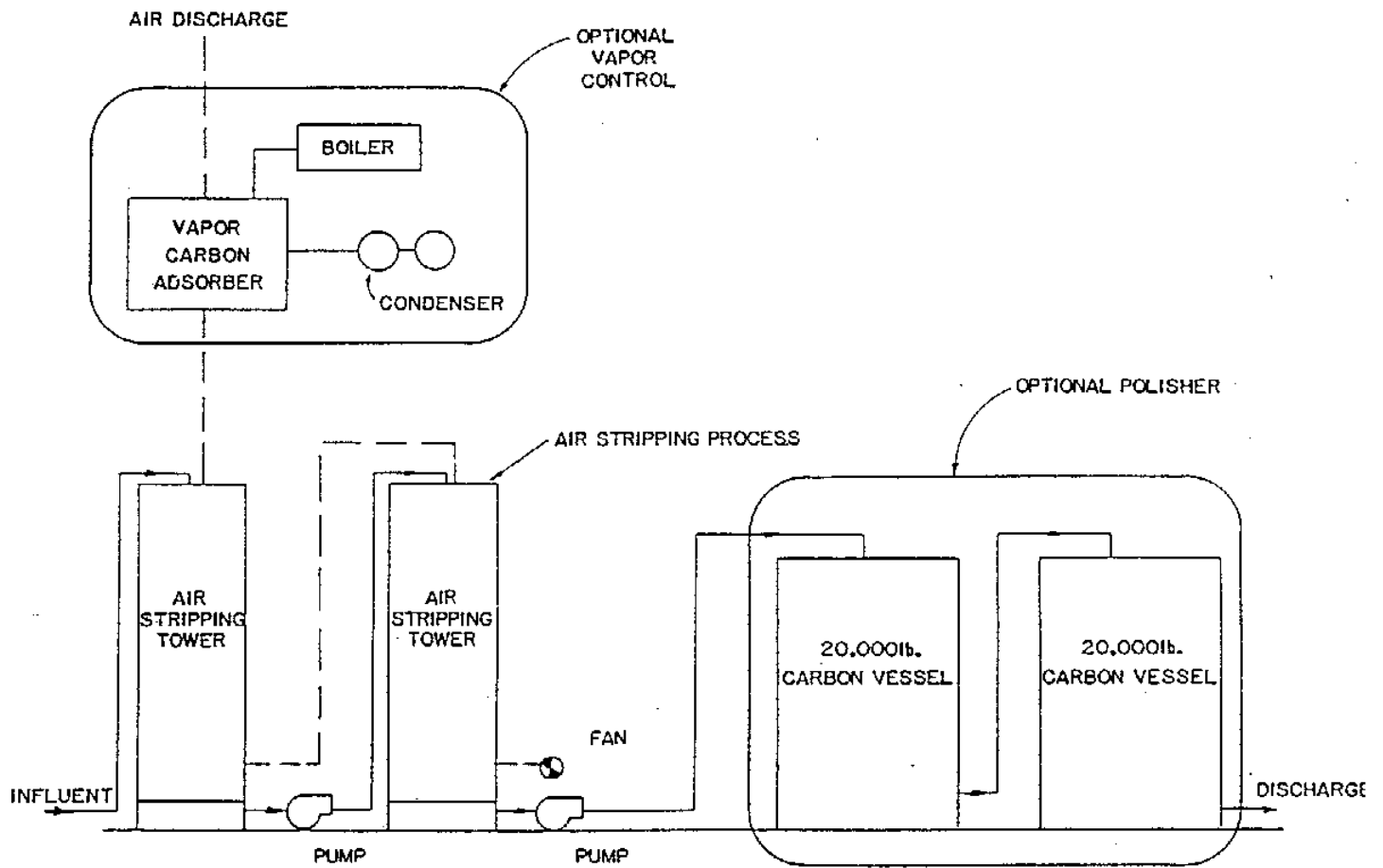


FIGURE XI-17
COUNTER CURRENT AIR
STRIPPING CONFIGURATION

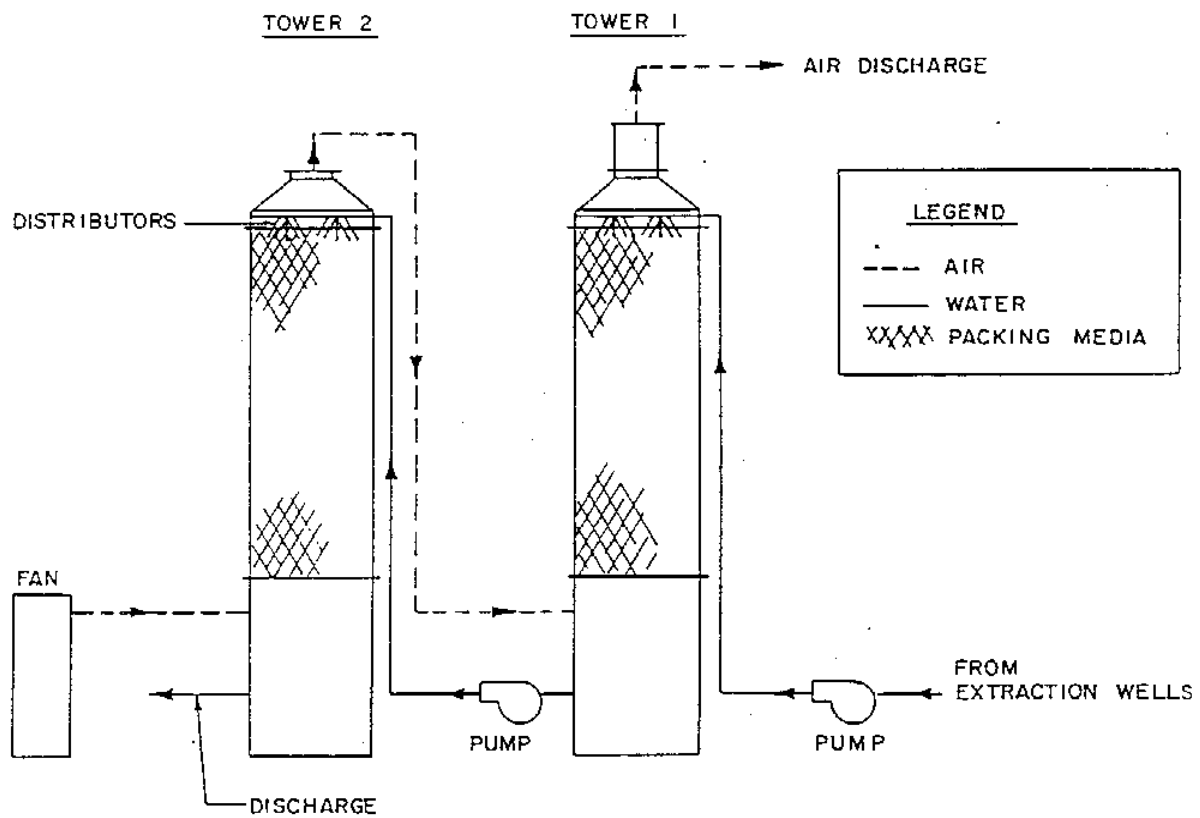


TABLE XI-3

MAXIMUM ESTIMATED AIR STRIPPING
INFLUENT AND EFFLUENT CONCENTRATIONS

Constituent	Influent (ug/l)	Effluent (ug/l)
Volatile Organic Compounds		
Benzene	10	ND*
Carbon Tetrachloride (CCl ₄)	0.1	ND
Chlorobenzene	0.1	ND
Chloroform (CHCl ₃)	60	ND
1,1-DCA	600	ND
1,2-DCA	20	ND
m-DCB	2	ND
p-DCB	5	ND
o-DCB	3	ND
1,1-DCE	150	ND
DCM	1,700	ND
1,2-DCP	4	ND
Ethyl Benzene	13	ND
PCE	70	ND
Toluene	60	ND
Trans	300	ND
TCA	2,200	ND
1,1,2-TCA	7	ND
TCE	200	ND
Vinyl Chloride	50	ND
Xylenes (total)	70	ND
Petroleum Hydrocarbons		
2,3-Dimethylbutane	7	7
Dimethyl Hexane	2	2
Dimethyl Pentane	6	6
2,4-Dimethyl Pentane	2	2
Isobutanol	10	10
2-Methyl Butane	7	7
Methyl Cyclopentane	1	1
Trimethyl Pentane	17	17
TPH	240	240

* ND - No detectable effluent concentration anticipated.

TABLE XI-3

MAXIMUM ESTIMATED AIR STRIPPING
INFLUENT AND EFFLUENT CONCENTRATIONS
(Continued)

Constituent	Influent (ug/l)	Effluent (ug/l)
Metals		
Antimony	4	4
Arsenic	10	10
Barium	30	30
Cadmium	1	1
Cobalt	1	1
Chromium	2	2
Copper	4	4
Iron	400	400
Lead	0.01	0.01
Manganese	130	130
Mercury	ND	ND
Molybdenum	5	5
Nickel	1	1
Selenium	7	7
Silver	0.05	0.05
Thallium	2	2
Vanadium	2	2
Zinc	30	30
Other Organic Compounds		
Acetone	100	100
gamma-BHC (Lindane)	ND	ND
delta-BHC	0.001	0.001
beta-BHC	ND	ND
Bis (2-ethyl hexyl) Phthalate	ND	ND
Butane	2	2
2-Butanone (MEK)	120	120
Butyl Cellosolve	4	4
Carbon Disulfide	0.2	0.2
Cresol Isomers	5	5
Di-n-octyl Phthalate	ND	ND
Endrin	ND	ND
Isopropyl Alcohol	30	30
Isopropyl Ether	1	1
Phenol	20	20

ND - No detectable effluent concentration anticipated.

Construction of an air stripping treatment plant can be easily implemented. The treatment system can be constructed on a flat bed trailer, so much of the construction can be done off-site and the treatment plant can be moved when it is no longer required.

The air stripping treatment plant poses no unusual safety risks. The Plant Site is not open to the general public, and the treatment plant site will likely be fenced. Walkways, pipe crossings, and other features of the plant will be constructed in accordance with Cal OSHA requirements.

Environmental Effectiveness

The air stripping treatment system is predicted to be 99.9 percent efficient in reducing total influent VOC concentrations. At an average flow rate of 300 gpm, the air stripping treatment plant would release approximately 20 pounds per day of chemicals to the atmosphere.

Institutional Issues

The air stripping treatment plant would require a permit from the South Coast Air Quality Management District (SCAQMD). The RWQCB would establish monitoring requirements for the treatment plant effluent. A National Pollution Discharge Elimination System (NPDES) permit is required for discharge.

Air Stripping with Vapor Control

When flow rates and chemical concentrations are high, air stripping may result in unacceptable volatile chemical emissions to air. To remove chemicals from the airstream, activated carbon can be used. Use of carbon to remove chemicals from air has several advantages over treatment of water with carbon. Activated carbon can adsorb higher quantities of volatile chemicals from air than from water, so regeneration is required less frequently. Carbon used for vapor control can be regenerated using less steam than carbon used for removal of chemicals from water. The configuration of vapor control carbon beds is such that the carbon can be regenerated in place, rather than requiring transfer to special regeneration vessels, as is the case with aqueous carbon systems.

Technical Feasibility

Air stripping with vapor control consists of the air stripping system described previously, with activated carbon vapor phase control (Figure XI-16). The activated carbon system consists of two beds with continuous operation of one of the beds while the alternate bed is

regenerated. Carbon is regenerated with steam and a distillation process enables recovery of nearly pure, recyclable solvent. While in use, the carbon beds are monitored continuously and the carbon regeneration process is activated automatically. Condensate from the carbon regeneration system is returned to the influent stream.

Such a vapor control system is fully automated and requires little maintenance. It has been estimated that each carbon bed can be regenerated approximately 100 times before the carbon must be replaced. Activated carbon for vapor phase control is considered to be a very reliable treatment process. Vapor phase control systems are available as packaged treatment modules. As a result, vapor phase control can be quickly implemented.

There are no unusual safety risks associated with construction of operation of activated carbon vapor control systems. Steam for carbon regeneration is produced with a low pressure boiler. This type of boiler has less stringent operating requirements than high pressure boilers required for regeneration of aqueous phase carbon.

Environmental Effectiveness

Activated carbon vapor control will substantially reduce air emissions from the air stripping process. The process produces a very concentrated liquid mixture of extracted chemicals. The chemical concentrate must be recycled or disposed of properly to minimize environmental risk. Once the carbon has been expended and can no longer be regenerated, it also must be disposed of properly.

Institutional Issues

The only institutional issue regarding vapor phase control is disposal of chemical concentrate. The chemical concentrate must be handled and manifested as a hazardous material. If chemical concentrate is stored longer than 90 days, the storage facilities may require permitting pursuant to RCRA.

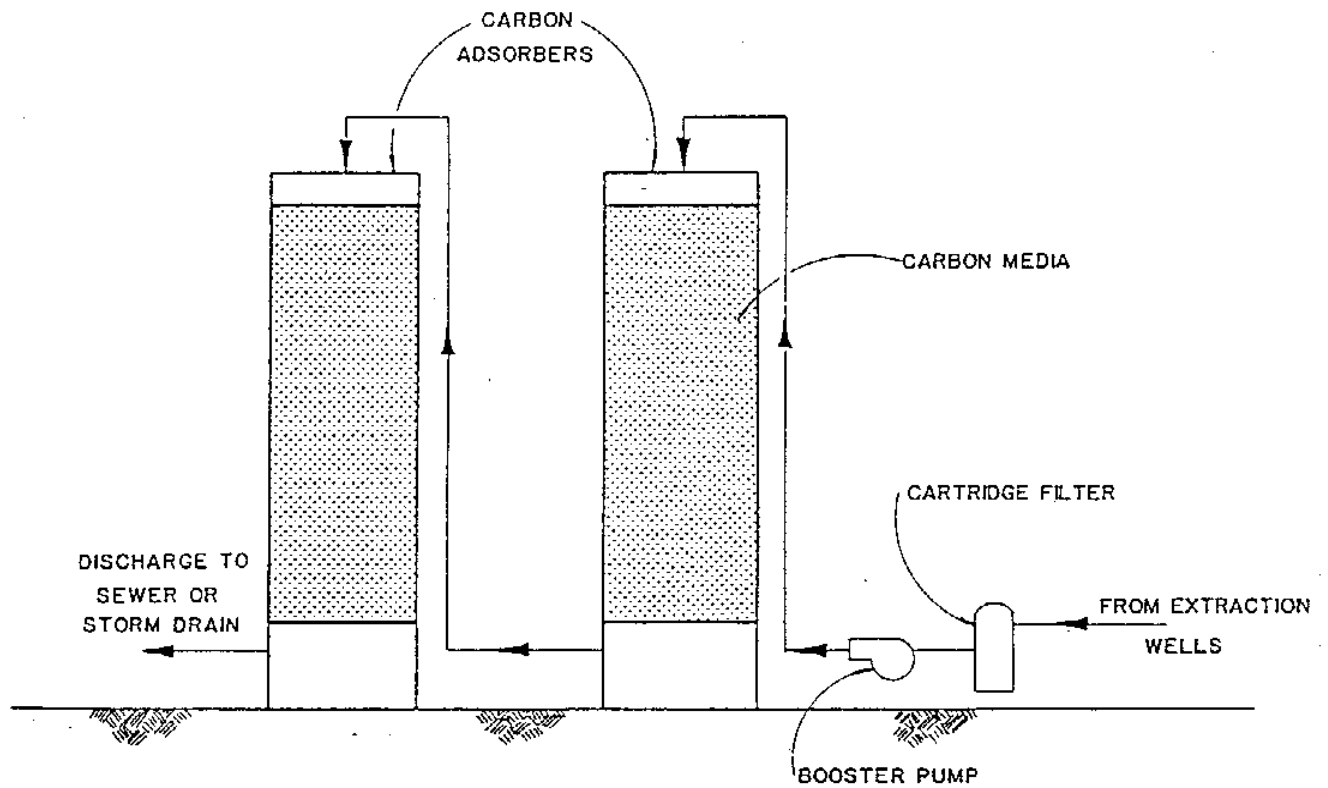
Air Stripping with Activated Carbon Polisher

If it became desirable to remove compounds from treated water effluent that cannot otherwise be removed by air stripping, the air stripping effluent can be further treated with activated carbon.

Technical Feasibility

A typical activated carbon treatment system is shown on Figure XI-18. The treatment facility would have a hydraulic capacity of approximately 500 gpm and would consist of two vessels, each filled with 20,000 pounds of activated carbon. Water would be conveyed to the top of the

FIGURE XI-18
DUAL BED LIQUID
PHASE CARBON
ADSORPTION SYSTEM



first vessel, flow down through the carbon, be conveyed to the top of the second vessel, and would down through the carbon. As water passes through the carbon, VOC's in the water would adsorb onto the surface of the carbon.

The two-vessel treatment system provides a very reliable treatment process. All chemicals would be adsorbed in the first vessel in the series until the carbon in the first vessel becomes loaded with chemicals. When the first vessel becomes loaded and chemicals pass through to the second vessel, "break-through" occurs. At this time, carbon in the first vessel would be replaced and the treatment path reversed so that the second vessel in the series becomes the first and vice versa. At projected flow rates (300 gpm) and chemical concentrations (approximately 1.3 ppm), carbon in one of the 20,000-pound vessels would require replacement every 60 days (loading of 0.014 pounds chemical per pound of carbon).

As water passes through the vessels and the carbon settles, resistance to flow increases. To counteract this effect, the system must be backwashed.

Activated carbon systems are pre-packaged treatment systems. Therefore, the activated carbon system can be implemented readily. Prior to implementation, carbon adsorption tests should be run with water which would be treated. Carbon adsorption rates have been predicted using conservative assumptions. Due to the mixture of chemicals in the influent stream and the relatively high TDS concentrations, actual loading rates are difficult to accurately predict without testing.

The only safety hazard associated with activated carbon systems is entry into the carbon vessels. Activated carbon depletes oxygen inside the vessels. There have been several fatalities due to careless entry into activated carbon vessels. Facility operators would be trained to avoid such risks.

Environmental Effectiveness

Activated carbon would reduce chemical concentrations in air stripper effluent to less than the limits of detection. Chemicals are transferred from the influent stream to the carbon media. Proper disposal of chemically loaded carbon would be required.

Institutional Issues

The principal institutional issues regard supply and disposal of carbon. The carbon would contain approximately 14,000 ppm of chemicals at disposal and would probably be classified as hazardous waste.

Activated Carbon Treatment

An activated carbon treatment system such as that described for polishing air stripper effluent could be used as the primary treatment process. Chemical loading, however, is fairly high. At 300 gpm and 7 ppm of influent chemicals, the plant would remove approximately 25 pounds of chemicals per day. Using a carbon adsorption capacity of 0.014 pounds of chemicals per pound of carbon, approximately 1,800 pounds of carbon would become loaded with chemicals each day. To supply and dispose of that much carbon would increase annual operating costs by 4 to 5 times. Therefore, this type of carbon treatment is impractical as the primary treatment process.

Activated Carbon with On-Site Regeneration

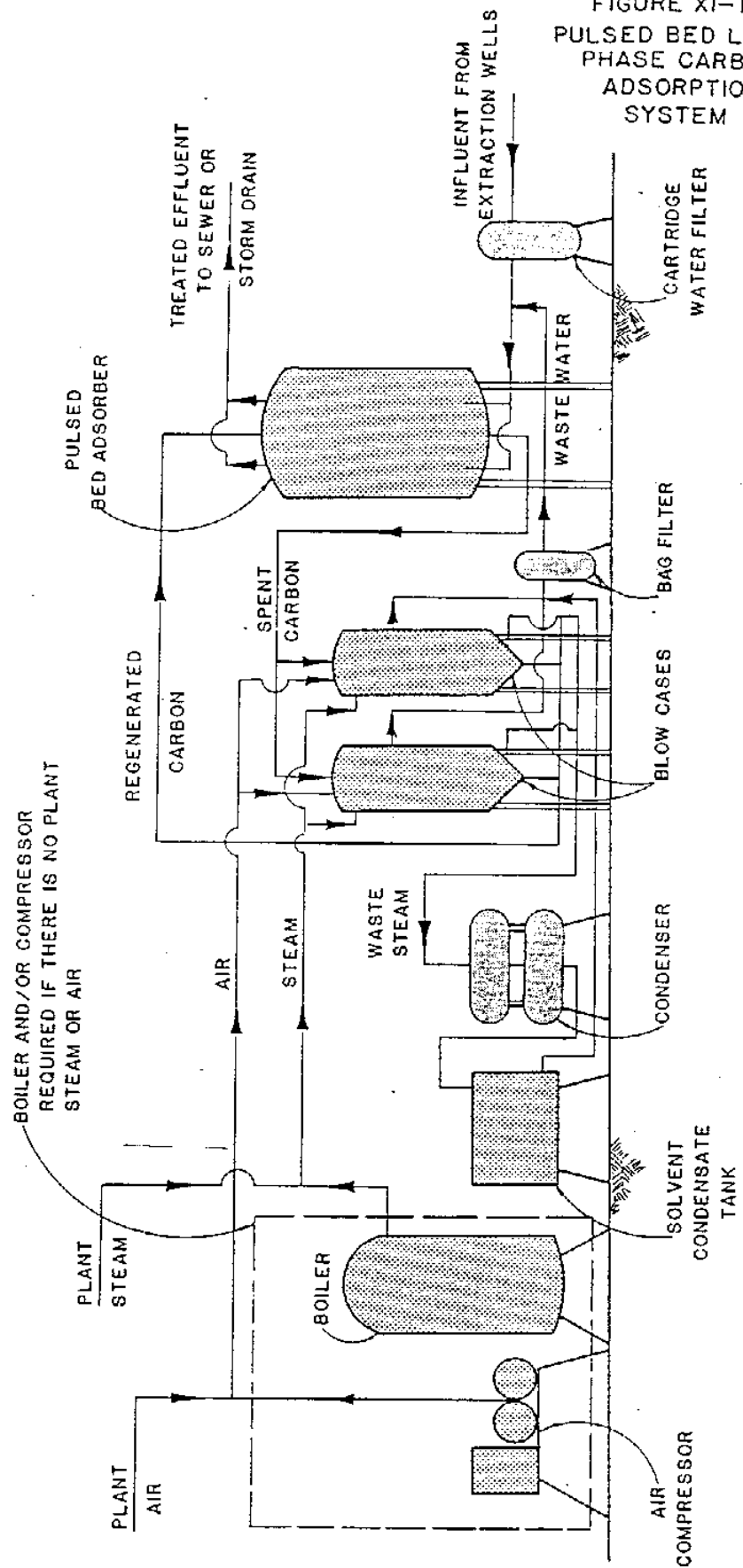
By providing capability for on-site regeneration of chemically loaded carbon, costs for carbon replacement can be significantly reduced. The carbon system evaluated herein is a pulsed-bed system, in which carbon regeneration can be accomplished without interrupting treatment operations.

Technical Feasibility

A typical pulsed-bed carbon treatment system is shown on Figure XI-19. The primary treatment component is the carbon adsorber vessel. Influent water flows up through the adsorber and out the top of the vessel. As water flows up through the carbon, chemicals are adsorbed. Sample taps are located up the side of the vessel, and by analyzing water from the taps, the point at which all chemicals are adsorbed can be determined. As carbon becomes loaded, the point of adsorption moves up the vessel. Periodically, carbon can be removed from the bottom of the vessel and transferred to carbon blow cases. Carbon is regenerated in the blow cases with steam. Condensate from the regeneration process is captured and can be distilled to a higher concentration or treated with processes such as ultraviolet oxidation. Regenerated carbon is transferred to the top of the carbon adsorption vessel, so carbon and water move through the carbon adsorption vessel in a countercurrent fashion.

Pulsed-bed carbon systems have high maintenance requirements. The carbon transfer and regeneration processes are complicated and require numerous valves to be opened and closed. The boiler is a high pressure system with special operator requirements. Laboratory analysis of samples from adsorber sample taps take time, so operation cannot be immediately adjusted. Movement of carbon through the adsorber vessel is not ideal. Bridging can occur in the vessel. As a result, pulsed bed carbon systems are not highly reliable.

FIGURE XI-19
PULSED BED LIQUID
PHASE CARBON
ADSORPTION
SYSTEM



Environmental Effectiveness

An optimum pulsed bed treatment system would be effective in reducing chemical concentrations in extracted groundwater. The primary environmental issue regarding such a system would be treatment and disposal of regeneration condensate. The system produces liquid hazardous waste.

DISPOSAL OF TREATED WATER

Two alternatives for disposal of treated water have been evaluated. The first alternative is to discharge treated water to an enclosed storm drain which would carry the water from the property to the Ballona Channel. The second alternative is to construct injection wells to return treated water to the groundwater system.

Discharge to the Storm Drain

Discharge to a storm drain could be implemented by installing a conveyance pipeline to the storm drain system, which would in turn discharge to the Ballona Channel. Discharge to the storm drain system is the easiest discharge option to accomplish.

Technical Feasibility

The discharge system would consist of a corrugated metal pipeline from the treatment plant to the inlet of the storm drain. The pipeline would be buried approximately two feet underground. The storm drain would convey treated water to the Ballona Channel and then to the Pacific Ocean. Average discharge from the treatment plant would be approximately 300 gpm.

Environmental Effectiveness

Discharge to the storm drain would be an effective option for disposing of treated effluent. Effluent chemical concentrations would be much less than levels which could potentially cause adverse environmental impacts to the Ballona Channel or Pacific Ocean.

Institutional Issues

A National Pollution Discharge Elimination System (NPDES) permit would be required for discharge to the storm drainage system. NPDES permits are issued by the RWQCB and specify acceptable parameters and effluent monitoring requirements. It takes approximately six months for the RWQCB to issue an NPDES permit after receipt of an application.

Discharge to Injection Wells

Treated groundwater could potentially be returned directly to the groundwater aquifer through injection wells. An advantage of injection wells is that, in some cases, they can be located and operated to accelerate the groundwater cleanup process. Injection wells are expensive, however, and they require special water treatment to prevent scaling which reduces the efficiency of the wells. Site conditions are not good for injection wells because the groundwater is within 10 to 25 feet of ground surface, limiting the pressure at which injection wells could be operated.

Technical Feasibility

For this evaluation, it is estimated that approximately 20 gpm can be recharged through each injection well. To provide standby capacity when injection wells are redeveloped, 18 injection wells would be constructed. Locations for injection wells would be selected to work in conjunction with extraction wells to form an additional hydraulic barrier to prevent groundwater from flowing off-site. Also, treated groundwater could potentially be injected along the sides of the chemical plumes to accelerate plume movement to longitudinal extraction wells.

Injection wells eventually clog, and redevelopment will be required. An important factor in injection well clogging is formation of carbonate precipitates. The pH increase which occurs in the air stripping process can accelerate carbonate precipitation. Air stripping effluent for groundwater injection is treated with carbon dioxide to reduce the effluent pH. Injection requires a booster pump at the treatment plant to provide required injection pressure. A booster pump would not be required unless injection wells are constructed.

The locations of extraction wells would be limited to the eastern portion of the Plant Site where groundwater surface occurs 20 to 25 feet below ground surface. On the west end of the property where groundwater is within about 10 feet of ground surface, there is an inadequate pressure head available for injection. On the east end of the Plant Site, injection would cause a rise in the groundwater table and could potentially cause flooding of building basements and structural problems for foundations.

Environmental Effectiveness

The principal advantage of injection wells is that treated water is returned to the groundwater aquifer. Injection wells frequently can be positioned to accelerate the groundwater remediation process at sites with favorable hydrogeologic conditions; however, at the Plant Site, the benefits of injection would be minimal, if any.

Institutional Issues

Construction of injection wells would require a well construction permit from the Los Angeles County Department of Health. Injection wells could also potentially require an EPA injection permit. There is also some question regarding whether treated water could be reinjected under the provisions of Proposition 65.

SECTION XII

RECOMMENDED ALTERNATIVE

The site remediation program for the Plant Site consists of three components: (1) Soils Remediation, (2) Gasoline Recovery, and (3) Groundwater Restoration. A preliminary schedule for implementation is shown on Figure XII-1.

REMEDIAL MEASURES PERFORMED TO DATE

A number of measures have been completed which minimize the possibility of any continuing discharge of chemicals from suspected sources on the Plant Site. The measures include:

- . A clarifier and a chromate waste sump at Building 35 have been relined;
- . A leaking gasoline fuel line west of Building 11 has been taken out of service;
- . Ten underground tanks in a fuel storage area on the west side of the Plant Site have been removed;
- . Containment barriers have been installed around metal cutting and tooling machinery in Building 15 to control cutting oil discharge to the utility trenches;
- . Soil containing greater than 100 ppm TPH has been removed from Test Site 2;
- . Soil containing greater than 100 ppm TPH has been removed from the Temporary Drum Storage Area;
- . Soil containing copper at concentrations which exceed hazardous waste criteria has been removed from the Remote Test Site;
- . Four sumps and immediately adjacent and underlying soils have been removed from the Salvage Yard; and
- . Soil containing high concentrations of benzene has been removed from the Engine Cleaning Pits Area.

FIGURE XII-1
OVERALL REMEDIAL
SCHEDULE

PHASE	YEAR									
	1	2	3	4	5	6	7	8	9	10
SOILS REMEDIATION										
Implementation										
West Side										
East Side										
GASOLINE RECOVERY										
Implementation										
Operation										
GROUNDWATER REMEDIATION										
Implementation										
Operation										

The following potential sources have been taken out of service:

- . Liquid Waste Neutralization Pit (Building 6);
- . Building 12 Backfilled Clarifiers and Test Sump;
- . Engine Cleaning Pits (north of Building 31, near runway);
- . Remote Test Site sumps and sewage pit;
- . Underground tank (south of Building 5);
- . Two underground tanks (west of Building 11);
- . Three 15,000-gallon underground storage tanks (Building 15);
- . 5,000-gallon underground JP-5 tank;
- . 10,000-gallon underground JP-5 fuel tank;
- . Two underground tanks (north of Building 12);
- . 300-gallon JP-4 fuel tank (east of Building 973);
- . Jet fuel tank (west of Building 45);
- . Purged Fuel Storage Area (west of Building 45);
- . Temporary Chemical Drum Storage Area (Building 29);
- . Test Site 3;
- . Test Site 2;
- . Fire Training Burn Pit; and,
- . Former Drum Storage Area.

SOILS REMEDIATION PROGRAM

The soils remediation program is designed to remove all soils containing chemicals in excess of hazardous waste criteria and TPH at concentrations greater than 100 ppm. Also, soil containing chemical concentrations which would be beneficial to remove in terms of the groundwater remediation program are recommended for removal. Specific soil quality criteria were discussed in Section X. Soil sampling would be conducted in all excavations prior to backfilling to verify that remaining soils meet cleanup criteria. In addition, underground storage tanks and in-ground sumps regulated as tanks in compliance with

City of Los Angeles and State regulations. Compliance will be achieved by closure of tanks which are out of service or are found to be leaking. Closure activities may result in additional remediation at tank locations.

More soil boring data have generally been collected for the west area than the east side manufacturing area. The data have been collected to identify potential chemical source areas and characterize the extent of chemicals in soil at potential source areas on the west side of the property. A more complete characterization of the west side sites than the east side sites was accomplished because the west side sites are scheduled for remediation first. Remedial action for east side sites has been evaluated and recommended on the basis of existing data and assumptions regarding probable soil conditions. Some additional soil analyses may be required in order to prepare detailed engineering plans for some of the sites. Evaluation of data for east side sites and recommendations for additional investigations are presented in Table XII-1, which follows this section.

The 10 potential source areas are listed below with a summary of recommended remediation activities and associated rationale. Following the summary are details of the remediation recommendations. At sites where remediation has been recently completed or initiated, the remediation is summarized. A separate remediation report for these sites will be prepared after all analytical data are received and post-remediation surveying is complete.

Potential Source Areas

- 1) Fire Training Burn Pit - dewater, excavate, and backfill.

Rationale: Large area of chemically-laden soil which appears to be cost effective to remediate relative to groundwater program.

- 2) Salvage Yard - excavate soils exceeding cleanup criteria and remove in-ground sumps.

Rationale: Soils in portion of Salvage Yard exceed cleanup criteria and sump removal is required for tank regulation compliance.

- 3) Former Drum Storage Area - excavate and backfill.

Rationale: Soils exceed cleanup criteria.

- 4) Storm Drainage Discharge Site - excavate.

Rationale: Soils exceed cleanup criteria.

- 5) Building 12 Backfilled Clarifiers and Test Sump - remove sump and clarifiers, excavate soils and backfill.

Rationale: Soils exceed cleanup criteria.

- 6) Building 15 Utility Trenches - complete additional soil sampling during future building demolition and define extent and type of soil cleanup.

Rationale: Soils exceed cleanup criteria but not hazardous waste levels; migration of groundwater from site will be controlled.

- 7) Building 14 Clarifier - excavate clarifier during future building demolition.

Rationale: No cleanup criteria exceeded.

- 8) Building 11 Tanks - excavate around piping, remove gasoline tanks, backfill and implement gasoline recovery.

Rationale: Gasoline floating on groundwater table.

- 9) Building 35 Sumps - remove organics sump and underlying soils.

Rationale: Soils exceed TPH cleanup criteria; other Building 35 sumps have been retrofitted and are not significant sources of chemicals to groundwater in operation.

- 10) Underground Tank South of Building 5 - temporarily close tank in place and remove and excavate surrounding soil during future building demolition.

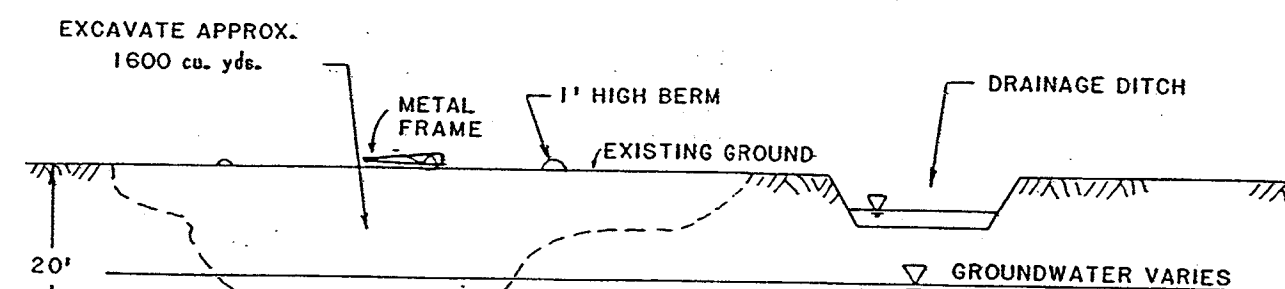
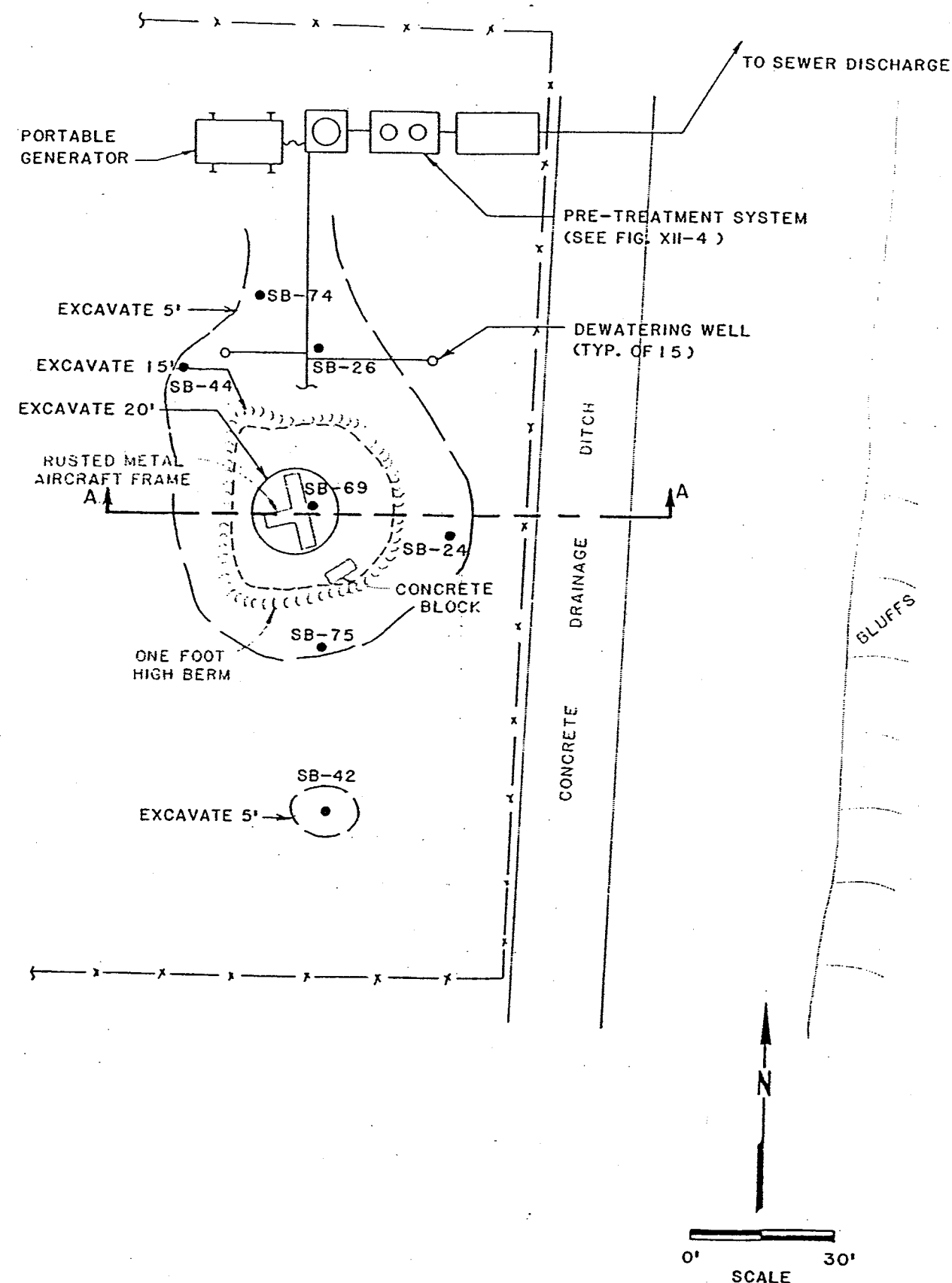
Rationale: 1) Soil criteria are exceeded, 2) depth of tank (approximately 24 feet) and adjacent passageway between basements of Buildings 5 and 6 prevent excavation with standard practices when buildings are in use, and 3) an extraction well immediately downgradient will control any chemicals originating in area.

Fire Training Burn Pit

Recommended remediation at the Fire Training Burn Pit is shown on Figure XII-2 and consists of the following:

- 1) Excavate and remove unsaturated soil in and within 10 to 15 feet of the bermed area to a depth of approximately 5 feet. This would remove a large portion of VOC's at the site, all PNA compounds, and soils at SB-69 and SB-75 containing TPH over 100 ppm.

FIGURE XII-2
FIRE TRAINING BURN PIT
EXCAVATION PLAN



SECTION A-A
SCALE: 1" = 20'

- 2) Excavate and remove additional unsaturated soil where total petroleum hydrocarbons (TPH) exceed 100 ppm by removing surface soils around SB-42 and SB-44 to a depth of about five feet.
- 3) Dewater, excavate, and remove saturated soils inside the berm where data indicate that VOC's in these low permeability clays may be a long-term source of chemicals to the shallow groundwater. Excavate to a depth of 15 to 20 feet in the center of the berm at SB-69 and remove soil as shown in Section A-A, Figure XII-2.

It is estimated that a total of 1,600 cubic yards of soil would be excavated. Actual volumes will be determined in the field based on observation and soil analysis from the excavation. The soil would be disposed of as non-hazardous in accordance with the DHS non-hazardous classification which has been received.

The dewatering system would be developed using a pilot well to determine the most effective well configuration and will probably consist of 15 well points. Groundwater would be pumped with air lift pumps and treated using a bag filter and carbon scrubber prior to discharge to the sewer (Figure XII-3). Approximately 4,400 feet of 3-inch aluminum pipe with victaulic couplings would be used to convey the water to the Purged Fuel Storage Area, where it would be discharged to the sewer as shown in Figure XII-4.

The first five feet of excavation would be completed in lifts of approximately one foot using either a track excavator or scraper/loader combination, depending on the method of disposal. The material would be stockpiled prior to loading for disposal. Deeper material would be excavated using a track excavator or clam shell to work in the dewatered material. Soil would be stockpiled prior to loading for disposal.

After excavation, soils at the bottom and sides of the excavation would be tested to determine if soils designated for removal have been excavated. After soil analyses have confirmed the quality of remaining soils, the excavation will be backfilled with clean soils.

Salvage Yard

Recommended and completed remediation of the Salvage Yard is shown on Figure XII-5 and consists of the following:

- 1) Excavation and removal of the sump south of Building 23. Analysis of samples is being completed to verify that chemical concentrations in remaining soil are below cleanup criteria.
- 2) Excavation and removal of the surface drain along with one cubic yard of soil to a depth of approximately one foot around C-39 where TPH exceed 100 ppm.

FIGURE XII-3
DEWATERING FLOW SCHEMATIC

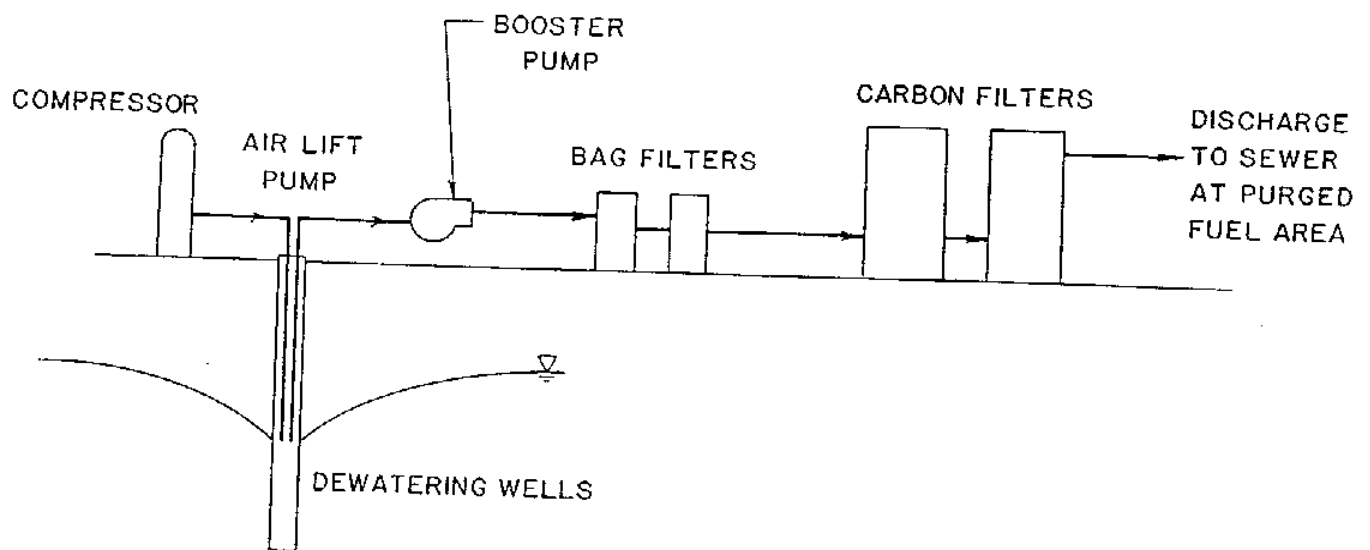


FIGURE XII-4
FIRE TRAINING BURN PIT
DEWATERING SYSTEM

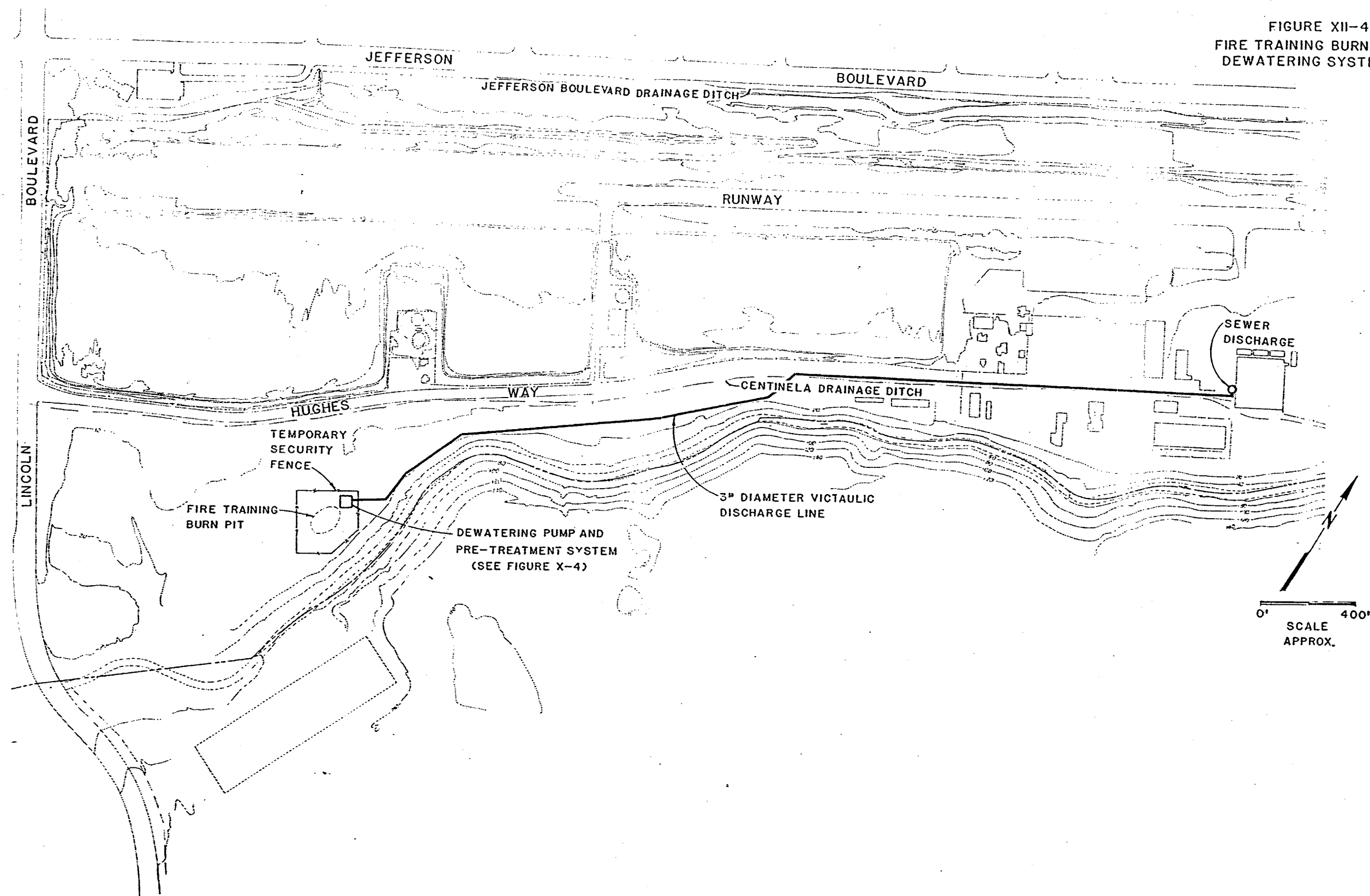
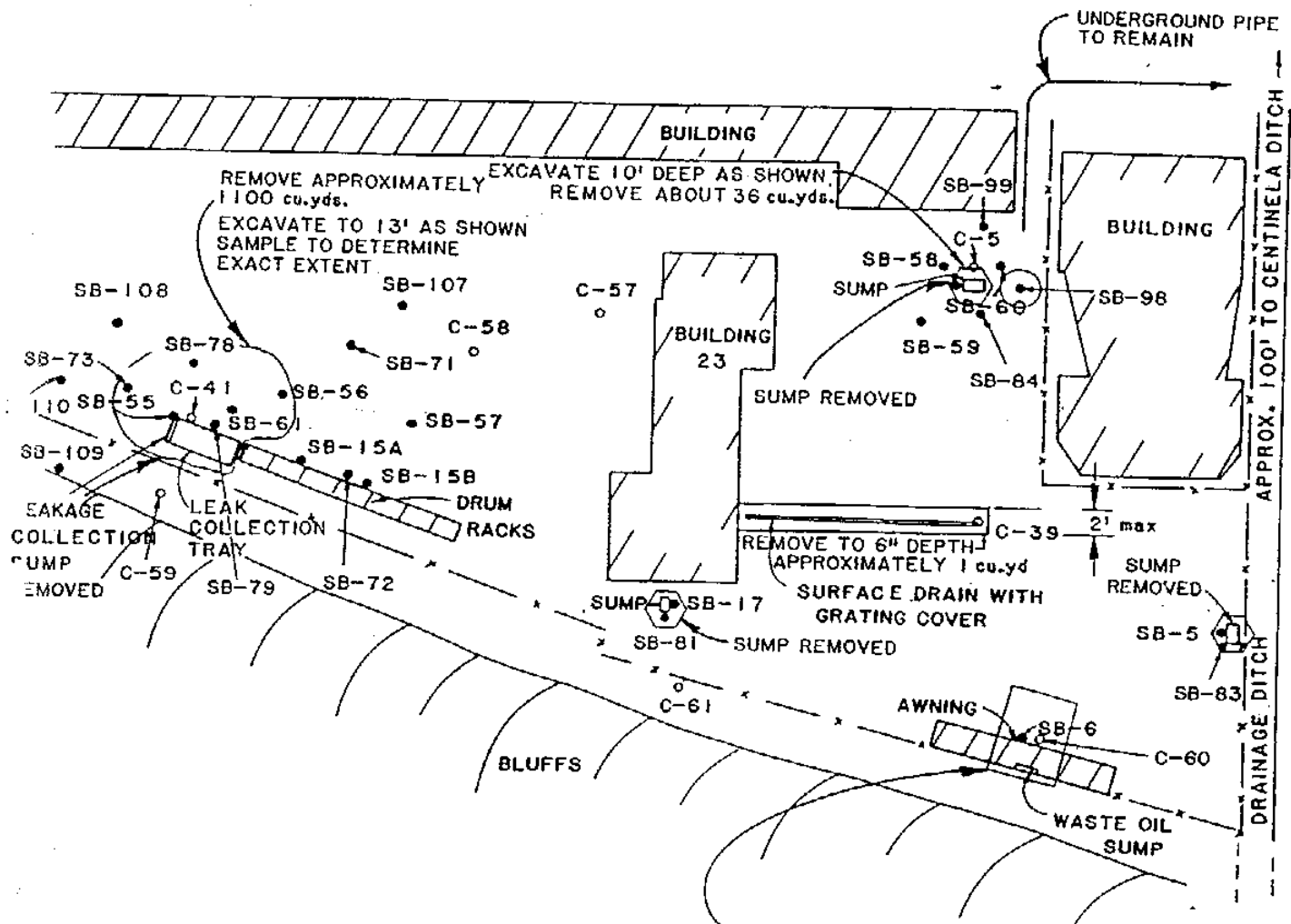


FIGURE XII-5
SALVAGE YARD
EXCAVATION PLAN



LEGEND

- SB-17 • SOIL BORING
C-39 ○ MONITORING WELL

NOTES:

1. REMOVED CONCRETE SUMP NEAR SB-5 AND EXCAVATED
8'x12' TO 10' DEEP (40 cu. yds.)
2. REMOVED CONCRETE AT LEAKAGE COLLECTION SUMP
16'x20'x12' DEEP (140 cu. yds.)

EXCAVATE TO DEPTH 9.5'-10' AS SHOWN
EXCAVATE & SAMPLE FOR REMOVAL-EXTENT
REMOVE APPROXIMATELY 150 cu.yds.



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- 3) Excavation and removal of the sump adjacent to the drainage ditch along with 15 cubic yards of soil. Analysis of samples are being completed to verify that chemical concentrations in remaining soil are below cleanup criteria.
- 4) Excavation and removal of the solvent sump northeast of Building 23 and 43 cubic yards of soil. Analyses of samples are being completed to verify chemical concentrations in remaining soils are below cleanup criteria.
- 5) Excavation and removal of the waste oil sump and approximately 150 cubic yards of soil to a depth of 10 feet around the sump where TPH is above 100 ppm. Analyze soil from beneath sump for polychlorinated biphenyls (PCB's), since PCB's were detected at 29 ppm in C-60 at 0.5 feet.
- 6) Excavation and removal of the leakage collection sump and approximately 140 cubic yards of unsaturated soil contiguous to the sump and Well C-41. After current operations are terminated from the Salvage Yard (1987), approximately 1,100 cubic yards of additional soil which could affect the cost effectiveness of groundwater remediation will be removed from this area. The excavation is planned to remove all unsaturated soil at SB-55, SB-56, SB-61, SB-73, SB-78, and SB-79 to a depth of approximately 12 feet. The actual volume of soil to be removed will be based on analytical results of soil samples taken during excavation.

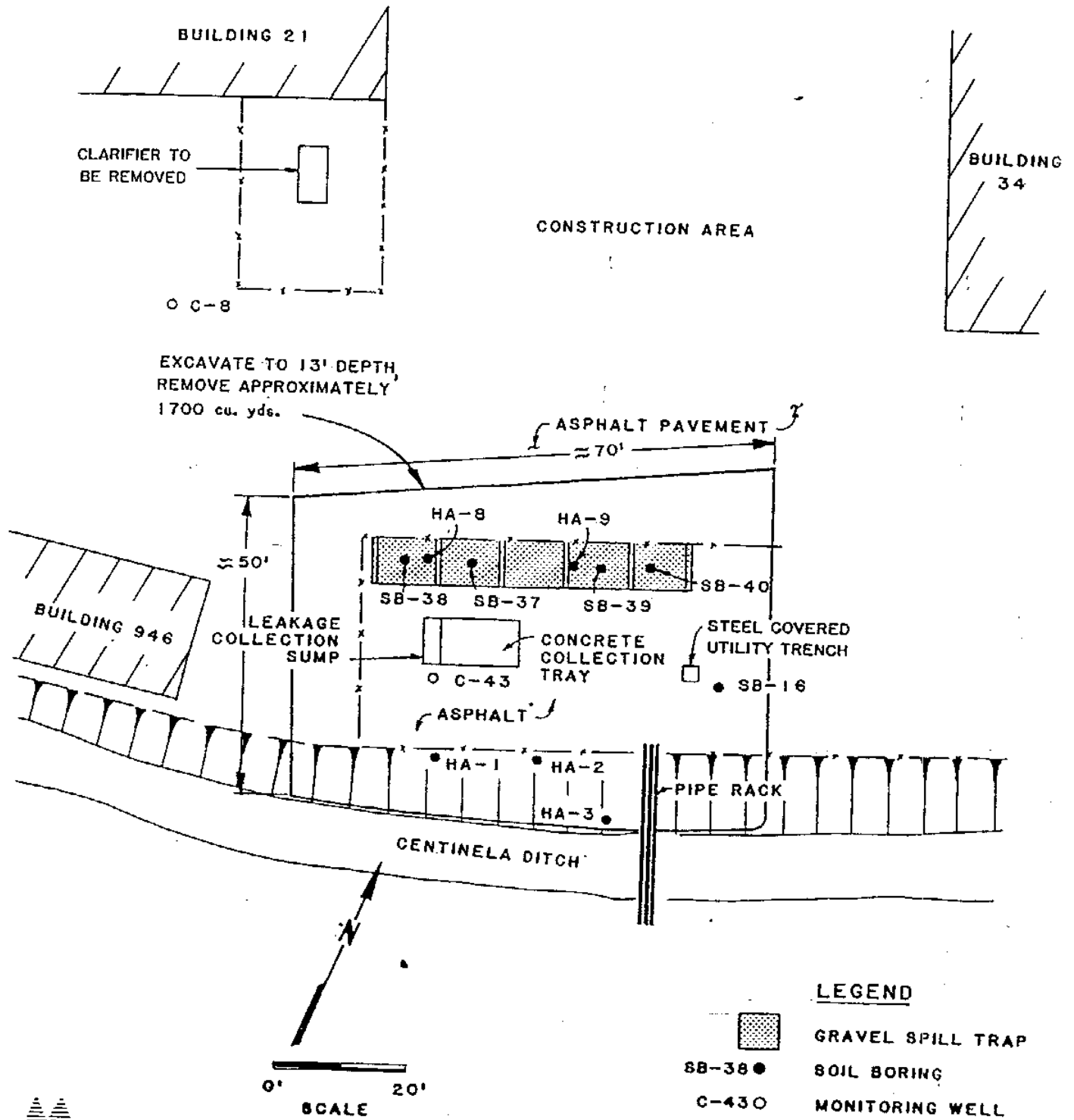
Former Drum Storage Area

Recommended remediation of the Former Drum Storage Area is shown on Figure XII-6 and consists of the following:

- 1) Collect samples from eight soil borings at this site located approximately ten feet beyond the site perimeter to determine the lateral extent of chemicals.
- 2) Excavation and removal of surface structures and approximately 1,700 cubic yards of soil to the water table because the soils may be classified hazardous or may affect the cost effectiveness of the groundwater remediation system. VOC's present in saturated soil will be addressed by the groundwater remediation program. Verify quality of remaining soil through sampling program.
- 3) Removal of clarifier south of Building 21 and analysis of soil samples to verify soil quality. Excavation of soils that exceed cleanup criteria.

Depending upon disposal costs, excavation and disposal may cost more than in-situ treatment such as soil flushing and devolatilization.

FIGURE A11-5
FORMER DRUM STORAGE
AREA AND CLARIFIER
SOUTHEAST OF BUILDING 21
EXCAVATION PLAN



Storm Drainage Discharge Site

Recommended remediation of the Storm Drainage Discharge Site is shown on Figure XII-7 and consists of the following:

- 1) Excavation and removal of up to 100 cubic yards of surface soils to a depth of approximately one foot because of the frequent occurrence of TPH above 100 ppm and because VOC's exceed cleanup criteria in SB-30 at 0.5 feet. Verify the quality of remaining soil through sampling program.

Building 12 Backfilled Clarifiers and Test Sump

Recommended remediation of the Building 12 Backfilled Clarifiers and Test Sump is shown on Figure XII-8 and consists of the following:

- 1) Collection of samples from three soil borings located at the second clarifier, the test sump, and the storm drain to determine whether these structures are source areas. Collection of samples from a fourth soil boring located ten feet northeast of C-47 to determine the lateral extent of chemicals at this site.
- 2) Excavation and removal of all sumps and approximately 150 cubic yards of unsaturated soil where VOC's exceed cleanup criteria.

Building 15 Utility Trenches and Clarifier

Soils beneath Building 15 should be remediated when the building is decommissioned in about ten years. During the interim period, chemicals originating at the site will be controlled by the groundwater remediation program. After demolition, surface soil sampling and soil borings in accordance with Table XII-1 should be completed. Results of sample analyses will allow a determination of the need for remediation and the relative effectiveness of excavation, soil flushing or devolatilization.

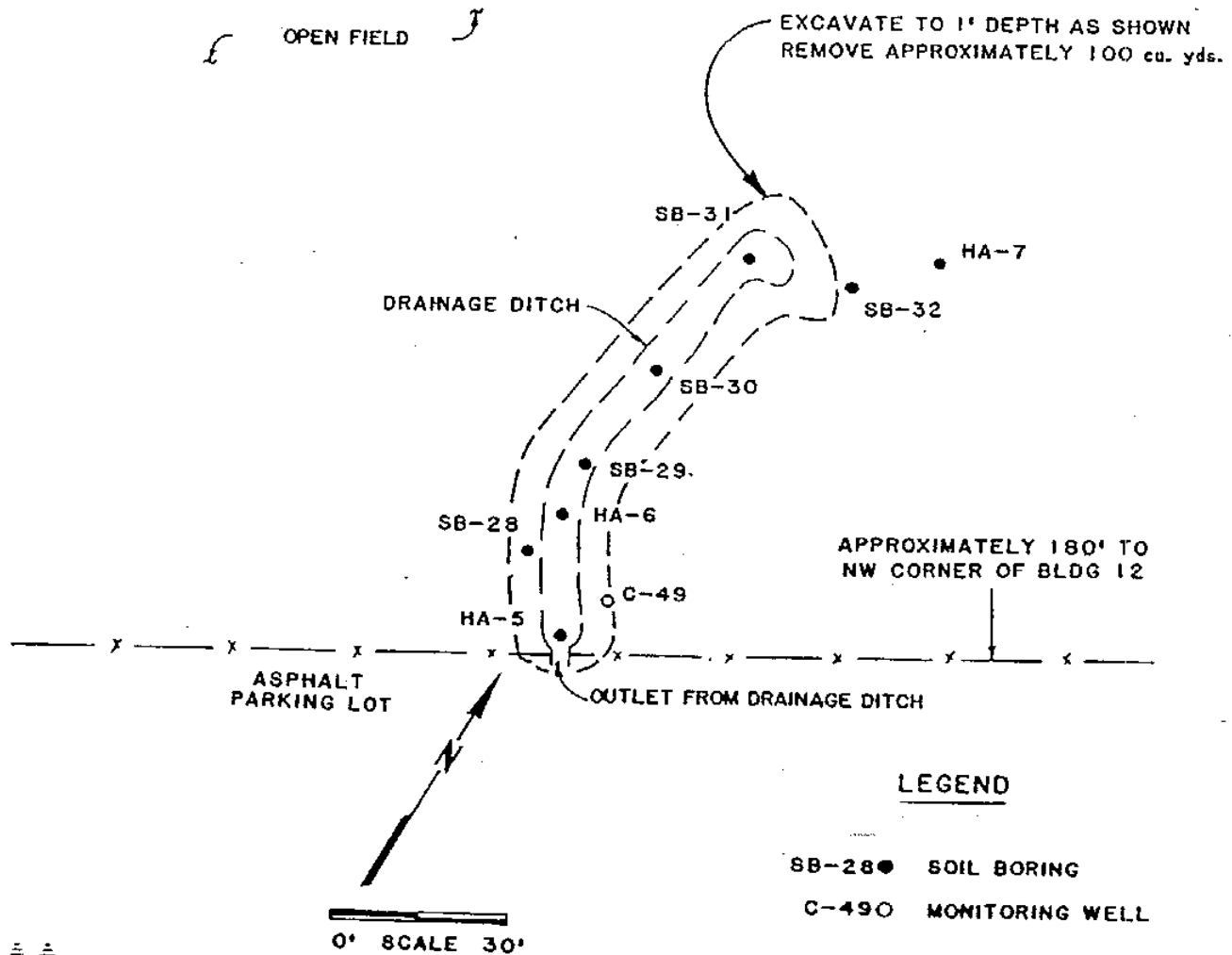
Building 14 Clarifiers

Recommended remediation of the Building 14 Clarifiers is shown on Figure XII-9. Remediation would be completed after the building is demolished in approximately ten years. In the interim period, if chemicals originate from the site, they would be controlled by the groundwater remediation program. Future remediation should consist of the following:

- 1) Excavation and removal of the outside clarifier and approximately 180 cubic yards of adjacent soils. Soil sampling and analysis would be used to verify that all soil exceeding cleanup criteria are removed.

FIGURE XII-7
STORM DRAINAGE
DISCHARGE SITE
EXCAVATION PLAN

ASPHALT RUNWAY



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FIGURE XII-8
BUILDING 12
BACKFILLED CLARIFIERS
AND TEST SUMP
EXCAVATION PLAN

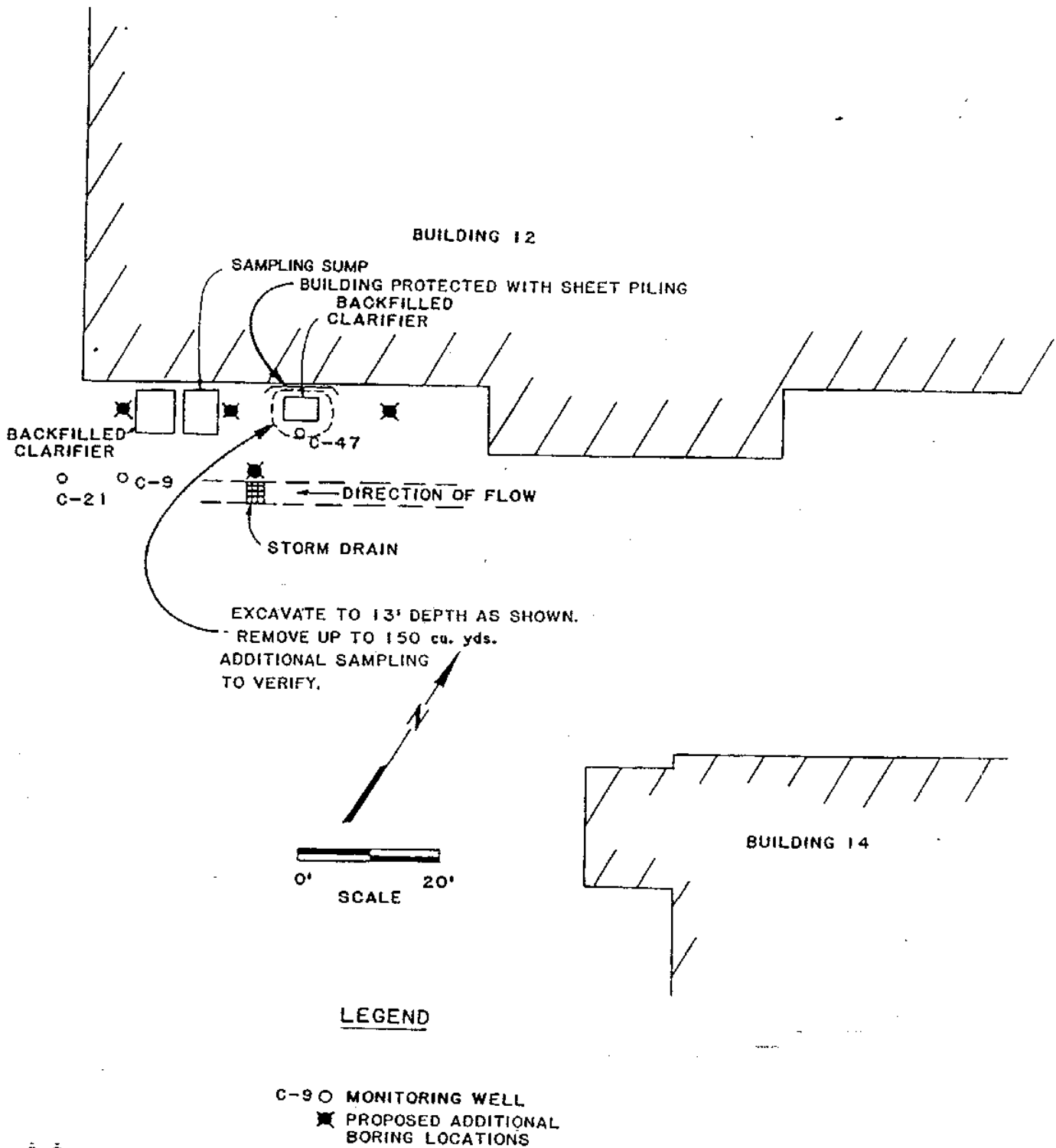
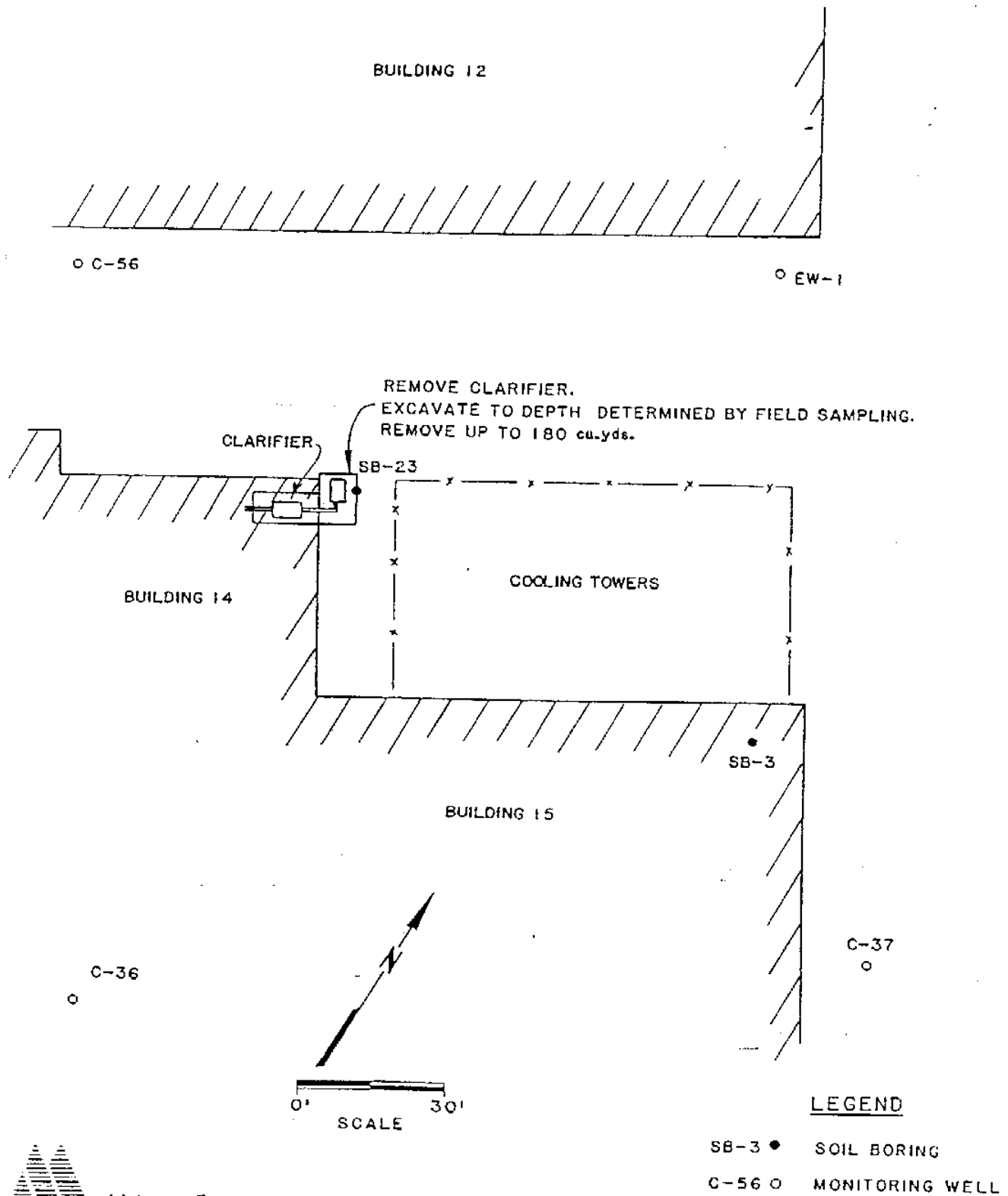


FIGURE XII-9
BUILDING 14 CLARIFIERS
EXCAVATION PLAN



Underground Tanks West of Building 11

Recommended remediation of the Underground Tanks West of Building 11 consists of the following:

- 1) Excavation and removal of two gasoline tanks, piping, and if contaminated soil is found, approximately 25 cubic yards of soil around the piping assumed to contain greater than 100 ppm TPH.
- 2) Tank tightness tests on two diesel tanks.
- 3) Construction and operation of gasoline recovery system.
- 4) After the gasoline recovery operation is complete, sample soils to determine the presence of residual chemicals that could potentially impact cost effectiveness of remediation.

Building 35 Sumps

Recommended remediation of the Building 35 Sumps is shown on Figure XII-10 and consists of the following:

- 1) Excavation and removal of organic sump as part of underground tank compliance program. Sample and analyze soils and, if required, excavate up to 190 cubic yards of soil which is a potential source of heavy metals to groundwater.

The sumps north of Building 35 were recently restored. Soil samples taken adjacent to these sumps indicate that these sumps are not sources of heavy metals to the groundwater. After the building is decommissioned in approximately ten years, samples will be collected from beneath the paint booths inside of the building and drainage pipes to the organic sump. If the soil samples indicate that cleanup levels are exceeded, remedial action may be appropriate.

Underground Tank South of Building 5

This tank is located approximately 24 feet below ground next to a basement-to-basement tunnel between Buildings 5 and 6. Tank removal and soil excavation cannot be accomplished using standard excavating procedures without potentially causing structural damage to the tunnel and building foundations. Recommended remediation of the Underground Tank South of Building 5 is shown on Figure XII-11 and consists of the following:

- 1) Temporarily closing the tank in place and controlling chemicals originating from the site by the groundwater extraction well recommended for construction approximately 200 feet downgradient.

FIGURE XII-10
BUILDING 35 SUMPS
EXCAVATION PLAN

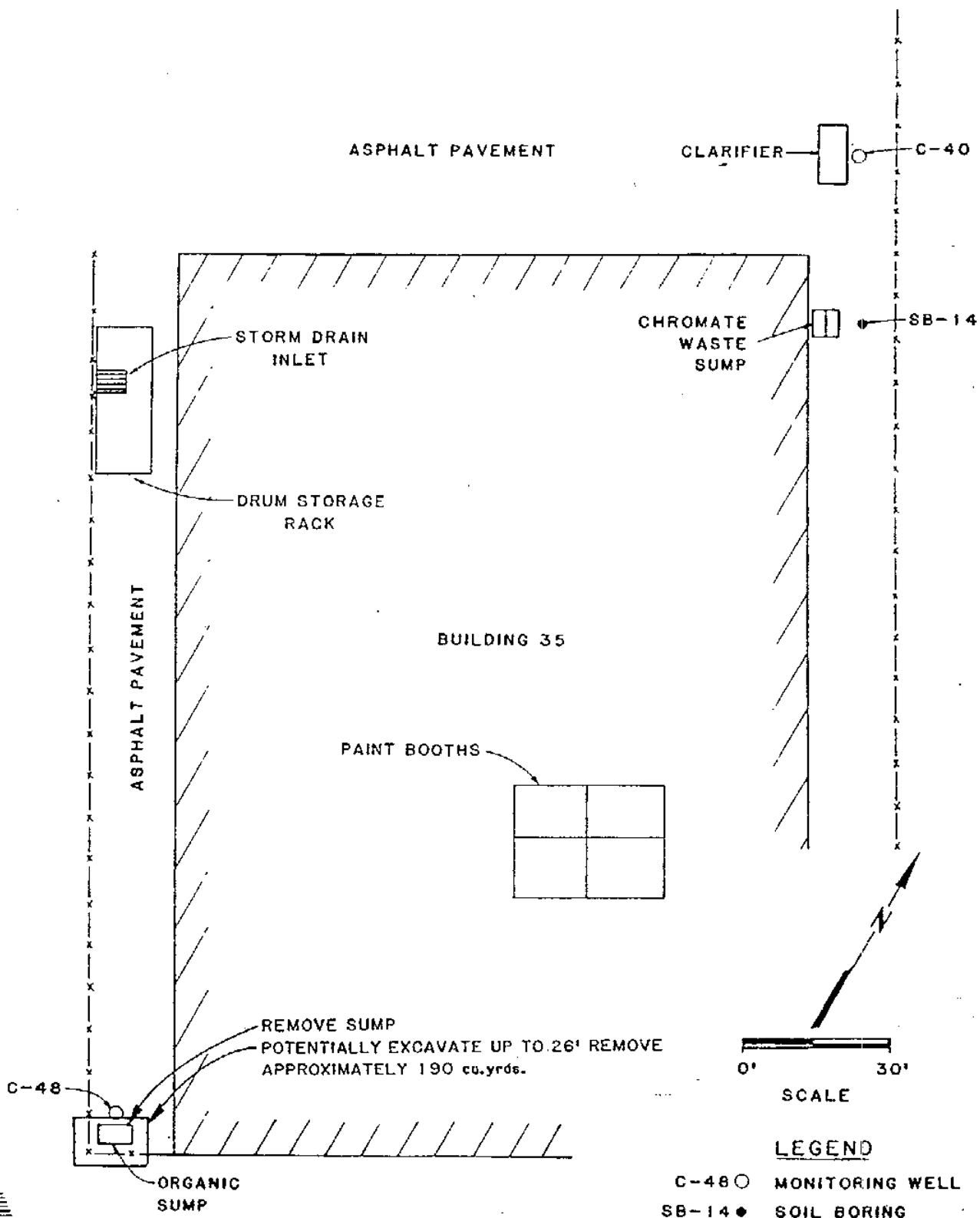
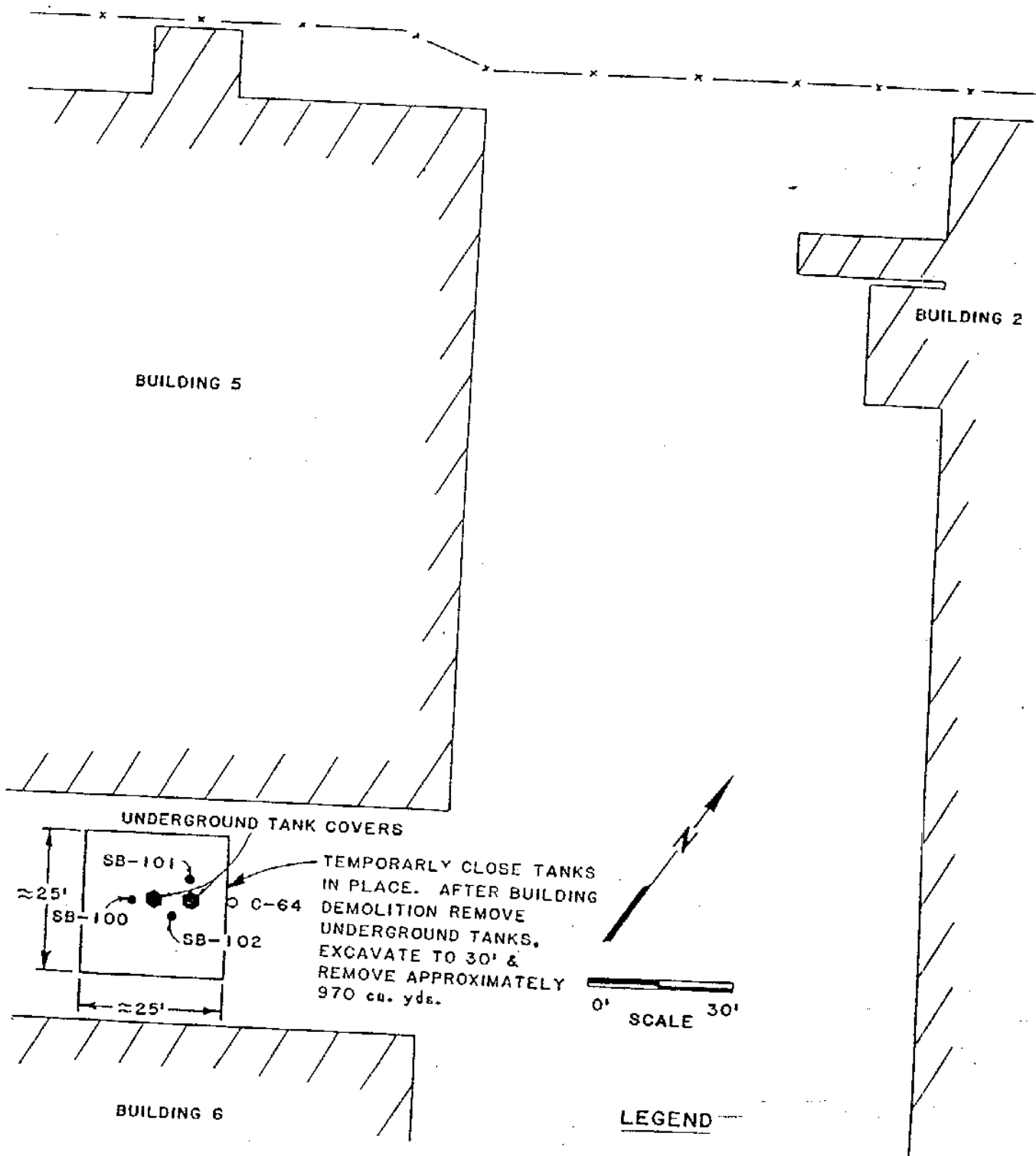


FIGURE XII-11
UNDERGROUND TANK
SOUTH OF BUILDING 5
EXCAVATION PLAN



SB-101 ● SOIL BORING
C-640 MONITORING WELL



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- 2) When Buildings 5 and 6 are demolished, which is currently planned to be in ten years, excavate and remove tank and approximately 970 cubic yards of soil where VOC's exceed cleanup criteria or TPH is above 100 ppm.

VOC's exceeding cleanup criteria and TPH above 100 ppm in saturated soils will be addressed by the groundwater remediation program.

Other Areas with Soils Remediation Recommended

In addition to remediation at the 10 potential source areas, soils remediation has been completed or is recommended for the following investigated areas:

- 1) Test Site 3 - remediation complete
Rationale: Soils exceeding 100 ppm TPH have been removed.
- 2) Temporary Drum Storage Area - remediation complete.
Rationale: Soils exceeding 100 ppm TPH have been removed.
- 3) Remote Test Site - remediation complete.
Rationale: Soils with copper exceeding hazardous waste criteria have been removed.
- 4) Engine Cleaning Pits Area - remediation complete.
Rationale: Limited volume of soils exceeding cleanup criteria has been removed.
- 5) Purged Fuel Storage Area - verify soil quality during demolition of site and underlying utilities and excavate soils as required to meet cleanup criteria.
Rationale: Additional soil sampling prior to site demolition restricted by underlying utilities.
- 6) Liquid Waste Neutralization Pit - remove pit and backfill excavation.
Rationale: No cleanup criteria exceeded; close pit as tank under regulations.
- 7) Underground Tanks North of Building 12 - remove tanks in accordance with closure requirements.
Rationale: Tanks are regulated by local and State requirements.

- 8) Clarifier Southeast of Building 21 - remove clarifier in accordance with closure permit requirements.

Rationale: Clarifier is regulated as a tank.

Test Site 3

Remediation of Test Site 3 is complete and is shown on Figure XII-12. Remediation consisted of the following:

- 1) Excavation and removal of up to seven cubic yards of soil to a depth of approximately three feet around SB-11 where TPH exceed 100 ppm. Samples taken after excavation showed that all TPH exceeding 100 ppm was removed. Excavated soils were removed to a Class I landfill.
- 2) Collection of hand auger samples at depths of one foot beneath the formerly paved drum storage area to verify that VOC's and TPH are not present. Analysis of those samples showed no VOC's or TPH above cleanup criteria.
- 3) Collection of two hand auger samples at depths of one foot from the vicinity of HA-15 to verify that dichloromethane is not present in surface soils at this site. Analysis of these samples showed no dichloromethane.

Temporary Drum Storage Area

Remediation of the Temporary Drum Storage Area is shown on Figure XII-13 and consisted of the following:

- 1) Excavation and removal of 10 cubic yards of soil to a depth of approximately 2 feet around SB-48 where TPH exceeds 100 ppm. Samples taken after excavation showed all soils with TPH exceeding 100 ppm were removed. Excavated soils were removed to a Class I landfill.

Remote Test Site

Remediation of the Remote Test Site is shown on Figure XII-14 and consisted of the following:

- 1) Excavation and removal of 15 cubic yards of soil to a depth of approximately 4 feet from the burn area where copper exceeded 2,500 ppm. Analysis of samples from the excavation confirms that all copper at concentrations greater than the TLC have been removed. Excavated soils were removed to a Class I landfill.

FIGURE XII-12
TEST SITE 3
EXCAVATION PLAN

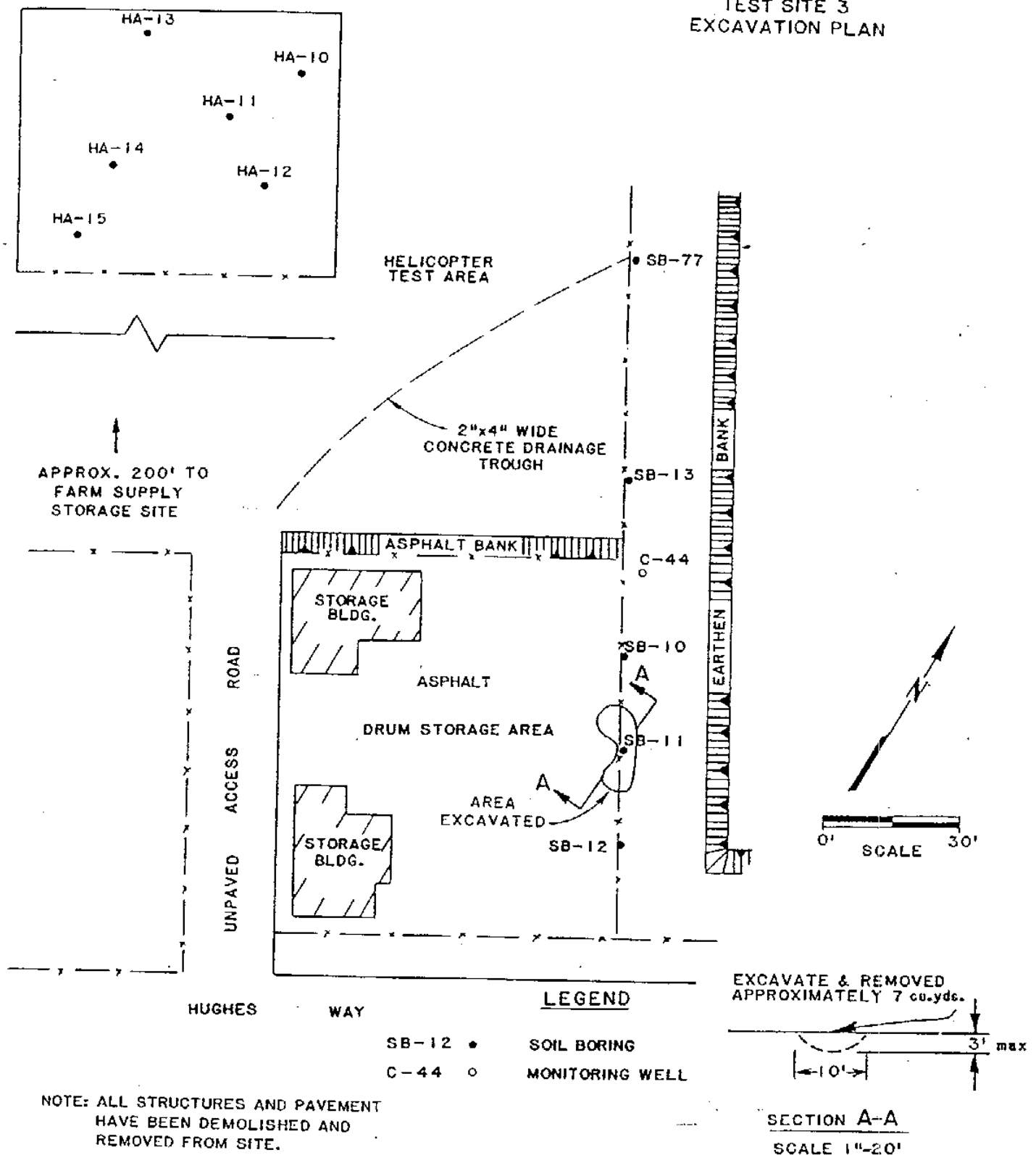


FIGURE XII-13
TEMPORARY DRUM
STORAGE AREA
EXCAVATION PLAN

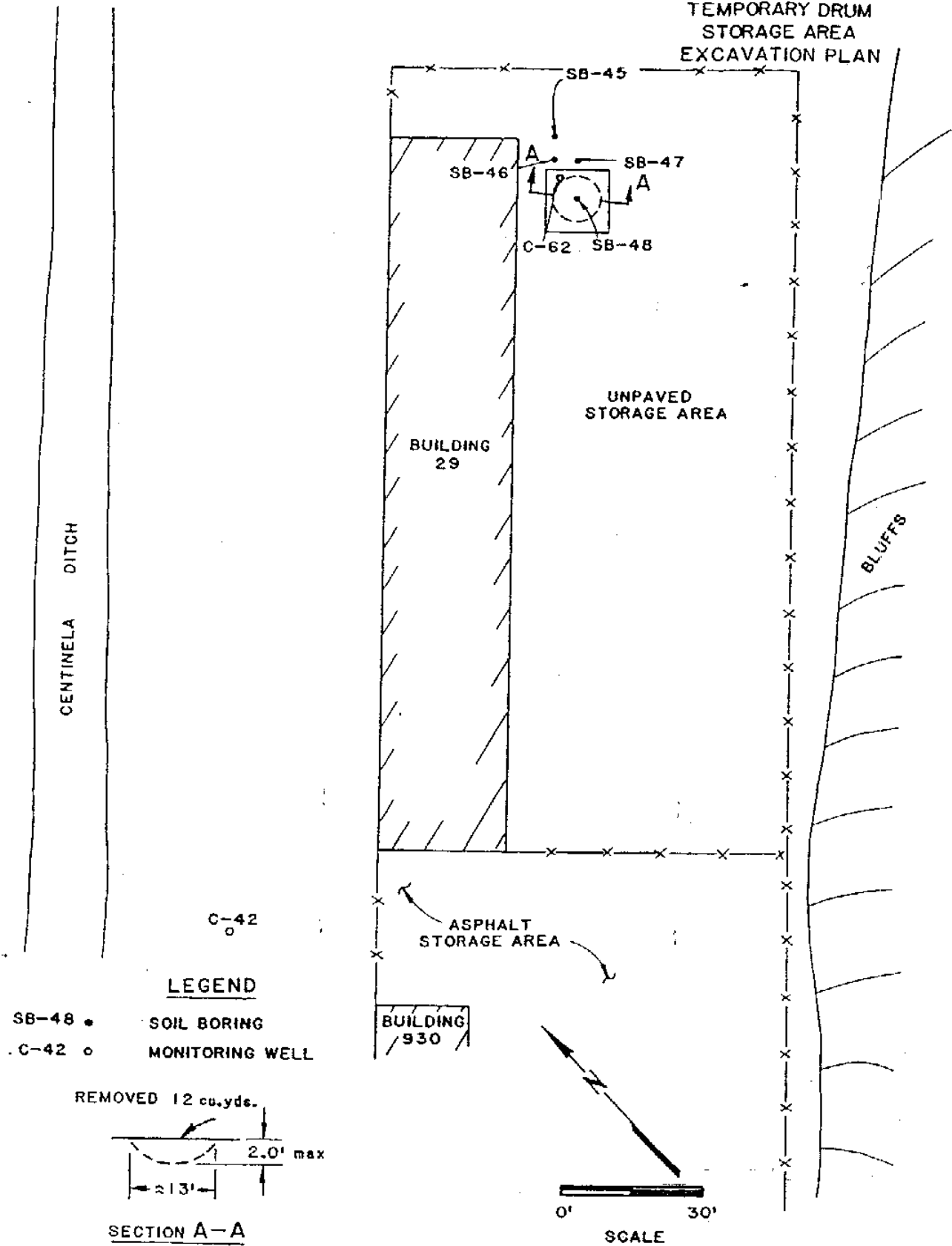
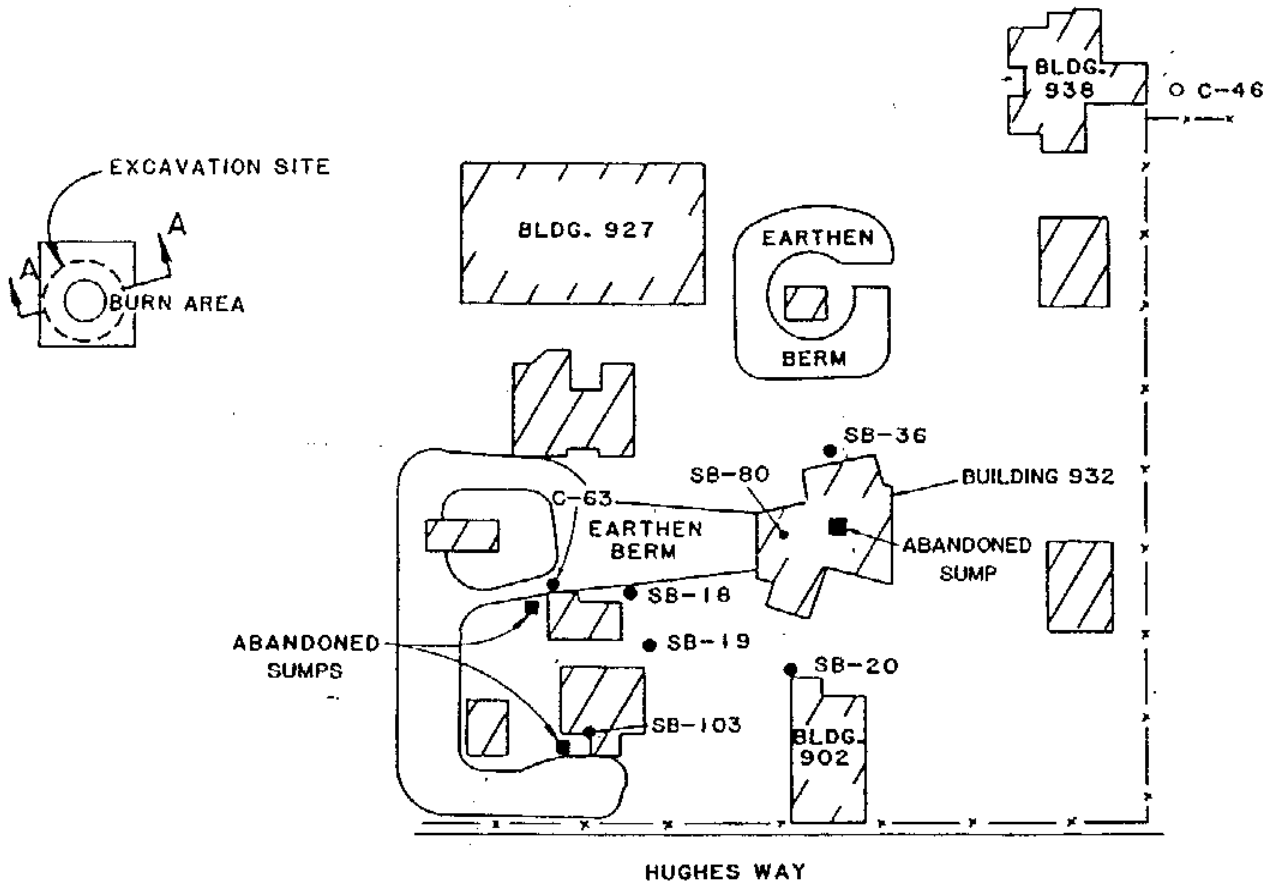
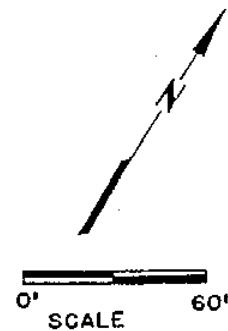
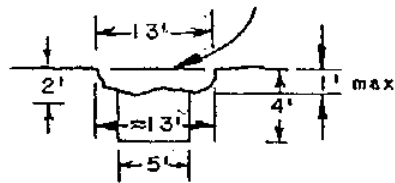


FIGURE XII-14
REMOTE TEST SITE
EXCAVATION PLAN



REMOVED UP TO 15 cu.yds.



NOTE: ALL STRUCTURES AND PAVEMENT
HAVE BEEN DEMOLISHED AND REMOVED
FROM SITE.

LEGEND

- SB-20 • SOIL BORING
- C-46 ○ MONITORING WELL



TPH reported above 100 ppm in C-63 is an anomalous value in saturated soil and is not supported by analyses of overlying or underlying soil data. Therefore, no remediation is required.

Engine Cleaning Pits Area

Remediation of the Engine Cleaning Pits Area is shown on Figure XII-15 and consisted of the following:

- 1) Excavation and removal of nine cubic yards of soil to a depth of one to two feet around SB-35 and SB-66. Soil samples were analyzed to verify the quality of soil remaining at this site. Excavated soils were removed to a Class I landfill.
- 2) Removal of asphalt from area. Collection of six hand auger samples from formerly paved area at depths of 1.0 foot to verify the VOC's and TPH are not present.
- 3) Excavation of additional soil if VOC's are detected at concentrations above cleanup criteria or if TPH exceeds 100 ppm.

TPH above 100 ppm in soils at 0.5 feet in SB-87 is probably derived from the asphalt and will be removed when the asphalt is removed.

Purged Fuel Storage Area

Specific remediation at this site has not been selected because of the inability to construct deep soil borings through the main portion of the site due to numerous buried utilities. This area, including underlying utilities, will be demolished in 1987 or 1988.

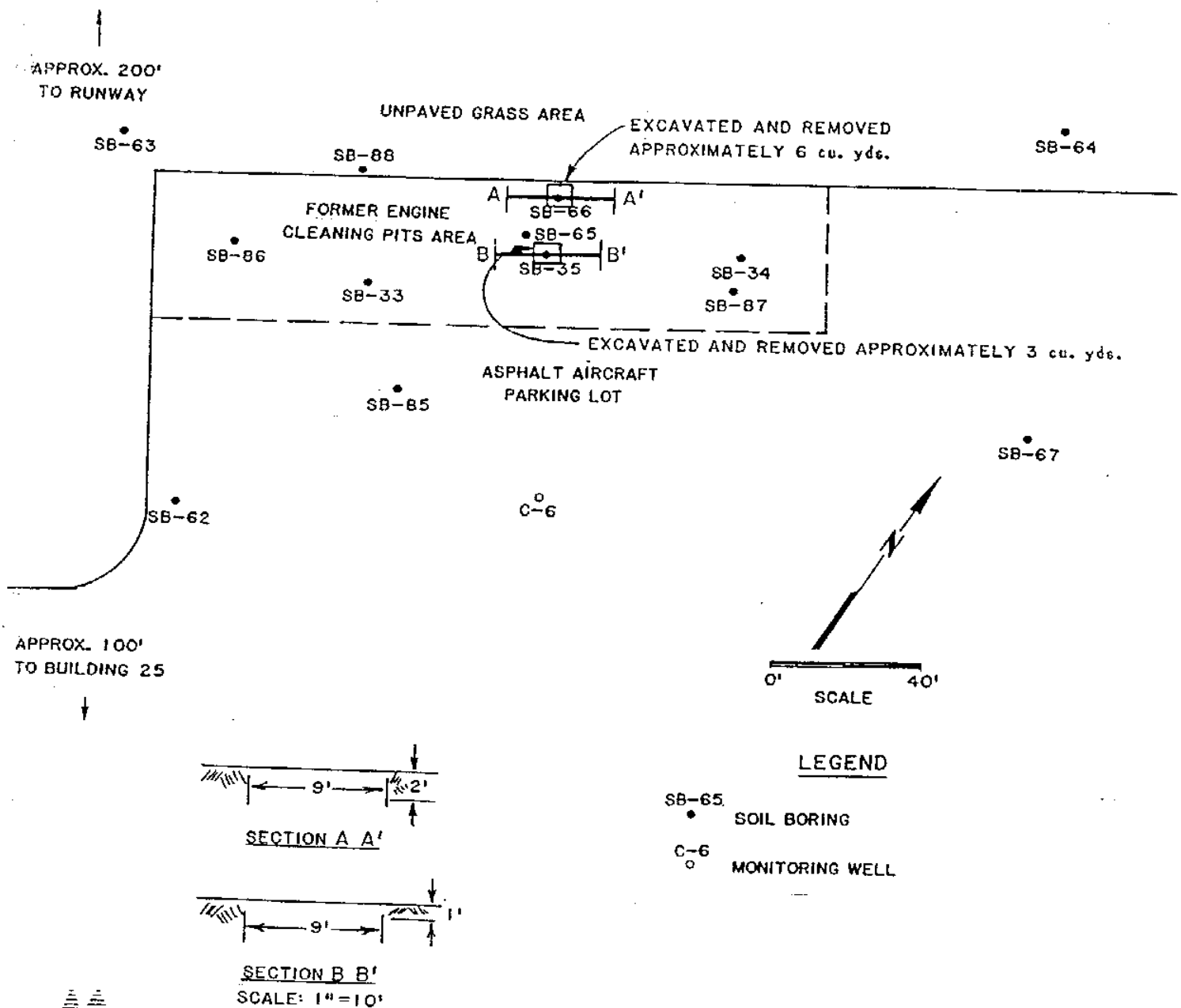
During demolition and associated utility excavations, soil samples will be collected to assure that excavated soils are properly disposed of and to assure removal of all soils exceeding cleanup criteria.

Liquid Waste Neutralization Pit

Recommended remediation of the Liquid Waste Neutralization Pit consists of the following:

- 1) Removal of the pit.
- 2) Soil sampling beneath the pit.
- 3) Soil excavation if chemical concentrations exceed cleanup criteria, otherwise backfill.

FIGURE XII-15
ENGINE CLEANING
PITS AREA
EXCAVATION PLAN



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Underground Tanks North of Building 12

A closure plan will be developed in accordance with City of Los Angeles and State regulations. The tanks will be excavated and removed from the site. Soils from beneath the tanks will be sampled and excavated if they exceed cleanup criteria.

GASOLINE RECOVERY

It is recommended that a gasoline recovery system be implemented west of Building 11. Design drawings of the recommended recovery system are included in Appendix F.

Gasoline Recovery Well

It is recommended that a 24-inch diameter recovery well be constructed west of Building 11. The well should be fitted with an auto-skimming pump system. These systems include a submersible groundwater depression pump, a floating gasoline recovery pump, and pump system controls.

The water table depression pump would be capable of pumping groundwater at a rate of 5 to 30 gpm. Appurtenances should include flow metering, valving, high/low water level sensors, and a remote telemetry interlock with the groundwater treatment plant.

Conveyance System

A two-inch diameter PVC line should be installed from the groundwater depression pump to the regional pipeline leading to the main treatment plant. A one-inch diameter double-contained PVC line should be installed from the skimmer pump to a gasoline storage tank located at the main treatment plant.

Gasoline Removal System

It is recommended that provisions be made in the water table depression pump pipeline to install a gasoline removal system. The recommended system consists of two adsorber canisters, each canister filled with 5,000 pounds KLENSORB adsorbing media.

Gasoline Recovery Storage Tank

A 2,000-gallon steel tank should be installed at the main treatment plant. The tank should be enclosed in a cinder block containment structure. The gasoline recovery line from the recovery well should transport gasoline to the tank for storage. Additionally, a high level tank sensor should be provided to shut down the recovery well.

GROUNDWATER RESTORATION

The groundwater remediation system including six groundwater extraction wells, conveyance system and treatment plant, should be constructed on the Plant Site. System components are described in the following sections. Design drawings are included in Appendix F.

Main Treatment Plant

The main treatment plant includes two counter-current air stripping towers, transfer pump, fan, vapor phase carbon treatment units, steam boiler, condenser and decanter, and a gasoline recovery storage tank to store gasoline recovered from the recovery wells west of Building 11. The treatment system should be designed for initial flows of 200 gpm and design flows from 300 to 600 gpm at full scale operation. Design parameters for the treatment system are presented in Table XII-2 at the end of this section. The system should be installed on a reinforced concrete pad and enclosed within a chain-link fence. A local telemetry system should provide operational control between the extraction wells and treatment plant. Treated effluent should be discharged to the storm drain system.

The air stripping treatment process is recommended because it is the lowest cost treatment option and because use of air stripping in other groundwater remediation projects has demonstrated air stripping to be reliable and effective. Without vapor control, the air stripping process would emit up to 20 pounds of chemicals per day. Vapor control is recommended to reduce air emissions.

Construction of the main treatment plant should be implemented prior to construction of the wells and conveyance systems. This scheduling will provide treatment of groundwater during the extraction well development.

Groundwater Extraction Wells and Conveyance System

Six groundwater extraction wells pumping from 40 to 100 gpm each should be installed on the Plant Site. These wells should be connected to the main treatment plant using PVC piping.

The pump systems should be submersible pumps capable of producing 50 to 100 gpm. Telemetry control should be provided between each pump and the main treatment plant. Additionally, each pump should be controlled by a high/low sensor system. Appurtenances include local electrical shut-off, flow metering, and control valves.

Construction of the extraction wells and conveyance system should be implemented in phases. Two extraction wells should be constructed first. The wells should be developed and tested for optimum

performance prior to construction of the remaining wells during the second phase of well construction. This implementation plan would allow modification of well placement, pumping rates, and design criteria if required.

Treated Water Discharge

It is recommended that treated water be discharged via the storm drainage system adjacent to the site. Disposal to injection wells is not recommended because their effectiveness would be limited due to the shallow groundwater table, raising the water table may threaten building foundations and basements, and benefits of injection would be negligible due to site characteristics.

TABLE XII-1

RATIONALE FOR DELINEATING THE EXTENT
OF CHEMICALS AT THE FORMER DRUM STORAGE AREA

Level of Characterization to Date	Assumptions Which Form the Basis for Site Remediation	Additional Work Recommended for Confirmation of Assumptions	Proposed Soil Remediation Pending Confirmation of Assumptions
VOC's - VOC's >200,000 ppb at C-43; VOC's >5,000 ppb at all borings.	VOC's - VOC's in soils at a distance of 15' from fenced area do not represent a significant potential extension to groundwater remediation.	VOC's - Eight soil borings to a depth of 10' located 15' from fenced area (20' on the ditch side) to delineate lateral extent of chemicals >5,000 ppb.	Excavate soil with chemical concentrations greater than values for groundwater protection.
TPH - TPH 58 to 367,000 ppm at several sampled locations.	TPH - TPH >100 ppm at most locations.	TPH - Analyze samples from proposed borings for TPH.	Excavate soil with concentrations exceeding criteria.
PCB's - None detected.	PCB's - PCB's <2 ppm at all locations.		

TABLE XII-3

RATIONALE FOR DELINEATING THE EXTENT
OF CHEMICALS AT THE STORM DRAINAGE DISCHARGE SITE

Level of Characterization to Date	Assumptions Which Form the Basis for Site Remediation	Additional Work Recommended for Confirmation of Assumptions	Proposed Soil Remediation Pending Confirmation of Assumptions
VOC's - VOC's >500 ppb to a depth of 10' in C-19 and SP-32, and to a depth of 2.5' in SB-29 and SP-30.	Chemicals in soils beneath surface do not represent a significant potential extension to groundwater remediation.	None	Excavate soil with >100 ppm TPH and >0.7 ppm benzene.
TPH - TPH >8,900 ppm in surface at SB-28. Not analyzed in other borings.	TPH in upper surface in defined drainage area.		

RATIONALE FOR DELINEATING THE EXTENT
OF CHEMICALS AT BUILDING 12 BACKFILLED CLARIFIERS
AND TEST SUMP

Level of Characterization to Date	Assumptions Which Form the Basis for Site Remediation	Additional Work Recommended for Confirmation of Assumptions	Proposed Soil Remediation Pending Confirmation of Assumptions
VOC's - VOC's >5,000 ppb at 20' at C-47.	VOC's - VOC's in soils at both backfilled clarifiers and at a distance of 15' from clarifiers represent a potential extension to groundwater remediation.	VOC's - One soil boring adjacent to the second clarifier, the sump, and the storm drain. One soil boring 15' northeast of C-47 to determine lateral extent of VOC's from the clarifier.	Excavate sumps and adjacent soil with chemical concentrations exceeding criteria.
TPH - TPH not detected at C-47; not analyzed at C-21 and C-9.	TPH - TPH <100 ppm at all locations.	TPH - Analyze samples from proposed borings for TPH.	

TABLE XII-1

RATIONALE FOR DELINEATING THE EXTENT
OF CHEMICALS AT THE BUILDING 15 UTILITY TRENCHES
AND CLARIFIER

Level of Characterization to Date	Assumptions Which Form the Basis for Site Remediation	Additional Work Recommended for Confirmation of Assumptions	Proposed Soil Remediation Including Confirmation of Assumptions
VOC's - VOC's >10,000 ppb at SB-49 (clarifier); >5,000 ppb at C-35; >2,500 ppb at SB-23; >500 ppb at SB-31; <500 ppb at SB-2, SB-1, C-36, and C-37.	VOC's - VOC's occur intermittently along trench and to an area within 10' of clarifier.	VOC's - Soil borings to 30' at 200' intervals along the trenches after building demolition in ten or more years. Additional borings near C-35, near clarifier, and other locations where VOC's >5,000 ppb.	When building is decommissioned, excavate clarifier and trenches and adjacent soil with chemical concentrations exceeding criteria.
TPH - TPH not detected. TPH not analyzed at C-35.	TPH - TPH <100 ppm at all locations.	TPH - Available data support assump- tions.	

RATIONALE FOR DELINEATING THE EXTENT
OF CHEMICALS AT THE BUILDING 14 CLARIFIERS

Level of Characterization to Date	Assumptions Which Form the Basis for Site Remediation	Additional Work Recommended for Confirmation of Assumptions	Proposed Soil Remediation Pending Confirmation of Assumptions
VOC's - VOC's >2,500 ppb at 15' at SB-23 and >2,000 ppb at 20'.	VOC's - VOC's in soils at inside clarifier and distance of 10' beyond outside clarifier do not represent a significant potential extension to groundwater remediation.	VOC's - When building is demolished (about ten years), one soil boring in clarifier inside Building 14 to determine the vertical extent of chemicals.	Excavate sumps and adjacent soils with high chemical concentrations.
TPH - TPH not detected.	TPH - TPH <100 ppm at all locations.	TPH - Analyze samples from proposed boring for TPH.	
PCB's - PCB's detected at 0.4 ppm at 10'.	PCB's - PCB's <2 ppm at all locations.	PCB's - Analyze samples from proposed boring for PCB's.	

TABLE XII-1

RATIONALE FOR DELINEATING THE EXTENT
OF CHEMICALS AT THE LIQUID WASTE NEUTRALIZATION PIT

Level of Characterization to Date	Assumptions Which Form the Basis for Site Remediation	Additional Work Recommended for Confirmation of Assumptions	Proposed Soil Remediation Pending Confirmation of Assumptions
VOC's - VOC's <500 ppb at SB-27.	VOC's - VOC's <500 ppb beneath sump.	VOC's - Sample below sump during sump demolition.	Excavate pit and underlying soils with high chemical concen- trations.

TABLE XII-7

RATIONALE FOR DELINEATING THE EXTENT
OF CHEMICALS AT THE OIL AND GREASE PIT AREA

Level of Characterization to Date	Assumptions Which Form the Basis for Site Remediation	Additional Work Recommended for Confirmation of Assumptions	Proposed Soil Remediation Pending Confirmation of Assumptions
VOC's - VOC's <100 ppb in unsaturated soil.	Soils are not a source area.	Available data support this assumption.	Clean and reline pit, continue to operate.

TPH - TPH not detected in SB-21,
not analyzed in SB-22.

TABLE XII-1

RATIONALE FOR DELINEATING THE EXTENT
OF CHEMICALS AT THE UNDERGROUND TANKS WEST OF
BUILDING 11

Level of Characterization to Date	Assumptions Which Form the Basis for Site Remediation	Additional Work Recommended for Confirmation of Assumptions	Proposed Soil Remediation Pending Confirmation of Assumptions
VOC'S - No Data.	VOC's - Benzene, toluene, and xylene associated with leakage from underground storage tanks are present at this site.	VOC's - Observations at the site and quality of downgradient groundwater have confirmed the presence of these chemicals at the	Excavate tanks and adjacent soil with high chemical concen- trations. After gasoline recovery is complete, sample soils for residual chemicals. Remediate soils that represent a significant potential extension to groundwater remediation.

TPH - Distribution of Floating
Gasoline Defined.

TPH - TPH present >100 ppm in soil
above floating product.

TABLE XII-1

RATIONALE FOR DELINEATING THE EXTENT
OF CHEMICALS AT THE BUILDING 35 CLARIFIERS,
NORTH SIDE

Level of Characterization to Date	Assumptions Which Form the Basis for Site Remediation	Additional Work Recommended for Confirmation of Assumptions	Proposed Soil Remediation Pending Confirmation of Assumptions
VOC's - VOC's = 500 ppb at SB-14 and C-40.	VOC's - VOC's < 500 ppb at sumps.	VOC's - Available data confirm the assumption.	When the building is decommis- sioned at a future date, excavate clarifiers and adjacent soil with high chemical concentrations.
TPH - TPH not detected at C-40.	TPH - TPH < 100 ppm at clarifier.	TPH - Available data confirm the assumption.	
Heavy Metals - Heavy metals 100 to 1,000 times less than TMLC.	Heavy Metals - Heavy metals at this site are 100 times below TMLC.	Heavy Metals - Available data confirm assumptions.	

TABLE AII-1

RATIONALE FOR DELINEATING THE EXTENT
OF CHEMICALS AT THE BUILDING 35 CLARIFIERS:
ORGANICS SUMP

Level of Characterization to Date	Assumptions Which Form the Basis for Site Remediation	Additional Work Recommended For Confirmation of Assumptions	Proposed Soil Remediation Pending Confirmation of Assumptions
VOC's - VOC's >5,000 ppb at 25' at C-119.	VOC's - VOC's in soil may represent a significant extension to ground- water remediation.	VOC's - Available data confirm the assumption.	Excavate sump and adjacent soil with chemical concentrations exceeding criteria.
TPH - TPH not detected.	TPH - TPH <100 ppm beneath sump.	TPH - Available data confirm the assumption.	
Heavy Metals - No Data.	Heavy Metals - All metals are 100 to 1,000 times lower than TLIC.	Heavy Metals - Analyze selected samples from one soil boring adjacent to sump for heavy metals.	

RATIONALE FOR DELINEATING THE EXTENT
OF CHEMICALS AT THE UNDERGROUND TANKS SOUTH OF
BUILDING 5

Level of Characterization to Date	Assumptions Which Form the Basis for Site Remediation	Additional Work Recommended for Confirmation of Assumptions	Proposed Soil Remediation Pending Confirmation of Assumptions
VOC's - VOC's >30,000 ppb at 25' at SR-101; >15,000 ppb at 10' at SR-100.	VOC's - VOC's in soil represent a potential significant extension to groundwater remediation.	VOC's - Available data confirm the assumptions.	Temporarily close tank in place and excavate tank and adjacent soils with chemical concen- trations exceeding criteria when building is demolished.
TPH - TPH >15,000 ppm in SB-101 and SR-102; not detected in SB-100.	TPH - TPH in soil represents a potential significant extension to groundwater remediation.	TPH - Available data confirm the assumption.	
PCB's - PCB's at 40 ppm at 25' at SR-101; <2 ppm in all other samples.	PCB's - PCB's are not a significant threat to groundwater quality.	PCB's - Available water quality data confirm the assumption.	

TABLE XII-1

RATIONALE FOR DELINEATING THE EXTENT
OF CHEMICALS AT THE UNDERGROUND TANKS NORTH OF
BUILDING 12

Level of Characterization to Date	Assumptions Which Form the Basis for Site Remediation	Additional Work Recommended for Confirmation of Assumptions	Proposed Soil Remediation Pending Confirmation of Assumptions
VOC's - No Data.	VOC's - VOC's >500 ppb near tanks; <500 ppb at 5' away from tanks.	VOC's - Remove tanks in compliance with underground tank regulations. Sample soils beneath tanks for VOC's.	Excavate soils with concentrations exceeding criteria.
TPH - No Data.	TPH - TPH >100 ppm near tank, <100 ppm at 5' away from tanks. No floating product on water table.	TPH - Analyze soil beneath tanks for TPH.	Excavate soils with concentrations exceeding criteria.

PCB's - Not present in fuel tanks.

PCB's - No Data.

TABLE XII-2
TREATMENT PLANT DESIGN PARAMETERS

Configuration	2 Towers in series
Tower Height	38 feet
Packing Height	25 feet
Tower Diameter	5 feet
Hydraulic Capacity	600 gpm
Maximum Loading	77.2 pounds per day
Air Flow	5,200 cfm
Vapor Phase Control	Dual 1,500 pound carbon beds
Vapor Phase Reduction	99 percent
Effluent VOC Concentration	Not detectable at 1 ppb

SECTION XIII

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**SITE INVESTIGATION AND
EVALUATION OF REMEDIAL MEASURES REPORT
HOWARD HUGHES PROPERTIES PLANT SITE
LOS ANGELES, CALIFORNIA**

MAY 8, 1987

APPENDICES A and B



McLaren Environmental Engineering

APPENDIX A
SOIL BORING LOGS



Page 1 of 1

LOCATION North Bay, NW corner in Bldg. 15

MONITOR WELL No.

START _____ FINISH _____

ELEVATION_ Not Surveyed

FINISH _____
DRILLERS & EQUIPMENT

INSPECTOR Reay

N/A

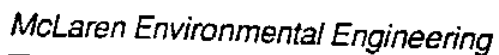
[illegible]



Page 1 of 1

PROJECT HHP-SI LOCATION Salvage yard, waste sump
 BORE HOLE No. SB-5 MONITOR WELL No. _____ ELEVATION Not surveyed
 DATE DRILLED 5-29-86 START _____ FINISH _____ INSPECTOR Veregge
 DRILLING METHOD Auger DRILLERS & EQUIPMENT Beylik; B-61 Auger

[illegible]



Page 1 of 1

LOCATION Salvage yard, waste oil sump

MONITOR WELL No.

ELEVATION Not surveyed

START.

FINISH

INSPECTOR Reay

DRILLERS & EQUIPMENT Beylik; B-61 Auger

[illegible]



Page 1 of 1

SOIL BORING LOG

Page 1 of 1

PROJECT <u>HHP-SI</u>	LOCATION <u>Test Site 2</u>
BORE HOLE No. <u>SB-7</u>	MONITOR WELL No. _____
DATE DRILLED <u>5-30-86</u>	ELEVATION <u>Not Surveyed</u>
DRILLING METHOD <u>Hand Auger</u>	INSPECTOR <u>Veregge</u>
	DRILLERS & EQUIPMENT <u>N/A</u>

[illegible]



Page 1 of 1

LOCATION Test Site 2

MONITOR WELL No.

ELEVATION Not Surveyed

DATE DRILLED 5-30-86

START

FINISH

INSPECTOR Veregge

DRILLING METHOD Hand Auger

DRILLERS & EQUIPMENT N/A

[illegible]



Page 1 of 1

LOCATION Test Site 2

MONITOR WELL No.

START _____ FINISH _____

ELEVATION Not Surveyed

INSPECTOR Veregge

DRILLERS & EQUIPMENT	N/A

[illegible]



Page 1 of 1

LOCATION Test Site 3

MONITOR WELL No.

START

FINISH

ELEVATION Not Surveyed

DRILLING METHOD Hand Auger

DRILLERS & EQUIPMENT_____ N/A

[illegible]



Page 1 of 1

LOCATION Test Site 3

MONITOR WELL No.

ELEVATION Not Surveyed

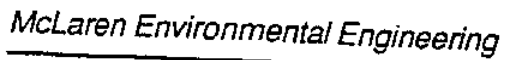
START

FINISH

INSPECTOR Veregge

DRILLERS & EQUIPMENT N/A

[illegible]



Page 1 of 1

LOCATION Test Site 3

MONITOR WELL No.

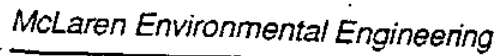
START _____ FINISH _____

ELEVATION Not Surveyed

INSPECTOR Veregghe

DRILLERS & EQUIPMENT N/A

[illegible]



Page 1 of 1

DRILLERS & EQUIPMENT N/A

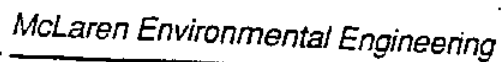
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Page 1 of 1

PROJECT HHP-SI Page 1 of 1
BORE HOLE No. SB-14 LOCATION Near Metals Process Sump, NE Corner Bldg. 35
DATE DRILLED 6-2-86 MONITOR WELL No. _____ ELEVATION Not Surveyed
DRILLING METHOD Auger START _____ FINISH _____ INSPECTOR Reay
DRILLERS & EQUIPMENT Beylik, B-61 Auger

[illegible]



SOIL BORING LOG

Page 1 of 1

PROJECT HHP-SI

BORE HOLE No. SBI5-B

LOCATION Salvage yard, drum racks

MONITOR WELL No.

ELEVATION Not surveyed

DATE DRILLED 6-5-86

START_____FINISH_____

INSPECTOR Reay

DRILLING METHOD Auger

DRILLERS & EQUIPMENT Beylik; B-61 Auger

[illegible]



Page 1 of 1

DRILLERS & EQUIPMENT Beylik; B-61 Auger

[illegible]



Page 1 of 1

LOCATION Remote Test Site

MONITOR WELL No.

ELEVATION Not surveyed

START _____ FINISH _____

INSPECTOR Reay

DRILLERS & EQUIPMENT Beylik B-61 Auger

[illegible]



Page 1 of 1

LOCATION Remote Test Site

MONITOR WELL No.

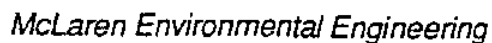
START_____FINISH

ELEVATION Not Surveyed

DRILLING METHOD Auger

DRILLERS & EQUIPMENT BEYLIK; B-61 Auger

[illegible]



Page 1 of 1

LOCATION Remote Test Site

MONITOR WELL No.

ELEVATION Not Surveyed

START _____ FINISH _____

INSPECTOR Reay

DRILLERS & EQUIPMENT Beylik: B-61 Auger

[illegible]



Page: 1 of 1

LOCATION Oil/Grease Pit - Building 11

MONITOR WELL No.

ELEVATION Not Surveyed

START_____FINISH

INSPECTOR Reay

DRILLING METHOD Auger

DRILLERS & EQUIPMENT Beylik; B-61 Auger

[illegible]



Page 1 of 1

LOCATION Fire Training Burn Pit

MONITOR WELL No.

ELEVATION Not Surveyed

START.

FINISH

INSPECTOR Reay

DRILLERS & EQUIPMENT Beylik; B-61 Auger

[illegible]



Page 1 of 1

LOCATION Fire Training Burn Pit

MONITOR WELL No.

ELEVATION Not Surveyed

DATE DRILLED 6-17-86

START _____ FINISH _____

INSPECTOR Reay

DRILLING METHOD Auger

DRILLERS & EQUIPMENT BEYLIK; B-61 Auger

[illegible]



Page 1 of 1

LOCATION Drainage ditch near runway

MONITOR WELL No.

ELEVATION Not surveyed

START.

FINISH

INSPECTOR Reay

DRILLERS & EQUIPMENT N/A

[illegible]



Page 1 of 1

LOCATION Drainage ditch near runway

MONITOR WELL No.

ELEVATION Not surveyed

START

FINISH

INSPECTOR Reay

DRILLERS & EQUIPMENT N/A

[illegible]



Page 1 of 1

LOCATION Drainage ditch near runway

MONITOR WELL No.

ELEVATION Not surveyed

START

FINISH

INSPECTOR Reay

DRILLING METHOD Hand Auger

DRILLERS & EQUIPMENT N/A

[illegible]



Page 1 of 1

PROJECT	HHP-SI	LOCATION	Drainage ditch near runway
BORE HOLE No.	SB-32	MONITOR WELL No.	
DATE DRILLED	6-19-86	ELEVATION	Not surveyed
DRILLING METHOD	Auger	START	FINISH
		INSPECTOR	Reay
		DRILLERS & EQUIPMENT	Beylik; B-61 Auger

[illegible]



Page 1 of 1

DRILLERS & EQUIPMENT _____ Beylik; B-61 Auger

[illegible]



Page 1 of 1

LOCATION Engine Cleaning Pits

MONITOR WELL No.

ELEVATION_ Not Surveyed

START_____FINISH

INSPECTOR Reay

DRILLERS & EQUIPMENT BEYLIK; B-61 Auger

[illegible]



Page 1 of 1

PROJECT HHP-SI LOCATION Former hazardous waste storage area Page 1 of 1
BORE HOLE No. SB-38 MONITOR WELL No. _____ ELEVATION Not surveyed
DATE DRILLED 6-9-86 START _____ FINISH _____ INSPECTOR Reay
DRILLING METHOD Hand Auger DRILLERS & EQUIPMENT N/A

[illegible]



Page 1 of 1

LOCATION Former hazardous waste storage area

MONITOR WELL No.

ELEVATION Not surveyed

START

FINISH

INSPECTOR Reay

DRILLERS & EQUIPMENT N/A

[illegible]



Page 1 of 1

PROJECT	HHP-SI	LOCATION	Former hazardous waste storage area
BORE HOLE No.	SB-40	MONITOR WELL No.	
DATE DRILLED	6-9-86	FINISH	
DRILLING METHOD	Hand Auger	DRILLERS & EQUIPMENT	N/A

[illegible]



Page 1 of 1

LOCATION Fire Training Burn Pit

MONITOR WELL No.

ELEVATION Not Surveyed

START

FINISH

INSPECTOR Abrahams

DRILLERS & EQUIPMENT Beylik: B-61 Auger

[illegible]

SOIL BORING LOG

Page 1 of 1

PROJECT	HHP-SI	LOCATION	Fire Training Burn Pit
BORE HOLE No.	SB-43	MONITOR WELL No.	ELEVATION Not Surveyed
DATE DRILLED	7-29-86	START	FINISH
DRILLING METHOD	Auger	INSPECTOR	Abrahams
		DRILLERS & EQUIPMENT	BEYLIK; B-61 Auger

[illegible]



Page 1 of 1

LOCATION Fire Training Burn Pit

MONITOR WELL No.

ELEVATION Not Surveyed

START

FINISH

INSPECTOR Abrahams

DRILLERS & EQUIPMENT BEYLIK; B-61 Auger

[illegible]



Page 1 of 1

PROJECT	HHP-SI	LOCATION	SE Corner Building
BORE HOLE No.	SB-45	MONITOR WELL No.	
DATE DRILLED	7-29-86	FINISH	
DRILLING METHOD	Hand Auger	DRILLERS & EQUIPMENT	N/A
		ELEVATION	Not Surveyed
		INSPECTOR	Abrahams

[illegible]



Page 1 of 1

[illegible]



Page 1 of 1

LOCATION South East corner Bldg. 29

MONITOR WELL No.

ELEVATION Not Surveyed

START_____FINISH_____

INSPECTOR Abrahams

DRILLERS & EQUIPMENT N/A

[illegible]

SOIL BORING LOG

Page 1 of 1

PROJECT	HHP-SI	LOCATION	South East corner Bldg. 29
BORE HOLE No.	SB-48	MONITOR WELL No.	
DATE DRILLED	7-30-86	ELEVATION	Not Surveyed
DRILLING METHOD	Hand Auger	INSPECTOR	Abrahams
		DRILLERS & EQUIPMENT	N/A

[illegible]



Page 1 of 1

PROJECT _____ HHP-SI _____ LOCATION _____ Fire Training Burn Pit
 BORE HOLE No. _____ SB-50 _____ MONITOR WELL No. _____ ELEVATION _____ Not Surveyed
 DATE DRILLED _____ 9-22 -86 _____ START _____ FINISH _____ INSPECTOR _____ Reay
 DRILLING METHOD _____ Auger _____ DRILLERS & EQUIPMENT _____ Beylik; B-61 Auger

[illegible]



Page 1 of 1

PROJECT	HHP-SI	LOCATION	Fire Training Burn Pit
BORE HOLE No.	SB-51	MONITOR WELL No.	
DATE DRILLED	9-23 -86	START	
DRILLING METHOD	Auger	FINISH	
		INSPECTOR	Abrahams
		DRILLERS & EQUIPMENT	Beylik; B-61 Auger

[illegible]



Page 1 of 1

PROJECT	HHP-SI	LOCATION	Fire Training Burn Pit	Page 1 of 1
BORE HOLE No.	SB-52	MONITOR WELL No.		ELEVATION
DATE DRILLED	9-23 -86	START		Not Surveyed
DRILLING METHOD	Auger	FINISH		INSPECTOR
		DRILLERS & EQUIPMENT		Reay
				Beylik; B-61 Auger

[illegible]



Page 1 of 1

PROJECT	HHP-SI	LOCATION	Fire Training Burn Pit
BORE HOLE No.	SB-53	MONITOR WELL No.	
DATE DRILLED	9-23 -86	START	
DRILLING METHOD	Auger	FINISH	
		INSPECTOR	Reay
		DRILLERS & EQUIPMENT	Beylik: B-61 Auger

[illegible]



Page 1 of 1

PROJECT	HHP-SI	LOCATION	Fire Training Burn Pit
BORE HOLE No.	SB-54	MONITOR WELL No.	
DATE DRILLED	9-23-86	ELEVATION	Not Surveyed
DRILLING METHOD	Auger	START	FINISH
		INSPECTOR	Reay
		DRILLERS & EQUIPMENT	Beylik; B-61 Auger

[illegible]



Page 1 of 1

PROJECT	HHP-SI	LOCATION	Salvage Yard
BORE HOLE No.	SB-55	MONITOR WELL No.	ELEVATION Not Surveyed
DATE DRILLED	9-24 -86	START	FINISH
DRILLING METHOD	Auger	INSPECTOR	Reay
		DRILLERS & EQUIPMENT	Beylik; B-61 Auger

[illegible]



Page 1 of 1

PROJECT	HHP-SI	LOCATION	Salvage Yard
BORE HOLE No.	SB-56	MONITOR WELL No.	ELEVATION Not Surveyed
DATE DRILLED	9-24 -86	START	FINISH
DRILLING METHOD	Auger	INSPECTOR	Reay
		DRILLERS & EQUIPMENT	Beylik; B-61 Auger

[illegible]



Page 1 of 1

PROJECT	HHP-SI	LOCATION	Salvage Yard
BORE HOLE No.	SB-57	MONITOR WELL No.	ELEVATION Not Surveyed
DATE DRILLED	9-25 -86	START	FINISH
DRILLING METHOD	Auger	INSPECTOR	Reay
		DRILLERS & EQUIPMENT	Beylik: B-61 Auger

[illegible]



Page 1 of 1

PROJECT	HHP-SI	LOCATION	Salvage Yard
BORE HOLE No.	SB-58	MONITOR WELL No.	ELEVATION Not Surveyed
DATE DRILLED	9-25 -86	START	FINISH
DRILLING METHOD	Auger	INSPECTOR	Reay
		DRILLERS & EQUIPMENT	Beylik; B-61 Auger

[illegible]



Page 1 of 1

PROJECT HHP-SI LOCATION Salvage Yard
 BORE HOLE No. SB-59 MONITOR WELL No. ELEVATION Not Surveyed
 DATE DRILLED 9-25 -86 START FINISH INSPECTOR Reay
 DRILLING METHOD Auger DRILLERS & EQUIPMENT Beylik; B-61 Auger

[illegible]

SOIL BORING LOG

Page 1 of 1

PROJECT	HHP-SI	LOCATION	Salvage Yard
BORE HOLE No.	SB-61	MONITOR WELL No.	ELEVATION Not Surveyed
DATE DRILLED	9-26 -86	START	FINISH INSPECTOR Reay
DRILLING METHOD	Auger	DRILLERS & EQUIPMENT	Baylik: B-61 Auger

[illegible]



Page 1 of 1

PROJECT	HHP-SI	LOCATION	Engine Cleaning Pits
BORE HOLE No.	SB-62	MONITOR WELL No.	ELEVATION Not Surveyed
DATE DRILLED	9-27-86	START	FINISH
DRILLING METHOD	Auger	INSPECTOR	Reay
		DRILLERS & EQUIPMENT	Baylik; B-61 Auger

[illegible]



Page 1 of 1

PROJECT	HHP-SI	LOCATION	Engine Cleaning Pits
BORE HOLE No.	SB-63	MONITOR WELL No.	ELEVATION Not Surveyed
DATE DRILLED	9-27-86	START	FINISH
DRILLING METHOD	Auger	INSPECTOR	Reay
		DRILLERS & EQUIPMENT	Beylik: B-61 Auger

[illegible]



Page 1 of 1

PROJECT	HHP-SI	LOCATION	Engine Cleaning Pits	Page 1 of 1
BORE HOLE No.	SB-64	MONITOR WELL No.	ELEVATION	Not Surveyed
DATE DRILLED	9-27-86	START	FINISH	INSPECTOR
DRILLING METHOD	Auger	DRILLERS & EQUIPMENT	Reay Beylik; B-61 Auger	

[illegible]



Page 1 of 1

PROJECT	HHP-SI	LOCATION	Engine Cleaning Pits
BORE HOLE No.	SB-66	MONITOR WELL No.	ELEVATION Not Surveyed
DATE DRILLED	9-27-86	START	FINISH
DRILLING METHOD	Auger	INSPECTOR	Reay
		DRILLERS & EQUIPMENT	Beylik; B-61 Auger

[illegible]



Page 1 of 1

PROJECT	HHP-SI	LOCATION	Engine Cleaning Pits
BORE HOLE No.	SB-67	MONITOR WELL No.	ELEVATION Not Surveyed
DATE DRILLED	9-27-86	START	FINISH INSPECTOR Reay
DRILLING METHOD	Auger	DRILLERS & EQUIPMENT	Beylik; B-61 Auger

[illegible]



Page 1 of 1

PROJECT HHP-SI LOCATION Fire Training Burn Pit
 BORE HOLE No. SB-69 MONITOR WELL No. ELEVATION Not Surveyed
 DATE DRILLED 10-28-86 START FINISH INSPECTOR Reay
 DRILLING METHOD Auger DRILLERS & EQUIPMENT Beylik: B-61 Auger

DEPTH BELOW SURFACE	STANDARD PENETRATION TEST RESULTS		SOIL DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	SAMPLES COLLECTED			WELL CONSTRUCTION DETAILS
	BLOWS	BPF	TEXTURE, COLOR, MOISTURE, CONSISTENCY, GRAIN-SIZE, DISTRIBUTION, ORGANICS ETC.			INT.	Hnu ppm	SAMP No.	
	6"-6"	"N"							
.			Sandy loam, brown, slightly moist, low plasticity	SM	[Pattern]	-	0	1	
.			Sandy loam, dark grayish brown, moist, low plasticity	SM	[Pattern]	-	5		
. 5			Sand, yellowish brown, moist, nonplastic	SM	[Pattern]	-	15	3	
.			Silty clay, gray, moist, plastic	CL	[Pattern]	-		4	
.			Sandy clay loam, dark gray ,very moist, plastic	SC	[Pattern]	-	5		
. 10			Silty clay, light brownish gray, moist, plastic	CL	[Pattern]	-		5	
.			Silty clay, grayish brown, saturated, plastic	CL	[Pattern]	-	20		
.			Clay, gray, saturated, plastic	CL	[Pattern]	-	30	6	
.			Silty clay with organics, very dark grayish brown, plastic	OL	[Pattern]	-			
. 20			Fine sand with organics, very dark gray , saturated, nonplastic	SM	[Pattern]	-		7	
.					[Pattern]	-		8	
. 25					[Pattern]	-			
.					[Pattern]	-			
. 30					[Pattern]	-			



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PROJECT	HHP-SI	LOCATION	Fire Training Burn Pit	
BORE HOLE No.	SB-70	MONITOR WELL No.	ELEVATION	Not Surveyed
DATE DRILLED	10-28-86	START	FINISH	INSPECTOR Reay
DRILLING METHOD	Auger	DRILLERS & EQUIPMENT	Beylik; B-61 Auger	

[illegible]



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PROJECT HHP-SI LOCATION Salvage Yard Page 1 of 1
BORE HOLE No. SB-71 MONITOR WELL No. ELEVATION Not surveyed
DATE DRILLED 10-29-86 START FINISH INSPECTOR Reay
DRILLING METHOD Auger DRILLERS & EQUIPMENT Beylik; B-61 Auger

[illegible]



SOIL BORING LOG

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PROJECT HHP-SI LOCATION Salvage Yard
 BORE HOLE No. SB-72 MONITOR WELL No. ELEVATION Not surveyed
 DATE DRILLED 10-29-86 START FINISH INSPECTOR Reay
 DRILLING METHOD Auger DRILLERS & EQUIPMENT Beylik; B-61 Auger

DEPTH BELOW SURFACE	STANDARD PENETRATION TEST RESULTS		SOIL DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	SAMPLES COLLECTED			WELL CONSTRUCTION DETAILS
			TEXTURE, COLOR, MOISTURE, CONSISTENCY, GRAIN-SIZE, DISTRIBUTION, ORGANICS ETC.			INT.	Hnu ppm	SAMP. No.	
	BLOWS	BPF							
	6"-6"	"N"							
			Asphalt	RR					
			Fine sand, dark brown, slightly moist, low plasticity.	SM				1	
			Fine sand, dark grayish brown, moist, low plasticity.	SM					
5			Silty clay loam, dark gray to very dark grayish brown, moist becoming slightly moist at 5.5, plastic.	CL				2	
			Fine sand, very dark gray, very moist, low plasticity.	SM				3	
10			Fine sand, gray, saturated, low plasticity.	SM					
			Fine sand, brown, saturated, low plasticity	SM				4	
15			Sandy clay loam, dark grayish brown, moist, plastic.	SC					
20								5	
25									



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PROJECT	HHP-SI	LOCATION	Salvage Yard
BORE HOLE No.	SB-73	MONITOR WELL No.	
DATE DRILLED	10-29-86	ELEVATION	Not surveyed
		START	FINISH
DRILLING METHOD	Auger	INSPECTOR	Reay
		DRILLERS & EQUIPMENT	Beylik; B-61 Auger

[illegible]



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PROJECT	HHP-S1	LOCATION	Fire Training Burn Pit
BORE HOLE No.	SB-74	MONITOR WELL No.	ELEVATION Not Surveyed
DATE DRILLED	11-3-86	START	FINISH
DRILLING METHOD	Auger	INSPECTOR	Reay
		DRILLERS & EQUIPMENT	Beylik: 8-61 Auger

[illegible]

SOIL BORING LOG

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PROJECT	HHP-SI	LOCATION	Fire Training Burn Pit	
BORE HOLE No.	SB-76	MONITOR WELL No.	ELEVATION	Not Surveyed
DATE DRILLED	11-4-86	START	FINISH	INSPECTOR Reay
DRILLING METHOD	Auger	DRILLERS & EQUIPMENT		Beylik; B-61 Auger

[illegible]



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PROJECT HHP-SI LOCATION Test Site 3
 BORE HOLE No. SB-77 MONITOR WELL No. _____ ELEVATION Not surveyed
 DATE DRILLED 11-4-86 START _____ FINISH _____ INSPECTOR Reay
 DRILLING METHOD Auger DRILLERS & EQUIPMENT Beylik; B-61 Auger

[illegible]



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PROJECT	HHP-SI	LOCATION	Salvage Yard
BORE HOLE No.	SB-78	MONITOR WELL No.	
DATE DRILLED	11-5-86	START	
DRILLING METHOD	Auger	FINISH	
		INSPECTOR	Reay
		DRILLERS & EQUIPMENT	Beylik; B-61 Auger

[illegible]



SOIL BORING LOG

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PROJECT HHP-SI LOCATION Salvage Yard
 BORE HOLE No. SB-79 MONITOR WELL No. _____ ELEVATION Not surveyed
 DATE DRILLED 11-5-86 START _____ FINISH _____ INSPECTOR Reay
 DRILLING METHOD Auger DRILLERS & EQUIPMENT Beylik; B-61 Auger

DEPTH BELOW SURFACE	STANDARD PENETRATION TEST RESULTS		SOIL DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	SAMPLES COLLECTED			WELL CONSTRUCTION DETAILS
			TEXTURE, COLOR, MOISTURE, CONSISTENCY, GRAIN-SIZE, DISTRIBUTION, ORGANICS ETC.			INT.	Hnu ppm	SAMP. No.	
	BLOWS	BPF							
	6"-6"	"N"							
			Asphalt	BB			20	1	
			Fine sandy loam, dark brown, slightly moist, non-plastic.	SM			60 40		
5			Silty loam, gray, slightly moist, low plasticity.	ML			10	2	
			Clay loam, very dark grayish brown, moist, plastic.	CL			20		
10			Fine sandy loam, dark grayish brown, very moist, non-plastic.	SM				3	
			Loamy fine sand, light olive brown, very moist, low plasticity.	SM			100		
15			Fine sand, light olive brown, saturated, low plasticity.	SM			150		
			Fine sand, light olive brown, saturated, low plasticity.	SP				4	
20			Fine sand, very dark gray, saturated, low plasticity.	SM			150	5	
			Silty loam, dark greenish gray, saturated, low plasticity.	ML				6	
25			Sand, greenish gray, saturated, non-plastic.	SP					
30								7	



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PROJECT	HHP-SI	LOCATION	Remote Test Site
BORE HOLE No.	SB-80	MONITOR WELL No.	
DATE DRILLED	11-7-86	FINISH	
DRILLING METHOD	Auger	DRILLERS & EQUIPMENT	Beylik; B-61 Auger
		ELEVATION	Not surveyed
		INSPECTOR	Reay

[illegible]



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PROJECT	HHP-SI	LOCATION	Salvage Yard
BORE HOLE No.	SB-81	MONITOR WELL No.	
DATE DRILLED	11-13-86	ELEVATION	Not surveyed
		START	FINISH
DRILLING METHOD	Auger	INSPECTOR	Abrahamis
		DRILLERS & EQUIPMENT	Beylik; B-61 Auger

[illegible]



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PROJECT	HHP-SI	LOCATION	Salvage Yard
BORE HOLE No.	SB-82	MONITOR WELL No.	
DATE DRILLED	11-13-86	START	
DRILLING METHOD	Auger	FINISH	
		INSPECTOR	Abrahams
		DRILLERS & EQUIPMENT	Beylik; B-61 Auger

[illegible]



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PROJECT	HHP-SI	LOCATION	Salvage Yard
BORE HOLE No.	SB-83	MONITOR WELL No.	
DATE DRILLED	11-14-85	START	
DRILLING METHOD	Auger	FINISH	
		INSPECTOR	Abrahams
		DRILLERS & EQUIPMENT	Beylik; B-61 Auger

[illegible]



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PROJECT	HHP-SI	LOCATION	Salvage Yard
BORE HOLE No.	SB-84	MONITOR WELL No.	
DATE DRILLED	11-14-86	FINISH	
DRILLING METHOD	Auger	INSPECTOR	Abrahams
		DRILLERS & EQUIPMENT	Beylik; B-61 Auger

[illegible]



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PROJECT	HHP-SI	LOCATION	Engine cleaning pits
BORE HOLE No.	SB-85	MONITOR WELL No.	ELEVATION Not surveyed
DATE DRILLED	11-15-86	START	FINISH INSPECTOR Stewart
DRILLING METHOD	Auger	DRILLERS & EQUIPMENT	Beylik; B-61 Auger

[illegible]



SOIL BORING LOG

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PROJECT	HHP-SI	LOCATION	Engine cleaning pits
BORE HOLE No.	SB-86	MONITOR WELL No.	ELEVATION Not surveyed
DATE DRILLED	11-15-86	START	FINISH INSPECTOR Stewart
DRILLING METHOD	Auger	DRILLERS & EQUIPMENT	Beylik; B-61 Auger

[illegible]



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PROJECT	HHP-SI	LOCATION	Engine cleaning pits
BORE HOLE No.	SB-87	MONITOR WELL No.	
DATE DRILLED	11-15-86	START	
DRILLING METHOD	Auger	FINISH	
		INSPECTOR	Stewart
		DRILLERS & EQUIPMENT	Beylik; B-61 Auger

[illegible]



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PROJECT	HHP-SI	LOCATION	Engine cleaning pits
BORE HOLE No.	SB-88	MONITOR WELL No.	ELEVATION Not surveyed
DATE DRILLED	11-15-86	START	FINISH
DRILLING METHOD	Auger	INSPECTOR	Stewart
		DRILLERS & EQUIPMENT	Beylik; B-61 Auger

[illegible]



SOIL BORING LOG

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PROJECT	HHP-SI	LOCATION	Purged Fuel Storage Area
BORE HOLE No.	SB-89	MONITOR WELL No.	-
DATE DRILLED	11-19-86	ELEVATION	Not surveyed
DRILLING METHOD	Hand Auger	START	-
		FINISH	-
		INSPECTOR	Reay
		DRILLERS & EQUIPMENT	-

[illegible]



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PROJECT	HHP-SI	LOCATION	Purged Fuel Storage Area	
BORE HOLE No.	SB-90	MONITOR WELL No.	-	ELEVATION Not surveyed
DATE DRILLED	11-19-86	START	-	FINISH -
DRILLING METHOD	Hand Auger	INSPECTOR	Reay	
		DRILLERS & EQUIPMENT	-	

[illegible]



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PROJECT	HHP-SI	LOCATION	Purged Fuel Storage Area
BORE HOLE No.	SB-91	MONITOR WELL No.	-
DATE DRILLED	11-19-86	ELEVATION	Not surveyed
START	-	FINISH	-
INSPECTOR	Reay	DRILLING METHOD	Hand Auger
DRILLERS & EQUIPMENT	-		

[illegible]



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PROJECT	HHP-SI	LOCATION	Purged Fuel Storage Area	
BORE HOLE No.	SB-92	MONITOR WELL No.	-	ELEVATION Not surveyed
DATE DRILLED	11-19-86	START	-	FINISH -
DRILLING METHOD	Hand Auger	INSPECTOR	Reay	
		DRILLERS & EQUIPMENT	-	

[illegible]



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[illegible]



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PROJECT	HHP-SI	LOCATION	Purged Fuel Storage Area	
BORE HOLE No.	SB-94	MONITOR WELL No.	-	ELEVATION Not surveyed
DATE DRILLED	11-19-86	START - FINISH	-	INSPECTOR Reay
DRILLING METHOD	Hand Auger	DRILLERS & EQUIPMENT	-	

[illegible]



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PROJECT	HHP-SI	LOCATION	Purged Fuel Storage Area
BORE HOLE No.	SB-95	MONITOR WELL No.	-
DATE DRILLED	11-19-86	ELEVATION	Not surveyed
DRILLING METHOD	Hand Auger	START	-
		FINISH	-
		INSPECTOR	Reay
		DRILLERS & EQUIPMENT	-

[illegible]



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PROJECT	HHP-SI	LOCATION	Purged Fuel Storage Area
BORE HOLE No.	SB-96	MONITOR WELL No.	-
DATE DRILLED	11-20-86	START	-
DRILLING METHOD	Hand Auger	FINISH	-
		INSPECTOR	Reay
		DRILLERS & EQUIPMENT	-

[illegible]



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PROJECT	HHP-SI	LOCATION	Purged Fuel Area
BORE HOLE No.	SB-97	MONITOR WELL No.	-
DATE DRILLED	11-20-86	START	-
DRILLING METHOD	Auger	FINISH	-
		INSPECTOR	Reay
		DRILLERS & EQUIPMENT	Beylik; B-61 Auger

[illegible]



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PROJECT	HHP-SI	LOCATION	Salvage Yard
BORE HOLE No.	SB-98	MONITOR WELL No.	ELEVATION Not surveyed
DATE DRILLED	11-22-85	START — FINISH —	INSPECTOR Reay
DRILLING METHOD	Auger	DRILLERS & EQUIPMENT	Baylik; B-61 auger

[illegible]



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PROJECT	HHP-SI	LOCATION	Salvage Yard
BORE HOLE No.	SB-99	MONITOR WELL No.	ELEVATION Not surveyed
DATE DRILLED	11-22-86	START	FINISH
DRILLING METHOD	Auger	INSPECTOR	Reay
		DRILLERS & EQUIPMENT	Beylik: B-61 auger

[illegible]



SOIL BORING LOG

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PROJECT HHP-SI LOCATION Underground tank south of Building 5
BORE HOLE No. SB-100 MONITOR WELL No. ELEVATION Not surveyed
DATE DRILLED 11-23-86 START FINISH INSPECTOR Reay
DRILLING METHOD Auger DRILLERS & EQUIPMENT Beylik, B-61 auger

DEPTH BELOW SURFACE	STANDARD PENETRATION TEST RESULTS		SOIL DESCRIPTION TEXTURE, COLOR, MOISTURE, CONSISTENCY, GRAIN-SIZE, DISTRIBUTION, ORGANICS ETC.	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	SAMPLES COLLECTED			WELL CONSTRUCTION DETAILS
	BLOWS	BPF				INT.	Hnu ppm	SAMP. No.	
	6"-6"	"N"							
			Asphalt	BB				1	
			Fine sand; brownish yellow; non-plastic; slightly moist to very moist below 3 feet; coarse sand interbeds.	SM			2 10 20	2	
			Fine sand; yellowish brown; non-plastic; very moist.	SM			100 120 200 300 300	3 4	



SOIL BORING LOG

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PROJECT HHP-SI LOCATION Underground tank south of Building 5
 BORE HOLE No. SB-101 MONITOR WELL No. ELEVATION Not surveyed
 DATE DRILLED 11-24-86 START -- FINISH -- INSPECTOR Reay
 DRILLING METHOD Auger DRILLERS & EQUIPMENT Beylik; B-61 auger

DEPTH BELOW SURFACE	STANDARD PENETRATION TEST RESULTS		SOIL DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	SAMPLES COLLECTED			WELL CONSTRUCTION DETAILS
			TEXTURE, COLOR, MOISTURE, CONSISTENCY, GRAIN-SIZE, DISTRIBUTION, ORGANICS ETC.			INT.	Hnu ppm	SAMP. No.	
	BLOWS	BPF							
	6"-6"	"N"							
5 <									



PROJECT	HHP-S1	LOCATION	Underground tank south of Building 5
BORE HOLE No.	SB-101	MONITOR WELL No.	
DATE DRILLED	11-24-86	START	-- FINISH --
DRILLING METHOD	Auger	INSPECTOR	Reay
		DRILLERS & EQUIPMENT	Beylik; B-51 auger

[illegible]



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PROJECT	HHP-SI	LOCATION	Underground Tank South of Bldg. 5.
BORE HOLE No.	SB-102	MONITOR WELL No.	-
ELEVATION	Not surveyed	DATE DRILLED	11-25-86
START	-	FINISH	-
INSPECTOR	Reay	DRILLING METHOD	Auger
DRILLERS & EQUIPMENT	Baylik; B-51 Auger		

[illegible]



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PROJECT HHP-SI LOCATION Remote Test Site
 BORE HOLE No. SB-103 MONITOR WELL No. - ELEVATION Not surveyed
 DATE DRILLED 12-2-85 START - FINISH - INSPECTOR Reay
 DRILLING METHOD Auger DRILLERS & EQUIPMENT Beylik; B-61 Auger

DEPTH BELOW SURFACE	STANDARD PENETRATION TEST RESULTS		SOIL DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	SAMPLES COLLECTED			WELL CONSTRUCTION DETAILS
			TEXTURE, COLOR, MOISTURE, CONSISTENCY, GRAIN-SIZE, DISTRIBUTION, ORGANICS ETC.			INT.	Hru ppm	SAMP. No.	
	BLOWS	BPF							
6"-6"	7"								
			Fine sandy loam; yellowish brown; non plastic; moist.	SM			0	1	
			Clay loam; very dark gray brown; plastic; moist.	CL			0		
5			Clay loam; olive; plastic; very moist.	CL			2	2	
			Clay loam; olive; plastic; saturated.	MH			1		
10							0	3	
			Clay; dark olive gray; plastic; very moist.	CH			0	4	
20			Fine sand; dark greenish gray; non plastic; saturated.	SM			0	5	
25									
30									



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PROJECT	HHP-SI	LOCATION	Salvage Yard
BORE HOLE No.	SB-107	MONITOR WELL No.	-
DATE DRILLED	12-10-86	ELEVATION	Not surveyed
DRILLING METHOD	Auger	START	-
		FINISH	-
		INSPECTOR	Reay
		DRILLERS & EQUIPMENT	Beylik; B-61 Auger

[illegible]



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LOCATION Salvage yard

MONITOR WELL No.

START

FINISH

ELEVATION_ N/S

DRILLERS & EQUIPMENT

INSPECTOR Reay

DRILLERS & EQUIPMENT Beylik; B-61 auger

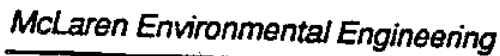
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PROJECT	HHP-SI	LOCATION	Salvage Yard
BORE HOLE No.	SB-109	MONITOR WELL No.	-
DATE DRILLED	12-11-86	START	-
DRILLING METHOD	Auger	FINISH	-
		INSPECTOR	Reay
		DRILLERS & EQUIPMENT	Beylik; B-61 Auger

[illegible]



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LOCATION Salvage Yard

MONITOR WELL No.

ELEVATION Not surveyed

START _____ FINISH _____

INSPECTOR Reay

DRILLERS & EQUIPMENT

Beylik: B-61 auger

DEPTH BELOW SURFACE	STANDARD PENETRATION TEST RESULTS		SOIL DESCRIPTION TEXTURE, COLOR, MOISTURE, CONSISTENCY, GRAIN-SIZE, DISTRIBUTION, ORGANICS ETC.	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	SAMPLES COLLECTED			WELL CONSTRUCTION DETAILS
	BLOWS	BPF				INT.	Hnu ppm	SAMP. No.	
	6"-6"	"N"							
0			Asphalt	BB					
0			Fine sandy loam, dark yellowish brown, moist, non-plastic	SM			15	1	
5			Clay loam, dark brown, slightly moist, low plasticity.	MH			30	2	
5			Silt loam, yellowish brown, moist, slightly plastic.	ML			50		
10			Fine sandy loam, dark brown grading to light yellowish brown at 12.0', very moist, non-plastic.	SM			0	3	
15								4	
20			Fine sand, light yellowish brown, saturated, non-plastic	SM				5	
25									
30									

SOIL BORING LOG

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PROJECT	HHP-SI	LOCATION	Purge Fuel Creek Bed
BORE HOLE No.	SB-111	MONITOR WELL No.	-
DATE DRILLED	12-17-86	ELEVATION	Not surveyed
DRILLING METHOD	Hand Auger	START	-
		FINISH	-
		INSPECTOR	Reay
		DRILLERS & EQUIPMENT	-

[illegible]



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PROJECT	HHP-S1	LOCATION	Purge Fuel Creek Bed
BORE HOLE No.	SB-113	MONITOR WELL No.	-
DATE DRILLED	12-17-86	START	-
DRILLING METHOD	Hand Auger	FINISH	-
		ELEVATION	Not surveyed
		INSPECTOR	Reay
		DRILLERS & EQUIPMENT	-

[illegible]



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PROJECT HHP-SI LOCATION Salvage Yard
BORE HOLE No. SB114 MONITOR WELL No. _____ ELEVATION Not Surveyed
DATE DRILLED 1-15-86 START _____ FINISH _____ INSPECTOR Stewart
DRILLING METHOD Auger DRILLERS & EQUIPMENT Beylik, B-51

[illegible]



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PROJECT	HHP-SI	LOCATION	Fire Training Burn Pit
BORE HOLE No.	SB115	MONITOR WELL No.	
DATE DRILLED	1-15-86	FINISH	
DRILLING METHOD	Auger	DRILLERS & EQUIPMENT	Beylik, B-61
		INSPECTOR	Stewart
		ELEVATION	Not Surveyed

[illegible]



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PROJECT HHP-SI LOCATION Fire Training Burn Pit
BORE HOLE No. SB115 MONITOR WELL No. _____ ELEVATION Not Surveyed
DATE DRILLED 1-15-86 START _____ FINISH _____ INSPECTOR Stewart
DRILLING METHOD Auger DRILLERS & EQUIPMENT Baylik, B-61

[illegible]



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PROJECT HHP-SI LOCATION Salvage Yard
 BORE HOLE No. SB 116 MONITOR WELL No. _____ ELEVATION Not surveyed
 DATE DRILLED 2-6-87 START _____ FINISH _____ INSPECTOR Stewart
 DRILLING METHOD Hand Auger DRILLERS & EQUIPMENT _____

[illegible]



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LOCATION Former Hazardous Waste Storage Area

MONITOR WELL No.

START _____ FINISH _____

ELEVATION Not Surveyed

 DRILLE

INSPECTOR Verecige

DRILLERS & EQUIPMENT N/A

[illegible]



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LOCATION Former Hazardous Waste Storage Area

MONITOR WELL No.

ELEVATION Not Surveyed

START

FINISH

INSPECTOR_Veregge

DRILLERS & EQUIPMENT N/A

[illegible]



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PROJECT HHP-SI LOCATION Former Hazardous Waste Area Page 1 of 1

BORE HOLE No. HA-3 MONITOR WELL No. _____ ELEVATION Not Surveyed

DATE DRILLED 7-2-86 START _____ FINISH _____ INSPECTOR Veregge

DRILLING METHOD Hand Auger DRILLERS & EQUIPMENT N/A

[illegible]



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LOCATION Purged Fuel Area

MONITOR WELL No.

ELEVATION Not Surveyed

START

FINISH

INSPECTOR Vereague

DRILLERS & EQUIPMENT N/A

[illegible]



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PROJECT	HHP-SI	LOCATION	Storm Drain Discharge	Page 1 of 1
BORE HOLE No.	HA-5	MONITOR WELL No.	ELEVATION	Not Surveyed
DATE DRILLED	10-12-86	START	FINISH	INSPECTOR
DRILLING METHOD	Hand Auger	DRILLERS & EQUIPMENT	N/A	Reay

[illegible]



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PROJECT HHP-SI LOCATION Storm Drain Discharge Page 1 of 1
 BORE HOLE No. HA-6 MONITOR WELL No. _____ ELEVATION Not Surveyed
 DATE DRILLED 10-12-86 START _____ FINISH _____ INSPECTOR Reay
 DRILLING METHOD Hand Auger DRILLERS & EQUIPMENT N/A

[illegible]



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PROJECT HHP-SI LOCATION Storm Drain Discharge
 BORE HOLE No. HA-7 MONITOR WELL No. ELEVATION Not Surveyed
 DATE DRILLED 10-12-86 START FINISH INSPECTOR Reay
 DRILLING METHOD Hand Auger DRILLERS & EQUIPMENT N/A

[illegible]



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PROJECT	HHP-SI	LOCATION	Former Hazardous Waste Storage
BORE HOLE No.	HA-8	MONITOR WELL No.	ELEVATION
DATE DRILLED	10-13-86	START	FINISH
DRILLING METHOD	Hand Auger	INSPECTOR	Reay
		DRILLERS & EQUIPMENT	N/A

[illegible]



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PROJECT	HHP-SI	LOCATION	Former Hazardous Waste Storage
BORE HOLE No.	HA-9	MONITOR WELL No.	
DATE DRILLED	10-13-86	ELEVATION	Not Surveyed
DRILLING METHOD	Hand Auger	START	FINISH
		INSPECTOR	Reay
		DRILLERS & EQUIPMENT	N/A

[illegible]



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PROJECT	HHP-SI	LOCATION	Farm Supply Storage (Test Site 3)
BORE HOLE No.	HA-10	MONITOR WELL No.	ELEVATION Not Surveyed
DATE DRILLED	11-4-86	START	FINISH
DRILLING METHOD	Hand Auger	DRILLERS & EQUIPMENT	INSPECTOR Abrahams
			N/A

[illegible]



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PROJECT _____ HHP-SI _____		LOCATION _____ Farm Supply Storage (Test Site 3)		Page 1 of 1
BORE HOLE No. _____	HA-11	MONITOR WELL No. _____	ELEVATION _____	Not Surveyed
DATE DRILLED _____	11-4-86	START _____	FINISH _____	INSPECTOR _____
DRILLING METHOD _____	Hand Auger	DRILLERS & EQUIPMENT _____		Abrahams
				N/A

[illegible]

SOIL BORING LOG

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PROJECT	HHP-SI	LOCATION	Farm Supply Storage (Test Site 3)	
BORE HOLE No.	HA-12	MONITOR WELL No.		ELEVATION Not Surveyed
DATE DRILLED	11-4-86	START	FINISH	INSPECTOR Abrahams
DRILLING METHOD	Hand Auger	DRILLERS & EQUIPMENT	N/A	

[illegible]



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[illegible]



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PROJECT	HHP-SI	LOCATION	Farm Supply Storage (Test Site 3)
BORE HOLE No.	HA-14	MONITOR WELL No.	
DATE DRILLED	11-4-86	ELEVATION	Not Surveyed
DRILLING METHOD	Hand Auger	START	FINISH
		INSPECTOR	Abrahams
		DRILLERS & EQUIPMENT	N/A

[illegible]



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PROJECT HHP-SI LOCATION Farm Supply Storage (Test Site 3)
 BORE HOLE No. HA-15 MONITOR WELL No. _____ ELEVATION Not Surveyed
 DATE DRILLED 11-4-86 START _____ FINISH _____ INSPECTOR Abrahams
 DRILLING METHOD Hand Auger DRILLERS & EQUIPMENT N/A

[illegible]



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LOCATION Remote test site

MONITOR WELL No.

ELEVATION Not surveyed

DATE DRILLED 2-5-87

START

FINISH

INSPECTOR Stewart

DRILLING METHOD Hand Auger

DRILLERS & EQUIPMENT

[illegible]



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PROJECT HHP-SI LOCATION Remote test site Page 1 of 1
 BORE HOLE No. WESB #3 MONITOR WELL No. _____ ELEVATION Not surveyed
 DATE DRILLED 2-5-87 START _____ FINISH _____ INSPECTOR Stewart
 DRILLING METHOD Hand Auger DRILLERS & EQUIPMENT _____

[illegible]



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PROJECT HHP-SI LOCATION Remote test site Page 1 of 1
BORE HOLE No. WESB #4 MONITOR WELL No. _____ ELEVATION Not surveyed
DATE DRILLED 2-6-87 START _____ FINISH _____ INSPECTOR Stewart
DRILLING METHOD Hand Auger DRILLERS & EQUIPMENT _____

[illegible]



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PROJECT HHP-SI LOCATION Remote test site
BORE HOLE No. WESB #6 MONITOR WELL No. _____ ELEVATION Not surveyed
DATE DRILLED 2-5-87 START _____ FINISH _____ INSPECTOR Stewart
DRILLING METHOD Hand Auger DRILLERS & EQUIPMENT _____

[illegible]



Page 1 of 1

LOCATION__Test site 2

MONITOR WELL No.

START _____ FINISH _____

ELEVATION Not surveyed

DRILLERS & EQUIPMENT

[illegible]



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PROJECT HHP-SI LOCATION Test site 2
 BORE HOLE No. WESB #9 MONITOR WELL No. _____ ELEVATION Not surveyed
 DATE DRILLED 2-9-87 START _____ FINISH _____ INSPECTOR Stewart
 DRILLING METHOD Hand Auger DRILLERS & EQUIPMENT _____

[illegible]



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PROJECT HHP-SI LOCATION Test site 2 Page 1 of 1
 BORE HOLE No. WESB #10 MONITOR WELL No. _____ ELEVATION Not surveyed
 DATE DRILLED 2-9-87 START _____ FINISH _____ INSPECTOR Stewart
 DRILLING METHOD Hand Auger DRILLERS & EQUIPMENT _____

[illegible]



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PROJECT	HHP-SI	LOCATION	Test site 2
BORE HOLE No.	WESB #11	MONITOR WELL No.	
DATE DRILLED	2-9-87	START	
DRILLING METHOD	Hand Auger	FINISH	
		INSPECTOR	Stewart
		DRILLERS & EQUIPMENT	

[illegible]



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DRILLERS & EQUIPMENT

[illegible]



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LOCATION Test site 2

MONITOR WELL No.

ELEVATION_ Not surveyed

START _____ FINISH _____

INSPECTOR Stewart

DRILLERS & EQUIPMENT

[illegible]



Page 1 of 1

LOCATION Test site 2

MONITOR WELL No.

ELEVATION Not surveyed

START

FINISH

INSPECTOR Stewart

DRILLERS & EQUIPMENT

[illegible]



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PROJECT HHP-SI LOCATION Test site 3
BORE HOLE No. WESB #15 MONITOR WELL No. _____ ELEVATION Not surveyed
DATE DRILLED 2-10-87 START _____ FINISH _____ INSPECTOR Stewart
DRILLING METHOD Hand Auger DRILLERS & EQUIPMENT _____

[illegible]



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PROJECT HHP-SI LOCATION Test site 3
 BORE HOLE No. WESB #16 MONITOR WELL No. _____ ELEVATION Not surveyed
 DATE DRILLED 2-10-87 START _____ FINISH _____ INSPECTOR Stewart
 DRILLING METHOD Hand Auger DRILLERS & EQUIPMENT _____

[illegible]



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PROJECT	HHP-SI	LOCATION	Test site 3
BORE HOLE No.	WESB #17	MONITOR WELL No.	
DATE DRILLED	2-10-87	START	
DRILLING METHOD	Hand Auger	FINISH	
		INSPECTOR	Stewart
		DRILLERS & EQUIPMENT	

[illegible]



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[illegible]



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PROJECT	HHP-SI	LOCATION	Test site 3
BORE HOLE No.	WESB #19	MONITOR WELL No.	
DATE DRILLED	2-10-87	START	
DRILLING METHOD	Hand Auger	FINISH	
		INSPECTOR	Stewart
		DRILLERS & EQUIPMENT	

[illegible]



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LOCATION Test site 3

MONITOR WELL No.

START

FINISH

ELEVATION Not surveyed

DRILLERS & EQUIPMENT

INSPECTOR Stewart

[illegible]



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PROJECT HHP-SI LOCATION Test site 3
BORE HOLE No. WESB #21 MONITOR WELL No. _____ ELEVATION Not surveyed
DATE DRILLED 2-10-87 START _____ FINISH _____ INSPECTOR Stewart
DRILLING METHOD Hand Auger DRILLERS & EQUIPMENT _____

[illegible]



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LOCATION Test site 3

MONITOR WELL No.

ELEVATION Not surveyed

START _____ FINISH _____

INSPECTOR Stewart

DRILLERS & EQUIPMENT

[illegible]



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PROJECT	HHP-SI	LOCATION	Test site 3
BORE HOLE No.	WESB #23	MONITOR WELL No.	
DATE DRILLED	2-10-87	FINISH	
DRILLING METHOD	Hand Auger	INSPECTOR	Stewart
		DRILLERS & EQUIPMENT	

[illegible]



Page 1 of 1

PROJECT	HHP-SI	LOCATION	Test site 3
BORE HOLE No.	WESB #24	MONITOR WELL No.	
DATE DRILLED	2-10-87	FINISH	
DRILLING METHOD	Hand Auger	INSPECTOR	Stewart
DRILLERS & EQUIPMENT			

[illegible]

SOIL BORING LOG

Page 1 of 1

PROJECT	HHP-SI	LOCATION	Fire training burn pit
BORE HOLE No.		MONITOR WELL No.	WP-1
DATE DRILLED	6-4-86	ELEVATION	Not surveyed
DRILLING METHOD	Hand Auger	INSPECTOR	Reay
		FINISH	
		DRILLERS & EQUIPMENT	N/A

[illegible]

SOIL BORING LOG

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PROJECT HHP-SI

LOCATION Fire training burn pit

BORE HOLE No.

MONITOR WELL No. WP-3

ELEVATION Not surveyed

DATE DRILLED 6-4-86

START.

FINISH

INSPECTOR ReayDRILLING METHOD Hand Auger

DRILLERS & EQUIPMENT N/A

DEPTH BELOW SURFACE	STANDARD PENETRATION TEST RESULTS		SOIL DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	SAMPLES COLLECTED			WELL CONSTRUCTION DETAILS
			TEXTURE, COLOR, MOISTURE, CONSISTENCY, GRAIN-SIZE, DISTRIBUTION, ORGANICS ETC.			INT.	Hnu ppm	SAMP. No.	
	BLOWS	BPF							
	6'-6"	"N"							
			Fine sandy loam, olive brown, slightly moist, non plastic.	SM					
			Very fine sandy loam, very dark gray, slightly moist, low plasticity, some coarse sands.	ML					
			Loamy sands, yellowish brown, slightly moist, low plasticity.	SM					
5			Sandy clay loam, dark yellowish brown, moist becoming saturated at 6', plastic, gravels.	SM					
10			Silty clay, very dark grayish brown, very moist, plastic.	CH					
15									
20									
25									
30									

Well cap

Neat cement

2" O.D. Sch. 40 PVC blank

#3 Monterey gravel

2" O.D. .020" PVC screen

End cap

TD=12'



Page 1 of 1

PROJECT	HHP-SI	LOCATION	Fire training burn pit
BORE HOLE No.		MONITOR WELL No.	WP-4
DATE DRILLED	6-4-86	ELEVATION	Not surveyed
START		FINISH	
DRILLING METHOD	Hand Auger	INSPECTOR	Reay
		DRILLERS & EQUIPMENT	N/A

DEPTH BELOW SURFACE	STANDARD PENETRATION TEST RESULTS		SOIL DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	SAMPLES COLLECTED			WELL CONSTRUCTION DETAILS
			TEXTURE, COLOR, MOISTURE, CONSISTENCY, GRAIN-SIZE, DISTRIBUTION, ORGANICS ETC.			INT.	Hnu ppm	SAMP. No.	
	BLOWS	BPF							
	6"-6"	7"							
0			Fine sandy loam, olive brown, slightly moist, non plastic	SM					
1			Very fine sandy loam, very dark gray, slightly moist, low plasticity, some coarse sands.	ML					
2			Loamy sands, yellowish brown, slightly moist, low plasticity.	SM					
5			Sandy clay loam, dark yellowish brown, moist becoming saturated at 6", plastic, gravels.	SM					
10			Silty clay, very dark grayish brown, very moist, plastic.	CH					
15									
20									
25									
30									



McLaren Environmental Engineering

SOIL BORING LOG

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PROJECT	HHP-SI	LOCATION	SE Corner of Bldg. 12		
BORE HOLE No.		MONITOR WELL No.	EW-1	ELEVATION	Not Surveyed
DATE DRILLED	7-12-86	START		FINISH	
DRILLING METHOD	Mud Rotary	DRILLERS & EQUIPMENT	Beylik, TH-100		
INSPECTOR	Reay				

DEPTH BELOW SURFACE	STANDARD PENETRATION TEST RESULTS		SOIL DESCRIPTION TEXTURE, COLOR, MOISTURE, CONSISTENCY, GRAIN-SIZE, DISTRIBUTION, ORGANICS ETC.	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	SAMPLES COLLECTED			WELL CONSTRUCTION DETAILS
	BLOWS	SPF				INT.	Hnu ppm	SAMP. No.	
	6"-6"	"N"							
			Asphalt	RB					
5			Sandy clay, dark gray to gray green, occasional clay lenses interbedded, common wood and shell fragments	SC					NEAT CEMENT 60 MESH SAND 8" O.D. BLANK 30 MONTEREY GRAVEL PACK 8" O.D. .020" S.S. SCREEN 8/16 MESH GRAVEL PACK 8" O.D. .050" S.S. SCREEN 8" O.D. BLANK 8" O.D. BOTTOM CAP SAND BENTON PLUG TD 110'
10									
15									
20									
25									
30			Sand, gray, poorly sorted, fine to medium, granitic, angular to subrounded, commonly gravelly abundant metamorphics, occasional clay lenses	SP					



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LOCATION SE Corner of Bldg. 12

MONITOR WELL No. EW-1

START _____ FINISH _____

ELEVATION Not Surveyed

DRILLERS & EQUIPMENT Beylik TH-100

[illegible]



McLaren Environmental Engineering

SOIL BORING LOG

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PROJECT HHP-SI LOCATION 600' West of Fire Training Pit
 BORE HOLE No. _____ MONITOR WELL No. C-33 ELEVATION 14.84 msl
 DATE DRILLED 5-22-86 START _____ FINISH _____ INSPECTOR Reay
 DRILLING METHOD 12" Auger DRILLERS & EQUIPMENT Beik; B-61 Auger

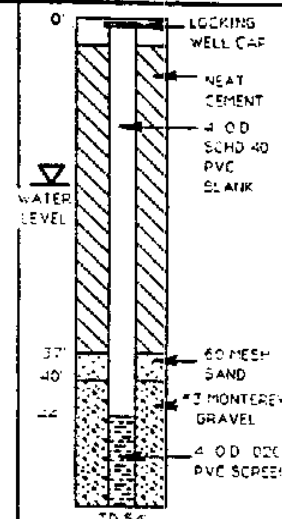
DEPTH BELOW SURFACE	STANDARD PENETRATION TEST RESULTS		SOIL DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	SAMPLES COLLECTED			WELL CONSTRUCTION DETAILS
			TEXTURE, COLOR, MOISTURE, CONSISTENCY, GRAIN-SIZE, DISTRIBUTION, ORGANICS ETC.			INT.	Hnu ppm	SAMP. No.	
	BLOWS	BPF							
	6'-6"	"N"							
			Fine sandy loam, brownish yellow grading to dark yellowish brown, dry grading to slightly moist non-plastic	SM					
5			Very fine sandy loam, very dark gray, slightly moist, non-plastic	ML					
10			Sandy loam, olive brown, moist, slightly plastic	SM					
15			Silty clay loam, dark gray, saturated, plastic	MH					
20			Sand clay, very dark gray brown grading to light gray, saturated, non-plastic	SC					
25									
30			Sandy loam, yellowish brown, saturated, slightly plastic	SM					



SOIL BORING LOG

PROJECT HHP-SI LOCATION Inside, Near West End Building 15
 BORE HOLE No. _____ MONITOR WELL No. C-35 ELEVATION Not Surveyed
 DATE DRILLED 5-24-86 START _____ FINISH _____ INSPECTOR Reay
 DRILLING METHOD 12" Auger DRILLERS & EQUIPMENT BEYLIK; B-61 Auger

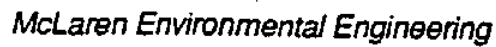
DEPTH BELOW SURFACE	STANDARD PENETRATION TEST RESULTS		SOIL DESCRIPTION TEXTURE, COLOR, MOISTURE, CONSISTENCY, GRAIN-SIZE, DISTRIBUTION, ORGANICS ETC.	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	SAMPLES COLLECTED			WELL CONSTRUCTION DETAILS
	BLOWS	BPF				INT.	Hnu ppm	SAMP. No	
	6"-6"	7"							
			Concrete and Base	CR					
			Sandy loam, dark yellowish brown, slightly moist, slightly plastic	SM					
5			Fine sandy loam, dark brown, slightly moist, moderately plastic	SM-SC			35	2	
			Sandy loam, yellowish brown, slightly moist, slightly plastic	SM					
10	3-4-7	11	Clay, dark gray brown, slightly moist, plastic	CH			10	3	
			Silty clay loam, dark brown, slightly moist, moderately plastic	ML					
15	4-5-7	12	Clay, dark gray to olive brown, moist to saturated @ 18", plastic	CH			15	4	
	3-4-6	10							
20			Sandy clay loam, dark gray, saturated, plastic	SC					
25									
30									





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DEPTH BELOW SURFACE	STANDARD PENETRATION TEST RESULTS		SOIL DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	SAMPLES COLLECTED			WELL CONSTRUCTION DETAILS
						INT.	Hnu ppm	SAMP. No.	
	BLOWS	BPF							
	6-8	N	Concrete	CH					
			Fine sandy loam, dark yellowish brown, slightly moist, non-plastic	SM				1	
			Sandy loam, dark yellowish brown, slightly moist, moderately plastic, organic	SC					
			Silty clay, black, slightly moist, moderately plastic, organic	OL					
5			Silty clay, gray, slightly moist, moderately plastic	CH				2	
	4-8-8	16	Fine to very fine sandy loam, gray brown to dark gray brown, slightly moist, moderately plastic	ML					
10								3	
	4-11-12	23							
15			Very fine sandy loam, very dark gray moist to saturated @ 16', moderately plastic	CL				4	
20									
25									
30			Sandy clay, dark gray to very dark gray brown, saturated, plastic	SC					



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[illegible]



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DEPTH BELOW SURFACE	STANDARD PENETRATION TEST RESULTS		SOIL DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	SAMPLES COLLECTED			WELL CONSTRUCTION DETAILS
						INT.	Hru ppm	SAMP. No.	
	BLOWS	BPF							
	6'-6"	7'							
			Loamy sand, dark brown to gray, slightly moist to moist, moderately plastic	SM				1	LOCKING WELL CAP NEAT CEMENT 4" O.D. SCHD 40 PVC BLANK WATER LEVEL 60 MESH SAND MONTEREY GRAVEL 4" O.D. 0.020" PVC SCREEN 4" O.D. END CAP TD 58'
		Fine sandy loam, gray, moist, non-plastic	ML						
		Sandy loam, dark gray, moist, moderately plastic	SM						
		Silty clay, dark, very dark gray, moist, non-plastic	ML						
		Organic clay, black, slightly moist, plastic	OL						
4-5-7	11	Silty clay loam, very dark gray brown, moist, plastic	MH		3		3		
		Very fine sandy loam, gray, very moist, low plasticity	ML						
4-5-6	11	Organic clay loam, black, very moist, plastic	OL		2		4		
3-3-4	7	Silty loam, very dark gray, very moist, low plasticity	ML						
		Silty clay loam, dark gray, saturated, plastic	CL						



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PROJECT	HHP-SI	LOCATION	Salvage Yard, East of Building 23
BORE HOLE No.		MONITOR WELL No.	C-39
DATE DRILLED	5-29-86	ELEVATION	3.68 msl
DRILLING METHOD	Auger	START	
		FINISH	
		INSPECTOR	Reay
		DRILLERS & EQUIPMENT	BEYLIK; B-61 Auger

DEPTH BELOW SURFACE	STANDARD PENETRATION TEST RESULTS		SOIL DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	SAMPLES COLLECTED			WELL CONSTRUCTION DETAILS
			TEXTURE, COLOR, MOISTURE, CONSISTENCY, GRAIN-SIZE, DISTRIBUTION, ORGANICS ETC.			INT.	Hnu ppm	SAMP. No.	
	BLOWS	BPF							
	6"-6"	"N"							
			Asphalt	BB					
			Fine sandy loam, yellowish brown, slightly moist, non-plastic	SM				1	
5	2-3-5	9	Organic clay loam, dark gray, slightly moist, plastic	OL			3	2	
			Loamy very fine sand, gray brown, slightly moist, little to no plasticity	ML					
10	3-5-7	15	Sandy loam, very dark gray, very dark gray brown to gray, saturated @ 15', low plasticity	SM			2	3	
	8-10-12	22					0	4	
15									
20									
25									
30									

LOCKING WELL CAP

NEAT CEMENT

4" O.D. SCHD 40 PVC BLANK

WATER LEVEL

60 MESH SAND

#3 MONTEREY GRAVEL

4" O.D. .020" PVC SCREEN

4" O.D. END CAP

TD 59'



McLaren Environmental Engineering

SOIL BORING LOG

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PROJECT	HHP-SI	LOCATION	Northeast Corner of Bldg. 35
BORE HOLE No.		MONITOR WELL No.	C-40
DATE DRILLED	6-2-86	ELEVATION	22.60 msl
DRILLING METHOD	12" Auger	INSPECTOR	Reay
		DRILLERS & EQUIPMENT	Belik; B-61 Auger

DEPTH BELOW SURFACE	STANDARD PENETRATION TEST RESULTS		SOIL DESCRIPTION TEXTURE, COLOR, MOISTURE, CONSISTENCY, GRAIN-SIZE, DISTRIBUTION, ORGANICS ETC.	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	SAMPLES COLLECTED			WELL CONSTRUCTION DETAILS
	BLOWS	BPF				INT.	Hnu ppm	SAMP. No.	
	6"-6"	"N"							
			Asphalt	BB					
			Loamy sands with gravel, light olive brown, slightly moist, non-plastic	SM				1	
5			Sandy clay loam, yellowish brown, slightly moist, plastic	CL				2	
	6-10-12	22	Silty clay, very dark gray, slightly moist, plastic	MH					
10			Clay loam, dark gray, slightly moist, plastic	CL				3	
	5-5-9	14	Sandy clay loam, yellowish brown, moist, plastic	SC					
15			Silty loam, brown, very moist, low plasticity	ML				4	
	3-3-5	8	Silty clay, gray, moist, becoming saturated @ 26', plastic	CH					
20								5	
	3-4-7	11							
25								6	
30			Sandy clay, dark gray brown, saturated, moderately plastic	SC					

SOIL BORING LOG

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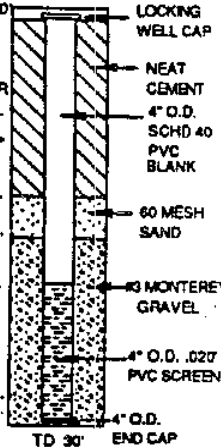
PROJECT	HHP-SI	LOCATION	Salvage Yard, West of Bldg. 23
BORE HOLE No.		MONITOR WELL No.	C-41
DATE DRILLED	6-3-86	ELEVATION	14.51 msl
DRILLING METHOD	12" Auger	INSPECTOR	Reay
		DRILLERS & EQUIPMENT	Belik; B-61 Auger

[illegible]



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PROJECT	HHP-SI	LOCATION	40' Northwest of Bldg. 29
BORE HOLE No.		MONITOR WELL No.	C-42
DATE DRILLED	6-5-86	ELEVATION	11.41 msl
DRILLING METHOD	Auger	START	FINISH
		INSPECTOR	Reay
		DRILLERS & EQUIPMENT	Bellik; B-61 Auger

DEPTH BELOW SURFACE	STANDARD PENETRATION TEST RESULTS		SOIL DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	SAMPLES COLLECTED			WELL CONSTRUCTION DETAILS
			TEXTURE, COLOR, MOISTURE, CONSISTENCY, GRAIN-SIZE, DISTRIBUTION, ORGANICS ETC.			INT.	Hnu ppm	SAMP. No.	
	BLOWS 6"-6"	BPF 7"							
			Asphalt						
5	2-3-7	10	Sandy loam with gravels @ 0.5' to 1.0', dark yellowish brown to yellowish brown, slightly moist, low plasticity	SM		0	1		
10	2-3-6	9	Clay, gray brown, moist becoming saturated @ 13.0', plastic	CH		0	3		
15	3-3-4					1			
20			Sandy clay loam, dark gray brown, saturated, plastic	SC					
25									
30									



SOIL BORING LOG

PROJECT HHP-SI LOCATION Former Hazardous Waste Storage Area
 BORE HOLE No. _____ MONITOR WELL No. C-43 ELEVATION 14.37' MSL
 DATE DRILLED 6-6-86 START _____ FINISH _____ INSPECTOR Reay
 DRILLING METHOD Auger DRILLERS & EQUIPMENT Beylik; B-61 Auger

DEPTH BELOW SURFACE	STANDARD PENETRATION TEST RESULTS		SOIL DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	SAMPLES COLLECTED			WELL CONSTRUCTION DETAILS
			TEXTURE, COLOR, MOISTURE, CONSISTENCY, GRAIN-SIZE, DISTRIBUTION, ORGANICS ETC.			INT.	Hnu ppm	SAMP. No.	
	BLOWS	BPF							
	6"-6"	"N"							
0 5 10 15 20 25 30	7-8-9	17	Sandy loam, dark yellowish brown, slightly moist, low plasticity	SM			30	1	
			Sandy clay, dark brown, slightly moist, moderately plastic	SC			70	2	
	5-6-13	19	Silty loam, light olive brown, slightly moist, low plasticity	ML			40	3	
	3-4-6	9					80	4	
	3-5-5	10	Clay, gray brown, moist, plastic	CH				5	
	1-2-4	6	Silty clay loam, gray to dark gray brown, moist ranging to very moist, plastic	CL			40	6	
	1-2-3	5					20	7	
	2-2-3	5					10	8	
			Silty clay loam, very dark gray, saturated, plastic, organic	OL			5		
			Sandy loam, gray, saturated, moderately plastic	SC			0		
			Loamy fine sands, dark gray, saturated, no plasticity	ML					



Page 2 of 2

PROJECT HHP-SI LOCATION Former hazardous waste storage area
BORE HOLE No. _____ MONITOR WELL No. C-43 ELEVATION 14.37' MSI
DATE DRILLED 6-6-86 START _____ FINISH _____ INSPECTOR Reay
DRILLING METHOD Auger DRILLERS & EQUIPMENT Reylik B-61

[illegible]



McLaren Environmental Engineering

SOIL BORING LOG

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PROJECT	HHP-SI	LOCATION	Northeast corner of Bldg. 32
BORE HOLE No.		MONITOR WELL No.	C-45
DATE DRILLED	6-11-86	ELEVATION	16.31' msl
DRILLING METHOD	Auger	INSPECTOR	Reay
		DRILLERS & EQUIPMENT	Beylik; B-61 Auger

DEPTH BELOW SURFACE	STANDARD PENETRATION TEST RESULTS		SOIL DESCRIPTION TEXTURE, COLOR, MOISTURE, CONSISTENCY, GRAIN-SIZE, DISTRIBUTION, ORGANICS ETC.	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	SAMPLES COLLECTED			WELL CONSTRUCTION DETAILS
	BLOWS	BPF				INT.	Hnu ppm	SAMP. No.	
	6"-6"	"N"							
0			Asphalt	RE			0	1	
5			Fine sand, yellowish brown, slightly moist, no plasticity	SM			0	2	
							0	3	
10	3-3-7	10	Fine sandy loam, brown, moist non-plastic	SM			0	4	
	3-3-5	8							
15			Organic silty clay, very dark gray, very moist, plastic	OL			0	5	
			Sandy clay loam, gray brown, very moist, plastic	SC					
20	2-3-4	7	Very fine sandy loam, gray, saturated, low plasticity	ML			0	6	
25									
30									



Page 1 of 2

PROJECT	HHP-SI	LOCATION	Near Southwest corner of Bldg. 12
BORE HOLE No.		MONITOR WELL No.	C-47
DATE DRILLED	6-13-86	ELEVATION	13.78' msl
DRILLING METHOD	Auger	START	FINISH
		INSPECTOR	Reay
		DRILLERS & EQUIPMENT	Beylik; 8-61 Auger

DEPTH BELOW SURFACE	STANDARD PENETRATION TEST RESULTS		SOIL DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	SAMPLES COLLECTED			WELL CONSTRUCTION DETAILS
			TEXTURE, COLOR, MOISTURE, CONSISTENCY, GRAIN-SIZE, DISTRIBUTION, ORGANICS ETC.			INT.	Hnu ppm	SAMP. No.	
	BLOWS	BPF							
	5"-6"	"N"							
0			Asphalt	HB					LOCKING WELL CAP NEAT CEMENT 4" O.D. SCHD 40 PVC BLANK WATER LEVEL 60 MESH SAND 30' MONTEREY GRAVEL 4" O.D. .020" PVC SCREEN 4" O.D. END CAP TD 40'
1			Sandy loam, dark yellowish brown to very dark gray brown, slightly moist, low plasticity	SM			1		
2			Organic clay, very dark brown, slightly moist, plastic	OH			2		
3	2-5-8	13	Silty loam, dark gray brown, slightly moist, low plasticity	ML		18	3		
4						40	4		
5	3-4-5	9	Sandy clay loam, gray brown, very moist, plastic	SC		15	5		
6									
7	2-4-12	16	Sandy clay, gray, very moist, moderately plastic	SC		6	6		
8									
9									
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20	3-9-14	23	Very fine sand, dark gray, very moist becoming saturated @ 22', low plasticity	SM		5	7		
21									
22									
23									
24									
25									
26									
27									
28									
29									
30									
31									
32									
33									
34									
35									
36									
37									
38									
39									
40									

SOIL BORING LOG

Page 2 of 2

PROJECT HHP-SI

LOCATION Southeast End of Building 12

BORE HOLE No.

MONITOR WELL No. C-47

ELEVATION 13.78' msl

DATE DRILLED 6-13-86

START

FINISH

INSPECTOR Reay

DRILLING METHOD Auger

DRILLERS & EQUIPMENT Beylik; B-61 Auger

[illegible]



Page 1 of 2

LOCATION Southwest Corner of Building 35

MONITOR WELL No. C-48

ELEVATION_ 22.08' msl

START_____FINISH

INSPECTOR_Reay

DRILLERS & EQUIPMENT—Beylik; B-61 Auger

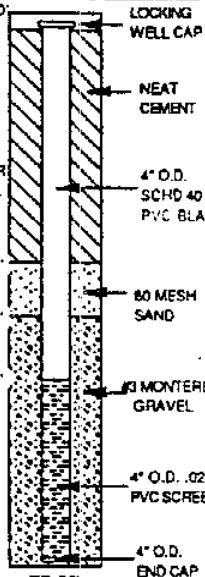
DEPTH BELOW SURFACE	STANDARD PENETRATION TEST RESULTS		SOIL DESCRIPTION TEXTURE, COLOR, MOISTURE, CONSISTENCY, GRAIN-SIZE, DISTRIBUTION, ORGANICS ETC.	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	SAMPLES COLLECTED			WELL CONSTRUCTION DETAILS
	BLOWS	BPF				INT.	Hnu ppm	SAMP. No.	
	6"-6"	7"							
			Asphalt	BB					
			Loamy sands, yellowish brown to dark yellowish brown, slightly moist to moist, moderately plastic	SM				1	
5								2	
								3	
	3-7-9	16	Silty clay, very dark gray brown, moist, plastic	CH			50	4	
10									
	7-10-25	35	Loamy sands, very dark gray brown, very moist, moderately plastic	SM			15	5	
15									
	8-15-25	40							
20			Sand with coarse layers, light olive brown, very moist, non-plastic	SM			20	6	
	3-3-4	7	Clay, dark greenish gray, very moist, plastic	CH			10	7	
25									
	6-15-18	33	Sandy loam, dark greenish gray, saturated, plastic	SC			40	8	
30									

LOCKING WELL CAP
NEAT CEMENT
4" O.D. SCHD 40 PVC BLANK
WATER LEVEL
26'
60 MESH SAND
1/2" MONTEREY GRAVEL
4" O.D. .020" PVC SCREEN
4" O.D. END CAP
TO 45'



Page 1 of 1

PROJECT	HHP-SI	LOCATION	Storm Drain Discharge, near runway
BORE HOLE No.		MONITOR WELL No.	C-49
DATE DRILLED	6-19-86	ELEVATION	11.98 msl
DRILLING METHOD	Auger	START	FINISH
		INSPECTOR	Reay
		DRILLERS & EQUIPMENT	BEYLIK; B-61 Auger

DEPTH BELOW SURFACE	STANDARD PENETRATION TEST RESULTS		SOIL DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	SAMPLES COLLECTED			WELL CONSTRUCTION DETAILS
			TEXTURE, COLOR, MOISTURE, CONSISTENCY, GRAIN-SIZE, DISTRIBUTION, ORGANICS ETC.			INT.	Hnu ppm	SAMP. No.	
	BLOWS	BPF							
	6"-6"	7"							
			Loam, very dark gray, slightly moist, low plasticity	ML				1	
5			Clay loam, light yellowish brown, slightly moist, moderately plastic	CL-ML				2	
10	6-9-9	18	Sandy clay, gray to gray brown, very moist becoming saturated @ 13.0', moderately plastic	SC		0	0	3	
	5-6-9	15						4	
15			Silty loam, dark greenish gray, saturated, low plasticity	ML					
			Sandy clay, dark gray, saturated, moderate plasticity	SC					
20			Loam, dark greenish gray, saturated, plastic	CL					
25			Fine sand, greenish gray, saturated, low plasticity	SM					
30									



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SOIL BORING LOG

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PROJECT <u>HHP-SI</u>	LOCATION <u>In street, near southwest corner of Building 16</u>
BORE HOLE No. _____	MONITOR WELL No. <u>C-50</u>
DATE DRILLED <u>6-23-86</u>	ELEVATION <u>13.50 msl</u>
DRILLING METHOD <u>Auger to 9.0' Mud Rotary</u>	INSPECTOR <u>Reay</u>
	DRILLERS & EQUIPMENT <u>Bevlik; B-61 Auger</u>

DEPTH BELOW SURFACE	STANDARD PENETRATION TEST RESULTS		SOIL DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	SAMPLES COLLECTED			WELL CONSTRUCTION DETAILS
						TEXTURE, COLOR, MOISTURE, CONSISTENCY, GRAIN-SIZE, DISTRIBUTION, ORGANICS ETC.	INT.	Hnu ppm	
	BLOWS	BPF							
6"-6"	7"								
			Asphalt	HB					
			Fine sand, brownish yellow, slightly moist, low plasticity	SM					
			Organic clay, black, slightly moist, plastic	OL					
5			Clay loam, dark gray brown, slightly moist, moderately plastic	CL-ML					
10			Very fine sandy loam, light brown gray to greenish gray, slightly moist becoming saturated @ 8.0'	ML					
15									
20			Fine sandy loam with organic material (wood, lignite), dark brown, gastropods present	SM					
25									
30			Sandy clay with organic material, inter-bedded fine sand and clay, dark gray	SC					

0'

LOOKING WELL CAP

NEAT CEMENT

4" O.D. SCHD 40 PVC BLANK

WATER LEVEL

92'

96'

100'

110'

TD 115'

60 MESH SAND

#3 MONTEREY GRAVEL

4" O.D. .020 PVC SCREEN

4" O.D. END CAP



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SOIL BORING LOG

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PROJECT HHP-SI

LOCATION In street, near southwest corner of Building 16

BORE HOLE No. _____

MONITOR WELL No. C-50

ELEVATION 13.50 msl

DATE DRILLED 6-23-86

START _____ FINISH _____

INSPECTOR Reay

DRILLING METHOD Auger to 9.0' Mud Rotary

DRILLERS & EQUIPMENT Beylik, B-61 Auger

DEPTH BELOW SURFACE	STANDARD PENETRATION TEST RESULTS		SOIL DESCRIPTION TEXTURE, COLOR, MOISTURE, CONSISTENCY, GRAIN SIZE, DISTRIBUTION, ORGANICS ETC.	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	SAMPLES COLLECTED			WELL CONSTRUCTION DETAILS
	BLOWS	BPF				INT.	Hnu ppm	SAMP. No.	
	6'-6"	"N"							
35			Coarse sand, gravelly, gray, ballona formation						
80									
85									
90			Fine sandy clay greenish gray, silverado formation						
95									
100									

NOTE BREAK IN DEPTH CONTINUITY



SOIL BORING LOG

Page 3 of 3

PROJECT <u>HHP-SI</u>	LOCATION <u>Northwest end of Building 19</u>
BORE HOLE No. _____	MONITOR WELL No. <u>C-50</u>
DATE DRILLED <u>6-23-86</u>	ELEVATION <u>13.50' msl</u>
DRILLING METHOD <u>Auger/Mud Rotary</u>	INSPECTOR <u>Reay</u>
	DRILLERS & EQUIPMENT <u>Beylik; B-61 Auger</u>

DEPTH BELOW SURFACE	STANDARD PENETRATION TEST RESULTS		SOIL DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	SAMPLES COLLECTED			WELL CONSTRUCTION DETAILS
			TEXTURE, COLOR, MOISTURE, CONSISTENCY, GRAIN-SIZE, DISTRIBUTION, ORGANICS ETC.			INT.	Hnu ppm	SAMP. No.	
	BLOWS	BPF							
6"-6"	7"								
105									
110									
115									
120			Note: Not possible to determine top of silverado while drilling. Contact of ballona - silverado formations determined from electric log at 90'						
125									
130									



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SOIL BORING LOG

Page 1 of 2

PROJECT HHP-SI LOCATION In street near Southwest corner of Building 16
BORE HOLE No. MONITOR WELL No. C-51 ELEVATION 13.72' msl
DATE DRILLED 6-26-86 START FINISH INSPECTOR Veregge
DRILLING METHOD Mud Rotary DRILLERS & EQUIPMENT Beylik; B-61 Auger

DEPTH BELOW SURFACE	STANDARD PENETRATION TEST RESULTS		SOIL DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	SAMPLES COLLECTED			WELL CONSTRUCTION DETAILS
			TEXTURE, COLOR, MOISTURE, CONSISTENCY, GRAIN-SIZE, DISTRIBUTION, ORGANICS ETC.			INT.	Hnu ppm	SAMP. No.	
	BLOWS	BPF							
6"-6"	6"-6"	TN"							
			Asphalt	RB					
			Fine sand, brownish yellow, dry, low plasticity	SM					
			Organic clay, black, dry, plastic	OL					
5			Clay loam, dark gray brown, slightly moist, moderately plastic	CL-ML					
10			Very fine sandy loam, light brown gray to greenish gray, slightly moist, becoming saturated @ 8.0'	ML					
15									
20			Fine sandy loam with organic material (wood, lignite), dark brown, gastropods present	SM					
25			Sandy clay with organic material, interbedded fine sand and clay, dark gray	SC					
30									



Page 1 of 4

PROJECT HHP-SI LOCATION On Playa Del Rey Bluff, East of Site
BORE HOLE No. _____ MONITOR WELL No. C-52 ELEVATION 123' msl
DATE DRILLED 6-26-86 START _____ FINISH _____ INSPECTOR Phillips
DRILLING METHOD Mud Rotary DRILLERS & EQUIPMENT Beylik, TH-100

DEPTH BELOW SURFACE	STANDARD PENETRATION TEST RESULTS		SOIL DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	SAMPLES COLLECTED			WELL CONSTRUCTION DETAILS
	BLOWS	BPF	TEXTURE, COLOR, MOISTURE, CONSISTENCY, GRAIN-SIZE, DISTRIBUTION, ORGANICS ETC.			INT.	Hnu ppm	SAMP. No.	
	6"-6"	7"							
5			Fine to medium sand, light brown to brown, minor interbeds of clay	SP-SW					
10									
45									
50									
55			Loamy sands, sand very coarse to coarse, dark brown to brown	SM					
60									
BREAK IN DEPTH CONTINUITY									

COMPLETED 1' SUB-SURFACE IN A CHRISTY B-12 VAULT BOX

10"

14" Ø OD SURFACE CASING

20" Ø OD MUD BOREHOLE

2" Ø BLANK, SCH. 40, T&C PIPE

GROUT SEAL

125'

139'

149'

154'

2" Ø JOHNSON, 0.020" V SLOT

174' S.S. WELL SCREEN

178'

12" Ø OD MUD BOREHOLE

216'

221'

228'

236'

SAND BRIDGE

GRAVEL PACK

250'

255'

260'

280'

TD 290'



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DRILLERS & EQUIPMENT Beylik; TH-100

DEPTH BELOW SURFACE	STANDARD PENETRATION TEST RESULTS		SOIL DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	SAMPLES COLLECTED			WELL CONSTRUCTION DETAILS
			TEXTURE, COLOR, MOISTURE, CONSISTENCY, GRAIN-SIZE, DISTRIBUTION, ORGANICS ETC.			INT.	Hnu ppm	SAMP. No.	
	BLOWS	BPF							
6"-6"	"N"								
65									
			Gravel and coarse grained sand	GP					
70			Gravel with coarse ranging to medium to fine grained sand	GP					
105									
110			Coarse to fine grained sandy loam, some gravels, greenish gray	SM					
115			Sandy clay, dark gray, plastic	SC					
120									
BREAK IN DEPTH CONTINUITY									



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SOIL BORING LOG

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PROJECT HHP-SI

LOCATION On Playa Del Rey Bluff; East of Site

BORE HOLE No. _____

MONITOR WELL No. C-52

ELEVATION 123' msl

DATE DRILLED 6-26-86

START _____ FINISH _____

INSPECTOR Phillips

DRILLING METHOD Mud Rotary

DRILLERS & EQUIPMENT Beylik; TH-100

DEPTH BELOW SURFACE	STANDARD PENETRATION TEST RESULTS		SOIL DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	SAMPLES COLLECTED			WELL CONSTRUCTION DETAILS
	BLOWS	BPF	TEXTURE, COLOR, MOISTURE, CONSISTENCY, GRAIN-SIZE, DISTRIBUTION, ORGANICS ETC.			INT.	Hnu ppm	SAMP. No.	
	6"-6"	"N"							
0									
125			Coarse to very fine sand, black, gray and white	GP					
150									
155			Gravel with sand and clay, gray to blue gray	GC					
160									
165			Silty sand with shell fragments, dark blue-green	SM					
170									
BREAK IN DEPTH CONTINUITY									



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SOIL BORING LOG

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PROJECT <u>HHP-SI</u>	LOCATION <u>On Playa Del Rey Bluff; East of Site</u>
BORE HOLE No. _____	MONITOR WELL No. <u>C-52</u>
DATE DRILLED <u>6-26-86</u>	ELEVATION <u>123' msl</u>
DRILLING METHOD <u>Mud Rotary</u>	INSPECTOR <u>Phillips</u>
START _____	FINISH _____
DRILLERS & EQUIPMENT <u>Beylik; TH-100</u>	

DEPTH BELOW SURFACE	STANDARD PENETRATION TEST RESULTS		SOIL DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	SAMPLES COLLECTED			WELL CONSTRUCTION DETAILS
	BLOWS	BPF	TEXTURE, COLOR, MOISTURE, CONSISTENCY, GRAIN-SIZE, DISTRIBUTION, ORGANICS ETC.			INT.	Hnu ppm	SAMP. No.	
	6"-6"	"N"							
175									
			Silty clay, occasional shell fragments, greenish gray	MH					
230									
235									
240			Silty fine sand with shell fragments, light gray	SM					
255			Silty coarse sand with shell fragments, some gravel, gray	SM					
265									
			BREAK IN DEPTH CONTINUITY						



SOIL BORING LOG

Page 2 of 3

PROJECT <u>HHP-SI</u>	LOCATION <u>Outside, North Center of Building 12</u>
BORE HOLE No. _____	MONITOR WELL No. <u>C-53</u>
DATE DRILLED <u>6-30-86</u>	ELEVATION <u>15.09' msl</u>
DRILLING METHOD <u>Mud Rotary</u>	INSPECTOR <u>Cudzilo</u>
START _____	FINISH _____
DRILLERS & EQUIPMENT <u>Bevlik; B-61</u>	

DEPTH BELOW SURFACE	STANDARD PENETRATION TEST RESULTS		SOIL DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	SAMPLES COLLECTED			WELL CONSTRUCTION DETAILS
	BLOWS	BPF	TEXTURE, COLOR, MOISTURE, CONSISTENCY, GRAIN-SIZE, DISTRIBUTION, ORGANICS ETC.			INT.	Hnu ppm	SAMP. No.	
	6"-6"	"N"							
35			Clayey sands, interbedded coarse gravelly sands, gray	SC					
40			Silty clay, some sand, gray	MH					
45			Coarse gravel and sand, gray	GP					
80									
85									
90			Coarse sand with organic material, gray	GW					
			BREAK IN DEPTH CONTINUITY						



Page 1 of 2

LOCATION Outside north center of Building 12

MONITOR WELL No. C-54

ELEVATION 14.51 MSL

DATE DRILLED 7-11-86

START_____FINISH

INSPECTOR_Reay

DRILLING METHOD Auger

DRILLERS & EQUIPMENT Beylik, B-61 Auger

DEPTH BELOW SURFACE	STANDARD PENETRATION TEST RESULTS		SOIL DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	SAMPLES COLLECTED			WELL CONSTRUCTION DETAILS
			TEXTURE, COLOR, MOISTURE, CONSISTENCY, GRAIN-SIZE, DISTRIBUTION, ORGANICS ETC.			INT.	Hnu ppm	SAMP. No.	
	BLOWS	BPF							
	6"-6'-6"	"N"							
			Asphalt	RB					
			Sandy loam, yellowish brown, slightly moist, plastic	SC					
			Sandy clay, very dark gray, slightly moist, plastic	SC					
			Organic clay, black, slightly moist, plastic	OL					
			Loam, dark gray, slightly moist, moderately plastic	CL-ML					
5			Clay loam, very dark gray, moist, plastic	CL					
			Silty loam, greenish gray, very moist, moderately plastic	CL-ML					
10			Silty loam, dark gray, very moist, low plasticity	ML					
15			Silty clay loam, very dark gray, saturated, plastic	MH					
20									
			Silty loam, dark gray, saturated, low plasticity	ML					
25									
30									

14' water level

33'

38'

45'

63'

T.D. = 70'

Locking well cap

Neat cement

4" O.D. Sch. 40 PVC blank

60 mesh sand

#3 Monterey gravel pack

4" O.D. 0.020" Sch. 40 PVC screen

4" O.D. end cap



PROJECT <u>HHP-SI</u>		LOCATION <u>Outside north center of Building 12</u>	
BORE HOLE No. _____	MONITOR WELL No. <u>C-54</u>	ELEVATION <u>14.51 MSL</u>	
DATE DRILLED <u>7-11-86</u>	START _____	FINISH _____	INSPECTOR <u>Reay</u>
DRILLING METHOD <u>Auger</u>	DRILLERS & EQUIPMENT <u>Beylik, B-61 Auger</u>		

[illegible]



Page 1 of 2

LOCATION In Street between Bldg. 5 and Bldg. 12

MONITOR WELL No. C-55

ELEVATION 16.27 msl

DATE DRILLED 7-14-86

START _____ FINISH _____

INSPECTOR Reay

DRILLING METHOD _____ Mud Rotary

DRILLERS & EQUIPMENT Beylik; B-61 Auger

DEPTH BELOW SURFACE	STANDARD PENETRATION TEST RESULTS		SOIL DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	SAMPLES COLLECTED			WELL CONSTRUCTION DETAILS
			TEXTURE, COLOR, MOISTURE, CONSISTENCY, GRAIN-SIZE, DISTRIBUTION, ORGANICS ETC.			INT.	H _{nu} ppm	SAMP. No.	
	BLOWS	BPF							
0'	6"-6"	7"	Silty clay, dark brown to gray brown	MH					
5'			Very fine sandy silt, clayey silt, gray green	ML-MH					
10'			Silty clay, dark brown, sticky	MH					
15'			Fine to coarse sand, gray	SP					
20'			Fine to medium sandy clay, gray to dark gray	SC					
25'									
30'									



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SOIL BORING LOG

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PROJECT	HHP-SI	LOCATION	In between Buildings 12 and 5
BORE HOLE No.		MONITOR WELL No.	C-55
DATE DRILLED	7-14-86	ELEVATION	16.27' msl
DRILLING METHOD	Mud Rotary	INSPECTOR	Reay
		DRILLERS & EQUIPMENT	Bevlik: B-61

DEPTH BELOW SURFACE	STANDARD PENETRATION TEST RESULTS		SOIL DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	SAMPLES COLLECTED			WELL CONSTRUCTION DETAILS
			TEXTURE, COLOR, MOISTURE, CONSISTENCY, GRAIN-SIZE, DISTRIBUTION, ORGANICS ETC.			INT.	Hnu ppm	SAMP. No.	
	BLOWS	BPF							
	6"-6"	7"							
35									
40			Coarse to gravelly sand, gray	SP					
45									
			Interbedded cobbles and gravelly sands, gray	GP					
70									
75									
80									
			BREAK IN DEPTH CONTINUITY						



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SOIL BORING LOG

Page 1 of 2

PROJECT <u>HHP-SI</u>	LOCATION <u>Near Southeast corner of Building 12</u>
BORE HOLE No. _____	MONITOR WELL No. <u>C-56</u>
DATE DRILLED <u>7-15-86</u>	ELEVATION <u>15.43 msl</u>
DRILLING METHOD <u>Mud Rotary</u>	INSPECTOR <u>Reay</u>
START _____	FINISH _____
DRILLERS & EQUIPMENT <u>Beylik B-61</u>	

DEPTH BELOW SURFACE	STANDARD PENETRATION TEST RESULTS		SOIL DESCRIPTION		UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	SAMPLES COLLECTED			WELL CONSTRUCTION DETAILS
			TEXTURE, COLOR, MOISTURE, CONSISTENCY, GRAIN-SIZE, DISTRIBUTION, ORGANICS ETC.				INT.	Hnu ppm	SAMP No.	
	BLOWS	BPF								
	6"-6"	"N"								
			Asphalt		HB					
			Sandy loam, brown		SM					
5										
			Silty clay, dark brown to dark gray, slightly plastic		MH					
10										
			Clay, brown, plastic		CL					
			Silty clay, brown, slightly plastic		CL-ML					
15			Clay, dark brown, semi-plastic		CL					
			Clayey sand, dark gray		SC					
20										
			Sandy clay, clay, dark gray, moderately plastic		SC					
25										
30										

0' LOCKING WELL CAP

NEAT CEMENT

4" O.D. SCHD 40 PVC BLANK

WATER LEVEL

41' 60 MESH SAND

45' #3 MONTEREY GRAVEL

50' 4" O.D. .020" PVC SCREEN

70' 4" O.D. END CAP

TD 73'



Page 2 of 2

LOCATION Near Southeast corner of Building 12

MONITOR WELL No. C-56

ELEVATION 15.43 msl

DATE DRILLED 7-15-86

START _____ FINISH _____

INSPECTOR Reay

DRILLING METHOD Mud Rotary

DRILLERS & EQUIPMENT Beylik; B-61

[illegible]



Page 1 of 2

LOCATION Salvage yard west of Building 23

MONITOR WELL No. C-57

ELEVATION Not surveyed

DATE DRILLED 7-28-86

START _____ FINISH _____

INSPECTOR Veragge

DRILLING METHOD Mud Rotary

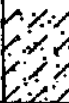
DRILLERS & EQUIPMENT Beylik; G.P. BRAT

DEPTH BELOW SURFACE	STANDARD PENETRATION TEST RESULTS		SOIL DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	SAMPLES COLLECTED			WELL CONSTRUCTION DETAILS
			TEXTURE, COLOR, MOISTURE, CONSISTENCY, GRAIN-SIZE, DISTRIBUTION, ORGANICS ETC.			INT.	Hnu ppm	SAMP. No.	
	BLOWS	BPF							
	6"-6"	7"							
			Asphalt	HR					LOCKING WELL CAP NEAT CEMENT 4" O.D. SCHD 40 PVC BLANK WATER LEVEL 60 MESH SAND MONTEREY GRAVEL 4" O.D. .020" PVC SCREEN 4" O.D. END CAP TD: 117'
			Silty sand, light brown, non-plastic, moist	SM					
5			Gravelly silty sand, light brown, non-plastic, moist	GM					
			Silty clay, black, organic, plastic, moist	OH					
10			Sandy clay, gray, moderately plastic	SC					
15									
20			Sand, gray, medium, well sorted with common wood chips, non-plastic	SW					
			Peat, brown, highly organic, spongy	PT					
			Sandy clay, gray, common to abundant wood and gastropods, slightly plastic	SC					
25			Peat, brown, highly organic, spongy	PT					
30			Sandy clay, gray, slightly plastic	SC					



SOIL BORING LOG

PROJECT HHP-SI LOCATION Salvage yard west of Building 23
BORE HOLE No. _____ MONITOR WELL No. C-57 ELEVATION Not surveyed
DATE DRILLED 7-28-86 START _____ FINISH _____ INSPECTOR Veregge
DRILLING METHOD Mud Rotary DRILLERS & EQUIPMENT Bevlik; G.P. BRAT

DEPTH BELOW SURFACE	STANDARD PENETRATION TEST RESULTS		SOIL DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	SAMPLES COLLECTED			WELL CONSTRUCTION DETAILS
			TEXTURE, COLOR, MOISTURE, CONSISTENCY, GRAIN-SIZE, DISTRIBUTION, ORGANICS ETC.			INT.	Hnu ppm	SAMP. No.	
	BLOWS	BPF							
	6"-6"	7"							
35			Gravelly sand, gray, granitic, very cobbly, poorly sorted	GW					
40									
85			Silty sand, green-gray green, fining downward, slightly to non-plastic						
95									
120			BREAK IN DEPTH SCALE						



SOIL BORING LOG

Page 1 of 2

PROJECT HHP-SI LOCATION Salvage Yard, West of Bldg. 23
 BORE HOLE No. _____ MONITOR WELL No. C-58 ELEVATION Not Surveyed
 DATE DRILLED 8-5-86 START _____ FINISH _____ INSPECTOR Abrahams
 DRILLING METHOD Auger DRILLERS & EQUIPMENT Belik; B-61 Auger

DEPTH BELOW SURFACE	STANDARD PENETRATION TEST RESULTS		SOIL DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	SAMPLES COLLECTED			WELL CONSTRUCTION DETAILS
	BLOWS	BPF	TEXTURE, COLOR, MOISTURE, CONSISTENCY, GRAIN-SIZE, DISTRIBUTION, ORGANICS ETC.			INT.	Hnu ppm	SAMP. No.	
	6"-6"	7"							
			Concrete						
5			Fine sand, dark yellowish brown, slightly moist, non-plastic	SM					
10			Sandy clay, dark gray brown, grading from moist to very moist @ 14\", slightly to non-plastic	SC					
15									
20			Silty clay, dark brown, very moist, firm, slightly plastic	CH					
25			Silty clay loam, very dark gray brown, saturated, firm, slightly plastic	CH					
30									



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PROJECT HHP-SI LOCATION Salvage yard
BORE HOLE No. _____ MONITOR WELL No. C-58 ELEVATION Not specified
DATE DRILLED 8-5-86 START _____ FINISH _____ INSPECTOR Abrahams
DRILLING METHOD Auger DRILLERS & EQUIPMENT Beylik; B-61 Auger

DEPTH BELOW SURFACE	STANDARD PENETRATION TEST RESULTS		SOIL DESCRIPTION TEXTURE, COLOR, MOISTURE, CONSISTENCY, GRAIN-SIZE, DISTRIBUTION, ORGANICS ETC.	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	SAMPLES COLLECTED			WELL CONSTRUCTION DETAILS
						INT.	Hnu ppm	SAMP. No.	
	BLOWS 6"-6"	BPF 7"							
			 Break in depth						
50			Cobbly, sandy clay, very dark gry, saturated, poorly sorted, granitic, non-plastic	SC					
55									
60									
			 Break in depth						
80									
85									
90									



McLaren Environmental Engineering

SOIL BORING LOG

Page 1 of 2

PROJECT	HHP-SI	LOCATION	Salvage Yard
BORE HOLE No.		MONITOR WELL No.	C-59
DATE DRILLED	10-30-86	ELEVATION	Not surveyed
DRILLING METHOD	Auger	INSPECTOR	Reay
		DRILLERS & EQUIPMENT	Beylik; B-61 auger

DEPTH BELOW SURFACE	STANDARD PENETRATION TEST RESULTS		SOIL DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	SAMPLES COLLECTED			WELL CONSTRUCTION DETAILS
	TEXTURE, COLOR, MOISTURE, CONSISTENCY, GRAIN-SIZE, DISTRIBUTION, ORGANICS ETC.		INT.			Hru ppm	SAMP. No.		
	BLOWS	BPF							
6"-6'-6"	7"								
			Asphalt	RB					
5			Loamy fine sand, very dark grey brown, slightly moist, non-plastic.	SM				1	
10								2	
15								3	
20			Fine sand, dark yellowish brown grading to yellowish brown, very moist to saturated at 12.0', non-plastic.	SM				4	
25								5	
30								6	
			Sand, greenish grey, saturated, non-plastic.	SW				7	



SOIL BORING LOG

[illegible]



Page 1 of 1

LOCATION Salvage Yard

MONITOR WELL No. C-60

ELEVATION Not surveyed

DATE DRILLED 11-6-86

START _____ FINISH _____

INSPECTOR Reay

DRILLING METHOD Auger

DRILLERS & EQUIPMENT Beylik; B-61 auger

DEPTH BELOW SURFACE	STANDARD PENETRATION TEST RESULTS		SOIL DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	SAMPLES COLLECTED			WELL CONSTRUCTION DETAILS
			TEXTURE, COLOR, MOISTURE, CONSISTENCY, GRAIN-SIZE, DISTRIBUTION, ORGANICS ETC.			INT.	How ppm	SAMP. No.	
	BLOWS	BPF							
	6"-6"	7"							
			Asphalt	BB					
			Loamy fine sand, light olive brown, very moist, low plasticity.	SM			5	1	
5			Loamy fine sand with gravels, olive yellow, slightly moist, low plasticity.	SM			3		
			Fine sand with gravels, olive yellow, moist, non-plastic.	SM			3	2	
10			Fine sand, olive yellow, very moist, non-plastic.	SW			0		
15			Fine sand, light olive brown, saturated, non-plastic.	SM				3	
20								4	
25									
30									
			T.D. 38'						

0'
LOCKING WELL CAP
NEAT CEMENT
1" O.D. SCHED 40 PVC BLANK
15'
17'
20'
25'
35'
60 MESH SAND
#3 MONTEREY GRAVEL
4" O.D. 120" PVC SCREEN
4" O.D. END CAP
T.D. 38'



Page 1 of 1

LOCATION Temporary chemical drain storage area

MONITOR WELL No. C-52

ELEVATION Not surveyed

START_____FINISH_____

INSPECTOR Reay

DRILLERS & EQUIPMENT Beylik, B-61 auger

DEPTH BELOW SURFACE	STANDARD PENETRATION TEST RESULTS		SOIL DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	SAMPLES COLLECTED			WELL CONSTRUCTION DETAILS
			TEXTURE, COLOR, MOISTURE, CONSISTENCY, GRAIN-SIZE, DISTRIBUTION, ORGANICS ETC.			INT.	Hnu ppm	SAMP. No.	
	BLOWS	BPF							
	6'-6"	"N"							
5			Loamy fine sand, light olive brown grading to yellowish brown, dry grading to slightly moist, non-plastic.	SM		0	1		
			Fine sand, yellowish brown, moist, non-plastic.	SM		3			
			Loamy fine sand, very dark grey brown, moist, low plasticity.	SM		2	2		
10			Sandy clay loam, light brown grey, very moist, plastic.	SC		1			
			Silty clay, dark grey brown, saturated, plastic.	CH		1	3		
15			Clay, grey, very moist, plastic.	CH		2	4		
			Sand, dark grey, saturated, non-plastic.	SM		0	5		
20			Sand, dark greenish grey, saturated, non-plastic.	SM		0	6		
25							7		
30									
			T.D. 38'						

0' LOCKING WELL CAP
NEAT CEMENT
4" O.D. SCH 40 PVC BLANK
13'
15'
20'
25'
35'
T.D. 38'

SOIL BORING LOG

Page 1 of 1

PROJECT HHP-SI

LOCATION Salvage Yard

BORE HOLE No.

MONITOR WELL No. C-53

ELEVATION Not surveyed

DATE DRILLED 11-21-86

START_____FINISH

INSPECTOR ReayDRILLING METHOD Auger

DRILLERS & EQUIPMENT Beylik; B-61 auger

DEPTH BELOW SURFACE	STANDARD PENETRATION TEST RESULTS		SOIL DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	SAMPLES COLLECTED			WELL CONSTRUCTION DETAILS
	BLOWS	BPF	TEXTURE, COLOR, MOISTURE, CONSISTENCY, GRAIN-SIZE, DISTRIBUTION, ORGANICS ETC.			INT.	Hhu ppm	SAMP. No.	
	6"-6"	"N"							
0			Fine sandy loam, brown, slightly moist, non-plastic.	SM			1		
5			Silty clay loam, dark yellowish brown grading to light olive brown, slightly moist to saturated at 6.0', plastic.	MH			2		
10			Clay, dark gray brown, very moist, plastic.	CH			3		
15			Silty clay, dark greenish gray, very moist, plastic.	CH			4		
20			Sandy clay, dark greenish gray, saturated, moderately plastic.	CL			5		
25			Fine sand, dark greenish gray, saturated, non-plastic.	SM			6		
			T.D. 38'						



Page 1 of 2

LOCATION Underground tank south of building 5

MONITOR WELL No. C-64

START_____FINISH

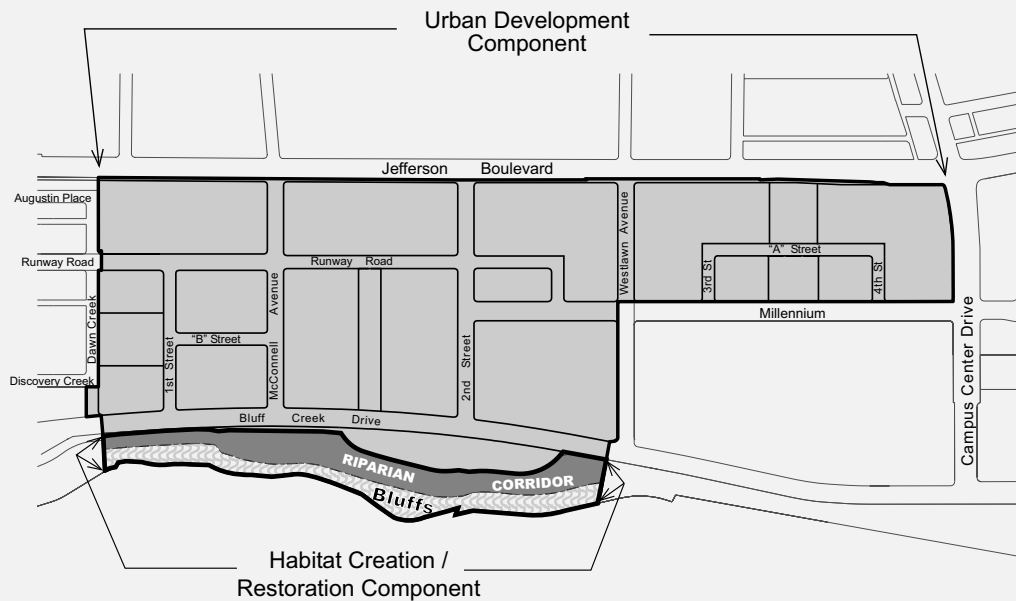
ELEVATION Not surveyed

FINISH _____ INSPECTOR Reay
DRILLERS & EQUIPMENT Baylik, B-61 Auger

Diagram of a well casing assembly showing various components and their dimensions:

- LOCKING WELL CAP
- NEAT CEMENT
- 4" O.D. SCHD 40 PVC BLANK
- 60 MESH SAND
- 6" MONTEREY GRAVEL
- 4" O.D. .020" PVC SCREEN
- 4" O.D. END CAP

DRAFT ENVIRONMENTAL IMPACT REPORT (DEIR) VILLAGE AT PLAYA VISTA



VOLUME XIX TECHNICAL APPENDIX J

J. SAFETY/RISK OF UPSET (CONT.)

DRAFT
ENVIRONMENTAL IMPACT REPORT (EIR)
VILLAGE AT PLAYA VISTA
TECHNICAL APPENDICES

VOLUME XIX
APPENDIX J:
SAFETY/RISK OF UPSET TECHNICAL APPENDIX
(CONTINUED)

City of Los Angeles
EIR No. ENV-2002-6129-EIR

State Clearinghouse
No. 2002111065

2003

TABLE OF CONTENTS

Appendix Number	Title

VOLUME XIX

J	Safety/Risk of Upset Technical Appendix (Continued)

J-12 (Continued)	McLaren Environmental Engineering, "Site Investigation and Evaluation of Remedial Measures Report, Howard Hughes Property Plant Site, Los Angeles, California, May 8, 1987. (Continued)
J-13	McLaren Environmental Engineering, Annual Update Report on Plant Site Remediation, March 1990.
J-14a	Village at Playa Vista Building Methane Mitigation Guidelines, August 12, 2003.
J-14b	Draft Methane Mitigation Standard, Los Angeles Department of Building and Safety, August 5, 2003.
J-14c	Draft Building Methane Mitigation Regulations, Division 71, July 24, 2003.
J-15	Camp Dresser & McKee Inc, "Addendum to Soil and Groundwater Investigation Report, Phase 2 Portion of the Area D Project Area, Playa Vista Site.

Other Safety/Risk of Upset Appendices:

SEE VOLUME XI for:

J-1	Environmental Data Resources, Inc. "The EDR Area Study Report for the Playa Vista 2nd Phase Project." September 25, 2002.

SEE VOLUME XII for:

J-1 (Continued)	Environmental Data Resources, Inc. "The EDR Area Study Report for the Playa Vista 2nd Phase Project." September 25, 2002. (Continued)

SEE VOLUME XIII for:

TABLE OF CONTENTS (CONT.)

Appendix Number	Title
J-2	<i>Summary of Soil and Groundwater Remediation Option, CDM, July 2003.</i>
J-3	<i>CDM, "Soil and Groundwater Investigation Report, Phase 2 Portion of the Area D Project Area," Playa Vista Site, May 15, 2002.</i>
SEE VOLUME XIV for:	
J-3 (Continued)	<i>CDM, "Soil and Groundwater Investigation Report, Phase 2 Portion of the Area D Project Area," Playa Vista Site, May 15, 2002. (Continued)</i>
SEE VOLUME XV for:	
J-3 (Continued)	<i>CDM, "Soil and Groundwater Investigation Report, Phase 2 Portion of the Area D Project Area," Playa Vista Site, May 15, 2002. (Continued)</i>
SEE VOLUME XVI for:	
J-4	<i>City of Los Angeles Department of Building and Safety. "Memorandum of General Distribution #92: Methane Potential Hazard Zones." March 19, 1991.</i>
J-5	<i>City of Los Angeles. Los Angeles Municipal Code, Chapter IX, Article 1 (Building Code), Division 71. "Methane Seepage District Regulations." Ordinance No. 170,953, Effective March 17, 1996.</i>
J-6	<i>City of Los Angeles, Office of the Chief Legislative Analyst. "Final Report for City Investigation of Potential Issues of Concern for Community Facilities District No. 4, Playa Vista Development Project," May 2001.</i>
SEE VOLUME XVII for:	
J-6 (Continued)	<i>City of Los Angeles, Office of the Chief Legislative Analyst. "Final Report for City Investigation of Potential Issues of Concern for Community Facilities District No. 4, Playa Vista Development Project," May 2001. (Continued)</i>
J-7	<i>Camp Dresser & McKee Inc, "Report of Sampling and Analysis of Soil Gas for Methane Phase 2 Portion of Playa Vista, CDM Project Number 10610-30928.RT.RPT, November 2, 2000.</i>
J-8	<i>Camp Dresser & McKee Inc, "Addendum to Report of Sampling and Analysis of Soil Gas for Methane Phase 2 Portion of Playa Vista, CDM Project Number 10610-30928.RT.RPT, May 8, 2001.</i>

TABLE OF CONTENTS (CONT.)

Appendix Number	Title
J-9	<i>Camp Dresser & McKee Inc, “Supplemental Addendum to Report of Sampling and Analysis of Soil Gas for Methane Phase 2 Portion of Playa Vista, CDM Project Number 10610-30928.RT.RPT, June 4, 2001.</i>
J-10	<i>Exploration Technologies Inc. (ETI), Subsurface Geochemical Assessment of Methane Gas Occurrences, Playa Vista Development, First Phase Project, Los Angeles, California. Prepared for the City of Los Angeles, Department of Building and Safety, Project No. 99-2219, April 17, 2000.</i>
SEE VOLUME XVIII for:	
J-11	<i>California Department of Transportation, <u>Helicopter Permit Nos. LA-190(H), LA-191(H), and LA-192(H)</u>, June 20, 1996.</i>
J-12	<i>McLaren Environmental Engineering, “Site Investigation and Evaluation of Remedial Measures Report, Howard Hughes Property Plant Site, Los Angeles, California, May 8, 1987.</i>

APPENDIX J-12 (CONTINUED):

**McLAREN ENVIRONMENTAL ENGINEERING, "SITE
INVESTIGATION AND EVALUATION OF REMEDIAL
MEASURES REPORT, HOWARD HUGHES PROPERTY
PLANT SITE, LOS ANGELES, CALIFORNIA," MAY 8,
1987**

**Appendix E-21: Site Investigation
Hughes Plant Site**

(CONTINUED)

McLaren Environmental Engineering

SITE INVESTIGATION AND
EVALUATION OF REMEDIAL MEASURES REPORT
HOWARD HUGHES PROPERTIES PLANT SITE
LOS ANGELES, CALIFORNIA

MAY 8, 1987

APPENDIX C



McLaren Environmental Engineering

APPENDIX C

GROUNDWATER QUALITY DATA

APPENDIX C

GROUNDWATER QUALITY DATA

The groundwater quality data in this appendix are divided into the following sections:

<u>Section</u>	<u>Analyses</u>
1	Volatile Organic Compounds
2	Total Petroleum Hydrocarbons
3	Metals
4	Acid Extraction
5	Base/Neutral Extraction
6	Pesticides, Herbicides, and PCB's
7	Miscellaneous Analyses
8	Memos

A colored title page separates each section.

The data in the printout include all data which were received from the analytical laboratories prior to January 9, 1987.

A dash "-" is printed when the compound was not detected at the detection limit printed. If a compound which was not detected had a detection limit that is different than the detection limit printed, the actual detection limit is printed as its concentrations, i.e.: "<0.2". When compounds coelute the concentration for the sum of the compounds, i.e. 10 ppb, is printed next to each compound as "< = 10". If there is any further information about the sampling or analytical procedures for a sample, the word "YES" appears in the row titled "MEMO" for that sample. This information can be found in Section 9, Memos. The memos are printed in order by McLaren I.D. numbers.

The screened interval printed on the data sheets is in fact mean sea level for Wells C-1 to C-56. For other wells survey data was not yet available, and the screened interval is measured from ground surface. The total depth printed out is measured from ground surface for all the wells.

SECTION 1

VOLATILE ORGANIC COMPOUNDS

WATER ANALYSIS - VOLATILES RESULTS IN PPM

WELL # C-01

TOP OF SCREEN = -23.00 BOTTOM OF SCREEN = -33.00 TOTAL DEPTH = 40.00

DATE 05/11/83 06/15/83 09/26/84

LAB ANAL TECH B & C B & C

MCLAREN ID S000179 S000180 S000181 S000182

DETECTION LIMIT

ANALYSIS

MEMO

	YES	YES	YES
ACETONE	-	-	-
ACHOLEIN	-	-	-
ACRYLONITRILE	-	-	-
BENZENE	-	-	-
CHLOROBENZENE	-	-	-
DICHLOROBENZENE (TOTAL)	-	-	-
1,2-DICHLOROBENZENE	-	-	-
1,3-DICHLOROBENZENE	-	-	-
1,4-DICHLOROBENZENE	-	-	-
BROMOFORM	-	-	-
BROMOETHANE	-	-	-
DIBROMOMETHANE	-	-	-
2-BUTANONE	-	-	-
CARBON DISULFIDE	-	-	-
CARBON TETRACHLORIDE	-	-	-
CHLOROMETHANE	-	-	-
DICHLOROMETHANE	-	-	-
CHLOROFORM	-	-	-
CHLORODIBROMOMETHANE	-	-	-
CHLOROETHANE	-	-	-
2-CHLOROETHYL VINYL ETHER	-	-	-
1,2-DIBROMOETHANE	-	-	-
DICHLOROBROMOMETHANE	-	-	-
DICHLORODIFLUOROMETHANE	-	-	-
1,1-DICHLOROETHANE	-	-	-
1,2-DICHLOROETHANE	-	-	-
1,1-DICHLOROETHYLENE	-	-	-
TRANS-1,2-DICHLOROETHYLENE	-	-	-
1,2-DICHLOROPROPANE	-	-	-
1,3-DICHLOROPROPYLENE	-	-	-
CIS-1,3-DICHLOROPROPYLENE	-	-	-
TRANS-1,3-DICHLOROPROPYLENE	-	-	-
ETHYLBENZENE	-	-	-
FREON 113	-	-	-
2-HEXANONE	-	-	-
4-METHYL-2-PENTANONE	-	-	-
STYRENE	-	-	-
TRICHLOROFLUOROMETHANE	-	-	-
1,1,2,2-TETRACHLOROETHANE	-	-	-
1,1,1-TRICHLOROETHANE	-	-	-
1,1,2-TRICHLOROETHANE	-	-	-
TETRACHLOROETHYLENE	-	-	-
TRICHLOROETHYLENE	-	-	-
TOLUENE	-	-	-
VINYL ACETATE	-	-	-
VINYL CHLORIDE	-	-	-
m-XYLENE	-	-	-
o-XYLEN	-	-	-
p-XYLEN	-	-	-
TOTAL XYLENES	-	-	-

DATE 05/03/85
 LAB B & C
 MCLAREN ID S000183
 DETECTION LIMIT 0.5
 ANALYSIS 601,602
 MEMO

10/22/86
 MCLAREN
 002718D
 0.5
 602

ACETONE	-	-	-
ACROLEIN	-	-	-
ACRYLONITRILE	-	-	-
BENZENE	-	-	-
CHLOROBENZENE	-	-	-
DICHLOROBENZENE (TOTAL)	-	-	-
1,2-DICHLOROBENZENE	-	-	-
1,3-DICHLOROBENZENE	-	-	-
1,4-DICHLOROBENZENE	-	-	-
BROMOFORM	-	-	-
BROMOMETHANE	-	-	-
DIBROMOMETHANE	-	-	-
2-BUTANONE	-	-	-
CARBON DISULFIDE	-	-	-
CARBON TETRACHLORIDE	-	-	-
CHLOROMETHANE	-	-	-
DICHLOROMETHANE	-	-	-
CHLOROFORM	-	-	-
CHLORODIBROMOMETHANE	-	-	-
CHLOROETHANE	-	-	-
2-CHLOROETHYL VINYL ETHER	-	-	-
1,2-DIBROMOETHANE	-	-	-
DICHLOROBROMOMETHANE	-	-	-
DICHLORODIFLUOROMETHANE	-	-	-
1,1-DICHLOROETHANE	-	-	-
1,2-DICHLOROETHANE	-	-	-
1,1-DICHLOROETHYLENE	-	-	-
TRANS-1,2-DICHLOROETHYLENE	-	-	-
1,2-DICHLOROPROPANE	-	-	-
1,3-DICHLOROPROPYLENE	-	-	-
CIS-1,3-DICHLOROPROPYLENE	-	-	-
TRANS-1,3-DICHLOROPROPYLENE	-	-	-
ETHYLBENZENE	-	-	-
FREON 113	-	-	-
2-HEXANONE	-	-	-
4-METHYL-2-PENTANONE	-	-	-
STYRENE	-	-	-
TRICHLOROFLUOROMETHANE	-	-	-
1,1,2,2-TETRACHLOROETHANE	-	-	-
1,1,1-TRICHLOROETHANE	-	-	-
1,1,2-TRICHLOROETHANE	-	-	-
TETRACHLOROETHYLENE	-	-	-
TRICHLOROETHYLENE	-	-	-
TOLUENE	-	-	-
VINYL ACETATE	-	-	-
VINYL CHLORIDE	-	-	-
m-XYLENE	-	-	-
o-XYLENE	-	-	-
p-XYLENE	-	-	-
TOTAL XYLENES	-	-	-

WATER ANALYSIS-VOLATILES-RESULTS IN PPB

WELL # C-02

TOP OF SCREEN= -19.00 BOTTOM OF SCREEN= -29.00 TOTAL DEPTH= 41.00

DATE 05/11/83 06/15/83 09/19/83 12/15/83
 LAB ANAL.TECH B & C B & C
 HCLAREN ID S000184 S000186 S000187
 DETECTION LIMIT S000184

ANALYSIS MEMO

YES

ACETONE	-	-	-	-
ACROLEIN	-	-	-	-
ACRYLONITRILE	-	-	-	-
BENZENE	-	-	-	-
CHLOROBENZENE	-	-	-	-
DICHLOROBENZENE (TOTAL)	-	-	-	-
1,2-DICHLOROBENZENE	-	-	-	-
1,3-DICHLOROBENZENE	-	-	-	-
1,4-DICHLOROBENZENE	-	-	-	-
BROMOFORM	-	-	-	-
BROMOMETHANE	-	-	-	-
DIBROMOMETHANE	-	-	-	-
2-BUTANONE	-	-	-	-
CARBON DISULFIDE	-	-	-	-
CARBON TETRACHLORIDE	-	-	-	-
CHLOROMETHANE	-	-	-	-
DICHLOROMETHANE	3	-	-	-
CHLOROFORM	1.9	-	-	-
CHLORODIBROMOMETHANE	-	-	-	-
CHLOROETHANE	-	-	-	-
2-CHLOROETHYL VINYL ETHER	-	-	-	-
1,2-DIBROMOETHANE	-	-	-	-
DICHLOROBROMOMETHANE	-	-	-	-
DICHLORODIFLUOROMETHANE	-	-	-	-
1,1-DICHLOROETHANE	-	-	-	-
1,2-DICHLOROETHANE	-	-	-	-
1,1-DICHLOROETHYLENE	3	-	-	-
TRANS-1,2-DICHLOROETHYLENE	20.7	-	-	-
1,2-DICHLOROPROPANE	-	-	-	-
1,3-DICHLOROPROPYLENE	-	-	-	-
CIS-1,3-DICHLOROPROPYLENE	-	-	-	-
TRANS-1,3-DICHLOROPROPYLENE	-	-	-	-
ETHYLBENZENE	-	-	-	-
PERON 113	-	-	-	-
2-HEXANONE	-	-	-	-
4-METHYL-2-PENTANONE	-	-	-	-
STYRENE	-	-	-	-
TRICHLOROFUOROMETHANE	-	-	-	-
1,1,2,2-TETRACHLOROETHANE	-	-	-	-
1,1,1-TRICHLOROETHANE	-	-	-	-
1,1,2-TRICHLOROETHANE	-	-	-	-
TETRACHLOROETHYLENE	-	-	-	-
TRICHLOROETHYLENE	126	-	-	-
TOLUENE	-	-	-	-
VINYL ACETATE	-	-	-	-
VINYL CHLORIDE	-	-	-	-
m-XYLENE	-	-	-	-
o-XYLENE	-	-	-	-
p-XYLENE	-	-	-	-
TOTAL XYLENES	-	-	-	-

WELL # C-02

41.00

TOP OF SCREEN = -19.00 BOTTOM OF SCREEN = -29.00 TOTAL DEPTH =

WATER ANALYSIS-VOLATILES RESULTS IN PPM

12/12/86
EUREKA
M42769
5
624

10/19/86
MCLAREN
002667
0.5
601,602

05/01/85
B & C
S000189

03/14/84
B & C
S000189

DATE
LAB

MCLAREN ID

DETECTION LIMIT

ANALYSIS

MEMO

ACETONE	-	-	<	10
ACROLEIN	-	-	-	-
ACRYLONITRILE	-	-	-	-
BENZENE	-	-	-	-
CHLOROBENZENE	-	-	-	-
DICHLOROBENZENE (TOTAL)	-	-	-	-
1,2-DICHLOROBENZENE	-	-	-	-
1,3-DICHLOROBENZENE	-	-	-	-
1,4-DICHLOROBENZENE	-	-	-	-
BROMOFORM	-	-	-	-
BROMOMETHANE	-	-	-	-
DIBROMOMETHANE	-	-	-	-
2-BUTANONE	-	-	-	-
CARBON DISULFIDE	-	-	-	-
CARBON TETRACHLORIDE	-	-	-	-
CHLOROMETHANE	-	-	-	-
DICHLOROMETHANE	-	-	-	-
CHLOROFORM	-	-	-	-
CHLORODIBROMOMETHANE	-	-	-	-
CHLOROETHANE	-	-	-	-
2-CHLOROETHYL VINYL ETHER	-	-	-	-
1,2-DIBROMOETHANE	-	-	-	-
DICHLOROBROMOMETHANE	-	-	-	-
DICHLORODIFLUOROMETHANE	-	-	-	-
1,1-DICHLOROETHANE	-	-	-	-
1,2-DICHLOROETHANE	-	-	-	-
1,1-DICHLOROETHYLENE	-	-	-	-
TRANS-1,2-DICHLOROETHYLENE	-	-	-	-
1,2-DICHLOROPROPANE	-	-	-	-
1,3-DICHLOROPROPYLENE	-	-	-	-
CIS-1,3-DICHLOROPROPYLENE	-	-	-	-
TRANS-1,3-DICHLOROPROPYLENE	-	-	-	-
ETHYLBENZENE	-	-	-	-
FREON 113	-	-	-	-
2-HEXANONE	-	-	-	-
4-METHYL-2-PENTANONE	-	-	-	-
STYRENE	-	-	-	-
TRICHLOROFLUOROMETHANE	-	-	-	-
1,1,2,2-TETRACHLOROETHANE	-	-	-	-
1,1,1,1-TETRACHLOROETHANE	-	-	-	-
1,1,1,2-TRICHLOROETHANE	-	-	-	-
1,1,2-TRICHLOROETHYLENE	-	-	-	-
TETRACHLOROETHYLENE	-	-	-	-
TRICHLOROETHYLENE	-	-	-	-
TOLUENE	-	-	-	-
VINYL ACETATE	-	-	-	-
VINYL CHLORIDE	-	-	-	-
m-XYLENE	-	-	-	-
o-XYLENE	-	-	-	-
p-XYLENE	-	-	-	-
XYLENES	-	-	-	-

DATE 12/12/86
 LAB EUREKA
 MCLAREN ID M42769D
 DETECTION LIMIT 5
 ANALYSIS 624
 MEMO

ACETONE	<	10
ACROLEIN		
ACRYLONITRILE		
BENZENE	-	-
CHLOROBENZENE		
DICHLOROBENZENE (TOTAL)		
1,2-DICHLOROBENZENE		
1,3-DICHLOROBENZENE		
1,4-DICHLOROBENZENE		
BROMOFORM	-	10
BROMOMETHANE	<	10
DIBROMOMETHANE	<	10
2-BUTANONE		
CARBON DISULFIDE		
CARBON TETRACHLORIDE	<	10
CHLOROMETHANE	<	50
DICHLOROMETHANE		
CHLOROFORM	<	10
CHLORODIBROMOMETHANE	<	10
CHLOROETHANE	<	10
2-CHLOROETHYL VINYL ETHER	<	10
1,2-DIBROMOETHANE		
DICHLOROBROMOMETHANE		
DICHLORODIFLUOROMETHANE		
1,1-DICHLOROETHANE		
1,2-DICHLOROETHANE		
1,1-DICHLOROETHYLENE		110
TRANS-1,2-DICHLOROETHYLENE		
1,2-DICHLOROPROPANE		
1,3-DICHLOROPROPYLENE		
CIS-1,3-DICHLOROPROPYLENE		
TRANS-1,3-DICHLOROPROPYLENE		
ETHYLBENZENE		
FREON 113		
2-HEXANONE		
4-METHYL-2-PENTANONE		
STYRENE	<	10
TRICHLOROFLUOROMETHANE		
1,1,2,2-TETRACHLOROETHANE		
1,1,1-TRICHLOROETHANE		
1,1,2-TRICHLOROETHANE		
TETRACHLOROETHYLENE		10
TRICHLOROETHYLENE		
TOLUENE		
VINYL ACETATE		
VINYL CHLORIDE	<	10
m-XYLENE		
o-XYLENE		
p-XYLENE		
TOTAL XYLENES		

WATER ANALYSIS S-VOLATILES RESULTS IN PPB WELL # C-03

TOP OF SCREEN = -23.00	BOTTOM OF SCREEN = -33.00	TOTAL DEPTH = 45.50
DATE 05/11/83	09/19/83	12/14/83
LAB ANAL. TECH.	D & C	B & C
MCLAREN ID S000190	S000191	S000192
DETECTION LIMIT		
ANALYSIS		
MEMO	YES	YES

ACETONE	-	-	-
ACROLEIN	-	-	-
ACRYLONITRILE	-	-	-
BENZENE	-	-	-
CHLOROBENZENE	-	-	-
DICHLOROBENZENE (TOTAL)	-	-	-
1,2-DICHLOROBENZENE	-	-	-
1,3-DICHLOROBENZENE	-	-	-
1,4-DICHLOROBENZENE	-	-	-
BROMOFORM	-	-	-
BROMOMETHANE	-	-	-
DIBROMOMETHANE	-	-	-
2-BUTANONE	-	-	-
CARBON DISULFIDE	-	-	-
CARBON TETRACHLORIDE	-	-	-
CHLOROMETHANE	-	-	-
DICHLOROMETHANE	5.3	-	-
CHLOROFORM	-	-	-
CHLORODIBROMOMETHANE	-	-	-
CHLOROETHANE	-	-	-
2-CHLOROETHYL VINYL ETHER	-	-	-
1,2-DIBROMOETHANE	-	-	-
DICHLOROBROMOMETHANE	-	-	-
DICHLORODIFLUOROMETHANE	-	-	-
1,1-DICHLOROETHANE	-	-	-
1,2-DICHLOROETHANE	-	-	-
1,1-DICHLOROETHYLENE	-	-	-
TRANS-1,2-DICHLOROETHYLENE	2.9	-	-
1,2-DICHLOROPROPANE	-	-	-
1,3-DICHLOROPROPYLENE	-	-	-
CIS-1,3-DICHLOROPROPYLENE	-	-	-
TRANS-1,3-DICHLOROPROPYLENE	-	-	-
ETHYLBENZENE	-	-	-
FREON 113	-	-	-
2-HEXANONE	-	-	-
4-METHYL-2-PENTANONE	-	-	-
STYRENE	-	-	-
TRICHLOROFUOROMETHANE	-	-	-
1,1,2,2-TETRACHLOROETHANE	-	-	-
1,1,1-TRICHLOROETHANE	-	-	-
1,1,2-TRICHLOROETHANE	-	-	-
TETRACHLOROETHYLENE	-	-	-
TRICHLOROETHYLENE	4.6	-	-
TOLUENE	-	-	-
VINYL ACETATE	-	-	-
VINYL CHLORIDE	-	-	-
m-XYLENE	-	-	-
o-XYLENE	-	-	-
p-XYLENE	-	-	-
TOTAL XYLENES	-	-	-

WATER ANALYSIS-VOLATILES RESULTS IN REV. WELL # C-03

TOP OF SCREEN= -21.00 BOTTOM OF SCREEN= -33.00 TOTAL DEPTH= 45.50

DATE	03/14/84	09/27/84	05/01/85	12/02/86
LAB	B & C	B & C	B & C	MCLAREN
MCLAREN ID	S000194	S000195	S000196	004068
DETECTION LIMIT				0.5
ANALYSIS				601,602

MEMO

ACETONE	-	-	-	-
ACROLEIN	-	-	-	-
ACRYLONITRILE	-	-	-	-
DENZENE	-	-	-	-
CHLOROBENZENE	-	-	-	-
DICHLOROBENZENE (TOTAL)	-	-	-	-
1,2-DICHLOROBENZENE	-	-	-	-
1,3-DICHLOROBENZENE	-	-	-	-
1,4-DICHLOROBENZENE	-	-	-	-
BROMOFORM	-	-	-	-
BROMOMETHANE	-	-	-	-
DIBROMOMETHANE	-	-	-	-
2-BUTANONE	-	-	-	-
CARBON DISULFIDE	-	-	-	-
CARBON TETRACHLORIDE	-	-	-	-
CHLOROMETHANE	-	-	-	-
DICHLOROMETHANE	-	-	-	-
CHLOROFORM	-	-	-	-
CHLORODIBROMOMETHANE	-	-	-	-
CHLOROETHANE	-	-	-	-
2-CHLOROETHYL VINYL ETHER	-	-	-	-
1,2-DIBROMOETHANE	-	-	-	-
DICHLOROBROMOMETHANE	-	-	-	-
DICHLORODIFLUOROMETHANE	-	-	-	-
1,1-DICHLOROETHANE	-	-	-	-
1,2-DICHLOROETHANE	-	-	-	-
1,1-DICHLOROETHYLENE	-	-	-	-
TRANS-1,2-DICHLOROETHYLENE	-	-	-	-
1,2-DICHLOROPROPANE	-	-	-	-
1,3-DICHLOROPROPYLENE	-	-	-	-
CIS-1,3-DICHLOROPROPYLENE	-	-	-	-
TRANS-1,3-DICHLOROPROPYLENE	-	-	-	-
ETHYLBENZENE	-	-	-	-
FREON 113	-	-	-	-
2-HEXANONE	-	-	-	-
4-METHYL-2-PENTANONE	-	-	-	-
STYRENE	-	-	-	-
TRICHLOROFLUOROMETHANE	-	-	-	-
1,1,2,2-TETRACHLOROETHANE	-	-	-	-
1,1,1-TRICHLOROETHANE	-	-	-	-
1,1,2-TRICHLOROETHANE	-	-	-	-
TETRACHLOROETHYLENE	-	-	-	-
TRICHLOROETHYLENE	-	-	-	-
TOLUENE	-	-	-	-
VINYL ACETATE	-	-	-	-
VINYL CHLORIDE	-	-	-	-
m-XYLENE	-	-	-	-
o-XYLENE	-	-	-	-
p-XYLENE	-	-	-	-
TOTAL XYLENES	-	-	-	-

WATER AN

IS-VOLATILES RESULTS IN PPB

WELL # 2-0-4

43.00

TOP OF SCREEN= -22.00 BOTTOM OF SCREEN= -32.00 TOTAL DEPTH=

DATE
LAB
MCLAREN ID
DETECTION LIMIT
ANALYSIS
MEMO

05/11/83
ANAL.TECH.
S000197

06/15/83
B & C
S000198

09/19/83
B & C
S000199

12/14/83
B & C
S000200

ACETONE	-	-	-
ACROLEIN	-	-	-
ACRYLONITRILE	-	-	-
BENZENE	-	-	-
CHLOROBENZENE	-	-	-
DICHLOROBENZENE (TOTAL)	-	-	-
1,2-DICHLOROBENZENE	-	-	-
1,3-DICHLOROBENZENE	-	-	-
1,4-DICHLOROBENZENE	-	-	-
BROMOFORM	-	-	-
BROMOETHANE	-	-	-
DIBROMOMETHANE	-	-	-
2-BUTANONE	-	-	-
CARBON DISULFIDE	-	-	-
CARBON TETRACHLORIDE	46.4	-	-
CHLOROMETHANE	42.1	-	-
DICHLOROMETHANE	-	-	-
CHLOROFORM	-	-	-
CHLORODIBROMOMETHANE	-	-	-
CHLOROETHANE	-	-	-
2-CHLOROETHYL VINYL ETHER	-	-	-
1,2-DIBROMOETHANE	-	-	-
DICHLOROBROMOMETHANE	-	-	-
DICHLORODIFLUOROMETHANE	-	-	-
1,1-DICHLOROETHANE	-	-	-
1,2-DICHLOROETHANE	-	-	-
1,1-DICHLOROETHYLENE	-	-	-
TRANS-1,2-DICHLOROETHYLENE	15.4	23	26
1,2-DICHLOROPROPANE	-	-	-
1,3-DICHLOROPROPYLENE	-	-	-
CIS-1,3-DICHLOROPROPYLENE	-	-	-
TRANS-1,3-DICHLOROPROPYLENE	-	-	-
ETHYLBENZENE	7.1	-	-
FREON 113	-	-	-
2-HEXANONE	-	-	-
4-METHYL-2-PENTANONE	-	-	-
STYRENE	-	-	-
TRICHLOROFLUOROMETHANE	-	-	-
1,1,2,2-TETRACHLOROETHANE	-	-	-
1,1,1-TRICHLOROETHANE	-	-	-
1,1,2-TRICHLOROETHANE	-	-	-
TETRACHLOROETHYLENE	-	-	-
TRICHLOROETHYLENE	25.3	-	-
TOLUENE	-	-	-
VINYL ACETATE	-	-	-
VINYL CHLORIDE	-	-	-
m-XYLENE	-	-	-
o-XYLENE	-	-	-
p-XYLENE	-	-	-
TOTAL XYLENES	-	-	-

WATER ANALYSIS-VOLATILES-RESULTS IN PPM TOP OF SCREEN= -22.00 BOTTOM OF SCREEN= -32.00 TOTAL DEPTH= 43.00 WELLS # C-04

DATE	03/14/84	09/27/84	05/03/85	11/24/86
LAB	B & C	B & C	B & C	MCLAREN
MCLAREN ID	S000201	S000202	S000203	003922
DETECTION LIMIT				0.5
ANALYSIS				601,602
MEMO				

ACETONE	-	-	-	-
ACROLEIN	-	-	-	-
ACRYLONITRILE	-	-	-	-
BENZENE	-	-	-	-
CHLOROBENZENE	-	-	-	-
DICHLOROBENZENE (TOTAL)	-	-	-	0.6
1,2-DICHLOROBENZENE	-	-	-	-
1,3-DICHLOROBENZENE	-	-	-	-
1,4-DICHLOROBENZENE	-	-	-	-
BROMOFORM	-	-	-	<
BROMOMETHANE	-	-	-	1
DIBROMOMETHANE	-	-	-	-
2-BUTANONE	-	20	-	-
CARBON DISULFIDE	-	-	-	-
CARBON TETRACHLORIDE	-	-	-	-
CHLOROMETHANE	14	-	-	3
CHLOROFORM	-	-	-	-
CHLORODIBROMOMETHANE	-	-	-	<
CHLOROETHANE	-	-	-	1
2-CHLOROETHYL VINYL ETHER	-	-	-	-
1,2-DIBROMOETHANE	-	-	-	-
DICHLOROBROMOMETHANE	-	-	-	-
DICHLORODIFLUOROMETHANE	-	-	-	7
1,1-DICHLOROETHANE	-	-	-	-
1,2-DICHLOROETHANE	-	-	-	-
1,1-DICHLOROETHYLENE	-	-	-	39
TRANS-1,2-DICHLOROETHYLENE	26	37	38	-
1,2-DICHLOROPROPANE	-	-	-	-
1,3-DICHLOROPROPYLENE	-	-	-	-
CIS-1,3-DICHLOROPROPYLENE	-	-	-	-
TRANS-1,3-DICHLOROPROPYLENE	-	-	-	-
ETHYLBENZENE	-	-	-	-
PREON 113	-	-	-	-
2-HEXANONE	-	-	-	-
4-METHYL-2-PENTANONE	-	-	-	-
STYRENE	-	-	-	-
TRICHLOROFLUOROMETHANE	-	-	-	-
1,1,2,2-TETRACHLOROETHANE	-	-	-	<=
1,1,1-TRICHLOROETHANE	-	-	-	4
1,1,2-TRICHLOROETHANE	-	-	-	84
TETRACHLOROETHYLENE	-	-	-	-
TRICHLOROETHYLENE	-	-	-	<=
TOLUENE	470	-	9	2
VINYL ACETATE	-	-	-	-
VINYL CHLORIDE	-	-	-	<
m-XYLENE	-	-	-	1
o-XYLENE	-	-	-	-
p-XYLENE	-	-	-	-
TOTAL XYLENES	-	-	-	-

WATER ANALYSIS-VOLATILES RESULTS IN PPM WELL # C-05

TOP OF SCREEN= -11.00 BOTTOM OF SCREEN= -21.00 TOTAL DEPTH= 35.50

DATE 05/11/83 06/16/83 06/16/83
LAB ANAL. TECH. ANAL. TECH.
MCLAREN ID S000302 S000304 S000305
DETECTION LIMIT
ANALYSIS

YES

ACETONE	-	-	-
ACROLEIN	-	-	-
ACRYLONITRILE	-	-	-
BENZENE	-	-	-
CHLOROBENZENE	-	-	-
DICHLOROBENZENE (TOTAL)	-	-	-
1,2-DICHLOROBENZENE	-	-	-
1,3-DICHLOROBENZENE	-	-	-
1,4-DICHLOROBENZENE	-	-	-
BROMOFORM	-	-	-
BROMOMETHANE	-	-	-
DIBROMOMETHANE	-	-	-
2-BUTANONE	-	30	10.3
CARBON DISULFIDE	-	-	-
CARBON TETRACHLORIDE	-	-	-
CHLOROMETHANE	-	-	-
DICHLOROMETHANE	-	-	-
CHLOROFORM	-	-	-
CHLORODIBROMOMETHANE	-	-	-
CHLOROETHANE	-	-	-
2-CHLOROETHYL VINYL ETHER	-	-	-
1,2-DIBROMOETHANE	-	-	-
DICHLOROBROMOMETHANE	-	-	-
DICHLORODIFLUOROMETHANE	-	44	3.5
1,1-DICHLOROETHANE	-	-	-
1,2-DICHLOROETHANE	-	-	-
1,1-DICHLOROETHYLENE	-	-	-
TRANS-1,2-DICHLOROETHYLENE	-	-	-
1,2-DICHLOROPROPANE	-	-	-
1,3-DICHLOROPROPYLENE	-	-	-
CIS-1,3-DICHLOROPROPYLENE	-	-	-
TRANS-1,3-DICHLOROPROPYLENE	-	-	-
ETHYLBENZENE	-	-	-
FREON 113	-	-	-
2-HEXANONE	-	-	-
4-METHYL-2-PENTANONE	-	-	-
STYRENE	-	-	-
TRICHLOROFLUOROMETHANE	-	-	-
1,1,2,2-TETRACHLOROETHANE	-	-	-
1,1,1-TRICHLOROETHANE	-	-	-
1,1,2-TRICHLOROETHANE	-	-	-
TETRACHLOROETHYLENE	-	3	4
TRICHLOROETHYLENE	-	64	-
TOLUENE	-	11	-
VINYL ACETATE	-	-	-
VINYL CHLORIDE	-	-	-
m-XYLENE	-	-	-
o-XYLENE	-	-	-
p-XYLENE	-	-	-
TOTAL XYLENES	-	-	-

WATER ANALYSIS - VOLATILES RESULTS IN PPM

WELL # C-05

TOP OF SCREEN = -11.00 BOTTOM OF SCREEN = -21.00 TOTAL DEPTH = 35.50

DATE

LAB

MCCLAREN ID

DETECTION LIMIT

ANALYSIS

MEMO

09/20/83

B & C

S000306

12/15/83

B & C

S000307

12/15/83

B & C

S000308

09/27/84

B & C

S000309

ACETONE	-	-	-
ACROLEIN	-	-	-
ACRYLONITRILE	-	-	-
BENZENE	-	-	-
CHLOROBENZENE	-	-	-
DICHLOROBENZENE (TOTAL)	-	-	-
1,2-DICHLOROBENZENE	-	-	-
1,3-DICHLOROBENZENE	-	-	-
1,4-DICHLOROBENZENE	-	-	-
BROMOFORM	-	-	-
BROMOMETHANE	-	-	-
DIBROMOMETHANE	-	-	-
2-BUTANONE	-	-	20
CARBON DISULFIDE	-	-	-
CARBON TETRACHLORIDE	-	-	-
CHLOROMETHANE	-	-	-
DICHLOROMETHANE	-	-	-
CHLOROFORM	-	-	-
CHLORODIBROMOMETHANE	-	-	-
CHLOROETHANE	-	-	-
2-CHLOROETHYL VINYL ETHER	-	-	-
1,2-DIBROMOETHANE	-	-	-
DICHLOROBROMOMETHANE	-	-	-
DICHLORODIFLUOROMETHANE	-	-	-
1,1-DICHLOROETHANE	-	13	14
1,2-DICHLOROETHANE	-	2	3
1,1-DICHLOROETHYLENE	-	7	15
TRANS-1,2-DICHLOROETHYLENE	-	-	-
1,2-DICHLOROPROPANE	-	-	-
1,3-DICHLOROPROPYLENE	-	-	-
CIS-1,3-DICHLOROPROPYLENE	-	-	-
TRANS-1,3-DICHLOROPROPYLENE	-	-	-
ETHYLBENZENE	-	-	-
FREON 113	-	-	-
2-HEXANONE	-	-	-
4-HEXYL-2-PENTANONE	-	-	-
STYRENE	-	-	-
TRICHLOROFLUOROMETHANE	-	-	-
1,1,2,2-TETRACHLOROETHANE	-	-	-
1,1,1-TRICHLOROETHANE	-	-	-
1,1,2-TRICHLOROETHANE	-	-	-
TETRACHLOROETHYLENE	-	-	-
TRICHLOROETHYLENE	-	-	1
TOLUENE	-	-	-
VINYL ACETATE	-	-	-
VINYL CHLORIDE	-	-	-
m-XYLENE	-	-	-
o-XYLENE	-	-	-
p-XYLENE	-	-	-
TOTAL XYLENES	-	-	-

95.50

98H/42/01

MCCLAREN

0027891)

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PARAFFIN
TOTAL HYDROCARBONS

1

PARAFFIN
TOTAL HYDROCARBONS

WATER ANALYSIS-VOLATILES RESULTS IN PPM

WELL # C-05

35.50

TOP OF SCREEN = -11.00 BOTTOM OF SCREEN = -21.00 TOTAL DEPTH =

DATE	10/24/86	10/24/86	11/18/86
LAB	MCLAREN	MCLAREN	MCLAREN
MCLAREN ID	002787B	002787BD	003521
DETECTION LIMIT	0.5	0.5	0.5
ANALYSIS	601,602	602	601,602
MEMO	BLANK	BLANK	

ACETONE			
ACROLEIN			
ACRYLONITRILE			
BENZENE	-	-	1
CHLOROBENZENE	-	-	-
DICHLOROBENZENE (TOTAL)	-	-	-
1,2-DICHLOROBENZENE	-	-	-
1,3-DICHLOROBENZENE	-	-	-
1,4-DICHLOROBENZENE	-	-	-
BROMOFORM	<	<	1
BROMOMETHANE	1		
DIBROMOMETHANE			
2-BUTANONE			
CARBON DISULFIDE			
CARBON TETRACHLORIDE	-		
CHLOROMETHANE	-		
DICHLOROMETHANE	-		
CHLOROFORM	-		1
CHLORODIBROMOMETHANE	<	<	
CHLOROETHANE			
2-CHLOROETHYL VINYL ETHER			
1,2-DIBROMOETHANE	-		
DICHLOROBROMOMETHANE	-		
DICHLORODIFLUOROMETHANE	-		
1,1-DICHLOROETHANE	-		24
1,2-DICHLOROETHANE	3		
1,1-DICHLOROETHYLENE	-		18
TRANS-1,2-DICHLOROETHYLENE	-		
1,2-DICHLOROPROPANE	-		
1,3-DICHLOROPROPYLENE	-		
CIS-1,3-DICHLOROCYCLOPENTYLENE	-		
TRANS-1,3-DICHLOROPROPYLENE	-		
ETHYLBENZENE	-		
FREON 113			
2-HEXANONE			
4-METHYL-2-PENTANONE			
STYRENE			
TRICHLOROFUOROMETHANE	-		
1,1,2,2-TETRACHLOROETHANE	-		8.9
1,1,1-TRICHLOROETHANE	-		
1,1,2-TRICHLOROETHANE	-		
TETRACHLOROETHYLENE	-		3
TRICHLOROETHYLENE	-		
TOLUENE	-		
VINYL ACETATE			
VINYL CHLORIDE	1		
m-XYLENE	<	<	
o-XYLENE	-		
p-XYLENE	-		
TOTAL XYLENES	-		

WATER ANALYSIS-VOLATILES RESULTS IN PPM

WELL # C-06

TOP OF SCREEN = -13.00 BOTTOM OF SCREEN = -23.00 TOTAL DEPTH = 32.50

12/14/83
B & C
S000207

09/19/83
B & C
S000206

06/15/83
B & C
S000205

05/09/83
ANAL. TECH.
S000204

DATE
LAB
MCLAREN ID
DETECTION LIMIT
ANALYSIS
MEMO

ACETONE	-	-	-
ACROLEIN	-	-	-
ACRYLONITRILE	-	-	-
BENZENE	-	-	-
CHLOROBENZENE	-	-	-
DICHLOROBENZENE (TOTAL)	-	-	-
1,2-DICHLOROBENZENE	-	-	-
1,3-DICHLOROBENZENE	-	-	-
1,4-DICHLOROBENZENE	-	-	-
BROMOFORM	-	-	-
BROMOMETHANE	-	-	-
DIBROMOMETHANE	-	-	-
2-BUTANONE	-	-	-
CARBON DISULFIDE	-	-	-
CARBON TETRACHLORIDE	-	-	-
CHLOROMETHANE	-	-	-
DICHLOROMETHANE	-	-	-
CHLOROFORM	-	-	-
CHLORODIBROMOMETHANE	-	-	-
CHLOROETHANE	-	-	-
2-CHLOROETHYL VINYL ETHER	-	-	-
1,2-DIBROMOETHANE	-	-	-
DICHLOROBROMOMETHANE	-	-	-
DICHLORODIFLUOROMETHANE	-	-	-
1,1-DICHLOROETHANE	-	-	-
1,2-DICHLOROETHANE	-	-	-
1,1-DICHLOROETHYLENE	-	-	-
TRANS-1,2-DICHLOROETHYLENE	-	-	-
1,2-DICHLOROPROPANE	-	-	-
1,3-DICHLOROPROPYLENE	-	-	-
CIS-1,3-DICHLOROPROPYLENE	-	-	-
TRANS-1,3-DICHLOROPROPYLENE	-	-	-
ETHYLBENZENE	-	-	-
FREON 113	-	-	-
2-HEXANONE	-	-	-
4-METHYL-2-PENTANONE	-	-	-
STYRENE	-	-	-
TRICHLOROFLUOROMETHANE	-	-	-
1,1,2,2-TETRACHLOROETHANE	-	-	-
1,1,1-TRICHLOROETHANE	-	-	-
1,1,2-TRICHLOROETHANE	-	-	-
TETRACHLOROETHYLENE	-	-	-
TRICHLOROETHYLENE	-	-	-
TOLUENE	-	-	-
VINYL ACETATE	-	-	-
VINYL CHLORIDE	-	-	-
m-XYLENE	-	-	-
o-XYLENE	-	-	-
p-XYLENE	-	-	-
TOTAL XYLENES	-	-	-

WATER ANALYSIS VOLATILES RESULTS IN PPM

WELL # C-08

TOP OF SCREEN = -13.00 BOTTOM OF SCREEN = -23.00 TOTAL DEPTH = 32.50

DATE
LAB
MCLAREN ID
DETECTION LIMIT
ANALYSIS
MEMO

09/26/84
B & C
S000208

05/01/85
B & C
S000209

11/24/86
MCLAREN
003925
0.5
601,602

11/24/86
MCLAREN
003929B
0.5
602

ACETONE	-	-	-	-	-
ACROLEIN	-	-	-	-	-
ACRYLONITRILE	-	-	-	-	-
BENZENE	-	-	-	-	-
CHLOROBENZENE	-	-	-	-	-
DICHLOROBENZENE (TOTAL)	-	-	-	-	-
1,2-DICHLOROBENZENE	-	-	-	-	-
1,3-DICHLOROBENZENE	-	-	-	-	-
1,4-DICHLOROBENZENE	-	-	-	-	-
BROMOFORM	-	-	-	-	-
BROMOMETHANE	-	-	-	-	-
DIBROMOMETHANE	-	-	-	-	-
2-BUTANONE	-	-	-	-	-
CARBON DISULFIDE	-	-	-	-	-
CARBON TETRACHLORIDE	-	-	-	-	-
CHLOROMETHANE	-	-	-	-	-
DICHLOROMETHANE	-	-	-	-	-
CHLOROFORM	-	-	-	-	-
CHLORODIBROMOMETHANE	-	-	-	-	-
CHLOROETHANE	-	-	-	-	-
2-CHLOROETHYL VINYL ETHER	-	-	-	-	-
1,2-DIBROMOETHANE	-	-	-	-	-
DICHLORODIBROMOMETHANE	-	-	-	-	-
DICHLORODIFLUOROMETHANE	-	-	-	-	-
1,1-DICHLOROETHANE	-	-	-	-	-
1,2-DICHLOROETHANE	-	-	-	-	-
1,1-DICHLOROETHYLENE	-	-	-	-	-
TRANS-1,2-DICHLOROETHYLENE	-	-	-	-	-
1,2-DICHLOROPROPANE	-	-	-	-	-
1,3-DICHLOROPROPYLENE	-	-	-	-	-
CIS-1,3-DICHLOROPROPYLENE	-	-	-	-	-
TRANS-1,3-DICHLOROPROPYLENE	-	-	-	-	-
ETHYLBENZENE	-	-	-	-	-
PERON 113	-	-	-	-	-
2-HEXANONE	-	-	-	-	-
4-METHYL-2-PENTANONE	-	-	-	-	-
STYRENE	-	-	-	-	-
TRICHLOROFLUOROMETHANE	-	-	-	-	-
1,1,2,2-TETRACHLOROETHANE	-	-	-	-	-
1,1,1-TRICHLOROETHANE	-	-	-	-	-
1,1,2-TRICHLOROETHANE	-	-	-	-	-
TETRACHLOROETHYLENE	-	-	-	-	-
TRICHLOROETHYLENE	-	-	-	-	-
TOLUENE	-	-	-	-	-
VINYL ACETATE	-	-	-	-	-
VINYL CHLORIDE	-	-	-	-	-
m-XYLENE	-	-	-	-	-
o-XYLENE	-	-	-	-	-
p-XYLENE	-	-	-	-	-
TOTAL XYLENES	-	-	-	-	-

0.06

WATER ANALYSIS - VOLATILES RESULTS IN 1000 WELLS # C-06 TOP OF SCREEN = -13.00 BOTTOM OF SCREEN = -23.00 TOTAL DEPTH = 32.50

DATE 11/24/86
LAB B & C
MCLAREN ID S000766
DETECTION LIMIT 1.0
ANALYSIS 624
MEMO

ACETONE	<	10
ACROLEIN	<	10
ACRYLONITRILE		
BENZENE		
CHLOROBENZENE		
DICHLOROBENZENE (TOTAL)		
1,2-DICHLOROBENZENE		
1,3-DICHLOROBENZENE		
1,4-DICHLOROBENZENE		
BROMOFORM		
DIBROMOMETHANE		
2-BUTANONE		
CARBON DISULFIDE		
CARBON TETRACHLORIDE		
CHLOROMETHANE		
DICHLOROMETHANE		
CHLOROFORM		
CHLORODIBROMOMETHANE		
CHLOROETHANE		
2-CHLOROETHYL VINYL ETHER		
1,2-DIBROMOETHANE		
DICHLOROBROMOMETHANE		
DICHLORODIFLUOROMETHANE		
1,1-DICHLOROETHANE		
1,2-DICHLOROETHANE		
1,1-DICHLOROETHYLENE		
TRANS-1,2-DICHLOROETHYLENE		
1,2-DICHLOROPROPANE		
1,3-DICHLOROPROPYLENE		
CIS-1,3-DICHLOROPROPYLENE		
TRANS-1,3-DICHLOROPROPYLENE		
ETHYLBENZENE		
FREON 113		
2-HEXANONE		
4-METHYL-2-PENTANONE		
STYRENE		
TRICHLOROFLUOROMETHANE		
1,1,2,2-TETRACHLOROETHANE		
1,1,1-TRICHLOROETHANE		
1,1,2-TRICHLOROETHANE		
TETRACHLOROETHYLENE		
TRICHLOROETHYLENE		
TOLUENE		
VINYL ACETATE		
VINYL CHLORIDE		
m-XYLENE		
o-XYLENE		
p-XYLENE		
TOTAL XYLENES		

DATE 05/09/83 TOP OF SCREEN= 0.57 BOTTOM OF SCREEN= 9.43 TOTAL DEPTH= 21.50
 LAB ANAL. TECH. 06/15/83 09/19/83 12/14/83
 MCLAREN ID S000210 B & C B & C
 DETECTION LIMIT S000211 S000212 S000213
 ANALYSIS
 MEMO

ACETONE	-	-	-
ACROLEIN	-	-	-
ACRYLONITRILE	-	-	-
BENZENE	-	-	-
CHLOROBENZENE	-	-	-
DICHLOROBENZENE (TOTAL)	-	-	-
1,2-DICHLOROBENZENE	-	-	-
1,3-DICHLOROBENZENE	-	-	-
1,4-DICHLOROBENZENE	-	-	-
BROMOFORM	-	-	-
BROMOMETHANE	-	-	-
DIBROMOMETHANE	-	-	-
2-BUTANONE	-	-	-
CARBON DISULFIDE	-	-	-
CARBON TETRACHLORIDE	-	-	-
CHLOROMETHANE	-	-	-
DICHLOROMETHANE	-	-	-
CHLOROFORM	-	-	-
CHLORODIBROMOMETHANE	-	-	-
CHLOROETHANE	-	-	-
2-CHLOROETHYL VINYL ETHER	-	-	-
1,2-DIBROMOETHANE	-	-	-
DICHLOROBROMOMETHANE	-	-	-
DICHLORODIFLUOROMETHANE	-	-	-
1,1-DICHLOROETHANE	-	-	-
1,2-DICHLOROETHANE	-	-	-
1,1-DICHLOROETHYLENE	-	-	-
TRANS-1,2-DICHLOROETHYLENE	-	-	-
1,2-DICHLOROPROPANE	-	-	-
1,3-DICHLOROPROPYLENE	-	-	-
CIS-1,3-DICHLOROPROPYLENE	-	-	-
TRANS-1,3-DICHLOROPROPYLENE	-	-	-
ETHYLBENZENE	-	-	-
FREON 113	-	-	-
2-HEXANONE	-	-	-
4-METHYL-2-PENTANONE	-	-	-
STYRENE	-	-	-
TRICHLOROFUOROMETHANE	-	-	-
1,1,2,2-TETRACHLOROETHANE	-	-	-
1,1,1-TRICHLOROETHANE	-	-	-
1,1,2-TRICHLOROETHANE	-	-	-
TETRACHLOROETHYLENE	-	-	-
TRICHLOROETHYLENE	-	-	-
TOLUENE	-	-	-
VINYL ACETATE	-	-	-
VINYL CHLORIDE	-	-	-
m-XYLENE	-	-	-
o-XYLENE	-	-	-
p-XYLENE	-	-	-
TOTAL XYLENES	-	-	-

7.3

WATER ANALYSIS-VOLATILES RESULTS IN PPM

WELL # C-07

TOP OF SCREEN= 0.57 BOTTOM OF SCREEN= 9.43 TOTAL DEPTH= 21.50

DATE 10/25/86

LAB MCLAREN

MCLAREN ID 002782B

DETECTION LIMIT 0.5

ANALYSIS 601,602

MEMO BLANK

ACETONE	-
ACROLEIN	-
ACRYLONITRILE	-
BENZENE	-
CHLOROBENZENE	-
DICHLOROBENZENE (TOTAL)	-
1,2-DICHLOROBENZENE	-
1,3-DICHLOROBENZENE	-
1,4-DICHLOROBENZENE	-
BROMOFORM	< 1
BROMOMETHANE	-
DIBROMOMETHANE	-
2-BUTANONE	-
CARBON DISULFIDE	-
CARBON TETRACHLORIDE	-
CHLOROMETHANE	-
DICHLOROMETHANE	-
CHLOROFORM	-
CHLORODIBROMOMETHANE	< 1
CHLOROETHANE	-
2-CHLOROETHYL VINYL ETHER	-
1,2-DIBROMOETHANE	-
DICHLOROBROMOMETHANE	-
DICHLORODIFLUOROMETHANE	-
1,1-DICHLOROETHANE	-
1,2-DICHLOROETHANE	-
1,1-DICHLOROETHYLENE	-
TRANS-1,2-DICHLOROETHYLENE	-
1,2-DICHLOROPROPANE	-
1,3-DICHLOROPROPYLENE	-
CIS-1,3-DICHLOROPROPYLENE	-
TRANS-1,3-DICHLOROPROPYLENE	-
ETHYLBENZENE	-
FREON 113	-
2-HEXANONE	-
4-METHYL-2-PENTANONE	-
STYRENE	-
TRICHLOROFUOROMETHANE	-
1,1,2,2-TETRACHLOROETHANE	-
1,1,1-TRICHLOROETHANE	-
1,1,2-TRICHLOROETHANE	-
TETRACHLOROETHYLENE	-
TRICHLOROETHYLENE	-
TOLUENE	-
VINYL ACETATE	-
VINYL CHLORIDE	< 1
m-XYLEN	-
o-XYLEN	-
p-XYLENE	-

WATER AND GAS-VOLATILES RESULTS IN WPH

WELL # C-08

TOP OF SCREEN= -9.00 BOTTOM OF SCREEN= -19.00 TOTAL DEPTH= 32.50

DATE 05/09/83 06/15/83 09/20/83 12/15/83

LAB ANAL. TECH. B & C B & C B & C

MULAKEN ID S000216 S000217 S000218 S000219

DETECTION LIMIT ANALYSIS

MEHO

ACETONE

ACROLEIN

ACRYLONITRILE

BENZENE

CHLOROBENZENE

DICHLOROBENZENE (TOTAL)

1,2-DICHLOROBENZENE

1,3-DICHLOROBENZENE

1,4-DICHLOROBENZENE

BROMOFORM

BROMOMETHANE

DIBROMOMETHANE

2-BUTANONE

CARBON DISULFIDE

CARBON TETRACHLORIDE

CHLOROMETHANE

DICHLOROMETHANE

CHLOROFORM

CHLORODIBROMOMETHANE

CHLOROETHANE

2-CHLOROETHYL VINYL ETHER

1,2-DIBROMOETHANE

DICHLOROBROMOMETHANE

DICHLORODIFLUOROMETHANE

1,1-DICHLOROETHANE

1,2-DICHLOROETHANE

1,1-DICHLOROETHYLENE

TRANS-1,2-DICHLOROETHYLENE

1,2-DICHLOROPROPANE

1,3-DICHLOROPROPYLENE

CIS-1,3-DICHLOROPROPYLENE

TRANS-1,3-DICHLOROPROPYLENE

ETHYLBENZENE

FREON 113

2-HEXANONE

4-METHYL-2-PENTANONE

STYRENE

TRICHLOROFLUOROMETHANE

1,1,2,2-TETRACHLOROETHANE

1,1,1-TRICHLOROETHANE

1,1,2-TRICHLOROETHANE

TETRACHLOROETHYLENE

TRICHLOROETHYLENE

TOLUENE

VINYL ACETATE

VINYL CHLORIDE

m-XYLENE

o-XYLENE

p-XYLENE

TOTAL XYLENES

YES

ACETONE	-	-	-	-
ACROLEIN	-	-	-	-
ACRYLONITRILE	-	-	-	-
BENZENE	-	-	-	-
CHLOROBENZENE	-	-	-	-
DICHLOROBENZENE (TOTAL)	-	-	-	-
1,2-DICHLOROBENZENE	-	-	-	-
1,3-DICHLOROBENZENE	-	-	-	-
1,4-DICHLOROBENZENE	-	-	-	-
BROMOFORM	-	-	-	-
BROMOMETHANE	-	-	-	-
DIBROMOMETHANE	-	-	-	-
2-BUTANONE	-	-	-	-
CARBON DISULFIDE	-	-	-	-
CARBON TETRACHLORIDE	-	-	-	-
CHLOROMETHANE	-	-	-	-
DICHLOROMETHANE	-	-	-	-
CHLOROFORM	-	-	-	-
CHLORODIBROMOMETHANE	-	-	-	-
CHLOROETHANE	-	-	-	-
2-CHLOROETHYL VINYL ETHER	-	-	-	-
1,2-DIBROMOETHANE	-	-	-	-
DICHLOROBROMOMETHANE	-	-	-	-
DICHLORODIFLUOROMETHANE	-	-	-	-
1,1-DICHLOROETHANE	-	-	-	-
1,2-DICHLOROETHANE	-	-	-	-
1,1-DICHLOROETHYLENE	-	-	-	-
TRANS-1,2-DICHLOROETHYLENE	-	-	-	-
1,2-DICHLOROPROPANE	-	-	-	-
1,3-DICHLOROPROPYLENE	-	-	-	-
CIS-1,3-DICHLOROPROPYLENE	-	-	-	-
TRANS-1,3-DICHLOROPROPYLENE	-	-	-	-
ETHYLBENZENE	-	-	-	-
FREON 113	-	-	-	-
2-HEXANONE	-	-	-	-
4-METHYL-2-PENTANONE	-	-	-	-
STYRENE	-	-	-	-
TRICHLOROFLUOROMETHANE	-	-	-	-
1,1,2,2-TETRACHLOROETHANE	-	-	-	-
1,1,1-TRICHLOROETHANE	-	-	-	-
1,1,2-TRICHLOROETHANE	-	-	-	-
TETRACHLOROETHYLENE	-	-	-	-
TRICHLOROETHYLENE	-	-	-	-
TOLUENE	-	-	-	-
VINYL ACETATE	-	-	-	-
VINYL CHLORIDE	-	-	-	-
m-XYLENE	-	-	-	-
o-XYLENE	-	-	-	-
p-XYLENE	-	-	-	-
TOTAL XYLENES	-	-	-	-

WELL # C-08

TOP OF SCREEN#	-9.00	BOTTOM OF SCREEN=	-19.00	TOTAL DEPTH=	32.50

DATE	LAB	MCLAREN ID	DETECTION LIMIT	ANALYSIS	MEMO

03/14/B4
B A C
S000220

09/26/84
B & C
S000221

05/02/85
B & C
S000222

11/24/86
MCLAREN
003930
5
601,602

32,50

MEMO

Chemical Name	Concentration (ppm)	Concentration (ppb)	Concentration (ppm)	Concentration (ppb)
ACETONE	-	-	-	-
ACROLEIN	-	-	-	-
ACRYLONITRILE	-	-	-	-
BENZENE	-	-	-	< 0.5
CHLOROBENZENE	-	-	-	< 0.5
DICHLOROBENZENE (TOTAL)	-	-	-	-
1,2-DICHLOROBENZENE	-	-	-	< 0.5
1,3-DICHLOROBENZENE	-	-	-	< 0.5
1,4-DICHLOROBENZENE	-	-	-	< 0.5
BROMOFORM	-	-	-	< 10
BROMOMETHANE	-	-	-	-
DIBROMOMETHANE	-	-	-	-
2-BUTANONE	-	-	-	-
CARBON DISULFIDE	-	-	-	-
CARBON TETRACHLORIDE	-	-	-	-
CHLOROMETHANE	-	-	-	-
DICHLOROMETHANE	160	-	-	-
CHLOROFORM	-	-	-	-
CHLORODIBROMOMETHANE	-	-	-	-
CHLOROETHANE	-	-	-	-
2-CHLOROETHYL VINYL ETHER	-	-	-	-
1,2-DIBROMOETHANE	-	-	-	-
DICHLOROBROMOMETHANE	-	-	-	-
DICHLORODIFLUOROMETHANE	-	-	-	-
1,1-DICHLOROETHANE	120	180	310	390
1,2-DICHLOROETHANE	16	67	200	280
1,1-DICHLOROETHYLENE	43	81	110	230
TRANS-1,2-DICHLOROETHYLENE	-	-	-	-
1,3-DICHLOROPROPYLENE	-	-	-	-
CIS-1,3-DICHLOROPROPYLENE	-	-	-	-
TRANS-1,3-DICHLOROPROPYLENE	-	-	-	-
ETHYLBENZENE	-	-	-	< 0.5
PERON 113	-	-	-	-
2-HEXANONE	-	-	-	-
4-METHYL-2-PENTANONE	-	-	-	-
STYRENE	-	-	-	-
TRICHLOROFLUOROMETHANE	-	-	-	-
1,1,1,2,2-TETRACHLOROETHANE	-	-	-	-
1,1,1-TRICHLOROETHANE	-	3	-	-
1,1,2-TRICHLOROETHANE	-	-	-	-
TETRACHLOROETHYLENE	-	-	-	-
TRICHLOROETHYLENE	-	-	9	-
TOLUENE	-	-	-	< 0.5
VINYL ACETATE	-	-	-	-
VINYL CHLORIDE	1	3	10	10
m-XYLENE	-	-	-	< 0.5
o-XYLENE	-	-	-	< 0.5
p-XYLENE	-	-	-	< 0.5
TOTAL XYLENES	3	-	-	-

WATER AN. SIS-VOLATILES RESULTS IN PPB WELL # C-09

TOP OF SCREEN= -11.00 BOTTOM OF SCREEN= -21.00 TOTAL DEPTH= 35.50

09/20/83
B & C
S000226

05/16/83
B & C
S000226

05/11/83
B & C
S000224

05/11/83
ANAL. TECH.
S000223

DATE
LAB
MCLAREN ID
DETECTION LIMIT
ANALYSIS
MEMO

ACETONE	-	-	-
ACROLEIN	-	-	-
ACRYLONITRILE	-	-	-
BENZENE	-	-	-
CHLOROBENZENE	-	-	-
DICHLOROBENZENE (TOTAL)	-	-	-
1,2-DICHLOROBENZENE	-	-	-
1,3-DICHLOROBENZENE	-	-	-
1,4-DICHLOROBENZENE	-	-	-
BROMOFORM	-	-	-
BROMOMETHANE	-	-	-
DIBROMOMETHANE	-	-	-
2-BUTANONE	-	-	-
CARBON DISULFIDE	-	-	-
CARBON TETRACHLORIDE	-	-	-
CHLOROMETHANE	-	-	-
DICHLOROMETHANE	-	-	-
CHLOROFORM	-	-	-
CHLORODIBROMOMETHANE	-	-	-
CHLOROETHANE	-	-	-
2-CHLOROETHYL VINYL ETHER	-	-	-
1,2-DIBROMOETHANE	-	-	-
DICHLOROBROMOMETHANE	-	-	-
DICHLORODIFLUOROMETHANE	193	750	2400
1,1-DICHLOROETHANE	-	-	-
1,2-DICHLOROETHANE	39	170	380
1,1-DICHLOROETHYLENE	2265	6000	20000
TRANS-1,2-DICHLOROETHYLENE	-	-	-
1,2-DICHLOROPROPANE	-	-	-
1,3-DICHLOROPROPYLENE	-	-	-
CIS-1,3-DICHLOROPROPYLENE	-	-	-
TRANS-1,3-DICHLOROPROPYLENE	-	-	-
ETHYLBENZENE	-	-	-
FREON 113	-	-	-
2-HEXANONE	-	-	-
4-METHYL-2-PENTANONE	-	-	-
STYRENE	-	-	-
TRICHLOROFLUOROMETHANE	-	-	-
1,1,2,2-TETRACHLOROETHANE	-	-	-
1,1,1-TRICHLOROETHANE	-	-	-
1,1,2-TRICHLOROETHANE	-	-	-
TETRACHLOROETHYLENE	736	1200	8600
TRICHLOROETHYLENE	-	-	-
TOLUENE	-	-	-
VINYL ACETATE	-	-	-
VINYL CHLORIDE	-	-	-
m-XYLENE	-	-	-
o-XYLENE	-	-	-
p-XYLENE	-	-	-
TOTAL XYLENES	-	-	-

WATER ANALYSIS-VOLATILES RESULTS IN PPM

WELL # C-09
TOP OF SCREEN= -11.00 BOTTOM OF SCREEN= -21.00 TOTAL DEPTH= 35.50

05/02/85
B & C
S000230

09/26/84
B & C
S000229

03/14/84
B & C
S000228

12/15/83
B & C
S000227

DATE
LAB
MCLAREN ID
DETECTION LIMIT
ANALYSIS
MEMO

ACETONE	-	-	-	-
ACROLEIN	-	-	-	-
ACRYLONITRILE	-	-	-	-
BENZENE	-	-	-	-
CHLOROBENZENE	-	-	-	-
DICHLOROBENZENE (TOTAL)	-	-	-	-
1,2-DICHLOROBENZENE	-	-	-	-
1,3-DICHLOROBENZENE	-	-	-	-
1,4-DICHLOROBENZENE	-	-	-	-
BROMOFORM	-	-	-	-
BROMOMETHANE	-	-	-	-
DIBROMOMETHANE	-	-	-	-
2-BUTANONE	-	-	-	-
CARBON DISULFIDE	-	-	-	-
CARBON TETRACHLORIDE	-	-	-	-
CHLOROMETHANE	-	-	-	-
DICHLOROMETHANE	-	-	-	-
CHLOROFORM	-	-	-	-
CHLORODIBROMOMETHANE	-	-	-	-
CHLOROETHANE	-	-	-	-
2-CHLOROETHYL VINYL ETHER	-	-	-	-
1,2-DIBROMOETHANE	-	-	-	-
DICHLOROBROMOMETHANE	-	-	-	-
DICHLORODIFLUOROMETHANE	-	-	-	-
1,1-DICHLOROETHANE	-	-	-	-
1,2-DICHLOROETHANE	-	-	-	-
1,1-DICHLOROETHYLENE	-	-	-	-
TRANS-1,2-DICHLOROETHYLENE	-	-	-	-
1,2-DICHLOROPROPANE	-	-	-	-
1,3-DICHLOROPROPYLENE	-	-	-	-
CIS-1,3-DICHLOROPROPYLENE	-	-	-	-
TRANS-1,3-DICHLOROPROPYLENE	-	-	-	-
ETHYLBENZENE	-	-	-	-
FREON 113	-	-	-	-
2-HEXANONE	-	-	-	-
4-METHYL-2-PENTANONE	-	-	-	-
STYRENE	-	-	-	-
TRICHLOROFLUOROMETHANE	-	-	-	-
1,1,2,2-TETRACHLOROETHANE	-	-	-	-
1,1,1-TRICHLOROETHANE	-	-	-	-
1,1,2-TRICHLOROETHANE	-	-	-	-
TETRACHLOROETHYLENE	-	-	-	-
TRICHLOROETHYLENE	-	-	-	-
TOLUENE	-	-	-	-
VINYL ACETATE	-	-	-	-
VINYL CHLORIDE	-	-	-	-
m-XYLENE	-	-	-	-
o-XYLENE	-	-	-	-
p-XYLENE	-	-	-	-
TOTAL XYLENES	-	-	-	-

3320
420
12000
43

2800
320
11000

2700
390
20000

1900
240
4600

2200
8
9

2600

2900

1200

WATER ANALYSIS - VOLATILES RESULTS IN PPM

TOP OF SCREEN = -11.00 BOTTOM OF SCREEN = -21.00 TOTAL DEPTH = 36.50

WELL # C-09

DATE 06/03/85
LAB MCLAREN
MCLAREN ID 0003309
DETECTION LIMIT 0.5
ANALYSIS 601,602
MEMO

ACETONE	-		
ACROLEIN	-		
ACRYLONITRILE	-		
BENZENE	-	<=	1
CHLOROBENZENE	-		
DICHLOROBENZENE (TOTAL)	-		
1,2-DICHLOROBENZENE	-		
1,3-DICHLOROBENZENE	-		15
1,4-DICHLOROBENZENE	-	<	1
BROMOFORM	-		
BROMOMETHANE	-		
DIBROMOMETHANE	-		
2-BUTANONE	-		
CARBON DISULFIDE	-		
CARBON TETRACHLORIDE	-		
CHLOROMETHANE	-		
DICHLOROMETHANE	-		
CHLOROFORM	-	<	1
CHLORODIBROMOMETHANE	-		
CHLOROETHANE	-		
2-CHLOROETHYL VINYL ETHER	-		
1,2-DIBROMOETHANE	-		
DICHLOROBROMOMETHANE	-		
DICHLORODIFLUOROMETHANE	3000		170
1,1-DICHLOROETHANE	-		
1,2-DICHLOROETHANE	600		45
1,1-DICHLOROETHYLENE	19000		390
TRANS-1,2-DICHLOROETHYLENE	-		
1,2-DICHLOROPROPANE	-		
1,3-DICHLOROPROPYLENE	-		
CIS-1,3-DICHLOROPROPYLENE	-		
TRANS-1,3-DICHLOROPROPYLENE	-		
ETHYLBENZENE	-		0.7
PERON 113	-		
2-HEXANONE	-		
1-METHYL-2-PENTANONE	-		
STYRENE	-		
TRICHLOROFUOROMETHANE	-	<=	3
1,1,2,2-TETRACHLOROETHANE	-		3
1,1,1-TRICHLOROETHANE	-		
1,1,2-TRICHLOROETHANE	-	<=	3
TETRACHLOROETHYLENE	3700		130
TRICHLOROETHYLENE	30		2
TOLUENE	-		
VINYL ACETATE	17	<	1
VINYL CHLORIDE	-	<=	1
m-XYLENE	-		5
o-XYLENE	-		
p-XYLENE	-		0.8
TOTAL XYLENES	-		

WATER ANALYSIS-VOLATILES RESULTS IN PPB

WELL # C-10

TOP OF SCREEN= -4.00 BOTTOM OF SCREEN= -16.00 TOTAL DEPTH= 32.00

05/11/83
B & C
S000232

06/16/83
B & C
S000234

09/20/83
B & C
S000235

DATE
LAB
HCLAREN ID
DETECTION LIMIT
ANALYSIS
MEMO

YES

YES

ACETONE	-	-	-
ACROLEIN	-	-	-
ACRYLONITRILE	-	-	-
BENZENE	-	4	28
CHLOROBENZENE	-	-	-
DICHLOROBENZENE (TOTAL)	-	-	-
1,2-DICHLOROBENZENE	-	-	-
1,3-DICHLOROBENZENE	-	-	-
1,4-DICHLOROBENZENE	-	-	-
BROMOFORM	-	-	-
BROMOMETHANE	-	-	-
DIBROMOMETHANE	-	-	-
2-BUTANONE	-	-	-
CARBON DISULFIDE	-	-	-
CARBON TETRACHLORIDE	-	-	-
CHLOROMETHANE	-	-	-
DICHLOROMETHANE	-	-	-
CHLOROFORM	-	-	-
CHLORODIBROMOMETHANE	-	-	-
CHLOROETHANE	-	-	-
2-CHLOROETHYL VINYL ETHER	-	-	-
1,2-DIBROMOETHANE	-	-	-
DICHLOROBROMOMETHANE	-	-	-
DICHLORODIFLUOROMETHANE	-	-	-
1,1-DICHLOROETHANE	-	-	-
1,2-DICHLOROETHANE	-	-	-
1,1-DICHLOROETHYLENE	-	-	-
TRANS-1,2-DICHLOROETHYLENE	-	4	-
1,2-DICHLOROPROPANE	-	2	-
1,3-DICHLOROPROPYLENE	-	-	-
CIS-1,3-DICHLOROPROPYLENE	-	-	-
TRANS-1,3-DICHLOROPROPYLENE	-	-	-
ETHYLBENZENE	-	-	31
FREON 113	-	-	-
2-HEXANONE	-	-	-
4-METHYL-2-PENTANONE	-	-	-
STYRENE	-	-	-
TRICHLOROFLUOROMETHANE	-	-	-
1,1,2,2-TETRACHLOROETHANE	-	-	-
1,1,1-TRICHLOROETHANE	-	-	-
1,1,2-TRICHLOROETHANE	-	-	-
TETRACHLOROETHYLENE	-	6	-
TRICHLOROETHYLENE	-	-	-
TOLUENE	-	-	-
VINYL ACETATE	-	-	-
VINYL CHLORIDE	-	-	-
m-XYLENE	-	-	-
o-XYLENE	-	-	-
p-XYLENE	-	-	-
TOTAL XYLENES	-	-	-

WATER AN AQS-VOLATILES RESULTS IN PIP

WELL # C-10

32.00

TOP OF SCREEN= -4.00 BOTTOM OF SCREEN= -16.00 TOTAL DEPTH=

05/03/85
H & C
S000239

09/26/84
B & C
S000238

03/14/84
B & C
S000237

12/15/83
B & C
S000236

DATE
LAB
MCLAREN ID
DETECTION LIMIT
ANALYSIS
MEMO

YES

ACETONE	-	-	-
ACROLEIN	-	-	-
ACRYLONITRILE	-	-	-
BENZENE	-	-	-
CHLOROBENZENE	-	-	-
DICHLOROBENZENE (TOTAL)	-	-	-
1,2-DICHLOROBENZENE	-	-	-
1,3-DICHLOROBENZENE	-	-	-
1,4-DICHLOROBENZENE	-	-	-
BROMOFORM	-	-	-
BROMOMETHANE	-	-	-
DIBROMOMETHANE	-	-	-
2-BUTANONE	-	-	-
CARBON DISULFIDE	-	-	-
CARBON TETRACHLORIDE	-	-	-
CHLOROMETHANE	-	-	-
DICHLOROMETHANE	-	-	-
CHLOROFORM	-	-	-
CHLORODIBROMOMETHANE	-	-	-
CHLOROETHANE	-	-	-
2-CHLOROETHYL VINYL ETHER	-	-	-
1,2-DIBROMOETHANE	-	-	-
DICHLOROBROMOMETHANE	-	-	-
DICHLORODIFLUOROMETHANE	-	-	-
1,1-DICHLOROETHANE	-	-	-
1,2-DICHLOROETHANE	-	-	-
1,1-DICHLOROETHYLENE	-	-	-
TRANS-1,2-DICHLOROETHYLENE	-	-	-
1,2-DICHLOROPROPANE	-	-	-
1,3-DICHLOROPROPYLENE	-	-	-
CIS-1,3-DICHLOROPROPYLENE	-	-	-
TRANS-1,3-DICHLOROPROPYLENE	-	-	-
ETHYLBENZENE	-	-	-
FREON 113	-	-	-
2-HEXANONE	-	-	-
4-METHYL-2-PENTANONE	-	-	-
STYRENE	-	-	-
TRICHLOROFLUOROMETHANE	-	-	-
1,1,2,2-TETRACHLOROETHANE	-	-	-
1,1,1-TRICHLOROETHANE	-	-	-
1,1,2-TRICHLOROETHANE	-	-	-
TETRACHLOROETHYLENE	-	-	-
TRICHLOROETHYLENE	-	-	-
TOLUENE	-	-	-
VINYL ACETATE	-	-	-
VINYL CHLORIDE	-	-	-
m-XYLENE	-	-	-
o-XYLENE	-	-	-
p-XYLENE	-	-	-
TOTAL XYLENES	-	-	-

WATER ANALYSIS-VOLATILES RESULTS IN Ppb

WELL # C-10

32.00

TOP OF SCREEN= -4.00 BOTTOM OF SCREEN= -16.00 TOTAL DEPTH=

05/03/85 12/18/86
B & C MCLAREN
S000239 4538
0.5
TPH 601,602

DATE
LAB
MCLAREN ID
DETECTION LIMIT
ANALYSIS
MEMO

ACETONE	-	
ACROLEIN	-	
ACRYLONITRILE	-	
BENZENE	-	
CHLOROBENZENE	-	
DICHLOROBENZENE (TOTAL)	-	
1,2-DICHLOROBENZENE	-	
1,3-DICHLOROBENZENE	-	
1,4-DICHLOROBENZENE	-	
BROMOFORM	-	
BROMOMETHANE	-	
DIBROMOMETHANE	-	
2-BUTANONE	-	
CARBON DISULFIDE	-	
CARBON TETRACHLORIDE	-	
CHLOROMETHANE	-	
DICHLOROMETHANE	-	
CHLOROFORM	-	
CHLORODIBROMOMETHANE	-	
CHLOROETHANE	-	
2-CHLOROETHYL VINYL ETHER	-	
1,2-DIBROMOETHANE	-	
DICHLOROBROMOMETHANE	-	
DICHLORODIFLUOROMETHANE	-	
1,1-DICHLOROETHANE	-	
1,2-DICHLOROETHANE	-	
1,1-DICHLOROETHYLENE	-	
TRANS-1,2-DICHLOROETHYLENE	-	
1,2-DICHLOROPROPANE	-	
1,3-DICHLOROPROPYLENE	-	
CIS-1,3-DICHLOROPROPYLENE	-	
TRANS-1,3-DICHLOROPROPYLENE	-	
ETHYLBENZENE	-	
FREON 113	-	
2-HEXANONE	-	
4-METHYL-2-PENTANONE	-	
STYRENE	-	
TRICHLOROFUOROMETHANE	-	
1,1,2,2-TETRACHLOROETHANE	-	
1,1,1-TRICHLOROETHANE	-	
1,1,2-TRICHLOROETHANE	-	
TETRACHLOROETHYLENE	-	
TRICHLOROETHYLENE	-	
TOLUENE	-	
VINYL ACETATE	-	
VINYL CHLORIDE	-	
m-XYLENE	-	
o-XYLENE	-	
p-XYLENE	-	
TOTAL XYLENES	-	

WATER ANAL. IS-VOLATILES RESULTS IN OGB

WELL # C-11

TOP OF SCREEN= 1.00 BOTTOM OF SCREEN= -9.00 TOTAL DEPTH= 27.00

DATE 05/11/83 06/15/83 09/20/83 12/15/83

LAB ANAL. TECH. B & C B & C B & C

MC LAREN ID S000240 S000241 S000242 S000243

DETECTION LIMIT

ANALYSIS

MEMO

YES

ACETONE	-	-	-	-
ACROLEIN	-	-	-	-
ACRYLONITRILE	-	-	-	-
BENZENE	-	-	-	-
CHLOROBENZENE	-	-	-	-
DICHLOROBENZENE (TOTAL)	-	-	-	-
1,2-DICHLOROBENZENE	-	-	-	-
1,3-DICHLOROBENZENE	-	-	-	-
1,4-DICHLOROBENZENE	-	-	-	-
BROMOFORM	-	-	-	-
BROMOMETHANE	-	-	-	-
DIBROMOMETHANE	-	-	-	-
2-BUTANONE	-	-	-	-
CARBON DISULFIDE	-	-	-	-
CARBON TETRACHLORIDE	-	-	-	-
CHLOROMETHANE	-	-	-	-
DICHLOROMETHANE	-	-	-	-
CHLOROFORM	-	-	-	-
CHLORODIBROMOMETHANE	-	-	-	-
CHLOROETHANE	-	-	-	-
2-CHLOROETHYL VINYL ETHER	-	-	-	-
1,2-DIBROMOETHANE	-	-	-	-
DICHLORODIBROMOMETHANE	-	-	-	-
DICHLORODIFLUOROMETHANE	-	-	-	-
1,1-DICHLOROETHANE	-	-	-	-
1,2-DICHLOROETHANE	-	-	-	-
1,1-DICHLOROETHYLENE	-	-	-	-
TRANS-1,2-DICHLOROETHYLENE	-	-	-	-
1,2-DICHLOROPROPANE	-	-	-	-
1,3-DICHLOROPROPYLENE	-	-	-	-
CIS-1,3-DICHLOROPROPYLENE	-	-	-	-
TRANS-1,3-DICHLOROPROPYLENE	-	-	-	-
ETHYLBENZENE	-	-	-	-
PERON 113	-	-	-	-
2-HEXANONE	-	-	-	-
4-METHYL-2-PENTANONE	-	-	-	-
STYRENE	-	-	-	-
TRICHLOROFLUOROMETHANE	-	-	-	-
1,1,2,2-TETRACHLOROETHANE	-	-	-	-
1,1,1-TRICHLOROETHANE	-	-	-	-
1,1,2-TRICHLOROETHANE	-	-	-	-
TETRACHLOROETHYLENE	-	-	-	-
TRICHLOROETHYLENE	-	-	-	-
2,8	-	-	-	-
TOLUENE	-	-	-	-
VINYL ACETATE	-	-	-	-
VINYL CHLORIDE	-	-	-	-
m-XYLENE	-	-	-	-
o-XYLENE	-	-	-	-
p-XYLENE	-	-	-	-
TOTAL XYLENES	-	-	-	-

WATER ANALYSIS-VOLATILES RESULTS IN PPB

WELL # C-11

TOP OF SCREEN= 1.00 BOTTOM OF SCREEN= -9.00 TOTAL DEPTH= 27.00

DATE 03/15/84 09/26/84 05/02/86 11/05/86
 LAB B & C B & C U & C MCLAREN
 MCLAREN ID S000244 S000245 S000246 003086
 DETECTION LIMIT ANALYSIS 0.5 601,602
 NPHO

ACETONE	-	-	-	-	-
ACROLEIN	-	-	-	-	-
ACRYLONITRILE	-	-	-	-	-
BENZENE	-	-	-	-	-
CHLOROBENZENE	-	-	-	-	-
DICHLOROBENZENE (TOTAL)	-	-	-	-	-
1,2-DICHLORODENZENE	-	-	-	-	-
1,3-DICHLOROBENZENE	-	-	-	-	-
1,4-DICHLOROBENZENE	-	-	-	-	-
BROMOFORM	-	-	-	-	-
BROMOMETHANE	-	-	-	-	-
DIBROMOMETHANE	-	-	-	-	-
2-BUTANONE	-	-	-	-	-
CARBON DISULFIDE	-	-	-	-	-
CARBON TETRACHLORIDE	-	-	-	-	-
CHLOROMETHANE	-	-	-	-	-
DICHLOROMETHANE	-	-	-	-	-
CHLOROFORM	-	-	-	-	-
CHLORODIBROMOMETHANE	-	-	-	-	-
CHLOROETHANE	-	-	-	-	-
2-CHLOROETHYL VINYL ETHER	-	-	-	-	-
1,2-DIBROMOETHANE	-	-	-	-	-
DICHLOROBROMOMETHANE	-	-	-	-	-
DICHLORODIFLUOROMETHANE	-	-	-	-	-
1,1-DICHLOROETHANE	-	-	-	-	-
1,2-DICHLOROETHANE	-	-	-	-	-
1,1-DICHLOROETHYLENE	-	-	-	-	-
TRANS-1,2-DICHLOROETHYLENE	-	-	-	-	-
1,2-DICHLOROPROPANE	-	-	-	-	-
1,3-DICHLOROPROPYLENE	-	-	-	-	-
CIS-1,3-DICHLOROPROPYLENE	-	-	-	-	-
TRANS-1,3-DICHLOROPROPYLENE	-	-	-	-	-
ETHYLBENZENE	-	-	-	-	-
FREON 113	-	-	-	-	-
2-HEXANONE	-	-	-	-	-
4-METHYL-2-PENTANONE	-	-	-	-	-
STYRENE	-	-	-	-	-
TRICHLOROFLUOROMETHANE	-	-	-	-	-
1,1,2,2-TETRACHLOROETHANE	-	-	-	-	-
1,1,1-TRICHLOROETHANE	-	-	-	-	-
1,1,2-TRICHLOROETHANE	-	-	-	-	-
TETRACHLOROETHYLENE	-	-	-	-	-
TRICHLOROETHYLENE	-	-	-	-	-
TOLUENE	-	-	-	-	-
VINYL ACETATE	-	-	-	-	-
VINYL CHLORIDE	-	-	-	-	-
m-XYLENE	-	-	-	-	-
o-XYLENE	-	-	-	-	-
p-XYLENE	-	-	-	-	-
TOTAL XYLENES	-	-	-	-	-

WATER AN. 215-VOLATILES RESULTS IN 001 WELLS # C-11 TOP OF SCREEN= 1.00 BOTTOM OF SCREEN= -9.00 TOTAL DEPTH= 27.00

DATE 11/05/86
 LAB B & C
 MCLAREN ID S000717
 DETECTION LIMIT 1
 ANALYSIS 624
 MEMO

ACETONE	<	10
ACROLEIN	<	10
ACRYLONITRILE		
BENZENE		
CHLOROBENZENE		
DICHLOROBENZENE (TOTAL)		
1,2-DICHLOROBENZENE		
1,3-DICHLOROBENZENE		
1,4-DICHLOROBENZENE		
BROMOFORM		
BROMOMETHANE		
DIBROMOMETHANE		
2-BUTANONE		
CARBON DISULFIDE		
CARBON TETRACHLORIDE		
CHLOROMETHANE		
DICHLOROMETHANE		
CHLOROFORM		
CHLORODIBROMOMETHANE		
CHLOROETHANE		
2-CHLOROETHYL VINYL ETHER		
1,2-DIBROMOETHANE		
DICHLOROBROMOMETHANE		
DICHLORODIFLUOROMETHANE		
1,1-DICHLOROETHANE		
1,2-DICHLOROETHANE		
1,1-DICHLOROETHYLENE		
TRANS-1,2-DICHLOROETHYLENE		
1,2-DICHLOROPROPANE		
1,3-DICHLOROPROPYLENE		
CIS-1,3-DICHLOROPROPYLENE		
TRANS-1,3-DICHLOROPROPYLENE		
ETHYLBENZENE		
PERON 113		
2-DEXANONE		
4-METHYL-2-PENTANONE		
STYRENE		
TRICHLOROFUOROMETHANE		
1,1,2,2-TETRACHLOROETHANE		
1,1,1-TRICHLOROETHANE		
1,1,2-TRICHLOROETHANE		
TETRACHLOROETHYLENE		
TRICHLOROETHYLENE		
TOLUENE		
VINYL ACETATE		
VINYL CHLORIDE		
m-XYLENE		
o-XYLENE		
p-XYLENE		
TOTAL XYLENES		

WATER ANALYSIS-VOLATILES RESULTS IN 1000

TOP OF SCREEN= 4.00 BOTTOM OF SCREEN= -6.00 TOTAL DEPTH= 30.00
 WELLS # C-12
 DATE 05/11/83 06/15/83 09/20/83 12/15/83
 LAB ANAL. TECH. B & C B & C B & C
 McLAUGHLIN ID S000247 S000248 S000249 S000250
 DETECTION LIMIT

ANALYSIS MEMO
 YES

ACETONE	-	-	-	-
ACROLEIN	-	-	-	-
ACRYLONITRILE	-	-	-	-
BENZENE	22.3	53	190	210
CHLOROBENZENE	-	-	-	7
DICHLOROBENZENE (TOTAL)	-	-	-	-
1,2-DICHLOROBENZENE	-	-	-	-
1,3-DICHLOROBENZENE	-	-	-	-
1,4-DICHLOROBENZENE	-	-	-	-
BROMOBENZENE	-	-	-	-
BROMOMETHANE	-	-	-	-
DIBROMOMETHANE	-	-	-	-
2-HEPTANONE	-	-	-	-
CARBON DISULFIDE	-	-	-	-
CARBON TETRACHLORIDE	-	-	-	-
CHLOROMETHANE	-	-	-	-
DICHLOROMETHANE	-	-	-	-
CHLOROFORM	-	-	-	-
CHLORODIBROMOMETHANE	-	-	-	-
CHLOROETHANE	-	-	-	-
1,2-DIBROMOETHANE	-	-	-	-
DICHLOROBROMOMETHANE	-	-	-	-
DICHLORODIFLUOROMETHANE	-	-	-	-
1,1-DICHLOROETHANE	-	-	-	-
1,1-DICHLOROETHYLENE	-	-	-	-
TRANS-1,2-DICHLOROETHYLENE	5.9	50	8	8
1,2-DICHLOROPROPANE	-	-	-	-
1,3-DICHLOROPROPYLENE	-	-	-	-
CIS-1,3-DICHLOROPROPYLENE	-	-	-	-
TRANS-1,3-DICHLOROPROPYLENE	-	-	-	-
ETHYLBENZENE	-	-	940	820
FREON 113	-	-	-	-
2-HEXANONE	-	-	-	-
4-METHYL-2-PENTANONE	-	-	-	-
STYRENE	-	-	-	-
TRICHLOROFLUOROMETHANE	-	-	-	-
1,1,2,2-TETRACHLOROETHANE	-	-	2	-
1,1,1-TRICHLOROETHANE	-	-	-	-
1,1,2-TRICHLOROETHANE	-	-	-	-
TETRACHLOROETHYLENE	49	110	70	56
TRICHLOROETHYLENE	36	54	50	36
TOLUENE	-	-	1300	550
VINYL ACETATE	-	-	-	-
VINYL CHLORIDE	-	-	-	-
m-XYLENE	-	-	-	-
p-XYLENE	-	-	-	-
TOTAL XYLENES	-	-	6000	2000

WATER ANALYSIS - VOLATILES RESULTS IN PPM

WELL # C-12

30.00

TOP OF SCREEN = 1.00 BOTTOM OF SCREEN = -6.00 TOTAL DEPTH =

DATE 03/14/84 05/03/85 12/20/86
 LAB B & C B & C MCLAREN
 MCLAREN ID S000251 S000253 4305
 DETECTION LIMIT S000251 S000253 13
 ANALYSIS 601
 MEMO

ACETONE	-	-	-
ACROLEIN	-	-	-
ACRYLONITRILE	12000	3500	2500
BENZENE	-	-	-
CHLOROBENZENE	-	-	-
DICHLOROBENZENE (TOTAL)	-	-	-
1,2-DICHLOROBENZENE	-	-	-
1,3-DICHLOROBENZENE	-	-	-
1,4-DICHLOROBENZENE	-	-	< 25
BROMOFORM	-	-	-
BROMOMETHANE	-	-	-
DIBROMOMETHANE	-	-	-
2-BUTANONE	-	-	-
CARBON DISULFIDE	-	-	-
CARBON TETRACHLORIDE	-	-	-
CHLOROMETHANE	-	-	-
DICHLOROMETHANE	-	-	< 25
CHLOROFORM	-	-	-
CHLORODIBROMOMETHANE	-	-	-
CHLOROETHANE	-	-	-
2-CHLOROETHYL VINYL ETHER	-	-	-
1,2-DIBROMOETHANE	-	-	-
DICHLOROBROMOMETHANE	-	-	-
DICHLORODIFLUOROMETHANE	-	-	-
1,1-DICHLOROETHANE	-	-	-
1,2-DICHLOROETHANE	-	-	-
1,1-DICHLOROETHYLENE	-	1	-
TRANS-1,2-DICHLOROETHYLENE	-	-	-
1,2-DICHLOROPROPANE	-	-	-
1,3-DICHLOROPROPYLENE	-	-	-
CIS-1,3-DICHLOROPROPYLENE	-	-	-
TRANS-1,3-DICHLOROPROPYLENE	-	-	-
ETHYLENE	110000	3700	2000
FIKON 113	-	-	-
2-HEXANONE	-	-	-
4-ETHYL-2-PENTANONE	-	-	-
STYRENE	-	-	-
TRICHLOROFUOROMETHANE	-	-	< 15
1,1,2,2-TETRACHLOROETHANE	-	-	-
1,1,1-TRICHLOROETHANE	-	-	-
1,1,2-TRICHLOROETHANE	-	-	< 15
TETRACHLOROETHYLENE	-	4	130
TRICHLOROETHYLENE	-	4	20
160000	7000	5500	
TOLUENE	-	-	-
VINYL ACETATE	-	-	< 25
VINYL CHLORIDE	-	-	-
m-XYLENE	-	-	-
p-XYLENE	-	-	-
TOTAL XYLENES	470000	20000	6000

WATER ANALYSIS-VOLATILES RESULTS IN PPB

WELL # C-12

TOP OF SCREEN= 4.00 BOTTOM OF SCREEN= -6.00 TOTAL DEPTH= 30.00

DATE 12/20/88

LAB MCLAREN

DETECTION LIMIT 4306

ANALYSIS 13000

MEMO 602

ACETONE	
ACROLEIN	
ACRYLONITRILE	
BENZENE	
CHLOROBENZENE	610000
DICHLOROBENZENE (TOTAL)	<1300000
1,2-DICHLOROBENZENE	
1,3-DICHLOROBENZENE	280000
1,4-DICHLOROBENZENE	400000
BROMOFORM	
BROMOMETHANE	
DIBROMOMETHANE	
2-BUTANONE	
CARBON DISULFIDE	
CARBON TETRACHLORIDE	
CHLOROETHANE	
DICHLOROMETHANE	
CHLOROFORM	
CHLORODIBROMOMETHANE	
CHLOROETHANE	
2-CHLOROETHYL VINYL ETHER	
1,2-DIBROMOETHANE	
DICHLOROBROMOMETHANE	
DICHLORODIFLUOROMETHANE	
1,1-DICHLOROETHANE	
1,2-DICHLOROETHANE	
1,1-DICHLOROETHYLENE	
TRANS-1,2-DICHLOROETHYLENE	
1,2-DICHLOROPROPANE	
1,3-DICHLOROPROPYLENE	
CIS-1,3-DICHLOROPROPYLENE	
TRANS-1,3-DICHLOROPROPYLENE	
ETHYLBENZENE	970000
FREON 113	
2-HEXANONE	
4-METHYL-2-PENTANONE	
STYRENE	
TRICHLOROFUOROMETHANE	
1,1,2,2-TETRACHLOROETHANE	
1,1,1-TRICHLOROETHANE	
1,1,2-TRICHLOROETHANE	
TETRACHLOROETHYLENE	
TRICHLOROETHYLENE	
TOLUENE	66000
VINYL ACETATE	
VINYL CHLORIDE	
m-XYLENE	<1300000
o-XYLENE	1600000
p-XYLENE	1900000
TOTAL XYLENES	

WATER ANALYSIS-VOLATILES RESULTS IN PPM

TOP OF SCREEN= -13.00 BOTTOM OF SCREEN= -23.00 TOTAL DEPTH= 40.00

WELL # C-13

DATE
LAB
MCLAHEN ID
DETECTION LIMIT
ANALYSIS
MEMO

05/11/83
ANAL. TECH.
S000254

06/16/83
B & C
S000255

06/16/83
ANAL. TECH.
S000256

09/20/83
B & C
S000257

ACETONE	100	-	-
ACROLEIN	-	-	-
ACRYLONITRILE	-	-	-
BENZENE	-	-	-
CHLOROBENZENE	-	-	-
DICHLOROBENZENE (TOTAL)	-	-	-
1,2-DICHLOROBENZENE	-	-	-
1,3-DICHLOROBENZENE	-	-	-
1,4-DICHLOROBENZENE	-	-	-
BROMOFORM	-	-	-
BROMOMETHANE	-	-	-
DIBROMOMETHANE	-	-	-
2-BUTANONE	-	-	-
CARBON DISULFIDE	8.3	-	-
CARBON TETRACHLORIDE	-	-	-
CHLOROMETHANE	16.8	-	-
DICHLOROMETHANE	-	-	-
CHLOROFORM	-	-	-
CHLORODIBROMOMETHANE	-	-	-
CHLOROSTHANE	-	-	-
2-CHLOROETHYL VINYL ETHER	-	-	-
1,2-DIBROMOMETHANE	-	-	-
DICHLOROBROMOMETHANE	-	-	-
DICHLORODIFLUOROMETHANE	-	-	3
1,1-DICHLOROETHANE	-	-	-
1,2-DICHLOROETHANE	-	-	-
1,1-DICHLOROETHYLENE	-	-	-
TRANS-1,2-DICHLOROETHYLENE	451.4	340	1100
1,2-DICHLOROPROPANE	-	-	-
1,3-DICHLOROPROPYLENE	-	-	-
CIS-1,3-DICHLOROPROPYLENE	-	-	-
TRANS-1,3-DICHLOROPROPYLENE	-	-	-
ETHYLBENZENE	10.9	-	-
FREON 113	-	-	-
2-HEXANONE	-	-	-
4-METHYL-2-PENTANONE	-	-	-
STYRENE	-	-	-
TRICHLOROFLUOROMETHANE	-	-	-
1,1,2,2-TETRACHLOROETHANE	-	-	-
1,1,1-TRICHLOROETHANE	-	-	-
1,1,2-TRICHLOROETHANE	-	-	-
TETRACHLOROETHYLENE	33.6	-	1
TRICHLOROETHYLENE	37.1	-	-
TOLUENE	-	-	-
VINYL ACETATE	1015.9	982	1900
VINYL CHLORIDE	1100	-	-
m-XYLENE	-	-	-
o-XYLENE	-	-	-
p-XYLENE	-	-	-
TOTAL XYLENES	-	-	-

WATER ANALYSIS-VOLATILES RESULTS IN P2D

TOP OF SCREEN= -13.00 BOTTOM OF SCREEN= -23.00 TOTAL DEPTH= 40.00

WELL # C-13

DATE
LAB
MCLAREN ID
DETECTION LIMIT
ANALYSIS
MEMO

12/15/83
B & C
S000258

03/15/84
B & C
S000259

09/26/84
B & C
S000260

05/02/85
B & C
S000261

ACETONE	-	-	-
ACROLEIN	-	-	-
ACRYLONITRILE	-	-	-
BENZENE	-	-	-
CHLOROBENZENE	-	-	-
DICHLOROBENZENE (TOTAL)	-	-	-
1,2-DICHLOROBENZENE	-	-	-
1,3-DICHLOROBENZENE	-	-	-
1,4-DICHLOROBENZENE	-	-	-
BROMOFORM	-	-	-
BROMOMETHANE	-	-	-
DIBROMOMETHANE	-	-	-
2-BUTANONE	-	-	-
CARBON DISULFIDE	-	-	-
CARBON TETRACHLORIDE	-	-	-
CHLOROMETHANE	-	-	-
DICHLOROMETHANE	-	-	-
CHLOROFORM	-	-	-
CHLORODIBROMOMETHANE	-	-	-
CHLOROETHANE	-	-	-
2-CHLOROETHYL VINYL ETHER	-	-	-
1,2-DIBROMOETHANE	-	-	-
DICHLOROBROMOMETHANE	-	-	-
DICHLORODIFLUOROMETHANE	-	-	-
1,1-DICHLOROETHANE	-	-	-
1,2-DICHLOROETHANE	-	-	-
1,1-DICHLOROETHYLENE	-	-	-
TRANS-1,2-DICHLOROETHYLENE	-	-	-
1,2-DICHLOROPROPANE	-	-	-
1,3-DICHLOROPROPYLENE	-	-	-
CIS-1,3-DICHLOROPROPYLENE	-	-	-
TRANS-1,3-DICHLOROPROPYLENE	-	-	-
ETHYLBENZENE	-	-	-
FREON 113	-	-	-
2-HEXANONE	-	-	-
4-METHYL-2-PENTANONE	-	-	-
STYRENE	-	-	-
TRICHLOROFLUOROMETHANE	-	-	-
1,1,2,2-TETRACHLOROETHANE	-	-	-
1,1,1-TRICHLOROETHANE	-	-	-
1,1,2-TRICHLOROETHANE	-	-	-
TETRACHLOROETHYLENE	-	-	-
TRICHLOROETHYLENE	-	-	-
TOLUENE	-	-	-
VINYL ACETATE	-	-	-
VINYL CHLORIDE	-	-	-
m-XYLENE	-	-	-
o-XYLENE	-	-	-
p-XYLENE	-	-	-
TOTAL XYLENES	-	-	-

1900

1900

5100

2200

26

10

580

2

610

760

310

WELL # C-13
TOP OF SCREEN = -13.00 BOTTOM OF SCREEN = -23.00 TOTAL DEPTH = 40.00

11/05/86
EUREKA
44239D
5
624

5

Chemical Name	Concentration (ppm)	Mass (g)	Volume (L)	Density (g/L)
ACETONE	-	-	< 10	< 10
ACROLEIN	-	-	-	-
ACRYLONITRILE	-	-	-	-
BENZENE	-	-	-	-
CHLOROBENZENE	-	-	-	-
DICHLOROBENZENE (TOTAL)	-	-	-	-
1,2-DICHLOROBENZENE	-	-	-	-
1,3-DICHLOROBENZENE	-	-	-	-
1,4-DICHLOROBENZENE	-	-	-	-
BROMOFORM	< 1	-	-	-
BROMOMETHANE	-	-	-	-
DIBROMOMETHANE	-	-	-	-
2-BUTANONE	-	-	-	-
CARBON DISULFIDE	-	-	-	-
CARBON TETRACHLORIDE	-	-	-	-
CHLOROMETHANE	-	-	-	-
DICHLOROMETHANE	-	-	-	-
CHLOROFORM	-	-	-	-
CHLORODIBROMOMETHANE	-	-	-	-
CHLOROETHANE	< 1	-	-	-
2-CHLOROETHYL VINYL ETHER	-	-	-	-
1,2-DIBROMOETHANE	-	-	-	-
DICHLORODIFLUOROMETHANE	-	-	-	-
1,1-DICHLOROETHANE	40	40	-	40
1,2-DICHLOROETHANE	-	-	-	-
1,1-DICHLOROETHYLENE	7.5	-	-	-
TRANS-1,2-DICHLOROETHYLENE	290	850	-	850
1,2-DICHLOROPROPANE	-	-	-	-
1,1,3-DICHLOROPROPYLENE	-	-	-	-
CIS-1,3-DICHLOROPROPYLENE	-	-	-	-
TRANS-1,3-DICHLOROPROPYLENE	-	-	-	-
ETHYLBENZENE	-	-	-	-
PERFUM 113	-	-	-	-
2-HEXANONE	-	-	-	-
4-METHYL-2-PENTANONE	-	-	-	-
STYRENE	-	-	-	-
TRICHLOROFLUOROMETHANE	-	-	-	-
1,1,1,2,2-TETRACHLOROETHANE	-	-	-	-
1,1,1-TRICHLOROETHANE	-	-	-	-
1,1,1,2-TRICHLOROETHANE	-	-	-	-
TETRACHLOROETHYLENE	-	-	-	-
TRICHLOROETHYLENE	5	-	-	-
TOLUENE	-	-	-	-
VINYL ACETATE	-	-	-	-
VINYL CHLORIDE	490	1100	-	850
m-XYLENE	-	-	-	-
p-XYLENE	-	-	-	-
TOTAL XYLENES	-	-	-	-

WATER ANALYSIS-VOLATILES RESULTS IN PPM

DATE 11/05/86
 LAB B & C
 MCLAREN ID S000721
 DETECTION LIMIT 5
 ANALYSIS 624
 HEMO

WELL # C-13

TOP OF SCREEN= -13.00 BOTTOM OF SCREEN= -23.00 TOTAL DEPTH= 40.00

ACETONE	<	50
ACROLEIN	<	50
ACRYLONITRILE		
BENZENE		
CHLOROBENZENE		
DICHLOROBENZENE (TOTAL)		
1,2-DICHLOROBENZENE		
1,3-DICHLOROBENZENE		
1,4-DICHLOROBENZENE		
BROMOFORM		
BROMOMETHANE		
DIBROMOMETHANE		
2-BUTANONE		
CARBON DISULFIDE		
CARBON TETRACHLORIDE		
CHLOROMETHANE		
DICHLOROMETHANE		30
CHLOROFORM		
CHLORODIBROMOMETHANE		
CHLOROETHANE		
2-CHLOROETHYL VINYL ETHER		
1,2-DIBROMOETHANE		
DICHLOROBROMOMETHANE		
DICHLORODIFLUOROMETHANE		
1,1-DICHLOROETHANE		44
1,2-DICHLOROETHANE		
1,1-DICHLOROETHYLENE		18
TRANS-1,2-DICHLOROETHYLENE		640
1,2-DICHLOROPROPANE		
1,3-DICHLOROPROPYLENE		
CIS-1,3-DICHLOROPROPYLENE		
TRANS-1,3-DICHLOROPROPYLENE		
ETHYLBENZENE		
FREON 113		
2-HEXANONE		
4-METHYL-2-PENTANONE		
STYRENE		
TRICHLOROFLUOROMETHANE		
1,1,2,2-TETRACHLOROETHANE		
1,1,1-TRICHLOROETHANE		
1,1,2-TRICHLOROETHANE		
TETRACHLOROETHYLENE		
TRICHLOROETHYLENE		
TOLUENE		
VINYL ACETATE		
VINYL CHLORIDE		8200
m-XYLENE		
o-XYLENE		
p-XYLENE		
TOTAL XYLENES		

WATER AND NON-VOLATILES RESULTS IN DDB

WELL # C-14
 TOP OF SCREEN = -3.00 BOTTOM OF SCREEN = -13.00 TOTAL DEPTH = 36.50

DATE 05/11/83
 LAB ANAL. TECH.
 MCLAREN ID S000262
 DETECTION LIMIT
 ANALYSIS
 MEMO

09/19/83
 B & C
 S000261

06/15/83
 B & C
 S000265

YES

ACETONE	-	-	-
ACRYLEIN	-	-	-
ACRYLONITRILE	-	-	-
BENZENE	4.5	-	-
CHLOROBENZENE	-	-	-
DICHLOROBENZENE (TOTAL)	-	-	-
1,2-DICHLOROBENZENE	-	-	-
1,3-DICHLOROBENZENE	-	-	-
1,4-DICHLOROBENZENE	-	-	-
BROMOFORM	-	-	-
BROMOMETHANE	-	-	-
DIBROMOMETHANE	-	-	-
2-BUTANONE	-	-	-
CARBON DISULFIDE	19.6	-	-
CARBON TETRACHLORIDE	-	-	-
CHLOROMETHANE	-	-	-
DICHLOROMETHANE	21.4	-	-
CHLOROPHORM	-	-	-
CHLORODIBROMOMETHANE	-	-	-
CHLOROETHANE	-	-	-
2-CHLOROETHYL VINYL ETHER	-	-	-
1,2-DIBROMOETHANE	-	-	-
DICHLOROBROMOMETHANE	-	-	-
DICHLORODIFLUOROMETHANE	-	-	-
1,1-DICHLOROETHANE	-	-	-
1,2-DICHLOROETHANE	-	-	-
1,1-DICHLOROETHYLENE	-	-	-
TRANS-1,2-DICHLOROETHYLENE	-	7	-
1,2-DICHLOROPROPANE	-	-	-
1,3-DICHLOROPROPYLENE	-	-	-
CIS-1,3-DICHLOROPROPYLENE	-	-	-
TRANS-1,3-DICHLOROPROPYLENE	-	-	-
ETHYLENE	10.2	-	-
FREON 113	-	-	-
2-HEXANONE	-	-	-
4-METHYL-2-PENTANONE	-	-	-
STYRENE	-	-	-
TRICHLOROFLUOROMETHANE	-	-	-
1,1,2,2-TETRACHLOROETHANE	-	-	-
1,1,1-TRICHLOROETHANE	-	-	-
1,1,2-TRICHLOROETHANE	-	-	-
TETRACHLOROETHYLENE	-	-	-
TRICHLOROETHYLENE	-	-	-
TOLUENE	32.6	-	-
VINYL ACETATE	-	-	-
VINYL CHLORIDE	-	-	-
OR-XYLENE	-	-	-
O-XYLENE	-	-	-
P-XYLENE	-	-	-
TOTAL XYLENES	-	-	-

WATER ANALYSIS-VOLATILES RESULTS IN PPM

TOP OF SCREEN= -3.00 BOTTOM OF SCREEN= -13.00 TOTAL DEPTH= 35.00

WELL # C-14

DATE

09/26/84

LAB

05/03/85

MCCLAREN ID

11/14/85

DETECTION LIMIT

B & C

MCCLAREN

ANALYSIS

003363

4550

MEMO

0.5

601,602

601

ACETONE

ACROLEIN

ACRYLONITRILE

BENZENE

CHLOROBENZENE

DICHLOROBENZENE (TOTAL)

1,2-DICHLOROBENZENE

1,3-DICHLOROBENZENE

1,4-DICHLOROBENZENE

BROMOFORM

DIBROMOMETHANE

DIBROMOMETHANE

2-BUTANONE

CARBON DISULFIDE

CARBON TETRACHLORIDE

CHLOROMETHANE

DICHLOROMETHANE

CHLOROFORM

CHLORODIBROMOMETHANE

CHLOROETHANE

2-CHLOROETHYL VINYL ETHER

1,2-DIBROMOETHANE

DICHLOROBROMOMETHANE

DICHLORODIFLUOROMETHANE

1,1-DICHLOROETHANE

1,2-DICHLOROETHANE

1,1-DICHLOROETHYLENE

TRANS-1,2-DICHLOROETHYLENE

1,2-DICHLOROPROPANE

1,3-DICHLOROPROPYLENE

CIS-1,3-DICHLOROPROPYLENE

TRANS-1,3-DICHLOROPROPYLENE

ETHYLBENZENE

FREON 113

2-HEXANONE

4-METHYL-2-PENTANONE

STYRENE

TRICHLOROFLUOROMETHANE

1,1,2,2-TETRACHLOROETHANE

1,1,1-TRICHLOROETHANE

1,1,2-TRICHLOROETHANE

TETRACHLOROETHYLENE

TOLUENE

VINYL ACETATE

VINYL CHLORIDE

m-XYLENE

o-XYLENE

p-XYLENE

TOTAL XYLENES

WATER AND DIS-VOLATILES RESULTS IN 1986

WELL # C-14

TOP OF SCREEN= -3.00 BOTTOM OF SCREEN= -13.00 TOTAL DEPTH= 35.50

DATE 12/19/86
LAB MCLAREN
MCLAREN ID 4550D
DETECTION LIMIT 0.5
ANALYSIS 601
MEMO

ACETONE			
ACROLEIN			
ACRYLONITRILE			
BENZENE			
CHLORO BENZENE			
DICHLOROBENZENE (TOTAL)			
1,2-DICHLOROBENZENE			
1,3-DICHLOROBENZENE			
1,4-DICHLOROBENZENE			
BROMOFORM			
BROMOMETHANE			
DIBROMOMETHANE			
2-BUTANONE			
CARBON DISULFIDE			
CARBON TETRACHLORIDE			
CHLOROMETHANE			
DICHLOROMETHANE			
CHLOROFORM			
CHLORODIBROMOMETHANE			
CHLOROETHANE			
2-CHLOROETHYL VINYL ETHER			
1,2-DIBROMOETHANE			
DICHLOROBROMOMETHANE			
DICHLORODIFLUOROMETHANE			
1,1-DICHLOROETHANE			
1,2-DICHLOROETHANE			
1,1-DICHLOROETHYLENE			
TRANS-1,2-DICHLOROETHYLENE			
1,2-DICHLOROPROPANE			
1,3-DICHLOROPROPYLENE			
CIS-1,3-DICHLOROPROPYLENE			
TRANS-1,3-DICHLOROPROPYLENE			
ETHYLBENZENE			
FREON 113			
2-HEXANONE			
4-METHYL-2-PENTANONE			
STYRENE			
TRICHLOROFLUOROMETHANE			
1,1,2,2-TETRACHLOROETHANE			
1,1,1-TRICHLOROETHANE			
1,1,2-TRICHLOROETHANE			
TETRACHLOROETHYLENE			
TRICHLOROETHYLENE			
TOLUENE			
VINYL ACETATE			
VINYL CHLORIDE			
m-XYLENE			
o-XYLENE			
p-XYLENE			
TOTAL XYLENES			

WATER ANALYSIS-VOLATILES RESULTS IN ppb

TOP OF SCREEN= -8.00 BOTTOM OF SCREEN= -28.00 TOTAL DEPTH= 55.00

WELL # S-15

DATE 05/14/85
LAB B & C
MCLAREN ID S000271
DETECTION LIMIT

09/28/85
B & C
S000269

08/23/84
B & C
S000268

YES

YES

YES

YES

YES

ANALYSIS	MEMO	YES	YES	YES	YES
ACETONE		-	-	-	-
ACROLEIN		-	-	-	-
ACRYLONITRILE		-	-	-	-
BENZENE	6	-	2	-	-
CHLOROBENZENE		-	-	-	-
DICHLOROBENZENE (TOTAL)		-	-	-	-
1,2-DICHLOROBENZENE		-	-	-	-
1,3-DICHLOROBENZENE		-	-	-	-
1,4-DICHLOROBENZENE		-	-	-	-
BROMOFORM		-	-	-	-
BROMOMETHANE		-	-	-	-
DIBROMOMETHANE		-	-	-	-
2-BUTANONE		-	-	-	-
CARBON DISULFIDE		-	-	-	-
CARBON TETRACHLORIDE		-	-	-	-
CHLOROMETHANE		-	-	-	-
DICHLOROMETHANE		-	-	-	-
CHLOROFORM		-	-	-	-
CHLORODIBROMOMETHANE		-	-	-	-
CHLOROETHANE		-	-	-	-
2-CHLOROETHYL VINYL ETHER		-	-	-	-
1,2-DIBROMOETHANE		-	-	-	-
DICHLOROBROMOMETHANE		-	-	-	-
DICHLORODIFLUOROMETHANE		-	-	-	-
1,1-DICHLOROETHANE		-	-	-	-
1,2-DICHLOROETHANE		-	-	-	-
1,1-DICHLOROETHYLENE		-	-	-	-
TRANS-1,2-DICHLOROETHYLENE		-	-	-	-
1,2-DICHLOROPROPANE	110	-	-	-	-
1,3-DICHLOROPROPYLENE		-	-	-	-
CIS-1,3-DICHLOROPROPYLENE		-	-	-	-
TRANS-1,3-DICHLOROPROPYLENE		-	-	-	-
ETHYLBENZENE		-	-	-	-
FREON 113		-	-	-	-
2-HEXANONE		-	-	-	-
4-METHYL-2-PENTANONE		-	-	-	-
STYRENE		-	-	-	-
TRICHLOROFUOROMETHANE		-	-	-	-
1,1,2,2-TETRACHLOROETHANE		-	-	-	-
1,1,1-TRICHLOROETHANE		-	-	-	-
1,1,2-TRICHLOROETHANE		-	-	-	-
TETRACHLOROETHYLENE		-	-	-	-
TRICHLOROETHYLENE		-	-	-	-
TOLUENE		-	-	-	-
VINYL ACETATE		-	-	-	-
VINYL CHLORIDE		-	-	-	-
m-XYLENE		-	-	-	-
o-XYLENE		-	-	-	-
p-XYLENE		-	-	-	-
TOTAL XYLENES		-	-	-	-

WATER ANALYSIS

VOLATILES RESULTS IN JOB

WELL # C-15

TOP OF SCREEN = -8.00 BOTTOM OF SCREEN = -28.00 TOTAL DEPTH = 55.00

DATE 11/14/86
 LAB MCLAREN
 MCLAREN ID 003368
 DETECTION LIMIT 0.5
 ANALYSIS 601,602
 MEMO

ACETONE	
ACROLEIN	
ACRYLONITRILE	
BENZENE	1
CHLOROBENZENE	-
DICHLOROBENZENE (TOTAL)	-
1,2-DICHLOROBENZENE	-
1,3-DICHLOROBENZENE	-
1,4-DICHLOROBENZENE	-
BROMOFORM	< 1
BROMOMETHANE	
DIBROMOMETHANE	
2-BUTANONE	
CARBON DISULFIDE	
CARBON TETRACHLORIDE	-
CHLOROMETHANE	-
DICHLOROMETHANE	-
CHLOROFORM	-
CHLORODIBROMOMETHANE	< 1
CHLOROETHANE	
2-CHLOROETHYL VINYL ETHER	
1,2-DIBROMOETHANE	-
DICHLOROBROMOMETHANE	-
DICHLORODIFLUOROMETHANE	-
1,1-DICHLOROETHANE	-
1,2-DICHLOROETHANE	-
1,1-DICHLOROETHYLENE	-
TRANS-1,2-DICHLOROETHYLENE	24
1,2-DICHLOROPROPANE	-
1,3-DICHLOROPROPYLENE	-
CIS-1,3-DICHLOROPROPYLENE	-
TRANS-1,3-DICHLOROPROPYLENE	-
ETHYLBENZENE	-
FREON 113	
2-HEXANONE	
4-METHYL-2-PENTANONE	
STYRENE	
TRICHLOROFLUOROMETHANE	-
1,1,2,2-TETRACHLOROETHANE	-
1,1,1-TRICHLOROETHANE	-
1,1,2-TRICHLOROETHANE	-
TETRACHLOROETHYLENE	-
TRICHLOROETHYLENE	2
TOLUENE	
VINYL ACETATE	
VINYL CHLORIDE	< 1
m-XYLENE	-
o-XYLENE	-
p-XYLENE	-
TOTAL XYLENES	

TOP OF SCREEN= -2.00 BOTTOM OF SCREEN= -32.00 TOTAL DEPTH= WELL # C-18

54.00

DATE	LAB	MCLAREN ID	DETECTION LIMIT	ANALYSIS	MEMO

08/23/84	B & C	3000272
09/28/84	B & C	3000273

04/29/85
B & C
S000274

СНЭМ

[illegible]

WATER AN

US-VOLATILES RESULTS IN PUB

WELL # C-18

TOP OF SCREEN= -2.00 BOTTOM OF SCREEN= -32.00 TOTAL DEPTH= 54.00

DATE 11/21/86
LAB MCLAREN
MCLAREN ID 3774D
DETECTION LIMIT 0.5
ANALYSIS 802
MEMO 601,602

ACETONE	-	-
ACROLEIN	-	-
ACRYLONITRILE	-	-
BENZENE	-	-
CHLOROBENZENE	-	-
DICHLOROBENZENE (TOTAL)	-	-
1,2-DICHLOROBENZENE	-	-
1,3-DICHLOROBENZENE	-	-
1,4-DICHLOROBENZENE	-	-
BROMOFORM	-	-
BROMOMETHANE	-	-
DIBROMOMETHANE	-	-
2-BUTANONE	-	-
CARBON DISULFIDE	-	-
CARBON TETRACHLORIDE	-	-
CHLOROMETHANE	-	-
DICHLOROMETHANE	-	-
CHLOROFORM	-	-
CHLORODIBROMOMETHANE	-	-
CHLOROETHANE	-	-
2-CHLOROETHYL VINYL ETHER	-	-
1,2-DIBROMOETHANE	-	-
DICHLOROBROMOMETHANE	-	-
DICHLORODIFLUOROMETHANE	-	-
1,1-DICHLOROETHANE	-	-
1,2-DICHLOROETHANE	-	-
1,1-DICHLOROETHYLENE	-	-
TRANS-1,2-DICHLOROETHYLENE	-	-
1,2-DICHLOROPROPANE	-	-
1,3-DICHLOROPROPYLENE	-	-
CIS-1,3-DICHLOROPROPYLENE	-	-
TRANS-1,3-DICHLOROPROPYLENE	-	-
ETHYLBENZENE	-	-
FREON 113	-	-
2-HEXANONE	-	-
4-METHYL-2-PENTANONE	-	-
STYRENE	-	-
TRICHLOROFLUOROMETHANE	-	-
1,1,2,2-TETRACHLOROETHANE	-	-
1,1,1-TRICHLOROETHANE	-	-
1,1,2-TRICHLOROETHANE	-	-
TETRACHLOROETHYLENE	-	-
TRICHLOROETHYLENE	-	-
TOLUENE	-	-
VINYL ACETATE	-	-
VINYL CHLORIDE	-	-
m-XYLENE	-	-
o-XYLENE	-	-
p-XYLENE	-	-
TOTAL XYLENES	-	-

WATER ANALYSIS-VOLATILES RESULTS IN PPM

WELL # C-18

TOP OF SCREEN= -9.00 BOTTOM OF SCREEN= -39.00 TOTAL DEPTH= 54.00

DATE	08/24/84	09/28/84	04/30/85	12/18/86
LAB	B & C	B & C	B & C	HCLAREN
HCLAREN ID	S000278	S000279	S000280	4536
DETECTION LIMIT				5
ANALYSIS				601,602
MEMO				

	YES	YES	YES
ACETONE	-	-	-
ACROLEIN	-	-	-
ACRYLONITRILE	-	-	-
BENZENE	10	-	17
CHLOROBENZENE	-	-	-
DICHLOROBENZENE (TOTAL)	-	-	-
1,2-DICHLOROBENZENE	-	-	7.2
1,3-DICHLOROBENZENE	-	-	4
1,4-DICHLOROBENZENE	-	-	-
BROMOFORM	-	-	0.9
BROMOMETHANE	-	-	1
DIBROMOMETHANE	-	-	1
2-BUTANONE	10	-	10
CARBON DISULFIDE	-	-	-
CAHUON TETRACILORIDE	-	-	-
CHLOROMETHANE	-	-	-
DICHLOROMETHANE	-	-	-
CHLOROFORM	-	-	-
CILORODIBROMOMETHANE	-	-	-
CHLOROETHANE	-	-	-
2-CHLOROETHYL VINYL ETHER	-	-	-
1,2-DIBROMOETHANE	-	-	-
DICHLOROBROMOMETHANE	-	-	-
DICHLORODIFLUOROMETHANE	-	-	-
1,1-DICHLOROETHANE	4	3	3
1,2-DICHLOROETHANE	-	-	-
1,1-DICHLOROETHYLENE	-	-	-
TRANS-1,2-DICHLOROETHYLENE	320	34	23
1,2-DICHLOROPROPANE	-	-	-
1,3-DICHLOROPROPYLENE	-	-	-
CIS-1,3-DICHLOROPROPYLENE	-	-	-
TRANS-1,3-DICHLOROPROPYLENE	-	-	-
ETHYLBENZENE	-	-	-
ETHION 113	-	-	2
2-HEXANONE	-	-	-
4-METHYL-2-PENTANONE	-	-	-
STYRENE	-	-	-
TRICHLOROFUOROMETHANE	-	-	-
1,1,2,2-TETRACHLOROETHANE	-	-	-
1,1,1-TRICHLOROETHANE	-	-	-
1,1,2-TRICHLOROETHANE	-	-	-
TETRACHLOROETHYLENE	7	-	-
TRICHLOROETHYLENE	8	-	-
TOLUENE	120	2	13
VINYL ACETATE	-	10	-
VINYL CHLORIDE	98	22	-
m-XYLENE	-	-	-
o-XYLENE	-	-	-
p-XYLENE	-	-	-
TOTAL XYLENES	-	-	-

WELL # C-19

WELL # C-12
TOP OF SCREEN= -10.00 BOTTOM OF SCREEN= -40.00 TOTAL DEPTH= 56.60

56.50

DATE _____
LAB _____
MCLAREN ID _____
DETECTION LIMIT _____
ANALYSIS _____
MEMO _____

08/21/84
B & C
5000281

09/28/84
H & C
S000282

04/29/85
B & C
S000283

11/21/86
MCLAREN
003771
0.5
601.602

ОТЪ
МЪЖЪ

601,602

[illegible]

WATER ANALYSIS-VOLATILES RESULTS IN PPB

WELL # C-20

TOP OF SCREEN= -20.00 BOTTOM OF SCREEN= -40.00 TOTAL DEPTH= 55.00

DATE 08/21/84
LAB B & C
MCLAREN ID S000284
DETECTION LIMIT
ANALYSIS
MEMO

04/29/85
B & C
S000286
MCKESSON
S000287

ACETONE	-	-	-
ACROLEIN	-	-	-
ACRYLONITRILE	-	-	-
BENZENE	-	-	-
CHLOROBENZENE	-	-	-
DICHLOROBENZENE (TOTAL)	-	-	-
1,2-DICHLOROBENZENE	-	-	-
1,3-DICHLOROBENZENE	-	-	-
1,4-DICHLOROBENZENE	-	-	-
BROMOFORM	-	-	-
BROMOMETHANE	-	-	-
DIBROMOMETHANE	-	-	-
2-BUTANONE	-	-	-
CARBON DISULFIDE	-	-	-
CARBON TETRACHLORIDE	-	-	-
CHLOROMETHANE	-	-	-
DICHLOROMETHANE	-	-	-
CHLOROFORM	-	-	-
CHLORODIBROMOMETHANE	-	-	-
CHLOROETHANE	-	-	-
2-CHLOROETHYL VINYL ETHER	-	-	-
1,2-DIBROMOETHANE	-	-	-
DICHLOROBROMOMETHANE	-	-	-
DICHLORODIFLUOROMETHANE	-	-	-
1,1-DICHLOROETHANE	-	-	-
1,2-DICHLOROETHANE	-	-	-
1,1-DICHLOROETHYLENE	-	-	-
TRANS-1,2-DICHLOROETHYLENE	-	-	-
1,2-DICHLOROPROPANE	-	-	-
1,3-DICHLOROPROPYLENE	-	-	-
CIS-1,3-DICHLOROPROPYLENE	-	-	-
TRANS-1,3-DICHLOROPROPYLENE	-	-	-
ETHYLBENZENE	-	-	-
FREON 113	-	-	-
2-HEXANONE	-	-	-
4-METHYL-2-PENTANONE	-	-	-
STYRENE	-	-	-
TRICHLOROFUOROMETHANE	-	-	-
1,1,2,2-TETRACHLOROMETHANE	-	-	-
1,1,1-TRICHLOROETHANE	-	-	-
1,1,2-TRICHLOROETHANE	-	-	-
TETRACHLOROETHYLENE	-	-	-
TRICHLOROETHYLENE	-	-	-
TOLUENE	-	-	-
VINYL ACETATE	-	-	-
VINYL CHLORIDE	-	-	-
m-XYLENE	-	-	-
o-XYLENE	-	-	-
p-XYLENE	-	-	-
TOTAL XYLENES	-	-	-

WATER ANALYSIS-VOLATILES RESULTS IN PPM

WELL # C-23

TOP OF SCREEN= -21.00 BOTTOM OF SCREEN= -41.00 TOTAL DEPTH= 63.00

DATE 08/22/84 05/03/85 05/03/85
 LAB B & C B & C
 MCLAREN ID S000295 S000296 S000297
 DETECTION LIMIT S000298
 ANALYSIS
 MEMO

ACETONE	-	-	-
ACROLEIN	-	-	-
ACRYLONITRILE	-	-	-
BENZENE	-	-	-
CHLOROBENZENE	-	-	-
DICHLOROBENZENE (TOTAL)	-	-	-
1,2-DICHLOROBENZENE	-	-	-
1,3-DICHLOROBENZENE	-	-	-
1,4-DICHLOROBENZENE	-	-	-
BROMOFORM	-	-	-
BROMOETHANE	-	-	-
DIBROMOMETHANE	-	-	-
2-BUTANONE	-	-	-
CARBON DISULFIDE	-	-	-
CARBON TETRACHLORIDE	-	-	-
CHLOROMETHANE	-	-	-
CHLOROFORM	-	-	-
CHLORODIBROMOMETHANE	-	-	-
CHLOROETHANE	-	-	-
2-CHLOROETHYL VINYL ETHER	-	-	-
1,2-DIBROMOETHANE	-	-	-
DICHLORODIBROMOMETHANE	-	-	-
DICHLORODIFLUOROMETHANE	-	-	-
1,1-DICHLOROETHANE	1	3	-
1,2-DICHLOROETHANE	-	-	-
1,1-DICHLOROETHYLENE	-	-	-
TRANS-1,2-DICHLOROETHYLENE	320	180	240
1,2-DICHLOROPROPANE	-	-	-
1,3-DICHLOROPROPYLENE	-	-	-
CIS-1,3-DICHLOROPROPYLENE	-	-	-
TRANS-1,3-DICHLOROPROPYLENE	-	-	-
ETHYLBENZENE	-	-	-
FREON 113	-	-	-
2-HEXANONE	-	-	-
4-METHYL-2-PENTANONE	-	-	-
STYRENE	-	-	-
TRICHLOROFUOROMETHANE	-	-	-
1,1,2,2-TETRACHLOROETHANE	-	-	-
1,1,1-TRICHLOROETHANE	-	-	-
1,1,2-TRICHLOROETHANE	-	-	-
TETRACHLOROETHYLENE	-	-	-
TRICHLOROETHYLENE	25	40	58
TOLUENE	-	-	-
VINYL ACETATE	-	-	-
VINYL CHLORIDE	2	-	24
m-XYLENE	-	-	-
o-XYLENE	-	-	-
p-XYLENE	-	-	-
TOTAL XYLENES	-	-	-

WELL # C-23

WELL # C-23
TOP OF SCREEN= -21.00 BOTTOM OF SCREEN= -41.00 TOTAL DEPTH=

DATE	LAB	MCLAREN ID	DETECTION LIMIT	ANALYSIS	MEMO
11/11/11	11/11/11	11/11/11	11/11/11	11/11/11	11/11/11

05/14/85
W & C
S000299

05/14/88
MCLAREN
859A
I
601,002

05/14/86	05/27/86
MCLAREN	MCLAREN
859AD	86G
1	1
601	601
	BLANK

Chemical Name	Concentration (ppm)	Concentration (ppb)	Concentration (ppm)	Concentration (ppb)
ACETONE	-	-	-	-
ACROLEIN	-	-	-	-
ACRYLONITRILE	-	-	-	-
BENZENE	-	-	-	-
CHLOROBENZENE	-	-	-	-
DICHLOROBENZENE (TOTAL)	-	-	-	-
1,2-DICHLOROBENZENE	-	-	-	-
1,3-DICHLOROBENZENE	-	-	-	-
1,4-DICHLOROBENZENE	-	-	-	-
BROMOFORM	-	-	-	-
BROMOMETHANE	-	-	-	-
DIBROMOMETHANE	-	-	-	-
2-BUTANONE	-	-	-	-
CARBON DISULFIDE	-	-	-	-
CARBON TETRACHLORIDE	-	-	-	-
CHLOROMETHANE	-	-	-	-
DICHLOROMETHANE	-	-	-	-
CHLOROFORM	-	-	-	-
CHLORODIBROMOMETHANE	-	-	-	-
CHLOROETHANE	-	-	-	-
2-CHLOROETHYL VINYL ETHER	-	-	-	-
1,2-DIBROMOETHANE	-	-	-	-
DICHLORODIBROMOMETHANE	-	-	-	-
DICHLORODIFLUOROMETHANE	-	-	-	-
1,1,1-TRICHLOROETHANE	-	-	-	-
1,2-DICHLOROETHANE	-	-	-	-
1,1-DICHLOROETHYLENE	-	-	-	-
TRANS-1,2-DICHLOROETHYLENE	-	-	-	-
1,2-DICHLOROPROPANE	-	-	-	-
1,3-DICHLOROPROPYLENE	-	-	-	-
CIS-1,3-DICHLOROPROPYLENE	-	-	-	-
TRANS-1,3-DICHLOROPROPYLENE	-	-	-	-
ETHYLBENZENE	-	-	-	-
FREON 113	-	-	-	-
2-HEXANONE	-	-	-	-
4-METHYL-2-PENTANONE	-	-	-	-
STYRENE	-	-	-	-
TRICHLOROFLUOROMETHANE	-	-	-	-
1,1,2,2-TETRACHLOROETHANE	-	-	-	-
1,1,1-TRICHLOROETHANE	-	-	-	-
1,1,2-TRICHLOROETHANE	-	-	-	-
TETRACHLOROETHYLENE	-	-	-	-
TRICHLOROETHYLENE	-	-	-	-
TOLUENE	-	-	-	-
VINYL ACETATE	-	-	-	-
VINYL CHLORIDE	-	-	-	-
m-XYLENE	-	-	-	-
p-XYLENE	-	-	-	-
o-XYLENE	-	-	-	-
TOTAL XYLENES	-	-	-	-

WATER ANALYSIS-VOLATILES RESULTS IN PPM WELL # C-23 TOP OF SCREEN= -21.00 BOTTOM OF SCREEN= -41.00 TOTAL DEPTH= 63.00

DATE 11/13/86
LAB MCLAREN
MCLAREN ID 003306
DETECTION LIMIT 0.5
ANALYSIS 601,602
MEMO

ACETONE		
ACROLEIN		
ACRYLONITRILE		
BENZENE	-	
CHLOROBENZENE	-	
DICHLOROBENZENE (TOTAL)	-	
1,2-DICHLOROBENZENE	-	
1,3-DICHLOROBENZENE	-	
1,4-DICHLOROBENZENE	-	
BROMOFORM	<	1
BROMOMETHANE		
DIBROMOMETHANE		
2-BUTANONE		
CARBON DISULFIDE	-	
CARBON TETRACHLORIDE	-	
CHLOROMETHANE	-	
DICHLOROMETHANE	-	
CHLOROFORM	-	
CHLORODIBROMOMETHANE	<	1
CHLOROETHANE		
2-CHLOROETHYL VINYL ETHER		
1,2-DIBROMOETHANE		
DICHLOROBROMOMETHANE		
DICHLORODIFLUOROMETHANE		5
1,1-DICHLOROETHANE	-	
1,2-DICHLOROETHANE	-	
1,1-DICHLOROETHYLENE		110
TRANS-1,2-DICHLOROETHYLENE	-	
1,2-DICHLOROPROPANE	-	
1,3-DICHLOROPROPYLENE	-	
CIS-1,3-DICHLOROPROPYLENE	-	
TRANS-1,3-DICHLOROPROPYLENE	-	
ETHYLBENZENE	-	
FREON 113		
2-HEXANONE		
4-METHYL-2-PENTANONE		
STYRENE		
TRICHLOROFLUOROMETHANE	-	
1,1,2,2-TETRACHLOROETHANE	-	
1,1,1-TRICHLOROETHANE	-	
1,1,2-TRICHLOROETHANE	-	
TETRACHLOROETHYLENE	-	34
TRICHLOROETHYLENE	-	
TOLUENE		
VINYL ACETATE	<	1
VINYL CHLORIDE	-	
m-XYLENE	-	
o-XYLENE	-	
p-XYLENE	-	
TOTAL XYLENES		

WATER ANALYSIS-VOLATILES RESULTS IN WELLS

WELL # C-24

TOP OF SCREEN= -17.00 BOTTOM OF SCREEN= -40.00 TOTAL DEPTH= 53.00

DATE 08/22/84 09/28/85 04/30/85 08/05/85
 LAB B & C B & C B & C B & C
 MCLAHEN ID S000311 S000312 S000313 S000314
 DETECTION LIMIT
 ANALYSIS
 MEMO

ACETONE	-	-	-	-
ACROLEIN	-	-	-	-
ACRYLONITRILE	-	-	-	-
BENZENE	-	-	-	-
CHLOROBENZENE	-	-	-	-
DICHLOROBENZENE (TOTAL)	-	-	-	-
1,2-DICHLOROBENZENE	-	-	-	-
1,3-DICHLOROBENZENE	-	-	-	-
1,4-DICHLOROBENZENE	-	-	-	-
BROMOFORM	-	-	-	-
BROMOMETHANE	-	-	-	-
DIBROMOMETHANE	-	-	-	-
2-BUTANONE	-	-	-	-
CARBON DISULFIDE	-	-	-	-
CARBON TETRACHLORIDE	-	-	-	-
CHLOROMETHANE	-	-	-	-
DICHLOROMETHANE	-	-	-	-
CHLOROFORM	-	-	-	-
CHLORODIBROMOMETHANE	-	-	-	-
CHLOROETHANE	-	-	-	-
2-CHLOROETHYL VINYL ETHER	-	-	-	-
1,2-DIBROMOETHANE	-	-	-	-
DICHLOROBROMOMETHANE	-	-	-	-
DICHLORODIFLUOROMETHANE	-	-	-	-
1,1-DICHLOROETHANE	-	-	-	-
1,2-DICHLOROETHANE	-	-	-	-
1,1-DICHLOROETHYLENE	-	-	-	-
TRANS-1,2-DICHLOROETHYLENE	-	-	-	-
1,2-DICHLOROPROPANE	-	-	-	-
1,3-DICHLOROPROPYLENE	-	-	-	-
CIS-1,3-DICHLOROPROPYLENE	-	-	-	-
TRANS-1,3-DICHLOROPROPYLENE	-	-	-	-
ETHYLBENZENE	-	-	-	-
FREON 113	-	-	-	-
2-HEXANONE	-	-	-	-
4-METHYL-2-PENTANONE	-	-	-	-
STYRENE	-	-	-	-
TRICHLOROFLUOROMETHANE	-	-	-	-
1,1,2,2-TETRACHLOROETHANE	-	-	-	-
1,1,1-TRICHLOROETHANE	-	-	-	-
1,1,2-TRICHLOROETHANE	-	-	-	-
TETRACHLOROETHYLENE	-	-	-	-
TRICHLOROETHYLENE	-	-	-	-
TOLUENE	-	-	-	-
VINYL ACETATE	-	-	-	-
VINYL CHLORIDE	-	-	-	-
m-XYLENE	-	-	-	-
o-XYLENE	-	-	-	-
p-XYLENE	-	-	-	-
TOTAL XYLENES	-	-	-	-

DATE 08/05/85 10/19/86
 LAB MCKESSON MCLAREN
 DETECTION LIMIT S000315 0.5
 ANALYSIS 601,602
 MEMO

ACETONE	-		
ACROLEIN	-		
ACRYLONITRILE	-		
BENZENE	-		
CHLOROBENZENE	-		
DICHLOROBENZENE (TOTAL)	-		
1,2-DICHLOROBENZENE	-		
1,3-DICHLOROBENZENE	-		
1,4-DICHLOROBENZENE	-		
BROMOFORM	-	<	1
BROMOMETHANE	-		
DIBROMOMETHANE	-		
2-BUTANONE	-		
CARBON DISULFIDE	-		
CARBON TETRACHLORIDE	-		
CHLOROETHANE	-		
DICHLOROMETHANE	-		
CHLOROFORM	-		
CHLORODIBROMOMETHANE	-	<	1
CHLOROETHANE	-		
2-CHLOROETHYL VINYL ETHER	-		
1,2-DIBROMOETHANE	-		
DICHLORODIBROMOMETHANE	-		
DICHLORODIFLUOROMETHANE	-		
1,1-DICHLOROETHANE	-	0.8	
1,2-DICHLOROETHANE	-		
1,1-DICHLOROETHYLENE	-		
TRANS-1,2-DICHLOROETHYLENE	-	36	
1,2-DICHLOROPROPANE	-		
1,3-DICHLOROPROPYLENE	-		
CIS-1,3-DICHLOROPROPYLENE	-		
TRANS-1,3-DICHLOROPROPYLENE	-		
ETHYLBENZENE	-		
FREON 113	-		
2-HEXANONE	-		
4-METHYL-2-PENTANONE	-		
STYRENE	-		
TRICHLOROFLUOROMETHANE	-		
1,1,2,2-TETRACHLOROETHANE	-	<=	0.9
1,1,1-TRICHLOROETHANE	-		
1,1,2-TRICHLOROETHANE	-		
TETRACHLOROETHYLENE	-	<=	0.9
TRICHLOROETHYLENE	-	18	
TOLUENE	-		
VINYL ACETATE	-		
VINYL CHLORIDE	-	<	1
m-XYLENE	-		
o-XYLENE	-		
p-XYLENE	-		
TOTAL XYLENES	-		

WATER ANALYSIS-VOLATILES RESULTS IN DIB

WELL # C-24A

TOP OF SCREEN= 9.00 BOTTOM OF SCREEN= -1.00 TOTAL DEPTH= 12.50

DATE 08/25/84 09/29/84 05/01/85
 LAB B & C B & C H & C
 NCLAREN ID S000316 S000317 S000318
 DETECTION LIMIT
 ANALYSIS
 MEMO

YES

ACETONE	-	-	-
ACROLEIN	-	-	-
ACRYLONITRILE	-	-	-
BENZENE	13	4	-
CHLOROBENZENE	2	2	-
DICHLOROBENZENE (TOTAL)			
1,2-DICHLOROBENZENE			
1,3-DICHLOROBENZENE			
1,4-DICHLOROBENZENE			
BROMOFORM	-	-	-
BROMOMETHANE	-	-	-
DIBROMOMETHANE	-	-	-
2-BUTANONE	-	-	-
CARBON DISULFIDE	-	-	-
CARBON TETRACHLORIDE	-	-	-
CHLOROMETHANE	-	-	-
DICHLOROMETHANE	10	10	12
CHLOROFORM	-	-	-
CHLORODIBROMOMETHANE	-	-	-
CHLOROETHANE	-	-	-
2-CHLOROETHYL VINYL ETHER	-	-	-
1,2-DIBROMOETHANE	-	-	-
DICHLORODIBROMOMETHANE	-	-	-
DICHLORODIFLUOROMETHANE	29	38	54
1,1-DICHLOROETHANE	-	-	-
1,2-DICHLOROETHANE	23	14	46
1,1-DICHLOROETHYLENE	5800	1100	900
TRANS-1,2-DICHLOROETHYLENE	-	-	-
1,2-DICHLOROPROPANE	-	-	-
1,3-DICHLOROPROPYLENE	-	-	-
CIS-1,3-DICHLOROPROPYLENE	-	-	-
TRANS-1,3-DICHLOROPROPYLENE	-	-	-
ETHYLBENZENE	-	-	-
FREON 113	-	-	-
2-HEXANONE	-	-	-
4-METHYL-2-PENTANONE	-	-	-
STYRENE	-	-	-
TRICHLOROFLUOROMETHANE	-	-	-
1,1,2,2-TETRACHLOROETHANE	160	84	82
1,1,1-TRICHLOROETHANE	-	-	-
1,1,2-TRICHLOROETHANE	9	11	10
TETRACHLOROETHYLENE	760	930	1400
TRICHLOROETHYLENE	2	3	-
TOLUENE	-	-	-
VINYL ACETATE	-	-	-
VINYL CHLORIDE	-	-	-
m-XYLENE	-	-	-
o-XYLENE	-	-	-
p-XYLENE	-	-	-
TOTAL XYLENES	-	-	-

WATER ANALYSIS - VOLATILES RESULTS IN DET

WELL # C-26

TOP OF SCREEN= 5.00 BOTTOM OF SCREEN= -63.00 TOTAL DEPTH= 194.00

07/17/85
MCKESSON
S000322

07/17/85
B & C
S000321

06/05/85
B & C
S000320

05/14/85
B & C
S000319

DATE
LAB
MCLAREN ID
DETECTION LIMIT
ANALYSIS
MEMO

ACETONE	-	-	-
ACROLEIN	-	-	-
ACRYLONITRILE	-	-	-
BENZENE	-	-	-
CHLOROBENZENE	-	-	-
DICHLOROBENZENE (TOTAL)	-	-	-
1,2-DICHLOROBENZENE	-	-	-
1,3-DICHLOROBENZENE	-	-	-
1,4-DICHLOROBENZENE	-	-	-
BROMOFORM	-	-	-
BROMOMETHANE	-	-	-
DIBROMOMETHANE	-	-	-
2-BUTANONE	-	-	-
CARBON DISULFIDE	-	-	-
CARBON TETRACHLORIDE	-	-	-
CHLOROMETHANE	-	-	-
DICHLOROMETHANE	-	-	-
CHLOROFORM	-	-	-
CHLORODIBROMOMETHANE	-	-	-
CHLOROETHANE	-	-	-
2-CHLOROETHYL VINYL ETHER	-	-	-
1,2-DIBROMOETHANE	-	-	-
DICHLOROBROMOMETHANE	-	-	-
DICHLORODIFLUOROMETHANE	-	-	-
1,1-DICHLOROETHANE	-	-	-
1,2-DICHLOROETHANE	-	-	-
1,1-DICHLOROETHYLENE	-	-	-
TRANS-1,2-DICHLOROETHYLENE	-	-	-
1,2-DICHLOROPROPANE	-	-	-
1,3-DICHLOROPROPYLENE	-	-	-
CIS-1,3-DICHLOROPROPYLENE	-	-	-
TRANS-1,3-DICHLOROPROPYLENE	-	-	-
ETHYLBENZENE	-	-	-
FREON 113	-	-	-
2-HEXANONE	-	-	-
4-METHYL-2-PENTANONE	-	-	-
STYRENE	-	-	-
TRICHLOROFLUOROMETHANE	-	-	-
1,1,2,2-TETRACHLOROETHANE	-	-	-
1,1,1-TRICHLOROETHANE	-	-	-
1,1,2-TRICHLOROETHANE	-	-	-
TETRACHLOROETHYLENE	-	-	-
TRICHLOROETHYLENE	-	-	-
TOLUENE	-	-	-
VINYL ACETATE	-	-	-
VINYL CHLORIDE	-	-	-
m-XYLENE	-	-	-
o-XYLENE	-	-	-
p-XYLENE	-	-	-
TOTAL XYLENES	-	-	-

WATER ANALYSIS-VOLATILES RESULTS IN MGD

TOP OF SCREEN= 5.00 BOTTOM OF SCREEN= -63.00 TOTAL DEPTH= 194.00

WELL # C-26

DATE	05/20/86	05/20/86	10/21/86
LAB	EUREKA	MCLAREN	MCLAREN
MCLAREN ID	41237	876	002710
DETECTION LIMIT	0.5	1	0.5
ANALYSIS	624	601,602	601,602
MEMO		BLANK	

ACETONE					
ACROLEIN					
ACRYLONITRILE					
BENZENE	-	< 0.5			-
CHLOROBENZENE	-	< 0.5			-
DICHLOROBENZENE (TOTAL)					
1,2-DICHLOROBENZENE	< 10	< 0.5			-
1,3-DICHLOROBENZENE	< 10	< 0.5			-
1,4-DICHLOROBENZENE	< 10	< 0.5			-
BROMOFORM	-	< 2			-
BROMOMETHANE	< 10		< 2		1
2-INITANONE					
CARBON DISULFIDE					
CARBON TETRACHLORIDE					
CHLOROMETHANE	< 10				-
DICHLOROMETHANE	< 10				-
CHLOROFORM	-				-
CHLORODIBROMOMETHANE	< 10	< 2	15		1
CHLOROETHANE	< 10		2		
2-CHLOROETHYL VINYL ETHER	< 10				
1,2-DIBROMOETHANE					
DICHLOROBROMOMETHANE	-				-
DICHLORODIFLUOROMETHANE	-				-
1,1-DICHLOROETHANE	-				-
1,2-DICHLOROETHANE	-		10		-
1,1-DICHLOROETHYLENE	-				-
TRANS-1,2-DICHLOROETHYLENE	41	45			72
1,2-DICHLOROPROPANE	-				-
1,3-DICHLOROPROPYLENE	-				-
CIS-1,3-DICHLOROPROPYLENE	-				-
TRANS-1,3-DICHLOROPROPYLENE	-				-
ETHYLBENZENE	-	< 1			-
FREON 113					
2-HEXANONE					
4-METHYL-2-PENTANONE					
STYRENE					
TRICHLOROFLUOROMETHANE	< 10				-
1,1,2,2-TETRACHLOROETHANE	-				-
1,1,1-TRICHLOROETHANE	-			4	-
1,1,2-TRICHLOROETHANE	-				-
TETRACHLOROETHYLENE	-				-
TRICHLOROETHYLENE	16	6			15
TOLUENE	-	< 0.5			-
VINYL ACETATE					
VINYL CHLORIDE	< 10	< 2	< 2		1
m-XYLENE		< 0.5			-
o-XYLENE		< 0.5			-
p-XYLENE		< 0.5			-
TOTAL XYLENES					

WATER AND GAS-VOLATILES RESULTS IN PUB

WELL # C-26

TOP OF SCREEN= 38.00 BOTTOM OF SCREEN= -30.00 TOTAL DEPTH= 194.00

DATE	05/13/85	05/20/86	05/20/86
LAB	B & C	MCLAREN	MCLAREN
MCLAREN ID	S000323	873A	873AD
DETECTION LIMIT		1	1
ANALYSIS		601,602	601
MEMO	YES		YES

ACETONE	-			
ACROLEIN	-			
ACRYLONITRILE	-			
BENZENE	3		< 0.5	
CHLOROBENZENE	-		< 0.5	
DICHLOROBENZENE (TOTAL)				
1,2-DICHLOROBENZENE			< 0.5	
1,3-DICHLOROBENZENE			< 0.5	
1,4-DICHLOROBENZENE			< 0.5	
BROMOFORM	-		< 2	2
BROMOMETHANE	-			
DIBROMOMETHANE	-			
2-BUTANONE	-			
CARBON DISULFIDE	-			
CARBON TETRACHLORIDE	-			
CHLOROMETHANE	-			
DICHLOROMETHANE	-			
CHLOROFORM	-			
CHLORODIBROMOMETHANE	-			
CHLOROETHANE	-		< 2	2
2-CHLOROETHYL VINYL ETHER	-			
1,2-DIBROMOETHANE	-			
DICHLOROBROMOMETHANE	-			
DICHLORODIFLUOROMETHANE	-			
1,1-DICHLOROETHANE	-			
1,2-DICHLOROETHANE	-			
1,1-DICHLOROETHYLENE	-			
TRANS-1,2-DICHLOROETHYLENE	16			
1,2-DICHLOROPROPANE	-			
1,3-DICHLOROPROPYLENE	-			
CIS-1,3-DICHLOROPROPYLENE	-			
TRANS-1,3-DICHLOROPROPYLENE	-			
ETHYLBENZENE	-		< 1	
FREON 113	-			
2-HEXANONE	-			
4-METHYL-2-PENTANONE	-			
STYRENE	-			
TRICHLOROFLUOROMETHANE	-			
1,1,2,2-TETRACHLOROETHANE	-			
1,1,1-TRICHLOROETHANE	-			
1,1,2-TRICHLOROETHANE	-			
TETRACHLOROETHYLENE	-			
TRICHLOROETHYLENE	5			
TOLUENE	-		< 0.5	
VINYL ACETATE	-			
VINYL CHLORIDE	-		< 2	2
m-XYLENE	-		< 0.5	
o-XYLENE	-		< 0.5	
p-XYLENE	-		< 0.5	
TOTAL XYLENES	-			

WATER ANALYSIS-VOLATILES RESULTS IN PPB

WELL # C-28

TOP OF SCREEN= 38.00 BOTTOM OF SCREEN= -30.00 TOTAL DEPTH= 194.00

DATE	05/20/86	05/20/86	05/27/86	10/18/86
LAB	EUREKA	EUREKA	MCLAREN	MCLAREN
LAB ID	41229	41229D	872	002659
DETECTION LIMIT	5	5	0.5	0.5
ANALYSIS	624	624	602	601,602
MEMO			BLANK	

ACETONE	-	-	-	-
ACROLEIN	-	-	-	-
ACRYLONITRILE	-	-	-	-
BENZENE	-	-	-	-
CHLOROBENZENE	-	-	-	-
DICHLOROBENZENE (TOTAL)	-	-	-	-
1,2-DICHLOROBENZENE	< 10	< 10	-	-
1,3-DICHLOROBENZENE	< 10	< 10	-	-
1,4-DICHLOROBENZENE	< 10	< 10	-	-
BROMOFORM	-	-	-	-
BROMOMETHANE	< 10	< 10	-	-
DIBROMOMETHANE	-	-	-	-
2-BUTANONE	-	-	-	-
CARBON DISULFIDE	-	-	-	-
CARBON TETRACHLORIDE	< 10	< 10	-	-
CHLOROMETHANE	< 10	< 10	-	-
DICHLOROMETHANE	-	-	-	-
CHLOROFORM	< 10	< 10	-	-
CHLORODIBROMOMETHANE	< 10	< 10	-	-
CHLOROETHANE	< 10	< 10	-	-
2-CHLOROETHYL VINYL ETHER	< 10	< 10	-	-
1,2-DIBROMOETHANE	-	-	-	-
DICHLORODIBROMOMETHANE	-	-	-	-
DICHLORODIFLUOROMETHANE	-	-	-	-
1,1-DICHLOROETHANE	-	-	-	-
1,2-DICHLOROETHANE	-	-	-	-
1,1-DICHLOROETHYLENE	-	-	-	-
TRANS-1,2-DICHLOROETHYLENE	-	-	-	-
1,2-DICHLOROPROPANE	-	-	-	-
1,3-DICHLOROPROPYLENE	-	-	-	-
CIS-1,3-DICHLOROPROPYLENE	-	-	-	-
TRANS-1,3-DICHLOROPROPYLENE	-	-	-	-
ETHYLBENZENE	-	-	-	-
FREON 113	-	-	-	-
2-HEXANONE	-	-	-	-
4-METHYL-2-PENTANONE	-	-	-	-
STYRENE	-	-	-	-
TRICHLOROFUOROMETHANE	< 10	< 10	-	-
1,1,2,2-TETRACHLOROETHANE	-	-	-	-
1,1,1-TRICHLOROETHANE	-	-	-	-
1,1,2-TRICHLOROETHANE	-	-	-	-
TETRACHLOROETHYLENE	-	-	-	-
TRICHLOROETHYLENE	-	-	-	-
TOLUENE	-	-	-	-
VINYL ACETATE	-	-	-	-
VINYL CHLORIDE	< 10	< 10	-	-
m-XYLENE	-	-	-	-
o-XYLENE	-	-	-	-
p-XYLENE	-	-	-	-
TOTAL XYLENES	-	-	-	-

WATER ANALYSIS - VOLATILES RESULTS IN PPM

WELL # C-28
TOP OF SCREEN= 38.00 BOTTOM OF SCREEN= -30.00 TOTAL DEPTH= 194.00

DATE 10/18/86
LAB B & C
MCLAREN ID S000724
DETECTION LIMIT 1
ANALYSIS 624
MEMO 601,602

ACETONE		
AUROLEIN	<	10
ACRYLONITRILE	<	10
BENZENE	-	-
CHLOROBENZENE	-	-
DICHLOROBENZENE (TOTAL)	-	-
1,2-DICHLOROBENZENE	-	-
1,3-DICHLOROBENZENE	-	-
1,4-DICHLOROBENZENE	-	-
BROMOFORM	<	1
BROMOMETHANE	-	-
DIBROMOMETHANE	-	-
2-BUTANONE	-	-
CARBON DISULFIDE	-	-
CARBON TETRACHLORIDE	-	-
CHLOROMETHANE	-	-
DICHLOROMETHANE	-	-
CHLOROFORM	<	1
CHLORODIBROMOMETHANE	-	-
CHLOROETHANE	-	-
2-CHLOROETHYL VINYL ETHER	-	-
1,2-DIBROMOETHANE	-	-
DICHLOROBROMOMETHANE	-	-
DICHLORODIFLUOROMETHANE	-	-
1,1-DICHLOROETHANE	-	-
1,2-DICHLOROETHANE	-	-
1,1-DICHLOROETHYLENE	-	-
TRANS-1,2-DICHLOROETHYLENE	-	-
1,2-DICHLOROPROPANE	-	-
1,3-DICHLOROPROPYLENE	-	-
CIS-1,3-DICHLOROPROPYLENE	-	-
TRANS-1,3-DICHLOROPROPYLENE	-	-
ETHYLBENZENE	-	-
FREON 113	-	-
2-HEXANONE	-	-
4-METHYL-2-PENTANONE	-	-
STYRENE	-	-
TRICHLOROFUOROMETHANE	-	-
1,1,2,2-TETRACHLOROETHANE	-	-
1,1,1-TRICHLOROETHANE	-	-
1,1,2-TRICHLOROETHANE	-	-
TETRACHLOROETHYLENE	-	-
TRICHLOROETHYLENE	-	-
TOLUENE	-	-
VINYL ACETATE	<	1
VINYL CHLORIDE	-	-
m-XYLENE	-	-
o-XYLENE	-	-
p-XYLENE	-	-
TOTAL XYLENES	-	-

WATER ANALYSIS-VOLATILES RESULTS IN PPB

TOP OF SCREEN= 5.00 BOTTOM OF SCREEN= -45.00 TOTAL DEPTH= 63.00

WELL # C-27

DATE

05/12/85
B & C
S000325

05/06/85
B & C
S000325

05/21/86
MCLAREN
892

05/21/86
MUREKA
41273
5
624

DETECTION LIMIT
ANALYSIS

MEMO

YES

ACETONE	-	-	-	-	-
ACROLEIN	-	-	-	-	-
ACRYLONITRILE	-	-	-	-	-
BENZENE	-	-	-	-	-
CHLOROBENZENE	-	-	-	-	-
DICHLOROBENZENE (TOTAL)	-	-	-	-	-
1,2-DICHLOROBENZENE	-	-	-	-	-
1,3-DICHLOROBENZENE	-	-	-	-	-
1,4-DICHLOROBENZENE	-	-	-	-	-
BROMOFORM	-	-	-	-	-
BROMOMETHANE	-	-	-	-	-
DIBROMOMETHANE	-	-	-	-	-
2-BUTANONE	-	-	-	-	-
CARBON DISULFIDE	-	-	-	-	-
CARBON TETRACHLORIDE	-	-	-	-	-
CHLOROMETHANE	-	-	-	-	-
DICHLOROMETHANE	-	-	-	-	-
CHLOROFORM	-	-	-	-	-
CHLORODIBROMOMETHANE	-	-	-	-	-
CHLOROETHANE	-	-	-	-	-
2-CHLOROETHYL VINYL ETHER	-	-	-	-	-
1,2-DIBROMOETHANE	-	-	-	-	-
DICHLOROBROMOMETHANE	-	-	-	-	-
DICHLORODIFLUOROMETHANE	-	-	-	-	-
1,1-DICHLOROETHANE	-	-	-	-	-
1,2-DICHLOROETHANE	-	-	-	-	-
1,1-DICHLOROETHYLENE	-	-	-	-	-
TRANS-1,2-DICHLOROETHYLENE	-	-	-	-	-
1,2-DICHLOROPROPANE	-	-	-	-	-
1,3-DICHLOROPROPYLENE	-	-	-	-	-
CIS-1,3-DICHLOROPROPYLENE	-	-	-	-	-
TRANS-1,3-DICHLOROPROPYLENE	-	-	-	-	-
ETHYLBENZENE	-	-	-	-	-
FREON 113	-	-	-	-	-
2-HEXANONE	-	-	-	-	-
4-METHYL-2-PENTANONE	-	-	-	-	-
STYRENE	-	-	-	-	-
TRICHLOROFLUOROMETHANE	-	-	-	-	-
1,1,2,2-TETRACHLOROETHANE	-	-	-	-	-
1,1,1-TRICHLOROETHANE	-	-	-	-	-
1,1,2-TRICHLOROETHANE	-	-	-	-	-
TETRACHLOROETHYLENE	-	-	-	-	-
TRICHLOROETHYLENE	-	-	-	-	-
TOLUENE	-	-	-	-	-
VINYL ACETATE	-	-	-	-	-
VINYL CHLORIDE	-	-	-	-	-
m-XYLENE	-	-	-	-	-
p-XYLENE	-	-	-	-	-
TOTAL XYLENES	-	-	-	-	-

WATER AN SIS-VOLATILES RESULTS IN PDB

WELL # C-27

TOP OF SCREEN= 5.00 BOTTOM OF SCREEN= -45.00 TOTAL DEPTH= 63.00

DATE 11/06/86
 LAB MCLAREN
 MCLAREN ID 003135
 DETECTION LIMIT 2.5
 ANALYSIS 601,602
 MEMO 601

ACETONE			
ACROLEIN			
ACRYLONITRILE			
BENZENE	< 0.5		
CHLOROBENZENE	< 0.5		
DICHLOROBENZENE (TOTAL)			
1,2-DICHLOROBENZENE	< 0.5		
1,3-DICHLOROBENZENE	< 0.5		
1,4-DICHLOROBENZENE	< 0.5		
BROMOFORM	< 5		
BROMOMETHANE			2
DIBROMOMETHANE			
2-BUTANONE			
CARBON DISULFIDE			
CARBON TETRACHLORIDE			
CHLOROMETHANE			
DICHLOROMETHANE			
CHLOROFORM			
CHLORODIBROMOMETHANE	< 5		2
CHLOROETHANE			
2-CHLOROETHYL VINYL ETHER			
1,2-DIBROMOETHANE			
DICHLOROBROMOMETHANE			
DICHLORODIFLUOROMETHANE			
1,1-DICHLOROETHANE	460		310
1,2-DICHLOROETHANE	32		21
1,1-DICHLOROETHYLENE	73		71
TRANS-1,2-DICHLOROETHYLENE	76		68
1,2-DICHLOROPROPANE			
1,3-DICHLOROPROPYLENE			
CIS-1,3-DICHLOROPROPYLENE			
TRANS-1,3-DICHLOROPROPYLENE			
ETHYLBENZENE	< 0.5		
FREON 113			
2-HEXANONE			
4-METHYL-2-PENTANONE			
STYRENE			
TRICHLOROFLUOROMETHANE			
1,1,2,2-TETRACHLOROETHANE	< 38	<=	17
1,1,1-TRICHLOROETHANE			
1,1,2-TRICHLOROETHANE			
TETRACHLOROETHYLENE	< 38	<=	17
TRICHLOROETHYLENE	20		19
TOLUENE	< 0.5		
VINYL ACETATE			
VINYL CHLORIDE	< 5	<	2
m-XYLENE	< 0.5		
o-XYLENE	< 0.5		
p-XYLENE	< 0.5		
TOTAL XYLENES			

WATER ANALYSIS-VOLATILES RESULTS IN PPD

TOP OF SCREEN = -18.00 BOTTOM OF SCREEN = -38.00 TOTAL DEPTH = 64.00

WELL # C-28

DATE	05/12/85	06/06/86	05/20/86
LAB	B & C	B & C	MCLAREN
MCLAREN ID	S000327	S000328	881D
DETECTION LIMIT			1
ANALYSIS			601,602
MEMO	YES		

ACETONE	-			
ACROLEIN	-			
ACRYLONITRILE	-			
BENZENE	12	6	37	46
CHLOROBENZENE	-		< 0.5	< 0.5
DICHLOROBENZENE (TOTAL)	-			
1,2-DICHLOROBENZENE	-		< 0.5	< 0.5
1,3-DICHLOROBENZENE	-		< 0.5	< 0.5
1,4-DICHLOROBENZENE	-		< 0.5	< 0.5
BROMOFORM	-		< 2	< 2
BROMOMETHANE	-			
DIBROMOMETHANE	-			
2-BUTANONE	-			
CARBON DISULFIDE	10			
CARBON TETRACHLORIDE	-			
CHLOROMETHANE	-			
DICHLOROMETHANE	-			
CHLOROFORM	-			
CHLORODIBROMOMETHANE	-		< 2	< 2
CHLOROETHANE	-			
2-CHLOROETHYL VINYL ETHER	-			
1,2-DIBROMOMETHANE	-			
DICHLOROBROMOMETHANE	-			
DICHLORODIFLUOROMETHANE	-			
1,1-DICHLOROETHANE	-			
1,2-DICHLOROETHANE	-			
1,1-DICHLOROETHYLENE	-			
TRANS-1,2-DICHLOROETHYLENE	71		93	97
1,2-DICHLOROPROPANE	-			
1,3-DICHLOROPROPYLENE	-			
CIS-1,3-DICHLOROPROPYLENE	-			
TRANS-1,3-DICHLOROPROPYLENE	-			
ETHYLBENZENE	-		< 1	< 1
FREON 113	-			
2-HEXANONE	-			
4-METHYL-2-PENTANONE	-			
STYRENE	-			
TRICHLOROFLUOROETHANE	-			
1,1,2,2-TETRACHLOROETHANE	-			
1,1,1-TRICHLOROETHANE	-			
1,1,2-TRICHLOROETHANE	-			
TETRACHLOROETHYLENE	-			
TRICHLOROETHYLENE	10	6	6	6
TOLUENE	-	4	< 0.5	< 0.5
VINYL ACETATE	-			
VINYL CHLORIDE	-		< 2	< 2
m-XYLENE	-		< 0.5	< 0.5
o-XYLEN	-		< 0.5	< 0.5
p-XYLEN	-		< 0.5	< 0.5
TOTAL XYLENES	-			

WATER A SUB-VOLATILES RESULTS IN PPM				WELL # C-28		TOTAL DEPTH	
TOP OF SCREEN = -18.00 BOTTOM OF SCREEN = -36.00				64.00			
DATE	LAB	05/12/85	06/06/85	05/20/86	05/20/86		
MCCLAREN ID	B & C	S000327	B & C	EUREKA	MCCLAREN		
DETECTION LIMIT			S000328	41245	BH1		
ANALYSIS				5	1		
MEMO	YES			624	601,602		
ACETONE	-						
ACRYLONITRILE	-						
BENZENE	12		6	95	37	<	0.5
CHLOROBENZENE	-						
DICHLOROBENZENE (TOTAL)							
1,2-DICHLOROBENZENE				<	10	<	0.5
1,3-DICHLOROBENZENE				<	10	<	0.5
1,4-DICHLOROBENZENE				<	10	<	0.5
BROMOFORM	-						
BROMOMETHANE	-			<	10	<	2
DIBROMOMETHANE							
2-BUTANONE			10				
CARBON DISULFIDE	-						
CARBON TETRACHLORIDE	-			<	10		
CHLOROMETHANE	-			<	10		
DICHLOROMETHANE	-						
CHLOROFORM	-						
CHLORODIBROMOMETHANE	-			<	10	<	2
CHLOROETHANE	-			<	10		
2-CHLOROETHYL VINYL ETHER	-			<	10		
1,2-DIBROMOETHANE	-						
DICHLOROBROMOMETHANE	-						
DICHLORODIFLUOROMETHANE	-						
1,1-DICHLOROETHANE	-						
1,2-DICHLOROETHANE	-						
1,1-DICHLOROETHYLENE	-						
TRANS-1,2-DICHLOROETHYLENE	120		74	125	93		
1,2-DICHLOROPROPANE	-						
1,3-DICHLOROPROPYLENE	-						
CIS-1,3-DICHLOROPROPYLENE	-						
TRANS-1,3-DICHLOROPROPYLENE	-						
ETHYLBENZENE	-					<	1
FREON 113							
2-HEXANONE							
4-METHYL-2-PENTANONE							
STYRENE							
TRICHLOROFLUOROMETHANE	-			<	10		
1,1,2,2-TETRACHLOROETHANE	-						
1,1,1-TRICHLOROETHANE	-						
1,1,2-TRICHLOROETHANE	-						
TETRACHLOROETHYLENE	-						
TRICHLOROETHYLENE	10		6	38	6	<	0.5
TOLUENE	-		4				
VINYL ACETATE							
VINYL CHLORIDE	-			<	10	<	2
m-XYLENE				<		<	0.5
p-XYLENE				<		<	0.5
TOTAL XYLENES							

WATER ANALYSIS-VOLATILES RESULTS IN PPM

DATE	TOP OF SCREEN=	BOTTOM OF SCREEN=	WELL #	C-2	DEPTH=
05/20/86	-18.00	-38.00	10/31/86		54.00
LAB					
MCCLAREN			MCCLAREN		
881D			002951		
DETECTION LIMIT			0.5		
ANALYSIS			601,602		
MEMO			BLANK		

ACETONE					
ACROLEIN					
ACRYLONITRILE					
BENZENE					
CHLOROBENZENE					
DICHLOROBENZENE (TOTAL)	45			28	
1,2-DICHLOROBENZENE	< 0.5			-	
1,3-DICHLOROBENZENE	< 0.5			-	
1,4-DICHLOROBENZENE	< 0.5			-	
BROMOFORM	< 2			-	
BROMOMETHANE				<	1
DIBROMOMETHANE					
2-BUTANONE					
CARBON DISULFIDE					
CARBON TETRACHLORIDE					
CHLOROMETHANE					
DICHLOROMETHANE					
CHLOROFORM					
CHLORODIBROMOMETHANE					
CHLOROETHANE	< 2			<	1
2-CHLOROETHYL VINYL ETHER					
1,2-DIBROMOETHANE					
DICHLOROBROMOMETHANE					
DICHLORODIFLUOROMETHANE					
1,1-DICHLOROETHANE					
1,2-DICHLOROETHANE					
1,1-DICHLOROETHYLENE					
TRANS-1,2-DICHLOROETHYLENE					
1,2-DICHLOROPROPANE	97			54	
1,3-DICHLOROPROPYLENE					
CIS-1,3-DICHLOROPROPYLENE					
TRANS-1,3-DICHLOROPROPYLENE					
ETHYLBENZENE	< 1				
FREON 113					
2-HEXANONE					
4-METHYL-2-PENTANONE					
STYRENE					
TRICHLOROFUOROMETHANE					
1,1,2,2-TETRACHLOROETHANE					
1,1,1-TRICHLOROETHANE					
1,1,2-TRICHLOROETHANE					
TETRACHLOROETHYLENE					
TRICHLOROETHYLENE	6			7.2	
TOLUENE	< 0.5				
VINYL ACETATE					
VINYL CHLORIDE					
m-XYLENE	< 0.5				
o-XYLENE	< 0.5				
p-XYLENE	< 0.5				

WATER AN.

WELL # C-28

05/20/86
EUREKA
41221
5
624

Year	Age	Sex	Weight (kg)	Length (cm)	Wing (cm)	Tail (cm)	Culmen (mm)	Gape (mm)	Bill (mm)	Foot (mm)	Middle toe (mm)	Hind toe (mm)
1960	10	F	10.5	180	110	70	15	15	15	15	15	15
1961	10	F	10.5	180	110	70	15	15	15	15	15	15
1962	10	F	10.5	180	110	70	15	15	15	15	15	15
1963	10	F	10.5	180	110	70	15	15	15	15	15	15
1964	10	F	10.5	180	110	70	15	15	15	15	15	15
1965	10	F	10.5	180	110	70	15	15	15	15	15	15
1966	10	F	10.5	180	110	70	15	15	15	15	15	15
1967	10	F	10.5	180	110	70	15	15	15	15	15	15
1968	10	F	10.5	180	110	70	15	15	15	15	15	15
1969	10	F	10.5	180	110	70	15	15	15	15	15	15
1970	10	F	10.5	180	110	70	15	15	15	15	15	15
1971	10	F	10.5	180	110	70	15	15	15	15	15	15
1972	10	F	10.5	180	110	70	15	15	15	15	15	15
1973	10	F	10.5	180	110	70	15	15	15	15	15	15
1974	10	F	10.5	180	110	70	15	15	15	15	15	15
1975	10	F	10.5	180	110	70	15	15	15	15	15	15
1976	10	F	10.5	180	110	70	15	15	15	15	15	15
1977	10	F	10.5	180	110	70	15	15	15	15	15	15
1978	10	F	10.5	180	110	70	15	15	15	15	15	15
1979	10	F	10.5	180	110	70	15	15	15	15	15	15
1980	10	F	10.5	180	110	70	15	15	15	15	15	15
1981	10	F	10.5	180	110	70	15	15	15	15	15	15
1982	10	F	10.5	180	110	70	15	15	15	15	15	15
1983	10	F	10.5	180	110	70	15	15	15	15	15	15
1984	10	F	10.5	180	110	70	15	15	15	15	15	15
1985	10	F	10.5	180	110	70	15	15	15	15	15	15
1986	10	F	10.5	180	110	70	15	15	15	15	15	15
1987	10	F	10.5	180	110	70	15	15	15	15	15	15
1988	10	F	10.5	180	110	70	15	15	15	15	15	15
1989	10	F	10.5	180	110	70	15	15	15	15	15	15
1990	10	F	10.5	180	110	70	15	15	15	15	15	15
1991	10	F	10.5	180	110	70	15	15	15	15	15	15
1992	10	F	10.5	180	110	70	15	15	15	15	15	15
1993	10	F	10.5	180	110	70	15	15	15	15	15	15
1994	10	F	10.5	180	110	70	15	15	15	15	15	15
1995	10	F	10.5	180	110	70	15	15	15	15	15	15
1996	10	F	10.5	180	110	70	15	15	15	15	15	15
1997	10	F	10.5	180	110	70	15	15	15	15	15	15
1998	10	F	10.5	180	110	70	15	15	15	15	15	15
1999	10	F	10.5									

WATER ANALYSIS-VOLATILES RESULTS IN PPB

WELL # C-22
TOP OF SCREEN = -92.00 BOTTOM OF SCREEN = -152.00 TOTAL DEPTH = 175.00

DATE	05/28/86	05/28/86	05/28/86
LAB	EUREKA	EUREKA	EUREKA
MCLAREN ID	41218	41220	41220D
DETECTION LIMIT	.5	.5	0.5
ANALYSIS	501,602	601,602	8015
MEMO	YES	YES	8015

ACETONE			
ACROLEIN			
ACRYLONITRILE			
BENZENE	<	1	<
CHLOROBENZENE	<	1	<
DICHLOROBENZENE (TOTAL)			
1,2-DICHLOROBENZENE	<	1	<
1,3-DICHLOROBENZENE	<	1	<
1,4-DICHLOROBENZENE	<	1	<
BROMOFORM			
BROMOMETHANE			
DIBROMOMETHANE			
2-BUTANONE			
CARBON DISULFIDE			
CARBON TETRACHLORIDE			
CHLOROMETHANE			
DICHLOROMETHANE			
CHLOROFORM			
CHLORODIBROMOMETHANE			
CHLOROETHANE			
2-CHLOROETHYL VINYL ETHER			
1,2-DIBROMOETHANE			
DICHLOROBROMOMETHANE			
DICHLORODIFLUOROMETHANE			
1,1-DICHLOROETHANE			
1,2-DICHLOROETHANE			
1,1-DICHLOROETHYLENE			
TRANS-1,2-DICHLOROETHYLENE			
1,2-DICHLOROPROPANE			
1,3-DICHLOROPROPYLENE			
CIS-1,3-DICHLOROPROPYLENE			
TRANS-1,3-DICHLOROPROPYLENE			
ETHYLBENZENE	<	1	<
FREON 113			
2-HEXANONE			
4-METHYL-2-PENTANONE			
STYRENE			
TRICHLOROFLUOROMETHANE			
1,1,2,2-TETRACHLOROETHANE			
1,1,1-TRICHLOROETHANE			
1,1,2-TRICHLOROETHANE			
TETRACHLOROETHYLENE			
TRICHLOROETHYLENE			
TOLUENE	<	1	<
VINYL ACETATE			
VINYL CHLORIDE			
m-XYLENE			
o-XYLENE			
p-XYLENE			
TOTAL XYLENES	<	1	<

WATER AN. AHS-VOLATILES RESULTS IN RPB

WELL # C-28
TOP OF SCREEN = -92.00 BOTTOM OF SCREEN = -152.00 TOTAL DEPTH = 175.00

DATE	05/20/86	10/30/86	10/30/86	10/30/86
LAB	MCCLAREN	MCCLAREN	EUREKA	EUREKA
MCCLAREN ID	867	002945	45461	45461D
DETECTION LIMIT	1	0.5	5	5
ANALYSIS	601	601,602	624	624
MEMO	BLANK			

ACETONE		<	10	<	10
ACROLEIN					
ACRYLONITRILE					
BENZENE					
CHLOROBENZENE					
DICHLOROBENZENE (TOTAL)					
1,2-DICHLOROBENZENE					
1,3-DICHLOROBENZENE					
1,4-DICHLOROBENZENE					
BROMOFORM	<	2	<		
BROMOMETHANE					
DIBROMOMETHANE			<	10	<
2-BUTANONE			<	10	<
CARBON DISULFIDE					
CARBON TETRACHLORIDE					
CHLOROMETHANE			<	10	<
DICHLOROMETHANE			<	50	<
CHLOROFORM	1				
CHLORODIBROMOMETHANE	<	2	<	10	<
CHLOROETHANE			<	10	<
2-CHLOROETHYL VINYL ETHER			<	10	<
1,2-DIBROMOETHANE					
DICHLOROBROMOMETHANE					
DICHLORODIFLUOROMETHANE					
1,1-DICHLOROETHANE					
1,2-DICHLOROETHANE	10				
1,1-DICHLOROETHYLENE					
TRANS-1,2-DICHLOROETHYLENE					
1,2-DICHLOROPROPANE					
1,3-DICHLOROPROPYLENE					
CIS-1,3-DICHLOROPROPYLENE					
TRANS-1,3-DICHLOROPROPYLENE					
ETHYLBENZENE					
FREON 113					
2-HEXANONE					
4-METHYL-2-PENTANONE					
STYRENE					
TRICHLOROFLUOROMETHANE			<	10	<
1,1,2,2-TETRACHLOROETHANE					
1,1,1-TRICHLOROETHANE	5				
1,1,2-TRICHLOROETHANE					
TETRACHLOROETHYLENE					
TRICHLOROETHYLENE					
TOLUENE					
VINYL ACETATE					
VINYL CHLORIDE	<	2	<	10	<
m-XYLENE					
o-XYLENE					
p-XYLENE					
TOTAL XYLENES					

WATER ANALYSIS-VOLATILES RESULTS IN PPH

WELL # C-28

TOP OF SCREEN= -92.00 BOTTOM OF SCREEN=-152.00 TOTAL DEPTH= 175.00

DATE 10/30/86
LAB HCLAUFN
HCLAUFN ID 0029430
DETECTION LIMIT 0.5
ANALYSIS 601.602
MEMO BLANK

ACETONE	<	10	
ACROLEIN	<	10	
ACRYLONITRILE			
BENZENE			4
CHLOROBENZENE			
DICHLOROBENZENE (TOTAL)			
1,2-DICHLOROBENZENE			
1,3-DICHLOROBENZENE			
1,4-DICHLOROBENZENE			
BROMOFORM			1
BROMOMETHANE			
DIBROMOMETHANE			
2-BUTANONE			
CARBON DISULFIDE			
CARBON TETRACHLORIDE			
CHLOROMETHANE			
DICHLOROMETHANE			
CHLOROFORM			
CHLORODIBROMOMETHANE			
CHLOROETHANE			
2-CHLOROETHYL VINYL ETHER			
1,2-DIBROMOETHANE			
DICHLOROBROMOMETHANE			
DICHLORODIFLUOROMETHANE			
1,1-DICHLOROETHANE			
1,2-DICHLOROETHANE			
1,1-DICHLOROETHYLENE			
TRANS-1,2-DICHLOROETHYLENE			
1,2-DICHLOROPROPANE			
1,3-DICHLOROPROPYLENE			
CIS-1,3-DICHLOROPROPYLENE			
TRANS-1,3-DICHLOROPROPYLENE			
ETHYLBENZENE			
PERON 113			
2-HEXANONE			
4-METHYL-2-PENTANONE			
STYRENE			
TRICHLOROFLUOROMETHANE			
1,1,2,2-TETRACHLOROETHANE			
1,1,1-TRICHLOROETHANE			
1,1,2-TRICHLOROETHANE			
TETRACHLOROETHYLENE			
TRICHLOROETHYLENE			
TOLUENE			
VINYL ACETATE			
VINYL CHLORIDE			
m-XYLENE			
o-XYLENE			
p-XYLENE			
TOTAL XYLENES			

WATER AT SIX-VOLATILES RESULTS IN PPD. WELL # C-30
 TOP OF SCREEN= -48.00 BOTTOM OF SCREEN= -78.00 TOTAL DEPTH= 102.50
 DATE 05/10/85 06/06/85 05/15/86
 LAB B & C B & C MCLAREN
 MCLAREN ID S000331 S000332 S000333
 DETECTION LIMIT
 ANALYSIS
 MEMO 601,602

ACETONE	-	-	-	< 0.5
ACROLEIN	-	-	-	< 0.5
ACRYLONITRILE	-	-	-	< 0.5
BENZENE	-	-	-	< 0.5
DICHLOROBENZENE (TOTAL)	-	-	-	< 0.5
1,2-DICHLOROBENZENE	-	-	-	< 0.5
1,3-DICHLOROBENZENE	-	-	-	< 0.5
1,4-DICHLOROBENZENE	-	-	-	< 0.5
BROMOFORM	-	-	-	< 2
BROMOMETHANE	-	-	-	< 2
DIBROMOMETHANE	-	-	-	< 2
2-BUTANONE	-	-	-	< 2
CARBON DISULFIDE	-	-	-	< 2
CARBON TETRACHLORIDE	-	-	-	< 2
CHLOROMETHANE	-	-	-	< 2
DICHLOROMETHANE	-	-	-	< 2
CHLOROFORM	-	-	-	< 2
CHLORODIBROMOMETHANE	-	-	-	< 2
CHLOROETHANE	-	-	-	< 2
2-CHLOROETHYL VINYL ETHER	-	-	-	< 2
1,2-DIBROMOETHANE	-	-	-	< 2
DICHLORODIBROMOMETHANE	-	-	-	< 2
DICHLORODIFLUOROMETHANE	-	-	-	< 2
1,1-DICHLOROETHANE	-	-	-	< 2
1,2-DICHLOROETHANE	-	-	-	< 2
1,1-DICHLOROETHYLENE	-	-	-	< 2
TRANS-1,2-DICHLOROETHYLENE	-	-	-	< 2
1,2-DICHLOROPROPANE	-	-	-	< 2
1,3-DICHLOROPROPYLENE	-	-	-	< 2
CIS-1,3-DICHLOROPROPYLENE	-	-	-	< 2
TRANS-1,3-DICHLOROPROPYLENE	-	-	-	< 2
ETHYLBENZENE	-	-	-	< 2
FREON 113	-	-	-	< 2
2-HEXANONE	-	-	-	< 2
4-METHYL-2-PENTANONE	-	-	-	< 2
STYRENE	-	-	-	< 2
TRICHLOROFLUOROMETHANE	-	-	-	< 2
1,1,2,2-TETRACHLOROETHANE	-	-	-	< 2
1,1,1-TRICHLOROETHANE	-	-	-	< 2
1,1,2-TRICHLOROETHANE	-	-	-	< 2
TETRACHLOROETHYLENE	-	-	-	< 2
TRICHLOROETHYLENE	-	-	-	< 2
TOLUENE	-	-	-	< 2
VINYL ACETATE	-	-	-	< 2
VINYL CHLORIDE	-	-	-	< 2
m-XYLENE	-	-	-	< 2
o-XYLENE	-	-	-	< 2
p-XYLENE	-	-	-	< 2
TOTAL XYLENES	-	-	-	< 2

WATER ANALYSIS-VOLATILES RESULTS IN ppb

WELL # C-20
TOP OF SCREEN= -48.00 BOTTOM OF SCREEN= -78.00 TOTAL DEPTH= 102.50

DATE	05/15/86	05/15/86	10/17/86
LAB	MCLAREN	MCLAREN	MCLAREN
MCLAREN ID	862AD	862AFD	41213
DETECTION LIMIT	1	1	5
ANALYSIS	601,602	601	601,602
MEMO			

ACETONE				
ACROLEIN				
ACRYLONITRILE				
BENZENE	< 0.5			
CHLOROBENZENE	< 0.5			
DICHLOROBENZENE (TOTAL)				
1,2-DICHLOROBENZENE	< 0.5			
1,3-DICHLOROBENZENE	< 0.5			
1,4-DICHLOROBENZENE	< 0.5			
BROMOFORM	< 2			
BROMOMETHANE		< 2		
DIBROMOMETHANE			< 10	
2-BUTANONE				
CARBON DISULFIDE				
CARBON TETRACHLORIDE				
CHLOROMETHANE			< 10	
DICHLOROMETHANE			< 10	
CHLOROFORM				
CHLORODIBROMOMETHANE	< 2		< 10	
CHLOROETHANE			< 10	
2-CHLOROETHYL VINYL ETHER				
1,2-DIBROMOETHANE			< 10	
DICHLOROBROMOMETHANE				
DICHLORODIFLUOROMETHANE				
1,1-DICHLOROETHANE				
1,1-DICHLOROETHYLENE				
TRANS-1,2-DICHLOROETHYLENE				
1,2-DICHLOROPROPANE	4			6.4
1,3-DICHLOROPROPYLENE				
CIS-1,3-DICHLOROPROPYLENE				
TRANS-1,3-DICHLOROPROPYLENE				
ETHYLBENZENE	< 1			
FREON 113				
2-HEXANONE				
4-METHYL-2-PENTANONE				
STYRENE				
TRICHLOROFLUOROMETHANE				
1,1,2,2-TETRACHLOROETHANE			< 10	
1,1,1-TRICHLOROETHANE				
1,1,2-TRICHLOROETHANE				2
TETRACHLOROETHYLENE				
TRICHLOROETHYLENE				1
TOLUENE	< 0.5			
VINYL ACETATE				
VINYL CHLORIDE	< 2			
m-XYLENE	< 0.5			
o-XYLENE	< 0.5			
p-XYLENE	< 0.5			
TOTAL XYLENES				

WATER AN

12-VOLATILES RESULTS IN PDB

WELL # C-31

TOP OF SCREEN = -63.00 BOTTOM OF SCREEN = -103.00 TOTAL DEPTH = 120.00

DATE 05/11/85 05/21/86 05/21/86
 LAH B & C B & C
 MCLAREN ID S000334 S000335 MCLAREN 41264
 DETECTION LIMIT S000334 889A
 ANALYSIS 601 5
 MEMO 624

ACETONE	-	-	-	-
ACROLEIN	-	-	-	-
ACRYLONITRILE	-	-	-	-
BENZENE	-	-	-	-
CHLOROBENZENE	-	-	-	-
DICHLOROBENZENE (TOTAL)	-	-	-	-
1,2-DICHLOROBENZENE	-	-	-	-
1,3-DICHLOROBENZENE	-	-	-	-
1,4-DICHLOROBENZENE	-	-	-	-
BROMOFORM	-	-	-	-
BROMOMETHANE	-	-	-	-
DIBROMOMETHANE	-	-	-	-
2-BUTANONE	-	-	-	-
CARBON DISULFIDE	-	-	-	-
CARBON TETRACHLORIDE	-	-	-	-
CHLOROMETHANE	-	-	-	-
DICHLOROMETHANE	-	-	-	-
CHLOROFORM	-	-	-	-
CHLORODIBROMOMETHANE	-	-	-	-
CHLOROETHANE	-	-	-	-
2-CHLOROETHYL VINYL ETHER	-	-	-	-
1,2-DIBROMOETHANE	-	-	-	-
DICHLOROBROMOMETHANE	-	-	-	-
DICHLORODIFLUOROMETHANE	-	-	-	-
1,1-DICHLOROETHANE	-	-	-	-
1,2-DICHLOROETHANE	-	-	-	-
1,1-DICHLOROETHYLENE	-	-	-	-
TRANS-1,2-DICHLOROETHYLENE	-	-	-	-
1,2-DICHLOROPROPANE	-	-	-	-
1,3-DICHLOROPROPYLENE	-	-	-	-
CIS-1,3-DICHLOROPROPYLENE	-	-	-	-
TRANS-1,3-DICHLOROPROPYLENE	-	-	-	-
ETHYLBENZENE	-	-	-	-
FREON 113	-	-	-	-
2-HEXANONE	-	-	-	-
4-METHYL-2-PENTANONE	-	-	-	-
STYRENE	-	-	-	-
TRICHLOROFLUOROMETHANE	-	-	-	-
1,1,2,2-TETRACHLOROETHANE	-	-	-	-
1,1,1-TRICHLOROETHANE	-	-	-	-
1,1,2-TRICHLOROETHANE	-	-	-	-
TETRACHLOROETHYLENE	-	-	-	-
TRICHLOROETHYLENE	-	-	-	-
TOLUENE	-	-	-	-
VINYL ACETATE	-	-	-	-
VINYL CHLORIDE	-	-	-	-
m-XYLENE	-	-	-	-
o-XYLENE	-	-	-	-
p-XYLENE	-	-	-	-
TOTAL XYLENES	-	-	-	-

WATER ANALYSIS-VOLATILES RESULTS IN PPM

WELL # C-31

TOP OF SCREEN= -63.00 BOTTOM OF SCREEN=-103.00 TOTAL DEPTH= 120.00

DATE	05/21/86	10/31/86
LAB	MCLAREN	MCLAREN
	888	002948
DETECTION LIMIT	0.5	0.5
ANALYSIS	602	601,602
MEMO	BLANK	

ACETONE	-	-
ACROLEIN	-	-
ACRYLONITRILE	-	-
BENZENE	-	-
CHLOROBENZENE	-	-
DICHLOROBENZENE (TOTAL)	-	-
1,2-DICHLOROBENZENE	-	-
1,3-DICHLOROBENZENE	-	-
1,4-DICHLOROBENZENE	-	-
BROMOFORM	-	-
BROMOMETHANE	-	-
DIBROMOMETHANE	-	-
2-BUTANONE	-	-
CARBON DISULFIDE	-	-
CARBON TETRACHLORIDE	-	-
CHLOROMETHANE	-	-
DICHLOROMETHANE	-	-
CHLOROFORM	-	-
CHLORODIBROMOMETHANE	-	-
CHLOROETHANE	-	-
2-CHLOROETHYL VINYL ETHER	-	-
1,2-DIBROMOETHANE	-	-
DICHLOROBROMOMETHANE	-	-
DICHLORODIFLUOROMETHANE	-	-
1,1-DICHLOROETHANE	-	-
1,2-DICHLOROETHANE	-	-
1,1-DICHLOROETHYLENE	-	-
TRANS-1,2-DICHLOROETHYLENE	-	-
1,2-DICHLOROPROPANE	-	-
1,3-DICHLOROPROPYLENE	-	-
CIS-1,3-DICHLOROPROPYLENE	-	-
TRANS-1,3-DICHLOROPROPYLENE	-	-
ETHYLBENZENE	-	-
FREON 113	-	-
2-HEXANONE	-	-
4-METHYL-2-PENTANONE	-	-
STYRENE	-	-
TRICHLOROFUOROMETHANE	-	-
1,1,2,2-TETRACHLOROETHANE	-	-
1,1,1-TRICHLOROETHANE	-	-
1,1,2-TRICHLOROETHANE	-	-
TETRACHLOROETHYLENE	-	-
TRICHLOROETHYLENE	-	-
TOLUENE	-	-
VINYL ACETATE	-	-
VINYL CHLORIDE	-	-
m-XYLENE	-	-
o-XYLENE	-	-
p-XYLENE	-	-
TOTAL XYLENES	-	-

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DATE 05/21/86 10/19/86 10/19/86
 LAB EUREKA MCLAREN MCLAREN
 MCLAREN ID 41254 884 002663D
 DETECTION LIMIT 5 1 0.5
 ANALYSIS 624 601 601.602
 MEMO BLANK

ACETONE	-	-	-	-
ACROLEIN	-	-	-	-
ACRYLONITRILE	-	-	-	-
BENZENE	-	-	-	-
CHLOROBENZENE	-	-	-	-
DICHLOROBENZENE (TOTAL)	-	-	-	-
1,2-DICHLOROBENZENE	< 10	-	-	-
1,3-DICHLOROBENZENE	< 10	-	-	-
1,4-DICHLOROBENZENE	< 10	-	-	-
BROMOFORM	-	< 2	< 1	< 1
BROMOMETHANE	< 10	-	-	-
DIBROMOMETHANE	-	-	-	-
2-BUTANONE	-	-	-	-
CARBON DISULFIDE	-	-	0.8	-
CARBON TETRACHLORIDE	-	-	-	-
CHLOROMETHANE	< 10	-	-	-
DICHLOROMETHANE	< 10	-	-	-
CHLOROFORM	-	16	2	2
CHLORODIBROMOMETHANE	< 10	< 2	< 1	< 1
CHLOROETHANE	< 10	-	-	-
2-CHLOROETHYL VINYL ETHER	< 10	-	-	-
1,2-DIBROMOETHANE	-	3	-	-
DICHLORODIBROMOMETHANE	-	-	-	-
DICHLORODIFLUOROMETHANE	-	-	-	-
1,1-DICHLOROETHANE	-	10	-	-
1,2-DICHLOROETHANE	-	-	-	-
1,1-DICHLOROETHYLENE	-	-	-	-
TRANS-1,2-DICHLOROETHYLENE	-	-	-	-
1,2-DICHLOROPROPANE	-	-	-	-
1,3-DICHLOROPROPYLENE	-	-	-	-
CIS-1,3-DICHLOROPROPYLENE	-	-	-	-
TRANS-1,3-DICHLOROPROPYLENE	-	-	-	-
ETHYLBENZENE	-	-	-	-
PERM 113	-	-	-	-
2-HEXANONE	-	-	-	-
4-METHYL-2-PENTANONE	-	-	-	-
STYRENE	-	-	-	-
TRICHLOROFUOROMETHANE	< 10	-	-	-
1,1,2,2-TETRACHLOROETHANE	-	-	-	-
1,1,1-TRICHLOROETHANE	-	13	-	-
1,1,2-TRICHLOROETHANE	-	-	-	-
TETRACHLOROETHYLENE	-	-	-	-
TRICHLOROETHYLENE	-	-	-	-
TOLUENE	-	-	-	-
VINYL ACETATE	-	-	-	-
VINYL CHLORIDE	< 10	< 2	< 1	< 1
m-XYLENE	-	-	-	-
o-XYLENE	-	-	-	-
p-XYLENE	-	-	-	-
TOTAL XYL-ES	-	-	-	-

WATER A SIS-VOLATILES RESULTS IN RPD TOP OF SCREEN= -9.00 BOTTOM OF SCREEN= -69.00 TOTAL DEPTH= 215.00 WELL # C-32

DATE 10/19/86
LAB MCLAREN
MCLAREN ID 002666B
DETECTION LIMIT 0.5
ANALYSIS 601,602
MEMO BLANK

ACETONE	
ACROLEIN	
ACRYLONITRILE	
BENZENE	
CHLOROBENZENE	
DICHLOROBENZENE (TOTAL)	
1,2-DICHLOROBENZENE	
1,3-DICHLOROBENZENE	
1,4-DICHLOROBENZENE	
BROMOFORM	< 1
BROMOMETHANE	
DIBROMOMETHANE	
2-BUTANONE	
CARBON DISULFIDE	
CARBON TETRACHLORIDE	
CHLOROMETHANE	
DICHLOROMETHANE	
CHLOROFORM	
CHLORODIBROMOMETHANE	< 1
CHLOROETHANE	
2-CHLOROETHYL VINYL ETHER	
1,2-DIBROMOETHANE	
DICHLOROBROMOETHANE	
DICHLORODIFLUOROMETHANE	
1,1-DICHLOROETHANE	
1,2-DICHLOROETHANE	
1,1-DICHLOROETHYLENE	
TRANS-1,2-DICHLOROETHYLENE	
1,2-DICHLOROPROPANE	
1,3-DICHLOROPROPYLENE	
CIS-1,3-DICHLOROPROPYLENE	
TRANS-1,3-DICHLOROPROPYLENE	
ETHYLBENZENE	
FREON 113	
2-HEXANONE	
4-METHYL-2-PENTANONE	
STYRENE	
TRICHLOROFLUOROMETHANE	
1,1,2,2-TETRACHLOROETHANE	
1,1,1-TRICHLOROETHANE	
1,1,2-TRICHLOROETHANE	
TETRACHLOROETHYLENE	
TRICHLOROETHYLENE	
TOLUENE	
VINYL ACETATE	
VINYL CHLORIDE	< 1
m-XYLENE	
o-XYLENE	
p-XYLENE	
TOTAL XYLENES	

WELL # Q-33

DATE 07/06/86
LAB MCLAREN
MCLAREN ID 1313A
DETECTION LIMIT 1
ANALYSIS 601,602

07/06/86
EUREKA
41365
5
624

12/02/86
MCLAREN
004062
0.5
601,602

MEMO

ACETONE					
ACROLEIN					
ACRYLONITRILE					
BENZENE	< 0.2	-	-	-	-
CHLOROBENZENE	< 0.2	-	-	-	-
DICHLOROBENZENE (TOTAL)	< 0.2	-	-	-	-
1,2-DICHLOROBENZENE	< 0.2	-	-	-	-
1,3-DICHLOROBENZENE	< 0.2	-	-	-	-
1,4-DICHLOROBENZENE	< 0.2	-	-	-	-
BROMOFORM	< 2	-	-	-	-
BROMOMETHANE		< 10			
DIBROMOMETHANE					
2-BUTANONE					
CARBON DISULFIDE					
CARBON TETRACHLORIDE		< 10			
CHLOROMETHANE		-	-	-	-
DICHLOROMETHANE		-	-	-	-
CHLOROFORM		-	-	-	-
CHLORODIBROMOMETHANE	< 2	< 10	< 1		
CHLOROETHANE		< 10			
2-CHLOROETHYL VINYL ETHER		< 10			
1,2-DIBROMOETHANE		< 10			
DICHLOROBROMOMETHANE		-	-	-	-
DICHLORODIFLUOROMETHANE		-	-	-	-
1,1-DICHLOROETHANE		-	-	-	-
1,2-DICHLOROETHANE		-	-	-	-
1,1,1-DICHLOROETHYLENE		-	-	-	-
TRANS-1,2-DICHLOROETHYLENE		-	-	-	-
1,2-DICHLOROPROPANE		-	-	-	-
1,3-DICHLOROPROPYLENE		-	-	-	-
CIS-1,3-DICHLOROPROPYLENE		-	-	-	-
TRANS-1,3-DICHLOROPROPYLENE		-	-	-	-
ETHYLBENZENE	< 0.2	-	-	-	-
FREON 113					
2-HEXANONE					
4-METHYL-2-PENTANONE					
STYRENE					
TRICHLOROFLUOROMETHANE		< 10			
1,1,2,2-TETRACHLOROETHANE		-	-	-	-
1,1,1-TRICHLOROETHANE		-	-	-	-
1,1,2-TRICHLOROETHANE		-	-	-	-
TETRACHLOROETHYLENE		-	-	-	-
TRICHLOROETHYLENE		-	-	-	-
TOLUENE	< 0.2	-	-	-	-
VINYL ACETATE					
VINYL CHLORIDE	< 2	< 10			
m-XYLENE	< 0.2				
o-XYLENE	< 0.2				
p-XYLENE	< 0.2				
TOTAL XYLENES					

WATER ANALYSIS-VOLATILES RESULTS IN PPM

WELL # C-34

TOP OF SCREEN = -35.00 BOTTOM OF SCREEN = -45.00 TOTAL DEPTH = 52.00

DATE	07/07/86	07/07/86	12/31/86
LAB	MCLAREN	EUREKA	B & C
MCLAREN ID	1317A	41381	50372
DETECTION LIMIT	1	5	1
ANALYSIS	601,602	624	601,602

MEMO

ACETONE					
ACROLEIN					
BENZENE	< 0.2				< 2
CHLOROBENZENE					< 2
DICHLOROBENZENE (TOTAL)					
1,2-DICHLOROBENZENE	< 0.2				8
1,3-DICHLOROBENZENE	< 0.2				2
1,4-DICHLOROBENZENE	< 0.2				2
BROMOFORM	< 2				1
BROMOMETHANE					
DIBROMOMETHANE					
2-BUTANONE					
CARBON DISULFIDE					
CARBON TETRACHLORIDE					
CHLOROMETHANE					
DICHLOROMETHANE					
CHLOROFORM					
CHLORODIBROMOMETHANE	< 2				1
CHLOROETHANE					
2-CHLOROETHYL VINYL ETHER					
1,2-DIBROMOETHANE					
DICHLOROBROMOMETHANE					
DICHLORODIFLUOROMETHANE					
1,1-DICHLOROETHANE					
1,2-DICHLOROETHANE					
1,1-DICHLOROETHYLENE					
TRANS-1,2-DICHLOROETHYLENE					
1,2-DICHLOROPROPANE					
1,3-DICHLOROPROPYLENE					
CIS-1,3-DICHLOROPROPYLENE					
TRANS-1,3-DICHLOROPROPYLENE					
ETHYLBENZENE	< 0.2				< 2
FREON 113					
2-HEXANONE					
4-METHYL-2-PENTANONE					
STYRENE					
TRICHLOROFLUOROMETHANE					
1,1,2,2-TETRACHLOROETHANE					
1,1,1-TRICHLOROETHANE	6				
1,1,2-TRICHLOROETHANE					
TETRACHLOROETHYLENE					
TRICHLOROETHYLENE	2				
TOLUENE	< 0.2				< 2
VINYL ACETATE					
VINYL CHLORIDE					
m-XYLENE					1
o-XYLENE	< 0.2				2
p-XYLENE	< 0.2				2
TOTAL XYLENES					

WATER ANALYSIS-VOLATILES RESULTS IN PPB

WELL # C-36

TOP OF SCREEN= -32.00 BOTTOM OF SCREEN= -42.00 TOTAL DEPTH= 58.00

DATE	06/28/86	06/28/86	11/10/86
LAB	MCCLAREN	MCCLAREN	MCCLAREN
MCCLAREN ID	1230A	1231B	003157
DETECTION LIMIT	.5	5	3
ANALYSIS	601,602	601,602	601,602
MEMO			

ACETONE			
ACROLEIN			
ACRYLONITRILE			
BENZENE	< 0.5	19	< 0.5
CHLOROBENZENE			
DICHLOROBENZENE (TOTAL)			
1,2-DICHLOROBENZENE	< 0.5		< 0.5
1,3-DICHLOROBENZENE	< 0.5		< 0.5
1,4-DICHLOROBENZENE	< 0.5		< 0.5
BROMOFORM	< 10		< 5
BROMOMETHANE			
DIBROMOMETHANE			
2-BUTANONE			
CARBON DISULFIDE			
CARBON TETRACHLORIDE	20	72	-
CHLOROMETHANE			
DICHLOROMETHANE			
CHLOROFORM			
CHLORODIBROMOMETHANE	< 10	10	< 5
CHLOROETHANE			
2-CHLOROETHYL VINYL ETHER			
1,2-DIBROMOETHANE			
DICHLOROBROMOMETHANE			
DICHLORODIFLUOROMETHANE			
1,1-DICHLOROETHANE	500	500	890
1,2-DICHLOROETHANE			
1,1,1-DICHLOROETHYLENE	57	57	360
TRANS-1,2-DICHLOROETHYLENE	98	99	240
1,2-DICHLOROPROPANE			
1,3-DICHLOROPROPYLENE			
CIS-1,3-DICHLOROPROPYLENE			
TRANS-1,3-DICHLOROPROPYLENE			
ETHYLBENZENE	< 1		< 0.5
PERON 113			
2-HEXANONE			
1-HEXYL-2-PENTANONE			
STYRENE			
TRICHLOROFLUOROMETHANE			
1,1,2,2-TETRACHLOROETHANE	< 10	10	< 34
1,1,1-TRICHLOROETHANE			
1,1,2-TRICHLOROETHANE			
TETRACHLOROETHYLENE	< 10	10	< 34
TRICHLOROETHYLENE	130	130	260
TOLUENE	< 0.5	< 0.5	< 0.5
VINYL ACETATE			
VINYL CHLORIDE	< 10	10	< 5
m-XYLENE	< 0.5	< 0.5	< 0.5
p-XYLENE	< 0.5	< 0.5	< 0.5
TOTAL XYLENES			

LATER ANALYSIS VOLATILES RESULTS IN PPM

WELL # C-36

TOP OF SCREEN = -32.00 BOTTOM OF SCREEN = -42.00 TOTAL DEPTH = 58.00

DATE 11/10/86 11/10/86
 LAB MCLAREN B & C MCLAREN
 DETECTION LIMIT 003157D 003156D
 ANALYSIS 5 0.05
 MEMO 601 601.602
 BLANK

ACETONE					
ACROLEIN					
ACRYLONITRILE					
BENZENE					
CHLOROBENZENE					
DICHLOROBENZENE (TOTAL)					
1,2-DICHLOROBENZENE					
1,3-DICHLOROBENZENE					
1,4-DICHLOROBENZENE					
BROMOFORM					0.06
BROMOMETHANE					1
DIBROMOMETHANE					
2-BUTANONE					
CARBON DISULFIDE					0.5
CARBON TETRACHLORIDE					
CHLOROMETHANE					21
CHLOROFORM					3
CHLORODIBROMOMETHANE					1
CHLOROETHANE					
2-CHLOROETHYL VINYL ETHER					
1,2-DIBROMOETHANE					1
DICHLOROBROMOMETHANE					
DICHLORODIFLUOROMETHANE					
1,1-DICHLOROETHANE					0.5
1,2-DICHLOROETHANE					0.5
1,1-DICHLOROETHYLENE					0.5
TRANS-1,2-DICHLOROETHYLENE					0.5
1,2-DICHLOROPROPANE					
1,3-DICHLOROPROPYLENE					
CIS-1,3-DICHLOROPROPYLENE					0.5
TRANS-1,3-DICHLOROPROPYLENE					0.5
ETHYLBENZENE					
FREON 113					
2-HEXANONE					
4-METHYL-2-PENTANONE					
STYRENE					
TRICHLOROFLUOROMETHANE					0.5
1,1,2,2-TETRACHLOROETHANE					0.5
1,1,1-TRICHLOROETHANE					3
1,1,2-TRICHLOROETHANE					0.5
TETRACHLOROETHYLENE					0.5
TRICHLOROETHYLENE					0.5
TOLUENE					
VINYL ACETATE					
VINYL CHLORIDE					1
m-XYLENE					
o-XYLENE					
p-XYLENE					
TOTAL XYLENES					

WATER ANALYSIS - VOLATILES RESULTS IN FEB 1986

WELL # C-37

58.00

TOP OF SCREEN = -12.00 BOTTOM OF SCREEN = -12.00 TOTAL DEPTH =

DATE	LAB	07/07/86	07/07/86	11/06/86	11/06/86
MCCLAREN ID	1319A	41390	41390	003140	0031380
DETECTION LIMIT	1	5	5	0.5	0.5
ANALYSIS	601,602	624	624	601,602	601,602
MEMO					BLANK

ACETONE					
ACROLEIN					
ACRYLONITRILE					
BENZENE	< 0.2				
CHLOROBENZENE	< 0.2				
DICHLOROBENZENE (TOTAL)					
1,2-DICHLOROBENZENE	< 0.2				
1,3-DICHLOROBENZENE	< 0.2				
1,1-DICHLOROBENZENE	< 0.2				
BROMOFORM	< 2				
BROMOMETHANE					
DIBROMOMETHANE					
2-BUTANONE					
CARBON DISULFIDE					
CARBON TETRACHLORIDE					
CHLOROMETHANE					
DICHLOROMETHANE					
CHLOROPROPANE					
CHLORODIBROMOMETHANE	< 2				
CHLOROETHANE					
2-CHLOROETHYL VINYL ETHER					
1,2-DIBROMOETHANE					
DICHLOROMETHANE					
BICHLORODIFLUOROMETHANE					
1,1-DICHLOROETHANE	88	160	240	8.3	
1,2-DICHLOROETHANE			49	68	2
1,1-DICHLOROETHYLENE	43				
TRANS-1,2-DICHLOROETHYLENE					
1,2-DICHLOROPROPANE					
1,3-DICHLOROPROPYLENE					
CIS-1,3-DICHLOROPROPYLENE					
TRANS-1,3-DICHLOROPROPYLENE					
ETHYLBENZENE	< 0.2				
PERON 113					
2-HEXANONE					
1-METHYL-2-PENTANONE					
STYRENE					
TRICHLOROFUOROMETHANE					
1,1,2,2-TETRACHLOROETHANE					
1,1,1-TRICHLOROETHANE					
1,1,2-TRICHLOROETHANE					
TETRACHLOROETHYLENE	21	15	48		
TRICHLOROETHYLENE	< 0.2	6			
TOLUENE					
VINYL ACETATE					
VINYL CHLORIDE					
m-XYLENE	< 0.2				
o-XYLENE	< 0.2				
p-XYLENE	< 0.2				
TOTAL XYLENES					

WATER ANALYSIS-VOLATILES RESULTS IN PPB

WELL # C-38

TOP OF SCREEN= -42.00 BOTTOM OF SCREEN= -52.00 TOTAL DEPTH= 58.00

DATE	07/06/86	07/06/86	10/22/86
LAB	MCLAREN	EUREKA	MCLAREN
MCLAREN ID	1315A	41373	002715
DETECTION LIMIT	1	5	0.5
ANALYSIS	601,602	624	601,602

MEMO

ACETONE			
ACROLEIN			
ACRYLONITRILE			
BENZENE	< 0.2	-	
CHLOROBENZENE	< 0.2	-	
DICHLOROBENZENE (TOTAL)			
1,2-DICHLOROBENZENE	< 0.2	-	
1,3-DICHLOROBENZENE	< 0.2	-	
1,4-DICHLOROBENZENE	< 0.2	-	
BROMOFORM	< 2	< 1	< 1
BROMOMETHANE		< 10	
DIBROMOMETHANE			
2-BUTANONE			
CARBON DISULFIDE	-		
CARBON TETRACHLORIDE		< 10	
CHLOROMETHANE	-		
DICHLOROMETHANE	-		
CHLOROFORM	< 2	< 10	< 1
CHLORODIBROMOMETHANE		< 10	
CHLOROETHANE		< 10	
2-CHLOROETHYL VINYL ETHER			
1,2-DIBROMOETHANE	-		
DICHLORODIBROMOMETHANE			
DICHLORODIFLUOROMETHANE	-		
1,1-DICHLOROETHANE	-		
1,2-DICHLOROETHANE	-		
1,1-DICHLOROETHYLENE	-		
TRANS-1,2-DICHLOROETHYLENE	-		
1,2-DICHLOROPROPANE	-		
1,3-DICHLOROPROPYLENE	-		
CIS-1,3-DICHLOROPROPYLENE	-		
TRANS-1,3-DICHLOROPROPYLENE	-		
ETHYLBENZENE	< 0.2		
PERON 113			
2-HEXANONE			
4-METHYL-2-PENTANONE			
STYRENE			
TRICHLOROFLUOROMETHANE	-		
1,1,2,2-TETRACHLOROETHANE	-	< 10	
1,1,1-TRICHLOROETHANE	-		
1,1,2-TRICHLOROETHANE	-		
TETRACHLOROETHYLENE	-		
TRICHLOROETHYLENE	-		
TOLUENE	< 0.2		
VINYL ACETATE			
VINYL CHLORIDE	< 2	< 10	< 1
m-XYLENE	< 0.2		
o-XYLENE	< 0.2		
p-XYLENE	< 0.2		
TOTAL XYLENES			

WATER AN

18-VOLATILES RESULTS IN PPD

WELL # C-38

TOP OF SCREEN= -42.00 BOTTOM OF SCREEN= -52.00 TOTAL DEPTH= 58.00

DATE 10/22/86
 LAB H & C
 MCLAREN ID 40710
 DETECTION LIMIT 1
 ANALYSIS 624
 MEMO 601,602
 BLANK

ACETONE	<	10	
ACROLEIN	<	10	
ACRYLONITRILE			
BENZENE			
CHLOROBENZENE			
DICHLOROBENZENE (TOTAL)			
1,2-DICHLOROBENZENE			
1,3-DICHLOROBENZENE			
1,4-DICHLOROBENZENE			
BROMOFORM			
BROMOMETHANE			
DIBROMOMETHANE			
2-BUTANONE			
CARBON DISULFIDE			
CARBON TETRACHLORIDE			
CHLOROMETHANE			
DICHLOROMETHANE			
CHLOROFORM			
CHLORODIBROMOMETHANE			
CHLOROETHANE			
2-CHLOROETHYL VINYL ETHER			
1,2-DIBROMOETHANE			
DICHLOROBROMOMETHANE			
DICHLORODIFLUOROMETHANE			
1,1-DICHLOROETHANE			
1,2-DICHLOROETHANE			
1,1-DICHLOROETHYLENE			
TRANS-1,2-DICHLOROETHYLENE			
1,2-DICHLOROPROPANE			
1,3-DICHLOROPROPYLENE			
CIS-1,3-DICHLOROPROPYLENE			
TRANS-1,3-DICHLOROPROPYLENE			
ETHYLBENZENE			
FREON 113			
2-HEXANONE			
4-METHYL-2-PENTANONE			
STYRENE			
TRICHLOROFLUOROMETHANE			
1,1,2,2-TETRACHLOROETHANE			
1,1,1-TRICHLOROETHANE			
1,1,2-TRICHLOROETHANE			
TETRACHLOROETHYLENE			
TRICHLOROETHYLENE			
TOLUENE			
VINYL ACETATE			
VINYL CHLORIDE			
m-XYLENE			
o-XYLENE			
p-XYLENE			
TOTAL XYLENES			

WATER ANALYSIS-VOLATILES RESULTS IN ppb

WELL # C-38

TOP OF SCREEN= -34.00 BOTTOM OF SCREEN= -14.00 TOTAL DEPTH= 58.00

DATE	07/01/86	07/11/86	11/18/86
LAB	EUREKA	MCLAREN	MCLAREN
MCLAREN ID	47090	127480	001524
DETECTION LIMIT	5	1	0.5
ANALYSIS	624	601	601,602

MEMO

ACETONE				
ACROLEIN				
ACRYLONITRILE				
BENZENE	-	< 0.2	-	-
CHLOROBENZENE	-	<= 0.7	-	-
DICHLOROBENZENE (TOTAL)				
1,2-DICHLOROBENZENE		< 0.2	-	-
1,3-DICHLOROBENZENE		< 0.2	-	-
1,4-DICHLOROBENZENE		4.1	-	-
BROMOFORM	-	< 2	< 2	< 1
BROMOMETHANE	< 10			
DIBROMOMETHANE				
2-BUTANONE				
CARBON DISULFIDE				
CARBON TETRACHLORIDE	-		-	-
CHLOROMETHANE	< 10		-	-
DICHLOROMETHANE	-		-	-
CHLOROFORM	-		-	-
CHLORODIBROMOMETHANE	< 10	< 2	< 2	< 1
CHLOROETHANE	< 10			
2-CHLOROETHYL VINYL ETHER	< 10			
1,2-DIBROMOETHANE	-		-	-
DICHLORODIBROMOMETHANE	-		-	-
DICHLORODIFLUOROMETHANE	-		-	-
1,1-DICHLOROETHANE	-		-	-
1,2-DICHLOROETHANE	-		-	-
1,1-DICHLOROETHYLENE	-		-	-
TRANS-1,2-DICHLOROETHYLENE	-	2	2	-
1,2-DICHLOROPROPANE	-		-	-
1,3-DICHLOROPROPYLENE	-		-	-
CIS-1,3-DICHLOROPROPYLENE	-		-	-
TRANS-1,3-DICHLOROPROPYLENE	-		-	-
ETHYLBENZENE	-	1		
FREON 113				
2-HEXANONE				
4-METHYL-2-PENTANONE				
STYRENE				
TRICHLOROFLUOROMETHANE	< 10		-	-
1,1,2,2-TETRACHLOROETHANE	-		-	-
1,1,1-TRICHLOROETHANE	41	5	5	-
1,1,2-TRICHLOROETHANE	-		-	-
TETRACHLOROETHYLENE	-		-	-
TRICHLOROETHYLENE	-	7	6	5.5
TOLUENE	-	0.4		-
VINYL ACETATE				
VINYL CHLORIDE	< 10	< 2	< 2	< 1
m-XYLENE		<= 0.7		-
o-XYLENE		0.4		-
p-XYLENE		0.6		-
TOTAL XYLENES	-			

WATER ANALYSIS-VOLATILES RESULTS IN DGB

WELL # C-40

TOP OF SCREEN= -21.00 BOTTOM OF SCREEN= -33.00 TOTAL DEPTH= 56.00

DATE	06/30/86	06/30/86	11/13/86	11/13/86
LAB	MCLAREN	EUREKA	MCLAREN	MCLAREN
	1268A	47065	003298	0033016
DETECTION LIMIT	.2	5	0.5	0.5
ANALYSIS	601,602	621	601,602	601,602
MEMO				BLANK

ACETONE					
ACROLEIN					
ACRYLONITRILE					
BENZENE	-				
CHLOROBENZENE	-				
DICHLOROBENZENE (TOTAL)	-				
1,2-DICHLOROBENZENE	-				
1,3-DICHLOROBENZENE	-				
1,4-DICHLOROBENZENE	-				
BROMOFORM	<	2			
BROMOMETHANE					
DIBROMOMETHANE					
2-BUTANONE					
CARBON DISULFIDE					
CARBON TETRACHLORIDE	<	1			
CHLOROMETHANE					
DICHLOROMETHANE	<	1			
CHLOROFORM	<	1			
CHLORODIBROMOMETHANE	<	2			
CHLOROETHANE					
2-CHLOROETHYL VINYL ETHER					
1,2-DIBROMOMETHANE					
DICHLOROBROMOMETHANE	<	1			
DICHLORODIFLUOROMETHANE					
1,1-DICHLOROETHANE	<	25			
1,2-DICHLOROETHANE	<	1			
1,1-DICHLOROETHYLENE	<	1			
TRANS-1,2-DICHLOROETHYLENE					
1,2-DICHLOROPROPANE	<	12			
1,3-DICHLOROPROPYLENE	<	1			
CIS-1,3-DICHLOROPROPYLENE	<	1			
TRANS-1,3-DICHLOROPROPYLENE	<	1			
ETHYLBENZENE					
FREON 113					
2-HEXANONE					
4-METHYL-2-PENTANONE					
STYRENE					
TRICHLOROFUOROMETHANE	<	1			
1,1,2,2-TETRACHLOROETHANE	<	1			
1,1,1-TRICHLOROETHANE					
1,1,2-TRICHLOROETHANE	<	4			
TETRACHLOROETHYLENE	<	1			
TRICHLOROETHYLENE	<	1			
TOLUENE					
VINYL ACETATE					
VINYL CHLORIDE	<	2			
m-XYLENE					
o-XYLENE					
p-XYLENE					
TOTAL XYLENES					

WATER ANALYSIS-VOLATILES RESULTS IN PPB

DATE		TOP OF SCREEN=		BOTTOM OF SCREEN=		WELL # C-41		TOTAL DEPTH=	
LAB	07/01/86	-5.00		-15.00		11/18/86		30.00	
MCLAREN	07/01/86	07/01/86		07/01/86		HCLAREN		H & C	
1272B	1272B	47081		47081		003527		56715	
DETECTION LIMIT	50	5		5		500		250	
ANALYSIS	601,602	624		624		601,602		624	
MEMO	YES	YES		YES		YES		YES	

ACETONE									30000
ACROLEIN									< 2500
ACRYLONITRILE									< 2500
BENZENE	< 0.2								-
CHLOROBENZENE	<= 2700			15					-
DICHLOROBENZENE (TOTAL)				-					-
1,2-DICHLOROBENZENE	< 0.2								-
1,3-DICHLOROBENZENE	< 0.2								-
1,4-DICHLOROBENZENE	40								-
BROMOFORM	< 100								-
BROMOMETHANE				< 10					-
DIBROMOMETHANE									-
2-BUTANONE									20000
CARBON DISULFIDE									-
CARBON TETRACHLORIDE									-
CHLOROMETHANE				< 10					-
DICHLOROMETHANE	8400			1900					83000
CHLOROFORM	66			22					-
CHLORODIBROMOMETHANE	< 100			< 10					-
CHLOROETHANE				< 10					-
2-CHLOROETHYL VINYL ETHER				< 10					-
1,2-DIBROMOETHANE									-
DICHLOROBROMOMETHANE									-
DICHLORODIFLUOROMETHANE									-
1,1-DICHLOROETHANE	1000			1400					1600
1,2-DICHLOROETHANE				19					-
1,1-DICHLOROETHYLENE	2500			6600					10000
TRANS-1,2-DICHLOROETHYLENE	210			320					7700
1,2-DICHLOROPROPANE									-
1,3-DICHLOROPROPYLENE									-
CIS-1,3-DICHLOROPROPYLENE									-
TRANS-1,3-DICHLOROPROPYLENE									-
ETHYLBENZENE	2200			1600					4200
FREON 113									-
2-HEXANONE									-
4-METHYL-2-PENTANONE									-
STYRENE									-
TRICHLOROFLUOROMETHANE				< 10					-
1,1,2,2-TETRACHLOROETHANE	<= 170								-
1,1,1-TRICHLOROETHANE	8100			2900					75000
1,1,1,2-TRICHLOROETHANE									-
TETRACHLOROETHYLENE	<= 170			150					280
TRICHLOROETHYLENE	6000			1900					1500
TOLUENE	1500			640					6000
VINYL ACETATE									-
VINYL CHLORIDE	< 100			< 10					-
m-XYLENE	<= 2700								-
o-XYLENE	670								1300
p-XYLENE	2100								4000
TOTAL XYLENES				3500					20000

DATE 09/09/86 12/02/86
 LAB MCLAREN MCLAREN
 MCLAREN ID 001954 004055
 DETECTION LIMIT .5 0.5
 ANALYSIS 601,602 601,602
 MEMO

ACETONE			
ACROLEIN			
ACRYLONITRILE			
BENZENE	< 0.2		
CHLOROBENZENE	< 0.2		
DICHLOROBENZENE (TOTAL)			
1,2-DICHLOROBENZENE	< 0.2		
1,3-DICHLOROBENZENE	< 0.2		
1,4-DICHLOROBENZENE	< 0.2		
BROMOFORM	< 1		
BROMOMETHANE			
DIBROMOMETHANE			
2-BUTANONE			
CARBON DISULFIDE			
CARBON TETRACHLORIDE			
CHLOROMETHANE			
DICHLOROMETHANE			
CHLOROPH	2		
CHLORODIBROMOMETHANE	1		
CHLOROETHANE			
2-CHLOROETHYL VINYL ETHER			
1,2-DIBROMOMETHANE			
DICHLOROBROMOMETHANE			
DICHLORODIFLUOROMETHANE			
1,1-DICHLOROETHANE	2		
1,2-DICHLOROETHANE			14
1,1-DICHLOROETHYLENE			8
TRANS-1,2-DICHLOROETHYLENE			
1,2-DICHLOROPROPANE	1		
1,3-DICHLOROPROPYLENE			
CIS-1,3-DICHLOROPROPYLENE			
TRANS-1,3-DICHLOROPROPYLENE			
ETHYLBENZENE	< 0.2		
FREON 113			
2-HEXANONE			
4-METHYL-2-PENTANONE			
STYRENE			
TRICHLOROFLUOROMETHANE			
1,1,2,2-TETRACHLOROETHANE			16
1,1,1-TRICHLOROETHANE			
1,1,2-TRICHLOROETHANE			
TETRACHLOROETHYLENE			2
TRICHLOROETHYLENE	0.5		
TOLUENE			
VINYL ACETATE			
VINYL CHLORIDE	< 1		
m-XYLENE	< 0.2		
o-XYLENE	< 0.2		
p-XYLENE	< 0.2		
TOTAL XYLENES			

35.00

35.00

DATE	LAB	MCLAREN ID	DETECTION LIMIT	ANALYSIS	MEMO

06/26/86
EUREKA
47058
5
624

05/28/86
HCLAREN
1244A
500
601,602

11/19/86
MCLAREN
003736
3000
601-602

11/19/86
M & C
57315
500
124

Chemical Name	58	<=	57	<	50	<=	90	<	5000	<	5000
ACETONE											
ACROLEIN											
ACRYLONITRILE											
BENZENE	58	<=	3300	<	50	<=	90	<	5000	<	5000
CHLOROBENZENE	-										
DICHLOROBENZENE (TOTAL)											
1,1,2-DICHLOROBENZENE		<	5	<	50						
1,1,3-DICHLOROBENZENE		<	5	<	50						
1,1,4-DICHLOROBENZENE			57	<	200						
BROMOFORM	-	<	1000	<	5000						
BROMOMETHANE	<										
DIBROMOMETHANE	10										
2-BUTANONE											
CARBON DISULFIDE	-										
CARBON TETRACHLORIDE											
CHLOROMETHANE	<										
DICHLOROMETHANE	2100		300000		450000						
CHLOROFORM	63		770		8000						
CHLORODIBROMOMETHANE	<	<=	4700	<	5000						
CHLOROETHANE	<										
2-CHLOROETHYL VINYL ETHER	<										
1,2-DIBROMOETHANE	10										
DICHLOROBROMOMETHANE	-										
DICHLORODIFLUOROMETHANE											
1,1,1,1-TETRACHLOROETHANE	17000		109000		190000						
1,1,2-DICHLOROETHANE	1900		4800								
1,1,1-DICHLOROETHYLENE	9900		4000		4000						
TRANS-1,2-DICHLOROETHYLENE	4800		10000		42000						
1,2-DICHLOROPROPANE	-										
1,1,3-DICHLOROPROPYLENE											
CIS-1,3-DICHLOROPROPYLENE	-	<=	4700								
TRANS-1,3-DICHLOROPROPYLENE	-										
ETHYLBENZENE	21		78		100						
PERFUM 113											
2-HEXANONE											
4-METHYL-2-PENTANONE											
STYRENE	<										
TRICHLOROFLUOROMETHANE	10										
1,1,1,2,2-TETRACHLOROETHANE	-	<=	7900	<=	24000						
1,1,1-TRICHLOROETHANE	4300		290000		600000						
1,1,2-TRICHLOROETHANE	-	<=	4700								
TETRACHLOROETHYLENE	2600	<=	7900	<=	24000						
TRICHLOROETHYLENE	1500		4500		20000						
TOLUENE	1200		7200		9100						
VINYL ACETATE											
VINYL CHLORIDE	<	<	1000	<	5000						
m-XYLENE		<=	57	<=	90						
o-XYLENE			91	</							

WELL # C-44
TOP OF SCREEN= -16.00 BOTTOM OF SCREEN= -26.00 TOTAL DEPTH= 30.00

10/21/86
HCLAREN
002707D
0.5
601

WATER ANALYSIS-VOLATILES RESULTS IN PPD

WELL # C-44
TOP OF SCREEN= -16.00 BOTTOM OF SCREEN= -26.00 TOTAL DEPTH= 30.00

DATE 10/21/86
LAB MCLAREN
MCLAREN ID 002705B
DETECTION LIMIT 0.5
ANALYSIS 601,602
MEMO BLANK

ACETONE	
ACROLEIN	
ACRYLONITRILE	
BENZENE	
CHLOROBENZENE	-
DICHLOROBENZENE (TOTAL)	-
1,2-DICHLOROBENZENE	-
1,3-DICHLOROBENZENE	-
1,4-DICHLOROBENZENE	-
BROMOFORM	< 1
BROMOMETHANE	
DIBROMOMETHANE	
2-BUTANONE	
CARBON DISULFIDE	
CARBON TETRACHLORIDE	-
CHLOROMETHANE	-
DICHLOROMETHANE	-
CHLOROFORM	< 1
CHLORODIBROMOMETHANE	
CHLOROETHANE	
2-CHLOROETHYL VINYL ETHER	
1,2-DIBROMOETHANE	
DICHLOROBROMOMETHANE	-
DICHLORODIFLUOROMETHANE	-
1,1-DICHLOROETHANE	-
1,2-DICHLOROETHANE	-
1,1-DICHLOROETHYLENE	-
TRANS-1,2-DICHLOROETHYLENE	-
1,2-DICHLOROPROPANE	-
1,3-DICHLOROPROPYLENE	-
CIS-1,3-DICHLOROPROPYLENE	-
TRANS-1,3-DICHLOROPROPYLENE	-
ETHYLBENZENE	-
FREON 113	
2-HEXANONE	
4-METHYL-2-PENTANONE	
STYRENE	
TRICHLOROFLUOROMETHANE	-
1,1,2,2-TETRACHLOROETHANE	-
1,1,1-TRICHLOROETHANE	-
1,1,2-TRICHLOROETHANE	-
TETRACHLOROETHYLENE	-
TRICHLOROETHYLENE	-
TOLUENE	
VINYL ACETATE	
VINYL CHLORIDE	< 1
m-XYLENE	-
o-XYLENE	-
p-XYLENE	-
TOTAL XYLENES	

WATER A GAS-VOLATILES RESULTS IN PPB

DATE	TOP OF SCREEN=	BOTTOM OF SCREEN=	WELL #	C-4.5	TOTAL DEPTH=
07/10/86	-9.00	-19.00	07/10/86	12/01/86	35.00
LAB			EUREKA	EUREKA	
MCLAREN ID			41301	41301D	
DETECTION LIMIT			5	5	
ANALYSIS			624	624	
MEMO					

ACETONE					
ACROLEIN					
ACRYLONITRILE					
BENZENE					
CHLOROBENZENE	<		1		
DICHLOROBENZENE (TOTAL)	<		0.2		
1,2-DICHLOROBENZENE	<		0.2		
1,3-DICHLOROBENZENE	<		0.2		
1,4-DICHLOROBENZENE	<		0.2		
BROMOFORM	<		2		
BROMOMETHANE					
DIBROMOMETHANE	<	10			
2-BUTANONE					
CARBON DISULFIDE					
CARBON TETRACHLORIDE					
CHLOROMETHANE			10		
CHLOROFORM			8		
CHLORODIBROMOMETHANE	<=		2		
CHLOROETHANE					
2-CHLOROETHYL VINYL ETHER					
1,2-DIBROMOETHANE			5		
DICHLOROBROMOMETHANE					
DICHLORODIFLUOROMETHANE					
1,1-DICHLOROETHANE		220	110		
1,2-DICHLOROETHYLENE					
1,1-DICHLOROETHYLENE					
TRANS-1,2-DICHLOROETHYLENE			7		
1,2-DICHLOROPROPANE					
1,3-DICHLOROPROPYLENE					
CIS-1,3-DICHLOROPROPYLENE	<=		2		
TRANS-1,3-DICHLOROPROPYLENE					
ETHYLBENZENE	<		0.2		
PREON 113					
2-HEXANONE					
4-METHYL-2-PENTANONE					
STYRENE					
TRICHLOROFLUOROMETHANE					
1,1,2,2-TETRACHLOROETHANE	<=		5		
1,1,1-TRICHLOROETHANE			27		
1,1,2-TRICHLOROETHANE	<=	30	2		
TETRACHLOROETHYLENE	<=		5		
TRICHLOROETHYLENE					
TOLUENE			0.7		
VINYL ACETATE					
VINYL CHLORIDE			54		
m-XYLENE	<	10			
o-XYLENE	<		0.2		
p-XYLENE	<		0.2		
TOTAL XYLENES					

WATER ANALYSIS VOLATILES RESULTS IN PPH

WELL # C-48

TOP OF SCREEN= -11.00 BOTTOM OF SCREEN= -21.00 TOTAL DEPTH= 30.00

DATE	07/01/86	07/08/86	07/09/86	12/31/86
LAB	MCLAREN	EUREKA	EUREKA	MCLAREN
DETECTION LIMIT	1362A	43205	43205D	4622
ANALYSIS	601,602	624	624	601,602
MEMO	YES			

ACETONE				
ACROLEIN				
ACRYLONITRILE				
BENZENE	< 0.2			
CHLOROBENZENE	<= 0.2			<= 0.7
DICHLOROBENZENE (TOTAL)				
1,2-DICHLOROBENZENE	< 0.2			
1,3-DICHLOROBENZENE	< 0.2			0.6
1,4-DICHLOROBENZENE	< 0.2			0.7
BROMOFORM	< 2			1
BROMOMETHANE				
DIBROMOMETHANE		< 10	< 10	
2-BUTANONE				
CARBON DISULFIDE				
CARBON TETRACHLORIDE				
CHLOROMETHANE		< 10	< 10	
DICHLOROMETHANE		< 10	< 10	
CHLOROFORM	15	10	10	
CHLORODIBROMOMETHANE	2	< 10	< 10	1
CHLOROETHANE		< 10	< 10	
2-CHLOROETHYL VINYL ETHER		< 10	< 10	
1,2-DIBROMOETHANE				
DICHLOROBROMOMETHANE				
DICHLORODIFLUOROMETHANE				
1,1-DICHLOROETHANE				3
1,2-DICHLOROETHANE				
1,1-DICHLOROETHYLENE				
TRANS-1,2-DICHLOROETHYLENE				
1,2-DICHLOROPROPANE				
1,3-DICHLOROPROPYLENE				
CIS-1,3-DICHLOROPROPYLENE				
TRANS-1,3-DICHLOROPROPYLENE				
ETHYLBENZENE	< 0.2			0.6
PERON 113				
2-HEXANONE				
4-METHYL-2-PENTANONE				
STYRENE				
TRICHLOROFUOROMETHANE		< 10	< 10	
1,1,2,2-TETRACHLOROETHANE				
1,1,1-TRICHLOROETHANE				
1,1,2-TRICHLOROETHANE				
TETRACHLOROETHYLENE				
TRICHLOROETHYLENE				
TOLUENE	< 0.2			0.6
VINYL ACETATE				
VINYL CHLORIDE		< 10	< 10	1
m-XYLENE	<= 0.2			<= 0.7
o-XYLENE	< 0.2			0.7
p-XYLENE	< 0.2			0.9
TOTAL XYLENES				

WATER ANALYSIS-VOLATILES RESULTS IN PPM

WELL # C-47

TOP OF SCREEN= -16.00 BOTTOM OF SCREEN= -26.00 TOTAL DEPTH= 10.00

DATE

11/12/86

LAB

11/12/86

MCLAREN ID

MCLAREN

DETECTION LIMIT

003316

ANALYSIS

1

MEMO

601,602

ACETONE

ACROLEIN

ACRYLONITRILE

BENZENE

CHLOROBENZENE

DICHLOBENZENE (TOTAL)

1,2-DICHLOROBENZENE

1,3-DICHLOROBENZENE

1,4-DICHLOROBENZENE

BROMOFORM

BROMOMETHANE

DIHYDROMETHANE

2-BUTANONE

CARBON DISULFIDE

CARBON TETRACHLORIDE

CHLOROMETHANE

DICHLOROMETHANE

CHLOROFORM

CHLORODIBROMOMETHANE

CHLOROETHANE

2-CHLOROETHYL VINYL ETHER

1,2-DIBROMOETHANE

DICHLOROBROMOMETHANE

DICHLORODIFLUOROMETHANE

1,1-DICHLOROETHANE

1,2-DICHLOROETHANE

1,1-DICHLOROETHYLENE

TRANS-1,2-DICHLOROETHYLENE

1,2-DICHLOROPROPANE

1,3-DICHLOROPROPYLENE

CIS-1,3-DICHLOROPROPYLENE

TRANS-1,3-DICHLOROPROPYLENE

ETHYLBENZENE

FREON 113

2-HEXANONE

4-METHYL-2-PENTANONE

STYRENE

TRICHLOROFUOROMETHANE

1,1,2,2-TETRACHLOROETHANE

1,1,1-TRICHLOROETHANE

1,1,2-TRICHLOROETHANE

TETRACHLOROETHYLENE

TRICHLOROETHYLENE

TOLUENE

VINYL ACETATE

VINYL CHLORIDE

m-XYLEN

o-XYLEN

p-XYLEN

TOTAL XYLENES

< 0.5

<= 1

< 0.5

< 0.5

< 9

< 5

< 53

< 5

530

160

1200

1

81

150

81

550

7

5

1

5

1

WATER ANALYSIS-VOLATILES RESULTS IN RIBB

TOP OF SCREEN= -13.00 BOTTOM OF SCREEN= -21.00 TOTAL DEPTH= 45.00

WELL # C-48

DATE	06/30/86	11/13/86	11/13/86
LAB	EUREKA	MCLAHEN	MCLAHEN
MCLAHEN ID	47073	003303	003303D
DETECTION LIMIT	5	0.5	1
ANALYSIS	624	601,602	602

MEMO

ACETONE					
ACROLEIN					
ACRYLONITRILE					
BENZENE	-	270	280	310	
CHLOROBENZENE	-	<= 53	<= 0.9	<=	1
DICHLOROBENZENE (TOTAL)					
1,2-DICHLOROBENZENE		47	-	<	1
1,3-DICHLOROBENZENE		29	8		9
1,4-DICHLOROBENZENE		38	21		23
BROMOFORM		2	1		
BROMOMETHANE	< 10				
DIBROMOMETHANE					
2-BUTANONE					
CARBON DISULFIDE		4			
CARBON TETRACHLORIDE	< 10				
CHLOROMETHANE	-	-	-		
DICHLOROMETHANE	-	-	-		
CHLOROFORM	< 10	< 2	< 1		
CHLORODIBROMOMETHANE	< 10				
CHLOROETHANE	< 10				
2-CHLOROETHYL VINYL ETHER	< 10				
1,2-DIBROMOETHANE	-				
DICHLOROBROMOMETHANE	-				
DICHLORODIFLUOROMETHANE	-				
1,1-DICHLOROETHANE	-				
1,2-DICHLOROETHANE	-				
1,1-DICHLOROETHYLENE	-				
TRANS-1,2-DICHLOROETHYLENE	-	6	17		
1,2-DICHLOROPROPANE	-				
1,3-DICHLOROPROPYLENE	-				
CIS-1,3-DICHLOROPROPYLENE	-				
TRANS-1,3-DICHLOROPROPYLENE	-				
ETHYLBENZENE	79	65	63	72	
PERFON 113					
2-HEXANONE					
4-METHYL-2-PENTANONE					
STYRENE	< 10				
TRICHLOROFLUOROMETHANE	-				
1,1,2,2-TETRACHLOROETHANE	-				
1,1,1-TRICHLOROETHANE	-				
1,1,2-TRICHLOROETHANE	-				
TETRACHLOROETHYLENE	-				
TRICHLOROETHYLENE	-	3	10		3
TOLUENE	68	140	2		
VINYL ACETATE					
VINYL CHLORIDE	< 10	2	4		1
m-XYLENE		<= 53	<= 0.9	<=	2
o-XYLENE		64	2		3
p-XYLENE		40	3		
TOTAL XYLENES	270				

WATER ANALYSIS-VOLATILES-RESULTS IN PPH

WELL # C-49

TOP OF SCREEN= -8.00 BOTTOM OF SCREEN= -18.00 TOTAL DEPTH= 30.00

DATE	07/03/86	07/03/86	11/20/86
LAB	HCLAREN	HCLAREN	HCLAREN
HCLAREN ID	13118	001311BD	003725
DETECTION LIMIT	1	1	0.5
ANALYSIS	601,602	601	601,602
MEMO	YES		

ACETONE					
ACROLEIN					
ACRYLONITRILE					
BENZENE	<	0.2			0.5
CHLOROBENZENE	<=	0.2			-
DICHLOROBENZENE (TOTAL)					
1,2-DICHLOROBENZENE		19			5
1,3-DICHLOROBENZENE		0.3			0.7
1,4-DICHLOROBENZENE		3.1			1
BROMOFORM	<	2		<	1
BROMOMETHANE					
DIBROMOMETHANE					
2-MITANONE					
CARBON DISULFIDE					
CARBON TETRACHLORIDE					
CHLOROMETHANE					
DICHLOROMETHANE					4
CHLOROFORM		18		17	-
CHLORODIBROMOMETHANE	<	2		2	1
CHLOROETHANE					
2-CHLOROETHYL VINYL ETHER					
1,2-DIBROMOETHANE					
DICHLOROBROMOMETHANE					
DICHLORODIFLUOROMETHANE					
1,1-DICHLOROETHANE		130		120	180
1,2-DICHLOROETHANE					
1,1-DICHLOROETHYLENE					
TRANS-1,2-DICHLOROETHYLENE		14		13	44
1,2-DICHLOROPROPANE		2		2	
1,3-DICHLOROPROPYLENE					
CIS-1,3-DICHLOROPROPYLENE					
TRANS-1,3-DICHLOROPROPYLENE					
ETHYLBENZENE	<	0.2			
FREON 113					
2-HEXANONE					
4-METHYL-2-PENTANONE					
STYRENE					
TRICHLOROFUOROMETHANE					
1,1,2,2-TETRACHLOROETHANE					
1,1,1-TRICHLOROETHANE		9		10	13
1,1,2-TRICHLOROETHANE					
TETRACHLOROETHYLENE					
TRICHLOROETHYLENE		2		2	
TOLUENE		4.4			0.7
VINYL ACETATE					
VINYL CHLORIDE		67		78	110
m-XYLENE	<=	0.2			
o-XYLENE		0.4			
p-XYLENE	<	0.2			
TOTAL XYLENES					

DATE 11/20/86
 LAB MCLAREN
 MCLAREN ID 3725D
 DETECTION LIMIT 0.5
 ANALYSIS 602
 MEMO

ACETONE	
ACROLEIN	
ACRYLONITRILE	
BENZENE	0.5
CHLOROBENZENE	-
DICHLOROBENZENE (TOTAL)	6
1,2-DICHLOROBENZENE	0.7
1,3-DICHLOROBENZENE	1
1,4-DICHLOROBENZENE	
BROMOFORM	
BROMOMETHANE	
DIBROMOMETHANE	
2-BUTANONE	
CARBON DISULFIDE	
CARBON TETRACHLORIDE	
CHLOROMETHANE	
DICHLOROMETHANE	
CHLOROFORM	
CHLORODIBROMOMETHANE	
CHLOROETHANE	
2-CHLOROETHYL VINYL ETHER	
1,2-DIBROMOETHANE	
DICHLOROBROMOMETHANE	
DICHLORODIFLUOROMETHANE	
1,1-DICHLOROETHANE	
1,2-DICHLOROETHANE	
1,1-DICHLOROETHYLENE	
TRANS-1,2-DICHLOROETHYLENE	
1,2-DICHLOROPROPANE	
1,3-DICHLOROPROPYLENE	
CIS-1,3-DICHLOROPROPYLENE	
TRANS-1,3-DICHLOROPROPYLENE	
ETHYLBENZENE	
FREON 113	
2-HEXANONE	
4-METHYL-2-PENTANONE	
STYRENE	
TRICHLOROFUOROMETHANE	
1,1,2,2-TETRACHLOROETHANE	
1,1,1-TRICHLOROETHANE	
1,1,2-TRICHLOROETHANE	
TETRACHLOROETHYLENE	
TRICHLOROETHYLENE	0.7
TOLUENE	
VINYL ACETATE	
VINYL CHLORIDE	
M-XYLENE	-
O-XYLENE	-
P-XYLENE	-
TOTAL XYLENES	

WATER ANALYSIS - VOLATILES RESULTS IN DDB

WELL # C-50

TOP OF SCREEN = -86.00 BOTTOM OF SCREEN = -96.00 TOTAL DEPTH = 115.00

DATE 10/17/86
LAB D & C
MCLAREN ID 45560
DETECTION LIMIT 1
ANALYSIS 624

10/17/86
MCLAREN
00264480
0.5
601

MEMO

ACETONE	<	10			
ACROLEIN	<	10			
ACRYLONITRILE					
BENZENE		4			
CHLOROBENZENE					
DICHLOROBENZENE (TOTAL)					
1,2-DICHLOROBENZENE					
1,3-DICHLOROBENZENE					
1,4-DICHLOROBENZENE					
BROMOFORM					
BROMOMETHANE					
DIBROMOMETHANE					
2-BUTANONE					
CARBON DISULFIDE					
CARBON TETRACHLORIDE					
CHLOROMETHANE					
DICHLOROMETHANE					
CHLOROFORM					
CHLORODIBROMOMETHANE					
CHLOROETHANE					
2-CHLOROETHYL VINYL ETHER					
1,2-DIBROMOETHANE					
DICHLOROBROMOMETHANE					
DICHLORODIFLUOROMETHANE		4			
1,1-DICHLOROETHANE					
1,2-DICHLOROETHANE		2			
1,1-DICHLOROETHYLENE					
TRANS-1,2-DICHLOROETHYLENE					
1,2-DICHLOROPROPANE					
1,3-DICHLOROPROPYLENE					
CIS-1,3-DICHLOROPROPYLENE					
TRANS-1,3-DICHLOROPROPYLENE					
ETHYLBENZENE					
FREON 113					
2-HEXANONE					
4-METHYL-2-PENTANONE					
STYRENE					
TRICHLOROFUOROMETHANE					
1,1,2,2-TETRACHLOROETHANE					
1,1,1-TRICHLOROETHANE					
1,1,2-TRICHLOROETHANE					
TETRACHLOROETHYLENE		1			
TRICHLOROETHYLENE					
TOLUENE					
VINYL ACETATE					
VINYL CHLORIDE					
m-XYLENE					
o-XYLENE					
p-XYLENE					
TOTAL XYLENES					

WATER ANALYSIS-VOLATILES RESULTS IN PPB

WELL # C-52A

TOP OF SCREEN= -31.00 BOTTOM OF SCREEN= -51.00 TOTAL DEPTH= 174.00

DATE	07/22/86	07/22/86	07/09/86
LAB	MCLAREN	EUREKA	MCLAREN
	001504A	43222D	1331A
DETECTION LIMIT	1	5	1
ANALYSIS	601,602	624	601,602
MEMO			

ACETONE				
ACROLEIN				
ACRYLONITRILE				
BENZENE	< 0.2	-	< 0.2	
CHLOROBENZENE	< 0.2	-	< 0.2	
DICHLOROBENZENE (TOTAL)				
1,2-DICHLOROBENZENE	< 0.2		< 0.2	
1,3-DICHLOROBENZENE	< 0.2		< 0.2	
1,4-DICHLOROBENZENE	< 0.2		< 0.2	
BROMOFORM	< 2	-	< 2	
BROMOMETHANE		< 10	< 10	
DIBROMOMETHANE				
2-BUTANONE				
CARBON DISULFIDE				
CARBON TETRACHLORIDE	-	< 10	-	
CHLOROMETHANE	-	-	-	
DICHLOROMETHANE	-	-	-	
CHLOROFORM	-	< 10	< 10	
CHLORODIBROMOMETHANE	< 2	< 10	< 2	
CHLOROETHANE		< 10		
2-CHLOROETHYL VINYL ETHER		< 10		
1,2-DIBROMOETHANE		< 10		
DICHLOROBROMOMETHANE	-	-	-	
DICHLORODIFLUOROMETHANE	-	-	-	
1,1-DICHLOROETHANE	-	-	-	
1,2-DICHLOROETHANE	-	-	-	
1,1,1-TRICHLOROETHYLENE	-	-	-	
TRANS-1,2-DICHLOROETHYLENE	-	-	-	
1,2-DICHLOROPROPANE	-	-	-	
1,3-DICHLOROPROPYLENE	-	-	-	
CIS-1,3-DICHLOROPROPYLENE	-	-	-	
TRANS-1,3-DICHLOROPROPYLENE	-	-	-	
ETHYLBENZENE	< 0.2	-	< 0.2	
FREON 113				
2-HEXANONE				
4-METHYL-2-PENTANONE				
STYRENE		< 10		
TRICHLOROFUOROMETHANE	-	-	-	
1,1,2,2-TETRACHLOROETHANE	-	-	-	
1,1,1-TRICHLOROETHANE	-	-	-	
1,1,2-TRICHLOROETHANE	-	-	-	
TETRACHLOROETHYLENE	-	-	-	
TRICHLOROETHYLENE	1	-	-	
TOLUENE	2	-	-	
VINYL ACETATE				
VINYL CHLORIDE	< 2	< 10	< 2	
m-XYLENE	< 0.2		< 0.2	
o-XYLENE	< 0.2		< 0.2	
p-XYLENE	< 0.2		< 0.2	
TOTAL XYLENES				

WATER ANAL. VOLATILES RESULTS IN PPB

WELL # C-52A

TOP OF SCREEN= -31.00 BOTTOM OF SCREEN= -51.00 TOTAL DEPTH= 174.00

DATE 10/23/86 10/23/86 10/23/86
 LAB MCLAREN EUREKA MCLAREN
 MCLAREN ID 002780 40730 002778B
 DETECTION LIMIT 0.6 5 0.5
 ANALYSIS 601.602 624 601.602
 MEMO BLANK

ACETONE	77	80	
ACROLEIN			
ACRYLONITRILE	-	-	-
BENZENE	-	-	-
CHLOROBENZENE	-	-	-
DICHLOROBENZENE (TOTAL)	-	-	-
1,2-DICHLOROBENZENE	-	-	-
1,3-DICHLOROBENZENE	-	-	-
1,4-DICHLOROBENZENE	-	-	-
BROMOFORM	< 1	< 1	< 1
BROMOMETHANE	< 10	< 10	< 10
DIBROMOMETHANE	< 10	< 10	< 10
2-BUTANONE	< 10	< 10	< 10
CARBON DISULFIDE	-	-	-
CARBON TETRACHLORIDE	< 10	< 10	< 10
CHLOROMETHANE	< 50	< 50	< 50
DICHLOROMETHANE	-	-	-
CHLOROFORM	< 10	< 10	< 10
CHLORODIBROMOMETHANE	< 10	< 10	< 10
CHLOROETHANE	< 10	< 10	< 10
2-CHLOROETHYL VINYL ETHER	-	-	-
1,2-DIBROMOETHANE	-	-	-
DICHLOROBROMOMETHANE	-	-	-
DICHLORODIFLUOROMETHANE	-	-	-
1,1-DICHLOROETHANE	-	-	-
1,2-DICHLOROETHANE	-	-	-
1,1-DICHLOROETHYLENE	-	-	-
TRANS-1,2-DICHLOROETHYLENE	-	-	-
1,2-DICHLOROPROPANE	-	-	-
1,3-DICHLOROPROPYLENE	-	-	-
CIS-1,3-DICHLOROPROPYLENE	-	-	-
TRANS-1,3-DICHLOROPROPYLENE	-	-	-
ETHYLBENZENE	-	-	-
FREON 113	-	-	-
2-HEXANONE	-	-	-
4-METHYL-2-PENTANONE	-	-	-
STYRENE	< 10	< 10	< 10
TRICHLOROFLUOROMETHANE	-	-	-
1,1,2,2-TETRACHLOROETHANE	-	-	-
1,1,1-TRICHLOROETHANE	-	-	-
1,1,2-TRICHLOROETHANE	-	-	-
TETRACHLOROETHYLENE	-	-	-
TRICHLOROETHYLENE	-	-	-
TOLUENE	< 1	< 1	< 1
VINYL ACETATE	-	-	-
VINYL CHLORIDE	< 10	< 10	< 10
m-XYLENE	-	-	-
o-XYLENE	-	-	-
p-XYLENE	-	-	-
TOTAL XYLENES	-	-	-

WATER ANALYSIS-VOLATILES RESULTS IN PPM

WELL # C-62B

TOP OF SCREEN=-103.00 BOTTOM OF SCREEN=-113.00 TOTAL DEPTH= 236.00

DATE	07/09/86	07/09/86	07/24/86
LAB	MCLAREN	EUREKA	EUREKA
MCLAREN ID	1337A	4323J	001522A
DETECTION LIMIT	1	5	1
ANALYSIS	601,602	624	601,602

MEMO

ACETONE				
ACROLEIN				
ACRYLONITRILE				
BENZENE	< 0.2	-	-	< 0.2
CHLOROBENZENE	< 0.2	-	-	< 0.2
DICHLOROBENZENE (TOTAL)				
1,2-DICHLOROBENZENE	< 0.2			< 0.2
1,3-DICHLOROBENZENE	< 0.2			< 0.2
1,4-DICHLOROBENZENE	< 0.2			< 0.2
BROMOFORM	< 2	-	-	< 2
BROMOMETHANE				
DIBROMOMETHANE		< 10	< 10	
2-INITANONE				
CARBON DISULFIDE				
CARBON TETRACHLORIDE	-	-	-	-
CHLOROMETHANE	-	< 10	< 10	-
DICHLOROMETHANE	-	-	-	-
CHLOROFORM	-	-	-	-
CHLORODIBROMOMETHANE	< 2	< 10	< 10	< 2
CHLOROETHANE		< 10	< 10	
2-CHLOROETHYL VINYL ETHER		< 10	< 10	
1,2-DIBROMOMETHANE	-	-	-	-
DICHLORODIBROMOMETHANE	-	-	-	-
DICHLORODIFLUOROMETHANE	-	-	-	-
1,1-DICHLOROETHANE	-	-	-	-
1,2-DICHLOROETHANE	-	-	-	-
1,1-DICHLOROETHYLENE	-	-	-	-
TRANS-1,2-DICHLOROETHYLENE	-	-	-	-
1,2-DICHLOROPROPANE	-	-	-	-
1,3-DICHLOROPROPYLENE	-	-	-	-
CIS-1,3-DICHLOROPROPYLENE	-	-	-	-
TRANS-1,3-DICHLOROPROPYLENE	-	-	-	-
ETHYLBENZENE	< 0.2	-	-	< 0.2
FREON 113				
2-HEXANONE				
4-METHYL-2-PENTANONE				
STYRENE				
TRICHLOROFLUOROMETHANE	-	< 10	< 10	-
1,1,2,2-TETRACHLOROETHANE	-	-	-	-
1,1,1-TRICHLOROETHANE	-	-	-	-
1,1,2-TRICHLOROETHANE	-	-	-	-
TETRACHLOROETHYLENE	-	-	-	-
TRICHLOROETHYLENE	-	-	-	-
TOLUENE	0.3			< 0.2
VINYL ACETATE				
VINYL CHLORIDE	< 2	< 10	< 10	< 2
m-XYLENE	< 0.2			< 0.2
o-XYLENE	< 0.2			< 0.2
p-XYLENE	< 0.2			< 0.2
TOTAL XYLENES				

WATER ANALYSIS - VOLATILES RESULTS IN PPB

WELL # C-62B

TOP OF SCREEN=-103.00 BOTTOM OF SCREEN=-113.00 TOTAL DEPTH= 236.00

DATE 11/03/86
 LAB MCLAREN
 MCLAREN ID 003077
 DETECTION LIMIT 0.5
 ANALYSIS 601,602
 MEMO

ACETONE	-	-	-
ACROLEIN	-	-	-
ACRYLONITRILE	-	-	-
BENZENE	-	-	-
CHLOROBENZENE	-	-	-
DICHLOROBENZENE (TOTAL)	-	-	-
1,2-DICHLOROBENZENE	-	-	-
1,3-DICHLOROBENZENE	-	-	-
1,4-DICHLOROBENZENE	-	-	-
BROMOFORM	<	1	<
BROMOMETHANE	-	-	-
DIBROMOMETHANE	-	-	-
2-BUTANONE	-	-	-
CARBON DISULFIDE	-	-	-
CARBON TETRACHLORIDE	-	-	-
CHLOROMETHANE	-	-	-
DICHLOROMETHANE	-	-	-
CHLOROFORM	-	-	-
CHLORODIBROMOMETHANE	<	1	<
CHLOROETHANE	-	-	-
2-CHLOROETHYL VINYL ETHER	-	-	-
1,2-DIBROMOETHANE	-	-	-
DICHLOROBROMOMETHANE	-	-	-
DICHLORODIFLUOROMETHANE	-	-	-
1,1-DICHLOROETHANE	-	-	-
1,2-DICHLOROETHANE	-	-	-
1,1-DICHLOROETHYLENE	-	-	-
TRANS-1,2-DICHLOROETHYLENE	-	-	-
1,2-DICHLOROPROPANE	-	-	-
1,3-DICHLOROPROPYLENE	-	-	-
CIS-1,3-DICHLOROPROPYLENE	-	-	-
TRANS-1,3-DICHLOROPROPYLENE	-	-	-
ETHYLBENZENE	-	-	-
FREON 113	-	-	-
2-HEXANONE	-	-	-
4-METHYL-2-PENTANONE	-	-	-
STYRENE	-	-	-
TRICHLOROFUOROMETHANE	-	-	-
1,1,2,2-TETRACHLOROETHANE	-	-	-
1,1,1-TRICHLOROETHANE	-	-	-
1,1,2-TRICHLOROETHANE	-	-	-
TETRACHLOROETHYLENE	-	-	-
TRICHLOROETHYLENE	-	-	-
TOLUENE	-	-	-
VINYL ACETATE	-	-	-
VINYL CHLORIDE	-	-	-
m-XYLENE	-	-	-
o-XYLENE	-	-	-
p-XYLENE	-	-	-
TOTAL XYLENES	-	-	-

WATER ANALYSIS-VOLATILES RESULTS IN PPB

DATE	TOP OF SCREEN=-137.00	BOTTOM OF SCREEN=-157.00	WELL # C-52C	TOTAL DEPTH=
07/09/86				280.00
LAB				
MCLAREN ID	07/09/86	07/23/86		
DETECTION LIMIT	1334A	EUREKA		
ANALYSIS	601.602	42939		
MEMO		5		
		624		

ACETONE				
ACROLEIN				
ACRYLONITRILE				
BENZENE	< 0.2	-		
CHLOROBENZENE	< 0.2	-		
DICHLOROBENZENE (TOTAL)				
1,2-DICHLOROBENZENE	< 0.2			
1,3-DICHLOROBENZENE	< 0.2			
1,4-DICHLOROBENZENE	< 0.2			
BROMOFORM	< 2			
BROMOMETHANE				
DIBROMOMETHANE				
2-BUTANONE				
CARBON DISULFIDE				
CARBON TETRACHLORIDE				
CHLOROMETHANE				
DICHLOROMETHANE				
CHLOROFORM				
CHLORODIBROMOMETHANE	< 2			
CHLOROETHANE				
2-CHLOROETHYL VINYL ETHER				
1,2-DIBROMOETHANE				
DICHLOROBROMOMETHANE				
DICHLORODIFLUOROMETHANE				
1,1-DICHLOROETHANE				
1,2-DICHLOROETHANE				
1,1-DICHLOROETHYLENE				
TRANS-1,2-DICHLOROETHYLENE				
1,2-DICHLOROPROPANE				
1,3-DICHLOROPROPYLENE				
CIS-1,3-DICHLOROPROPYLENE				
TRANS-1,3-DICHLOROPROPYLENE				
ETHYLBENZENE	< 0.2			
FRON 113				
2-HEXANONE				
4-METHYL-2-PENTANONE				
STYRENE				
TRICHLOROFLUOROMETHANE				
1,1,2,2-TETRACHLOROETHANE				
1,1,1-TRICHLOROETHANE	2			
1,1,2-TRICHLOROETHANE				
TETRACHLOROETHYLENE				
TRICHLOROETHYLENE				
TOLUENE	< 0.2			
VINYL ACETATE				
VINYL CHLORIDE				
m-XYLENE	< 2			
o-XYLENE	< 0.2			
p-XYLENE	< 0.2			
TOTAL XYLENES				

WATER ANALYSIS VOLATILES RESULTS IN PPM

WELL # C-62C

TOP OF SCREEN=-137.00 BOTTOM OF SCREEN=-157.00 TOTAL DEPTH= 280.00

DATE 07/23/86
 LAB MCLAREN
 MCLAREN ID 001524A
 DETECTION LIMIT 1
 ANALYSIS 601,602

MEMO

ACETONE			
ACROLEIN			
ACRYLONITRILE			
BENZENE	< 0.2		
CHLOROBENZENE	< 0.2		
DICHLOROBENZENE (TOTAL)			
1,2-DICHLOROBENZENE	< 0.2		
1,3-DICHLOROBENZENE	< 0.2		
1,4-DICHLOROBENZENE	< 0.2		
BROMOFORM	< 2		
BROMOMETHANE			
DIBROMOMETHANE			
2-BUTANONE			
CARBON DISULFIDE			
CARBON TETRACHLORIDE			
CHLOROMETHANE			
DICHLOROMETHANE			
CHLOROFORM	< 2		
CHLORODIBROMOMETHANE			
CHLOROETHANE			
2-CHLOROETHYL VINYL ETHER			
1,2-DIBROMOETHANE			
DICHLOROBROMOMETHANE			
DICHLORODIFLUOROETHANE			
1,1-DICHLOROETHANE			
1,2-DICHLOROETHANE			
1,1-DICHLOROETHYLENE			
TRANS-1,2-DICHLOROETHYLENE			
1,2-DICHLOROPROPANE			
1,3-DICHLOROPROPYLENE			
CIS-1,3-DICHLOROPROPYLENE			
TRANS-1,3-DICHLOROPROPYLENE			
ETHYLBENZENE	< 0.2		
FREON 113			
2-HEXANONE			
4-METHYL-2-PENTANONE			
STYRENE			
TRICHLOROFUOROMETHANE			
1,1,2,2-TETRACHLOROETHANE			
1,1,1-TRICHLOROETHANE			
1,1,2-TRICHLOROETHANE			
TETRACHLOROETHYLENE			
TRICHLOROETHYLENE			
TOLUENE	< 0.2		
VINYL ACETATE			
VINYL CHLORIDE	< 2		
m-XYLENE	< 0.2		
o-XYLENE	< 0.2		
p-XYLENE	< 0.2		
TOTAL XYLENES			

WATER ANALYSIS-VOLATILES RESULTS IN ppb

WELL # C-53

TOP OF SCREEN = -95.00 BOTTOM OF SCREEN = -105.00 TOTAL DEPTH = 125.00

DATE	08/20/86	08/20/86	10/18/86
LAB	MCLAREN	MCLAREN	MCLAREN
ANALYSIS	001836	002656	002656D
DETECTION LIMIT	0.5	0.5	0.5
ANALYSIS	601,602	601,602	601

MEMO

ANALYTE	08/20/86	08/20/86	10/18/86
ACETONE			
ACROLEIN			
ACRYLONITRILE			
BENZENE	< 0.2		
CHLOROBENZENE	< 0.2		
DICHLOROBENZENE (TOTAL)			
1,2-DICHLOROBENZENE	< 0.2		
1,3-DICHLOROBENZENE	< 0.2		
1,4-DICHLOROBENZENE	< 0.2		
BROMOFORM	< 1	< 1	< 1
BROMOETHANE			
DIBROMOMETHANE			
2-BUTANONE			
CARBON DISULFIDE			
CARBON TETRACHLORIDE			
CHLOROMETHANE			
DICHLOROMETHANE	0.6		
CHLOROFORM	1	1	1
CHLORODIBROMOMETHANE	< 1	< 1	< 1
CHLOROETHANE			
2-CHLOROETHYL VINYL ETHER			
1,2-DIBROMOETHANE			
DICHLOROBROMOMETHANE			
DICHLORODIFLUOROMETHANE			
1,1-DICHLOROETHANE			
1,2-DICHLOROETHANE			
1,1-DICHLOROETHYLENE			
TRANS-1,2-DICHLOROETHYLENE	1		
1,2-DICHLOROPROPANE			
1,3-DICHLOROPROPYLENE			
CIS-1,3-DICHLOROPROPYLENE			
TRANS-1,3-DICHLOROPROPYLENE			
ETHYLBENZENE	< 0.2		
FREON 113			
2-HEXANONE			
4-METHYL-2-PENTANONE			
STYRENE			
TRICHLOROFLUOROMETHANE			
1,1,2,2-TETRACHLOROETHANE			
1,1,1-TRICHLOROETHANE		2	
1,1,2-TRICHLOROETHANE			
TETRACHLOROETHYLENE			
TRICHLOROETHYLENE		1	
TOLUENE	0.8		
VINYL ACETATE			
VINYL CHLORIDE	< 1	< 1	< 1
m-XYLENE	< 0.2		
o-XYLENE	< 0.2		
p-XYLENE	< 0.2		
TOTAL XYLENES			

WELL # C-64

[illegible]

DATE	LAB	MCLAREN ID	DETECTION LIMIT	ANALYSIS	MEMO

09/09/86
MCLAREN
001961
0.5
601,602

11/20/86
MCLAREN
003733
0.5
601,602

11/20/86
B & C
57347
10
624

MEMO

Chemical Name	Concentration (ppm)	Concentration (ppb)
ACETONE	< 0.2	< 100
ACROLEIN	< 0.2	< 100
ACRYLONITRILE	-	-
BENZENE	-	-
CHLORODENZENE	2.5	2
DICHLOROBENZENE (TOTAL)	< 0.2	-
1,1,2-DICHLOROBENZENE	< 0.2	-
1,1,3-DICHLOROBENZENE	< 0.2	-
1,1,4-DICHLOROBENZENE	< 1	-
BROMOFORM	< 1	-
BROMOMETHANE	-	-
DIIBROMOMETHANE	-	-
2-BUTANONE	-	-
CARBON DISULFIDE	-	-
CARBON TETRACHLORIDE	-	20
CHLOROMETHANE	-	-
DICHLOROMETHANE	-	-
CHLOROFORM	< 1	< 1
CHLORODIBROMOMETHANE	< 1	-
CHLOROETHANE	-	-
2-CHLOROETHYL VINYL ETHER	-	-
1,2-DIBROMOETHANE	-	-
DICHLOROBROMOMETHANE	44	36
DICHLORODIFLUOROMETHANE	-	-
1,1-DICHLOROETHANE	-	-
1,2-DICHLOROETHANE	2	-
1,1-DICHLOROETHYLENE	150	260
TRANS-1,2-DICHLOROETHYLENE	0.7	-
1,2-DICHLOROPROPANE	-	-
1,3-DICHLOROPROPYLENE	-	-
CIS-1,3-DICHLOROPROPYLENE	-	-
TRANS-1,3-DICHLOROPROPYLENE	-	-
ETHYLBENZENE	< 0.2	-
FREON 113	-	-
2-HEXANONE	-	-
4-METHYL-2-PENTANONE	-	-
STYRENE	-	-
TRICHLOROFLUOROMETHANE	-	-
1,1,2,2-TETRACHLOROETHANE	-	-
1,1,1-TRICHLOROETHANE	-	58
1,1,1,2-TRICHLOROETHANE	-	-
TETRACHLOROETHYLENE	-	-
TRICHLOROETHYLENE	9.5	5
TOLUENE	< 0.2	-
VINYL ACETATE	150	200
VINYL CHLORIDE	< 0.2	-
m-XYLENE	< 0.2	-
o-XYLENE	< 0.2	-
p-XYLENE	< 0.2	-
TOTAL XYLENES	-	350

WATER ANALYSIS-VOLATILES RESULTS IN PPB

WELL # C-55

TOP OF SCREEN= -35.00 BOTTOM OF SCREEN= -55.00 TOTAL DEPTH= 71.00

DATE 07/17/86 07/17/86
 LAB HCLAREN EUREKA
 HCLAREN ID 1435 42956
 DETECTION LIMIT 1 5
 ANALYSIS 601,602 624
 HENQ 601,602

ACETONE					
ACROLEIN					
ACRYLONITRILE					
BENZENE	78				
CHLOROBENZENE	< 0.2				
DICHLOROBENZENE (TOTAL)					
1,2-DICHLOROBENZENE	< 0.2				
1,3-DICHLOROBENZENE	< 0.2				
1,4-DICHLOROBENZENE	1				
BROMOFORM	2				
BROMOMETHANE					
DIBROMOMETHANE					
2-BUTANONE					
CARBON DISULFIDE					
CARBON TETRACHLORIDE					
CHLOROMETHANE					
DICHLOROMETHANE					
CHLOROFORM	2				
CHLORODIBROMOMETHANE	3				
CHLOROETHANE					
2-CHLOROETHYL VINYL ETHER					
1,2-DIBROMOETHANE					
DICHLOROBROMOMETHANE					
DICHLORODIFLUOROMETHANE	200				
1,1-DICHLOROETHANE					
1,2-DICHLOROETHANE	24				
1,1-DICHLOROETHYLENE	190				
TRANS-1,2-DICHLOROETHYLENE					
1,2-DICHLOROPROPANE					
1,3-DICHLOROPROPYLENE					
CIS-1,3-DICHLOROPROPYLENE	3				
TRANS-1,3-DICHLOROPROPYLENE					
ETHYLBENZENE	< 0.2				
FRON 113					
2-HEXANONE					
4-METHYL-2-PENTANONE					
STYRENE					
TRICHLOROFUOROMETHANE					
1,1,2,2-TETRACHLOROETHANE	9				
1,1,1-TRICHLOROETHANE	7				
1,1,2-TRICHLOROETHANE	3				
TETRACHLOROETHYLENE	9				
TRICHLOROETHYLENE	50				
TOLUENE	1				
VINYL ACETATE					
VINYL CHLORIDE	14				
m-XYLENE	< 0.2				
o-XYLENE	0.8				
p-XYLENE	< 0.2				
TOTAL XYLENES					

WATER ANALYSIS-VOLATILES RESULTS IN RDB

TOP OF SCREEN= -35.00 BOTTOM OF SCREEN= -55.00 TOTAL DEPTH= 70.00

WELL # C-56

DATE	07/17/86	07/17/86	11/07/86
LAB	MCLAREN	EUREKA	MCLAREN
	1437	42971	003148
		5	0.5
DETECTION LIMIT	1	624	601,602
ANALYSIS	601,602		

MEMO

ACETONE				
ACROLEIN				
ACRYLONITRILE				
BENZENE	< 0.2	-	-	-
CHLOROBENZENE	< 0.2	-	-	-
DICHLOROBENZENE (TOTAL)				
1,2-DICHLOROBENZENE	< 0.2			
1,3-DICHLOROBENZENE	< 0.2			
1,4-DICHLOROBENZENE	< 0.2			
BROMOFORM	< 2			< 1
BROMOMETHANE				
DIBROMOMETHANE		< 10	< 10	
2-BUTANONE				
CARBON DISULFIDE				
CARBON TETRACHLORIDE				
CHLOROMETHANE		< 10	< 10	
DICHLOROMETHANE		< 10	< 10	
CHLOROFORM	3			
CHLORODIBROMOMETHANE	2			< 1
CHLOROETHANE		< 10	< 10	
2-CHLOROETHYL VINYL ETHER				
1,2-DIBROMOETHANE				
DICHLOROBROMOMETHANE				
DICHLORODIFLUOROMETHANE				
1,1-DICHLOROETHANE	96	180	180	200
1,2-DICHLOROETHANE	12	20	20	9
1,1-DICHLOROETHYLENE	26	30	40	71
TRANS-1,2-DICHLOROETHYLENE				27
1,2-DICHLOROPROPANE				
1,3-DICHLOROPROPYLENE				
CIS-1,3-DICHLOROPROPYLENE				
TRANS-1,3-DICHLOROPROPYLENE				
ETHYLBENZENE	< 0.2			
FREON 113				
2-HEXANONE				
4-METHYL-2-PENTANONE				
STYRENE				
TRICHLOROFLUOROMETHANE				
1,1,2,2-TETRACHLOROETHANE				
1,1,1-TRICHLOROETHANE	2			< 1
1,1,2-TRICHLOROETHANE				
TETRACHLOROETHYLENE	3			< 1
TRICHLOROETHYLENE	4.2			26
TOLUENE				
VINYL ACETATE				
VINYL CHLORIDE				
m-XYLENE	< 0.2			
o-XYLENE	< 0.6			
p-XYLENE	< 0.2			
TOTAL XYLENES				

WATER ANALYSIS-VOLATILES RESULTS IN. P.P.B.

TOP OF SCREEN= 97.00 BOTTOM OF SCREEN= 117.00 TOTAL DEPTH= 120.00

WELL # C-67

DATE 09/09/86
LAB MCLAREN
MCLAREN ID 001970
DETECTION LIMIT 0.5
ANALYSIS 601,602
MEMO 601,602

ACETONE		
ACROLEIN		
ACRYLONITRILE		
BENZENE	< 0.2	-
CHLOROBENZENE	< 0.2	-
DICHLOROBENZENE (TOTAL)		
1,2-DICHLOROBENZENE	< 0.2	-
1,3-DICHLOROBENZENE	< 0.2	-
1,4-DICHLOROBENZENE	< 0.2	-
BROMOFORM	< 1	< 1
BROMOMETHANE		
DIBROMOMETHANE		
2-BUTANONE		
CARBON DISULFIDE		
CARBON TETRACHLORIDE	-	-
CHLOROMETHANE	-	-
DICHLOROMETHANE	-	-
CHLOROFORM	-	-
CHLORODIBROMOMETHANE	< 1	< 1
CHLOROETHANE		
2-CHLOROETHYL VINYL ETHER		
1,2-DIBROMOETHANE	-	-
DICHLOROBROMOMETHANE	-	-
DICHLORODIFLUOROMETHANE	-	-
1,1-DICHLOROETHANE	-	-
1,2-DICHLOROETHANE	-	-
1,1-DICHLOROETHYLENE	-	-
TRANS-1,2-DICHLOROETHYLENE	-	-
1,2-DICHLOROPROPANE	-	-
1,3-DICHLOROPROPYLENE	-	-
CIS-1,3-DICHLOROPROPYLENE	-	-
TRANS-1,3-DICHLOROPROPYLENE	-	-
ETHYLBENZENE	< 0.2	-
FREON 113		
2-HEXANONE		
4-METHYL-2-PENTANONE		
STYRENE		
TRICHLOROFUOROMETHANE	-	-
1,1,2,2-TETRACHLOROETHANE	-	-
1,1,1-TRICHLOROETHANE	-	-
1,1,2-TRICHLOROETHANE	-	-
TETRACHLOROETHYLENE	-	-
TRICHLOROETHYLENE	0.7	-
TOLUENE		
VINYL ACETATE	< 1	< 1
VINYL CHLORIDE	< 0.2	-
m-XYLENE	< 0.2	-
o-XYLENE	< 0.2	-
p-XYLENE	< 0.2	-
TOTAL XYLENES		

DATE: 02/19/86
 LAB: SCLAREN
 4555
 5
 601

ACETONE		
ACROLEIN		
ACRYLONITRILE		
ACRYLONE		
1-HYDROBENZENE		
1,2-DICHLOROBENZENE (TOTAL)		
1,2-DICHLOROBENZENE		
1,3-DICHLOROBENZENE		
1,4-DICHLOROBENZENE		
BROMOFORM		5
BROMOMETHANE		
BROMODIMETHANE		
2-BR TANONE		
CARBON DISULFIDE		
CARBON TETRACHLORIDE		
CHLOROMETHANE		
DICHLOROMETHANE		
CHLOROFORM		
CHLORODIBROMOMETHANE		5
CHLOROETHANE		
2-CHLOROETHYL VINYL ETHER		
1,2-DIBROMOETHANE		
1,1-DIBROMOMETHANE		
DICHLORODIFLUOROMETHANE		
1,1-DICHLOROETHANE		
1,2-DICHLOROETHANE		
1,1-DICHLOROETHYLENE		
TRANS-1,2-DICHLOROETHYLENE		
1,2-DICHLOROPROPANE		
1,3-DICHLOROPROPYLENE		
CIS-1,3-DICHLOROPROPYLENE		
TRANS-1,3-DICHLOROPROPYLENE		
ETHYLBENZENE		
HEXANONE		
1-METHYL-2-PENTANONE		
STYRENE		
DICHLORODIFLUOROMETHANE		
1,1,2,2-TETRACHLOROETHANE		
1,1,1,1-TETRACHLOROETHANE		
1,1,2,2-TETRACHLOROETHANE		
1,1,2,2-TETRACHLOROETHYLENE		
TRICHLOROETHYLENE		
TRICHLOROETHYLENE		
TRICHLOROETHYLENE		
VINYL ACETATE		5
VINYL CHLORIDE		
o-XYLENE		
p-XYLENE		
TOTAL ANALYST		65

WELL # C-59
TOP OF SCREEN= 25.00 BOTTOM OF SCREEN= 35.00 TOTAL DEPTH= 38.00

CH:3H

Chemical Name	Concentration (ppm)	Reference
ACETONE		
ACROLEIN		
ACRYLONITRILE		
BENZENE		
CHLOROBENZENE		
DICHLOROBENZENE (TOTAL)		
1,2-DICHLOROBENZENE		
1,3-DICHLOROBENZENE		
1,4-DICHLOROBENZENE		
BROMOFORM		
BROMOMETHANE		
DIBROMOMETHANE		
2-BUTANONE		
CARBON DISULFIDE		
CARBON TETRACHLORIDE		
CHLOROMETHANE		
DICHLOROMETHANE		
CHLOROFORM		
CHLORODIBROMOMETHANE		
CHLOROETHANE		
2-CHLOROETHYL VINYL ETHER		
1,2-DIBROMOETHANE		
DICHLOROBROMOMETHANE		
DICHLORODIFLUOROMETHANE		
1,1-DICHLOROETHANE		
1,2-DICHLOROETHANE		
1,1-DICHLOROETHYLENE		
TRANS-1,2-DICHLOROETHYLENE		
1,2-DICHLOROPROPANE		
1,3-DICHLOROPROPYLENE		
CIS-1,3-DICHLOROPROPYLENE		
TRANS-1,3-DICHLOROPROPYLENE		
ETHYLBENZENE		
PERON 113		
2-HEXANONE		
4-METHYL-2-PENTANONE		
STYRENE		
TRICHLOROFUOROMETHANE		
1,1,2,2-TETRACHLOROETHANE		
1,1,1-TRICHLOROETHANE		
1,1,2-TRICHLOROETHANE		
TETRACHLOROETHYLENE		
TRICHLOROETHYLENE		
TOLUENE		
VINYL ACETATE		
VINYL CHLORIDE		
m-XYLENE		
o-XYLENE		
p-XYLENE		
TOTAL XYLENES		

WATER ANALYSIS-VOLATILES RESULTS IN RPD

WELL # C-60

TOP OF SCREEN= 25.00 BOTTOM OF SCREEN= 35.00 TOTAL DEPTH= 38.00

DATE 12/16/86
LAB MCLAREN
MCLAREN ID 004455
DETECTION LIMIT 13
ANALYSIS 601.602
MEMO

ACETONE		
ACROLEIN		
ACRYLONITRILE		
BENZENE	<	0.5
CHLOROBENZENE	<	0.5
DICHLOROBENZENE (TOTAL)		
1,2-DICHLOROBENZENE	<	0.5
1,3-DICHLOROBENZENE	<	0.5
1,4-DICHLOROBENZENE	<	0.5
BROMOPORH	<	25
BROMOMETHANE		
DIBROMOMETHANE		
2-BUTANONE		
CARBON DISULFIDE		
CARBON TETRACHLORIDE		
CHLOROMETHANE		
DICHLOROMETHANE		
CHLOROFORM		110
CHLORODIBROMOMETHANE	<	25
CHLOROETHANE		
2-CHLOROETHYL VINYL ETHER		
1,2-DIBROMOETHANE		
DICHLORODIBROMOMETHANE		
DICHLORODIFLUOROMETHANE		
1,1-DICHLOROETHANE		50
1,2-DICHLOROETHANE		
1,1-DICHLOROETHYLENE		
TRANS-1,2-DICHLOROETHYLENE		
1,2-DICHLOROPROPANE		
1,3-DICHLOROPROPYLENE		
CIS-1,3-DICHLOROPROPYLENE		
TRANS-1,3-DICHLOROPROPYLENE		
ETHYLBENZENE	<	0.5
FREON 113		
2-HEXANONE		
4-METHYL-2-PENTANONE		
STYRENE		
TRICHLOROFLUOROMETHANE		
1,1,2,2-TETRACHLOROETHANE		
1,1,1-TRICHLOROETHANE		
1,1,2-TRICHLOROETHANE		
TRICHLOROETHYLENE		1600
TRICHLOROETHYLENE	<	0.5
TOLUENE		
VINYL ACETATE		
VINYL CHLORIDE	<	25
m-XYLENE	<	0.5
o-XYLENE		1
p-XYLENE	<	0.5
TOTAL XYLES		

WATER ANALYSIS - VOLATILES RESULTS IN PPM TOP OF SCREEN= 25.00 BOTTOM OF SCREEN= 35.00 TOTAL DEPTH= 38.00

WELL # C-81

DATE 12/16/86
LAB MCCLAREN
MCCLAREN ID 4450
DETECTION LIMIT 0.5
ANALYSIS 601,602
MEMO

ACETONE		
ACROLEIN		
ACRYLONITRILE		
BENZENE	<=	2
CHLOROBENZENE		3
DICHLOROBENZENE (TOTAL)		1
1,2-DICHLOROBENZENE		-
1,3-DICHLOROBENZENE		1
1,4-DICHLOROBENZENE		1
BROMOFORM	<	1
BROMOMETHANE		
DIBROMOMETHANE		
2-BUTANONE		
CARBON DISULFIDE		
CARBON TETRACHLORIDE		
CHLOROMETHANE		
DICHLOROMETHANE		11
CHLOROFORM	<	1
CHLORODIBROMOMETHANE		
CHLOROETHANE		
2-CHLOROETHYL VINYL ETHER		
1,2-DIBROMOETHANE		
DICHLOROBROMOMETHANE		
DICHLORODIFLUOROMETHANE		
1,1-DICHLOROETHANE		
1,2-DICHLOROETHANE		
1,1-DICHLOROETHYLENE		
TRANS-1,2-DICHLOROETHYLENE	8.9	
1,2-DICHLOROPROPANE		
1,3-DICHLOROPROPYLENE		
CIS-1,3-DICHLOROPROPYLENE		
TRANS-1,3-DICHLOROPROPYLENE		
ETHYLBENZENE		2
FREON 113		
2-HEXANONE		
4-METHYL-2-PENTANONE		
STYRENE		
TRICHLOROFUOROMETHANE		
1,1,2,2-TETRACHLOROETHANE		
1,1,1-TRICHLOROETHANE		
1,1,2-TRICHLOROETHANE		
TETRACHLOROETHYLENE		25
TRICHLOROETHYLENE		10
TOLUENE		
VINYL ACETATE	<	1
VINYL CHLORIDE	<=	3
m-XYLENE		4
o-XYLENE		4
p-XYLENE		4
TOTAL XYLENES		

WATER A. SIS-VOLATILES RESULTS IN PPM

WELL # C-83

TOP OF SCREEN= 25.00 BOTTOM OF SCREEN= 35.00 TOTAL DEPTH= 38.00

DATE 12/22/86

LAB MCLAREN

4571B

4568

0.5

601,602

DETECTION LIMIT

ANALYSIS

601

BLANK

MEMO

12/22/86

MCLAREN

4571

0.5

601,602

BLANK

12/22/86

MCLAREN

4569D

0.5

602

ACETONE					
ACROLEIN					
ACRYLONITRILE					
BENZENE					
CHLOROBENZENE					
DICHLOROBENZENE (TOTAL)					
1,2-DICHLOROBENZENE					
1,3-DICHLOROBENZENE					
1,4-DICHLOROBENZENE					
BROMOFORM					
BROMOMETHANE					
DIBROMOMETHANE					
2-BUTANONE					
CARBON DISULFIDE					
CARBON TETRACHLORIDE					
CHLOROMETHANE					
DICHLOROMETHANE					
CHLOROFORM					
CHLORODIBROMOMETHANE					
CHLOROETHANE					
2-CHLOROETHYL VINYL ETHER					
1,2-DIBROMOETHANE					
DICHLOROBROMOMETHANE					
DICHLORODIFLUOROMETHANE					
1,1-DICHLOROETHANE					
1,2-DICHLOROETHANE					
1,1-DICHLOROETHYLENE					
TRANS-1,2-DICHLOROETHYLENE					
1,2-DICHLOROPROPANE					
1,3-DICHLOROPROPYLENE					
CIS-1,3-DICHLOROPROPYLENE					
TRANS-1,3-DICHLOROPROPYLENE					
ETHYLBENZENE					
FREON 113					
2-HEXANONE					
4-METHYL-2-PENTANONE					
STYRENE					
TRICHLOROFLUOROMETHANE					
1,1,2,2-TETRACHLOROETHANE					
1,1,1-TRICHLOROETHANE					
1,1,2-TRICHLOROETHANE					
TETRACHLOROETHYLENE					
TRICHLOROETHYLENE					
TOLUENE					
VINYL ACETATE					
VINYL CHLORIDE					
m-XYLENE					
o-XYLENE					
p-XYLENE					
TOTAL XYLENES					

WATER ANALYSIS (SEMI-VOLATILES) RESULTS IN PPM TOP OF SCREEN= 25.00 BOTTOM OF SCREEN= 35.00 TOTAL DEPTH= 38.00

WELL # C-64

DATE 12/19/86
LAB MCLAREN
MCLAREN ID 4553
DETECTION LIMIT 50
ANALYSIS 601,602
MEMO

ACETONE		
ACROLEIN		
ACRYLONITRILE		
BENZENE	<=	180
CHLOROBENZENE		130
DICHLOROBENZENE (TOTAL)		9
1,2-DICHLOROBENZENE		5
1,3-DICHLOROBENZENE		30
1,4-DICHLOROBENZENE		100
BROMOFORM		
BROMOMETHANE		
DIBROMOMETHANE		
2-BUTANONE		
CARBON DISULFIDE		
CARBON TETRACHLORIDE		
CHLOROMETHANE		510
DICHLOROMETHANE		14000
CHLOROFORM		100
CHLORODIBROMOMETHANE		
CHLOROETHANE		
2-CHLOROETHYL VINYL ETHER		
1,2-DIBROMOETHANE		
DICHLORODIBROMOMETHANE		
DICHLORODIFLUOROMETHANE		590
1,1-DICHLOROETHANE		
1,2-DICHLOROETHANE		
1,1-DICHLOROETHYLENE		670
TRANS-1,2-DICHLOROETHYLENE		570
1,2-DICHLOROPROPANE		
1,3-DICHLOROPROPYLENE		
CIS-1,3-DICHLOROPROPYLENE		
TRANS-1,3-DICHLOROPROPYLENE		130
ETHYLBENZENE		
FREON 113		
2-HEXANONE		
4-METHYL-2-PENTANONE		
STYRENE		
TRICHLOROFLUOROMETHANE		
1,1,2,2-TETRACHLOROETHANE	<=	300
1,1,1-TRICHLOROETHANE		190
1,1,2-TRICHLOROETHANE		
TETRACHLOROETHYLENE	<=	300
TRICHLOROETHYLENE		12000
TOLUENE		310
VINYL ACETATE		
VINYL CHLORIDE		100
m-XYLENE	<=	130
o-XYLENE		190
p-XYLENE		140
TOTAL XYLENES		

DATE	08/01/86	08/21/86	09/11/86	09/11/86
LAB	MCCLAREN	MCCLAREN	MCCLAREN	MCCLAREN
MCCLAREN ID	001629	001834	001973	001973
DETECTION LIMIT	1	0.5	0.5	2.5
ANALYSIS	601,602	601,602	601,602	601
MEMO	YES	YES	YES	YES
ACETONE				
ACROLEIN				
ACRYLONITRILE				
BENZENE	190	<	<	<
CHLOROBENZENE	< 0.2	< 0.2	< 0.2	< 0.2
DICHLOROBENZENE (TOTAL)				
1,2-DICHLOROBENZENE	< 0.2	< 0.2	< 0.2	< 0.2
1,3-DICHLOROBENZENE	< 0.2	< 0.2	< 0.2	< 0.2
1,4-DICHLOROBENZENE	< 0.2	< 0.2	< 0.2	< 0.2
BROMOFORM	<	<	<	<
BROMOMETHANE	2	1	1	5
DIBROMOMETHANE				
2-BUTANONE				
CARBON DISULFIDE				
CARBON TETRACHLORIDE				
CHLOROMETHANE			1	
DICHLOROMETHANE				
CHLOROFORM				
CHLORODIBROMOMETHANE	< 2	< 1	< 1	< 5
CHLOROETHANE				
2-CHLOROETHYL VINYL ETHER				
1,2-DIBROMOETHANE				
DICHLOROBROMOMETHANE				
DICHLORODIFLUOROMETHANE	8	13	24	28
1,1-DICHLOROETHANE			5.8	
1,2-DICHLOROETHANE			3	
1,1-DICHLOROETHYLENE		1	240	400
TRANS-1,2-DICHLOROETHYLENE	310	310		
1,2-DICHLOROPROPANE				
1,3-DICHLOROPROPYLENE				
CIS-1,3-DICHLOROPROPYLENE				
TRANS-1,3-DICHLOROPROPYLENE				
ETHYLBENZENE	< 0.2	< 0.2	< 0.2	<
PREON 113				
2-HEXANONE				
4-METHYL-2-PENTANONE				
STYRENE				
TRICHLOROFLUOROMETHANE				
1,1,2,2-TETRACHLOROETHANE			5	<= 3
1,1,1-TRICHLOROETHANE				
1,1,2-TRICHLOROETHANE				
TETRACHLOROETHYLENE			5	<= 3
TRICHLOROETHYLENE	140	220	170	240
TOLUENE	0.7	1	0.5	
VINYL ACETATE				
VINYL CHLORIDE		20	100	100
m-XYLENE	< 0.2	< 0.2	< 0.2	< 0.2
o-XYLENE	< 0.2	< 0.2	< 0.2	< 0.2
p-XYLENE	< 0.2	< 0.2	< 0.2	< 0.2
TOTAL XYLENES				

WATER ANALYSIS-VOLATILES RESULTS IN GPD

TOP OF SCREEN= 20.00 BOTTOM OF SCREEN= 90.00 TOTAL DEPTH= 95.00				WELL # EW-1	
DATE	09/12/86	09/12/86	09/12/86		
LAB	MCLAREN	MCLAREN	MCLAREN		
LAB ID	001988	001984	001986		
DETECTION LIMIT	0.5	0.5	0.5		
ANALYSIS	601,602	601,602	601,602		
MEMO	YES	YES	YES		
ACETONE					
ACROLEIN					
ACRYLONITRILE					
BENZENE	< 0.2	< 0.2	< 0.2		
CHLOROBENZENE	< 0.2	< 0.2	< 0.2		
DICHLOROBENZENE (TOTAL)					
1,2-DICHLOROBENZENE	< 0.2	< 0.2	< 0.2		
1,3-DICHLOROBENZENE	< 0.2	< 0.2	< 0.2		
1,4-DICHLOROBENZENE	< 0.2	< 0.2	< 0.2		
BROMOFORM	< 1	< 0.5	< 1		
BROMOMETHANE					
DIUROMOMETHANE					
2-NUTANONE					
CARBON DISULFIDE					
CARBON TETRACHLORIDE	-	-	-		
CHLOROMETHANE	-	-	-		
CHLOROFORM	-	-	-		
CHLORODIBROMOMETHANE	< 1	< 0.5	< 1		
CHLOROETHANE					
2-CHLOROETHYL VINYL ETHER					
1,2-DIBROMOETHANE					
DICHLORODIBROMOMETHANE					
DICHLORODIFLUOROMETHANE					
1,1-DICHLOROETHANE	36	32	37		40
1,2-DICHLOROETHANE	-	-	-		
1,1-DICHLOROETHYLENE	2	2	2		
TRANS-1,2-DICHLOROETHYLENE	170	180	190		390
1,2-DICHLOROPROPANE	-	-	-		
1,3-DICHLOROPROPYLENE	-	-	-		
CIS-1,3-DICHLOROPROPYLENE	-	-	-		
TRANS-1,3-DICHLOROPROPYLENE	-	-	-		
ETHYLBENZENE	< 0.2	< 0.2	< 0.2		
FREON 113					
2-HEXANONE					
4-METHYL-2-PENTANONE					
STYRENE					
TRICHLOROFUOROMETHANE	-	-	-		
1,1,2,2-TETRACHLOROETHANE	2	3	2		10
1,1,1-TRICHLOROETHANE	1	-	1		
1,1,2-TRICHLOROETHANE	-	-	-		
TETRACHLOROETHYLENE	2	3	2		
TRICHLOROETHYLENE	77	100	96		50
THOUENE	< 0.2	0.7	0.2		
VINYL ACETATE					
VINYL CHLORIDE	160	150	150		85
m-XYLENE	< 0.2	< 0.2	< 0.2		
p-XYLENE	< 0.2	< 0.2	< 0.2		
TOTAL XYLENES					

WATER ANALYSIS - VOLATILES RESULTS IN PPB

WELL # 25W-1

TOP OF SCREEN= 20.00 BOTTOM OF SCREEN= 90.00 TOTAL DEPTH= 95.00

DATE	09/12/86	09/12/86	09/17/86
LAB	EUREKA	EUREKA	MCCLAREN
MCCLAREN ID	1988ED	42487D	002019
DETECTION LIMIT	5	0.5	0.5
ANALYSIS	624	601,602	601,602
MEMO			YES

ACETONE				
ACROLEIN				
ACRYLONITRILE				
BENZENE				0.8
CHLOROBENZENE				0.2
DICHLOROBENZENE (TOTAL)				
1,2-DICHLOROBENZENE				0.8
1,3-DICHLOROBENZENE				0.2
1,4-DICHLOROBENZENE				0.2
BROMOFORM				1
BROMOMETHANE	<			
DIBROMOMETHANE	10			
2-BUTANONE				
CARBON DISULFIDE				
CARBON TETRACHLORIDE				
CHLOROMETHANE	<	10		
DICHLOROMETHANE	<	50	2	
CHLOROFORM				
CHLORODIBROMOMETHANE	<	10		1
CHLOROETHANE	<	10		
2-CHLOROETHYL VINYL ETHER	<	10		
1,2-DIBROMOETHANE				
DICHLOROBROMOMETHANE				
DICHLORODIFLUOROMETHANE		170	170	70
1,1-DICHLOROETHANE	40			
1,2-DICHLOROETHANE				7
1,1-DICHLOROETHYLENE			470	200
TRANS-1,2-DICHLOROETHYLENE	370			
1,2-DICHLOROPROPANE				
CIS-1,3-DICHLOROPROPYLENE				
1,3-DICHLOROPROPYLENE				
TRANS-1,3-DICHLOROPROPYLENE				
ETHYLENE				0.2
FURON 113				
2-HEXANONE				
4-METHYL-2-PENTANONE				
STYRENE				
TRICHLOROFLUOROMETHANE	<	10		1
1,1,2,2-TETRACHLOROETHANE				
1,1,1-TRICHLOROETHANE				
1,1,2-TRICHLOROETHANE				1
TETRACHLOROETHYLENE			200	66
TRICHLOROETHYLENE	40	180		0.2
TOLUENE				
VINYL ACETATE				100
VINYL CHLORIDE	91			0.2
m-XYLENE				0.2
o-XYLENE				0.2
p-XYLENE				
TOTAL XYLENES				

WATER ANALYSIS-VOLATILES RESULTS IN DDB

TOP OF SCREEN= 20.00 BOTTOM OF SCREEN= 90.00 TOTAL DEPTH= 95.00

WELL # BW-1

DATE	09/17/86	09/19/86	09/22/86	09/24/86
LAB	MCLAREN	MCLAREN	MCLAREN	MCLAREN
MC LAREN ID	002021	002045	002054	002080
DETECTION LIMIT	0.5	0.5	.5	0.5
ANALYSIS	601,602	601,602	601,602	601,602
MEMO	YES	YES	YES	YES

ACETONE				
ACROLEIN				
ACRYLONITRILE				
BENZENE	< 0.2	< 0.2	< 0.2	< 0.2
CHLOROBENZENE	< 0.2	< 0.2	< 0.2	< 0.2
DICHLOROBENZENE (TOTAL)	0.7	0.3	0.2	1
1,2-DICHLOROBENZENE	< 0.2	< 0.2	< 0.2	< 0.2
1,3-DICHLOROBENZENE	< 0.2	< 0.2	< 0.2	< 0.2
1,4-DICHLOROBENZENE	< 1	< 1	< 1	< 1
BROMOFORM				
BROMOMETHANE				
DIBROMOMETHANE				
2-BUTANONE				
CARBON DISULFIDE				
CARBON TETRACHLORIDE				
CHLOROMETHANE				
DICHLOROMETHANE				
CHLOROFORM	< 1	< 1	< 1	< 1
CHLORODIBROMOMETHANE				
CHLOROETHANE				
3-CHLOROETHYL VINYL ETHER				
1,2-DIBROMOETHANE				
DICHLOROBROMOMETHANE				
DICHLORODIFLUOROMETHANE				
1,1-DICHLOROETHANE	48	86	58	73
1,2-DICHLOROETHANE				
1,1-DICHLOROETHYLENE	2	7	9	8.7
TRANS-1,2-DICHLOROETHYLENE	150	250	170	170
1,2-DICHLOROPROPANE		0.5	2	
1,3-DICHLOROPROPYLENE				
CIS-1,3-DICHLOROPROPYLENE				
TRANS-1,3-DICHLOROPROPYLENE				
ETHYL BENZENE	< 0.2	< 0.2	< 0.2	< 0.2
PERON 113				
2-HEXANONE				
4-METHYL-2-PENTANONE				
STYRENE				
TRICHLOROFUOROMETHANE				
1,1,2,2-TETRACHLOROETHANE	<= 1	<= 2		<= 1
1,1,1-TRICHLOROETHANE		3		
1,1,2-TRICHLOROETHANE				
TETRACHLOROETHYLENE	<= 1	<= 2		<= 1
TRICHLOROETHYLENE	49	75	35	42
TOLUENE	< 0.2	< 0.2	< 0.2	< 0.2
VINYL ACETATE				
VINYL CHLORIDE	100	140	150	150
m-XYLENE	< 0.2	< 0.2	< 0.2	< 0.2
o-XYLENE	< 0.2	< 0.2	< 0.2	< 0.2
p-XYLENE	< 0.2	< 0.2	< 0.2	< 0.2
TOTAL XYLENES				

Color Analysis-Statistics in PDF

WELL, # EW-1
 DEPTH= 90.00 TOTAL DEPTH= 95.00

WELL # NEW-1
LEN= 90.00 TOTAL DEPTH=

TOP OF SCREEN= 20.00 BOTTOM OF

THE SILENT EVIDENCE

DATE	09/30/86	10/01/86	10/03/86	10/06/86
LAB	MCLAREN	MCLAREN	MCLAREN	MCLAREN
SOLAREN ID	002358	002395	002375	002421
DETR. TIME LIMIT	0.5	0.5	0.5	0.5
ANALYSIS	601,602	601,602	601,602	601,602
MEMO	YES	YES	YES	YES

[illegible]

WATER ANALYSIS VOLATILES RESULTS IN GPD

WELL # 12W-1

90.00 TOTAL DEPTH= 95.00

DATE 10/16/86 10/16/86 10/16/86
 LAB HCLAREN HCLAREN HCLAREN
 HCLAREN ID 002593 002593D 55494
 DETECTION LIMIT 0.5 0.5 5
 ANALYSIS 601,602 601,602 624
 MEMO

TOP OF SCREEN=	20.00	BOTTOM OF SCREEN=	90.00	TOTAL DEPTH=	95.00
ACETONE					
ACROLEIN					
ACRYLONITRILE					
BENZENE	< 0.5	< 0.5			
CHLOROBENZENE	< 0.5	< 0.5			
DICHLOROBENZENE (TOTAL)	< 0.5	< 0.5			
1,2-DICHLOROBENZENE	< 0.5	< 0.5			
1,3-DICHLOROBENZENE	< 0.5	< 0.5			
1,4-DICHLOROBENZENE	< 0.5	< 0.5			
BROMOFORM	< 1	< 1			
BROMOMETHANE					
2-BUTANONE					
CARBON DISULFIDE					
CARBON TETRACHLORIDE					
CHLOROMETHANE					
DICHLOROMETHANE					
CHLOROFORM					
CHLORODIBROMOMETHANE	< 1	< 1			
CHLOROETHANE					
2-CHLOROETHYL VINYL ETHER					
1,2-DIBROMOETHANE					
DICHLOROBROMOMETHANE					
DICHLORODIFLUOROMETHANE					
1,1-DICHLOROETHANE	88	76	170	120	
1,2-DICHLOROETHANE	19	13	20	10	
1,1-DICHLOROETHYLENE	110	97	360	240	
TRANS-1,2-DICHLOROETHYLENE					
1,2-DICHLOROPROPANE					
1,3-DICHLOROPROPYLENE					
CIS-1,3-DICHLOROPROPYLENE					
TRANS-1,3-DICHLOROPROPYLENE					
ETHYLBENZENE	< 0.5	< 0.5			
FREON 113					
2-HEXANONE					
1-METHYL-2-PENTANONE					
STYRENE					
TRICHLOROFUOROMETHANE					
1,1,2,2-TETRACHLOROETHANE	<= 2	<= 2	10	10	
1,1,1-TRICHLOROETHANE					
1,1,2-TRICHLOROETHANE					
TETRACHLOROETHYLENE	<= 2	<= 2	30	30	
TRICHLOROETHYLENE	35	29			
TOLUENE	< 0.5	< 0.5			
VINYL ACETATE					
VINYL CHLORIDE	140	140	90	70	
m-XYLENE	< 0.5	< 0.5			
o-XYLENE	< 0.5	< 0.5			
p-XYLENE	< 0.5	< 0.5			
TOTAL XYLENES					

WATER ANALYSIS-VOLATILES RESULTS IN PPB WELL # WP-1 12.00 TOTAL DEPTH= 12.00

DATE 08/19/86
LAB MCLAREN
MCLAREN ID 001745
DETECTION LIMIT 13
ANALYSIS 601,602

TOP OF SCREEN= 10.00 BOTTOM OF SCREEN= 12.00

MEMO

ACETONE			
ACROLEIN			
ACRYLONITRILE			
BENZENE	< 0.2	< 2.5	
CHLOROBENZENE	<= 0.4	< 2.5	
DICHLOROBENZENE (TOTAL)			
1,2-DICHLOROBENZENE	0.6	< 2.5	
1,3-DICHLOROBENZENE	0.2	< 2.5	
1,4-DICHLOROBENZENE	0.9	< 2.5	
BROMOFORM	< 26	< 50	
BROMOETHANE			
DIHYDROETHANE			
2-BUTANONE			
CARBON DISULFIDE			
CARBON TETRACHLORIDE			
CHLOROMETHANE			
DICHLOROMETHANE		490	
CHLOROFORM	< 26	< 50	
CHLORODIBROMOMETHANE			
CHLOROETHANE			
2-CHLOROETHYL VINYL ETHER			
1,2-DIBROMOETHANE			
DICHLOROBROMOMETHANE			
DICHLORODIFLUOROMETHANE	160	230	
1,1-DICHLOROETHANE			
1,2-DICHLOROETHANE			
1,1-DICHLOROETHYLENE	2700	3300	
TRANS-1,2-DICHLOROETHYLENE			
1,2-DICHLOROPROPANE			
1,3-DICHLOROPROPYLENE			
CIS-1,3-DICHLOROPROPYLENE			
TRANS-1,3-DICHLOROPROPYLENE	< 0.2	< 2.5	
ETHYLBENZENE			
FREON 113			
2-HEXANONE			
4-METHYL-2-PENTANONE			
STYRENE			
TRICHLOROFUOROMETHANE	<= 30	<= 120	
1,1,2,2-TETRACHLOROETHANE	110		
1,1,1-TRICHLOROETHANE			
1,1,2-TRICHLOROETHANE	<= 30	<= 120	
TETRACHLOROETHYLENE	1900	2800	
TRICHLOROETHYLENE	0.4	< 2.5	
TOLUENE			
VINYL ACETATE	< 26	< 50	
VINYL CHLORIDE	<= 0.4	< 2.5	
m-XYLENE	< 0.2	< 2.5	
o-XYLENE	< 0.2	< 2.5	
p-XYLENE			

WATER ANALYSIS-VOLATILES RESULTS IN PPB

DATE 08/19/86 TOP OF SCREEN= 10.00 BOTTOM OF SCREEN= 12.00 TOTAL DEPTH= 12.00

LAB MCLAREN 12/08/86
MCLAREN ID 001750 MCLAREN
DETECTION LIMIT 13 4254
ANALYSIS 601,602 30
MEMO 601,602

ACETONE				
ACROLEIN				
ACRYLONITRILE				
BENZENE	<	0.2	<	5
CHLOROBENZENE	<=	0.3	<	5
DICHLOROBENZENE (TOTAL)				
1,2-DICHLOROBENZENE		0.4		7
1,3-DICHLOROBENZENE		0.3	<	5
1,4-DICHLOROBENZENE		2	<	5
BROMOFORM				
BROMOMETHANE	<	26	<	50
BROMOMETHANE				
2-BUTANONE				
CARBON DISULFIDE				
CARBON TETRACHLORIDE				
CHLOROMETHANE				
DICHLOROMETHANE				
CHLOROFORM				
CHLORODIBROMOMETHANE	<	26	<	50
CHLOROETHANE				
2-CHLOROETHYL VINYL ETHER				
1,2-DIBROMOETHANE				
DICHLOROBROMOMETHANE				
DICHLORODIFLUOROMETHANE				
1,1-DICHLOROETHANE		126		
1,2-DICHLOROETHANE				
1,1-DICHLOROETHYLENE				
TRANS-1,2-DICHLOROETHYLENE		1800		2700
1,2-DICHLOROPROPANE				
1,3-DICHLOROPROPYLENE				
CIS-1,3-DICHLOROPROPYLENE				
TRANS-1,3-DICHLOROPROPYLENE				
ETHYLBENZENE		0.3	<	5
FREON 113				
2-HEXANONE				
4-METHYL-2-PENTANONE				
STYRENE				
TRICHLOROFUOROMETHANE				
1,1,2,2-TETRACHLOROETHANE	<=	29	<=	130
1,1,1-TRICHLOROETHANE		47		
1,1,2-TRICHLOROETHANE				
TETRACHLOROETHYLENE	<=	29	<=	130
TRICHLOROETHYLENE		790		1600
TOLUENE		2	<	5
VINYL ACETATE				
VINYL CYCLIDE	<	26	<	50
m-XYLEN	<=	0.3	<	5
o-XYLENE		0.5	<	5
p-XYLENE	<	0.2	<	5

WATER ANALYSIS VOLATILES RESULTS IN DIB

TOP OF SCREEN= 10.00 BOTTOM OF SCREEN= 12.00 TOTAL DEPTH= 12.00

WELL # WP-3

DATE 08/19/86
LAB MCLAREN
MCLAREN ID 001751
DETECTION LIMIT 100
ANALYSIS 601,602
MEMO

12/08/86
MCLAREN
42580
2.5
602

12/08/86
MCLAREN
4257
50
601,602
YES

ACETONE					
ACROLEIN					
ACRYLONITRILE					
BENZENE	<	1			
CHLOROBENZENE	<=	4			
DICHLOROBENZENE (TOTAL)					
1,2-DICHLOROBENZENE		200	390		410
1,3-DICHLOROBENZENE		18	58		64
1,4-DICHLOROBENZENE		25	66		72
BROMOFORM	<	200			100
BROMOMETHANE					
DIBROMOMETHANE					
2-BUTANONE					
CARBON DISULFIDE					
CARBON TETRACHLORIDE					
CHLOROMETHANE					
DICHLOROMETHANE					
CHLOROFORM					
CHLORODIBROMOMETHANE	<	200			100
CHLOROETHANE					
2-CHLOROETHYL VINYL ETHER					
1,2-DIBROMOMETHANE					
DICHLOROBROMOMETHANE					
DICHLORODIFLUOROMETHANE		840			
1,1-DICHLOROETHANE					
1,2-DICHLOROETHANE					
1,1-DICHLOROETHYLENE					
TRANS-1,2-DICHLOROETHYLENE		27000			16000
1,2-DICHLOROPROPANE					
1,3-DICHLOROPROPYLENE					
CIS-1,3-DICHLOROPROPYLENE					
TRANS-1,3-DICHLOROPROPYLENE					
ETHYLBENZENE	<	1			
PERON 113					
2-HEXANONE					
4-METHYL-2-PENTANONE					
STYRENE					
TRICHLOROFLUOROMETHANE					
1,1,2,2-TETRACHLOROETHANE	<=	400			650
1,1,1-TRICHLOROETHANE					
1,1,2-TRICHLOROETHANE					
TETRACHLOROETHYLENE	<=	400			650
TRICHLOROETHYLENE		1500			800
TOLUENE		7	4		4
VINYL ACETATE					
VINYL CHLORIDE		10			13
m-XYLENE	<=	4			3
o-XYLENE		4			5
p-XYLENE		2			3
TOTAL XYLENES					

WATER ANALYSIS-VOLATILES RESULTS IN ppb

WELL # WP-4

TOP OF SCREEN=		10.00	BOTTOM OF SCREEN=		12.00	TOTAL DEPTH=		12.00
DATE	06/15/83		05/14/85	08/19/86		12/08/86		
LAB	B & C		B & C	MCLAREN		MCLAREN		
MCLAREN ID	S000263		S000271	001754		4261		
DETECTION LIMIT				100		50		
ANALYSIS				601,602		601,602		
MEMO	YES		YES			YES		

ACETONE	-				
ACROLEIN	-				
ACRYLONITRILE	-				
BENZENE	-				
CHLOROBENZENE	-				
DICHLOROBENZENE (TOTAL)	-				
1,2-DICHLOROBENZENE	-				
1,3-DICHLOROBENZENE	-				
1,4-DICHLOROBENZENE	-				
BROMOFORM	-				
DIBROMOMETHANE	-				
2-BUTANONE	-				
CARBON DISULFIDE	-				
CARBON TETRACHLORIDE	-				
CHLOROMETHANE	-				
DICHLOROMETHANE	-				
CHLOROFORM	-				
CHLORODIBROMOMETHANE	-				
CHLOROETHANE	-				
2-CHLOROETHYL VINYL ETHER	-				
1,2-DIBROMOETHANE	-				
DICHLOROBROMOMETHANE	-				
DICHLORODIFLUOROMETHANE	-				
1,1-DICHLOROETHANE	-				
1,2-DICHLOROETHANE	-				
1,1-DICHLOROETHYLENE	-				
TRANS-1,2-DICHLOROETHYLENE	-				
1,2-DICHLOROPROPANE	-				
1,3-DICHLOROPROPYLENE	-				
CIS-1,3-DICHLOROPROPYLENE	-				
TRANS-1,3-DICHLOROPROPYLENE	-				
ETHYLENE	-				
PERON 113	-				
2-HEXANONE	-				
4-METHYL-2-PENTANONE	-				
STYRENE	-				
TRICHLOROFLUOROMETHANE	-				
1,1,2,2-TETRACHLOROETHANE	-				
1,1,1-TRICHLOROETHANE	-				
1,1,2-TRICHLOROETHANE	-				
TETRACHLOROETHYLENE	-				
TRICHLOROETHYLENE	-				
TOLUENE	-				
VINYL ACETATE	-				
VINYL CHLORIDE	-				
m-XYLENE	-				
o-XYLENE	-				
p-XYLENE	-				

WATER ANALYSIS-VOLATILES RESULTS IN PPB WELLS # WP-4 TOP OF SCREEN= 10.00 BOTTOM OF SCREEN= 12.00 TOTAL DEPTH= 12.00

DATE 12/08/86
 LAB B & C
 MCLAREN ID 50804
 DETECTION LIMIT 624
 ANALYSIS 625
 MEMO

ACETONE	<	1000
ACHOLEIN	<	1000
ACRYLONITRILE	-	-
BENZENE	-	-
CHLOROBENZENE	-	-
DICHLOROBENZENE (TOTAL)	-	-
1,2-DICHLOROBENZENE	-	-
1,3-DICHLOROBENZENE	-	-
1,4-DICHLOROBENZENE	-	-
BROMOFORM	-	-
BROMOMETHANE	-	-
DIBROMOMETHANE	-	-
2-BUTANONE	-	-
CARBON DISULFIDE	-	-
CARBON TETRACHLORIDE	-	-
CHLOROMETHANE	-	-
DICHLOROMETHANE	-	-
CHLOROFORM	-	-
CHLORODIBROMOMETHANE	-	-
CHLOROETHANE	-	-
2-CHLOROETHYL VINYL ETHER	-	-
1,2-DIBROMOETHANE	-	-
DICHLOROBROMOMETHANE	-	-
DICHLORODIFLUOROMETHANE	-	-
1,1-DICHLOROETHANE	320	-
1,2-DICHLOROETHANE	-	-
1,1-DICHLOROETHYLENE	180	-
TRANS-1,2-DICHLOROETHYLENE	23000	-
1,2-DICHLOROPROPANE	-	-
1,3-DICHLOROPROPYLENE	-	-
CIS-1,3-DICHLOROPROPYLENE	-	-
TRANS-1,3-DICHLOROPROPYLENE	-	-
ETHYLBENZENE	-	-
PREON 113	-	-
2-HEXANONE	-	-
4-METHYL-2-PENTANONE	-	-
STYRENE	-	-
TRICHLOROFUOROMETHANE	-	-
1,1,2,2-TETRACHLOROETHANE	-	-
1,1,1-TRICHLOROETHANE	-	-
1,1,2-TRICHLOROETHANE	-	-
TETRACHLOROETHYLENE	1200	-
TRICHLOROETHYLENE	-	-
TOLUENE	-	-
VINYL ACETATE	-	-
VINYL CHLORIDE	-	-
m-XYLENE	-	-
o-XYLENE	-	-
XYLENE	-	-

WATER ANALYSIS-VOLATILES RESULTS IN PPM

WELL # SAMPLE BLANK

0.00

TOP OF SCREEN= 0.00

BOTTOM OF SCREEN= 0.00

TOTAL DEPTH= 0.00

DATE	05/20/86	05/20/86	05/20/86	05/20/86
LAB	MCLAREN	MCLAREN	MCLAREN	MCLAREN
	876	867	866	884
DETECTION LIMIT	1	1	1	1
ANALYSIS	601	601	601	601
MEMO	YES	YES	YES	YES

ACETONE				
ACROLEIN				
ACRYLONITRILE				
BENZENE				
CHLOROBENZENE				
DICHLOROBENZENE (TOTAL)				
1,2-DICHLOROBENZENE				
1,3-DICHLOROBENZENE				
1,4-DICHLOROBENZENE				
BROMOFORM	< 2	< 2	< 2	< 2
BROMOMETHANE				
DIBROMOMETHANE				
2-BUTANONE				
CARBON DISULFIDE				
CARBON TETRACHLORIDE				
CHLOROMETHANE				
DICHLOROMETHANE				
CHLOROFORM	16	1		16
CHLORODIBROMOMETHANE	< 2	< 2	< 2	< 2
CHLOROETHANE				
2-CHLOROETHYL VINYL ETHER				
1,2-DIBROMOETHANE				
DICHLOROBROMOMETHANE				
DICHLORODIFLUOROMETHANE				
1,1-DICHLOROETHANE				
1,2-DICHLOROETHANE	10	10	7	10
1,1-DICHLOROETHYLENE				
TRANS-1,2-DICHLOROETHYLENE				
1,2-DICHLOROPROPANE				
1,3-DICHLOROPROPYLENE				
CIS-1,3-DICHLOROPROPYLENE				
TRANS-1,3-DICHLOROPROPYLENE				
ETHYLBENZENE				
PERON 113				
2-HEXANONE				
3-METHYL-2-PENTANONE				
STYRENE				
TRICHLOROFUOROMETHANE				
1,1,2,2-TETRACHLOROETHANE				
1,1,1-TRICHLOROETHANE	4	6	2	13
1,1,2-TRICHLOROETHANE				
TETRACHLOROETHYLENE				
TRICHLOROETHYLENE				
TOLUENE				
VINYL ACETATE				
VINYL CHLORIDE	< 2	< 2	< 2	< 2
m-XYLENE				
p-XYLENE				

WATER ANALYSIS - VOLATILES RESULTS IN DDB WELL # SAMPLE BLANK

DATE	TOP OF SCREEN=	BOTTOM OF SCREEN=	TOTAL DEPTH=
05/20/86	0.00	0.00	0.00
LAB			
MCLAREN	872	880	41376
DETECTION LIMIT	.5	.5	5
ANALYSIS	602	602	624
MEMO	YES	YES	YES

ACETONE	-	-	-
ACROLEIN	-	-	-
ACRYLONITRILE	-	-	-
BENZENE	-	-	-
CHLOROBENZENE	-	-	-
DICHLOROBENZENE (TOTAL)	-	-	-
1,2-DICHLOROBENZENE	-	-	-
1,3-DICHLOROBENZENE	-	-	-
1,4-DICHLOROBENZENE	-	-	-
BROMOFORM	-	-	-
BROMOMETHANE	-	-	-
DIBROMOMETHANE	-	-	-
2-BUTANONE	-	-	-
CARBON DISULFIDE	-	-	-
CARBON TETRACHLORIDE	-	-	-
CHLOROMETHANE	-	-	-
DICHLOROMETHANE	-	-	-
CHLOROFORM	-	-	-
CHLORODIBROMOMETHANE	-	-	-
CHLOROETHANE	-	-	-
2-CHLOROETHYL VINYL ETHER	-	-	-
1,2-DIBROMOETHANE	-	-	-
DICHLOROBROMOMETHANE	-	-	-
DICHLORODIFLUOROMETHANE	-	-	-
1,1-DICHLOROETHANE	-	-	-
1,2-DICHLOROETHANE	-	-	-
1,1-DICHLOROETHYLENE	-	-	-
TRANS-1,2-DICHLOROETHYLENE	-	-	-
1,2-DICHLOROPROPANE	-	-	-
1,3-DICHLOROPROPYLENE	-	-	-
CIS-1,3-DICHLOROPROPYLENE	-	-	-
TRANS-1,3-DICHLOROPROPYLENE	-	-	-
ETHYLBENZENE	-	-	-
PERON 113	-	-	-
2-HEXANONE	-	-	-
4-METHYL-2-PENTANONE	-	-	-
STYRENE	-	-	-
TRICHLOROFLUOROMETHANE	-	-	-
1,1,2,2-TETRACHLOROETHANE	-	-	-
1,1,1-TRICHLOROETHANE	-	-	-
1,1,2-TRICHLOROETHANE	-	-	-
TETRACHLOROETHYLENE	-	-	-
TRICHLOROETHYLENE	-	-	-
TOLUENE	-	-	-
VINYL ACETATE	-	-	-
VINYL CHLORIDE	-	-	-
m-XYLENE	-	-	-
o-XYLENE	-	-	-
p-XYLENE	-	-	-

WELL # TRIP BLANK
EN= 0.00 TOTAL DEPTH= 0.00

05/20/86

00100110

413124
EUMERA

019840

624

b2b

ACRYLONITRILE

CHLOROBENZENE

1,2-DICHLOROBENZENE

1,4-DICHLOROBENZENE

BROMOMETHANE

2-MUTANE

CARBON TETRA

DICHLOROMETHANE

CHLORODIBROMOMETH

2-CHLOROETHYL

DICHLORODIBROMOMETHANE
DICHLORODIFLUOROMETHANE

1,1-DICHLOROETHANE
1,3-DICHLOROETHANE

TRANS-1,2-DICHLOROCYCLOHEXANE

31A08308011C1D-1

TRANS-1,3-DICHLOROPROPYLENE

REFRIGERANT FREON 113

4-METHYL-2-

TRICHLOROFI.

1,1,1-TRICHLOROETHANE

TETRACHLOROETHYLENE

TOLUENE

VINYL CHLORIDE

o-XYLENE

WATER ANALYSIS-VOLATILES RESULTS IN PPB

WELL # TRIP BLANK

DATE	TOP OF SCREEN=	0.00	BOTTOM OF SCREEN=	0.00	TOTAL DEPTH=	0.00
10/17/86	11/03/86	11/06/86	11/07/86			
MCLAREN	MCLAREN	MCLAREN	MCLAREN			
002645B	003075B	003133B	003146B			
0.5	0.5	0.5	0.5			
602	601,602	601,602	601,602			

MEMO
ANALYSIS
DETECTION LIMIT
MCLAREN ID
LAB

ACETONE	-	-	-	-	-	-
ACROLEIN	-	-	-	-	-	-
ACRYLONITRILE	-	-	-	-	-	-
DENZENE	-	-	-	-	-	-
CHLOROBENZENE	-	-	-	-	-	-
DICHLOROBENZENE (TOTAL)	-	-	-	-	-	-
1,2-DICHLOROBENZENE	-	-	-	-	-	-
1,3-DICHLOROBENZENE	-	-	-	-	-	-
1,4-DICHLOROBENZENE	-	-	-	-	-	-
BROMOFORM	-	-	-	-	-	-
BROMOMETHANE	-	-	-	-	-	-
DIBROMOMETHANE	-	-	-	-	-	-
2-BUTANONE	-	-	-	-	-	-
CARBON DISULFIDE	-	-	-	-	-	-
CARBON TETRACHLORIDE	-	-	-	-	-	-
CHLOROMETHANE	-	-	-	-	-	-
DICHLOROMETHANE	-	-	-	-	-	-
CHLOROFORM	-	-	-	-	-	-
CHLORODIBROMOMETHANE	-	-	-	-	-	-
CHLOROETHANE	-	-	-	-	-	-
2-CHLOROTHYLVINYL ETHER	-	-	-	-	-	-
1,2-DIBROMOETHANE	-	-	-	-	-	-
DICHLOROBROMOMETHANE	-	-	-	-	-	-
DICHLORODIFLUOROMETHANE	-	-	-	-	-	-
1,1-DICHLOROETHANE	-	-	-	-	-	-
1,2-DICHLOROETHANE	-	-	-	-	-	-
1,1-DICHLOROETHYLENE	-	-	-	-	-	-
TRANS-1,2-DICHLOROETHYLENE	-	-	-	-	-	-
1,2-DICHLOROPROPANE	-	-	-	-	-	-
1,3-DICHLOROPROPYLENE	-	-	-	-	-	-
CIS-1,3-DICHLOROPROPYLENE	-	-	-	-	-	-
TRANS-1,3-DICHLOROPROPYLENE	-	-	-	-	-	-
ETHYLBENZENE	-	-	-	-	-	-
FREON 113	-	-	-	-	-	-
2-HEXANONE	-	-	-	-	-	-
4-METHYL-2-PENTANONE	-	-	-	-	-	-
STYRENE	-	-	-	-	-	-
TRICHLOROFUOROMETHANE	-	-	-	-	-	-
1,1,2,2-TETRACHLOROETHANE	-	-	-	-	-	-
1,1,1-TRICHLOROETHANE	-	-	-	-	-	-
1,1,2-TRICHLOROETHANE	-	-	-	-	-	-
TETRACHLOROETHYLENE	-	-	-	-	-	-
TRICHLOROETHYLENE	-	-	-	-	-	-
TOLUENE	-	-	-	-	-	-
VINYL ACETATE	-	-	-	-	-	-
VINYL CHLORIDE	-	-	-	-	-	-
m-XYLENE	-	-	-	-	-	-
o-XYLENE	-	-	-	-	-	-
n-XYLENE	-	-	-	-	-	-

WATER ANALYSIS-VOLATILES RESULTS IN PPM

TOP OF SCREEN= 0.00 BOTTOM OF SCREEN= 0.00 TOTAL DEPTH= 0.00

WELL # TRIP BLANK

DATE	11/10/86	11/12/86	11/18/86
LAD	MCLAREN	MCLAREN	MCLAREN
MCLAREN ID	003177B	003314B	003366B
DETECTION LIMIT	0.5	0.5	0.5
ANALYSIS	601.602	601	601
MEMO		BLANK	BLANK

ACETONE					
ACROLEIN					
ACRYLONITRILE					
BENZENE					
CHLOROBENZENE					
DICHLOROBENZENE (TOTAL)					
1,2-DICHLOROBENZENE					
1,3-DICHLOROBENZENE					
1,4-DICHLOROBENZENE					
BROMOFORM					
BROMOMETHANE					
DIBROMOMETHANE					
2-BUTANONE					
CARBON DISULFIDE					
CARBON TETRACHLORIDE					
CHLOROMETHANE					
DICHLOROMETHANE					
CHLOROFORM	1				
CHLORODIBROMOMETHANE					
CHLOROETHANE					
2-CHLOROETHYL VINYL ETHER					
1,2-DIBROMOETHANE					
DICHLOROBROMOMETHANE					
DICHLORODIFLUOROMETHANE					
1,1-DICHLOROETHANE					
1,2-DICHLOROETHANE					
1,1-DICHLOROETHYLENE					
TRANS-1,2-DICHLOROETHYLENE					
1,2-DICHLOROPROPANE					
1,3-DICHLOROPROPYLENE					
CIS-1,3-DICHLOROPROPYLENE					
TRANS-1,3-DICHLOROPROPYLENE					
ETHYLBENZENE					
FREON 113					
2-HEXANONE					
4-METHYL-2-PENTANONE					
STYRENE					
TRICHLOROFUOROMETHANE					
1,1,2,2-TETRACHLOROETHANE					
1,1,1-TRICHLOROETHANE					
1,1,2-TRICHLOROETHANE					
TETRACHLOROETHYLENE					
TRICHLOROETHYLENE					
TOLUENE					
VINYL ACETATE					
VINYL ALDEHYDE					
m-XYLENE					
o-XYLENE					

WATER ANALYSIS - VOLATILES RESULTS IN PPB

WELL # TRIP BLANK

0.00

TOTAL DEPTH =

0.00

SCREEN =

BOTTOM OF

TOP OF SCREEN =

DATE

11/20/86

LAB

MCLAREN

MCLAREN ID

003727B

DETECTION LIMIT

.5

ANALYSIS

601,602

MEMO

12/17/86

MCLAREN

4458A

0.5

602

ACETONE

ACROLEIN

ACRYLONITRILE

BENZENE

CHLOROBENZENE

DICHLOROBENZENE (TOTAL)

1,2-DICHLOROBENZENE

1,3-DICHLOROBENZENE

1,4-DICHLOROBENZENE

BROMOFORM

BROMOMETHANE

DIBROMOMETHANE

2-BUTANONE

CARBON DISULFIDE

CARBON TETRACHLORIDE

CHLOROMETHANE

DICHLOROMETHANE

CHLOROFORM

CHLORODIBROMOMETHANE

CHLOROETHANE

2-CHLOROETHYL VINYL ETHER

1,2-DIBROMOETHANE

DICHLORODIBROMOMETHANE

DICHLORODIFLUOROMETHANE

1,1-DICHLOROETHANE

1,2-DICHLOROETHANE

1,1-DICHLOROETHYLENE

TRANS-1,2-DICHLOROETHYLENE

1,2-DICHLOROPROPANE

1,3-DICHLOROPROPYLENE

CIS-1,3-DICHLOROPROPYLENE

TRANS-1,3-DICHLOROPROPYLENE

ETHYLBENZENE

FREON 113

2-HEXANONE

4-METHYL-2-PENTANONE

STYRENE

TRICHLOROFUOROMETHANE

1,1,2,2-TETRACHLOROETHANE

1,1,1-TRICHLOROETHANE

1,1,2-TRICHLOROETHANE

TETRACHLOROETHYLENE

TRICHLOROETHYLENE

TOLUENE

VINYL ACETATE

VINYL CHLORIDE

m-XYLENE

o-XYLENE

p-XYLENE

<=

2

13

6

5

4

8.3

33

<=

13

14

17

WATER ANALYSIS-VOLATILES RESULTS IN PPB

WELL # METHOD BLANK
0.00 TOTAL DEPTH=

TOP OF SCREEN= 0.00 BOTTOM OF SCREEN= 0.00

DATE	05/23/86	07/02/86	07/09/86
LAB	EUREKA	EUREKA	EUREKA
MCLAREN ID	MB2	MB3	MB5
DETECTION LIMIT	5	5	5
ANALYSIS	624	624	624
MEMO	YES	YES	YES

ACETONE			
ACROLEIN			
ACRYLONITRILE			
BENZENE	-	-	-
CHLOROBENZENE	-	-	-
DICHLOROBENZENE (TOTAL)			
1,2-DICHLOROBENZENE	< 10	< 10	< 10
1,3-DICHLOROBENZENE	< 10	< 10	< 10
1,4-DICHLOROBENZENE	< 10	< 10	< 10
BROMOFORM	-	-	-
BROMOMETHANE	< 10	< 10	< 10
DIBROMOMETHANE			
2-BUTANONE			
CARBON DISULFIDE			
CARBON TETRACHLORIDE			
CHLOROMETHANE	< 10	< 10	< 10
DICHLOROMETHANE	60	72	86
CHLOROFORM	-	-	-
CHLORODIBROMOMETHANE	< 10	< 10	< 10
CHLOROETHANE	< 10	< 10	< 10
2-CHLOROETHYL VINYL ETHER	< 10	< 10	< 10
1,2-DIBROMOETHANE	-	-	-
DICHLORODIBROMOMETHANE			
DICHLORODIFLUOROMETHANE			
1,1-DICHLOROETHANE	-	-	-
1,2-DICHLOROETHANE	-	-	-
1,1-DICHLOROETHYLENE	-	-	-
TRANS-1,2-DICHLOROETHYLENE	-	-	-
1,2-DICHLOROPROPANE	-	-	-
1,3-DICHLOROPROPYLENE	-	-	-
CIS-1,3-DICHLOROPROPYLENE	-	-	-
TRANS-1,3-DICHLOROPROPYLENE	-	-	-
ETHYLBENZENE			
FREON 113			
2-HEXANONE			
4-METHYL-2-PENTANONE			
STYRENE			
TRICHLOROFLUOROMETHANE	< 10	< 10	< 10
1,1,2,2-TETRACHLOROETHANE	-	-	-
1,1,1-TRICHLOROETHANE	-	-	-
1,1,2-TRICHLOROETHANE	-	-	-
TETRACHLOROETHYLENE	-	-	-
TRICHLOROETHYLENE	-	-	-
TOLUENE			
VINYL ACETATE			
VINYL CHLORIDE			
m-XYLENE	< 10	< 10	< 10
p-XYLENE			

WATER ANALYSIS-VOLATILES RESULTS IN PPM

WELL # R.T.S. TANK
 TOP OF SCREEN= 0.00 BOTTOM OF SCREEN= 0.00 TOTAL DEPTH= 0.00

DATE 10/16/86
 LAB 002570
 MCLAREN ID 002570
 DETECTION LIMIT 0.5
 ANALYSIS 601/602
 MEMO

ACETONE		
ACROLEIN		
ACRYLONITRILE		
BENZENE		
CHLOROBENZENE		
DICHLOROBENZENE (TOTAL)		
1,2-DICHLOROBENZENE		
1,3-DICHLOROBENZENE		
1,4-DICHLOROBENZENE		
BROMOFORM	<	0.001
BROMOMETHANE		
2-BUTANONE		
CARBON DISULFIDE		
CARBON TETRACHLORIDE		
CHLOROMETHANE		
DICHLOROMETHANE		
CHLOROFORM		
CHLORODIBROMOMETHANE	<	0.001
CHLOROETHANE		
2-CHLOROETHYL VINYL ETHER		
1,2-DIBROMOETHANE		
DICHLOROBROMOMETHANE		
DICHLORODIFLUOROMETHANE		
1,1-DICHLOROETHANE		
1,2-DICHLOROETHANE		
1,1-DICHLOROETHYLENE		
TRANS-1,2-DICHLOROETHYLENE		
1,2-DICHLOROPROPANE		
1,3-DICHLOROPROPYLENE		
CIS-1,3-DICHLOROPROPYLENE		
TRANS-1,3-DICHLOROPROPYLENE		
ETHYLBENZENE		
FREON 113		
2-HEXANONE		
4-METHYL-2-PENTANONE		
STYRENE		
TRICHLOROFLUOROMETHANE		
1,1,2,2-TETRACHLOROETHANE		
1,1,1-TRICHLOROETHANE		
1,1,2-TRICHLOROETHANE		
TETRACHLOROETHYLENE		
TRICHLOROETHYLENE		
TOLUENE		
VINYL ACETATE		
VINYL CHLORIDE		
m-XYLENE	<	0.001
p-XYLENE		
o-XYLENE		

CAMP DRESSER & MCKEE INC

SECTION 2

TOTAL PETROLEUM HYDROCARBONS

ATER ANALYSIS-TOTAL PETROLEUM HYDROCARBON RESULTS IN PPM

TOP OF SCREEN= 0.00 BOTTOM OF SCREEN= 0.00 TOTAL DEPTH= 0.00

WELL # BURN PIT

DATE 11/10/86
LAB MCLAREN
MCLAREN ID 003176
DETECTION LIMIT 0.5
ANALYSIS TPH
MEMO

GASOLINE RANGE
DIESEL RANGE
MOTOR OIL RANGE
TOTAL PETROLEUM HYDROCARBONS 0.5

TOP OF SCREEN=-23.00 BOTTOM OF SCREEN=-33.00 TOTAL DEPTH= 40.00

WELL # C-01

DATE 10/22/86
LAB MCLAREN
MCLAREN ID 002720
DETECTION LIMIT 1
ANALYSIS TPH
MEMO

GASOLINE RANGE
DIESEL RANGE
MOTOR OIL RANGE
TOTAL PETROLEUM HYDROCARBONS

TOP OF SCREEN=-19.00 BOTTOM OF SCREEN=-29.00 TOTAL DEPTH= 41.00

WELL # C-02

DATE 10/19/86
LAB MCLAREN
MCLAREN ID 002619
DETECTION LIMIT 0.1
ANALYSIS TPH
MEMO

GASOLINE RANGE
DIESEL RANGE
MOTOR OIL RANGE
TOTAL PETROLEUM HYDROCARBONS

WATER ANALYSIS-TOTAL PETROLEUM HYDROCARBON RESULTS IN ppm

WELL # C-03
TOP OF SCREEN=-23.00 BOTTOM OF SCREEN=-33.00 TOTAL DEPTH= 45.50

DATE 12/02/86
LAB MCLAREN
MCLAREN ID 004069
DETECTION LIMIT 0.3
ANALYSIS TPH
MEMO

GASOLINE RANGE
DIESEL RANGE
MOTOR OIL RANGE
TOTAL PETROLEUM HYDROCARBONS

WELL # C-04
TOP OF SCREEN=-22.00 BOTTOM OF SCREEN=-32.00 TOTAL DEPTH= 43.00

DATE 11/24/86
LAB MCLAREN
MCLAREN ID 003924
DETECTION LIMIT 0.6
ANALYSIS TPH
MEMO

GASOLINE RANGE
DIESEL RANGE
MOTOR OIL RANGE
TOTAL PETROLEUM HYDROCARBONS

WELL # C-05
TOP OF SCREEN=-11.00 BOTTOM OF SCREEN=-21.00 TOTAL DEPTH= 35.50

DATE 10/24/86
LAB MCLAREN
MCLAREN ID 002791
DETECTION LIMIT 0.3
ANALYSIS TPH
MEMO

GASOLINE RANGE
DIESEL RANGE
MOTOR OIL RANGE
TOTAL PETROLEUM HYDROCARBONS

WATER ANALYSIS-TOTAL PETROLEUM HYDROCARBON RESULTS IN PPM

WELL # C-06
 TOP OF SCREEN=13.00 BOTTOM OF SCREEN=23.00 TOTAL DEPTH= 32.50

DATE 11/24/86
 LAB MCLAREN
 MCLAREN ID 003927
 DETECTION LIMIT 0.6
 ANALYSIS TPH
 MEMO

GASOLINE RANGE
 DIESEL RANGE
 MOTOR OIL RANGE
 TOTAL PETROLEUM HYDROCARBONS

0.4

WELL # C-07
 TOP OF SCREEN= 0.57 BOTTOM OF SCREEN= 9.43 TOTAL DEPTH= 21.50

DATE 10/25/86
 LAB MCLAREN
 MCLAREN ID 002786
 DETECTION LIMIT 0.3
 ANALYSIS TPH
 MEMO

GASOLINE RANGE
 DIESEL RANGE
 MOTOR OIL RANGE
 TOTAL PETROLEUM HYDROCARBONS

< 0.3

WELL # C-08
 TOP OF SCREEN= -9.00 BOTTOM OF SCREEN= 19.00 TOTAL DEPTH= 32.50

DATE 11/24/86
 LAB MCLAREN
 MCLAREN ID 003932
 DETECTION LIMIT 0.6
 ANALYSIS TPH
 MEMO

GASOLINE RANGE
 DIESEL RANGE
 MOTOR OIL RANGE
 TOTAL PETROLEUM HYDROCARBONS

WATER ANALYSIS-TOTAL PETROLEUM HYDROCARBON RESULTS IN ppm

WELL # C-09
TOP OF SCREEN=-11.00 BOTTOM OF SCREEN=-21.00 TOTAL DEPTH= 35.50

DATE 11/12/86
LAB MCLAREN
MCLAREN ID 003362
DETECTION LIMIT 0.5
ANALYSIS TPH
MEMO

GASOLINE RANGE
DIESEL RANGE
MOTOR OIL RANGE
TOTAL PETROLEUM HYDROCARBONS

WELL # C-10
TOP OF SCREEN=-4.00 BOTTOM OF SCREEN=-16.00 TOTAL DEPTH= 32.00
09/20/83 12/15/83 03/14/84 09/26/84
B & C B & C B & C B & C
S000235 S000236 S000237 S000238

DATE
LAB
MCLAREN ID
DETECTION LIMIT
ANALYSIS
MEMO

GASOLINE RANGE
DIESEL RANGE
MOTOR OIL RANGE
TOTAL PETROLEUM HYDROCARBONS

8 6.6 1.7 1.8

WELL # C-10
TOP OF SCREEN=-1.00 BOTTOM OF SCREEN=-16.00 TOTAL DEPTH= 32.00

DATE 05/03/85 12/10/86
LAB B & C MCLAREN
MCLAREN ID S000239 4315
DETECTION LIMIT 0.3
ANALYSIS TPH
MEMO YES

GASOLINE RANGE
DIESEL RANGE
MOTOR OIL RANGE
TOTAL PETROLEUM HYDROCARBONS

< 1

WATER ANALYSIS-TOTAL PETROLEUM HYDROCARBON RESULTS IN ppm

WELL # C-11
TOP OF SCREEN= 1.00 BOTTOM OF SCREEN= -9.00 TOTAL DEPTH= 27.00

DATE 09/26/84 11/05/86
LAB B & C MCLAREN B & C
MCLAREN ID S000245T S000715
DETECTION LIMIT 0.3
ANALYSIS TPH
MEMO

GASOLINE RANGE
DIESEL RANGE
MOTOR OIL RANGE
TOTAL PETROLEUM HYDROCARBONS < 1 0.3

WELL # C-12
TOP OF SCREEN= 4.00 BOTTOM OF SCREEN= -6.00 TOTAL DEPTH= 30.00
DATE 09/20/83 03/14/84 09/26/84
LAB B & C B & C B & C
MCLAREN ID S000249 S000250 S000251
DETECTION LIMIT
ANALYSIS
MEMO

GASOLINE RANGE
DIESEL RANGE
MOTOR OIL RANGE
TOTAL PETROLEUM HYDROCARBONS 60 250 130 110

WELL # C-12
TOP OF SCREEN= 4.00 BOTTOM OF SCREEN= -6.00 TOTAL DEPTH= 30.00

DATE 05/03/85 12/18/86
LAB B & C MCLAREN B & C
MCLAREN ID S000253 4535/ 50289
DETECTION LIMIT 9000
ANALYSIS TPH
MEMO

GASOLINE RANGE
DIESEL RANGE
MOTOR OIL RANGE
TOTAL PETROLEUM HYDROCARBONS 24 130000 360000

WATER ANALYSIS-TOTAL PETROLEUM HYDROCARBON RESULTS IN PPM

WELL # C-13
TOP OF SCREEN=-13.00 BOTTOM OF SCREEN=-23.00 TOTAL DEPTH= 40.00

DATE 11/05/86
LAB MCLAREN
MCLAREN ID 003091
DETECTION LIMIT 0.3
ANALYSIS TPH
MEMO METALS/TPH

GASOLINE RANGE
DIESEL RANGE
MOTOR OIL RANGE
TOTAL PETROLEUM HYDROCARBONS 0.2

WELL # C-14
TOP OF SCREEN=-3.00 BOTTOM OF SCREEN=-13.00 TOTAL DEPTH= 35.50

DATE 11/14/86
LAB MCLAREN
MCLAREN ID 003365
DETECTION LIMIT 0.5
ANALYSIS TPH
MEMO

GASOLINE RANGE
DIESEL RANGE
MOTOR OIL RANGE
TOTAL PETROLEUM HYDROCARBONS

WELL # C-15
TOP OF SCREEN=-8.00 BOTTOM OF SCREEN=-28.00 TOTAL DEPTH= 55.00

DATE 09/28/84
LAB B & C
MCLAREN ID S000288T
DETECTION LIMIT S000270T
ANALYSIS TPH
MEMO TPH

GASOLINE RANGE
DIESEL RANGE
MOTOR OIL RANGE
TOTAL PETROLEUM HYDROCARBONS < 1 < 1 0.6

WATER ANALYSIS-TOTAL PETROLEUM HYDROCARBON RESULTS IN ppm

TOP OF SCREEN= -2.00 BOTTOM OF SCREEN= -32.00 TOTAL DEPTH= 53.00 WELL # C-16

DATE 11/21/86
LAB MCLAREN
MCLAREN ID 003778
DETECTION LIMIT 0.5
ANALYSIS TPH
MEMO

GASOLINE RANGE
DIESEL RANGE
MOTOR OIL RANGE
TOTAL PETROLEUM HYDROCARBONS

TOP OF SCREEN= -8.00 BOTTOM OF SCREEN= -28.00 TOTAL DEPTH= 46.00 WELL # C-17

DATE 11/20/86
LAB MCLAREN
MCLAREN ID 003732
DETECTION LIMIT 0.5
ANALYSIS TPH
MEMO

GASOLINE RANGE
DIESEL RANGE
MOTOR OIL RANGE
TOTAL PETROLEUM HYDROCARBONS

WATER ANALYSIS-TOTAL PETROLEUM HYDROCARBON RESULTS IN PPM

DATE 08/24/84 TOP OF SCREEN=-9.00 BOTTOM OF SCREEN=-39.00 TOTAL DEPTH= 54.00
 LAB B & C 04/30/85 12/10/86
 MCLAREN ID S000278 B & C MCLAREN
 DETECTION LIMIT S000278T 4310
 ANALYSIS 0.3
 MEMO YES YES TPH

GASOLINE RANGE
 DIESEL RANGE
 MOTOR OIL RANGE
 TOTAL PETROLEUM HYDROCARBONS 8.1

DATE 12/18/86 TOP OF SCREEN=-9.00 BOTTOM OF SCREEN=-39.00 TOTAL DEPTH= 54.00
 LAB KUREKA
 MCLAREN ID 4531
 DETECTION LIMIT 0.3
 ANALYSIS TPH
 MEMO

GASOLINE RANGE
 DIESEL RANGE
 MOTOR OIL RANGE
 TOTAL PETROLEUM HYDROCARBONS 0.07

DATE 11/21/86 TOP OF SCREEN=-10.00 BOTTOM OF SCREEN=-40.00 TOTAL DEPTH= 50.50
 LAB MCLAREN
 MCLAREN ID 003773
 DETECTION LIMIT 0.5
 ANALYSIS TPH
 MEMO

GASOLINE RANGE
 DIESEL RANGE
 MOTOR OIL RANGE
 TOTAL PETROLEUM HYDROCARBONS

WATER ANALYSIS-TOTAL PETROLEUM HYDROCARBON RESULTS IN ppm

WELL # C-21
TOP OF SCREEN=-24.00 BOTTOM OF SCREEN=-34.00 TOTAL DEPTH= 49.00

DATE 11/12/86
LAB MCLAREN
MCLAREN ID 003313
DETECTION LIMIT 0.5
ANALYSIS TPH
MEMO

GASOLINE RANGE
DIESEL RANGE
MOTOR OIL RANGE
TOTAL PETROLEUM HYDROCARBONS

WELL # C-22
TOP OF SCREEN= 5.00 BOTTOM OF SCREEN=-25.00 TOTAL DEPTH= 50.00

DATE 08/24/84 09/24/84 05/02/85 12/31/86
LAB B & C B & C MCLAREN
MCLAREN ID S000292T S000294T 4624
DETECTION LIMIT TPH
ANALYSIS TPH
MEMO

GASOLINE RANGE
DIESEL RANGE
MOTOR OIL RANGE
TOTAL PETROLEUM HYDROCARBONS

WELL # C-23
TOP OF SCREEN=-21.00 BOTTOM OF SCREEN=-41.00 TOTAL DEPTH= 63.00

DATE 09/29/84 05/14/86 11/13/86
LAB B & C MCLAREN
MCLAREN ID S000296T 00861D 003308
DETECTION LIMIT TPH
ANALYSIS TPH
MEMO

GASOLINE RANGE
DIESEL RANGE
MOTOR OIL RANGE
TOTAL PETROLEUM HYDROCARBONS

WATER ANALYSIS-TOTAL PETROLEUM HYDROCARBON RESULTS IN ppm

TOP OF SCREEN=-17.00 BOTTOM OF SCREEN=-40.00 TOTAL DEPTH= 53.00 WELL # C-24

DATE 10/19/86
LAB MCLAREN
MCLAREN ID 002672
DETECTION LIMIT 0.1
ANALYSIS TPH
MEMO

GASOLINE RANGE
DIESEL RANGE
MOTOR OIL RANGE
TOTAL PETROLEUM HYDROCARBONS

TOP OF SCREEN= 9.00 BOTTOM OF SCREEN= -1.00 TOTAL DEPTH= 12.50 WELL # C-24A

DATE 08/25/84
LAB B & C
MCLAREN ID S000316
DETECTION LIMIT
ANALYSIS TPH
MEMO

GASOLINE RANGE
DIESEL RANGE
MOTOR OIL RANGE
TOTAL PETROLEUM HYDROCARBONS

4.1 < 1 < 1

TOP OF SCREEN= 5.00 BOTTOM OF SCREEN=-63.00 TOTAL DEPTH= 194.00 WELL # C-25

DATE 05/20/86
LAB MCLAREN
MCLAREN ID 00879
DETECTION LIMIT 0.3
ANALYSIS TPH
MEMO

GASOLINE RANGE
DIESEL RANGE
MOTOR OIL RANGE
TOTAL PETROLEUM HYDROCARBONS

0.4

WATER ANALYSIS-TOTAL PETROLEUM HYDROCARBON RESULTS IN PPM

WELL # C-26
TOP OF SCREEN= 38.00 BOTTOM OF SCREEN=-30.00 TOTAL DEPTH= 194.00

DATE 10/18/86
LAB MCLAREN
MCLAREN ID 002661
DETECTION LIMIT 0.1
ANALYSIS TPH
MEMO

GASOLINE RANGE
DIESEL RANGE
MOTOR OIL RANGE
TOTAL PETROLEUM HYDROCARBONS

WELL # C-27
TOP OF SCREEN= 5.00 BOTTOM OF SCREEN=-45.00 TOTAL DEPTH= 63.00

DATE 05/21/86
LAB MCLAREN
MCLAREN ID 00894
DETECTION LIMIT 0.3
ANALYSIS TPH
MEMO

GASOLINE RANGE
DIESEL RANGE
MOTOR OIL RANGE
TOTAL PETROLEUM HYDROCARBONS

WELL # C-28
TOP OF SCREEN= -18.00 BOTTOM OF SCREEN=-38.00 TOTAL DEPTH= 64.00

DATE 05/20/86
LAB MCLAREN
MCLAREN ID 00883
DETECTION LIMIT 0.3
ANALYSIS TPH
MEMO

GASOLINE RANGE
DIESEL RANGE
MOTOR OIL RANGE
TOTAL PETROLEUM HYDROCARBONS

WATER ANALYSIS-TOTAL PETROLEUM HYDROCARBON RESULTS IN PPM

WELL # C-29
 TOP OF SCREEN=-92.00 BOTTOM OF SCREEN=-152.00 TOTAL DEPTH= 175.00

DATE	05/20/86	10/30/86	10/30/86
LAB	MCLAREN	MCLAREN	B & C
MCLAREN ID	00871	002947	45468
DETECTION LIMIT	0.3	1	0.4
ANALYSIS	TPH	TPH	TPH & MER
MEMO			

GASOLINE RANGE
 DIESEL RANGE
 MOTOR OIL RANGE
 TOTAL PETROLEUM HYDROCARBONS

WELL # C-30
 TOP OF SCREEN=-48.00 BOTTOM OF SCREEN=-78.00 TOTAL DEPTH= 102.50

DATE	05/15/86	10/17/86
LAB	MCLAREN	MCLAREN
MCLAREN ID	00864	002655
DETECTION LIMIT	0.8	0.1
ANALYSIS	TPH	TPH
MEMO		

GASOLINE RANGE
 DIESEL RANGE
 MOTOR OIL RANGE
 TOTAL PETROLEUM HYDROCARBONS

WELL # C-31
 TOP OF SCREEN=-63.00 BOTTOM OF SCREEN=-103.00 TOTAL DEPTH= 120.00

DATE	05/21/86	10/31/86
LAB	MCLAREN	MCLAREN
MCLAREN ID	00891	002950
DETECTION LIMIT	0.3	1
ANALYSIS	TPH	TPH
MEMO		

GASOLINE RANGE
 DIESEL RANGE
 MOTOR OIL RANGE
 TOTAL PETROLEUM HYDROCARBONS

WATER ANALYSIS-TOTAL PETROLEUM HYDROCARBON RESULTS IN ppm

WELL # C-32
 TOP OF SCREEN=-9.00 BOTTOM OF SCREEN=-69.00 TOTAL DEPTH= 215.00

DATE 05/21/86
 LAB MCLAREN
 MCLAREN ID 00887
 DETECTION LIMIT 0.3
 ANALYSIS TPH
 MEMO

GASOLINE RANGE
 DIESEL RANGE
 MOTOR OIL RANGE
 TOTAL PETROLEUM HYDROCARBONS

WELL # C-33
 TOP OF SCREEN=-33.00 BOTTOM OF SCREEN=-43.00 TOTAL DEPTH= 58.00

DATE 07/06/86
 LAB EUREKA
 MCLAREN ID 41367
 DETECTION LIMIT 1
 ANALYSIS TPH
 MEMO

GASOLINE RANGE
 DIESEL RANGE
 MOTOR OIL RANGE
 TOTAL PETROLEUM HYDROCARBONS

WELL # C-34
 TOP OF SCREEN=-35.00 BOTTOM OF SCREEN=-45.00 TOTAL DEPTH= 52.00

DATE 07/07/86
 LAB EUREKA
 MCLAREN ID 41383
 DETECTION LIMIT 0.3
 ANALYSIS TPH
 MEMO

GASOLINE RANGE
 DIESEL RANGE
 MOTOR OIL RANGE
 TOTAL PETROLEUM HYDROCARBONS

WATER ANALYSIS-TOTAL PETROLEUM HYDROCARBON RESULTS IN PPM

WELL # C-35
TOP OF SCREEN=-28.00 BOTTOM OF SCREEN=-38.00 TOTAL DEPTH= 54.00

DATE 07/14/86
LAB EUREKA
MCLAREN ID 47631
DETECTION LIMIT 0.3
ANALYSIS TPH
MEMO

GASOLINE RANGE
DIESEL RANGE
MOTOR OIL RANGE
TOTAL PETROLEUM HYDROCARBONS

WELL # C-38
TOP OF SCREEN=-32.00 BOTTOM OF SCREEN=-42.00 TOTAL DEPTH= 58.00

DATE 06/28/86
LAB EUREKA
MCLAREN ID 47621
DETECTION LIMIT 0.3
ANALYSIS TPH
MEMO

GASOLINE RANGE
DIESEL RANGE
MOTOR OIL RANGE
TOTAL PETROLEUM HYDROCARBONS

WELL # C-37
TOP OF SCREEN=-32.00 BOTTOM OF SCREEN=-42.00 TOTAL DEPTH= 54.00

DATE 07/07/86
LAB EUREKA
MCLAREN ID 41392
DETECTION LIMIT 0.3
ANALYSIS TPH
MEMO

GASOLINE RANGE
DIESEL RANGE
MOTOR OIL RANGE
TOTAL PETROLEUM HYDROCARBONS

WATER ANALYSIS-TOTAL PETROLEUM HYDROCARBON RESULTS IN ppm

WELL # C-38
 TOP OF SCREEN=-12.00 BOTTOM OF SCREEN=-52.00 TOTAL DEPTH= 58.00

DATE 07/06/86 10/22/86
 LAB EUREKA HCLAHEN
 HCLAHEN ID 41375 002717
 DETECTION LIMIT 1 0.3
 ANALYSIS TPH 0.2
 MEMO TPH

GASOLINE RANGE
 DIESEL RANGE
 MOTOR OIL RANGE
 TOTAL PETROLEUM HYDROCARBONS

WELL # C-39
 TOP OF SCREEN=-34.00 BOTTOM OF SCREEN=-44.00 TOTAL DEPTH= 58.00

DATE 07/01/86 11/18/86
 LAB EUREKA HCLAHEN
 HCLAHEN ID 47092 003526
 DETECTION LIMIT 1 0.5
 ANALYSIS TPH

GASOLINE RANGE
 DIESEL RANGE
 MOTOR OIL RANGE
 TOTAL PETROLEUM HYDROCARBONS

WELL # C-40
 TOP OF SCREEN=-23.00 BOTTOM OF SCREEN=-33.00 TOTAL DEPTH= 56.00

DATE 06/30/86 11/13/86
 LAB EUREKA HCLAHEN
 HCLAHEN ID 47067 003300
 DETECTION LIMIT 1 0.5
 ANALYSIS TPH

GASOLINE RANGE
 DIESEL RANGE
 MOTOR OIL RANGE
 TOTAL PETROLEUM HYDROCARBONS

WATER ANALYSIS-TOTAL PETROLEUM HYDROCARBON RESULTS IN ppm

WELL # C-41
TOP OF SCREEN = -5.00 BOTTOM OF SCREEN = -15.00 TOTAL DEPTH = 30.00

DATE 07/01/86 11/18/86
LAB EUREKA B & C
MCLAREN ID 47083 56717
DETECTION LIMIT 1 0.5
ANALYSIS TPH
MEMO YES

INE RANGE 2
DIL RANGE -
MOTOR OIL RANGE 2
TOTAL PETROLEUM HYDROCARBONS 1.1 5.1

WELL # C-42
TOP OF SCREEN = -9.00 BOTTOM OF SCREEN = -19.00 TOTAL DEPTH = 30.00

DATE 12/02/86
LAB MCLAREN
MCLAREN ID 004056
DETECTION LIMIT 0.3
ANALYSIS TPH
MEMO

GASOLINE RANGE
DIESEL RANGE
MOTOR OIL RANGE
TOTAL PETROLEUM HYDROCARBONS

WELL # C-43
TOP OF SCREEN = -11.00 BOTTOM OF SCREEN = -21.00 TOTAL DEPTH = 35.00

DATE 07/14/86 11/19/86
LAB EUREKA B & C
MCLAREN ID 47060 57319
DETECTION LIMIT 1 0.5
ANALYSIS TPH
MEMO

GASOLINE RANGE 2
DIESEL RANGE -
MOTOR OIL RANGE 2
TOTAL PETROLEUM HYDROCARBONS 1 10.6

WATER ANALYSIS - TOTAL PETROLEUM HYDROCARBON RESULTS IN PPM

TOP OF SCREEN = -16.00 BOTTOM OF SCREEN = -26.00 TOTAL DEPTH = 30.00
WELL # C-44

DATE 07/14/86 10/21/86
 LAB EUREKA MCLAREN
 MCLAREN ID 43216 002709
 DETECTION LIMIT 0.3
 ANALYSIS TPH
 MEMO

GASOLINE RANGE -
 DIESEL RANGE -
 MOTOR OIL RANGE -
 TOTAL PETROLEUM HYDROCARBONS -

TOP OF SCREEN = -9.00 BOTTOM OF SCREEN = -19.00 TOTAL DEPTH = 35.00
WELL # C-45

DATE 12/01/86
 LAB MCLAREN
 MCLAREN ID 003987
 DETECTION LIMIT 0.3
 ANALYSIS TPH
 MEMO

GASOLINE RANGE
 DIESEL RANGE
 MOTOR OIL RANGE
 TOTAL PETROLEUM HYDROCARBONS 0.4

TOP OF SCREEN = -11.00 BOTTOM OF SCREEN = -21.00 TOTAL DEPTH = 30.00
WELL # C-46

DATE 07/14/86 11/25/86
 LAB EUREKA MCLAREN
 MCLAREN ID 43209 003935
 DETECTION LIMIT 1 0.6
 ANALYSIS TPH
 MEMO YES

GASOLINE RANGE -
 DIESEL RANGE -
 MOTOR OIL RANGE -
 TOTAL PETROLEUM HYDROCARBONS -

WATER ANALYSIS-TOTAL PETROLEUM HYDROCARBON RESULTS IN ppm

WELL # C-47
 TOP OF SCREEN=-16.00 BOTTOM OF SCREEN=-25.00 TOTAL DEPTH= 40.00

DATE 07/01/86 11/12/86
 LAB EUREKA MCLAREN
 MCLAREN ID 47100 003318
 DETECTION LIMIT 1 0.5
 ANALYSIS TPH
 MEMO

GASOLINE RANGE
 DIESEL RANGE
 MOTOR OIL RANGE
 TOTAL PETROLEUM HYDROCARBONS

WELL # C-48
 TOP OF SCREEN=-13.00 BOTTOM OF SCREEN=-23.00 TOTAL DEPTH= 45.00

DATE 06/30/86 11/13/86
 LAB EUREKA MCLAREN
 MCLAREN ID 47075 001105
 DETECTION LIMIT 1 0.5
 ANALYSIS TPH
 MEMO

GASOLINE RANGE
 DIESEL RANGE
 MOTOR OIL RANGE
 TOTAL PETROLEUM HYDROCARBONS

WELL # C-49
 TOP OF SCREEN=-8.00 BOTTOM OF SCREEN=-18.00 TOTAL DEPTH= 30.00

DATE 07/03/86 11/20/86
 LAB EUREKA MCLAREN
 MCLAREN ID 41358 003729
 DETECTION LIMIT 1 0.5
 ANALYSIS TPH
 MEMO

GASOLINE RANGE
 DIESEL RANGE
 MOTOR OIL RANGE
 TOTAL PETROLEUM HYDROCARBONS

WATER ANALYSIS-TOTAL PETROLEUM HYDROCARBON RESULTS IN ppm

TOP OF SCREEN=-86.00 BOTTOM OF SCREEN=-96.00 TOTAL DEPTH= 119.00 WELL # C-50

DATE 07/14/86 10/17/86
 LAB EUREKA MCLAREN
 MCLAREN ID 47647 002548
 DETECTION LIMIT 1 0.1
 ANALYSIS TPH
 MEMO

GASOLINE RANGE -
 DIESEL RANGE -
 MOTOR OIL RANGE -
 TOTAL PETROLEUM HYDROCARBONS 0.5

TOP OF SCREEN=-32.00 BOTTOM OF SCREEN=-42.00 TOTAL DEPTH= 55.00 WELL # C-51

DATE 06/29/86 10/17/86
 LAB EUREKA MCLAREN
 MCLAREN ID 47639 002652
 DETECTION LIMIT 1 0.1
 ANALYSIS TPH
 MEMO

GASOLINE RANGE -
 DIESEL RANGE -
 MOTOR OIL RANGE -
 TOTAL PETROLEUM HYDROCARBONS 0.1

TOP OF SCREEN=-31.00 BOTTOM OF SCREEN=-51.00 TOTAL DEPTH= 174.00 WELL # C-62A

DATE 07/24/86 10/23/86
 LAB EUREKA MCLAREN
 MCLAREN ID 42921 002792
 DETECTION LIMIT 4 0.1
 ANALYSIS TPH
 MEMO

GASOLINE RANGE -
 DIESEL RANGE -
 MOTOR OIL RANGE -
 TOTAL PETROLEUM HYDROCARBONS 0.3

WATER ANALYSIS-TOTAL PETROLEUM HYDROCARBON RESULTS IN PPM

WELL # C-52B

TOP OF SCREEN=103.00 BOTTOM OF SCREEN=113.00 TOTAL DEPTH= 236.00

DATE 07/10/86
LAB EUREKA
MCLAREN ID 43235
DETECTION LIMIT 3
ANALYSIS TPH
MEMO

GASOLINE RANGE
DIESEL RANGE
MOTOR OIL RANGE
TOTAL PETROLEUM HYDROCARBONS

WELL # C-52B

TOP OF SCREEN=103.00 BOTTOM OF SCREEN=113.00 TOTAL DEPTH= 236.00

DATE 11/03/86
LAB MCLAREN
MCLAREN ID 003079
DETECTION LIMIT 0.3
ANALYSIS TPH
MEMO

GASOLINE RANGE
DIESEL RANGE
MOTOR OIL RANGE
TOTAL PETROLEUM HYDROCARBONS

WELL # C-52C

TOP OF SCREEN=137.00 BOTTOM OF SCREEN=157.00 TOTAL DEPTH= 280.00

DATE 07/25/86
LAB EUREKA
MCLAREN ID 42943
DETECTION LIMIT 4
ANALYSIS TPH
MEMO

GASOLINE RANGE
DIESEL RANGE
MOTOR OIL RANGE
TOTAL PETROLEUM HYDROCARBONS

WATER ANALYSIS-TOTAL PETROLEUM HYDROCARBON RESULTS IN ppm

WELL # C-53
TOP OF SCREEN=-95.00 BOTTOM OF SCREEN=-105.00 TOTAL DEPTH= 125.00

DATE 08/20/86
LAB MCLAREN
MCLAREN ID 001838
DETECTION LIMIT 0.1
ANALYSIS TPH
MEMO

LINE RANGE
OIL RANGE
TOTAL PETROLEUM HYDROCARBONS 0.3

WELL # C-54
TOP OF SCREEN=-30.00 BOTTOM OF SCREEN=-50.00 TOTAL DEPTH= 65.00

DATE 09/09/86
LAB MCLAREN
MCLAREN ID 001963
DETECTION LIMIT 0.2
ANALYSIS TPH
MEMO

LINE RANGE
DIESEL RANGE
MOTOR OIL RANGE
TOTAL PETROLEUM HYDROCARBONS

WELL # C-55
TOP OF SCREEN=-35.00 BOTTOM OF SCREEN=-55.00 TOTAL DEPTH= 71.00

DATE 07/18/86
LAB MCLAREN
MCLAREN ID 003145
DETECTION LIMIT 0.3
ANALYSIS TPH
MEMO

GASOLINE RANGE
DIESEL RANGE
MOTOR OIL RANGE
TOTAL PETROLEUM HYDROCARBONS

WATER ANALYSIS-TOTAL PETROLEUM HYDROCARBON RESULTS IN PPM

WELL # C-56
TOP OF SCREEN=-35.00 BOTTOM OF SCREEN=-55.00 TOTAL DEPTH= 70.00

DATE 07/18/86
LAB EUREKA
MCLAREN ID 42968
DETECTION LIMIT 1
ANALYSIS TPH
MEMO

GASOLINE RANGE
DIESEL RANGE
MOTOR OIL RANGE
TOTAL PETROLEUM HYDROCARBONS

WELL # C-57
TOP OF SCREEN= 97.00 BOTTOM OF SCREEN=117.00 TOTAL DEPTH= 120.00

DATE 09/09/86
LAB MCLAREN
MCLAREN ID 001972
DETECTION LIMIT 0.02
ANALYSIS TPH
MEMO

GASOLINE RANGE
DIESEL RANGE
MOTOR OIL RANGE
TOTAL PETROLEUM HYDROCARBONS

WELL # C-58
TOP OF SCREEN= 60.00 BOTTOM OF SCREEN= 80.00 TOTAL DEPTH= 82.00

DATE 09/09/86
LAB MCLAREN
MCLAREN ID 001969
DETECTION LIMIT 0.2
ANALYSIS TPH
MEMO

GASOLINE RANGE
DIESEL RANGE
MOTOR OIL RANGE
TOTAL PETROLEUM HYDROCARBONS

0.5

WATER ANALYSIS-TOTAL PETROLEUM HYDROCARBON RESULTS IN ppm

WELL # C-59
TOP OF SCREEN= 25.00 BOTTOM OF SCREEN= 35.00 TOTAL DEPTH= 38.00

DATE 12/17/86
LAB MCLAREN
MCLAREN ID 4464
DETECTION LIMIT 0.6
ANALYSIS TPH
MEMO

LINE RANGE
FUEL RANGE
FOR OIL RANGE
TOTAL PETROLEUM HYDROCARBONS

0.6

WELL # C-60
TOP OF SCREEN= 25.00 BOTTOM OF SCREEN= 35.00 TOTAL DEPTH= 38.00

DATE 12/16/86
LAB MCLAREN
MCLAREN ID 4457
DETECTION LIMIT 0.3
ANALYSIS TPH
MEMO

GASOLINE RANGE
DIESEL RANGE
FOR OIL RANGE
TOTAL PETROLEUM HYDROCARBONS

1.9

WELL # C-61
TOP OF SCREEN= 25.00 BOTTOM OF SCREEN= 35.00 TOTAL DEPTH= 38.00

DATE 12/16/86
LAB MCLAREN
MCLAREN ID 4452
DETECTION LIMIT 0.3
ANALYSIS TPH
MEMO

GASOLINE RANGE
DIESEL RANGE
FOR OIL RANGE
TOTAL PETROLEUM HYDROCARBONS

0.9

WATER ANALYSIS-TOTAL PETROLEUM HYDROCARBON RESULTS IN PPM

TOP OF SCREEN= 25.00 BOTTOM OF SCREEN= 35.00 TOTAL DEPTH= 38.00 WELL # C-62

DATE 12/17/86
LAB MCLAREN
MCLAREN ID 4461
DETECTION LIMIT 0.6
ANALYSIS TPH
MEMO

GASOLINE RANGE
DIESEL RANGE
MOTOR OIL RANGE
TOTAL PETROLEUM HYDROCARBONS 0.4

TOP OF SCREEN= 25.00 BOTTOM OF SCREEN= 35.00 TOTAL DEPTH= 38.00 WELL # C-63

DATE 12/22/86
LAB MCLAREN
MCLAREN ID 4570
DETECTION LIMIT 0.3
ANALYSIS TPH
MEMO

GASOLINE RANGE
DIESEL RANGE
MOTOR OIL RANGE
TOTAL PETROLEUM HYDROCARBONS 0.8

TOP OF SCREEN= 25.00 BOTTOM OF SCREEN= 35.00 TOTAL DEPTH= 38.00 WELL # C-64

DATE 12/19/86
LAB MCLAREN
MCLAREN ID 4554
DETECTION LIMIT 0.3
ANALYSIS TPH
MEMO

GASOLINE RANGE
DIESEL RANGE
MOTOR OIL RANGE
TOTAL PETROLEUM HYDROCARBONS 2

WATER ANALYSIS-TOTAL PETROLEUM HYDROCARBON RESULTS IN PPM

WELL # **EW-1** TOP OF SCREEN= 20.00 BOTTOM OF SCREEN= 90.00 TOTAL DEPTH= 95.00

DATE 08/01/86
LAB MCLAREN
MCLAREN ID 001868
DETECTION LIMIT 0.3
ANALYSIS TPH
MEMO

GASOLINE RANGE
DIESEL RANGE
MOTOR OIL RANGE
TOTAL PETROLEUM HYDROCARBONS

0.4

WELL # **EW-1** TOP OF SCREEN= 20.00 BOTTOM OF SCREEN= 90.00 TOTAL DEPTH= 95.00

DATE 09/12/86
LAB MCLAREN
MCLAREN ID 001990
DETECTION LIMIT 0.3
ANALYSIS TPH
MEMO

GASOLINE RANGE
DIESEL RANGE
MOTOR OIL RANGE
TOTAL PETROLEUM HYDROCARBONS

0.3

09/12/86
MCLAREN
001991
0.2
TPH

09/12/86
EUREKA
1991AA
0.04
TPH

09/17/86
MCLAREN
002023
0.3
TPH

WELL # **EW-1** TOP OF SCREEN= 20.00 BOTTOM OF SCREEN= 90.00 TOTAL DEPTH= 95.00

DATE 09/17/86
LAB MCLAREN
MCLAREN ID 002024
DETECTION LIMIT 0.3
ANALYSIS TPH
MEMO

GASOLINE RANGE
DIESEL RANGE
MOTOR OIL RANGE
TOTAL PETROLEUM HYDROCARBONS

0.7

09/17/86
MCLAREN
002047
0.3
TPH

09/22/86
MCLAREN
002056
0.3
TPH

09/24/86
MCLAREN
002085
0.3
TPH

WELL # EW-1
TOP OF SCREEN= 20.00 BOTTOM OF SCREEN= 90.00 TOTAL DEPTH= 95.00

DATE 09/26/86 10/01/86 10/03/86
LAB MCLAREN MCLAREN MCLAREN
MCLAREN ID 002137 002297 002377
DETECTION LIMIT 1 0.3 0.3
ANALYSIS TPH TPH TPH
MEMO

GASOLINE RANGE
DIESEL RANGE
MOTOR OIL RANGE
TOTAL PETROLEUM HYDROCARBONS

0.5

WELL # EW-1
TOP OF SCREEN= 20.00 BOTTOM OF SCREEN= 90.00 TOTAL DEPTH= 95.00

DATE 10/06/86 10/08/86 10/10/86 10/13/86
LAB MCLAREN MCLAREN MCLAREN MCLAREN
MCLAREN ID 002423 002456 002549 002552
DETECTION LIMIT 0.3 0.3 1 0.3
ANALYSIS TPH TPH TPH TPH
MEMO

GASOLINE RANGE
DIESEL RANGE
MOTOR OIL RANGE
TOTAL PETROLEUM HYDROCARBONS

0.4

WELL # EW-1
TOP OF SCREEN= 20.00 BOTTOM OF SCREEN= 90.00 TOTAL DEPTH= 95.00

DATE 10/16/86
LAB MCLAREN
MCLAREN ID 002595
DETECTION LIMIT 0.5
ANALYSIS TPH
MEMO

GASOLINE RANGE
DIESEL RANGE
MOTOR OIL RANGE
TOTAL PETROLEUM HYDROCARBONS

WATER ANALYSIS--TOTAL PETROLEUM HYDROCARBON RESULTS IN

WELL # METHOD BLANK

TOP OF SCREEN= 0.00 BOTTOM OF SCREEN= 0.00 TOTAL DEPTH= 0.00

DATE 07/02/86
LAB EUREKA
MCLAREN ID HB4

DETECTION LIMIT
ANALYSIS TPH

ONE RANGE < 1 < 1
T. RANGE < 1 < 1
MOTOR OIL RANGE < 1 < 1
TOTAL PETROLEUM HYDROCARBONS < 1

WELL # WP-1
TOP OF SCREEN= 10.00 BOTTOM OF SCREEN= 12.00 TOTAL DEPTH= 12.00

DATE 12/08/86
LAB MCLAREN
MCLAREN ID 4253
DETECTION LIMIT 0.3
ANALYSIS TPH

MEMO

GASOLINE RANGE
DIESEL RANGE
MOTOR OIL RANGE
TOTAL PETROLEUM HYDROCARBONS

WELL # WP-2
TOP OF SCREEN= 10.00 BOTTOM OF SCREEN= 12.00 TOTAL DEPTH= 12.00

DATE 12/08/86
LAB MCLAREN
MCLAREN ID 4256
DETECTION LIMIT 0.3
ANALYSIS TPH

MEMO

GASOLINE RANGE
DIESEL RANGE
MOTOR OIL RANGE
TOTAL PETROLEUM HYDROCARBONS

WATER ANALYSIS--TOTAL PETROLEUM HYDROCARBON RESULTS IN ppm

TOP OF SCREEN= 10.00 BOTTOM OF SCREEN= 12.00 TOTAL DEPTH= 12.00 WELL # WP-3

DATE 12/08/86
LAB MCLAREN
MCLAREN ID 4259
DETECTION LIMIT 0.3
ANALYSIS 4259

MEMO

GASOLINE RANGE
DIESEL RANGE
MOTOR OIL RANGE
TOTAL PETROLEUM HYDROCARBONS

TOP OF SCREEN= 10.00 BOTTOM OF SCREEN= 12.00 TOTAL DEPTH= 12.00 WELL # WP-4

DATE 12/08/86
LAB MCLAREN
MCLAREN ID 4262
DETECTION LIMIT 0.3
ANALYSIS TPH

MEMO

GASOLINE RANGE
DIESEL RANGE
MOTOR OIL RANGE
TOTAL PETROLEUM HYDROCARBONS

12/08/86
B & C
50802
TPH
12/10/86
EUREKA
50811
10
625

2.2

SECTION 3

METALS

WATER ANALYSIS-METALS AND CYANIDE RESULTS IN PPM

TOP OF SCREEN= -23.00 BOTTOM OF SCREEN= -33.00 TOTAL DEPTH=

40.00

09/26/84
B & C
S001008

12/15/83
R & C
S001007

06/15/83
D & C
S001006

05/11/83
ANAL. TECH.
S001005

DATE

LAB

MCCLAREN ID

DETECTION LIMIT

ANALYSIS

MEMO

ALUMINUM

0.012

0.01

0.01

0.01

0.01

HEXAVALENT CHROMIUM

TOTAL CHROMIUM

0.13

0.63

0.01

0.17

0.12

0.12

0.12

0.12

0.12

0.12

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CYANIDE

WATER ANAL

1-METALS AND CYANIDE RESULTS IN ppm

TOP OF SCREEN= -23.00 BOTTOM OF SCREEN= -33.00 TOTAL DEPTH= 40.00

05/08/85

DATE

D & C

LAB

5001009

MCLAREN ID

DETECTION LIMIT

ANALYSIS

MEMO

ALUMINUM
ANTIMONY
ARSENIC
BERYLLIUM
CADMIUM
HEXAVALENT CHROMIUM
TOTAL CHROMIUM
COBALT
COPPER
IRON
LEAD
MANGANESE
MERCURY
MOLYBDENUM
NICKEL
SELENIUM
SILVER
STRONTIUM
THALLIUM
VANADIUM
ZINC
CYANIDE

0.08

0.7

0.01

WATER ANALYSIS - METALS AND CYANIDE RESULTS IN ppm

WELL NO. 2

TOP OF SCREEN = -19.00 BOTTOM OF SCREEN = -29.00 TOTAL DEPTH = 41.00

05/01/85
B & C
S001015

DATE
LAB
MCLAREN ID
DETECTION LIMIT
ANALYSIS
MEMO

ALUMINUM
ANTHONY
ARSENIC
BARIUM
BISMUTH
BORON
BROMINE
CALCIUM
CHLORINE
CHROMIUM
COBALT
COPPER
IRON
LEAD
MANGANESE
MERCURY
MOLYBDENUM
NICKEL
SILVER
STRONTIUM
THALLIUM
VANADIUM
ZINC

0.05
0.38

1

CYANIDE

DATE	05/11/83	TOP OF SCREEN=	-23.00	BOTTOM OF SCREEN=	-33.00	TOTAL DEPTH=	45.50
LAB	ANAL. TECH.	06/15/83	B & C	09/19/83	B & C	12/14/83	B & C
MCCLAREN ID	S001016		S001017		S001018		S001019
DETECTION LIMIT ANALYSIS MEMO							

ALUMINUM	-	-	-	-	-	-	-
ANTIMONY	-	-	-	-	-	-	-
ARSENIC	-	-	-	-	-	-	-
BARIUM	-	-	-	-	-	-	-
BISMUTH	-	-	-	-	-	-	-
CADMIUM	-	-	-	-	-	-	-
CHROMIUM	-	-	-	-	-	-	-
COBALT	0.02	0.01	-	-	-	-	-
COPPER	0.16	-	-	-	-	-	-
IRON	-	-	-	-	-	-	-
LEAD	0.28	0.05	-	-	-	-	-
MANGANESE	0.003	-	-	-	-	-	-
MERCURY	-	-	-	-	-	-	-
MOLYBDENUM	-	-	-	-	-	-	-
NICKEL	-	-	-	-	-	-	-
SELENIUM	-	-	-	-	-	-	-
SILVER	-	-	-	-	-	-	-
STRONTIUM	1.11	-	-	-	-	-	-
THALLIUM	-	-	-	-	-	-	-
VANADIUM	-	-	-	-	-	-	-
ZINC	-	-	-	-	-	-	-
CYANIDE	-	-	-	-	-	-	-

WATER ANALYSIS - METALS AND CYANIDE RESULTS IN PPM
 TOP OF SCREEN = -23.00 BOTTOM OF SCREEN = -33.00 TOTAL DEPTH = 45.50
 DATE 03/14/84 09/27/84 05/01/86
 LAB B & C B & C B & C
 MCCLAREN ID S001020 S001021 S001022
 DETECTION LIMIT
 ANALYSIS
 MEMO

ALUMINUM			
ANTIMONY			
ARSENIC			
BARIUM			
BISMUTH			
BORON			
BROMINE			
CADMIUM			
CAesium			
CHLORINE			
CHROMIUM			
COPPER			
COBALT			
IRON			
LEAD	0.54	0.35	0.45
MANGANESE			
MERCURY			
MOLYBDENUM			
NICKEL			
SELENIUM			
SILVER			0.7
STRONTIUM			
THALLIUM			
THIUM			
VANADIUM			
ZINC			
CYANIDE			

WATER ANALYSIS-METALS AND CYANIDE RESULTS IN PPM

DATE 06/11/83 TOP OF SCREEN= -22.00 BOTTOM OF SCREEN= -32.00 TOTAL DEPTH= 43.00
 LAB ANAL. TECH. 06/15/83 09/19/83 12/14/83
 MCLAREN ID S001023 B & C B & C
 DETECTION LIMIT S001024 S001025 S001026
 ANALYSIS
 MEMO

ALUMINUM	-	0.01	-	0.01	-
ANTIMONY	-	-	-	-	-
ARSENIC	-	-	-	-	-
BARIUM	-	-	-	-	-
BORON	-	-	-	-	-
CADMIUM	-	-	-	-	-
CHROMIUM	-	-	-	-	-
COBALT	-	-	-	-	-
COPPER	-	0.01	-	-	-
IRON	-	0.19	-	-	-
LEAD	-	0.27	-	0.8	1.2
MANGANESE	-	-	-	-	-
MERCURY	-	-	-	-	-
MOLYBDENUM	-	-	-	-	-
NICKEL	-	-	-	-	-
SELENIUM	-	-	-	-	-
SILVER	-	-	-	-	-
STRONTIUM	-	1.28	-	-	-
THALLIUM	-	-	-	-	-
VANADIUM	-	-	-	-	-
ZINC	-	-	-	-	-
CYANIDE	-	-	-	-	-

WATER ANAL - METALS AND CYANIDE RESULTS IN PPM WELLS # C-04
 TOP OF SCREEN -22.00 BOTTOM OF SCREEN -32.00 TOTAL DEPTH= 43.00

DATE 03/14/84 05/03/85
 LAB B & C B & C
 MCCLAREN ID S001027 S001029
 DETECTION LIMIT
 ANALYSIS

MEMO

ALUMINUM		
ANTIMONY		
ARSENIC		
BARIUM		
BERYLLIUM		
CADMIUM		
HEXAVALENT CHROMIUM		
TOTAL CHROMIUM		
COBALT		
COPPER		
IRON		
LEAD	1.1	0.39
MANGANESE		
MERCURY		
MOLYBDENUM		
NICKEL		
SELENIUM		
SILVER		0.9
STRONTIUM		
THALLIUM		
VANADIUM		
ZINC		
CYANIDE		

WATER ANALYSIS-METALS AND CYANIDE RESULTS IN PPM

TOP OF SCREEN = -11.00 BOTTOM OF SCREEN = -21.00 TOTAL DEPTH = 35.50

WELL # C-05

DATE 05/11/83 ANAL. TECH. B & C S001030 06/15/83 09/20/83 12/15/83
 LAB ANAL. TECH. B & C S001030 S001032 S001033
 MCLAREN ID
 DETECTION LIMIT
 ANALYSIS

MEMO

ALUMINUM
 ANTIMONY
 ARSENIC
 BARIUM
 BISMUTH
 CADMIUM
 CHROMIUM
 COBALT
 COPPER
 IRON
 LEAD
 MANGANESE
 MERCURY
 MOLYBDENUM
 NICKEL
 SELENIUM
 SILVER
 STRONTIUM
 THALLIUM
 VANADIUM
 ZINC
 CYANIDE

0.006
 0.02
 0.18
 0.49
 0.34
 0.0002
 0.15
 0.1

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840
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CYANIDE

-	<	0.08
-	<	0.1
-	<	0.11
-	<	0.02
-	<	0.01
-	<	0.02
-	<	0.01
-	<	0.01
-	<	0.05
-	<	0.1
-	<	0.07
-	<	0.06
-	<	0.02
-	<	0.1
-	<	0.1
-	<	0.01
-	<	0.01
-	<	0.1
-	<	0.01
-	<	0.07

DRESSER & MCKEE INC

TOP OF SCREEN = -11.00 BOTTOM OF SCREEN = -21.00 TOTAL DEPTH = 35.50

DATE 12/12/86
 LAB EUREKA
 MCLAREN ID 50344
 DETECTION LIMIT .01
 ANALYSIS 6010
 MEMO

ALUMINUM	<	0.05
ANTHONY	<	0.1
PHIC	<	0.15
LIUM	<	0.02
HEXAVALENT CHROMIUM	<	0.01
TOTAL CHROMIUM	<	0.02
COBALT	<	0.01
COPPER	<	0.02
IRON	<	
LEAD	<	0.1
MANGANESE	<	
MERCURY	<	0.05
MOLYBDENUM	<	0.01
NICKEL	<	0.1
SELENIUM	<	0.1
SILVER	<	0.01
STRONTIUM	<	
THALLIUM	<	0.1
VANADIUM	<	0.01
ZINC	<	0.15
CYANIDE		

WATER ANALYSIS - METALS AND CYANIDE RESULTS IN PPM

WATER ANALYSIS - METALS AND CYANIDE RESULTS IN PPM

TOP OF SCREEN = -13.00 BOTTOM OF SCREEN = -23.00 TOTAL DEPTH = 32.50

DATE 05/09/83 06/15/83 09/19/83 12/14/83

LAB ANAL. TECH. D & C H & C

MCLAREN ID S001037 S001038 S001039 S001010

DETECTION LIMIT ANALYSIS

MEMO

ALUMINUM	-	-	-
ANTIMONY	-	-	-
ARSENIC	-	-	-
BARIUM	-	-	-
BORON	-	-	-
CADMIUM	-	-	-
CHROMIUM	-	-	-
HEXAVALENT CHROMIUM	-	-	-
TOTAL CHROMIUM	-	-	-
COBALT	0.03	0.01	0.01
COPPER	0.11	0.06	0.06
IRON	0.19	0.14	0.14
LEAD	-	-	-
MANGANESE	-	-	-
MERCURY	-	-	-
MOLYBDENUM	-	-	-
NICKEL	-	-	-
SELENIUM	-	-	-
SILVER	-	-	-
STRONTIUM	2.5	-	-
THALLIUM	-	-	-
VANADIUM	0.05	0.02	0.02
ZINC	-	-	-
CYANIDE	-	-	-

WATER ANALYSIS-RESULTS AND CYANIDE RESULTS IN PPM

TOP OF SCREEN= -13.00 BOTTOM OF SCREEN= -23.00 TOTAL DEPTH= 32.50

DATE 09/26/84 05/01/85
 LAB B & C H & C
 MCCLAREN ID S001041 S001042
 DETECTION LIMIT
 ANALYSIS

MEMO

ALUMINUM
 ANTIMONY
 ARSENIC
 BARIUM
 BISMUTH
 BORON
 BROMINE
 CADMIUM
 CALCIUM
 CHLORINE
 CHROMIUM
 COBALT
 COPPER
 IRON
 LEAD
 MANGANESE
 MERCURY
 MOLYBDENUM
 NICKEL
 SELENIUM
 SILVER
 STRONTIUM
 THALLIUM
 TANTALUM
 TIN
 CYANIDE

0.02
 0.16
 1.4

WATER ANAL 1-METALS AND CYANIDE RESULTS IN PPM WADSWORTH C 37
 TOP OF SCREEN= 0.57 BOTTOM OF SCREEN= 9.43 TOTAL DEPTH= 21.50
 DATE 05/09/83 09/19/83 12/14/83
 LAB ANAL. TECH. B & C B & C
 MCLAREN ID S001043 S001044 S001045
 DETECTION LIMIT
 ANALYSIS
 MEMO

ALUMINUM	-	-	-
ANTIMONY	-	-	0.02
ARSENIC	-	-	-
BARIUM	-	-	-
BERYLLIUM	-	-	-
CADMIUM	-	-	-
HEXAVALENT CHROMIUM	-	-	-
TOTAL CHROMIUM	-	-	-
COBALT	-	0.02	0.02
COPPER	-	-	0.47
IRON	0.6	-	0.01
LEAD	0.1	0.05	0.04
MANGANESE	-	-	0.03
MERCURY	-	-	-
MOLYBDENUM	-	-	-
NICKEL	-	-	-
SELENIUM	0.006	-	-
SILVER	-	-	-
STRONTIUM	2.6	-	-
THALLIUM	-	-	-
VANADIUM	-	0.01	0.11
ZINC	-	-	-
CYANIDE	-	-	-

DATE 09/26/84 05/02/85
 LAB B & C B & C
 MCLAREN ID S001047 S001048
 DETECTION LIMIT
 ANALYSIS
 MEMO

TOP OF SCREEN= 0.57 BOTTOM OF SCREEN= 9.43 TOTAL DEPTH= 21.50

ALUMINUM
 ANTIMONY
 BIC
 BROMINE
 CADMIUM
 CALCIUM
 CHLORINE
 CHROMIUM
 COBALT
 COPPER
 IRON
 LEAD
 MANGANESE
 MERCURY
 MOLYBDENUM
 NICKEL
 SELENIUM
 SILVER
 STRONTIUM
 THALLIUM
 VANADIUM
 ZINC
 CYANIDE

0.25 0.35 3.6

32.50

MEMO

5001019

0501005

5001051

5001052

CYANIDE

1.4

WELL #	108
EN = -19.00	TOTAL DEPTH = 32.50

DATE	LAB	MCLAREN ID	DETECTION LIMIT	ANALYSIS	MEMO

03/14/84
U & C
5001053

09/26/84
B & C
S001054

05/02/85
B & C
5001055

ALUMINUM
ANTHONY
BERNIE
LUM
LILLIUM
LUM
HEXAVALENT
TOTAL CHURCH
COBALT
COPPER
IRON
LEAD
MANGANESE
MOLYBDENUM
NICKEL
SELENIUM
SILVER
STRONTIUM
THALLIUM
VANADIUM
ZINC
CYANIDE

0.23

0.1

Q. 26

9.0

RESSER & MCKEE INC

WATER ANAL

IS-METALS AND CYANIDE RESULTS IN PPM

WELL # C-09

35.50

TOP OF SCREEN= -11.00 BOTTOM OF SCREEN= -21.00 TOTAL DEPTH=

DATE 05/11/83
 LAB ANAL. TECH.
 MCLAREN ID S001056
 DETECTION LIMIT
 ANALYSIS
 MEMO

06/16/83
 B & C
 S001057

09/19/83
 B & C
 S001058

12/15/83
 B & C
 S001059

ALUMINUM

ANTIMONY

AR

BARIUM

BELLINIUM

BISMUTH

CADMIUM

CHROMIUM

HEXAVALENT CHROMIUM

TOTAL CHROMIUM

COBALT

COPPER

IRON

LEAD

MANGANESE

MERCURY

MOLYBDENUM

NICKEL

SELENIUM

SILVER

STRONTIUM

THALLIUM

VANADIUM

ZINC

CYANIDE

0.01

0.21

0.18

0.06

0.52

0.41

2.8

0.04

0.01

WATER ANALYSIS-TRACE METALS AND CYANIDE RESULTS IN PPM
 TOP OF SCREEN= -11.00 BOTTOM OF SCREEN= -21.00 TOTAL DEPTH= 35.50
 DATE 03/14/84 09/26/84 05/02/85
 LAB B & C B & C B & C
 MCCLAREN ID S001060 S001061 S001062
 DETECTION LIMIT
 ANALYSIS
 MEMO

ALUMINUM
 ANTIMONY
 ARSENIC
 BARIUM
 BERYLLIUM
 BISMUTH
 HEXAVALENT CHROMIUM
 TOTAL CHROMIUM
 COBALT
 COPPER
 IRON
 LEAD
 MANGANESE
 MERCURY
 MOLYBDENUM
 NICKEL
 SELENIUM
 SILVER
 STRONTIUM
 THALLIUM
 VANADIUM
 ZINC
 CYANIDE

0.32
 0.37
 0.3
 3.1

WATER ANALYSIS

IS-METALS AND CYANIDE RESULTS IN PPM

WELL # C-10

32.00

TOP OF SCREEN= -4.00 BOTTOM OF SCREEN= -16.00 TOTAL DEPTH=

DATE 05/11/83
LAB ANAL. TECH.
MCLAREN ID S001063
DETECTION LIMIT
ANALYSIS
MEMO

06/10/83
B & C
S001064

09/19/83
B & C
S001065

12/15/83
B & C
S001066

ALUMINUM
ANTIMONY
ARSENIC
BARIUM
BERYLLIUM
CADMIUM
HEXAVALENT CHROMIUM
TOTAL CHROMIUM
COBALT
COPPER
IRON
LEAD
MANGANESE
MERCURY
MOLYBDENUM
NICKEL
SELENIUM
SILVER
STRONTIUM
THALLIUM
VANADIUM
ZINC

0.006

0.02

0.02

0.01

0.69

1.67

2.7

2.1

1.1

0.06
2.8

0.01

0.01

CYANIDE

WATER ANALYSIS-DETAILED AND CYANIDE RESULTS IN PER

TOP OF SCREEN= -4.00 BOTTOM OF SCREEN= -16.00 TOTAL DEPTH= 32.00

W.P.L. # C-10

DATE 03/14/84 05/03/85

LAB B & C B & C

MCLAREN ID S001067 S001068

DETECTION LIMIT

ANALYSIS

MEMO

ARSENIC

BARIUM

BORON

BROMINE

CADMIUM

CALCIUM

CHLORINE

CHROMIUM

COPPER

COBALT

IRON

LEAD

MANGANESE

MERCURY

MOLYBDENUM

NICKEL

SELENIUM

SILVER

STRONTIUM

THALLIUM

VANADIUM

ZINC

CYANIDE

0.98

0.61

0.24

2.5

WATER ANALYSIS - METALS AND CYANIDE RESULTS IN PPM
 TOP OF SCREEN= 1.00 BOTTOM OF SCREEN= -9.00 TOTAL DEPTH= 27.00
 DATE 05/11/83 09/19/83 12/15/83
 LAB ANAL. TECH. B & C H & C
 MCLAREN ID S001070 S001071 S001072 S001073
 DETECTION LIMIT
 ANALYSIS
 MEMO

ALUMINUM
 ANTIMONY
 ARSENIC
 BARIUM
 BISMUTH
 CADMIUM
 CHROMIUM
 HEXAVALENT CHROMIUM
 TOTAL CHROMIUM
 COBALT
 COPPER
 IRON
 LEAD
 MANGANESE
 MERCURY
 MOLYBDENUM
 NICKEL
 SELENIUM
 SILVER
 STRONTIUM
 THALLIUM
 VANADIUM
 ZINC
 CYANIDE

0.01	0.02	
0.39	0.6	0.7
0.02		

WATER ANALYSIS-DELTAS AND CYANIDE RESULTS IN DPM

TOP OF SCREEN= 1.00 BOTTOM OF SCREEN= -9.00 TOTAL DEPTH= 27.00

DATE-- 03/15/84
 LAB B & C
 MCLAREN ID S001074
 DETECTION LIMIT S001076
 ANALYSIS S001076
 HEMO

ALUMINUM
 ANTIMONY
 ARSENIC
 BARIUM
 BISMUTH
 BORON
 BROMINE
 CADMIUM
 CALCIUM
 CHLORINE
 CHROMIUM
 COBALT
 COPPER
 IRON
 LEAD
 MANGANESE
 MERCURY
 MOLYBDENUM
 NICKEL
 SILVER
 STRONTIUM
 THALLIUM
 VANADIUM
 ZINC
 CYANIDE

0.76 0.57 0.76

2

WATER ANAL

IS-METALS AND CYANIDE RESULTS IN ppm

TOP OF SCREEN= 4.00 BOTTOM OF SCREEN= -6.00 TOTAL DEPTH= 10.00

WELL # 2-22

DATE

05/11/83

LAB

ANAL. TECH.

MCLAREN ID

S001077

DETECTION LIMIT

ANALYSIS

MEMO

ALUMINUM

ANTIMONY

ARSENIC

BARIUM

BERYLLIUM

CADMIUM

HEXAVALENT CHROMIUM

TOTAL CHROMIUM

COBALT

COPPER

IRON

LEAD

MANGANESE

MERCURY

MOLYBDENUM

NICKEL

SELENIUM

SILVER

STRONTIUM

THALLIUM

VANADIUM

ZINC

CYANIDE

06/15/83

B & C

S001078

09/19/83

B & C

S001079

12/15/83

B & C

S001080

0.01

0.46

0.05

1.8

1.2

3.7

2.8

0.01

WATER ANALYSIS-METALS AND CYANIDE RESULTS IN RPM

WELLS # C-12

TOP OF SCREEN= 4.00 BOTTOM OF SCREEN= -6.00 TOTAL DEPTH= 30.00

DATE 03/14/84 12/18/86 12/18/86

LAB B & C B & C EUREKA

NCLAREN ID S001081 S001004 S001004D

DETECTION LIMIT 0.1 0.1

ANALYSIS 6010 6010

MEMO

ALUMINUM

ANTIMONY

ARSENIC

BARIUM

BELLINIUM

CADMIUM

HEXAVALENT CHROMIUM

TOTAL CHROMIUM

COBALT

COPPER

IRON

LEAD

MANGANESE

MERCURY

MOLYBDENUM

NICKEL

SELENIUM

SILVER

STRONTIUM

THALLIUM

VANADIUM

ZINC

CYANIDE

31.65

31.83

0.78

2

WATER AN

IS-METALS AND CYANIDE RESULTS IN PPM

WELL # 15
TOP OF SCREEN = -13.00 BOTTOM OF SCREEN = -23.00 TOTAL DEPTH = 40.00

DATE

05/11/83

LAB

ANAL. TECH.

MCLAREN ID

S001083

DETECTION LIMIT

ANALYSIS

MEMO

06/16/83

B & C

S001084

06/16/83

B & C

S001085

09/19/83

B & C

S001086

ALUMINUM

ANTIMONY

ARSENIC

BARIUM

BERYLLIUM

CADMIUM

HEXAVALENT CHROMIUM

TOTAL CHROMIUM

COBALT

COPPER

IRON

LEAD

MANGANESE

MERCURY

MOLYBDENUM

NICKEL

SELENIUM

SILVER

STRONTIUM

THALLIUM

VANADIUM

ZINC

CYANIDE

0.051

0.14

0.15

0.16

1.52

0.01

0.056

0.01

0.25

0.22

0.21

0.08

0.8

0.04

0.04

0.24

0.01

0.096

WATER ANALYSIS-METALS AND CYANIDE RESULTS IN PPM

DATE
LAB
HCLAREN ID
DETECTION LIMIT
ANALYSIS
MEMO

12/15/83
B & C
S001087

03/15/84
B & C
S001088

09/26/84
B & C
S001089

05/02/85
B & C
S001090

40.00

TOP OF SCREEN= -13.00 BOTTOM OF SCREEN= -23.00 TOTAL DEPTH=

ALUMINUM

ANTHONY

BAR

BATH

BELLUM

CADMIUM

CHROMIUM

CHROMIUM

CHROMIUM

CHROMIUM

CHROMIUM

CHROMIUM

CHROMIUM

CHROMIUM

CHROMIUM

CHROMIUM

CHROMIUM

CHROMIUM

CHROMIUM

CHROMIUM

CHROMIUM

CHROMIUM

CHROMIUM

CHROMIUM

CHROMIUM

CHROMIUM

CHROMIUM

0.2

0.17

0.2

0.13

0.21

0.14

0.05

0.08
0.03
0.55

0.3

CYANIDE

WATER ANAL

S-METALS AND CYANIDE RESULTS IN ppm

WELL # C-13

40.00

TOP OF SCREEN= -13.00 BOTTOM OF SCREEN= -23.00 TOTAL DEPTH=

DATE

11/05/86

LAB

EUREKA

MCLAREN ID

44242

DETECTION LIMIT

.01

ANALYSIS

6010

MEMO

METALS/TPH

ALUMINUM

ANTIMONY

ARSENIC

BARIUM

BISMUTH

BORON

BROMINE

CALCIUM

CHLORINE

CHROMIUM

COBALT

COPPER

IRON

LEAD

MANGANESE

MERCURY

MOLYBDENUM

NICKEL

SELENIUM

SILVER

STRONTIUM

THALLIUM

VANADIUM

ZINC

CYANIDE

<	0.05	<	0.02
<	0.01	<	0.11
<	0.2	<	0.006
<	0.02	<	-
<	0.01	<	-
<	0.02	<	0.03
<	0.01	<	0.04
<	0.01	<	0.003
<	0.01	<	0.0005
<	0.05	<	0.0005
<	0.06	<	0.06
<	0.01	<	0.02
<	0.01	<	-
<	0.01	<	-
<	0.01	<	-
<	0.01	<	0.08
<	0.04	<	-

WATER ANALYSIS-METALS AND CYANIDE RESULTS IN PPM
 TOP OF SCREEN= -3.00 BOTTOM OF SCREEN= -13.00 TOTAL DEPTH= 35.50
 W L L # 0-8-4
 DATE 05/11/83 09/19/83 12/14/83
 LAB ANAL. TECH. B & C B & C
 MCLAREN ID S001091 S001092 S001093 S001094
 DETECTION LIMIT
 ANALYSIS
 MEMO

ALUMINUM	-	-	-
ANTIMONY	-	-	-
ARSENIC	-	-	-
BARIUM	-	-	-
BORON	-	-	-
CADMIUM	-	-	-
CHLORINE	-	-	-
CHROMIUM	-	-	-
COBALT	-	-	-
COPPER	0.92	0.01	-
IRON	-	-	-
LEAD	3.32	5	4.9
MANGANESE	-	-	9.8
MERCURY	-	-	-
MOLYBDENUM	-	-	-
NICKEL	-	-	-
SELENIUM	-	-	-
SILVER	-	-	-
STRONTIUM	1.6	-	-
THALLIUM	-	-	-
TUNGSTEN	-	-	-
VANADIUM	-	0.01	-
ZINC	-	-	-
CYANIDE	-	-	-

WATER ANAL

S-METALS AND CYANIDE RESULTS IN PPM

TOP OF SCREEN= -3.00 BOTTOM OF SCREEN= -13.00 TOTAL DEPTH= 35.50

DATE 09/26/84
LAB B & C
MCLAREN ID S001095
DETECTION LIMIT S001096

ANALYSIS
MEMO

ALUMINUM
ANTIMONY
ARSENIC
BARIUM
BISMUTH
BROMINE
CALCIUM
CHLORINE
CHROMIUM
COBALT
COPPER
IRON
LEAD
MANGANESE
MERCURY
MOLYBDENUM
NICKEL
SILVER
STRONTIUM
THALLIUM
VANADIUM
ZINC
CYANIDE

5.8
9.6
1.9
0.06

WELL # C-15

55.00

DATE	LAB	MCLAREN ID	DETECTION LIMIT	ANALYSIS	MEMO

08/23/84
B & C
S001097

09/28/84
B & C
S00109H

04/30/B5
B & C
6601005

YSIS
MEMO

ALUMINUM
ANTIMONY
BIC
BISMUTH
Cadmium
CHLORINE
CHROMIUM
HEXAVALENT CHROMIUM
TOTAL CHROMIUM
COBALT
COPPER
IRON
LEAD
MANGANESE
MERCURY
NICKEL
NIOBENUM
NICKEL
SELENIUM
SILVER
STRONTIUM
THALLIUM
VANADIUM
ZINC

EDINBURGH

CAMP DRESSER & McKINNEY

WATER ANALYSIS-METALS AND CYANIDE RESULTS IN PPM

DATE 08/22/84
LAB B & C
MCLAREN ID S001103
DETECTION LIMIT
ANALYSIS
MEMO

TOP OF SCREEN= -8.00 BOTTOM OF SCREEN= -28.00 TOTAL DEPTH= 46.00

WELL # S-17

ALUMINUM
ANTIMONY
ARSENIC
BARIUM
BISMUTH
BROMINE
CALCIUM
CHLORINE
CHROMIUM
COBALT
COPPER
IRON
LEAD
MANGANESE
MERCURY
MOLYBDENUM
NICKEL
SILVER
STRONTIUM
THALLIUM
VANADIUM
ZINC

0.71
0.75
1.9
0.41
0.09
0.02

CYANIDE

WRL 4048

TOP OF SHEET

01/30/85

R & C

500110B

1000

CYANIDE

0.02

TOP OF SCREEN= -10.00 BOTTOM OF SCREEN= -40.00 TOTAL DEPTH= 56.50

DATE 08/21/84
LAB B & C
MCLAREN ID S001109
DETECTION LIMIT S001110
ANALYSIS
MEMO

09/28/84
B & C
S001110
04/29/85
H & C
S001111

ALUMINUM
ANTIMONY
ARSENIC
BARIUM
BISMUTH
BRYLLIUM
CADMIUM
CHROMIUM
COBALT
COPPER
IRON
LEAD
MANGANESE
MERCURY
MOLYBDENUM
NICKEL
SELENIUM
SILVER
STRONTIUM
THALLIUM
VANADIUM
ZINC
CYANIDE

0.48
0.54
1.9
1.5
0.04
0.02

WATER ANAL

METALS AND CYANIDE RESULTS IN PPM

WELL # C-20

55.00

TOP OF SCREEN = -20.00 BOTTOM OF SCREEN = -40.00 TOTAL DEPTH =

DATE

08/21/84

LAB

B & C

MCLAREN ID

S001112

DETECTION LIMIT

S001113

ANALYSIS

MEMO

ALUMINUM

ANTIMONY

BIC

CH

COPPER

IRON

LEAD

MANGANESE

MERCURY

NICKEL

SILVER

STRONTIUM

THALLIUM

VANADIUM

ZINC

CYANIDE

HEXAVALENT CHROMIUM

TOTAL CHROMIUM

COBALT

COPPER

IRON

LEAD

MANGANESE

MERCURY

NICKEL

SILVER

STRONTIUM

THALLIUM

VANADIUM

ZINC

CYANIDE

ZINC

CYANIDE

ZINC

CYANIDE

ZINC

CYANIDE

ZINC

CYANIDE

ZINC

CYANIDE

ZINC

CYANIDE

ZINC

CYANIDE

ZINC

CYANIDE

ZINC

CYANIDE

ZINC

CYANIDE

ZINC

CYANIDE

ZINC

CYANIDE

ZINC

CYANIDE

ZINC

CYANIDE

WpL₁L₂ # C-21
EN= -34.66 TOTAL DEPTH= 49.06

04/30/85
B & C
5001117

DRESSER & McFEE INC.

WATER ANAL

IS-METALS AND CYANIDE RESULTS IN ppm

WELL # C-22
TOP OF SCREEN= 5.00 BOTTOM OF SCREEN= -25.00 TOTAL DEPTH= 50.00

DATE

08/24/84

LAB

B & C

MCLAREN ID

S001118

DETECTION LIMIT

ANALYSIS

MEMO

ALUMINUM

ANTIMONY

ARSENIC

BARIUM

BERYLLIUM

CADMIUM

HEXAVALENT CHROMIUM

TOTAL CHROMIUM

COBALT

COPPER

IRON

LEAD

MANGANESE

MERCURY

MOLYBDENUM

NICKEL

SELENIUM

SILVER

STRONTIUM

THALLIUM

VANADIUM

ZINC

CYANIDE

0.55

0.51

0.46

1.7

2.1

2

0.02

WATER ANALYSIS-METALS AND CYANIDE RESULTS IN PPM

DATE 08/22/84 TOP OF SCREEN= -21.00 BOTTOM OF SCREEN= -41.00 TOTAL DEPTH= 53.00
 LAB B & C
 MCLAREN ID S001121
 DETECTION LIMIT S001122
 ANALYSIS S001123
 HEMO

ALUMINUM
 ANTIMONY
 ARSENIC
 BARIUM
 BISMUTH
 BROMINE
 BUTYLENE
 CHLORINE
 CHROMIUM
 COBALT
 COPPER
 IRON
 LEAD
 MANGANESE
 MERCURY
 MOLYBDENUM
 NICKEL
 SELENIUM
 SILVER
 STRONTIUM
 THALLIUM
 VANADIUM
 ZINC
 CYANIDE

0.2
 0.22
 0.18
 0.7
 1.6
 0.1

WATER ANALYSIS

S-METALS AND CYANIDE RESULTS IN PPM

TOP OF SCREEN = -17.00 BOTTOM OF SCREEN = -40.00 TOTAL DEPTH = 53.00

DATE: 09/28/84

LAB

08/22/84

04/30/85

MCLAREN ID

B & C

B & C

DETECTION LIMIT

S001125

S001124

S001126

ANALYSIS

MEMO

ALUMINUM			
ANTIMONY			
ARSENIC			
BARIUM			
BERYLLIUM			
CADMIUM			
CHROMIUM			
COBALT			
COPPER			
IRON			
LEAD			
MANGANESE	0.99	0.89	1.1
MERCURY			
MOLYBDENUM			
NICKEL			
SELENIUM			
SILVER			
STRONTIUM	1.3	1.4	0.9
THALLIUM			
VANADIUM			
ZINC		0.05	0.12
CYANIDE			

WATER ANALYSIS-METALS AND CYANIDE RESULTS IN PPM

DATE
LAB
MCLAREN ID
DETECTION LIMIT
ANALYSIS
MEMO

TOP OF SCREEN= 9.00 BOTTOM OF SCREEN= -1.00 TOTAL DEPTH= 12.00

08/25/84
B & C
S001127

09/29/84
B & C
S001128

05/01/85
B & C
S001129

ALUMINUM
ANTHONY
BENIC
BRYLLIUM
CADMIUM
HEXAVALENT CHROMIUM
TOTAL CHROMIUM
COBALT
COPPER
IRON
LEAD
MANGANESE
MERCURY
MOLYBDENUM
NICKEL
SELENIUM
SILVER
STRONTIUM
THALLIUM
VANADIUM
ZINC
CYANIDE

0.01

0.8

0.7

0.8

0.02

WATER ANAL -METALS AND CYANIDE RESULTS IN PPM TOP OF SCREEN= 5.00 BOTTOM OF SCREEN= -63.00 TOTAL DEPTH= 194.00

DATE 05/14/85 10/21/86
 LAB B & C EUREKA
 MCCLAREN ID S001130 44138
 DETECTION LIMIT 10
 ANALYSIS 6010
 MEMO

ALUMINUM	<	0.05
ANTIMONY	<	0.1
BIC	<	0.2
COBALT	<	0.02
COPPER	<	0.01
IRON	<	0.1
LEAD	<	0.09
MANGANESE	<	0.05
MERCURY	<	0.01
MOLYBDENUM	<	0.1
NICKEL	<	0.1
SELENIUM	<	0.01
SILVER	<	0.1
STRONTIUM	<	0.01
THALLIUM	<	0.5
TUNGSTEN	<	0.01
ZINC	<	0.01
CYANIDE		

TOP OF SCREEN= 38.00 BOTTOM OF SCREEN= -30.00 TOTAL DEPTH= 104.00

DATE 05/13/87
 LAB B & C
 MCLAREN ID S001137

DETECTION LIMIT
 ANALYSIS

MEMO

ALUMINUM
 ANTIMONY
 ARSENIC
 BARIUM
 BISMUTH
 BORON
 BROMINE
 CADMIUM
 CALCIUM
 CHLORINE
 CHROMIUM
 COBALT
 COPPER
 IRON
 LEAD
 MANGANESE
 MERCURY
 MOLYBDENUM
 NICKEL
 SILVER
 STRONTIUM
 THALLIUM
 VANADIUM
 ZINC
 CYANIDE

0.12
 0.9
 0.47

DATE 06/12/85 TOP OF SCREEN= 5.00 BOTTOM OF SCREEN= -45.00 TOTAL DEPTH= 50.00
LAB B & C
MCLAREN ID S001131
DETECTION LIMIT 10
ANALYSIS 6010
MEMO

ALUMINUM	<	0.05
ANTIMONY	<	0.1
ARSENIC	<	0.07
BARIUM	<	0.02
BERYLLIUM	<	0.01
CADMIUM	<	0.02
HEXAVALENT CHROMIUM	<	0.01
TOTAL CHROMIUM	<	0.01
COBALT	<	0.01
COPPER	<	0.1
IRON	<	0.1
LEAD	<	0.08
MANGANESE	<	0.03
MERCURY	<	0.1
MOLYBDENUM	<	0.1
NICKEL	<	0.01
SELENIUM	<	0.01
SILVER	<	0.1
STRONTIUM	<	0.01
THALLIUM	<	0.03
VANADIUM	<	0.03
ZINC	<	0.03
CYANIDE	<	0.03

DATE 05/12/85 10/31/86
 LAB B & C EUREKA
 MCLAREN ID S001132 45486
 DETECTION LIMIT 10
 ANALYSIS 6010

MEMO

ARSENIC	-	<	0.05
BARIUM	-	<	0.1
BORON	-	<	0.06
CADMIUM	-	<	0.02
CHROMIUM	-	<	0.01
COBALT	-	<	0.01
COPPER	-	<	0.01
IRON	-	<	0.1
LEAD	-	<	0.05
MANGANESE	0.32	<	0.01
MERCURY	-	<	0.1
MOLYBDENUM	-	<	0.1
NICKEL	-	<	0.01
SELENIUM	-	<	0.01
SILVER	1.7	<	0.01
STRONTIUM	-	<	0.01
THALLIUM	-	<	0.1
VANADIUM	-	<	0.03
ZINC	-	<	0.03
CYANIDE	-	<	

WATER ANAL - METALS AND CYANIDE RESULTS IN PPM

WELL NO. 9

175.00

TOP OF SCREEN = -92.00 BOTTOM OF SCREEN = -152.00 TOTAL DEPTH =

DATE 05/09/86
LAB B & C
MCLAREN ID S001133
DETECTION LIMIT
ANALYSIS

10/30/86
EUREKA
45464
10
6010

10/30/86
EUREKA
45464D
10
6010

ALUMINUM	<	0.05	<	0.05
ARSENIC	<	0.1	<	0.1
BARIUM	<	0.05	<	0.05
BORON	<	0.02	<	0.02
BROMINE	<	0.01	<	0.01
CADMIUM	<	0.02	<	0.02
CHLORINE	<	0.01	<	0.01
COPPER	<	0.01	<	0.01
IRON	<	0.1	<	0.1
LEAD	<	0.13	<	0.05
MANGANESE	<	0.05	<	0.01
MERCURY	<	0.01	<	0.1
MOLYBDENUM	<	0.1	<	0.1
NICKEL	<	0.1	<	0.01
SELENIUM	<	0.01	<	0.1
SILVER	<	0.7	<	0.1
STRONTIUM	<	0.01	<	0.01
THALLIUM	<	0.01	<	0.04
VANADIUM	<	0.01	<	0.04
ZINC	<	0.01	<	0.04

(ANIDE

TOP OF SCREEN= -48.00 BOTTOM OF SCREEN= -78.00 TOTAL DEPTH=

10/17/86

05/10/85

EUREKA
45586
10
6010

DATE
LAB
MCLAREN ID
DETECTION LIMIT
ANALYSIS
MEMO

B & C
S001134

ALUMINUM		<	0.05
ANTIMONY		<	0.1
ARSENIC	0.5	<	0.09
BARIUM		<	0.02
BORON		<	0.01
BROMINE	0.005	<	
CA		<	0.02
CAVALENT CHROMIUM		<	0.01
TOTAL CHROMIUM		<	0.01
COBALT		<	0.01
COPPER		<	
IRON		<	0.1
LEAD		<	
MANGANESE	0.28	<	0.05
MERCURY		<	0.01
MOLYBDENUM		<	0.1
NICKEL		<	0.1
SELENIUM		<	0.01
SILVER	1.3	<	
STRONTIUM		<	0.1
THALLIUM		<	0.01
TANADIUM		<	0.09
ZINC		<	

CYANIDE

WATER ANAL 1-METALS AND CYANIDE RESULTS IN PPM WELL # C-31
 TOP OF SCREEN= -63.00 BOTTOM OF SCREEN= -103.00 TOTAL DEPTH= 120.00

DATE 05/11/85
 LAB B & C
 MCLAREN ID S001135

DETECTION LIMIT
 ANALYSIS
 MEMO

ALUMINUM
 ANTIMONY
 ARSENIC
 BARIUM
 BERYLLIUM
 CADMIUM
 HEXAVALENT CHROMIUM
 TOTAL CHROMIUM
 CALT
 COPPER
 IRON
 LEAD
 MANGANESE
 MERCURY
 MOLYBDENUM
 NICKEL
 SELENIUM
 SILVER
 THORIUM
 THALLIUM
 VANADIUM
 ZINC
 CYANIDE

0.22
 1.4
 0.02

WATER ANALYSIS-METALS AND CYANIDE RESULTS IN PPM WELLS # C-32
TOP OF SCREEN= -9.00 BOTTOM OF SCREEN= -69.00 TOTAL DEPTH= 215.00

DATE 08/05/85
LAB B & C
MCLAREN ID S001136

DETECTION LIMIT
ANALYSIS
MEMO

ALUMINUM
ANTIMONY
ARSENIC
BARIUM
BISMUTH
BROMINE
CALCIUM
CHLORINE
CHROMIUM
COBALT
COPPER
IRON
LEAD
MANGANESE
MERCURY
MOLYBDENUM
NICKEL
SELENIUM
SILVER
STRONTIUM
THALLIUM
VANADIUM
ZINC
CYANIDE

0.11

0.4

0.04

ENTER SITE NO. AND LOCATION OF SCREENS IN SLOTS TOP OF SCREEN = 33700 BOTTOM OF SCREEN = 43.00 TOTAL DEPTH = 58.00

DATE 12/02/86
LAB EUREKA
MCLAREN ID 57300
DETECTION LIMIT 6010
ANALYSIS 6010

MEMO

ALUMINUM	<	0.05	<	0.05
ANTIMONY	<	0.1	<	0.1
ARSENIC	<	0.07	<	0.07
BARIUM	<	0.02	<	0.02
BERYLLIUM	<	0.01	<	0.01
BISMUTH	<	0.01	<	0.01
CHROMIUM	<	0.02	<	0.02
COBALT	<	0.01	<	0.01
COPPER	<	0.08	<	0.05
IRON	<	0.1	<	0.1
LEAD	<	0.05	<	0.05
MANGANESE	<	0.01	<	0.01
MERCURY	<	0.1	<	0.1
MOLYBDENUM	<	0.1	<	0.1
NICKEL	<	0.01	<	0.01
SELENIUM	<	0.01	<	0.01
SILVER	<	0.1	<	0.1
STRONTIUM	<	0.1	<	0.1
THALLIUM	<	0.01	<	0.01
VANADIUM	<	0.25	<	0.25
ZINC	<	0.25	<	0.25

CYANIDE

WATER ANALYSIS-METALS AND CYANIDE RESULTS IN ppm

TOP OF SCREEN= -35.00 BOTTOM OF SCREEN= -45.00 TOTAL DEPTH= 52.00

WELL # C-34

DATE

12/03/86

12/03/86

12/03/86

LAB

EUREKA

EUREKA

B & C

MCCLAREN ID

50359

50359D

50367

DETECTION LIMIT

ANALYSIS

6010

6010

6010

MEMO

ALUMINUM

ANTIMONY

ARSENIC

BARIUM

BISMUTH

BORON

BROMINE

CADMIUM

CHLORINE

CHROMIUM

COPPER

COBALT

IRON

LEAD

MANGANESE

MERCURY

MOLYBDENUM

NICKEL

SELENIUM

SILVER

STRONTIUM

THALLIUM

TITANIUM

ZINC

CYANIDE

ALUMINUM	<	0.05	<	0.05	<	0.02
ANTIMONY	<	0.1	<	0.1	<	0.02
ARSENIC	<	0.07	<	0.08	<	0.088
BARIUM	<	0.02	<	0.02	<	0.006
BISMUTH	<	0.01	<	0.01	<	0.009
BORON	<	0.02	<	0.02	<	0.03
BROMINE	<	0.01	<	0.01	<	0.03
CHLORINE	<	0.01	<	0.01	<	0.04
CHROMIUM	<	0.1	<	0.1	<	0.02
COPPER	<	0.05	<	0.05	<	0.0005
COBALT	<	0.01	<	0.01	<	0.2
IRON	<	0.1	<	0.1	<	0.05
LEAD	<	0.01	<	0.1	<	0.02
MANGANESE	<	0.05	<	0.05	<	0.01
MERCURY	<	0.01	<	0.1	<	0.05
MOLYBDENUM	<	0.1	<	0.1	<	0.02
NICKEL	<	0.1	<	0.1	<	0.01
SELENIUM	<	0.01	<	0.01	<	0.02
SILVER	<	0.1	<	0.1	<	0.01
STRONTIUM	<	0.1	<	0.1	<	0.02
THALLIUM	<	0.01	<	0.01	<	0.03
TITANIUM	<	0.11	<	0.12	<	0.08
ZINC	<		<		<	

WATER ANAL

S-METALS AND CYANIDE RESULTS IN PPM

WELL # C-35

54.00

TOP OF SCREEN= -28.00 BOTTOM OF SCREEN= -38.00 TOTAL DEPTH=

DATE

11/10/86

LAB

EUREKA

MCLAREN ID

45848D

DETECTION LIMIT
ANALYSIS

6010

6010

MEMO

ALUMINUM

ANTIMONY

BARIUM

BISMUTH

BORON

BROMINE

Cadmium

CALCIUM

CHLORINE

CHROMIUM

COBALT

COPPER

IRON

LEAD

MANGANESE

MERCURY

MOLYBDENUM

NICKEL

SILVER

STRONTIUM

THALLIUM

VANADIUM

ZINC

CYANIDE

<	0.05	<	0.05
<	0.1	<	0.1
<	0.08	<	0.09
<	0.02	<	0.02
<	0.01	<	0.01
<	0.02	<	0.02
<	0.01	<	0.01
<	0.02	<	0.02
<	0.1	<	0.1
<	0.05	<	0.05
<	0.01	<	0.01
<	0.1	<	0.1
<	0.1	<	0.1
<	0.01	<	0.01
<	0.1	<	0.1
<	0.01	<	0.01
<	0.1	<	0.1
<	0.01	<	0.01
<	0.2	<	0.21

WATER ANALYSIS-METALS AND CYANIDE RESULTS IN ppm WEL. # C-36
 TOP OF SCREEN= -32.00 BOTTOM OF SCREEN= -12.00 TOTAL DEPTH= 58.00

DATE 11/10/86 11/10/86
 LAB EUREKA H & C
 MCLAREN ID 44162 44162D
 DETECTION LIMIT 10
 ANALYSIS 6010
 METALS/TPH

ALUMINUM	<	0.05	<	0.05	<	0.02
ANTIMONY	<	0.1	<	0.1	<	0.02
ARSENIC	<	0.09	<	0.08	<	0.006
BARIUM	<	0.02	<	0.02	<	0.01
BISMUTH	<	0.03	<	0.03	<	0.03
CHROMIUM	<	0.02	<	0.02	<	0.04
COBALT	<	0.01	<	0.01	<	0.02
COPPER	<	0.08	<	0.08	<	0.0003
IRON	<	0.1	<	0.1	<	0.06
LEAD	<	0.1	<	0.1	<	0.02
MANGANESE	<	0.1	<	0.11	<	0.02
MERCURY	<	0.03	<	0.03	<	0.06
MOLYBDENUM	<	0.1	<	0.1	<	0.02
NICKEL	<	0.1	<	0.1	<	0.01
SELENIUM	<	0.01	<	0.01	<	0.02
SILVER	<	0.1	<	0.1	<	0.01
STRONTIUM	<	0.1	<	0.1	<	0.02
THALLIUM	<	0.01	<	0.01	<	0.38
TUNGSTEN	<	0.45	<	0.45	<	

CYANIDE

WATER ANAL

3-METALS AND CYANIDE RESULTS IN PPM

WELL # C-37

58.00

TOP OF SCREEN = -32.00 BOTTOM OF SCREEN = -42.00 TOTAL DEPTH =

11/16/86

DATE

EUREKA

LAD

45433

MCLAREN ID

10

DETECTION LIMIT

6010

ANALYSIS

MEMO

ALUMINUM

IRON

NICKEL

COPPER

ZINC

MANGANESE

MERCURY

POLYBROMINE

NICKEL

SELENIUM

SILVER

STRONTIUM

THALLIUM

VANADIUM

ZINC

< 0.05

< 0.1

< 0.07

< 0.02

< 0.01

< 0.02

< 0.01

< 0.03

< 0.1

< 0.11

< 0.02

< 0.1

< 0.1

< 0.01

< 0.1

< 0.01

< 0.11

< 0.11

CYANIDE

WATER ANALYSIS-METALS AND CYANIDE RESULTS IN PPM

WELL # C-38

TOP OF SCREEN = -42.00 BOTTOM OF SCREEN = -52.00 TOTAL DEPTH = 64.00

DATE 10/22/86

LAB EUREKA

WCLAREN ID 40704

DETECTION LIMIT 10

ANALYSIS 6010

MEMO

ALUMINUM	<	0.05
ANTIMONY	<	0.1
ARSENIC	<	0.17
BARIUM	<	0.02
BORON	<	0.01
BROMINE	<	0.02
CHLORINE	<	0.01
CHROMIUM	<	0.01
COBALT	<	0.01
COPPER	<	0.01
IRON	<	0.1
LEAD	<	0.05
MANGANESE	<	0.01
MERCURY	<	0.1
NICKEL	<	0.1
NIOBENUM	<	0.01
SILVER	<	0.1
STRONTIUM	<	0.01
THALLIUM	<	0.1
VANADIUM	<	0.01
ZINC	<	0.08
CYANIDE		

WATER ANALYSIS METALS AND CYANIDE RESULTS IN PPM WELLS # C-39
 TOP OF SCREEN = -34.00 BOTTOM OF SCREEN = -44.00 TOTAL DEPTH = 58.00

DATE 12/12/86
 LAB EUREKA
 MCLAREN ID 50348D
 DETECTION LIMIT .01
 ANALYSIS 6010

MEMO

ALUMINUM	<	0.05	<	0.05
ANTHONY	<	0.1	<	0.1
ARSENIC	<	0.15	<	0.15
BARIUM	<	0.02	<	0.02
BERYLLIUM	<	0.01	<	0.01
CADMIUM	<	0.02	<	0.02
HEXAVALENT CHROMIUM	<	0.01	<	0.01
TOTAL CHROMIUM	<	0.02	<	0.02
COBALT	<	0.1	<	0.1
COPPER	<	0.05	<	0.05
IRON	<	0.01	<	0.01
LEAD	<	0.1	<	0.1
MANGANESE	<	0.05	<	0.05
MERCURY	<	0.01	<	0.01
MOLYBDENUM	<	0.1	<	0.1
NICKEL	<	0.1	<	0.1
SELENIUM	<	0.01	<	0.01
SILVER	<	0.1	<	0.1
STRONTIUM	<	0.01	<	0.01
THALLIUM	<	0.15	<	0.1
VANADIUM	<	0.1	<	0.1
ZINC	<	0.1	<	0.1

CYANIDE

WATER ANALYSIS-METALS AND CYANIDE RESULTS IN PPM

WELL # C-40

TOP OF SCREEN= -23.00 BOTTOM OF SCREEN= -33.00 TOTAL DEPTH= 56.00

DATE 11/13/86
 LAB EUREKA
 MCLAREN ID 42729
 DETECTION LIMIT 10
 ANALYSIS 6010

MEMO

ALUMINUM	0.09
ANTIMONY	0.3
ARSENIC	0.06
BARIUM	0.02
BERYLLIUM	0.01
CADMIUM	0.03
HEXAVALENT CHROMIUM	0.01
TOTAL CHROMIUM	0.01
COBALT	0.01
COPPER	0.01
IRON	0.1
LEAD	0.15
MANGANESE	0.05
MERCURY	0.1
MOLYBDENUM	0.2
NICKEL	0.01
SELENIUM	0.1
SILVER	0.01
STRONTIUM	0.1
THALLIUM	0.01
VANADIUM	0.09
ZINC	

CYANIDE

WATER ANAL

IS-METALS AND CYANIDE RESULTS IN PPM

WELL # C-41

30.00

TOP OF SCREEN= -5.00 BOTTOM OF SCREEN= -15.00 TOTAL DEPTH=

DATE 11/18/86

LAB B & C

MCLAREN ID 56719

DETECTION LIMIT 6010

6010

ANALYSIS

MEMO

ALUMINUM	<	0.004	<	0.1
ANTHONY	<	0.02	<	0.41
BARITUM	<	0.076	<	0.06
BORON	<	0.006	<	0.02
BRYLLIUM	<	0.01	<	0.01
CADMIUM	<	0.03	<	0.02
HEXAVALENT CHROMIUM	<	0.03	<	0.01
TOTAL CHROMIUM	<	0.04	<	0.03
COBALT	<	0.008	<	0.1
COPPER	<	0.0002	<	0.17
IRON	<	0.2	<	0.04
LEAD	<	0.06	<	0.1
MANGANESE	<	0.02	<	0.2
MERCURY	<	0.01	<	0.01
MOLYBDENUM	<	0.02	<	0.1
NICKEL	<	0.01	<	0.01
SELENIUM	<	0.02	<	0.1
SILVER	<	0.03	<	0.01
STRONTIUM	<	0.14	<	0.12
THALLIUM	<		<	
VANADIUM	<		<	
ZINC	<		<	

CYANIDE

WATER ANALYSIS-METALS AND CYANIDE RESULTS IN ppm

WELL # C-42

TOP OF SCREEN= -9.00 BOTTOM OF SCREEN= -19.00 TOTAL DEPTH= 30.00

DATE 12/02/86

LAB EUREKA

WCLAREN ID 57290

DETECTION LIMIT 6010

ANALYSIS

MEMO

ALUMINUM	<	0.05
ANTIMONY	<	0.1
ARSENIC	<	0.07
BARIUM	<	0.02
BERYLLIUM	<	0.03
BISMUTH	<	0.02
CHROMIUM	<	0.01
HEXAVALENT CHROMIUM	<	0.05
TOTAL CHROMIUM	<	0.1
COBALT	<	0.05
COPPER	<	0.05
IRON	<	0.1
LEAD	<	0.05
MANGANESE	<	0.01
MERCURY	<	0.1
MOLYBDENUM	<	0.1
NICKEL	<	0.01
SELENIUM	<	0.01
SILVER	<	0.01
STRONTIUM	<	0.1
THALLIUM	<	0.01
VANADIUM	<	0.17
ZINC	<	0.17

CYANIDE

TOP OF SCREEN= -11.00 BOTTOM OF SCREEN= -21.00 TOTAL DEPTH= 35.00

DATE 11/19/86
 LAB B & C
 MCLAREN ID 57317
 DETECTION LIMIT 6010
 ANALYSIS
 MEMO

ALUMINUM	<	0.02	0.05
ANTIMONY	<	0.002	0.1
ARSENIC	<	1.2	0.92
BARIUM	<	0.006	0.02
BORON	<	0.01	0.02
BROMINE	<		
CALCIUM	<	0.03	0.03
CHLORINE	<	0.03	0.01
CHROMIUM	<	0.04	0.03
COBALT	<		
COPPER	<	0.003	0.07
IRON	<		
LEAD	<	0.0002	0.12
MANGANESE	<	0.2	0.05
MERCURY	<	0.06	0.1
MOLYBDENUM	<	0.02	0.02
NICKEL	<	0.01	0.01
SELENIUM	<		
SILVER	<	0.02	0.1
STRONTIUM	<	0.03	0.03
THALLIUM	<	0.18	0.09
VANADIUM	<		
ZINC	<		
CYANIDE			

DATE 10/21/86
 LAB EUREKA
 MCLAREN ID 44129
 DETECTION LIMIT 10
 ANALYSIS 6010
 MEMO 6010

ALUMINUM	<	0.05	<	0.05
ANTIMONY	<	0.1	<	0.1
ARSENIC	<	0.2	<	0.2
BARIUM	<	0.02	<	0.02
BILLIUM	<	0.01	<	0.01
BROMINE	<	0.02	<	0.02
CAVALENT CHROMIUM	<	0.01	<	0.01
CAL CHROMIUM	<	0.01	<	0.01
COBALT	<	0.01	<	0.01
COPPER	<	0.01	<	0.01
IRON	<	0.1	<	0.1
LEAD	<	0.05	<	0.05
MANGANESE	<	0.01	<	0.01
MERCURY	<	0.1	<	0.1
LYBDENUM	<	0.1	<	0.1
NICKEL	<	0.01	<	0.01
SELENIUM	<	0.1	<	0.1
SILVER	<	0.1	<	0.1
STRONTIUM	<	0.01	<	0.01
THALLIUM	<	0.01	<	0.01
VANADIUM	<	0.14	<	0.14
ZINC	<	0.14	<	0.14
CYANIDE				

WATER ANAL

S-METALS AND CYANIDE RESULTS IN PPM

WELL # C-45
 TOP OF SCREEN = -9.00 BOTTOM OF SCREEN = -19.00 TOTAL DEPTH = 35.00

DATE

12/01/86

LAB

EUREKA

MCLAREN ID

57271

DETECTION LIMIT

ANALYSIS

6010

MEMO

ALUMINUM	<	0.05	<	0.05
ANTIMONY	<	0.1	<	0.1
ARSENIC	<	0.04	<	0.04
BARIUM	<	0.02	<	0.02
BERYLLIUM	<	0.01	<	0.01
CADMIUM	<	0.02	<	0.02
HEXAVALENT CHROMIUM	<	0.01	<	0.01
TOTAL CHROMIUM	<	0.01	<	0.01
COBALT	<	0.01	<	0.01
COPPER	<	0.1	<	0.1
IRON	<	0.05	<	0.05
LEAD	<	0.01	<	0.01
MANGANESE	<	0.01	<	0.01
MERCURY	<	0.1	<	0.2
MOLYBDENUM	<	0.1	<	0.1
NICKEL	<	0.01	<	0.01
SELENIUM	<	0.1	<	0.1
SILVER	<	0.02	<	0.02
STRONTIUM	<	0.18	<	0.18
THALLIUM	<	0.02	<	0.02
VANADIUM	<	0.18	<	0.18
ZINC	<	0.02	<	0.02

CYANIDE

WATER ANALYSIS-METALS AND CYANIDE RESULTS IN PPM

WELL # C-43
 TOP OF SCREEN= -11.00 BOTTOM OF SCREEN= -21.00 TOTAL DEPTH= 30.00

DATE 12/10/86

LAB EUREKA

MCLAREN ID 50342D

DETECTION LIMIT .01

ANALYSIS 6010

MEMO

ALUMINUM	<	0.05	<	0.05
ANTIMONY	<	0.1	<	0.1
ARSENIC	<	0.05	<	0.05
BARIUM	<	0.02	<	0.02
BERYLLIUM	<	0.03	<	0.03
CADMIUM	<	0.02	<	0.02
HEXAVALENT CHROMIUM	<	0.01	<	0.01
TOTAL CHROMIUM	<	0.07	<	0.07
COBALT	<	0.1	<	0.1
COPPER	<	0.05	<	0.05
IRON	<	0.11	<	0.1
LEAD	<	0.1	<	0.1
MANGANESE	<	0.1	<	0.1
MERCURY	<	0.01	<	0.01
MOLYBDENUM	<	0.01	<	0.01
NICKEL	<	0.01	<	0.01
SELENIUM	<	0.01	<	0.01
SILVER	<	0.01	<	0.01
STRONTIUM	<	0.1	<	0.1
THALLIUM	<	0.01	<	0.01
VANADIUM	<	0.37	<	0.34
ZINC	<	0.01	<	0.01
CYANIDE				

WATER ANAL

S-METALS AND CYANIDE RESULTS IN PPM

WELL # C-47
TOP OF SCREEN= -16.00 BOTTOM OF SCREEN= -26.00 TOTAL DEPTH= 40.00

DATE 11/12/86

LAB

EUREKA

MCLAREN ID

45240

DETECTION LIMIT

10

ANALYSIS

6010

MEMO

ALUMINUM

ANTHONY

ENIC

IUM

BELLUM

CADIUM

HEXAVALENT CHROMIUM

TOTAL CHROMIUM

COBALT

COPPER

IRON

LEAD

MANGANESE

MERCURY

MOLYBDENUM

NICKEL

SELENIUM

SILVER

STRONTIUM

THALIUM

VANADIUM

ZINC

CYANIDE

<	0.05
<	0.1
<	0.02
<	0.02
<	0.01
<	0.02
<	0.01
<	0.01
<	0.1
<	0.05
<	0.02
<	0.1
<	0.1
<	0.01
<	0.1
<	0.01
<	0.01
<	0.07

WATER ANALYSIS-TRIALS AND CYANIDE RESULTS IN PPM

WELL # C-48

45.00

TOP OF SCREEN = -13.00 BOTTOM OF SCREEN = -23.00 TOTAL DEPTH =

11/13/86

11/13/86

EUREKA
42715D
10
6010

EUREKA
42715
10
6010

DATE

LAB

MCCLAREN ID

DETECTION LIMIT

ANALYSIS

MEMO

ALUMINUM	0.1	0.11
ANTIMONY	0.4	0.4
ARSENIC	0.05	0.05
BARIUM	0.02	0.02
BISMUTH	0.01	0.01
CHROMIUM	0.02	0.02
COBALT	0.02	0.02
COPPER	0.01	0.01
IRON	0.1	0.1
LEAD	0.18	0.19
MANGANESE	0.06	0.06
MERCURY	0.1	0.1
MOLYBDENUM	0.22	0.23
NICKEL	0.01	0.01
SELENIUM	0.1	0.1
SILVER	0.02	0.02
STRONTIUM	0.03	0.03
THALLIUM		
VANADIUM		
ZINC		
CYANIDE		

WALKER & CO. - 9
ENR -18.00 TOTAL DEPTH= 30.00

NET WT. = 18.00 TOTAL DRY WT. = 13.33

11/20/85

БУДЬТЕ
СВОБОДНЫ

decisions

0103

0100

— 48 —

CYANIDE

DRESSER & McK

WATER ANALYSIS-METALS AND CYANIDE RESULTS IN PPM WELLS # C-50
 TOP OF SCREEN= -86.00 BOTTOM OF SCREEN= -96.00 TOTAL DEPTH= 115.00

DATE 12/15/86
 LAB EUREKA
 MCLAREN ID M42777
 DETECTION LIMIT 6010
 ANALYSIS
 MEMO

ALUMINUM	<	0.05
ANTIMONY	<	0.1
ARSENIC	<	0.06
BARIUM	<	0.02
BORON	<	0.01
BROMINE	<	0.02
CHLORINE	<	0.01
CHROMIUM	<	0.01
COBALT	<	0.01
COPPER	<	0.1
IRON	<	0.1
LEAD	<	0.05
MANGANESE	<	0.02
MERCURY	<	0.1
MOLYBDENUM	<	0.1
NICKEL	<	0.01
SELENIUM	<	0.1
SILVER	<	0.01
STRONTIUM	<	0.1
THALLIUM	<	0.01
VANADIUM	<	0.08
ZINC		
CYANIDE		

WATER ANAL I-METALS AND CYANIDE RESULTS IN PPM WELL # C-51 TOP OF SCREEN= -32.00 BOTTOM OF SCREEN= -42.00 TOTAL DEPTH= 55.00

DATE 10/17/86

LAB EUREKA
 MCLAREN ID 45578
 DETECTION LIMIT 10
 ANALYSIS 6010

MEMO

ALUMINUM	<	0.05	<	0.05
ANTIMONY	<	0.1	<	0.1
ARSENIC	<	0.11	<	0.11
BARIUM	<	0.02	<	0.02
BERYLLIUM	<	0.01	<	0.01
CADMIUM	<	0.02	<	0.02
HEXAVALENT CHROMIUM	<	0.01	<	0.01
TOTAL CHROMIUM	<	0.01	<	0.01
CODALT	<	0.01	<	0.01
COPPER	<	0.1	<	0.1
IRON	<	0.05	<	0.05
LEAD	<	0.01	<	0.01
MANGANESE	<	0.1	<	0.1
MERCURY	<	0.01	<	0.01
MOLYBDENUM	<	0.1	<	0.1
NICKEL	<	0.1	<	0.1
SELENIUM	<	0.01	<	0.01
SILVER	<	0.1	<	0.1
STRONTIUM	<	0.01	<	0.01
THALLIUM	<	0.01	<	0.01
VANADIUM	<	0.03	<	0.02
ZINC	<		<	
CYANIDE				

WATER ANALYSIS-METALS AND CYANIDE RESULTS IN PPM

WELL # C-52A

TOP OF SCREEN = -31.00 BOTTOM OF SCREEN = -51.00 TOTAL DEPTH = 174.00

10/23/86

10/23/86

EUREKA
40733D
10
6010

EUREKA
40733
10
6010

DATE
LAB
MCLAREN ID
DETECTION LIMIT
ANALYSIS
MEMO

ALUMINUM	<	0.05	<	0.05
ANTIMONY	<	0.1	<	0.1
ARSENIC	<	1.4	<	1
BARIUM	<	0.02	<	0.02
BISMUTH	<	0.01	<	0.01
HEXAVALENT CHROMIUM	<	0.02	<	0.02
TOTAL CHROMIUM	<	0.01	<	0.01
COBALT	<	0.03	<	0.01
COPPER	<	0.1	<	0.1
IRON	<	0.1	<	0.1
LEAD	<	0.05	<	0.05
MANGANESE	<	0.01	<	0.01
MERCURY	<	0.1	<	0.1
MOLYBDENUM	<	0.1	<	0.1
NICKEL	<	0.1	<	0.1
SELENIUM	<	0.01	<	0.01
SILVER	<	0.1	<	0.1
STRONTIUM	<	0.1	<	0.1
THALLIUM	<	0.01	<	0.01
VANADIUM	<	0.35	<	0.26
ZINC	<		<	
CYANIDE				

WATER ANALYSIS S-METALS AND CYANIDE RESULTS IN PPM
 TOP OF SCREEN=-103.00 BOTTOM OF SCREEN=-113.00 TOTAL DEPTH= 236.00
 DATE 12/16/86
 LAD EUREKA
 MCLAREN ID 51103
 DETECTION LIMIT 6010
 ANALYSIS 6010
 MEMO

ALUMINUM	<	0.05	<	0.05	<	0.05
ANTIMONY	<	0.1	<	0.1	<	0.1
ARSENIC	<	0.17	<	0.16	<	0.16
BARIUM	<	0.02	<	0.02	<	0.02
BISMUTH	<	0.01	<	0.01	<	0.01
BROMINE	<	0.02	<	0.02	<	0.02
CADMIUM	<	0.01	<	0.01	<	0.01
CHLORINE	<	0.09	<	0.09	<	0.09
COPPER	<	0.1	<	0.1	<	0.1
IRON	<	0.05	<	0.05	<	0.05
LEAD	<	0.14	<	0.14	<	0.14
MANGANESE	<	0.1	<	0.1	<	0.1
MERCURY	<	0.1	<	0.1	<	0.1
MOLYBDENUM	<	0.01	<	0.01	<	0.01
NICKEL	<	0.1	<	0.1	<	0.1
SILVER	<	0.01	<	0.01	<	0.01
STRONTIUM	<	0.1	<	0.1	<	0.1
THALLIUM	<	0.03	<	0.03	<	0.03
VANADIUM	<	0.2	<	0.2	<	0.2
ZINC	<	0.03	<	0.03	<	0.03
CYANIDE	<	0.2	<	0.2	<	0.2

DATE 11/04/86
 LAB EUREKA
 MCLAREN ID 44212
 DETECTION LIMIT 10
 ANALYSIS 6010
 MEMO

ALUMINUM	<	0.05	<	0.05
ANTIMONY	<	0.1	<	0.1
ARSENIC	<	0.03	<	0.03
BARIUM	<	0.02	<	0.02
BELLINIUM	<	0.01	<	0.01
BISMUTH	<	0.02	<	0.02
CHROMIUM	<	0.01	<	0.01
COBALT	<	0.01	<	0.01
COPPER	<	0.1	<	0.1
IRON	<	0.05	<	0.05
LEAD	<	0.01	<	0.01
MANGANESE	<	0.1	<	0.1
MERCURY	<	0.05	<	0.05
MOLYBDENUM	<	0.01	<	0.01
NICKEL	<	0.1	<	0.1
SELENIUM	<	0.1	<	0.1
SILVER	<	0.01	<	0.01
STRONTIUM	<	0.1	<	0.1
THALLIUM	<	0.01	<	0.01
VANADIUM	<	0.96	<	0.92
ZINC	<	0.01	<	0.01
CYANIDE	<	0.01	<	0.01

WATER ANAL

METALS AND CYANIDE RESULTS IN PPM

WELL # C-53
TOP OF SCREEN = -95.00 BOTTOM OF SCREEN = -105.00 TOTAL DEPTH = 125.00

DATE 10/18/86

LAB EUREKA

MCLAREN ID 45598

DETECTION LIMIT 10

ANALYSIS 6010

MEMO

ANTIMONY
ARSENIC
BARIUM
BERYLLIUM
CADMIUM
HEXAVALENT CHROMIUM
TOTAL CHROMIUM
COBALT
COPPER
IRON
LEAD
MANGANESE
MERCURY
MOLYBDENUM
NICKEL
SELENIUM
SILVER
STRONTIUM
THALLIUM
ZINC

< 0.05
< 0.1
< 0.13
< 0.02
< 0.01
< 0.02
< 0.01
< 0.01
< 0.1
< 0.05
< 0.01
< 0.1
< 0.1
< 0.01
< 0.1
< 0.01
< 0.01
< 0.01

CYANIDE

LAB B & C
 EUREKA 57399
 S000786
 6010
 6010

DETECTION LIMIT
 ANALYSIS
 MEMO

ALUMINUM	<	0.05	<	0.02
ANTIMONY	<	0.1	<	0.01
ARSENIC	<	0.05	<	0.06
BARIUM	<	0.02	<	0.005
BORON	<	0.01	<	0.01
BROMINE	<	0.02	<	0.03
CHLORINE	<	0.01	<	0.03
CHROMIUM	<	0.02	<	0.09
COBALT	<	0.01	<	0.021
COPPER	<	0.03	<	0.0005
IRON	<	0.1	<	0.2
LEAD	<	0.06	<	0.06
MANGANESE	<	0.02	<	0.008
MERCURY	<	0.1	<	0.01
MOLYBDENUM	<	0.1	<	0.02
NICKEL	<	0.01	<	0.03
SELENIUM	<	0.01	<	0.14
SILVER	<	0.1	<	
STRONTIUM	<	0.01	<	
THALLIUM	<	0.01	<	
VANADIUM	<	0.11	<	
ZINC	<		<	

CYANIDE

WATER ANAL

METALS AND CYANIDE RESULTS IN PPM

WELL # C-25
TOP OF SCREEN = -35.00 BOTTOM OF SCREEN = -55.00 TOTAL DEPTH = 71.00

DATE 11/07/86

LAB

EUREKA

MCLAREN ID 45444

DETECTION LIMIT 10

ANALYSIS 6010

MEMO

ALUMINUM	0.07
ANTIMONY	0.2
ARSENIC	0.05
BARIUM	<
BERYLLIUM	0.02
CADMIUM	0.01
HEXAVALENT CHROMIUM	<
TOTAL CHROMIUM	0.02
COBALT	0.01
COPPER	<
IRON	<
LEAD	0.1
MANGANESE	<
MERCURY	0.11
MOLYBDENUM	0.03
NICKEL	<
SELENIUM	0.1
SILVER	<
STRONTIUM	0.01
THALLIUM	<
VANADIUM	0.03
ZINC	<

CYANIDE

WATER ANALYSIS-RESULTS AND CYANIDE RESULTS IN PPM TOP OF SCREEN= -35.00 BOTTOM OF SCREEN= -55.00 TOTAL DEPTH= 70.00

DATE 11/07/86
LAB EUREKA
MCLAREN ID 45258
DETECTION LIMIT 10
ANALYSIS 6010
MEMO

ALUMINUM	<	0.05
ANTIMONY	<	0.1
ARSENIC	<	0.08
BARIUM	<	0.02
BERYLLIUM	<	0.01
BISMUTH		
CAVALENT CHROMIUM		0.02
TOTAL CHROMIUM		0.01
COBALT		0.01
COPPER		
IRON	<	0.1
LEAD		
MANGANESE		0.09
MERCURY		0.03
MOLYBDENUM		0.04
NICKEL	<	0.1
SELENIUM	<	0.01
SILVER		
STRONTIUM	<	0.1
THALLIUM		0.02
VANADIUM		0.04
ZINC		
CYANIDE		

WATER ANAL

METALS AND CYANIDE RESULTS IN PPM

TOP OF SCREEN= 97.00 BOTTOM OF SCREEN= 117.00 TOTAL DEPTH= 120.00

DATE 10/20/86

LAB

EUREKA

MCLAREN ID

45599

DETECTION LIMIT

10

ANALYSIS

6010

MEMO

ALUMINUM

ANTIMONY

BARIUM

BISMUTH

CALCIUM

CADMIUM

HEXAVALENT CHROMIUM

TOTAL CHROMIUM

COBALT

COPPER

IRON

LEAD

MANGANESE

MERCURY

MOLYBDENUM

NICKEL

SELENIUM

SILVER

STRONTIUM

THALLIUM

VANADIUM

ZINC

CYANIDE

<	0.05
<	0.1
<	0.1
<	0.02
<	0.01
<	0.01
<	0.02
<	0.01
<	0.01
<	0.1
<	0.05
<	0.01
<	0.1
<	0.1
<	0.01
<	0.1
<	0.01
<	0.01
<	0.04

WATER ANALYSIS-METALS AND CYANIDE RESULTS IN PPM
 TOP OF SCREEN= 60.00 BOTTOM OF SCREEN= 80.00 TOTAL DEPTH= 82.00

DATE 10/20/86

LAB EUREKA

MCCLAREN ID 45113

10

DETECTION LIMIT 5010

ANALYSIS

MEMO

ALUMINUM	<	0.05
ANTIMONY	<	0.1
ARSENIC	<	0.11
BARIUM	<	0.02
BERYLLIUM	<	0.01
CADMIUM	<	0.02
HEXAVALENT CHROMIUM	<	0.01
TOTAL CHROMIUM	<	0.01
COBALT	<	0.01
COPPER	<	0.1
IRON	<	0.1
LEAD	<	0.05
MANGANESE	<	0.01
MERCURY	<	0.1
MOLYBDENUM	<	0.1
NICKEL	<	0.01
SELENIUM	<	0.01
SILVER	<	0.01
STRONTIUM	<	0.1
THALLIUM	<	0.01
THORIUM	<	0.01
ZINC	<	0.01

CYANIDE

TOP OF SCREEN= 25.00 BOTTOM OF SCREEN= 35.00 TOTAL DEPTH=

12/17/86

12/17/86

12/17/86

EUREKA
M42775

EUREKA
M42775D

B & C
45801

DATE
LAB
MCLAREN ID
DETECTION LIMIT
ANALYSIS
MEMO

6010

6010

6010

ALUMINUM
ANTHONY
ARSENIC
BARIUM
BISMUTH
BORON
BROMINE
CALCIUM
CHLORINE
CHROMIUM
COBALT
COPPER
IRON
LEAD
MANGANESE
MERCURY
MOLYBDENUM
NICKEL
SILVER
SODIUM
STRONTIUM
THALLIUM
VANADIUM
ZINC

<	0.05	<	0.05	<	0.02
<	0.1	<	0.1	<	0.02
<	0.03	<	0.03	<	0.04
<	0.02	<	0.02	<	0.006
<	0.01	<	0.01	<	0.01
<	0.02	<	0.02	<	0.03
<	0.01	<	0.01	<	0.03
<	0.14	<	0.13	<	
<	0.1	<	0.1	<	0.02
<	0.05	<	0.05	<	0.0005
<	0.02	<	0.02	<	0.2
<	0.1	<	0.1	<	0.06
<	0.1	<	0.1	<	0.02
<	0.01	<	0.01	<	0.03
<	0.1	<	0.1	<	0.02
<	0.01	<	0.01	<	0.03
<	0.1	<	0.1	<	0.02
<	0.13	<	0.12	<	0.03

CYANIDE

WATER ANALYSIS-METALS AND CYANIDE RESULTS IN ppm WELLS # C-43
 TOP OF SCREEN= 25.00 BOTTOM OF SCREEN= 35.00 TOTAL DEPTH= 38.00

DATE 12/22/86

LAD EUREKA
 45909

DETECTION LIMIT
 ANALYSIS
 MEMO

6010

ALUMINUM	<	0.05
ANTIMONY	<	0.1
ARSENIC	<	0.1
BARIUM	<	0.02
BISMUTH	<	0.01
BORON	<	0.02
BREXAVALENT CHROMIUM	<	0.01
TOTAL CHROMIUM	<	0.02
COBALT	<	0.02
COPPER	<	0.1
IRON	<	0.1
LEAD	<	0.05
MANGANESE	<	0.01
MERCURY	<	0.1
MOLYBDENUM	<	0.1
NICKEL	<	0.01
SELENIUM	<	0.1
SILVER	<	0.01
STRONTIUM	<	0.1
THALLIUM	<	0.01
VANADIUM	<	0.16
ZINC	<	

CYANIDE

WATER ANALYSIS-METALS AND CYANIDE RESULTS IN PPM

DATE 12/10/86 TOP OF SCREEN= 10.00 BOTTOM OF SCREEN= 12.00 TOTAL DEPTH= 12.00

LAB

DATE

LAB

EUREKA

50397

.01

6010

DETECTION LIMIT

ANALYSIS

MEMO

ALUMINUM

ANTIMONY

ARSENIC

BARIUM

BORON

BROMINE

CADMIUM

CHLORINE

CHROMIUM

COPPER

COBALT

IRON

LEAD

MANGANESE

MERCURY

MOLYBDENUM

NICKEL

SELENIUM

SILVER

STRONTIUM

THALLIUM

VANADIUM

ZINC

CYANIDE

< 0.05

< 0.1

< 0.06

< 0.02

< 0.01

< 0.02

< 0.01

< 0.08

< 0.1

< 0.05

< 0.02

< 0.1

< 0.1

< 0.01

< 0.1

< 0.01

< 0.26

WATER ANALYSIS - METALS AND CYANIDE RESULTS IN PPM

DATE 12/10/86

TOP OF SCREEN = 10.00 BOTTOM OF SCREEN = 12.00 TOTAL DEPTH = 12.00

LAB EUREKA
 MCCLAREN ID 50333
 DETECTION LIMIT .01
 ANALYSIS 6010
 MEMO

ALUMINUM	<	0.05	<	0.05
ANTIMONY	<	0.1	<	0.1
ARSENIC	<	0.11	<	0.11
BARIUM	<	0.02	<	0.02
BERYLLIUM	<	0.02	<	0.02
CADMIUM	<	0.02	<	0.02
HEXAVALENT CHROMIUM	<	0.01	<	0.01
TOTAL CHROMIUM	<	0.1	<	0.1
COBALT	<	0.1	<	0.1
COPPER	<	0.1	<	0.1
IRON	<	0.1	<	0.1
LEAD	<	0.1	<	0.1
MANGANESE	<	0.06	<	0.06
MERCURY	<	0.03	<	0.03
MOLYBDENUM	<	0.1	<	0.1
NICKEL	<	0.1	<	0.1
SELENIUM	<	0.01	<	0.01
SILVER	<	0.1	<	0.1
STRONTIUM	<	0.1	<	0.1
THALLIUM	<	0.02	<	0.02
VANADIUM	<	0.33	<	0.33
ZINC	<	0.33	<	0.33
CYANIDE				

WATER ANALYSIS-METALS AND CYANIDE RESULTS IN PPM

TOP OF SCREEN= 10.00 BOTTOM OF SCREEN= 12.00 TOTAL DEPTH= 12.00

DATE 12/08/86

LAB H & C

MCLAREN ID 50801

DETECTION LIMIT 624/S

ANALYSIS

MEMO

ALUMINUM	<	0.02	<	0.05
ANTIMONY	<	0.06	<	0.1
ARSENIC	<	0.07	<	0.06
BARIUM	<	0.006	<	0.02
BELLUM	<	0.009	<	0.02
BISMUTH	<	0.03	<	0.02
HEXAVALENT CHROMIUM	<	0.03	<	0.01
TOTAL CHROMIUM	<	0.04	<	0.06
COBALT	<	0.45	<	0.1
COPPER	<	0.02	<	0.1
IRON	<	0.97	<	0.05
LEAD	<	0.0005	<	0.03
MANGANESE	<	0.2	<	0.1
MERCURY	<	0.075	<	0.1
MOLYBDENUM	<	0.02	<	0.01
NICKEL	<	0.01	<	0.1
SELENIUM	<	0.02	<	0.01
SILVER	<	0.02	<	0.1
STRONTIUM	<	0.03	<	0.01
THALLIUM	<	0.08	<	0.23
VANADIUM	<		<	
ZINC	<		<	

CYANIDE

SECTION 4

ACID EXTRACTION

WATER ANALYSIS-ACID EXTRACTION RESULTS IN OPD

TOP OF SCREEN= -19.00 BOTTOM OF SCREEN= -29.00 TOTAL DEPTH= 41.00

WELL # C-02

DATE: 12/12/86

LAB: EUREKA

MCCLAREN ID: M42767

DETECTION LIMIT: 10

ANALYSIS: 625

MEMO

2-CHLOROPHENOL -
 1-DICHLOROPHENOL -
 1-METHYLPHENOL <
 1-NITRO-2-METHYLPHENOL <
 1-NITRO-3-CRESOL <
 1-NITRO-4-CRESOL <
 2-NITROPHENOL <
 3-NITROPHENOL <
 4-NITROPHENOL <
 2-CHLORO-4-CRESOL -
 2-CHLORO-6-CRESOL -
 2-CHLORO-3-CRESOL -
 2-CHLORO-1-CRESOL -
 2,4,6-TRICHLOROPHENOL -

ANILINE
 BENZOIC ACID
 BENZYL ALCOHOL
 1-CHLOROANILINE
 1-CHLORO-2-NITROANILINE
 1-CHLORO-3-NITROANILINE
 1-CHLORO-4-NITROANILINE
 1-CHLORO-5-NITROANILINE
 1-CHLORO-6-NITROANILINE
 1-CHLORO-7-NITROANILINE
 1-CHLORO-8-NITROANILINE
 1-CHLORO-9-NITROANILINE
 1-CHLORO-10-NITROANILINE
 1-CHLORO-11-NITROANILINE
 1-CHLORO-12-NITROANILINE
 1-CHLORO-13-NITROANILINE
 1-CHLORO-14-NITROANILINE
 1-CHLORO-15-NITROANILINE
 1-CHLORO-16-NITROANILINE
 1-CHLORO-17-NITROANILINE
 1-CHLORO-18-NITROANILINE
 1-CHLORO-19-NITROANILINE
 1-CHLORO-20-NITROANILINE
 1-CHLORO-21-NITROANILINE
 1-CHLORO-22-NITROANILINE
 1-CHLORO-23-NITROANILINE
 1-CHLORO-24-NITROANILINE
 1-CHLORO-25-NITROANILINE
 1-CHLORO-26-NITROANILINE
 1-CHLORO-27-NITROANILINE
 1-CHLORO-28-NITROANILINE
 1-CHLORO-29-NITROANILINE
 1-CHLORO-30-NITROANILINE
 1-CHLORO-31-NITROANILINE
 1-CHLORO-32-NITROANILINE
 1-CHLORO-33-NITROANILINE
 1-CHLORO-34-NITROANILINE
 1-CHLORO-35-NITROANILINE
 1-CHLORO-36-NITROANILINE
 1-CHLORO-37-NITROANILINE
 1-CHLORO-38-NITROANILINE
 1-CHLORO-39-NITROANILINE
 1-CHLORO-40-NITROANILINE
 1-CHLORO-41-NITROANILINE
 1-CHLORO-42-NITROANILINE
 1-CHLORO-43-NITROANILINE
 1-CHLORO-44-NITROANILINE
 1-CHLORO-45-NITROANILINE
 1-CHLORO-46-NITROANILINE
 1-CHLORO-47-NITROANILINE
 1-CHLORO-48-NITROANILINE
 1-CHLORO-49-NITROANILINE
 1-CHLORO-50-NITROANILINE
 1-CHLORO-51-NITROANILINE
 1-CHLORO-52-NITROANILINE
 1-CHLORO-53-NITROANILINE
 1-CHLORO-54-NITROANILINE
 1-CHLORO-55-NITROANILINE
 1-CHLORO-56-NITROANILINE
 1-CHLORO-57-NITROANILINE
 1-CHLORO-58-NITROANILINE
 1-CHLORO-59-NITROANILINE
 1-CHLORO-60-NITROANILINE
 1-CHLORO-61-NITROANILINE
 1-CHLORO-62-NITROANILINE
 1-CHLORO-63-NITROANILINE
 1-CHLORO-64-NITROANILINE
 1-CHLORO-65-NITROANILINE
 1-CHLORO-66-NITROANILINE
 1-CHLORO-67-NITROANILINE
 1-CHLORO-68-NITROANILINE
 1-CHLORO-69-NITROANILINE
 1-CHLORO-70-NITROANILINE
 1-CHLORO-71-NITROANILINE
 1-CHLORO-72-NITROANILINE
 1-CHLORO-73-NITROANILINE
 1-CHLORO-74-NITROANILINE
 1-CHLORO-75-NITROANILINE
 1-CHLORO-76-NITROANILINE
 1-CHLORO-77-NITROANILINE
 1-CHLORO-78-NITROANILINE
 1-CHLORO-79-NITROANILINE
 1-CHLORO-80-NITROANILINE
 1-CHLORO-81-NITROANILINE
 1-CHLORO-82-NITROANILINE
 1-CHLORO-83-NITROANILINE
 1-CHLORO-84-NITROANILINE
 1-CHLORO-85-NITROANILINE
 1-CHLORO-86-NITROANILINE
 1-CHLORO-87-NITROANILINE
 1-CHLORO-88-NITROANILINE
 1-CHLORO-89-NITROANILINE
 1-CHLORO-90-NITROANILINE
 1-CHLORO-91-NITROANILINE
 1-CHLORO-92-NITROANILINE
 1-CHLORO-93-NITROANILINE
 1-CHLORO-94-NITROANILINE
 1-CHLORO-95-NITROANILINE
 1-CHLORO-96-NITROANILINE
 1-CHLORO-97-NITROANILINE
 1-CHLORO-98-NITROANILINE
 1-CHLORO-99-NITROANILINE
 1-CHLORO-100-NITROANILINE

WATER ANALYSIS - ACID EXTRACTABLE RESULTS IN PPM WELLS # C-05 35.50
 TOP OF SCREEN = -11.00 BOTTOM OF SCREEN = -21.00 TOTAL DEPTH =

DATE 11/18/86 12/12/86
 LAB EUREKA EUREKA
 ANALYST ID 56736 50347
 DETECTION LIMIT 10 10
 ANALYSIS 625 625

HEMO

2-CHLOROPHENOL -
 1-DICHLOROPHENOL -
 4-DIMETHYLPHENOL < 50
 1,6-DINITRO-2-METHYLPHENOL < 50
 1,6-DINITRO-O-CRESOL < 50
 2,1-DINITROPHENOL < 50
 2-NITROPHENOL -
 4-NITROPHENOL < 50
 P-CHLORO-M-CRESOL -
 PENTACHLOROPHENOL -
 PHENOL -
 2,4,6-TRICHLOROPHENOL -

ANILINE
 BENZOIC ACID
 BENZYL ALCOHOL
 4-CHLOROANILINE
 DIBENZOFURAN
 2-METHYL NAPHTHALENE
 2-NETHYLPHENOL
 1-METHYLPHENOL
 2-NITROANILINE
 3-NITROANILINE
 4-NITROANILINE
 2,1,5-TRICHLOROPHENOL

WATER ANALYSIS-ACID EXTRACTION RESULTS (N. PPB) WELLS # C-08
 TOP OF SCREEN= -9.00 BOTTOM OF SCREEN= -19.00 TOTAL DEPTH= 32.50

DATE 11/28/86
 LAB EUREKA
 MC LAREN JD 57259
 DETECTION LIMIT 10
 ANALYSIS 625
 MEMO

2,4-DICHLOROPHENOL -
 DICHLOROPHENOL -
 DINITRO-2-METHYLPHENOL < 50
 DINITRO-O-CRESOL -
 2,4-DINITROPHENOL < 50
 2-NITROPHENOL -
 1-NITROPHENOL < 50
 P-CHLORO-M-CRESOL -
 PENTACHLOROPHENOL -
 PHENOL -
 2,4,6-TRICHLOROPHENOL -
 ANILINE -
 BENZOIC ACID -
 BENZYL ALCOHOL -
 4-CHLOROANILINE -
 DIBENZOFURAN -
 2-METHYL NAPHTHALENE -
 2-METHYLPHENOL -
 1-METHYLPHENOL -
 2-NITROANILINE -
 3-NITROANILINE -
 4-NITROANILINE -
 2,4,5-TRICHLOROPHENOL -

WATER AND S-ACID EXTRACTION RESULTS IN PPB FOR OF SCREEN= -4.00 BOTTOM OF SCREEN= -16.00 TOTAL DEPTH= 32.00

DATE 12/12/86
 LAB EUREKA
 ANALYST 50918
 DETECTION LIMIT 10
 ANALYSIS 025
 MEMO

2-CHLOROPHENOL	-	
2,4-DICHLOROPHENOL	-	
2,4-DIMETHYLPHENOL	-	
2,4-DINITRO-2-METHYLPHENOL	<	50
2,6-DINITRO-O-CRESOL	<	50
2,4-DINITROPHENOL	-	
2-NITROPHENOL	<	50
4-NITROPHENOL	-	
1-CHLORO-4-CRESOL	-	
PENTACHLOROPHENOL	-	
PHENOL	-	
2,4,6-TRICHLOROPHENOL	-	
ANILINE	-	
BENZOIC ACID	-	
BENZYL ALCOHOL	-	
1-CHLOROANILINE	-	
DIBENZOFURAN	-	
2-METHYL NAPHTHALENE	-	
2-METHYLPHENOL	-	
1-METHYLPHENOL	-	
2-NITROANILINE	-	
3-NITROANILINE	-	
4-NITROANILINE	-	
2,1,5-TRICHLOROPHENOL	-	

WATER ANALYSIS-ACID EXTRACTION RESULTS IN PPB

WELL # C-13
TOP OF SCREEN= -13.00 BOTTOM OF SCREEN= -23.00 TOTAL DEPTH= 40.00

DATE 11/05/86
LAB EUREKA
MCCLAREN ID 44425
DETECTION LIMIT 10
ANALYSIS 625

MEMO

2-CHLOROPHENOL	-	-	-
1,1-DICHLOROPHENOL	-	-	-
1-DIMETHYLPHENOL	-	-	-
2,4-DINITRO-2-METHYLPHENOL	<	50	<
2,6-DINITRO-O-CRESOL	<	50	<
2,4-DINITROPHENOL	<	50	<
2-NITROPHENOL	-	50	-
1-NITROPHENOL	-	-	-
2-CHLORO-4-CRESOL	-	-	-
PENTACHLOROPHENOL	-	-	-
PHENOL	-	-	-
2,4,6-TRICHLOROPHENOL	-	-	-
ANILINE	-	-	-
BENZOIC ACID	-	-	-
BENZYL ALCOHOL	-	-	-
1-CHLOROANILINE	-	-	-
DIBENZOFURAN	-	-	-
2-METHYL NAPHTHALENE	-	-	-
2-METHYLPHENOL	-	-	-
1-METHYLPHENOL	-	-	-
2-NITROANILINE	-	-	-
3-NITROANILINE	-	-	-
4-NITROANILINE	-	-	-
2,4,5-TRICHLOROPHENOL	-	-	-

WATER ANALYSIS - 15-ACID EXTRACTION RESULTS IN PPB - WELLS # C-14
 TOP OF SCREEN = -3.00 BOTTOM OF SCREEN = -13.00 TOTAL DEPTH = 35.50

DATE 12/10/86
 LAB EUREKA
 ANALYST 50400
 DETECTION LIMIT 10
 ANALYSIS 625

METHOD

2-CHLOROPHENOL
 1-DICHLOROPHENOL
 DIMETHYLPHENOL
 DINITRO-2-METHYLPHENOL
 2,4-DINITROPHENOL
 2,4-DINITROPHENOL
 2-NITROPHENOL
 4-NITROPHENOL
 P-CHLORO-M-CRESOL
 PENTACHLOROPHENOL
 PHENOL
 2,4,6-TRICHLOROPHENOL

-
 -
 -
 50
 50
 -
 50
 -
 -
 -
 -

ANILINE
 BENZOIC ACID
 BENZYL ALCOHOL
 1-CHLORANILINE
 DIENZOPIRAN
 2-METHYL NAPHTHALENE
 2-METHYLPHENOL
 1-METHYLPHENOL
 2-NITROANILINE
 3-NITROANILINE
 4-NITROANILINE
 2,4,5-TRICHLOROPHENOL

-

WELL # C-18
TOP OF SCREEN= -9.00 BOTTOM OF SCREEN= -39.00 TOTAL DEPTH= 54.00

DATE 08/24/84
LAB B & C
RELAREN ID S000709

DETECTION LIMIT
ANALYSIS
MEMO

CHLOROPHENOL
1,1-DICHLOROPHENOL
1,2-DIMETHYLPHENOL
2,4-DINITRO-2-METHYLPHENOL
1,6-DINITRO-O-CRESOL
2,4-DINITROPHENOL
2-NITROPHENOL
4-NITROPHENOL
P-CHLORO-H-CRESOL
PENTACHLOROPHENOL
PHENOL
2,1,6-TRICHLOROPHENOL
ANILINE
BENZOIC ACID
BENZYL ALCOHOL
4-CHLOROANILINE
DIRENZOFURAN
2-METHYL NAPHTHALENE
2-METHYLPHENOL
1-METHYLPHENOL
2-NITROANILINE
3-NITROANILINE
4-NITROANILINE
2,4,5-TRICHLOROPHENOL

WATER ANALYSIS-ACID EXTRACTION RESULTS IN PPB WELLS # C-21
 TOP OF SCREEN= -24.00 BOTTOM OF SCREEN= -31.00 TOTAL DEPTH= 19.00

DATE 09/23/84
 LAB H & C
 NCLAREN ID S000710

DETECTION LIMIT
 ANALYSIS
 NEMO

2-CHLOROPHENOL
 2,4-DICHLOROPHENOL
 2,4-DIMETHYLPHENOL
 1,6-DINITRO-2-METHYLPHENOL
 1,6-DINITRO-O-CRESOL
 2,4-DINITROPHENOL
 2-NITROPHENOL
 4-NITROPHENOL
 P-CHLORO-H-CRESOL
 PENTACHLOROPHENOL
 PHENOL
 2,1,6-TRICHLOROPHENOL

ANILINE
 BENZOIC ACID
 BENZYL ALCOHOL
 1-CHLOROANILINE
 DIBENZOFURAN
 2-METHYL NAPHTHALENE
 2-METHYLPHENOL
 1-METHYLPHENOL
 2-NITROANILINE
 3-NITROANILINE
 1-NITROANILINE
 2,1,5-TRICHLOROPHENOL

WATER ANALYSIS-ACID EXTRACTION RESULTS IN PPM WELL # C-22
 TOP OF SCREEN= 5.00 BOTTOM OF SCREEN= -25.00 TOTAL DEPTH= 50.00

DATE 08/24/84
 LAB B & C
 ANALYST S000711

DETECTION LIMIT
 ANALYSIS MENU

- 2-CHLOROPHENOL -
- 2,1-DICHLOROPHENOL -
- 1,1-DIMETHYLPHENOL -
- 1,6-DINITRO-2-METHYLPHENOL -
- 1,6-DINITRO-O-CRESOL -
- 2,4-DINITROPHENOL -
- 2-NITROPHENOL -
- 4-NITROPHENOL -
- 9-CHLORO-M-CRESOL -
- PENTACHLOROPHENOL -
- PHENOL -
- 2,4,6-TRICHLOROPHENOL -
- ANILINE
- BENZOIC ACID
- BENZYL ALCOHOL
- 1-CHLOROANILINE
- DIBENZOFURAN
- 2-METHYL NAPHTHALENE
- 2-METHYLPHENOL
- 1-METHYLPHENOL
- 2-NITROANILINE
- 3-NITROANILINE
- 4-NITROANILINE
- 2,4,5-TRICHLOROPHENOL

WATER ANALYSIS - SLOWED EXTRACTION RESULTS IN PPB
TOP OF SCREEN= 9.00 BOTTOM OF SCREEN= 11.00 TOTAL DEPTH= 12.50

WELL # C-24A

DATE 05/01/85
LAB D & C
MC LAREN ID S000712

DETECTION LIMIT
ANALYSIS

MEMO

2-CHLOROPHENOL -
2,4-DICHLOROPHENOL -
2,4-DIMETHYLPHENOL -
1,6-DINITRO-2-METHYLPHENOL -
1,6-DINITRO-O-CRESOL -
2,4-DINITROPHENOL -
2-NITROPHENOL -
4-NITROPHENOL -
P-CHLORO-N-CRESOL -
PENTACHLOROPHENOL -
PHENOL -
2,4,6-TRICHLOROPHENOL -

ANILINE
BENZOIC ACID
BENZYL ALCOHOL
4-CHLOROANILINE
DIBENZOFURAN
2-METHYL NAPHTHALENE
2-METHYLPHENOL
1-METHYLPHENOL
2-NITROANILINE
3-NITROANILINE
4-NITROANILINE
2,4,5-TRICHLOROPHENOL

WATER ANALYSIS-ACID EXTRACTION RESULTS IN G/L

WELL # C-27

TOP OF SCREEN= 5.00 BOTTOM OF SCREEN= -45.00 TOTAL DEPTH= 63.00

DATE 07/17/85
LAB B & C
RELAREN ID S000713

DETECTION LIMIT
ANALYSIS
MEMO

2-CHLOROPHENOL -
1-CHLOROPHENOL -
1-DIMETHYLPHENOL -
1-DINITRO-2-METHYLPHENOL -
1,6-DINITRO-O-CRESOL -
2,4-DINITROPHENOL -
2-NITROPHENOL -
1-NITROPHENOL -
4-CHLORO-M-CRESOL -
PENTACHLOROPHENOL -
PHENOL -
2,4,6-TRICHLOROPHENOL -

ANILINE -
BENZOIC ACID -
BENZYL ALCOHOL -
1-CHLOROANILINE -
DIBENZOFURAN -
2-METHYL NAPHTHALENE -
2-METHYLPHENOL -
1-METHYLPHENOL -
2-NITROANILINE -
3-NITROANILINE -
1-NITROANILINE -
2,4,5-TRICHLOROPHENOL -

WATER ANALYSIS-ACID EXTRACTION RESULTS IN PPB WELL # C-28
TOP OF SCREEN= -18.00 BOTTOM OF SCREEN= -38.00 TOTAL DEPTH= 64.00

DATE 07/17/85
LAB B & C
MCLAREN ID S000714

DETECTION LIMIT
ANALYSIS
METHOD

2-CHLOROPHENOL -
2,4-DICHLOROPHENOL -
2,4-DIMETHYLPHENOL -
2,6-DINITRO-2-METHYLPHENOL -
2,6-DINITRO-O-CRESOL -
2,4-DINITROPHENOL -
2-NITROPHENOL -
4-NITROPHENOL -
P-CHLORO-M-CRESOL -
PENTACHLOROPHENOL -
PHENOL -
2,4,6-TRICHLOROPHENOL -

ANILINE
BENZOIC ACID
BENZYL ALCOHOL
4-CHLOROANILINE
DIBENZOFURAN
2-METHYL NAPHTHALENE
2-METHYLPHENOL
1-NAPHTHOL
2-NITROANILINE
3-NITROANILINE
4-NITROANILINE
2,4,5-TRICHLOROPHENOL

TOP OF SCREEN = -35.00 BOTTOM OF SCREEN = -45.00 TOTAL DEPTH = 52.00

DATE	LAB	NICLAREN ID	DETECTION LIMIT	ANALYSIS	MEMO

112/01/86
EUREKA
50361
10
625

112/03/HG
B & C
50371
10
625

[illegible]

ANILINE
BENZYL ALCOHOL
BENZOIC ACID
1-HIDROKANTILINE
DIBENZOFURAN
2-METHYL NAPTIALENE
2-METHYLPHENOL
1-METHYLPIENOL
3-NITROANILINE
1-NITROANILINE
2,4,5-TRICHLOROPRENE

[illegible]

WATER ANALYSIS AND EXTRACTION RESULTS IN JOB WELLS # C-35
 TOP OF SCREEN = -28.00 BOTTOM OF SCREEN = -38.00 TOTAL DEPTH = 54.00

DATE 12/23/80
 LAB EUREKA
 HCLAREN ID 45846
 DETECTION LIMIT 10
 ANALYSIS 625
 MEMO

2-CHLOROPHENOL -
 2,4-DICHLOROPHENOL -
 1-DIMETHYLPHENOL -
 1,6-DINITRO-2-METHYLPHENOL < 50
 1,6-DINITRO-O-CRESOL < 50
 2,4-DINITROPHENOL < 50
 2-NITROPHENOL -
 4-NITROPHENOL < 50
 P-CHLORO-M-CRESOL -
 PENTACHLOROPHENOL -
 PHENOL -
 2,4,6-TRICHLOROPHENOL -

ANILINE
 BENZOIC ACID
 BENZYL ALCOHOL
 4-CHLOROANILINE
 DIBENZOFURAN
 2-METHYL NAPHTHALENE
 2-METHYLPHENOL
 1-METHYLPHENOL
 2-NITROANILINE
 3-NITROANILINE
 1-NITROANILINE
 2,4,5-TRICHLOROPHENOL

WATER ANALYSIS-ACID EXTRACTION RESULTS IN DUB

WELL # C-38

TOP OF SCREEN= -32.00 BOTTOM OF SCREEN= -12.00 TOTAL DEPTH= 58.00

DATE 11/10/86
 LAB EUREKA
 NCLAREN ID 44168
 DETECTION LIMIT 10
 ANALYSIS 625
 MEMO 625

2-CHLOROPHENOL
 2,4-DICHLOROPHENOL
 2,4-DIMETHYLPHENOL
 1,6-DINITRO-2-METHYLPHENOL
 1,6-DINITRO-O-CRESOL
 2,4-DINITROPHENOL
 2-NITROPHENOL
 4-NITROPHENOL
 P-CHLORO-M-CRESOL
 PENTACHLOROPHENOL
 PHENOL
 2,4,6-TRICHLOROPHENOL
 ANILINE
 BENZOIC ACID
 BENZYL ALCOHOL
 1-CHLOROANILINE
 DIDENZO FURAN
 2-METHYL NAPHTHALENE
 2-METHYLPHENOL
 1-METHYLPHENOL
 2-NITROANILINE
 3-NITROANILINE
 1-NITROANILINE
 2,1,5-TRICHLOROPHENOL

-
 -
 -
 50
 <
 50
 -
 50
 -
 -
 -
 -

<
 <
 <

50
 25
 25

WATER ANALYSIS-ACID EXTRACTION RESULTS IN PPM WELL # C-40
 TOP OF SCREEN= -23.00 BOTTOM OF SCREEN= -33.00 TOTAL DEPTH= 56.00

DATE 11/13/86
 LAB EUREKA
 MCLAREN ID 42734
 DETECTION LIMIT 10
 ANALYSIS 625
 MEMO

2-CHLOROPHENOL	-
1,1-DICHLOROPHENOL	-
1,2-DIMETHYLPHENOL	-
1,3-DINITRO-2-METHYLPHENOL	< 50
1,4-DINITRO-2-METHYLPHENOL	< 50
2,4-DINITROPHENOL	< 50
2-NITROPHENOL	-
4-NITROPHENOL	< 50
1,3-CHLORO-H-CRESOL	-
PENTACHLOROPHENOL	-
PHENOL	-
2,4,6-TRICHLOROPHENOL	-
ANILINE	-
BENZOIC ACID	-
BENZYL ALCOHOL	-
1-CHLOROANILINE	-
DIBENZOFURAN	-
2-METHYL NAPHTHALENE	-
1-METHYLPHENOL	-
2-NITROANILINE	-
3-NITROANILINE	-
4-NITROANILINE	-
2,4,5-TRICHLOROPHENOL	-

WATER ANALYSIS-ACID EXTRACTION RESULTS IN GPH

WELL # C-41

30.00

TOP OF SCREEN= -5.00 BOTTOM OF SCREEN= -15.00 TOTAL DEPTH=

DATE 11/18/86
 LAB D & C
 NO. SCREEN ID 56721
 DETECTION LIMIT 100
 ANALYSIS 625
 MEMO YES

2-CHLOROPHENOL -
 1-DICHLOROPHENOL -
 DIMETHYLPHENOL -
 DINITRO-2-METHYLPHENOL < 50
 4-DINITROPHENOL < 50
 2-NITROPHENOL -
 4-NITROPHENOL < 50
 1-CHLORO-4-CRESOL -
 1-PENTACHLOROPHENOL -
 PHENOL -
 2,4,6-TRICHLOROPHENOL 30

ANILINE
 BENZOIC ACID
 BENZYL ALCOHOL
 1-CHLOROANILINE
 DIBENZOFURAN
 2-METHYL NAPHTHALENE
 2-NITROPHENOL
 1-METHYLPHENOL
 2-NITROANILINE
 1-NITROANILINE
 4-NITROANILINE
 2,4,5-TRICHLOROPHENOL

WATER ANALYSIS-ACID EXTRACTION RESULTS IN PPB WELL # C-43
 TOP OF SCREEN= -11.00 BOTTOM OF SCREEN= -21.00 TOTAL DEPTH= 35.00

DATE 11/19/86
 LAB B & C
 MCLAREN ID 57322
 DETECTION LIMIT 100
 ANALYSIS 625

MEMO

2,4-DICHLOROPHENOL -
 2,4-DIMETHYLPHENOL 300
 2,6-DINITRO-2-METHYLPHENOL <
 2,6-DINITRO-O-CRESOL <
 2,4-DINITROPHENOL <
 2-NITROPHENOL <
 4-NITROPHENOL <
 P-CHLORO-M-CRESOL -
 PENTACHLOROPHENOL -
 PHENOL 12000
 2,4,6-TRICHLOROPHENOL -

ANILINE
 BENZOIC ACID
 BENZYL ALCOHOL
 1-CHLOROANILINE
 DIBENZOFURAN
 2-METHYL NAPHTHALENE
 2-METHYLPHENOL
 4-METHYLPHENOL
 3-NITROANILINE
 1-NITROANILINE
 2,1,5-TRICHLOROPHENOL

-
 -
 290
 < 50
 < 50
 < 50
 < 50
 -
 -
 19000
 -

WATER ANALYSES-Acid EXTRACTION RESULTS IN PPB WELL # C-46
 TOP OF SCREEN= -11.00 BOTTOM OF SCREEN= -21.00 TOTAL DEPTH= 30.00

DATE 12/03/86
 LAB EUREKA
 ANALYST ID 50381
 DETECTION LIMIT 10
 ANALYSIS 625
 MEMO

2-CHLOROPHENOL -
 1-DICHLOROPHENOL -
 DIMETHYLPHENOL -
 DINITRO-2-METHYLPHENOL < 50
 2,4-DINITRO-O-CRESOL < 50
 2,4-DINITROPHENOL < 50
 2-NITROPHENOL -
 3-NITROPHENOL -
 P-CHLORO-H-CRESOL < 50
 PENTACHLOROPHENOL -
 PHENOL -
 2,4,6-TRICHLOROPHENOL -

ANILINE
 BENZOIC ACID
 BENZYL ALCOHOL
 3-CHLOROANILINE
 DIBENZOFURAN
 2-METHYL NAPHTHALENE
 2-METHYLPHENOL
 1-METHYLPHENOL
 2-NITROANILINE
 3-NITROANILINE
 4-NITROANILINE
 2,4,5-TRICHLOROPHENOL

WATER ANALYSIS-AQUIC EXTRACTION RESULTS IN DEB WELL # C-47
 TOP OF SCREEN= -16.00 BOTTOM OF SCREEN= -26.00 TOTAL DEPTH= 40.00

DATE 11/12/88
 LAB EUREKA
 HCLAREN ID 45743
 DETECTION LIMIT 10
 ANALYSIS 625
 MEMO

3-CHLOROPHENOL	-	
2,4-DICHLOROPHENOL	-	
2,4-DIMETHYLPHENOL	-	
1,6-DINITRO-2-METHYLPHENOL	<	50
1,6-DINITRO-O-CRESOL	<	50
2,1-DINITROPHENOL	<	50
2-NITROPHENOL	-	
4-NITROPHENOL	-	
P-CHLORO-N-CRESOL	-	
PENTACHLOROPHENOL	-	
PHENOL	-	
2,4,6-TRICHLOROPHENOL	-	
ANILINE		
BENZOIC ACID		
BENZYL ALCOHOL		
1-CHLOROANILINE		
DIBENZOFURAN		
2-METHYL NAPHTHALENE		
2-METHYLPHENOL		
4-METHYLPHENOL		
2-NITROANILINE		
3-NITROANILINE		
1-NITROANILINE		
2,1,5-TRICHLOROPHENOL		

WATER ANALYSIS-ACID EXTRACTION RESULTS IN PPB WELL # C-49
 TOP OF SCREEN= -8.00 BOTTOM OF SCREEN= -18.00 TOTAL DEPTH= 30.00

DATE 11/20/86
 LAB EUREKA
 ANALYST S000781
 DETECTION LIMIT 10
 ANALYSIS 625
 NMO

2-CHLOROPHENOL	-
2,4-DICHLOROPHENOL	-
2,4-DIMETHYLPHENOL	-
3,5-DINITRO-2-METHYLPHENOL	< 50
3,5-DINITRO-O-CRESOL	<
2,4-DINITROPHENOL	< 50
2-NITROPHENOL	-
4-NITROPHENOL	< 50
4-NITRO-H-CRESOL	-
PENTACHLOROPHENOL	-
PHENOL	-
2,4,6-TRICHLOROPHENOL	-
ANILINE	-
BENZOIC ACID	-
BENZYL ALCOHOL	-
1-CHLOROANILINE	-
DIBENZOPURAN	-
2-METHYL NAPHTHALENE	-
2-METHYLPHENOL	-
4-METHYLPHENOL	-
2-NITROANILINE	-
3-NITROANILINE	-
4-NITROANILINE	-
2,4,5-TRICHLOROPHENOL	-

WATER ANALYSIS-ACID EXTRACTION RESULTS IN PPB WELL # C-51
 TOP OF SCREEN = -12.00 BOTTOM OF SCREEN = -12.00 TOTAL DEPTH = 55.00

DATE 12/01/86
 LAB EUREKA
 MCCLAREN ID 57262
 DETECTION LIMIT 10
 ANALYSIS 625
 MEMO

2-CHLOROPHENOL	-
2,4-DICHLOROPHENOL	-
2,4-DIMETHYLPHENOL	-
1,3-DINITRO-2-METHYLPHENOL	< 50
1,3-DINITRO-4-CRESOL	< 50
1-DINITROPHENOL	-
2-NITROPHENOL	< 50
4-NITROPHENOL	-
3-CHLORO-4-CRESOL	-
PENTACHLOROPHENOL	-
PHENOL	-
2,1,6-TRICHLOROPHENOL	-
ANILINE	-
BENZOIC ACID	-
BENZYL ALCOHOL	-
4-CHLORANILINE	-
DIBENZOFURAN	-
2-METHYL NAPHTHALENE	-
2-METHYLPHENOL	-
1-METHYLPHENOL	-
2-NITROANILINE	-
3-NITROANILINE	-
1-NITROANILINE	-
2,3,5-TRICHLOROPHENOL	-

WATER ANALYSIS-ACID EXTRACTION RESULTS IN PPB

WELL # C-59

TOP OF SCREEN= 25.00 BOTTOM OF SCREEN= 35.00 TOTAL DEPTH= 38.00

DATE 12/17/86
 LAB EUREKA
 MCLAREN ID H42771
 DETECTION LIMIT 10
 ANALYSIS 625
 MEMO

2-CHLOROPHENOL -
 1,1-DICHLOROPHENOL -
 1,1-DIMETHYLPHENOL -
 2,4-DINITRO-2-METHYLPHENOL < 50
 1,6-DINITRO-O-CRESOL < 50
 2,4-DINITROPHENOL < 50
 2-NITROPHENOL < 50
 4-NITROPHENOL < 50
 P-CHLORO-M-CRESOL -
 PENTACHLOROPHENOL -
 PHENOL -
 2,4,6-TRICHLOROPHENOL -
 ANILINE -
 BENZOIC ACID -
 BENZYL ALCOHOL -
 4-CHLOROANILINE -
 DIBENZOFURAN -
 2-METHYL NAPHTHALENE -
 2-METHYLPHENOL -
 4-METHYLPHENOL -
 2-NITROANILINE -
 3-NITROANILINE -
 4-NITROANILINE -
 2,4,5-TRICHLOROPHENOL -

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WATER ANALYSIS-ACID EXTRACTION RESULTS IN PPB

DATE 12/17/86
 LAB EUREKA
 MCLAREN ID M42774
 DETECTION LIMIT 10
 ANALYSIS 625

WELL # C-62
 TOP OF SCREEN= 25.00 BOTTOM OF SCREEN= 35.00 TOTAL DEPTH= 38.00

MEMO

2-CHLOROPHENOL	-	-
2,4-DICHLOROPHENOL	-	-
2,4-DIMETHYLPHENOL	-	-
1,6-DINITRO-2-METHYLPHENOL	<	50
1,6-DINITRO-O-CRESOL	<	50
2,4-DINITROPHENOL	<	50
2-NITROPHENOL	-	-
4-NITROPHENOL	<	50
P-CHLORO-N-CRESOL	-	-
PENTACHLOROPHENOL	-	-
PHENOL	-	-
2,4,6-TRICHLOROPHENOL	-	-
ANILINE	-	-
BENZOIC ACID	-	-
BENZYL ALCOHOL	-	-
4-CHLOROANILINE	-	-
DIBENZOFURAN	-	-
2-METHYL NAPHTHALENE	-	-
2-METHYLPHENOL	-	-
4-METHYLPHENOL	-	-
2-NITROANILINE	-	-
3-NITROANILINE	-	-
4-NITROANILINE	-	-
2,4,5-TRICHLOROPHENOL	-	-

WATER ANALYSIS-ACID EXTRACTION RESULTS IN PPB WELLS # C-63
TOP OF SCREEN= 25.00 BOTTOM OF SCREEN= 35.00 TOTAL DEPTH= 38.00

DATE 12/23/86

LAB EUREKA

MCLAREN ID 45912

DETECTION LIMIT 10

ANALYSIS 625

MEMO

2-CHLOROPHENOL -
2,4-DICHLOROPHENOL -
2,4-DIMETHYLPHENOL -
4,6-DINITRO-2-METHYLPHENOL < 50
1,6-DINITRO-O-CRESOL < 50
1,1-DINITROPHENOL -
NITROPHENOL -
1-NITROPHENOL < 50
P-CHLORO-M-CRESOL -
PENTACHLOROPHENOL -
PHENOL -
2,4,6-TRICHLOROPHENOL -

ANILINE
BENZOLIC ACID
BENZYL ALCOHOL
1-CHLOROANILINE
DIBENZOFURAN
2-METHYL NAPHTHALENE
2-METHYLPHENOL
4-METHYLPHENOL
2-NITROANILINE
3-NITROANILINE
4-NITROANILINE
2,4,5-TRICHLOROPHENOL

WATER ANALYSIS-ACID EXTRACTION RESULTS IN PPB WELL # C-64 TOP OF SCREEN= 25.00 BOTTOM OF SCREEN= 35.00 TOTAL DEPTH= 38.00

DATE 12/22/86

LAB EUREKA

MCCLAREN ID 45840

DETECTION LIMIT 10

ANALYSIS 625

MEMO

2-CHLOROPHENOL	-
2,4-DICHLOROPHENOL	-
2,4-DIMETHYLPHENOL	-
1,6-DINITRO-2-METHYLPHENOL	< 50
1,6-DINITRO-O-CRESOL	< 50
2,4-DINITROPHENOL	-
2-NITROPHENOL	< 50
1-NITROPHENOL	-
P-CHLORO-M-CRESOL	-
PENTACHLOROPHENOL	-
PHENOL	-
2,4,6-TRICHLOROPHENOL	-
ANILINE	-
BENZOIC ACID	-
BENZYL ALCOHOL	-
4-CHLOROANILINE	-
DIBENZOFURAN	-
2-METHYL NAPHTHALENE	-
2-NETHYLPHENOL	-
1-NETHYLPHENOL	-
2-NITROANILINE	-
3-NITROANILINE	-
4-NITROANILINE	-
2,4,5-TRICHLOROPHENOL	-

WELL # EW-1
 TCE= 90.00 TOTAL DEPTH= 95.00

DATE	09/26/86
LAB	EUREKA
NCLAREN ID	55415
DETECTION LIMIT	10
ANALYSIS	625

10/16/86
EUREKA
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CHINA

2-CHLOROPHENOL,
2, 4-DICHLOROPHENOL,
2, 4-DIMETHYLPHENOL,
4, 6-DINITRO-2-METHYLPHENOL,
4, 6-DINITRO-O-CRESOL,
2, 4-DINITROPHENOL,
2-NITROPHENOL,
4-NITROPHENOL,
P-CHLORO-N-CRESOL,
PENTACHLOROPHENOL,
2, 4, 6-TRICHLOROPHENOL.

ANILINE
BENZOIC ACID
BENZYL ALCOHOL
4-CHLOROANILINE
DIBENZOFURAN
2-METHYL NAPHTHALENE
2-METHYLPHENOL
4-METHYLPHENOL
2-NITROANILINE
3-NITROANILINE
4-NITROANILINE
2,4,5-TRICHLOROPHENOL

WATER ANALYSIS - WTD. EXTRACTION RESULTS IN PPM. WELL # WP-2
 TOP OF SCREEN = 10.00 BOTTOM OF SCREEN = 12.00 TOTAL DEPTH = 12.00

DATE 12/10/86
 LAB EUREKA
 MCCLAREN ID 50326
 DETECTION LIMIT 10
 ANALYSIS 625

MEMO

2-CHLOROPHENOL -
 2,4-DICHLOROPHENOL -
 2,4-DIMETHYLPHENOL -
 4,6-DINITRO-2-METHYLPHENOL < 50
 4,6-DINITRO-O-CRESOL < 50
 2,4-DINITROPHENOL < 50
 2-NITROPHENOL -
 1-NITROPHENOL < 50
 1-CHLORO-M-CRESOL -
 PENTACHLOROPHENOL -
 PHENOL -
 2,4,6-TRICHLOROPHENOL -
 ANILINE
 BENZOIC ACID
 BENZYL ALCOHOL
 1-CHLOROANILINE
 DIBENZOFURAN
 2-METHYL NAPHTHALENE
 2-METHYLPHENOL
 4-METHYLPHENOL
 2-NITROANILINE
 3-NITROANILINE
 4-NITROANILINE
 2,4,5-TRICHLOROPHENOL

SECTION 5

BASE/NEUTRAL EXTRACTION

DATE 12/12/86
 LAB EUREKA
 MCLAREN ID M42767
 DETECTION LIMIT 10
 ANALYSIS 625
 METHOD

ACENAPHTHENE	-	80
PERYDINE	<	
4-TRICHLOROBENZENE	-	
ACHLOROETHANE	-	
BIS-(2-CHLOROETHYL) ETHER	-	
2-CHLORONAPHTHALENE	-	
2-METHYLNAPHTHALENE	-	
1,2-DICHLOROBENZENE	-	
1,3-DICHLOROBENZENE	-	
1,4-DICHLOROBENZENE	-	
3,3-DICHLOROBENZIDINE	<	20
2,1-DINITROTOLUENE	<	20
2,6-DINITROTOLUENE	<	20
1,2-DIPHENYLHYDRAZINE	<	20
FLUORANTHENE	-	
4-CHLOROPHENYL PHENYL ETHER	-	
N-NITROSODIMETHYLAMINE	-	
N-NITROGUINIDINYLAMINE	-	
N-NITROSODI-N-PROPYLAMINE	-	
BIS (2-ETHYLHEXYL) PHTHALATE	<	50
BUTYL BENZYL PHTHALATE	-	
DI-N-BUTYL PHTHALATE	-	
DI-N-OCTYL PHTHALATE	-	
DIMETHYL PHTHALATE	-	
DIETHYL PHTHALATE	-	
BENZO (A) ANTHRACENE	-	
BENZO (A) PYRENE	-	
3,1-BENZOFUORANTHENE	-	
BENZO (K) FLUORANTHENE	-	
CHRYSENE	-	
ACENAPHTHYLENE	-	
ANTHRACENE	-	
1-DIMOPHENYL PHENYL ETHER	-	
BIS (2-CHLOROISOPROPYL) ETHER	-	
BIS (2-CHLOROETHOXY) METHANE	<	20
HEXACHLOROBUTADIENE	-	
HEXACHLOROCYCLOPENTADIENE	-	
ISOPHORONE	-	
NAPHTHALENE	-	
NITROBENZENE	-	
BENZO (CH) PERYLENE	-	
FLUORENE	-	
PIENANTHRENE	-	
DIBENZO (A,H) ANTHRACENE	-	
INDENO (1,2,3-CD) PYRENE	-	
PYRENE	-	
DIOXIN	-	

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11/18/86
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 625

DATE
 LAB
 NO. LAB ID
 DETECTION LIMIT
 ANALYSIS
 MEMO

ACENAPHTHENE	-	-	-	-	-
BENZIDINE	<	80	<	<	80
1,2,4-TRICHLOROBENZENE	-	-	-	-	-
HEXACHLOROBENZENE	-	-	-	-	-
HEXACHLOROETHANE	-	-	-	-	-
BIS-(2-CHLOROETHYL) ETHER	-	-	-	-	-
2-CHLORONAPHTHALENE	-	-	-	-	-
2-METHYLNAPHTHALENE	-	-	-	-	-
1,2-DICHLOROBENZENE	-	-	-	-	-
1,3-DICHLOROBENZENE	-	-	-	-	-
1,4-DICHLOROBENZENE	-	-	-	-	-
3,3-DICHLOROBENZIDINE	<	20	<	<	20
2,4-DINITROTOLUENE	<	20	<	<	20
2,6-DINITROTOLUENE	<	20	<	<	20
1,2-DIPHENYLHYDRAZINE	<	20	<	<	20
FLUORANTHENE	-	-	-	-	-
4-CHLOROPHENYL PHENYL ETHER	-	-	-	-	-
N-NITROSODIMETHYLAMINE	-	-	-	-	-
N-NITROSODIPHENYLAMINE	-	-	-	-	-
N-NITROSODI-N-PROPYLAMINE	-	-	-	-	-
BIS (2-ETHYLHEXYL) PHTHALATE	<	50	<	<	50
BUTYL BENZYL PHTHALATE	-	-	-	-	-
DI-N-BUTYL PHTHALATE	-	-	-	-	-
DI-N-OCTYL PHTHALATE	-	-	-	-	-
DIETHYL PHTHALATE	-	-	-	-	-
DIMETHYL PHTHALATE	-	-	-	-	-
BENZO (A) ANTHRACENE	-	-	-	-	-
BENZO (A) PYRENE	-	-	-	-	-
3,3-BENZOFLUORANTHENE	-	-	-	-	-
BENZO (K) FLUORANTHENE	-	-	-	-	-
CHRYSENE	-	-	-	-	-
ACENAPHTHYLENE	-	-	-	-	-
ANTHRACENE	-	-	-	-	-
4-BROMOPHENYL PHENYL ETHER	-	-	-	-	-
BIS (2-CHLOROISOPROPYL) ETHER	-	-	-	-	-
BIS (2-CHLOROETHOXY) METHANE	<	20	<	<	20
HEXACHLOROBUTADIENE	-	-	-	-	-
HEXACHLOROCYCLOPENTADIENE	-	-	-	-	-
ISOPHORONE	-	-	-	-	-
NAPHTHALENE	-	-	-	-	-
NITROBENZENE	-	-	-	-	-
BENZO (GH) PERYLENE	-	-	-	-	-
FLUORENE	-	-	-	-	-
PHENANTHRENE	-	-	-	-	-
DI-BENZO (A,H) ANTHRACENE	-	-	-	-	-
INDENO (1,2,3-CD) PYRENE	-	-	-	-	-
PYRENE	-	-	-	-	-
DIOLIN	-	-	-	-	-

WATER ANALYSIS BASE/NEUTRAL EXTRACTION RESULTS IN PPM

WELL # C-08

BOTTOM OF SCREEN = 19.00 TOTAL DEPTH = 32.50

TOP OF SCREEN = 9.00

DATE 11/24/86

LAB EUREKA

57259

MC LAREN ID

DETECTION LIMIT 10

ANALYSIS 625

MEMO

ACENAPHTHENE	-	
BENZIDINE	<	80
1,1,1-TRICHLOROENZENE	-	
CHLOROBENZENE	-	
CHLOROETHANE	-	
-(2-CHLOROETHYL) ETHER	-	
CHLORONAPHTHALENE	-	
2-METHYLNAPHTHALENE	-	
1,2-DICHLOROENZENE	-	
1,3-DICHLOROENZENE	-	
1,4-DICHLOROENZENE	-	
3,3-DICHLOROBENZIDINE	<	20
2,4-DINITROTOLUENE	<	20
2,6-DINITROTOLUENE	<	20
1,2-DIPHENYLHYDRAZINE	<	20
FLUORANTHENE	-	
1-CHLOROPHENYL PHENYL ETHER	-	
N-NITROSODIMETHYLAMINE	-	
N-NITROSODIPHENYLAMINE	-	
N-NITROSODI-N-PROPYLAMINE	-	
BIS (2-ETHYLHEXYL) PHTHALATE	<	50
BUTYL BENZYL PHTHALATE	-	
4-N-BUTYL PHTHALATE	-	
DI-N-OCTYL PHTHALATE	-	
DIETHYL PHTHALATE	-	
DIMETHYL PHTHALATE	-	
BENZO (A) ANTHRACENE	-	
BENZO (A) PYRENE	-	
3,4-BENZOFLUORANTHENE	-	
BENZO (K) FLUORANTHENE	-	
CHRYSENE	-	
ACENAPHTHYLENE	-	
ANTHRACENE	-	
1-BROMOPHENYL PHENYL ETHER	-	
BIS (2-CHLOROISOPROPYL) ETHER	-	
BIS (2-CHLOROETHOXY) ETHANE	<	20
HEXACHLOROBUTADIENE	-	
HEXACHLOROCYCLOPENTADIENE	-	
ISOBORANE	-	
NAPHTHALENE	-	
NITROBENZENE	-	
BENZO (GHI) PERYLENE	-	
FLUORENE	-	
PHENANTHRENE	-	
DIBENZO (A,B) ANTHRACENE	-	
INDENO (1,2,3-CD) PYRENE	-	
PYRENE	-	
DIOXIN	-	

WATER AREA IS-GAS/NEUTRAL EXTRACTION RESULTS IN DRIB WEI.L. # C-10 TOP OF SCREEN = 4.00 BOTTOM OF SCREEN = 16.00 TOTAL DEPTH = 32.00

DATE 12/12/80
LAB EUREKA
NO LARSEN ID 50918
DETECTION LIMIT 10
ANALYSIS 625
MEMO

1-NAPHTHENE	<	80
BENZIDINE	<	
1,2,4-TRICHLOROBENZENE		
HEXACHLOROBENZENE		
HEXACHLOROETHANE		
BIS-(2-CHLOROETHYL) ETHER		
2-CHLORONAPHTHALENE		
2-METHYLNAPHTHALENE		
1,2-DICHLOROBENZENE		
1,3-DICHLOROBENZENE		
1,4-DICHLOROBENZENE		
3,3-DICHLOROBENZIDINE	<	20
2,1-DINITROTOLUENE	<	20
2,6-DINITROTOLUENE	<	20
1,2-DIPHENYLHYDRAZINE	<	20
FLUORANTHENE		
4-CHLOROPHENYL PHENYL ETHER		
N-NITROSODIMETHYLAMINE		
N-NITROSODIPHENYLAMINE		
N-NITROSODI-N-PROPYLAMINE		
BIS (2-ETHYLHEXYL) PHTHALATE	<	50
BUTYL BENZYL PHTHALATE		
DI-N-NOYL PHTHALATE		
DI-N-OCTYL PHTHALATE		
DIETHYL PHTHALATE		
DIMETHYL PHTHALATE		
BENZO (A) ANTHRACENE		
BENZO (A) PYRENE		
3,1-BENZOFUORANTHENE		
BENZO (K) FLUORANTHENE		
CHRYSENE		
ACENAPHTHYLENE		
ANTHRACENE		
4-BROMOPHENYL PHENYL ETHER		
BIS (2-CHLOROISOPROPYL) ETHER		
BIS (2-CHLOROETHOXY) METHANE	<	20
HEXACHLOROBUTADIENE		
HEXACHLOROCYCLOPENTADIENE		
ISOPHTHENE		
NAPHTHALENE		
NITROBENZENE		
BENZO (GH) PERYLENE		
FLUORENE		
PHENANTHRENE		
DIBENZO (A,H) ANTHRACENE		
INDENO (1,2,3-CD) PYRENE		
PYRENE		
DIOXIN		

WATER ANALYSIS-DAT/NEUTRAL EXTRACTION RESULTS IN PPB

WELL # C-13

40.00

TOP OF SCREEN= -13.00 BOTTOM OF SCREEN= -23.00 TOTAL DEPTH=

DATE 11/05/86
LAB EUREKA
N° LARSEN ID 44425
DETECTION LIMIT 10
ANALYSIS 625
MEMO

ACENAPHTHENE	-	<	80	-	<	40
BENZIDINE	-	-	-	-	-	-
1,4-TRICHLOROBENZENE	-	-	-	-	-	-
CHLOROBENZENE	-	-	-	-	-	-
ACETOETHANE	-	-	-	-	-	-
3-(2-CHLOROETHYL) ETHER	-	-	-	-	-	-
2-CHLORONAPHTHALENE	-	-	-	-	-	-
2-METHYLNAPHTHALENE	-	-	-	-	-	-
1,2-DICHLOROBENZENE	-	-	-	-	-	-
1,3-DICHLOROBENZENE	-	-	-	-	-	-
1,4-DICHLOROBENZENE	-	-	-	-	-	-
3,3-DICHLOROBENZIDINE	-	<	20	-	-	-
2,4-DINITROTOLUENE	-	<	20	-	-	-
2,6-DINITROTOLUENE	-	<	20	-	-	-
1,2-DIPHENYLDIAZINE	-	<	20	-	-	-
FLUORANTHENE	-	-	-	-	-	-
4-CHLOROPHENYL PHENYL ETHER	-	-	-	-	-	-
N-NITROSODIMETHYLAMINE	-	-	-	-	<	80
N-NITROSODIPHENYLAMINE	-	-	-	-	-	-
N-NITROSODI-N-PROPYLAMINE	-	-	-	-	<	40
BIS (2-ETHYLHEXYL) PHTHALATE	-	<	50	-	-	-
ACTYL BENZYL PHTHALATE	-	-	-	-	-	-
DI-N-BUTYL PHTHALATE	-	-	-	-	<	50
DIETHYL PHTHALATE	-	-	-	-	-	-
DIMETHYL PHTHALATE	-	-	-	-	<	25
BENZO (A) ANTHRACENE	-	-	-	-	-	-
BENZO (A) PYRENE	-	-	-	-	-	-
3,4-BENZOFLUORANTHENE	-	-	-	-	-	-
BENZO (K) FLUORANTHENE	-	-	-	-	-	-
CHRYSENE	-	-	-	-	-	-
ACENAPHTHYLENE	-	-	-	-	-	-
ANTHRACENE	-	-	-	-	-	-
4-BROMOPHENYL PHENYL ETHER	-	-	-	-	-	-
BIS (2-CHLOROISOPROPYL) ETHER	-	-	-	-	-	-
BIS (2-CHLOROETHOXY) METHANE	-	<	20	-	-	-
HEXA-CHLOROBUTADIENE	-	-	-	-	-	-
HEXA-CHLOROCYCLOPENTADIENE	-	-	-	-	-	-
ISOPHORONE	-	-	-	-	-	-
NAPHTHALENE	-	-	-	-	-	-
NITROBENZENE	-	-	-	-	-	-
BENZO (GH) PERYLENE	-	-	-	-	-	-
FLUORENE	-	-	-	-	-	-
PHENANTHRENE	-	-	-	-	-	-
DIBENZO (A,H) ANTHRACENE	-	-	-	-	-	-
INDENO (1,2,3-CD) PYRENE	-	-	-	-	-	-
PYRENE	-	-	-	-	-	-
DIOXIN	-	-	-	-	-	-

WATER ANALYSIS - GASE/NEUTRAL EXTRACTION RESULTS IN PPB

WELL # C-14

TOP OF SCREEN = -3.00

BOTTOM OF SCREEN = -13.00 TOTAL DEPTH = 35.50

DATE 12/10/86

LAB EUREKA

MEGAREN ID 50400

DETECTION LIMIT 10

ANALYSIS 625

NRRO

ACENAPHTHENE			
PICAZIDINE	<	80	
1,1,1-TRICHLOROBENZENE			
1,2-DICHLOROBENZENE			
1,3-DICHLOROBENZENE			
1,4-DICHLOROBENZENE			
BIS-(2-CHLOROETHYL) ETHER			
2-CHLORONAPHTHALENE			
2-METHYLNAPHTHALENE			
1,2-DICHLOROBENZENE			
1,3-DICHLOROBENZENE			
1,4-DICHLOROBENZENE			
3,3-DICHLOROBENZIDINE	<	20	
2,4-DINITROTOLUENE	<	20	
2,6-DINITROTOLUENE	<	20	
1,2-DIPHENYLHYDRAZINE			
FLUORANTHENE			
4-CHLOROPHENYL PHENYL ETHER			
N-NITROSODIMETHYLAMINE			
N-NITROSODIPHENYLAMINE			
N-NITROSODI-N-PROPYLAMINE			
BIS (2-ETHYLHEXYL) PHTHALATE	<	50	
BUTYL BENZYL PHTHALATE			
DI-N-BUTYL PHTHALATE			
DI-N-OCTYL PHTHALATE			
DIMETHYL PHTHALATE			
DIMETHYL PHTHALATE			
BENZO (A) ANTHRACENE			
BENZO (A) PYRENE			
3,4-BENZOFLUORANTHENE			
BENZO (K) FLUORANTHENE			
CHRYSENE			
ACENAPHTHYLENE			
ANTHRACENE			
4-BROMOPHENYL PHENYL ETHER			
BIS (2-CHLOROISOPROPYL) ETHER			
BIS (2-CHLOROETHOXY) METHANE	<	20	
HEXACHLOROBUTADIENE			
HEXACHLOROCYCLOPENTADIENE			
ISOPHORBONE			
NAITRALENE			
NITROBENZENE			
BENZO (GH) PERYLENE			
FLUORENE			
PHENANTHRENE			
BIBENZO (A,H) ANTHRACENE			
INDENO (1,2,3-CD) PYRENE			
PYRENE			
DIOXIN			

08/24/84
B & C
S000703

DATE
LAB
MCLAREN ID
DETECTION LIMIT
ANALYSIS
MEMO

ACENAPHTHENE
BENZIDINE
1,2,4-TRICHLOROBENZENE
HEXACHLOROBENZENE
HEXACHLOROETHANE
BIS-(2-CHLOROETHYL) ETHER
2-CHLORONAPHTHALENE
2-METHYLNAPHTHALENE
1,2-DICHLOROBENZENE
1,3-DICHLOROBENZENE
1,4-DICHLOROBENZENE
3,3-DICHLOROBENZIDINE
2,4-DINITROTOLUENE
2,6-DINITROTOLUENE
1,2-DIPHENYLHYDRAZINE
FLUORANTHENE
4-CHLOROPHENYL PHENYL ETHER
N-NITROSODIMETHYLAMINE
N-NITROSODIPHENYLAMINE
N-NITROSODI-N-PROPYLAMINE
BIS-(2-ETHYLHEXYL) PHTHALATE
N-ETHYL BENZYL PHTHALATE
DI-N-ETHYL PHTHALATE
DIETHYL PHTHALATE
DIETHYL PHTHALATE
BENZO (A) ANTHRACENE
BENZO (A) PYRENE
3,4-BENZOFUORANTHENE
BENZO (K) FLUORANTHENE
CHRYSENE
ACENAPHTHYLENE
ANTHRACENE
4-BROMOPHENYL PHENYL ETHER
BIS-(2-CHLOROISOPROPYL) ETHER
BIS-(2-CHLOROETHOXY) METHANE
HEXACHLOROBTADIENE
HEXACHLOROCYCLOPENTADIENE
ISOPHORONE
NAPHTHALENE
NITROBENZENE
BENZO (GH) PERYLENE
FLUORENE
FLUORANTHENE
DIENZO (A,H) ANTHRACENE
INDENO (1,2,3-CD) PYRENE
PYRENE
DIOXIN

WATER ANALYSIS-BASE/NEUTRAL EXTRACTION RESULTS IN DPH WELD. # C-21 19.00
 TOP OF SCREEN= -21.00 BOTTOM OF SCREEN= -31.00 TOTAL DEPTH=

08/23/84
 B & C
 S000701

DATE
 LAB
 SCLAREN ID
 DETECTION LIMIT
 ANALYSIS
 REMO

ACENAPHTHENE
 BENZIDINE
 1,2,4-TRICHLOROBENZENE
 HEXACHLOROBENZENE
 HEXACHLOROETHANE
 BIS-(2-CHLOROETHYL) ETHER
 2-CHLORONAPHTHALENE
 2-METHYLNAPHTHALENE
 1,2-DICHLOROBENZENE
 1,3-DICHLOROBENZENE
 1,4-DICHLOROBENZENE
 3,3-DICHLOROBENZIDINE
 2,4-DINITROTOLUENE
 2,6-DINITROTOLUENE
 1,2-DIPHENYLHYDRAZINE
 FLUORANTHENE
 1-CHLOROPHENYL PHENYL ETHER
 N-NITROSODIMETHYLAMINE
 N-NITROSODIPHENYLAMINE
 N-NITROSODI-N-PROPYLAMINE
 BIS (2-ETHYLHEXYL) PHTHALATE
 BUTYL BENZYL PHTHALATE
 DI-N-NOCTYL PHTHALATE
 DIETHYL PHTHALATE
 DIOCTYL PHTHALATE
 BENZO (A) ANTHRACENE
 BENZO (A) PYRENE
 3,4-BENZOFUORANTHENE
 BENZO (K) FLUORANTHENE
 CHRYSENE
 ACENAPHTHYLENE
 ANTHRACENE
 1-HYDROPHENYL PHENYL ETHER
 BIS (2-CHLOROISOPROPYL) ETHER
 BIS (2-CHLOROETHOXY) METHANE
 HEXACHLOROCYCLOPENTADIENE
 HEXACHLOROCYCLOPENTADIENE
 ISOPHTHORENE
 NAPHTHALENE
 NITROBENZENE
 BENZO (GH) PERYLENE
 FLUORENE
 PHENANTHRENE
 DIENZO (A,B) ANTHRACENE
 INDERO (1,2,3-CD) PYRENE
 PYRENE
 DIOXIN

VIEW ANALYSIS-BASE/NEUTRAL EXTRACTION RESULTS IN PPM
TOP OF SCREEN=

WELL # C-22
5.00 BOTTOM OF SCREEN= -25.00 TOTAL DEPTH= 50.00

08/24/84

DATE

B & C

LAB

S000705

MCLEAREN ID

DETECTION LIMIT

ANALYSIS

MEMO

ACENAPHTHENE
BENZIDINE
1,2,4-TRICHLOROBENZENE
1-CHLOROBENZENE
1-CHLOROETHANE
1,2-DICHLOROETHYL ETHER
1-CHLORONAPHTHALENE
2-METHYLNAPHTHALENE
1,2-DICHLOROBENZENE
1,3-DICHLOROBENZENE
1,4-DICHLOROBENZENE
3,4-DICHLOROBENZIDINE
2,4-DINITROTOLUENE
2,6-DINITROTOLUENE
1,2-DIPHENYLDIAZINE
FLUORANTHENE
4-CHLOROPHENYL PHENYL ETHER
N-NITROSODIMETHYLAMINE
N-NITROSODIPHENYLAMINE
N-NITROSODIPHENYLAMINE
N-NITROSODI-N-PROPYLAMINE
BIS (2-ETHYLBENZYL) PHTHALATE
BIS (2-ETHYLBENZYL) PHTHALATE
DI-N-BUTYL PHTHALATE
DI-N-OCTYL PHTHALATE
DIETHYL PHTHALATE
DIMETHYL PHTHALATE
BENZO (A) ANTHRACENE
BENZO (A) PYRENE
4,4-BENZOFUORANTHENE
BENZO (K) FLUORANTHENE
CHRYSENE
ACENAPHTHYLENE
ANTHRACENE
1-BROMOPHENYL PHENYL ETHER
BIS (2-CHLOROISOPROPYL) ETHER
BIS (2-CHLOROETHOXY) METHANE
HEXACHLOROBUTADIENE
HEXACHLOROCYCLOPENTADIENE
ISOPHTHORENE
NAPHTHALENE
NITROBENZENE
BENZO (GH) PERYLENE
FLUORENE
DIENANTHRENE
DIENANTHRENE (A,B) ANTHRACENE
INDENO (1,2,3-CD) PYRENE
PYRENE
PHTHALIN

DATE 05/01/85
 LAB H & C
 RELAKEN ID S000706

DETECTION LIMIT
 ANALYSIS
 MEMO

ACENAPHTHENE	
ACETYLIDINE	
1,1-TRICHLOROBENZENE	
1,4-DICHLOROBENZENE	
HEXACHLOROETHANE	
BIS-(2-CHLOROETHYL) ETHER	
2-CHLORONAPHTHALENE	
2-NETHYLNAPHTHALENE	
1,2-DICHLOROBENZENE	
1,3-DICHLOROBENZENE	
1,4-DICHLOROBENZENE	
3,3-DICHLOROBENZIDINE	
2,4-DINITROTOLUENE	
2,6-DINITROTOLUENE	
1,2-DITHENYLHYDRAZINE	
FLUORANTHENE	
4-CHLOROPHENYL PHENYL ETHER	
N-NITROSODIMETHYLAMINE	
N-NITROSODIPHENYLAMINE	
N-NITROSODI-N-PROPYLAMINE	100
BIS (2-ETHYLHEXYL) PHTHALATE	
BUTYL BENZYL PHTHALATE	
DI-N-BUTYL PHTHALATE	10
DI-N-OCTYL PHTHALATE	
DIEHTYL PHTHALATE	
DIMETHYL PHTHALATE	
BENZO (A) ANTHRACENE	
BENZO (A) PYRENE	
3,3-DENZOFLUORANTHENE	
BENZO (K) FLUORANTHENE	
CHRYSENE	
ACENAPHTHYLENE	
ANTHRACENE	
4-BROMOPHENYL PHENYL ETHER	
BIS (2-CHLOROISOPROPYL) ETHER	
BIS (2-CHLOROETHOXY) METHANE	
HEXACHLOROBUTADIENE	
HEXACHLOROXYCLOPENTADIENE	
ISOPHORONE	
NAPHTHALENE	
NITROBENZENE	
BENZO (GH) PERYLENE	
FLUORENE	
PHENANTHRENE	
BLENZO (A,B) ANTHRACENE	
INDENO (1,2,3-CD) PYRENE	
PYRENE	
DIOXIN	

WELL ANALYSIS-BASIN/NEUTRAL EXTRACTION RESULTS IN PPD

WELL # C-27
 5.00 BOTTOM OF SCREEN= -45.00 TOTAL DEPTH= 60.00

DATE 05/12/85

LAB U & C

NO. TAKEN 10

5000707

DETECTION LIMIT

ANALYSIS

MEMO

1,1-DICHLOROETHANE

BENZIDINE

1,2,4-TRICHLOROBENZENE

HEXACHLOROBENZENE

HEXACHLOROETHANE

BIS-(2-CHLOROETHYL) ETHER

2-CHLORONAPHTHALENE

2-METHYLNAPHTHALENE

1,2-DICHLOROBENZENE

1,3-DICHLOROBENZENE

1,4-DICHLOROBENZENE

1,3-DICHLOROBENZIDINE

2,4-DINITROTOLUENE

2,6-DINITROTOLUENE

1,2-DIPHENYLHYDRAZINE

FLUORANTHENE

4-CHLOROPHENYL PHENYL ETHER

N-NITROSODIMETHYLANILINE

N-NITROSODIPHENYLAMINE

N-NITROSODI-N-PROPYLAMINE

BIS (2-ETHYLHEXYL) PHTHALATE

NPYL BENZYL PHTHALATE

DI-N-BUTYL PHTHALATE

DI-N-OCTYL PHTHALATE

DIETHYL PHTHALATE

DIMETHYL PHTHALATE

BENZO (A) ANTHRACENE

BENZO (A) PYRENE

3,4-BENZOFLUORANTHENE

BENZO (K) FLUORANTHENE

CHRYSENE

ACENAPHTHYLENE

ANTHRACENE

4-BROMOPHENYL PHENYL ETHER

BIS (2-CHLOROISOPROPYL) ETHER

BIS (2-CHLOROETHOXY) METHANE

HEXACHLOROBUTADIENE

HEXACHLOROCYCLOPENTADIENE

ISOPHORONE

NAPHTHALENE

NITROBENZENE

BENZO (GH) PERYLENE

FLUORENE

DIENANTHRENE

DIBENZO (A,H) ANTHRACENE

INDENO (1,2,3-CD) PYRENE

PYRENE

DIOXIN

WELL # C-28
 TOP OF SCREEN= -18.00 BOTTOM OF SCREEN= -38.00 TOTAL DEPTH= 64.00

05/12/85
 B & C
 S000708

DATE
 LAB
 ANALYST
 DETECTION LIMIT
 ANALYSIS
 MERO

ACENAPHTHENE	-
BENZIDINE	-
1,2,4-TRICHLOROBENZENE	-
HEXACHLOROBENZENE	-
HEXACHLOROETHANE	-
BIS-(2-CHLOROETHYL) ETHER	-
2-CHLORONAPHTHALENE	-
2-METHYLNAPHTHALENE	-
1,2-DICHLOROBENZENE	-
1,1-DICHLOROBENZENE	-
1,1-DICHLOROBENZIDINE	-
3,3-DICHLOROBENZIDINE	-
2,1-DINITROTOLUENE	-
2,4-DINITROTOLUENE	-
1,2-DIPHENYLDIAZINE	-
FLUORANTHENE	-
4-CHLOROPHENYL PHENYL ETHER	-
N-NITROSODIMETHYLAMINE	-
N-NITROSODIPHENYLAMINE	-
N-NITROSODI-N-PROPYLAMINE	-
BIS-(2-ETHYLHEXYL) PHTHALATE	-
BUTYL BENZYL PHTHALATE	-
DI-N-BUTYL PHTHALATE	-
DI-N-OCTYL PHTHALATE	-
DIETHYL PHTHALATE	-
DIMETHYL PHTHALATE	-
BENZO (A) ANTHRACENE	-
BENZO (A) PYRENE	-
3,3-BENZOFUORANTHENE	-
BENZO (K) FLUORANTHENE	-
CHRYSENE	-
ACENAPHTHYLENE	-
ANTHRACENE	-
4-BROMOPHENYL PHENYL ETHER	-
BIS (2-CHLOROISOPROPYL) ETHER	-
BIS (2-CHLOROETHOXY) METHANE	-
HEXACHLOROBUTADIENE	-
HEXACHLOROCYCLOPENTADIENE	-
ISOPHORONE	-
NAPHTHALENE	-
NITROBENZENE	-
BENZO (GH) PERYLENE	-
FLUORENE	-
PERANTRHENE	-
DIBENZO (A,H) ANTHRACENE	-
UNDENO (1,2,3-CD) PYRENE	-
PYRENE	-
DIOXIN	-

WATER ANALYSIS - BASE/NEUTRAL EXTRACTION RESULTS IN PPB WELL # C-35 TOP OF SCREEN -26.00 BOTTOM OF SCREEN -38.00 TOTAL DEPTH - 54.00

DATE 12/23/86
LAB EUREKA
POLAREN ID 45846
DETECTION LIMIT 10
ANALYSIS 625
MEMO

ACENAPHTHENE		
BENZIDENE	<	80
1,2,4-TRICHLOROBENZENE		
HEXACHLOROBENZENE		
HEXACHLOROETHANE		
BIS-(2-CHLOROETHYL) ETHER		
2-CHLORONAPHTHALENE		
2-METHYLNAPHTHALENE		
1,2-DICHLOROBENZENE		
1,3-DICHLOROBENZENE		
1,4-DICHLOROBENZENE		
3,3-DICHLOROBENZIDINE	<	20
2,4-DINITROTOLUENE	<	20
2,6-DINITROTOLUENE	<	20
1,2-DIPHENYLHYDRAZINE	<	
FLUORANTHENE		
1-CHLOROPHENYL PHENYL ETHER		
N-NITROSODIMETHYLANILINE		
N-NITROSODIPHENYLANILINE		
N-NITROSODI-N-PROPYLAMINE		
N-NITROSO-1-N-HEXYL PHTHALATE	<	50
BIS-(2-ETHYLHEXYL) PHTHALATE		
BUTYL BENZYL PHTHALATE		
DI-N-BUTYL PHTHALATE		
DI-N-OCTYL PHTHALATE		
DIMETHYL PHTHALATE		
DIMETHYL PHTHALATE		
BENZO (A) ANTHRACENE		
BENZO (A) PYRENE		
3,4-BENZOFLOURANTHENE		
BENZO (K) FLUORANTHENE		
CHRYSENE		
ACENAPHTHYLENE		
ANTHRACENE		
4-BROMOPHENYL PHENYL ETHER		
BIS-(2-CHLOROISOPROPYL) ETHER		
BIS-(2-CHLOROETHOXY) METHANE	<	20
HEXACHLOROBUTADIENE		
HEXACHLOROCYCLOPENTADIENE		
ISOPHORONE		
NAPHTHALENE		
NITROBENZENE		
BENZO (GH) PERYLENE		
FLUORENE		
PHENANTHRENE		
INDENZO (A,B) ANTHRACENE		
INDENO (1,2,3-CD) PYRENE		
PYRENE		
DIOXIN		

WELL # C-36

58.00

TOP OF SCREEN = -32.00 BOTTOM OF SCREEN = -42.00 TOTAL DEPTH =

11/10/86
B & C
S000776
10
625

11/10/86
EUREKA
44166
10
625

DATE
LAB
HCLAREN ID
DETECTION LIMIT
ANALYSIS
VEND

ACENAPHTHENE				
BENZIDINE	<	80		40
1,2,4-TRICHLOROBENZENE				
HEXACHLOROBENZENE				
HEXACHLOROETHANE				
BIS-(2-CHLOROETHYL) ETHER				
2-CHLORONAPHTHALENE				
2-METHYLNAPHTHALENE				
1,2-DICHLOROBENZENE				
1,3-DICHLOROBENZENE				
1,1-DICHLOROBENZENE				
3,3-DICHLOROBENZIDINE	<	20		
2,1-DINITROTOLUENE	<	20		
2,6-DINITROTOLUENE	<	20		
1,2-DIPHENYLHYDRAZINE	<	20		
FLUORANTHENE				
1-CHLOROPHENYL PHENYL ETHER				
N-NITROSODIMETHYLAMINE				80
N-NITROSODIPHENYLAMINE				
N-NITROSODI-N-PROPYLAMINE				10
BIS (2-ETHYLHEXYL) PHTHALATE				
BUTYL BENZYL PHTHALATE				
DI-N-BUTYL PHTHALATE				50
DI-N-OCTYL PHTHALATE				
DIEHTYL PHTHALATE				
DIMETHYL PHTHALATE				25
BENZO (A) ANTHRACENE				
BENZO (A) PYRENE				
3,1-BENZOFLOURANTHENE				
BENZO (K) FLUORANTHENE				
CHRYSENE				
ACENAPHTHYLENE				
ANTHRACENE				
4-BROMOPHENYL PHENYL ETHER				
BIS (2-CHLOROSOPROPYL) ETHER				
BIS (2-CHLOROETHOXY) METHANE	<	20		
HEXACHLOROBTADIENE				
HEXACHLOROCYCLOOCTADIENE				
ISOPHTHORENE				
NAPHTHALENE				
NITROBENZENE				
BKZO (GHI) PERYLENE				
FLUORENE				
FLUENANTHRENE				
DIBENZO (A,H) ANTHRACENE				
TRIBENZO (1,2,3-CD) PYRENE				
PYRENE				
DIOXIN				

WELL # C-40
 TOP OF SCREEN = 23.00 BOTTOM OF SCREEN = 33.00 TOTAL DEPTH = 56.00

DATE 11/19/80
 LAB BUREKA
 NO. 42734
 DETECTION LIMIT 10
 ANALYST 625
 MEMO

ACENAPHTHENE	<	80
BENZIDENE		
1,2,4-TRICHLOROBENZENE		
HEXACHLOROBENZENE		
HEXACHLOROETHANE		
BIS-(2-CHLOROETHYL) ETHER		
7-CHLORONAPHTHALENE		
2-ETHYLNAPHTHALENE		
1,2-DICHLOROBENZENE		
1,3-DICHLOROBENZENE		
1,4-DICHLOROBENZENE		
3,3-DICHLOROBENZIDINE	<	20
2,4-DINITROTOLUENE	<	20
2,6-DINITROTOLUENE	<	20
1,2-DIPHENYLHYDRAZINE	<	20
FLUORANTHENE		
1-CHLOROPHENYL PHENYL ETHER		
N-NITROSODIMETHYLANILINE		
N-NITROSODIPHENYLANILINE		
N-NITROSODI-N-PROPYLANILINE		
BIS (2-ETHYLHEXYL) PHTHALATE	<	50
ROTYL BENZYL PHTHALATE		
DI-N-BUTYL PHTHALATE		
DI-N-OCTYL PHTHALATE		
DIEHTYL PHTHALATE		
DIEHTHYL PHTHALATE		
BENZO (A) ANTHRACENE		
BENZO (A) PYRENE		
3,4-BENZOFLOURANTHENE		
BENZO (K) FLUORANTHENE		
CHRYSENE		
ACENAPHTHYLENE		
ANTHRACENE		
1-BROMOPHENYL PHENYL ETHER		
BIS (2-CHLOROISOPROPYL) ETHER		
BIS (2-CHLOROETHOXY) METHANE	<	20
HEXACHLOROBUTADIENE		
HEXACHLOROXYCLOPENTADIENE		
ISODIOXANE		
NAPHTHALENE		
NITROBENZENE		
BENZO (GH) PERYLENE		
FLUORENE		
PHENANTHRENE		
DIBENZO (A,H) ANTHRACENE		
P-DENO (1,2,3-CD) PYRENE		
PYRENE		
DIOXIN		

WELL # C-41

RESULTS IN PPB

TOP OF SCREEN -5.00 BOTTOM OF SCREEN -15.00 TOTAL DEPTH 30.00

11/18/86
B & C
56721
100
625
YES

DATE
LAB
MCLAREN ID
DETECTION LIMIT
ANALYSIS
MERO

ACENAPHTHENE	<	400	<	80
BENZIDINE				
1,2,4-TRICHLOROBENZENE				
HEXACHLOROBENZENE				
HEXACHLOROETHANE				
BIS-(2-CHLOROETHYL) ETHER				
2-CHLORONAPHTHALENE				
2-METHYLNAPHTHALENE				
1,2-DICHLOROBENZENE				
1,3-DICHLOROBENZENE				
1,4-DICHLOROBENZENE				
1,3-DICHLOROBENZIDINE				
2,4-DINITROTOLUENE				
2,6-DINITROTOLUENE				
1,2-DIPHENYLHYDRAZINE				
FLUORANTHENE				
4-CHLOROPHENYL PHENYL ETHER				
N-NITROSODIPHENYLAMINE				
N-NITROSODIETHYLAMINE				
N-NITROSODI-N-PROPYLAMINE				
BIS (2-ETHYLHEXYL) PHTHALATE				
BUTYL BENZYL PHTHALATE				
DI-N-OCTYL PHTHALATE				
DIETHYL PHTHALATE				
DIMETHYL PHTHALATE				
BENZO (A) ANTHRACENE				
BENZO (A) PYRENE				
3,1-BENZOFUORANTHENE				
BENZO (K) FLUORANTHENE				
CHRYSENE				
ACENAPHTHYLENE				
ANTHRACENE				
4-BROMOPHENYL PHENYL ETHER				
BIS (2-CHLOROISOPROPYL) ETHER				
BIS (2-CHLOROETHOXY) METHANE				
HEXACHLOROBUTADIENE				
HEXACHLOROCYCLOPENTADIENE				
ISOPHTHENE				
NAPHTHALENE				
NITROBENZENE				
BENZO (GH) PERYLENE				
FLUORENE				
PHENANTHRENE				
DIBENZO (A,H) ANTHRACENE				
INDENO (1,2,3-CD) PYRENE				
PYRENE				
DIOXIN				

DATE 12/03/86
 LAB EUREKA
 MCCLAREN ID 50381
 DETECTION LIMIT 10
 ANALYSIS 625
 HUSO

ACENAPHTHENE	-
PERZIDINE	< 80
1-TRICHLOROBENZENE	-
1-CHLOROBENZENE	-
ACHTOROETHANE	-
1,3-12-CHLOROETHYLE ETHER	-
2-CHLORONAPHTHALENE	-
2-NETHYLNAPHTHALENE	-
1,2-DICHLOROBENZENE	-
1,3-DICHLOROBENZENE	-
1,4-DICHLOROBENZENE	-
3,3-DICHLOROBENZIDINE	< 20
2,1-DINITROTOLUENE	< 20
2,6-DINITROTOLUENE	< 20
1,2-DIPHENYLHYDRAZINE	< 20
FLUORANTHENE	-
4-CHLOROPHENYL PHENYL ETHER	-
N-NITROSODIMETHYLAMINE	-
N-NITROSDIPHENYLAMINE	-
N-NITROSODI-N-PROPYLAMINE	-
BIS (2-ETHYLHEXYL) PHTHALATE	< 50
DIETHYL BENZYL PHTHALATE	-
DI-N-BUTYL PHTHALATE	-
DI-N-OCTYL PHTHALATE	-
DIEHTYL PHTHALATE	-
DIMETHYL PHTHALATE	-
BENZO (A) ANTHRACENE	-
BENZO (A) PYRENE	-
3,4-BENZOFUORANTHENE	-
BENZO (K) FLUORANTHENE	-
CHRYSENE	-
ACENAPHTHYLENE	-
ANTHRACENE	-
4-BROMOPHENYL PHENYL ETHER	-
BIS (2-CHLOROISOPROPYL) ETHER	-
BIS (2-CHLOROETHOXY) METHANE	< 20
HEXACHLOROBUTADIENE	-
HEXACHLOROCYCLOPENTADIENE	-
ISOPHORONE	-
NAPHTHALENE	-
NITROBENZENE	-
BENZO (GH) PERYLENE	-
FLUORENE	-
PHENANTHRENE	-
DIBENZO (A,H) ANTHRACENE	-
INDENO (1,2,3-CD) PYRENE	-
PYRENE	-
DIOXIN	-

WELLS, # C-47

11/12/86

EULEKA

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DATE 11/20/86
 LAB EPREKA
 NO. ANALYSES 5000781
 DETECTION LIMIT 10
 ANALYSIS 625
 MEMO

ACENAPHTHENE	<	80
BENZIDINE		
1,2,4-TRICHLOROBENZENE		
HEXACHLOROBENZENE		
HEXACHLOROCYCLOPENTADIENE		
BIS (2-CHLOROETHYL) ETHER		
2-CHLORONAPHTHALENE		
2-METHYLNAPHTHALENE		
1,2-DICHLOROBENZENE		
1,3-DICHLOROBENZENE		
1,4-DICHLOROBENZENE		
3,3-DICHLOROBENZIDINE	<	20
2,4-DINITROTOLUENE	<	20
2,6-DINITROTOLUENE	<	20
1,2-DIPHENYLHYDRAZINE	<	20
FLUORANTHENE		
4-CHLOROPHENYL PHENYL ETHER		
N-NITROSODIMETHYLANILINE		
N-NITROSODIPHENYLANILINE		
N-NITROSODI-N-PROPYLANILINE		
BIS (2-ETHYLHEXYL) PHTHALATE	<	50
BUTYL BENZYL PHTHALATE		
DI-N-BUTYL PHTHALATE		
DI-N-OCTYL PHTHALATE		
DIEHTYL PHTHALATE		
DIMETHYL PHTHALATE		
BENZO (A) ANTHRACENE		
BENZO (A) PYRENE		
3,4-BENZOFUORANTHENE		
BENZO (K) FLUORANTHENE		
CHRYSENE		
ACENAPHTHYLENE		
ANTHRACENE		
4-BROMOPHENYL PHENYL ETHER		
BIS (2-CHLOROISOPROPYL) ETHER		
BIS (2-CHLOROETHOXY) METHANE	<	20
HEXACHLOROBUTADIENE		
HEXACHLOROCYCLOPENTADIENE		
ISOPHORENE		
NAPHTHALENE		
NITROBENZENE		
BENZO (GH) PERYLENE		
FLUORENE		
PHENANTHRENE		
DIBENZO (A,H) ANTHRACENE		
INDENO (1,2,3-CD) PYRENE		
PYRENE		
DIOXIN		

DATE: 12/17/86
 LAB: EUREKA
 SAMPLE ID: H4274
 DETECTION LIMIT: 10
 ANALYSIS: 625
 REMO: 625

ACENAPHTHENE					
BENZIDINE	<	80			
1,2,3-TRICHLOROBENZENE			<	10	
CHLOROBENZENE					
DICHLOROETHANE					
1,2-DICHLOROETHYLENE					
2-METHYLNAPHTHALENE					
1,2-DICHLOROBENZENE					
1,3-DICHLOROBENZENE					
1,4-DICHLOROBENZENE					
3,3-DICHLORODENAZIDINE	<	20			
2,4-DINITROTOLUENE	<	20			
2,6-DINITROTOLUENE	<	20			
1,2-DIPHENYLDIAZINE	<	20			
FLUORANTHENE					
1-CHLOROPHENYL PHENYL ETHER					
N-NITROSODIMETHYLAMINE				80	
N-NITROSODIPHENYLAMINE					
N-NITROSODI-N-PROPYLAMINE			<	40	
BIS (2-ETHYLHEXYL) PHTHALATE	<	50			
BUTYL BENZYL PHTHALATE					
DI-N-BUTYL PHTHALATE			<	50	
DI-N-OCTYL PHTHALATE					
DIETHYL PHTHALATE					
DIMETHYL PHTHALATE				25	
BENZO (A) ANTHRACENE					
BENZO (A) PYRENE					
3,4-BENZOFLUORANTHENE					
BENZO (K) FLUORANTHENE					
CHRYSENE					
ACENAPHTHYLENE					
ANTHRACENE					
4-BROMOPHENYL PHENYL ETHER					
BIS (2-CHLOROISOPROPYL) ETHER					
BIS (2-CHLOROETHOXY) METHANE	<	20			
HEXACHLOROCYCLOPENTADIENE					
HEXACHLOROCYCLOPENTADIENE					
ISOPHTHENE					
NAPHTHALENE					
NITROBENZENE					
BENZO (GH) PERYLENE					
FLUORENE					
PHENANTHRENE					
DIENZO (A,H) ANTHRACENE					
INDENO (1,2,3-CD) PYRENE					
PYRENE					
DIOLIN					

DATE 12/23/86
LAB FUREKA
RELAREN ID 45912
DETECTION LIMIT 10
ANALYSIS 025
NERO

ACENAPHTHENE			
PIRENE	<	80	
1-TRICHLOROBENZENE			
1-CHLOROBENZENE			
ACHTHORETHANE			
13-(2-CHLOROETHYL)ETHER			
2-CHLORONAPHTHALENE			
2-METHYLNAPHTHALENE			
1,2-DICHLOROBENZENE			
1,3-DICHLOROBENZENE			
1,4-DICHLOROBENZENE			
3,4-DICHLOROBENZIDINE	<	20	
2,4-DINITROTOLUENE	<	20	
2,6-DINITROTOLUENE	<	20	
1,2-DIPHENYLHYDRAZINE	<	20	
FLUORANTHENE			
4-CHLOROPHENYL PHENYL ETHER			
N-NITROSODIMETHYLAMINE			
N-NITROSODIPHENYLAMINE			
N-NITROSODI-N-PROPYLAMINE			
BIS (2-ETHYLHEXYL) PHTHALATE	<	50	
BUTYL BENZYL PHTHALATE			
DI-N-ONYL PHTHALATE			
DIETHYL PHTHALATE			
DIMETHYL PHTHALATE			
BENZO (A) ANTHRACENE			
BENZO (A) PYRENE			
3,4-DENZOFLUORANTHENE			
BENZO (K) FLUORANTHENE			
CHRYSENE			
ACENAPHTHYLENE			
ANTHRACENE			
1-BROMOPHENYL PHENYL ETHER			
BIS (2-CHLOROISOPROPYL) ETHER			
BIS (2-CHLOROETHOXY) METHANE	<	20	
HEXACHLOROBUTADIENE			
HEXACHLOROCYCLOPENTADIENE			
1-SODIOPURONE			
NAPHTHALENE			
NITROBENZENE			
BENZO (GH) PERYLENE			
FLUORENE			
FLUORANTHENE			
1-BENZO (A,B) ANTHRACENE			
INDENO (1,2,3-CD) PYRENE			
PYRENE			
DIOXIN			

WATER ANALYSIS - 48-HOUR/SHUTTLER EXTRACTION RESULTS IN PPM

DATE: 12/22/86

WELL # C-64

25.00 BOTTLES OF SCREEN = 95.00 TOTAL DEPTH = 38.00

TOP OF SCREEN =

DATE

LAB

45840

RECLAM ID

DETECTION LIMIT

ANALYSIS

MEMO

ACENAPHTHENE	<	80	
ACETIDINE			
1,2,3-TRICHLOROBENZENE			
HEXACHLOROBENZENE			
HEXACHLOROETHANE			
BIS-(2-CHLOROETHYL) ETHER			
2-CHLORONAPHTHALENE			
2-METHYLNAPHTHALENE			
1,2-DICHLOROBENZENE			
1,3-DICHLOROBENZENE			
1,4-DICHLOROBENZENE			
3,3-DICHLOROBENZIDINE	<	20	
3,4-DINITROTOLUENE	<	20	
2,6-DINITROTOLUENE	<	20	
1,2-DIPHENYLHYDRAZINE	<	20	
FLUORANTHENE			
1-CHLOROPHENYL PHENYL ETHER			
N-NITROSODIMETHYLANILINE			
N-NITROSODIPHENYLAMINE			
N-NITROSOT-N-PROPYLAMINE			
BIS (2-ETHYLHEXYL) PHTHALATE	<	50	
BUTYL BENZYL PHTHALATE			
DI-N-BUTYL PHTHALATE			
DI-N-OCTYL PHTHALATE			
DIETHYL PHTHALATE			
DIMETHYL PHTHALATE			
BENZO (A) ANTHRACENE			
BENZO (A) PYRENE			
3,4-BENZOFUORANTHENE			
BENZO (K) FLUORANTHENE			
CHRYSENE			
ACENAPHTHYLENE			
ANTHRACENE			
1-BROMOPHENYL PHENYL ETHER			
BIS (2-CHLOROISOPROPYL) ETHER			
BIS (2-CHLOROETHOXY) METHANE	<	20	
HEXACHLOROBUTADIENE			
HEXACHLOROCYCLOPENTADIENE			
1,4-DIBIONE			
NAPHTHALENE			
NITROBENZENE			
BENZO (GH) PERYLENE			
FLUORENE			
PHENANTHRENE			
DIBENZO (A,H) ANTHRACENE			
INDENO (1,2,3-CD) PYRENE			
PYRENE			
DIOXIN			

WELL # W12-2
 TOP OF SCREEN= 12.00 BOTTOM OF SCREEN= 10.00 TOTAL DEPTH= 12.00

DATE 12/10/86
 LAB EUREKA
 MELAREN ID 5032B
 DETECTION LIMIT 10
 ANALYSIS 625
 MEMO

ACENAPHTHENE	-	80
BENZIDINE	<	
1,2,4-TRICHLOROBENZENE	-	
HEXACHLOROBENZENE	-	
HEXACHLOROETHANE	-	
1,2,4-TRICHLOROETHYL ETHER	-	
CHLORONAPHTHALENE	-	
1,2-DICHLOROBENZENE	-	
1,3-DICHLOROBENZENE	-	
1,4-DICHLOROBENZENE	<	20
3,4-DICHLOROBENZIDINE	<	20
2,4-DINITROTOLUENE	<	20
2,6-DINITROTOLUENE	<	20
1,2-DIPHENYLHYDRAZINE	-	
FLUORANTHENE	-	
1-CHLOROPHENYL PHENYL ETHER	-	
N-NITROSODIMETHYLAMINE	-	
N-NITROSODIPHENYLAMINE	-	
N-NITROSODI-N-PROPYLAMINE	-	
BIS (2-ETHYLHEXYL) PHTHALATE	<	50
BUTYL BENZYL PHTHALATE	-	
DI-N-BUTYL PHTHALATE	-	
DI-N-OCTYL PHTHALATE	-	
DIETHYL PHTHALATE	-	
DIMETHYL PHTHALATE	-	
BENZO (A) ANTHRACENE	-	
BENZO (A) PYRENE	-	
9,10-BENZOFLUORANTHENE	-	
BENZO (K) FLUORANTHENE	-	
CHRYSENE	-	
ACENAPHTHYLENE	-	
ANTHRACENE	-	
4-MONOPHENYL PHENYL ETHER	-	
BIS (2-CHLOROISOPROPYL) ETHER	-	
BIS (2-CHLOROETHOXY) METHANE	<	20
HEXACHLOROCYCLOPENTADIENE	-	
HEXACHLOROCYCLOHEPTADIENE	-	
ISOPHTHALENE	-	
NAPHTHALENE	-	
NITROBENZENE	-	
BENZO (GH) PERYLENE	-	
FLUORENE	-	
CHLORANTHRENE	-	
DIBENZO (A,H) ANTHRACENE	-	
INDENO (1,2,3-CD) PYRENE	-	
PYRENE	-	
DIOXIN	-	

DATE 12/08/86
 LAB B & C
 NO. LAREN ID 50803
 DETECTION LIMIT 10
 ANALYSIS 625
 MEMO

ACENAPHTHENE	<	40	<	20
BENZIDINE	<	40	<	20
1,2,4-TRICHLOROBENZENE	-	-	-	-
1-CHLOROBENZENE	-	-	-	-
1-NACHLOROBETHANE	-	-	-	-
1,3-(2-CHLOROETHYL) ETHER	-	-	-	-
2-CHLORONAPHTHALENE	-	-	-	-
2-METHYLNAPHTHALENE	-	-	-	-
1,2-DICHLOROBENZENE	-	-	-	-
1,3-DICHLOROBENZENE	-	-	-	-
1,4-DICHLOROBENZENE	-	-	-	-
3,3-DICHLOROBENZIDINE	-	-	-	-
2,4-DINITROTOLUENE	-	-	-	-
2,6-DINITROTOLUENE	-	-	-	-
1,2-DIPHENYLHYDRAZINE	-	-	-	-
FLUORANTHENE	-	-	-	-
4-CHLOROPHENYL PHENYL ETHER	-	-	-	-
N-NITROSODIMETHYLAMINE	<	80	<	20
N-NITROSODIPHENYLAMINE	<	40	<	20
N-NITROSODI-N-PROPYLAMINE	<	40	<	20
BIS (2-ETHYLHEXYL) PHTHALATE	-	-	-	-
BUTYL BENZYL PHTHALATE	-	-	-	-
DI-N-BUTYL PHTHALATE	<	50	<	20
DI-N-OCTYL PHTHALATE	-	-	-	-
DIETHYL PHTHALATE	<	25	<	20
DIMETHYL PHTHALATE	-	-	-	-
BENZO (A) ANTHRACENE	-	-	-	-
BENZO (A) PYRENE	-	-	-	-
3,4-DENZOFLUORANTHENE	-	-	-	-
BENZO (K) FLUORANTHENE	-	-	-	-
CRYSENE	-	-	-	-
ACENAPHTHYLENE	-	-	-	-
ANTHRACENE	-	-	-	-
1-BROMOPHENYL PHENYL ETHER	-	-	-	-
BIS (2-CHLOROISOPROPYL) ETHER	-	-	-	-
BIS (2-CHLOROETHOXY) METHANE	-	-	-	-
HENACHLOROBUTADIENE	-	-	-	-
HENACHLOROCYCLOPENTADIENE	-	-	-	-
1,3-DICHLORONE	-	-	-	-
NAPHTHALENE	-	-	-	-
NITROBENZENE	-	-	-	-
BENZO (GH) PERYLENE	-	-	-	-
FLUORENE	-	-	-	-
FLUORANTHRENE	-	-	-	-
BIBENZO (A,H) ANTHRACENE	-	-	-	-
INDENO (1,2,3-CD) PYRENE	-	-	-	-
PYRENE	-	-	-	-
DIOXIN	-	-	-	-

SECTION 6

PESTICIDES, HERBICIDES, AND PCB'S

12/12/80

12/12/80

EDREKA
M02760

EDREKA
M02768

91 JAN 10

DETECTION LIMIT

ANALYSIS

4000

10

675

CHLORIN

CHLORIN

CHLORIN

CHLORIN

2-BBQ (LINDANE)

CHLORODANE

1,1-DDE

1,1-DDE

1,1-DDE

1,1-DDE

1,1-DDE

1,1-DDE

1,1-DDE

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ANALYSIS OF PESTICIDES AND HERBICIDES RESULTS IN PPM TOP OF SCREEN = 1.00 BOTTOM OF SCREEN = 10.00 TOTAL DETECTED = 32.00

WELL # C-10

DATE 12/12/86
LAB EUREKA
SPLASH ID 50918
OFFICE LIST 10
ANALYSIS 625
MEMO 608

ALDRIN	<	0.05
DDT	<	0.02
DD	<	0.05
DDT	<	0.02
DDT (LINDANE)	<	0.08
CHLORODANE	<	0.05
4,4-DDE	<	0.18
4,4-DDT	<	0.03
1,4-DDT	<	0.17
DIELDRIN	<	0.06
a-ENDOSULFAN (1)	<	0.03
b-ENDOSULFAN (11)	<	0.07
ENDOSULFAN 1/11	<	0.05
ENDOSULFAN SULPHATE	<	0.01
ENDRIN	<	0.13
ENDRIN KETONE	<	0.05
HEPTACHLOR EPOXIDE	<	0.05
KEPONE	<	0.05
TOXAPHENE	<	0.05
METHOXYCHLOR	<	0.05
ENDRIN ALDEHYDE	<	0.05
2,4,5-TP	<	0.05
2,4,6-TP	<	0.05
AROCOR 1016	<	0.05
AROCOR 1221	<	0.05
AROCOR 1232	<	0.05
AROCOR 1242	<	0.05
AROCOR 1218	<	0.05
AROCOR 1254	<	0.05
AROCOR 1260	<	0.05
AROCOR 1202	<	0.05
PCB	<	0.05

WATER ANALYSIS-PESTICIDES AND HERBICIDES RESULTS IN DUBUQUE COUNTY, IOWA

WELL # C-13

40.00

TOP OF SCREEN= -13.00 BOTTOM OF SCREEN= -23.00 TOTAL DEPTH=

11/05/86
R & C
S000719
J
608

11/05/86
EUREKA
4425
10
E25

11/05/86
EUREKA
44244
05
608

DATE
LAB
SCREEN ID
DEPT FOR DUBUQUE
ANALYSIS
MEMO

ALDRIN	<	0.05	<	0.005
D-DDE	<	0.02	<	0.005
D-DDE	<	0.08	<	0.01
DDE	<	0.02	<	0.01
DDC (LINDANE)	<	0.08	<	0.01
DDDDANE	<	0.05	<	0.1
A-DDD	<	0.18	<	0.01
1,1-DDE	<	0.03	<	0.01
1,1-DDE	<	0.17	<	0.02
DDELDIN	<	0.06	<	0.01
D-ENOSULFAN (1)	<	0.03	<	0.01
D-ENOSULFAN (1)	<	0.07	<	0.01
ENDOSULFAN 1/11	<	0.05	<	0.05
ENDOSULFAN SULFONATE	<	0.04	<	0.01
ENDIN	<	0.13	<	0.01
ENDIN KETONE	<	0.05	<	0.01
HEPTACHLOR	<	0.05	<	0.01
HEPTACHLOR EPOXIDE	<	0.05	<	0.01
KETONE	<	0.05	<	0.5
TOXAPIRENE	<	0.05	<	0.02
METROXYCHLOR	<	0.05	<	
ENDIN ALDERHYDE	<	0.05	<	
2,4-D	<	0.25	<	
2,4,5-F	<		<	
2,4,5-TP	<		<	
AROCLOR 1016	<		<	
AROCLOR 1221	<		<	
AROCLOR 1232	<		<	
AROCLOR 1242	<		<	
AROCLOR 1248	<		<	
AROCLOR 1254	<		<	
AROCLOR 1260	<		<	
AROCLOR 1262	<		<	
PCB	<		<	

DATE 12/10/86
 LAB EUREKA
 SOIL AREA ID 50399
 DETECTION LIMIT 10
 ANALYSIS 025
 MEMO 004

ALDRIN	<	0.05
γ-BHC	<	0.02
δ-BHC	<	0.05
α-BHC	<	0.02
γ-CLINDANE	<	0.08
LORCLANE	<	0.05
1,1-DDE	<	0.18
1,1-DDE	<	0.03
4,4-DDT	<	0.17
DIELDRIN	<	0.06
α-ENDOSULFAN (1)	<	0.03
β-ENDOSULFAN (11)	<	0.07
ENDOSULFAN 1/11	<	0.05
ENDOSULFAN SULPHATE	<	0.04
ENDRIN	<	0.13
ENDRIN KETONE	<	0.05
HEPTACHLOR	<	0.05
HEPTACHLOR EPOXIDE	<	0.05
KETONE	<	0.05
TOXAPHENE	<	0.05
METHOXYCHLOR	<	0.05
ENDRIN ALDEHYDE	<	0.05
2,4-D	<	0.25
2,4,5-F	<	
2,4,5,TP	<	
AROCLOH 1016	<	
AROCLOH 1221	<	
AROCLOH 1232	<	
AROCLOH 1242	<	
AROCLOH 1218	<	
AROCLOH 1254	<	
AROCLOH 1260	<	
AROCLOH 1262	<	
PCB	<	

WATER ANALYSIS - PESTICIDES AND HERBICIDES, DESH. IS. IN. 1990. WEL. # C-18. TOTAL DEPTH = 54.00

DATE 08/23/84
LAB B & C
MCLAREN ID S001001

DETECTION LIMIT
ANALYSIS
MEMO

ALDRIN
BHC
DDT
DDE
DDE (CIS-DANE)
DIAZODANE
1,1-DDD
1,1-DDE
1,1-DOT
DIELDRIN
alpha-ENDOSULFAN (1)
beta-ENDOSULFAN (11)
ENDOSULFAN 1/11
ENDOSULFAN SULPHATE
ENDRIN
ENDRIN KETONE
HEPTACHLOR
HEPTACHLOR EPOXIDE
KEPONE
TOXAPHENE
METHOXYCHLOR
ENDRIN ALDEHYDE
2,4-D
2,4,5-T
2,4,5,TP
AROCOR 1016
AROCOR 1221
AROCOR 1232
AROCOR 1242
AROCOR 124H
AROCOR 1254
AROCOR 1260
AROCOR 1262
PAC

DATE ANALYSTS-SPECIFICATIONS AND HERBICIDES RESULTS IN LPPB
 TOP OF SCREEN= 21.00 BOTTOM OF SCREEN= 34.00 TOTAL DEPTH= 49.00

DATE 08/23/84
 LAB B & C
 NO. LARSEN ID S001002
 DETECTION LIMIT
 ANALYSTS
 METHOD

ALDRIN
 D-DIC
 DDT
 DIB
 DIB (LINDANE)
 DIBRODANE
 1,1-DIB
 1,1-DDE
 1,1-DDT
 DIELDRIN
 a-ENDOSULFAN (1)
 b-ENDOSULFAN (11)
 ENDOSULFAN 1/11
 ENDOSULFAN SULPHATE
 ENDURIN
 ENDRIN KETONE
 DEPTACHLOR
 DEPTACHLOR EPOXIDE
 KETONE
 TOXAPHENE
 METHIOXYCHLOR
 ENDRIN ALDEHYDE
 2,4-D
 2,4,5,T
 2,4,5,TP
 ARACHLOR 1016
 ARACHLOR 1221
 ARACHLOR 1232
 ARACHLOR 1242
 ARACHLOR 1244
 ARACHLOR 1254
 ARACHLOR 1260
 ARACHLOR 1262
 PCB

52.50

WELL # C-34

52.50

12/01/86

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WATER ANALYSIS-PESTICIDES AND HERBICIDES RESULTS IN PPD

WELL # C-41

30.00

TOP OF SCREEN= -5.00 BOTTOM OF SCREEN= -15.00 TOTAL DEPTH=

DATE

11/18/86

11/18/86

11/18/86

LAB

U & C

EDUEKA

EDUEKA

NO. LARSEN ID#

56720

5000773

5000779

DETECTION LIMIT

608

608

10

ANALYSIS

608

625

625

Q120

ENDRIN

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DATE 11/19/86 11/19/86
LAB EUREKA EUREKA
SCLAREN ID 57321 S000770
DETECTION LIMIT 0.1 10
ANALYSIS 608 625
NEMO

CHLORIN	<	0.05	<	0.05	<	100
DDC	<	0.05	<	0.05	<	100
DDC	<	-	<	0.02	<	100
1,1-DIC (1,1-DICARE)	<	-	<	0.02	<	100
CHLORODANE	<	1	<	0.05	<	100
1,4-DDB	<	-	<	0.18	<	100
1,4-DDE	<	-	<	0.03	<	100
1,4-DDT	<	0.2	<	0.17	<	100
DIENDRIN	<	-	<	0.06	<	100
1-ENDOSULFAN (1)	<	-	<	0.03	<	100
1-ENDOSULFAN (11)	<	-	<	0.07	<	100
ENDOSULFAN 1/11	<	0.5	<	0.05	<	100
ENDOSULFAN SULPHATE	<	-	<	0.01	<	100
ENDRIN	<	-	<	0.13	<	100
ENDRIN KETONE	<	-	<	0.35	<	100
HEPTACHLOR	<	-	<	0.05	<	100
HEPTACHLOR EPOXIDE	<	-	<	0.05	<	100
KETONE	<	5	<	0.05	<	100
TOXAPHENE	<	-	<	0.05	<	100
METHOXYCHLOR	<	0.2	<	0.05	<	100
ENDRIN ALDEHYDE	<	-	<	0.05	<	100
1,1-D	<	-	<	-	<	100
1,1,1,1,1,1	<	-	<	-	<	100
2,1,5,TP	<	3	<	-	<	100
AROCOR 1016	<	3	<	-	<	100
AROCOR 1221	<	3	<	-	<	100
AROCOR 1232	<	3	<	-	<	100
AROCOR 1242	<	3	<	-	<	100
AROCOR 1248	<	3	<	-	<	100
AROCOR 1254	<	3	<	-	<	100
AROCOR 1260	<	3	<	-	<	100
AROCOR 1262	<	3	<	-	<	100
PCB	<	-	<	0.25	<	100

DATE 12/03/86

LAB EUREKA

ANALYST 50381

10

625

DATE

LAB

ANALYST

625

DETECTION LIMIT

ANALYSIS

625

ALDRIN

< 100

D-DTC

< 100

D-DTC

< 100

D-DTC (LINDANE)

< 100

D-DTC

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D-DTC

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D-DTC

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TOP OF SCREEN= -8.00 BOTTOM OF SCREEN= -18.00 TOTAL DEPTH=

DATE 11/20/86
 LAB EUREKA
 NO. EUREKA ID S000775
 DETECTION LIMIT 10
 ANALYSIS 608
 9000 020

ALDRIN	<	0.05	-
CHC	<	0.02	-
DDT	<	0.08	-
DC (LINDANE)	<	0.02	-
DDT	<	0.08	-
ALDRIN	<	0.05	100
4,4-DDD	<	0.18	-
1,4-DDE	<	0.03	-
1,4-DDT	<	0.17	-
DIELDRIN	<	0.06	-
4-ENDESULFAN (1)	<	0.03	20
4-ENDESULFAN (11)	<	0.07	-
ENDOSULFAN 1/11	<	0.05	20
ENDOSULFAN SULPHATE	<	0.04	20
ENDRIN	<	0.13	-
ENDRIN KETONE	<	0.05	-
HEPTACHLOR	<	0.05	-
HEPTACHLOR EPOXIDE	<	0.05	-
KETONE	<	0.05	500
TOXAPHENE	<	0.05	-
METHOXYCHLOR	<	0.05	-
1,2-DIN ALDEHYDE	<	0.05	-
2,4,5,7	<	0.25	100
2,4,5,7P	<	0.25	100
ARCTOL 1016	<	0.25	100
ARCTOL 1221	<	0.25	100
ARCTOL 1232	<	0.25	100
ARCTOL 1242	<	0.25	100
ARCTOL 1248	<	0.25	100
ARCTOL 1254	<	0.25	100
ARCTOL 1260	<	0.25	100
ARCTOL 1262	<	0.25	100
PCB	<	0.25	100

WATER ANALYSIS-PESTICIDES AND HERBICIDES RESULTS IN PPB

WELL # C-59

38.00

TOP OF SCREEN= 25.00 BOTTOM OF SCREEN= 35.00 TOTAL DEPTH=

DATE
LAB
ANALYST ID
DETECTION LIMIT
ANALYSIS
MEMO

12/17/86
EUREKA
M42770
608

12/17/86
EUREKA
M42771
10
625

12/17/86
P & C
15801
608

ALDRIN	<	0.05	<	0.005
DIC	<	0.02	<	0.005
D-BHC	<	0.05	<	0.01
D-BHC	<	0.02	<	0.01
γ-BHC (LINDANE)	<	0.08	<	0.01
CHLORODANE	<	0.05	<	0.1
1,4-DDD	<	0.18	<	0.01
1,4-DDE	<	0.03	<	0.01
1,4-DDT	<	0.17	<	0.02
DELDRIN	<	0.06	<	0.01
D-ENDOSULFAN (11)	<	0.03	<	0.01
D-ENDOSULFAN (11)	<	0.07	<	0.01
ENDOSULFAN 1/11	<	0.05	<	0.05
ENDOSULFAN SULPHATE	<	0.04	<	0.01
ENDRIN	<	0.13	<	0.01
ENDRIN KETONE	<	0.05	<	0.01
HEPTACHLOR	<	0.05	<	0.01
HEPTACHLOR EPOXIDE	<	0.05	<	0.01
KEPONE	<	0.05	<	0.5
TOXAPHENE	<	0.05	<	0.02
METHIOXYCHLOR	<	0.05	<	
ENDRIN ALDEHYDE	<	0.05	<	
2,4,4'-D	<		<	
2,4,5,5'-T	<		<	
2,4,5,5'-TP	<		<	
AROCOR 1016	<		<	0.3
AROCOR 1221	<		<	0.3
AROCOR 1242	<		<	0.3
AROCOR 1242	<		<	0.3
AROCOR 1248	<		<	0.3
AROCOR 1254	<		<	0.3
AROCOR 1260	<		<	0.3
AROCOR 1262	<		<	0.3
PCB	<	0.25	<	100

C-63

WELL # C-63

TOP OF SOLENE = 25.00 BOTTOM OF SOLENE = 39.00 TOTAL DEPTH = 38.00

CASTS FOR PARTICLES AND MERCURIES RESULTS IN PPD

12/21/89.

EURKA
45912

$$X=1$$

CONFIDENTIAL
SPECIAL AGENT
IN CHARGE
FBI

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Chemical Name	Concentration (ppm)	Detection Limit (ppm)
ALDRIN	<	0.05
CHLORDEK	-	0.02
D-DIC	<	0.05
D-DIC	-	0.02
D-DIC	<	0.08
S-MHC (LINENED)	<	0.05
ETHIOCRANE	<	0.18
1-DBP	<	0.03
1-DBP	-	0.17
1,4-DBP	<	0.06
DELDREN	<	0.03
A-ENDOSULFAN (I)	<	0.07
D-ENDOSULFAN (II)	<	0.05
ENDOSULFAN I/II	<	0.04
ENDOSULFAN SULPHATE	<	0.05
ENDRIN	<	0.13
ENDRIN KETONE	-	0.05
HEPTACHLOR	-	0.05
HEPTACHLOR EPOXIDE	<	0.05
KETONE	<	0.05
POLYPHENE	<	0.05
METHOXYCHLOR	<	0.05
ENDRIN ALDEHYDE	<	0.05
2,4,D	<	0.05
2,4,5,T	<	0.05
2,4,5,TP	<	0.05
AROC'LOR 101G	<	0.05
AROC'LOR 1221	<	0.05
AROC'LOR 1232	<	0.05
AROC'LOR 1242	<	0.05
AROC'LOR 1248	<	0.05
AROC'LOR 1254	<	0.05
AROC'LOR 1260	<	0.05
AROC'LOR 1262	<	0.05
PCB	<	0.05

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Figure 1

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WATER ANALYSIS-PESTICIDES AND HERBICIDES RESULTS IN PPM

WELL # **BW-1**

95.00

TOP OF SCREEN= 20.00 BOTTOM OF SCREEN= 90.00 TOTAL DEPTH=

DATE	09/26/86	09/26/86	10/16/86
LAB	EUREKA	EUREKA	EUREKA
NO. LABEN TO	55415	55416	55417
DETECTION LIMIT	10	10	0.02
ANALYSIS	625	608	608

MEMO

ALDRIN	-	<	0.05
D-DTC	-	<	0.02
D-DTC	-	<	0.08
D-DTC	-	<	0.02
D-DTC (LINDANE)	-	<	0.08
CHLORDANE	< 100	<	0.05
1,4-DDD	-	<	0.18
1,1-DDD	-	<	0.03
1,4-DDT	-	<	0.17
DELORIN	-	<	0.06
α-ENDOSULFAN 411	< 20	<	0.03
β-ENDOSULFAN 411	-	<	0.07
ENDOSULFAN 1/11	-	<	0.05
ENDOSULFAN SULPHATE	< 20	<	0.04
ENDRIN	< 20	<	0.13
ENDRIN KETONE	-	<	0.05
HEPTACHLOR	-	<	0.05
HEPTACHLOR EPOXIDE	-	<	0.05
KETONE	-	<	0.05
TOXAPHENE	< 500	<	0.05
METHOXYCHLOR	-	<	0.05
ENDRIN ALDEHYDE	-	<	0.05
2,4,5,T	-	<	0.25
2,4,5,TP	-	<	0.25
ARACHLOR 1016	-	<	0.25
ARACHLOR 1221	-	<	0.25
ARACHLOR 1232	-	<	0.25
ARACHLOR 1242	-	<	0.25
ARACHLOR 1218	-	<	0.25
ARACHLOR 1251	-	<	0.25
ARACHLOR 1260	-	<	0.25
ARACHLOR 1262	-	<	0.25
PTB	< 100	<	0.25

WATER ANAL. N-PHENYLCIDES AND DERIVATIVES RESULTS IN PPM

WELL # BW-1

TOP OF SCREEN= 29.00 BOTTOM OF SCREEN= 90.00 TOTAL DEPTH= 95.00

DATE 10/16/86

LAB EUREKA

55492

SOLUTION TO

DETECTION LIMIT

ANALYSIS

MEQ

ALDRIN	-
4-BDC	-
1-BDC	-
4-BDC (LINDANE)	-
CHLORODANE	< 100
1,3-DDD	-
1,4-DDD	-
4,4'-DDT	-
DIELDRIN	-
4-ENDOSULFAN (11)	< 20
4-ENDOSULFAN (11)	-
ENDOSULFAN 1/11	< 20
ENDOSULFAN SULPHATE	< 20
ENDRIN	-
ENDRIN KETONE	-
HEPTACHLOR	-
HEPTACHLOR EPOXIDE	-
KETONE	-
TOXAPHENE	< 500
METHIOXYCHLOR	-
ENDRIN ALDEHYDE	-
2,4-D	-
2,4,5,T	-
2,4,5,TP	-
4-OCLOL 1016	-
4-OCLOL 1221	-
4-OCLOL 1232	-
4-OCLOL 1242	-
4-OCLOL 1248	-
4-OCLOL 1254	-
4-OCLOL 1260	-
4-OCLOL 1262	-
PCB	< 100

DATE 12/10/86

LAB

ANALYST

DETECTION LIMIT

ANALYSIS

METHOD

608

50.125

0.02

608

50.125

50.125

10

62.5

ALDRIN

< 0.05

D-DIC

< 0.02

D-DIC

< 0.05

D-DIC

< 0.02

D-DIC (LINDANE)

< 0.08

CHLORODANE

< 0.05

1,1-DDD

< 0.18

1,1-DDE

< 0.03

1,1-DDT

< 0.17

DELDRLN

< 0.06

K-ENDOSULFAN (1)

< 0.03

D-ENDOSULFAN (11)

< 0.07

ENDOSULFAN 1/11

< 0.05

ENDOSULFAN SULPHATE

< 0.04

ENDRLN KETONE

< 0.13

HEPTACHLOR

< 0.05

HEPTACHLOR EPOXIDE

< 0.05

KEPONE

< 0.05

TOXAPHENE

< 0.05

METHOXYCHLOR

< 0.05

ENDRLN ALDEHYDE

< 0.05

2,1,1-D

< 0.25

2,1,1,5,7

< 100

2,1,1,5,7D

< 100

ALDOLOR 1016

< 100

ALDOLOR 1221

< 100

ALDOLOR 1232

< 100

ALDOLOR 1242

< 100

ALDOLOR 1248

< 100

ALDOLOR 1254

< 100

ALDOLOR 1260

< 100

ALDOLOR 1262

< 100

PCB

SECTION 7
MISCELLANEOUS ANALYSES

MISCELLANEOUS WATER ANALYSES

TOP OF SCREEN= -33.00 BOTTOM OF SCREEN= -43.00 TOTAL DEPTH= 58.00

WELL # C-33

DATE 12/02/86
LAB FURKEA
MCLAREN ID 57250
DETECTION LIMIT 15
ANALYSIS GEN. MNRLS.

MEMO

TOTAL ALKALINITY	mg/l CaCO3	
BICARBONATE ALKALINITY	mg/l CaCO3	15
DIODONATE ALKALINITY	mg/l CaCO3	480
ACIDE ALKALINITY	mg/l CaCO3	15
AL ALKALINITY	ppm	390
AMONIA	ppm	
CALCIUM	ppm	
CHLORIDE	ppm	140
COPPER	ppm	0.06
CYANIDE	ppm	
EC	umhos/cm	1500
FLOURIDE	ppm	570
HARDNESS	ppm	
FE SCAN	ppm	
IRON	ppm	0.29
MAGNESIUM	ppm	66
MANGANESE	ppm	0.19
NIBAS	ppm	0.02
NITRATE	ppm	
Oil & GREASE	ppm	7.5
POTASSIUM	ppm	
SODIUM	ppm	120
SULPHATE	ppm	240
TDS	ppm	980
ZINC	ppm	0.03

MISCELLANEOUS WATER ANALYSES

WHIL # C-34
TOP OF SCREEN= -35.00 BOTTOM OF SCREEN= -45.00 TOTAL DEPTH= 52.00

DATE 12/03/86
LAB BUREKA
MCLAREN ID 50360
DETECTION LIMIT 15
ANALYSIS GEN. MNRLS.
MEMO

12/03/86
B & C
50369

TOTAL ALKALINITY	mg/l CACO3	
CARBONATE ALKALINITY	mg/l CACO3	15
BICARBONATE ALKALINITY	mg/l CACO3	610
HYDROXIDE ALKALINITY	mg/l CACO3	15
TOTAL ALKALINITY	ppm	500
AMMONIA	ppm	
CALCIUM	ppm	120
CHLORIDE	ppm	
COPPER	ppm	200
CYANIDE	ppm	0.1
EC	umhos/cm	1500
FLOURIDE	ppm	
HARDNESS	ppm	470
HC SCAN	ppm	
IRON	ppm	
MAGNESIUM	ppm	8.5
MANGANESE	ppm	55
MBAS	ppm	0.28
NITRATE	ppm	0.02
OIL & GREASE	ppm	
PH	ppm	7.7
POTASSIUM	ppm	
SODIUM	ppm	11
SULPHATE	ppm	170
TDS	ppm	72
ZINC	ppm	950
		0.11

MISCELLANEOUS WATER ANALYSES

WELL # C-35

TOP OF SCREEN= -28.00 BOTTOM OF SCREEN= -38.00 TOTAL DEPTH= 54.00

DATE 12/22/86
LAB EUREKA
MCLAREN ID 45847
DETECTION LIMIT
ANALYSIS 6010
MEMO

TOTAL ALKALINITY	mg/l CaCO3	590
CARBONATE ALKALINITY	mg/l CaCO3 <	15
BICARBONATE ALKALINITY	mg/l CaCO3	590
HYDROXIDE ALKALINITY	mg/l CaCO3 <	15
TOTAL ALKALINITY	ppm	
AMMONIA	ppm	
CALCIUM	ppm	
CHLORIDE	ppm	430
COPPER	ppm	0.13
CYANIDE	ppm	
EC	umhos/cm	2900
FLOURIDE	ppm	1300
HARDNESS	ppm	
HC SCAN	ppm	
IRON	ppm	0.5
MAGNESIUM	ppm	140
MANGANESE	ppm	0.24
MBAS	ppm	0.02
NITRATE	ppm	
OIL & GREASE	ppm	
PH		6.9
POTASSIUM	ppm	
SODIUM	ppm	260
SULPHATE	ppm	520
TDS	ppm	3000
ZINC	ppm	0.8

MISCELLANEOUS WATER ANALYSES

WELL # C-36

TOP OF SCREEN=32.00 BOTTOM OF SCREEN=-42.00 TOTAL DEPTH= 58.00

DATE 11/10/86
LAB EUREKA
MCLAREN ID 44164
DETECTION LIMIT
ANALYSIS GEN. MINERALS
MEMO

TOTAL ALKALINITY	mg/l CaCO3	
CARBONATE ALKALINITY	ppm	< 15
BICARBONATE ALKALINITY	ppm	620
HYDROXIDE ALKALINITY	ppm	< 15
TOTAL ALKALINITY	ppm	620
AMMONIA	ppm	
CALCIUM	ppm	
CHLORIDE	ppm	840
COPPER	ppm	< 0.02
CYANIDE	ppm	
EC	umhos/cm	1800
FLOURIDE	ppm	950
HARDNESS	ppm	
HC SCAN	ppm	
IRON	ppm	0.2
MAGNESIUM	ppm	110
MANGANESE	ppm	0.21
NBAS	ppm	0.2
NITRATE	ppm	
OIL & GREASE	ppm	
PH	ppm	7.4
POTASSIUM	ppm	
SODIUM	ppm	240
SULPHATE	ppm	520
TDS	ppm	2500
ZINC	ppm	0.24

MISCELLANEOUS WATER ANALYSES

WELL # C-37
 TOP OF SCREEN=-32.00 BOTTOM OF SCREEN= 42.00 TOTAL DEPTH= 58.00

DATE 11/06/86
 LAB EUREKA
 MCLAREN ID 45435
 DETECTION LIMIT 15000
 ANALYSIS GEN.MNRLS.
 MEMO

TOTAL ALKALINITY	mg/l	CACO3	
CARBONATE ALKALINITY	ppm	<	15
BICARBONATE ALKALINITY	ppm	<	590
HYDROXIDE ALKALINITY	ppm	<	15
TOTAL ALKALINITY	ppm		590
AMMONIA	ppm		
CALCIUM	ppm		
CHLORIDE	ppm		800
COPPER	ppm		0.07
CYANIDE	ppm		
EC	umhos/cm		2000
FLOURIDE	ppm		1000
HARDNESS	ppm		
HC SCAN	ppm		
IRON	ppm		1.5
MAGNESIUM	ppm		110
MANGANESE	ppm		0.26
MBAS	ppm		0.1
NITRATE	ppm		
OIL & GREASE	ppm		
PH			7.2
POTASSIUM	ppm		
SODIUM	ppm		240
SULPHATE	ppm		490
TDS	ppm		2500
ZINC	ppm		0.07

MISCELLANEOUS WATER ANALYSES

WELL # C-38

TOP OF SCREEN=-42.00 BOTTOM OF SCREEN=-52.00 TOTAL DEPTH= 58.00

DATE 10/22/86
LAB EUREKA
MCLAREN ID 40703
DETECTION LIMIT
ANALYSIS
MEMO GEN. MNRLS

TOTAL ALKALINITY	mg/l CaCO3	
CARBONATE ALKALINITY	ppm <	15
BICARBONATE ALKALINITY	ppm	550
HYDROXIDE ALKALINITY	ppm <	15
TOTAL ALKALINITY	ppm	550
AMMONIA	ppm	
CALCIUM	ppm	
CHLORIDE	ppm	630
COPPER	ppm <	0.02
CYANIDE	ppm	
EC	umhos/cm	1600
FLOURIDE	ppm	
HARDNESS	ppm	144
HC SCAN	ppm	
IRON	ppm <	0.1
MAGNESIUM	ppm	54
MANGANESE	ppm	0.05
MBAS	ppm	0.05
NITRATE	ppm	
OIL & GREASE	ppm	
PH		7.6
POTASSIUM	ppm	
SODIUM	ppm	140
SULPHATE	ppm <	10
TDS	ppm	970
ZINC	ppm <	0.01

MISCELLANEOUS WATER ANALYSES

WELL # C-39

TOP OF SCREEN= -34.00 BOTTOM OF SCREEN= -44.00 TOTAL DEPTH= 58.00

DATE 12/10/86

LAB EUREKA

MCLAREN ID 50350

DETECTION LIMIT

GEN. MNRLS.

ANALYSIS

MEMO

TOTAL ALKALINITY	mg/l CaCO3	440
CARBONATE ALKALINITY	mg/l CaCO3 <	15
BICARBONATE ALKALINITY	mg/l CaCO3	440
HYDROXIDE ALKALINITY	mg/l CaCO3 <	15
TOTAL ALKALINITY	ppm	
AMMONIA	ppm	
CALCIUM	ppm	
CHLORIDE	ppm	190
COPPER	ppm	0.05
CYANIDE	ppm	
EC	umhos/cm	1600
FLOURIDE	ppm	
HARDNESS	ppm	600
HC SCAN	ppm	
IRON	ppm	0.8
MAGNESIUM	ppm	71
MANGANESE	ppm	0.24
MBAS	ppm <	0.02
NITRATE	ppm	
OIL & GREASE	ppm	
PH		7
POTASSIUM	ppm	
SODIUM	ppm	150
SULPHATE	ppm	230
TDS	ppm	1100
ZINC	ppm	0.18

MISCELLANEOUS WATER ANALYSES

WELL # C-40
TOP OF SCREEN=-23.00 BOTTOM OF SCREEN=-33.00 TOTAL DEPTH= 56.00

DATE 11/13/86 11/13/86
LAB EUREKA EUREKA
MCLAREN ID 42731 42731D
DETECTION LIMIT
ANALYSIS GEN. MNRLS GEN. MNRLS
MEMO

TOTAL ALKALINITY	mg/l CaCO3	
CARBONATE ALKALINITY	ppm	< 15
BICARBONATE ALKALINITY	ppm	510
HYDROXIDE ALKALINITY	ppm	< 15
TOTAL ALKALINITY	ppm	510
AMMONIA	ppm	
CALCIUM	ppm	
CHLORIDE	ppm	980
COPPER	ppm	< 0.02
CYANIDE	ppm	
EC	umhos/cm	2200
FLOURIDE	ppm	920
HARDNESS	ppm	
HC SCAN	ppm	0.6
IRON	ppm	100
MAGNESIUM	ppm	0.31
MANGANESE	ppm	0.2
MBAS	ppm	
NITRATE	ppm	7.5
OIL & GREASE	ppm	220
PH	ppm	320
POTASSIUM	ppm	1600
SODIUM	ppm	0.32
SULPHATE	ppm	
TDS	ppm	
ZINC	ppm	

MISCELLANEOUS WATER ANALYSES

WFL # C-11
TOP OF SCREEN = -5.00 BOTTOM OF SCREEN = -15.00 TOTAL DEPTH = 30.00

DATE 11/18/86
LAB EUREKA
MCLAREN ID S000788
DETECTION LIMIT
ANALYSIS GEN. MNRLS.
MEMO

TOTAL ALKALINITY	mg/l CaCO ₃		
CARBONATE ALKALINITY	ppm	< 15	
BICARBONATE ALKALINITY	ppm	510	
HYDROXIDE ALKALINITY	ppm	< 15	
TOTAL ALKALINITY	ppm	510	
AMMONIA	ppm		
CALCIUM	ppm	460	
CHLORIDE	ppm	0.03	
COPPER	ppm		
CYANIDE	ppm	1700	
EC	umhos/cm		
FLUORIDE	ppm	540	
HARDNESS	ppm		
HC SCAN	ppm	11	
IRON	ppm	59	
MAGNESIUM	ppm	1.2	
MANGANESE	ppm	< 0.02	
MBAS	ppm		
NITRATE	ppm		
OIL & GREASE	ppm	6.5	
PH			
POTASSIUM	ppm	85	
SODIUM	ppm	68	
SULPHATE	ppm	1000	
TDS	ppm	0.12	
ZINC	ppm		

MISCELLANEOUS WATER ANALYSES

TOP OF SCREEN= -9.00 BOTTOM OF SCREEN= -19.00 WELL # C-42 TOTAL DEPTH= 30.00

DATE 12/02/86
LAB EUREKA
MCLAREN ID 57292
DETECTION LIMIT 15
ANALYSIS GEN.MNRLS.
MEMO

TOTAL ALKALINITY	me/l	CACO3	
CARBONATE ALKALINITY	ppm	<	15
BICARBONATE ALKALINITY	ppm		540
HYDROXIDE ALKALINITY	ppm	<	15
TOTAL ALKALINITY	ppm		440
AMMONIA	ppm		
CALCIUM	ppm		
CHLORIDE	ppm		130
COPPER	ppm		0.2
CYANIDE	ppm		
EC	umhos/cm		1200
FLOURIDE	ppm		400
HARDNESS	ppm		
HC SCAN	ppm		
IRON	ppm		3.6
MAGNESIUM	ppm		43
MANGANESE	ppm		0.3
MBAS	ppm		0.06
NITRATE	ppm		
OIL & GREASE	ppm		
PH			7.2
POTASSIUM	ppm		
SODIUM	ppm		110
SULPHATE	ppm		22
TDS	ppm		720
ZINC	ppm		1

MISCELLANEOUS WATER ANALYSES

WELL # C-43

TOP OF SCREEN = -11.00 BOTTOM OF SCREEN = 21.00 TOTAL DEPTH = 35.00

DATE 11/19/86
LAB B & C
MCLAREN ID 57320
DETECTION LIMIT
ANALYSIS CATIONS GEN. MNRLS.
MEMO

TOTAL ALKALINITY	mg/l CaCO ₃	
CARBONATE ALKALINITY	ppm	< 15
BICARBONATE ALKALINITY	ppm	780
HYDROXIDE ALKALINITY	ppm	< 15
TOTAL ALKALINITY	ppm	780
AMMONIA	ppm	
CALCIUM	ppm	520
CHLORIDE	ppm	580
COPPER	ppm	< 0.02
CYANIDE	ppm	
EC	umhos/cm	4000
FLOURIDE	ppm	1600
HARDNESS	ppm	2.4
HC SCAN	ppm	200
IRON	ppm	0.58
MAGNESIUM	ppm	0.15
MANGANESE	ppm	
MEAS	ppm	
NITRATE	ppm	
OIL & GREASE	ppm	6.5
PH		
POTASSIUM	ppm	300
SODIUM	ppm	10
SULPHATE	ppm	3100
TDS	ppm	0.08
ZINC	ppm	

MISCELLANEOUS WATER ANALYSES

TOP OF SCREEN=-16.00 BOTTOM OF SCREEN=-26.00 TOTAL DEPTH= 30.00
WELL # C-14

DATE 10/21/86
LAB EUREKA
MCLAREN ID 44128
DETECTION LIMIT 44128D

GEN. MNRLS GEN. MNRLS

TOTAL ALKALINITY	mg/l	CaCO3	
CARBONATE ALKALINITY	ppm	<	15
BICARBONATE ALKALINITY	ppm	<	680
HYDROXIDE ALKALINITY	ppm	<	15
TOTAL ALKALINITY	ppm	<	680
AMMONIA	ppm		
CALCIUM	ppm		
CHLORIDE	ppm		
COPPER	ppm	<	2100
CYANIDE	ppm	<	0.02
EC	umhos/cm		2500
FLOURIDE	ppm		
HARDNESS	ppm		310
HC SCAN	ppm		
IRON	ppm		0.3
MAGNESIUM	ppm		120
MANGANESE	ppm		0.39
MBAS	ppm		0.06
NITRATE	ppm		
OIL & GREASE	ppm		
PH			7.9
POTASSIUM	ppm		
SODIUM	ppm		330
SULPHATE	ppm		60
TDS	ppm		1400
ZINC	ppm	<	0.01

MISCELLANEOUS WATER ANALYSES

WELL # C-45

TOP OF SCREEN= -9.00 BOTTOM OF SCREEN= -19.00 TOTAL DEPTH= 35.00

DATE 12/01/86
 LAB EUREKA
 MCLAREN ID 57273
 DETECTION LIMIT 15
 ANALYSIS GEN. MNRLS
 MEMO

TOTAL ALKALINITY	mg/l CaCO3	
CARBONATE ALKALINITY	ppm	15
BICARBONATE ALKALINITY	ppm	980
HYDROXIDE ALKALINITY	ppm	15
TOTAL ALKALINITY	ppm	800
AMMONIA	ppm	
CALCIUM	ppm	
CHLORIDE	ppm	1300
COPPER	ppm	0.04
CYANIDE	ppm	
EC	umhos/cm	5900
FLOURIDE	ppm	
HARDNESS	ppm	280
HC SCAN	ppm	
IRON	ppm	1.5
MAGNESIUM	ppm	37
MANGANESE	ppm	0.08
MBAS	ppm	0.03
NITRATE	ppm	
OIL & GREASE	ppm	
PH		7.8
POTASSIUM	ppm	
SODIUM	ppm	1300
SULPHATE	ppm	480
TDS	ppm	3700
ZINC	ppm	0.4

MISCELLANEOUS WATER ANALYSES

WELL # C-46

TOP OF SCREEN=-11.00 BOTTOM OF SCREEN=21.00 TOTAL DEPTH=30.00

DATE 12/01/86
 LAB RUREKA
 MCLAREN ID 50382
 DETECTION LIMIT
 ANALYSIS GEN. MNRLS
 MEMO

TOTAL ALKALINITY	mg/l	CACO3	
CARBONATE ALKALINITY	ppm	<	15
BICARBONATE ALKALINITY	ppm	<	840
HYDROXIDE ALKALINITY	ppm	<	15
TOTAL ALKALINITY	ppm		690
AMMONIA	ppm		
CALCIUM	ppm		
CHLORIDE	ppm		110
COPPER	ppm		0.11
CYANIDE	ppm		
EC	umhos/cm		1700
FLOURIDE	ppm		540
HARDNESS	ppm		
HC SCAN	ppm		3.3
IRON	ppm		63
MAGNESIUM	ppm		0.13
MANGANESE	ppm		0.02
MBAS	ppm		
NITRATE	ppm		
OIL & GREASE	ppm		7.5
PH	ppm		
POTASSIUM	ppm		210
SODIUM	ppm		170
SULPHATE	ppm		1100
TDS	ppm		0.22
ZINC	ppm		

MISCELLANEOUS WATER ANALYSES

WELL # C-47

TOP OF SCREEN=-15.00 BOTTOM OF SCREEN=-26.00 TOTAL DEPTH= 40.00

DATE 11/12/86
LAB EUREKA
MCLAREN ID 45242
DETECTION LIMIT
ANALYSIS GEN.MNRLS
MEMO

TOTAL ALKALINITY	mg/l	CACO3	130
CARBONATE ALKALINITY	ppm		120
BICARBONATE ALKALINITY	ppm		15
HYDROXIDE ALKALINITY	ppm		250
TOTAL ALKALINITY	ppm		
AMMONIA	ppm		
CALCIUM	ppm		580
CHLORIDE	ppm		0.04
COPPER	ppm		
CYANIDE	ppm		400
EC	umhos/cm		
FLOURIDE	ppm		140
HARDNESS	ppm		
HC SCAN	ppm		3.2
IRON	ppm		11
MAGNESIUM	ppm		0.02
MANGANESE	ppm		0.03
MBAS	ppm		
NITRATE	ppm		
OIL & GREASE	ppm		9.6
PH	ppm		
POTASSIUM	ppm		47
SODIUM	ppm		10
SULPHATE	ppm		220
TDS	ppm		0.84
ZINC	ppm		

MISCELLANEOUS WATER ANALYSES

TOP OF SCREEN = -13.00 BOTTOM OF SCREEN = -23.00 TOTAL DEPTH = 45.00 WELL # C-48

DATE 11/13/86
LAB EUREKA
MCLAREN ID 42717
DETECTION LIMIT
ANALYSIS GEN. MNRLS
MEMO

TOTAL ALKALINITY	mg/l CaCO3	
CARBONATE ALKALINITY	ppm	15
BICARBONATE ALKALINITY	ppm	550
HYDROXIDE ALKALINITY	ppm	15
TOTAL ALKALINITY	ppm	550
AMMONIA	ppm	
CALCIUM	ppm	
CHLORIDE	ppm	550
COPPER	ppm	0.02
CYANIDE	ppm	
EC	umhos/cm	2200
FLOURIDE	ppm	
HARDNESS	ppm	1200
HC SCAN	ppm	
IRON	ppm	8.5
MAGNESIUM	ppm	140
MANGANESE	ppm	0.53
MBAS	ppm	0.02
NITRATE	ppm	
OIL & GREASE	ppm	
PH		7.4
POTASSIUM	ppm	
SODIUM	ppm	140
SULPHATE	ppm	800
TDS	ppm	2000
ZINC	ppm	0.06

MISCELLANEOUS WATER ANALYSES

WELL # C-49

TOP OF SCREEN = -8.00 BOTTOM OF SCREEN = -18.00 TOTAL DEPTH = 30.00

DATE 11/20/86
LAB EUREKA
MCLAREN ID S0007900
DETECTION LIMIT
ANALYSIS GEN.MNRLS
MEMO GEN.MNRLS

TOTAL ALKALINITY	mg/l CaCO3	
CARBONATE ALKALINITY	ppm	< 15
BICARBONATE ALKALINITY	ppm	480
HYDROXIDE ALKALINITY	ppm	< 15
TOTAL ALKALINITY	ppm	480
AMMONIA	ppm	
CALCIUM	ppm	
CHLORIDE	ppm	200
COPPER	ppm	< 0.02
CYANIDE	ppm	
EC	umhos/cm	1000
FLOURIDE	ppm	350
HARDNESS	ppm	
HC SCAN	ppm	0.6
IRON	ppm	44
MAGNESIUM	ppm	0.13
MANGANESE	ppm	0.8
MBAS	ppm	
NITRATE	ppm	7.5
OIL & GREASE	ppm	
PH		
POTASSIUM	ppm	49
SODIUM	ppm	< 10
SULPHATE	ppm	450
TDS	ppm	0.02
ZINC	ppm	

MISCELLANEOUS WATER ANALYSES

TOP OF SCREEN=31.00 BOTTOM OF SCREEN=51.00 TOTAL DEPTH=174.00 WELL # C-52A

DATE 10/23/86
LAB EUREKA
MCLAREN ID S000726
DETECTION LIMIT
ANALYSIS
MEMO

10/23/86 10/23/86
EUREKA EUREKA
S000726 S000726
GEN.MNRIS GEN.MNRIS

TOTAL ALKALINITY	mg/l	CACO3	
CARBONATE ALKALINITY	ppm	< 15	
BICARBONATE ALKALINITY	ppm	< 15	
HYDROXIDE ALKALINITY	ppm	2800	
TOTAL ALKALINITY	ppm	2800	
AMMONIA	ppm		
CALCIUM	ppm		
CHLORIDE	ppm	8.8	
COPPER	ppm	0.03	
CYANIDE	ppm		
EC	umhos/cm	13000	
FLOURIDE	ppm	1200	
HARDNESS	ppm		
HC SCAN	ppm		
IRON	ppm	0.22	
MAGNESIUM	ppm	< 0.1	
MANGANESE	ppm	< 0.1	
MBAS	ppm	0.25	
NITRATE	ppm		
OIL & GREASE	ppm		
PH		12.5	
POTASSIUM	ppm		
SODIUM	ppm	190	
SULPHATE	ppm	< 10	
TDS	ppm	2.5	
ZINC	ppm	1.7	

MISCELLANEOUS WATER ANALYSES

WELL # C-52B
TOP OF SCREEN=-103.00 BOTTOM OF SCREEN=-113.00 TOTAL DEPTH= 236.00

DATE 12/16/86
LAB EUREKA
MCLAREN ID 51105
DETECTION LIMIT
ANALYSIS GEN.MNRLS.
MEMO

TOTAL ALKALINITY	mg/l CaCO3	370
CARBONATE ALKALINITY	mg/l CaCO3	100
BICARBONATE ALKALINITY	mg/l CaCO3	15
HYDROXIDE ALKALINITY	mg/l CaCO3	270
TOTAL ALKALINITY	ppm	
AMMONIA	ppm	
CALCIUM	ppm	
CHLORIDE	ppm	140
COPPER	ppm	< 0.02
CYANIDE	ppm	
EC	umhos/cm	1800
FLOURIDE	ppm	
HARDNESS	ppm	260
HC SCAN	ppm	
IRON	ppm	0.7
MAGNESIUM	ppm	1
MANGANESE	ppm	0.02
MBAS	ppm	0.04
NITRATE	ppm	
OIL & GREASE	ppm	10.8
PH		
POTASSIUM	ppm	
SODIUM	ppm	120
SULPHATE	ppm	20
TDS	ppm	550
ZINC	ppm	0.7

MISCELLANEOUS WATER ANALYSES

WELL # C-52C

TOP OF SCREEN=137.00 BOTTOM OF SCREEN=157.00 TOTAL DEPTH= 280.00

DATE
LAB
MCLAREN ID
DETECTION LIMIT
ANALYSIS
MEMO

11/04/86
EUREKA
44211

GEN.MNRLS

TOTAL ALKALINITY	mg/l	CACO3	
CARBONATE ALKALINITY	ppm		130
BICARBONATE ALKALINITY	ppm		120
HYDROXIDE ALKALINITY	ppm	<	15
TOTAL ALKALINITY	ppm		250
AMMONIA	ppm		
CALCIUM	ppm		
CHLORIDE	ppm		210
COPPER	ppm	<	0.02
CYANIDE	ppm		
EC	umhos/cm		7800
FLOURIDE	ppm		
HARDNESS	ppm		182
HC SCAN	ppm		
IRON	ppm		0.2
MAGNESIUM	ppm		17.7
MANGANESE	ppm		0.04
MBAS	ppm		0.58
NITRATE	ppm		
OIL & GREASE	ppm		
PH			9.2
POTASSIUM	ppm		
SODIUM	ppm		84
SULPHATE	ppm	<	10
TDS	ppm		522
ZINC	ppm		20

MISCELLANEOUS WATER ANALYSES

WELL # C-54

TOP OF SCREEN= -30.00 BOTTOM OF SCREEN= -50.00 TOTAL DEPTH= 65.00

DATE 11/20/86

LAB EUREKA

MCLAREN ID S000791

DETECTION LIMIT

ANALYSIS GEN. MNRLS

MEMO

TOTAL ALKALINITY	mg/l CaCO3	
BICARBONATE ALKALINITY	mg/l CaCO3	15
BICARBONATE ALKALINITY	mg/l CaCO3	670
HYDROXIDE ALKALINITY	mg/l CaCO3	15
TOTAL ALKALINITY	ppm	670
AMMONIA	ppm	330
CALCIUM	ppm	
CHLORIDE	ppm	600
COPPER	ppm	0.16
CYANIDE	ppm	
EC	umhos/cm	2000
FLOURIDE	ppm	
HARDNESS	ppm	990
HC SCAN	ppm	
IRON	ppm	0.3
MAGNESIUM	ppm	120
MANGANESE	ppm	0.2
MBAS	ppm	0.02
NITRATE	ppm	
OIL & GREASE	ppm	7.3
pH		
POTASSIUM	ppm	12
SODIUM	ppm	250
SULPHATE	ppm	
TDS	ppm	1700
ZINC	ppm	0.06

MISCELLANEOUS WATER ANALYSES

WELL # C-55

TOP OF SCREEN=-35.00 BOTTOM OF SCREEN=-55.00 TOTAL DEPTH= 71.00

DATE 11/07/86
LAB EUREKA
MCLAREN ID 45446
DETECTION LIMIT
ANALYSIS
MEMO

11/07/86
EUREKA
45446D
GEN.MNRLS
GEN.MNRLS

TOTAL ALKALINITY	mg/l CaCO3	
CARBONATE ALKALINITY	ppm	< 15
BICARBONATE ALKALINITY	ppm	730
HYDROXIDE ALKALINITY	ppm	< 15
TOTAL ALKALINITY	ppm	730
AMMONIA	ppm	
CALCIUM	ppm	
CHLORIDE	ppm	650
COPPER	ppm	0.02
CYANIDE	ppm	
EC	umhos/cm	1900
FLOURIDE	ppm	900
HARDNESS	ppm	900
HC SCAN	ppm	
IRON	ppm	0.5
MAGNESIUM	ppm	100
MANGANESE	ppm	0.22
MBAS	ppm	0.1
NITRATE	ppm	
OIL & GREASE	ppm	
PH	ppm	7.6
POTASSIUM	ppm	
SODIUM	ppm	7.2
SULPHATE	ppm	590
TDS	ppm	2500
ZINC	ppm	0.02

MISCELLANEOUS WATER ANALYSES

WELL # C-56
TOP OF SCREEN=-35.00 BOTTOM OF SCREEN=-55.00 TOTAL DEPTH= 70.00

DATE 11/07/86
LAB EUREKA
MCLAREN ID 45260
DETECTION LIMIT
ANALYSIS GEN.MNRLS
MEMO

TOTAL ALKALINITY	mg/l	CACO3	
CARBONATE ALKALINITY	ppm	<	15
BICARBONATE ALKALINITY	ppm	<	520
HYDROXIDE ALKALINITY	ppm	<	15
TOTAL ALKALINITY	ppm		520
AMMONIA	ppm		
CALCIUM	ppm		950
CHLORIDE	ppm		0.02
COPPER	ppm		
CYANIDE	ppm		
EC	umhos/cm		2100
FLOURIDE	ppm		1000
HARDNESS	ppm		
HC SCAN	ppm	<	0.1
IRON	ppm		110
MAGNESIUM	ppm		0.21
MANGANESE	ppm		0.1
MBAS	ppm		
NITRATE	ppm		
OIL & GREASE	ppm		7.3
PH			
POTASSIUM	ppm		250
SODIUM	ppm		400
SULPHATE	ppm		2400
TDS	ppm	<	0.01
ZINC	ppm		

MISCELLANEOUS WATER ANALYSES

TOP OF SCREEN= 97.00 BOTTOM OF SCREEN=117.00 TOTAL DEPTH= 120.00
WELL # C-57

DATE 10/20/86
LAB EUREKA
MCLAREN ID 44112
DETECTION LIMIT
ANALYSIS
MEMO

10/20/86 10/20/86
EUREKA EUREKA
44112 44112
GEN.MNRLS GEN.MNRLS

TOTAL ALKALINITY	mg/l CaCO3		
CARBONATE ALKALINITY	ppm	< 15	< 15
BICARBONATE ALKALINITY	ppm	480	500
HYDROXIDE ALKALINITY	ppm	< 15	< 15
TOTAL ALKALINITY	ppm	480	500
AMMONIA	ppm		
CALCIUM	ppm		
CHLORIDE	ppm	410	750
COPPER	ppm	0.06	0.02
CYANIDE	ppm		
EC	umhos/cm	1600	1500
FLOURIDE	ppm	170	250
HARDNESS	ppm		
HC SCAN	ppm		
IRON	ppm	0.1	0.13
MAGNESIUM	ppm	60	93
MANGANESE	ppm	0.14	0.16
MBAS	ppm	0.02	0.2
NITRATE	ppm		
OIL & GREASE	ppm		
PH	ppm	7.6	7.6
POTASSIUM	ppm		
SODIUM	ppm	140	180
SULPHATE	ppm	120	230
TDS	ppm	1000	1500
ZINC	ppm	0.03	0.02

MISCELLANEOUS WATER ANALYSES

WELL # C-5B
 TOP OF SCREEN= 60.00 BOTTOM OF SCREEN= 80.00 TOTAL DEPTH= 82.00

DATE 10/20/86
 LAB EUREKA
 MCLAREN ID 45600
 DETECTION LIMIT
 ANALYSIS GEN.MNRLS
 MEMO

TOTAL ALKALINITY	mg/l CaCO3	
CARBONATE ALKALINITY	ppm	< 15
BICARBONATE ALKALINITY	ppm	530
HYDROXIDE ALKALINITY	ppm	< 15
TOTAL ALKALINITY	ppm	530
AMMONIA	ppm	
CALCIUM	ppm	
CHLORIDE	ppm	750
COPPER	ppm	< 0.02
CYANIDE	ppm	
EC	umhos/cm	1600
FLOURIDE	ppm	240
HARDNESS	ppm	
HC SCAN	ppm	0.1
IRON	ppm	90
MAGNESIUM	ppm	0.15
MANGANESE	ppm	0.02
MBAS	ppm	
NITRATE	ppm	
OIL & GREASE	ppm	7.6
PH		
POTASSIUM	ppm	170
SODIUM	ppm	220
SULPHATE	ppm	1600
TDS	ppm	0.01
ZINC	ppm	

MISCELLANEOUS WATER ANALYSES

WELL # C-59
TOP OF SCREEN= 25.00 BOTTOM OF SCREEN= 35.00 TOTAL DEPTH= 38.00

DATE 12/17/86
LAB B & C
MCLAREN ID 45802
DETECTION LIMIT 45803

12/17/86
SUREKA
50267

GEN. MNRLS.

MEMO

TOTAL ALKALINITY	mg/l	CAC03	200		220
CARBONATE ALKALINITY	mg/l	CAC03	<		20
BICARBONATE ALKALINITY	mg/l	CAC03	200		200
HYDROXIDE ALKALINITY	mg/l	CAC03	<		15
TOTAL ALKALINITY	ppm				
AMMONIA	ppm				
CALCIUM	ppm		91		
CHLORIDE	ppm		150		130
COPPER	ppm		0.03		0.19
CYANIDE	ppm				
SC	umhos/cm			1100	1100
FLOURIDE	ppm				
HARDNESS	ppm				29
HC SCAN	ppm			0.6	
IRON	ppm				18
MAGNESIUM	ppm		32		29
MANGANESE	ppm		0.027		0.17
MBAS	ppm		0.1		0.02
NITRATE	ppm			4.3	
OIL & GREASE	ppm				
PH				8.5	8.3
POTASSIUM	ppm			8.1	
SODIUM	ppm			120	120
SULPHATE	ppm			160	140
TDS	ppm			690	660
ZINC	ppm			0.16	0.38

DATE: 12/17/86
 LAD: B & C
 MCLAREN ID: 50284
 DETECTION LIMIT: 50281
 ANALYSIS: GEN.HNRUS.
 MEMO

TOTAL ALKALINITY	mg/l	CACO3	350		390
CARBONATE ALKALINITY	mg/l	CACO3<	20	<	15
BICARBONATE ALKALINITY	mg/l	CACO3	350		390
HYDROXIDE ALKALINITY	mg/l	CACO3<	20	<	15
TOTAL ALKALINITY	ppm				
AMMONIA	ppm				
CALCIUM	ppm		880		
CHLORIDE	ppm		20000		18000
COPPER	ppm		0.04		0.83
CYANIDE	ppm				
EC	umhos/cm		51000		41000
FLOURIDE	ppm				2100
HARDNESS	ppm				
HC SCAN	ppm				
IRON	ppm<		0.06		9.1
MAGNESIUM	ppm		310		290
MANGANESE	ppm		0.025		0.93
NICKEL	ppm<		0.1	<	0.02
NITRATE	ppm<		0.4		
OIL & GREASE	ppm		7.5		7.3
PH			7.5		
POTASSIUM	ppm				11000
SODIUM	ppm		12000		160
SULPHATE	ppm		170		30000
TDS	ppm		35000		7.1
ZINC	ppm		0.15		

TOP OF SCREEN= 25.00 BOTTOM OF SCREEN= 35.00 TOTAL DEPTH= 38.00

DATE 12/22/86
 LAB EUREKA
 HCLAREN ID 45907
 DETECTION LIMIT
 ANALYSIS GEN. MNILLS.
 MEMO

TOTAL ALKALINITY	mg/l	CACO3	61
CARBONATE ALKALINITY	mg/l	CACO3<	15
BICARBONATE ALKALINITY	mg/l	CACO3	61
HYDROXIDE ALKALINITY	mg/l	CACO3<	15
TOTAL ALKALINITY	ppm		
AMMONIA	ppm		
CALCIUM	ppm		
CHLORIDE	ppm		170
COPPER	ppm		0.74
CYANIDE	ppm		
EC	umhos/cm		1700
FLOURIDE	ppm		
HARDNESS	ppm		480
HC SCAN	ppm		
IRON	ppm		200
MAGNESIUM	ppm		55
MANGANESE	ppm		4.6
MBAS	ppm		0.06
NITRATE	ppm		
OIL & GREASE	ppm		
pH			7.2
POTASSIUM	ppm		
SODIUM	ppm		190
SULPHATE	ppm		68
TDS	ppm		1100
ZINC	ppm		1.9

MISCELLANEOUS WATER ANALYSES

TOP OF SCREEN= 20.00 BOTTOM OF SCREEN= 90.00 TOTAL DEPTH= 95.00

WELL # RW-1

DATE 09/12/86 10/12/86 10/16/86
LAB EUREKA EUREKA EUREKA
MCLAREN ID 42491 42491 55496
DETECTION LIMIT ANALYSIS GEN.MNRLS. GEN.MNRLS. GEN.MNRLS.

MEMO

TOTAL ALKALINITY	mg/l	520	560	600	580
CARBONATE ALKALINITY	mg/l	15	15	15	15
BICARBONATE ALKALINITY	mg/l	520	560	600	580
HYDROXIDE ALKALINITY	mg/l	15	15	15	15
TOTAL ALKALINITY	ppm				
AMMONIA	ppm				
CALCIUM	ppm				
CHLORIDE	ppm	710		700	720
COPPER	ppm	0.02		0.02	0.02
CYANIDE	ppm				
EC	umhos/cm	2000	2100	2000	1800
FLOURIDE	ppm				
HARDNESS	ppm	1000	980	330	340
HC SCAN	ppm				
IRON	ppm	0.1	0.1	0.2	0.2
MAGNESIUM	ppm	110	110	120	120
MANGANESE	ppm	0.2	0.2	0.19	0.2
MBAS	ppm	6	5.5	0.04	0.04
NITRATE	ppm				
OIL & GREASE	ppm				
PH		7.5	7.4	7.2	7.2
POTASSIUM	ppm				
SODIUM	ppm	260	260	240	240
SULPHATE	ppm	650	650	780	740
TDS	ppm	2400	2400	560	580
ZINC	ppm	0.05	0.05	0.1	0.1

MISCELLANEOUS WATER ANALYSES

WELL # WP-2

TOP OF SCREEN= 10.00 BOTTOM OF SCREEN= 12.00 TOTAL DEPTH= 12.00

DATE 12/08/86
LAB BURRKA
MCLAREN ID 50324
DETECTION LIMIT
ANALYSIS GEN. MNRLS.
MEMO

TOTAL ALKALINITY	mg/l CaCO3	823
CARBONATE ALKALINITY	mg/l CaCO3 <	15
BICARBONATE ALKALINITY	mg/l CaCO3	823
HYDROXIDE ALKALINITY	mg/l CaCO3 <	15
TOTAL ALKALINITY	ppm	
AMMONIA	ppm	
CALCIUM	ppm	
CHLORIDE	ppm	94
COPPER	ppm	0.05
CYANIDE	ppm	
SC	umhos/cm	1900
FLOURIDE	ppm	
HARDNESS	ppm	670
HC SCAN	ppm	
IRON	ppm	19
MAGNESIUM	ppm	73
MANGANESE	ppm	1.1
MBAS	ppm	1.6
NITRATE	ppm	
OIL & GREASE	ppm	
PH	ppm	6.6
POTASSIUM	ppm	
SODIUM	ppm	170
SULPHATE	ppm	140
TDS	ppm	1100
ZINC	ppm	0.09

MISCELLANEOUS WATER ANALYSES

WELL # WP-4

TOP OF SCREEN= 10.00 BOTTOM OF SCREEN= 12.00 TOTAL DEPTH= 12.00

DATE 12/08/86

LAB B & C

MCLAREN ID 60801

DETECTION LIMIT
ANALYSIS

MEMO

TOTAL ALKALINITY	mg/l CaCO3	1100
CARBONATE ALKALINITY	mg/l CaCO3 <	20
BICARBONATE ALKALINITY	mg/l CaCO3	1100
HYDROXIDE ALKALINITY	mg/l CaCO3 <	20
TOTAL ALKALINITY	ppm	
AMMONIA	ppm	
CALCIUM	ppm	220
CHLORIDE	ppm	340
COPPER	ppm <	0.04
CYANIDE	ppm	
EC	umhos/cm	3200
FLOURIDE	ppm	
HARDNESS	ppm	
HC SCAN	ppm	
IRON	ppm	0.45
MAGNESIUM	ppm	160
MANGANESE	ppm	0.97
MBAS	ppm	2
NITRATE	ppm <	0.4
OIL & GREASE	ppm	
PH		6.8
POTASSIUM	ppm	18
SODIUM	ppm	2.95
SULPHATE	ppm	340
TDS	ppm	2300
ZINC	ppm <	0.08

SECTION 8

MEMOS

MEMOS FOR SAMPLES

McLaren ID = 001629

VINYL CHLORIDE CONCENTRATION IS ESTIMATED.

McLaren ID = 001834

VINYL CHLORIDE CONCENTRATION IS ESTIMATED.

McLaren ID = 001973

VINYL CHLORIDE CONCENTRATION IS ESTIMATED.

McLaren ID = 001973D

VINYL CHLORIDE CONCENTRATION IS ESTIMATED.

McLaren ID = 001984

VINYL CHLORIDE CONCENTRATION IS ESTIMATED.
SAMPLE TAKEN AT 14:40.

McLaren ID = 001986

VINYL CHLORIDE CONCENTRATION IS ESTIMATED.
SAMPLE TAKEN AT 22:00.

McLaren ID = 001988

VINYL CHLORIDE CONCENTRATION IS ESTIMATED.
SAMPLE TAKEN AT 10:00

McLaren ID = 002019

VINYL CHLORIDE CONCENTRATION IS ESTIMATED.
SAMPLE TAKEN AT 10:00.

McLaren ID = 002021

VINYL CHLORIDE CONCENTRATION IS ESTIMATED.
SAMPLE TAKEN AT 13:30.

McLaren ID = 002045

VINYL CHLORIDE CONCENTRATION IS ESTIMATED.

McLaren ID = 002054

OTHER COMPOUNDS DETECTED

McLaren ID = 002080

VINYL CHLORIDE CONCENTRATION IS ESTIMATED.

MEMOS FOR SAMPLES

McLaren ID = 002135

VINYL CHLORIDE CONCENTRATION IS ESTIMATED.

McLaren ID = 002135D

VINYL CHLORIDE CONCENTRATION IS ESTIMATED.

McLaren ID = 002358

VINYL CHLORIDE CONCENTRATION IS ESTIMATED

McLaren ID = 002375

VINYL CHLORIDE CONCENTRATION IS ESTIMATED