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W 6.a

ENERGY AND OCEAN RESOURCES UNIT
Date Filed: .....January 9, 1998
49th Day: .....February 27, 1998
180th Day: .....July 8, 1998
Staff: .....MH/AD/LE/CS
Staff Report: .....January 21, 1998
Hearing Date: .....February 4, 1998
Item No.: .....W 6.a
Commission Action: .....
Commission Vote: .....

STAFF REPORT: REGULAR CALENDAR

Permit Number:	**E-96-28**
Applicant:	**Windward Associates (Macpherson Oil Company, General Partner)**
Agent:	David Gautschy, David E. Gautschy, Inc.
Project Location:	555 Valley Drive, City of Hermosa Beach, County of Los Angeles.
Project Description:	Drill 30 oil and gas production wells; convert one existing oil well to a water disposal well; drill three additional water disposal wells; construct and operate a production tank farm; construct a 30-foot high sound attenuation wall around perimeter of property; and construct and operate a crude oil and a natural gas pipeline — each ½-mile long.
Approvals Received:	City of Hermosa Beach: Condition Use Permit 95-5632 approved August 12, 1993; EIR No. 89060701 certified May 8, 1990; addendum certified August 12, 1993. California State Lands Commission approval, June 30, 1992. South Coast Air Quality Management District: Permits to Construct 306267, 306268, 306269, 306270, 306271, 306272, 306273, 306274, 306275, extended through October 13, 1998.
Substantive File Documents:	See Appendix A.

MACPHERSON OIL COMPANY — PROJECT TIMELINE

1919.....The Legislature of the State of California grants to the City of Hermosa Beach the tidelands and submerged lands within the City boundaries, in trust.

1932.....The City of Hermosa Beach institutes a citywide ban on oil development.

1976.....The Macpherson Oil Company initially proposes developing oil in the tidelands of Hermosa Beach from the City-owned "Biltmore" site. Proposal subsequently withdrawn.

1981.....The City of Hermosa Beach submits draft Coastal Land Use Plan to the Coastal Commission for certification. The City requests that the Commission postpone consideration of land use designation for city-owned "Biltmore" site and associated energy policies. Oil development is still a potential, but locally controversial, option for development.

1982.....Hermosa Beach LUP certified without incorporating energy policies.

1984.....Ballot Measures P and Q are passed, granting exceptions to the drilling ban, authorizing oil development on two city-owned parcels.

1985.....The Hermosa Beach City Council adopts an oil and gas code within the city zoning ordinances which establishes terms and conditions governing oil drilling and development in the city.

1986.....The City of Hermosa Beach enters into a lease with Macpherson Oil Company to allow Macpherson to drill for onshore oil from the City Maintenance Yard site.

1986.....The City of Hermosa Beach files an application with the California State Lands Commission (CSLC) to allow drilling for oil, gas and other hydrocarbons in the tidelands area. The CSLC requires the preparation of an Environmental Impact Report (EIR).

1989.....The City of Hermosa Beach changes the General Plan designation of the City Maintenance Yard site from "open space" to "industrial." The City does not amend the certified LUP designation of "open space."

May, 1990.....The Hermosa Beach City Council certifies the EIR and adopts a Statement of Overriding Considerations for the project.

May, 1990.....The Hermosa Beach City Council adopts amendments to Hermosa Beach's zoning ordinance to add oil drilling as a permitted use for an M-1 (light manufacturing) zone, and allowing oil and gas facilities to temporarily exceed the City's maximum height limit of 35 feet.

January, 1992 .....The California State Lands Commission approves the oil and gas lease between the City of Hermosa Beach and Macpherson Oil Company.

January, 1992 .....The City of Hermosa Beach executes a new lease with the applicant to authorize drilling for both onshore and offshore oil from the same site.

August, 1993 .....The Hermosa Beach City Council certifies an Addendum to the EIR and approves a Conditional Use Permit for the proposed project.

August, 1993 .....The Hermosa Beach Stop Oil Coalition files a petition for Writ of Mandate with the Los Angeles Superior Court against the California State Lands Commission (CSLC), challenging CSLC's decision to approve a tidelands lease agreement between the Macpherson Oil Company and the City of Hermosa Beach.

September, 1993 .....The Macpherson Oil Company submits an application to the Coastal Commission for a coastal development permit for the proposed project.

September, 1993 .....The Hermosa Beach Stop Oil Coalition files a lawsuit claiming: (a) a violation of the referendum measure that had limited oil wells to those "drilled from a site not exceeding an acre"; and (b) a variety of errors under the California Environmental Quality Act (CEQA) in the project EIR.

January, 1994 .....The Los Angeles court finds that the State, in approving the lease agreement between the Macpherson Oil Company and the City of Hermosa Beach, had not explicitly found that the leasing of the tidelands was in the best interest of the State. The California State Lands Commission (CSLC) at further public hearings reaffirms its decision and determines it was in the best interest of the State to approve the lease agreement.

May, 1994.....The Los Angeles court finds that the CSLC had complied with the orders and directions of the court and the judge grants an order discharging the Peremptory Writ of Mandate filed by the Hermosa Beach Stop Oil Coalition in August, 1993.

September, 1994 .....The lawsuit filed by the Stop Oil Coalition in September, 1993, results in a determination by the court that the 1.3-acre oil drilling project violates the size restrictions in the referendum measure and the Conditional Use Permit is invalid.

January, 1995 .....Macpherson withdraws coastal development permit application.

November, 1995.....Ballot Measure E passes in Hermosa Beach, stripping local ordinances of the provisions for the limited oil and gas development authorized by Measures P and Q, and effectively re-establishing the total ban on oil and gas development within city limits.

June, 1996 .....The Macpherson Oil Company and the City of Hermosa Beach appeal the court's decision in 1994 regarding the validity of the Conditional Use Permit. The Court of Appeals rules in their favor, reversing the decision of the trial

court and validating the Conditional Use Permit. The matter is sent back to trial court in Los Angeles for further proceedings on the CEQA issues.

November, 1996.....Macpherson submits a new application to the Coastal Commission for a coastal development permit.

February, 1997.....The City of Hermosa Beach submits a draft LUP amendment package for preliminary, informal review by Coastal Commission staff. Commission staff suggest a LUP amendment defining and applying an appropriate energy or industrial land use designation for the proposed site, accompanied by the necessary policies to provide for such development.

April, 1997.....The Los Angeles trial court denies Writ of Mandate on the CEQA issues raised in 1994 by the Stop Oil Coalition.

June, 1997.....The Stop Oil Coalition files notice of appeal of judgment denying Writ of Mandate on the CEQA issues.

June, 1997.....Stop Oil Coalition files lawsuit asserting that Measure E applies retroactively to the proposed Macpherson Oil project. Lawsuit is still pending.

June, 1997.....City of Hermosa Beach staff notifies Coastal Commission staff that the City's history of various ballot measure approvals and general plan amendments must suffice as adequate policy consideration of the Macpherson proposal and that no further LUP amendments will be submitted by the City.

July, 1997.....Macpherson agrees to suspend further processing of application while the proposal undergoes a third-party review of the hazard risk analysis. Arthur D. Little, Inc., an independent engineering consulting firm, begins its assessment of the risks from the proposed project.

September, 1997.....Arthur D. Little, Inc. preliminary review completed.

September, 1997.....The Hermosa Beach Stop Oil Coalition abandons appeal of judgment denying Writ of Mandate on the CEQA issues.

November, 1997.....Macpherson revises coastal development permit application to state that no wells will be produced that exceed 40 ppm hydrogen sulfide and agrees to remove hydrogen sulfide treatment equipment from the project plans (added after the Conditional Use Permit was approved), keeping the project consistent with the City's CUP.

December, 1997.....Final Arthur D. Little, Inc. review of hazard analysis is released.

January, 1998.....Macpherson's coastal development permit application is filed. Commission staff report prepared.

February, 1998.....Coastal Commission public hearing on permit application scheduled for February 4, 1998.

SYNOPSIS

Project Description and Background

Windward Associates (hereinafter "The Macpherson Oil Company" or "Macpherson") proposes a 30-well oil and gas development project on City-owned property in the midst of a densely populated beach community in Hermosa Beach.

The proposed project includes:

- **Wells:** Maximum of 30 oil and gas wells using slant reach technology to tap offshore and onshore reservoirs. Wells will be drilled with a 135-foot drilling rig.
- **Production Tank Farm:** 5 tanks — 3 crude oil tanks, a water storage tank and a raw brine tank (12-16 feet high, two 2,000 barrel capacity, two 3,300 barrel capacity, and one 500 barrel capacity).
- **Production Equipment:** A range of oil and gas production equipment including compressors, scrubbers, dehydrators, a gas refrigeration unit, a thermal oxidizer, metering and filtration equipment.
- **Pipelines:** Construction and operation of a crude oil and natural gas pipeline, each ½-mile long. These pipelines will connect with an existing Southern California Edison pipeline system.
- **Enclosure Wall:** Construction of a 30-foot high sound attenuation wall around perimeter of property.

In 1986, the City of Hermosa Beach entered into a lease with the Macpherson Oil Company for development of the City's tidelands oil reserves. The City performed an environmental impact analysis and issued a Conditional Use Permit (CUP) for the applicant's project in 1993.

Oil development has been politically controversial in the City of Hermosa Beach for decades. Adverse effects of antiquated oil development practices led to eyesores and hazards in the community in the 1920s (rusting derricks abandoned in place, potholes opening on city streets, contaminated soils) and a ban on further oil development was passed by local residents in the 1930s. Oil revenues to the City were hard to overlook, however, and when local citizens were told that nearby Redondo Beach tidelands wells were draining Hermosa Beach tidelands, ballot Measures P and Q were passed in 1984 authorizing oil development from two City-owned parcels in Hermosa Beach.

These ballot measures were approved in large part because the City needed royalties to buy promised park and school lands. Macpherson led the campaign for passage of Measures P and Q promising $1 million per year for the land purchases. The lands have since been purchased with funds from other sources. The City did not approve a permit for the proposed project until 1993, and lawsuits subsequently added further delays. The local voters passed Measure E in 1995, which

renews a citywide ban on oil and gas development in Hermosa Beach. City officials believe that Measure E does not apply to the Macpherson project, but that interpretation has not been definitively determined by the courts.

The Coastal Commission's Standard of Review

The question of whether the proposed project is well suited for the proposed site turns in part on questions of overall community character that are, in many cases, more appropriately taken up with the local government that approved the project. The City sought and approved this project, and its main effects will be on the local community rather than publicly-used coastal facilities.

As industrial development, the project is not provided for in the City's certified coastal Land Use Plan. However, the City does not have a fully certified Local Coastal Program. Therefore, the LUP functions as guidance from the Commission in the local application of Coastal Act policies. The applicant has obtained local government approval for the project, has met the tests of adequacy for filing a coastal development permit application, and thus is entitled to the Coastal Commission's consideration of a permit application. Where there is not a fully certified LCP, the Commission's legal standard of review for permit consideration is whether the proposed project:

(a) is consistent with the Chapter 3 policies of the Coastal Act,

(b) will not prejudice the City's ability to prepare a Local Coastal Program, and

(c) is consistent with the requirements of the California Environmental Quality Act.

Significant Chapter 3 issues are summarized in the table below, and as explained hereinafter, significant impacts the proposed project may pose to coastal resources are mitigated either through measures incorporated into the project by the applicant or by measures imposed by means of the applicable special conditions set forth below.

Staff Recommendation: Approval with Extensive Conditions

The staff recommends that the Commission adopt the proposed findings stating that as extensively conditioned to mitigate project impacts to less than significant levels, the proposed project is consistent with the applicable policies of Chapter 3 of the Coastal Act. On this basis, the staff recommends that the Commission approve the proposed project, as conditioned.

Table 1. Issue Summary: Potential Project-Related Impacts

Significant Issue Area	Coastal Act Analysis
Siting of Industrial Development	**Issue:** The applicant proposes to locate a hazardous oil and gas industrial development in a fully developed urban area with nearby residences. **Conclusion:** • The Coastal Act requires that, where feasible, hazardous industrial development be located away from existing development. No alternative sites are permissible in Hermosa Beach because a 1995 ballot measure bans oil development citywide. The applicant evaluated alternative sites in Redondo Beach. Sites on or near the Southern California Edison power plant property could technically accomplish the project's objectives. Oil and gas development is not currently authorized by the City of Redondo Beach ordinances, however. Redondo Beach revised its zoning ordinances in 1992 to limit permissible uses strictly to those listed in the relevant zoning districts. Oil and gas development is not listed in any zone district. Therefore, Redondo Beach staff have determined that the Macpherson project could not obtain local approval there. For these reasons, no legally feasible alternatives to the applicant's proposed site exist.
Hazards	**Issue:** While the applicant believes that hydrogen sulfide will not be encountered in the oil and gas stream, the applicant sought a permit to treat unspecified concentrations of hydrogen sulfide that might be encountered in the future. Commission staff did not believe the applicant had fully analyzed the potential worst-case accidental release of hydrogen sulfide that might occur. In addition, some nearby wells have historically produced significant amounts of hydrogen sulfide. As a result, the applicant agreed to fund an independent, third party review of its hazard risk analysis. The consultant, Arthur D. Little, Inc., working under the direction of Commission staff, determined that hydrogen sulfide, an acutely toxic gas, could be encountered during drilling and/or production and could pose a significant safety risk to offsite populations. Hydrogen sulfide is lethal within a few breaths at concentrations of 1,000 parts per million (ppm), and kills within ½-hour at concentrations of 300 ppm. Injuries may occur at lower concentrations and occupational safety standards are triggered at 10 ppm.

Significant Issue Area	Coastal Act Analysis
Hazards (continued)	**Mitigation Measures:** • After reviewing Arthur D. Little Inc.'s preliminary report, Macpherson modified its project to operate wells only so long as untreated (downcasing) hydrogen sulfide concentrations do not exceed 40 parts per million (ppm) in any well. Wells in excess of 40 ppm hydrogen sulfide shall either be re-completed to avoid hydrogen sulfide or permanently shut-in (**Special Condition M-1**). The applicant shall also delete from project plans all hydrogen sulfide treatment equipment (**Special Condition M-4**). Under a worst-case release scenario, the 40 ppm of hydrogen sulfide would begin mixing almost immediately with the open air, and would be diluted to insignificant concentrations before offsite exposure, if any, would occur. • The applicant shall maintain a 360-degree perimeter hydrogen sulfide detection and alarm system that detects hydrogen sulfide at concentrations of 5 ppm and automatically alerts police and fire departments. At 10 ppm, visible and audible alarms are activated at the site boundaries (**Special Condition M-2**). **Issue**: The project poses a risk of fire and explosion. **Mitigation Measures**: • The applicant shall make use of best available technology for equipment design, valve placement and specifications, well blowout preventers, etc.. • The applicant shall install a Supervisory Control and Data Acquisition automatic safety and alarm system to provide optimal emergency response capabilities. • Qualified staff shall be present onsite 24 hours per day to oversee operations. • **Special Condition M-7** requires the applicant to prepare a Fire Protection Plan for California State Lands Commission and local Fire Department review and approval, with required annual updates. • **Special Condition M-6** requires preparation of Hazard and Operability Studies before construction of Phase I (testing) and before Phase II (production). The applicant must implement any safety improvements identified during final design review. • **Special Condition A-9** requires independent monitoring and oversight by the California State Lands Commission for the life of the project, thus ensuring strict enforcement of all safety requirements. **Issue:** Withdrawal of reservoir fluids and associated changes in reservoir pressures may lead to subsidence. Subsidence of the nearshore area could lead to changes in beach profiles and result in loss of sandy beach. Subsidence can also cause increase seismic activity.

Significant Issue Area	Coastal Act Analysis
Hazards (continued)	**Mitigation Measures:** • **Special Condition M-35** requires implementation of a Subsidence Monitoring and Control Program. The program in part provides for Commission intervention if subsidence is detected. **Issue:** Re-injection of produced fluids poses a remote risk of increased earthquake activity. **Mitigation Measures:** • **Special Condition M-36** requires preparation of a Seismic Monitoring Plan that provides for monitoring by a qualified, independent entity and intervention by the Commission if project-induced seismicity is detected.
Oil Spills	**Issue:** Project-related operations could result in an accidental oil spill from the production facility/drilling site (a maximum 2,800-barrel spill), a tanker truck (a maximum 175-barrel spill), and/or a pipeline (a maximum 141-barrel spill). **Mitigation Measures:** • **Special Condition M-13** requires membership in Clean Coastal Waters, Inc., or an equivalent Oil Spill Response Organization. • **Special Condition M-14** requires the applicant to keep 500 sandbags dedicated exclusively to oil spill response stored within ½- mile of the project production facility. The sandbags would be deployed immediately to prevent oil from entering the storm drain system, which drains to the sea. • The facility will be designed to contain a worst-case spill on site. • The applicant will use back-up computer systems and automatic controls, such as leak detection systems and automatic shut-off valves, to shut down operations and to isolate and reduce the size of any spills. • The applicant is required to routinely inspect the production facility, storage tanks, pipelines and drilling rigs pursuant to state and federal requirements (**Special Condition M-15**). • The applicant is required to have an OSPR-approved oil spill contingency plan in place.
Visual	**Issue:** Drilling and well work-over activities require a 110 to 135-foot tall drilling rig which (a) contrasts sharply with existing neighborhood building heights, (b) will be somewhat visible from several coastal public viewing areas, and (c) is incompatible with the low-profile visual character of this beach community.

Significant Issue Area	Coastal Act Analysis
Visual (continued)	**Mitigation Measures:** • The 135-foot tall drilling rig will be removed after all wells are drilled — no later than four years after the first well is drilled. Thereafter, a 110-foot tall workover rig may be onsite for up to 90 days per year. • To compensate for adverse visual impacts that cannot be fully mitigated, the applicant proposes to pay $1,000 per month (adjusted for inflation), or a sum pro-rated based on the numbers of days per month that a rig is standing onsite for any reason, into the City's Coastal Resource Enhancement Fund. **Special Condition M-30** requires, through execution of a Memorandum of Understanding with the City, that the mitigation fees be spent exclusively for projects to visually enhance public coastal open spaces and recreation areas from which the project is visible.
Recreation / Public Access	**Issue:** The applicant proposes to remove 12 parking spaces, six of which are currently available to the public on weekends for beach access. **Mitigation Measures:** • The applicant proposes to provide six new free public parking spaces for public use seven days a week.

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1.0 STAFF RECOMMENDATION

Approval With Conditions

The staff recommends Conditional Approval of Coastal Development Permit Application E-96-28.

Motion:

I move to approve Coastal Development Permit E-96-28 subject to the conditions specified in the staff recommendation dated January 21, 1998.

The staff recommends a **YES** vote. To pass the motion, a majority vote of the Commissioners present is required. Approval of the motion will result in the adoption of the following resolution and findings:

Resolution:

The Coastal Commission hereby grants Coastal Development Permit E-96-28, subject to the conditions specified below, on the grounds that:

(1) the development as conditioned will be in conformity with the provisions of Chapter 3 of the California Coastal Act of 1976;

(2) the development as conditioned would not prejudice the ability of the local government having jurisdiction over the area to prepare a Local Coastal Program conforming to the provisions of the Coastal Act; and

(3) there are no feasible alternatives or feasible mitigation measures available, other than those specified in this permit, which would substantially lessen any significant adverse impact which the activity may have on the environment within the meaning of the California Environmental Quality Act.

2.0 STANDARD CONDITIONS — SEE APPENDIX B.

3.0 SPECIAL CONDITIONS

This permit is granted subject to the following special conditions:

ADMINISTRATIVE

A-1 In addition to any immunities provided for by law, in exercising this permit, the permittee agrees to hold harmless and indemnify the Commission, its officers, employees, agents, successors and assigns from any claims, demands, costs, expenses, and liabilities for any damage to public or private property or personal injury that may result directly or indirectly from the project.

The permittee shall be jointly and severally liable without regard to fault for all legally compensable damages or injuries suffered by any property or person that result from or arise out of any hydrocarbon, brine or water spillage, fire, explosion, subsidence, induced seismicity, odor, noise, or air pollution, or in any way involving petroleum or gas or the impurities contained therein or removed therefrom which arise out of the Hermosa Beach Urban Slant Drilling operation. For the purpose of this condition, the "operation" shall be deemed to include the construction and operation of all facilities described herein and any subsequent approved revisions or modifications. "Operation" shall also include all project-associated transportation activities, including deliverance of supplies containing hazardous materials, hydrocarbon or hydrocarbon byproduct transportation to or from the site, or transportation of hydrocarbon or hydrocarbon byproducts from the site to receiving entities. "Operation" shall also include all activities necessary to remediate pre-existing contaminated soils on the project site. This declaration of strict liability and the limitations upon it shall be governed by the applicable law of California on strict liability.

A-2 The permittee shall reimburse the Commission in full for all costs and attorneys fees — including (1) those charged by the Office of the Attorney General, and (2) any court costs and attorneys fees that the Commission may be required by a court to pay — that the Commission incurs in connection with the defense of any action brought against the Commission, its officers, employees, agents, successors and assigns challenging the approval or issuance of this permit, the interpretation and/or enforcement of permit conditions, or any other matter related to this permit.

A-3 Acceptance of this permit shall be deemed acceptance of all conditions of this permit. In accepting this permit, the permittee agrees that it shall not challenge the limitations on the operation of the project provided in the conditions to this permit and agrees to waive any and all rights to challenge this permit under any legal theory, including but not limited to those based on abuse of discretion, lack of support by evidence in the record, and inverse condemnation.

A-4 In accepting this permit, the permittee acknowledges that authority to conduct development activities under this permit is contingent upon full and continuing compliance with every condition of this permit. In addition to all other remedies, failure to comply fully with the requirements of any condition of this permit shall constitute grounds for a cease and desist order issued by the executive director or the Commission (Coastal Act §§30809 and 30810).

A-5 As to any condition that requires for its effective enforcement the inspection of records or facilities by the Coastal Commission or its agents, the permittee shall make all relevant records available and provide access to such facilities upon reasonable notice from the Coastal Commission. For inspection of the physical project facility, reasonable notice shall be by telephone or letter received by the permittee or the permittee's designated representative at least twenty-four (24) hours in advance of the pending inspection. For inspection of written or computer-stored records, if such records are maintained on the project site, reasonable notice shall be the same as for inspection of the physical project facility; for records that are maintained elsewhere by the permittee, reasonable notice shall be by telephone or letter received by the permittee at least five (5) working days in advance of the pending inspection and such records shall be made available to the Coastal Commission or its agents either at the project site or at a Coastal Commission office designated by the executive director.

A-6 The project facility shall be staffed by qualified employees twenty-four (24) hours per day for the life of the project. The designated employee(s) shall be trained in all aspects of facility safety procedures and informed of all public safety and emergency response plans and procedures. The onsite employee(s) shall at all times have available the following communications equipment: a minimum of two land line telephone extensions (including at least one extension in the well cellar), a portable cellular telephone; and backup radio equipment. All applicable emergency response telephone numbers shall be prominently posted at each communications station.

A-7 In the event that the permittee seeks any new permit for additional proposed development materially related to the development authorized pursuant to this permit, or seeks any material modification to the City of Hermosa Beach's Conditional Use Permit 93-5632, the permittee shall submit a copy of the relevant application to the executive director within ten (10) days of such submittal to the permitting authority. Any additional materials subsequently submitted in association with such application shall also be submitted to the executive director within ten (10) days of such submittal to the permitting authority.

A-8 Prior to issuance of this permit, or according to other specified timelines, the permittee shall submit a complete set of project plans (for Phase I prior to permit issuance, and for Phase II, prior to commencement of Phase II activities), including final engineered project plans and designs, and a copy of the permittee's Compliance Plan (as specified below) to the executive director, State Division of Oil and Gas and Geothermal Resources (DOGGR), the California

State Lands Commission (CSLC), the State Fire Marshal's Pipeline Safety Division (PSD), the Federal Department of Transportation, and the City of Hermosa Beach Fire Department. The executive director shall review the Compliance Plan in consultation with these agencies and departments and determine whether the plan is adequate to ensure the effective implementation of the special conditions applicable to this permit. If the permittee and the executive director do not agree on Compliance Plan adequacy, the Compliance Plan shall be submitted to the Coastal Commission for a determination as to its adequacy. The Compliance Plan is intended to provide a monitoring and reporting framework for compliance with all conditions, programs and plans specified by these conditions.

The Compliance Plan shall identify the necessary documentation and appropriate reporting periods to enable the Coastal Commission to determine that the permittee remains in compliance with all conditions of this permit. The project shall not commence until the Compliance Plan is approved. All costs to implement the approved Compliance Plan for the life of the project shall be the responsibility of the permittee.

The permittee shall provide a copy of each monthly Compliance Plan report to the City of Hermosa Beach Community Development Department at the same time such reports are submitted to the executive director. The copy submitted to the City of Hermosa Beach shall be placed in the public file associated with the City's Conditional Use Permit 93-5632, to ensure that local citizens may inspect the reports at a convenient location and at no charge.

The Compliance Plan shall include but not be limited to the following:

1. a complete set of all approved plans, as specified by these conditions, relevant to construction and operation of the permitted facilities. If separate plans exist, they may be referenced rather than physically included in the Compliance Plan submittal;
2. provisions for onsite monitoring by the California State Lands Commission (CSLC), or as otherwise specified and approved by the executive director pursuant to **Special Condition A-9**, during Phase I and Phase II construction and production operations. The onsite monitor shall have overall responsibility for monitoring the permittee's compliance with the conditions of this permit and ongoing reporting of the status of compliance to the executive director. The monitor shall be selected by and responsible to the executive director, and to the extent that the CSLC is willing and able to perform this function pursuant to **Special Condition A-9** set forth below, the executive director shall assign responsibility for onsite monitoring to the CSLC. Onsite monitoring shall be funded by the permittee for the life of the project;
3. provisions to ensure contractor knowledge of and compliance with these conditions;
4. provisions for the submittal to the Coastal Commission or to the Commission's designated representative of monthly reports throughout construction and annual summary reports during operations unless more frequent reporting is deemed necessary by the executive director or required pursuant to other applicable Special Conditions set forth herein. Upon receipt of compliance reports, the executive director shall advise the

permittee if additional compliance items require reporting prior to the next report. The regularly scheduled monthly reports shall describe:

(a) Project status, including but not necessarily limited to:

i. extent to which construction has been completed,

ii. the rate of production/throughput during operation,

iii. monthly report of maximum hydrogen sulfide concentrations detected in each producing well,

iv. identification of any incident in which the downcasing hydrogen sulfide limitation of forty (40) parts per million was exceeded in any well,

v. any revised time schedules or timetables of construction and/or operation that will occur in the next one (1)-year period.

(b) Permit condition compliance including but not necessarily limited to the results of the specific mitigation requirements identified in these conditions and compliance plans.

(c) Results and analyses of all tests conducted by the permittee pursuant to these permit conditions including, or in addition to, any analyses set forth in any applicable condition herein. The reports shall also include the results and analyses of samples collected by a qualified party approved by the executive director and funded by the permittee. In addition to analyses that may be required by other applicable permits and conditions, independent sampling to test for hydrogen sulfide levels in each well shall be performed, and split samples tested by laboratories selected by the executive director. Such tests shall be required a minimum of once per quarter for wells with less than thirty-five (35) parts per million of hydrogen sulfide and monthly for wells exceeding thirty-five (35) parts per million of hydrogen sulfide. Independent sampling reports shall be provided directly to the executive director, to the project monitor, and to the permittee. Standard chain-of-custody protocols shall be strictly observed during sample withdrawal, transport, and analysis.

(d) Subsidence and induced seismicity monitoring and/or mitigation program reports or analyses required pursuant to **Special Conditions M-34** through **M-36** set forth herein.

(e) Pipeline testing and maintenance results and reports.

(f) Results of monthly tests and inspections conducted by the CSLC, shown by way of example in Exhibit 22.

(g) Notice of any violation of local, state, or federal standards, permit conditions, or other applicable regulations.

A-9 (a) The Coastal Commission hereby designates the California State Lands Commission to undertake the oversight and monitoring required pursuant to the approved Compliance Plan described in **Special Condition A-8** herein and other applicable provisions of this

permit. If at any time the CSLC proves unwilling, or, in the opinion of the executive director, unable, to carry out the responsibilities set forth herein, the executive director shall schedule a noticed public hearing at a regularly scheduled Commission meeting and make recommendations to the Commission for designation of an alternative, qualified entity or agency to undertake this responsibility. The alternative project monitor shall be chosen by the Commission and funded by the permittee.

(b) The costs incurred by the monitoring and oversight entity pursuant to the requirements of this permit shall be at the permittee's expense. Compensation by the permittee shall be made pursuant to a Memorandum of Understanding between the permittee, the City of Hermosa Beach, and the executive director, in a form and content acceptable to the executive director. Compensable expenses to be funded by the permittee shall include all necessary costs for condition compliance and the enforcement of this permit, including necessary consultations with qualified experts, reasonable studies and/or field tests and analyses, project monitoring, equipment, travel, and associated operating costs incurred by the Coastal Commission or its designated monitor to ensure compliance with and/or to enforce the conditions of this permit.

A-10 Within sixty (60) days of the conclusion of the Phase I testing, the permittee shall notify the executive director of its determination as to the feasibility of Phase II (production). The permittee shall commence Phase II no later than one calendar year after the conclusion of Phase I testing. The combined length of Phase I and Phase II activities shall not exceed thirty-five (35) years from the commencement of Phase I (testing). No extension of this development period shall be authorized without an approved amendment to this permit pursuant to §13166 of the Commission's regulations.

Notwithstanding the above, if any cause beyond the control of the applicant shall enforce a delay of project construction or operation, other than the risks attendant to the exploration and development of the project itself, an extension of time for any such cause shall be for the period of the enforced delay and shall commence to run from the time of the commencement of the cause, if notice by the party claiming the extension is sent to the executive director in writing, by certified mail, within thirty (30) days of the commencement of the cause.

A-11 Prior to construction, the permittee shall demonstrate to the executive director that it carries a minimum of $15,000,000 in General Liability Insurance, and $15,000,000 in Well Control Drilling Insurance on the subject oil and gas project with a company rated "A" or better. The General Liability Insurance policy shall be in effect prior to construction and shall be maintained for the life of the project, through abandonment of the facility. The Well Control Drilling Insurance policy shall only be required to be in effect while drilling or workover drilling operations are being conducted. The permittee may satisfy this requirement by having its drilling contractor or subcontractors supply the required insurance, so long as the aggregate insurance maintains the totals required. The policy(s) shall specify that the amount

and/or extent of coverage may not be modified or canceled without sixty (60) days prior written notice to the Coastal Commission.

A-12 The permittee shall furnish the executive director with copies of all local, state, and federal permits relative to the project authorized by this permit within thirty (30) days of receipt by the permittee.

A-13 Any reference to any public agency or private entity contained in these special conditions shall be deemed also to be a reference to any successor public agency or successor private entity.

A-14 Prior to issuance of this permit, the permittee shall submit an executed letter of intent from Southern California Edison's pipeline subsidiary indicating that Edison Pipeline and Terminal Company (EPTC) intends to allow the permittee to connect the crude oil and natural gas liquid (NGL) pipeline authorized by this permit to the EPTC pipeline system at the Southern California Edison Redondo Beach Terminal and Generating Station for purposes of accepting the crude oil and natural gas liquids produced during Phase II of the permittee's project. The subject letter of intent shall contain evidence that the EPTC pipeline system has adequate capacity to accept the maximum crude oil and natural gas liquid (NGL) production anticipated by the permittee over the life of the project (maximum rate of 9,410 barrels per day or 3,350,000 barrels per year) for the term of this permit (up to 35 years).

A-15 Prior to commencement of Phase II activities, the permittee shall demonstrate to the executive director's satisfaction that it has entered into a binding agreement with Edison Pipeline and Terminal Company (EPTC) for connection to and use of the EPTC pipeline system for the project's anticipated crude oil and natural gas liquid production volumes and throughput rates. The subject agreement shall contain evidence that the EPTC pipeline system has adequate capacity to accept the maximum crude oil and natural gas liquid (NGL) production anticipated by the permittee over the life of the project (maximum rate of 9,410 barrels per day or 3,350,000 barrels per year) for the term of this permit (up to 35 years).

A-16 Prior to commencement of Phase II activities, the permittee shall submit an executed letter of intent from Southern California Edison indicating that SCE intends to allow the permittee to connect the natural gas pipeline authorized by this permit to the Edison pipeline system for the purpose of shipping the estimated volume and production rate of the project's produced natural gas to the Edison Redondo Beach Power Plant. The letter of intent shall acknowledge that the produced gas may contain hydrogen sulfide concentrations of up to forty (40) parts per million and that Edison is authorized and willing to purchase the anticipated volumes of natural gas produced pursuant to the oil and gas extraction activities authorized by this permit. If the permittee intends to substitute a different sales destination for the produced gas, and if no attendant physical change in the project authorized by this

permit is required to accommodate the alternative buyer, the same provisions of this condition shall apply to an executed letter of intent from the alternative buyer.

A-17 No later than thirty-five (35) years following commencement of construction for Phase II, the permittee shall submit a complete application for a new coastal development permit from the Coastal Commission for the abandonment of the project. In accepting this permit, the permittee acknowledges that it shall be responsible for full project abandonment and site restoration in accordance with all laws, regulations, and policies applicable at that time. The applicant shall obtain all necessary permits and approvals and shall remove any and all abandoned processing facilities and portions of unburied pipeline, constructed and/or operated under this permit, excavate and/or remediate any contaminated soils, and re-contour and revegetate the site in accordance with an approved abandonment and restoration plan within two (2) years of the expiration of the term of this permit.

A-18 Prior to commencement of construction for Phase I, the permittee shall post a performance bond, cash, or other security device in an amount and form acceptable to the executive director, with the City of Hermosa Beach, for the estimated costs of abandoning Phase I facilities. In addition, prior to commencement of construction for Phase II, the permittee shall post a performance bond, cash, or other security device in an amount and form acceptable to the executive director, with the City of Hermosa Beach, for the estimated costs of abandoning Phase II facilities.

MITIGATION MEASURES

Public Safety/Hazards

M-1 The permittee is only authorized to operate wells developed pursuant to this permit so long as untreated (downcasing) hydrogen sulfide concentrations do not exceed forty (40) parts per million (ppm) in any well. If untreated concentrations of hydrogen sulfide in any well are determined pursuant to **Special Condition A-8** to exceed forty (40) ppm, that well shall be immediately shut in and the executive director shall be notified within twenty-four (24) hours of detection of the exceedance. The permittee shall either re-complete the well to avoid excessive hydrogen sulfide concentration, or abandon the well to State Division of Oil and Gas and Geothermal Resources standards within six (6) months of detection of the exceedance of 40 ppm of hydrogen sulfide.

M-2 The permittee shall install and continuously maintain a 360-degree perimeter hydrogen sulfide detection and alarm system. The system shall be calibrated to trigger alarms, transmit automatic telephone warnings, and otherwise be operated according to the following requirements:

(a) the system shall be calibrated to detect ambient air concentrations of hydrogen sulfide at five (5) ppm in onsite drilling and production areas and shall trigger visual and audible

. alarms detectable by the onsite project operator if this concentration is detected;

(b) the system shall be calibrated to detect ambient air concentrations of hydrogen sulfide at five (5) ppm at the site boundaries and shall activate an automatic telephone warning system if this concentration is detected. The telephone warning system shall use dedicated line separate from other required communications lines and equipment on site. The telephone warning system shall automatically call the Hermosa Beach police and fire departments and if they are not dispatched twenty-four (24) hours per day, the system shall additionally telephone the emergency 9-1-1 operator after regular department hours. The telephone warning system shall be designed to continue calling the designated parties in sequence until the parties acknowledge the call;

(c) the system shall be calibrated to detect ambient air concentrations of hydrogen sulfide at ten (10) ppm at the site boundaries and shall activate flashing hazard warning lights, next to which explanatory hazard warning signs shall be placed, on all sides of the site and at project entrances. The ten (10) ppm hydrogen sulfide threshold shall also trigger audible alarms;

(d) the system shall not be disabled for any reason without prior notice to the executive director's designated project monitor and to the Hermosa Beach police and fire departments. Notice shall also be given to these parties when the system is placed back in service. The dates, times, duration, and cause of such interruptions shall be noted in a permanent log maintained onsite and in the monthly Compliance Plan required pursuant to **Special Condition A-8**; and

(e) tests of the perimeter detection and alarm system, including the telephone warning system, shall be made once per month, at a minimum, for the life of the project. Tests shall be conducted by the independent monitor and results shall be logged in the monthly Compliance Plan reports required pursuant to **Special Condition A-8**.

M-3 Prior to issuance of this permit, the permittee shall execute and record a lease restriction, in a form and content acceptable to the executive director, stating that the subject permit is only for the development described in Coastal Development Permit E-96-28 and that any future additions or improvements to the property that might otherwise be exempt from permit requirements under PRC § 30610(b) will require a permit from the Coastal Commission. The document shall run with the lease, binding all successors and assigns, and shall be recorded free of prior liens and any other encumbrances which the executive director determines may affect the interest being conveyed.

M-4

(a) Prior to issuance of this permit, the permittee shall submit for the review and approval of the executive director, revised plans showing the deletion of all previously proposed hydrogen sulfide treatment equipment.

(b) Prior to construction of Phase I and prior to construction of Phase II the permittee shall submit evidence to the executive director's satisfaction that the applicable final designs and engineering drawings incorporate all recommendations contains in the "Geologic Hazards Investigation" prepared for the permittee's project by Ryland Associates, dated June 10, 1994. The final plans shall be stamped as approved by a registered engineering geologist familiar with the referenced land reports.

M-5 Prior to placing the natural gas liquids (NGL) processing system in service, the permittee shall provide for a comprehensive safety and reliability analysis of the NGL processing system. The analysis shall be performed by a qualified agency or consultant approved by the executive director and funded by the permittee. The analysis shall be submitted to the executive director, the California State Lands Commission, and the City of Hermosa Beach Fire Department within ten (10) days of completion. Any deficiencies detected during the analysis, or suggestions for safety improvements made by reviewing agencies, shall be implemented by the permittee prior to placing the systems in service. Any additional inspections or testing necessary to confirm the efficacy of these modifications or improvements shall be completed prior to placing the NGL processing system in service. The permittee shall provide the executive director with evidence of the successful final clearance of the NGL processing system. The NGL processing system shall not be placed in service until the executive director notifies the permittee that this special condition has been fully satisfied.

M-6 Prior to construction of Phase I, and again prior to construction of Phase II, the permittee shall provide for the executive director's review and approval a comprehensive Hazard and Operability Study (HAZOP) for the proposed facility and ancillary equipment. Each HAZOP shall be performed by a qualified consultant approved by the executive director and funded by the permittee. The HAZOPs shall identify likely sources of potential accidental releases and shall recommend mitigation measures to prevent or reduce the likelihood of the identified potential accidental release scenarios. The HAZOPs shall be reviewed and approved by the California State Lands Commission (CSLC) and the Fire Chief of the City of Hermosa Beach, and evidence of such approval shall be submitted to the satisfaction of the executive director. Additional mitigation measures that may be recommended as a result of the HAZOPs, or by the reviewing entities, that require material changes to the proposed project may require an amendment to this permit. New mitigation measures required as the result of a HAZOP(s) shall become additional enforceable special conditions of this permit.

M-7 Prior to commencement of Phase I construction, the permittee shall provide a letter from the Fire Chief of the City of Hermosa Beach to the executive director confirming that the following requirements have been satisfied:

(a) that the Arthur D. Little, Inc. final risk analysis for the proposed project has been reviewed by the Fire Chief and that any additional equipment or training (for example, but not limited to, confined space rescue training) the Fire Department finds necessary to

respond effectively to potential hazards associated with the project have been provided by the permittee;

(b) that a dedicated fire fighting water source with adequate volume and pressure, and/or a chemical suppression system, designed to effectively control a worst case release and ignition of flammable gases, or other fire risk posed by the project, is available at the site perimeter or in an adjacent location readily accessible by fire department personnel; and

(c) that the permittee has prepared and the City of Hermosa Beach Fire Chief has approved, a Fire Protection Plan (FPP), including specific components set forth below, demonstrating that all facilities, construction activities, process equipment, and fire protection equipment associated with the project approved pursuant to this permit comply with the standards of the National Fire Protection Association (NFPA), the American Petroleum Institute, and the applicable standards of the City of Hermosa Beach. Should these standards conflict, the standard most protective of public safety shall prevail.

The FPP shall include at minimum, but shall not be limited to, discussions of and specific measures to address the following:

(a) Onsite fire fighting equipment and systems;

(b) Fire and gas detection;

(c) Access;

(d) Site management to control ignition and fuel sources;

(e) Employee training and safe practices;

(f) Drainage and containment;

(g) Safety inspection;

(h) Maintenance practices; and

(i) Identification, storage, use, and disposal of flammable and/or hazardous materials and wastes.

Phase I construction shall not commence until the executive director receives evidence of California State Lands Commission approval of the FPP.

The permittee shall update the FPP by January 1 of each year. The updated FPP shall reflect current project operating conditions and practices. The permittee shall submit the updated FPP to the Fire Chief of the City of Hermosa Beach and to the California State Lands Commission for review by January 1 of each year and shall submit evidence of the satisfactory review of the updated FPP by these agencies, together with evidence that any reasonable additional fire protection measures recommended by the California State Lands Commission or Fire Chief have been implemented, to the executive director by May 1 of each year. In addition, the permittee shall furnish a copy of the FPP, including the comments

of the reviewing agencies, to the City of Hermosa Beach Community Development Department by May 1 of each year. The City copy shall be placed in the public file for the permittee's project.

M-8 Non-emergency flaring of produced natural gas shall be permitted during Phase I only. The permittee shall keep records of all emergency flaring incidents, including the cause of the emergency, the duration of flaring, and any other pertinent information. This information shall be included in the reports required pursuant to **Special Condition A-8**.

Oil Spill Prevention and Response

M-9 If at any time the executive director determines that new proven technological advances not previously available could substantially improve the prevention or effective clean up of potential oil spills associated with the permittee's project, then the executive director shall schedule a hearing before the Coastal Commission and recommend additional reasonable conditions for the consideration of, and possible imposition by, the Coastal Commission. Reasonable technical consultation and analysis by qualified experts shall be made available to the executive director at the permittee's expense for the purpose of evaluating relevant technological advances and providing a recommendation to the Commission. Such additional consideration by the Coastal Commission shall be made at a noticed public hearing during the Commission's regular monthly meeting.

M-10 Prior to placing the crude oil and natural gas lines in service, the permittee shall submit to the executive director evidence that all tests required by state and federal regulations have been performed and that the results have been reviewed and approved by the State Fire Marshal and/or the Federal Department of Transportation, as appropriate.

M-11 Transportation of crude oil produced in accordance with this permit shall be by truck during Phase I only. During Phase II, crude oil and natural gas shall be transported to its refinery destination via pipeline only. No truck transportation of crude oil after Phase I shall be permitted.

M-12 Prior to construction of the proposed oil and gas pipelines, the permittee shall demonstrate to the executive director's satisfaction that it has submitted the final pipeline design and construction plans to the State Fire Marshal's office, the Federal Department of Transportation, and the California State Lands Commission for review. The permittee shall also submit evidence to the executive director's satisfaction that any suggestions for improved pipeline testing or design made during the course of such review have been incorporated into the final project plans and pipeline testing program. The project plans shall verify the safety design compatibility with the Southern California Edison oil and gas pipeline systems or any other receiving party proposed by the permittee with potentially

interactive or affected safety systems. Notations of compatibility requirements shall be included on final project plans.

In addition, final project plans shall include pipeline valves designed to be operated by the permittee's pipeline Supervisory Control and Data Acquisition (SCADA) system and shall be designed to fail in a closed position. In addition to other requirements, (a) a fail-closed block valve shall be installed at the intersection of the permittee's and the Southern California Edison oil and gas pipelines, and (b) block/check valve combinations shall be installed at the Herondo Storm Drain and at any fault crossing.

M-13 Prior to drilling wells authorized pursuant to this permit, the permittee shall demonstrate to the executive director's satisfaction that the permittee is a member of a federal and California-approved offshore Oil Spill Response Organization (OSRO) such as Clean Coastal Waters, Inc. The permittee shall maintain such membership continuously throughout the life of the project.

M-14 Prior to commencement of Phase I construction, the permittee shall demonstrate to the executive director's satisfaction that the permittee has arranged to make available at all times 500 filled sandbags either onsite or at a permanently designated site within ½ mile or less of the proposed site. The sandbags shall be constantly available for immediate deployment to protect the public storm drain system in the event of an oil spill originating from production or transportation of oil associated with this project. Access to the designated site shall be available 24 hours per day to emergency response agencies, to the trucking company transporting the permittee's oil, and to the permittee's designated Macpherson onsite employee.

M-15 The permittee shall implement routinely scheduled pigging of the gas pipeline to remove pockets of accumulated fluids that contribute to internal corrosion, and for both the oil and gas pipelines shall use corrosion inhibitors and corrosion coupons, and conduct periodic testing by a state-of-the-art "smart pig" as specified below. The permittee shall ensure that:

(a) Whenever any section of a pipe is removed for any reason, it shall be inspected for possible internal corrosion and records of the inspection results retained for inspection by the State Fire Marshal or the Federal Department of Transportation, as applicable. Prior to returning the pipeline to service, the permittee shall submit evidence to the satisfaction of the executive director's designated monitor that the applicable regulatory agency has confirmed that all necessary repairs or replacement have been performed to that agency's satisfaction; and

(b) The pipelines shall be routinely tested with state-of-the-art "smart pig" technology to identify areas where corrosion, pipewall thinning, dents, cracks and other defects have occurred. State-of-the-art pigging shall be defined as technology capable of defining wall-thickness contours around any area of reduced wall thickness. Smart pigging shall be done prior to initial use of the oil and gas pipelines and at subsequent intervals as

recommended by the State Fire Marshal or the Federal Department of Transportation, as applicable. The permittee shall provide the executive director's designated monitor with copies of all smart pigging results, and shall demonstrate to the satisfaction of the executive director's designated monitor that any deficiencies identified pursuant to the required testing have been remediated to the satisfaction of the State Fire Marshal or Federal Department of Transportation, as applicable.

M-16 The permittee shall undertake the following provisions to avoid external pipeline corrosion:

(a) The permittee shall demonstrate to the executive director that oil and gas pipelines shall be coated with an external coating designed to reduce the potential for external corrosion in accordance with the requirements of the State Fire Marshal or the Federal Department of Transportation, as applicable; and

(b) A baseline pipe-to-soil cathodic profile and reading shall be obtained after the pipelines have been installed, but before any cathodic protection facilities are connected. Other utilities shall disconnect their bonds, as well, prior to taking the necessary readings. This measure shall be included on the construction plans which shall be reviewed by the State Fire Marshal and the Federal Department of Transportation, as applicable.

M-17 The permittee shall provide structural support for underground utilities in and near the construction area during work in the trench and backfilling operations to prevent damage to such facilities during construction activities.

M-18 The permittee shall use hand tools (that is, non-motor operated equipment) in utility intensive areas and within twenty-four (24) inches of underground structures. Any soil remediation or excavation work in the vicinity of the pipeline shall also require the use of hand tools within twenty-four (24) inches of the pipeline.

M-19 If damage to an underground utility occurs during the course of project construction or operations, the permittee shall halt work in the immediate vicinity until the owner of the utility has been contacted and repairs made. The permittee shall not leave the affected site unattended until a representative of the utility is present.

M-20 A plastic ribbon or other suitable material shall be buried twelve (12) to eighteen (18) inches above the pipeline and shall cover the length of the pipelines. The material shall be brightly colored and labeled with a warning that this area contains a hazardous pipeline trench. This measure shall be noted on the design and construction plans and included in the Compliance Plan.

M-21 The permittee shall notify owners through the office of Underground Service Alert of any underground facilities (including but not limited to electrical, water, gas, petroleum pipelines, fiber-optics, or drainage pipes) forty-eight (48) hours in advance of excavation in the vicinity of these facilities. The permittee shall have an electrical contractor on-call at all

times during construction near the potentially affected facility to repair any circuits if required by the owner in the event that such circuits may be damaged during construction. The appropriate response to hazards associated with damage to natural gas pipelines shall be determined in consultation with the Southern California Gas Company. The Fire Departments of the Cities of Redondo Beach and Hermosa Beach shall be notified at least ten (10) days in advance of the schedule for construction activities in the vicinity of natural gas and other oil pipelines in their jurisdictions.

M-22 Upon completion of pipeline construction the permittee shall provide all potentially affected emergency response agencies identified in the permittee's Compliance Plan, and utility owners sharing the as-built pipeline corridors, with at least two copies of maps showing the finished pipeline route and the locations accessible by fire department emergency response vehicles.

M-23 Prior to commencement of Phase II production, the permittee shall demonstrate to the executive director's satisfaction that the pipeline and operating facility Supervisory Control and Data Acquisition (SCADA) and Emergency Shutdown (ESD) systems, including inspection, maintenance and quality assurance procedures for SCADA and ESD systems, use best available technology and have been reviewed and approved by the California State Fire Marshal and the Federal Department of Transportation, as applicable. The pipeline SCADA and ESD systems shall be linked to the Edison Pipeline and Terminal Company and Edison Redondo Beach Power Plant gas transmission systems so that an upset on the permittee's pipeline(s) is noted automatically at the applicable control center. In addition, a red phone "hot line" and an intercompany radio, or equivalent emergency communications equipment, shall be installed in each control room and onsite at the permittee's facility. These measures shall be included in the construction, emergency and compliance plans. The permittee shall demonstrate to the satisfaction of the executive director or the executive director's designated representative the successful performance of the SCADA system, system interconnections, and emergency communications systems prior to commencement of Phase II production.

M-24 Within six (6) months following Phase I and Phase II construction, respectively, and within six (6) months of any significant additional construction or modification of the project or related facilities thereafter, the permittee shall submit as-built or revised as-built drawings of the entire facility or related structures (such as pipelines), to the executive director. Duplicate sets of the as-built drawings shall be submitted to the California State Lands Commission, the California State Fire Marshal (for oil pipeline or pipeline-related construction or modifications only), the Federal Department of Transportation (gas pipeline or pipeline-related construction or modifications only), and to the Hermosa Beach Fire Department.

Remediation of Contaminated Soils

M-25 Upon completion of all remediation activities to abate existing site contamination, the permittee shall notify the executive director that all applicable California Regional Water Quality Control Board standards have been satisfied and shall indicate the scope of work completed and identify the site where contaminated soils have been disposed.

Visual

M-26 No unobstructed or unshielded beam of exterior lighting except as required by the Federal Aviation Administration for safety purposes shall be directed toward any area outside the exterior boundaries of the project drilling and production site. Any lighting along roadways within the project shall use low intensity, ground level, shielded fixtures.

M-27 No glare or other light emissions resulting from facilities constructed pursuant to this permit, other than lighting fixtures, gas flares, and heat exchangers shall be detectable at any point along or outside the exterior project boundaries.

M-28 Prior to issuance of this permit, the permittee shall submit a detailed final landscaping and fence installation plan to the executive director. The plan shall screen or soften the visual impact of the development to the maximum extent feasible. The permittee shall maintain the fencing and landscaping in acceptable condition to achieve the continuous screening and softening effects provided for by the approved plans for the duration of the project, and the responsibility for such maintenance shall be solely that of the applicant. The permittee shall be required to replace landscape plants that perish or fail to attain adequate height or scale to achieve the necessary mitigation of the project's visual impacts.

M-29 All permanent structures onsite, and to the extent feasible, all drilling rigs, shall be painted or covered in a neutral color designed to blend into the background and to minimize the visual impact of the project as viewed from public coastal recreational areas.

M-30 Prior to issuance of this permit, the permittee shall enter into a Memorandum of Understanding (MOU) with the City of Hermosa Beach and with the Coastal Commission. Pursuant to the MOU the permittee shall deposit $1,000 per month, or a sum pro-rated based on the number of days per month for any month or portion thereof that a rig is standing onsite for any reason, adjusted annually for inflation according to the Consumer Price Index or alternative published federal index acceptable to the executive director, into the City's Coastal Resource Enhancement Fund (CREF). The applicant's contributions to the CREF shall be used to mitigate the residual adverse impacts of the project on coastal visual resources.

The MOU shall specify the following:

(a) the funds may, at the City's discretion, accrue for up to five (5) years at a time for application to larger projects than the monthly amounts alone could fund;

(b) the unspent balance of deposited funds, and all accumulated interest from unspent visual impact mitigation deposits, must be applied exclusively to permanent projects that visually enhance the City's public recreational areas from which the project's drilling rig is visible (particularly the greenbelt corridor adjacent to the project);

(c) funds paid by the permittee into the CREF pursuant to this special condition shall not be used to fund repair and maintenance activities or other short-term activities from which no lasting benefit is realized. An exception to this requirement may be made for the care of tree plantings or other permanent landscape plantations that may be necessary to ensure their establishment;

(d) the funds deposited pursuant to this special condition shall only be awarded to projects proposed by public agencies or registered non-profit organizations;

(e) all projects receiving funds pursuant to this special condition shall be approved by the City Council of Hermosa Beach at a publicly noticed hearing; and

(f) the City of Hermosa Beach shall annually notify the executive director of new projects funded by the permittee's CREF deposits, the status of previously funded projects under development, and the amount of remaining balances and accumulated interest.

Coastal Access Public Parking

M-31 All replacement public parking stalls as shown on the City-approved "Replacement Public Parking Plan," Sheet No. PK-1, shown herein as Exhibit 23, shall be installed either (1) before drilling of the first test well, or (2) no later than six months from the time the City of Hermosa Beach vacates the subject property to allow project development, whichever occurs first. The permittee shall notify the executive director within ten (10) days of the City's complete vacation of the property. If the permittee is unable to install the replacement parking as shown on Exhibit 23 and 24 within the time specified above, through no fault of the permittee, the executive director may extend the time allowed to comply with this condition. On-street public parking provided pursuant to Exhibit 23 and 24 shall not be used for parking by the permittee's employees, contractors, or representatives. Public parking provided pursuant to this special condition shall remain available for public coastal access parking for the life of the development authorized pursuant to this permit. If the City of Hermosa Beach re-designates such parking to another use beyond the control of the permittee, the permittee shall develop a proposal for providing equivalent replacement public parking within the City of Hermosa Beach within sixty (60) days of such re-designation. If replacement public parking within the City of Hermosa Beach cannot be provided for any reason during the life of the project, the Commission shall, at a regularly

noticed public hearing, impose additional mitigation measures to compensate for the loss of coastal access parking.

Energy and Water Conservation

M-32 The design of all new and/or modified onsite facilities shall incorporate the use of cost-effective water-conserving fixtures and practices. If water injection into the produced zones of the proposed oil and gas extraction sites in excess of the amount produced as wastewater by the project becomes necessary in the future (to control subsidence, for example), the permittee shall apply for an amendment to this permit to secure approval for increased water injection. Such amendment request shall demonstrate that reclaimed water will be used to the maximum extent feasible, shall identify the source of the water, and shall provide plans demonstrating the use of the most energy-efficient means of transporting the water proposed for injection.

M-33 Throughout the project life, as equipment is added or replaced, cost-effective energy conservation techniques shall be incorporated into project design.

Subsidence

M-34 This permit incorporates all subsidence-related conditions imposed pursuant to the City of Hermosa Beach Conditional Use Permit 95-5632.

M-35 The subsidence monitoring and control program described in *Subsidence Monitoring and Control Plan* prepared for the City of Hermosa Beach dated August 1, 1994, by Leonard W. Brock and the *Offshore Subsidence Monitoring Program Hermosa Beach*, California, dated January 14, 1998, prepared by Coastal Environments, shall be implemented by the applicant throughout the life of the project.

Induced Seismicity

M-36 Prior to issuance of this permit, the permittee shall submit for the executive director approval of a Seismicity Monitoring Plan that provides for:

(1) Monitoring of seismic activity for a sufficient time period prior to the Phase II production (at least one year) to establish the pre-production baseline seismic pattern in the vicinity of the project;

(2) Ongoing monitoring of seismic activity during Phase II production to detect any and all changes from the pre-project seismic pattern;

(3) The monitoring stations shall be of sufficient quantity and quality to detect all events of magnitude two and greater, and to locate the hypocenter of these events to within one kilometer, both horizontal and vertical;

(4) The collection and analysis of monitoring data by a qualified, independent entity approved by the executive director;

(5) submittal by the independent seismicity monitor of annual reports to the executive director's designated project monitor (California State Lands Commission pursuant to **Special Conditions A-8** and **A-9**), or more frequently if warranted by monitoring results; and

(6) establishment of indicators of induced seismicity (these may not occur simultaneously), including but not necessarily limited to:

a. an increase in the number of events, 50% above background;

b. the occurrence of swarms (hundreds of small events over several days);

c. shallow events at depths near the depths of production and re injection;

d. casing breaks.

If independent monitoring results indicate that project-induced seismicity may be occurring, the independent monitor shall notify the executive director immediately and provide the executive director with all applicable monitoring data. The executive director shall thereafter schedule a public hearing on the matter before the Coastal Commission at the earliest practicable regularly scheduled Commission hearing. The Coastal Commission shall consider the evidence of project-induced seismicity, take recommendations from staff, and determine whether project operations should cease altogether or whether modified project operations may be implemented to abate the increased seismicity. Any project changes or additional mitigation measures required by the Commission shall be imposed as additional special conditions to this permit and shall be enforceable as such.

If data suggesting project-induced seismicity is obtained, the permittee shall fund peer review by a minimum of three qualified experts jointly selected by the permittee and the executive director to review the monitoring data. In addition, the permittee shall fund reasonable expert consultations and/or additional studies that the executive director may find necessary to prepare an adequate staff recommendation to the Commission pursuant to the above requirements. If a disagreement among experts arises as to the interpretation of the monitoring data, the required hearing before the Commission shall not be delayed and the Commission shall, to the extent of its jurisdiction, make the final determination as to the implications of the monitoring data.

The preparation and implementation of the Seismicity Monitoring Plan, and implementation of any related mitigation measures required by the Commission through applicable special conditions shall be at the sole expense of the permittee.

Air Quality

M-37 Prior to commencement of Phase II construction, the permittee shall provide to the executive director copies of all required Permits to Operate from the South Coast Air Quality Management District (SCAQMD).

4.0 FINDINGS AND DECLARATIONS

The Commission finds and declares as follows:

4.1 PROJECT BACKGROUND

4.1.1 History of Macpherson Proposal

Windward Associates (hereinafter "Macpherson") initially proposed developing oil in the tidelands of Hermosa Beach in 1976, from a City of Hermosa Beach site known as the old Biltmore Hotel property at 15th Street and The Strand. That proposal was withdrawn in the face of strong local support for the continuance of a citywide ban on oil development dating back to the 1930s. The 1976 proposal was the first attempt to overcome the ban since 1958. At that time Shell Oil proposed new oil development during a time of financial distress for the City of Hermosa Beach. Despite the prospect of needed royalties, local voters rejected the project.

In 1981, the City submitted its draft Coastal Land Use Plan (LUP) to the Coastal Commission for certification (the LUP was certified on April 21, 1982). Commission staff recommended that policies guiding energy development, consistent with Chapter 3 of the Coastal Act, be added to the LUP. The City was still unsettled, however, about what to do with the Biltmore site, and although energy development remained an option, there was significant controversy within the City about whether to allow oil development there. City officials requested that the Commission postpone consideration of the LUP modifications containing energy policies while the City decided on the most desirable use of the Biltmore site. The energy development policies were deleted from the modifications required to obtain LUP certification.[1]

In 1984, however, just two years after the Commission certified the City's LUP, the City again faced significant financial constraints because City officials had committed to purchasing lands for schools and parks only to discover that the City did not have adequate funds. Macpherson Oil Company led a successful campaign that year for ballot measures authorizing oil development on two city-owned parcels (Exhibit 1). Macpherson pledged up to $1 million per year in royalty

[1] Pursuant to a subsequent LUP amendment (1-84) certified by the Commission, a specific plan was approved for the Biltmore site and a hotel was later constructed.

payments to the City for the purchase of open space and school lands[2]. The supporters of Measures P and Q claimed that Hermosa Beach tidelands were being drained of oil by wells drilled from nearby Redondo Beach and that some of the most profitable Redondo Beach wells were on Hermosa Beach tidelands boundaries. The supporters said that Redondo Beach had recovered $270 million in oil since 1955 — some, they claimed — from Hermosa Beach tidelands.[3]

In 1995, in part due to mixed local reaction to the applicant's present proposal, the voters of Hermosa Beach passed another oil-related ballot measure — Measure E (Exhibit 2). Measure E strips local ordinances of the provisions for the limited oil and gas development authorized by Measures P and Q, effectively re-establishing the total ban on oil and gas development within city limits.

The local Hermosa Beach Stop Oil Coalition, a citizen's group opposed to the applicant's proposal, is pursuing a lawsuit asserting that Measure E applies not only to future oil development but also retroactively to the Macpherson project and thus precludes City issuance of land use approvals for the project. The City Attorney of Hermosa Beach has written an opinion that Measure E probably does not apply to the Macpherson proposal (Exhibit 4). Regardless, the pending litigation does not affect the Coastal Commission's authority to consider this application for a coastal development permit at this time.

4.1.2 Local Government Review

In 1985, after the voters of Hermosa Beach authorized oil development on two city parcels the previous year, the City Council adopted an oil and gas code within the city zoning ordinances (Ordinance No. 85-5315) and established terms and conditions governing oil drilling and development in the city.

In 1986, the City of Hermosa Beach entered into a lease with the Macpherson Oil Company to allow Macpherson to drill for onshore oil from the presently proposed site (the city maintenance yard).

In 1989, by way of Resolution No. 89-5315, the City changed the General Plan designation of the project site from "open space" to "industrial," thereby making it consistent with the preexisting "manufacturing" zoning designation of the site. The City did not amend the certified LUP designation of "open space," however.

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[2] The lands have since been purchased with funds from other sources.

[3] The California State Lands Commission staff did not concur that the wells drilled into the Redondo Beach tidelands were draining the Hermosa Beach tidelands; however, on June 30, 1992, the CSLC found, contrary to its staff's recommendation, that drainage was occurring (Exhibit 3) even though the Redondo Beach operator (Triton Oil Company) had plugged and abandoned all Redondo Beach tidelands wells by 1991. See also Section 4.3.2 of this report.

On May 8, 1990, the City Council certified an Environmental Impact Report (EIR) and adopted a Statement of Overriding Considerations for the project, pursuant to the requirements of the California Environmental Quality Act.

In 1992, the City executed a new lease with the applicant to additionally authorize Macpherson to drill for both onshore and offshore oil from the same site. A plan to build a tank farm at a nearby site (the former "School Site" now developed as the public "School Park") was dropped and the project modified to concentrate the project on the presently-proposed site.

On August 12, 1993, the City Council certified an addendum to the project EIR, and passed Resolution No. 93-5632, thereby approving a Conditional Use Permit for the proposed project.

4.1.3 Coastal Permit Review

The review of various iterations of the Macpherson proposal by Commission staff has taken, cumulatively, more than four years. As explained below, filing review of the most recent proposal has taken more than a year, mostly to resolve concerns about:

(1) the project's seeming inconsistency with the open space designation presently applied to the proposed site in the City's LUP, and

(2) the adequacy of the risk analysis submitted by the applicant.

4.1.3.1 Previous Macpherson Application

In September, 1993, Macpherson submitted the first application for a coastal development permit to the Coastal Commission for the proposed project. While Commission staff reviewed the application for filing, the Hermosa Beach Stop Oil Coalition filed a lawsuit challenging the City's approval of the project and the adequacy of the EIR. In September, 1994, the court found that the City's approval of the 1.3-acre oil drilling project must be set aside because it violated the Municipal Code which limits oil drilling at the City's maintenance yard site to one acre only. Macpherson subsequently withdrew its permit application in January, 1995. Macpherson submitted a new application in 1996, after the lower court's ruling was overturned on appeal.

4.1.3.2 Present Macpherson Application Filing Review

On November 26, 1996, Macpherson submitted a new application for a coastal development permit. During filing review the Commission staff identified two particularly significant issues:

(1) the apparent inconsistency of the proposed project with the open space land use designation of the proposed site in the City's certified LUP, and

(2) questions concerning the adequacy of the applicant's risk analysis.

A third potential filing issue — whether the applicant's addition of hydrogen sulfide treatment equipment to the project plans after the City's Conditional Use Permit for the project was approved in 1993 — meant that the applicant needed a CUP amendment to demonstrate the required local approval,[4] was resolved in November, 1997. The applicant agreed to remove the hydrogen sulfide treatment equipment from the project plans and to revise the project to shut-in and re-complete or abandon wells encountering concentrations of hydrogen sulfide at untreated levels of no more than 40 parts per million, per well.

Land Use Plan Inconsistencies

The first issue Commission staff identified during the filing review of the proposed project was the question of whether an amendment to the City's Coastal Land Use Plan would be advisable either prior to, or concurrently with, the Commission's consideration of the Macpherson application for a coastal development permit. The City's LUP designates the proposed site as open space, and as explained in Section 4.1.1, the LUP specifically excludes provisions for energy development. The LUP lacks either energy or industrial land use designations that would typically be applied to a site considered for oil and gas development and production, and contains no policies to guide oil and gas development. In 1981, the City asked the Coastal Commission to suspend the inclusion of such policies in its LUP until or unless the City resolved to allow oil drilling on the old Biltmore site. A hotel was built instead, and the LUP remains silent on energy development.

City staff explained that the City had overlooked the need to amend the coastal LUP when the General Plan was amended in 1989 to accommodate the project. They requested that the Commission staff consider the City's general plan amendment re-designating the site from "Open Space" to "Industrial," and the voter approval of ballot Measures P and Q authorizing oil and gas development on two city parcels, as "de facto" LUP amendments.

Commission staff determined that even if the City's actions could be considered "de facto" LUP amendments, such amendments have no force or effect in the coastal zone until or unless certified by the Coastal Commission. The City Council had not submitted any of these actions for Commission certification review.

While Commission and City staff, as well as the applicant, always understood that the Commission's legal standard of review for a project in an area without a fully certified Local Coastal Program is whether a proposed project is consistent with the Chapter 3 policies of the

[4] The Hermosa Beach City Manager, Stephen Burrell, confirmed in an October 17, 1997, meeting with Commission staff, California State Lands Commission staff, and the applicant, that the City's 1993 CUP for the Macpherson project did not approve the installation of hydrogen sulfide equipment nor did the project EIR address potential public safety risks arising from hydrogen sulfide produced during project activities. Mr. Burrell clarified that the potential to produce hydrogen sulfide concentrations of concern, or the need to treat hydrogen sulfide, had not been identified previously.

Coastal Act, the applicant was concerned that to the extent unresolved land use questions might place the project in an unfavorable light, these concerns should be addressed if possible. Therefore, the applicant voluntarily agreed to the suspension of further application processing while the City staff prepared an LUP amendment submittal for Commission staff consideration.

In February, 1997, the City staff submitted a draft LUP amendment package for preliminary, informal review by Commission staff. Commission staff responded that the City's submittal would likely require substantial modifications — most importantly the addition of a LUP amendment defining and applying an appropriate energy or industrial land use designation for the proposed site, accompanied by the necessary policies to provide for such development. Commission staff also noted that LUP amendments must be submitted to the Coastal Commission for formal consideration by a resolution of the City Council and that a submittal from the City staff would not be adequate to secure filling of an amendment submittal.

While City staff was willing to prepare the LUP amendments recommended, they were also concerned that since the effect of the amendments would be to authorize oil and gas development, the amendment could not be approved by the City Council without violating the provisions of Measure E.

After further consideration, on June 11, 1997, the City staff notified Commission staff that the Measure P and Q approvals and the City's general plan amendments constituted adequate policy consideration of the Macpherson proposal and that no further LUP amendments would be prepared by the City (see letter, Exhibit 5). The City staff did not believe that approval of the Macpherson proposal would undermine the City's ability to prepare a Local Coastal Program pursuant to Coastal Act Section 30604. The City staff thereby declined to pursue further development of a project-related LUP amendment package, and the Commission staff review of the Macpherson application continued. For further discussion of local land use restrictions and the implications for project siting and alternatives, see Section 4.4.1.

Adequacy of Hazard Risk Analysis

The second significant issue identified by Commission staff during filing review was the adequacy of the applicant's hazard risk analysis. Staff determined that Macpherson had added hydrogen sulfide treatment equipment to the project plans but that the equipment had not appeared in the plans at the time of the City's Conditional Use Permit approval.[5] In part because the EIR for the proposed project did not evaluate any public safety risks that might arise from hydrogen sulfide production or treatment onsite, questions arose as to whether significant concentrations of the toxic

[5] The applicant's agent, David Gautschy, states that the hydrogen sulfide treatment equipment was added in response to questions raised by Commission staff during filing review in 1994.

gas might be encountered in the produced oil and gas, and if so, what public safety risks could result from a worst-case accidental release from the project.[6]

Commission staff, in consultation with the California State Lands Commission staff, determined that nearby tidelands wells in Redondo Beach had produced concentrations of hydrogen sulfide of at least 1,500 ppm.[7] Subsequently, the applicant determined that about ten percent of the Redondo Beach tidelands wells produced hydrogen sulfide, with one well reportedly producing concentrations as high as 5,500 ppm.

The applicant contended that the hydrogen sulfide produced in Redondo Beach occurred as the avoidable consequence of faulty wastewater disposal practices that would not be repeated by the Macpherson project. Macpherson argued that its wastewater disposal practices would be superior, and would not result in hydrogen sulfide production. Macpherson conceded, however, that treatment of re-injected wastewater to kill bacteria responsible for producing hydrogen sulfide is too expensive to undertake preventatively and that the necessary chemicals would only be added upon the detection of rising levels of hydrogen sulfide in the produced gas. Whether treatment measures implemented after hydrogen sulfide production occurs would effectively retard the bacterial decomposition processes already underway in the reservoir is uncertain.

Moreover, Commission staff was concerned that if the contaminated Redondo Beach wells were draining oil from the Hermosa Beach tidelands, as the California State Lands Commission had confirmed they were, then the proposed Macpherson wells could eventually drain the contaminated portions of the reservoir in Redondo Beach, in reverse. [8]

By mid-July, 1997, to resolve the impasse between the applicant and Commission staff over the adequacy of the applicant's hazard risk analysis, the applicant agreed to allow a qualified third-party to perform an independent review. Arthur D. Little, Inc., was jointly selected by the applicant and the Commission staff, and funded by the applicant.

On September 8, 1997, Arthur D. Little, Inc., released a preliminary review of the applicant's hazard risk analysis showing that the project posed significant risks to public safety. The risk profile calculated by Arthur D. Little, Inc. showed that project risks were an order of magnitude higher than

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[6] Commission staff research indicated that occupational safety standards for adult exposure to hydrogen sulfide in the workplace were generally triggered at concentrations of ten (10) parts per million, that death could occur after ½-hour of exposure to concentrations as low as 300 ppm, and that injuries or lasting health effects could be caused by exposures at much lower concentrations.

[7] The Redondo Beach wells, last operated by Triton Energy, were shut-in by 1991. Macpherson asserts that the Redondo Beach wells were draining the Hermosa Beach tidelands oil reserves.

[8] The staff of the State Division of Oil and Gas and Geothermal Resources disputes the CSLC findings that such drainage has occurred and asserts that a hydraulic connection between the Redondo Beach tidelands and the Hermosa Beach tidelands is unlikely. DOGGR staff postulates the existence of subterranean fractures that may function as barriers between the two areas.

the estimate of risk contained in the applicant's analysis (which contained a graphing error that plotted the project's risk profile incorrectly). The preliminary review also confirmed that hydrogen sulfide could potentially be encountered during project production.

The preliminary report determined that additional analysis of hydrogen sulfide risks offsite should be performed based on the characteristics of the reservoir (sulfur content, production history), and in light of the applicant's proposal to install hydrogen sulfide treatment equipment. The report also determined that the worst case analysis of an accidental release should evaluate a well casing failure and a simultaneous failure of the hydrogen sulfide treatment system. Arthur D. Little, Inc. also identified additional information and analyses necessary to fully evaluate other project risks, and identified potential mitigation measures to reduce some project risks (most notably, an alternative oil pipeline system that subsequently proved to be a far better option for the applicant than its proposal to reactivate the abandoned Chevron pipeline).

After reviewing the recommendations of the preliminary report, the applicant asked to suspend preparation of the final report and further processing of the application by Commission staff. The applicant asked for additional time to consider possible changes to the project description, conduct additional analyses, and pursue the possible use of the alternative crude oil pipeline suggested by Arthur D. Little, Inc.

Between September, 1997, and the publication of the final Arthur D. Little, Inc. report in December, 1997, the applicant, in consultation with Arthur D. Little, Inc., Commission staff, City of Hermosa Beach staff, California State Lands Commission staff, and the staff of the State Division of Oil and Gas and Geothermal Resources, (a) developed supplemental risk assessments, (b) revised the project to cap produced (untreated) casing gas concentrations of hydrogen sulfide at forty (40) parts per million, per well, (c) deleted the proposed installation of hydrogen sulfide treatment equipment, and (d) amended the application to propose the use of the Edison Pipeline Transmission Company crude oil pipeline transportation system. As the result, the applicant resolved many of the Commission staff concerns. The independent review by Arthur D. Little, Inc., proved to be an effective analytical tool that increased staff confidence in the adequacy of the project review and in the usefulness of the proposed mitigation measures.

The final conclusions of the Arthur D. Little, Inc. report are evaluated further in Section 4.4.2 of these findings. The final report is included in the exhibit packet (Exhibit 7).

4.2 PROJECT DESCRIPTION

4.2.1 Overview

Macpherson proposes to develop crude oil and natural gas reserves in tidelands reserves granted by the State of California to the City of Hermosa Beach and subsequently leased to the applicant, as well as oil under onshore lands. The applicant proposes to develop these reserves from an onshore

drilling and production site via "slant drilling" technology, in two phases. Phase I includes drilling and testing of up to three wells to prove the project's commercial value, and Phase II entails full project development of up to thirty oil and gas producing wells. If Phase I is successful, the total project term would last a maximum of thirty-five years.

The proposed onshore site is located at 555 Valley Drive, at the northwest intersection of Valley Drive and Sixth Street, seven blocks east of the beach, in the City of Hermosa Beach. The 1.3-acre (60,129 sq. ft.) parcel is owned by the City and presently used as a maintenance yard. The site is designated Open Space in the City's certified Coastal Land Use Plan (LUP); however, the City amended its General Plan to redesignate the project site from Open Space to Industrial. The area surrounding the project site is fully developed and adjacent land uses include light manufacturing on three sides, and a public greenbelt/open space on the east (inland) side. Within two blocks of the proposed site, land uses are primarily residential (see Exhibits 8-10).

The applicant proposes to re-grade the site, remediate existing contaminated soil, install new electrical service equipment, a 30-foot sound attenuation wall, fencing and landscaping, remove one existing tree and twelve existing parking spaces presently used on weekdays by City employees and on weekends by the public as beach access parking, construct six employee parking spaces onsite and six new on-street public parking spaces for permanent, public parking available seven days per week.

The applicant proposes to remove several small, existing structures onsite, including a 7,500 square foot Butler-type metal industrial building, a 4,400 square foot wood frame and stucco shop building, a 484 square foot kennel, and a gasoline pump and underground storage tanks.

4.2.2 Phase I — Exploration

Phase I — exploration and testing — will last approximately one year. During this time, the applicant proposes to drill up to three exploratory wells to prove the commercial value of the development. The applicant also proposes to convert an existing, idle oil well onsite to a wastewater disposal well. The electrically-operated drill rig onsite for the one year exploratory phase will stand approximately 135 feet above grade and will operate continuously during Phase I.

Prior to drilling, the applicant will demolish all existing maintenance yard facilities (except for a metal building located on the northeast corner of the property), and remove all paving, concrete slabs, retaining walls and debris. Phase I preliminary construction will include re-grading of the site (3,000 cubic yards of cut; 1,000 cubic yards of fill)[9], installation of a nine (9)-foot concrete block retaining wall on the west side of the parcel, a six (6)-foot chainlink fence topped by three-strand barbed wire on the remaining three sides of the project (these sides are separated from other

[9] The applicant states that contaminated soils scheduled for removal during Phase II will not be disturbed by grading activities or other aspects of project construction during Phase I.

development by a street's width), and a 30-foot-above-grade sound attenuation wall, a concrete well cellar, new electrical service equipment, and temporary treatment and production facilities.

If Phase I is unsuccessful, the applicant will remove all above-ground facilities, abandon the test wells in accordance with the requirements of the State Division of Oil, Gas and Geothermal Resources, and otherwise restore the site to its pre-project condition. The applicant must also seek a new coastal development permit for post-Phase I abandonment.

During Phase I, the produced emulsion (oil and water mixture) will be processed onsite using portable equipment. All produced water will be re-injected; produced water will not be disposed via the public sewer or storm drain systems. Oil will be stored onsite in portable tanks, and the oil will be trucked offsite to a refinery via three to four tanker truck trips per day, each carrying 175 barrels of oil. Trucks will not deviate from the route designated in Exhibit 11.

The applicant proposes to flare the produced gas during Phase I and has obtained the necessary approvals for flaring from the South Coast Air Quality Management District. The applicant also agrees that permissible concentrations of hydrogen sulfide in raw gas (that is, gas in an untreated state as it is drawn into the well casing) will be restricted to a maximum of 40 parts per million (ppm) in any well, during both phases of the project. The applicant agrees to stop production of any well that exceeds the hydrogen sulfide threshold authorized by this permit.

The applicant estimates that Phase I crude oil production from the (up to) three test wells will be a maximum of approximately 600 barrels per day and natural gas production will be approximately 125,000 standard cubic feet per day.

4.2.3 Phase II — Soil Remediation

The proposed project site presently contains two areas of contaminated soils which the applicant proposes to remediate as part of the project. A pocket of soils contaminated by petroleum hydrocarbons is located concomitantly with the former City dump. A second area contains elevated lead residues from an undisclosed source. In accordance with the requirements of the applicant's lease with the City of Hermosa Beach, the applicant proposes to remove and dispose of approximately 700 cubic yards of soil and clean up the contaminated areas of the site to a standard acceptable to the Regional Water Quality Control Board.

Soil remediation will occur after the conclusion of Phase I activities, but before commencement of Phase II non-remediation construction. The applicant will perform the required remediation whether Phase II commercial construction and production proceeds or not.

4.2.4 Phase II — Production

Phase II includes the installation of up to 27 additional oil and gas wells, three waste water disposal wells, a subterranean tank farm with five oil storage tanks, permanent processing equipment (to separate oil, NGLs, natural gas, and water), additional fencing and landscape elements, electrical transformers and switches, and other ancillary structures (see Exhibit 12, site plans).

The drill rig for Phase II will be of the same height as the drill rig proposed for use during Phase I (approximately 135 feet above grade) and will be onsite continuously for up to three years during well completion. Workover rigs of approximately 110 feet in height will be used for well maintenance up to three months of every year thereafter for the life of the project. Thus, drilling and workover rigs of this general scale would be onsite for a cumulative total of approximately twelve years during the project's 35-year projected economic life.

The 9-foot concrete block wall constructed during Phase I will be augmented during Phase II by a 12-foot decorative masonry perimeter wall, installation of permanent landscape plantings, and the removal of the chain link fencing.

During Phase II, the applicant will install two new pipelines — a six-inch crude oil line and a four-inch gas line — each approximately ½ mile (2,500 feet) long. The pipelines will connect to crude oil and natural gas transportation systems owned by Southern California Edison. The applicant proposes to transport all produced oil and gas offsite via these pipelines during Phase II. The applicant does not propose to continue truck transportation of oil, gas, or natural gas liquids (NGLs), or the non-emergency flaring of gas during Phase II.

The crude oil and NGLs will be commingled and delivered via pipeline to the Southern California Edison (SCE) Redondo Beach storage facility and pipeline system. The applicant proposes to construct onsite oil storage facilities of sufficient capacity to contain produced oil onsite during routine or emergency interruptions of the pipeline. Therefore, truck transport of produced oil and NGLs would not occur under any circumstances during Phase II.

The natural gas will be transported via pipeline to SCE's Redondo Beach power plant.[10] The power plant is permitted by the South Coast Air Quality Management District (SCAQMD) to burn gas containing up to 40 ppm of hydrogen sulfide. The applicant is authorized under the special conditions of this permit to produce gas with concentrations of up to 40 ppm or less of hydrogen

[10] The SCE Redondo Beach power plant is proposed for divestiture pursuant to California Public Utilities Commission requirements. If the plant is sold, the applicant must negotiate natural gas sales with the new owner. If the plant is eventually abandoned as uneconomic to operate further, and if the applicant's produced natural gas contains more than 4–6 ppm of hydrogen sulfide (the limit for sales to Southern California Gas), treatment of the gas to reduce levels of hydrogen sulfide may be required. If the applicant proposes to install hydrogen sulfide treatment equipment for these reasons, a new coastal development permit will be required. The 40 ppm hydrogen sulfide restriction would still be appropriate, however, as discussed in section 4.4.2.

sulfide; therefore, the applicant does not propose to install hydrogen sulfide treatment equipment as part of the project.

The applicant proposes continued re-injection of all produced fluids and wastewater during Phase II. No disposal of produced liquid wastes by any means other than re-injection would be authorized by this permit.

The applicant estimates that the total Phase II crude oil production of 30 wells will be approximately 30 million barrels (less production during Phase I) and that peak production will be approximately 8,000 barrels per day. Throughput for the oil pipeline during peak production will be approximately 175 gallons per minute, on average. The applicant estimates that natural gas production will be approximately 2,500,000 standard cubic feet per day.

Abandonment and remediation of the site are not part of the proposed project. Site conditions, applicable technology, and adjacent land uses may change dramatically and in unpredictable ways over the 35-year projected economic life of the project. For these reasons, development of abandonment plans and applicable standards and conditions of approval for eventual abandonment activities would be premature at this time. The Commission typically requires subsequent coastal development permits for abandonment of energy projects. Therefore, the applicant will be required to obtain a new coastal development permit, in addition to all other necessary approvals, as completion of Phase II nears. Abandonment activities will include the removal of all above-ground facilities, and the re-grading and remediation of the site in accordance with an abandonment and restoration plan acceptable to the City of Hermosa Beach[11] and approved by the Coastal Commission. Wells will be abandoned in accordance with the requirements of the State Division of Oil and Gas and Geothermal Resources. The oil and gas pipelines will be purged, capped and abandoned in place in accordance with the standards of the State Fire Marshall and the Federal Department of Transportation.

4.3 OTHER AGENCY APPROVALS

4.3.1 City of Hermosa Beach

In May 1990, the City of Hermosa Beach certified Environmental Impact Report ("EIR") No. 89060701 for the proposed project. In August, 1993, the City certified an Addendum to the Hermosa Beach Urban Slant Drilling Project EIR and granted to Macpherson Oil Company Conditional Use Permit 93-5632.

[11] The applicant's lease with the City of Hermosa Beach specifies that "at the expiration of this Lease or upon its sooner quitclaim or termination, the Lessee shall surrender the Leased Lands and the Drill Site and all improvements on them in good condition, or the City may provide that the Lessee shall remove some or all of the structures and other fixtures placed upon the Drill Site and transfer to City, in whole or in part, the Drill Site in a clean, cleared and suitable condition for reuse at no cost to the City."

4.3.2 California State Lands Commission

In 1919, the legislature of the State of California granted to the City of Hermosa Beach the tidelands and submerged lands within the City boundaries, in trust. Public Resources Code (PRC) § 7057 requires that "... no tide or submerged lands owned or under the jurisdiction of any city shall be leased for the exploration for, drilling for or production of petroleum products within the boundaries of the areas of the County of Los Angeles ... unless such lands are within one nautical mile of the ordinary high water mark...."

In January, 1992, when the California State Lands Commission ("CSLC") eventually considered the proposed Macpherson slant drilling project, the Hermosa Beach tidelands were part of an oil and gas sanctuary that could be leased only if pursuant to PRC § 6872 the CSLC determined that (1) oil or gas deposits are believed to be contained in the sanctuary lands; (2) these deposits are being drained by means of wells on adjacent lands; and (3) the leasing for the production of oil and/or gas will be in the best interests of the State.

Drainage of Hermosa Beach Tidelands

The main issue here was whether wells drilled from neighboring Redondo Beach were draining oil deposits from Hermosa Beach's tidelands. For many years, wells drilled into the adjacent Redondo Beach tidelands from an onshore drillsite produced substantial amounts of oil. The City of Hermosa Beach claimed that these wells were draining oil from its tidelands.

Although Redondo Beach oil production had ceased in 1990, the CSLC found on June 30, 1992 that oil was draining from the Hermosa Beach tidelands to the Redondo Beach tidelands as a result of a reservoir pressure differential caused by past production from the Redondo Beach wells.

Oil Leasing in Best Interests of the State

In August, 1993, the Hermosa Beach Stop Oil Coalition filed a petition for Writ of Mandate with the Los Angeles Superior Court challenging the validity of the CSLC decision. The superior court held that substantial evidence in the record supported the CSLC finding that oil deposits were being drained from the Hermosa Beach tidelands by means of wells on adjacent lands. However, the court also found that the CSLC had failed to make a necessary finding that the leasing of Hermosa Beach tidelands for the production of oil and gas was in the best interests of the state and remanded the matter to the CSLC for further consideration. In April, 1994, the CSLC reaffirmed its earlier findings that drainage of Hermosa Beach tidelands was occurring and additionally found that the leasing of these lands was in the best interests of the State, thus resolving all outstanding issues regarding the adequacy of CSLC approval.

4.3.3 South Coast Air Quality Management District

In 1991, the South Coast Air Quality Management District (SCAQMD) issued to the applicant Permits to Construct for the exploration and production phases of the proposed project. These permits were extended yearly until 1995, when the applicant was required to resubmit permit applications to be reviewed under amended SCAQMD rules and regulations. In 1995, the SCAQMD issued to Macpherson Oil Company new Permits to Construct (permit nos. 306267, 306268, 206269, 306270, 306271, 306272, 306273, 306274 and 306275), imposing all current, applicable SCAQMD standards. The applicant has obtained extensions for all of the Permits to Construct through October 13, 1998.

The site remediation phase of the proposed project does not require any discretionary permits from the SCAQMD. However, the construction contractor hired by the applicant to excavate the contaminated soil must have a general SCAQMD Rule 1146 excavation permit.

Special Condition M-37 requires Macpherson to submit all necessary Permits to Operate from the SCAQMD prior to commencement of Phase II construction.

4.4 COASTAL ACT ISSUES

4.4.1 Siting of Industrial Development

Coastal Act § 30250(a) and (b) state in part:

> *(a) New residential, commercial, or industrial development ... shall be located within, or contiguous with, or in close proximity to, existing developed areas able to accommodate it or, where such areas are not able to accommodate it, in other areas with adequate public services and where it will not have significant adverse effects, either individually or cumulatively, on coastal resources....*
>
> *(b) Where feasible, new hazardous industrial development shall be located away from existing developed areas.*

Coastal Act § 30108 (definitions):

> *"Feasible" means capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, social, and technological factors.*

The applicant proposes to located the project on a 1.3-acre parcel in a fully developed area of Hermosa Beach. Light manufacturing uses (such as the Bodyglove wetsuit factory) surround the project site for approximately one block on three sides, with a narrow public greenbelt flanking the

site opposite Valley Drive to the East (see Exhibit 9 and 10). Coastal Act Section 30250 guides the location of new development in relation to existing development according to four considerations: (1) Can the proposed development be accommodated within or near other compatible, existing development? (2) If not, will there be adequate public services for the project in the proposed location? (3) If the project is developed in the proposed location, will it have significant adverse effects on coastal resources? and (4) If the development is hazardous, can it be feasibly located away from existing development? The four tests of Section 30250 are considered in the following sections.

4.4.1.1 Can the proposed development be located within, contiguous to, or in close proximity to existing areas able to accommodate it?

An area of similar energy-related development exists in nearby Redondo Beach. The following analysis of alternatives sites, and of the feasibility of re-locating the proposed project, explains why the project cannot be located near the identified area of existing industrial development.

Alternatives Analysis

The range of technically feasible alternative project sites generally extends approximately three miles from the drilling takeoff point, in the direction of the oil reserves of interest. This distance may vary, depending on the characteristics of the geologic formations penetrated by the drill bit, the vertical distance required to achieve an adequate horizontal reach, and upon the characteristics of the reservoir itself. An adequate alternative site would accommodate the approximately 30 new oil and gas wells proposed by the applicant at a distance from the reservoir that would reasonably achieve the project's goals.

The Environmental Impact Report (EIR) prepared for the project evaluated the "no project" alternative and two scaled-down versions of the project at the proposed site or at a nearby site known as the "School Site" (since developed as a public park). The EIR did not evaluate other locations outside of the City limits as potential alternatives. As explained in the following sections, there are no other feasible sites within Hermosa Beach due to the oil ban restored by Measure E in 1995.

A review of recent aerial photographs (see Exhibit 13), together with site visits by Commission staff, show that the general area behind Southern California Edison's Redondo Beach generating station contains alternative sites that would potentially consolidate the proposed development with other like development. A location within or adjacent to the generating station property would consolidate the proposed development with similar industrial development of even greater height, scale, and potential to pose risks to public safety. The generating station is also the target sales destination for the applicant's produced gas and ties into the pipeline system proposed by the applicant for transportation of its crude oil. Thus, a location near the power plant would not only

reduce the project's visual and public safety impacts, but would also minimize the need to construct pipelines, as compared to the construction of the project at the proposed location.

At the request of Commission staff, the applicant evaluated eight alternative locations in Redondo Beach in a document titled, "*Alternative Land Use Site Analysis for Macpherson Oil Company Project*," dated August 22, 1997 (Exhibit 14). The alternatives analysis concludes that none of the eight sites are feasible alternatives to the proposed site. The applicant's analysis does not dispute that drilling from the Redondo Beach sites is technically feasible but argues that economic and legal constraints preclude use of any of the sites for the proposed project. The following sections evaluate the economic and legal feasibility of the alternative sites.

Economic Feasibility of Alternative Sites

The applicant asserts that alternative locations even ¼ mile further from the oil reserves of interest, as compared to the proposed project, are economically infeasible. The applicant states that these sites would result in an approximately 15% reduction in the volume of projected oil recovery (a 4 million barrel loss of recoverable oil). However, according to a separate financial analysis submitted by the applicant (Exhibit 15), the recovery of 15 million barrels of oil would pay for project development and provide an approximately 30% return on investment. The applicant has stated that the proposed site, with 100 % recovery baseline for comparison, is projected to yield 30 million barrels of oil. Thus, even a site returning only 50% of the projected recovery should, according to the applicant's analysis, provide recovery of the 15 million barrels of oil necessary to generate an adequate return on investment.

Therefore, 85% recovery from an alternative Redondo Beach site would render that site an economically feasible alternative, as the following Table shows:

Table 2. Economic Comparison of Proposed and Hypothetical Site (¼ mile inland).

	PERCENT RECOVERY	BARRELS OF OIL (MILLIONS)	DEVELOPMENT COSTS[12] (MILLIONS)	REVENUES[13] (MILLIONS)	NET REVENUES (MILLIONS)
Proposed Project	100 %	30	$ 50	$ 569	$ 519
Alternative Site	85 %	25.6	$ 50	$ 486	$ 436.4
Alternate Site	50 %	15	$ 50	$ 284	$ 234

(SOURCE OF ECONOMIC DATA: MACPHERSON OIL COMPANY, 1997.)

Legal Feasibility of Alternative Sites

The applicant further asserts that permits for the proposed project cannot be obtained from the applicable local government jurisdictions at any location within the Cities of Hermosa Beach or Redondo Beach except for the site the applicant proposes.

Hermosa Beach Restrictions

In the case of Hermosa Beach, voters approved an exception to the City's long-standing ban on oil development in 1984 (ballot Measures P and Q). The exception authorized oil development, but only on two City-owned parcels. One site (the "School Site") has since been developed as a public park, and the other ("City Maintenance Yard") is the applicant's proposed site. After the City of Hermosa Beach approved the applicant's Conditional Use Permit in 1993, local voters passed another ballot measure (Measure E, 1995) restoring the former citywide ban on all oil development. Therefore, otherwise feasible alternative sites in Hermosa Beach have been rendered impermissible by Measure E. Therefore, no legally feasible alternative sites exist in Hermosa Beach.

[12] Development cost estimates supplied by the applicant include: $15.6 million for cost of proposed development including project initiation costs, test phase (exploration and testing), final phase (production, including development of permanent drill site and tank farm). Drilling and pumping equipment installation for 30 oil and gas wells, 3 new water disposal wells, and conversion of one existing oil well to a water disposal well total an additional $34 million in costs, for a final total of $50 million, which is assumed to be the same for the hypothetical alternative locations.

[13] The applicant's submittal projects oil revenues of approximately $18 per barrel.

Redondo Beach Alternatives

As noted above, Redondo Beach contains alternative sites which (1) "would ... attain most of the basic purposes of the project" (14 CFR § 15126(d)), (2) "would avoid or substantially lessen [certain] of the significant effects of the project" (*Id.*), and 3) are both technologically and financially feasible.

Under the California Environmental Quality Act (CEQA), consideration of less environmentally-damaging project alternatives is qualified by the issue of feasibility. (PRC § 21080.5(d)(2)(i).) "Legal" considerations are factors that need to be taken into account in evaluating the feasibility of project alternatives. (14 CCR § 15126(d)(5)(A).) The degree of consistency of the proposed project with existing governmental land use designations as found in provisions of applicable general plans and zoning ordinances is one of the factors to be considered in assessing "legal feasibility" (*Id.*)

The City of Redondo Beach Coastal Land Use Plan (LUP), as certified by the Commission in 1982, functions as the City's general plan for the portion of the City located within the coastal zone. (PRC §§ 30108.5; 30108.55.) In the view of the Commission, oil and gas development is a permissible use of land that the Redondo Beach LUP designates as "Industrial." The Industrial Land Use Designation states:

> *Industrial*
>
> *This is a relatively light industrial district intended to accommodate small to medium-size industrial operations that do not result in obnoxious output that would detrimentally impact surrounding districts. Performance standards will be designed as part of the implementation phase of the Local Coastal Program to encourage and ensure quality industrial developments on the limited amount of land within the Coastal Zone suitable for industrial development. Adequate buffering between the industrial districts and the surrounding land uses will be included in the development standards. Additionally, pursuant to Ordinance No. 1467 adopted March 28, 1955,* ***oil drilling will be permitted within this land use classification.*** (Emphasis added.)

Former Triton Oil Company (the "Portofino Site") wells (found by the California State Lands Commission in 1992 to be draining oil from Hermosa Beach tidelands reserves), were drilled from lands within the City of Redondo Beach. Therefore, it is obviously feasible to tap the tidelands reservoirs of interest to the applicant from Redondo Beach.

Despite the Triton Oil Company land use precedent, the City of Redondo Beach planning staff states that oil and gas development is no longer provided for in the Industrial land use designation. The City's staff has explained that Ordinance No. 1467 (referenced in the industrial land use designation above) provided for oil leasing to Shell Oil in 1955 (and subsequently, after a series of

operators, to Triton Oil Company). The lease expired in 1990, and with it, according to the City, the LUP's provision for oil drilling.

The City of Redondo Beach revised its zoning ordinances in 1992 to incorporate a provision that limits permissible development explicitly to uses listed in the ordinances. Because oil and gas development is not a listed use, City staff interprets the ordinances to prohibit all oil and gas development. In the City's opinion, the rezoning is not inconsistent with the LUP industrial designation because the expiration of Ordinance No. 1467 extinguished all oil drilling from the industrial designation.

Legal Analysis — Redondo Beach Alternatives

This presumption of legal infeasibility could be overcome by a showing that the applicant has the ability to compel the City of Redondo Beach to bring the provisions of its zoning into conformity with its LUP. Government Code §§ 65860 (a) and (c) require the zoning of cities and counties to be consistent with general plans of such local governments. However, Government Code § 65803 exempts charter cities from this requirement except insofar as the charter of any such city may include any such requirement. Redondo Beach is a charter city and its charter is silent with respect to any requirement for consistency between zoning and general plan provisions. Therefore, the presumption of legal infeasibility noted above is not overcome.

In the case of *Verdugo Woodlands v. City of Glendale* (1986) 179 Cal.App.3d 696, 704, the Court of Appeal invited the legislature to reconsider the wisdom of exempting charter cities from the general plan consistency requirement. Because, as is clearly illustrated by the circumstances of the present application, such an exemption frustrates sound land use planning, the Commission joins the Court of Appeal in this invitation.

Therefore, for the reasons set forth above, the Commission finds that despite the existence of technically feasible alternative sites adjacent to similar industrial development, the proposed project cannot be consolidated within these locations because of legal and permitting constraints. The Commission therefore finds that there are no feasible alternative locations to site this proposed development.

4.4.1.2 If the proposed project cannot be consolidated with other development, will the proposed location have adequate public services?

The applicant has provided a "will serve" letter from Southern California Edison assuring adequate capacity to provide electrical service to the proposed project. The project will not discharge wastewater into the City sewer system; all wastewater will be collected and re-injected into the producing formations. **Special Condition M-7** requires the applicant to prepare a Fire Protection Plan for review by the City of Hermosa Beach Fire Department. The approved plan must ensure adequate fire fighting resources and water supply, and adequate training and capability of the Fire

Department to respond to the potential hazards posed by the proposed project. Therefore, the Commission finds that the proposed project meets the second test of Coastal Act Section 30250(a).

4.4.1.3 Would the new development have significant adverse effects on coastal resources?

The third test of Coastal Act Section 30250(a) requires that the proposed development be consistent with all other applicable Chapter 3 policies of the Coastal Act — that is, that all significant adverse impacts upon coastal resources be mitigated to less than significant levels. As noted below, unless mitigated pursuant to the applicable special conditions set forth in this report, the proposed project could have significant, adverse effects on coastal resources. Specifically, the project could (1) adversely affect public safety through fire, explosion, or exposure to hydrogen sulfide; (2) pose a risk of oil release into the marine environment, (3) cause subsidence or induced seismicity, and (4) adversely affect public coastal views and recreation.

As set forth in more detail in the subsequent sections, the Commission's consideration and approval of the proposed project is contingent upon the imposition of extensive conditions requiring mitigation measures designed to protect public safety and coastal resources. Through the requirements in the special conditions, potentially significant impacts will be reduced to less than significant levels. For these reasons, the Commission finds that the proposed project, as conditioned, will not result in significant adverse impacts to coastal resources, and therefore meets the third test of Coastal Act Section 30250(a).

4.4.1.4 Where feasible, new hazardous industrial development shall be located away from existing developed areas.

The Commission finds for the reasons set forth in Section 4.4.2 of this report that the proposed development is hazardous. Coastal Act Section 30250 (b) requires that new hazardous industrial development be located away from existing developed areas, where feasible. Feasible, pursuant to Coastal Act Section 30108, means capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, social, and technological factors.

As explained in the previous sections, legal constraints preclude siting the project at any of the otherwise feasible locations that have been identified. Legal constraints represent a social factor that must be taken into consideration. Therefore, the Commission finds that there are no feasible alternatives available to relocate the proposed project further away from existing development than in presently proposed. For this reason, the Commission finds that the project, as proposed, is consistent with Coastal Act Section 30250(b).

4.4.2 Hazards

Coastal Act § 30253(1) and (2) provides that:

> *New development shall:*
>
> *(1) Minimize risks to life and property in areas of high geologic, flood, and fire hazard.*
>
> *(2) Assure stability and structural integrity, and neither create nor contribute significantly to erosion, geologic instability, or destruction of the site or surrounding area....*

Coastal Act § 30262(a)(e) and (f) states:

> *Oil and gas development shall be permitted in accordance with Section 30260, if the following conditions are met:*
>
> *(a) The development is performed safely and consistent with the geologic conditions of the well site...*
>
> *(e) Such development will not cause or contribute to subsidence hazards unless it is determined that adequate measures will be undertaken to prevent damage from such subsidence...*
>
> *(f) With respect to new facilities, all oilfield brines are re-injected into oil-producing zones unless the Division of Oil and Gas of the Department of Conservation determines to do so would adversely affect production of the reservoirs and unless injection into other subsurface zones will reduce environmental risks. Exceptions to re-injections will be granted consistent with the Ocean Waters Discharge Plan of the State Water Resources Control Board and where adequate provision is made for the elimination of petroleum odors and water quality problems.*
>
> *Where appropriate, monitoring programs to record land surface and near-shore ocean floor movements shall be initiated in locations of new large-scale fluid extraction on land or near shore before operations begin and shall continue until surface conditions have stabilized. Costs of monitoring and mitigation programs shall be borne by liquid and gas extraction operators.*

4.4.2.1 Public Safety/Hazards

Independent review of applicant's risk analysis

The Macpherson application contains a document entitled *"Macpherson Oil Company City of Hermosa Beach Project Hazard Footprint Analysis"* dated May 9, 1995, prepared by Reese-Chambers Systems Consultants, Inc.. (The report is an Appendix to Exhibit 7.) The Reese-Chambers report states that "...Any H_2S (hydrogen sulfide) that might be in the [Macpherson project produced] gas will be removed at the Macpherson production facility and hence, the gas will not be toxic." This statement together with other related comments in the analysis raised Commission staff questions concerning potential hydrogen sulfide production and related safety issues. In addition, the applicant's plans contained hydrogen sulfide treatment equipment that had not been included in the plans approved by the City of Hermosa Beach in 1993. The applicant sought an open-ended permit with respect to potential concentrations of hydrogen sulfide that would be authorized. The applicant subsequently suggested a 1,000 parts per million (ppm) limit in above ground gas processing facilities, but this proposal raised even more questions about the treatment equipment and project safety.

As discussed in Section 4.1.3.2, to resolve filing review concerns, Commission staff requested a third-party review of the applicant's risk analysis. The applicant agreed to fund the requested review. An independent, qualified third-party review of the applicant's hazard risk analysis was undertaken by Arthur D. Little, Inc., in August, 1997, and finalized in December, 1997. The final report, entitled "*Review of the Hazard Analysis For the Macpherson Oil Company Hermosa Beach Project — Final Report*," is attached as Exhibit 7 and itself contains four attachments, which are the four iterative hazard footprint analyses prepared by the applicant's consulting risk analyst, Reese–Chambers Systems Consultants, Inc., between 1995 and 1997.

Scope of Review

The Arthur D. Little, Inc. review of the applicant's hazard risk analysis evaluated potential hydrogen sulfide hazards, production and transportation hazards, and project risk profiles. Arthur D. Little, Inc. was not asked to prepare a new hazard risk analysis, but to review the assumptions, methods, and conclusions presented in the applicant's analysis.

Hazard assessment methodology and presentation

The hazard risk analysis prepared by Reese–Chambers used a risk assessment methodology outlined in Santa Barbara County's Environmental Thresholds for Public Safety. Arthur D. Little, Inc. concurred that the use of this methodology was appropriate to evaluate the Macpherson proposal. These thresholds, which were recently revised, specify levels of acceptable risk based on the likelihood for different numbers of potential fatalities. The Santa Barbara County thresholds are based on and are consistent with many national and international risk analysis thresholds, including

the United States Nuclear Regulatory Commission, United Kingdom Health and Safety Executive, UK Atomic Energy Authority, the Netherlands, and the European Union. In addition, several companies and organizations, such as British Petroleum, Shell Oil, and the American Institute of Chemical Engineers, have adopted similar risk criteria. Using these generally accepted risk criteria, three general zones, or levels of risk, have been identified as follows:

De Manifestis — This classification is considered unacceptable, and the proposed development or activity should not proceed unless mitigation can be instituted that successfully reduces the risk to below this level.

Grey Region — This classification is considered significant but acceptable if mitigated to the maximum extent feasible, preferably to a level of insignificance.

De Minimis — Risk levels within this classification are considered tolerable; however, feasible mitigation is still recommended for possible catastrophic events at commensurate costs to keep their probability of occurrence sufficiently low to qualify as insignificant.

Possible Hydrogen Sulfide Production: Basis for Concern

The potential production of hydrogen sulfide during project operations warrants concern for two reasons: First, the gas is acutely hazardous, with a toxicity to humans similar to that of hydrogen cyanide, and second, the applicant proposes to locate the project in a fully developed urban area with a significant residential population close to the site.

Characteristics of Hydrogen Sulfide

Hydrogen sulfide is a colorless gas with a strong characteristic rotten egg odor at low concentrations. Created by the bacterial decomposition of metal sulfides and organic matter, hydrogen sulfide may occur naturally in oil and gas deposits or develop over time as a reservoir contaminant produced by sulfur-reducing bacteria introduced via wastewater re-injection. The rotten egg odor is detectable at less than one part per million but is not always a reliable warning signal because at higher concentrations, olfactory fatigue and loss of odor occurs. In fact, the odor of hydrogen sulfide at dangerous concentrations can rarely be perceived.

Toxicity

Hydrogen sulfide is both a pulmonary irritant and a chemical asphyxiant. Hydrogen sulfide may kill healthy adults exposed to concentrations of approximately 1,000 ppm within a few breaths, within five minutes of exposure at 800 ppm, and within one-half hour of exposure at concentrations of 300 ppm. Inhalation of 1,000 to 2,000 ppm may cause coma after a single breath, giving rise to its description as a "knock-down" gas.

Emergency Response Planning Guidelines issued by the American Hygiene Association set 100 ppm as the maximum airborne concentration below which it is believed, that nearly all individuals could be exposed up to one hour without experiencing life-threatening consequences. This level is for use in emergency response planning and is not meant for use as an exposure threshold.

Injuries may be caused by exposure to hydrogen sulfide at sublethal concentrations. The organ systems affected by hydrogen sulfide include those with exposed mucous membranes or high oxygen demands, reflecting its irritant and chemical asphyxiant effects, respectively.

Evidence is accumulating that even one sublethal exposure may cause permanent health effects, including the onset of chronic asthma in children. A persistent asthma-like syndrome referred to as reactive airways syndrome (RADS) may develop after a single exposure to a respiratory irritant.

At low concentrations (i.e., less than 10 ppm) hydrogen sulfide causes irritation of the eyes, mucous membranes, and upper respiratory system. Symptoms may include sore throat, rhinitis, and cough. When exposed to higher concentrations (10-50 ppm), persons tend to experience mild eye and upper respiratory irritation, headaches, and dizziness. Concentrations from about 50-200 ppm can cause severe eye and respiratory tract irritation, acute conjunctivitis, lacrimation, and difficulty breathing, as well as a sudden loss of consciousness. Prolonged exposure at these concentrations may lead to bronchitis, pneumonitis, and migraine headaches. At higher levels, hydrogen sulfide causes a severe loss of motor coordination, coma, pulmonary edema, respiratory paralysis, and ultimately death.

Safe Thresholds of Exposure

Upper limits of safe exposure to hydrogen sulfide are difficult to set with confidence. The acute toxicity thresholds described above result primarily from data derived from occupational exposures of healthy adult males. It is well known that infants, children, the elderly, pregnant women, and those with compromised immune systems or respiratory impairments may experience adverse health effects from exposure to toxic chemicals at much lower thresholds than would be expected in healthy adult males suffering similar exposure. Occupational safety thresholds that trigger action to limit employee exposure to hydrogen sulfide are set at concentrations of 10 ppm. Allowable concentrations of hydrogen sulfide in natural gas pipelines connecting to residences, etc., are limited to concentrations of 4 ppm.

Potential Consequences

As noted, the proposed project could introduce a potentially lethal gas into the midst of a densely developed urban neighborhood with a significant residential population. Occupied structures exist approximately fifty feet offsite, and a public greenbelt heavily used by pedestrians and joggers borders the project opposite Valley Drive. Depending on the concentrations of hydrogen sulfide in an accidental release from the proposed project, the consequences to populations offsite could be catastrophic. Risk assessments performed for the project indicate that the meteorological conditions

that would result in the largest hazard footprint in an accidental release occur late at night, when nearby residents could be expected to be sleeping and therefore unable to perceive or escape a lethal accidental release from the project site. Although the odor of hydrogen sulfide is detectable at very low concentrations, it rapidly causes olfactory fatigue at higher levels, and therefore is not considered to have adequate warning properties.

Results of Preliminary Independent Hazard Risk Assessment

The preliminary Arthur D. Little, Inc. analysis affirmed that the presence of hydrogen sulfide in the produced gas could be a concern during the life of the proposed project. The report stated that:

> *While reservoir sulfur content is not an absolute indicator of produced gas hydrogen sulfide concentrations, reservoir fluid (crude oil and gas mixture) data indicate that onshore sulfur levels average approximately 1.4 percent while offshore levels average approximately 2.4 percent. While much of this sulfur would remain with the crude oil as elemental sulfur, the presence of sulfur in the reservoir fluids would tend to indicate the potential for elevated hydrogen sulfide levels in the produced gas. In addition other nearby wells in the same reservoir have shown elevated hydrogen sulfide concentrations, some greater than 5,000 ppm (MACPHERSON May 30, 1997 responses to CCC, page 8).*
>
> *MACPHERSON has stated they do not expect to observe elevated H_2S concentrations in the produced gas stream, and that proper management of the reservoir would prevent the formation of H_2S, but the reservoir is not a virgin field that has never been produced. Even if no H_2S is observed during the initial production stages, it is likely that sour gas will migrate from other nearby parts of the reservoir that have shown relatively high levels of H_2S.*

The Arthur D. Little, Inc. draft review did not support the applicant's risk analysis characterizing the project's risk profile as "De Minimis." (De Minimis means a project poses no significant risks to public safety.) The risk profile as corrected by Arthur D. Little, Inc. showed that the risk profile traversed the "Grey Region" (the project risk profile considers all aspects of the project's risks and traverses the grey region with or without inclusion of risks due solely to the potential presence of hydrogen sulfide) which equates with a finding that the project poses significant risks to public safety. The independent consultant determined that the likely source of the Macpherson error was a graphing mistake, and that the incorrect graph led to the misinterpretation of the project's risks. The difference in the resultant risk profile was substantial, and caused the applicant to underestimate the project's potential risks by an order of magnitude.

Subsequent Analysis of Hydrogen Sulfide Hazards

After the Arthur D. Little, Inc. draft report was released in September of 1997, the applicant requested time to consider the report's implications and to perform additional analyses. During the requested hiatus in the report's finalization, the applicant's risk analyst, in consultation with Arthur

D. Little, Inc., evaluated the hazard footprint for a worst case hydrogen sulfide release using 2,000 ppm of hydrogen sulfide as the concentration in the initial release. The resulting hazard zones for injuries and fatalities are shown on page 9 of Exhibit 7.

The 2,000 ppm analysis determined that potentially fatal concentrations of hydrogen sulfide would not reach residential areas under worst-case meteorological conditions at the time of an accidental release, but fatal concentrations could occur at the adjacent businesses. Since these businesses were likely to be closed late at night when the worst-case meteorological conditions would be expected to occur, the potential for fatalities at businesses under this scenario was considered unlikely. The analysis did confirm that injuries could be expected in residential areas under a worse-case release scenario at 2000 ppm, however.

Applicant Caps Permissible Hydrogen Sulfide Concentrations

Before publication of the Arthur D. Little, Inc. final report, the applicant revised the project description to specify that if untreated oil and gas (downcasing) in any well authorized in accordance with its coastal development permit contained hydrogen sulfide concentrations in excess of forty (40) ppm, that well would be shut-in immediately and either re-completed to a different depth to avoid the contamination or abandoned.

The applicants' Permits to Construct from the South Coast Air Quality Management District (SCAQMD) authorize production of natural gas containing up to 40 ppm hydrogen sulfide. In addition, the applicant proposed to sell natural gas containing up to 40 ppm of hydrogen sulfide to SCE's Redondo beach power plant. The plant is authorized to burn natural gas containing up to 40 ppm of hydrogen sulfide. Therefore, 40 ppm per well of hydrogen sulfide represents an upper permit limit that does not require Macpherson to install hydrogen sulfide treatment equipment. **Special Condition M-4** deletes hydrogen sulfide equipment from the project plans. In addition, **Special Condition M-1** sets forth the 40 ppm per well restriction on hydrogen sulfide and **Special Condition M-2** requires extensive monitoring, detection, and alarms to ensure that safe thresholds are not exceeded by the proposed project.

Under a worst-case release scenario, the authorized maximum concentration of 40 ppm of hydrogen sulfide would begin mixing almost immediately with the open air, and would be diluted to insignificant concentrations before offsite exposure, if any, would occur (Exhibit 16).

Conclusion of Final Independent Report (Hydrogen Sulfide)

The final Arthur D. Little, Inc. report confirmed that a 40 ppm per well limit on hydrogen sulfide levels would assure that no injuries or fatalities would occur offsite as the result of an accidental release from the proposed facility. The final Arthur D. Little, Inc., report states:

> *As stated previously, the MACPHERSON project, as currently proposed, would not be permitted to produce or process gas with H_2S levels of more than 40 ppm. Therefore, any*

potential risk to the public from exposure to H_2S would be negligible under the currently proposed project. The project, as currently proposed, would not allow for any H_2S in the produced gas at concentrations greater than 40 ppm. Potential toxic hazards to the population surrounding the proposed facility associated with a produced gas H_2S concentration of 40 ppm would be considered negligible.

Advancements in Treatment Technology would not mitigate Worst-Case Release Scenario due to Seismic Risks

The applicant states that if a concentration of hydrogen sulfide above 40 ppm is encountered in any well in the future, the affected well would (a) be shut-in and abandoned, (b) re-completed to avoid the contaminated formation, or (c) the applicant could seek an amended or new permit to treat the elevated levels of hydrogen sulfide. Option (c) would require the installation of hydrogen sulfide treatment equipment. Such equipment may treat much higher concentrations than the proposed 40 ppm limit. Thus, future installation of hydrogen sulfide treatment equipment could raise the question of whether higher hydrogen sulfide thresholds than 40 ppm per well might be acceptable.[14]

If hydrogen sulfide treatment is installed within a well, the worst case risk of hydrogen sulfide exposure to nearby populations arises from a release caused by the simultaneous failure of a well casing and the hydrogen sulfide treatment system in the well. The direct release of untreated gas into the air would result. This scenario is most likely to result from an earthquake. Therefore, no matter how reliable a hydrogen sulfide treatment system might be during ordinary operating circumstances, the system's complete failure during a strong earthquake must be considered.

The potential risk of a well casing and hydrogen treatment system failure due to an earthquake is underscored by a report submitted by the applicant, entitled "*Geologic Hazards Investigation*" prepared by Ryland Associates, Inc., dated June 10, 1994. The report states that the site of the proposed project is subject to the effects of major regional earthquakes on the Newport–Inglewood, Palos Verdes, San Andreas, Whittier, Norwalk, and various other regional faults. The report states that the site is dominated by its proximity to the Palos Verdes; and Newport–Inglewood Faults and that these fault systems are assigned maximum earthquakes of magnitude 7 and 7.5, respectively.

The Ryland report also states that the San Andreas Fault generated one of the largest earthquakes in California history in 1857 with a magnitude in excess of 8, and concludes that a recurrence of this

[14] The applicant's initial risk analysis, dated May 9, 1995, did not identify a worst-case release scenario triggered by an earthquake. The applicant's 1995 and March, 1997 risk analyses represented that a worst-case hydrogen sulfide exposure would arise from a two-inch diameter hole, equivalent to a faulty pipe connection or tank perforation, with gas containing hydrogen sulfide as a constituent escaping under high pressure from the theoretical point of release, and commingling (thus diluting) rapidly with the open air. The applicant's analysis modeled such a release with a hydrogen sulfide concentration of 6,000 parts per million (ppm) and concluded that due to expected dilution under assumed atmospheric conditions, the resultant vapor cloud at ground level would not be expected to exceed 300 ppm.

event is quite possible or probable during the lifetime of the project. Based on dating studies, such earthquakes occur every 130 years, on the average.

The Commission finds that a seismically-induced worst-case release scenario means that future technological innovations in hydrogen sulfide treatment equipment would be unlikely to mitigate the public safety risks that could be posed by an increased hydrogen sulfide production limit. Moreover, under a worst case scenario triggered by a major earthquake, emergency response personnel and equipment could be overwhelmed by competing demands for assistance. As the result, the Commission finds that future technical innovations in hydrogen sulfide treatment systems are unlikely to eliminate the need for a 40 ppm per well limit on hydrogen sulfide concentrations.

As the Commission previously noted, most data concerning dose-response relationships between hydrogen sulfide exposure concentrations and resultant injuries or fatalities have been extrapolated from occupational exposures of generally healthy, adult male populations. Emerging data indicates that other populations, such as the elderly, those with respiratory system impairments, and most notably, children, may suffer adverse acute or chronic health effects at much lower thresholds than would be expected of generally more robust adult male populations. The Commission also notes that even in occupational settings, occupational safety restrictions and procedures associated with potential hydrogen sulfide exposures are generally triggered at thresholds as low as 10 ppm of hydrogen sulfide.

For all of these reasons, and because residential populations are located in close proximity to the project site, the Commission therefore finds that the permit limit of 40 parts per million per well of hydrogen sulfide is the likely upper concentration of hydrogen sulfide in untreated gas that would likely ever be approved for production at the proposed location.[15]

Continuing Hydrogen Sulfide Restrictions; Economic Implications

The Commission finds that in fairness to the applicant's need to make rational investment decisions,[16] the likely retention of this 40 ppm hydrogen sulfide permit limit must be disclosed. Thus, accepting the terms and limits of this permit approval, the applicant understands the

[15] California State Lands Commission staff, and the applicant, have determined that elevated concentrations of hydrogen sulfide, ranging from 1,500 ppm to 5,500 ppm per well, were previously encountered in approximately ten percent of the onshore-to-offshore wells produced from nearby Redondo Beach Portofino project, last produced by Triton Oil Company. These wells tapped the same offshore reservoir Macpherson proposes to develop. The applicant has previously asserted that the Redondo Beach wells were draining the Hermosa Beach tidelands, which suggests the long-term potential for hydrogen sulfide to migrate into some Macpherson wells. On the other hand, the applicant claims, and CSLC staff have stated (Exhibit 17) that such migration is unlikely. The applicant further states that it does not believe concentrations of hydrogen sulfide actually produced will ever reach the 40 ppm per well limit during the 35-year projected economic life of the project. Therefore, the applicant asserts that the 40 ppm per well limit would not constrain the anticipated production over the life of the project.

[16] Information supplied by the applicant indicates that the total development costs for the proposed project will be approximately $50 million.

likelihood of this continuing limitation and the implication that any well exceeding 40 ppm hydrogen sulfide in the future may be denied a higher hydrogen sulfide limit, thus requiring shut-in of the offending well if re-working is unsuccessful.

Increased Buffers

The Commission finds that one alternative mitigation measure exists for future consideration by the applicant in seeking an upward revision of the 40 ppm per well hydrogen sulfide limit: the applicant could elect to purchase and abandon sufficient surrounding properties to provide a buffer against the increased safety risks posed by a higher hydrogen sulfide limit in the future. The applicant estimates that the proposed project will generate revenues of approximately $569 million (see Table 2, Section 4.4.1.1). The applicant may decide in the future that oil and gas recovery from wells showing increasing concentrations of hydrogen sulfide (should such increases occur) promise sufficient financial benefits to warrant the purchase of properties to provide the necessary buffer. On the other hand, as Table 2 in Section 4.4.1.1 shows, even if the applicant's projected recovery were reduced by 50%, due to hypothetical shut-ins in the wake of elevated hydrogen sulfide detection, the project would still produce a 30% return on investment and thus be economically feasible according to the applicant's own definition.[17]

Independent Assessment of Additional Hazards

In addition to questions about hydrogen sulfide risks posed by the Macpherson project, Arthur D. Little, Inc. also evaluated other aspects of potential risks posed by the project, including oil transportation and the potential for fire and explosion, as discussed below.

Most of the issues identified during the Arthur D. Little, Inc. review have been resolved through further analysis, clarification by the applicant, incorporation of additional mitigation measures into the proposed project, or revisions of the proposed project. The Arthur D. Little, Inc. review identified project changes that reduced potential safety problems and increased the economic viability of the project — most notably, the consultant identified an alternative crude oil pipeline transportation system owned by SCE that eliminated the need to reactivate a long-abandoned Chevron pipeline. The applicant subsequently amended the project description to take advantage of this option.

The Arthur D. Little, Inc. final report states that the Macpherson project, as revised after the issuance of the Arthur D. Little, Inc. preliminary report, is generally well designed and incorporates

[17] During filing review, Commission staff requested that the applicant disclose the proportion of the oil reserves that the applicant believes must be recovered for the project to be financially feasible. In response #19m page 10, dated March 14, 1997, the applicant states that the minimal production of 15 million barrels of oil (50% of the recovery projected from the proposed site) would pay for the cost of drilling and producing the necessary wells to recover such amount of oil with a 30% return on investment.

a wide variety of safety and mitigation measures to minimize potential hazards associated with the proposed project. The final report concludes that:

> *The hazard analyses that have been prepared for the proposed MACPHERSON Hermosa Beach Project have evaluated a wide variety of potential hazards that could adversely affect the surrounding community as shown in Figure 5. A majority of the hazards are associated with fire and explosion hazards associated with crude oil and natural gas production, processing and transportation. Since MACPHERSON has committed to monitor their wells for hydrogen sulfide and would shut down wells containing more than 40 ppm hydrogen sulfide, potential acute toxic hazards associated with the proposed project would be considered minimal.*
>
> *As summarized in the previous section, the risk associated with the proposed project falls mainly in the "Grey Region" which is classified as a significant impact "... but acceptable if mitigated to the maximum extent feasible, preferably to a level of insignificance (Santa Barbara County Risk Guidelines)." A review of the safety features that are included in the project's design, as well as additional commitments made by the applicant for additional safety features, would indicate that the proposed project incorporates safety mitigation measures to the maximum extent feasible. However, potential fire and explosion hazards associated with the proposed project, especially given the location in close proximity to residential areas, would still be classified as a significant impact based on the generally accepted risk criteria used by the applicant. As a result, the detailed hazard and operability study recommended in this report may be able to identify additional design and operational hazards that could lead to the need for additional safety features or design/operational modifications.*

Recommendation for Hazard and Operability Study (HAZOP)

The final report (page 13, Mitigation Measure 4-1) recommends the imposition of the following mitigation measure, which the Commission has hereby incorporated as **Special Condition M-6,** to require preparation of the recommended Hazard and Operability Study prior to Phase I and Phase II of project construction and operations. This requirement ensures that the potential safety risks of the proposed project are reduced to the maximum extent feasible through final design analysis and refinement. The Arthur D. Little, Inc. final report recommends:

> *A Hazard and Operability Study (HAZOP) for the proposed facility and ancillary equipment should be prepared by MACPHERSON prior to both Phase I and Phase II operations. The HAZOP should identify potential accidental release scenarios and mitigation measures that would prevent or reduce the likelihood of the release scenarios that are identified. The HAZOP should also be reviewed and approved by the California State Lands Commission prior to initiation of facility operations.*

The Commission emphasizes that a Hazard and Operability Study (HAZOP) is a final design review intended to ensure maximum project safety by providing an opportunity to "fine tune" the project at the final design stage. A HAZOP would not generally be expected to detect significant new problems and thus is not a deferred analysis of the project's safety. Because a HAZOP does not defer significant impact assessment and resultant mitigation to the future, **Special Condition M-6** is structured to allow the HAZOP to be performed after permit issuance but before commencement of construction for Phase I and Phase II. In addition, **Special Condition M-5** ensures a safety review of the natural gas liquids processing system. **Special Condition M-7** ensures that an adequate Fire Prevention Plan is prepared and approved.

Applicant Agreement to Fund Independent Monitoring and Project Oversight

To ensure that the standards and mitigation measures imposed by the Commission through the applicable Special Conditions will be strictly monitored and reliably enforced, the applicant has agreed to, and will fund, independent monitoring and oversight of all phases of the project. The California State Lands Commission staff, which has extensive oil and gas development oversight experience, has agreed to perform this function. **Special Conditions A-8** and **A-9** memorialize the applicant's commitment and the specific requirements for the preparation of an associated Compliance Plan, etc.

Commission Conclusion: Project Safety

As discussed above, the presence of an acutely toxic gas as a constituent of the geologic formation associated with the proposed project constitutes a potential hazard to life that must be considered by the Commission pursuant to Coastal Act Section 30253(1). This policy requires that new development minimize risks to life and property in areas of high geologic hazards. In addition, regional seismic risks discussed more fully below also illustrate that the project area is one of high geologic hazards. In addition, oil and gas development is specifically subject to the provisions of Coastal Act Section 30262(a) which requires the development to be performed safely and consistent with the geologic conditions of the well site.

The Commission notes that neither Coastal Act Section 30262 nor Section 30253 require that a project be completely risk-free. Rather, these Coastal Act provisions require in part that an oil and gas development be performed safely, and that new development minimize risks to life and property in areas of high geologic hazard.

The Commission further notes that the risk analysis methodology used by Arthur D. Little, Inc. and by the applicant's risk consultant, Reese-Chambers, Inc., conclude that the potential risks posed by the Macpherson project fall within the "Grey Region," defined previously as representing a level of risk that is considered significant but acceptable if mitigated to the maximum extent feasible, preferably to a level of insignificance.

The Commission finds that mitigation measures incorporated into the applicant's proposed project design substantially decrease the risks the project would otherwise pose to public safety. The mitigation measures incorporated by the applicant include (a) the use of blowout preventers to prevent uncontrolled high pressure releases of oil and gas from the proposed wells, (b) use of strategically placed block valves designed to fail in a closed position and thus limit the potential release of oil or gas from proposed pipelines, (c) use of best available technology for the proposed Supervisory Control and Data Acquisition System, (d) amendment of the proposed project to avoid risks posed by the production of hydrogen sulfide at concentrations above 40 ppm in any well on site, and commitment to shut-in and rework, or abandon altogether, any offending well, (e) amendment of the proposed project to delete hydrogen sulfide treatment equipment, (f) amendment of the project to use an alternative, active oil pipeline system instead of re-activating the aged, and presently abandoned Chevron pipeline, and (g) the applicant's agreement to fund comprehensive project monitoring and oversight pursuant to the administrative special conditions referenced above.

The Commission finds that as extensively conditioned to provide maximum feasible mitigation of potential public safety risks posed by the proposed project, the project is consistent with the public safety requirements of Coastal Act Sections 30262(a) and 30253(i).

4.4.2.2 Active Faults and Seismicity

The applicant has submitted a report entitled "*Geologic Hazards Investigation*," prepared by Ryland Associates, Inc., dated June 10, 1994. The Ryland report states that the site is subject to the effects of major regional earthquakes on the Newport–Inglewood, Palos Verdes, San Andreas, Whittier, Norwalk, and various other regional faults, and is dominated by its proximity to the Palos Verdes and Newport–Inglewood Faults. These systems are assigned maximum earthquakes of magnitude 7 and 7.5, respectively, for seismic design.

The Ryland report also notes that the San Andreas Fault generated one of the largest earthquakes in California history in 1857 with a magnitude in excess of 8; a recurrence of this event is quite possible or probable during the lifetime of the project. Based on dating studies such earthquakes occur every 130 years, on the average.

The Geologic Hazards Investigation concludes that the potential for tectonic fault rupture onsite is negligible, and further concludes that risk to the project from seismic-related hazards such as liquefaction, tsunami and soil failure do not pose special concerns. The investigation, on pages 5–7, sets forth specific recommendations for final seismic design parameters which, according to the consultant, if implemented would ensure the project's ability to withstand the maximum credible seismic or seismic-related hazard predicted for the project site. **Special Condition M-4** requires the applicant to ensure that these recommendations are incorporated into the final project design and requires that the final project plans and designs be reviewed and approved by a registered engineering geologist prior to permit issuance (for Phase I designs) and prior to implementation of construction (for Phase II designs). The Commission, in consideration of the information set forth

above, finds that, as conditioned by **Special Condition M-4**, the proposed project is consistent with the applicable provisions of Coastal Act Sections 30252(i) and 30262(a), with respect to earthquake hazards that may affect the proposed project.

4.4.2.3 Induced Seismicity

Induced seismicity, an increase in seismic (earthquake) activity resulting from human actions, may result from any of the following: extracting fluid from the ground, injecting fluid into the ground, filling and/or draining reservoirs (dam impoundment), underground mining, and detonations. Inducted earthquake activity caused by fluid withdrawal or the re-injection of fluids into the ground to mitigate subsidence is a potential geologic hazard associated with oil development, both onshore and offshore. The dangers that induced seismicity present include surface rupture, seismic shaking, earth material failure (i.e., mass movement and liquefaction), uplift, subsidence, and tsunamis.

Petroleum recovery operations may influence seismicity through both fluid extraction and fluid injection. Fluid extraction can cause subsidence and trigger seismic slip along existing and new fractures. Fluid injection for secondary recovery can increase the likelihood of fault movement, as well as create new fractures if injection pressure is too high. Induced seismicity presents a hazard during oil recovery operations even in areas of low historic seismicity; therefore, it is of special concern in seismically active areas such as the California coastal zone.

Examples of Injection-Induced Seismicity

The possibility of causing increased seismic activity is the most significant geologic hazard associated with injection. Injection-induced seismicity is triggered by the pumping of fluids under pressure into the subsurface, which increases the underground fluid pressure and stimulates movement along faults and fractures. Increased seismicity in the Denver, Colorado, area in the early 1960s has been conclusively tied to waste water injection at the Rocky Mountain Arsenal northeast of the city. Increased seismicity in the Attica-Dale region of New York is attributed to fluid injection for the solution mining of salt. Some cases of injection induced seismicity involving water flooding for secondary petroleum recovery in the United States are in the Baldwin Hills section of the Inglewood Oil field in southern California, and at Rangely, Colorado. Rangely was the site of a controlled experiment in injection induced seismicity.

California Examples

The California coastal zone is a seismically active geologic area and has undergone notably increased seismic activity for more than two decades. Seismicity is being monitored for its relation to oil production and water flooding in southern California. The monitoring programs have been operating in the onshore Los Angeles Basin 25 years, in the Dos Cuadras field for 18 years, and in the offshore Beta field for 15 years. While the results suggest that induced seismicity is occurring in

the Inglewood oil field, they suggest that induced seismicity is not occurring in the Dos Cuadras and Beta fields.

Applicant's Re-injection Program

The applicant proposes to re-inject all wastewater and produced water during project construction and operations.[18] Re-injection is a currently accepted method to control subsidence. As discussed previously, subterranean injection of fluids has the potential to increase earthquake activity locally. This phenomenon is known as "induced seismicity." Because induced seismicity could adversely impact public safety, and jeopardize both life and property, an analysis of the proposed project's potential to induce seismicity is necessary. The applicant's disposal parameters are as follows:

The Stinnet #1 well, located onsite in the city yard, will be converted from an idle oil well to an injection well during the initial testing phase (Phase I). If Phase I is successful, three additional injection wells will be used during the life of the project. The Stinnet #1 well is completed in the Upper Main Zone. The additional wells will be completed in the Upper Main, Lower Main, and Del Amo Zones.

- The maximum injection volume will be 12,000 barrels per day.
- The maximum injection pressure will be less than 900 psi surface pressure (approximately 62 bars).
- The disposal wells will be monitored with standard industry radioactive tracer surveys annually, as required by the State Division of Oil and Gas, to ensure zonal isolation.

Independent Monitoring of Seismicity Recommended

The applicant has submitted a report dated July 29, 1994, prepared by Merrill E. Wright, a California registered geologist, entitled: "*A Comparison of Induced Seismicity in Colorado, at the Rocky Mountain Arsenal and Rangely Oil Field, to the Planned Activities at the Proposed Hermosa Beach Oil Field.*" The report evaluates the potential for fluid injection as proposed by the applicant to induce seismic activity, and concludes that although project-induced seismicity is highly unlikely, independent monitoring is nevertheless recommended.

Coastal Commission staff has previously reviewed the potential for offshore oil and gas development to induce seismicity. Commission staff (*Local Assistance Notes #7*, McCarthy et al, 1989) also recommends that an independent seismic monitoring program be implemented for new offshore oil and gas development projects.

[18] The Commission notes that re-injection of water can prevent subsidence and the Coastal Act requires such re-injection.

Based on the recommendations of the applicant's consulting geologist and of the Commission's technical staff, the Commission finds that a seismic monitoring program is necessary to ensure that the proposed fluid withdrawal and re-injection of wastewater and produced water do not increase seismic activity and that if evidence of seismicity triggered by project activities emerges, that with Commission approval the project shall be halted or modified to sufficiently abate the increased seismic activity. **Special Condition M-36** requires the applicant to submit a Seismicity Monitoring Plan (SMP) subject to the executive director's review and approval. The SMP shall be designed to detect significant change in seismic activity that may be caused by the applicant. The SMP shall be prepared and implemented at the applicant's expense, and shall provide for data acquisition and interpretation by a qualified, independent entity approved by the executive director. **Special Condition M-36** provides a mechanism to reopen the permit for additional Commission consideration and action, including permit revocation, required changes in project operations, or the imposition of additional mitigation measures.

Commission Conclusions

For the reasons set forth above, the Commission finds that **Special Condition M-36**, to establish an independent Seismicity Monitoring Plan, is necessary to ensure public safety consistent with the requirements of the Coastal Act. The Commission therefore finds the proposed project is consistent with the applicable requirements of Coastal Act Sections 30253 and 30262.

4.4.2.4 Subsidence

Subsidence is the dropping or lowering of the earth's surface, and has long been recognized as a potential concern with oil and gas extraction projects.

Subsidence can be extremely hazardous to shoreline areas. One of the more documented cases of subsidence occurred in the Wilmington oil field which showed over 29 feet of subsidence over a 53 year period. The associated impacts included inundated harbor facilities, oil wells and other property (Terminal Island needed to be diked to prevent flooding and parts of Long Beach were filled); ruptured oil well casings, pipelines, sewers and storm drains; separated or buckled railroad tracks; a jammed drawbridge; and cracked walls and foundations of local buildings[19]. It should be noted that the Wilmington field had a total voidage[20] of 1045.9 MMbbls prior to re-pressuring, but once re-pressuring of the field began, no further subsidence-related surface damage was noted and approximately 1.5' of elevation gain (or rebound) occurred.

[19] From information provided in a letter Report prepared by R. K Baker, Division of Oil and Gas, to Ms. Lorena Margoles, July 30, 1982, entitled "Comments on the Various Subsidence Reports and Associated Criticisms for the Riviera Drilling Districts and Alternate Drill Site EIR."

[20] Voidage is the total amount of fluid withdrawn from a reservoir minus the total fluid injected back into the reservoir.

Many structures along the shore are designed to remain safe and effective for identified water elevations. For example, embedded in the design for many seawalls, breakwaters, etc. is a design water elevation and wave height. When water elevations are increased, the structure will provide less protection and may be damaged. These dangers are two-fold. First, subsidence of the offshore sea bottom effectively causes an elevation in water elevation for all existing structures and for the general beach area. A structure which was built to have a top elevation 10 feet above mean sea level will only be 9 feet above mean sea level if the land upon which the structure is built subsides by 1 foot. Second, water depth in front of the structure will increase by 1 foot, and this increase in depth will allow larger waves to break on the structure. Since the energy carried by a wave increases proportionally with the square of the wave height, a small increase in water depth can cause a much larger increase in the available wave energy.

The beach itself will also be affected by subsidence. Direct subsidence of the beach will inundate part of the beach and cause a loss of dry beach. Subsidence of the nearshore area will allow larger waves to come closer to the dry beach, increasing the wave energy expended on the beach and increasing sand movement. A gradual increase in beach erosion (or decrease in accretion) is a likely effect of this localized change in wave energy.

Subsidence occurs for a number of reasons, including oil and gas extraction. California is a tectonically active area and subsidence is frequently linked to earthquake events (seismically induced subsidence). These changes in elevation are sudden, with areas rising or dropping in a few seconds. Regional surface elevations also change gradually over time, due to long-term compaction of soils, adjustments to past seismic events, etc. Human caused subsidence comes mainly from fluid extraction — groundwater as well as oil and gas. Subsurface mining can also cause subsidence, but this is not a concern in the Hermosa Beach area.

The City of Hermosa Beach's Required Subsidence Program

The Conditional Use Permit issued by the City of Hermosa Beach has six conditions which address subsidence. In summary, they require:

- The applicant shall hire an independent engineer to prepare a plan showing the potential zone of influence for all soil settlement, measured to 0.01 feet at any control point.
- The survey area to extend a minimum of 1,000 feet from the zone of influence and that an elevation baseline control survey be done before the drilling begins.
- The applicant shall prepare a plan outlining the method to monitor subsidence as well as any corrective measures for settlements in excess of 0.10 feet. The plan must be approved by an independent engineer and the Director of Public Works.
- The applicant shall undertake annual elevation surveys of the project area and monitor and evaluate any potential settlement.

- If the survey data indicates subsidence then the applicant must take such action as provided in the subsidence control plan as approved by the Director of Public Works, which shall include a program for more frequent monitoring, and monitoring subsidence along the pipeline route.

A *Subsidence Monitoring and Control Plan*, dated August 1, 1994, was prepared for the City of Hermosa Beach by Leonard W. Brock, petroleum engineer. This plan establishes a series of benchmarks that cover the area above the oil reservoirs that are tied into adjacent stable areas and stable benchmarks. The plan, as shown in Exhibit 18, proposes to use 13 existing benchmarks and 20 new benchmarks. There will be 10 benchmarks along the shoreline and three benchmarks located on the City of Hermosa Beach Pier. The only offshore benchmarks are the three which are located on the pier. All other benchmarks are on land. The plan recommends that this network be established as a base prior to oil production and then surveyed annually thereafter. The benchmarks will be surveyed by a qualified land surveyor using Class II specifications with an accuracy of 0.02 to 0.05 feet. The plan recommends that selected wells will have the casing measured to detect compaction in the producing intervals. The only control efforts identified in this plan require that "any evidence of subsidence attributable to the oil operations will be immediately followed by water injection." **Special Condition M-34** incorporates into this permit all subsidence-related conditions imposed by the City of Hermosa Beach in CUP 95-5632.

Subsidence Program Modifications

Due to concerns raised by the Commission staff about offshore and nearshore subsidence, the applicant supplemented the 1994 *Subsidence Monitoring and Control Plan* with the *Offshore Subsidence Monitoring Program*, Hermosa Beach, California, dated January 14, 1998, prepared by Coastal Environments and attached as Exhibit 26. The applicant's Subsidence Monitoring and Control Program, which incorporates modifications suggested by the Commission's technical staff, is summarized below:

Re-injection: The applicant proposes to re-inject all produced water. Re-injection is the "state of the art" technique to halt or prevent subsidence. Re-injection at Wilmington was effective at halting subsidence, and through a detailed re-pressuring program, the Wilmington area experienced approximately 1.5' of rebound. Re-injection of all produced water reduces the total voidage and tends to reduce the potential for subsidence to occur.

Monitoring: The applicant proposes to monitor for subsidence within the "zone of influence" of the entire project — both onshore and offshore. The survey techniques will be different for the onshore monitoring and the offshore monitoring. Monitoring onshore will be undertaken using standard survey techniques, with established benchmarks and reference points. Monitoring offshore will use Global Positioning combined with tautly anchored monitoring points. Since subsidence can occur for various reasons, the monitoring program must provide sufficient information on the area to allow the effects of this project to be isolated from other activities. This will be accomplished by

establishing control points outside the zone of influence. Elements of the Subsidence Monitoring Plan include:

- Establishment of onshore benchmarks for annual surveys and determination of existing ground surface elevations before drilling begins. These ground surface elevations shall be used as a base of reference.

- Placement of offshore bench marks, monitoring of benchmarks, and baseline and background data collection[21] (semi-annual measurement taken at all identified survey locations, starting before or no later than the start of Phase II construction.)

- Preparation of a report summarizing all onshore and offshore baseline and background data collection, including a review of regional and local geologic conditions affecting ground movement in the Hermosa area; review of historic regional and local subsidence and settlement problems and related processes; review of historic changes effecting coastal sediments and projects; development of an agency and individual contact program; and quantification of background or baseline elevation changes without the full oil and gas extraction program and extrapolation of pre-production conditions, in five year increments, to establish the "without project" elevation changes against which the measured changes will be evaluated. This report shall be completed and made available to the executive director and the CSLC at least two months and no more that six months prior to planned commencement of Phase II Production.

  If requested by the executive director, the applicant will fund a peer review of this report.

  The applicant may, at any time update and add to the information available in the Phase II Development Phase Baseline and Background Conditions Report. If the applicant decides to re-examine the background study, the applicant shall notify the executive director that additional research is being undertaken. Such efforts shall be undertaken in a timely manner and shall not be used as a reason to delay any of the subsidence mitigation steps.

- Measuring of shoreline and offshore elevations shall continue annually through the life of the project, with annual summary reports provided to the executive director and CSLC within one month following the end of each annual cycle. If the measurements identify any onshore sites with elevation changes greater than 4" from the agreed upon baseline, or any offshore sites with subsidence greater than 1' from the agreed upon baseline, all reviewing agencies should be notified of these changes by phone at the same time that the reports are being transmitted. While these changes may be within the bounds of the anticipated natural conditions, these changes may be sufficient to require modifications to the extent or frequency of the monitoring effort.

[21] Baseline conditions are the surface elevations measured at the time of, or close to the time of initial production. Background conditions are the surface elevation changes measured prior to the commencement of production. These measurements shall be used as indicators of natural subsidence which is not influenced by the production phase of the project. The measured pre-production phase elevation changes shall be used to extrapolate future natural subsidence, without the project.

- Selected wells will be measured to detect compaction on the producing zones. This information shall be included in the annual reports provided to the executive director.

Mitigation: Macpherson will undertake the following steps if subsidence is detected during monitoring:

- If the offshore monitoring identifies a bowl-like subsidence feature, with progressive subsidence (greater than the extrapolated background level) of 6 or more inches at any two sites, or of 4 or more inches at any one site which is located in less than 30 feet of water, the applicant shall:

  (1) immediately notify the executive director;

  (2) increase the monitoring schedule to every 3 months for onshore and offshore surveys;

  (3) evaluate the injection program and propose to the executive director changes or modifications to better address existing conditions within two months after the elevation drop being observed; and

  (4) implement approved changes to the re-injection program within 30 days after approval has been received.

  If the changes to the re-injection program do not halt or reverse subsidence, and the offshore monitoring program identifies a bowl-like subsidence feature, with progressive subsidence (greater than the extrapolated background levels) of 8 inches at any two sites, or of 8 or more inches at any one site which is located in less than 30 feet of water, the applicant shall:

  (1) immediately notify the executive director;

  (2) evaluate a re-pressuring program which would re-inject a quantity of fluid somewhat comparable to the total amount of fluid being withdrawn;

  (3) propose to the executive director changes or modifications to the re-injection program to better address existing conditions within two months after the elevation drop being observed; and

  (4) implement approved changes to the re-injection program within 30 days after approve has been received.

  If the changes to the re-injection program do not halt or reverse subsidence, and the offshore monitoring program identifies a bowl-like subsidence feature, with progressive subsidence (greater than the extrapolated background level) of 12 inches at any one site which is located in less than 30 feet of water, the applicant shall:

  (1) immediately notify the executive director; and

  (2) halt or reduce production from all wells within the zone of subsidence, or initiate any and all

other changes to production to halt the drop on elevation and or the lateral spreading of this drop.

If, after modifications to re-injection and production are attempted, the measured elevation drops continue to subside, or if the number of sites with an elevation drop increases, the entire project shall halt until both the measured subsidence stabilizes and a new extraction and re-injection plan can be prepared to insure no additional subsidence will occur.

- If onshore monitoring identifies a bowl-like subsidence feature, with progressive subsidence (greater that the extrapolated background level) of 0.1 foot at six or more of the onshore benchmarks, shown in Exhibit 18, the applicant shall:

  (1) immediately notify the executive director and any other contacts identified by the City's Conditional Use Permit;

  (2) increase the monitoring schedule to every 3 months for onshore and offshore surveys;

  (3) evaluate the injection program and propose to the executive director changes or modifications to better address existing conditions within two months after the elevation drop being observed; and

  (4) implement approved changes to the re-injection program within 30 days after approve has been received.

  If the changes to the re-injection program do not halt or reverse subsidence, and the onshore monitoring program identifies a bowl-like subsidence feature, with progressive subsidence (greater than the extrapolated background levels) of 0.15 feet at six or more onshore benchmarks, the applicant shall:

  (1) immediately notify the executive director;

  (2) evaluate a re-pressuring program which would re-inject a quantity of fluid somewhat comparable to the total amount of fluid being withdrawn;

  (3) propose to the executive director changes or modifications to the re-injection program to better address existing conditions within two months after the elevation drop being observed: and

  (4) implement approved changes to the re-injection program within 30 days after approval has been received.

  If the identified actions do not halt or reverse onshore subsidence, and the onshore monitoring identifies a bowl-like feature with progressive subsidence (greater than the extrapolated level) exceeding 0.2 feet at six or more onshore benchmarks, the applicant shall halt or reduce production from all wells within the zone of subsidence, or initiate any and all other changes to

production to halt the drop on elevation and or the lateral spreading of this drop. If, after modifications to re-injection and production are attempted, the measured elevation drops continue to subside, or if the number of sites with an elevation drop increases, the entire project shall halt until both the measured subsidence stabilizes and a new extraction and re-injection plan can be prepared to insure no additional subsidence will occur.

Special Condition M-35 requires the applicant, throughout the life of the project, to carry out the subsidence monitoring and control program described in the 1994 *Subsidence, Monitoring and Control Plan*, prepared by Leonard W. Brock, and the 1998 *Offshore Subsidence Monitoring Program Hermosa Beach*, prepared by Coastal Environments.

The Commission thus finds that the applicant's modified Subsidence Monitoring and Control Program incorporates adequate measures to ensure that the project will not cause or contribute to subsidence hazards. The project, as conditioned, is therefore consistent with Coastal Act Section 30262(e).

4.4.2.5 Produced Water Re-injection

Coastal Act Section 30262(f) requires that oil and gas development projects re-inject all oilfield brines into oil-producing zones. Coastal Act Section 30231 encourages waste water reclamation to protect the biological quality of coastal waters. The applicant proposes to re-inject all produced brines and wastewater. Therefore, the Commission finds that the project, as proposed, is consistent with the applicable provisions of Coastal Acts Sections 30262(f) and 30231.

4.4.3 Oil Spills

Coastal Act § 30232 states:

> *Protection against the spillage of crude oil, gas petroleum products, or hazardous substances shall be provided in relation to any development or transportation of such materials. Effective containment and cleanup facilities and procedures shall be provided for accidental spills that do occur.*

4.4.3.1 Potential Project-Related Oil Spills

The proposed project poses a potential risk of spillage of crude oil or other petroleum products, such as natural gas liquids, via three potential sources:

(1) a release from the production facility during Phase I or Phase II (e.g., storage tank failure);

(2) a tanker truck release (Phase I only); and/or

(3) a pipeline release (Phase II).

The proposed drilling and production site is located approximately seven blocks inland from Hermosa City Beach. Therefore, the primary risk for an oil spill is on-land, and the greatest risk of impacts is to coastal resources on the land surface and underground. However, the Phase I proposed tanker truck route and Phase II pipelines traverse public storm drain entry points. Therefore, there is a risk, albeit a low risk, that a tanker truck release on Valley Drive or a crude oil pipeline rupture could cause oil to reach the shoreline and marine waters via the storm drain system.

The applicant has prepared an oil spill contingency plan (OSCP) for the production/drilling facility and its related components pursuant to the contingency plan regulations (14 CCR §§ 815.01 – 820.01) of the California Department of Fish and Game, Office of Spill Prevention and Response (OSPR). These OSCPs describe the "reasonable worst case" scenarios for potential oil spills, the prevention measures proposed to reduce the risk of oil spills, and the response and spill mitigation measures proposed to protect the coastal and marine resources from the oil spill impacts of a "reasonable worst case" scenario. At this time, the applicant's OSCP for the proposed project has not been submitted to OSPR for its review and approval. However, pursuant to 14 CCR §816.02 the applicant must submit its OSCP to the OSPR for review and approval six months prior to start-up operation of the facility.

Production Facility/Drilling Site (Phase I and Phase II)

The worst case oil spill that could occur during Phase I and Phase II operations would result from a well blow-out. However, the risk of a well blow-out is extremely low for the following reasons:

- the oil being drilled is in a low pressure field and is not naturally free flowing (i.e., it needs to be pumped under pressure); and
- the well drilling equipment is the best technology available to prevent oil spill blow-outs.

Due to these prevention measures and the low pressure oil field, it is highly unlikely that a well blow out would occur, according to California State Lands Commission engineers. The applicant did not, therefore, include a well-blow out scenario in its reasonable worst case oil calculations.

The risk of an oil spill from either the storage tanks and/or pressure vessels is low due to the following prevention measures: 1) the federal and state mandated design and construction requirements for the tanks or pressure vessels; and 2) the inspection and maintenance standards required under federal and state regulations. (For more detail see Section 4.4.3.2 below.)

Notwithstanding the low risk of an oil spill resulting from the failure of a storage tank and/or pressure vessel, the OSCP provides three potential reasonable worst case scenarios. For Phase I operations, the OSCP identified an on-site worst-case oil spill of 500 barrels of crude oil resulting from the failure of one of the two oil handling pressure vessels (heater treater). For Phase II operations, the OSCP identified two reasonable worst-case oil spill scenarios that potentially could occur on site: 1) a spill of 525 barrels of crude oil from the pressure vessels (heater treater); or 2) a

spill of 2,800 barrels of crude oil from the maximum operating capacity of the largest above-ground storage tank on site. Therefore, the largest reasonable worst case spill for the production facility and drilling site is 2,800 barrels of crude oil from the storage tank.

Risk of Oil Spill From Tanker Trucks (Phase I Only)

Approximately four tanker trucks per day are required to transport oil offsite during Phase I. Any spill during transfer operations from the production facility to a truck would be contained on site. However, it is possible for oil to get into the storm drains and then reach the ocean, in the event of a tanker truck accident along adjacent Valley Drive (see Exhibit 13). One tanker truck carries a maximum of 175 barrels of oil.

Crude Oil Pipeline Oil Spill (Phase II Only)

The applicant proposes to construct a ½-mile crude oil pipeline to carry up to 8,000 barrels per day of crude oil and natural gas liquids produced during Phase II of the proposed project. The OCSP identifies six potential causes for pipeline releases: (1) corrosion, (2) third party damage, (3) a seismic event, (4) landslide/ground movement, (5) material failure, and/or (6) operational procedures.

The applicant's OSCP identifies a potential reasonable worst case pipeline spill of 141 barrels, of which 11 barrels could potentially reach the surface street and enter a storm drain.

4.4.3.2 Oil Spill Prevention

The first test of Coastal Act Section 30232 requires the applicant to "provide protection against the spillage of crude oil, gas, petroleum products, or hazardous substances..."

To prevent or reduce an oil spill, the proposed production/drilling facility and its related on-site storage tanks and pipelines are designed with the best available technologies, pursuant to the latest oil industry standards and in compliance with state and federal regulations (e.g. California's Division of Oil and Gas and Geothermal Resources (DOGGR), the California State Fire Marshal (CSFM), Regional Water Quality Control Board, and the U.S. Environmental Protection Agency). These industry standards and federal and state regulations also require redundant back-up computer systems and automatic controls (e.g., leak detection systems and alarms, and automatic shut-off valves) to shut down operations to isolate and reduce the size of a spill.

In addition, pursuant to state and federal requirements under the EPA, DOGGR, CSFM, and RWQCB the production facility, storage tanks, pipelines, and drilling rigs are inspected on a frequent basis and the owner/operator must provide evidence that the facility, storage tanks, pipelines, drilling rigs, and other facility components are maintained in a safe operating condition to protect human health and environmental resources.

Human error is a potential cause of oil spill accidents. The applicant's OSCP documents the training and operational procedures (e.g., methods to reduce spills during transfer operations, risk reduction incentive programs, and alcohol and drug testing programs) that will be put into place at the production/drilling facility to reduce avoidable human error. These measures will further reduce the likelihood of an oil spill.

As an additional measure to contain facility oil spills onsite, the facility has been designed to hold the maximum volume of oil spill that could occur, including the simultaneous release of all tanks and vessels. To create the necessary containment capacity, all wells are located in a 10-foot deep cellar, all vessels and tanks are located in a below-grade secondary containment system, and the entire facility is surrounded by a tertiary containment system. The containment areas do not connect to off-site storm or sanitary drains, therefore it is virtually impossible for a worst-case facility spill to adversely affect coastal resources.

The oil pipeline is also designed to meet pipeline safety regulations as specified by the Federal Department of Transportation and as set forth in 49 CFR (Code of Federal Regulations) Part 195. These regulations are enforced by the CSFM as authorized by the California Pipeline Safety Act of 1981. Applicable measures to protect pipeline integrity pursuant to these regulations include installation of markers and signs, weekly right-of-way inspections, corrosion control, replacement of corroded pipeline sections, valve inspection and maintenance, and installation of overpressure safety devices. **Special Conditions M-10, M-12, M-15, M-16,** and **M-23** require the applicant to submit to the executive director evidence that all pipeline safety tests and design standards required by the State Fire Marshall's office, the California State Lands Commission, and the Department of Transportation, as applicable, have been met. Also, if at any time the executive director determines that new proven oil spill prevention and cleanup technological advances have become available, **Special Condition M-9** provides for the executive director to schedule a hearing before the Coastal Commission to consider imposing additional reasonable oil spill mitigation measures.

The Commission therefore finds that the proposed project, as conditioned, meets the first test of Coastal Act Section 30232.

4.4.3.3 Oil Spill Response

The second test of Coastal Act section 30232 requires the applicant to provide "effective containment and cleanup equipment and procedures for accidental spills that do occur."

To prevent and mitigate oil spill impacts to neighboring off-site coastal and marine resources, the facility has been designed to contain on-site any spill that does occur at facility, including a release from all tanks and vessels failing simultaneously. The 10-foot deep well cellar around each of the wells and vessels (e.g., heat treaters and storage tank will be capable of containing over 750 barrels of liquid. The secondary containment system capacity will be capable of holding a maximum

capacity of 6,900 barrels of crude oil. Therefore, adequate containment is provided by the facility design.

As noted above, there is the potential for a maximum 175 barrel spill from a tanker truck accident. If such an accident occurred upon a truck leaving the production/drilling site, some oil could enter the storm drain system. The trucking company would have ultimate responsibility for any oil spills caused by its trucking operations. Therefore, to provide the fastest oil spill response effort **Special Condition M-14** requires the applicant to maintain at a site within ½-mile of the production facility, 500 sandbags for immediate deployment to block the storm drains from the flow of oil. The sandbags could also be used to block the storm drains from an oil flow that might result from a pipeline rupture that allowed oil to surface to the street.

In addition, **Special Condition M-13** requires the applicant to obtain membership in Clean Coastal Waters, Inc. (CCW), or an equivalent Oil Spill Response Organization (OSRO) approved by OSPR, pursuant to OSPR's contingency plan regulations 14 CCR §817.02. Membership or a contract with an OSRO would demonstrate that the applicant has the equipment and personnel capability under contract to recover and clean-up a spill from project-related operations.

The Commission therefore finds that the proposed project, as conditioned, meets the second test of Coastal Act Section 30232.

4.4.4 Visual Impacts

Coastal Act § 30251 states:

> *The scenic and visual qualities of coastal areas shall be considered and protected as a resource of public importance. Permitted development shall be sited and designed to protect views to and along the ocean and scenic coastal areas, ... to be visually compatible with the character of surrounding areas, and where feasible, to restore and enhance visually degraded areas.*

4.4.4.1. Certified Coastal Land Use Plan Policies

The City of Hermosa Beach describes itself as a fully developed "beach cottage-style" community. Some of the one story cottages have made way for two and sometimes three story condominiums and duplexes. The City has undergone a substantial revitalization and redevelopment, and in recent years has seen new interest in waterfront commercial development with new restaurants, shops, and other amenities for coastal visitors and local residents. The City's civic leaders have emphasized the preservation of aesthetic qualities and community character, primarily through restrictions on both the height and nature of new development.

As noted previously, prior to full certification of a Local Coastal Program (LCP), the Commission relies upon a local government's certified Land Use Plan (LUP) as guidance in applying the policies of the Coastal Act to local circumstances. The City of Hermosa Beach LUP was certified as legally adequate by the Coastal Commission on April 21, 1982. The City's LUP reflects the requirements of Coastal Act Section 30251 through a number of policy statements, including pages G12–13 which state in pertinent part:

> *Hermosa Beach is a unique coastal community with cultural and historical significance and a scale and character not found elsewhere along the California coast. It is the rich and varied character of residential development, as well as the area's natural coastal resources, which make the area of such region-wide significance as an important visitor destination... Environmental, public use, and visual considerations pose important constraints and modifying factors for private development in the Coastal Zone; future residential and commercial development must be guided to insure that the existing community character and resources are not eliminated.*

The LUP, in Appendix G, further states in pertinent part:

> *Design/Character:*
>
> *The character and design of structures within the City is a unique mixture of old and new. The buildings that have been constructed throughout the City's history reflect both varied construction techniques used over the past 80 years and also the varied lifestyles of the residents in the community. The community's main attraction, other than the beach, is the variety and unique mixture of land uses. Through the years, Hermosa Beach residents have been adamant in retaining an informal "beach cottage" atmosphere for the City.*
>
> *Elements which define the character of the City vary. Physical features such as buildings, topography and special land forms (i.e., an ocean beach) play an important role in determining an area's character. In addition to these physical elements, other less definable social and cultural elements serve to clarify an area's ultimate character...*
>
> *The main physical elements which define the character of Hermosa Beach are: topography, building height/scale, building architecture, land use mixture, landscaping and commercial signing. Each element contributes to the design of the Coastal Zone and together set an overall tone for the City.*

The LUP incorporates specific height restrictions in the Development/Design section of Appendix M:

> *The scale of the City is subdued and reflective of the natural contours of the beach and dune areas. The City, at present, does not contain any large obtrusive structures. Building heights*

for all areas are controlled by zoning height limitations. Present height restrictions is the basic view preservation mechanism utilized by the City. The maximum building height allowable in the City is 3 stories or 45 feet, for commercial property and 35 feet for residential property (see Table XXV).

Finally, the LUP, in Section VI (Coastal Development and Design), Subsection C (Policies and Programs), pages 10–11, sets forth explicit restrictions on height as a means of protecting citywide overviews and viewshed qualities:

Existing Policies & Programs:

Policy: That the City should restrict building height to protect overview and viewshed qualities and to preserve the City's existing low-rise profile.

Program: Zoning and building codes limit the height of all structures, depending on zone. The maximum height in each residential R-1, R-2, and R-3 zones are 25 ft., 30 ft., and 35 ft. respectively. The maximum height in the City is 45 ft. or three stories and is in the commercial zone. (See Appendix G, Table XIII)

The applicant proposes to construct an oil and gas development project on an approximately 1.3-acre parcel designated as "Open Space" in the City's certified Land Use Plan. Although the site is designated as open space, it is presently used for the City's maintenance yard, rather than for public recreation. The site contains a kennel, a shop, a gas pump, parking for various city vehicles, an abandoned oil well, and several areas apparently used to dispose of green wastes collected elsewhere by City staff.

The proposed site is immediately surrounded (for less than one block in each direction) on three sides by light manufacturing uses and borders the public greenbelt/strip park on the east side. The greater area beyond the adjacent light manufacturing structures contains mostly residential development (see Exhibits 8-10). The proposed site is located less than one mile (seven blocks) east of Hermosa City Beach, a popular attraction for tourists and local beach visitors.

The proposal would convert existing maintenance yard uses to oil drilling, storage, processing, and transportation uses. The applicant proposes to re-grade the site, construct a temporary chain link fence (except for the west side of the property which will be fenced with a 12-foot masonry fence) and 30-foot sound attenuation wall during Phase I (which will last approximately one year), and to replace the chain link fence with a permanent concrete block and decorative masonry wall, and install landscaping, prior to commencement of Phase II (production). The tank vessels will be placed in an excavated, 6-foot deep concrete basin on the eastern portion of the site. After drilling is completed, wells (up to 30 oil and gas wells) will be produced with mechanical rod and beam pumping units known as "grasshoppers," not to exceed 16 feet in height. The tanks, including appurtenances, will extend above the height of the perimeter wall. The tanks and production

facilities will be painted a neutral color to blend in with the surroundings. Nevertheless, though the permanent fencing and landscaping will shield public views of the facility to a great extent, a portion of the tank farm and permanent vessels will remain visible above the fenceline.

The primary visual impact of the proposed development will be the presence of the approximately 135-foot drilling rig (the equivalent of about 15 stories) that will be located onsite continuously for the one year of Phase I exploratory drilling, and for approximately three additional years during Phase II drilling and production. After the initial construction of wells, the applicant proposes to have a workover rig standing an average of 110 feet in height onsite for up to three months each year for as long as thirty-three additional years after Phase I is completed (total project life is up to 35 years). Thus, the cumulative total length of time that a rig of this height could be onsite is approximately 12 years. The rigs would also be visible at night because they must be lighted to ensure the safety of aircraft.

Commission staff requested that the applicant flag a crane hoisted to the same height as the proposed 135-foot drilling rig. On a site visit to examine the result, staff confirmed that the drilling rig will be partially visible from most prominent public coastal viewing places within the City of Hermosa Beach, including the waterfront and pier. The views of coastal visitors using the public greenbelt adjacent to the project will be more severely impacted than the views available from other public coastal recreational areas closer to the beach.

During construction, heavy-duty trucks maneuvering onsite while transporting equipment, and a large crane onsite during drill rig assembly, will be visible to nearby residents and greenbelt visitors. In addition, as many as four tanker truck trips per day, on weekdays only, may be necessary to transport oil offsite during Phase I. Oil tanker truck trips will not be allowed during weekends and holidays. Drilling operations will proceed around-the-clock, and will require up to three truck trips per day for removal of drilling cuttings and muds. Posting of onsite signage will be limited to the minimum required by law and to ensure public safety.

At the commencement of Phase II, pipeline construction excavation and installation activity will result in temporary, localized visual impacts along the approximately ½-mile pipeline corridor (see Exhibit 19). The applicant will not store construction materials outside of the designated right-of-way and will clean all affected streetways daily. Construction activities will be limited to weekdays between 8:00 a.m. and 3:00 p.m.

As stated above, the applicant proposes to install permanent, decorative masonry perimeter fencing and landscaping during Phase II of the project, and to paint all protruding permanent equipment and structures onsite a neutral color in addition to other mitigation measures set forth above. **Special Conditions M-26** and **M-27** require the minimization of project lighting and glare, consistent with applicable safety standards. **Special Condition M-28** requires submittal of final landscaping plans for the executive director's review and long-term implementation of landscaping techniques to

soften the project's appearance. **Special Condition M-29** requires the use of neutral colors to minimize the visual impacts of permanent structures.

The Commission finds, however, and the applicant acknowledges, that despite the implementation of these measures, residual adverse visual impacts to public coastal views will remain. The drill rig will be visible from most coastal public viewing areas and will contrast sharply with the building heights in the nearby neighborhoods and public parks. Night lighting of protruding structures for safety reasons will contribute to visual impacts. Moreover, despite implementation of the proposed mitigation measures, the construction and operation of the proposed project, particularly the scale and character of drill and workover rigs ranging in height from 110 feet to 135 feet, are not compatible with the visual character of the surrounding area, which otherwise conforms to the building height restrictions (a maximum of 45 feet in height for commercial structures) set forth in the certified LUP.

The City's LUP policies, which offer guidance to the Commission's previous applications of Coastal Act policies with the City, clearly cite height restrictions as a key means of protecting community character. The LUP states, "*the City, at present, does not contain any large obtrusive structures.*"

Coastal Act Section 30251 requires that new development be visually compatible with the character of the surrounding area. The Commission concedes that the various drilling and workover rigs will not be permanent structures, and that the rigs, however visually intrusive while present may nevertheless be compared to temporary construction cranes. The Commission finds that the total presence of such rigs for up to twelve years, cumulatively, will significantly impact visual resources in a manner that transcends the usual meaning of "temporary impact."

Despite the imposition of applicable Special Conditions, the Commission finds that residual adverse impacts to public coastal views and community character will remain. Therefore, compensatory mitigation is the only remaining means to reduce the adverse visual impacts of the applicant's proposal to less than significant levels. The applicant recognizes the need to fund compensatory visual enhancement measures to offset its projects adverse effects on public coastal views. The applicant has proposed and committed to contribute additional sums to the previously established Coastal Resource Enhancement Fund for the specific purpose of assisting the Hermosa Greenbelt Improvement Project (CIP 96-508) approved by the City Council in December 1997. Macpherson Oil Company shall contribute to the Fund $1,000 per month, or a sum pro-rated based on the number of days per month, that any rigs are standing on the site for any reason. Any funds remaining after the project is completed shall be expended for other visual enhancement projects according to the requirements of **Special Condition M-30**.

The applicant's proposal is incorporated into **Special Condition M-30**, which also relies on a Memorandum of Understanding with the City of Hermosa Beach to ensure appropriate expenditures of the mitigation fees and accrued interest. The applicant's mitigation fees, together with any

interest earned by unexpended funds, would be reserved exclusively for projects that visually enhance the public coastal open spaces and recreation areas from which the project would be visible. Priority would be given to projects designed to enhance the public greenbelt immediately east of the project. The funds generated for this purpose would only be available to qualified projects approved by the City Council and proposed by public agencies or registered non-profit organizations.

The Commission further notes that because neither the production facilities nor the drilling rigs will remain as permanent development, and because the visual enhancements funded by the applicant are expected to provide permanent improvements, the visual impacts of the proposed project will be mitigated to less than significant levels. Therefore, the Commission finds that as conditioned by **Special Conditions M-26** to **M-30**, the proposed project is consistent with Coastal Act Section 30251.

4.4.5 Recreation and Public Access

Coastal Act § 30211 states in part :

> *Development shall not interfere with the public's right of access to the sea....*

Coastal Act § 30240(b) states:

> *Development in areas adjacent to ... parks and recreation areas shall be sited and designed to prevent impacts which would significantly degrade such areas....*

The applicant proposes to remove twelve existing onsite parking spaces presently used by City of Hermosa Beach employees on weekdays, and by the public — including coastal visitors — at no charge on weekends. The City Manager of Hermosa Beach has confirmed that the public uses the existing spaces extensively on weekends for coastal access parking. The applicant proposes to construct six new parking spaces onsite for employee use. In addition, the applicant has prepared, and the City of Hermosa Beach has approved, a parking plan (Exhibit 23) that provides for the construction of six additional on-street parking spaces adjacent to the proposed project.

Special Condition M-31 requires the new spaces to be provided after the site is re-graded, curbs installed, etc., but before the construction of any wells. There will be a temporal loss of coastal access parking during the approximately six months that may elapse between the onset of project grading and other construction activities and the installation of curbing, striping, etc., necessary to release the new spaces for public parking. The short-term loss of parking will be compensated for by the long-term provision of six new parking spaces that will be available seven days per week, rather than on weekends only as is presently the case. In addition, **Special Condition M-31** prohibits the use of the six new on-street parking spaces by project employees. Therefore, the Commission finds that as conditioned by **Special Condition M-31**, the project would not have

adverse impacts on coastal access parking and thus would be consistent with the requirements of Coastal Act Section 30211. **Special Condition M-30**, as discussed in Section 4.4.4 above, provides for payment by the applicant of mitigation fees to offset the visual impacts of the proposed project, particularly upon the adjacent public greenbelt. The Commission finds that as conditioned to require visual enhancement of the public recreational areas adversely affected by the project's visual impacts, the proposed project is consistent with the applicable requirements of Coastal Act Section 30240(b).

4.4.6 Air Quality

Coastal Act § 30253(3) states:

> *New development shall:*
>
> *Be consistent with requirements imposed by an air pollution control district or the State Air Resources Control Board as to each particular development.*

Air emissions associated with the proposed project would be generated from a variety of stationary and mobile sources.

Primary short-term emission-generating activities during Phase I of the proposed project consist of: dust generated from grading operations, estimated at about 110 lbs/day of dust per acre of area graded; truck traffic, estimated at approximately 27.7 lbs/day (consisting of carbon monoxide, reactive organics, nitrogen oxides, sulfur oxides, and particulates); off-site electricity generation for exploratory drilling, estimated at 15.21 lbs/day (consisting of carbon monoxide, reactive organics, nitrogen oxides, sulfur oxides, and particulates); and drill stem test operations, estimated at 181-lbs/12 hr day (consisting of carbon monoxide, nitrogen oxides, total organic gases, and particulates).

The emission rate of volatile organic compounds (VOCs) from the proposed site remediation phase (Phase II) is assumed to be minimal based on the low volatility of the compounds being excavated, and is estimated to be less than 10 lbs/day.

Primary long-term emission-generating activities during Phase II consist of: evaporation from on-site temporary storage of crude oil estimated at 96.6 lbs/day of hydrocarbons (however, the production tanks will be equipped with vapor recovery systems as required by the City in the CUP which will reduce emissions from the tanks to 9.6 lbs/day); and off-site electricity generation estimated at 27.2 lbs/day (consisting of carbon monoxide, reactive organics, nitrogen oxides, sulfur oxides, and particulates).

Occasional odors from the proposed project from diesel-powered trucks, drill muds and cuttings, waste gases, and hydrocarbon evaporation may be detected throughout the life of the project, but

due to City-required odor control measures (such as location and design of tanks, odorless drilling muds, the burning of "waste" gases during the exploratory phase and the use of commercial recovery systems during the permanent production phase, and the limited time during which well tubing and rods remain out of the well), odors are not expected to be significant.

The South Coast Air Quality Management District (SCAQMD) is the local air pollution control district responsible for implementing federal and state air quality standards in the project area. In 1991 the SCAQMD issued to the applicant the first Permits to Construct for Phases I and II. These were extended yearly until 1995, when the applicant was required to resubmit permit applications to be reviewed under amended SCAQMD rules and regulations. The new Permits to Construct were issued in 1995 and extensions granted in 1996 and 1997. The site remediation component of Phase II does not require any discretionary permits from the SCAQMD. However, the construction contractor responsible for the excavation must have a general SCAQMD excavation permit which requires notification of the SCAQMD before excavation activity.

The current Permits to Construct act as temporary Permits to Operate for Phase I of the proposed project. The SCAQMD must be notified by the applicant when the equipment is operational for Phase II, at which time the SCAQMD will conduct an inspection and approve or deny Permits to Operate. **Special Condition M-37** requires the applicant to submit to the executive director copies of Permits to Operate prior to the operation of Phase II of the proposed project.

Since the project as proposed and conditioned is consistent with the South Coast Air Quality Management District rules and requirements, the Commission finds the project consistent with Coastal Act Section 30253(3).

4.4.7 Energy and Water Conservation

Coastal Act Section 30231 states in part:

> *The biological productivity and the quality of coastal waters, streams, wetlands, estuaries, and lakes appropriate to maintain optimum populations of marine organisms and for the protection of human health shall be maintained and, where feasible, restored through, among other means...encouraging waste water reclamation...*

Coastal Act Section 30253(4) states in pertinent part that new development shall:

> *(4) Minimize energy consumption...*

The Coastal Act encourages the use of reclaimed water (among other means) to protect, and where feasible, restore coastal waters, streams, wetlands, estuaries, and lakes. The applicant proposes to re-inject all produced waste water from project operations rather than discharge such waste water into the City's sewer system, in part to control potential subsidence. If the applicant's proposed re-

injection program proves inadequate to control subsidence, additional water injection may become necessary in the future pursuant to **Special Conditions M-34** and **M-35**. **Special Condition M-32** requires that if additional use of water is required by the project, reclaimed water shall be used to the maximum extent feasible, pursuant to Coastal Act Section 30231.

Coastal Act Section 30253(4) requires new development to minimize energy consumption. Therefore, **Special Condition M-33** requires that throughout the project life, as equipment is added or replaced, cost-effective energy conservation techniques shall be incorporated into project design. Therefore, energy conservation considerations must be taken into account in selecting future project equipment.

Therefore, the Commission finds that as conditioned, the proposed project is consistent with the applicable requirements of Coastal Act Sections 30231 and 30253(4).

5.0 CALIFORNIA ENVIRONMENTAL QUALITY ACT

As "lead agency" under the California Environmental Quality Act ("CEQA"), the City of Hermosa Beach certified an EIR (EIR No. 89060701) in May 1990 and an Addendum to the EIR in August 1993 for the proposed project. The Commission's permit process has been designated by the State Resources Agency as the functional equivalent of the CEQA environmental impact review process. Pursuant to section 21080.5(d)(2)(i) of the CEQA and section 15252(b)(1) of Title 14, California Code of Regulations, the Commission may not approve a development project "if there are feasible alternatives or feasible mitigation measures available which would substantially lessen any significant adverse impact which the activity may have on the environment."

Section 4.4.1 of this report contains an analysis of feasible alternative sites and concludes that no legally feasible alternatives to the proposed project site exist.

Although the Commission believes the applicant's project may cause adverse impacts to coastal resources (hazards, oil spills, visual, recreation/public access), Section 3.0 of this report sets forth extensive measures that, if fully implemented, would mitigate these impacts to less than significant levels.

For these reasons, the Commission finds that there are no feasible less environmentally damaging alternatives or additional feasible mitigation measures that would substantially lessen any significant adverse impact which the proposed project may have on the environment, other than those identified herein. Therefore, the Commission finds that the project, as conditioned, is consistent with the applicable provisions of the CEQA.

APPENDIX A — SUBSTANTIVE FILE DOCUMENTS

AGENCY APPROVALS

City of Hermosa Beach, Conditional Use Permit 93-12, August 10, 1997.

City of Hermosa Beach, Oil and Gas Lease #2, by and between City of Hermosa Beach and Windward Associates, January 14, 1992.

California State Lands Commission, Memorandum of Understanding, by and between City of Hermosa Beach and California State Lands Commission, May 11, 1993.

South Coast Air Quality Management District, *Permits to Construct #'s 306267, 306268, 306269, 306270, 306271, 306272, 306273, 306274, 306275*, granted October 30, 1995, November 2, 1995, December 27, 1995, and July 25, 1996. Extended October 29, 1996.

CORRESPONDENCE

Correspondence — Macpherson Oil Company

September 12, 1989. Letter from Michael Schubach, City of Hermosa Beach, to Don Macpherson. *Regarding: Proposed plans for oil drilling at the South School Site and City Yard.*

December 02, 1993. Letter from Alison Dettmer, CCC, to David Gautschy, David Gautschy, Inc. *Regarding: Filing status of coastal development permit application E-93-17 for oil and gas exploration and development at an urban drillsite in the City of Hermosa Beach.*

March 19, 1997. Letter from David Gautschy, David Gautschy, Inc., to Alison Dettmer, CCC. *Regarding: Ruling on Petition for Writ of Mandate.*

March 23, 1994. Letter from Alison Dettmer, CCC, to Michael Schubach, City of Hermosa Beach. *Regarding: Filing status of coastal development permit application E-93-17 for oil and gas exploration and development at an urban drillsite in the City of Hermosa Beach.*

September 01, 1994. Letter from Alison Dettmer, CCC, to Don Macpherson, Macpherson Oil Company, and Larry Morton, Stocker Resources, Inc. *Regarding: Filing status of coastal development permit application E-94-11 for oil and gas exploration and development at an urban drillsite in the City of Hermosa Beach.*

December 23, 1996. Letter from Alison Dettmer, CCC, to David Gautschy, David Gautschy, Inc. *Regarding: Filing Status of Coastal Development Permit Application E-96-28.*

April 10, 1997. Letter from Alison Dettmer, CCC, to David Gautschy, David Gautschy, Inc. *Regarding: Construction and Operation of Crude Oil Shipping Pipeline.*

April 16, 1997. Letter from Alison Dettmer, CCC, to David Gautschy, David Gautschy, Inc. *Regarding: Filing Status of Coastal Development Permit Application E-96-28.*

April 22, 1997. Letter from David Gautschy, David Gautschy, Inc., to Alison J. Dettmer, CCC. *Regarding: Updated materials for Application E-96-28.*

June 26, 1997. Letter from Donald Macpherson, Macpherson Oil Company, to Stephen Burrell, City of Hermosa Beach. *Regarding: Oil Development Project Coastal Resource Enhancement Fund.*

June 27, 1997. Letter from Alison Dettmer, CCC, to David Gautschy, David Gautschy, Inc. *Regarding: Filing status of Coastal Development Permit Application E-96-28.*

August 05, 1997. Letter from David Gautschy, David Gautschy, Inc. to Alison Dettmer, CCC. *Regarding: Response to Request for Additional Information letter of June 27, 1997.*

August 11, 1997. Letter from Joseph Petrillo, Sheppard, Mullin, Richter & Hampton, to Alison Dettmer/Melanie Hale, CCC. *Regarding: Status of review of coastal development permit application.*

August 26, 1997. Letter from Maria Pracher, Sheppard, Mullin, Richter & Hampton, to Melanie Hale, CCC. *Regarding: Alternative analysis supplement.*

September 08, 1997. From Macpherson Oil Company to California Coastal Commission. *City of Hermosa Beach Oil and Gas Recovery Project — Fact Sheet.*

September 22, 1997. Transmittal from David Gautschy, David Gautschy, Inc. to Melanie Hale, CCC. *Vicinity Map — Marble #102 well location compared to city maintenance yard in Hermosa Beach.*

September 29, 1997. Transmittal from David Gautschy, David Gautschy, Inc. to Melanie Hale, CCC. *Copies of letters dated March 14, 1997 and April 22, 1997.*

October 02, 1997. Fax from Joseph Petrillo, Sheppard, Mullin, Richter & Hampton, to Melanie Hale, CCC. *Regarding: Status of outstanding information for Macpherson Oil Company coastal development permit application.*

October 03, 1997. Transmittal from David Gautschy, David Gautschy, Inc., to Melanie Hale, CCC. *1) Photo copy of Division of Oil, Gas and Geothermal Resources, Map #126 map title, sale and legend (full size), 2) Photo copy of map showing location of Marble #102 well in relationship to project site location (full size).*

October 07, 1997. Transmittal from David Gautschy, David Gautschy, Inc., to Melanie Hale, CCC. *Draft Letter of Intent from Edison Pipeline and Terminal Co. for shipping of crude oil to local refineries, and Area Plan showing Edison Pipeline & Terminal Co. pipeline system in Southern California.*

October 08, 1997. Letter from Joseph Petrillo, Sheppard, Mullin, Richter & Hampton, to Melanie Hale, CCC. *Regarding: Tim Chambers ready to prepare final report.*

October 08, 1997. Letter from Donald R. Macpherson, Macpherson Oil Company, to Lesley Ewing, CCC. *Regarding: Subsidence monitoring conditions.*

October 22, 1997. Letter from Theresa Van Andler, South Coast Air Quality Management District, to David E. Gautschy/Ted Guth, Macpherson Oil Company. *Extension of Permits to Construct to October 31, 1998.*

November 12, 1997. Fax from Steve Radis, Arthur D. Little, to Melanie Hale, CCC. *October 17, 1997 meeting in California State Lands Commission Office — Minutes.*

November 14, 1997. Letter from Melanie Hale, CCC, to Donald Macpherson, Macpherson Oil Company. *Regarding: Comments — Draft minutes transmitted 27 OCT 97.*

November 18, 1997. Letter from David Gautschy, David Gautschy, Inc., to Alison Dettmer, CCC. *Regarding: Hermosa Beach Oil Development Project — hydrogen sulfide.*

November 19, 1997. Letter from David Gautschy, David Gautschy, Inc., to Melanie Hale, CCC. *Regarding: Off-site crude oil spill clean-up response, Hermosa Beach Oil Development Project.*

December 08, 1997. Letter from David Gautschy, David Gautschy, Inc., to Alison Dettmer, CCC. *Regarding: Procedure for Handling Wells Containing Hydrogen Sulfide in Excess of 40 ppm.*

Correspondence ó City of Hermosa Beach

June 11, 1997. Letter from Stephen Burrell, City of Hermosa Beach, to Alison Dettmer, CCC. *Regarding: City's position relative to the land use policies and regulations applicable to the Macpherson development project.*

October 17, 1997. Letter from Melanie Hale, CCC, to Ken Robertson, City of Hermosa Beach. *Regarding: Macpherson Oil Company Project Plans and City Council Staff Reports.*

October 28, 1997. Letter from Ken Robertson, City of Hermosa Beach, to Melanie Hale, CCC. *Regarding: Macpherson Oil Company Project Plans and requested City Council Staff Reports.*

Correspondence — Ex-Parte Communications

July 21, 1997. Letter from John C. Hisserich to Susan Hansch, CCC. *Regarding: Ex-parte Communication.*

October 02, 1997. *Form for Disclosure of Ex-Parte Communications*, filed by Sara Wan.

Correspondence — Stop Oil Coalition

February 04, 1997. Letter from Rosamond Fogg, Hermosa Beach Stop Oil Coalition, to May Reviczky and Hermosa Beach City Council. *Regarding: Measure E and Hermosa Beach LCP certification.*

March 31, 1997. Hermosa Beach Stop Oil Coalition, *Draft Discussion of Macpherson Oil Co. Application for CDP.*

April 14, 1997. Hermosa Beach Stop Oil Coalition, *Draft Discussion of Macpherson Oil Co. Application for CDP.*

May 24, 1994. Chatten-Brown, Jan and Ellison Folk, Shute, Mihaly & Weinberger. *Hermosa Beach Stop Oil Coalition vs. City of Hermosa Beach — Case No. BSO25250 — Petitioners' Opening Brief in Support of Petition for Writ of Mandate.*

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APPENDIX B — STANDARD CONDITIONS

Permit Application No. E-96-28

1. **Notice of Receipt and Acknowledgment.** The permit is not valid and development shall not commence until a copy of the permit, signed by the permittee or authorized agent, acknowledging receipt of the permit and acceptance of the terms and conditions, is returned to the Commission office.

2. **Expiration.** If development has not commenced, the permit will expire two years from the date on which the Commission voted on the application. Development shall be pursued in a diligent manner and completed in a reasonable period of time. Application for extension of the permit must be made prior to the expiration date.

3. **Compliance.** All development must occur in strict compliance with the proposal as set forth in the application for permit, subject to any special conditions set forth below. Any deviation from the approved plans must be reviewed and approved by the staff and may require Commission approval.

4. **Interpretation.** Any questions of intent of interpretation of any condition will be resolved by the executive director or the Commission.

5. **Inspections.** The Commission staff shall be allowed to inspect the site and the development during construction, subject to 24-hour advance notice.

6. **Assignment.** The permit may be assigned to any qualified person, provided assignee files with the Commission an affidavit accepting all terms and conditions of the permit.

7. **Terms and Conditions Run with the Land.** These terms and conditions shall be perpetual, and it is the intention of the Commission and the permittee to bind all future owners and possessors of the subject property to the terms and conditions.

LIST OF EXHIBITS

Exhibit 1	City of Hermosa Beach, Measures P & Q
Exhibit 2	City of Hermosa Beach, Measure E
Exhibit 3	California State Lands Commission, Minute Item 41, June 30, 1992
Exhibit 4	Letter from City of Hermosa Beach Attorney, RE: Measure E and Macpherson proposal
Exhibit 5	Letter from City of Hermosa Beach to California Coastal Commission, June 11, 1997, RE: LCP and Macpherson proposal
Exhibit 6	Letters from Coastal Commission, December 23, 1997; April 10, 1997; April 16 1997; and June 27, 1997, RE: Filing Status of E-96-28
Exhibit 7	Review of the Hazard Analysis for the Macpherson Oil Company Hermosa Beach Project, December, 1997- Final Report, Arthur D. Little, Inc.
Exhibit 8	Proposed Development Site — Thomas Brothers Guide Map
Exhibit 9	Proposed Development Site — Aerial Photograph
Exhibit 10	Proposed Development Site — Hermosa Beach General Plan Map
Exhibit 11	Truck Route Plan
Exhibit 12	Proposed Project Site Plans (with list)
Exhibit 13	Redondo Beach Alternative Sites Map
Exhibit 14	Alternative Land Use Site Analysis for Macpherson Oil Company Project, August 22, 1997
Exhibit 15	Macpherson Oil Company, response to filing letter, March 14, 1997, RE: Project Recovery Analysis
Exhibit 16	Letter from Macpherson, RE: Hydrogen Sulfide Maximum Concentration and Deletion of Hydrogen Sulfide Treatment Equipment
Exhibit 17	Letter from California State Lands Commission, RE: Hydrogen Sulfide Production
Exhibit 18	Subsidence Monitoring and Control Plan, August 1, 1994. Prepared for the City of Hermosa Beach by Leonard W. Brock
Exhibit 19	Pipeline Corridor Map
Exhibit 20	Storm Drain System
Exhibit 21	Letter from Macpherson, January 6 1998, RE: Visual Resource Component of Coastal Resource Enhancement Fund
Exhibit 22	Example of results of monthly tests and inspections conducted by the California State Lands Commission
Exhibit 23	Replacement Public Parking Plan, Sheet No. PK-1
Exhibit 24	Parking Lot Restriping, Sheet No. PK-2
Exhibit 25	Correspondence

STATE OF CALIFORNIA—THE RESOURCES AGENCY

PETE WILSON, *GOVERNOR*

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PERMIT APPLICATION #E-96-28
MACPHERSON OIL COMPANY

Date Filed: January 9, 1998
Hearing Date: February 4, 1998
Item No.: WED 6a

Please Add The Attached EXHIBIT 26 To The Exhibit Packet

OFFSHORE SUBSIDENCE MONITORING PROGRAM AND POSSIBLE MITIGATION MEASURES

HERMOSA BEACH, CALIFORNIA

by

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EXECUTIVE SUMMARY

The offshore subsidence monitoring program is designed to detect the early stages of oil production related subsidence. Criteria have been developed to distinguish the distinct pattern of change in sea floor elevation, associated with fluid pressure reduction in producing reservoirs, relative to other types of natural and man-induced ground surface changes common in southern California. Mitigation, if necessary, would be designed to respond to identified localized reduction in elevation without altering the natural and/or other man-induced regional trends. Offshore bench marks will be positioned, in a grid or pattern, over proposed production zones. If subsidence, due to a pressure drop in the reservoir, occurs it should be first observed above the zone of maximum fluid withdrawal. As production continues, a bowl-shaped depression will develop and enlarge with time. Movement of the affected bench marks will be in a pattern related to bottom hole production sites. If subsidence due to oil extraction is significant, measured changes in elevation will exceed the natural background trend. The subsidence zone will not affect the nearshore zone unless the depression enlarges to the point where it affects the seaward boundary of longshore sediment transport at water depths about 30 feet. The primary objective of the offshore monitoring program is to prevent the zone of subsidence from enlarging into shallow water. Early detection of subsidence seaward of the zone of sediment will allow production managers time to take mitigation action, such as repressurization, before it affects the beach and coastal structures.

The monitoring program will include: (1) the collection and analysis of pre-production background subsidence data; (2) the installation of offshore bench marks; (3) baseline measurements of all offshore bench marks and selected onshore bench marks; and (4) long-term monitoring during production.

1. INTRODUCTION

Subsidence, uplift and tilting have been observed along the California coast for a number of years. Subsidence can be caused by a number of natural and man-induced processes, including among other things: (a) natural consolidation of sedimentary deposits; (b) earthquake-induced liquefaction and associated consolidation and reduction in pore space; (c) secondary consolidation and compaction of organic material; (d) regional tectonic activity (coseismic and aseismic); and (e) withdrawal of fluids including water and oil. The effects of subsidence include a reduction in regional ground surface elevation, an increase in surface tilt and in extreme cases ground cracking. In coastal areas, where there has been substantial ground water and petroleum production and associated subsidence, mitigating measures were required to prevent coastal erosion and damage to man made structures. Subsidence is often confused with differential settlement of poorly designed engineered structures.

Oil field subsidence has been linked to a decline in fluid or pore pressure within production zones. Prior to withdrawal of fluids, total earth pressures acting on the reservoir rocks are balanced by fluid pore pressure. A loss of pressure, during oil production, will result in less support or an increase in effective stress and greater compressive stresses on the reservoir rocks. Overburden of rocks and sediment above the reservoir are subject to loads resulting in potential surface elevation changes. Re-injection of water, produced during oil extraction, can maintain fluid pressures and prevent subsidence.

The purpose of the proposed offshore subsidence monitoring program (OSMP) is not to develop empirical data for the prediction of total subsidence in the Hermosa Beach area due to oil production, but rather to detect the early stages of a regional reduction in ground surface elevation due directly to oil production. A primary objective is therefore, the determination of the origin and rate of vertical elevation changes within the study area (Figure 1). The surface of the earth is not static. Clearly, an understanding of the processes (natural and man-induced) effecting subsidence within the study area is critical for understanding the need and effectiveness of mitigation.

Observational evidence and measurements, indicating oil extraction induced subsidence, will trigger mitigation such as injecting fluid to maintain or elevate reservoir pressure. Permits to drill require mitigation if onshore subsidence is in excess of 0.1 foot. Offshore measurements, because of environmental factors (i.e., waves, sediment transportation, and visibility) will be less accurate, than onshore. However, offshore subsidence will not affect the shoreline beaches and structures until it brings about a change in the balance of sediments in the sand wedge that is moving within the littoral zone. Therefore, the lack of accuracy is not as critical as it is on land where it affects beaches, structures, and human activities.

The OSMP will provide background and baseline data and long-term sea floor elevation monitoring during Macpherson Oil Company's production of oil from the northwesterly portion of the Belmont-Wilmington-Torrance-Redondo Beach anticline, a geologic structure that provided production in the Torrance Oil Field (TOF) to the east and the Redondo Beach Field to the south. There has been no oil or gas production from the offshore lands seaward of Hermosa Beach, California (Figure 1). Background data collection and analysis of the performance of existing onshore bench marks are needed to understand the historic performance of individual onshore bench marks relative to natural and man-induced processes that can effect their performance and the development of an optimal monitoring program. A history of elevation changes to any of the onshore bench marks, before any oil production begins, is critical to the monitoring program. The monitoring program will include baseline measurements and frequent vertical elevation change readings over a predetermined offshore area as discussed below. The frequency of measurements will be related to elevation change rate and production volumes. The OSMP will include the following primary tasks:

1. pre-production background data collection and analysis of existing bench mark data, etc.;

2. review of regional and local geologic conditions and historic changes affecting local subsidence and settlement and coastal sediments in the Hermosa Beach area;

3. key agency (CCC, City of Hermosa Beach, USGS, etc.) and individual (e.g., Leonard W. Brock) contact program;

4. placement, baseline measurements and long-term monitoring of offshore bench marks; and

5. preparation of timely summary of findings and conclusions reports.

Reservoir engineering, required for mitigation of subsidence due to oil production, is beyond the scope of the OSMP. The nature, type, timing and extent of mitigation can not be accurately predicted based on existing data. Mitigation measures will be provided under separate cover.

2. OIL PRODUCTION

The Hermosa Beach prospect is an offshore oil field on the westerly continuation of the Belmont-Wilmington-Torrance-Redondo Beach anticline. This trend is subparallel to and between the Newport-Inglewood and Palos Verdes fault zones. Major production is expected from Pliocene to Miocene formations, including the Upper Main, Lower Main, Del Amo and Lower Del Amo Zones. The 103 Fault, a splay of the Palos Verdes fault zone, is the principal closing element in the Redondo Beach-Hermosa Beach sector (Figure 2). This fault barrier is at the highest structural position on the entire anticlinal trend. All potential productive horizons appear to be closed against the 103 fault which extends into the regional basement or Catalina Schist (Hacker Inc., 1988).

The Belmont-Wilmington-Torrance-Redondo Beach oil field has as of 1988 produced 2,494,151,000 barrels of oil and 1,283 MMCF of natural gas. The Hermosa Beach portion of the field lies at the structural apex of this producing trend. The nearest developed, offshore portion of the field is the Redondo Beach field which has produced ≈7,957,000 barrels of oil, 5,100 MCF of natural gas, and ≈72,000,000 barrels of water. It is anticipated that the Hermosa Beach field will have similar reserves per acre-ft plus the possibility of developing substantial reserves from the "Nodular Shale" and the Schist Conglomerate. These two zones, in high structural positions, were not adequately explored in the Redondo Beach portion of the structure (Hacker Inc, 1988). Total production of oil and water from Hermosa Beach could exceed Redondo Beach due to its larger productive area.

It is anticipated that most of the production will be from fractured shales and discontinuous stringers of very finely-grained sands and possibly schist conglomerate. This is entirely different from the reservoir characteristics of the southeastern parts of the anticlinal trend, near Wilmington, where production is from clean uncemented sands and finer grained layers or sedimentary beds that undergo significant volumetric change due to a drop in fluid pressure.

3. POTENTIAL EFFECTS OF OIL PRODUCTION ON BEACHES

Beaches experience a seasonal cycle in response to changes in the size of summer and winter waves. Winter storms remove material from the beach (bar-berm) and deposit it on the shorerise, where it remains available for transport back to the beach by the smaller waves in summer.

High-energy wave events episodically overwhelm the equilibrium of the beach profiles and may cause down welling of the shore zone sand to distances and depths where normal summer wave action cannot return it to the beach. Such events constitute net sand loss from the shore zone to the shelf. The conditions for a net change, in sand, depends upon the intensity and duration or total energy of the storm and the slope of the shelf below the toe of the shorerise.

The sand participating in seasonal beach changes remains within the shore zone. The water depth of seasonal change is usually less than 33 ft (10 m) and is referred to as the "closure depth.", or null point. Local bathymetry is shown in Figure 2A. The closure depth is best illustrated from a plot of depth versus the standard deviation of depth changes from repeated surveys of the same profiles as shown on Figure 3. This figure shows the reduction in standard deviation of depth changes at water depths > 25 feet. Appendix A gives examples of closure depth for beaches located in southern California. These beach profiles close together at water depth about 30. It should be pointed out that due to a cluster of very large storm waves, beaches can erode seaward of the 30 foot water depth. These beaches slowly recover. As will be explained in the following section the closure point will determine the offshore limit of the area where no change in bottom elevation is permitted.

The shoreline adjusts to the rate of change of longshore transport along the coast (divergence of the drift). If the volume of sand which moves into the area is greater than the volume of sand which leaves the area the net result is accretion of the beach. The portion of the beach which participates in the change is limited to the part of the beach profile inshore of the closure or null point. This is because wave- induced water velocity plus the velocity of bottom currents is less than the threshold velocity needed for sand movement.

4. RATIONALE FOR MONITORING PROGRAM

Detection of the early stages of oil production related subsidence is the goal of the OSMP. The critical issues are: (1) what criteria or test(s) can be used to reasonably determine the origin of offshore, vertical elevation changes; and (2) what level of risk or pattern of elevation change is a reliable indicator of potential near shore/onshore problems. The working postulate is: (a) oil production, without fluid injection, or more specifically a temporal reduction in reservoir fluid pressure, can potentially result in measurable regional subsidence; and (b) the elevation of the ground surface in the study area is not static (i.e., processes, other than oil production, are active and inducing subsidence and differential settlement).

The number and type of processes, both natural and man-induced, that can cause vertical elevation change are significant. As a result, the area and amount and rate of oil production induced subsidence are difficult to predict (Helm, 1984). Oil production related subsidence is a function of rock type, reservoir pressure, thickness of the reservoir, width of the reservoir to depth ratio, the mechanical properties of the rock in and above the reservoir and pre consolidation effects including prior pressure drops (Martin and Serdengecti, 1984). The proposed production reservoir is part of the Belmont-Wilmington-Torrance-Redondo Beach anticline which has had a long production history and associated pressure changes. However, there are no existing offshore bench marks in the proposed production area. There are a number of inshore coastal bench marks that have been in existence for years (Figure 2).

Figure 4 is a hypothetical plot of vertical elevation change vs. time for a single coastal bench mark. The data for each bench mark consists of vertical elevation measurements and the time or date of the measurement. Total elevation change and the rate of change can be computed from these data. If the bench mark is resting on material similar to offshore sediments, and near to the offshore bench mark, its historic performance can be used to estimate future elevation changes or trends. If the long term subsidence is relatively constant (i.e., line ABCD is approximately straight), a change in rate, possibly related to pressure drop in the reservoir, can be estimated as shown on Figure 4.

Clearly a single bench mark is less reliable as a predictor of the rate of pre-production regional elevation change as are a group of bench marks (Figure 5). The performance of a single bench mark can be influenced by local processes that are unrelated to regional elevation change. The same could be true for an offshore bench mark. Therefore, the subsidence rate, within the Hermosa Beach project area (Figure 2), will be based on the performance of a series of coastal bench marks that extend from south of Redondo Beach to the northern limits of Manhattan Beach. Some of these bench marks are shown on Figure 2. A subsidence rate profile will be constructed. The average subsidence rate and rate changes, as a function of time, for each onshore bench mark will be calculated. Changes in the rate of subsidence, for each bench mark, will be reviewed as to cause (i.e, earthquake induced settlement, etc.). Historic subsidence rate and rate variations, if any, will be calculated for the Hermosa Beach area.

Offshore bench marks will be established in a grid pattern directly above and beyond the expected zone of maximum oil production as shown on Figure 2. Offshore subsidence rates, if measurable, will be compared to historic and ongoing onshore rates.

Oil production related subsidence, if it occurs, should be first observable directly above the region of maximum oil withdrawal or maximum change in reservoir pressure. Elevation changes will diminish radially from the area of maximum production. A test for oil production related subsidence is therefore a systematic change in the rate of subsidence that diminishes as a function of distance from the zone of maximum fluid withdrawal. Shown on Figure 5 is a an example of the

test noted above. Review of Figure 5 indicates that the amount and location of subsidence and resultant tilt of the ground surface, relative to the shore line (MLLW), are also critical.

In summary, mitigation of suspected oil production subsidence will commence when all of the following offshore bench mark changes are observed:

1. There is a regional increase in the rate of subsidence, at several adjoining bench marks, that can not be attributed to other processes (Figure 4);
2. The change in subsidence rate, of the OSMP grid of bench marks, conforms to a pattern of concentrated rate change above the zone of maximum fluid withdrawal and/or fluid pressure drop and a reduction in subsidence rate as a function of increasing distance from the reservoir (Figure 5); and
3. The near shore change in slope gradient is projected to affect the elevation of bench marks in the closure or null zone (Figure 6).

5. MONITORING AREA

Twelve Bench Marks will provide the necessary offshore control for monitoring shoreline changes. Proposed locations of OSMP bench marks are shown on Figure 2. Bench marks are located in a grid pattern above and beyond the limits of the surface projection of the prominent oil/gas producing zones in the Pliocene/Miocene strata that have closure on the 103 Fault. Two bench marks are located seaward of the fault and the rest along a grid that can be extended on land forming a series of traverses over the portion of the field where most of the production is likely to take place. This will provide regional control of elevation changes both on land and over the offshore producing field. The seaward end of the Hermosa Beach Pier is ideally located to provide a reference control of the underwater Bench Marks. The pier also provides a means of relating offshore bench marks to the on land bench mark grid.

6. MONITORING METHODOLOGY

The OSMP will include measuring the rate and amount of slope variation along three transects extending from on land to the 103 Fault (Figure 2). Three bench mark transects are recommended over the Upper Main or primary target zone for production. The distribution of bench marks covers sufficient initial area to account for variations in bottom hole targets as the field is developed.

Measurements will be conducted by attaching a taught wire buoy/platform to bench mark sediment anchors jetted into the sea floor to a depth of 6 to 10 feet (Figure 7). The surface buoy will be winched taut so that there is little to no movement caused by passing sea, swell, and wind (Figure 8). This method has been used in other areas of southern California for a number of years and is a known method of establishing long term study sites on the sea floor. An echo-sounder on the buoy/platform will also be used to determine a mean depth of water as the elevation measurements are being made. Differential Global Positioning System with an accuracy of ± 1.5 cm (5/8 inch) in the horizontal direction and ± 2 cm (± 0.8 inch) in the vertical direction will be used to determine buoy location over the sea floor bench marks (Appendix B). Divers will attach the taught wire buoy/platform to the bench marks. Depth measurements will be accurate to ± 4 cm (± 1.6 inch). The total accuracy of the measured offshore bench marks elevation will be ± 6 cm (± 2.4 inch).

Bench marks will be installed and baseline measurements will be conducted prior to the production phase. During the first stages of production measurements will be taken biannually. As production increases measurements may be taken more often. The frequency of measurements will ultimately be based on subsidence rate and nearshore tilting of the coastline. Annual measurements are recommended as a minimum.

7. SUBSIDENCE CONCERNS AND SUMMARY OF POSSIBLE MITIGATION MEASURES

The following is summary of additional actions agreed upon by Macpherson Oil Company. In the following the word "applicant" means Macpherson Oil Company.

7.1 Reinjection Program

All oil field brines will be reinjected into oil producing zones unless the Division of Oil and Gas of the Department of Conservation determines, in writing, that to do so would adversely affect production of the reservoirs and unless reinjection into other subsurface zones will reduce environmental risk. All changes to the reinjection plan will be submitted to the Commission for written approval, by the executive director, prior to initiation.

7.2 Phase II: Development Phase Monitoring

All onshore and offshore bench marks will be in place prior to the commencement of the Phase II Development Phase. Semi-annual data collection, taken at all identified survey locations, shall start before or no later than the start of the development phase and three sets of measurements shall be taken prior to the beginning of the Phase III Production Phase.

7.3 Report on Baseline and Background Conditions

The applicant will prepare a report summarizing all baseline and background[1] data collection, including a review of regional and local geologic conditions affecting ground movement in the Hermosa area; review of historic regional and local subsidence and settlement problems and related

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[1] Baseline conditions are the surface elevations measured at the time of, or close to the time of initial production. Background conditions are the surface elevation changes measured prior to the commencement of production. These measurements shall be used as indicators of natural subsidence which is not influenced by the production phase of the project. The measured pre-production phase elevation changes shall be used to extrapolate future natural subsidence, without the project.

processes; review of historic changes effecting coastal sediments and project; development of an agency and individual contact program; quantification of both baseline elevation and background elevation changes without the full oil and gas extraction program; and, extrapolation of pre-production conditions, in five year increments, to establish the "without project" elevation changes against which the measured changes will be evaluated. This report will be completed and made available to the California Coastal Commission and the State Land Commission at least two months and no more than six months prior to planned commencement of Phase III Production. If required by the Executive Director, Macpherson will fund a peer review of this report, with up to three reviewers approved by the Executive Director.

The applicant reserves the right to update and add to the information available in the Phase II Development Phase Baseline Background Conditions Report, at any time. If the applicant decides to reexamine the Baseline and Background Conditions Report, the applicant will notify the executive director that additional research is being undertaken. Such effort shall be undertaken in a timely manner and will not be used as a reason to delay any of the subsidence mitigation steps. All new information will be submitted to the Executive Director and to the State Lands Commission and will be reviewed by the peer review process established for the initial report. The new information and accompanying analysis will not be incorporated into the Baseline and Background Conditions Report until the peer review is complete and the changes or additions have been approved, in writing, by the executive director.

7.4 Phase III: Production Phase Monitoring

The applicant will measure shoreline and offshore elevations annually through the life of the project, with annual summary reports provided to the executive director and the State Lands Commission, within one month following the end of each annual cycle. If the measurements identify any onshore sites with a total elevation changes greater than 4" from the agreed upon baseline (including the extrapolated background changes), or any offshore sites with subsidence greater than 1' from the agreed upon baseline (including the extrapolated background changes), the executive director will be notified of these changes by phone at the same time that the reports are

being transmitted. Changes to the location and frequency of monitoring will be undertaken. If 1) results of these monitoring efforts indicate that changes would improve the monitoring information; 2) these changes would not reduce the utility of the background report and earlier monitoring results; and 3) the executive director has approved of these changes, in writing.

7.5 Mitigation of Offshore Subsidence

If the offshore monitoring identifies a bowl-like subsidence feature, with progressive subsidence (greater than the extrapolated background level) of 6 or more inches at any two sites, or of 4 or more inches at any one site which is located in less than 30 feet of water, the applicant will 1) immediately notify the executive director; 2) increase the monitoring schedule to every 3 months for onshore and offshore surveys; 3) evaluate the injection program and propose to the executive director changes or modifications to better address existing conditions within two months after the elevation drop being observed; 4) implement approved changes to the reinjection program within 30 days after approve has been received.

If the changes to the reinjection program do not halt or reverse subsidence, and the offshore monitoring program identifies a bowl-like subsidence feature, with progressive subsidence (greater than the extrapolated background level) of 8 or more inches at any two sites, or of 8 or more inches at any one site which is located in less than 30 feet of water, the applicant will 1) immediately notify the executive director; 2) evaluate a repressuring program which would reinject a quantity of fluid somewhat comparable to the total amount of fluid being withdrawn; 3) propose to the executive director changes or modifications to the reinjection program to better address existing conditions within two months after the elevation drop being observed; 4) implement approved changes to the reinjection program within 30 days after approve has been received.

If the changes to the reinjection program do not halt or reverse subsidence, and the offshore monitoring program identifies a bowl-like subsidence feature, with progressive subsidence (greater than the extrapolated background level) of 12 or more inches at any one site which is located in less than 30 feet of water, the applicant will 1) immediately notify the executive director; 2) halt or

reduce production from all wells within the zone of subsidence or initiate any and all other changes to production to halt the drop in elevation and or the lateral spreading of this drop. If after modifications to reinjection and production are attempted, the measured elevation drops continue to subside, or if the number os sites with an elevation drop increases, the entire project shall halt until both the measure subsidence stabilizes and a new extraction and reinjection plan can be prepared to insure no additional subsidence will occur.

7.6 Mitigation of Onshore Subsidence

If on-shore monitoring identifies a bowl-like subsidence feature with progressive subsidence (greater than the extrapolated background level) of 1.2 inches (0.1 feet) at 6 or more of the benchmark sites identified in the Exhibit A of the City approved Subsidence Monitoring and Control Plan Prepared for The City of Hermosa Beach by Leonard W. Brock, dated 1 August 1994, the applicant will 1) immediately notify the executive director and any other contacts identified by the City's Conditional Use Permit; 2) increase the monitoring schedule to every 3 months for onshore and offshore surveys; 3) evaluate the injection program and propose to the executive director changes or modifications to better address existing conditions within 2 months after the elevation drop being observed; 4) implement approved changes to the reinjection program within 30 days after approve has been received.

If the changes to the reinjection program do not halt or reverse subsidence, and the on-shore monitoring program identified a bowl-like subsidence feature, with progressive subsidence (greater than the extrapolated background level) of 1.8 inches (0.15 feet) at any two sites , or of 8 or more inches at 6 or more of the benchmark sites identified in the Exhibit A of the City approved Subsidence Monitoring and Control Plan Prepared for The City of Hermosa Beach by Leonard W. Brock (1994), the applicant will 1) immediately notify the executive director and any other contacts identified by the City's Conditional Use Permit; 2) evaluate a repressuring program which would reinject a quantity of fluid somewhat comparable to the total amount of fluid being withdrawn; 3) propose to the executive director changes or modifications to the reinjection program to better

address existing conditions within two months after the elevation drop being observed; 4) implement approved changes to the reinjection program within 30 days after approve has been received.

If the identified action do not halt or reverse on-shore subsidence, and the on-shore monitoring identifies a bowl-like subsidence feature, with progressive subsidence (greater than the extrapolated level) exceeds 2.4 inches (0.2 feet) or 6 or more of the bench mark sites identified in the Exhibit A of the City approved Subsidence Monitoring and Control Plan Prepared for the City of Hermosa Beach by Leonard W. Brock (1994), the applicant will halt or reduce production from all wells within the zone of subsidence, or initiate any and all other changes to production to halt the drop in elevation and or the lateral spreading of this drop. If, after modifications to reinjection and production are attempted, the measured elevation drops continue to subside, or if the number of sites with an elevation drop increases, the entire project shall halt until both the measured subsidence stabilizes and a new extraction and reinjection plan can be prepared to insure no additional subsidence will occur.

8. REFERENCES

Brock, L. W., 1994. Subsidence Monitoring and Control Plan Prepared For City of Hermosa Beach. Report submitted to Mr. Stephen Burrell, City Manager, City of Hermosa Beach, Civic Center, 1315 Valley Drive, Hermosa Beach, CA 90254-3885, dated 1 August 1994, 4 pp plus addendum and 4 Exhibits.

Helm, D. C., 1984. Field-based computational techniques for predicting subsidence due to fluid withdrawal, in Man-Induced Land Subsidence, Ed. T. L. Holzer, GSA Reviews in Engineering Geology, v. VI, 1 - 22.

Martin, J. C. and Serdengecti, S., 1984. Subsidence over oil and gas fields, in Man-Induced Land Subsidence, Ed. T. L. Holzer, GSA Reviews in Engineering Geology, v. VI, 23 - 34.

Robert N. Hacker, Inc., 1988. Geologic report Hermosa Beach tidelands and uplands, prepared for Macpherson Oil Company.

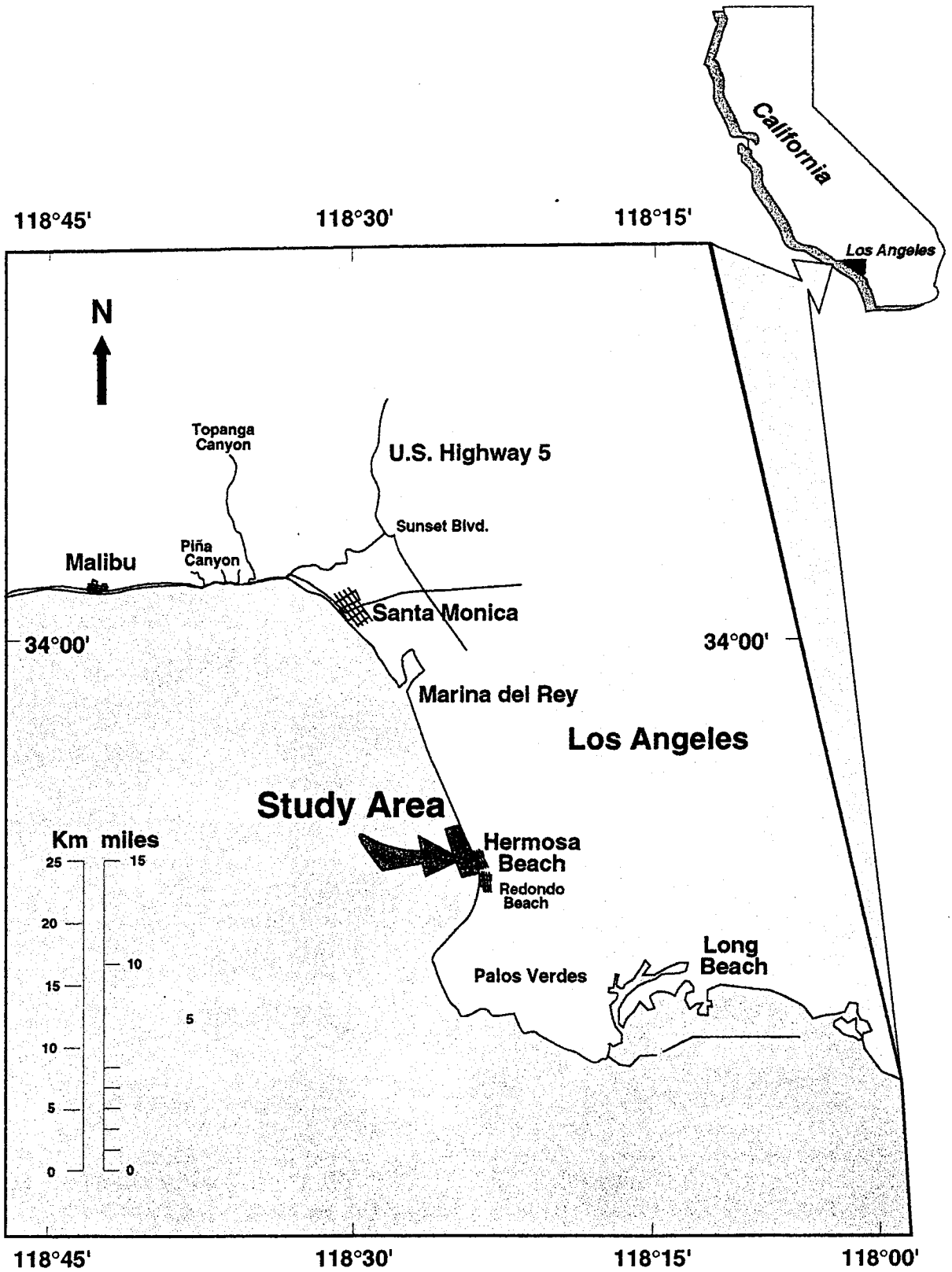


Figure 1 - Index map of Hermosa Beach study area relative to Los Angeles and the southern California coast line.

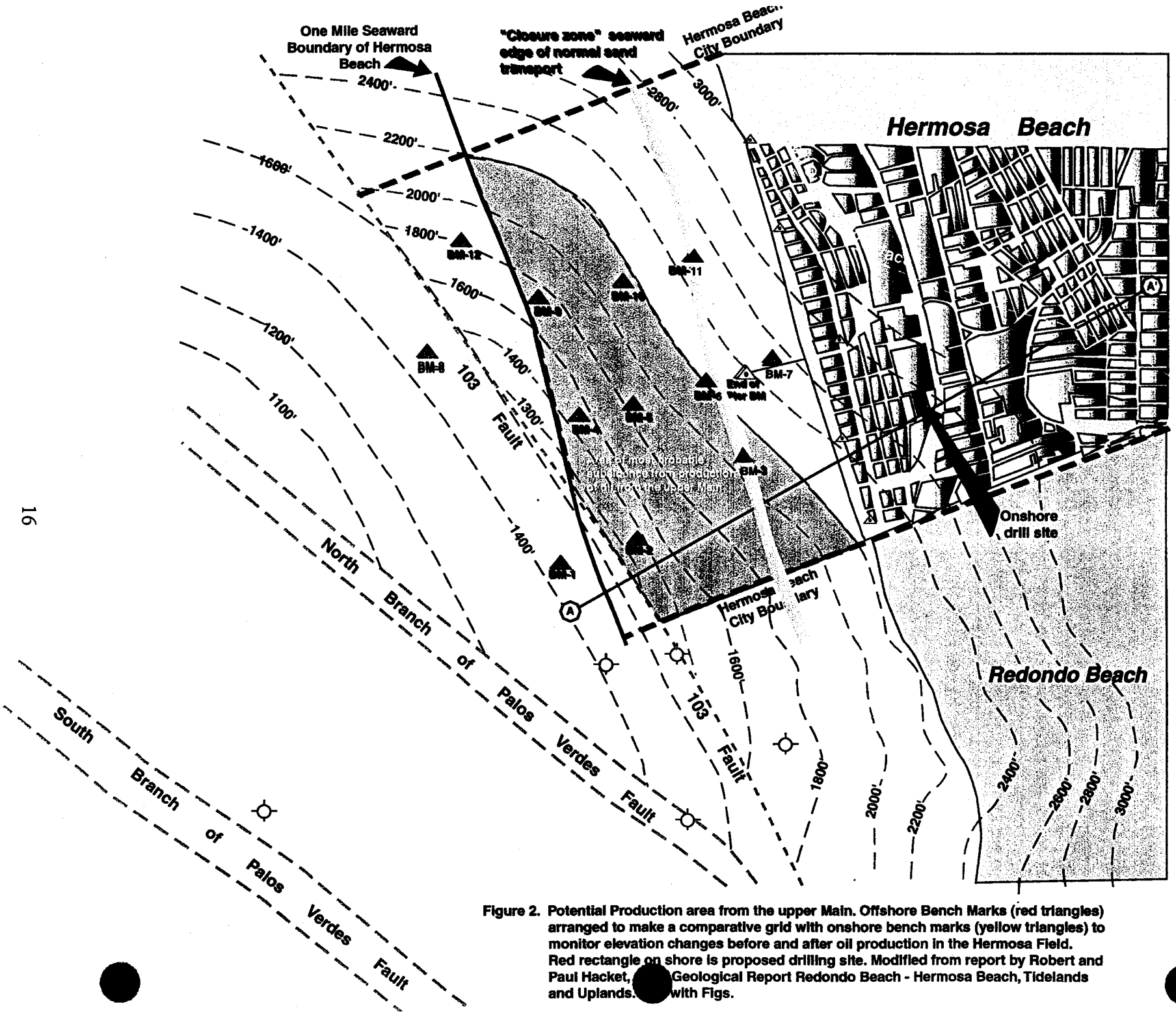


Figure 2. Potential Production area from the upper Main. Offshore Bench Marks (red triangles) arranged to make a comparative grid with onshore bench marks (yellow triangles) to monitor elevation changes before and after oil production in the Hermosa Field. Red rectangle on shore is proposed drilling site. Modified from report by Robert and Paul Hacket, Geological Report Redondo Beach - Hermosa Beach, Tidelands and Uplands. with Figs.

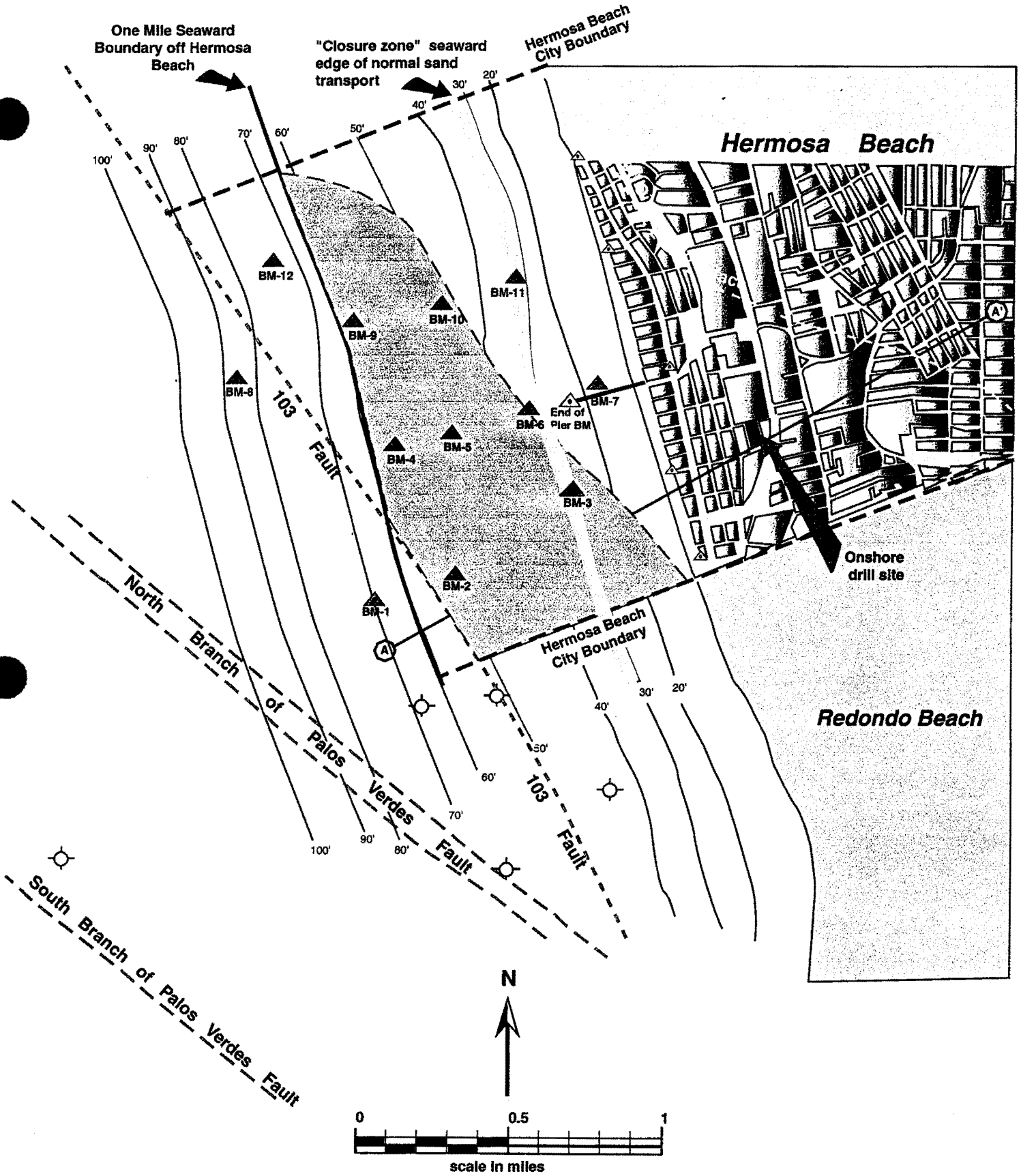


Figure 2A. Bottom bathymetry seaward of Hermosa Beach showing locations of Underwater Bench Marks in the area over potential oil production (blue). Yellow to green band at 30 to 35 feet is the seaward edge of the zone of non-transport of beach sands. Contour interval is 10 ft. Red block onshore is the site of proposed directional offshore drilling. Modified form report by Robert and Paul Hacket, 1988, Geological Report Redondo Beach - Hermosa Beach, Tidelands and Uplands, 16 p. with Figs. and projected depths from a survey by Eco-Systems Management, Inc.

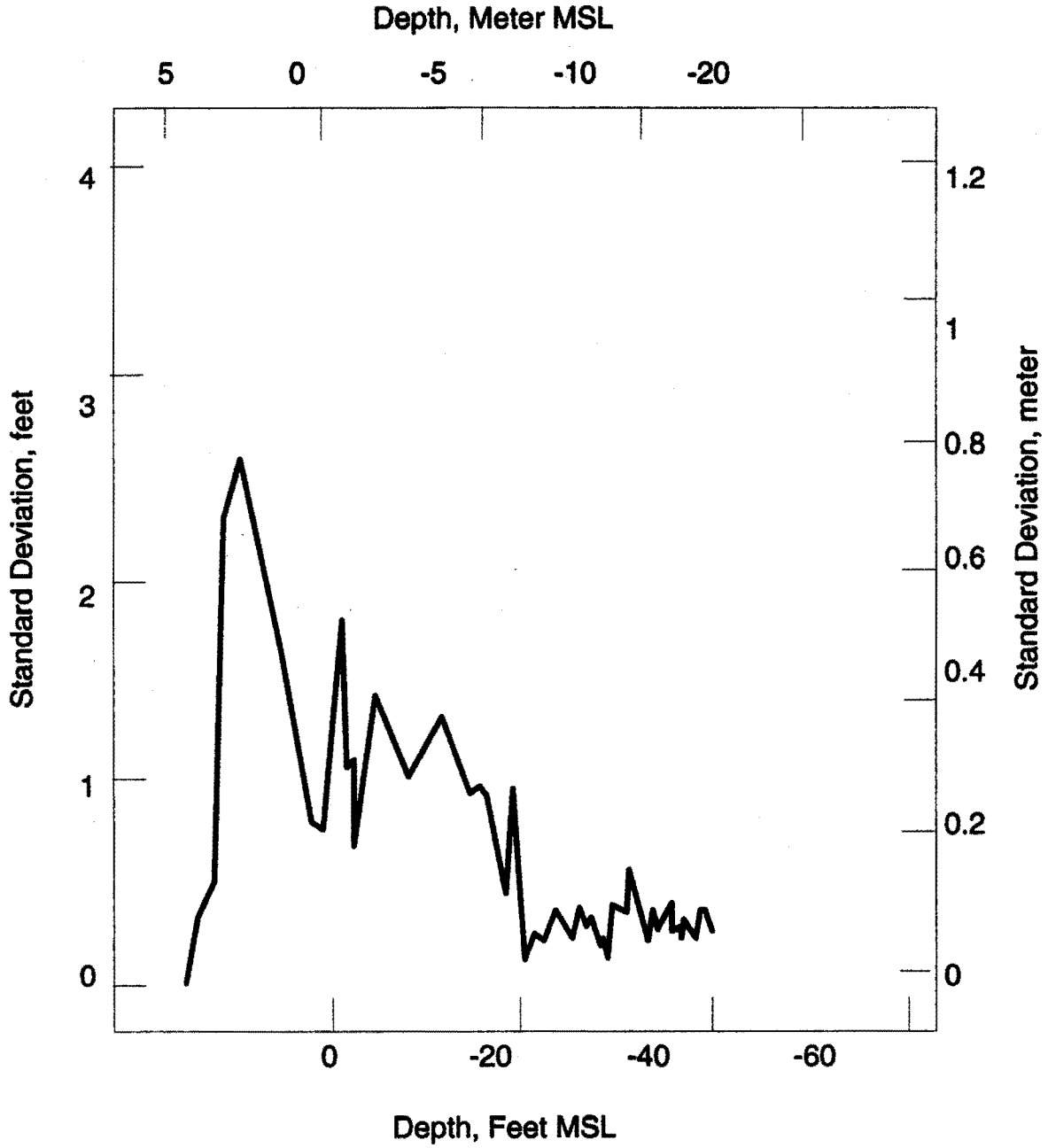
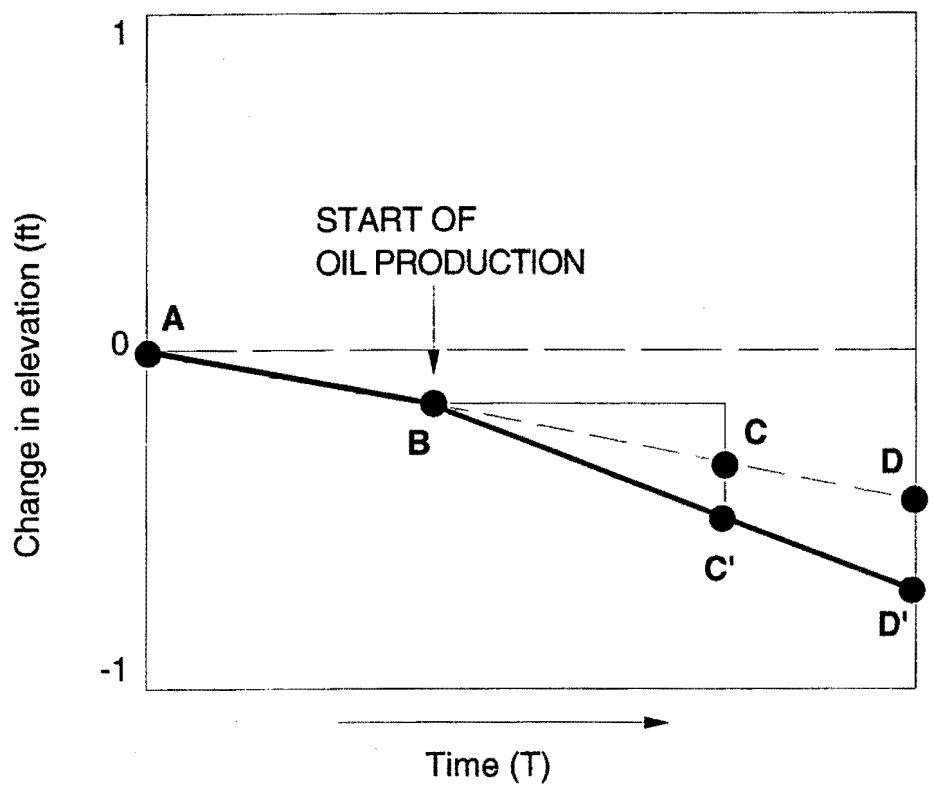


Figure 3 - Typical plot of standard deviation of depth changes and depth from repeated surveys of the same profile. Closure depth is about 10 m (30+ feet).



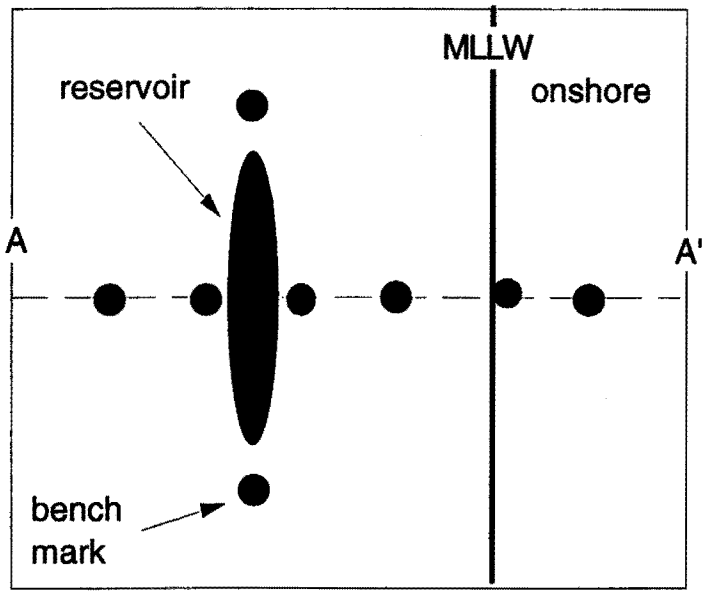
$S = (A - B)/T$

= Long term, onshore pre-oil production subsidence rate or change in elevation/time between measurements

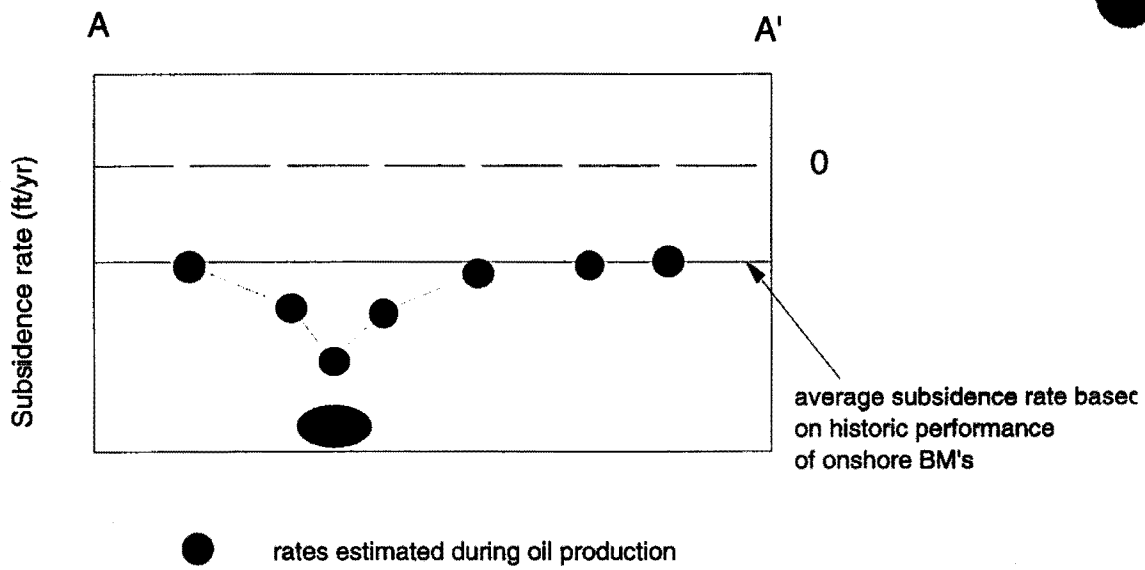
$SOP = [(B - C')/T] - S$

= Approximate subsidence rate due to oil production

Figure 4 - Long term elevation change, single onshore bench mark, and potential effect of oil production on bench mark performance.



(A) Map view



(B) Cross-section A-A'

Figure 5 - Typical subsidence pattern associated with the production of fluids relative to average regional elevation change.

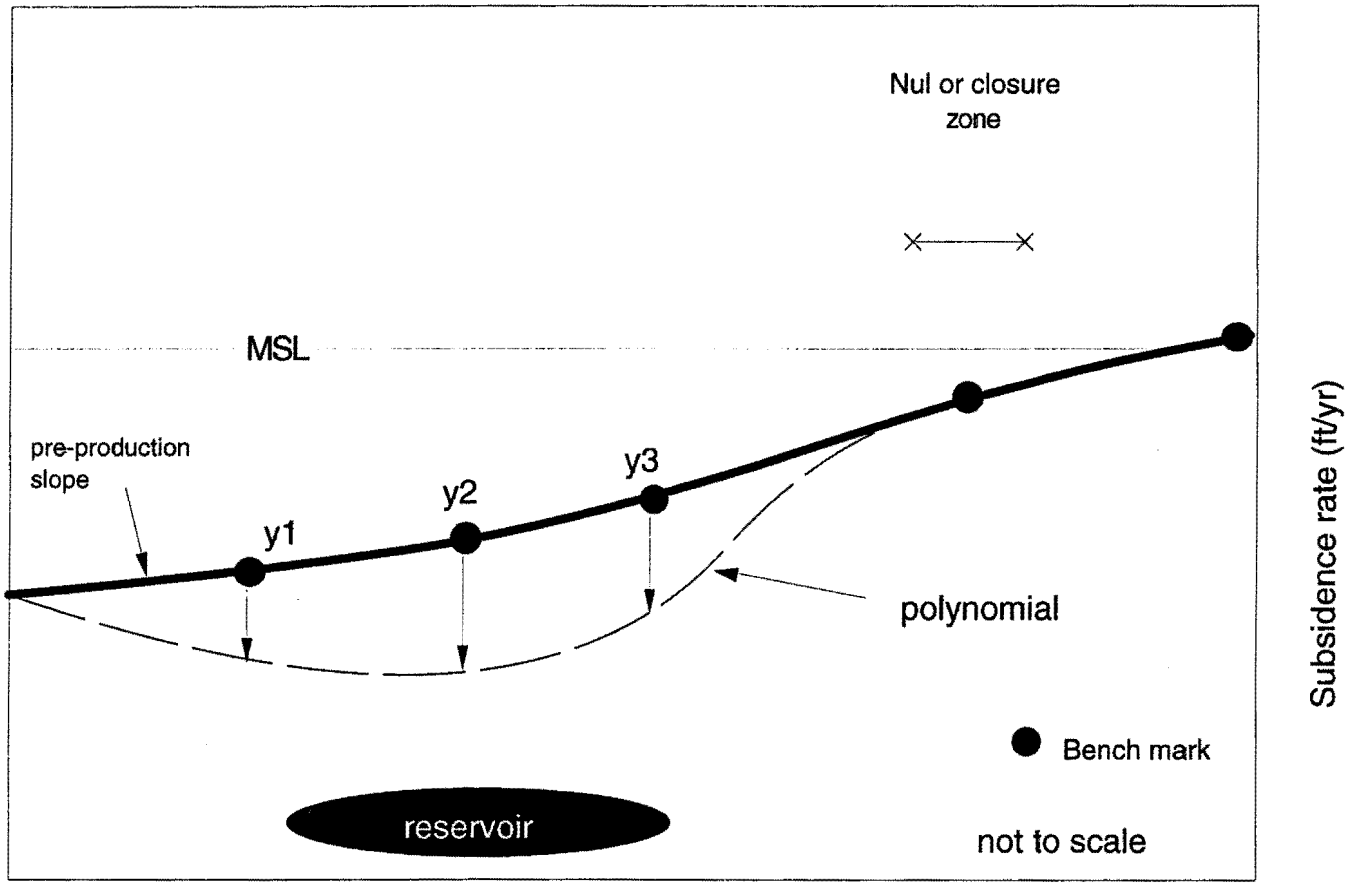


Figure 6 - Skematic diagram shows bench marks y1, y2, and y3 uniformly located across the production reservoir. A best fit polynomial is fitted to subsidence rate to estimate the influence of oil production.

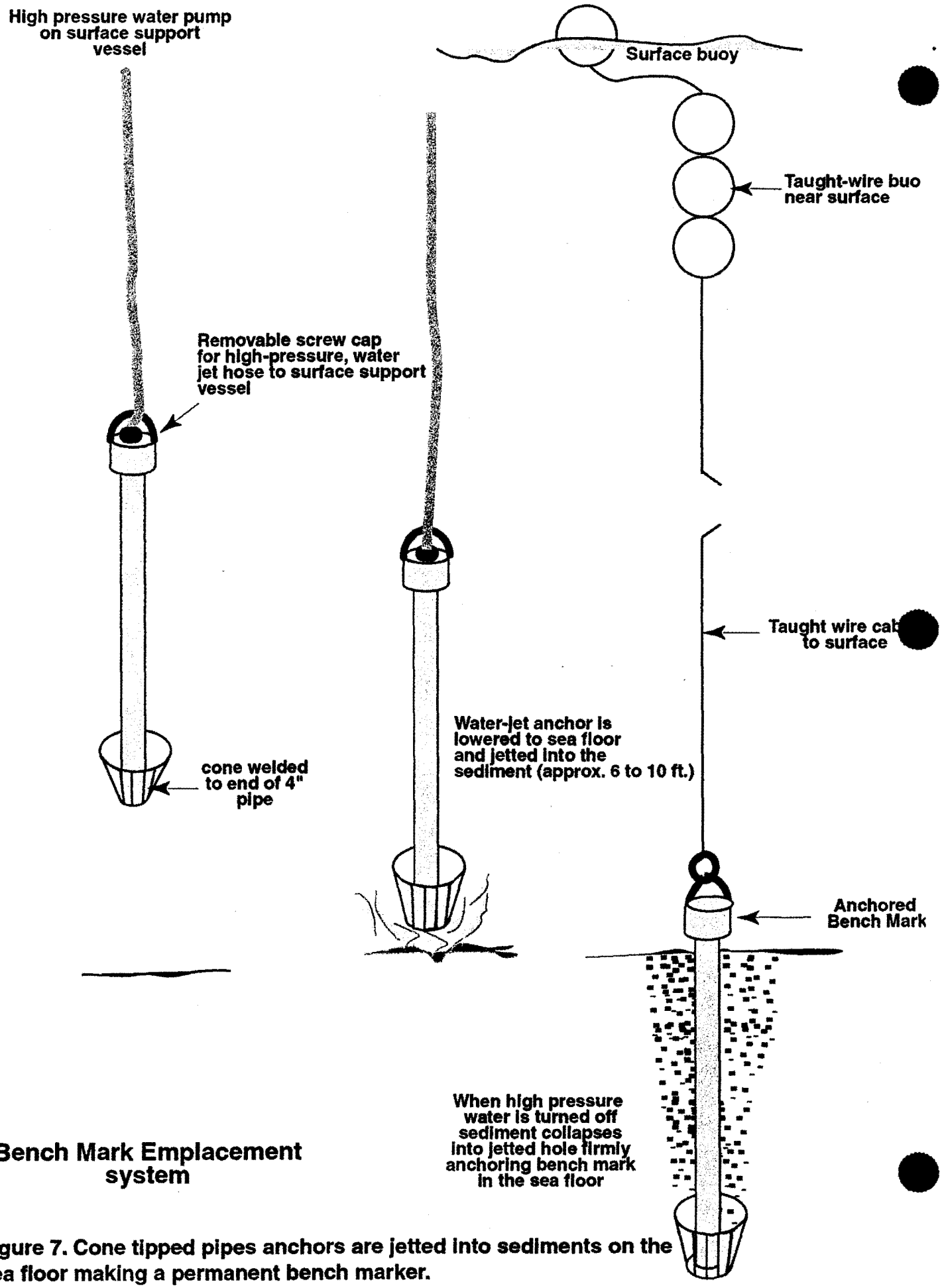


Figure 7. Cone tipped pipes anchors are jetted into sediments on the sea floor making a permanent bench marker.

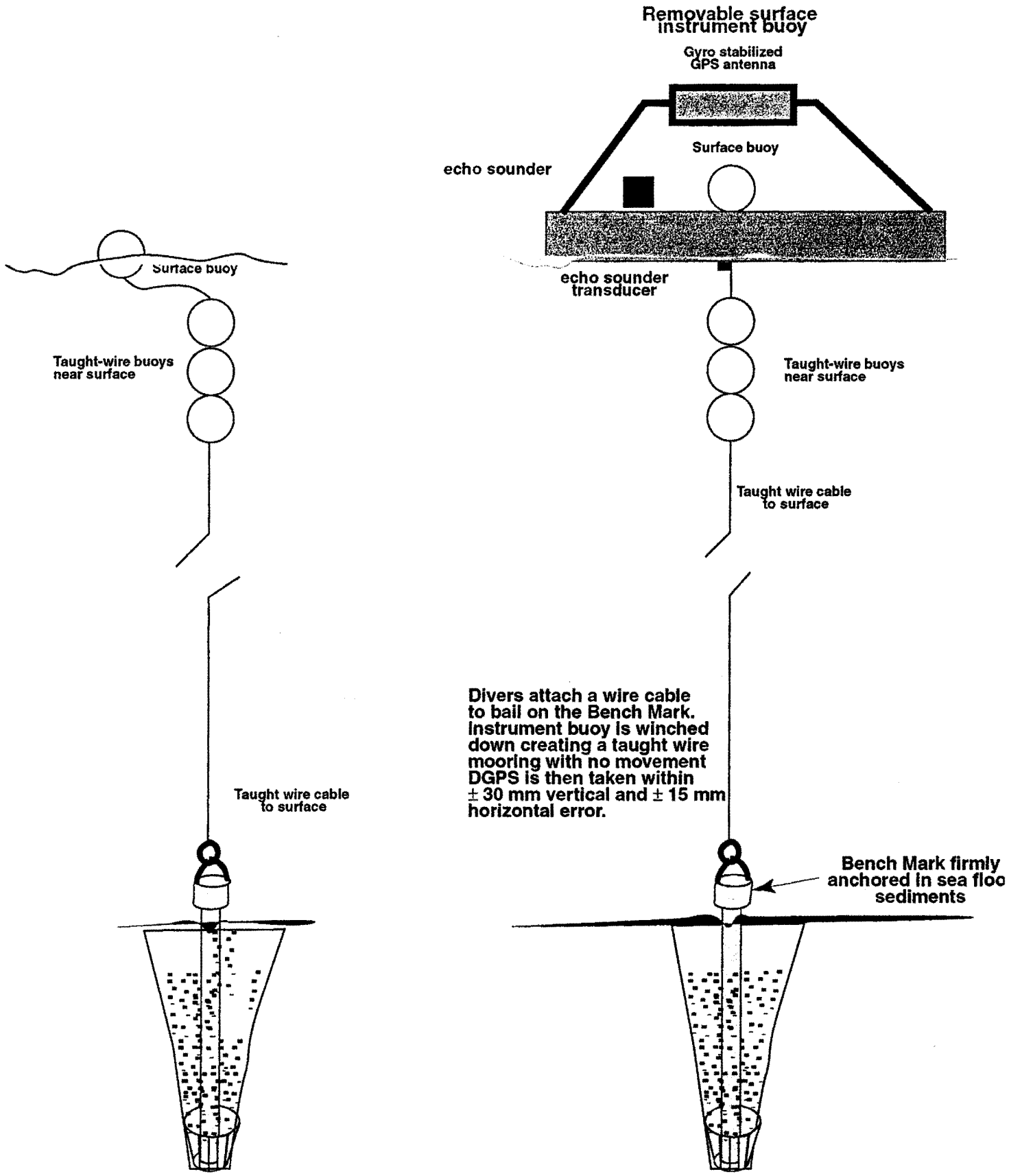


Figure 8. Bench mark measurement require a diver to attach a wire line to the bench mark after location using a DGPS at the surface. Once attached the wire in winched tight to the surface instrument buoy. An echo sounder records depth and insures no vertical movement of instrum buoy.

APPENDIX A

BEACH PROFILES

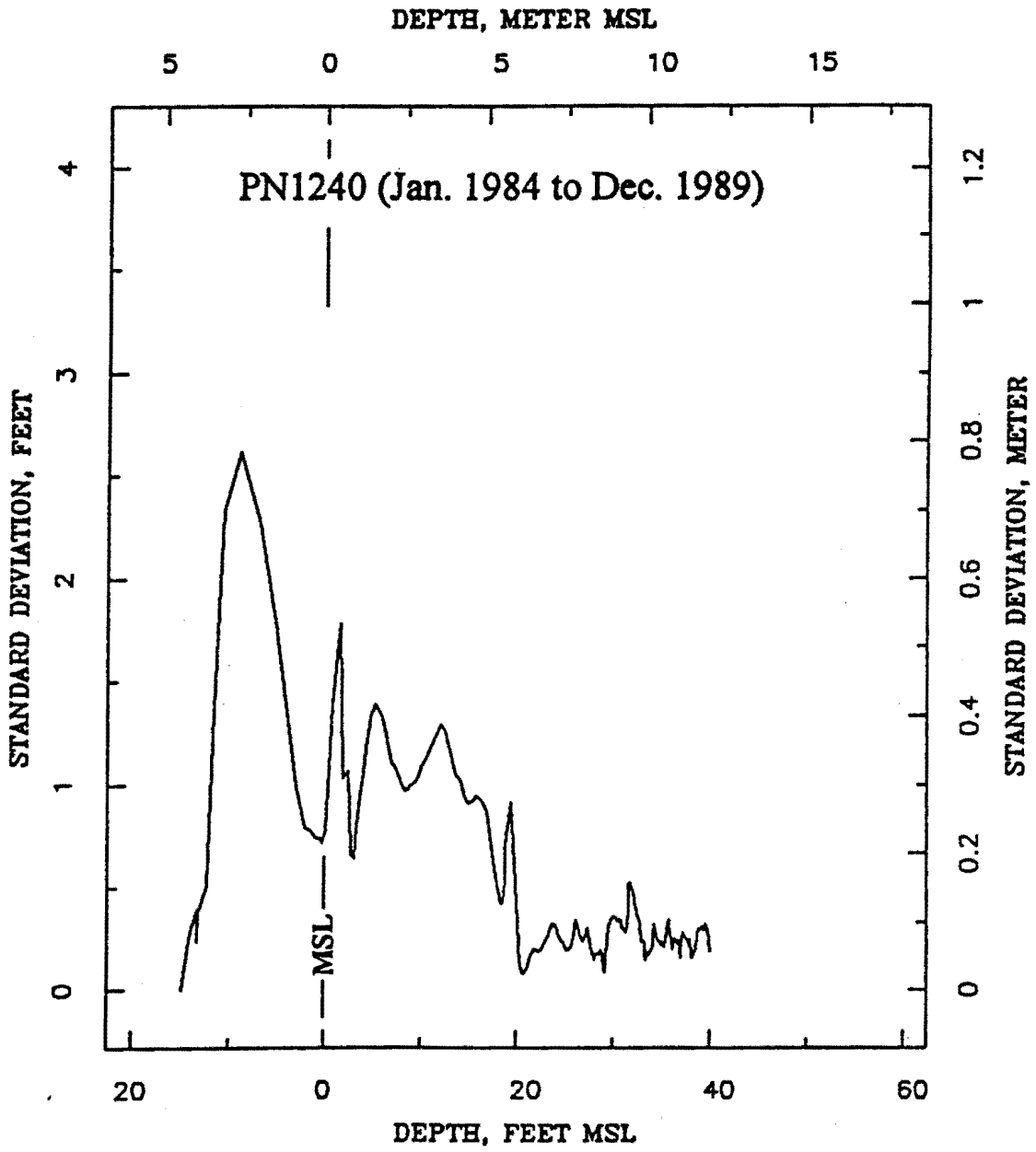


Figure A-1. Closure interval for the period January 1984 to December 1989 on range PN1240. Range PN1240 is located north of Oceanside Harbor. Data are based on nine surveys with about 300 data points each.

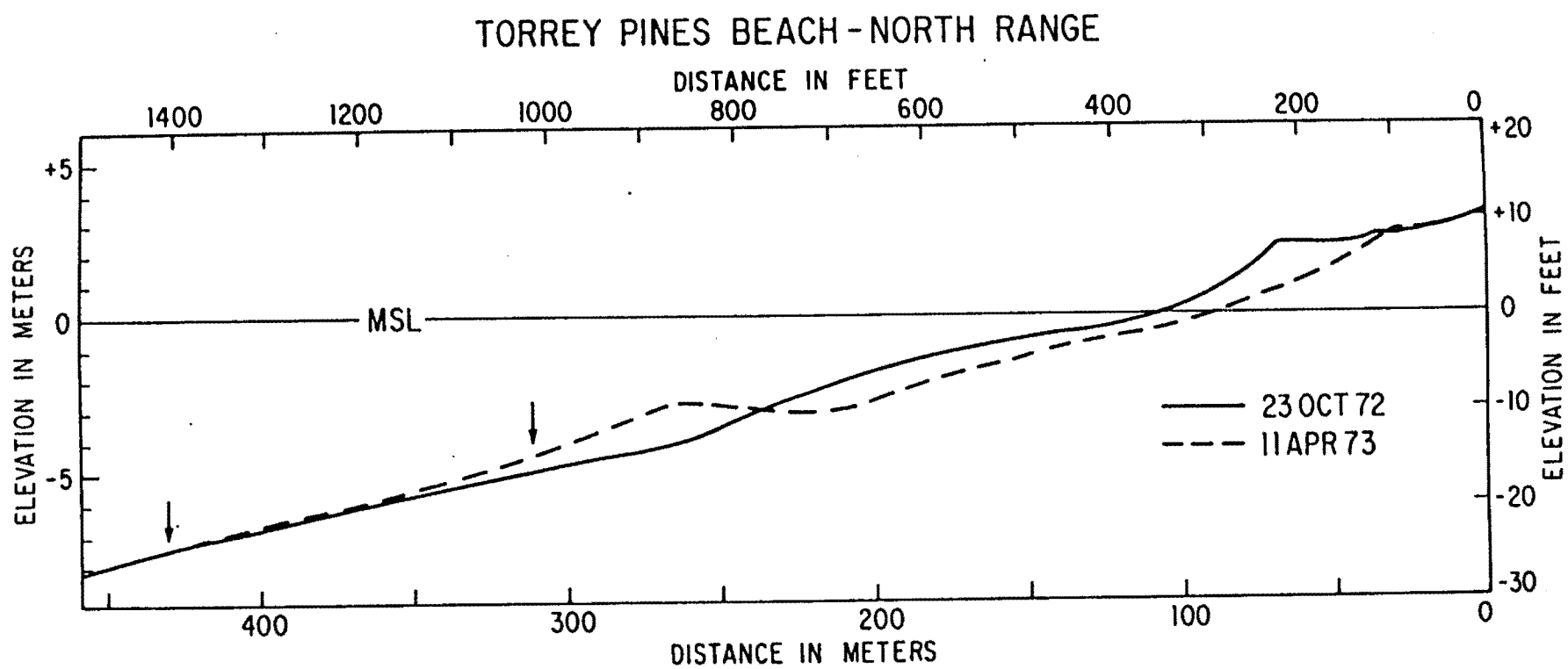


Figure A-2. Beach profiles measured at Torrey Pines Beach (from Nordstorm and Inman, 1975).

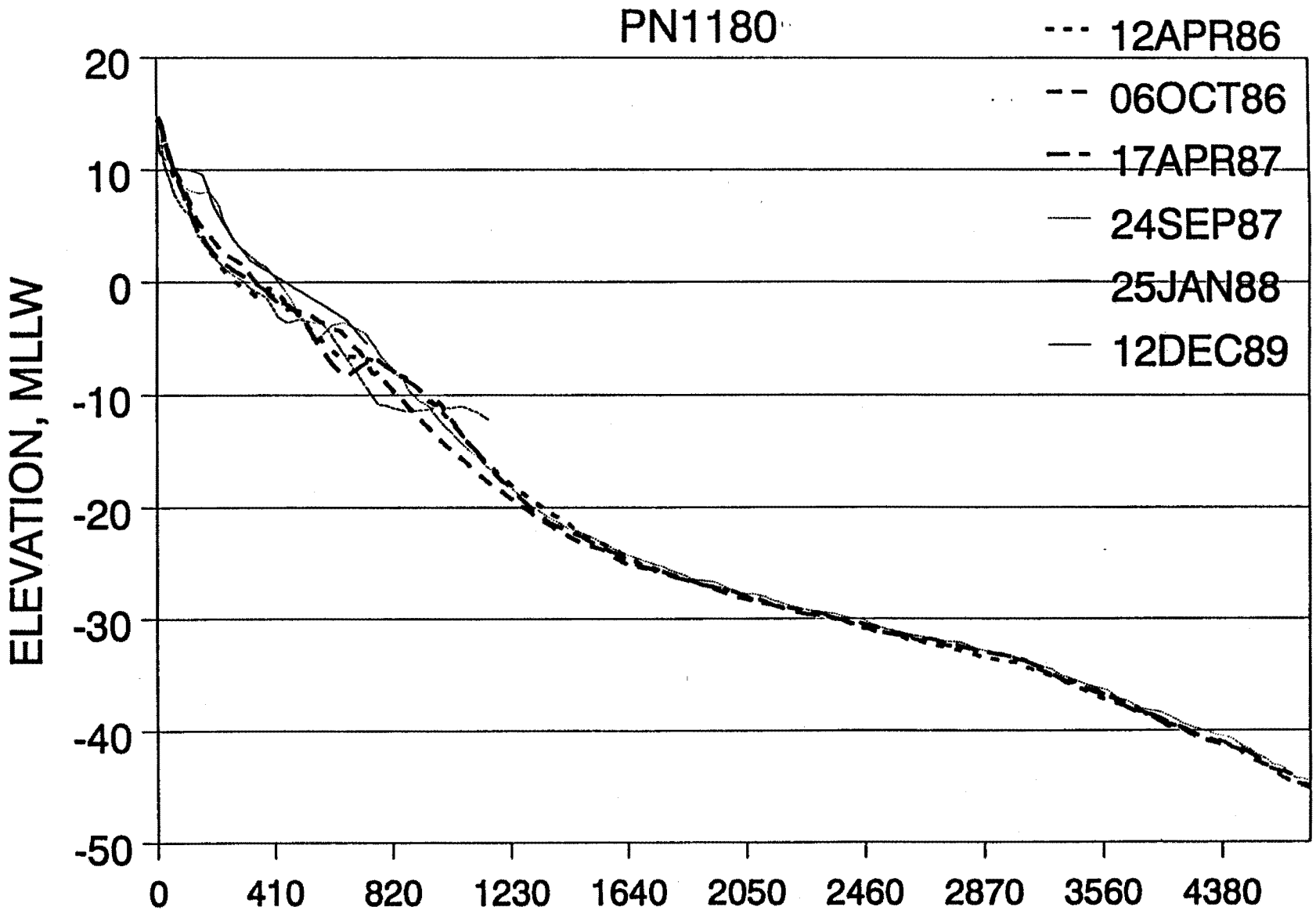


Figure A-3. Beach profiles measured at ra PN1180 located 12,000 ft north of Oceanside Harbor.

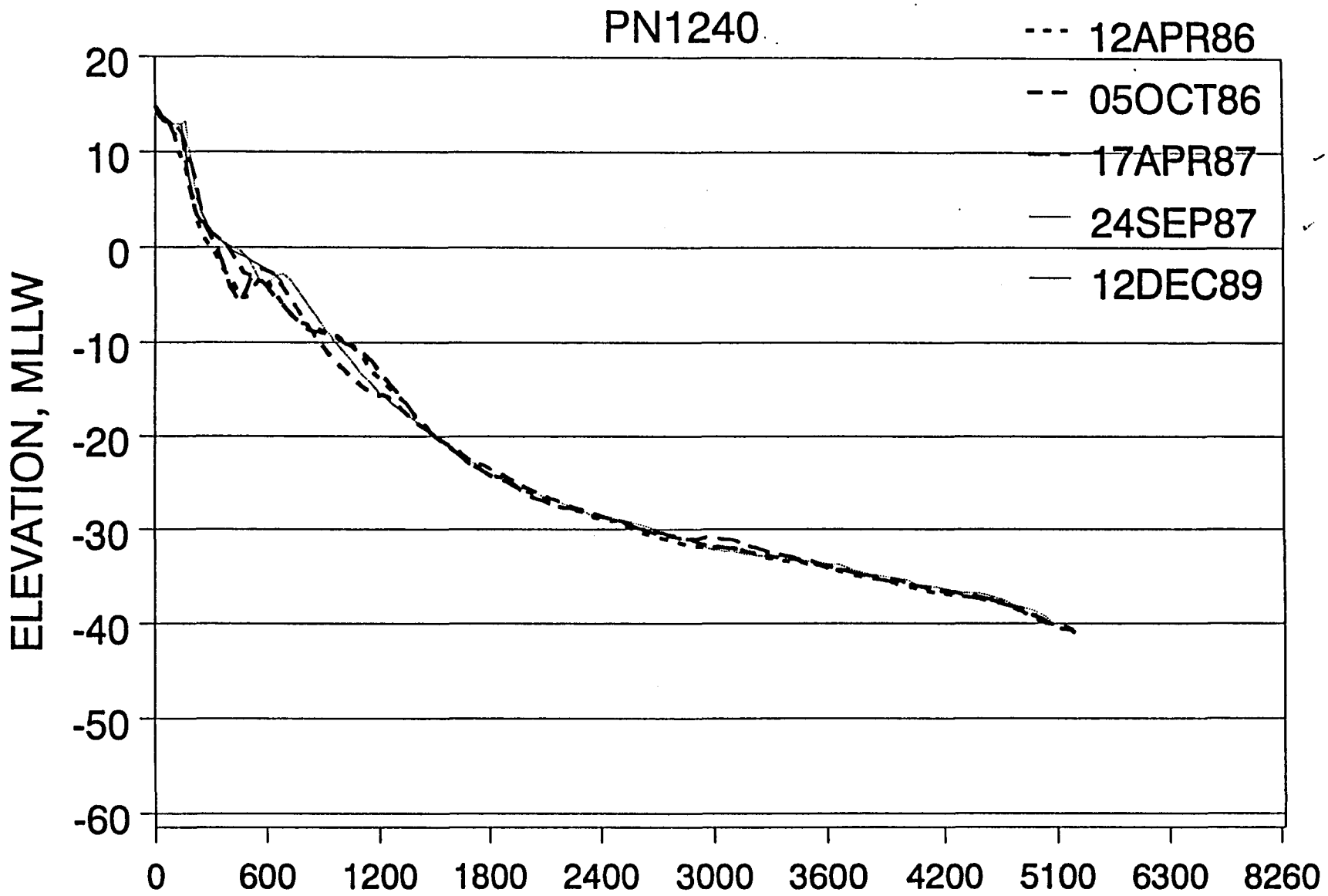


Figure A-4. Beach profiles measured at range PN1240 located 22,000 ft north of Oceanside Harbor.

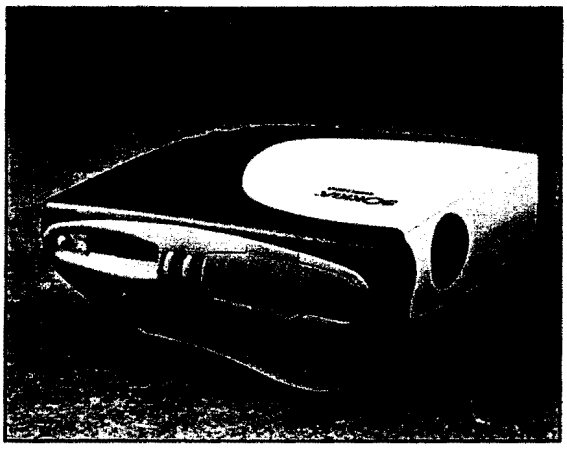
APPENDIX B

SPECIFICATIONS OF THE GLOBAL POSITIONING SYSTEM (GPS)

SOKKIA™

NEW GSR2300

GPS SYSTEM



Sokkia's new GSR2300 GPS System is an integrated, compact system for high-accuracy post-processed and real-time GPS surveying.

The GSR2300 is a small, light-weight and affordable GPS system. But don't let its size fool you; the GSR2300 provides all the power and flexibility you need for topographic mapping, stake-out, control and photogrammetry surveys. Short observation times, even over long baselines, enable a one-person crew to survey many more points per day than are possible using traditional survey instruments.

Combining a 12-channel, dual-frequency GPS receiver, battery, removable PCMCIA card for memory storage, and an optional internal radio datalink into one small unit, the GSR2300 is a portable system that allows centimeter-accurate surveying. All this in a small unit that weighs less than four pounds!

Surveying Productivity and Reliability

Use your GSR2300 for real-time kinematic or post-processed static, rapid static and kinematic positioning. The two-button, eight-character display controls the unit; or, for even greater flexibility, you may choose to add a separate hand-held survey controller such as Sokkia's new SDR®33 GPS/RTK Controller.

For real-time kinematic surveying (RTK), the standard GSR2300 can be used in base station or rover mode. The system offers speed, reliability and productivity because of its combined Z-Tracking and advanced algorithms that provide unprecedented performance.

When it comes to speed, the GSR2300 excels with instantaneous, precise centimeter positions in real-time. It even calculates positions up to 10 times a second. And the dual-frequency reception solves for ionospheric refractions, so baseline measurements are consistently accurate.

Z-Tracking improves satellite tracking under noisy electromagnetic conditions, such as near power lines, transmission towers and airports—even with short observation times for post-processed surveys. Centimeter-accurate measurements over baselines of one mile can typically be made with one-minute observations, increasing your productivity because you can make more measurements in less time.

Integration and Flexibility

The GSR2300's integration makes it extremely easy to use; all the components are in one compact package, so you don't have to worry about cumbersome connections or compatibility. The system offers significantly reduced power consumption compared to other GPS surveying receivers; you can survey up to 4.5 hours on a single internal battery! (You can also use external batteries when necessary.)

The GSR2300 offers flexible memory options with its PC-card (PCMCIA) slot for removable data storage. This allows you to configure memory from 2 to 85Mb using PCMCIA cards. And data transfer is easy; just remove the memory card and insert it into your computer. Or, connect the GSR2300 directly to your computer using one of the four RS232 serial ports.

Another convenient benefit of the GSR2300 is its optional internal spread-spectrum radio used as a data link for real-time centimeter processing (RTK). The integrated radio makes the real-time link much easier and more reliable, because there are fewer connections and less equipment to carry and maintain. Or, if you prefer, you may also use your GSR2300 with other external UHF and spread-spectrum radios.

GSR2300 Specifications

Survey Performance

Static, Rapid Static	5 mm + 1 ppm
Post-processed kinematic and Pseudo-Kinematic Survey	1 cm + 1 ppm
Real-time Differential Position	<1 m (PDOP <4)
Real-time Z Kinematic Position	
Static (rms)	Horizontal 1cm Vertical 1.7cm
Static occupation time	2 seconds (typ.)
Sub-centimeter accuracy with longer occupation time.	
While moving (rms)	Horizontal 3cm Vertical 5cm
Azimuth	0.15 + 1.5/baseline length in km

Standard Features

- 12 Channel "all-in-view" operation
- Full wavelength carrier on L1 and L2
- Z-Tracking
- Real-time kinematic (base and rover) for cm-accuracy
- Removable PCMCIA memory card slot
- Internal, replaceable battery slot for 4.5 hr. operation
- Integrated 8-character LED display w/ 2-button control receiver interface
- Audible alarm for low power and battery power level
- Selectable update rate from 1 to 2Hz
- Real-time data outputs
- Real-time differential RTCM 2.1 input
- NMEA 0183 output
- 1 PPS timing signal
- Remote monitoring
- Session programming
- 7.5 Watt power consumption
- External 10 - 28 VDC power input
- 4 RS232 ports (115,200 baud max)

Standard Accessories

- Communications software
- Internal battery
- International dual battery charger
- RS232 data cable (Z-format)
- Receiver operating manual
- Field Quick Reference card
- Shoulder carrying strap

Design and specifications are subject to change without notice.

Receiver Communication Software

Quickly and easily configure the GSR2300 GPS receiver for a variety of surveying applications. Using the standard Windows™ interface, you can select serial port commands and set the required receiver parameters. Commander runs on Microsoft Windows™3.11, Windows™NT, and Windows™95.

Environmental

Water resistant; meets MIL-STD 810E (wind-driven rain)

Temperature Ranges		
GSR2300 Receiver	Operating	-20° to +50°C
	Storage	-30° to +75°C
Antenna	Operating	-40° to +65°C
	Storage	-55° to +75°C
Humidity	95%	

Physical Characteristics

Weight	Receiver	3.75 lbs
	Antenna	3.75 lbs
Dimensions	3"H x 7.3"W x 8.25"D	

Optional Features

- Internal spread-spectrum radio for RTK surveying
- 2, 4, 8, 10 and 20, 85Mb PCMCIA memory cards
- Real-time differential GPS RTCM output
- External frequency standard input 1 to 20 MHz in 10KHz steps
- Event marker
- Fast data output (10Hz)

Optional Accessories

- Geodetic antenna kit
- Kinematic antenna kit
- Backpack Kit
- Survey Tribrach and adapter
- Kinematic bipod and pole
- 3, 10, 30-meter antenna cable (expandable to 150 meters with line amps)
- External battery
- GSPRO2000 Post-Processing Software Package
- Choke Ring Antenna
- Aircraft antenna kit
- AC power cable
- UHF radio kit
- External spread-spectrum radio kit

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02GSR2300(6/97)TSP

STATE OF CALIFORNIA—THE RESOURCES AGENCY PETE WILSON, *Governor*

CALIFORNIA COASTAL COMMISSION
45 FREMONT, SUITE 2000
SAN FRANCISCO, CA 94105-2219
VOICE AND TDD (415) 904-5200

RECORD PACKET COPY

PERMIT APPLICATION # E-96-28
MACPHERSON OIL COMPANY

Date Filed: January 9, 1998
Hearing Date: February 4, 1998
Item No.: WED 6a

EXHIBITS

LIST OF EXHIBITS

Exhibit 1 City of Hermosa Beach, Measures P & Q

Exhibit 2 City of Hermosa Beach, Measure E

Exhibit 3 State Lands Commission, Minute Item 41, June 30, 1992

Exhibit 4 Letter from City of Hermosa Beach Attorney, RE: Measure E and Macpherson proposal

Exhibit 5 Letter from City of Hermosa Beach to California Coastal Commission, June 11, 1997, RE: LCP and Macpherson proposal

Exhibit 6 Letters from Coastal Commission, December 23, 1997; April 10, 1997; April 16 1997; and June 27, 1997, RE: Filing Status of E-96-28

Exhibit 7 Review of the Hazard Analysis for the Macpherson Oil Company Hermosa Beach Project, December, 1997- Final Report, Arthur D. Little, Inc.

Exhibit 8 Proposed Development Site - Thomas Brothers Guide Map

Exhibit 9 Proposed Development Site - Aerial Photograph

Exhibit 10 Proposed Development Site - Hermosa Beach General Plan Map

Exhibit 11 Truck Route Plan

Exhibit 12 Proposed Project Site Plans (with list)

Exhibit 13 Redondo Beach Alternative Sites Map

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MEASURE P

AN ORDINANCE OF THE CITY OF HERMOSA BEACH SUBMITTED TO THE VOTERS BY THE CITY COUNCIL AMENDING THE PROHIBITION AGAINST OIL WELLS TO ALLOW FOR THE PROCUREMENT OF OIL AND GAS FROM CERTAIN CITY OWNED LANDS.

The people of the City of Hermosa Beach do ordain as follows:

SECTION 1. There shall be added to Municipal Code section 21-10, Oil Wells Prohibited, Exceptions, a new paragraph to read in full as follows: "(a). There shall also be excepted from the prohibition of this Section 21-10, wells drilled from a site not to exceed one acre in size at the present City maintenance yard, which yard is located at the corner of Valley Drive and 6th Street. The drilling of wells bottomed in the Tidelands may produce revenue the use of which is limited by the State. General Fund revenue for which Tidelands revenue is substituted shall be used first to reduce any bonded indebtedness resulting from the enactment of Community Facilities District No. 1, which District would acquire the South School site, the Seaview Parkette, and the Railroad Right-of-Way; and, second, when the bonded indebtedness is paid, the acquisition, maintenance and improvement of available excess school or other properties for open space and parkland purposes.

SECTION 2. This ordinance may be amended only by a vote of the people.

SECTION 3. If any portion of this ordinance is declared invalid, the remaining portion is to be considered valid.

SECTION 4. Upon certification that this ordinance has been adopted by the voters of the City, the Mayor shall sign and the City Clerk shall attest to the passage and cause the ordinance to be published in the Easy Reader not later than the fifteenth dav after its adoption.

/ /

EXHIBIT NO. 1
APPLICATION NO.
E-96-28
Macpherson Oil

PASSED, APPROVED AND ADOPTED BY THE ELECTORATE OF THE CITY OF HERMOSA BEACH AT THE SPECIAL MUNICIPAL ELECTION OF NOVEMBER 6, 1984 BY THE FOLLOWING VOTE:

AYES - 4743 NOES - 3222

PRESIDENT of the City Council and
MAYOR of the City of Hermosa Beach

Attest:

Kathleen Reviczky, City Clerk

Approved as to Form:

City Attorney

ORDINANCE NO. 84-759 MEASURE Q

AN ORDINANCE OF THE CITY OF HERMOSA BEACH SUBMITTED TO THE VOTERS BY THE CITY COUNCIL AMENDING THE PROHIBITION AGAINST OIL WELLS TO ALLOW FOR THE PROCUREMENT OF OIL AND GAS FROM CERTAIN LANDS OWNED BY THE HERMOSA BEACH CITY SCHOOL DISTRICT.

The people of the City of Hermosa Beach do ordain as follows:

SECTION 1. There shall be added to Municipal Code Section 21-10, Oil Wells Prohibited, Exceptions, a new paragraph to read as follows: "(b). There shall also be excepted from the prohibition of this Section 21-10, wells drilled from a site not to exceed one acre in size to be located along the north boundary of the playground area of the former South School site, which playground area is adjacent to Valley Drive. No wells drilled from this site may be bottomed within the tidelands. The revenue derived by the School District from this site shall be used only for educational purposes.

SECTION 2. This ordinance may be amended only by a vote of the people.

SECTION 3. If any portion of this ordinance is declared invalid, the remaining portion is to be considered valid.

SECTION 4. Upon certification that this ordinance has been adopted by the voters of the City, the Mayor shall sign and the City Clerk shall attest to the passage and cause the ordinance to be published in the Easy Reader not later than the fifteenth day after its adoption.

PASSED, APPROVED AND ADOPTED BY THE ELECTORATE OF THE CITY OF HERMOSA BEACH AT THE SPECIAL MUNICIPAL ELECTION OF NOVEMBER 6, 1984 BY THE FOLLOWING VOTE:

AYES - 4009 NOES - 3889

PRESIDENT of the City Council and
MAYOR of the City of Hermosa Beach

Attest:

City Clerk

Approved as to Form:

City Attorney

ORDINANCE NO. 95-1139 MEASURE E

AN ORDINANCE OF THE CITY OF HERMOSA BEACH, CALIFORNIA, DELETING FROM THE MUNICIPAL CODE PARAGRAPHS (a) AND (b) OF SECTION 21-10 RELATING TO THE TWO EXCEPTIONS TO THE CITYWIDE OIL WELL DRILLING PROHIBITION WHICH ARE LOCATED AT THE CITY YARD SITE (6TH STREET AND VALLEY DRIVE) AND THE FORMER SOUTH SCHOOL PLAYGROUND (5TH STREET AND VALLEY DRIVE).

THE PEOPLE OF THE CITY OF HERMOSA BEACH DO ORDAIN AS FOLLOWS:

SECTION 1. Purpose and Findings. Clean water, pure air, and a safe environment are vital to maintaining the quality of life in the South Bay. The People of the City of Hermosa Beach find the safety and protection of the lives of its citizens and the public generally, and protection of persons and property from the dangers of fire, explosions, pollution, and other hazards, demand and require that the drilling or operating for the discovery of and/or production of oil, gas, hydrocarbon, or other related substances be prohibited, as in this ordinance set forth; now, therefore,

SECTION 2. Paragraphs (a) and (b) of Municipal Code Section 21-10, Oil Wells Prohibited, Exceptions are hereby deleted in their entirety.

SECTION 3. If any portion of this ordinance is declared invalid, the remaining portion is to be considered valid.

SECTION 4. There shall be no modification, amendment or repeal of any provisions of this initiative except by a vote of the people.

PASSED, APPROVED AND ADOPTED BY THE ELECTORATE OF THE CITY OF HERMOSA BEACH AT THE GENERAL MUNICIPAL ELECTION ON NOVEMBER 7, 1995, BY THE FOLLOWING VOTE:

AYES - 2,505 NOES - 1,940

PRESIDENT of the City Council and MAYOR of the City of Hermosa Beach, California

ATTEST:

Elaine Doerfling

City Clerk

EXHIBIT NO. 2
APPLICATION NO.
E-96-28
Macpherson Oil

MINUTE ITEM
This Calendar Item No. 41
was approved as Minute Item
No. 41 by the State Lands
Commission by a vote of 3
, 0 at its 6-30-92
meeting.

MINUTE ITEM 41

W 40015

Willard

Frey

CONSIDERATION OF PROPOSED CITY OF HERMOSA BEACH OIL AND GAS LEASE FOR GRANTED TIDE AND SUBMERGED LANDS, LOS ANGELES COUNTY

After receiving testimony from officials of the City of Hermosa Beach, its consultants and State Lands Commission staff, the Commission found that the granted tidelands of the City of Hermosa Beach are being drained.

The Commission directed staff to work with the City of Hermosa Beach to resolve the remaining leasing issues which must be approved pursuant to the Public Resources Code, including resolution of environmental concerns previously expressed by staff and report back to the Commission.

A 51

S 29

CALENDAR PAGE ___
MINUTE PAGE ___

EXHIBIT NO. 3
APPLICATION NO.
E-96-28
Macpherson Oil

CALENDAR ITEM

A 51

S 29

41

06/30/92
W 40015
G 05-02
Willard
Frey

CONSIDERATION OF PROPOSED CITY OF HERMOSA BEACH
OIL AND GAS LEASE FOR GRANTED TIDE AND
SUBMERGED LANDS, LOS ANGELES COUNTY

The City of Hermosa Beach (City) is proposing to lease, for the exploration and development of oil and gas, certain tide and submerged lands granted in trust by the Legislature to the City in 1919.

BACKGROUND:
In October 1986, the City entered into a lease with Macpherson Oil Company for oil and gas development on the uplands from specific sites designated by the City. Although Macpherson has no rights to drill into the tidelands, it was understood that the upland drill sites would be the only drilling sites within the City. Thus, Macpherson would be the City's lessee if a tidelands lease was ever authorized. On this basis, Macpherson funded the City's preparation of an EIR for oil exploration and production from an urban drillsite. The EIR was certified by the City on May 8, 1990. The Commission staff did comment and object to the certification of the document on the belief that the analysis was deficient in several areas. The deficiencies include the need for soils testing at the drill site, the lack of an oil spill prevention and control countermeasures plan, the lack of an oil drilling contingency plan, the absence of a determination of the project's hazard footprint, the lack of a security plan, and the extent of fire suppression systems for the onshore drilling and production site. The City's response was that these concerns would be addressed later in the conditional use permit process. It is the opinion of staff that the EIR does not provide information and analyses for the consideration of oil and gas development of the offshore granted lands, assuming that the statutory requirements discussed below could be satisfied.

CALENDAR PAGE 52
MINUTE PAGE 252

STATUTORY CONSIDERATIONS:
The P.R.C. sets forth the Legislature's intent for the production of oil and gas from State-owned tide and submerged lands. Section 6871.1 provides that such lands are open for leasing with the exception of those areas described in Section 6871.2. Those areas are commonly referred to as oil and gas sanctuaries. Among those lands excluded from leasing are lands within Los Angeles County from Point Fermin to the Ventura County line (Section 6871.2 (a)). The tidelands fronting the City of Hermosa Beach fall within this sanctuary.

Nevertheless, tidelands within the Los Angeles County sanctuary can be leased for oil and gas production if the State Lands Commission makes certain findings under Section 6872. These findings are: (1) oil and gas deposits are believed to be contained in the tidelands; (2) such deposits are being drained by means of wells upon adjacent lands and (3) the leasing of the tidelands for the production of oil and gas will be in the best interests of the State (Section 6872(a)). Further, lands within the sanctuary to be leased must be within one nautical mile of the ordinary high water mark, and all drilling must be done by means of slant drilling from an upland site (Section 6872(b)). The tidelands, including minerals, fronting Hermosa Beach were granted in trust to the City of Hermosa Beach in 1919. The leasing of such granted tidelands within a sanctuary area is controlled by Section 6878. This section provides that no city can lease its tidelands until the Commission has made the findings described in Section 6872. This requirement is repeated in Section 7057 which provides conditions for the leasing of city-owned property in general.

DISCUSSION:
In the 15 years that the Commission staff has dealt with the leasing of these tidelands, the focus has been almost exclusively on the statutory requirement of the presence of drainage by wells drilled along the common boundary between Hermosa Beach and Redondo Beach. When staff first investigated the drainage issue in 1977, it concluded that drainage had certainly occurred in the past, but it was unlikely that significant drainage was occurring in 1977, or that it could be projected into the future. A 1986 study showed that production rates for the boundary wells had leveled off and had done so for some time. Therefore, staff concluded that drainage could be occurring.

However, in 1989, further review of the Redondo Field by staff showed that the production rates for the border wells had dropped dramatically and that five of the eight border wells were shut in. The operator indicated that the wells were to be abandoned when they failed and that the entire field would be abandoned sometime in 1990 or shortly thereafter. Based on this review, staff concluded that it could not recommend the City's leasing proposal for approval. The City was so notified by letter on December 18, 1989.

Staff understands that all wells have been abandoned as of September 1991 and that the Redondo onshore drill site in the City of Redondo Beach is being restored for other uses. With all of these wells permanently abandoned, staff concludes that no significant drainage can be occurring from wells adjacent to the City of Hermosa Beach. Therefore, the drainage requirement of Section 6872(a) is not substantiated.

The City and Macpherson Oil disagree with the staff's conclusions on the drainage issue. They believe that past production of the City of Redondo Beach has created a pressure sink that is still causing drainage from lands within the City of Hermosa Beach. After a meeting with Commission staff on January 8, 1990, the City and Macpherson advised that they would prepare a package for the Commission showing their contentions on the amount and rate of drainage. This report was received on February 24, 1992. Staff review and analysis of the report was completed and summarized by memorandum dated April 3, 1992, and is included in the Commission's file. The City's report implies there is a significant pressure gradient across the Hermosa\Redondo boundary. The assumptions and the data used in the fluid migration calculation are subject to considerable speculation. In staff's opinion, the lack of pressure data on the offshore Hermosa side required projection of data without adequate engineering and geologic justification. The nature of the alleged fluid migration is also unclear. Staffs' conclusion is that the fluid is predominately water and not much, if any, oil. The fact that wells on the Redondo side were producing at very high water cuts (percentage) prior to abandonment supports this conclusion.

The purpose of the drainage finding required by Section 6872 is to prevent a loss of oil and gas resources, in this instance by

the City of Hermosa Beach, from producing wells on adjacent lands. Again, this situation does not exist, as all wells have been abandoned. As stated above, the assertion that drainage is occurring as a result of underground fluid migration is not correct and is not consistent with the statute, which requires a finding of drainage by production from wells on adjacent lands. This is the drainage that the Commission must find under Section 6872(a) in order to permit leasing of sanctuary lands.

AB 884:

N/A.

IT IS RECOMMENDED THAT THE COMMISSION:

1. FIND THAT THE ACTIVITY IS EXEMPT FROM THE REQUIREMENTS OF THE CEQA PURSUANT TO 14 CAL. CODE REGS. 15061 P.R.C. 21080(b)(5) AND 14 CAL. CODE REGS. 15270, PROJECTS WHICH A PUBLIC AGENCY REJECTS OR DISAPPROVES.

2. FIND THAT DRAINAGE OF OIL AND GAS IS NOT OCCURRING AS A RESULT OF PRODUCTION FROM WELLS ON ADJACENT LANDS.

3. DENY THE PROPOSAL OF THE CITY OF HERMOSA BEACH TO LEASE ITS GRANTED TIDELANDS FOR OIL AND GAS EXPLORATION AND DEVELOPMENT PURSUANT TO P.R.C. 6872(a) AND P.R.C. 6878.

EXHIBIT NO. 4
APPLICATION NO.
E-96-28
MACPHERSON OIL

RICHARDS, WATSON & GERSHON
ATTORNEYS AT LAW
A PROFESSIONAL CORPORATION

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ROBERT G. BEVERLY
HARRY L. GERSHON
DOUGLAS W. ARGUE
MARK L. LAMKEN
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OF COUNSEL
WILLIAM K. KRAMER

July 25, 1994

OS64568
OUR FILE NUMBER
10649-00003

Honorable Mayor Edgerton and
Members of the City Council
City of Hermosa Beach
1315 Valley Drive
Hermosa Beach, California 90254

Re: Proposed Initiative Prohibiting Oil Drilling: Applicability to Existing Lease

Dear Mayor Edgerton and Members of the City Council:

You have asked for our opinion as to whether an initiative measure recently circulated in the City of Hermosa Beach and now determined to qualify for the ballot will, if passed, apply to an existing lease so as to prohibit oil drilling on the City Yard property. Although not free from doubt, we conclude that while the lessee has no vested rights, application of the proposed initiative to the existing lease would unconstitutionally impair the lessees' right to contract. Accordingly, we conclude that the initiative, even if passed, would not affect the validity of the lease.

We cannot predict with certainty how a court would rule on the questions presented. Further, the issues discussed below may not be the only issues raised if this matter were to proceed to litigation. In the course of this assignment, we have reviewed a compilation of certain documents, prepared for us by the office of the City Attorney, including correspondence, resolutions of the City Council and several revisions of the lease itself. Our conclusions are based on the facts recited below. The existence of other documents or the discovery of other facts could reveal new legal theories and defenses, or could change the analysis below.

Facts

On October 14, 1986, the City of Hermosa Beach and Windward Associates and GLG Energy, L.P. ("the lessees") entered into Oil and Gas Lease No. 1, which provided for the lease of certain City-owned land above the mean high tide line of the Pacific Ocean. Lease No. 1 was amended later in 1986, again in 1988 and in 1991. On May 8, 1990, the City approved a final EIR on the oil drilling project, along with a Statement of Overriding Considerations.

On January 14, 1992, the City and the lessees entered into Oil and Gas Lease No. 2 to allow for oil exploration and drilling on a City-owned lot ("the lease"). The lease superseded Lease No. 1, and granted the lessee the additional right to drill into tidelands under the City's control.[1/] Under Section 21-10(a) and (b) of the Hermosa Beach Municipal Code, new oil exploration is a permitted use in the City only on two properties, one of which is the leased site.

On August 12, 1993, the City Council adopted Resolution No. 93-5632, approving a Conditional Use Permit ("CUP") for the oil drilling project. The City Council also considered in that Resolution an addenda to the Final Project EIR adopted and certified earlier. A lawsuit challenging the approval of the CUP was filed a few days after the approval by a group of project opponents; that suit still is pending.

Throughout the two-year period following approval of the lease, the process of gaining the required governmental approvals of the project was slow. The State Lands Commission required lease amendments and additional information. The opposition group filed a separate suit challenging the State Lands Commission's actions. Submittal of an application for a coastal development permit from the California Coastal Commission was consequently delayed. At the time of this writing, no complete application is pending before the Coastal Commission.

On April 21, 1994, the local opposition group published a Notice of Intent to Circulate an Initiative Petition ("the proposed initiative"). The proposed initiative would repeal Section 21-10 (a) and (b) of the Municipal Code, thereby banning oil drilling throughout the City, including on the site leased to the lessee. The proposed initiative has been qualified for the ballot at the November, 1995 election.

1/ Unless otherwise noted, all further references to "the lease" are references to Lease No. 2.

The potential adoption of the initiative has raised the questions addressed in this letter with respect to the proposed oil drilling project.

Discussion

As the Council is probably aware, most newly enacted City ordinances are prospective in effect. A prospective law establishes requirements, or prohibits certain conduct or actions in the future, after the law takes effect. However, the proposed anti-oil drilling initiative clearly is intended to act retroactively. That is, the proposed initiative measure is an attempt to prohibit a project which has been proposed and already approved by the City, and which was legal at the time it was proposed. Laws which would have a retroactive effect necessarily raise concerns that such laws violate the due process rights, guaranteed by the federal and California constitutions, of persons whom the law affects retroactively[2].

A law is not necessarily constitutionally infirm simply because it may adversely impact preexisting rights or obligations. League v. Texas, 184 U.S. 156, 46 L.Ed. 478 (1902); McCann v. Jordan, 218 Cal. 577, 579 (1933). Such a law is invalid only if it also violates one or more of the constitutional provisions described below:

1. The law may not be an ex post facto law[3];

2. The law may not deprive or substantially impair a vested right of a property owner, thereby denying due process to the person whose rights are impaired[4].

2/ The Fourteenth Amendment to the United States Constitution provides that no state [or subdivision] shall deprive any person of life, liberty, or property, without due process of law. Article I, Sections 7 and 15 of the California Constitution contain similar guarantees.

3/ An ex post facto law is one which makes criminal acts which were committed prior to the time the law was enacted. This requirement is obviously not relevant to the instant matter, and will not be further discussed.

4/ Discussed in Section 1, below.

3. The law may not impair the obligation of a contract in existence at the time the law was enacted[5].

Roberts v. Wehmeyer, 191 Cal. 601, 612 (1923).

Thus, the possible application of the proposed oil drilling initiative to the existing lease involves a number of legal issues, each of which is discussed in detail below.

1. Does the lessee of the City Yard oil lease have a vested right to explore for oil, which may not be terminated by application of a subsequently enacted zoning ordinance?

One major question lies at the heart of the vested rights doctrine in California: At what point in the development process has the developer, acting in reliance on a City-issued permit, progressed with a project to such an extent that the project will not be affected by subsequent changes in the law? While the issue arises in a number of different factual contexts, developers commonly contend that a city's rules cannot change after the earliest point in a project at which significant funds are committed.

In the absence of a statutory vesting mechanism (such as a development agreement or vesting tentative map), California courts have created a straightforward rule to determine when a property owner's rights vest. This rule is sometimes referred to as "the building permit rule." The rule was summarized by the California Supreme Court in the leading case on the subject, Avco Community Developers, Inc. v. South Coast Regional Com., 17 Cal.3d 785, 791 (1976):

> "It has long been the rule in this state and in other jurisdictions that if a property owner has performed substantial work and incurred substantial liabilities in good faith reliance upon a permit issued by the government, he acquires a vested right to complete construction in accordance with the terms of the permit. [citations]. Once a landowner has secured a vested right the government may not, by virtue of a change in the zoning laws, prohibit construction authorized by the permit upon which he relied."

5/ Discussed in Section 2, below.

Id. (citing Dobbins v. City of Los Angeles, 195 U.S. 223, 49 L.Ed. 169 (1904); Trans-Oceanic Oil Corp. v. Santa Barbara, 85 Cal.App.2d 776, 784 (1948)).

In Avco, the developer argued that it had acquired vested rights to build at the time the property was subdivided and grading permits issued, after expending some $3 million in development costs. The trial court held that the developer had no vested right to construct any buildings on the site, since no building permits had been issued. The California Supreme Court affirmed, setting out a very clear rule for both local authorities and developers:

> ". . . [earlier controlling cases] stand for the proposition that neither the existence of a particular zoning nor work undertaken pursuant to governmental approvals prepatory [sic] to construction of buildings can form the basis of a vested right to build a structure which does not comply with the laws applicable at the time a building permit is issued. By zoning the property or issuing approvals for work preliminary to construction the government makes no representation to a landowner that he will be exempt from the zoning laws in effect at the subsequent time he applies for a building permit or that he may construct particular structures on the property, and thus the government cannot be estopped to enforce the laws in effect when the permit is issued."

Avco, supra, 17 Cal.3d at 793.[5]

Further, the Supreme Court held that:

> "A landowner which has not even applied for a permit cannot be in a better position merely because it had previously received permission to subdivide its property and made certain improvements on the land."

Id., at 795.

While Avco represented the modern-day restatement of "the building permit rule" by the California Supreme Court, the decision was by no means new law in California. A number of

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5/ The vested rights doctrine applies equally to a leaseholder, as well. O'Hagen v. Board of Zoning Adjustment, 19 Cal.App.3d 151, 158 (1971).

cases, including those cited by the Court in Avco, had previously held that for a developer's rights to vest, the developer must have obtained a building permit and performed substantial work and incurred substantial liabilities in good faith reliance on the building permit. See, e.g., Griffin v. County of Marin, 157 Cal.App.2d 507, 511 (1958) (right to build a gas station was vested after issuance of building permit and start of construction, rezoning did not apply); Kissinger v. City of Los Angeles, 161 Cal.App.2d 454, 463 (1958) (and cases there cited) (down zoning invalid after issuance of building permit and construction activity).

After the decision in Avco, developers attempted to argue that a CUP might substitute for a building permit in the vested rights context, if the terms of the CUP were quite specific. In response, a few courts modified "the building permit rule" to accomplish vesting upon the issuance of all necessary discretionary approvals. See, Youngblood v. Bd. of Supervisors, 35 Cal.3d 858 (1984) and City of West Hollywood v. Beverly Towers, Inc., et al., 52 Cal.3d 1184 (1991). However, those cases involved approvals where no construction activity or building permits were contemplated. In cases where a building permit is the final necessary step in the approval process, California courts still take the position that:

> ". . . the vested rights doctrine enunciated in Avco has stood the test of time, and may properly be applied even to modern land use planning devices. . . ."

Consaul v. City of San Diego, 6 Cal.App.4th 1781, 1801 (1992).

Cases such as Youngblood and Beverly Towers have no application to the instant matter for two reasons. First, the lessee has not yet obtained, or even applied for, the final discretionary approval from the Coastal Commission. Second, the "building permit rule" clearly is applicable here since construction activity is contemplated within the project and a building permit will be required.

The Consaul decision was important for a number of reasons. First, as noted, it reaffirmed that "the building permit rule" still is the applicable law when a building permit is required, regardless of the complexity of the permit at issue. Second, the Consaul court discarded the argument that rights had vested based upon representations allegedly made by City staff. Finally, the court reaffirmed the longstanding rule that a developer's "soft costs," such as for design, consultants, and studies, constituted substantial work or liabilities incurred pursuant to a permit.

That cost guideline was established years earlier in Raley v. California Tahoe Regional Planning Agency, 68 Cal.App.3d 965 (1977) and Highland Development Co. v. City of Los Angeles, 170 Cal.App.3d 169 (1985). Those cases held that vested rights accrued only upon the expenditure of "hard costs," such as for labor and materials, relating to the physical improvement of the land. Thus, developers may not acquire vested rights simply by sinking dollars into consultant's fees, payroll, and permit costs. For that reason, the cases cited by the lessees' lawyers in support of their argument that rights have vested have no bearing here; all those cases involved factual situations where substantial "hard costs" were expended.

This latter point regarding costs is especially relevant in this situation since it disposes of any argument that the lessees have acquired vested rights simply because they have expended funds on the project. The lessees have not undertaken any physical improvement on the site. Obviously, no construction has yet been approved and any work which occurs on the site would be illegal. None of the costs incurred by the lessees would appear to fall within the "hard costs" of physical improvements which are required to constitute "substantial work" and "substantial liabilities" under the vested rights doctrine. The lessees have not yet obtained any building permit for this project, nor any permit from the California Coastal Commission which might be considered the "final discretionary approval." Since it is clear from both the Lease Agreement itself and the CUP that the lessees are required to obtain both building permits and "drilling and well permits" from the City of Hermosa Beach prior to proceeding with drilling, no vested right could have been obtained as of the time of this writing.

2. Would application of the proposed initiative measure to prohibit drilling under the existing lease unconstitutionally impair the contract rights of the lessee?

Obviously, the proposed initiative measure, if passed and applied to the existing lease, would have a significant impact upon the existing contractual relationship between the City and the lessees. The question is thus presented whether that impact would rise to the level of a constitutional violation. Both the federal and California constitutions forbid the enactment of retroactive laws which would "impair the obligation of contracts." See, U.S. Const., Art. I, § 10; Cal. Const., Art. I, § 16.

Although both of those constitutional provisions appear on their face to be an absolute ban on the impairment of existing contracts by governmental action, the prohibitions must also be:

> ". . . accommodated to the inherent police power of the state to safeguard the vital interests of its people."

Interstate Marina Development Co. v. County of Los Angeles, 155 Cal.App.3d 435, 445 (1984) (citing United States Trust Co. v. New Jersey, 431 U.S. 1, 25 (1977); Energy Reserves v. Kansas, 459 U.S. at 410, 74 L.Ed.2d at 426 (1943); Allied Structural Steel Co. v. Spannus, 438 U.S. 234, 244, 57 L.Ed.2d 727, 736, 98 S.Ct.2716 (1978)).

Thus, police power regulations - such as land use decisions - which impair existing contracts may be valid. However, laws altering the rights and obligations of contracting parties must be reasonable and necessary for the public purpose for which they were enacted. Interstate Marina, supra at 445. In general, deference is given to the legislative declaration of public purpose; if a legitimate public purpose is served, the impairment of contract will not be found unconstitutional. Energy Reserves v. Kansas, 459 U.S. at 411-13, 74 L.Ed.2d at 580.

A two step process is involved in determining whether a law which would have a retroactive effect constitutes an unconstitutional impairment of the agreement. First, it must be determined if the retroactive law would cause a "substantial" impairment of an existing contract right. If it would not, then no violation of the contract clause has occurred. Energy Reserves, supra; Interstate Marina, 155 Cal.App.3d at 445 ["Minimal alteration of contractual obligations may end the inquiry at its first stage"]. If a substantial impairment is found, the court must take the second step of the process, which is to determine whether the impairment is justified by and serves a significant public purpose. Energy Reserves, 459 U.S. at 411-412, 74 L.Ed.2d at 581. A law which impairs a contract to which the government itself is a party will receive closer scrutiny than impairments affecting only private contracts. Allied Structural Steel Co. v. Spannus, 438 U.S. at 244, fn. 15, 57 L.Ed.2d at 736; Sonoma County Organization of Public Employees v. County of Sonoma, 23 Cal.3d 296, 308-310 (1979).

Validity under the second step of the process requires a showing of four basic elements:

1. An emergency or significant problem must exist which furnishes the proper occasion for the exercise of the police power.

2. The law must be addressed to a legitimate end, that is, not for the mere advantage of particular individuals but for the protection of a basic interest of society.

3. The relief afforded must be of a character appropriate to the emergency and the conditions imposed must be reasonable.

4. The legislation is temporary in operation, limited to the exigency for which it was enacted.

Interstate Marine, supra, at 446.

We note that the legislative power of the voters to act by initiative is generally "coextensive with the power of the Legislature," in this case the City Council. Building Industry Assn v. City of Camarillo, 41 Cal.3d 810, 821 (1986). A statutory initiative is subject to the same state and federal constitutional limitations as are the Legislature and the statutes which it enacts. Legislature v. Deukmejian, 34 Cal.3d 658, 674 (1983). Thus, a court would apply the same analysis to an initiative measure enacted by the voters as to an ordinance enacted by the City Council.

Applying the two-step process in light of the existing oil-drilling lease, it appears that the initiative would not survive scrutiny under the contract clause.

First, there can be little disagreement that an absolute ban on the object of an agreement - a ban that makes the agreement impossible to perform - would constitute a substantial impairment of the contract. The initiative as proposed would make drilling illegal, and seems intended to render the lease unenforceable. This leads to the second step in the analysis, and an examination of the elements outlined above. Again, courts will undertake exacting scrutiny of a law which would change the enacting government's obligation under an existing contract.

With regard to the first element of the second step, the proposed initiative identifies environmental concerns, and the protection of health, safety and property as its general purposes. The protection of the environment has long been recognized as a important public policy consideration in California. See, Public Resources Code §§ 21000 - 21014. Further, the protection of public health, safety, and welfare is the essence of a city's police power. Chicago, B. & Q. Rwy. Co. v. Illinois, 200 U.S. 561, 592 50 L.Ed. 596, 609 (1906). However, there may be some question as to whether the oil drilling project actually is an emergency, or a problem so significant that it must be dealt with through this absolute, retroactive ban.

A strong argument could be made that existing controls are sufficient to deal with the potential threats to the

environment posed by the oil drilling project. Because existing law requires several "layers" of approvals and environmental review before this project may proceed, a court might rule that those controls will provide the same protection sought by the ordinance. If that argument succeeds, the proposed ordinance may well fail the enhanced scrutiny the proposed initiative will receive.

With regard to the second element of the second step in the analysis, the initiative would appear to be directed toward a legitimate end. The initiative would make the Municipal Code's ban on oil drilling consistent throughout the City, although it would impact only one existing project. There does not appear to be any individual or group that would be peculiarly benefitted by the measure. Also, the proposed initiative is directed at the protection of basic societal interests, the environment and public health and safety.

With regard to the third element of this second step, the proposed initiative encounters more obvious constitutional problems. Again, it could be strongly argued that there are less stringent conditions which could be imposed to address the problems identified in the proposed initiative. Indeed, the City Council, in its discretion, imposed over 140 conditions on the project through the CUP to address environmental, health and safety concerns. The Coastal Commission also may add conditions to those imposed by the City and the State Lands Commission. If those conditioned approvals are granted, it will strengthen the lessees' argument that reasonable conditions will accomplish the police power objectives, making an outright ban unnecessary and unreasonable.

Finally, the proposed initiative likely fails the fourth element as well. That element requires that the legislation be temporary, and limited to the exigency for which it was created. The proposed initiative, however, imposes a total, permanent ban which may be amended only through a vote of the people. Thus, rather than addressing some temporary emergency, the proposed initiative would prohibit the oil drilling project permanently. The fourth element is intended to ensure that retroactive legislation creates only a <u>temporary</u>, rather than <u>permanent</u>, impairment of a contract right. Courts normally contemplate that once an emergency situation has been rectified, the parties will return to their original bargained-for positions.

Such was the case in <u>Interstate Marina</u>, <u>supra</u>, where the County of Los Angeles had leased land to housing developers for apartment construction. The lease guaranteed the lessees a reasonable rental income as return on their investment. When the

County later imposed a one-year rent control ordinance on the properties, the lessees sued for impairment of contract. The court found that the rent control ordinance did not unconstitutionally impair the leases, since the rent control law was temporary, and intended to deal with a short term affordable housing crisis.[7]

At the opposite end of the of the spectrum, a court is likely to look at this proposed initiative, if enacted, as a long-term policy decision by the people of Hermosa Beach, rather than as a temporary "fix." As it enacts a total and permanent ban, the proposed initiative is directed not at some temporary emergency, but rather at more permanent direction for land use in the City. The policy decision itself would be permissible, although the unconstitutional impact upon the lessees' contract rights would not. We believe it likely that the proposed initiative would fail the impairment test for this reason.

Thus, the City should be aware of the substantial risk that the proposed initiative measure, as applied to the existing lease, may be held to be an unconstitutional impairment of an existing contract. In that case, the initiative could not validly be applied, and the ban on oil drilling from the City Yard property would not be effective against these lessees as long as the lease remains in effect and all permits are in hand.

The issue of city liability for adoption of an initiative which serves to terminate a contract between a city and a private party is currently before the First District of the California Court of Appeal in the case of Sime v. City of Rohnert Park, Case No. 1st Civ. A057779. In that case, the City entered into an agreement with mobile home park owners that mobile home rent control would not be enacted for a 10-year period. The voters subsequently enacted a rent control initiative, and the park owners sued the City on a theory of unconstitutional impairment of contract and breach of contract. The trial court held that the initiative was not invalid as an impairment of contract, but that the adoption of the initiative was a breach of the contract for which the City was liable in damages. The City appealed, supported by the League of California Cities, and a

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7/ As it turns out, rent control in Los Angeles County was not a "temporary" measure. After Interstate Marina was decided, the Los Angeles County Board of Supervisors determined that deregulation of rents under the original one-year sunset clause would create an extreme hardship on tenants. The Board then extended rent regulation, which still exists in some parts of the County. See, Los Angeles County Code § 8.52.010.

RICHARDS, WATSON & GERSHON

decision is months away. We will keep the City informed as to the result of that case, since the decision may provide guidance in this matter.

In conclusion, we believe that there is substantial risk to the City in applying the proposed initiative to the existing oil drilling lease. Although the lessee has no vested right to drill on the property, the initiative may be held to unconstitutionally impair the lessees' agreement with the City.

We appreciate the opportunity to have worked with the City on this challenging and unique matter. We would welcome any further questions you may have.

Very truly yours,

Michael Jenkins

MJ:clm
0564568

cc: Stephen R. Burrell, City Manager
Charles S. Vose, Esq., City Attorney
Edward Lee, Esq.

EXHIBIT NO. 5
APPLICATION NO.
E-96-28
Macpherson Oil

City of Hermosa Beach

Civic Center, 1315 Valley Drive, Hermosa Beach, California 90254-3885

RECEIVED
JUN 23 1997
CALIFORNIA
COASTAL COMMISSION

June 11, 1997

Alison Dettmer
California Coastal Commission
45 Fremont, Suite 2000
San Francisco, California 94105-2219

Re: Macpherson Oil Development Project

Dear Alison:

Thank you for coordinating the Coastal Commission staff visit to Hermosa Beach on May 6, 1997. I appreciated the opportunity to talk with you about the project and to show you the site and other areas of interest. We are pleased that you and your colleagues took the time to review all of the issues with us.

In response to our discussion of April 21, 1997 in your offices, this letter will clarify the City's position relative to the land use policies and regulations applicable to Macpherson's oil development project. In particular, it will address the apparent inconsistency between the City's LUP and General Plan designations of the subject site, and explain why Commission approval of the project application will not have a detrimental effect on the ability of the City to prepare a Local Coastal Plan. We trust that this letter will provide adequate assurance to the Commission that there is no barrier to approval of the project application.

Hermosa Beach's Regulation of Oil Development.

In 1984, the Hermosa Beach voters enacted two measures allowing certain exceptions to the City's long-standing ban on oil and gas drilling. One of those, Measure P, approve by 59% of the electorate, expressly allowed for oil drilling on the City maintenance yard, the Macpherson project site. The measure required that any revenues accruing to the City from such drilling be devoted to acquisition, improvement and maintenance of open space. Further, Measure L, adopted in 1987 by an 88% majority, reaffirmed the dedication of oil revenue for open space purposes.

In reliance on these measures, the City took the following actions:

1. **Entered into an oil and gas lease.** In 1986, the City and Windward Associates (predecessor entity to Macpherson) entered into Oil and Gas Lease No. 1,

The LUP Designation of the Project Site.

The City was recently made aware that its Land Use Plan designates the project for "open space" and was inadvertently not amended in 1989 when the General Plan designation was changed to "Industrial." This omission does not, however, bar the Commission from approving Macpherson's application for the following reasons:

1. **Macpherson's application is to be reviewed under Chapter 3 of the Coastal Act.** Coastal Development Permits for development in the City are reviewed by the Commission under Chapter 3 of the Coastal Act because the City does not have a certified Local Coastal Plan (Pub. Res. Code Sec. 30604 (a)). Under Chapter 3, the City's LUP provides guidance to the Commission but is not binding. In this instance, the LUP designation is inconsistent with all of the City's legislative enactments and quasi-judicial approvals regarding the project site, as well as the historic use of the site, and accordingly, should be given no weight.

2. **The open space designation does not preclude the project on the site.** The open space designation has historically been applied to property -- particularly City-owned property -- that is developed for a variety of uses. For example, the City's civic center (containing its city hall, police station, fire station and library), Community Center, various parking lots, a water storage tank site and schools have been designated open space. Moreover, the project site has for many years been classified as Manufacturing (M-1) in the City's zoning map. Indeed, at the time the LUP map was adopted in 1979 (based on the existing General Plan map), the site was being used as a maintenance yard. That remains the case today. Existing uses on the site include a maintenance building, underground storage tanks and gas pumps for diesel and unleaded fuel, an oil well, a veterinary holding pen, a sign shop, a vehicle repair area, excess materials (i.e. asphalt and gravel), a storage area, city vehicle parking, and a 12-space employee parking lot.

3. **Approval of the project will not prejudice the City's ability to prepare and adopt an LCP.** At such time as the City prepares a local coastal plan for certification by the Commission, the plan will be consistent with the City's intended utilization of the project site for oil drilling and development consistent with all of its above-described actions and approvals.

Accordingly, on the basis of the foregoing, the City submits that the obsolete LUP designation of the site is not an obstacle to the Commission approval of the project.

Conclusion

In conclusion, the City supports Macpherson's project application and urges its approval. The project has been subjected to substantial environmental review and analysis, has been

heavily conditioned to meet detailed operational and environmental standards, and satisfies the requirements of the City's oil development code. Further, the City intends to use the revenue from the project to enhance coastal recreational resources which may include, among other things, renovation of the beach restrooms, renovation and maintenance of the Pier, and construction of a new bike path west of the Strand. Additionally, the City is agreeable to Macpherson's proposal to replace the twelve existing on-site spaces that are often used by weekend beach-goers. The project will therefore serve to enhance coastal visitor-serving resources, consistent with the public access and recreation policies of the Coastal Act.

I trust this letter addresses your concerns and clarifies the City's position relative to this project. Please let me know if you require any additional information.

Sincerely,

Stephen R. Burrell
City Manager

SRB:reb

STATE OF CALIFORNIA—THE RESOURCES AGENCY

CALIFORNIA COASTAL COMMISSION
45 FREMONT, SUITE 2000
N FRANCISCO, CA 94105-2219
CE AND TDD (415) 904-5200

EXHIBIT NO. 6
APPLICATION NO.
E-96-28
Macpherson Oil

April 10, 1997

David Gautschy
David E. Gautschy, Inc.
2698 Junipero Avenue, Suite 201B
Signal Hill, California 90806

Re: **Coastal Development Permit Application E-97-6; Construction and Operation of Crude Oil Shipping Pipeline**

Dear Mr. Gautschy:

The Coastal Commission staff has reviewed Macpherson Oil Company's coastal development permit ("CDP") application E-97-6 for the construction and operation of a six-inch diameter 2500-foot length crude oil pipeline along Valley Drive in the City of Hermosa Beach. The purpose of the crude oil pipeline is to transport crude oil from the proposed Hermosa Beach Oil Development Project to Chevron's existing Redondo Beach pipeline (for delivery to the El Segundo Refinery).[1]

We have determined that CDP application E-97-6 is incomplete and cannot be filed pursuant to CDP filing requirements contained in 14 CCR § 13053.5(a) until the following additional information is submitted.

Project Description

1. The 2500-foot length crude oil and produced gas pipelines are to be installed 3-6 feet below the existing street surface in a 24-inch wide trench. How wide is the construction corridor for pipeline installation?

2. Please estimate how much material will be excavated for pipeline installation.

3. Please estimate how many days it will take to complete pipeline construction.

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[1] In its November 1996 application for the Hermosa Beach Oil Development Project, the Macpherson Oil Company informed Coastal Commission staff that it intends to transfer to Chevron Pipeline Company ownership of the oil pipeline after project construction. In a December 23, 1996 letter, the Commission staff advised the Macpherson Oil Company to submit a separate CDP application for the oil pipeline segment of the overall Hermosa Beach Oil Development Project so that a permit re-assignment from Macpherson Oil Company to Chevron Pipeline Company could be easily processed in the future. The Commission will consider the proposed Hermosa Beach Oil Development Project under separate CDP application E-96-28.

4. Please identify the location of the pipeline construction staging area.

Cultural Resources

5. Will any archaeological monitoring be undertaken during pipeline construction? If so, please describe the monitoring program.

Oil Spills

6. The Hermosa Crude Oil Pipeline Oil Spill Contingency and Emergency Response Plan states on page 6-47 that there is a high probability that any accidental release of oil from the pipeline will enter the municipal storm drain system and drain directly to the ocean outfall. Under this spill scenario, how quickly could oil reach marine waters?

7. The oil spill contingency plan states on page 6-47 that to prevent a spill from reaching marine waters, the responsible party should in part (1) construct sand bag dams in the street to prevent oil from reaching the storm drain system; and (2) dam the storm drain on the down stream side with absorbent material in the event that oil has already entered a storm drain. Where will such oil spill containment and cleanup equipment be stored and maintained? How quickly can the oil spill equipment be deployed?

8. Although Chevron will assume ownership of the crude oil pipeline after Phase 2 construction, will Macpherson's on site personnel be trained to respond initially to a spill until Chevron's oil spill responder(s) arrives on site?

9. The oil spill contingency plan states on page 2-1 that Figure 1-1 is to illustrate the location of the block valves and check valves along the proposed oil pipeline route. The Figure 1-1 in our plan does not show the proposed valve locations. Therefore, please submit a revised site plan showing the valve locations. Are the proposed block valves strategically placed so as to minimize the amount of oil that could enter the storm drains in the event of a spill?

10. The oil spill contingency plan states on page 5-1 that Chevron Pipeline Company has established contracts with Primary Spill Contractors in the Los Angeles basin that are acceptable to the California Department of Fish and Game. Coastal Act § 30232 requires in part that the Coastal Commission find that <u>effective</u> oil spill cleanup equipment is available to respond to a worst case accidental spill. Therefore, please identify Chevron's primary oil spill contractor(s) and submit a summary list of onshore and shoreline response equipment that will be available to respond to a project-related spill.

11. How quickly can Chevron's oil spill responder(s) reach an <u>onshore</u> project-related spill? How quickly can Chevron's oil spill responder(s) reach an <u>offshore</u> project-related spill?

Please call me at 415/904-5246 or Melanie Hale at 415/904-5247 if you have any questions.

Sincerely,

Alison Dettmer

ALISON J. DETTMER
Supervisor
Energy & Ocean Resources Unit

cc. Steve Burrell, City of Hermosa Beach
Sol Blumenfeld, City of Hermosa Beach

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STATE OF CALIFORNIA—THE RESOURCES AGENCY PETE WILSON, Governor

CALIFORNIA COASTAL COMMISSION
45 FREMONT, SUITE 2000
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April 16, 1997

David Gautschy
David E. Gautschy, Inc.
Petroleum Consulting Services
7122 Blue Sails Drive
Huntington Beach, California 92647

Re: **Filing Status of Coastal Development Permit Application E-96-28; Hermosa Beach Oil Development Project**

Dear Mr. Gautschy:

The Coastal Commission staff has reviewed Macpherson Oil Company's March 18, 1997 coastal development permit ("CDP") application E-96-28 submittals (in response to the Commission staff's December 23, 1996 letter) and has determined that the application is still incomplete and cannot be filed until the following additional information, pursuant to CDP application filing requirements contained in 14 CCR § 13053.5(a), is submitted.

Site Remediation

1. In its site remediation workplan, Entrix proposes that additional lead sampling be undertaken to verify the results of a single sample taken in March 1995. It is unclear when this additional sampling will take place. Please submit the timeline for sampling, results of the additional sampling work, and any modifications to the workplan that may be necessary as a result of the additional sampling effort.

2. Please submit a site plan delineating (1) the areas of petroleum-hydrocarbon-contaminated and lead-contaminated soils; (2) the proposed site remediation staging area; and (3) the proposed clean overburden stockpile area(s).

3. Page 2-3 of the workplan states that in the event that separate-phase petroleum is encountered during excavation that "contingency equipment" such as a skimmer pump, booms, drums and a vacuum truck will be available. Please provide more specific information on the amount and types of oil spill cleanup equipment that will be available on site during all site remediation activities.

4. How long will site remediation take to complete? Where will the excavated material be disposed? How many truck trips will be required to dispose of all contaminated soil?

5. Phase 1 oil and gas production will be ongoing during the site remediation and Phase 2 construction activities. Using heavy equipment and conducting major earthmoving and other construction activities on site during Phase 1 production increases the risk of an accident occurring. Please describe all measures the applicant will undertake during the Phase 2 site remediation and construction activities to minimize hazards and prevent an accident from occurring.

6. The Coastal Commission's regulations require (14 CCR § 13052) that all development for which a coastal development permit is required shall not be accepted for filing by the executive director unless all government agencies with approval authority over the project have granted at a minimum their preliminary approvals for said development. Accordingly, please submit evidence of at least preliminary approval of the proposed workplan from the Regional Water Quality Control Board - Los Angeles region.

Hydrogen Sulfide Gas

7. The project description states on page 3-25 of the CDP application that:

The project geologist could not find any historical data that would suggest hydrogen sulfide has ever been encountered in any appreciable amount during drilling operations in the Los Angeles Basin. In conversations with a number of petroleum geologists with numerous years of experience working in the Los Angeles Basin, no one ever recalled a hydrogen sulfide problem with wells and gas monitoring equipment during drilling.

The State Lands Commission ("SLC") staff has informed Coastal Commission staff that while encountering hydrogen sulfide concentrations of concern during drilling may be a remote possibility, hydrogen sulfide may nevertheless emerge during the production phase of the project, perhaps years after production commences. The SLC staff noted, for example, that the Redondo Beach hydrogen sulfide project levels were approximately 1500 ppm during the later years of its production phase. SLC believes there may be other oil production operations in the Los Angeles Basin that have encountered H_2S at concentrations higher than the Redondo Beach project. The SLC staff further commented that hydrogen sulfide could appear during the proposed Hermosa Beach project from two sources: migration from the former Redondo Beach site or possibly as the result of wastewater reinjection.

Therefore, the hydrogen sulfide component of the hazard footprint analysis needs to be revised to consider the potential for significant hydrogen sulfide levels during production. Accordingly, please submit (1) information regarding the maximum produced levels of hydrogen sulfide that have been encountered during production at other drilling projects in the Los Angeles Basin; and (2) a revised hazard footprint analysis evaluating a potential accidental release of at least 1500 ppm hydrogen sulfide (or higher based on the results of subpart 1). The revised analysis should evaluate the potential hydrogen sulfide

release pathways during production, explain the characteristics of hydrogen sulfide (for example, its weight in relation to air and resultant tendency to sink), and explain in detail variables and assumptions, listed by way of example but not limited to:

(a) mobility of a hydrogen sulfide release based on molecular weight, etc.;

(b) distance from potential point of release to nearest occupied structures;

(c) distance from potential point of release to nearest residences;

(d) analysis under complete inversion conditions (no air movement);

(e) analysis under inversion conditions with moderate air movement (2 mph);

(f) likely point of release during production phase;

(g) likely levels of air mixture (dilution), given heavier-than-air weight of H_2S;

(h) attendant timelines to achieve varying levels of dilution (for example, the range might be expressed as virtually no dilution from release levels for X minutes after release if complete inversion conditions prevail, through 95 percent dilution within X minutes at typical daytime maximum windspeeds of Y) and elapsed time from release for subsequent migration of the hydrogen sulfide cloud to the nearest receptor;

(i) likeliest direction of migration for the above scenarios based on best publicly available windrose data (from APCD or other regulatory agency).

8. The application states on page 3-26 that *if hydrogen sulfide is found in the gas stream in excess of 800 (SCAQMD) ppm or 4.23 ppm (SCGC), a treatment system will be installed and a monitoring program will be implemented immediately.* Please provide additional information: which of these two levels of hydrogen sulfide would trigger the proposed installation of treatment equipment? Describe the monitoring system that would be in place to detect hydrogen sulfide, detection levels, and the resultant response time (please differentiate answer for drilling and production phases). What would be the immediate effect on on-site operations of hydrogen sulfide detection? Explain the proposed protocol for treatment equipment installation. For example: would operations immediately be stopped and wells shut-in while installation occurs?

9. The hazard footprint analyses appear to consider hydrogen sulfide and methane interchangeably in some instances--most notably in discussions of modeling of gas being vented from a vertical flare. In that instance, the original hazard footprint analysis stated on page 3-3 that with an initial concentration of 6,000 ppm of hydrogen sulfide, and the same air/gas mixing assumptions used to model the flammable vapor cloud, hydrogen

sulfide would be diluted to 300 ppm based on the assumption that the mixture is by then 95% air and 5% gas. The passage concludes: *Five percent has been utilized here since modeling for the flammable vapor cloud has shown that a 5% concentration would not reach ground level. Thus, produced gas containing 6,000 ppm H_2S would not result in a 300 ppm ground level concentration of H_2S.* The implication is that hydrogen sulfide behaves similarly to methane; however, methane is lighter than air. Hydrogen sulfide is heavier than air and therefore, we don't understand why the hydrogen sulfide constituent of a release would not be expected to sink, thereby reaching ground level, even though the methane might be expected to disperse upward. Please explain.

10. The most recent hazard footprint analysis calculates that the worst-case flammable gas cloud would result from a release from the process area. Would a worst-case hydrogen sulfide release during the production phase of the project be likeliest in this area also? If so, such a release should be analyzed, as stated under question 7 (subpart 2) above, based on the appropriate concentration of hydrogen sulfide (1500 ppm minimum).

11. Please evaluate the feasiblity of reinjecting sour gas instead of implementing onsite treatment.

If you have any questions, please call me at 415/904-5246 or Melanie Hale at 415/904-5247.

Sincerely,

Alison Dettmer

ALISON J. DETTMER
Supervisor
Energy & Ocean Resources Unit

ad\22\hermosa\hermosa8.ltr

STATE OF CALIFORNIA—THE RESOURCES AGENCY PETE WILSON, Governor

CALIFORNIA COASTAL COMMISSION
45 FREMONT, SUITE 2000
SAN FRANCISCO, CA 94105-2219
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June 27, 1997

David Gautschy
David E. Gautschy, Inc.
Petroleum Consulting Services
7122 Blue Sails Drive
Huntington Beach, California 92647

RE: **Filing Status of Coastal Development Permit Application E-96-28; Hermosa Beach Oil Development Project**

Dear Mr. Gautschy:

The Coastal Commission staff has reviewed the most recent Macpherson Oil Company submittal (June 2, 1997) and has determined that the application remains incomplete and cannot be filed until the following additional information is submitted.

Hydrogen Sulfide Gas

You have revised the baseline production level of hydrogen sulfide from 6,000 ppm to only 1,000 ppm on the theory that at levels of over 1,000 ppm the wells would be shut in and additional treatment equipment placed on line before production resumes. As there is evidence of hydrogen sulfide production from other wells in the Los Angeles Basin exceeding 5,000 ppm, we believe the analysis in your most recent submittal should be supplemented with a similar analysis utilizing a 6,000 ppm baseline.

A hydrogen sulfide release at Chevron's Gaviota processing site last April underscores the need to include an analysis of a low-pressure "pure" hydrogen sulfide release from the treatment/containment components of the proposed facility. This type of scenario varies considerably from a high pressure production stream release such as that discussed in the most recently submitted materials. Please supplement your analysis with an assessment of such a release scenario.

Please show all resultant hazard footprints on a map to scale with reduced copies for reproduction in the forthcoming staff report.

Water Treatment

Your most recent submittal amounts to a revision of the project description due to the addition of proposed chemical treatment of produced water onsite in preparation for reinjection. Please include plans for such treatment, including containment and storage structures, identification of the chemicals to be used, and disclosure of any hazardous properties that such chemicals may have (and necessary containment structures or applicable safe handling protocols). Incorporate any risk of upset and resultant hazard footprint in the risk analysis. If on-site storage of associated chemicals is proposed, please update the site plan (and provide reduced copies of the revised plans) to show how these facilities will be located amidst the other proposed development. In addition, please provide us with your transportation plan for supplying the necessary chemicals onsite.

Gas Treatment Site

The proposed project would send produced gas to the SCE Redondo Beach power plant facility for treatment. We have been notified that SCE's plant is now for sale and that if a buyer is not located the plant may be abandoned. Please show evidence of a commitment by SCE to treat the produced gas or disclose where the gas would be treated if the Redondo facility is closed. What changes in the associated pipeline construction proposal would be required as the result?

Parking Impacts

The site visit clarified that parking impacts from the proposed project will exceed those stated in the application. The City has verified that parking spaces lost to the project are in fact relied upon for weekend coastal access parking. In addition, it is clear that the loss of access to the Bodyglove facility will result in a reduction of capacity in their parking lot and associated increased competition for on-street parking. The cumulative impact will be greater loss of public access parking. As we have discussed, the City's plan to offset the lost parking capacity with additional on-street spaces must be submitted so that we can analyze the potential impacts to coastal access.

In addition, we understand that additional environmental impact analyses of alternative sites may be submitted for our consideration. If so, we encourage you to send such materials, together with the information requested above, as quickly as possible so that we can continue on track toward an August hearing for this application.

If you have any questions, please call me at 415/904-5246 or Melanie Hale at 415/904-5247.

Sincerely,

Alison Dettmer

ALISON J. DETTMER
Supervisor
Energy & Ocean Resources Unit

STATE OF CALIFORNIA—THE RESOURCES AGENCY PETE WILSON, Governor

CALIFORNIA COASTAL COMMISSION
45 FREMONT, SUITE 2000
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December 23, 1996

David Gautschy, Inc.
2698 Junipero Avenue, Suite 201B
Signal Hill, California 90806

Re: **Coastal Development Permit Application E-96-28; Hermosa Beach Urban Oil and Gas Drilling Project**

Dear Mr. Gautschy:

The Coastal Commission staff has reviewed Macpherson Oil Company's coastal development permit ("CDP") application E-96-28[1] and has determined that the application is incomplete. The application cannot be filed, pursuant to CDP filing requirements contained in 14 CCR § 13053.5(a), until the following additional information is submitted:

Project Description

1. Please provide the date the "Declaration of Posting" (Appendix D) was posted at the proposed drillsite.

2. Please submit grading plans that show cut and fill lines, a clear delineation of the material being graded and the square footage of each equipment pad.

3. Please submit a set of plans that have been approved by the City of Hermosa Beach (i.e., the City's stamp/signature on each plan).

4. The Annual Oil Production Forecast graph is outdated. It assumes production to begin in 1993. Please submit an updated graph.

5. Please provide an estimate of natural gas production rates during Phase I and Phase II.

6. How will runoff be contained on site during the grading/construction phases?

7. The application does not describe or illustrate the proposed project's truck route. Please submit a detailed map showing the route each truck will take upon leaving the production site.

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[1] Since Macpherson Oil Company plans to transfer ownership of the proposed 2,400 foot long crude oil pipeline to Chevron after it is constructed, you agreed to submit a separate CDP application for the construction and operation of the crude oil pipeline. Accordingly, this application status letter does not address the construction and operation of the crude oil line. The Commission staff will process the crude oil pipeline application concurrently with CDP application E-96-28.

8. Macpherson's 1993 application suggested that trucking of oil (up to 4 truck trips per day) may occur for 2.5 years (until the crude oil pipeline is constructed and operational). Based on Macpherson's most recent plans, is this still the case?

9. Please submit conceptual, preliminary engineering plans for the gas pipeline.

10. Please submit clear 8-1/2 x 11-inch reductions of all site plans, including any additional plans and exhibits that we may request.

11. The application includes a soil contamination site characterization study prepared by Entrix. That analysis identifies two areas of concern: (1) an accumulation of TPH-contaminated soil (motor oil or crude oil) at the base of the former City Dump, and (2) an accumulation of lead and cadmium in the former city landfill at a depth of 15 feet. The report also recommends to the City of Hermosa Beach and Macpherson Oil that (1) additional sampling be undertaken to define the extent of metals-contaminated soils and, if warranted, excavate the contaminated area, and (2) use bioremediation (bioventing) to remediate TPH-contaminated soils It is unclear whether Entrix's recommendations are proposed as part of this project. Please submit a work plan specifically describing Macpherson's proposed site remediation plans.

12. Please provide plans or maps of the drilling pattern for the exploration, production and reinjection wells and show their general location through each production zone. For any plans which have not yet been finalized, please provide conceptual plans based on your best current estimates.

13. Please provide maps or plans of the probable limit of each target zone. The alternative site analysis and the subsidence plan show some of these limits; however, we could not find all the boundaries delineated on one map or plan. Also, please explain briefly why the one mile limit is significant to this boundary.

Other Agency Approvals

14. What is the Regional Water Quality Control Board's (RWQCB) role in the remediation of the Maintenance Yard site? Entrix's soil remediation recommendations are based on a cleanup level of 1,000 ppm. Please submit evidence that the RWQCB agrees with the 1,000 ppm standard for this site. (We are aware, for example, that the Central Coast RWQCB prefers a 100 ppm TPH soil contamination cleanup standard.)

15. Is RWQCB review and approval needed for any other phase of the project?

16. Please submit a list of all discretionary approvals (e.g., City of Hermosa Beach, SCAQMD, RWQCB, etc.) necessary for the proposed project (including the remediation phase).

Alternative Site Analysis

17. The technical discussion of the alternate site analysis is difficult to follow without a map showing the limits of the reserves relative to the proposed sites. The general analysis seems to assume that every acre-foot of the reservoir will have the same production potential and that failure to reach the extreme edges of the reservoirs will have the same effect on production as failure to reach the center part of the reservoir. We need further clarification of the alternate site analysis and of the assumptions used to identify that the Hermosa Beach site is the only technically feasible site.

18. Please map the range of alternatives by using the City's certified land use plan map overlain with an arc representing the technical reach of directional drilling.

19. Please provide us with the proportion of the reserves that you believe must be recovered for this project to be financially feasible. Please explain the economic justification for your conclusion.

Oil Spills

20. The project's Oil Spill Contingency Plan (OSCP) acknowledges that the most significant potential accident associated with well drilling is a blowout. The plan concludes, however, that there is "virtually no possibility" that a drilling or well-related release could occur at the site; no analysis of a well blowout scenario is provided. We agree that the probability of a well blowout is low, but we are not convinced that a well blowout should be dismissed as a potential accident scenario at this site. Please provide additional information (e.g., specific characteristics of this reservoir, special features of the proposed blowout prevention system) to support your finding that the chance of a well blowout is so remote as to not warrant quantitative analysis.

21. How many barrels of oil can the Phase II well cellar hold in the event of an accidental release of crude oil?

22. The OSCP states on page 3-6 that the Phase I worst case spill is 500 barrels of crude oil. How did you determine the 500 barrel worst case spill volume? Please provide your assumptions and calculations.

23. It is our understanding that the produced crude oil will be sold to Chevron for delivery to its El Segundo Refinery. At what point during the Phase I production/transportation cycle is the ownership of the oil transferred to Chevron --- before the crude oil is transferred to a tank truck or when the oil reaches the refinery?

24. The risk and hazard analysis concludes that all potential oil discharges during Phase I will be contained on site and therefore no off-site resources will be at risk. Page 3-8 of the

OSCP states that the "risk of a release that can leave the facility is essentially non-existent." The analysis fails, however, to consider a tank truck accident after the truck has left the production site. Such an accident could theoretically occur on Valley Drive. A worst case discharge from a truck accident is 150 barrels. Such an oil release could enter the City's storm drain system and ocean waters. We believe this potential scenario should be addressed in the OSCP.

25. The OSCP states that if a tank truck accident occurs, it will be the responsibility of the transport company to respond to a spill. If a transport company has been identified for this project, please submit a copy if its OSCP.

Geotechnical Investigation Soils Analysis

26. There are a number of recommendations in the "Geotechnical Investigation Soils Analysis" report concerning overexcavation, foundation designs, etc.. Please identify what recommendations will be followed by the applicant. If there are any recommendations which will not be followed, please discuss the basis for this decision and explain what substitute actions, if any, will be proposed. Would these recommendations affect the contours of the requested grading plans, etc.?

Subsidence Monitoring Plan

27. How will evidence of subsidence "attributable to oil operations" be determined? Who will compile and interpret the results of the annual monitoring program? How quickly can a water injection program be developed and implemented once discovery of subsidence is found? If subsidence is discovered due to oil drilling operations, will monitoring occur more frequently thereafter?

28. Please provide a map of the proposed benchmark network and the detailed monitoring plan which is cited in the subsidence plan.

29. The subsidence plan states that offshore soil compaction can be detected by measuring the casing "on the hook." Please provide details about what efforts will be undertaken to detect soil compaction including, but not limited to:

- accuracy of this detection method
- ability to measure compaction once it is detected
- information on measurement accuracy
- the relationship between surface subsidence and soil compaction
- locations of the casings which will be measured and frequency of measurements
- triggers for further action if compaction is detected and the types of responses which would be considered.

30. The application states that water reinjection is a standard technique to address subsidence and recognizes that the California Coastal Act (Section 30262(f)) requires that all produced water be reinjected into producing zones. However, Macpherson Oil proposes to delay filing an application for reinjection wells with the Division of Oil and Gas and Geothermal Resources (DOGGR) until commercial values have been determined. We cannot fully evaluate the effects of the production phase of this project without more information on Macpherson's plans for water reinjection. Therefore, please provide a conceptual reinjection plan based on your current best estimates. Is it feasible to locate all potential reinjection wells within the physical boundary of the proposed project site?

Hazard Footprint Analysis

31. Please submit a map showing the hazard footprint in relationship to adjacent parcels, mapped to scale against the City's certified land use plan.

32. Please submit a breakout of upset scenarios, resultant hazards, hazard distances, potential fatalities and injuries. Please also submit a comprehensive quantitative risk assessment for the proposed project and site alternatives and a consequence analysis. Please include vapor dispersion models under varying release scenarios. Please state how far the project is from the nearest school, sensitive receptors and residences.

33. The Hazard Footprint Analysis dismisses the risk of hydrogen sulfide (H_2S) exposure from project operations. However, the risk assessment models a potential scenario for H_2S release. Please provide a more detailed analysis of a possible H_2S release and explain all assumptions regarding climate, dispersion, etc.. Please map the H_2S footprint on the certified land use plan map (see No. 31).

Seismicity

34. Please provide a more detailed map showing the project site, well sites, local area and faults. A map of the entire western United States is too general.

Visual

35. Macpherson's 1993 CDP application E-94-11 included a cross section rendering that we returned to you in March 1995 when that application was withdrawn. We would appreciate you re-submitting that visual aid as a part of this application submittal.

Air Quality

36. The application includes SCAQMD-issued Permits to Construct for Phases I and II. Please submit also (1) evidence of all necessary permits from the SCAQMD for the site

remediation component of the proposed project, and (2) estimated emission totals for the site remediation phase.

37. The 1989 EIR for the proposed project includes estimates of total emissions associated with Phase I and Phase II. Are these emission estimates still accurate? If not, please submit a new analysis describing all project-related emission totals.

We would like to discuss further with you the contents of this letter after you return from your holiday vacation. In the meantime, we will continue discussions with the staff of the City of Hermosa Beach regarding the processing of all amendments to the certified land use plan necessary for this proposed project.

Sincerely,

Alison Dettmer

ALISON J. DETTMER
Supervisor
Energy and Ocean Resources Unit

cc. Macpherson Oil Company
Sol Blumenfeld, City of Hermosa Beach

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Arthur D Little

Review of the Hazard Analysis For The Macpherson Oil Company Hermosa Beach Project

FINAL REPORT

Prepared for
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December 1997

Reference 34629

EXHIBIT NO. 7
APPLICATION NO.
E-96-28
Macpherson Oil

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1 Hazard Footprint Analysis - May 9, 1995
2 Hazard Footprint Analysis - March 3, 1997
3 Hazard Footprint Analysis - October 2, 1997
4 Hazard Footprint Analysis - October 29, 1997

1.0 Introduction

This report has been prepared for the California Coastal Commission (CCC) to provide an independent, qualified third-party review of certain hazard analysis aspects of a proposed exploration and production project submitted by Macpherson Oil Company (MACPHERSON) to the CCC as part of Application E-96-28 for a coastal development permit (CDP).

MACPHERSON has been selected by the City of Hermosa Beach to conduct exploratory drilling and production of hydrocarbons from the City Maintenance Yard. MACPHERSON proposes to drill three exploratory wells from the City Maintenance Yard. If the exploratory drilling and associated temporary production testing prove successful, MACPHERSON proposes to drill up to 30 wells from the City Maintenance Yard. Permanent tanks and production facilities would also be installed at the City Maintenance Yard site.

The original CDP application submitted by MACPHERSON indicated that crude oil would be shipped to the Chevron El Segundo Refinery, while produced gas would be dehydrated and delivered to the Southern California Gas Company. During the exploratory phase of the project, gas would be flared, and the oil would be trucked from the site to the Chevron El Segundo Refinery. If the exploration phase of the project proves successful, then the gas would be delivered to Southern California Gas Company via pipeline and the oil and natural gas liquids (NGLs) would be commingled and shipped via pipeline to the Chevron El Segundo Refinery.

Subsequent to the preparation of a draft of this report, MACPHERSON amended their CDP application to address some of the concerns that were raised in the draft report, as well as clarified some potential inconsistencies between their CDP application and their project as permitted by the City of Hermosa Beach. These changes, as well as the potential implications, and summarized as follows:

- ***Crude Oil Transportation*** - MACPHERSON is no longer proposing to utilize a decommissioned Chevron crude oil pipeline to transport crude oil to the Chevron El Segundo Refinery. Instead, MACPHERSON has decided to connect their proposed crude oil pipeline into the Edison Pipeline and Terminal Company (EPTC) transportation system at the Southern California Edison Redondo Beach Terminal and Generating Station. This change will allow MACPHERSON to deliver their crude oil to any of the refineries in the Los Angeles Basin.

- ***Produced Gas Transportation*** - The MACPHERSON Hermosa Beach Project, as permitted by the City of Hermosa Beach, did not include any gas sweetening equipment that would allow for the removal of hydrogen sulfide, nor did the Environmental Impact Report (EIR) for the project include any analysis of potential environmental or safety impacts associated with hydrogen sulfide. Based on available data on potential hydrogen sulfide concentrations in the produced gas, it is likely that the produced gas would not meet the Southern California Gas Company hydrogen sulfide limit of 4 ppm during the entire lifetime of the project without the installation of gas sweetening equipment and further environmental review. As a

result, MACPHERSON has amended their CDP to transport produced gas to the Southern California Edison Redondo Beach Terminal and Generating Station which can accept natural gas with concentrations of up to 40 ppm hydrogen sulfide.

Several hazard impact analysis reports have been prepared for the MACPHERSON Hermosa Beach Project by Reese-Chambers Systems Consultants (Reese-Chambers) over the past year. The original draft report of this third-party review was based on Reese-Chambers' reports dated May 9, 1995 and March 3, 1997. Subsequent to our draft third-party review, two additional reports have been prepared by Reese-Chambers dated October 2, 1997 and October 29, 1997. These reports are included as Attachments 1 through 4, respectively.

The original hazard impact analyses (May 9, 1995 and March 3, 1997) conducted by Reese-Chambers for this project have generally identified the range and magnitude of potential hazards associated with the proposed MACPHERSON Hermosa Beach Project. However, there was still some uncertainty associated with the magnitude of potential risk associated with the proposed project, hazards associated with equipment that is ancillary to the project, as well as characteristics of the Torrance Oil Field and proposed project. Based on this initial review, the following sections were prepared to present a discussion of a wide variety of safety issues associated with the proposed project, including:

- Potential hydrogen sulfide hazards,
- Additional hazard scenarios,
- Project risk profiles,
- Transportation risk,
- Pipeline safety, and
- Concerns related to the abandoned Chevron pipeline.

Each of these issues has been evaluated as part of this review in terms of the adequacy of the analyses conducted to date, proposed safety features and the potential need for additional mitigation. Generally, the project is well designed and provides a wide variety of safety and mitigation measures that would serve to minimize potential hazards associated with the proposed project. However, in cases where some potential hazards had not been identified, or safety issues had not been fully evaluated or resolved, additional analyses were required.

Many of these safety issues have been resolved through further analysis, clarification by the applicant or additional mitigation measures. However, for each of the issues identified above, the original discussion from the draft report, as well as how each issue was resolved, is included in this final third-party review.

2.0 Potential Hydrogen Sulfide Hazards

2.1 Previous Hydrogen Sulfide Hazard Issue

While reservoir sulfur content is not an absolute indicator of produced gas hydrogen sulfide (H_2S) concentrations, reservoir fluid (crude oil and gas mixture) data indicated that onshore sulfur levels average approximately 1.4 percent while offshore levels average approximately 2.4 percent. While much of this sulfur would remain with the crude oil as elemental sulfur, the presence of sulfur in the reservoir fluids would tend to indicate the potential for elevated H_2S levels in the produced gas. In addition, other nearby wells in the same reservoir have shown elevated hydrogen sulfide concentrations, some greater than 5,000 ppm (MACPHERSON May 30, 1997 responses to CCC, page 8).

MACPHERSON has stated they do not expect to observe elevated H_2S concentrations in the produced gas stream, and that proper management of the reservoir would prevent the formation of H_2S, but the reservoir is not a virgin field that has never been produced. Even if no H_2S is observed during the initial production stages, it is likely that sour gas will migrate from other nearby parts of the reservoir that have shown relatively high levels of H_2S (i.e., levels well in excess of 1,000 ppm). MACPHERSON has acknowledged the potential for reservoir fluid migration in their responses to the CCC (July 2, 1997 responses, page 9).

To address the uncertainty associated with current and future levels of hydrogen sulfide in the produced gas, MACPHERSON originally committed to monitoring the produced gas for hydrogen sulfide gas. Under that proposal, if hydrogen sulfide concentration were found to exceed 1,000 ppm, MACPHERSON would have treated the produced gas downhole (i.e., in the well casing) to maintain a hydrogen sulfide level of less than 1,000 ppm. In the event that hydrogen sulfide concentrations could not be reduced to a level of less than 1,000 ppm, the well would have been permanently shut in.

MACPHERSON originally proposed to monitor produced gas H_2S concentrations at a single location in the well header collection system. Under that proposal, the produced gas from each well would be commingled in the well header system. As a result, it is quite likely that wells could have operated with H_2S concentrations well in excess of 1,000 ppm because these levels would be masked by dilution from other unaffected wells (the applicant proposes to drill 30 wells). MACPHERSON has subsequently committed to monitoring the wells individually for elevated H_2S.

Possible Mitigation Measures

2-1 Monitoring for Hydrogen Sulfide
Continuous monitoring for H_2S should occur at each wellhead casing, as well as in the well header, gas processing train, or any other process location where high H_2S levels are possible. Gas streams found to exceed the 1,000 ppm limit for H_2S should be immediately shut down until excess levels of H_2S can be abated. Widespread, continuous monitoring for H_2S, associated with

the ability to isolate gas streams with high H_2S levels, would effectively abate potentially high levels of H_2S. Should continuous H_2S monitoring not be feasible at each well casing, the H_2S levels that would trigger an evaluation of each well should be based on the ratio of 1,000 ppm H_2S divided by the number of wells entering the gas stream, as well as weighted for the flow rate of each well.

2.2 Resolution of the Hydrogen Sulfide Hazard Issue

The MACPHERSON project, as currently proposed, would not be permitted to produce or process gas with H_2S levels of more than 40 ppm. Therefore, any potential risk to the public from exposure to H_2S would be negligible under the currently proposed project (see Section 3.1.1). The Reese-Chambers report dated October 2, 1997 evaluated potential H_2S hazards associated with a range of potential accidental release scenarios and H_2S concentrations. The Reese-Chambers report dated October 29, 1997 removed all analysis of potential H_2S hazards, since the project, as currently proposed in the CDP permit application to the Commission, would not allow for any H_2S in the produced gas at concentrations greater than 40 ppm. Section 3.1 of this report summarizes the potential H_2S hazards that were identified in the Reese-Chambers report dated October 29, 1997.

The H_2S monitoring requirements outlined in the previous section would also be applied to the revised MACPHERSON project. Produced gas at each well would be monitored on a regular basis (i.e., monthly), and the gas from the combined wells would be monitored on a continuous basis. Any well found to contain H_2S in excess of 40 ppm would be shut in, or recompleted in a reservoir zone with less than 40 ppm H_2S.

It should also be noted that the applicant has proposed to install and operate hydrogen sulfide monitoring equipment through the facility and around the perimeter of the project site. This monitoring system would be capable of detecting low concentrations of hydrogen sulfide and would warn the facility operators of potential equipment malfunctions and accidental releases of hydrogen sulfide. Also, at these low hydrogen sulfide levels, and with the proposed monitoring equipment in place, the facility should not create objectionable hydrogen sulfide odors in areas surrounding the facility under normal operating conditions.

3.0 Additional Hazard Scenarios

Overall, the hazard impact analyses prepared by Reese-Chambers have generally identified the range and magnitude of potential hazards associated with the proposed Hermosa Beach Project. However, two additional scenarios need to be evaluated and included in the project risk profile. These include potential hydrogen sulfide releases and produced gas treatment releases. Both of these are summarized below.

3.1 Hydrogen Sulfide Risk

3.1.1 Previous Hydrogen Sulfide Risk Issue

As noted in the previous section, the potential for H_2S in the produced gas remained a concern if elevated H_2S levels were found in the produced gas. Figures 1 and 2 provide information on the potential health effects associated with exposure to hydrogen sulfide. Additional information is also included on odor thresholds and perception. Note that these potential health effects are derived from occupational exposure and extrapolated to include children, the elderly and people with respiratory ailments. As a result, there is some uncertainty when applying these potential health effects to the general population, since some segments of the population may experience potentially adverse health effects at lower concentrations.

While MACPHERSON had proposed an H_2S contingency to mitigate potential production of sour gas, this mitigation did not completely abate the risk associated with sour gas. Subsurface casing gas treatment did not address the following issues:

- Reliability of the H_2S treatment system under normal conditions.
- Effectiveness of the H_2S treatment system.
- Reliability of the H_2S treatment system under upset conditions.
- Potential for high levels of sour gas upstream of H_2S monitoring.
- Potential failures of shut in wells.

The proposed H_2S monitoring system would not prevent the potential for sour gas to occur or to be released, but only reduced the amount of sour gas handling that could occur, thus reducing the potential for an accidental sour gas release. Even with effective monitoring and control for elevated H_2S levels, there was still a potential for an H_2S release with a concentration greater than 1,000 ppm. The combined reliability of the proposed H_2S treatment system, the effectiveness of monitoring equipment, and the reliability of the well head complex needed to be fully evaluated. This is especially important since the proposed facility location is in such close proximity to a populated area.

In addition, the risk profile developed by Reese-Chambers did not include any hydrogen sulfide release scenarios. Potential hydrogen sulfide release scenarios should be developed and included in the risk profile for the project. The scenarios should include normal operation as well as possible upset conditions, such as a well head release with failure of the H_2S treatment system. While this type of scenario would have a low likelihood of occurrence, it could have high consequences given the close proximity to a populated area.

Possible Mitigation Measures

3-1 Reliability of Hydrogen Sulfide Monitoring and Treatment Systems
A thorough evaluation of all components associated with the detection and treatment of sour gas should be thoroughly evaluated and included in the project's risk profile. Additional safety

Figure 1 - Hydrogen Sulfide Fatality Dose-Response Data

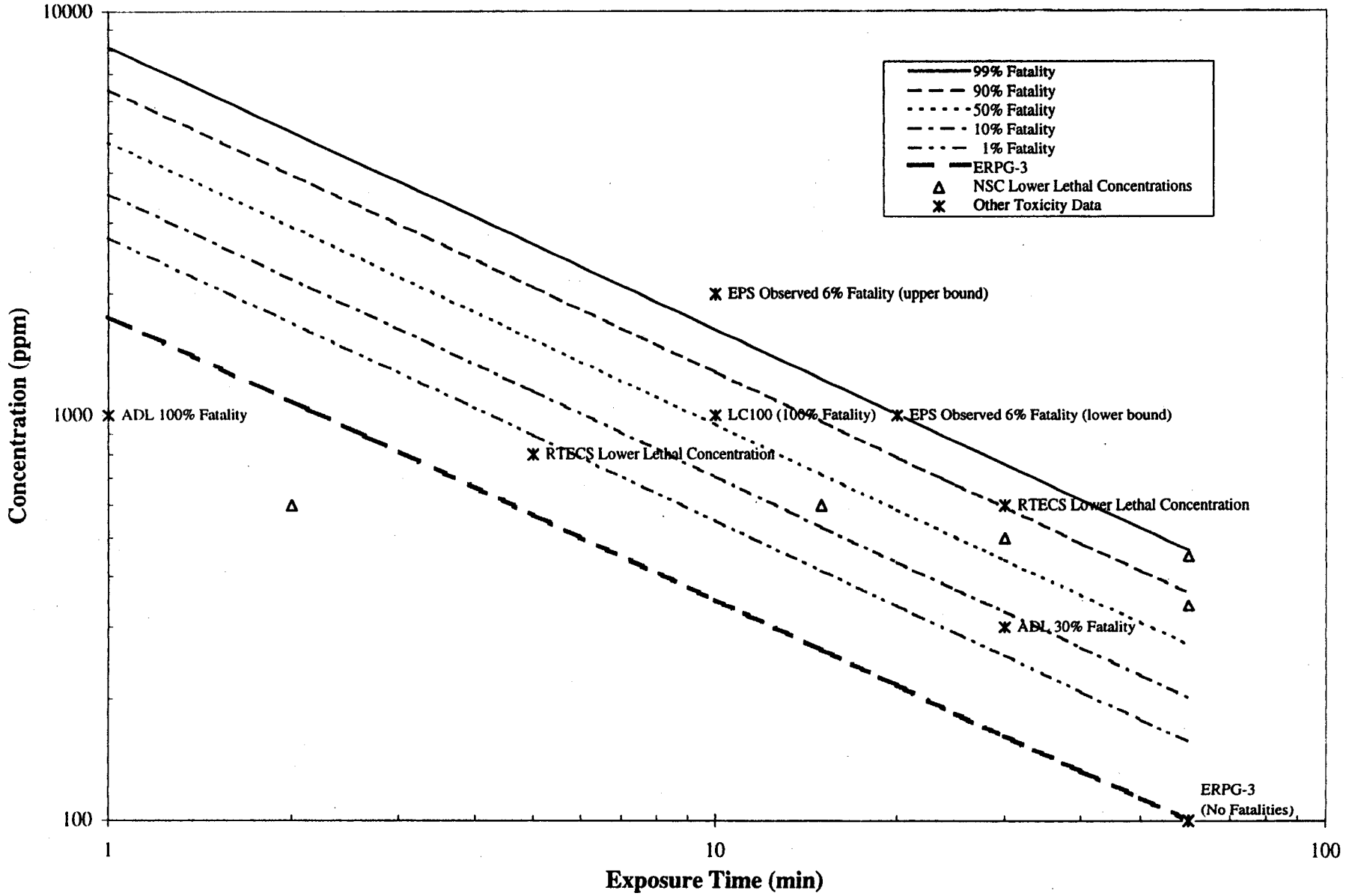

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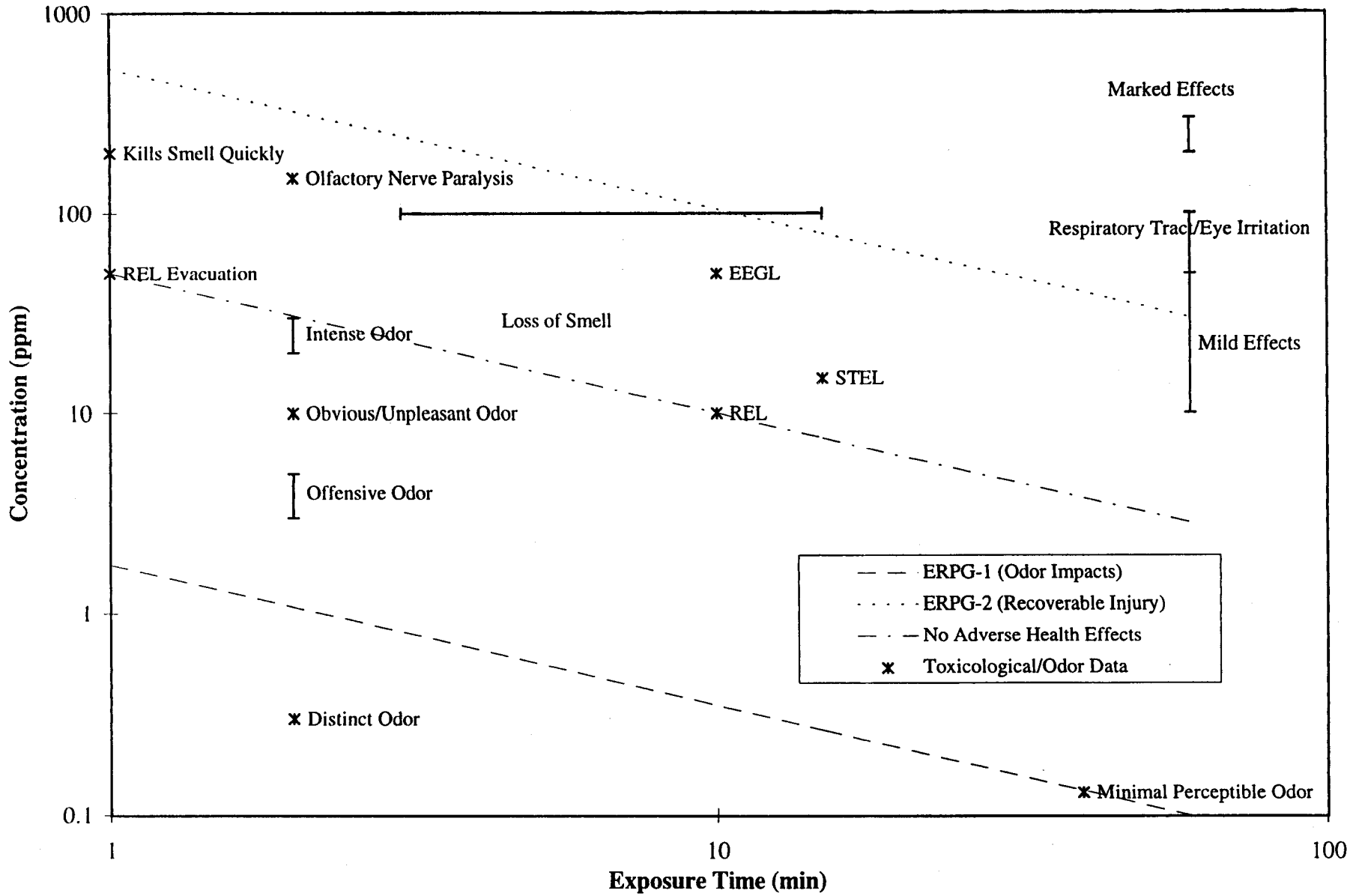
Figure 2 - Hydrogen Sulfide Injury Dos-Response Data



features or permit limitations should be added to effectively abate H_2S hazards if the results of risk assessment warrant additional mitigation. (Note: this mitigation measure would not be necessary as long as the hydrogen sulfide levels in the produced (untreated) gas remain below the applicant's proposed limit of 40 ppm.)

3.1.2 Resolution of the Hydrogen Sulfide Risk Issue

The Reese-Chambers report dated October 2, 1997 evaluated potential hazards associated with an accidental release of produced gas with elevated H_2S concentrations. The analysis evaluated H_2S concentrations ranging from 1,000 to 5,000 ppm. The results of this analysis indicated that an accidental release of produced gas containing 2,000 ppm H_2S would not result in potentially fatal concentrations of H_2S over the nearby residential areas under worst-case meteorological conditions, but potentially fatal H_2S concentrations could occur at the adjacent businesses that surround the site (see Figure 3). However, the worst-case meteorological conditions would occur at night when most of the businesses would be closed. Therefore, the potential for fatalities was considered unlikely. Based on the results of this analysis, MACPHERSON identified 2,000 ppm as a potential H_2S limit for the produced gas.

Produced (i.e., untreated) gas containing 2,000 ppm H_2S would have the potential to result in potential injuries at nearby residential and commercial/industrial areas, potentially affecting areas within 630 feet of the proposed facility (see Figure 3). While the hazards analysis showed that there would be a low probability for a fatality at 2,000 ppm H_2S in the produced gas, the likelihood that there would be injuries would be higher and extend further offsite. Based on the Reese-Chambers report dated October 2, 1997, a produced gas H_2S limit of approximately 300 ppm per well would be required to prevent potential injuries to the population surrounding the proposed MACPHERSON facility in the event of an accidental produced gas release.

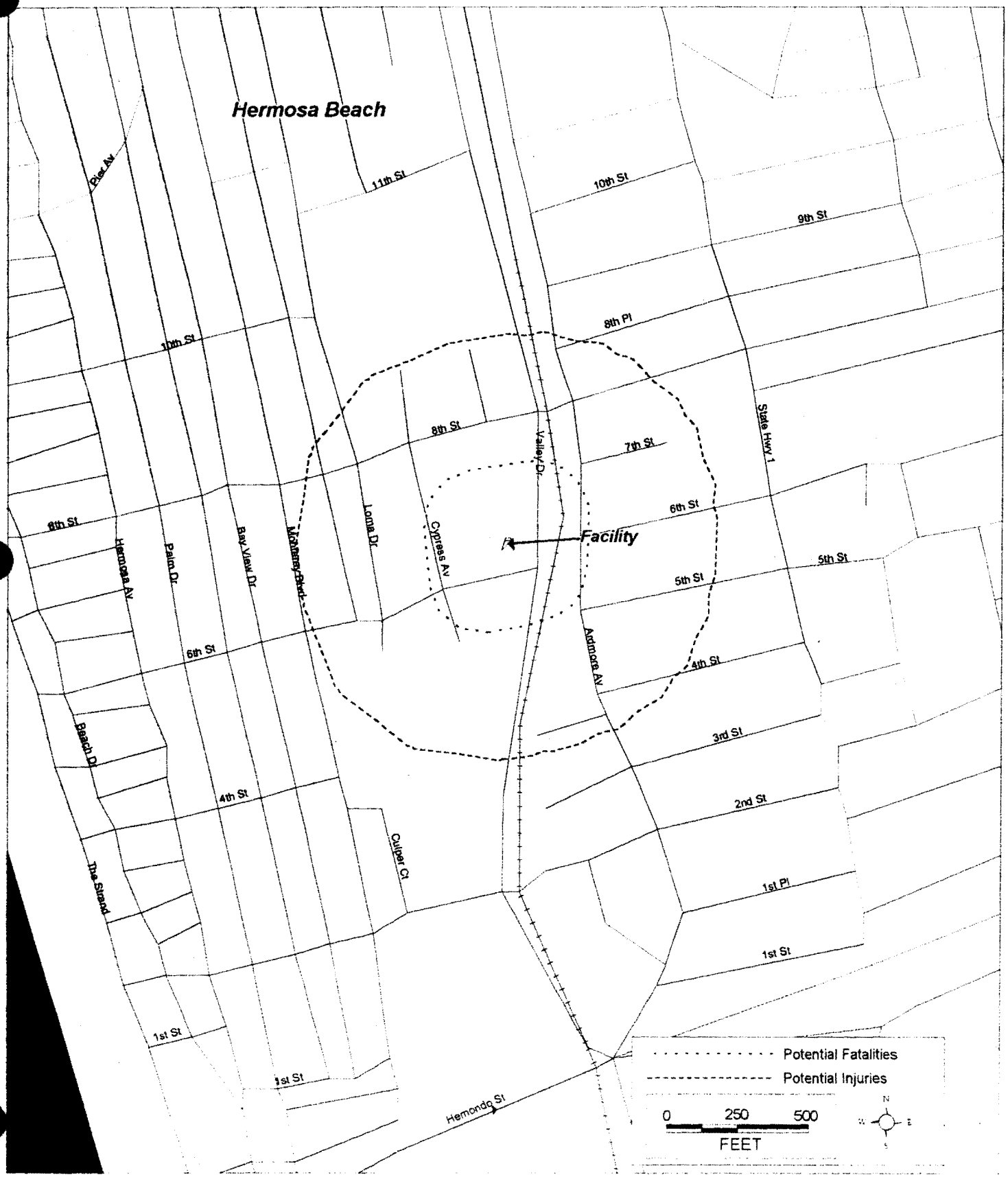
As stated previously, the MACPHERSON project, as currently proposed, would not be permitted to produce or process gas with H_2S levels of more than 40 ppm. Therefore, any potential risk to the public from exposure to H_2S would be negligible under the currently proposed project. The project, as currently proposed in the CDP permit application to the CCC, would not allow for any H_2S in the produced gas at concentrations greater than 40 ppm. Potential toxic hazards to the population surrounding the proposed facility associated with a produced gas H_2S concentration of 40 ppm would be considered negligible.

3.2 Produced Gas Treatment and Natural Gas Liquids

3.2.1 Previous Produced Gas Treatment and Natural Gas Liquids Issue

The Piping and Instrumentation Diagrams (P&IDs) showed that a refrigeration system would be included in the design of the project's production phase. A refrigeration system is necessary to treat the produced gas which has fractions of heavier hydrocarbons (e.g., propane, butane, etc.) that are above the Southern California Gas Company's pipeline specifications. Refrigeration

Figure 3 Hazard Zones for Produced Gas with a Hydrogen Sulfide Concentration of 2,000 ppm



skids generally use propane as a refrigerant in a closed loop system, much like a refrigerator uses freon. The refrigeration system is used to remove the heavier hydrocarbons from the gas and produce what are called natural gas liquids (NGLs).

NGLs are relatively volatile and extremely flammable. Under the current project Phase II design that was used in the initial hazards analysis report, NGLs extracted from the produced gas stream would be commingled with the crude oil and transported to the Chevron El Segundo Refinery via pipeline (the project has since been revised to utilize the Edison pipeline system). Since the hazard analysis prepared for the proposed project treated the crude oil as a flammable liquid, potential hazards associated with the combined crude oil/NGL stream have been adequately evaluated.

Potential hazards associated with the refrigeration system would include the potential for a NGL spill and resulting fire or explosion. In addition, if propane is used as a refrigerant, there is a potential for a release, fire and/or explosion.

Based upon previous studies we have conducted on similar refrigeration systems, there is the potential for release to affect the surrounding population. Hazards associated with a propane refrigeration can be easily abated.

3.2.2 Resolution of the Produced Gas Treatment and Natural Gas Liquids Issue

The revised Reese-Chambers reports dated October 2, 1997 and October 29, 1997 evaluated potential hazards associated with the proposed propane refrigeration and NGL systems. The results of the Reese-Chambers hazard analyses indicated that many of the potential accidental release scenarios associated with proposed propane refrigeration and NGL systems would be negligible. A potential catastrophic failure of the NGL surge vessel could result in adverse offsite impacts, but the probability of this scenario is extremely low. However, the potential risks associated with the proposed propane refrigeration and NGL systems were evaluated further in the Reese-Chambers risk profiles as discussed in the following section. While potential hazards associated with the proposed propane refrigeration and NGL systems were not evaluated in the draft Reese-Chambers report, the evaluations presented in the revised Reese-Chambers reports adequately identify and address potential hazards associated with these systems.

4.0 Project Risk Profiles

4.1 Previous Risk Profile Issue

The risk profile prepared for the proposed project was incorrectly presented in the report entitled *"Hazard Footprint Analysis Hermosa Beach Project"* prepared by Reese-Chambers dated March 3, 1997. While this was most likely an inadvertent graphical error (the numerical data supplied by Reese-Chambers was correct), the incorrect risk profile gave the indication that the potential risk posed by the project would be in the *"De Minimis"*, or insignificant region of the risk

matrix. Based on a review of the data that was used to generate the risk profile, it became apparent that the risk profile was plotted one order of magnitude too low, and that the risk profile actually traverses the *"Grey Region"* of the risk matrix which is indicative of a significant risk that requires mitigation. The corrected risk profile is shown in Figure 4.

The risk profile was constructed based on the risk to local residents and traffic. The risk profiles did not include estimates for potential fatalities in nearby commercial and industrial locations. Therefore, this risk would likely be slightly higher if the commercial/industrial population, excluding those workers at the MACPHERSON project site, were included in the risk estimate.

The risk profile was also based on a limited number of accidental release scenarios (i.e., one scenario), and did not include risk estimates for facilities such as the offsite oil and gas pipelines, and most of the onsite treatment facilities. The risk profile did not include any hydrogen sulfide releases. While many of these release scenarios would not likely result in offsite fatalities, there are some scenarios that should have been included in the risk estimate.

Risk profiles are commonly used to identify the cumulative frequency of potential fatalities that could occur from a wide range of accidental release scenarios. The analysis of the MACPHERSON Oil Company Hermosa Beach Project followed the methodology and presentation style outlined by Santa Barbara County's Environmental Thresholds for Public Safety. These thresholds, which were recently revised, specify levels of acceptable risk based on the likelihood for different numbers of potential fatalities. Santa Barbara County's safety thresholds are based on, and are consistent with, many national and international risk analysis thresholds, including the United States Nuclear Regulatory Commission, United Kingdom Health and Safety Executive, UK Atomic Energy Authority, the Netherlands, and the European Union. In addition, several companies and organizations, such as British Petroleum, Shell Oil, and the American Institute of Chemical Engineers, have adopted similar risk criteria. Using these generally accepted risk criteria, three general zones, or levels of risk, have been identified as follows:

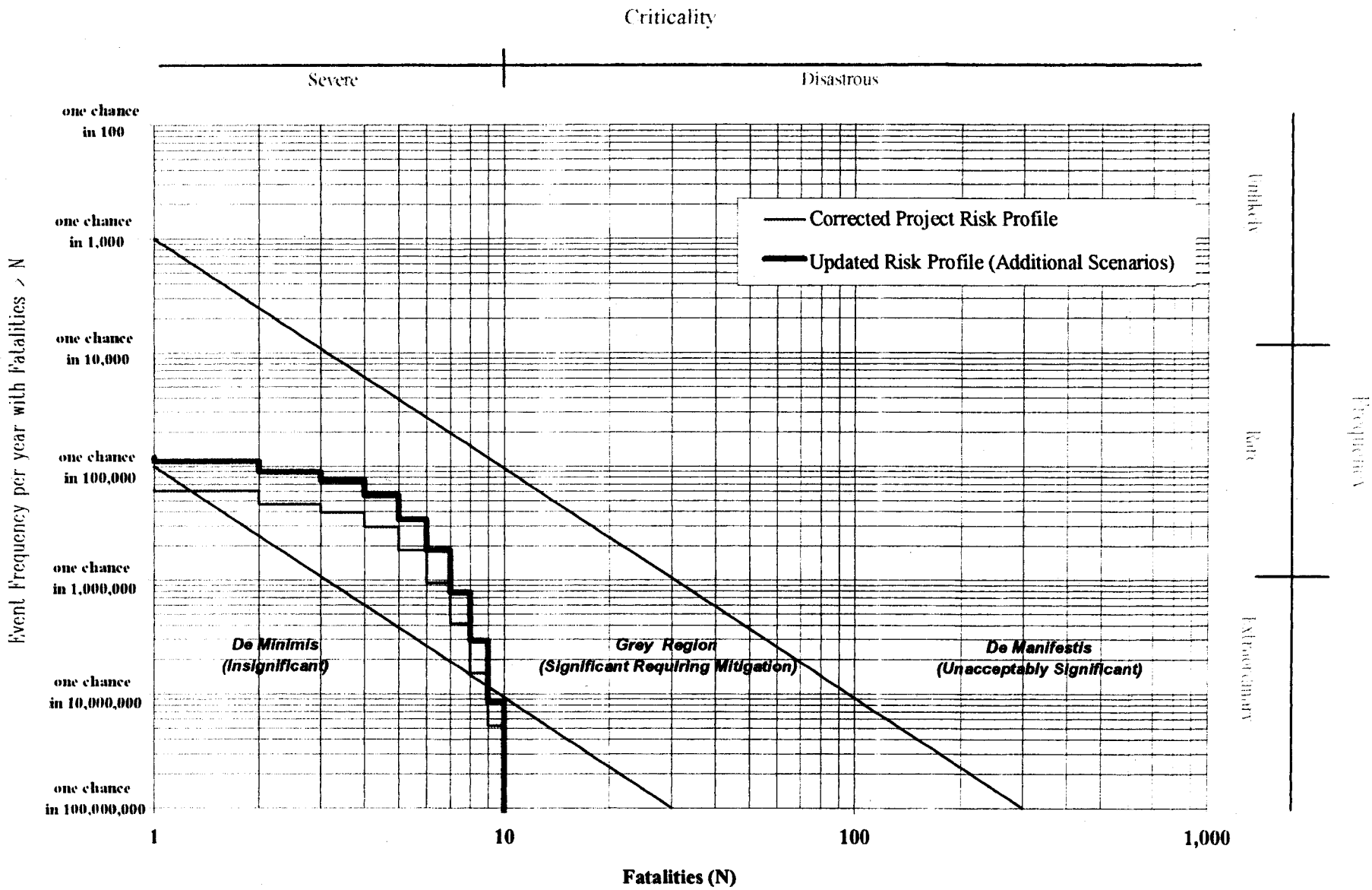
De Manifestis - This classification is considered unacceptable, and the proposed development or activity should not proceed unless mitigation can be instituted that successfully reduces the risk to below this level.

Grey Region - This classification is considered significant but acceptable if mitigated to the maximum extent feasible, preferably to a level of insignificance.

De Minimis - Risk levels within this classification are considered tolerable; however, feasible mitigation is still recommended for possible catastrophic events at commensurate costs to keep their probability of occurrence sufficiently low to qualify as insignificant.

Based on the risk profile prepared by Reese-Chambers for the MACPHERSON Oil Company Hermosa Beach Project, public safety impacts would be considered significant and should

Figure 4 - Macpherson Oil Company Hermosa Beach Project Fixed Facility Risk Profiles



require further evaluation and possibly additional mitigation in an effort to reduce the overall risk associated with the proposed project.

Possible Mitigation Measures

4-1 Hazard and Operability Study
A Hazard and Operability Study (HAZOP) for the proposed facility and ancillary equipment should be prepared by MACHPERSON prior to both Phase I and II operations. The HAZOP should identify potential accidental release scenarios and mitigation measures that would prevent or reduce the likelihood of the release scenarios that are identified. The HAZOP should also be reviewed and approved by the State Lands Commission prior to initiation of facility operations.

4.2 Resolution of the Risk Profile Issue

Reese-Chambers completely reevaluated their risk profile for the MACPHERSON project based on the comments in the draft version of this report. The Reese-Chambers report dated October 2, 1997 evaluated all of the additional accidental release scenarios that were identified, including potential hydrogen sulfide hazards. The Reese-Chambers report dated October 29, 1997 includes an evaluation of the risk associated with the project, as currently proposed for CDP approval. The risk profile for the currently proposed project is also shown on Figure 4. This risk profile illustrates the cumulative risk for all the hazard scenarios that were identified in the Reese-Chambers analysis.

As summarized above, the risk associated with the proposed project falls mainly in the "Grey Region" which is classified as a significant impact "...but acceptable if mitigated to the maximum extent feasible, preferably to a level of insignificance." A review of the safety features that are included in the project's design, as well as additional commitments made by the applicant for additional safety features, would indicate that the proposed project incorporates safety mitigation measures to the maximum extent feasible. However, potential fire and explosion hazards associated with the proposed project, especially given the location in close proximity to residential areas, would still be classified as a significant impact based on the generally accepted risk criteria used by the applicant. As a result, the detailed hazard and operability study recommended above may be able to identify additional design and operational hazards that could lead to the need for additional safety features or design/operational modifications.

5.0 Transportation Risk

5.1 Previous Transportation Risk Issue

Under the original proposal, crude oil would be transported via tanker truck during Phase I, while crude oil and natural gas would be transported via pipeline during Phase II of the proposed

project. Two issues were identified related to product transportation including quantification of transportation risk and emergency response capabilities.

Hazard zones were identified for crude oil spills (truck and pipeline transportation) and gas pipeline failures. These hazard zones appear to represent a reasonable worst-case. However, the risk associated with these accidental releases had not been quantified, and potential hazard zones had not been displayed on a map. As a result, the potential risk associated with crude oil and natural gas transportation had not been fully evaluated.

MACPHERSON has developed an emergency response plan covering a potential release from their proposed natural gas pipeline, and would be responsible for responding to any accident/incident. Crude oil will be metered at the site, thus relieving MACPHERSON of most emergency response requirements. A crude oil spill would continue to flow after a spill, potentially to the ocean, as well as pose a fire hazard to the surrounding population. Since the potential for an oil spill is directly related to the proposed development project, MACPHERSON should consider cooperating with the crude oil shippers on oil spill planning and response, as well as maintain oil spill response equipment onsite.

Possible Mitigation Measures

5-1 Transportation Risk Analysis
The risk associated with crude oil and natural gas transportation should be fully evaluated and include a quantification of the risk associated with product transportation (risk profile or risk matrix identifying the probability of an accident and the potential number of fatalities/injuries), and a map that clearly shows the pipeline/truck routes and associated hazard zones. This information should be prepared for truck transportation, as well as the crude oil and natural gas pipelines (including the Chevron pipeline).

5-2 Oil Spill Response
MACPHERSON should maintain onsite oil spill response equipment, plans and procedures to respond to an offsite truck or pipeline spill. The Oil Spill Contingency and Emergency Response Plan for crude oil transportation, as well as the onsite equipment necessary to respond to a spill, should be approved by the California Department of Fish and Game, Office of Oil Spill Prevention prior to operation of the proposed project.

5.2 Resolution of the Transportation Risk Issue

The revised hazard analysis prepared by Reese-Chambers clearly outlines potential transportation hazards and risk. Results of the Reese-Chambers risk analysis indicate that potential hazards associated with crude oil and natural gas transportation would be less than significant for the project as currently proposed. While the hazard zones related to crude oil and natural gas transportation clearly overlap developed residential areas, the probabilities of these hazards occurring are sufficiently low to warrant a less than significant finding.

Subsequent to the preparation of the draft version of this report, an oil spill response plan was received from MACPHERSON outlining their proposed oil spill response planning. This planning, while quite comprehensive, does not meet the above proposed mitigation measure (#5-2), especially since MACPHERSON will be responsible for any crude oil spill between their facility and the Edison pipeline terminus at the Redondo Beach Terminal and Generating Station. Therefore, additional oil spill response equipment and/or agreements may be necessary.

6.0 Pipeline Safety - New Pipelines

6.1 Previous New Pipeline Safety Issue

The proposed new pipelines directly associated with the proposed project are generally well designed per the requirements of the California State Fire Marshall (CSFM). A wide variety of safety measures are incorporated in the oil and gas pipeline designs, and pipeline installation includes several mitigation measures to reduce the potential for third-party pipeline damage. These measures include a cement/sand slurry around the pipeline to prevent settling and alert third parties that a pipeline is present, and brightly colored tape placed above the pipeline to again alert third parties that a pipeline is present. The pipeline is also designed to meet the current code requirements for material specifications.

The crude oil pipeline would be operated using a Supervisory Control and Data Acquisition (SCADA) system which allows the operator, in this case Chevron, to remotely monitor and control the pipeline. It is unclear what type of valves are proposed for the new pipeline, as well as what valves are included on the Chevron pipeline.

The natural gas pipeline is also designed per the requirements of the CSFM, and is equipped with check and control valves. The natural gas pipeline will be equipped with a pressure monitoring system with an automatic shutdown system.

Mitigation Measures

6-1 Crude Oil Pipeline Valves
All valves on the MACPHERSON oil pipeline should be designed to be operated by Chevron using their SCADA system and should be designed to fail in a closed position. Valves on the Chevron pipeline should also be upgraded to fail in a closed position. A fail-closed block valve should be installed at the intersection of the MACPHERSON and Chevron pipelines. Block/check valve combinations should be installed at any channel or fault crossing (if any).

6.2 Resolution of the New Pipeline Safety Issue

The proposed new crude oil and natural gas pipelines would meet or exceed current regulatory safety requirements. In addition, MACPHERSON has proposed to add additional safety valves

on the crude oil pipeline to reduce the volume of oil that would be spilled in the event of a pipeline failure. Continuous pressure readings taken at these valves would be communicated to the SCADA system and would contribute to the rapid detection of a pipeline leak or rupture. Results of the Reese-Chambers risk analysis also indicate that potential hazards associated with crude oil and natural gas pipeline transportation would be less than significant for the project as currently proposed. This is a reasonable finding given the relatively short length of these pipelines and the more rigorous design and operational provisions now required by the California State Fire Marshall. However, given the close proximity of these pipelines to the population in a densely developed urban area (i.e., the pipelines would be constructed under the street), there would still be a potential for the public to be exposed to potential fire and explosion hazards in the event of a pipeline failure. In addition, a failure of the crude oil pipeline could cause oil to flow into the ocean through existing storm drains resulting in localized coastal environmental damage, although adequate onsite oil spill containment equipment and planning could prevent or reduce the likelihood of oil reaching the ocean in the event of a spill.

7.0 Concerns Related to the Abandoned Chevron Pipeline

7.1 Previous Chevron Pipeline Safety Issue

The main concern related to the proposed project and pipeline product transportation was the reactivation of a very old, and partially abandoned, crude oil pipeline owned by Chevron. While the crude oil would not be the responsibility of MACPHERSON once it leaves their site and is transferred to Chevron ownership, reactivation of this pipeline is clearly a result of MACPHERSON's Hermosa Beach project.

The Chevron pipeline was originally constructed in 1925, although several segments have been replaced as recently as 1984. Pipelines during this period generally utilized lap welded pipe which has a failure rate of approximately 18 times greater than electric resistance welded pipe which is commonly used today (CSFM, 1993). Pre-1940 pipelines have also been found to have failure rates approximately 20 times greater than those constructed in the 1980s (CSFM, 1993). Some portions of this pipeline are approximately 72 years old and will likely be more than 100 years old near the end of the project's life. It is doubtful that this pipeline was designed for this long of a service life.

There was also a considerable amount of uncertainty related to the overall condition of this pipeline, how the pipeline was abandoned, how, or if, the pipeline was sealed when segments were removed, and whether or not cathodic protection was continued after the pipeline was abandoned.

It should be noted that the CSFM refused to allow Arco to resume crude oil shipments in their Line 1 between the San Joaquin Valley and Carson Refinery until significant improvements were made to the line. Since Arco declined to replace all of the segments that were lap welded, they abandoned the pipeline. This pipeline was also constructed in the 1920s and failed in several locations during the Northridge earthquake. It is also possible that Chevron may decline to

commit the resources necessary to reactivate this pipeline, given the resources that may be required. Without this pipeline, it is unlikely that the proposed project could move forward without a reasonable method of crude oil transportation.

Possible Mitigation Measures

7-1 Chevron Crude Oil Pipeline Testing
The Chevron pipeline should be upgraded to allow for the use of an instrumented tool (i.e., smart pig) to allow for a thorough evaluation of the pipeline's condition. Once modified, the pipeline should be evaluated, and repaired as necessary, prior to crude oil shipments proceed. All pipeline sections that show a degradation of wall thickness of more than 25 percent should be replaced.

7-2 Chevron Crude Oil Pipeline Upgrades
All lap welded section of the Chevron pipeline should be replaced with seamless steel pipe. Block and check valves should be installed, as appropriate, as listed in Mitigation Measure 6-1.

7-3 Transportation Risk Analysis
The risk associated with crude oil transportation should be fully evaluated and include a quantification of the risk associated with product transportation (risk profile or risk matrix identifying the probability of an accident and the potential number of fatalities/injuries), and a map that clearly shows the pipeline route and associated hazard zones.

7-4 Alternate Crude Oil Transportation
Crude oil transportation for the final phase of the project should be limited to pipeline transportation. Assuming the peak production of 6,000 barrels per day, approximately 40 truck trips per day would be required if a pipeline were not available. Given the accident high probabilities associated with truck transportation, this would represent an unacceptable risk.

7.2 Resolution of the Chevron Pipeline Safety Issue

MACPHERSON is no longer proposing to utilize the decommissioned Chevron crude oil pipeline to transport crude oil to the Chevron El Segundo Refinery. Instead, MACPHERSON has decided to connect their proposed crude oil pipeline into the Edison Pipeline and Terminal Company (EPTC) transportation system at the Southern California Edison Redondo Beach Terminal and Generating Station.

EPTC owns and operates a pipeline system and petroleum storage facility that is used to move and store various types of petroleum products. The EPTC system has a total storage capacity of approximately 16.6 million barrels, and consists of one tank farm, storage facilities at eight generating stations, eleven heating and pumping stations (five of which are individual facilities and six of which are located at generating stations), and an underground oil pipeline system located in the greater Los Angeles area.

The EPTC pipeline system was originally built to store and re-supply Southern California Edison (SCE) steam generation stations with fuel oil purchased from local refineries or brought into the system by tanker. The fuel oil was shipped to the generating stations and stored at a number of locations throughout the system. In late 1994 SCE received permission from the California Public Utilities Commission (CPUC) to transport and store crude oil and other petroleum products using their pipeline system. SCE formed EPTC to operate the pipeline system for third party commercial use. As part of the CPUC decision, 12.5 percent of the EPTC operating revenue goes to the SCE rate payers. Consequently, SCE, through EPTC, contracts its available storage capacity and pipeline infrastructure to outside parties for the storage and transport of their petroleum products.

The EPTC pipeline system has not experienced a reportable spill since the 1970s and utilizes a maintenance and inspection program that is more rigorous than that required by the California State Fire Marshall. As a result, substituting the EPTC pipeline system for the abandoned Chevron pipeline resolves any safety issues related to the long-term crude oil transportation needs associated with the proposed project.

8.0 Summary of Existing Hazards

The applicant qualitatively evaluated the hazards that currently exist at the proposed project site. Existing hazards at the project site include gasoline storage and transportation, and a small propane tank. These existing hazards would be similar to the truck transportation hazards associated with the proposed project and the small propane vessel that would be used at the production facility. The Reese-Chambers report dated October 29, 1997 stated that existing hazards at the site would be about the same as the proposed project. While this may be true for crude oil transportation and the propane vessel, the MACPHERSON project would add a significantly greater volume and size of components for production, processing and transportation of crude oil and natural gas. As a result, existing hazards would be considered insignificant, while the proposed project would introduce a far greater hazard to the surrounding community than currently exists.

Using the information that was presented in Figure 4, the incremental risk proposed by the existing hazards at the site was subtracted from the proposed project risk profile. The resulting incremental increase in risk that would be created by the proposed project would be nearly identical to the project risk profile as presented in Figure 4 (i.e., the risk profile is imperceptibly different than the original profile that was not corrected for baseline risk levels). The risk associated with the proposed project would still fall mainly in the "Grey Region" which is classified as a significant impact "...but acceptable if mitigated to the maximum extent feasible, preferably to a level of insignificance (Santa Barbara County Risk Guidelines)." (See Section 9 for a discussion of the risk associated with the proposed project.)

9.0 Summary of Project-Related Hazards

The hazard analyses that have been prepared for the proposed MACPHERSON Hermosa Beach Project have evaluated a wide variety of potential hazards that could adversely affect the surrounding community as shown in Figure 5. A majority of the hazards are associated with fire and explosion hazards associated with crude oil and natural gas production, processing and transportation. Since MACPHERSON has committed to monitor their wells for hydrogen sulfide, and would shut down wells containing more than 40 ppm hydrogen sulfide, potential acute toxic hazards associated with the proposed project would be considered minimal.

As summarized in the previous section, the risk associated with the proposed project falls mainly in the "Grey Region" which is classified as a significant impact "...but acceptable if mitigated to the maximum extent feasible, preferably to a level of insignificance (Santa Barbara County Risk Guidelines)." A review of the safety features that are included in the project's design, as well as additional commitments made by the applicant for additional safety features, would indicate that the proposed project incorporates safety mitigation measures to the maximum extent feasible. However, potential fire and explosion hazards associated with the proposed project, especially given the location in close proximity to residential areas, would still be classified as a significant impact based on the generally accepted risk criteria used by the applicant. As a result, the detailed hazard and operability study recommended in this report may be able to identify additional design and operational hazards that could lead to the need for additional safety features or design/operational modifications.

The quantitative risk estimates for the proposed project can be compared to the individual chances of fatality due to other causes, as shown in Table 1 (all of these figures should be compared on an order of magnitude basis, but not in terms of their exact numerical value). As can be seen from this figure, the risks from the proposed MACPHERSON Hermosa Beach Project are low relative to those associated with various diseases and accidental causes.

Figure 5 Macpherson Hermosa Beach Project Hazard Zones

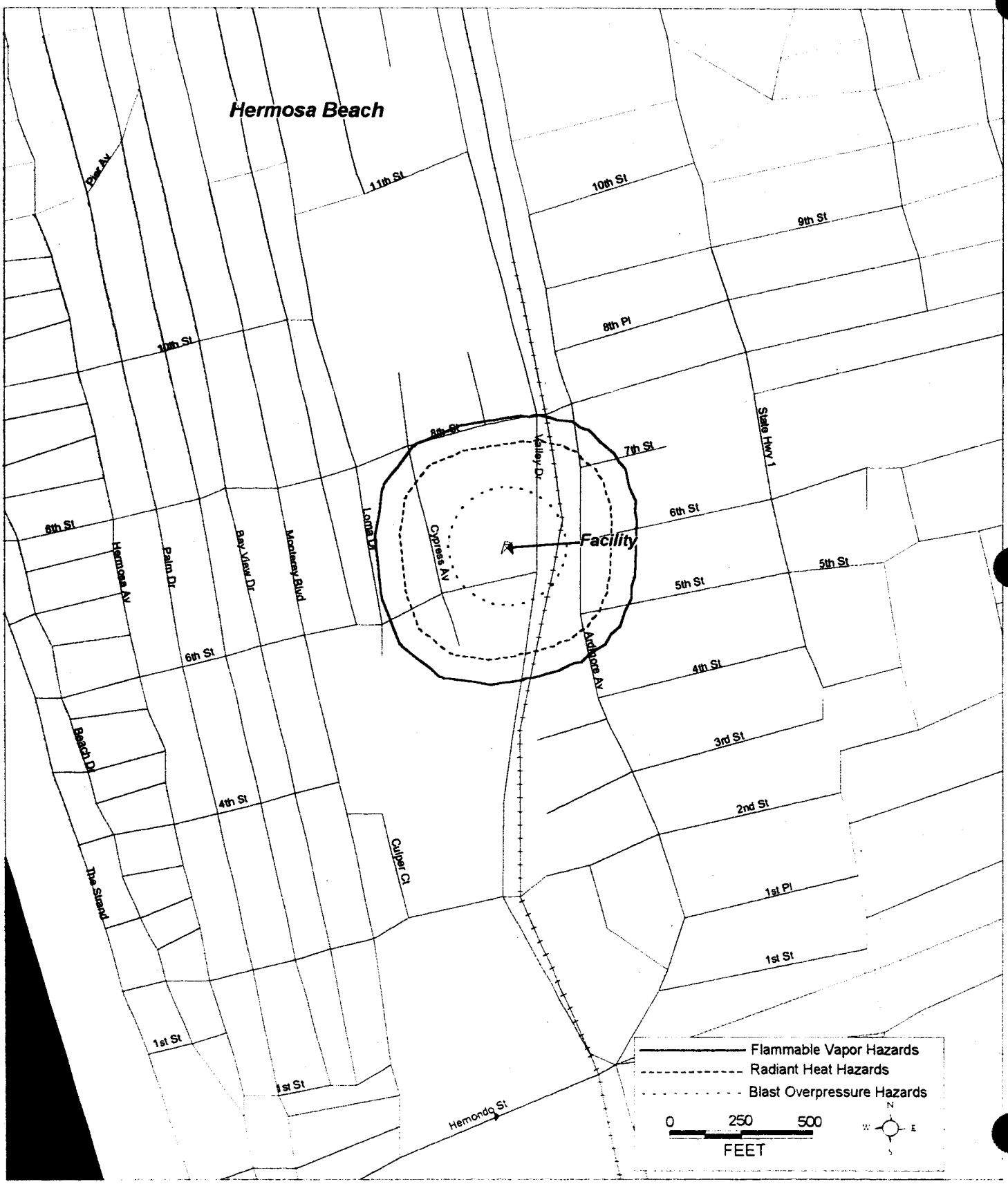


Table 1 Individual Risk Comparisons for the Proposed MACPHERSON Hermosa Beach Project

Cause of Death	Annual Mortality Rate	
	Per Single Person at Risk	Per 1,000 Persons at Risk
MACPHERSON Hermosa Beach Project	0.000012	0.012
All causes:	0.009	9
Heart Disease	0.003	3
Cancer	0.002	2
Accidents:	0.0004	0.4
- Motor Vehicles	0.0002	0.2
- Fires	0.00002	0.02
- Falls	0.00005	0.05
- Drowning	0.00002	0.02
- Excessive Heat	0.000002	0.002
- Lightning	0.0000003	0.0003

Source: Accident Facts, 1991 Edition. National Safety Council.

Attachment 1

Macpherson Oil Company City of Hermosa Beach Project
Hazard Footprint Analysis - May 9, 1995

MACPHERSON OIL COMPANY

CITY OF HERMOSA BEACH PROJECT

HAZARD FOOTPRINT ANALYSIS

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1.0 INTRODUCTION

The purpose of this analysis is to determine the potential risk to the surrounding community from the proposed Macpherson Oil Company City of Hermosa Beach Project. The analysis addresses the potential impact from fires, explosions, and releases at the proposed production site and from potential accidents involving the transportation of oil and gas from the site. The analysis makes use of the hazard footprint methodology described in the Port of Los Angeles "Final Risk Management Plan, An Amendment to the Port Master Plan" (Port of Los Angeles, 1983) and the Port of Long Beach "Risk Management Plan, An Amendment to the Certified Port Master Plan, Final" (Port of Long Beach, 1981). The methodology was developed in concert with the City of Long Beach and City of Los Angeles Fire Departments, the U.S. Coast Guard, and the California Coastal Commission.

The Risk Management Plans are in use at the Ports and govern the development of new projects and the modification of existing projects handling hazardous materials. Proposed new or modified projects are analyzed using the methodology in the Risk Management Plans, and projects not meeting the criteria in the plan are not approved. These procedures have been in place in the Ports for over 10 years.

In addition, the analysis estimates the probability of accidents occurring involving the proposed project. These estimates are based on historical data for similar projects.

Appendix A presents information on Reese-Chambers Systems Consultants, Inc. experience in conducting risk analysis. Appendix B contains the resumé of Tim Chambers, the individual who conducted the analysis.

2.0 METHODOLOGY

This analysis looked at the proposed project and then postulated the types of accidents that could occur. The types of accidents postulated were based on historical data with similar type projects and on the types of accidents required to be analyzed by the Ports' Risk Management Plans. These accidents, referred to as Design Basis Accidents (DBAs), are listed below.

(1) A release in the well area without a fire
(2) A release in the well area with a fire
(3) A fire in an atmospheric storage tank
(4) The rupture of a storage tank into the surrounding secondary containment system without an ensuing fire
(5) The rupture of a storage tank into the surrounding secondary containment system with an ensuing fire
(6) An explosion in a storage tank
(7) A gas release from a process vessel
(8) A liquid release from a process vessel into the surrounding secondary containment system without an ensuing fire
(9) A liquid release from a process vessel into the surrounding secondary containment system with an ensuing fire
(10) An accident involving the trucking of crude oil during Phase I
(11) An accident involving the crude oil pipeline during Phase II
(12) An accident involving the gas pipeline during Phase II

For each of the DBAs, the extent of the potential impact is then estimated using "hazard footprints." A hazard footprint is a diagram indicating the extent of the area within which a specified level of adverse effect is exceeded against a specified vulnerable resource. The following hazard footprints were calculated for the above DBAs as appropriate.

- *Radiant Heat from a Fire.* A fire will produce radiant heat. The distances to the 5 kW/m^2 (1,600 Btu/sq.ft./hr) heat level from those accidents involving fires have been calculated. This is the level that can begin causing second-degree burns to human skin exposed for 30 seconds. People inside homes or shielded by objects such as buildings or walls could stand a higher heat level before being impacted.

- *Flammable Gas Cloud from a Release.* When a flammable material is released, it begins producing flammable vapors which can drift with the wind, producing a gas cloud which may be ignited. The distances the cloud may travel before dispersing to a concentration below its lower flammability limit (LFL) have been calculated for releases of flammable materials. The flammable gas cloud hazard footprint has been calculated for two atmospheric conditions: stability condition F with 2.2 mph wind, and stability condition D with 5 mph

wind. Stability Condition F consists of a low inversion layer, which tends to trap gas releases and prevent them from dispersing in the atmosphere. This condition occurs at night with low wind speeds. This condition usually results in the largest gas cloud hazard footprints. The largest of hazard footprints for the two atmospheric conditions has been presented in this analysis.

- *Toxic Gas Cloud from a Release.* When a potentially toxic material is released, it begins producing toxic vapors which can drift with the wind. The distances the cloud may travel before dispersing to a concentration below which it is no longer toxic has been calculated for releases of toxic materials. The toxic gas cloud hazard footprint has been calculated for the two atmospheric conditions described above. The largest of hazard footprints for the two atmospheric conditions has been presented in this analysis.

- *Blast Overpressure and Flying Debris from an Explosion.* Both vessels and unconfined vapor clouds have the potential to explode. The blast overpressure, as a function of distance from such an explosion, has been calculated, along with an estimate of the distance that debris may be hurled by an explosion, as appropriate. A blast overpressure of 2.5 psig, which represents the pressure that can begin causing eardrum rupture, has been used as the blast overpressure hazard footprint threshold.

The crude oil and gas to be produced by the proposed project are not expected to contain constituents that can generate toxic vapors if released. In particular, the gas is not expected to contain any hydrogen sulfide (H_2S). However, toxic gas cloud hazard footprints for gas containing various levels of H_2S have been calculated to assist in establishing maximum H_2S levels allowed for the proposed project.

Hazard footprints have been determined using HFCP, the computer model used by the Ports of Los Angeles and Long Beach. The details of the methodology used by HFCP are documented in the Users' Manual (Reese-Chambers Systems Consultants, Inc., 1991). Gas release rates were modeled using Chems-Plus, developed by Arthur D. Little.

3.0 ANALYSIS AND RESULTS

The proposed project will consist of two phases. Phase I will include the drilling of one to three exploratory and producing wells to prove the commercial value of the development. The emulsion (an oil and water mixture) and associated gas will be processed on site using portable equipment and the oil will be trucked offsite to a refinery. The water will be reinjected into a reservoir. The gas will be scrubbed and incinerated. Phase II will produce emulsion and associated gas from 30 wells; separate the gas, oil, and water using gravity and heat; clean the separated water and reinject it using four wells; and store the oil on site until shipped by a newly constructed pipeline. The gas will also be shipped by a newly constructed pipeline.

The exact characteristics of the crude oil to be produced is not known at this time, however, the API gravity is expected to be between 17 and 21. While the characteristics of the oil have little effect on the size of the radiant heat, blast overpressure, and flying debris hazard footprints, they can have a significant impact on the flammable vapor cloud hazard footprint. Thus, to be conservative, we have assumed that the crude is fairly light with a flash point below 100°F, making it a flammable liquid. This assumption will tend to overestimate the size of the flammable vapor cloud hazard footprint.

The produced gas is expected to be sweet, that is, it is not expected to contain hydrogen sulfide (H_2S) in concentrations high enough to be considered hazardous. The potential effects of H_2S on humans is a function of two parameters, the exposure concentration and the exposure time. The higher the exposure concentration, the less time it takes to cause adverse health effects. This analysis has addressed two concentration exposure times, 300 parts per million(ppm) for 30 minutes and 1000 ppm for 30 seconds. The 300 ppm concentration is the immediately dangerous to life or health (IDLH) concentration for H_2S. IDLH represents a maximum level from which one could escape within 30 minutes without any escape-impairing symptoms or any irreversible health effects. The 1000 ppm concentration could cause death after a few breaths.

3.1 Risk From Wells

The best known and potentially the most significant accident associated with well drilling is a blowout. A blowout is defined as the uncontrolled flow of formation fluids from a wellbore. They occur when formation fluids flow uncontrolled into a low-pressure subsurface zone (an underground blowout) or to the surface (a surface blowout). Most commonly, a blowout happens when there is insufficient pressure in a wellbore to control subsurface pressures. If wellbore hydrostatic pressure is allowed to drop below the subsurface formation pressure, then a "kick" will occur as the formation fluids flow into the well. Typically, a kick is circulated out of a well in a controlled manner, with formation fluids flowing into a production flowline or emergency flare line. When a kick is detected during drilling operations, the blowout prevention equipment (BOPE) is closed, sealing

the wellbore and preventing any additional formation fluid from entering the wellbore. Additional kick-control procedures are implemented such as circulating higher density drilling fluid into the wellbore until the kick is circulated out of the well and normal operations can be resumed. A surface blowout occurs when formation fluids flow to the surface in an uncontrolled manner. A kick can lead to a blowout in rare instances (e.g., in a gas well that experiences a failure in the mechanical integrity of the equipment/system). Redundancy of equipment is a primary feature of blowout prevention equipment design.

A source of information on blowouts in California is a document titled "A History of Oil- and Gas-Well Blowouts in California, 1950 - 1990", published by the California Department of Conservation Division of Oil, Gas and Geothermal Resources (CDOG). This database includes both onshore and offshore wells.

The CDOG data shows an overall drilling incident rate of one blowout per 1,953 wells drilled during the time period 1950 - 1990. The incident rate for blowouts resulting in a release of oil is 1:20,315. The blowout incident rate from 1970 (after the Unocal blowout offshore Santa Barbara) through 1990 was 1:3,046 (a probability of 3.3×10^{-4} per well drilled).

A detailed analysis of the CDOG data for the time period 1980 - 1990 conducted by Mobil for their Clearview Project application determined that after blowouts caused by steam injection and in abnormally high pressurized reservoirs were removed from the database, the blowout incident rate is 1:10,969 (a probability of 9.1×10^{-5} per well drilled). None of the remaining blowouts in the database flowed oil.

One factor that would tend to further reduce this low probability of a blowout is the fact that the Hermosa Beach project will be drilling into a reservoir whose characteristics are well known. The reservoir is not highly pressurized and will require pumping to bring the oil to the surface.

Based on the above statistics (blowout incident rate of 1:10,969), the probability of a blowout for the two phases of the proposed project are presented below.

PHASE	NUMBER OF WELLS	PROBABILITY OF BLOWOUT
I	6	5.5×10^{-4}
II	24	2.2×10^{-3}
BOTH	30	2.7×10^{-3}

The probability of a blowout during drilling was deemed to be not significant by the previous Final Environmental Impact Report (Ultrasystems, 1994). This conclusion was based on the fact that the wells will be equipped with redundant safety devices, including blowout protectors. Thus, the

worst case accident involving the wells has been postulated to be a leak in the well area flooding the well cellar. The leak would involve an emulsion containing approximately half oil and half water.

The well cellar covers an area of approximately 2,060 feet. HFCP was utilized to calculate the flammable vapor cloud and radiant heat hazard footprints for a release that would cover the entire cellar area. The size of the hazard footprints is measured from the edge of the cellar area. The results are presented below.

- Radiant heat - 152 feet
- Flammable gas cloud - 17 feet

It is noted here that the vaporization rate from this pool would not produce enough vapor to become involved in an unconfined vapor cloud explosion.

Regulations and technology have made wells extremely safe and the probability of a release of any size from a well is unlikely. Previous EIRs (County of Santa Barbara, 1985) have estimated that the probability of a major spill from a wellhead is 1.8×10^{-8} per year. This would equate to an annual probability of a major release of 5.4×10^{-7} (once in 1.8 million years) for all 30 proposed wells. The probability that the oil would become ignited would be 1.0×10^{-2} or one in a hundred (Country of Santa Barbara, 1985). Thus, the annual probability of a release with fire would be 5.4×10^{-9}.

Although the probability of a gas blowout is extremely low, a discussion of such an event follows. First, if a large pressure surge is encountered, the blowout prevention systems should prevent gas from escaping by closing off the annulus. In the highly improbable event that the annulus does not close, the gas will be diverted to the processing equipment or the on-site vent if the processing equipment is unable to handle the flow. The vent allows the gas, which is lighter than air, to escape upward away from potential ignition sources. Modeling shows that the gas being vented from a vertical flare will not reach flammable concentrations (approximately 5 percent for methane) at ground level and therefore should not be subject to ignition.

As stated previously, the gas is expected to be sweet and should therefore not present a toxic hazard. An H_2S concentration of 6000 ppm means that the gas contains 0.6 percent (0.006) H_2S. If released, the gas would immediately begin to mix with air thereby diluting the overall concentration of H_2S. When the gas has been diluted with air such that the mixture is 95 % air and 5% gas, the H_2S concentration would be 300 ppm (6000 ppm X .05). Five percent has been utilized here since modeling for the flammable vapor cloud has shown that a 5 % concentration would not reach ground level. Thus, produced gas containing 6,000 ppm H_2S would not result in a 300 ppm ground level concentration of H_2S.

3.2 Risk from Storage Tanks

Oil and process water will be stored in five storage tanks located in a common secondary containment system (i.e. diked area). All of the tanks will have cone roofs with weak seams. In the unlikely event of an explosion, the roof is designed to lift up to vent the energy, thereby preventing the tank from rupturing and possibly resulting in flying debris. The roof is expected to travel no more than several tank diameters from the tank. It is also noted here that the tanks will be blanketed with gas to prevent oxygen from being present. As long as oxygen is not present, an explosion is impossible.

The potential DBAs from the tanks addressed in this analysis include a fire in a tank, an explosion in a tank, and a rupture of a tank flooding the diked area, either with or without a fire. The following hazard footprint distances were calculated using HFCP. The largest tank, with a 3,333 bbl capacity, was used in the calculations. All of the hazard footprints are measured from the edge of the tank or diked area.

- Radiant heat from a fire in a tank - 156 feet
- Blast overpressure from an explosion in a tank - 141 feet
- Flying debris from an explosion in a tank - 77 feet
- Radiant heat from a fire in the diked area - 271 feet
- Flammable gas cloud from a release into the dike area - 33 feet

The rupture of an atmospheric storage tank due to all causes, including seismic events, is estimated to be 1.6×10^{-4}/year or once in 6,300 years (Country of Santa Barbara, 1985). The probability that the oil is ignited is 1.0×10^{-2}, or one in a hundred. Thus, the probability of a release with a fire is estimated to be 1.6×10^{-6} per tank, or once in 625,000 years. Since there will be three storage tanks that may store crude oil, the probability of a spill with fire, per year, would be 4.8×10^{-6}, or once in 208,000 years.

The probability of an explosion in an oil storage tank has been estimated to be 1×10^{-4} per year (County of Santa Barbara, 1988). This is for all types of storage tanks. The tanks for the proposed project will be gas blanketed, which will virtually eliminate the possibility of a tank explosion.

3.3 Risk from Process Area

The first step in processing the emulsion will be the separation of the gas, oil, and water by means of gravity using free water knockout (FWKO) vessels. The gas that will be separated out will be primarily methane which is the predominant gas in natural gas piped to most homes. The emulsion enters the FWKO whereby the water, which is heavier than the oil, falls to the bottom of the tank while the oil floats on the oil. The gas which escapes from the emulsion goes to the top of the tank. The water is drawn off the bottom of the tank and sent to the wastewater treatment system. The gas is drawn off and directed to the gas compression and treatment system. The oil is sent to

heater treaters where it is further processed. The FWKOs are ASME certified pressure vessels. The potential for an explosion in one of these vessels is extremely unlikely, and thus no hazard footprints have been calculated for a vessel rupture. Instead, the DBA from a FWKO has been assumed to be a release from a 2-inch diameter hole, which represents a release from a pipe connection or other small release. The flammable gas hazard footprint from a 2-inch diameter hole in the tank would produce a flammable vapor cloud hazard footprint that would extend up to 327 feet from the point of release under worst case atmospheric conditions (stability F, 2.2 mph wind). The rate of release from the vessel was calculated using the Chems-Plus model developed by Arthur D. Little. This rate of release was then input to both Chems-Plus and HFCP to calculate the flammable gas cloud hazard footprint. The models also determined that the amount of gas (methane) in the cloud would not be enough to become involved in an unconfined vapor cloud explosion.

The release has also been modeled assuming the gas contains various levels of H_2S. First, if the gas contains 6,000 ppm H_2S, then the 300 ppm hazard footprint would extend 327 feet from the point of release (the 300 ppm hazard footprint would be the same size as the 5 % flammable vapor cloud hazard footprint since 5 % dilution of a gas containing 6,000 ppm H_2S would contain 300 ppm H_2S). However, it is unlikely that a release would last for 30 minutes and thus this hazard footprint is conservative. Chems-Plus and HFCP were utilized to calculate the toxic gas cloud hazard footprint to 1000 ppm H_2S. The size of this hazard footprint was calculated to be 173 feet.

The oil is sent to heater treaters where it is heated to further separate out water and gas from the oil. In this case the majority of the emulsion entering the vessels is oil. The heater treaters are also ASME certified pressure vessels. Since the heater treaters will operate at approximately the same pressure as the FWKO, the release rate of gas from a 2-inch diameter hole will be approximately the same as that from the FWKO (it will actually be slightly less since the gas will expand because it is heated) and thus, the flammable vapor cloud hazard footprint will be approximately the same size. Again, there should not be a toxic gas hazard footprint because the gas is expected to be sweet. The discussion in the previous paragraph applies if the gas contains H_2S.

A release of oil from the FWKOs or heater treaters could spread and cover the secondary containment area around the vessels. The surface area of the secondary containment area is approximately 7780 sq.ft. The flammable gas cloud (if the spill doesn't ignite) and radiant heat hazard footprints were calculated by HFCP to be:

- Flammable gas cloud - 41 ft
- Radiant heat - 266 ft

County of Santa Barbara, 1985, has estimated that the probability of a major release from a pressure vessel is 2×10^{-5} per year, or once in 50,000 years. For the four vessels proposed for the facility, the combined annual probability of a major release would be 8.0×10^{-5} (once 12,500 years).

The probability that the released oil would become ignited is 1.0×10^{-2}. Thus, the annual probability of a major spill with fire is 8.0×10^{-7} (once in 1.25 million years).

3.4 Risk from Trucking

During Phase I, the oil will be stored on site in portable tanks and then loaded into tanker trucks for transportation to a refinery. It is estimated that four tanker truck trips per day, each carrying 150 bbls of oil, will be required to handle the 600 bbl per day production. The tanker trucks will be loaded inside the facility in an area equipped with a drain and sump to contain any spillage, although none is expected. The Phase I site sump/containment system will be adequate to fully contain a 150 bbl spill. Trucks will exit the facility and follow designated routing from the facility. Trucks will not deviate from the designated routing through residential neighborhoods.

Trucking of petroleum products is quite common throughout the country. Gasoline and other petroleum products are routinely transported by tanker trucks to gas stations and industrial facilities. Tanker trucks can become involved in traffic accidents but these do not usually result in a loss of cargo. A worst case accident would result in the loss of the entire contents of the truck (150 bbls). The released oil would then spread on the ground and could ignite if it encounters an ignition source. The area covered by the spill would be a function of the elevation profile of the surrounding area. It is also possible that the spilled oil could enter a storm sewer.

For the purpose of calculating the potential hazard footprints, it has been assumed that the oil is spilled on a flat surface and spreads to a uniform depth of one inch. The spill would cover an area of approximately 10,000 sq. ft. with a radius of approximately 57 ft. The radiant heat and flammable gas cloud hazard footprints were calculated by HFCP to be:

- Flammable gas cloud - 47 ft
- Radiant heat - 297 ft

It is noted here that oil burns at a rate of approximately 4 mm (0.16 in.) per minute and hence, a one-inch deep pool would burn for approximately 6.4 minutes. The pool would burn for a longer time if it were deeper, however, then the area would be smaller and the radiant heat footprint smaller.

The Handbook of Chemical Hazard Analysis Procedures (FEMA, undated) recommends using a truck accident rate of 2×10^{-6} accidents per mile with 20% of the accidents resulting in a release of cargo. The Handbook goes on to recommend that the following spill distribution be utilized:

- 10% cargo loss (15 bbl) - 60% of the time
- 30% cargo loss (45 bbl) - 20% of the time
- 100% cargo loss (150 bbl) - 20% of the time

Assuming that a loaded truck travels 10 miles results in the following annual probabilities of accidents and releases. It is assumed that the trucking lasts for one full year.

Event	Annual Probability
Accident	2.9×10^{-2}
Spill of any size	5.8×10^{-3}
Spill less than 30 bbls	3.5×10^{-3}
Spill between 30 bbls and 100 bbls	1.2×10^{-3}
Spill greater than 100 bbls	1.2×10^{-3}

3.5 Risk from Crude Oil Pipeline

A new produced crude oil shipping line will be constructed to transport produced crude oil from the oil production facility to the existing Wilmington to Torrance Pipeline. The Wilmington to Torrance Pipeline, operated by Chevron, will transport the crude oil to the Chevron refinery in El Segundo. The new pipeline will have an outside diameter of 6 inches and be approximately 0.5 miles (2500 ft) long. The pipeline is designed for a maximum crude flow of 8,000 bbl per day with a maximum operating pressure of 350 psig.

The amount of oil that can be released from a pipeline is made up of the amount that can be released until pumping is stopped plus the amount that can drain from the line due to gravity. Because the pipeline will be equipped with a supervisory control and data acquisition (SCADA) system that will monitor the pipeline at all times, it is conservatively estimated that a pipeline rupture would be detected and the pumping shut down within 10 minutes. Hence, a maximum of 56 bbls [8,000 bbls per hour / (24 hr X 60 min per hr) X 10 min] could be lost due to pumping. The capacity of the pipeline is 85 bbls. That is the maximum amount of oil that could drain from the pipeline if all the oil were to escape. Thus, the worst case release from the pipeline would be 141 bbls (56 bbls + 85 bbls).

As with a trucking accident, the area impacted by a pipeline spill would be a function of the elevation profile of the surrounding area. Assuming again that the spill occurs on a flat surface and spreads to a depth of one inch, this results in a 9500 sq. ft. area being covered.

The radiant heat and flammable gas cloud hazard footprints were calculated by HFCP to be:

- Flammable gas cloud - 46 ft
- Radiant heat - 289 ft

The probabilities of a leak and rupture for modern, crude oil pipelines are generally estimated to be around 5.4×10^{-4} spills per pipeline-mile per year, and 2.7×10^{-4} ruptures per pipeline-mile per

year, respectively (Aspen, 1995). This equates to the following annual probabilities for the 0.5 mile pipeline.

- Probability of leak - 2.7×10^{-4}
- Probability of rupture - 1.3×10^{-4}

3.6 Risk from Gas Pipeline

A new gas pipeline will be constructed to transport utility-grade gas from the facility to an existing utility gas pipeline. The new pipeline will have an outside diameter of 4 inches and will be approximately 0.5 miles long. Gas will be sent through the line on a continuous basis at approximately 120 psig, using the compressor located at the Macpherson production facility. Any H_2S that might be in the gas will be removed at the Macpherson production facility and hence, the gas will not be toxic.

The rate of release of gas from the pipeline would be a function of the size of the hole. The larger the hole, the greater the release rate. A complete rupture of the line would shut down the compressor almost immediately. In addition, the line will be equipped with a check valve at the point where it connects to the utility line that would prevent gas from flowing into the line from the utility line.

Chems-Plus has been utilized to calculate the release rate and flammable vapor cloud hazard footprint from a pipeline rupture and from a small leak (e.g. ¼-inch diameter hole). The results are presented below.

Accident	Downwind Distance to LFL
• Pipeline rupture	474 feet
• ¼-inch hole	54 feet

It is noted here that the downwind distance to the LFL calculated for the rupture is an overprediction because Chems-Plus treats the release as a point source and ignores the initial mixing with air caused by the jet release of the gas. The pipeline would be emptied of gas within about 4 seconds in the rupture case. It is also noted that this line is essentially the same as the numerous utility owned and operated gas lines throughout the area.

If the gas release were to ignite, it would burn as a jet release until the gas flow ceased. This would last about 4 seconds. The flame length could be up to 211 feet long. If the gas cloud were to ignite, the fire would burn back to the source and then burn as a jet flame. Thus, the radiant heat hazard footprint has been assumed to be equal to the flammable gas cloud hazard footprint.

3.7 Summary of Results

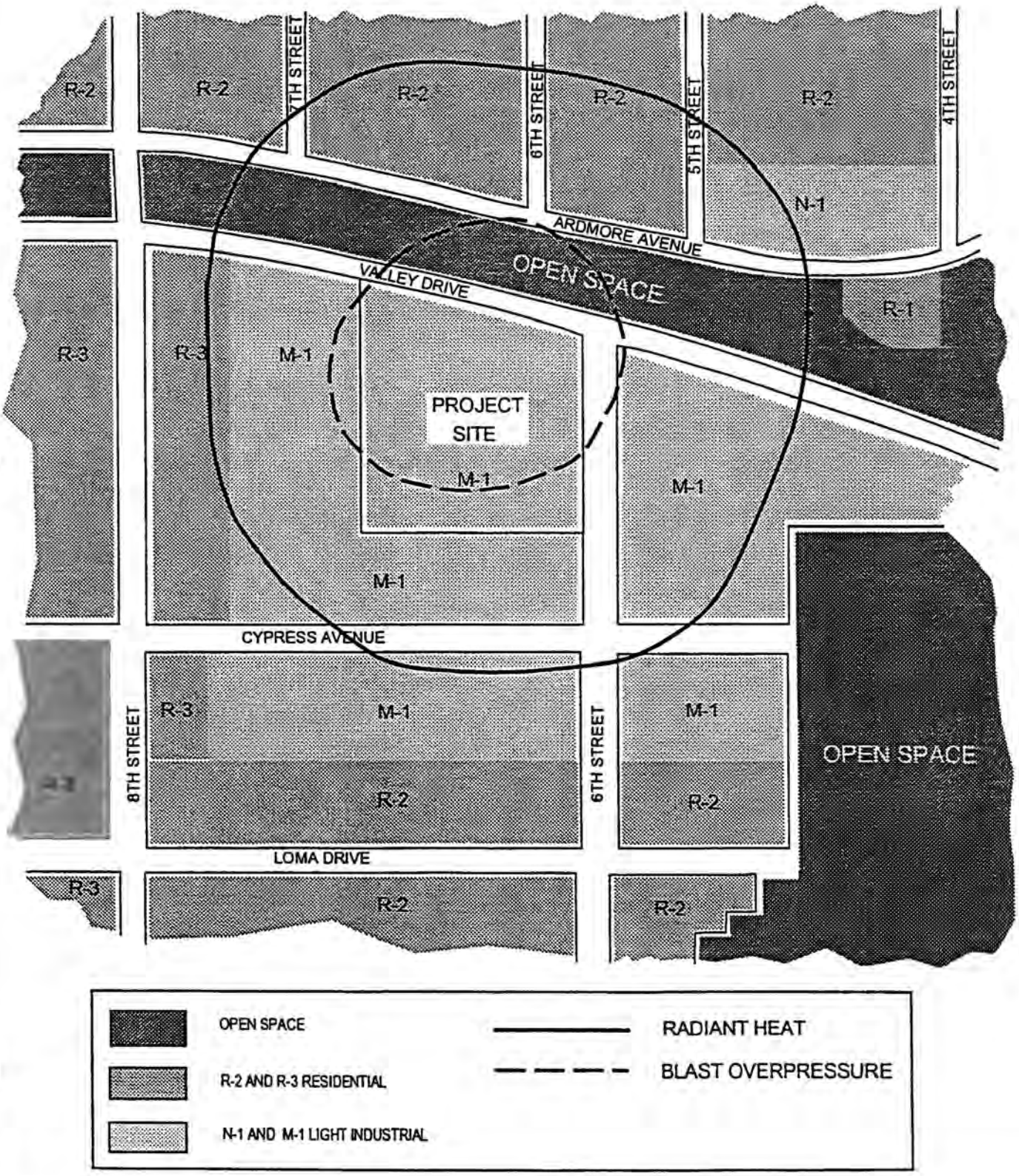
The results of hazard footprint analysis are summarized below. The hazard footprints are displayed on Figure 3-1. Since sour gas is not expected, toxic hazard footprints are not included in the table.

COMPONENTS	RADIANT HEAT HAZARD FOOTPRINT (ft)	FLAMMABLE GAS CLOUD HAZARDOUS FOOTPRINT (ft)	BLAST OVERPRESSURE HAZARD FOOTPRINT (ft)	FLYING DEBRIS HAZARD FOOTPRINT (ft)
Wells	152	17	N/A	N/A
Storage Tanks	271	33	141	77
Process Equipment	266	41	N/A	N/A
Trucks	297	47	N/A	N/A
Oil Pipeline	289	46	N/A	N/A
Gas Pipeline	474	474	N/A	N/A

As can be seen from the table, the largest hazard footprint from the facility would be 271 feet from a release by a storage tank into the surrounding secondary containment system, followed by a fire. The radiant heat hazard footprint could extend into the residential neighborhood to the north and just touch the R-3 neighborhood to the west. It is noted here that this footprint would not impact people inside or behind structures. In addition, people outdoors, exposed to the heat from a fire, would have time to find shelter before they would sustain burns. A fire at the facility should not impact homes or other structures in the area. The other facility hazard footprints should not impact residential areas.

The truck, oil pipeline, and gas pipeline accidents would occur offsite and their potential impact would be a function of where the accident occurred relative to vulnerable resources.

FIGURE 3-1 HAZARD FOOTPRINT



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APPENDIX A
EXPERIENCE SUMMARY

REESE-CHAMBERS SYSTEMS CONSULTANTS, INC.

Reese-Chambers Systems Consultants, Inc. (RCSC) is a small company located in Southern California near the City of Camarillo. RCSC has been providing professional consulting services to industry and agencies since 1979. One of RCSC's specialty areas is risk analysis of industrial projects. RCSC has conducted risk analysis in conjunction with Environmental Impact Reports and Statements (EIRs and EISs), Risk Management and Prevention Programs (RMPP), Hazard and Operability Studies (HAZOPs), Environmental Quality Assurance Programs (EQAP), and other agency-required special studies. RCSC has utilized various models in the conduct of risk studies including *ARCHIE, CHEMS-PLUS, WHAZAN, SLAB, AFTOX,* and *ISC*. RCSC has specific experience with a broad range of industrial applications including numerous oil industry facilities such as pipelines, pump stations, tank farms, and marine terminals:

- Preparation of the system safety/public safety section of the EIR for the State Lands Commission lease renewal of the Unocal Rodeo Marine Terminal.

- Conduct of 25 separate risk and hazard analyses to fullfill California Office of Oil Spill Prevention and Response (OSPR) requirements for oil spill contingency plans. Analyses included marine terminals, pipelines, oil platforms, onshore producing facilities, and onshore processing facilities.

- Consultant to Texaco Trading and Transportation, Inc. (TTTI) for the permitting of the Gaviota Marine Terminal. Also developed various risk analysis studies and papers in support of permit negotiation and compliance. Developed many of the Terminal contingency plans including the Emergency Response Plan and Oil Spill Contingency Plan.

- Developed the Risk Management Plans for the Ports of Los Angeles and Long Beach. The plans have been certified by the California Coastal Commission as annexes to the Ports' Master Plans, dealing with risk management for hazardous cargoes and petroleum products.

- Developed the risk analysis section of an environmental study addressing a proposed oil and gas development project on Sakhalin Island, Russia. The analysis addressed all aspects of the proposed project including oil and LNG export terminals.

- Developed terminal operations manuals for the Gaviota Marine Terminal and Unocal Avila Terminal to meet U.S. Coast Guard and California State Lands Commission requirements.

- Developed EQAP for Unocal Sisquoc Pipeline and Santa Maria Pump Station.

- Conducted overall spill risk and prevention analysis for Pacific Pipeline System, Santa Barbara to Los Angeles refineries.

- Conduct of RMPP and HAZOP studies for four electrical generation plants, a steam generating facility, a refrigeration plant, and numerous oil industry facilities including pipelines, tank farms, processing plants, and pump stations.

- Preparation of Process Safety Manuals for Unocal Rincon oil processing facility.

- Developed oil spill response plans for numerous facilities including the Gaviota Marine Terminal, Unocal Avila Wharf Terminal, Bush Oil Rincon Operations, and several pipelines in response to OPA 90 requirements.

- Developed numerous emergency response plans and fire protection plans for oil and gas projects including marine terminals, processing plants, pump stations, and pipelines.

- Conducted numerous risk studies as listed below:

  - GATX Port of Los Angeles Chemical Terminal
  - Proposed California Ammonia Company Ammonia Terminal in the Port of Los Angeles
  - Chevron Carpinteria Oil and Gas Processing Facility
  - Chevron Elk Hills Gas Plant Risk of Explosion Study
  - McMillen Long Beach Refinery Potential Risk to Nearby School Site
  - Oil and Gas Development Project on Sakhalin Island, Russia
  - Relocation of Defense Logistic Agency Fuel Pier and Pipeline in the Port of Los Angeles
  - Mutual Liquid Gas Propane Storage and Truck Loading Facility in Wilmington, California
  - Liquefied Gas and Chemical Terminal on the Firth of Forth, Scotland
  - Southern Pacific Pipeline Tank Farm Expansion in Carson, California
  - Unocal Product Pipeline through the City of Carson
  - Gaviota Interim Marine Terminal
  - Matlack Hazardous Material Trucking Terminal and Truck Cleaning Facility in Carson
  - Proposed Oil and Gas Development on Vandenberg Air Force Base
  - Proposed Natural Gas Pipeline Projects into the San Joaquin Valley

- Tesoro Fuel Depot and Southern California Edison Storage Tanks in the Port of Hueneme
- OSCO Solvent Recycling Facility in City of Azusa, California
- Unocal Gas and Oil Processing Facility in Lisbon, Utah

Timothy J. Chambers
Senior System Safety Analyst

SUMMARY OF EXPERIENCE

Over 24 years of experience as a systems analyst, with major emphasis on safety and risk management analysis; oil and gas activities; hazardous material handling, storage, and transportation analysis; and contingency planning. Experience during the past 15 years has included extensive environmental work including that involving facilities handling hazardous materials. Other environmental analysis has involved risk management of maritime transportation, marine terminals, oil and gas activities, pipelines, truck and train transportation, and processing facilities. Experience includes work with industry and governmental agencies.

MAJOR PROJECT EXPERIENCE

- Conduct of 25 separate risk and hazard analyses to fulfill OSPR requirements for oil spill contingency plans. Marine facilities addressed included marine terminals, pipelines, platforms, onshore producing facilities, and onshore processing facilities, and customers included Unocal, Shell, Vintage, Torch, Global, Macpherson, and Mobil.

- Consultant to Unocal for the development of OPA 90 and OSPR oil spill contingency plans for the Avila Marine Terminal, Coast Area pipelines, Valley Area pipelines, and Point Pedernales pipeline.

- Consultant to Macpherson Oil Company for development of Oil Spill and Emergency Response Plans for their proposed Hermosa Beach oil development project. Plans were prepared for the drilling and production site, crude oil pipeline, and gas pipeline.

- Project Manager for the development of operating procedures for Unocal's Rincon Facility (ROSF)

- Development of public safety and vessel traffic analysis sections of an EIR on the renewal of Unocal's Rodeo Marine Terminal lease with the California State Lands Commission.

- Conduct of an analysis addressing the potential impacts on marine operations (nearby terminals and vessel traffic) caused by the construction of four alternative bridge configurations parallel to the existing Benicia-Martinez Bridge.

- Consultant to the Gaviota Terminal Company for the permitting of an oil transport marine terminal at Gaviota, California. Work included conduct of various studies and analyses to support system safety aspects of the marine terminal, its operations, and the transport of oil by tankers; negotiation of permit conditions; and the development of contingency plans including the Oil Spill Contingency Plan, Shoreline Cleanup Plan, Shoreline Access Plan, Terminal Operations Manual, Emergency Response Plan, and Fire Protection Contingency Plan.

- Development of the Navigational Hazard Analysis section of the various oil spill cooperative Regional Resource Manuals.

- Development of the vessel traffic analysis section of the Wickland Oil Terminal Expansion EIR.

- Consultant to Unocal Oil and Gas for the development of emergency response plans for their Santa Maria Basin oil and gas development project. Specifically developed separate emergency response plans for the Lompoc HS&P, the Battles Gas Plant, oil and gas pipeline segment from shore to the Lompoc HS&P, and the oil pipeline segment from the HS&P to the Orcutt Pump Station.

- Consultant to Unocal for the permitting of the Sisquoc Pipeline System. Conducted various analyses and developed various plans in support of this effort, including Fire Protection Plan, Emergency Response Plan, Oil Spill Contingency Plan, Environmental Quality Assurance Plan, Risk Analysis, and HAZOP.

- Responsible for risk analysis and mitigation development for a proposed offshore oil and gas development project in Russia. Risk analysis addressed all aspects of the project including offshore drilling and production, offshore and onshore oil and gas pipelines, oil and gas processing facilities, oil export terminal, LNG plant and export terminal, and refinery.

- Consultant for development of risk management programs and addressal of citizen concerns for various petroleum pipeline, tank farm, processing plant, refinery, and gas pipeline projects. Clients included City of Carson, City of Torrance, Long Beach Unified School District.

- Manager of system safety portions of EIR and EIS documents for various projects, including transportation, transfer, handling, and storage of chemicals for a proposed GATX chemical tank farm in Carson, California; natural gas pipeline development in San Joaquin Valley; oil and gas drilling, storage, transportation, and processing for Vandenberg Air Force Base; hazardous material transport, transfer, cleaning, and storage for the City of Carson; and hazardous waste material storage, transfer, processing, transport, and recycling for a facility located in Azusa, CA.

- Conducted risk analysis of potential for release, fire, and explosion at one of the gas plants at the Elk Hills Naval Petroleum Reserve.

- Risk analysis and mitigation design, contingency planning, and design and operation of risk management programs for various clients including County of Santa Barbara, Ports of Los Angeles and Long Beach, Cities of Beaumont and Carpinteria, Holchem, California Ammonia Company, Mutual Liquid Gas and Equipment Company, and others.

- Development of Risk Management and Prevention Programs (RMPPs) as required by California law for several industrial facilities including Colmac Energy, Bonneville Pacific, and Tracy Operators power plants; Sharyn Steam steam generation plant; and United Foods food processing plant. RMPPs address acutely hazardous materials such as ammonia, chlorine, and sulfuric acid.

- Conduct of Hazard and Operability (HAZOP) studies in support of the RMPPs listed above and for several oil pipeline and pump station projects.

- Development of risk management and maritime factors portions of EAs/EIRs/EISs for various oil and natural gas recovery projects covering gas and oil pipeline safety, shipping and other maritime impacts, drilling safety, etc. Projects included ARCO, Cities Service, Chevron, Phillips Petroleum, Shell Oil Company, Texaco.

- Responsible for public and system safety analysis section of EIR on a proposed household and small business hazardous waste collection facility in Santa Barbara, California.

- Responsible for all public and system safety aspects of the EIR/EIS for the Port of Los Angeles/Port of Long Beach 2020 Plan, a proposed landfill and expansion project. Work covered potential system safety impacts from landfill construction; impact on recreational, fishing, and commercial vessels; impact from trucking, pipeline, and train transportation of hazardous materials; impact on anchorages; and impact from oil spills.

- Responsible for analysis of potential impacts between tanker traffic to a proposed Exxon offshore marine terminal and potential oil and gas development in the vicinity of the marine terminal. Work conducted in the form of a supplemental EIR for the California State Lands Commission.

- Developed risk analysis and emergency procedures section of an environmental and risk assessment of coastal communities from LNG tanker traffic offshore Alaska.

- Responsible for risk analysis section of oil spill response plan developed for Alyeska Valdez Marine Terminal.

- Prime consultant to PBQ&D and US Navy for risk and reliability analysis for relocation of Navy fuel pier to Port of Long Beach. Work included extensive pipeline, tank farm, and marine terminal risk management analysis.

- Consultant to GATX for permitting risk analysis of a proposed expansion of a multi-petroleum product and chemical marine terminal and storage facility in the Port of Los Angeles.

- Project manager and consultant for port and vessel traffic risk management analysis for a multi-liquefied-gas terminal on the Firth of Forth, Scotland. Client was the Forth Ports Authority.

- Prime contractor and consultant to the Ports of Los Angeles and Long Beach, California in the development of the Ports' risk management plan for the handling, transportation, and storage of hazardous cargos at and through the ports. Also developed a generalized computerized model to calculate potential areas at risk from existing and proposed facilities.

EDUCATION

Bachelor of Science, Mathematics, Northeast Missouri University, Kirksville, MO (1966)

Bachelor of Science, Education (Mathematics and Physics), Northeast Missouri University, Kirksville, MO (1966)

Master of Science, Mathematics, University of Toledo, Toledo, OH (1968)

EMPLOYMENT EXPERIENCE

1979-Present	Reese-Chambers Systems Consultants, Inc. Principal of small consulting firm.
1968-1979	Naval Ship Systems Engineering Station, Port Hueneme, CA Branch Head for the Systems Analysis Branch.

ORGANIZATIONS

Society for Risk Analysis

Attachment 2

Macpherson Oil Company City of Hermosa Beach Project
Hazard Footprint Analysis - March 3, 1997

HAZARD FOOTPRINT ANALYSIS
HERMOSA BEACH PROJECT

Revised

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1.0 INTRODUCTION

The purpose of this analysis is to determine the potential risk to the surrounding community from the proposed Macpherson Oil Company City of Hermosa Beach Project. The analysis addresses the potential impact from fires, explosions, and releases at the proposed production site. The analysis makes use of the hazard footprint methodology described in the Port of Los Angeles "Final Risk Management Plan, An Amendment to the Port Master Plan" (Port of Los Angeles, 1983); the Port of Long Beach "Risk Management Plan, An Amendment to the Certified Port Master Plan, Final" (Port of Long Beach, 1981); and the Molino Gas Project EIR (Arthur D. Little, 1995). The methodology in the Port Risk Management Plans was developed in concert with the City of Long Beach and City of Los Angeles Fire Departments, the U.S. Coast Guard, and the California Coastal Commission. The methodology in the Molino Gas Project EIR was developed in accordance with County of Santa Barbara criteria.

The Port Risk Management Plans are in use at the Ports and govern the development of new projects and the modification of existing projects handling hazardous materials. Proposed new or modified projects are analyzed using the methodology in the Risk Management Plans, and projects not meeting the criteria in the plan are not approved. These procedures have been in place in the Ports for over 10 years. The County of Santa Barbara safety impact thresholds utilized for projects within the County are presented in their Environmental Thresholds and Guidelines Manual (County of Santa Barbara, 1995).

The analysis also estimates the probability of accidents occurring involving the proposed project. These estimates are based on historical data for similar projects. These probabilities, the hazard footprints, and the nearby population density are then combined to construct risk profiles similar to those presented in the Molino Gas Project EIR. The risk profiles present estimated annual frequency of number of fatalities from the proposed project.

Appendix A presents information on Reese-Chambers Systems Consultants, Inc. experience in conducting risk analysis. Appendix B contains the résumé of Tim Chambers, the individual who conducted the analysis.

2.0 METHODOLOGY

This analysis looked at the proposed project and then postulated the types of accidents that could occur. The types of accidents postulated were based on historical data with similar type projects and on the types of accidents required to be analyzed by the Ports' Risk Management Plans. These accidents, referred to as Design Basis Accidents (DBAs), are listed below.

(1) A release in the well area without a fire

(2) A release in the well area with a fire

(3) A fire in an atmospheric storage tank

(4) The rupture of a storage tank into the surrounding secondary containment system without an ensuing fire

(5) The rupture of a storage tank into the surrounding secondary containment system with an ensuing fire

(6) An explosion in a storage tank

(7) A gas release from a process vessel

(8) A liquid release from a process vessel into the surrounding secondary containment system without an ensuing fire

(9) A liquid release from a process vessel into the surrounding secondary containment system with an ensuing fire

(10) An accident involving the trucking of crude oil during Phase I

(11) An accident involving the crude oil pipeline during Phase II

(12) An accident involving the gas pipeline during Phase II

For each of the DBAs, the extent of the potential impact is then estimated using "hazard footprints." A hazard footprint is a diagram indicating the extent of the area within which a specified level of adverse effect is exceeded against a specified vulnerable resource. The following hazard footprints were calculated for the above DBAs as appropriate.

- *Radiant Heat from a Fire.* A fire will produce radiant heat. The distances to the 5 kW/m^2 (1,600 Btu/sq.ft./hr) heat level from those accidents involving fires have been calculated. This is the level that can begin causing second-degree burns to human

skin exposed for 30 seconds. People inside homes or shielded by objects such as homes or walls could stand a higher heat level before being impacted.

- *Flammable Gas Cloud from a Release.* When a flammable material is released, it begins producing flammable vapors which can drift with the wind, producing a gas cloud which may be ignited. The distances the cloud may travel before dispersing to a concentration below its lower flammability limit (LFL) have been calculated for releases of flammable materials. The flammable gas cloud hazard footprint has been calculated for two atmospheric conditions: stability condition F with 2.2 mph wind, and stability condition D with 5 mph wind. Stability Condition F consists of a low inversion layer, which tends to trap gas releases and prevent them from dispersing in the atmosphere. This condition occurs at night with low wind speeds. This condition usually results in the largest gas cloud hazard footprints.

- *Toxic Gas Cloud from a Release.* When a potentially toxic material is released, it begins producing toxic vapors which can drift with the wind. The distances the cloud may travel before dispersing to a concentration below which it is no longer toxic has been calculated where required for releases of toxic materials. The toxic gas cloud hazard footprint has been calculated for the two atmospheric conditions described above.

- *Blast Overpressure and Flying Debris from an Explosion.* Both vessels and unconfined vapor clouds have the potential to explode. The blast overpressure, as a function of distance from such an explosion, has been calculated, along with an estimate of the distance that debris may be hurled by an explosion, as appropriate. A blast overpressure of 2.5 psig, which represents the pressure that can begin causing eardrum rupture, has been used as the blast overpressure hazard footprint threshold.

The only potential toxic material to be handle by the proposed project would be hydrogen sulfide (H_2S). It is possible that small amounts of H_2S will be present in the oil and gas produced by the proposed project, however, no more than 5 parts per million (ppm) of H_2S is expected. Thus, only "sweet" gas is expected. However, to provide for unforeseen circumstances, this risk analysis assumes that up to 100 ppm H_2S could be present.

Hazard footprints have been determined using HFCP, the computer model used by the Ports of Los Angeles and Long Beach, and Chems-Plus, a commercially available program developed by and available from Arthur D. Little. The details of the methodology used by HFCP are documented in the Users' Manual (Reese-Chambers Systems Consultants, Inc.,

1991). Details of Chems-Plus are contained in the Chems-Plus User Guide (Arthur D. Little, 1988). Gas release rates were modeled using Chems-Plus.

3.0 ANALYSIS AND RESULTS

The proposed project will consist of two phases. Phase I will include the drilling of one to three exploratory and producing wells to prove the commercial value of the development. The emulsion (an oil and water mixture) and associated gas will be processed on site using portable equipment and the oil will be trucked offsite to a refinery. The water will be reinjected into a reservoir. The gas will be scrubbed and incinerated. Phase II will produce emulsion and associated gas from 30 wells; separate the gas, oil, and water using gravity and heat; clean the separated water and reinject it using four wells; and store the oil on site until shipped by a newly constructed pipeline. The gas will also be shipped by a newly constructed pipeline.

The exact characteristics of the crude oil to be produced is not known at this time, however, the API gravity is expected to be between 17 and 21. While the characteristics of the oil have little effect on the size of the radiant heat, blast overpressure, and flying debris hazard footprints, they can have a significant impact on the flammable vapor cloud hazard footprint. Thus, to be conservative, we have assumed that the crude is fairly light with a flash point below 100°F, making it a flammable liquid. This assumption will tend to overestimate the size of the flammable vapor cloud hazard footprint.

The produced gas is expected to be sweet, that is, it is not expected to contain hydrogen sulfide in concentrations high enough to be considered hazardous. As stated in the previous section, the risk analysis assumes a maximum H_2S concentration of 100 ppm while the expected H_2S concentration is less than 5 ppm. The potential effects of H_2S on humans is a function of two parameters, the exposed concentration level and the exposure time. The higher the exposure concentration, the less time it takes to cause adverse health effects. Previous analyses done for projects in Santa Barbara County (e.g., Sandpiper Golf Course and Residential Development Draft EIR [County of Santa Barbara, 1994] and Chevron Point Arguello Field and Gaviota Processing Facility SEIR [Arthur D. Little, 1988]) have generally used one or both of the following two H_2S concentrations in their risk analysis; 1000 ppm and/or 300 ppm. The 1000 ppm concentration was utilized as the H_2S concentration which could cause death after a few breaths. The 300 ppm concentration is the immediately dangerous to life or health (IDLH) concentration for H_2S. The IDLH concentration is defined as the maximum level from which one could escape within 30 minutes without any escape-impairing symptoms or any irreversible health effects (U.S. Department of Transportation, 1992).

Recently, some analysts have been examining the Emergency Response Planning Guidelines (ERPGs) for use in risk analyses. These levels have been issued by the

American Hygiene Association for use in emergency response planning and are not meant to be exposure thresholds. The ERPGs are substantially more conservative than IDLHs. The ERPG-3 concentration for H_2S is 100 ppm. ERPG-3 is defined as the maximum airborne concentration below which it is believed that nearly all individuals could be exposed up to one hour without experiencing or developing life-threatening health effects. Note that the maximum H_2S concentration considered in this analysis is equal to the ERPG-3 value and one third that of the IDLH.

3.1 Risk From Wells

The best known and potentially the most significant accident associated with well drilling is a blowout. A blowout is defined as the uncontrolled flow of formation fluids from a wellbore. They occur when formation fluids flow uncontrolled into a low-pressure subsurface zone (an underground blowout) or to the surface (a surface blowout). Most commonly, a blowout happens when there is insufficient pressure in a wellbore to control subsurface pressures. If wellbore hydrostatic pressure is allowed to drop below the subsurface formation pressure, then a "kick" will occur as the formation fluids flow into the well. Typically, a kick is circulated out of a well in a controlled manner, with formation fluids flowing into a production flowline or emergency flare line. When a kick is detected during drilling operations, the blowout prevention equipment (BPOE) is closed, sealing the wellbore and preventing any additional formation fluid from entering the wellbore. Additional kick-control procedures are implemented such as circulating higher density drilling fluid into the wellbore until the kick is circulated out of the well and normal operations can be resumed. A surface blowout occurs when formation fluids flow to the surface in an uncontrolled manner. A kick can lead to a blowout in rare instances (e.g., in a gas well that experiences a failure in the mechanical integrity of the equipment/system). Redundancy of equipment is a primary feature of blowout prevention equipment design.

A source of information on blowouts in California is a document titled "A History of Oil- and Gas-Well Blowouts in California, 1950 - 1990", published by the California Department of Conservation Division of Oil, Gas and Geothermal Resources (CDOG). This database includes both onshore and offshore wells.

The CDOG data shows an overall drilling incident rate of one blowout per 1,963 wells drilled during the time period 1950 - 1990. The incident rate for blowouts resulting in a release of oil is 1:20,315. The blowout incident rate from 1970 (after the 1969 Unocal blowout offshore Santa Barbara) through 1990 was 1:3,046 (a probability of 3.3×10^{-4} per well drilled).

A detailed analysis of the CDOG data for the time period 1980 - 1990 determined that after blowouts caused by steam injection and in abnormally high pressurized reservoirs were removed from the database, the blowout incident rate is 1:10,969 (a probability of 9.1×10^{-5} per well drilled). None of the remaining blowouts in the database flowed oil.

One factor that would tend to further reduce this low probability of a blowout is the fact that the Hermosa Beach project will be drilling into a reservoir whose characteristics are well known. The reservoir is not highly pressurized and will require pumping to bring the oil to the surface.

Based on the above statistics (blowout incident rate of 1:10,969), the probability of a blowout for the two phases of the proposed project are presented below.

PHASE	NUMBER OF WELLS	PROBABILITY OF BLOWOUT
1	6	5.5×10^{-4}
II	24	2.2×10^{-3}
BOTH	30	2.7×10^{-3}

Although the probability of a gas blowout is extremely low, a discussion of such an event follows. First, if a large pressure surge is encountered, the blowout prevention systems should prevent gas from escaping by closing off the annulus. In the highly improbably event that the annulus does not close, the gas will be diverted to the processing equipment or the on-site vent if the processing equipment is unable to handle the flow. The vent allows the gas, which is lighter than air, to escape upward away from potential ignition sources. Modeling shows that the gas being vented from a vertical flare will not reach flammable concentrations (approximately 5 percent for methane) at ground level and therefore should not be subject to ignition.

The Molino Gas Project EIR combined the analysis of a blowout with that of the gas production pipelines. The annual probability of such an occurrence was estimated to be 1.1×10^{-4}. The document states that a blowout has a lower probability of occurring than a production pipeline failure. The Molino estimate of a blowout is consistent with the blowout probabilities in the table above when considering that the Molino estimates include the pipelines. The extent of the potential flammable gas cloud hazard footprint from a blowout was assumed to be the same as that of a pipeline rupture. The flammable gas cloud hazard footprint was calculated to be 381 feet for stability condition F. This same approach

was taken in this analysis and the flammable gas cloud hazard footprint was calculated using Chems-Plus to extend 327 feet for stability condition F, 2.2 mph wind.

As stated previously, the gas is expected to be sweet and should therefore not present a toxic hazard. An H_2S concentration of 100 ppm means that the gas contains 0.01 percent (0.0001) H_2S. If released, the gas would immediately begin to mix with air thereby diluting the overall concentration of H_2S to a concentration of less than 100 ppm, the ERPG-3 value. The H_2S concentration that would be in the air from a release of gas would be well below the 300 ppm IDLH level and below the 100 ppm ERPG-3 level and, therefore, would not present a health risk to the surrounding area. Thus, no modeling of an H_2S gas cloud was done or required.

The probability of a blowout during drilling was deemed to be not significant by the Final Environmental Impact Report (Ultrasystems, 1994). This conclusion was based on the fact that the wells will be equipped with redundant safety devices, including blowout protectors. Thus, the worst case accident involving the wells has been postulated to be a leak in the well area flooding the well cellar. The leak would involve an emulsion containing approximately half oil and half water.

The well cellar covers an area of approximately 2,060 feet. HFCP was utilized to calculate the flammable vapor cloud and radiant heat hazard footprints for a release that would cover the entire cellar area. The size of the hazard footprints is measured from the edge of the cellar area. The results are presented below.

- Radiant heat - 152 feet
- Flammable gas cloud - 17 feet

It is noted here that the vaporization rate from this pool would not produce enough vapor to become involved in an unconfined vapor cloud explosion.

Regulations and technology have made wells extremely safe and the probability of a release of any size from a well is unlikely. Previous EIRs (Arthur D. Little, 1995) have estimated that the probability of a major spill from a wellhead complex is 1.1×10^{-4} per year. The probability that the oil would become ignited would be 1.0×10^{-2} or one in a hundred (Country of Santa Barbara, 1985). Thus, the annual probability of a release with fire would be 1.1×10^{-6}.

3.2 Risk from Storage Tanks

Oil and process water will be stored in five storage tanks located in a common secondary containment system (i.e. diked area). All of the tanks will have cone roofs with weak seams. In the unlikely event of an explosion, the roof is designed to lift up to vent the energy, thereby preventing the tank from rupturing and possibly resulting in flying debris. The roof is expected to travel no more than several tank diameters from the tank. It is also noted here that the tanks will be blanketed with gas to prevent oxygen from being present. As long as oxygen is not present, an explosion is impossible.

The potential DBAs from the tanks addressed in this analysis include a fire in a tank, an explosion in a tank, and a rupture of a tank flooding the diked area, either with or without a fire. The following hazard footprint distances were calculated using HFCP. The largest tank, with a 3,333 bbl capacity, was used in the calculations. All of the hazard footprints are measured from the edge of the tank or diked area.

- Radiant heat from a fire in a tank - 156 feet
- Blast overpressure from an explosion in a tank - 141 feet
- Flying debris from an explosion in a tank - 77 feet
- Radiant heat from a fire in the diked area - 271 feet
- Flammable gas cloud from a release into the dike area - 33 feet

The annual probability of a tank fire has been estimated to be 7.0 x 10 (Envicom, 1992). This equates to an annual probability of 2.1×10^{-4} for the three tanks. The rupture of an atmospheric storage tank due to all causes, including seismic events, is estimated to be 1.6×10^{-4}/year or once in 6,300 years (County of Santa Barbara, 1985). The probability that the oil is ignited is 1.0×10^{-2}, or one in a hundred. Thus, the probability of a release with a fire is estimated to be 1.6×10^{-6} per tank, or once in 625,000 years. Since there will be three storage tanks that may store crude oil, the probability of a spill with fire, per year, would be 4.8×10^{-6}, or once in 208,000 years.

The probability of an explosion in an oil storage tank has been estimated to be 1×10^{-4} per year (County of Santa Barbara, 1988). This is for all types of storage tanks. The tanks for the proposed project will be gas blanketed, which will virtually eliminate the possibility of a tank explosion.

3.3 Risk from Process Area

The first step in processing the emulsion will be the separation of the gas, oil, and water by means of gravity using free water knockout (FWKO) vessels. The gas that will be separated out will be primarily methane which is the predominant gas in natural gas piped to most homes. The emulsion enters the FWKO whereby the water, which is heavier than the oil, falls to the bottom of the tank while the oil floats on the water. The gas which escapes from the emulsion goes to the top of the tank. The water is drawn off the bottom of the tank and sent to the wastewater treatment system. The gas is drawn off and directed to the gas compression and treatment system. The oil is sent to heater treaters where it is further processed. The FWKOs are ASME certified pressure vessels. The potential for an explosion in one of these vessels is extremely unlikely, and thus no hazard footprints have been calculated for a vessel rupture. Instead, the DBA from a FWKO has been assumed to be a release from a 2-inch diameter hole, which represents a release from a pipe connection or other small release. The flammable gas hazard footprint from a 2-inch diameter hole in the tank would produce a flammable vapor cloud hazard footprint that would extend up to 327 feet from the point of release under worst case atmospheric conditions (stability F, 2.2 mph wind). The rate of release from the vessel was calculated using the Chems-Plus model developed by Arthur D. Little. This rate of release was then input to both Chems-Plus and HFCP to calculate the flammable gas cloud hazard footprint. The models also determined that the amount of gas (methane) in the cloud would not be enough to become involved in an unconfined vapor cloud explosion.

Again, no toxic (H_2S) gas cloud hazard foot print was calculated because the gas would have no more than 100 ppm H_2S and , thus, not present a health hazard from a release.

The oil is sent to heater treaters where it is heated to further separate out water and gas from the oil. In this case the majority of the emulsion entering the vessels is oil. The heater treaters are also ASME certified pressure vessels. Since the heater treaters will operate at approximately the same pressure as the FWKO, the release rate of gas from a 2-inch diameter hole will be approximately the same as that from the FWKO (it will actually be slightly less since the gas will expand because it is heated) and thus, the flammable vapor cloud hazard footprint will be approximately the same size. Again, there will not be a toxic gas hazard footprint because the gas is expected to be sweet (less than 5 ppm H_2S) and in no case will it contain more than 100 ppm H_2S.

A release of oil from the FWKOs or heater treaters could spread and cover the secondary containment area around the vessels. The surface area of the secondary containment area is approximately 7,780 sq.ft. The flammable gas cloud (if the spill doesn't ignite) and radiant heat hazard footprints were calculated by HFCP to be:

- flammable gas cloud - 41 ft
- radiant heat - 266 ft

Arthur D. Little, 1995, has estimated that the probability of a major release from a pressure vessel is 8.0×10^{-7} per year, or once in 1,250,000 years. For the four vessels proposed for the facility, the combined annual probability of a major release would be 3.2×10^{-5} (once every 312,500 years). The probability that the released oil would become ignited is 1.0×10^{-2}. Thus, the annual probability of a major spill with fire is 3.2×10^{-7} (once in 3 million years).

3.4 Risk from Trucking

During Phase 1, the oil will be stored on-site in portable tanks and then loaded into tanker trucks for transportation to a refinery. It is estimated that three to four tanker truck trips per day, each carrying 175 bbls of oil, will be required to handle the 600 bbl per day production. The tanker trucks will be loaded inside the facility in an area equipped with a drain and sump to contain any spillage, although none is expected. The Phase I site sump/containment system will be adequate to fully contain a 175 bbl spill. Trucks will exit the facility and follow designated routing from the facility. Trucks will not deviate from the designated routing through residential neighborhoods.

Trucking of petroleum products is quite common throughout the country. Gasoline and other petroleum products are routinely transported by tanker trucks to gas stations and industrial facilities. Tanker trucks can become involved in traffic accidents but these do not usually result in a loss of cargo. A worst case accident would result in the loss of the entire contents of the trucks (175 bbls). The released oil would then spread on the ground and could ignite if it encounters an ignition source. The area covered by the spill would be a function of the elevation profile of the surrounding area.

For the purpose of calculating the potential hazard footprints, it has been assumed that the oil is spilled on a flat surface and spreads to a uniform depth of one inch. The spill would cover an area of approximately 11,800 sq. ft. with a radius of approximately 57 ft. The radiant heat and flammable gas cloud hazard footprints were calculated by HFCP to be:

- Flammable gas cloud - 52 ft
- Radiant heat - 320 ft

It is noted here that oil burns at a rate of approximately 4 mm (0.16 in.) per minute and hence, a one-inch deep pool would burn for approximately 6.4 minutes. The pool would burn for a longer time if it were deeper, however, then the area would be smaller and the radiant heat footprint smaller.

The Handbook of Chemical Hazard Analysis Procedures (FEMA, undated) recommends using a truck accident rate of 2×10^{-6} accidents per mile with 20% of the accidents resulting in a release of cargo. The Handbook goes on to recommend that the following spill distribution be utilized:

- 10% cargo loss (17.5 bbl) - 60% of the time
- 30% cargo loss (52.5 bbl) - 20% of the time
- 100% cargo loss (175 bbl) - 20% of the time

Assuming that a loaded truck travels 10 miles results in the following annual probabilities of accidents and releases. It is assumed that the trucking lasts for one full year.

Event	Annual Probability
Accidents	2.5×10^{-2}
Spill of any size	5.0×10^{-3}
Spill of 17.5 bbls or less	3.0×10^{-3}
Spill between 17.5 bbls and 52.5 bbls	1.0×10^{-3}
Spill greater than 52.5 bbls	1.0×10^{-3}

3.5 Risk from Crude Oil Pipeline

A new produced crude oil shipping line will be constructed to transport produced crude oil from the oil production facility to the existing Wilmington to Torrance pipeline. The Wilmington to Torrance Pipeline, operated by Chevron, will transport the crude oil to the Chevron refinery in El Segundo. The new pipeline will have an outside diameter of 6 inches and be approximately 0.5 miles (2,500 ft.) long. The pipeline is designed for a maximum operating pressure of 350 psig.

The amount of oil than can be released from a pipeline is made up of the amount that can be released until pumping is stopped plus the amount than can drain from the line due to gravity. Because the pipeline will be equipped with a supervisory control and data acquisition (SCADA) system that will monitor the pipeline at all times, it is conservatively

estimated that a pipeline rupture would be detected and the pumping shut down within 10 minutes. Hence, a maximum of 56 bbls [8,000 bbls per hour / (24 hr x 60 min per hour) x 10 min] could be lost due to pumping. The capacity of the pipeline is 85 bbls which is the maximum amount of oil that could drain from the pipeline if all the oil were to escape. Thus, the worst case release from the pipeline would be 141 bbls (56 bbls + 85 bbls).

As with a trucking accident, the area impacted by a pipeline spill would be a function of the elevation profile of the surrounding area. Assuming again that the spill occurs on a flat surface and spreads to a depth of one inch, this results in a 9,500 sq. ft. area being covered.

The radiant heat and flammable gas cloud hazard footprints were calculated by HFCP to be:

- Flammable gas cloud - 46 ft
- Radiant heat - 289 ft

The probabilities of a leak and rupture for modern crude oil pipelines are generally estimated to be around 5.4×10^{-4} spills per pipeline-mile per year, and 2.7×10^{-4} ruptures per pipeline-mile per year, respectively (Aspen, 1995). This equates to the following annual probabilities for the 0.5 mile pipeline.

- Probability of leak - 2.7×10^{-4}
- Probability of rupture - 1.3×10^{-4}

3.6 Risk from Gas Pipeline

The new gas pipeline will be constructed to transport utility-grade gas from the facility to an existing utility gas pipeline. The new pipeline will have an outside diameter of 4 inches and will be approximately 0.5 miles long. Gas will be sent through the line on a continuous basis at approximately 120 psig, using the compressor located at the Macpherson production facility. Any small amounts of H_2S that might be in the gas will be removed at the Macpherson production facility and hence, the gas will not be toxic.

The rate of release of gas from the pipeline would be a function of the size of the hole. The larger the hole, the greater the release rate. A complete rupture of the line would shut down the compressor almost immediately. In addition, the line will be equipped with a

check valve at the point where it connects to the utility line that would prevent gas from flowing into the line from the utility line.

Chems-Plus has been utilized to calculated the release rate and flammable vapor cloud hazard footprint from a pipeline rupture and from a small leak (e.g. ¼-inch diameter hole). The results are presented below.

Accident	Downwind Distance to LFL
• Pipeline rupture	467 feet
• ¼-inch hole	<10 feet

It is noted here that the downwind distance to the LFL calculated for the rupture is an overprediction because Chems-Plus treats the release as a point source and ignores the initial mixing with air caused by the jet release of the gas. The pipeline would be emptied of gas in about 4 seconds in the rupture case. It is also noted that this line is essentially the same as the numerous utility-owned and -operated gas lines throughout the area.

If the gas release were to ignite, it would burn as a jet release until the gas flow ceased. This would last about 4 seconds. The flame length could be up to 211 feet long. If the gas cloud were to ignite, the fire would burn back to the source and burn as a jet flame. Thus, the radiant heat hazard footprint has been assumed to be equal to the flammable gas cloud hazard footprint.

The probability of a leak for a modern gas line is estimate to be 1.5×10^{-3} per pipeline-mile per year (Arthur D. Little, 1995). Thirty one percent of the leaks are estimated to be major leaks or ruptures. This equates to the following annual probabilities for the 0.5 mile gas pipeline.

• Probability of leak	- 5.2×10^{-4}
• Probability of rupture	- 2.3×10^{-4}

Table 3-1 Summary of Accident Probabilities and Hazard Footprints

SCENARIO	ANNUAL PROB OF ACCIDENT	STABILITY F / 2.2 MPH WIND			STABILITY D / 5 MPH WIND		
		DOWNWIND DISTANCE (FT)	CROSSWIND DISTANCE (FT)	AREA (SQ. FT.)	DOWNWIND DISTANCE (FT)	CROSSWIND DISTANCE (FT)	AREA (SQ. FT.)
(1) Release in well area (blowout or pipe rupture) without fire - flammable gas hazard	1.1×10^{-4}	327	131	33,600	101	41	3,250
(2) Release in well area with fire - radiant heat hazard	1.1×10^{-6}	152	Circle	18,150	152	Circle	18,150
(3) Fire in atmospheric storage tank - radiant heat hazard	2.1×10^{-6}	156	Circle	19,100	156	Circle	19,100
(4) Release into containment system from storage tank without fire - flammable gas hazard	4.8×10^{-4}	33	15	390	11	5	43
(5) Release into containment system from storage tank with fire - radiant heat hazard	4.8×10^{-6}	271	Circle	53,000	271	Circle	53,000
(6) Explosion in storage tank - blast overpressure and flying debris hazards	0 - tanks will be gas blanketed						
(7) Release from a process vessel - flammable gas hazard	3.2×10^{-5}	327	131	33,600	101	41	3,250
(8) Process vessel leak into containment system without fire - flammable gas hazard	3.2×10^{-5}	41	20	640	14	6	115
(9) Process vessel leak into containment system with fire - radiant heat hazard	3.2×10^{-7}	266	Circle	55,600	266	Circle	55,600
(10) Truck release of crude oil without fire - flammable gas hazard	5.0×10^{-3}	52	25	1,020	16	8	100
(11) Truck release of crude oil with fire - radiant heat hazard	5.0×10^{-3}	320	Circle	80,400	320	Circle	80,400
(12) Pipeline release of crude oil without fire - flammable gas hazard	1.3×10^{-4}	46	22	800	15	7	80
(13) Pipeline release of crude oil with fire - radiant heat hazard	1.3×10^{-5}	289	Circle	65,000	289	Circle	65,000
(14) Gas pipeline release - flammable gas hazard	2.3×10^{-4}	467	187	68,600	214	86	14,450

3.7 Summary of Accident Probabilities and Hazard Footprints

The results of hazard footprint analysis are summarized in Table 3-1. The table includes the probability of the accident, the extent of the hazard footprints (downwind and crosswind for flammable gas hazard footprints) for the two environmental conditions (stability F and stability D), and the area covered by the hazard footprint. The hazard footprints are displayed on Figure 3-1.

As can be seen from the table, the largest hazard footprint would be 327 feet from a wellhead, blowout, or gas processing release. This hazard footprint would extend into the residential neighborhood to the north and the R-3 neighborhood to the west. The actual hazard footprint at the time of a release would only extend downwind, and would not cover the entire circular area shown. Also, it is noted here that the footprint would only be 327 feet during worst case environmental conditions, e.g. stability F with low wind speeds. As can be seen from the table, the hazard footprint would only extend 101 feet during typical environmental conditions, The flammable gas hazard footprint would only be a hazard if it were to be ignited. The radiant heat hazard footprint would extend 271 feet and would form a circle as shown because the radiant heat would be given off in all directions. The radiant heat hazard footprint extends into the residential neighborhood to the north and just touches the R-3 neighborhood to the west. It is noted here that this footprint would not impact people inside or behind structures. In addition, people outdoors exposed to the heat from a fire, would have time to find shelter before they would sustain burns. A fire at the facility should not impact homes or other structures in the area.

The truck, oil pipeline, and gas pipeline accidents would occur offsite and their potential impact would be a function of where the accident occurred relative to vulnerable resources.

3.8 Consequence Analysis

The results of the failure rate and consequence analysis have been combined to develop plots of frequency versus fatalities similar to that shown in the Molino Gas Project EIR. These curves are commonly called risk profiles. Figure 3-2 presents the guidelines used in the Molino Gas Project EIR for the determination of offsite risk and significance. Points above the upper line, labeled "De Manifestis", are considered to be an unacceptable risk, while those below the line, labeled "De Minimis", are considered acceptable. Points between the two lines, labeled "grey region", are acceptable but mitigation may be required. The following factors were utilized in developing the risk profiles.

- extent of hazard footprint for each environmental condition
- estimated frequency rate for each accident
- estimated frequency of occurrence for each atmospheric condition
- estimated frequency of occurrence of wind direction
- population density

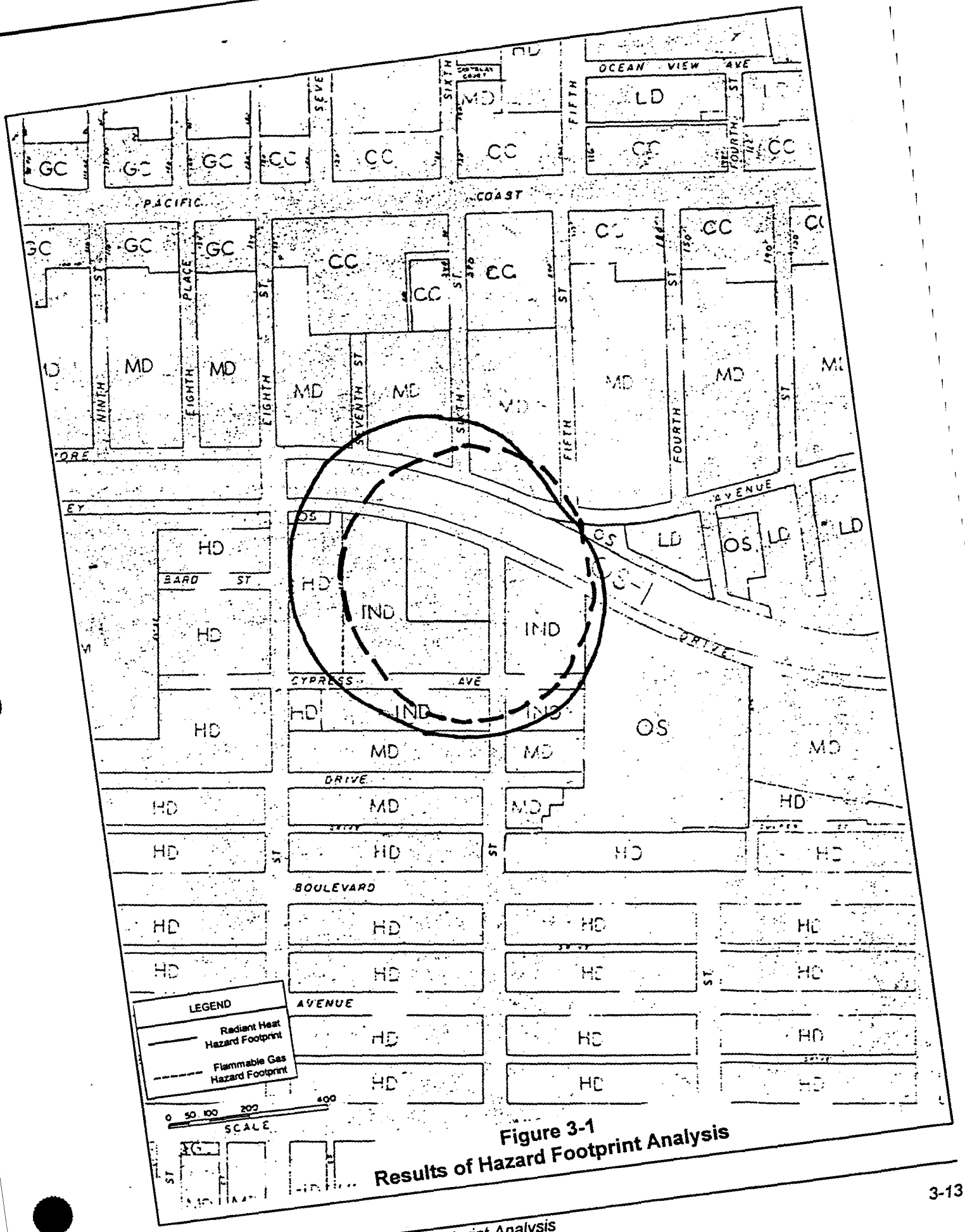
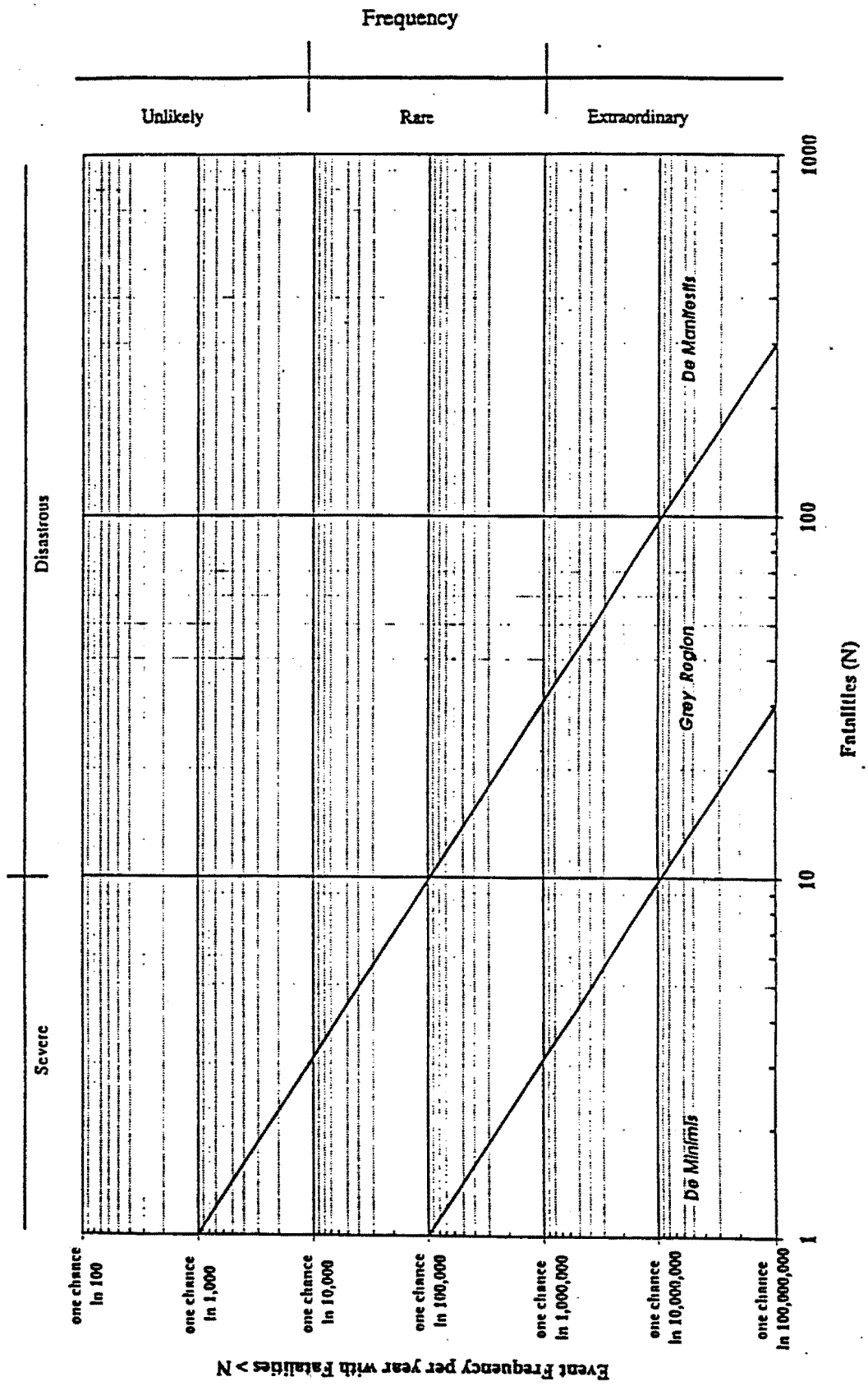


Figure 3-1
Results of Hazard Footprint Analysis

Figure 3-2
Offsite Risk and Significance Guidelines



- presence of ignition sources
- probability of ignition from each ignition source

Meteorological Data - Meteorological data for the project site were obtained from California Air Resources Board, 1984 and California Department of Water Resources, 1978. Data for two sites, Los Angeles International Airport and Redondo-King Harbor were utilized.

- population density
- presence of ignition sources
- probability of ignition from each ignition source

The basic approach determined the relative likelihood of each of the two stability conditions, D and F, occurring. Condition D was used to represent conditions A through D and condition G to represent conditions E and F. The frequency of wind direction was taken from the two data sources.

Conditional Impact Probabilities - The likelihood is not 100 percent of a fatality resulting from an exposure to a vapor cloud fire. Buildings can provide some protection hazards. The analysis assumes 30 percent fatality within the lower flammability limit.

People inside buildings would not be harmed by a radiant heat hazard footprint. People outside their homes could begin to received second degree burns if exposed for longer than 30 seconds. Because the radiant heat hazard footprint only overlaps a small residential area, it has been assumed that most people exposed would be in their homes or could easily leave the area in a short time. Thus, it has been assumed there would be no fatalities due to radiant heat.

Population Distribution - The population distribution was estimated from the Hermosa Beach General Plan Map. Each residential unit was assumed to house four people.

Ignition Probabilities - Flammable vapor clouds have the potential to ignite anywhere within their flammable limits. Hence, it is necessary to identify potential ignition sources that a cloud may encounter, and to quantify the likelihood of ignition, if the cloud encompasses the sources. In general, when trying to identify ignition sources, the search is primarily for open flames, hot surfaces and electrical sparks, and, to a lesser extent, friction sparks from both continuous and intermittent activities. Some of the potential ignition sources identified in the Molina Gas Project EIR were:

- Vehicles (many specific sources were identified)
- Boilers
- Gas turbines
- Blow torches
- Fired heaters
- Welding
- Faulty wiring
- Pilot flames
- Fireplaces and wood/coal stoves
- Smoking materials
- Doorbells
- Switches
- Furnaces/incinerators
- Machine tools
- Flares

Ignition probabilities used in the Molino Gas Project EIR include:

- ***Cars*** - 0.2 per car; although many potential ignition sources within a car like faulty wiring or backfires are due to fuel rich mixtures in intake air, they are not always present nor guaranteed to cause ignition.

- ***Houses*** - 0.01 per house; while there are many ignition sources within a home, such as switches, doorbells, faulty wiring, pilot lights, smoking materials, fireplaces and wood- or coal-burning stoves, the flammable vapors must first penetrate the house before these ignition sources pose a hazard. Typical residence times of clouds are often brief enough that this is relatively unlikely.

- ***Immediate Ignition*** - There are various ignition sources at the project facility such as electrostatic ignition or friction sparks that would ignite the vapor cloud on the project site. In keeping with the Molino Gas Project EIR, a figure of 0.2 has been assumed for the probability of immediate ignition.

Construction of Risk Profiles - The risk profile displays the frequency with which fatalities could occur. They indicate accident size and display how the potential number of fatalities varies as a function of frequency. The risk profile has been plotted on a log-log scale because the profiles span multiple orders of magnitude.

The general approach involved in constructing a risk profile involves determining the frequency and number of fatalities associated with each release scenario. A release scenario is defined by the following:

- Release location
- Release frequency
- Meteorological stability condition and its likelihood
- Wind direction and its likelihood
- Whether and where ignition occurs
- Area of the hazard zone
- Number of individuals exposed within each hazard zone
- Assumed fatality rate for that type of hazard

Some of these factors affect frequency, some determine impacts, and some influence both. Once all possible combinations have been analyzed, the results are combined to give the overall risk profile.

If a flammable release does not ignite immediately, the material will disperse, forming a vapor cloud which will travel downwind. Should the cloud encounter an ignition source (such as cars, pilot lights, open flames, furnaces or other equipment), the cloud will ignite and burn through the flammable area until all flammable material is consumed. For each release scenario, it is necessary to identify the ignition sources that would be encountered. Assuming that a particular area or travel path contains a number of potential ignition sources, the probability can be calculated for the cloud not igniting after covering that area. Hence, it is possible to calculate the probability for the cloud to ignite at various stages in its development, for a given release location and wind direction.

For each release scenario (consisting of a release quantity, release location, a specific stability class and wind speed, and a wind direction), the ignition sources encountered by the cloud are listed. Letting P_i represent the ignition probability of the ith ignition source to be encountered, and assuming that area A contains the first k sources, the probability that the cloud has not yet ignited after covering the area A is given by:

$$\prod_{i=1}^{k}(1-P_i)=(1-P_1)(1-P_2)\ldots(1-P_k)$$

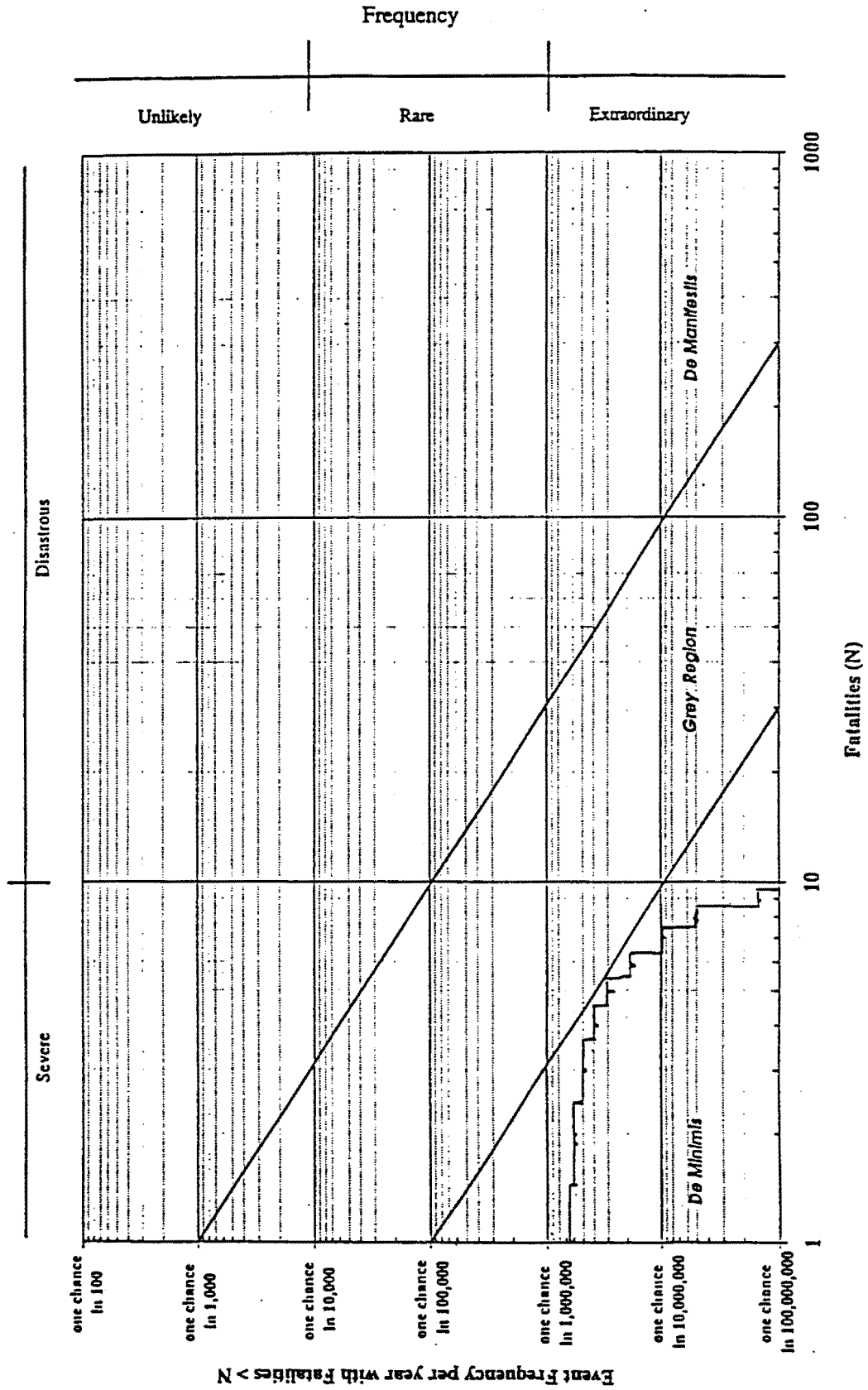
Uncertainties Associated with the Risk Profiles - There are many sources of uncertainty which can affect the accuracy of the risk profiles. These uncertainties deal with:

- Release frequency
- Release size
- Population impacts, including distribution and likelihood of fatality
- Behavior of the release (jet mixing versus passive dispersion)
- Accuracy of the hazard models
- Ignition sources and probabilities

The release frequencies and sizes are the most important contributors to overall uncertainty. The values chosen are conservative, i.e., they overstate rather than understate the risk. Changes in failure rates will directly influence the risk profile. A doubling of the event frequencies would double the probability of fatalities. Changes in the relative size of leaks and ruptures will influence the risk profile, but to a lesser extent. The assumptions on population distribution and ignition probability also influence the risk profiles, but are not as significant as the other sources of uncertainty.

Results of Analysis - The results of the consequence analysis are displayed on Figure 3-3. As can be seen by the figure, the risk profile for the proposed project lies in the "De Minimus" range and hence, is considered to present an acceptable risk.

Figure 3-3
Project Risk Profile



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REESE-CHAMBERS SYSTEMS CONSULTANTS, INC.

Reese-Chambers Systems Consultants, Inc. (RCSC) is a small company located in Southern California near the City of Camarillo. RCSC has been providing professional consulting services to industry and agencies since 1979. One of RCSC's specialty areas is risk analysis of industrial projects. RCSC has conducted risk analysis in conjunction with Environmental Impact Reports and Statements (EIRs and EISs), Risk Management and Prevention Programs (RMPP), Hazard and Operability Studies (HAZOPs), Environmental Quality Assurance Programs (EQAP), and other agency-required special studies. RCSC has utilized various models in the conduct of risk studies including *ARCHIE, CHEMS-PLUS, WHAZAN, SLAB, AFTOX,* and *ISC.* RCSC has specific experience with a broad range of industrial applications including numerous oil industry facilities such as pipelines, pump stations, tank farms, and marine terminals:

- Preparation of the system safety/public safety section of the EIR for the State Lands Commission lease renewal of the Unocal Rodeo Marine Terminal.

- Conduct of 25 separate risk and hazard analyses to fullfill California Office of Oil Spill Prevention and Response (OSPR) requirements for oil spill contingency plans. Analyses included marine terminals, pipelines, oil platforms, onshore producing facilities, and onshore processing facilities.

- Consultant to Texaco Trading and Transportation, Inc. (TTTI) for the permitting of the Gaviota Marine Terminal. Also developed various risk analysis studies and papers in support of permit negotiation and compliance. Developed many of the Terminal contingency plans including the Emergency Response Plan and Oil Spill Contingency Plan.

- Developed the Risk Management Plans for the Ports of Los Angeles and Long Beach. The plans have been certified by the California Coastal Commission as annexes to the Ports' Master Plans, dealing with risk management for hazardous cargoes and petroleum products.

- Developed the risk analysis section of an environmental study addressing a proposed oil and gas development project on Sakhalin Island, Russia. The analysis addressed all aspects of the proposed project including oil and LNG export terminals.

- Developed terminal operations manuals for the Gaviota Marine Terminal and Unocal Avila Terminal to meet U.S. Coast Guard and California State Lands Commission requirements.

- Developed EQAP for Unocal Sisquoc Pipeline and Santa Maria Pump Station.

- Conducted overall spill risk and prevention analysis for Pacific Pipeline System, Santa Barbara to Los Angeles refineries.

- Conduct of RMPP and HAZOP studies for four electrical generation plants, a steam generating facility, a refrigeration plant, and numerous oil industry facilities including pipelines, tank farms, processing plants, and pump stations.

- Preparation of Process Safety Manuals for Unocal Rincon oil processing facility.

- Developed oil spill response plans for numerous facilities including the Gaviota Marine Terminal, Unocal Avila Wharf Terminal, Bush Oil Rincon Operations, and several pipelines in response to OPA 90 requirements.

- Developed numerous emergency response plans and fire protection plans for oil and gas projects including marine terminals, processing plants, pump stations, and pipelines.

- Conducted numerous risk studies as listed below:

  - GATX Port of Los Angeles Chemical Terminal
  - Proposed California Ammonia Company Ammonia Terminal in the Port of Los Angeles
  - Chevron Carpinteria Oil and Gas Processing Facility
  - Chevron Elk Hills Gas Plant Risk of Explosion Study
  - McMillen Long Beach Refinery Potential Risk to Nearby School Site
  - Oil and Gas Development Project on Sakhalin Island, Russia
  - Relocation of Defense Logistic Agency Fuel Pier and Pipeline in the Port of Los Angeles
  - Mutual Liquid Gas Propane Storage and Truck Loading Facility in Wilmington, California
  - Liquefied Gas and Chemical Terminal on the Firth of Forth, Scotland
  - Southern Pacific Pipeline Tank Farm Expansion in Carson, California
  - Unocal Product Pipeline through the City of Carson
  - Gaviota Interim Marine Terminal
  - Matlack Hazardous Material Trucking Terminal and Truck Cleaning Facility in Carson
  - Proposed Oil and Gas Development on Vandenberg Air Force Base
  - Proposed Natural Gas Pipeline Projects into the San Joaquin Valley

- Tesoro Fuel Depot and Southern California Edison Storage Tanks in the Port of Hueneme
- OSCO Solvent Recycling Facility in City of Azusa, California
- Unocal Gas and Oil Processing Facility in Lisbon, Utah

Timothy J. Chambers
Senior System Safety Analyst

SUMMARY OF EXPERIENCE

Over 24 years of experience as a systems analyst, with major emphasis on safety and risk management analysis; oil and gas activities; hazardous material handling, storage, and transportation analysis; and contingency planning. Experience during the past 15 years has included extensive environmental work including that involving facilities handling hazardous materials. Other environmental analysis has involved risk management of maritime transportation, marine terminals, oil and gas activities, pipelines, truck and train transportation, and processing facilities. Experience includes work with industry and governmental agencies.

MAJOR PROJECT EXPERIENCE

- Conduct of 25 separate risk and hazard analyses to fulfill OSPR requirements for oil spill contingency plans. Marine facilities addressed included marine terminals, pipelines, platforms, onshore producing facilities, and onshore processing facilities, and customers included Unocal, Shell, Vintage, Torch, Global, Macpherson, and Mobil.

- Consultant to Unocal for the development of OPA 90 and OSPR oil spill contingency plans for the Avila Marine Terminal, Coast Area pipelines, Valley Area pipelines, and Point Pedernales pipeline.

- Consultant to Macpherson Oil Company for development of Oil Spill and Emergency Response Plans for their proposed Hermosa Beach oil development project. Plans were prepared for the drilling and production site, crude oil pipeline, and gas pipeline.

- Project Manager for the development of operating procedures for Unocal's Rincon Facility (ROSF)

- Development of public safety and vessel traffic analysis sections of an EIR on the renewal of Unocal's Rodeo Marine Terminal lease with the California State Lands Commission.

- Conduct of an analysis addressing the potential impacts on marine operations (nearby terminals and vessel traffic) caused by the construction of four alternative bridge configurations parallel to the existing Benicia-Martinez Bridge.

- Consultant to the Gaviota Terminal Company for the permitting of an oil transport marine terminal at Gaviota, California. Work included conduct of various studies and analyses to support system safety aspects of the marine terminal, its operations, and the transport of oil by tankers; negotiation of permit conditions; and the development of contingency plans including the Oil Spill Contingency Plan, Shoreline Cleanup Plan, Shoreline Access Plan, Terminal Operations Manual, Emergency Response Plan, and Fire Protection Contingency Plan.

- Development of the Navigational Hazard Analysis section of the various oil spill cooperative Regional Resource Manuals.

- Development of the vessel traffic analysis section of the Wickland Oil Terminal Expansion EIR.

- Consultant to Unocal Oil and Gas for the development of emergency response plans for their Santa Maria Basin oil and gas development project. Specifically developed separate emergency response plans for the Lompoc HS&P, the Battles Gas Plant, oil and gas pipeline segment from shore to the Lompoc HS&P, and the oil pipeline segment from the HS&P to the Orcutt Pump Station.

- Consultant to Unocal for the permitting of the Sisquoc Pipeline System. Conducted various analyses and developed various plans in support of this effort, including Fire Protection Plan, Emergency Response Plan, Oil Spill Contingency Plan, Environmental Quality Assurance Plan, Risk Analysis, and HAZOP.

- Responsible for risk analysis and mitigation development for a proposed offshore oil and gas development project in Russia. Risk analysis addressed all aspects of the project including offshore drilling and production, offshore and onshore oil and gas pipelines, oil and gas processing facilities, oil export terminal, LNG plant and export terminal, and refinery.

- Consultant for development of risk management programs and addressal of citizen concerns for various petroleum pipeline, tank farm, processing plant, refinery, and gas pipeline projects. Clients included City of Carson, City of Torrance, Long Beach Unified School District.

- Manager of system safety portions of EIR and EIS documents for various projects, including transportation, transfer, handling, and storage of chemicals for a proposed GATX chemical tank farm in Carson, California; natural gas pipeline development in San Joaquin Valley; oil and gas drilling, storage, transportation, and processing for Vandenberg Air Force Base; hazardous material transport, transfer, cleaning, and storage for the City of Carson; and hazardous waste material storage, transfer, processing, transport, and recycling for a facility located in Azusa, CA.

- Conducted risk analysis of potential for release, fire, and explosion at one of the gas plants at the Elk Hills Naval Petroleum Reserve.

- Risk analysis and mitigation design, contingency planning, and design and operation of risk management programs for various clients including County of Santa Barbara, Ports of Los Angeles and Long Beach, Cities of Beaumont and Carpinteria, Holchem, California Ammonia Company, Mutual Liquid Gas and Equipment Company, and others.

- Development of Risk Management and Prevention Programs (RMPPs) as required by California law for several industrial facilities including Colmac Energy, Bonneville Pacific, and Tracy Operators power plants; Sharyn Steam steam generation plant; and United Foods food processing plant. RMPPs address acutely hazardous materials such as ammonia, chlorine, and sulfuric acid.

- Conduct of Hazard and Operability (HAZOP) studies in support of the RMPPs listed above and for several oil pipeline and pump station projects.

- Development of risk management and maritime factors portions of EAs/EIRs/EISs for various oil and natural gas recovery projects covering gas and oil pipeline safety, shipping and other maritime impacts, drilling safety, etc. Projects included ARCO, Cities Service, Chevron, Phillips Petroleum, Shell Oil Company, Texaco.

- Responsible for public and system safety analysis section of EIR on a proposed household and small business hazardous waste collection facility in Santa Barbara, California.

- Responsible for all public and system safety aspects of the EIR/EIS for the Port of Los Angeles/Port of Long Beach 2020 Plan, a proposed landfill and expansion project. Work covered potential system safety impacts from landfill construction; impact on recreational, fishing, and commercial vessels; impact from trucking, pipeline, and train transportation of hazardous materials; impact on anchorages; and impact from oil spills.

- Responsible for analysis of potential impacts between tanker traffic to a proposed Exxon offshore marine terminal and potential oil and gas development in the vicinity of the marine terminal. Work conducted in the form of a supplemental EIR for the California State Lands Commission.

- Developed risk analysis and emergency procedures section of an environmental and risk assessment of coastal communities from LNG tanker traffic offshore Alaska.

- Responsible for risk analysis section of oil spill response plan developed for Alyeska Valdez Marine Terminal.

- Prime consultant to PBQ&D and US Navy for risk and reliability analysis for relocation of Navy fuel pier to Port of Long Beach. Work included extensive pipeline, tank farm, and marine terminal risk management analysis.

- Consultant to GATX for permitting risk analysis of a proposed expansion of a multi-petroleum product and chemical marine terminal and storage facility in the Port of Los Angeles.

- Project manager and consultant for port and vessel traffic risk management analysis for a multi-liquefied-gas terminal on the Firth of Forth, Scotland. Client was the Forth Ports Authority.

- Prime contractor and consultant to the Ports of Los Angeles and Long Beach, California in the development of the Ports' risk management plan for the handling, transportation, and storage of hazardous cargos at and through the ports. Also developed a generalized computerized model to calculate potential areas at risk from existing and proposed facilities.

EDUCATION

Bachelor of Science, Mathematics, Northeast Missouri University, Kirksville, MO (1966)

Bachelor of Science, Education (Mathematics and Physics), Northeast Missouri University, Kirksville, MO (1966)

Master of Science, Mathematics, University of Toledo, Toledo, OH (1968)

EMPLOYMENT EXPERIENCE

1979-Present	Reese-Chambers Systems Consultants, Inc. Principal of small consulting firm.
1968-1979	Naval Ship Systems Engineering Station, Port Hueneme, CA Branch Head for the Systems Analysis Branch.

ORGANIZATIONS

Society for Risk Analysis

Attachment 3

Macpherson Oil Company City of Hermosa Beach Project
Hazard Footprint Analysis - October 2, 1997

MACPHERSON OIL COMPANY

CITY OF HERMOSA BEACH PROJECT

HAZARD FOOTPRINT ANALYSIS

October 1997

MACPHERSON OIL COMPANY

CITY OF HERMOSA BEACH PROJECT

HAZARD FOOTPRINT ANALYSIS

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1.0 INTRODUCTION

The purpose of this analysis is to determine the potential risk to the surrounding community from the proposed Macpherson Oil Company City of Hermosa Beach Project. The analysis addresses the potential impact from fires, explosions, and releases at the proposed production site. The analysis makes use of the hazard footprint methodology described in the Port of Los Angeles "Final Risk Management Plan, An Amendment to the Port Master Plan" (Port of Los Angeles, 1983); the Port of Long Beach "Risk Management Plan, An Amendment to the Certified Port Master Plan, Final" (Port of Long Beach, 1981); and the Molino Gas Project EIR (Arthur D. Little, 1995). The methodology in the Port Risk Management Plans was developed in concert with the City of Long Beach and City of Los Angeles Fire Departments, the U.S. Coast Guard, and the California Coastal Commission. The methodology in the Molino Gas Project EIR was developed in accordance with County of Santa Barbara criteria.

The Port Risk Management Plans are in use at the Ports and govern the development of new projects and the modification of existing projects handling hazardous materials. Proposed new or modified projects are analyzed using the methodology in the Risk Management Plans, and projects not meeting the criteria in the plan are not approved. These procedures have been in place in the Ports for over 10 years. The County of Santa Barbara safety impact thresholds utilized for projects within the County are presented in their Environmental Thresholds and Guidelines Manual (County of Santa Barbara, 1995).

The analysis also estimates the probability of accidents occurring involving the proposed project. These estimates are based on historical data for similar projects. These probabilities, the hazard footprints, and the nearby population density are then combined to construct risk profiles similar to those presented in the Molino Gas Project EIR. The risk profiles present estimated annual frequency of number of fatalities from the proposed project.

Appendix A presents information on Reese-Chambers Systems Consultants, Inc. experience in conducting risk analysis. Appendix B contains the résumé of Tim Chambers, the individual who conducted the analysis.

This analysis looked at the proposed project and then postulated the types of accidents that could occur. The types of accidents postulated were based on historical data with similar type projects, on the types of accidents required to be analyzed by the Ports' Risk Management Plans, and on discussion with the Coastal Commission and Arthur D. Little. These accidents, referred to as Design Basis Accidents (DBAs), are listed below.

(1) A release in the well area without a fire

(2) A wellhead release containing hydrogen sulfide (H_2S)

(3) A release in the well area with a fire

(4) A fire in an atmospheric storage tank

(5) The rupture of a storage tank into the surrounding secondary containment system without an ensuing fire

(6) The rupture of a storage tank into the surrounding secondary containment system with an ensuing fire

(7) An explosion in a storage tank

(8) A gas release from a process vessel

(9) A liquid release from a process vessel into the surrounding secondary containment system without an ensuing fire

(10) A liquid release from a process vessel into the surrounding secondary containment system with an ensuing fire

(11) An NGL system accident

(12) An accident involving the trucking of crude oil during Phase I

(13) An accident involving the crude oil pipeline during Phase II

(14) An accident involving the gas pipeline during Phase II

For each of the DBAs, the extent of the potential impact is then estimated using "hazard footprints." A hazard footprint is a diagram indicating the extent of the area within which a specified level of adverse effect is exceeded against a specified vulnerable resource. The following hazard footprints were calculated for the above DBAs as appropriate.

- *Radiant Heat from a Fire.* A fire will produce radiant heat. The distances to the 5 kW/m^2 (1,600 Btu/sq.ft./hr) and 10 kW/m^2 (3,200 Btu/sq.ft./hr) heat levels from those accidents involving fires have been calculated. 5 kW/m^2 is the level that can begin causing pain and second-degree burns to human skin exposed for

30 seconds, and is considered the minor injury level while 10 kW/m^2 can begin causing pain after 8 seconds and is considered the major injury threshold. People inside homes or shielded by objects such as homes or walls could stand a higher heat level before being impacted.

- *Flammable Gas Cloud from a Release.* When a flammable material is released, it begins producing flammable vapors which can drift with the wind, producing a gas cloud which may be ignited. The distances the cloud may travel before dispersing to a concentration below its lower flammability limit (LFL) have been calculated for releases of flammable materials. The flammable gas cloud hazard footprint has been calculated for two atmospheric conditions: stability condition F with 2.2 mph wind, and stability condition D with 5 mph wind. Stability Condition F consists of a low inversion layer, which tends to trap gas releases and prevent them from dispersing in the atmosphere. This condition occurs at night with low wind speeds. This condition usually results in the largest gas cloud hazard footprints.

- *Toxic Gas Cloud from a Release.* When a potentially toxic material is released, it begins producing toxic vapors which can drift with the wind. The distances the cloud may travel before dispersing to a concentration below which it is no longer toxic has been calculated where required for releases of toxic materials. The toxic gas cloud hazard footprint has been calculated for the two atmospheric conditions described above.

- *Blast Overpressure and Flying Debris from an Explosion.* Both vessels and unconfined vapor clouds have the potential to explode. The blast overpressure, as a function of distance from such an explosion, has been calculated, along with an estimate of the distance that debris may be hurled by an explosion, as appropriate. A blast overpressure of 2.5 psig, which represents the pressure that can begin causing eardrum rupture, has been used as the blast overpressure hazard footprint threshold.

The only potential toxic material to be handle by the proposed project would be hydrogen sulfide (H_2S). It is possible that small amounts of H_2S will be present in the oil and gas produced by the proposed project, however, no more than 10 parts per million (ppm) of H_2S is initially expected. Thus, only "sweet" gas is expected. However, to provide for unforeseen circumstances and to determine thresholds, this risk analysis has analyzed H_2S concentration of up to 5,000 ppm in the produced gas.

Hazard footprints have been determined using HFCP, the computer model used by the Ports of Los Angeles and Long Beach, and Chems-Plus, a commercially available program developed by and available from Arthur D. Little. The details of the methodology used by HFCP are documented in the Users' Manual (Reese-Chambers Systems Consultants, Inc., 1991). Details of Chems-Plus are contained in the Chems-Plus User Guide (Arthur D. Little, 1988). Gas release rates were modeled using Chems-Plus.

The proposed project will consist of two phases. Phase I will include the drilling of one to three exploratory and producing wells to prove the commercial value of the development. The emulsion (an oil and water mixture) and associated gas will be processed on site using portable equipment and the oil will be trucked offsite to a refinery. The water will be reinjected into a reservoir. The gas will be scrubbed and incinerated. Phase II will produce emulsion and associated gas from 30 wells; separate the gas, oil, and water using gravity and heat; clean the separated water and reinject it using four wells; and store the oil on site until shipped by a newly constructed pipeline. The gas will also be shipped by a newly constructed pipeline.

The exact characteristics of the crude oil to be produced is not known at this time, however, the API gravity is expected to be between 17 and 21. While the characteristics of the oil have little effect on the size of the radiant heat, blast overpressure, and flying debris hazard footprints, they can have a significant impact on the flammable vapor cloud hazard footprint. Thus, to be conservative, we have assumed that the crude is fairly light with a flash point below 100°F, making it a flammable liquid. This assumption will tend to overestimate the size of the flammable vapor cloud hazard footprint.

The produced gas is expected to be sweet, that is, it is not expected to contain hydrogen sulfide in concentrations high enough to be considered hazardous. As stated in the previous section, the risk analysis analyzes H_2S concentrations up to 5,000 ppm while the expected H_2S concentration is less than 10 ppm. The potential effects of H_2S on humans is a function of two parameters, the exposed concentration level and the exposure time. The higher the exposure concentration, the less time it takes to cause adverse health effects. Previous analyses done for projects in Santa Barbara County (e.g., Sandpiper Golf Course and Residential Development Draft EIR [County of Santa Barbara, 1994] and Chevron Point Arguello Field and Gaviota Processing Facility SEIR [Arthur D. Little, 1988]) have generally used one or both of the following two H_2S concentrations in their risk analysis; 1000 ppm and/or 300 ppm. The 1000 ppm concentration was utilized as the H_2S concentration which could cause death after a few breaths. The 300 ppm concentration is the immediately dangerous to life or health (IDLH) concentration for H_2S. The IDLH concentration is defined as the maximum level from which one could escape within 30 minutes without any escape-impairing symptoms or any irreversible health effects (U.S. Department of Transportation, 1992).

Recently, some analysts have been examining the Emergency Response Planning Guidelines (ERPGs) for use in risk analyses. These levels have been issued by the American Hygiene Association for use in emergency response planning and are not meant to be exposure thresholds. The ERPGs are substantially more conservative than IDLHs. The ERPG-3 concentration for H_2S is 100 ppm. ERPG-3 is defined as the maximum

airborne concentration below which, it is believed, that nearly all individuals could be exposed up to one hour without experiencing or developing life-threatening health effects. The ERPG-2 concentration for H_2S is 30 ppm. ERPG-2 is defined as the maximum airborne concentration below which, it is believed, nearly all individuals could be exposed for up to one hour without experiencing or developing irreversible or other serious health effects or symptoms that would impair an individual's ability to take protective action.

3.1 Risk From Wells

Blowouts - The best known and potentially the most significant accident associated with well drilling is a blowout. A blowout is defined as the uncontrolled flow of formation fluids from a wellbore. They occur when formation fluids flow uncontrolled into a low-pressure subsurface zone (an underground blowout) or to the surface (a surface blowout). Most commonly, a blowout happens when there is insufficient pressure in a wellbore to control subsurface pressures. If wellbore hydrostatic pressure is allowed to drop below the subsurface formation pressure, then a "kick" will occur as the formation fluids flow into the well. Typically, a kick is circulated out of a well in a controlled manner, with formation fluids flowing into a production flowline or emergency flare line. When a kick is detected during drilling operations, the blowout prevention equipment (BPOE) is closed, sealing the wellbore and preventing any additional formation fluid from entering the wellbore. Additional kick-control procedures are implemented such as circulating higher density drilling fluid into the wellbore until the kick is circulated out of the well and normal operations can be resumed. A surface blowout occurs when formation fluids flow to the surface in an uncontrolled manner. A kick can lead to a blowout in rare instances (e.g., in a gas well that experiences a failure in the mechanical integrity of the equipment/system). Redundancy of equipment is a primary feature of blowout prevention equipment design.

A source of information on blowouts in California is a document titled "A History of Oil- and Gas-Well Blowouts in California, 1950 - 1990", published by the California Department of Conservation Division of Oil, Gas and Geothermal Resources (CDOG). This database includes both onshore and offshore wells.

The CDOG data shows an overall drilling incident rate of one blowout per 1,963 wells drilled during the time period 1950 - 1990. The incident rate for blowouts resulting in a release of oil is 1:20,315. The blowout incident rate from 1970 (after the 1969 Unocal blowout offshore Santa Barbara) through 1990 was 1:3,046 (a probability of 3.3×10^{-4} per well drilled).

A detailed analysis of the CDOG data for the time period 1980 - 1990 determined that after blowouts caused by steam injection and in abnormally high pressurized reservoirs were removed from the database, the blowout incident rate is 1:10,969 (a probability of 9.1×10^{-5} per well drilled). None of the remaining blowouts in the database flowed oil.

One factor that would tend to further reduce this low probability of a blowout is the fact that the Hermosa Beach project will be drilling into a reservoir whose characteristics are well known. The reservoir is not highly pressurized and will require pumping to bring the oil to the surface.

Based on the above statistics (blowout incident rate of 1:10,969), the probability of a blowout for the two phases of the proposed project are presented below.

PHASE	NUMBER OF WELLS	PROBABILITY OF BLOWOUT
1	6	5.5×10^{-4}
II	24	2.2×10^{-3}
BOTH	30	2.7×10^{-3}

Although the probability of a gas blowout is extremely low, a discussion of such an event follows. First, if a large pressure surge is encountered, the blowout prevention systems should prevent gas from escaping by closing off the annulus. In the highly improbably event that the annulus does not close, the gas will be diverted to the processing equipment or the on-site vent if the processing equipment is unable to handle the flow. The vent allows the gas, which is lighter than air, to escape upward away from potential ignition sources. Modeling shows that the gas being vented from a vertical flare will not reach flammable concentrations (approximately 5 percent for methane) at ground level and therefore should not be subject to ignition.

The Molino Gas Project EIR combined the analysis of a blowout with that of the gas production pipelines. The annual probability of such an occurrence was estimated to be 1.1×10^{-4}. The document states that a blowout has a lower probability of occurring than a production pipeline failure. The Molino estimate of a blowout is consistent with the blowout probabilities in the table above when considering that the Molino estimates include the pipelines. The extent of the potential flammable gas cloud hazard footprint from a blowout was assumed to be the same as that of a pipeline rupture. The flammable gas cloud hazard footprint was calculated to be 381 feet for stability condition F. This same approach was taken in this analysis and the flammable gas cloud hazard footprint was calculated using Chems-Plus to extend 327 feet for stability condition F, 2.2 mph wind.

The probability of a blowout during drilling was deemed to be not significant by the Final Environmental Impact Report (Ultrasystems, 1994). This conclusion was based on the fact that the wells will be equipped with redundant safety devices, including blowout protectors. Thus, the worst case accident involving the wells has been postulated to be a leak in the

well area flooding the well cellar. The leak would involve an emulsion containing approximately half oil and half water.

Wellhead Releases - Initially, very little H_2S is expected in the produced gas. Over time, it is possible that the amount of H_2S in the produced gas will increase. If an increase does occur, it would be gradual over an extended time period. Macpherson will monitor the H_2S concentration in the commingled gas stream of all the wells on a continuous real time basis. In addition, the H_2S concentration of each individual well will be measured on a monthly basis. Based on the H_2S concentration of the individual wells and the combined gas stream, a real time H_2S concentration increase threshold will be established for the combined gas stream that will cause all the wells to be shut in and then analyzed individually to determine if any have increased above the shutdown threshold.

If the H_2S concentration of any well gets above a predetermined threshold, then downhole treatment will begin. The gas comes to the surface through the casing. The gas must travel through water which is put in the casing. When treatment is begun, a chemical is pumped into the water. As the gas travels through the water containing the chemical, the chemical reacts with the H_2S, pulling it out of the H_2S. Extra chemical is put in the water at the beginning and maintained at all times. Thus, it for some reason the pump that injects the chemical is shut down or fails, the H_2S scrubbing system will still be effective for several days. In fact, another way of treating the gas downhole is to have the supplier inject the chemical on a periodic bases.

Chems-Plus was utilized to calculate the downwind distances to four concentrations, 1,000 ppm, 300 ppm, 100 ppm, and 30 ppm for the two meteorological conditions. Five potential H_2S concentrations (1,000 ppm, 2,000 ppm, 3,000 ppm, 4,000 ppm, and 5,000 ppm) in the gas were analyzed. The results are summarized in Table 3-1.

TABLE 3-1

H_2S HAZARD AREAS FROM WELL RELEASE

H_2S CONCENTRATION IN GAS (ppm)	DOWNWIND HAZARD ZONE TO LISTED CONCENTRATION (FEET)							
	1000 ppm		IDLH 300 ppm		ERPG-3 100 ppm		ERPG-2 30 ppm	
	F/2.2	D/5	F/2.2	D/5	F/2.2	D/5	F/2.2	D/5
1,000	0	0	128	41	226	71	431	132
2,000	99	32	183	58	327	101	634	189
3,000	122	39	226	71	407	125	798	235
4,000	141	45	263	82	512	155	942	274
5,000	158	50	298	92	540	163	1072	309

The probability of a well release containing H_2S concentrations above 1,000 ppm have been estimated as follows. First, a release would have to take place. Arthur D. Little supplied a fault tree which established the failure rate to be 1.05×10^{-4}/yr. This is consistent with previous EIRs (Arthur D. Little, 1995). Next, the H_2S concentration in the gas would have to be above 1,000 ppm. In order for this to occur, the downhole concentration would have to be above 1,000 ppm, and the H_2S treatment system would have to fail. Macpherson has agreed to shut-in any well that has an H_2S concentration greater than 2,000 ppm. Additional analysis and permitting would be required before such a well could be restarted.

Of the wells proposed to be drilled, less than one third will be to the south into the Redondo Beach area. This area has been previously developed and thus has some potential for higher levels of H_2S. Records show that of the 60 wells produced in that area, 5 were being treated for H_2S levels above 1,000 ppm. Thus, not every well drilled to that area would be expected to have elevated levels of H_2S. The wells being drilled into the new zones (over two thirds) would be carefully managed and would have even a less likely probability of ever having elevated levels of H_2S.

The next thing that would have to happen is that the downhole treatment system would have to fail. Because of the way the system works, this is highly unlikely. First, as stated previously, excess chemical is maintained in the water column in the casing. Thus, even if the injection pump were to fail, the treatment system would continue to be effective for several days. Second, Macpherson will alarm the injection pumps to notify the operator in the event of a failure. Spare pumps will be maintained at the facility so the pump could be quickly replaced. Third, if an adequate amount of chemical is not maintained in the water column, the H_2S content in the combined stream would significantly increase, resulting in all the wells being shut down.

Thus, for H_2S treatment not to be effective, the injection pump would have to fail and the operator would have to not replace the pump within two days, or the pump would have to fail and the water column would not have to have sufficient chemical to continue to be effective. Assuming extremely conservative estimates of 10 percent failure rates (extremely high) for each of the events results in a one percent probability that the treatment system could fail at the same time there is a release. Thus, the overall estimated frequency of a well release containing elevated levels of H_2S would be $0.01 \times 1.05 \times 10^{-4}$/yr = 1.05×10^{-6}/yr. This would equate to 3.1×10^{-5}/yr if all 30 wells had 2,000 ppm H_2S.

Releases into the Well Cellar - The well cellar covers an area of approximately 2,060 feet. HFCP was utilized to calculate the flammable vapor cloud and radiant heat hazard footprints for a release that would cover the entire cellar area. The size of the hazard footprints is measured from the edge of the cellar area. The results are presented below.

- Radiant heat (5 kW/m^2) - 152 feet
- Radiant heat (10 kW/m^2) - 75 feet
- Flammable gas cloud - 17 feet

It is noted here that the vaporization rate from this pool would not produce enough vapor to become involved in an unconfined vapor cloud explosion.

Regulations and technology have made wells extremely safe and the probability of a release of any size from a well is unlikely. As estimated previously, the probability of a major spill from a wellhead complex is 1.05×10^{-4} per year. The probability that the oil would become ignited would be 1.0×10^{-2} or one in a hundred (County of Santa Barbara, 1985). Thus, the annual probability of a release with fire would be 1.05×10^{-6}.

3.2 Risk from Storage Tanks

Oil and process water will be stored in five storage tanks located in a common secondary containment system (i.e. diked area). All of the tanks will have cone roofs with weak seams. In the unlikely event of an explosion, the roof is designed to lift up to vent the energy, thereby preventing the tank from rupturing and possibly resulting in flying debris. The roof is expected to travel no more than several tank diameters from the tank. It is also noted here that the tanks will be blanketed with gas to prevent oxygen from being present. As long as oxygen is not present, an explosion is impossible.

The potential DBAs from the tanks addressed in this analysis include a fire in a tank, an explosion in a tank, and a rupture of a tank flooding the diked area, either with or without a fire. The following hazard footprint distances were calculated using HFCP. The largest tank, with a 3,333 bbl capacity, was used in the calculations. All of the hazard footprints are measured from the edge of the tank or diked area.

- Radiant heat from a fire in a tank - 156 feet ($5kW/m^2$); 76 feet ($10kW/m^2$)
- Blast overpressure from an explosion in a tank - 141 feet
- Flying debris from an explosion in a tank - 77 feet ($5kW/m^2$); 131 feet ($10kW/m^2$)
- Radiant heat from a fire in the diked area - 271 feet
- Flammable gas cloud from a release into the dike area - 33 feet

The annual probability of a tank fire has been estimated to be 7.0×10^{-5} (Envicom, 1992). This equates to an annual probability of 2.1×10^{-4} for the three tanks. The rupture of an atmospheric storage tank due to all causes, including seismic events, is estimated to be 1.6×10^{-4}/year or once in 6,300 years (County of Santa Barbara, 1985). The probability that the oil is ignited is 1.0×10^{-2}, or one in a hundred. Thus, the probability of a release with a fire is estimated to be 1.6×10^{-6} per tank, or once in 625,000 years. Since there will be three storage tanks that may store crude oil, the probability of a spill with fire, per year, would be 4.8×10^{-6}, or once in 208,000 years.

The probability of an explosion in an oil storage tank has been estimated to be 1×10^{-4} per year (County of Santa Barbara, 1988). This is for all types of storage tanks. The tanks for the proposed project will be gas blanketed, which will virtually eliminate the possibility of a tank explosion.

3.3 Risk from Process Area

Free Water Knockouts - The first step in processing the emulsion will be the separation of the gas, oil, and water by means of gravity using free water knockout (FWKO) vessels. The gas that will be separated out will be primarily methane which is the predominant gas in natural gas piped to most homes. The emulsion enters the FWKO whereby the water, which is heavier than the oil, falls to the bottom of the tank while the oil floats on the water. The gas which escapes from the emulsion goes to the top of the tank. The water is drawn off the bottom of the tank and sent to the wastewater treatment system. The gas is drawn off and directed to the gas compression and treatment system. The oil is sent to heater treaters where it is further processed. The FWKOs are ASME certified pressure vessels. The potential for an explosion in one of these vessels is extremely unlikely, and thus no hazard footprints have been calculated for a vessel rupture. Instead, the DBA from a FWKO has been assumed to be a release from a 2-inch diameter hole, which represents a release from a pipe connection or other small release. The flammable gas hazard footprint from a 2-inch diameter hole in the tank would produce a flammable vapor cloud hazard footprint that would extend up to 327 feet from the point of release under worst case atmospheric conditions (stability F, 2.2 mph wind). The rate of release from the vessel was calculated using the Chems-Plus model developed by Arthur D. Little. This rate of release was then input to both Chems-Plus and HFCP to calculate the flammable gas cloud hazard footprint. The models also determined that the amount of gas (methane) in the cloud would not be enough to become involved in an unconfined vapor cloud explosion. A release from a FWKO or gas line would result in a rapid release which would last for a very short time, less than several minutes. The gas can have a maximum H_2S concentration of 1,000 ppm. Since the hazard would only be present for several minutes, the 1,000 ppm concentration is the only one that would present a hazard, and since the gas only has a maximum H_2S concentration of 1,000 ppm, there would be no H_2S hazard footprint.

Heater Treaters - The oil is sent to heater treaters where it is heated to further separate out water and gas from the oil. In this case the majority of the emulsion entering the vessels is oil. The heater treaters are also ASME certified pressure vessels. Since the heater treaters will operate at approximately the same pressure as the FWKO, the release rate of gas from a 2-inch diameter hole will be approximately the same as that from the FWKO (it will actually be slightly less since the gas will expand because it is heated) and thus, the flammable vapor cloud hazard footprint will be approximately the same size. Again, there will not be a toxic gas hazard footprint because the gas will not contain more than 1,000 ppm H_2S.

A release of oil from the FWKOs or heater treaters could spread and cover the secondary containment area around the vessels. The surface area of the secondary containment area is approximately 7,780 sq.ft. The flammable gas cloud (if the spill doesn't ignite) and radiant heat hazard footprints were calculated by HFCP to be:

- flammable gas cloud - 41 ft
- radiant heat (5 kW/m^2) - 266 ft

- radiant heat (10 kW/m^2) - 130 ft

Arthur D. Little, 1995, has estimated that the probability of a major release from a pressure vessel is 8.0 x 10^{-7} per year, or once in 1,250,000 years. For the four vessels proposed for the facility, the combined annual probability of a major release would be 3.2 x 10^{-5} (once every 312,500 years). The probability that the released oil would become ignited is 1.0 x 10^{-2}. Thus, the annual probability of a major spill with fire is 3.2 x 10^{-7} (once in 3 million years).

NGL Treatment - The gas stream will be run through a refrigeration system to condense out the natural gas liquids (NGLs). It is most likely that a freon-based system will be used. However, depending on the composition of the gas, it is possible that a propane-base system will be required. The project engineer has calculated that if a propane system is required, only 5 to 10 gallons of propane will be required. This is equivalent to a backyard barbecue system and presents no hazard to the surrounding area.

The gas will be run through a 2 ft. diameter by 16 ft. tall cylindrical vessel (tower) for processing. There will be about a 5 ft. liquid level in the tower. The estimated maximum production rate of NGLs from the tower is 1 gal/min which will be blended with the crude oil. The worst case accident involving the tower is a boiling liquid expanding vapor explosion (BLEVE). For this scenario to occur, four events need to occur simultaneously, including significant external fire, failure of the pressure relief valve, vessel blockage, and no external fire fighting efforts. It is noted here that the tower is located in a containment pit with the other processing equipment, and that the floor is contoured such that all spills would drain to a sump system away from the equipment. Arthur D. Little, 1995 has estimated that the failure rate of this event is 8.0 x 10^{-7} per year which is classified as extraordinary.

The consequences of such an event include a fireball and a blast wave. Chems-Plus was utilized to calculate the following hazard footprints.

- Blast overpressure (0.5 psi) - 700 ft
- Blast overpressure (2.5 psi) - 194 ft
- Fireball thermal radiation - 183 ft (minor injury); 84 ft (major injury)

Two other types of releases could occur with the NGL system, a gas release and a liquid release. The consequence of a gas release would be the same as addressed previously for the other processing equipment except that the H_2S would be removed prior to going to NGL processing. The liquid from a release would drain toward the sump. It would begin evaporating immediately upon release. The maximum amount of NGLs that could be released would be π x 1^2 (radius) x 5 (liquid height) = 15.7 ft^3 = 118 gal. Such a release would product a flammable vapor cloud of 353 ft. for F stability with 2.2 mph wind and 144 for D stability with 5 mph wind. The probability of such an event occurring has been estimated to be the same as that of a process vessel (3.2 x 10^{-5}).

3.4 Risk from Trucking

During Phase 1, the oil will be stored on-site in portable tanks and then loaded into tanker trucks for transportation to a refinery. It is estimated that three to four tanker truck trips per day, each carrying 175 bbls of oil, will be required to handle the 600 bbl per day production. The tanker trucks will be loaded inside the facility in an area equipped with a drain and sump to contain any spillage, although none is expected. The Phase I site sump/containment system will be adequate to fully contain a 175 bbl spill. Trucks will exit the facility and follow designated routing from the facility. Trucks will not deviate from the designated routing through residential neighborhoods.

Trucking of petroleum products is quite common throughout the country. Gasoline and other petroleum products are routinely transported by tanker trucks to gas stations and industrial facilities. Tanker trucks can become involved in traffic accidents but these do not usually result in a loss of cargo. A worst case accident would result in the loss of the entire contents of the trucks (175 bbls). The released oil would then spread on the ground and could ignite if it encounters an ignition source. The area covered by the spill would be a function of the elevation profile of the surrounding area.

For the purpose of calculating the potential hazard footprints, it has been assumed that the oil is spilled on a flat surface and spreads to a uniform depth of one inch. The spill would cover an area of approximately 11,800 sq. ft. with a radius of approximately 57 ft. The radiant heat and flammable gas cloud hazard footprints were calculated by HFCP to be:

- Flammable gas cloud - 52 ft
- Radiant heat (5 kW/m^2) - 320 ft
- Radiant heat (10 kW/m^2) - 182 ft

It is noted here that oil burns at a rate of approximately 4 mm (0.16 in.) per minute and hence, a one-inch deep pool would burn for approximately 6.4 minutes. The pool would burn for a longer time if it were deeper, however, then the area would be smaller and the radiant heat footprint smaller.

The Handbook of Chemical Hazard Analysis Procedures (FEMA, undated) recommends using a truck accident rate of 2×10^{-6} accidents per mile with 20% of the accidents resulting in a release of cargo. The Handbook goes on to recommend that the following spill distribution be utilized:

- 10% cargo loss (17.5 bbl) - 60% of the time
- 30% cargo loss (52.5 bbl) - 20% of the time
- 100% cargo loss (175 bbl) - 20% of the time

Assuming that a loaded truck travels 10 miles results in the following annual probabilities of accidents and releases. It is assumed that the trucking lasts for one full year.

Event	Annual Probability
Accidents	2.5×10^{-2}
Spill of any size	5.0×10^{-3}
Spill of 17.5 bbls or less	3.0×10^{-3}
Spill between 17.5 bbls and 52.5 bbls	1.0×10^{-3}
Spill greater than 52.5 bbls	1.0×10^{-3}

3.5 Risk from Crude Oil Pipeline

A new produced crude oil shipping line will be constructed to transport produced crude oil from the oil production facility to the Southern California Edison (SCE) Redondo Beach storage facility and pipeline system. The Chevron pipeline previously being considered has been dropped. The new pipeline will be connected to the SCE manifold at the Redondo Beach storage facility and the oil directed to one of the storage tanks. The oil would then later be batched to one of the local refineries through the existing SCE pipeline system. The new pipeline would have an outside diameter of 6 inches and be approximately 0.5 miles (2,500 ft.) long. The pipeline is designed for a maximum operating pressure of 350 psig.

The amount of oil than can be released from a pipeline is made up of the amount that can be released until pumping is stopped plus the amount than can drain from the line due to gravity. Because the pipeline will be equipped with a supervisory control and data acquisition (SCADA) system that will monitor the pipeline at all times, it is conservatively estimated that a pipeline rupture would be detected and the pumping shut down within 5 minutes. The SCADA system monitoring the pipeline system would automatically shut down the pumps and close the appropriate block valves in the event an abnormal condition is detected. Hence, a maximum of 28 bbls [8,000 bbls per day / (24 hr x 60 min per hour) x 5 min] could be lost due to pumping. The capacity of the entire pipeline is 85 bbls, however block valves would be located at both ends of the line, with an additional one located approximately in the middle and hence, the maximum amount of oil that could drain from the pipeline if all the oil between block valves were to escape would be 43 bbls. Thus, the worst case release from the pipeline would be 71 bbls (28 bbls + 43 bbls).

As with a trucking accident, the area impacted by a pipeline spill would be a function of the elevation profile of the surrounding area. Assuming again that the spill occurs on a flat surface and spreads to a depth of one inch results in a 4,800 sq. ft. area being covered.

The radiant heat and flammable gas cloud hazard footprints were calculated by HFCP to be:

- Flammable gas cloud - 30 ft
- Radiant heat (5 kW/m^2) - 216 ft
- Radiant heat (10 kW/m^2) - 106 ft

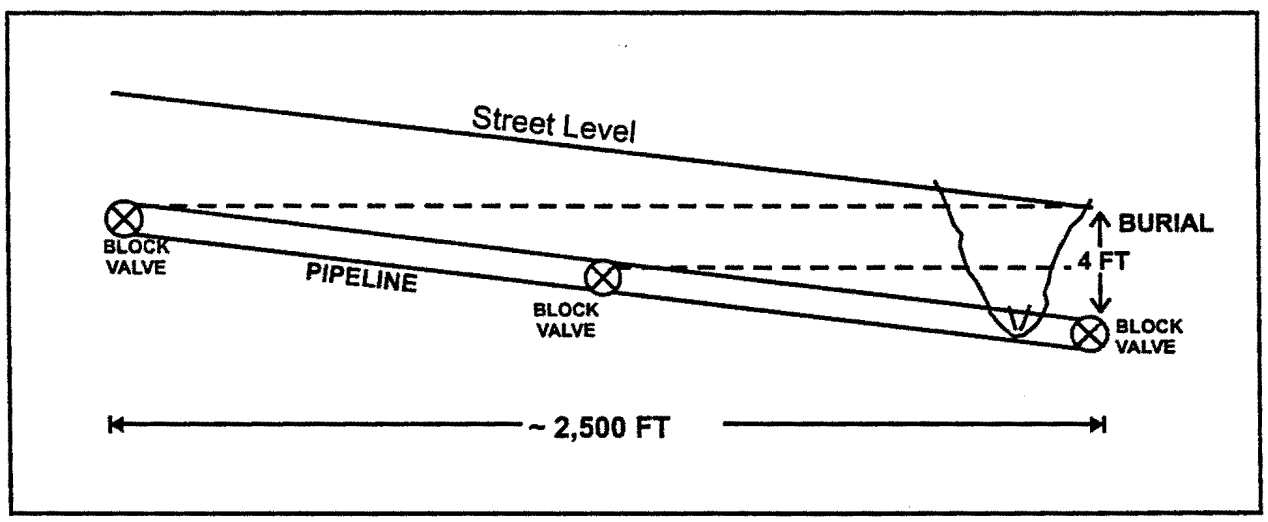
The probabilities of a leak and rupture for modern crude oil pipelines are generally estimated to be around 5.4×10^{-4} spills per pipeline-mile per year, and 2.7×10^{-4} ruptures per pipeline-mile per year, respectively (Aspen, 1995). This equates to the following annual probabilities for the 0.5 mile pipeline.

- Probability of leak - 2.7×10^{-4}
- Probability of rupture - 1.3×10^{-4}

The potential for oil getting in the ocean from a pipeline release was also examined. First, it would be virtually impossible for 43 bbls of oil to drain from the pipeline after pumping has ceased and the block valves are shut. The pipeline follows a relatively flat terrain dropping only about four feet in elevation between the proposed facility and the SCE Redondo Beach facility. The pipeline will be buried four feet below grade.

If the pipeline were to rupture near the end at its lowest point, up to 28 bbls could be pumped out. The pipeline trench will be backfilled with sand during construction. Much of the released oil would soak into the sand. Once the pumping has stopped, oil would begin draining out due to gravity. As shown in Figure 3-1, the top of the grade (i.e. street level) would be about even with the top of the pipeline at the facility. The top of the grade would be about two feet above the top of the pipe at the center of the block valve. Thus, it would not be possible for oil to drain out of the pipe into the street due to gravity.

FIGURE 3-1
PIPELINE PROFILE



Hence, it has been assumed that 28 bbls could be pumped out. It has further been assumed that one fourth of the oil (7 bbls) would be absorbed by the sand in the trench, leaving 21 bbls that could escape. This oil would flow in the street and most likely eventually find its way to a storm drain opening. If it were raining, it is likely that most of the 21 bbls would reach the storm drain and get carried to the ocean. If it were dry, the oil

would form smaller pools due to the unevenness of the street. Some of the oil would stick to the street as it flowed. Thus, somewhat less than 21 bbls would enter the drain and flow to the ocean though it is difficult to estimate the amount.

3.6 Risk from Gas Pipeline

The new gas pipeline will be constructed to transport utility-grade gas from the facility to an existing utility gas pipeline. The new pipeline will have an outside diameter of 4 inches and will be approximately 0.5 miles long. Gas will be sent through the line on a continuous basis at approximately 120 psig, using the compressor located at the Macpherson production facility. Any small amounts of H_2S that might be in the gas will be removed at the Macpherson production facility and hence, the gas will not be toxic.

The rate of release of gas from the pipeline would be a function of the size of the hole. The larger the hole, the greater the release rate. A complete rupture of the line would shut down the compressor almost immediately. In addition, the line will be equipped with a check valve at the point where it connects to the utility line that would prevent gas from flowing into the line from the utility line.

Chems-Plus has been utilized to calculated the release rate and flammable vapor cloud hazard footprint from a pipeline rupture and from a small leak (e.g. ¼-inch diameter hole). The results are presented below.

Accident	Downwind Distance to LFL
• Pipeline rupture	467 feet
• ¼-inch hole	<10 feet

It is noted here that the downwind distance to the LFL calculated for the rupture is an overprediction because Chems-Plus treats the release as a point source and ignores the initial mixing with air caused by the jet release of the gas. The pipeline would be emptied of gas in about 4 seconds in the rupture case. It is also noted that this line is essentially the same as the numerous utility-owned and -operated gas lines throughout the area.

If the gas release were to ignite, it would burn as a jet release until the gas flow ceased. This would last about 4 seconds. The flame length could be up to 211 feet long. If the gas cloud were to ignite, the fire would burn back to the source and burn as a jet flame. Thus, the radiant heat hazard footprint has been assumed to be equal to the flammable gas cloud hazard footprint.

The probability of a leak for a modern gas line is estimate to be 1.5×10^{-3} per pipeline-mile per year (Arthur D. Little, 1995). Thirty one percent of the leaks are estimated to be major leaks or ruptures. This equates to the following annual probabilities for the 0.5 mile gas pipeline.

- Probability of leak - 5.2×10^{-4}
- Probability of rupture - 2.3×10^{-4}

3.7 Summary of Accident Probabilities and Hazard Footprints

The results of hazard footprint analysis are summarized in Table 3-2. The table includes the probability of the accident, the extent of the hazard footprints (downwind and crosswind for flammable gas hazard footprints) for the two environmental conditions (stability F and stability D), and the area covered by the hazard footprint. The hazard footprints are displayed on Figure 3-2.

As can be seen by the table, the largest hazard footprint would be 700 feet from an NGL tower BLEVE. This hazard footprint would consist of a 0.5 psi blast wave that is capable of breaking windows. The probability of a BLEVE is classified as extraordinary (8.0×10^{-7}/yr). The next largest hazard footprint is that of an NGL liquids release. Such a release would produce a 353 foot flammable gas cloud hazard footprint. This hazard footprint would extend into the residential neighborhood to the north and the R-3 neighborhood to the west. The actual hazard footprint at the time of a release would only extend downwind, and would not cover the entire circular area shown. Also, it is noted here that the footprint would only be 353 feet during worst case environmental conditions, e.g. stability F with low wind speeds. As can be seen from the table, the hazard footprint would only extend 144 feet during typical environmental conditions. The flammable gas hazard footprint would only be a hazard if it were to be ignited. The largest injury radiant heat hazard footprint would extend 271 feet and would form a circle as shown because the radiant heat would be given off in all directions. The injury radiant heat hazard footprint extends into the residential neighborhood to the north and just touches the R-3 neighborhood to the west. It is noted here that this footprint would not impact people inside or behind structures. In addition, people outdoors exposed to the heat from a fire, would have time to find shelter before they would sustain burns. The largest major injury radiant heat hazard footprint would extend 131 feet. A fire at the facility should not impact homes or other structures in the area.

The largest toxic gas cloud hazard footprint for gas containing 2,000 ppm H_2S extends 99 feet to 1,000 ppm and 183 feet to 300 ppm for worst case meteorological conditions. Neither of these footprints extend into residential areas. For D stability and 5 mph winds, the cloud extends 32 feet to 1,000 ppm and 58 feet to 300 ppm. The 58-foot hazard footprint extends slightly into the industrial area west of the facility.

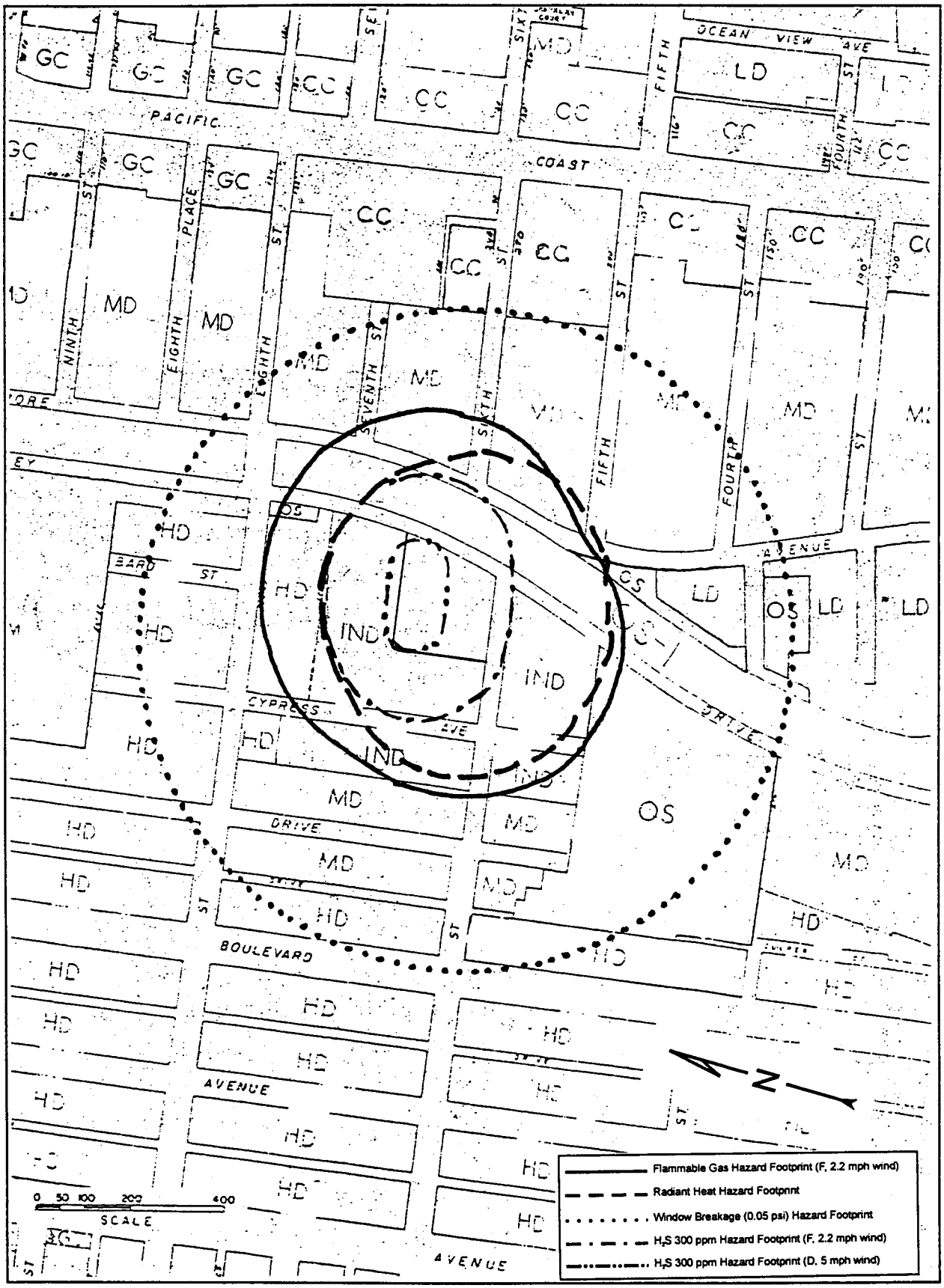
The truck, oil pipeline, and gas pipeline accidents would occur offsite and their potential impact would be a function of where the accident occurred relative to vulnerable resources. Figure 3-3 shows the proposed truck route and Figure 3-4 shows the proposed oil and gas pipeline route. Figure 3-5 plots the truck hazard footprints while Figure 3-6 plots the pipeline hazard footprints.

TABLE 3-2
SUMMARY OF ACCIDENT PROBABILITIES AND HAZARD FOOTPRINTS

SCENARIO	ANNUAL PROB OF ACCIDENT	STABILITY F / 2.2 MPH WIND			STABILITY D / 5 MPH WIND		
		DOWNWIND DISTANCE (FT)	CROSSWIND DISTANCE (FT)	AREA (SQ. FT.)	DOWNWIND DISTANCE (FT)	CROSSWIND DISTANCE (FT)	AREA (SQ. FT.)
(1) Release in well area (blowout or pipe rupture) without fire - flammable gas hazard	1.1×10^{-4}	327	131	33,600	101	41	3,250
(2) Wellhead release containing 2,000 ppm H_2S - toxic gas hazard footprint	3.1×10^{-5}	99 ft to 1,000 ppm 183 ft to 300 ppm	40 74	2,800 10,400	32 ft to 1,000 ppm 58 ft to 300 ppm	13 24	330 1,100
(3) Release in well area with fire - radiant heat hazard	1.1×10^{-6}	152 ft minor injury 75 ft major injury	Circle	18,150 4,400	152 ft minor injury 75 ft major injury	Circle	18,150 4,400
(4) Fire in atmospheric storage tank - radiant heat hazard	2.1×10^{-6}	156 ft minor injury 76 ft major injury	Circle	19,100 4,500	156 ft minor injury 76 ft major injury	Circle	19,100 5,400
(5) Release into containment system from storage tank without fire - flammable gas hazard	4.8×10^{-4}	33	15	390	11	5	43
(6) Release into containment system from storage tank with fire - radiant heat hazard	4.8×10^{-6}	271 ft minor injury 131 ft major injury	Circle	53,000 13,500	271 ft minor injury 131 ft major injury	Circle	53,000 13,500
(7) Explosion in storage tank - blast overpressure and flying debris hazards	0 - tanks will be gas blanketed						
(8) Release from a process vessel - flammable gas hazard	3.2×10^{-5}	327	131	33,600	101	41	3,250
(9) Process vessel liquids leak into containment system without fire - flammable gas hazard	3.2×10^{-5}	41	20	640	14	6	115
(10) Process vessel leak into containment system with fire - radiant heat hazard	3.2×10^{-7}	266 ft minor injury 130 ft major injury	Circle	55,600 13,300	266 ft minor injury 130 ft major injury	Circle	55,600 13,300

SCENARIO	ANNUAL PROB OF ACCIDENT	STABILITY F / 2.2 MPH WIND			STABILITY D / 5 MPH WIND		
		DOWNWIND DISTANCE (FT)	CROSSWIND DISTANCE (FT)	AREA (SQ. FT.)	DOWNWIND DISTANCE (FT)	CROSSWIND DISTANCE (FT)	AREA (SQ. FT.)
(11a) NGL tower BLEVE Blast overpressure	8.0×10^{-7}	700 ft to 0.05 psi 194 ft to 2.5 psi	Circle	385,000 29,600	700 ft to 0.5 psi 194 ft to 2.5 psi	Circle	385,000 29,600
(11b) NGL tower BLEVE Fireball thermal radiation	8.0×10^{-7}	183 ft minor injury 84 ft major injury	Circle	26,600 5,500	183 ft minor injury 84 ft major injury	Circle	26,600 5,500
(11c) NGL tower gas release - flammable gas hazard	3.2×10^{-5}	327	131	33,600	101	41	3,250
(11d) NGL tower liquid release - flammable gas hazard	3.2×10^{-5}	353	142	39,500	144	58	6,600
(12a) Truck-release of crude oil without fire - flammable gas hazard	5.0×10^{-3}	52	25	1,020	16	8	100
(12b) Truck release of crude oil with fire - radiant heat hazard	5.0×10^{-4}	320 ft minor injury 182 ft major injury	Circle	80,400 26,000	320 ft minor injury 182 ft major injury	Circle	80,400 26,000
(13a) Pipeline release of crude oil without fire - flammable gas hazard	1.3×10^{-4}	30	14	330	10	5	40
13b) Pipeline release of crude oil with fire - radiant heat hazard	1.3×10^{-5}	216 ft minor injury 106 ft major injury	Circle	36,600 8,800	216 ft minor injury 106 ft major injury	Circle	36,600 8,800
(14) Gas pipeline release - flammable gas hazard	2.3×10^{-4}	467	187	68,600	214	86	14,450

FIGURE 3-2
RESULTS OF HAZARD FOOTPRINT ANALYSIS



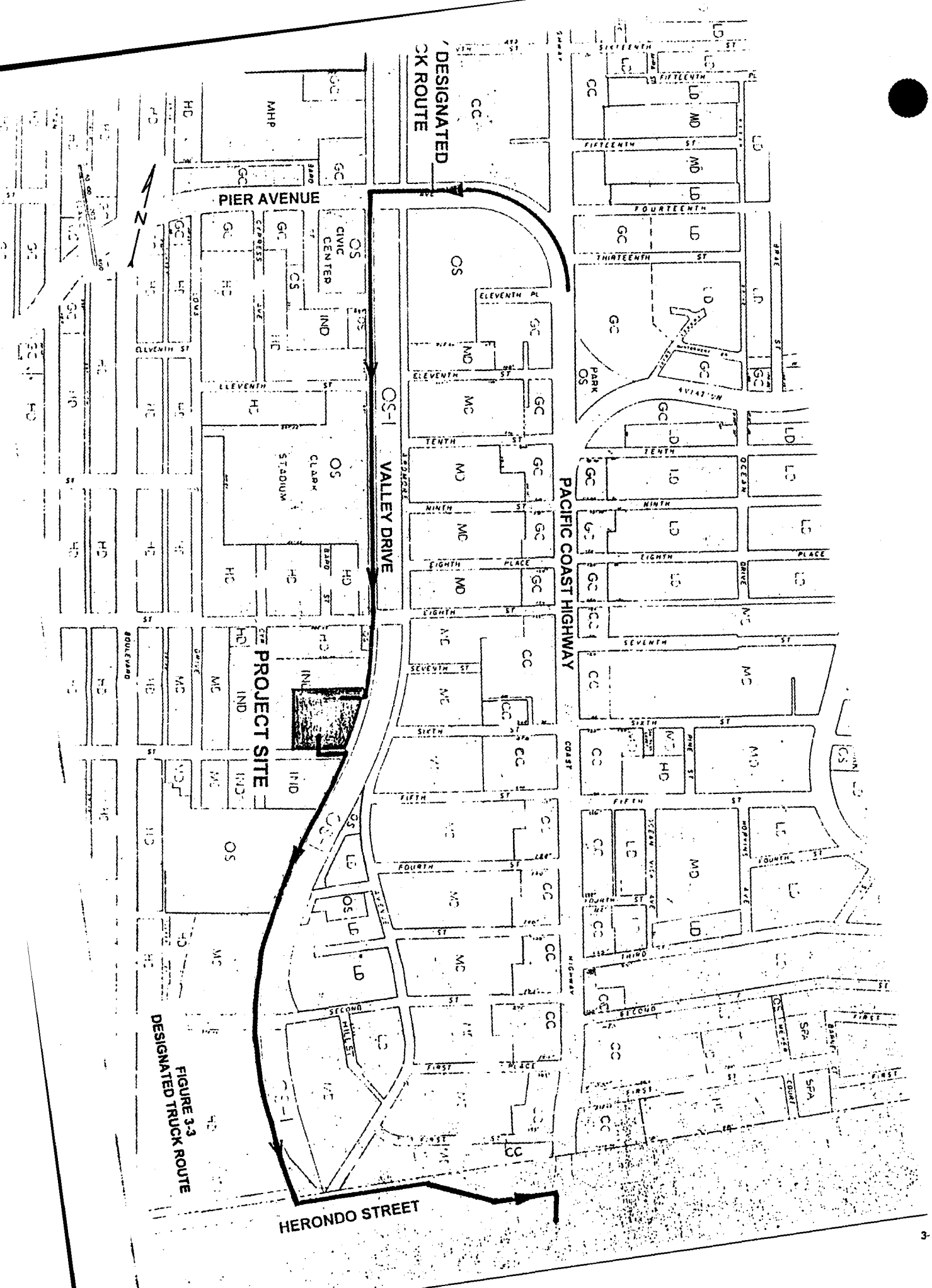
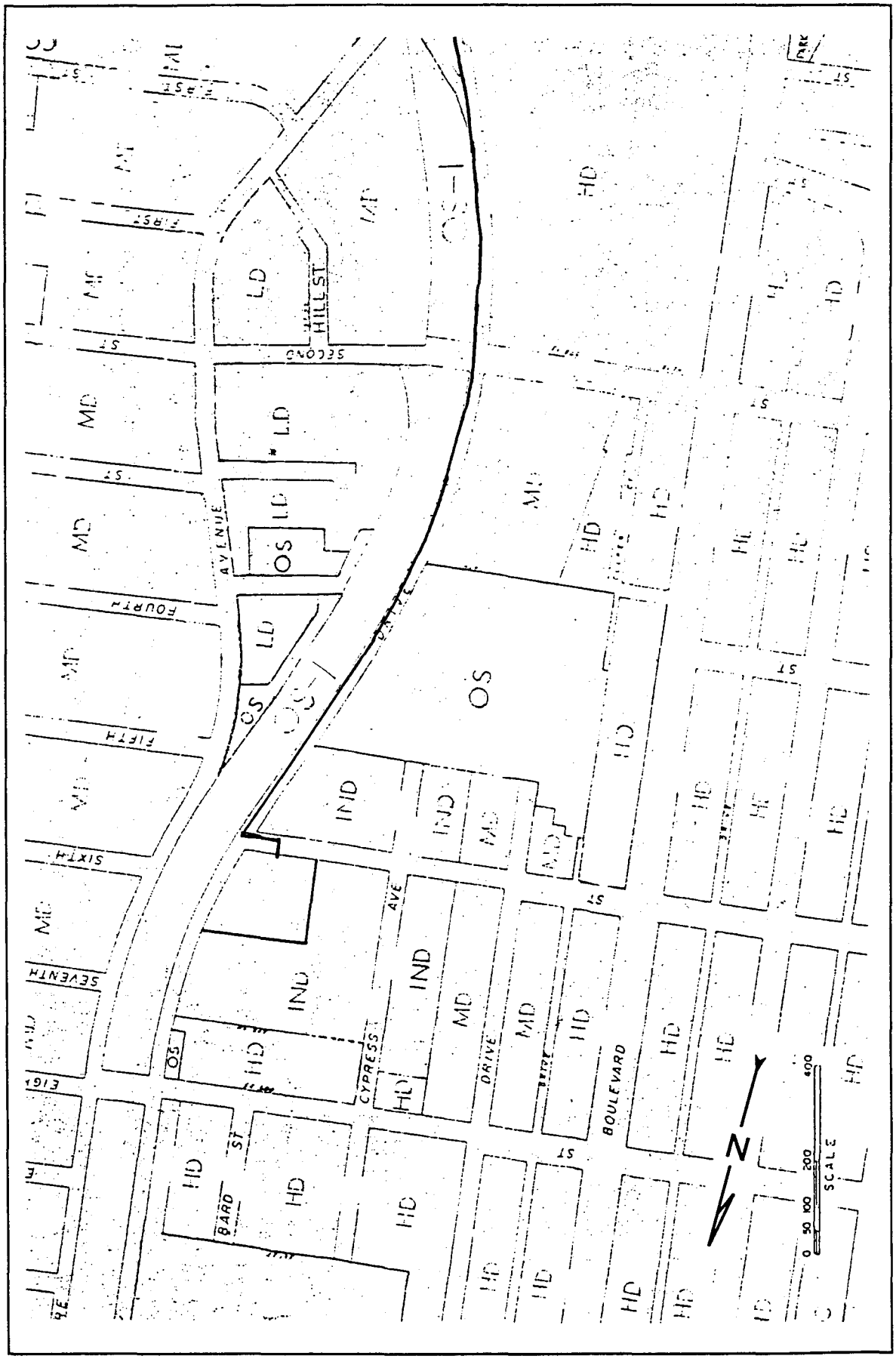


FIGURE 3-3
DESIGNATED TRUCK ROUTE

FIGURE 3-4
OIL AND GAS PIPELINE ROUTE



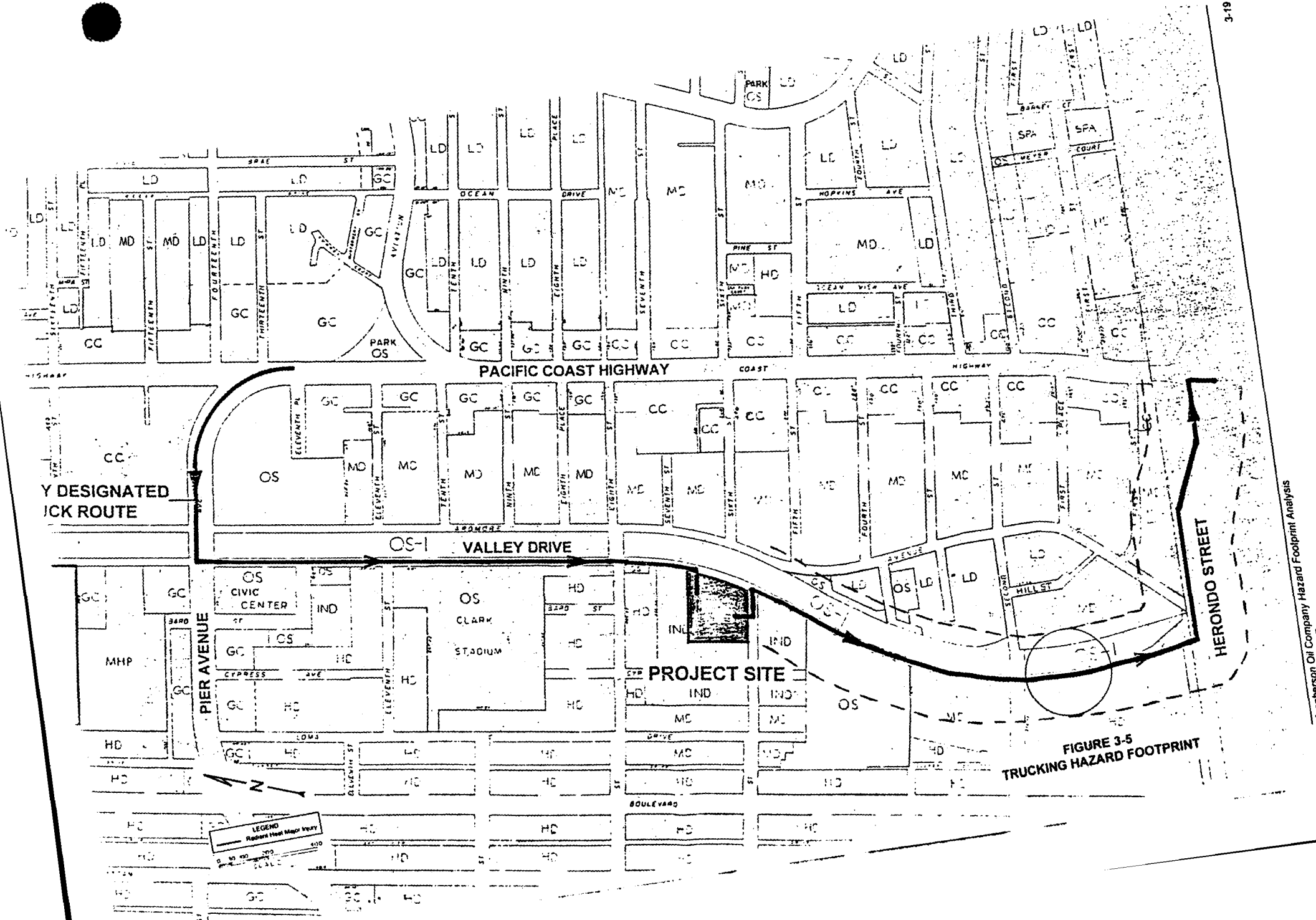
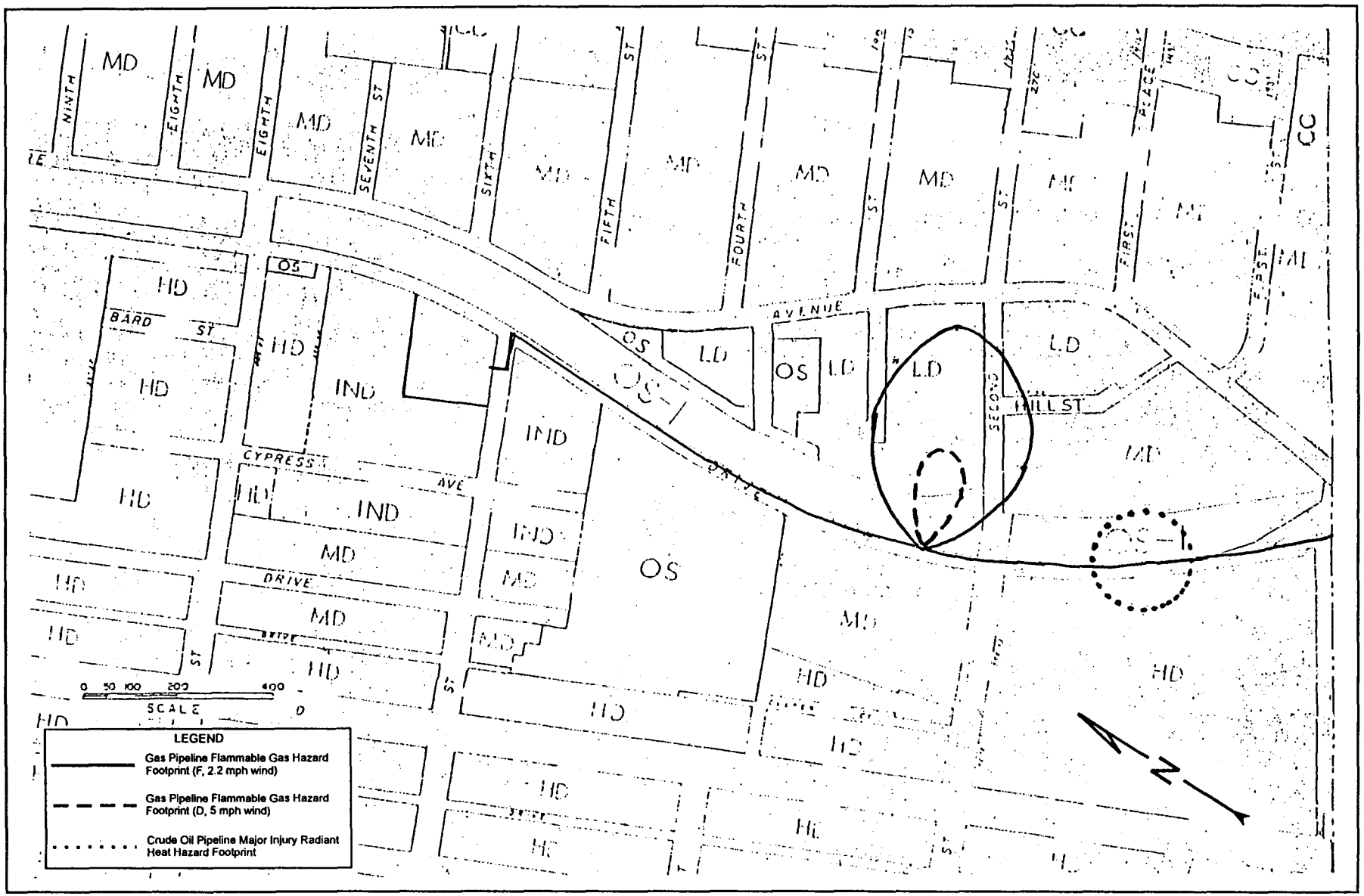


FIGURE 3-5
TRUCKING HAZARD FOOTPRINT

FIGURE 3-6
PIPELINE HAZARD FOOTPRINTS



3.8 Consequence Analysis

The results of the failure rate and consequence analysis have been combined to develop plots of frequency versus fatalities similar to that shown in the Molino Gas Project EIR. These curves are commonly called risk profiles. Figure 3-7 presents the guidelines used in the Molino Gas Project EIR for the determination of offsite risk and significance. Points above the upper line, labeled "De Manifestis", are considered to be an unacceptable risk, while those below the line, labeled "De Minimis", are considered acceptable. Points between the two lines, labeled "grey region", are acceptable but mitigation may be required. The following factors were utilized in developing the risk profiles.

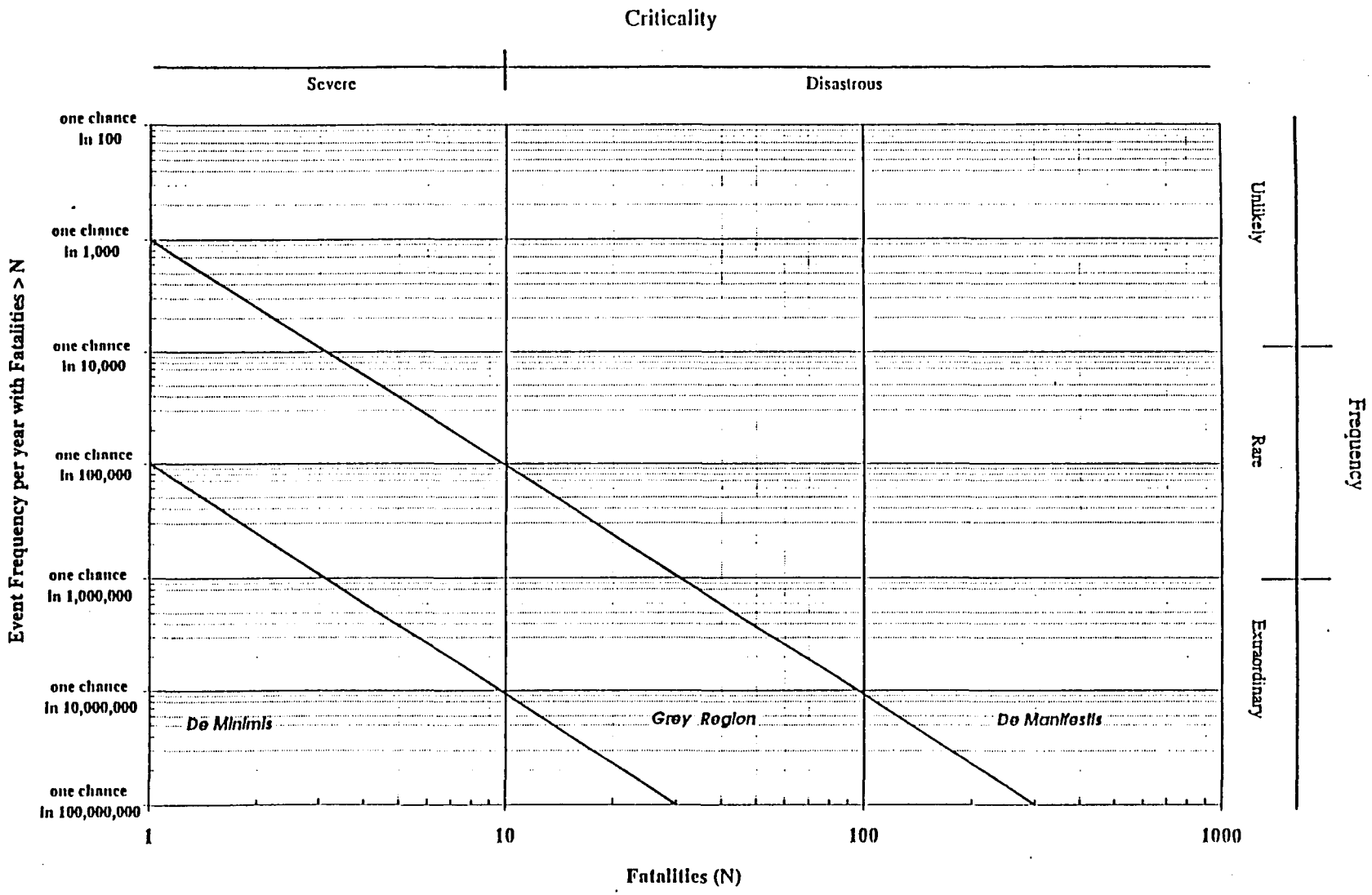
- extent of hazard footprint for each environmental condition
- estimated frequency rate for each accident
- estimated frequency of occurrence for each atmospheric condition
- estimated frequency of occurrence of wind direction
- population density
- presence of ignition sources
- probability of ignition from each ignition source

Meteorological Data - Meteorological data for the project site were obtained from California Air Resources Board, 1984 and California Department of Water Resources, 1978. Data for two sites, Los Angeles International Airport and Redondo-King Harbor were utilized.

The basic approach determined the relative likelihood of each of the two stability conditions, D and F, occurring. Condition D was used to represent conditions A through D and condition f to represent conditions E and F. The frequency of wind direction was taken from the two data sources.

Conditional Impact Probabilities - The likelihood is not 100 percent of a fatality resulting from an exposure to a vapor cloud fire. Buildings can provide some protection hazards. The analysis assumes 30 percent fatality within the lower flammability limit. Likewise, the likelihood of fatality resulting from an exposure to H_2S is not 100 percent. The following assumptions have been taken from Arthur D. Little, 1988. A 30 percent fatality rate has been assumed for an exposure to 300 ppm for 30 minutes for people both indoors or outdoors. A 50 percent fatality rate has been assumed for an exposure to 1,000 ppm because the cloud may pass very quickly and those indoors may be protected.

FIGURE 3-7
OFFSITE RISK AND SIFNIFICANCE GUIDELINES



People inside buildings would not be harmed by a radiant heat hazard footprint. People outside their homes could begin to received second degree burns if exposed for longer than 30 seconds. Because the radiant heat hazard footprint only overlaps a small residential area, it has been assumed that most people exposed would be in their homes or could easily leave the area in a short time. Thus, it has been assumed there would be no fatalities due to radiant heat.

Population Distribution - The population distribution was estimated from the Hermosa Beach General Plan Map. Each residential unit was assumed to house four people.

Ignition Probabilities - Flammable vapor clouds have the potential to ignite anywhere within their flammable limits. Hence, it is necessary to identify potential ignition sources that a cloud may encounter, and to quantify the likelihood of ignition, if the cloud encompasses the sources. In general, when trying to identify ignition sources, the search is primarily for open flames, hot surfaces and electrical sparks, and, to a lesser extent, friction sparks from both continuous and intermittent activities. Some of the potential ignition sources identified in the Molina Gas Project EIR were:

- Vehicles (many specific sources were identified)
- Boilers
- Gas turbines
- Blow torches
- Fired heaters
- Welding
- Faulty wiring
- Pilot flames
- Fireplaces and wood/coal stoves
- Smoking materials
- Doorbells
- Switches
- Furnaces/incinerators
- Machine tools
- Flares

Ignition probabilities used in the Molino Gas Project EIR include:

- ***Cars*** - 0.2 per car; although many potential ignition sources within a car like faulty wiring or backfires are due to fuel rich mixtures in intake air, they are not always present nor guaranteed to cause ignition.

- ***Houses*** - 0.01 per house; while there are many ignition sources within a home, such as switches, doorbells, faulty wiring, pilot lights, smoking materials,

fireplaces and wood- or coal-burning stoves, the flammable vapors must first penetrate the house before these ignition sources pose a hazard. Typical residence times of clouds are often brief enough that this is relatively unlikely.

- ***Immediate Ignition*** - There are various ignition sources at the project facility such as electrostatic ignition or friction sparks that would ignite the vapor cloud on the project site. In keeping with the Molino Gas Project EIR, a figure of 0.2 has been assumed for the probability of immediate ignition.

Construction of Risk Profiles - The risk profile displays the frequency with which fatalities could occur. They indicate accident size and display how the potential number of fatalities varies as a function of frequency. The risk profile has been plotted on a log-log scale because the profiles span multiple orders of magnitude.

The general approach involved in constructing a risk profile involves determining the frequency and number of fatalities associated with each release scenario. A release scenario is defined by the following:

- Release location
- Release frequency
- Meteorological stability condition and its likelihood
- Wind direction and its likelihood
- Whether and where ignition occurs
- Area of the hazard zone
- Number of individuals exposed within each hazard zone
- Assumed fatality rate for that type of hazard

Some of these factors affect frequency, some determine impacts, and some influence both. Once all possible combinations have been analyzed, the results are combined to give the overall risk profile.

If a flammable release does not ignite immediately, the material will disperse, forming a vapor cloud which will travel downwind. Should the cloud encounter an ignition source (such as cars, pilot lights, open flames, furnaces or other equipment), the cloud will ignite and burn through the flammable area until all flammable material is consumed. For each release scenario, it is necessary to identify the ignition sources that would be encountered. Assuming that a particular area or travel path contains a number of potential ignition sources, the probability can be calculated for the cloud not igniting after covering that area. Hence, it is possible to calculate the probability for the cloud to ignite at various stages in its development, for a given release location and wind direction.

For each release scenario (consisting of a release quantity, release location, a specific stability class and wind speed, and a wind direction), the ignition sources encountered by the cloud are listed. Letting P_i represent the ignition probability of the ith ignition source to be encountered, and assuming that area A contains the first k sources, the probability that the cloud has not yet ignited after covering the area A is given by:

$$\prod_{i=1}^{k}(1-P_i)=(1-P_1)(1-P_2)\ldots(1-P_k)$$

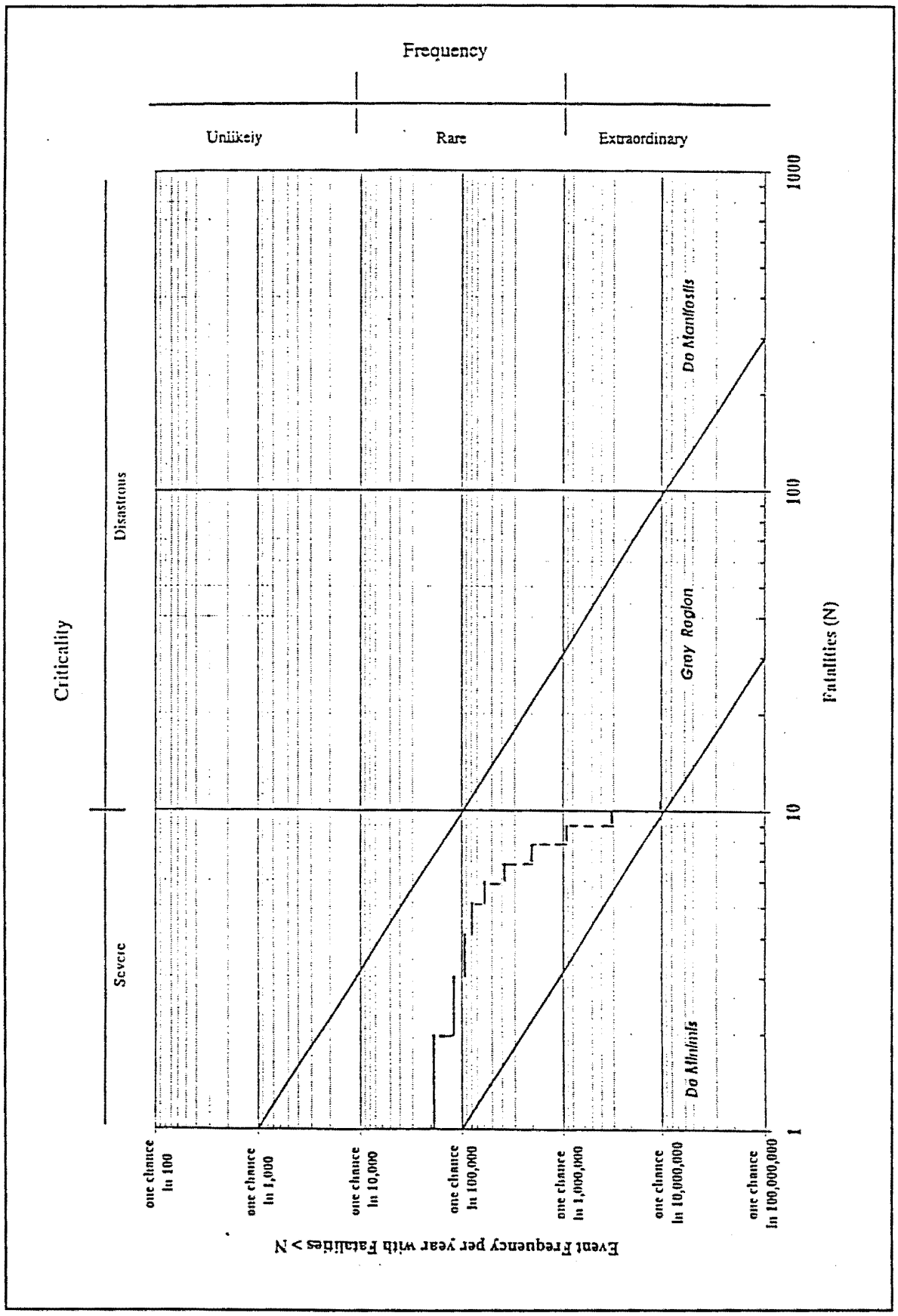
<u>*Uncertainties Associated with the Risk Profiles*</u> - There are many sources of uncertainty which can affect the accuracy of the risk profiles. These uncertainties deal with:

- Release frequency
- Release size
- Population impacts, including distribution and likelihood of fatality
- Behavior of the release (jet mixing versus passive dispersion)
- Accuracy of the hazard models
- Ignition sources and probabilities

The release frequencies and sizes are the most important contributors to overall uncertainty. The values chosen are conservative, i.e., they overstate rather than understate the risk. Changes in failure rates will directly influence the risk profile. A doubling of the event frequencies would double the probability of fatalities. Changes in the relative size of leaks and ruptures will influence the risk profile, but to a lesser extent. The assumptions on population distribution and ignition probability also influence the risk profiles, but are not as significant as the other sources of uncertainty.

<u>*Results of Analysis*</u> - The results of the consequence analysis are displayed on Figure 3-8. As can be seen by the figure, the risk profile for the proposed project lies in the grey region which is acceptable since the proposed project is equipped with extensive mitigation measures.

FIGURE 3-8
PROJECT RISK PROFILE



3.9 Transportation Risk Matrix

The potential risk of transportation of crude oil by truck and pipeline and natural gas by pipeline have been summarized using the criticality and frequency classification matrix defined in County of Santa Barbara Environmental Thresholds and Guidelines Manual and used in numerous EIRs in Santa Barbara County, including the Molino Gas Project EIR. The criticality and frequency classifications are presented in Table 3-3, while Figure 3-9 presents them in matrix format with shading added to show those boxes of the matrix classified as significant. The transportation-related accidents have been added to the appropriate boxes in the matrix and displayed as Figure 3-10. The following describes how the proper box was chosen for each mode of transportation.

Risk from Trucking

Section 3.4 presented information on the potential risk of transportation of crude oil by truck for one year during Phase 1 of the proposed project. Each tank truck will carry a maximum of 175 bbls of oil. Thus, according Figure 3-9, a tank truck release would be classified as "minor" according to spill size. The estimate frequency of tank truck release is 5.0×10^{-3} per year or once every 200 years (see Scenario 12a in Table 3-2). This would put the accident in the "unlikely" category which, when coupled with the minor consequence, would make the accident not significant. For a tank truck accident to present a public safety impact, the released oil would have to become ignited. The estimated frequency of occurrence of a spill with a fire has been calculated to be 5.0×10^{-4} per year or once every 2,000 years (see Scenario 12b in Table 3-2). This would place the accident in the "unlikely" category. If only the less than one mile section near the facility in Hermosa Beach is considered instead of the 10 mile trip, the estimated frequency of a spill with fire would be 5.0×10^{-5} per year or once every 20,000 years. This would put it in the "rare" category. A spill with fire would create a radiant hear footprint which could cause burns to the skin of exposed personnel. The radiant heat footprint would be limited to the area around the spill. People inside nearby homes or buildings would be protected from the radiant heat. People near the fire would instinctively move away from the heat. Thus, at most, such an accident could result in few minor injuries, putting it in the "minor" category. Thus, this accident would not be classified as significant. It is also pointed out here that this risk would only be present for one year.

Risk from Crude Oil Pipeline

The potential risk from the crude pipeline would be less than that of trucking because the estimated frequency of occurrence would be less and the maximum volume released would be less. The maximum volume that could be released would be 71 bbls, putting it in the "minor" category. The estimated frequency of a release is 1.3×10^{-4} per year, or once in

7,700 years (see Scenario 13a in Table 3-2), putting it in the "unlikely" category. Thus, the accident would not be classified as significant.

The estimated frequency of a release with fire is 1.3×10^{-5} per year or once in 77,000 years, putting it in the "rare" category. As with a truck release with fire, such an accident could cause, at most, a few minor injuries, putting it in the "minor" category. Such an accident would not be classified as significant.

Risk for Natural Gas Pipeline

It is possible for the 0.5-mile gas pipeline to become ruptured thereby releasing natural gas. The estimated expected frequency of such an event occurring is 2.3×10^{-4} or once every 4,300 years. The extent of the flammable gas hazard footprint and the potential consequences of the cloud would be a function of the size of the release, the location of the release relative to land use, the wind direction and speed, and stability condition. When all these variables are factored in, the probability of injuries from a gas pipeline release is less than 1.0×10^{-4} or once every 10,000 years, putting it in the "rare" category. Such an accident would result in some severe injuries due to burns, putting the accident in the "major" severity of consequence classification. Such an accident would not be classified as significant.

In summary, as can be seen by Figure 3-10, none of the transportation-related accidents would be classified as significant.

TABLE 3-3
CRITICALITY AND FREQUENCY CLASSIFICATIONS

CLASSIFICATION	DESCRIPTION OF PUBLIC SAFETY HAZARD
Negligible	No significant risk to the public, with no minor injuries
Minor	Small level or public risk with, at most, a few minor injuries
Major	Major level of public risk with up to 10 severe injuries
Severe	Severe public risk with up to 100 severe injuries or up to 10 fatalities
Disastrous	Disastrous public risk involving more than 100 severe injuries or more than 10 fatalities

TYPE	FREQUENCY	DESCRIPTION
Extraordinary	Less than once in one million years	An event whose occurrence is extremely unlikely
Rare	Between once in ten thousand years and once in one million years	An event which almost certainly would not occur during the project lifetime
Unlikely	Between once in a hundred and once in ten thousand years	An event which is not expected to occur during the project lifetime
Likely	Between once a year and once in one hundred years	An event which probably would occur during the project lifetime
Frequent	Greater than once a year	An event which would occur more than once a year on average

FIGURE 3-9
SEVERITY AND FREQUENCY MATRIX OF SIGNIFICANCE

		SEVERITY OF CONSEQUENCE				
		Negligible: No significant risk to the public, with no minor injuries; less than 10 bbls spilled	Minor: Small level of public risk, with at most a few minor injuries	Major: Major level of public risk with up to 10 severe injuries; 238-2,380 bbls spilled	Severe: Severe public risk with up to 100 severe injuries or up to 10 fatalities; 2,380 to 357,142 bbls spilled	Disastrous: Disastrous public risk involving more than 100 severe injuries or more than 10 fatalities; greater than 357,142 bbls spilled
FREQUENCY OF OCCURRENCE	Frequent: Greater than once a year					
	Likely: Between once a year and once in one hundred years					
	Unlikely: Between once in a hundred and once in ten thousand years					
	Rare: Between once in ten thousand years and once in a million years					
	Extraordinary: Less than once in a million years					

County defined as significant impacts

Source: County of Santa Barbara Department of Resource Management, Environmental Thresholds & Guidelines Manual, Amended 1990; Shell Hercules Platform EIR, 1983.

FIGURE 3-10
TRANSPORTATION RISK MATRIX

		SEVERITY OF CONSEQUENCE				
		Negligible: No significant risk to the public, with no minor injuries; less than 10 bbls spilled	Minor: Small level of public risk, with at most a few minor injuries	Major: Major level of public risk with up to 10 severe injuries; 238-2,380 bbls spilled	Severe: Severe public risk with up to 100 severe injuries or up to 10 fatalities; 2,380 to 357,142 bbls spilled	Disastrous: Disastrous public risk involving more than 100 severe injuries or more than 10 fatalities; greater than 357,142 bbls spilled
FREQUENCY OF OCCURRENCE	Frequent: Greater than once a year					
	Likely: Between once a year and once in one hundred years					
	Unlikely: Between once in a hundred and once in ten thousand years		Trucking accident with release and/or fire Crude oil pipeline release			
	Rare: Between once in ten thousand years and once in a million years		Crude oil pipeline release with fire	Gas pipeline accident		
	Extraordinary: Less than once in a million years					

County defined as significant impacts

Source: County of Santa Barbara Department of Resource Management, Environmental Thresholds & Guidelines Manual, Amended 1990; Shell Hercules Platform EIR, 1983.

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REESE-CHAMBERS SYSTEMS CONSULTANTS, INC.

Reese-Chambers Systems Consultants, Inc. (RCSC) is a small company located in Southern California near the City of Camarillo. RCSC has been providing professional consulting services to industry and agencies since 1979. One of RCSC's specialty areas is risk analysis of industrial projects. RCSC has conducted risk analysis in conjunction with Environmental Impact Reports and Statements (EIRs and EISs), Risk Management and Prevention Programs (RMPP), Hazard and Operability Studies (HAZOPs), Environmental Quality Assurance Programs (EQAP), and other agency-required special studies. RCSC has utilized various models in the conduct of risk studies including *ARCHIE, CHEMS-PLUS, WHAZAN, SLAB, AFTOX,* and *ISC.* RCSC has specific experience with a broad range of industrial applications including numerous oil industry facilities such as pipelines, pump stations, tank farms, and marine terminals:

- Preparation of the system safety/public safety section of the EIR for the State Lands Commission lease renewal of the Unocal Rodeo Marine Terminal.

- Conduct of 25 separate risk and hazard analyses to fullfill California Office of Oil Spill Prevention and Response (OSPR) requirements for oil spill contingency plans. Analyses included marine terminals, pipelines, oil platforms, onshore producing facilities, and onshore processing facilities.

- Consultant to Texaco Trading and Transportation, Inc. (TTTI) for the permitting of the Gaviota Marine Terminal. Also developed various risk analysis studies and papers in support of permit negotiation and compliance. Developed many of the Terminal contingency plans including the Emergency Response Plan and Oil Spill Contingency Plan.

- Developed the Risk Management Plans for the Ports of Los Angeles and Long Beach. The plans have been certified by the California Coastal Commission as annexes to the Ports' Master Plans, dealing with risk management for hazardous cargoes and petroleum products.

- Developed the risk analysis section of an environmental study addressing a proposed oil and gas development project on Sakhalin Island, Russia. The analysis addressed all aspects of the proposed project including oil and LNG export terminals.

- Developed terminal operations manuals for the Gaviota Marine Terminal and Unocal Avila Terminal to meet U.S. Coast Guard and California State Lands Commission requirements.

- Developed EQAP for Unocal Sisquoc Pipeline and Santa Maria Pump Station.

- Conducted overall spill risk and prevention analysis for Pacific Pipeline System, Santa Barbara to Los Angeles refineries.

- Conduct of RMPP and HAZOP studies for four electrical generation plants, a steam generating facility, a refrigeration plant, and numerous oil industry facilities including pipelines, tank farms, processing plants, and pump stations.

- Preparation of Process Safety Manuals for Unocal Rincon oil processing facility.

- Developed oil spill response plans for numerous facilities including the Gaviota Marine Terminal, Unocal Avila Wharf Terminal, Bush Oil Rincon Operations, and several pipelines in response to OPA 90 requirements.

- Developed numerous emergency response plans and fire protection plans for oil and gas projects including marine terminals, processing plants, pump stations, and pipelines.

- Conducted numerous risk studies as listed below:

  - GATX Port of Los Angeles Chemical Terminal
  - Proposed California Ammonia Company Ammonia Terminal in the Port of Los Angeles
  - Chevron Carpinteria Oil and Gas Processing Facility
  - Chevron Elk Hills Gas Plant Risk of Explosion Study
  - McMillen Long Beach Refinery Potential Risk to Nearby School Site
  - Oil and Gas Development Project on Sakhalin Island, Russia
  - Relocation of Defense Logistic Agency Fuel Pier and Pipeline in the Port of Los Angeles
  - Mutual Liquid Gas Propane Storage and Truck Loading Facility in Wilmington, California
  - Liquefied Gas and Chemical Terminal on the Firth of Forth, Scotland
  - Southern Pacific Pipeline Tank Farm Expansion in Carson, California
  - Unocal Product Pipeline through the City of Carson
  - Gaviota Interim Marine Terminal
  - Matlack Hazardous Material Trucking Terminal and Truck Cleaning Facility in Carson
  - Proposed Oil and Gas Development on Vandenberg Air Force Base
  - Proposed Natural Gas Pipeline Projects into the San Joaquin Valley
  - Tesoro Fuel Depot and Southern California Edison Storage Tanks in the Port of Hueneme
  - OSCO Solvent Recycling Facility in City of Azusa, California
  - Unocal Gas and Oil Processing Facility in Lisbon, Utah

Timothy J. Chambers
Senior System Safety Analyst

SUMMARY OF EXPERIENCE

Over 24 years of experience as a systems analyst, with major emphasis on safety and risk management analysis; oil and gas activities; hazardous material handling, storage, and transportation analysis; and contingency planning. Experience during the past 15 years has included extensive environmental work including that involving facilities handling hazardous materials. Other environmental analysis has involved risk management of maritime transportation, marine terminals, oil and gas activities, pipelines, truck and train transportation, and processing facilities. Experience includes work with industry and governmental agencies.

MAJOR PROJECT EXPERIENCE

- Conduct of 25 separate risk and hazard analyses to fulfill OSPR requirements for oil spill contingency plans. Marine facilities addressed included marine terminals, pipelines, platforms, onshore producing facilities, and onshore processing facilities, and customers included Unocal, Shell, Vintage, Torch, Global, Macpherson, and Mobil.

- Consultant to Unocal for the development of OPA 90 and OSPR oil spill contingency plans for the Avila Marine Terminal, Coast Area pipelines, Valley Area pipelines, and Point Pedernales pipeline.

- Consultant to Macpherson Oil Company for development of Oil Spill and Emergency Response Plans for their proposed Hermosa Beach oil development project. Plans were prepared for the drilling and production site, crude oil pipeline, and gas pipeline.

- Project Manager for the development of operating procedures for Unocal's Rincon Facility (ROSF)

- Development of public safety and vessel traffic analysis sections of an EIR on the renewal of Unocal's Rodeo Marine Terminal lease with the California State Lands Commission.

- Conduct of an analysis addressing the potential impacts on marine operations (nearby terminals and vessel traffic) caused by the construction of four alternative bridge configurations parallel to the existing Benicia-Martinez Bridge.

- Consultant to the Gaviota Terminal Company for the permitting of an oil transport marine terminal at Gaviota, California. Work included conduct of various studies and analyses to support system safety aspects of the marine terminal, its operations, and the transport of oil by tankers; negotiation of permit conditions; and the development of contingency plans including the Oil Spill Contingency Plan, Shoreline Cleanup Plan, Shoreline Access Plan, Terminal Operations Manual, Emergency Response Plan, and Fire Protection Contingency Plan.

- Development of the Navigational Hazard Analysis section of the various oil spill cooperative Regional Resource Manuals.

- Development of the vessel traffic analysis section of the Wickland Oil Terminal Expansion EIR.

- Consultant to Unocal Oil and Gas for the development of emergency response plans for their Santa Maria Basin oil and gas development project. Specifically developed separate emergency response plans for the Lompoc HS&P, the Battles Gas Plant, oil and gas pipeline segment from shore to the Lompoc HS&P, and the oil pipeline segment from the HS&P to the Orcutt Pump Station.

- Consultant to Unocal for the permitting of the Sisquoc Pipeline System. Conducted various analyses and developed various plans in support of this effort, including Fire Protection Plan, Emergency Response Plan, Oil Spill Contingency Plan, Environmental Quality Assurance Plan, Risk Analysis, and HAZOP.

- Responsible for risk analysis and mitigation development for a proposed offshore oil and gas development project in Russia. Risk analysis addressed all aspects of the project including offshore drilling and production, offshore and onshore oil and gas pipelines, oil and gas processing facilities, oil export terminal, LNG plant and export terminal, and refinery.

- Consultant for development of risk management programs and addressal of citizen concerns for various petroleum pipeline, tank farm, processing plant, refinery, and gas pipeline projects. Clients included City of Carson, City of Torrance, Long Beach Unified School District.

- Manager of system safety portions of EIR and EIS documents for various projects, including transportation, transfer, handling, and storage of chemicals for a proposed GATX chemical tank farm in Carson, California; natural gas pipeline development in San Joaquin Valley; oil and gas drilling, storage, transportation, and processing for Vandenberg Air Force Base; hazardous material transport, transfer, cleaning, and storage for the City of Carson; and hazardous waste material storage, transfer, processing, transport, and recycling for a facility located in Azusa, CA.

- Conducted risk analysis of potential for release, fire, and explosion at one of the gas plants at the Elk Hills Naval Petroleum Reserve.

- Risk analysis and mitigation design, contingency planning, and design and operation of risk management programs for various clients including County of Santa Barbara, Ports of Los Angeles and Long Beach, Cities of Beaumont and Carpinteria, Holchem, California Ammonia Company, Mutual Liquid Gas and Equipment Company, and others.

- Development of Risk Management and Prevention Programs (RMPPs) as required by California law for several industrial facilities including Colmac Energy, Bonneville Pacific, and Tracy Operators power plants; Sharyn Steam steam generation plant; and United Foods food processing plant. RMPPs address acutely hazardous materials such as ammonia, chlorine, and sulfuric acid.

- Conduct of Hazard and Operability (HAZOP) studies in support of the RMPPs listed above and for several oil pipeline and pump station projects.

- Development of risk management and maritime factors portions of EAs/EIRs/EISs for various oil and natural gas recovery projects covering gas and oil pipeline safety, shipping and other maritime impacts, drilling safety, etc. Projects included ARCO, Cities Service, Chevron, Phillips Petroleum, Shell Oil Company, Texaco.

- Responsible for public and system safety analysis section of EIR on a proposed household and small business hazardous waste collection facility in Santa Barbara, California.

- Responsible for all public and system safety aspects of the EIR/EIS for the Port of Los Angeles/Port of Long Beach 2020 Plan, a proposed landfill and expansion project. Work covered potential system safety impacts from landfill construction; impact on recreational, fishing, and commercial vessels; impact from trucking, pipeline, and train transportation of hazardous materials; impact on anchorages; and impact from oil spills.

- Responsible for analysis of potential impacts between tanker traffic to a proposed Exxon offshore marine terminal and potential oil and gas development in the vicinity of the marine terminal. Work conducted in the form of a supplemental EIR for the California State Lands Commission.

- Developed risk analysis and emergency procedures section of an environmental and risk assessment of coastal communities from LNG tanker traffic offshore Alaska.

- Responsible for risk analysis section of oil spill response plan developed for Alyeska Valdez Marine Terminal.

- Prime consultant to PBQ&D and US Navy for risk and reliability analysis for relocation of Navy fuel pier to Port of Long Beach. Work included extensive pipeline, tank farm, and marine terminal risk management analysis.

- Consultant to GATX for permitting risk analysis of a proposed expansion of a multi-petroleum product and chemical marine terminal and storage facility in the Port of Los Angeles.

- Project manager and consultant for port and vessel traffic risk management analysis for a multi-liquefied-gas terminal on the Firth of Forth, Scotland. Client was the Forth Ports Authority.

- Consultant to US NAVY for the development of the risk management portions of an encroachment analysis for the Seal Beach Naval Weapons Station. Risk management portions included vessel safety relative to explosive ordnance handling in Anaheim Bay, and potential hazards to the surrounding populace from ammunition storage and handling.

- Prime contractor and consultant to the Ports of Los Angeles and Long Beach, California in the development of the Ports' risk management plan for the handling, transportation, and storage of hazardous cargos at and through the ports. Also developed a generalized computerized model to calculate potential areas at risk from existing and proposed facilities.

EDUCATION

Bachelor of Science, Mathematics, Northeast Missouri University, Kirksville, MO (1966)

Bachelor of Science, Education (Mathematics and Physics), Northeast Missouri University, Kirksville, MO (1966)

Master of Science, Mathematics, University of Toledo, Toledo, OH (1968)

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1979-Present	Reese-Chambers Systems Consultants, Inc. Principal of small consulting firm.
1968-1979	Naval Ship Systems Engineering Station, Port Hueneme, CA Branch Head for the Systems Analysis Branch.

ORGANIZATIONS

Society for Risk Analysis

Attachment 4

Macpherson Oil Company City of Hermosa Beach Project
Hazard Footprint Analysis - October 29, 1997

MACPHERSON OIL COMPANY

CITY OF HERMOSA BEACH PROJECT

HAZARD FOOTPRINT ANALYSIS

October 29, 1997

MACPHERSON OIL COMPANY

CITY OF HERMOSA BEACH PROJECT

HAZARD FOOTPRINT ANALYSIS

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The purpose of this analysis is to determine the potential risk to the surrounding community from the proposed Macpherson Oil Company City of Hermosa Beach Project. The analysis addresses the potential impact from fires, explosions, and releases at the proposed production site. It is emphasized here that the gas produced by the proposed project will contain levels of hydrogen sulfide (H_2S) well below levels considered to be a hazard to the surrounding community. The analysis makes use of the hazard footprint methodology described in the Port of Los Angeles "Final Risk Management Plan, An Amendment to the Port Master Plan" (Port of Los Angeles, 1983); the Port of Long Beach "Risk Management Plan, An Amendment to the Certified Port Master Plan, Final" (Port of Long Beach, 1981); and the Molino Gas Project EIR (Arthur D. Little, 1995). The methodology in the Port Risk Management Plans was developed in concert with the City of Long Beach and City of Los Angeles Fire Departments, the U.S. Coast Guard, and the California Coastal Commission. The methodology in the Molino Gas Project EIR was developed in accordance with County of Santa Barbara criteria.

The Port Risk Management Plans are in use at the Ports and govern the development of new projects and the modification of existing projects handling hazardous materials. Proposed new or modified projects are analyzed using the methodology in the Risk Management Plans, and projects not meeting the criteria in the plan are not approved. These procedures have been in place in the Ports for more than 10 years. The County of Santa Barbara safety impact thresholds utilized for projects within the County are presented in their Environmental Thresholds and Guidelines Manual (County of Santa Barbara, 1995).

The analysis also estimates the probability of accidents occurring involving the proposed project. These estimates are based on historical data for similar projects. These probabilities, the hazard footprints, and the nearby population density are then combined to construct a risk profile similar to those presented in the Molino Gas Project EIR. The risk profile presents an overall estimate of the total risk of the proposed project site to the surrounding community.

The results of the analysis show that the potential for accidents involving the facility is quite low and that the potential for these accidents causing fatalities is even lower. Some of the major results of the analysis are presented below.

- The expected annual frequency of a gas release that could result in an offsite flammable gas cloud is 8.2×10^{-5} (once in 12,100 years)

- The expected annual frequency of an oil release with fire is 5.1×10^{-6} (once in 195,000 years)

- The expected annual frequency of a vessel explosion is 8.0×10^{-7} (once in 1.25 million years)

- The expected annual frequency of a facility-caused offsite fatality is 1.2×10^{-5} (once in 83,000 years)

The expected annual frequency of a fatality to a nearby resident or other member of the public (e.g. passerby or worker) due to fires and/or burns from all causes is approximately 100 times greater than that due to an accident at the proposed facility. The expected annual frequency of a fatality due to electrocution is about five times greater than that due to the facility. The risk of fatality from distribution of natural gas to homes is approximately the same as the risk from the proposed facility.

It is also noted here that the proposed project site is currently being used by the City of Hermosa Beach as a maintenance operations facility and that these operations include the storage and handling of hazardous materials. As such, the site presently presents a potential hazard to the surrounding area similar to that of the proposed project. This potential hazard is discussed in the last section of this report.

This analysis looked at the proposed project and then postulated the types of accidents that could occur. The types of accidents postulated were based on historical data with similar type projects, on the types of accidents required to be analyzed by the Ports' Risk Management Plans, and on discussion with the Coastal Commission and Arthur D. Little, Inc. These accidents, referred to as Design Basis Accidents (DBAs), are listed below.

(1) A release of gas or oil in the well area without an immediate fire

(2) A release of oil in the well area with a fire

(3) A fire in an atmospheric oil storage tank

(4) The rupture of an oil storage tank into the surrounding secondary containment system without an ensuing fire

(5) The rupture of an oil storage tank into the surrounding secondary containment system with an ensuing fire

(6) An explosion in an oil storage tank

(7) A gas release from a process vessel

(8) An oil release from a process vessel into the surrounding secondary containment system without an ensuing fire

(9) An oil release from a process vessel into the surrounding secondary containment system with an ensuing fire

(10) A natural gas liquids (NGL) system accident including a liquids and gas release

(11) An accident involving the trucking of crude oil during Phase I

(12) An accident involving the crude oil pipeline during Phase II

(13) An accident involving the natural gas pipeline during Phase II

For each of the DBAs, the extent of the potential impact is then estimated using "hazard footprints." A hazard footprint is a diagram indicating the extent of the area within which a specified level of adverse effect is exceeded against a specified vulnerable resource. The following hazard footprints were calculated for the above DBAs as appropriate.

- *Radiant Heat from a Fire.* A fire will produce radiant heat. The distances to the 5 kW/m^2 (1,600 Btu/sq.ft./hr) and 10 kW/m^2 (3,200 Btu/sq.ft./hr) heat levels from those accidents involving fires have been calculated. 5 kW/m^2 is the level that can begin causing pain and second-degree burns to human skin exposed for 30 seconds, and is considered the minor injury level while 10 kW/m^2 can begin causing pain after 8

seconds and is considered the major injury threshold. People inside homes or shielded by objects such as homes or walls could stand a higher heat level before being impacted.

- *Flammable Gas Cloud from a Release.* When a flammable material is released, it begins producing flammable vapors which can drift with the wind, producing a gas cloud which may be ignited. The distances the cloud may travel before dispersing to a concentration below its lower flammability limit (LFL) have been calculated for releases of flammable materials. The flammable gas cloud hazard footprint has been calculated for two atmospheric conditions: stability condition F with 2.2 mph wind, and stability condition D with 5 mph wind. Stability Condition F consists of a low inversion layer, which tends to trap gas releases and prevent them from dispersing in the atmosphere. This condition occurs at night with low wind speeds. This condition usually results in the largest gas cloud hazard footprints.

- *Blast Overpressure and Flying Debris from an Explosion.* Both vessels and unconfined vapor clouds have the potential to explode. The blast overpressure, as a function of distance from such an explosion, has been calculated, along with an estimate of the distance that debris may be hurled by an explosion, as appropriate. A blast overpressure of 2.5 psig, which represents the pressure that can begin causing eardrum rupture, has been used as the blast overpressure hazard footprint threshold.

The only potential toxic material to be handled by the proposed project would be hydrogen sulfide (H_2S). It is possible that small amounts of H_2S will be present in the oil and gas produced by the proposed project, however, no more than 40 parts per million (ppm) of H_2S is expected, which is substantially below concentrations that would pose a health risk. The H_2S concentration of the produced gas will be monitored on a regular basis, i.e. each well will be tested monthly and the combined gas from all the wells will be monitored continuously. Any well found to contain H_2S in excess of 40 ppm will be shut in, or recompleted in a zone with less than 40 ppm.

It is noted here that the gas will be sold to Southern California Edison, which will accept up to 40 ppm H_2S in the gas. The proposed project also has a permit from the South Coast Air Quality Management District (SCAQMD) allowing gas with up to 40 ppm to be burned in the thermal oxidizer.

Hazard footprints have been determined using HFCP, the computer model used by the Ports of Los Angeles and Long Beach, and Chems-Plus, a commercially available program developed by and available from Arthur D. Little. The details of the methodology used by HFCP are documented in the Users' Manual (Reese-Chambers Systems Consultants, Inc., 1991). Details of Chems-Plus are contained in the Chems-Plus User Guide (Arthur D. Little, 1988). Gas release rates were modeled using Chems-Plus.

The proposed project will consist of two phases. Phase I will include the drilling of one to three exploratory and producing wells to prove the commercial value of the development. The emulsion (an oil and water mixture) and associated gas will be processed on site using portable equipment and the oil will be trucked offsite to a refinery. The water will be reinjected into the oil-producing reservoir. The gas will be scrubbed and incinerated. Phase II will produce emulsion and associated gas from 30 wells; separate the gas, oil, and water using gravity and heat; clean the separated water and reinject it using four wells; and store the oil on site until shipped by a newly constructed pipeline. The gas will also be shipped by a newly constructed pipeline.

The exact characteristics of the crude oil to be produced is not known at this time, however, the API gravity is expected to be between 17 and 21. While the characteristics of the oil have little effect on the size of the radiant heat, blast overpressure, and flying debris hazard footprints, they can have a significant impact on the flammable vapor cloud hazard footprint. Thus, to be conservative, we have assumed that the crude is fairly light with a flash point below 100°F, making it a flammable liquid. This assumption will tend to overestimate the size of the flammable vapor cloud hazard footprint.

The produced gas is expected to contain less than 40 ppm of hydrogen sulfide (H_2S). Hence, it is not expected to contain H_2S in concentrations high enough to be considered hazardous. Previous analyses done for projects in Santa Barbara County (e.g., Sandpiper Golf Course and Residential Development Draft EIR County of Santa Barbara, 1994] and Chevron Point Arguello Field and Gaviota Processing Facility SEIR [Arthur D. Little, 1988]) have generally used one or both of the following two H_2S concentrations in their risk analysis; 1000 ppm and/or 300 ppm. The 1000 ppm concentration was utilized as the H_2S concentration which could cause death after a few breaths. The 300 ppm concentration is the immediately dangerous to life or health (IDLH) concentration for H_2S. The IDLH concentration is defined as the maximum level from which one could escape within 30 minutes without any escape-impairing symptoms or any irreversible health effects (U.S. Department of Transportation, 1992).

Recently, some analysts have been examining the Emergency Response Planning Guidelines (ERPGs) for use in risk analyses. These levels have been issued by the American Hygiene Association for use in emergency response planning and are not meant to be exposure thresholds. The ERPGs are substantially more conservative than IDLHs. The ERPG-3 concentration for H_2S is 100 ppm. ERPG-3 is defined as the maximum airborne concentration below which, it is believed, that nearly all individuals could be exposed up to one hour without experiencing or developing life-threatening health effects. As can be seen by the discussion above, the maximum expected H_2S concentration 40 ppm in the proposed project produced

gas is well below the concentrations considered to be hazardous. In addition, it is noted that any gas released would immediately begin mixing with the surrounding air and that the H_2S concentration in the air would be well below 40 ppm.

3.1 Risk From Wells

Blowouts - A blowout is defined as the uncontrolled flow of formation fluids from a wellbore. They occur when formation fluids flow uncontrolled into a low-pressure subsurface zone (an underground blowout) or to the surface (a surface blowout). Most commonly, a blowout happens when there is insufficient pressure in a wellbore to control subsurface pressures. If wellbore hydrostatic pressure is allowed to drop below the subsurface formation pressure, then a "kick" will occur as the formation fluids flow into the well. Typically, a kick is circulated out of a well in a controlled manner, with formation fluids flowing into a production flowline or emergency flare line. When a kick is detected during drilling operations, the blowout prevention equipment (BPOE) is closed, sealing the wellbore and preventing any additional formation fluid from entering the wellbore. Additional kick-control procedures are implemented such as circulating higher density drilling fluid into the wellbore until the kick is circulated out of the well and normal operations can be resumed. A surface blowout occurs when formation fluids flow to the surface in an uncontrolled manner. A kick can lead to a blowout in rare instances (e.g., in a gas well that experiences a failure in the mechanical integrity of the equipment/system). Redundancy of equipment is a primary feature of blowout prevention equipment design.

A source of information on blowouts in California is a document titled "A History of Oil- and Gas-Well Blowouts in California, 1950 - 1990", published by the California Department of Conservation Division of Oil, Gas and Geothermal Resources (CDOG). This database includes both onshore and offshore wells.

The CDOG data shows an overall drilling incident rate of one blowout per 1,963 wells drilled during the time period 1950 - 1990. The incident rate for blowouts resulting in a release of oil is 1:20,315. The blowout incident rate from 1970 (after new regulations were implemented) through 1990 was 1:3,046 (a probability of 3.3×10^{-4} per well drilled).

Since the proposed project will not be into abnormally high pressurized reservoirs, and since steam injection will not be utilized, these types blowouts were excluded from the blowout incident rate calculations, resulting in a blowout incident rate of 1:10,969, a probability of 9.1×10^{-5} per well drilled. None of the remaining blowouts in the database flowed oil.

One factor that would tend to further reduce this low probability of a blowout is the fact that the Hermosa Beach project will be drilling into a reservoir whose characteristics are well known. The reservoir is not highly pressurized and will require pumping to bring the oil to the surface.

Based on the above statistics (blowout incident rate of 1:10,969), the probability of a blowout for the two phases of the proposed project are presented below. It is noted here that there is also one existing well on the site which will be converted to a water injection well.

PHASE	NUMBER OF WELLS	PROBABILITY OF BLOWOUT
1	3	2.7×10^{-4}
II	31	2.8×10^{-3}
BOTH	34	3.1×10^{-3}

Although the probability of a gas blowout is extremely low, a discussion of such an event follows. First, if a large pressure surge is encountered, the blowout prevention systems located on each well should prevent gas from escaping by closing off the annulus. In the highly improbably event that the annulus does not close, the gas will be diverted to the processing equipment or the on-site vent if the processing equipment is unable to handle the flow. The vent allows the gas, which is lighter than air, to escape upward away from potential ignition sources. Modeling shows that the gas being vented from a vertical flare will not reach flammable concentrations (approximately 5 percent for methane) at ground level and therefore should not be subject to ignition.

The Molino Gas Project EIR combined the analysis of a blowout with that of the gas production pipelines. The annual probability of such an occurrence was estimated to be 1.05×10^{-4}, or once every 9,500 years. The document states that a blowout has a lower probability of occurring than a production pipeline failure. The Molino estimate of a blowout is below that presented in the above table. The extent of the potential flammable gas cloud hazard footprint from a blowout was assumed to be the same as that of a pipeline rupture. The flammable gas cloud hazard footprint was calculated to be 381 feet for stability condition F. This same approach was taken in this analysis and the flammable gas cloud hazard footprint was calculated using Chems-Plus to extend 327 feet for stability condition F, 2.2 mph wind.

The probability of a blowout during drilling was deemed to be not significant by the Final Environmental Impact Report (Ultrasystems, 1994). This conclusion was based on the fact that the wells will be equipped with redundant safety devices, including blowout protectors. Thus, the worst case accident involving the wells has been postulated to be a leak in the well area flooding the well cellar. The leak would involve an emulsion containing approximately half oil and half water. The well cellar would be expected to contain any spilled liquid keeping it from spreading out.

Releases into the Well Cellar - The well cellar covers an area of approximately 2,060 feet. HFCP was utilized to calculate the flammable vapor cloud and radiant heat hazard footprints

for a release that would cover the entire cellar area. The size of the hazard footprints is measured from the edge of the cellar area. The results are presented below.

- Radiant heat (5 kW/m^2) - 152 feet
- Radiant heat (10 kW/m^2) - 75 feet
- Flammable gas cloud - 17 feet

It is noted here that the vaporization rate from this pool would not produce enough vapor to become involved in an unconfined vapor cloud explosion. It is also noted here that the well cellar is below grade and that there is a 12 foot high block wall around the whole facility. This wall would somewhat reduce the extent of the radiant heat and flammable gas hazard footprints.

Regulations and technology have made wells extremely safe and the probability of a release of any size from a well is unlikely. As estimated previously, the probability of a major spill from a wellhead complex is 1.05×10^{-4} per year. The probability that the oil would become ignited would be 1.0×10^{-2} or one in a hundred (County of Santa Barbara, 1985). Thus, the annual probability of a release with fire would be 1.05×10^{-6}, or once every 950,000 years.

3.2 Risk from Storage Tanks

Oil and process water will be stored in five storage tanks located in a common secondary containment system (i.e. diked area that is eight feet below grade). The space above the liquid in the tanks will be filled (i.e. blanketed) with gas to prevent oxygen from being present. As long as oxygen is not present, an explosion is impossible. Hence, for an explosion to occur in a tank, the gas blanketing system would have to fail, a gas vapor/oxygen mixture in the flammable range would have to be present in the tank, and a source would have to ignite the vapor. The chances of this happening are extremely low. Nevertheless, the tanks will be constructed with weak seam cone roofs which are designed to lift to vent energy from an explosion, thereby preventing the tank from rupturing or blowing apart. If a roof does lift up from an explosion, it is expected to travel no more than several tank diameters from the tank. Although the proposed tank mitigation measures will virtually eliminate the possibility of an explosion, we have been requested to include such an accident in this analysis.

To mitigate the potential for a fire, each crude oil tank will be equipped with an external water deluge system that can flood the exterior of the tank with water for cooling purposes. Each tank will be fitted with a fire protection system that can blanket the internal head space of each tank with fire retardant foam, eliminating any possibility of fire. The water deluge system and foam system can be operated independently of each other or together as the case may require. These systems can be used to protect the tanks from other fire sources (e.g. a building fire on a nearby property).

The potential DBAs from the tanks addressed in this analysis include a fire in a tank, an explosion in a tank, and a rupture of a tank flooding the diked area, either with or without a fire. The following hazard footprint distances were calculated using HFCP. The largest tank, with a 2,600 bbl capacity, was used in the calculations. All of the hazard footprints are measured from the edge of the tank or diked area.

- Radiant heat from a fire in a tank - 156 feet ($5kW/m^2$); 76 feet ($10kW/m^2$)
- Blast overpressure from an explosion in a tank - 141 feet
- Flying debris from an explosion in a tank - 77 feet ($5kW/m^2$); 131 feet ($10kW/m^2$)
- Radiant heat from a fire in the diked area - 271 feet
- Flammable gas cloud from a release into the dike area - 33 feet

Again, it is noted that the 12 foot high block wall and the below-grade containment area would somewhat reduce the extent of all the hazard footprints.

The annual probability of a tank fire has been estimated to be 7.0×10^{-5} (Envicom, 1992). This equates to an annual probability of 2.1×10^{-4} for the three tanks, or once in 4,700 years. The rupture of an atmospheric storage tank due to all causes, including seismic events, is estimated to be 1.6×10^{-4}/year or once in 6,300 years (County of Santa Barbara, 1985). The probability that the oil is ignited is 1.0×10^{-2}, or one in a hundred. Thus, the probability of a release with a fire is estimated to be 1.6×10^{-6} per tank, or once in 625,000 years. Since there will be three storage tanks that may store crude oil, the probability of a spill with fire, per year, would be 4.8×10^{-6}, or once in 208,000 years.

The probability of an explosion in an oil storage tank has been estimated to be 1×10^{-4} per year (County of Santa Barbara, 1988). This is for all types of storage tanks. The tanks for the proposed project will be gas blanketed, which will virtually eliminate the possibility of a tank explosion.

3.3 Risk from Process Area

Free Water Knockouts - The first step in processing the emulsion will be the separation of the gas, oil, and water by means of gravity using free water knockout (FWKO) vessels. The gas that will be separated out will be primarily methane which is the predominant gas in natural gas piped to most homes. The emulsion enters the FWKO whereby the water, which is heavier than the oil, falls to the bottom of the tank while the oil floats on the water. The gas which escapes from the emulsion goes to the top of the tank. The water is drawn off the bottom of the tank and sent to the wastewater treatment system. The gas is drawn off and directed to the gas compression and treatment system. The oil is sent to heater treaters where it is further processed. The FWKOs are ASME certified pressure vessels. The potential for an explosion in one of these vessels is extremely unlikely, and thus no hazard footprints have

been calculated for a vessel rupture. Instead, the DBA from a FWKO has been assumed to be a release from a 2-inch diameter hole, which represents a release from a pipe connection or other small release. The flammable gas hazard footprint from a 2-inch diameter hole in the tank would produce a flammable vapor cloud hazard footprint that would extend up to 327 feet from the point of release under worst case atmospheric conditions (stability F, 2.2 mph wind). The rate of release from the vessel was calculated using the Chems-Plus model developed by Arthur D. Little. This rate of release was then input to both Chems-Plus and HFCP to calculate the flammable gas cloud hazard footprint. The models also determined that the amount of gas (methane) in the cloud would not be enough to become involved in an unconfined vapor cloud explosion. A release from a FWKO or gas line would result in a rapid release which would last for a very short time, less than several seconds.

Heater Treaters - The oil is sent to heater treaters where it is heated to further separate out water and gas from the oil. In this case the majority of the emulsion entering the vessels is oil. The heater treaters are also ASME certified pressure vessels. Since the heater treaters will operate at approximately the same pressure as the FWKO, the release rate of gas from a 2-inch diameter hole will be approximately the same as that from the FWKO (it will actually be slightly less since the gas will expand because it is heated) and thus, the flammable vapor cloud hazard footprint will be approximately the same size.

A release of oil from the FWKOs or heater treaters could spread and cover the secondary containment area around the vessels. The surface area of the secondary containment area is approximately 7,780 sq.ft. The flammable gas cloud (if the spill doesn't ignite) and radiant heat hazard footprints were calculated by HFCP to be:

- flammable gas cloud - 41 ft
- radiant heat (5 kW/m^2) - 266 ft
- radiant heat (10 kW/m^2) - 130 ft

Arthur D. Little, 1995, has estimated that the probability of a major release from a pressure vessel is 8.0×10^{-7} per year, or once in 1,250,000 years. For the four vessels proposed for the facility, the combined annual probability of a major release would be 3.2×10^{-5} (once every 31,250 years). The probability that the released oil would become ignited is 1.0×10^{-2}. Thus, the annual probability of a major spill with fire is 3.2×10^{-7} (once in 3 million years).

Gas Dehydration - The gas from the FWKOs and heater treaters will be commingled with the casing gas and then compressed to 200 psig for further processing to remove any remaining water and the natural gas liquids (NGLs). The gas is then shipped out of the facility via a pipeline to be constructed.

A release from the 200 psig portion of the gas processing system would result in a rapid release and depressurization of the piping, glycol tower, and NGL tower. It has been

conservatively estimated that there is less than 27 lbs. of produced gas in this portion of the system. This gas would be released in a few seconds. Low pressure sensors should shutdown production, preventing any additional gas from being released. If the system were to fail, gas would then be released from the 50 psig system until it was depressurized and then at the gas production rate. The 50 psig system was addressed above.

The release from the 200 psig system was modeled as a puff release. The flammable gas cloud for the two meteorological conditions is presented below. It is also noted that the gas cloud would dissipate rather rapidly. Also presented below is the maximum length of time that the lower flammability limit would be exceeded at any given location within the cloud.

- Stability F, 2.2 mph wind - 249 ft (7 seconds)
- Stability D, 5 mph wind - 118 ft (3 seconds)

NGL Treatment - The gas stream will be run through a refrigeration system to condense out the natural gas liquids (NGLs). It is most likely that a freon-based system will be used. However, depending on the composition of the gas, it is possible that a propane-base system will be required. The project engineer has calculated that if a propane system is required, only 5 to 10 gallons of propane will be required. This is equivalent to a backyard barbecue system and presents no hazard to the surrounding area.

The gas will be run through a 2 ft. diameter by 16 ft. tall cylindrical vessel (tower) for processing. This NGL tower will be an ASME-certified, heavy-walled pressure vessel equipped with safety relief valves to prevent the tank from being overpressurized. The vessel is designed in excess of a 4 to 1 safety factor. There will be about a 5 ft. liquid level in the tower. The estimated maximum production rate of NGLs from the tower is 1 gal/min which will be blended with the crude oil. The worst case accident involving the tower is a boiling liquid expanding vapor explosion (BLEVE). For this scenario to occur, four events need to occur simultaneously, including significant external fire, failure of the pressure relief valve, vessel blockage, and no external fire fighting efforts. It is noted here that the tower is located in a containment pit with the other processing equipment, and that the floor is contoured such that all spills would drain to a sump system away from the equipment. Arthur D. Little, 1995 has estimated that the failure rate of this event is 8.0×10^{-7} per year (once in 1.25 million years), which is classified as extraordinary.

The consequences of such an event include a fireball and a blast wave. Chems-Plus was utilized to calculate the following hazard footprints.

- Blast overpressure (2.5 psi) - 194 ft
- Fireball thermal radiation - 183 ft (minor injury); 84 ft (major injury)

Two other types of releases could occur with the NGL system, a gas release and a liquid release. The gas release was addressed above under gas dehydration. The liquid from a release would drain toward the sump. It would begin evaporating immediately upon release. The maximum amount of NGLs that could be released would be $\pi \times 1^2$ (radius) x 5 (liquid height) = 15.7 ft^3 = 118 gal. Such a release would produce a flammable vapor cloud of 353 ft. for F stability with 2.2 mph wind and 144 for D stability with 5 mph wind. The probability of such an event occurring has been estimated to be the same as that of a process vessel (3.2×10^{-5} or once in 31,250 years).

3.4 Risk from Trucking

During Phase 1, the oil will be stored on-site in portable tanks and then loaded into tanker trucks for transportation to a refinery. It is estimated that three to four tanker truck trips per day, each carrying 175 bbls of oil, will be required to handle the 600 bbl per day production. The tanker trucks will be loaded inside the facility in an area equipped with a drain and sump to contain any spillage, although none is expected. The Phase I site sump/containment system will be adequate to fully contain a 175 bbl spill. Trucks will exit the facility and follow designated routing from the facility. Trucks will not deviate from the city-designated route.

Trucking of petroleum products is quite common throughout the country. Gasoline and other petroleum products are routinely transported by tanker trucks to gas stations and industrial facilities. Tanker trucks can become involved in traffic accidents but these do not usually result in a loss of cargo. A worst case accident would result in the loss of the entire contents of the trucks (175 bbls). The released oil would then spread on the ground and could ignite if it encounters an ignition source. The area covered by the spill would be a function of the elevation profile of the surrounding area.

For the purpose of calculating the potential hazard footprints, it has been assumed that the oil is spilled on a flat surface and spreads to a uniform depth of one inch. The spill would cover an area of approximately 11,800 sq. ft. with a radius of approximately 57 ft. The radiant heat and flammable gas cloud hazard footprints were calculated by HFCP to be:

- Flammable gas cloud - 52 ft
- Radiant heat (5 kW/m^2) - 320 ft
- Radiant heat (10 kW/m^2) - 182 ft

It is noted here that oil burns at a rate of approximately 4 mm (0.16 in.) per minute and hence, a one-inch deep pool would burn for approximately 6.4 minutes. The pool would burn for a longer time if it were deeper, however, then the area would be smaller and the radiant heat footprint smaller.

The Handbook of Chemical Hazard Analysis Procedures (FEMA, undated) recommends using a truck accident rate of 2×10^{-6} accidents per mile with 20% of the accidents resulting in a release of cargo. The Handbook goes on to recommend that the following spill distribution be utilized:

- 10% cargo loss (17.5 bbl) - 60% of the time
- 30% cargo loss (52.5 bbl) - 20% of the time
- 100% cargo loss (175 bbl) - 20% of the time

Assuming that a loaded truck travels 10 miles results in the following annual probabilities of accidents and releases. It is assumed that the trucking lasts for one full year.

Event	Annual Probability
Accidents	2.5×10^{-2}
Spill of any size	5.0×10^{-3}
Spill of 17.5 bbls or less	3.0×10^{-3}
Spill between 17.5 bbls and 52.5 bbls	1.0×10^{-3}
Spill greater than 52.5 bbls	1.0×10^{-3}

3.5 Risk from Crude Oil Pipeline

A new produced crude oil shipping line will be constructed to transport produced crude oil from the oil production facility to the Southern California Edison (SCE) Redondo Beach storage facility and pipeline system. The Chevron pipeline previously being considered has been dropped. The new pipeline will be connected to the SCE manifold at the Redondo Beach storage facility and the oil directed to one of the storage tanks. The oil would then later be batched to one of the local refineries through the existing SCE pipeline system. The new pipeline would have an outside diameter of 6 inches and be approximately 0.5 miles (2,500 ft.) long. The pipeline is designed for a maximum operating pressure of 350 psig.

The amount of oil than can be released from a pipeline is made up of the amount that can be released until pumping is stopped plus the amount than can drain from the line due to gravity. The pipeline will be equipped with two systems that will continuously monitor the pipeline operation and shut it down automatically if abnormal conditions are detected. The supervisory control and data acquisition (SCADA) system will monitor crude oil flow rates at both ends of the pipeline and the volume of crude oil sent at the one end and the amount received on the other end. If the flow rates or volume at the two ends of the pipeline do not match within preset limits, the pipeline will be shut in, i.e. the pump shut down and the block valves closed. The second system will measure the pressure in the pipeline. The pipeline will be shut in if

The second system will measure the pressure in the pipeline. The pipeline will be shut in if either the pressure exceeds a preset limit or drops below a preset limit. A pipeline rupture would result in a nearly instantaneous pressure drop that would automatically shut in the pipeline. It is conservatively estimated that this would be done within 2 minutes. Hence, a maximum of 11 bbls [8,000 bbls per day / (24 hr x 60 min per hour) x 2 min] could be lost due to pumping. The capacity of the entire pipeline is 85 bbls, however block valves would be located at both ends of the line, with an additional one located approximately in the middle and hence, the maximum amount of oil that could drain from the pipeline if all the oil between block valves were to escape would be 43 bbls. Thus, the worst case release from the pipeline would be 54 bbls (11 bbls + 43 bbls).

As with a trucking accident, the area impacted by a pipeline spill would be a function of the elevation profile of the surrounding area. Assuming again that the spill occurs on a flat surface and spreads to a depth of one inch, this results in a 3,600 sq. ft. area being covered.

The radiant heat and flammable gas cloud hazard footprints were calculated by HFCP to be:

- Flammable gas cloud - 30 ft
- Radiant heat (5 kW/m^2) - 193 ft
- Radiant heat (10 kW/m^2) - 95 ft

The probabilities of a leak and rupture for modern crude oil pipelines are generally estimated to be around 5.4×10^{-4} spills per pipeline-mile per year, and 2.7×10^{-4} ruptures per pipeline-mile per year, respectively (Aspen, 1995). This equates to the following annual probabilities for the 0.5 mile pipeline.

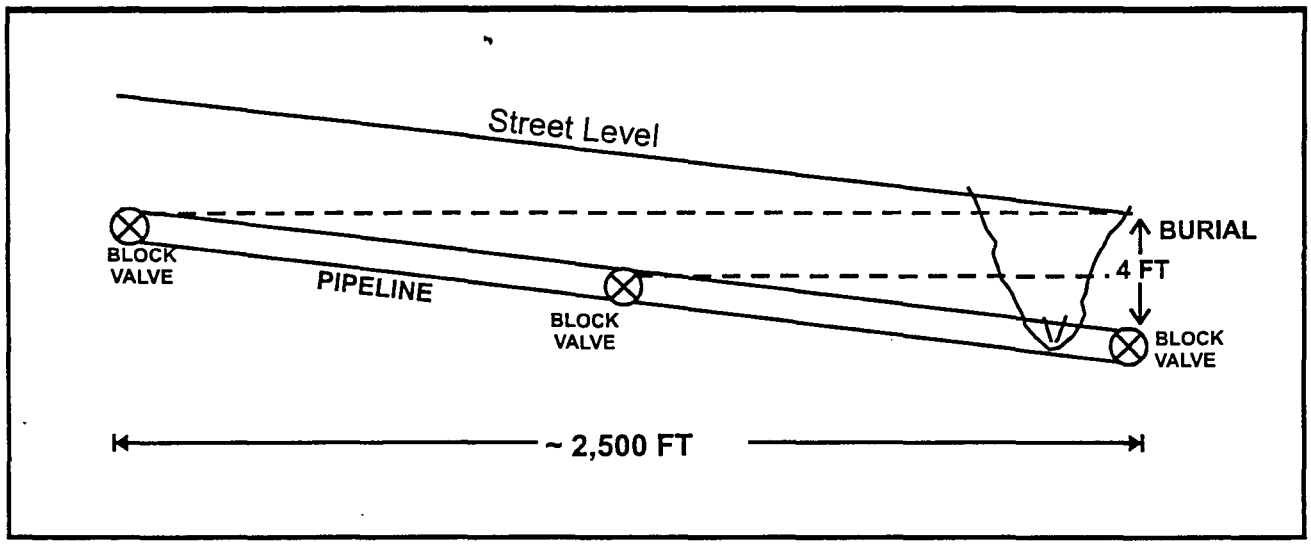
- Probability of leak - 2.7×10^{-4} (once in 3,700 years)
- Probability of rupture - 1.3×10^{-4} (once in 7,700 years)

The potential for oil getting in the ocean from a pipeline release was also examined. First, it would be virtually impossible for 43 bbls of oil to drain from the pipeline after pumping has ceased and the block valves are shut. The pipeline follows a relatively flat terrain dropping only about four feet in elevation between the proposed facility and the SCE Redondo Beach facility. The pipeline will be buried four feet below grade.

If the pipeline were to rupture near the end at its lowest point, up to 11 bbls could be pumped out. The pipeline trench will be backfilled with sand during construction. Much of the released oil would soak into the sand. Once the pumping has stopped, oil would begin draining out due to gravity. As shown in Figure 3-1, the top of the grade (i.e. street level) would be about even with the top of the pipeline at the facility. The top of the grade would be about two feet above

the top of the pipe at the center of the block valve. Thus, it would not be possible for oil to drain out of the pipe into the street due to gravity.

FIGURE 3-1
PIPELINE PROFILE



Hence, it has been assumed that 11 bbls could be pumped out. It has further been assumed that approximately one fourth of the oil (3 bbls) would be absorbed by the trench, leaving 8 bbls that could escape. This oil would flow in the street and most likely eventually find its way to a storm drain opening. If it were raining, it is likely that most of the 8 bbls would reach the storm drain and get carried to the ocean. If it were dry, the oil would form smaller pools due to the unevenness of the street. Some of the oil would stick to the street as it flowed. Thus, somewhat less than 8 bbls would enter the drain and flow to the ocean though it is difficult to estimate the amount. It is also noted here that response actions would be taken to prevent the oil from entering storm drain openings. Sandbags and other measures would be used to block the drain openings and direct oil away from the drains to an area where the oil could be recovered. Cleanup contractors also have the necessary equipment and experience to contain the oil in the storm drains if it is not raining too hard. Macpherson has prepared a preliminary oil spill response plan which must be finalized and approved by the California Office of Oil Spill Prevention and Response (OSPR) prior to startup of the project. This plan addresses measures to be taken in the event of a pipeline release.

3.6 Risk from Gas Pipeline

The new gas pipeline will be constructed to transport gas from the facility to Southern California Edison. The new pipeline will have an outside diameter of 4 inches and will be approximately 0.5 miles long. Gas will be sent through the line on a continuous basis at approximately 120 psig, using the compressor located at the Macpherson production facility. Edison is permitted by SCAQMD to burn gas containing up to 40 ppm of H_2S. As stated previously, this concentration of H_2S is not hazardous. In addition, it is noted that any released gas would immediately mix with the air at the release point resulting in much lower concentrations of H_2S in the air than 40 ppm.

The rate of release of gas from the pipeline would be a function of the size of the hole. The larger the hole, the greater the release rate. A complete rupture of the line would shut down the compressor almost immediately. In addition, the line will be equipped with a check valve at the point where it connects to the utility line that would prevent gas from flowing into the line from the utility line.

Chems-Plus has been utilized to calculated the release rate and flammable vapor cloud hazard footprint from a pipeline rupture and from a small leak (e.g. ¼-inch diameter hole). The results are presented below.

Accident	Downwind Distance to LFL
• Pipeline rupture	467 feet
• ¼-inch hole	<10 feet

It is noted here that the downwind distance to the LFL calculated for the rupture is an overprediction because Chems-Plus treats the release as a point source and ignores the initial mixing with air caused by the jet release of the gas. The pipeline would be emptied of gas in about 4 seconds in the rupture case. It is also noted that this line is essentially the same as the numerous utility-owned and -operated gas lines throughout the area.

If the gas release were to immediately ignite, it would burn as a jet release until the gas flow ceased. This would last about 4 seconds. The flame length could be up to 211 feet long. If the gas cloud were to ignite, the fire would burn back to the source and burn as a jet flame. Thus, the radiant heat hazard footprint has been assumed to be equal to the flammable gas cloud hazard footprint.

The probability of a leak for a modern gas line is estimate to be 1.5×10^{-3} per pipeline-mile per year (Arthur D. Little, 1995). Thirty one percent of the leaks are estimated to be major leaks or ruptures. This equates to the following annual probabilities for the 0.5 mile gas pipeline.

- Probability of leak - 5.2×10^{-4} (once in 1,900 years)
- Probability of rupture - 2.3×10^{-4} (once in 4,300 years)

3.7 Summary of Accident Probabilities and Hazard Footprints

The results of hazard footprint analysis are summarized in Table 3-2. The table includes the probability of the accident, the extent of the hazard footprints (downwind and crosswind for flammable gas hazard footprints) for the two environmental conditions (stability F and stability D), and the area covered by the hazard footprint. The hazard footprints are displayed on Figure 3-2. Also included on the figure is the expected frequency of the accidents causing the hazard footprints. The expected frequencies presented are the sum of all the events that could cause that hazard footprint to occur.

As can be seen by the table, the largest hazard footprint from the facility would be an NGL liquids release. Such a release would produce a 353 foot flammable gas cloud hazard footprint. This hazard footprint would extend into the residential neighborhood to the north and the R-3 neighborhood to the west. The actual hazard footprint at the time of a release would only extend downwind, and would not cover the entire circular area shown. The actual hazard footprint for a west wind condition is also shown on the figure to illustrate this point. Also, it is noted here that the footprint would only be 353 feet during worst case environmental conditions, e.g. stability F with low wind speeds. As can be seen from the table, the hazard footprint would only extend 144 feet during typical environmental conditions. The flammable gas hazard footprint would only be a hazard if it were to be ignited. The largest injury radiant heat hazard footprint would extend 271 feet and would form a circle as shown because the radiant heat would be given off in all directions. The injury radiant heat hazard footprint extends into the residential neighborhood to the north and just touches the R-3 neighborhood to the west. It is noted here that this footprint would not impact people inside or behind structures. In addition, people outdoors exposed to the heat from a fire, would have time to find shelter before they would sustain burns. The largest major injury radiant heat hazard footprint would extend 131 feet. A fire at the facility should not impact homes or other structures in the area.

The truck, oil pipeline, and gas pipeline accidents would occur offsite and their potential impact would be a function of where the accident occurred relative to vulnerable resources. Figure 3-3 shows the proposed truck route and Figure 3-4 shows the proposed oil and gas pipeline route. Figure 3-5 plots the truck hazard footprints while Figure 3-6 plots the pipeline hazard footprints.

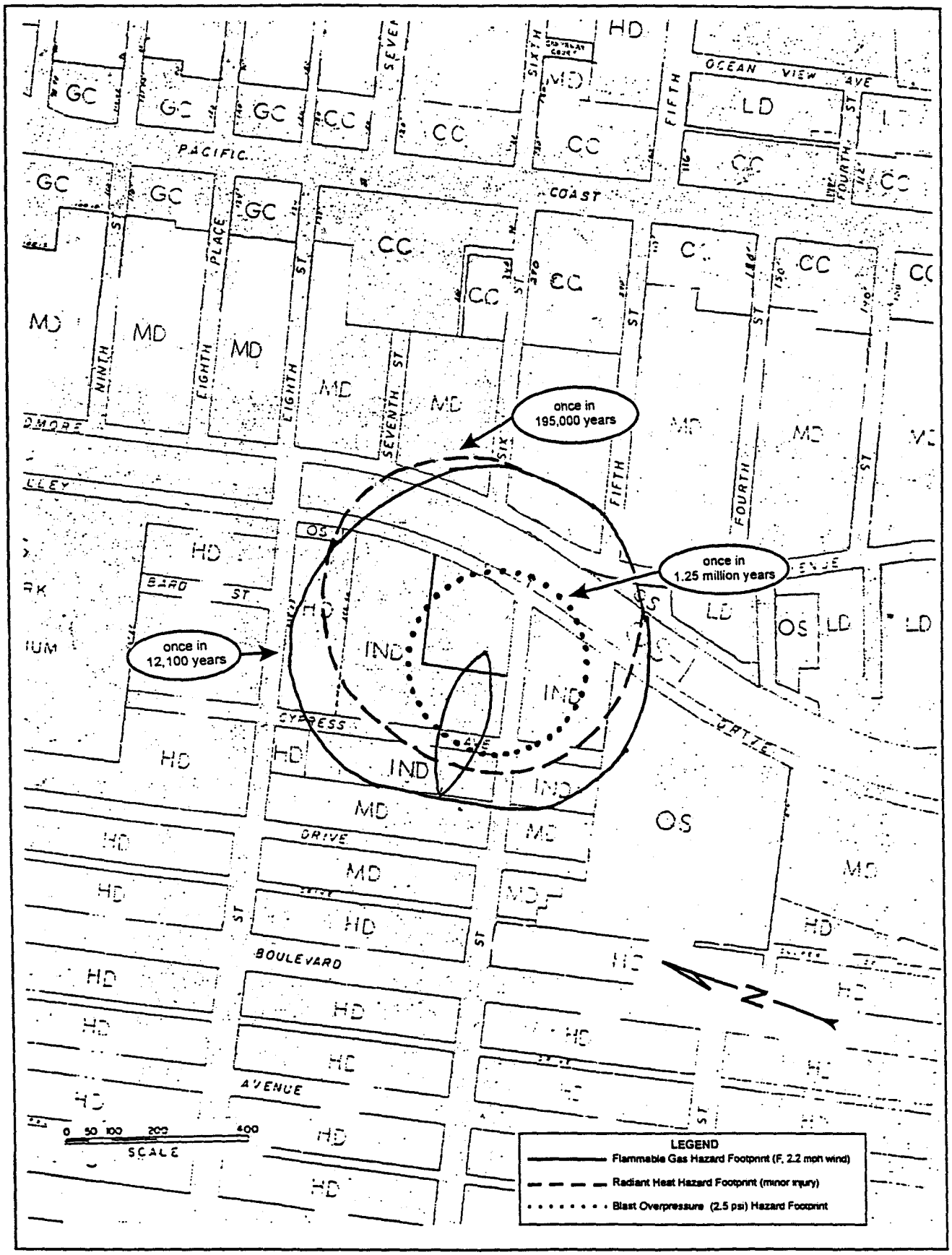
TABLE 3-2
SUMMARY OF ACCIDENT PROBABILITIES AND HAZARD FOOTPRINTS

SCENARIO	ANNUAL PROB OF ACCIDENT	STABILITY F / 2.2 MPH WIND			STABILITY D / 5 MPH WIND		
		DOWNWIND DISTANCE (FT)	CROSSWIND DISTANCE (FT)	AREA (SQ. FT.)	DOWNWIND DISTANCE (FT)	CROSSWIND DISTANCE (FT)	AREA (SQ. FT.)
(1) Release in well area (blowout or pipe rupture) without fire - flammable gas hazard	1.1×10^{-4}	327	131	33,600	101	41	3,250
(2) Release in well area with fire - radiant heat hazard	1.1×10^{-6}	152 ft minor injury 75 ft major injury	Circle	18,150 4,400	152 ft minor injury 75 ft major injury	Circle	18,150 4,400
(3) Fire in atmospheric storage tank - radiant heat hazard	2.1×10^{-6}	156 ft minor injury 76 ft major injury	Circle	19,100 4,500	156 ft minor injury 76 ft major injury	Circle	19,100 5,400
(4) Release into containment system from storage tank without fire - flammable gas hazard	4.8×10^{-4}	33	15	390	11	5	43
(5) Release into containment system from storage tank with fire - radiant heat hazard	4.8×10^{-6}	271 ft minor injury 131 ft major injury	Circle	53,000 13,500	271 ft minor injury 131 ft major injury	Circle	53,000 13,500
(6) Explosion in storage tank - blast overpressure and flying debris hazards	0 - tanks will be gas blanketed						
(7a) Release from a 50 psig process vessel - flammable gas hazard	3.2×10^{-5}	327	131	33,600	101	41	3,250
(7b) Release from the 200 psig process system	3.2×10^{-5}	249	21	5,200	118	17	2,000
(8) Process vessel liquids leak into containment system without fire - flammable gas hazard	3.2×10^{-5}	41	20	640	14	6	115
(9) Process vessel leak into containment system with fire - radiant heat hazard	3.2×10^{-7}	266 ft minor injury 130 ft major injury	Circle	55,600 13,300	266 ft minor injury 130 ft major injury	Circle	55,600 13,300

TABLE 3-2
SUMMARY OF ACCIDENT PROBABILITIES AND HAZARD FOOTPRINTS (continued)

SCENARIO	ANNUAL PROB OF ACCIDENT	STABILITY F / 2.2 MPH WIND			STABILITY D / 5 MPH WIND		
		DOWNWIND DISTANCE (FT)	CROSSWIND DISTANCE (FT)	AREA (SQ. FT.)	DOWNWIND DISTANCE (FT)	CROSSWIND DISTANCE (FT)	AREA (SQ. FT.)
(10a) NGL tower BLEVE Blast overpressure	8.0×10^{-7}	194 ft to 2.5 psi	Circle	29,600	194 ft to 2.5 psi	Circle	29,600
(10b) NGL tower BLEVE Fireball thermal radiation	8.0×10^{-7}	183 ft minor injury 84 ft major injury	Circle	26,600 5,500	183 ft minor injury 84 ft major injury	Circle	26,600 5,500
(10c) NGL tower liquid release - flammable gas hazard	3.2×10^{-5}	353	142	39,500	144	58	6,600
(11a) Truck release of crude oil without fire - flammable gas hazard	5.0×10^{-3}	52	25	1,020	16	8	100
(11b) Truck release of crude oil with fire - radiant heat hazard	5.0×10^{-4}	320 ft minor injury 182 ft major injury	Circle	80,400 26,000	320 ft minor injury 182 ft major injury	Circle	80,400 26,000
(12a) Pipeline release of crude oil without fire - flammable gas hazard	1.3×10^{-4}	30	14	330	10	5	40
12b) Pipeline release of crude oil with fire - radiant heat hazard	1.3×10^{-5}	193 ft minor injury 95 ft major injury	Circle	36,600 8,800	193 ft minor injury 95 ft major injury	Circle	36,600 8,800
(13) Gas pipeline release - flammable gas hazard	2.3×10^{-4}	467	187	68,600	214	86	14,450

FIGURE 3-2
RESULTS OF HAZARD FOOTPRINT ANALYSIS



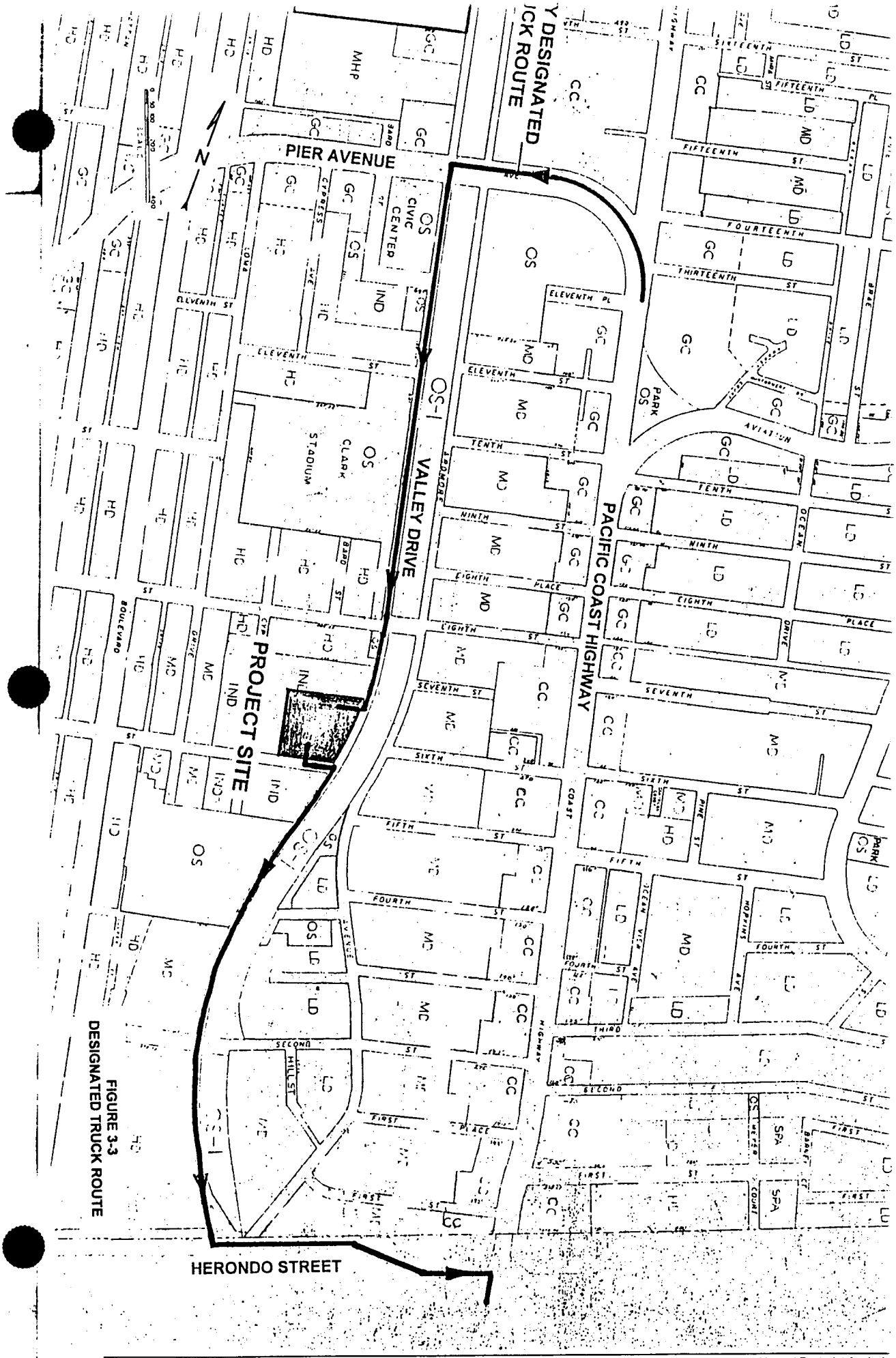
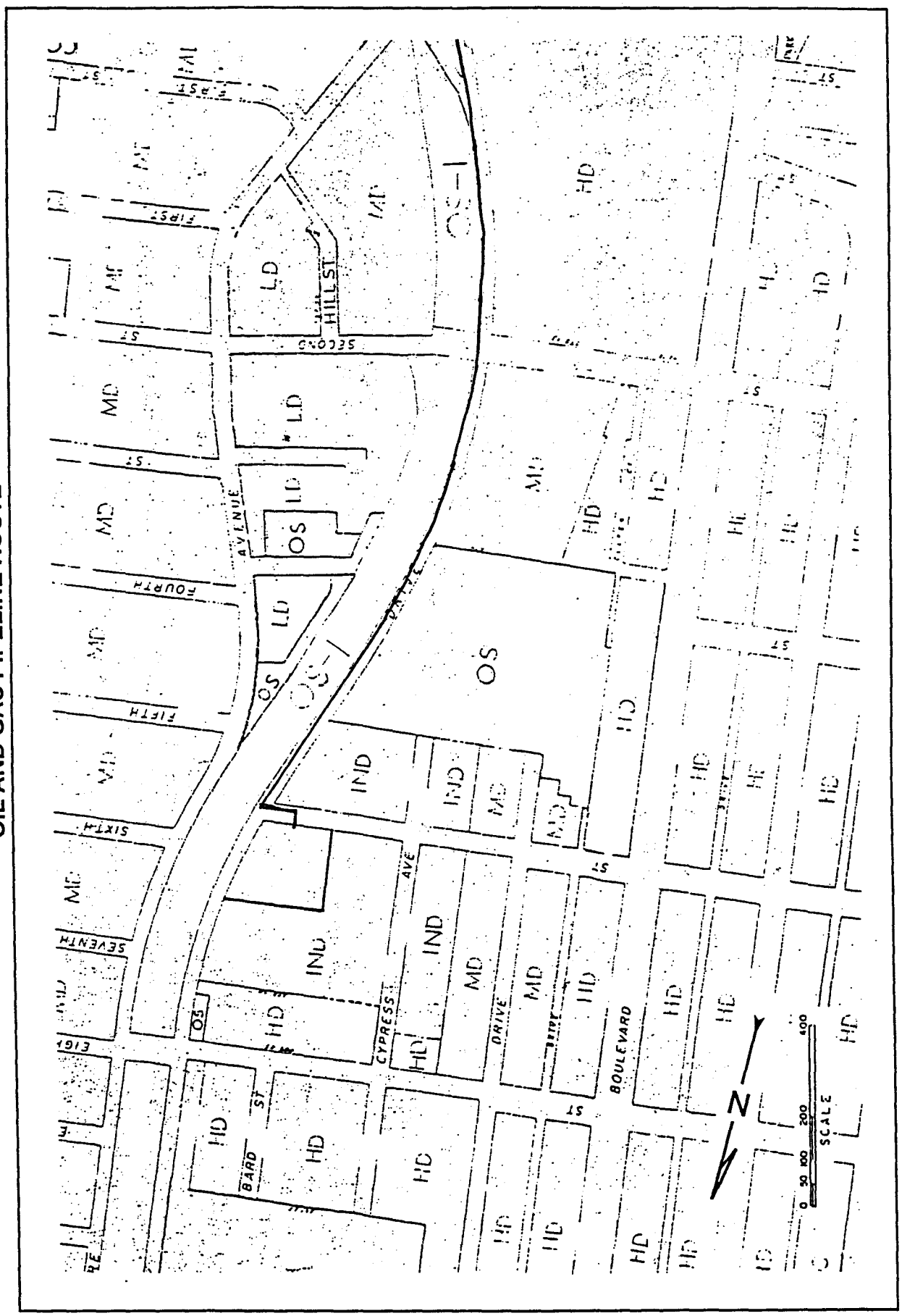


FIGURE 3-3
DESIGNATED TRUCK ROUTE

FIGURE 3-4
OIL AND GAS PIPELINE ROUTE



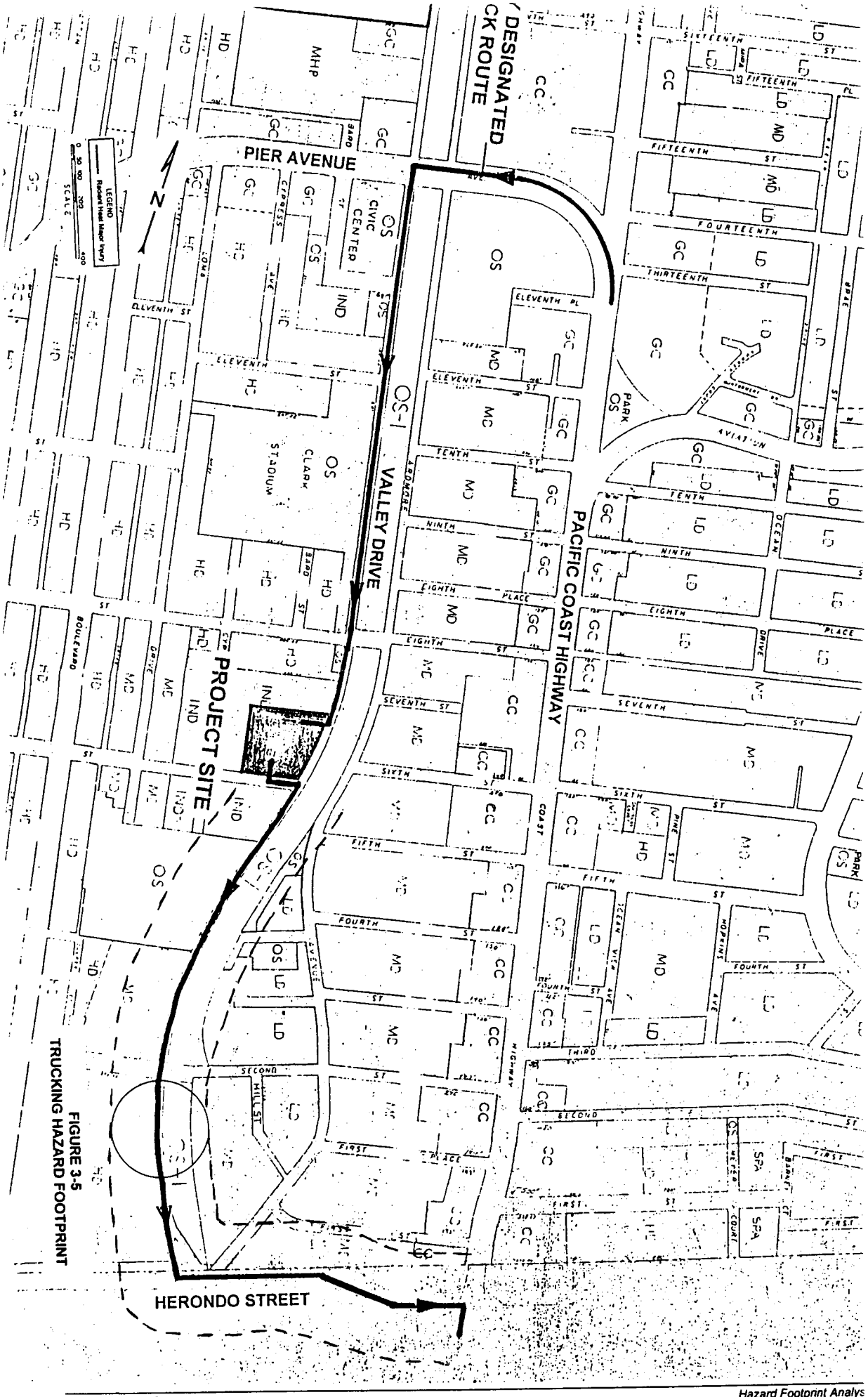
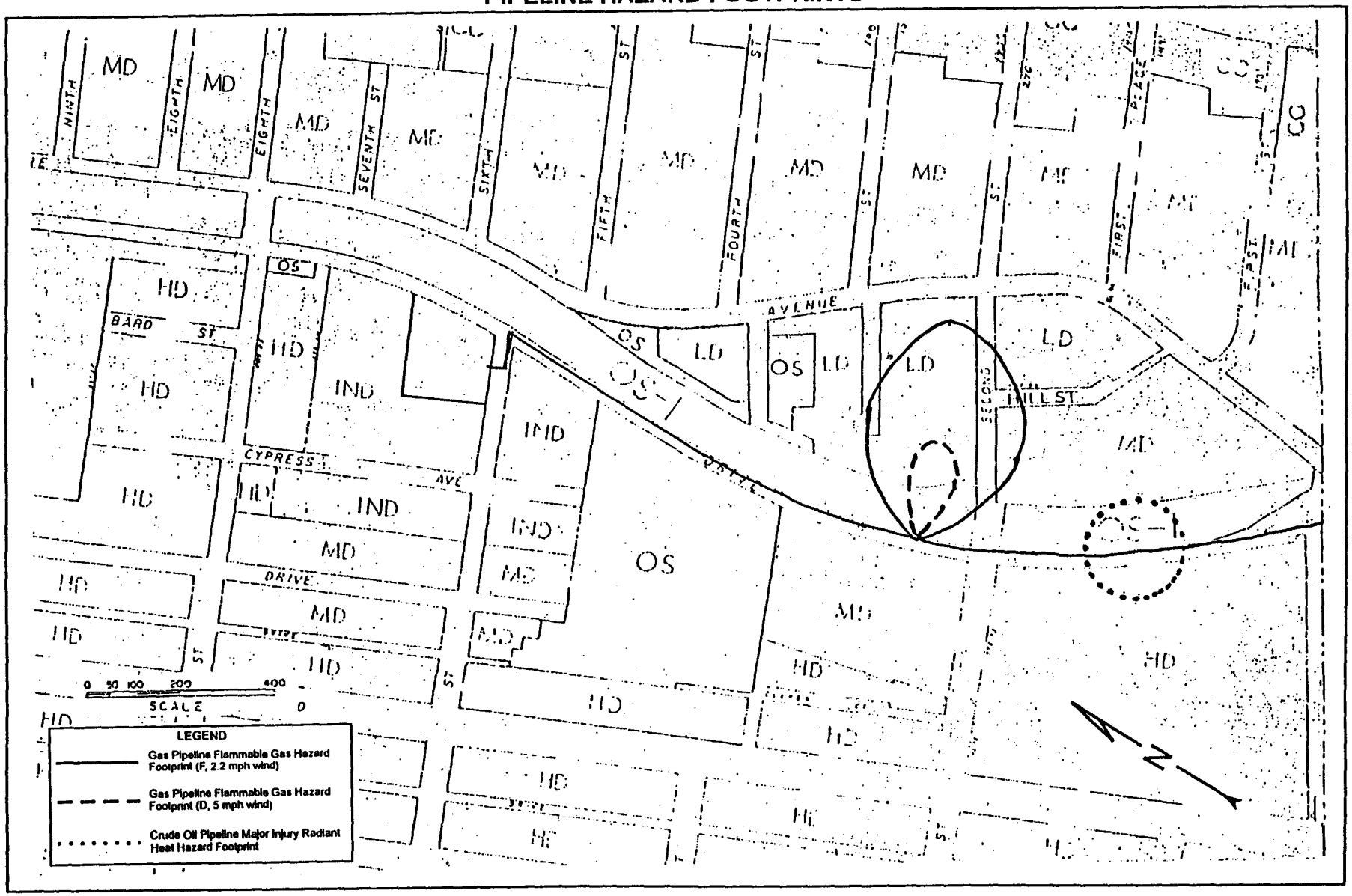


FIGURE 3-5
TRUCKING HAZARD FOOTPRINT

FIGURE 3-6
PIPELINE HAZARD FOOTPRINTS



3.8 Consequence Analysis

The results of the failure rate and consequence analysis have been combined to develop plots of frequency versus fatalities similar to that shown in the Molino Gas Project EIR. These curves are commonly called risk profiles. Figure 3-7 presents the guidelines used in the Molino Gas Project EIR for the determination of offsite risk and significance. Points above the upper line, labeled "De Manifestis", are considered to be an unacceptable risk, while those below the line, labeled "De Minimis", are considered acceptable. Points between the two lines, labeled "grey region", are acceptable but mitigation may be required. The following factors were utilized in developing the risk profiles.

- extent of hazard footprint for each environmental condition
- estimated frequency rate for each accident
- estimated frequency of occurrence for each atmospheric condition
- estimated frequency of occurrence of wind direction
- population density
- presence of ignition sources
- probability of ignition from each ignition source

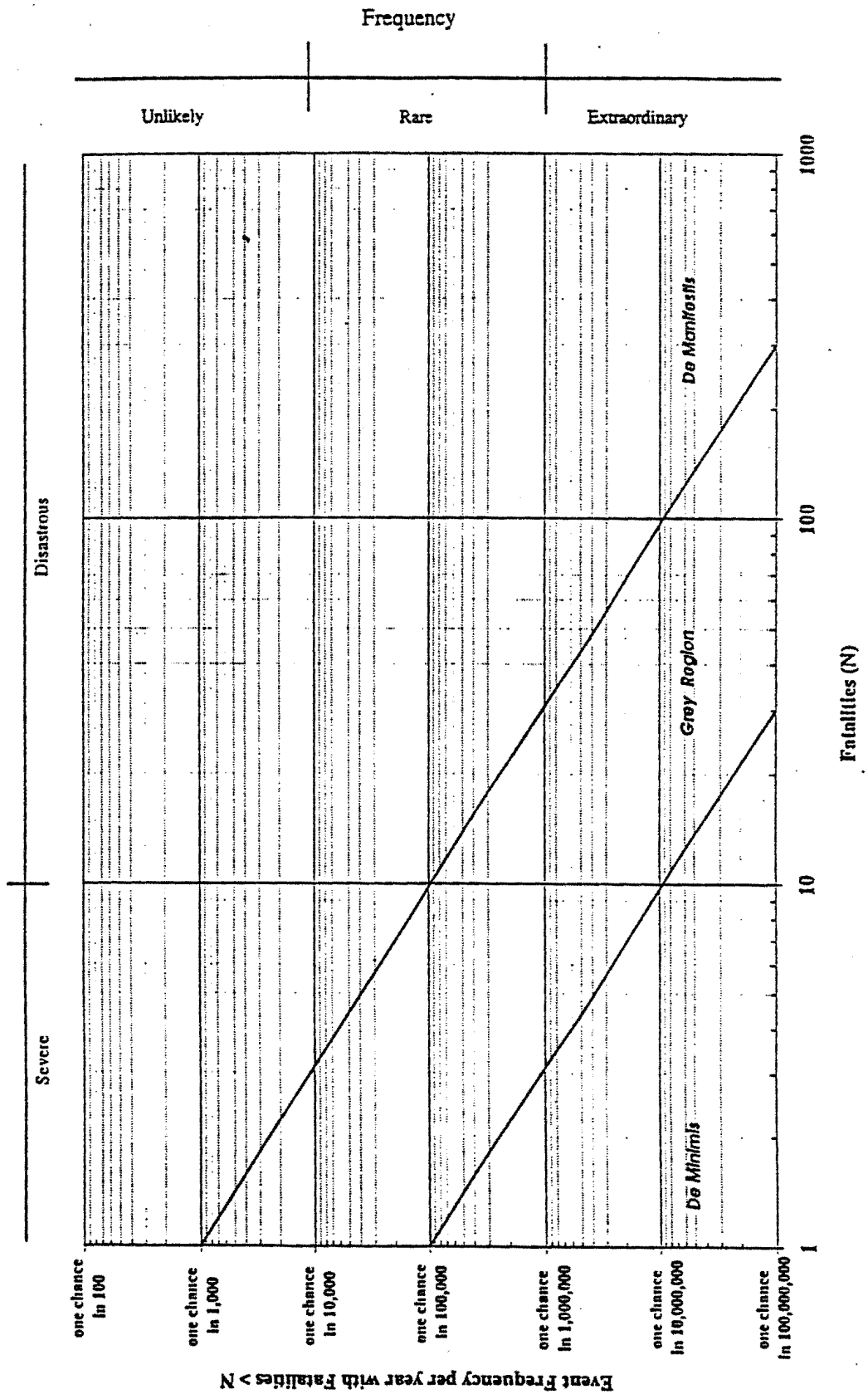
Meteorological Data - Meteorological data for the project site were obtained from California Air Resources Board, 1984 and California Department of Water Resources, 1978. Data for two sites, Los Angeles International Airport and Redondo-King Harbor were utilized.

The basic approach determined the relative likelihood of each of the two stability conditions, D and F, occurring. Condition D was used to represent conditions A through D and condition f to represent conditions E and F. The frequency of wind direction was taken from the two data sources.

Conditional Impact Probabilities - The likelihood is not 100 percent of a fatality resulting from an exposure to a vapor cloud fire. Buildings can provide some protection hazards. The analysis assumes 30 percent fatality within the lower flammability limit.

People inside buildings would not be harmed by a radiant heat hazard footprint. People outside their homes could begin to received second degree burns if exposed for longer than 30 seconds. Because the radiant heat hazard footprint only overlaps a small residential area, it has been assumed that most people exposed would be in their homes or could easily leave the area in a short time. Thus, it has been assumed there would be no fatalities due to radiant heat.

FIGURE 3-7
OFFSITE RISK AND SIGNIFICANCE GUIDELINES



Population Distribution - The population distribution was estimated from the Hermosa Beach General Plan Map. Each residential unit was assumed to house four people.

Ignition Probabilities - Flammable vapor clouds have the potential to ignite anywhere within their flammable limits. Hence, it is necessary to identify potential ignition sources that a cloud may encounter, and to quantify the likelihood of ignition, if the cloud encompasses the sources. In general, when trying to identify ignition sources, the search is primarily for open flames, hot surfaces and electrical sparks, and, to a lesser extent, friction sparks from both continuous and intermittent activities. Some of the potential ignition sources identified in the Molina Gas Project EIR were:

- Vehicles (many specific sources were identified)
- Boilers
- Gas turbines
- Blow torches
- Fired heaters
- Welding
- Faulty wiring
- Pilot flames
- Fireplaces and wood/coal stoves
- Smoking materials
- Doorbells
- Switches
- Furnaces/incinerators
- Machine tools
- Flares

Ignition probabilities used in the Molino Gas Project EIR include:

- ***Cars*** - 0.2 per car; although many potential ignition sources within a car like faulty wiring or backfires are due to fuel rich mixtures in intake air, they are not always present nor guaranteed to cause ignition.

- ***Houses*** - 0.01 per house; while there are many ignition sources within a home, such as switches, doorbells, faulty wiring, pilot lights, smoking materials, fireplaces and wood- or coal-burning stoves, the flammable vapors must first penetrate the house before these ignition sources pose a hazard. Typical residence times of clouds are often brief enough that this is relatively unlikely.

- ***Immediate Ignition*** - There are various ignition sources at the project facility such as electrostatic ignition or friction sparks that would ignite the vapor cloud on the

project site. In keeping with the Molino Gas Project EIR, a figure of 0.2 has been assumed for the probability of immediate ignition.

Construction of Risk Profiles - The risk profile displays the frequency with which fatalities could occur. They indicate accident size and display how the potential number of fatalities varies as a function of frequency. The risk profile has been plotted on a log-log scale because the profiles span multiple orders of magnitude.

The general approach involved in constructing a risk profile involves determining the frequency and number of fatalities associated with each release scenario. A release scenario is defined by the following:

- Release location
- Release frequency
- Meteorological stability condition and its likelihood
- Wind direction and its likelihood
- Whether and where ignition occurs
- Area of the hazard zone
- Number of individuals exposed within each hazard zone
- Assumed fatality rate for that type of hazard

Some of these factors affect frequency, some determine impacts, and some influence both. Once all possible combinations have been analyzed, the results are combined to give the overall risk profile.

If a flammable release does not ignite immediately, the material will disperse, forming a vapor cloud which will travel downwind. Should the cloud encounter an ignition source (such as cars, pilot lights, open flames, furnaces or other equipment), the cloud will ignite and burn through the flammable area until all flammable material is consumed. For each release scenario, it is necessary to identify the ignition sources that would be encountered. Assuming that a particular area or travel path contains a number of potential ignition sources, the probability can be calculated for the cloud not igniting after covering that area. Hence, it is possible to calculate the probability for the cloud to ignite at various stages in its development, for a given release location and wind direction.

For each release scenario (consisting of a release quantity, release location, a specific stability class and wind speed, and a wind direction), the ignition sources encountered by the cloud are listed. Letting P_i represent the ignition probability of the ith ignition source to be encountered,

and assuming that area A contains the first k sources, the probability that the cloud has not yet ignited after covering the area A is given by:

$$\prod_{i=1}^{k}(1-P_i)=(1-P_1)(1-P_2)\ldots(1-P_k)$$

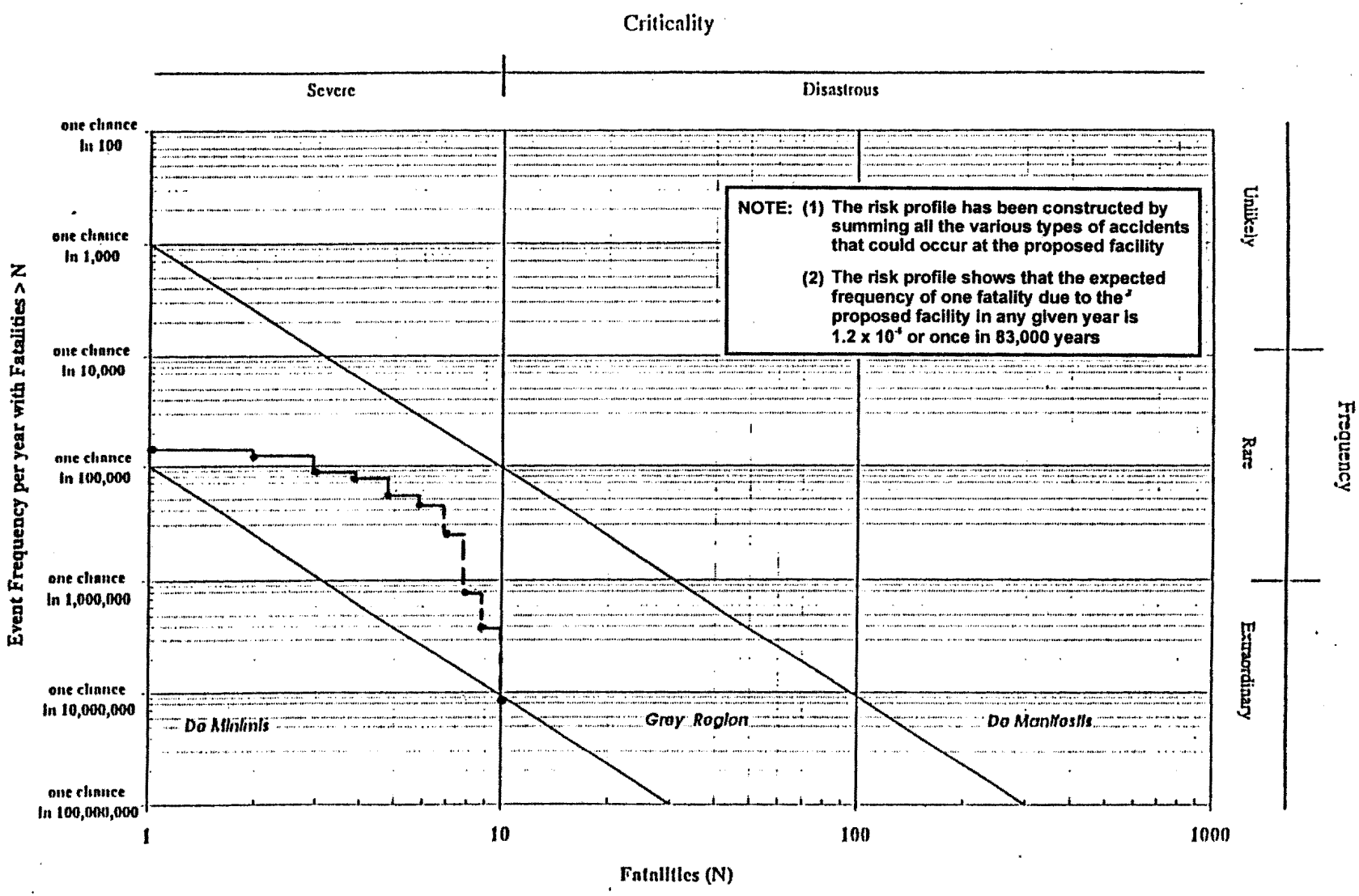
Uncertainties Associated with the Risk Profiles - There are many sources of uncertainty which can affect the accuracy of the risk profiles. These uncertainties deal with:

- Release frequency
- Release size
- Population impacts, including distribution and likelihood of fatality
- Behavior of the release (jet mixing versus passive dispersion)
- Accuracy of the hazard models
- Ignition sources and probabilities

The release frequencies and sizes are the most important contributors to overall uncertainty. The values chosen are conservative, i.e., they overstate rather than understate the risk. Changes in failure rates will directly influence the risk profile. A doubling of the event frequencies would double the probability of fatalities. Changes in the relative size of leaks and ruptures will influence the risk profile, but to a lesser extent. The assumptions on population distribution and ignition probability also influence the risk profiles, but are not as significant as the other sources of uncertainty.

Results of Analysis - The results of the consequence analysis are displayed on Figure 3-8. As can be seen by the figure, the risk profile for the proposed project lies in the grey region which is acceptable since the proposed project is equipped with extensive mitigation measures. It is emphasized here that the risk profile presents the expected frequency of fatalities occurring due to all the types of accidents that could occur at the proposed facility involving all the various pieces of equipment and operations. The risk profile shows that the expected frequency of a single fatality (the left-most point on the risk profile) in any given year is 1.2×10^{-5} (once in 83,000 years), while the expected frequency of ten fatalities (the right-most point) is 8.3×10^{-8} (once in 12 million years).

FIGURE 3-8
PROJECT RISK PROFILE



3.9 Transportation Risk Matrix

The potential risk of transportation of crude oil by truck and pipeline and natural gas by pipeline have been summarized using the criticality and frequency classification matrix defined in County of Santa Barbara Environmental Thresholds and Guidelines Manual and used in numerous EIRs in Santa Barbara County, including the Molino Gas Project EIR. The criticality and frequency classifications are presented in Table 3-3, while Figure 3-9 presents them in matrix format with shading added to show those boxes of the matrix classified as significant. The transportation-related accidents have been added to the appropriate boxes in the matrix and displayed as Figure 3-10. The following describes how the proper box was chosen for each mode of transportation.

Risk from Trucking

Section 3.4 presented information on the potential risk of transportation of crude oil by truck for one year during Phase 1 of the proposed project. Each tank truck will carry a maximum of 175 bbls of oil. Thus, according Figure 3-9, a tank truck release would be classified as "minor" according to spill size. The estimate frequency of tank truck release is 5.0×10^{-3} per year or once every 200 years (see Scenario 11a in Table 3-2). This would put the accident in the "unlikely" category which, when coupled with the minor consequence, would make the accident not significant. For a tank truck accident to present a public safety impact, the released oil would have to become ignited. The estimated frequency of occurrence of a spill with a fire has been calculated to be 5.0×10^{-4} per year or once every 2,000 years (see Scenario 11b in Table 3-2). This would place the accident in the "unlikely" category. If only the less than one mile section near the facility in Hermosa Beach is considered instead of the 10 mile trip, the estimated frequency of a spill with fire would be 5.0×10^{-5} per year or once every 20,000 years. This would put it in the "rare" category. A spill with fire would create a radiant heat footprint which could cause burns to the skin of exposed personnel. The radiant heat footprint would be limited to the area around the spill. People inside nearby homes or buildings would be protected from the radiant heat. People near the fire would instinctively move away from the heat. Thus, at most, such an accident could result in few minor injuries, putting it in the "minor" category. Thus, this accident would not be classified as significant. It is also pointed out here that this risk would only be present for one year.

Risk from Crude Oil Pipeline

The potential risk from the crude pipeline would be less than that of trucking because the estimated frequency of occurrence would be less and the maximum volume released would be less. The maximum volume that could be released would be 71 bbls, putting it in the "minor" category. The estimated frequency of a release is 1.3×10^{-4} per year, or once in 7,700 years (see Scenario 12a in Table 3-2), putting it in the "unlikely" category. Thus, the accident would not be classified as significant.

TABLE 3-3
CRITICALITY AND FREQUENCY CLASSIFICATIONS

CLASSIFICATION	DESCRIPTION OF PUBLIC SAFETY HAZARD
Negligible	No significant risk to the public, with no minor injuries
Minor	Small level or public risk with, at most, a few minor injuries
Major	Major level of public risk with up to 10 severe injuries
Severe	Severe public risk with up to 100 severe injuries or up to 10 fatalities
Disastrous	Disastrous public risk involving more than 100 severe injuries or more than 10 fatalities

TYPE	FREQUENCY	DESCRIPTION
Extraordinary	Less than once in one million years	An event whose occurrence is extremely unlikely
Rare	Between once in ten thousand years and once in one million years	An event which almost certainly would not occur during the project lifetime
Unlikely	Between once in a hundred and once in ten thousand years	An event which is not expected to occur during the project lifetime
Likely	Between once a year and once in one hundred years	An event which probably would occur during the project lifetime
Frequent	Greater than once a year	An event which would occur more than once a year on average

The estimated frequency of a release with fire is 1.3×10^{-5} per year or once in 77,000 years, putting it in the "rare" category. As with a truck release with fire, such an accident could cause, at most, a few minor injuries, putting it in the "minor" category. Such an accident would not be classified as significant.

Risk for Natural Gas Pipeline

It is possible for the 0.5-mile gas pipeline to become ruptured thereby releasing natural gas. The estimated expected frequency of such an event occurring is 2.3×10^{-4} or once every 4,300 years. The extent of the flammable gas hazard footprint and the potential consequences of the cloud would be a function of the size of the release, the location of the release relative to land use, the wind direction and speed, and stability condition. When all these variables are factored in, the probability of injuries from a gas pipeline release is less than 1.0×10^{-4} or once every 10,000 years, putting it in the "rare" category. Such an accident would result in some severe injuries due to burns, putting the accident in the "major" severity of consequence classification. Such an accident would not be classified as significant.

In summary, as can be seen by Figure 3-10, none of the transportation-related accidents would be classified as significant.

FIGURE 3-9
SEVERITY AND FREQUENCY MATRIX OF SIGNIFICANCE

		SEVERITY OF CONSEQUENCE				
		Negligible: No significant risk to the public, with no minor injuries; less than 10 bbls spilled	Minor: Small level of public risk, with at most a few minor injuries	Major: Major level of public risk with up to 10 severe injuries; 238-2,380 bbls spilled	Severe: Severe public risk with up to 100 severe injuries or up to 10 fatalities; 2,380 to 357,142 bbls spilled	Disastrous: Disastrous public risk involving more than 100 severe injuries or more than 10 fatalities; greater than 357,142 bbls spilled
FREQUENCY OF OCCURRENCE	Frequent: Greater than once a year					
	Likely: Between once a year and once in one hundred years					
	Unlikely: Between once in a hundred and once in ten thousand years					
	Rare: Between once in ten thousand years and once in a million years					
	Extraordinary: Less than once in a million years					

County defined as significant impacts

Source: County of Santa Barbara Department of Resource Management, Environmental Thresholds & Guidelines Manual, Amended 1990; Shell Hercules Platform EIR, 1983.

FIGURE 3-10
TRANSPORTATION RISK MATRIX

		SEVERITY OF CONSEQUENCE				
		Negligible: No significant risk to the public, with no minor injuries; less than 10 bbls spilled	Minor: Small level of public risk, with at most a few minor injuries	Major: Major level of public risk with up to 10 severe injuries; 238-2,380 bbls spilled	Severe: Severe public risk with up to 100 severe injuries or up to 10 fatalities; 2,380 to 357,142 bbls spilled	Disastrous: Disastrous public risk involving more than 100 severe injuries or more than 10 fatalities; greater than 357,142 bbls spilled
FREQUENCY OF OCCURRENCE	Frequent: Greater than once a year					
	Likely: Between once a year and once in one hundred years					
	Unlikely: Between once in a hundred and once in ten thousand years		Trucking accident with release and/or fire Crude oil pipeline release			
	Rare: Between once in ten thousand years and once in a million years		Crude oil pipeline release with fire	Gas pipeline accident		
	Extraordinary: Less than once in a million years					

County defined as significant impacts

Source: County of Santa Barbara Department of Resource Management, Environmental Thresholds & Guidelines Manual, Amended 1990; Shell Hercules Platform EIR, 1983.

The proposed project site is presently being used by the City of Hermosa Beach as a maintenance operations facility. These operations include a variety of activities such as repair and maintenance of vehicles; storage of materials, supplies and equipment; a workplace for city workers who repair and maintain facilities and equipment in the city; and for storage and painting of signs. It is natural that there would be some hazards associated with these activities and the purpose of this section is to describe these hazards and compare them with similar hazards presented by the proposed project.

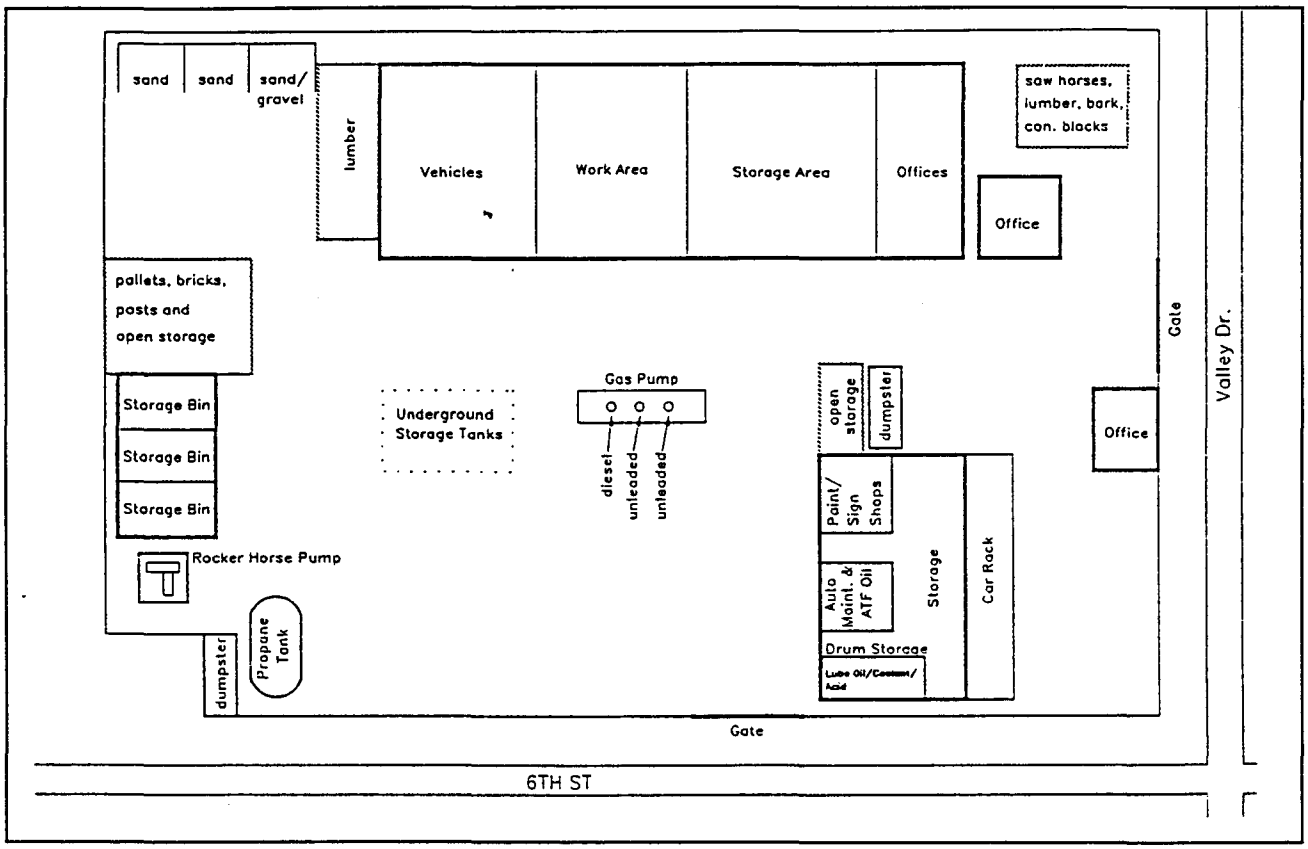
Figure 4-1 is a diagram of the present site usage and graphically depicts the location of materials and equipment throughout the facility. The following list indicates the major items on-site that could present a hazard to the surrounding community.

- 100 gallon propane tank
- 2 - 4000 gallon underground fuel storage tanks (gasoline)
- 1 - 2000 gallon underground fuel storage tank (diesel)
- Storage and use of flammable paints and solvents
- Storage and use of flammable compressed gases (acetylene)
- Storage and use of automotive lubricants (55 gallon drums)
- Flammable structures and other materials on-site

None of the items in the above list is unusual or presents a greater hazard than one would expect from a facility of this type. These types of hazards would probably exist to a greater or lesser degree at many industrial operations where a significant number of vehicles are serviced and maintained. The purpose of the comparison with the project hazards is to show that many of the hazards associated with the project will be similar to those presently existing at the site.

The significant off-site hazards associated with the materials presently on-site are thermal radiation associated with fire and blast overpressure associated with explosion of on-site materials. While there may be toxic materials on-site, the amounts are sufficiently small that a significant off-site hazard does not exist. In addition, it is possible that a fire could release some toxic materials from the stored paints and solvents. Because the volumes are limited, it is not expected that a significant off-site hazard would exist.

FIGURE 4-1
CITY OF HERMOSA BEACH
MAINTENANCE YARD



The potential explosion hazard associated with the proposed project results from a thermal load on an NGL liquids storage tank and resulting BLEVE. The risk analysis has determined this to be a very low probability event and extensive damage would only occur in close proximity to the site. The proposed NGL liquids tank could have a maximum of 118 gals of NGL in storage. There presently exists a propane storage tank on the site with a maximum capacity of 100 gals. The same scenario that would cause the proposed NGL liquids tank to undergo a BLEVE would cause the existing propane tank to BLEVE. The resulting overpressures would essentially be the same. In addition, present maintenance operations utilize compressed flammable gases such as acetylene which have similar potentials for explosion. Thus, the present hazard of an explosion associated with fire is very similar to that which would be expected from the proposed new facility.

Thermal radiation associated with fire is a hazard associated with the present facility as well as the new facility. For the new facility, this hazard is associated with a crude oil fire that could occur at the facility, as described earlier in the report. The probability of this fire is quite low and the facility has been designed to contain any spilled oil and restrict the occurrence of fire. The existing facility contains many flammable materials as well as flammable structures. Because of the number of diverse maintenance operations that occur on-site and the many

different flammable materials on-site, there is a greater probability of fire on the present site than would be found at the proposed facility. Several of the present operations such as welding and cutting use active torches that could ignite materials and cause a fire. The changing nature of the materials and equipment on-site make it difficult to provide an exact comparison of the hazard region however, the hazards associated with a fire at the current site are at least as great as those associated with the proposed facility and may be greater.

The final hazard for the present site is associated with the transfer of gasoline to the site from trucks. While the new facility would transport oil from the site in trucks for a period of time, crude oil is not as volatile as the gasoline that is presently being transported to the site. There would be a greater number of vehicular trips containing crude than are presently used to refill the underground gasoline tanks. The present trucking hazard is significantly lower than a commercial gasoline service station because the usage is much smaller. Both the present and proposed usages would have some hazard from trucking of flammable materials.

In summary, the hazards associated with the present facility are similar to those that would result from the new facility. The new facility is not introducing any new hazards to the area. They all presently exist because of the present operations at the site.

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PROJECT SITE AND VICINITY MAP

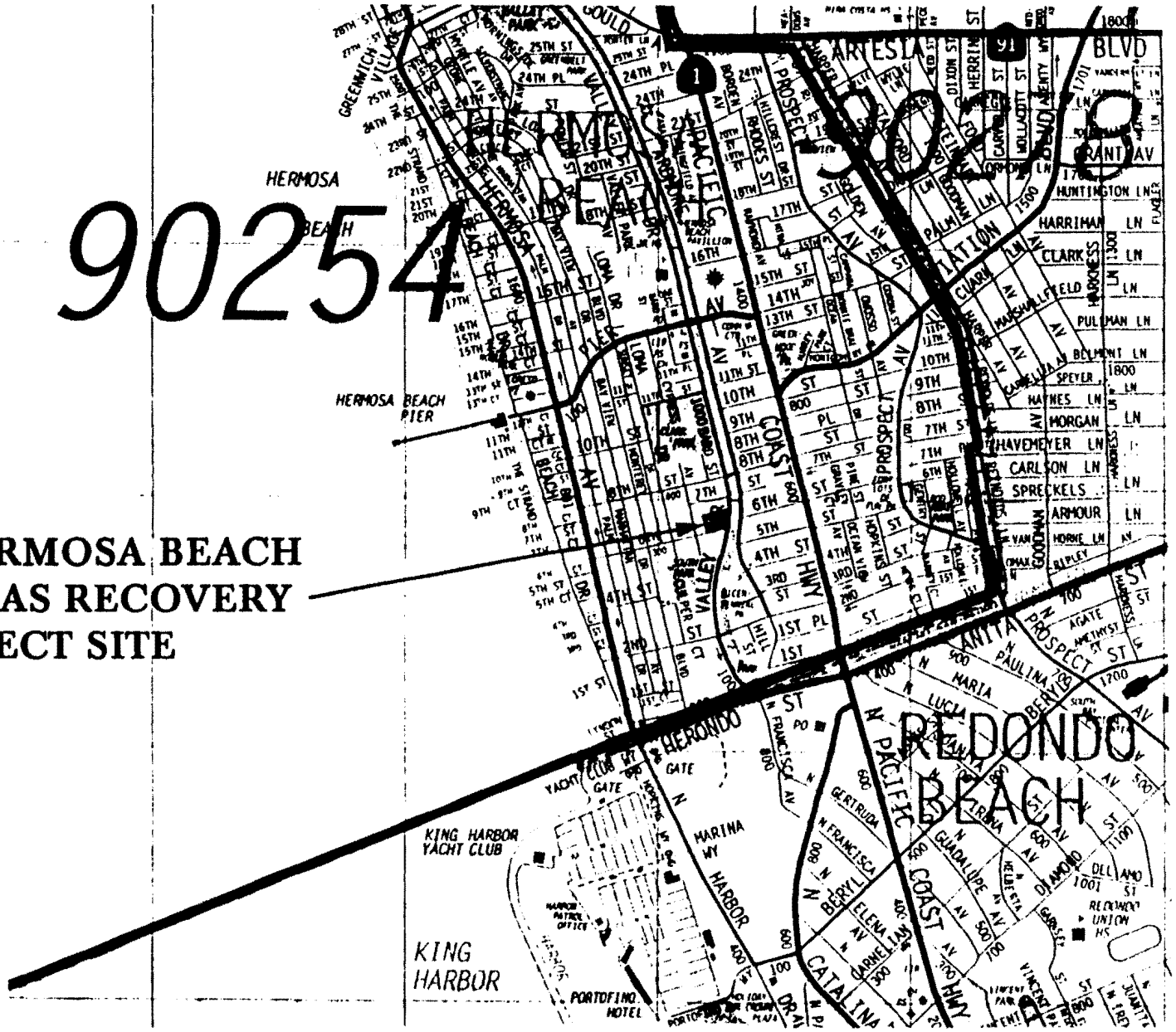

EXHIBIT NO.	8
APPLICATION NO.	E-96-28
Macpherson Oil	

Proposed Development Site

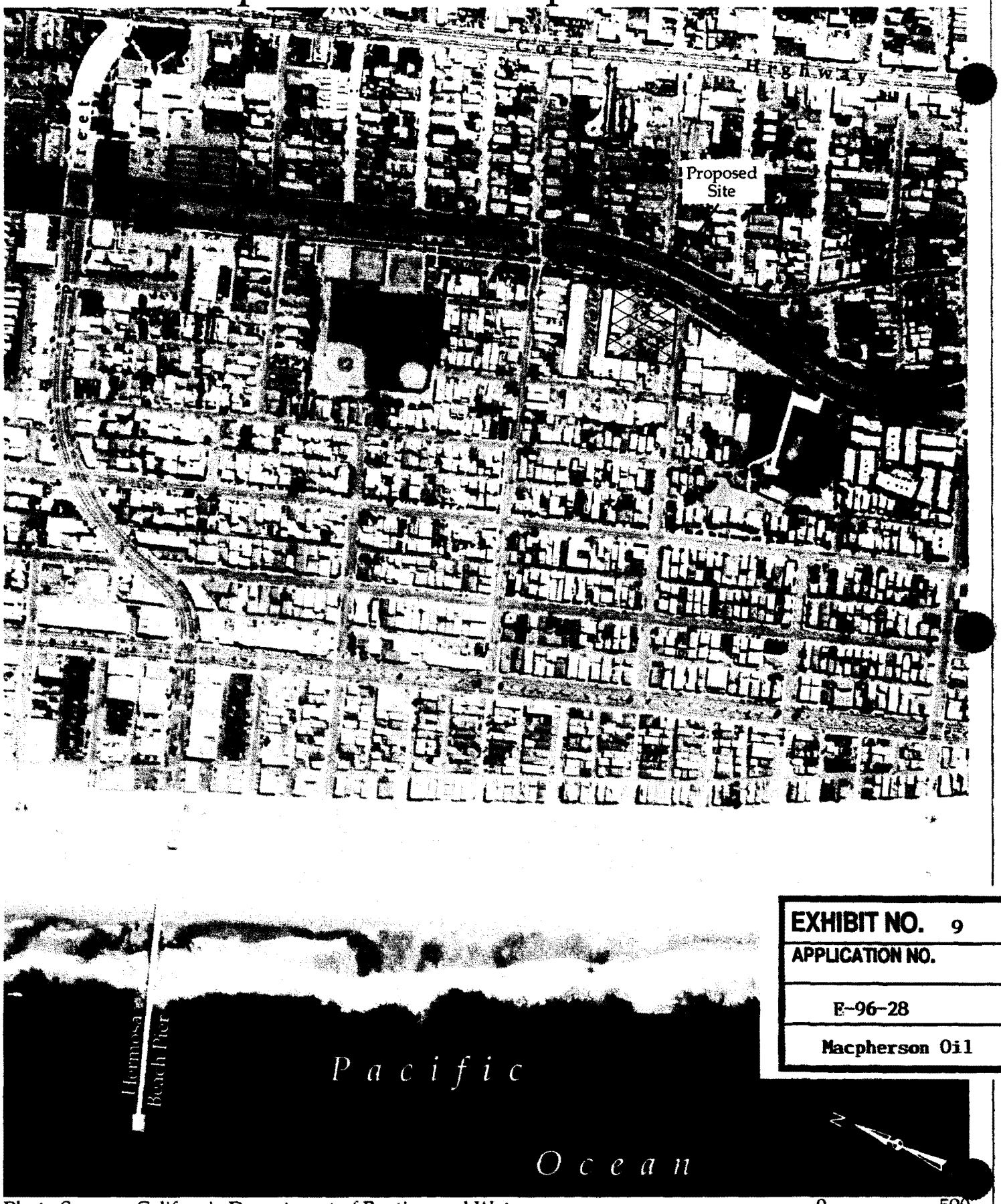

EXHIBIT NO. 9
APPLICATION NO.
E-96-28
Macpherson Oil

Photo Source: California Department of Boating and Waterways,
Original Scale 1:12000, 4/14/93.
All locations approximate. For illustrative purposes only.

0 500
feet

California Coastal Commission
Technical Services Division

JAN 7 97

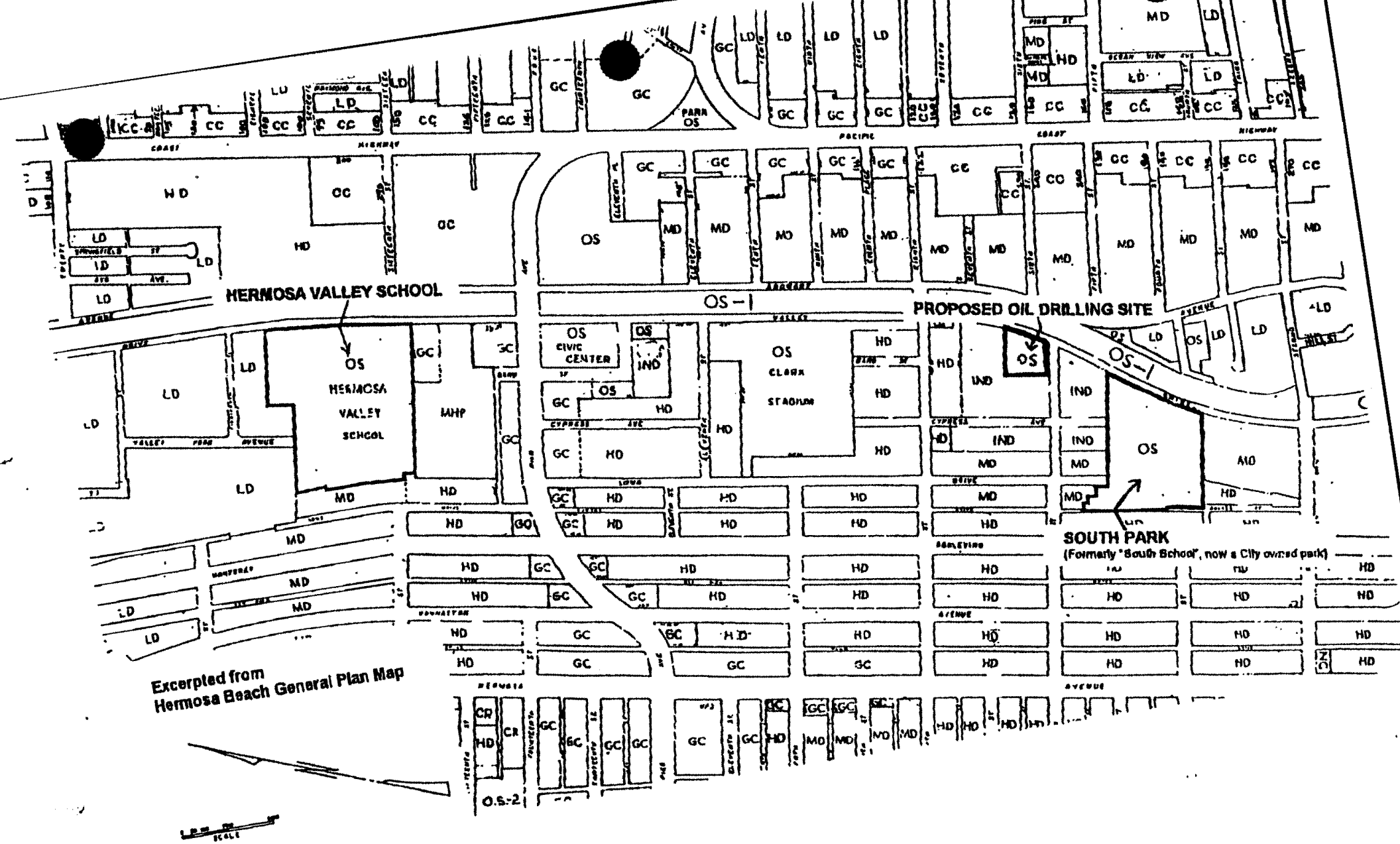

EXHIBIT NO. 10
APPLICATION NO.
E-96-23
Macpherson

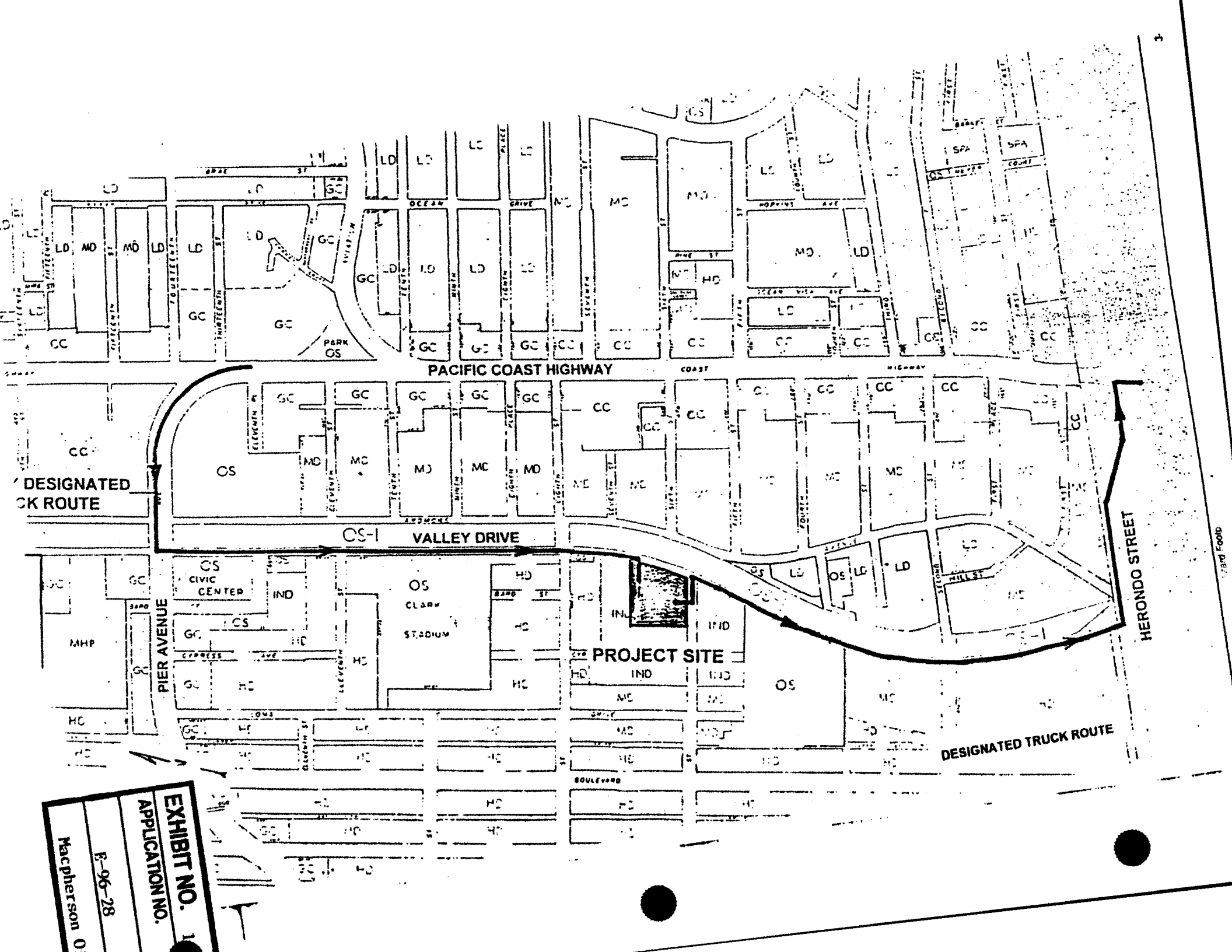

EXHIBIT NO. 1
APPLICATION NO.
E-96-28
Macpherson Oil

E-96-28 MACPHERSON OIL COMPANY
PROJECT PLANS

A-0.01 - Title Sheet
A-0.02 - Drawing Sheet Index

A-1.01 - Test Phase, Conceptual Site Plan, Drilling
A-1.02 - Test Phase, Conceptual Site Plan, Testing
A-1.03 - Test Phase, Elevations, West and North
A-1.04 - Test Phase, Elevations, East and South
A-1.05 - Test & Final Phase, East & West Cross Sections
A-1.06 - Test Phase, Drilling Rig Elevation
A-1.10 - Test Phase, Conceptual Hydrogen Sulfide Detection

A-2.01 - Final Phase, Conceptual Site Plan, Drilling
A-2.02 - Final Phase, Conceptual Site Plan, Production
A-2.03 - Final Phase, Elevations, East & South
A-2.04 - Final Phase, Elevations, West & North
A-2.05 - Typical Oil Production Tank Plans
A-2.06 - Final Phase, Southerly Elevation w/ Drilling Rig
A-2.07 - Final Phase, Easterly Elevation w/ Drilling Rig
A-2.08 - Final Phase, West Elevation w/ Drilling Rig
A-2.09 - Final Phase, North Elevation w/ Drilling Rig
A-2.11 - Final Phase, Conceptual Hydrogen Sulfide Detection Plan

L-1.01 - Landscape, Test Phase, Planting
L-1.02 - Landscape, Test Phase, Irrigation
L-2.01 - Landscape, Final Phase, Planting
L-2.02 - Landscape, Final Phase, Irrigation
L-2.03 - Landscape, Final Phase, Elevations Sixth Street and Valley Drive
L-2.04 - Landscape, Final Phase, Elevations North-West and South-West

C-1.0 - Grading General Notes
C-1.1 - Existing Conditions - Boundary & Topographic Survey
C-1.2 - Site Demolition, Test Phase
C-1.3 - Rough Grading, Test Phase
C-1.4 - Erosion Control Plan

C-2.1 - Precise Grading, Final Phase

M-1.02 - Gas Shipping Facilities P&ID
M-2.08 - Piping & Instrumentation Diagram

EXHIBIT NO. 12
APPLICATION NO.
E-96-28
Macpherson Oil

Figure 2-2 Process Flow
Figure 2-3 Process Flow

PID-1 Test Phase P&ID
PID-2 Test Phase P&ID
PID-3 Test Phase P&ID
PID-4 Test Phase P&ID
PID-10 Final Phase P&ID
PID-11 Final Phase P&ID
PID-12 Final Phase P&ID
PID-13 Final Phase P&ID

R.N. Hacker's Exhibits
- Structure Section
- Contours Top Upper Main
- Contours Top Lower Main
- Contours Del Amo
- Contours Schist Conglomerate

Geologic Maps
- Exploration Phase
- Development Phase
- Alternate Drill Sites Undrained Reserves

Boring Location Plan - Plate A

HERMOSA BEACH OIL DEVELOPMENT PROJECT

555 SIXTH STREET

HERMOSA BEACH, CALIFORNIA

DEVELOPER:

MACPHERSON OIL COMPANY

REVISIONS TO APPROVED PLANS	ORIGINAL DRAWING	PLANS PREPARED BY:	PLANS PREPARED FOR:	HERMOSA BEACH PROJECT TITLE SHEET	
△ NO. / BY / NO. / DATE / DESCRIPTION / APPROVAL BY MOC / MGO / DATE	CAD File No. HBTLTSHT Date Drawn FEB 27, 1997 Drawn By MGO Revised MAR 3, 1997 Designed Approved	DAVID E. GAUTSCHY, INC. 2698 JUNIPERO AVE. # 201B SIGNAL HILL, CALIFORNIA 90806 (562) 427-0419	MACPHERSON OIL COMPANY 2716 OCEAN PARK BLVD., NO. 3080 SANTA MONICA, CALIFORNIA 90405	555 SIXTH STREET, HERMOSA BEACH, CA.	Dwg Scale N.A. Plot Date MAR 3, 1997 **A-0.01** Sheet of

PROJECT PARTICIPANTS

PROPERTY OWNER	CITY OF HERMOSA BEACH CIVIC CENTER 1315 VALLEY DRIVE HERMOSA BEACH, CA. 90254
CONTRACT OPERATOR	MACPHERSON OIL COMPANY 2716 OCEAN PARK BLVD., NO. 3080 SANTA MONICA, CA. 90405
PROJECT MANAGEMENT	DAVID E. GAUTSCHY, INC. 2698 JUNIPERO AVE., NO. 201B SIGNAL HILL, CA. 90806
MECHANICAL ENGINEER	DGJ, LIMITED 1458 AVENIDA LA POSTA ENCINITAS, CA. 92024
CIVIL ENGINEER	ASHBA ENGINEERS, LTD. 2698 JUNIPERO AVE., NO. 201B SIGNAL HILL, CA. 90806
LANDSCAPE ARCHITECT	CRAIG WEBER & ASSOCIATES 790 REDONDO AVENUE LONG BEACH, CA. 90804
STRUCTURAL ENGINEER	BAUMANN ENGINEERING 567 SAN NICHOLAS DR., NO. 104 NEWPORT BEACH, CA. 92660

DRAWING SHEET INDEX

A-0.01	TITLE SHEET
A-0.02	LIST OF DRAWING SHEETS & PARTICIPANTS
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A-1.02	TEST PHASE, CONCEPTUAL SITE PLAN, TESTING
A-1.03	TEST PHASE ELEVATIONS WEST AND NORTH
A-1.04	TEST PHASE ELEVATIONS EAST AND SOUTH
A-1.05	TEST & FINAL PHASE, EAST & WEST CROSS-SECTIONS
A-1.06	TEST PHASE, SOUTHERLY ELEV. W/ DRILLING RIG
A-2.01	FINAL PHASE, CONCEPTUAL SITE PLAN, DRILLING
A-2.02	FINAL PHASE, CONCEPTUAL SITE PLAN, PRODUCTION
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A-2.04	FINAL PHASE ELEVATIONS WEST AND NORTH
A-2.05	TYPICAL OIL PRODUCTION TANK PLANS
A-2.06	FINAL PHASE, SOUTHERLY ELEV. W/ DRILLING RIG
A-2.07	FINAL PHASE, EASTERLY ELEV. W/ DRILLING RIG
A-2.08	FINAL PHASE, WEST ELEVATION W/ DRILLING RIG
A-2.09	FINAL PHASE, NORTH ELEVATION W/ DRILLING RIG
L-1.01	LANDSCAPE, TEST PHASE PLANTING
L-1.02	LANDSCAPE, TEST PHASE, IRRIGATION
C-1.0	GRADING GENERAL NOTES
C-1.1	EXISTING CONDITIONS
C-1.2	SITE DEMOLITION, TEST PHASE
C-1.3	ROUGH GRADING, TEST PHASE
C-1.4	EROSION CONTROL PLAN
C-2.1	PRECISE GRADING, FINAL PHASE

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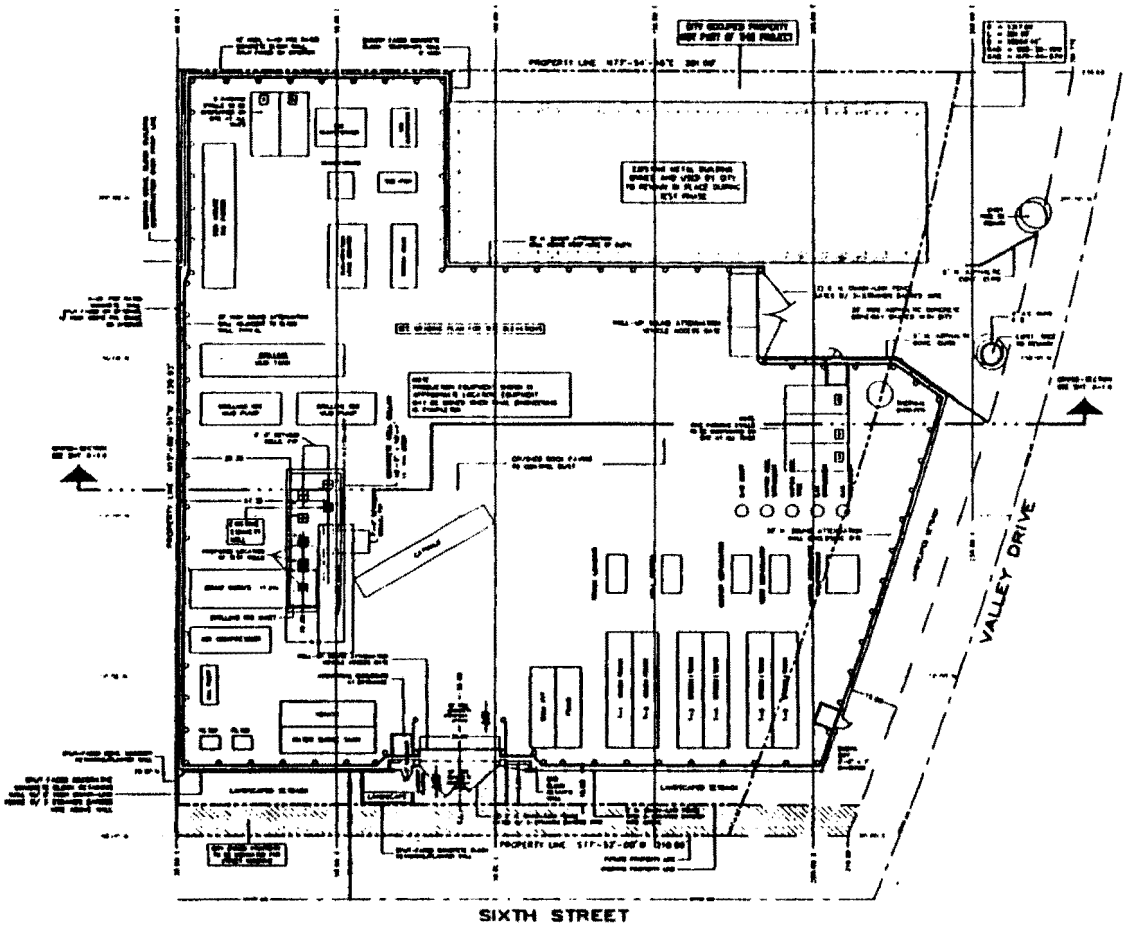

CITY OF HERMOSA BEACH
OIL DEVELOPMENT PROJECT
MACPHERSON OIL COMPANY

TEST PHASE, CONCEPTUAL SITE PLAN, DRILLING

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Dwg Scale 1" = 20'-0"
Plot Date MAR 18, 1997

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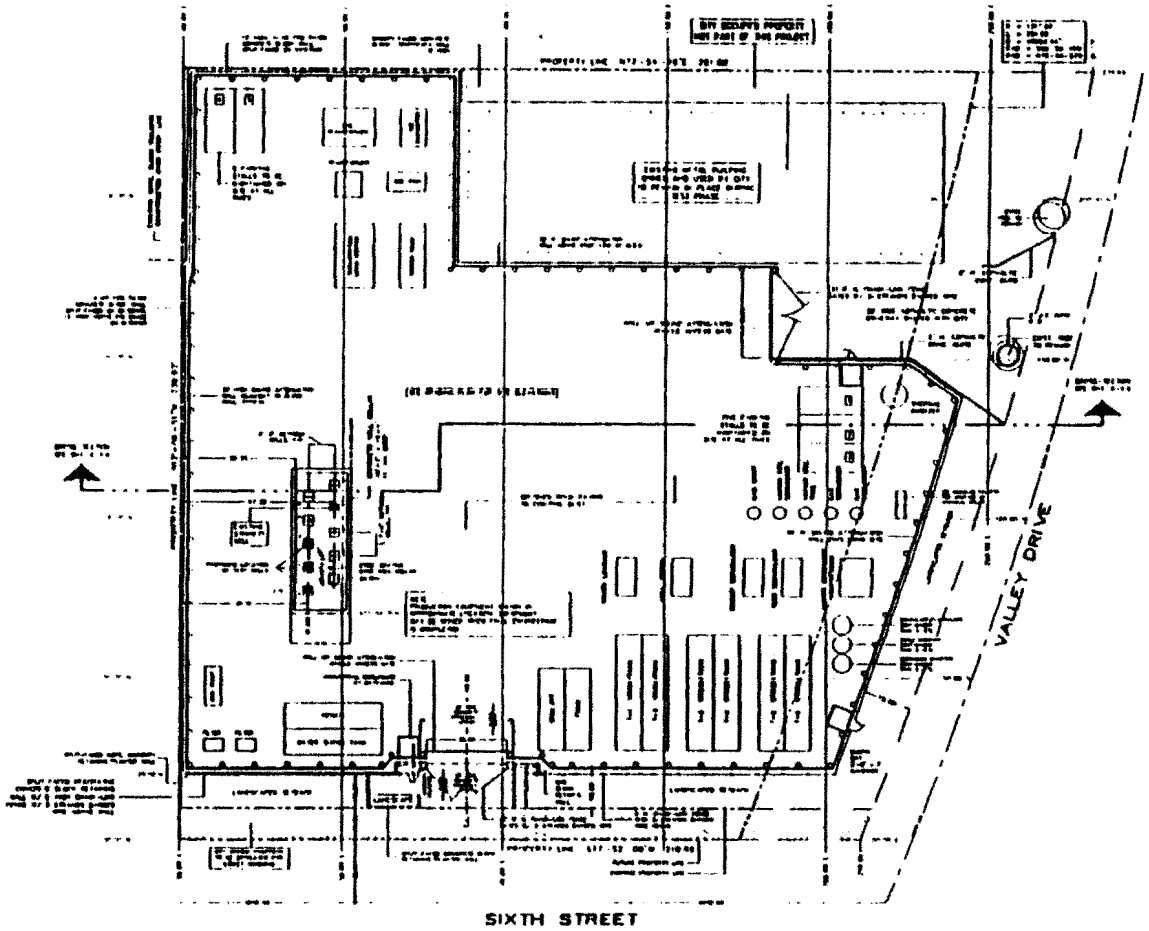
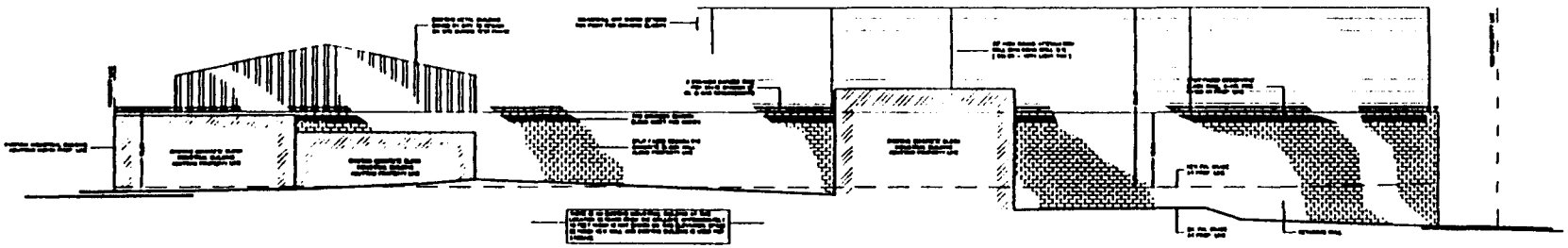


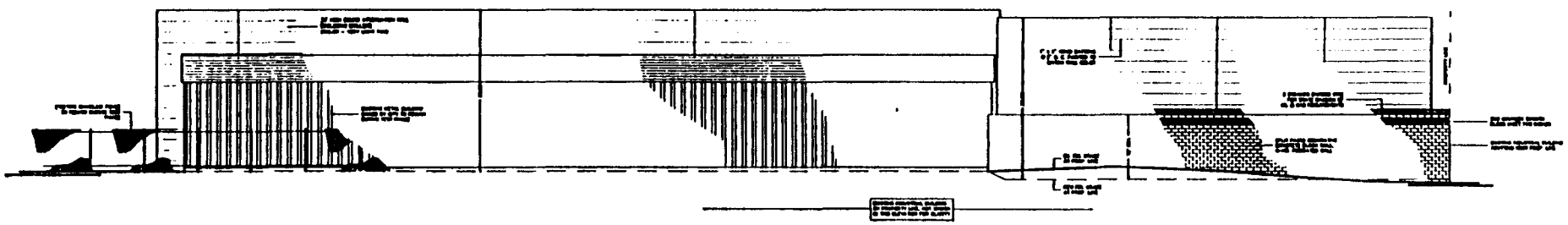
CITY OF HERMOSA BEACH
OIL DEVELOPMENT PROJECT
MACPHERSON OIL COMPANY

TEST PHASE, CONCEPTUAL SITE PLAN, TESTING

REVISIONS TO APPROVED PLANS	ORIGINAL DRAWING	PLANS PREPARED BY	PLANS PREPARED FOR		
DATE / DESCRIPTION / APPROVAL BY	CAD File No. / Date Drawn / Drawn By / Revised / Revised	DAVID E. GAUTSCHY, INC. 2698 JUNIPERO AVE. # 201B SIGNAL HILL, CALIFORNIA 90806 (562) 427-0419	MACPHERSON OIL COMPANY 2716 OCEAN PARK BLVD., NO. 3080 SANTA MONICA, CALIFORNIA 90405	HERMOSA BEACH PROJECT TEST PHASE PRODUCTION FACILITY SITE PLAN 555 SIXTH STREET, HERMOSA BEACH, CA.	A-1.02



WEST ELEVATION



NORTH ELEVATION

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Date Drawn	NOV 27, 1996
Drawn By	DEG
Revised	JAN 31, 1997
Revised	MAR 10, 1997
Approved	

PLANS PREPARED BY:
DAVID E. GAUTSCHY, INC.
2698 JUNIPERO AVE. # 201B
SIGNAL HILL, CALIFORNIA 90806
(562) 427-0419

PLANS PREPARED FOR:
MACPHERSON OIL COMPANY
2716 OCEAN PARK BLVD., NO. 3080
SANTA MONICA, CALIFORNIA 90405

HERMOSA BEACH PROJECT
TEST PHASE
ELEVATIONS, PRODUCTION FACILITY
555 SIXTH STREET, HERMOSA BEACH, CA.

Dwg Scale 1" = 10'-0"
Plot Date MAR 10, 1997

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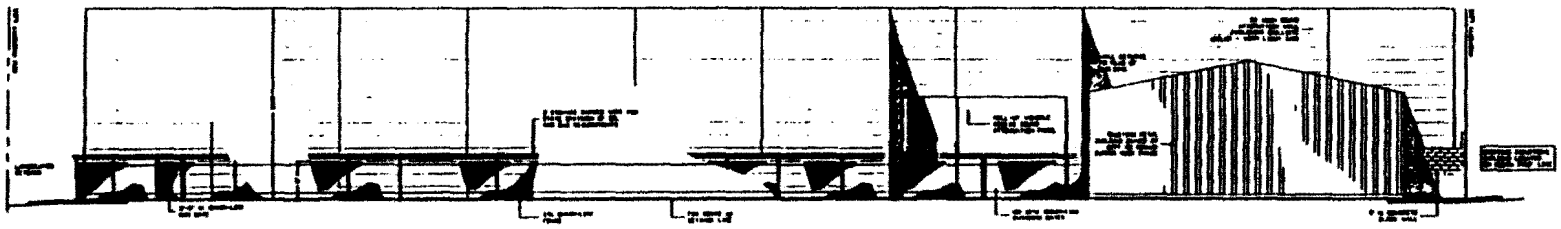
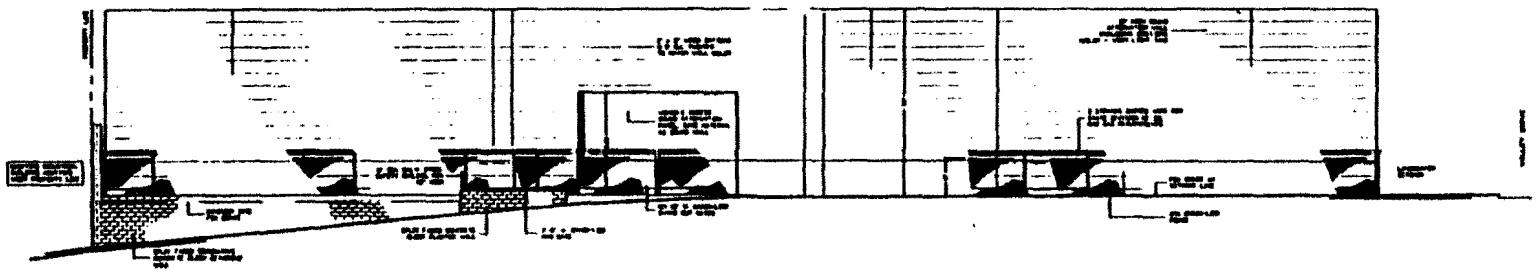


EASTERLY ELEVATION



SOUTHERLY ELEVATION

REVISIONS TO APPROVED PLANS	ORIGINAL DRAWING	PLANS PREPARED BY:	PLANS PREPARED FOR:	HERMOSA BEACH PROJECT
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Dwg. Scale 1" = 10'-0"
Plot Date FEB 27, 1997

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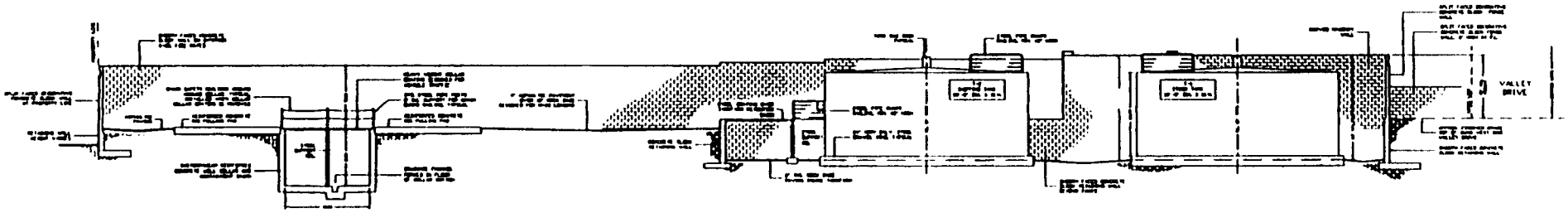
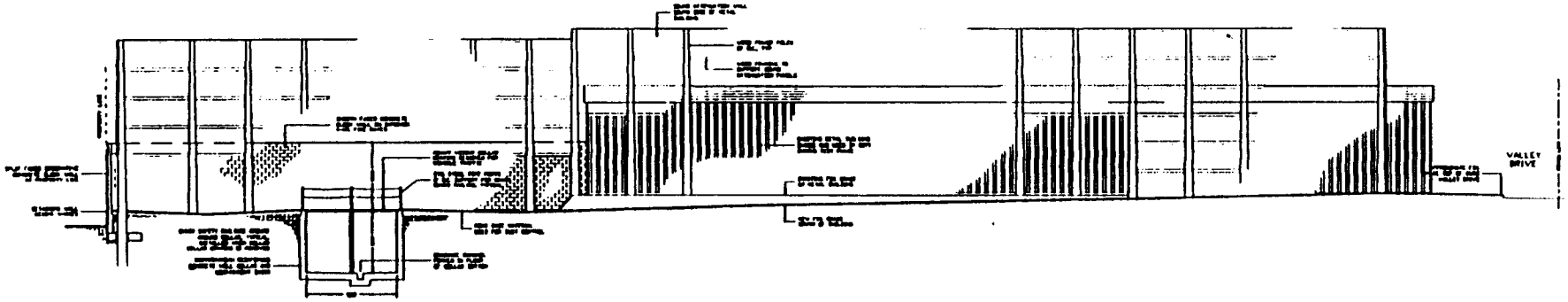
Sheet 4



EAST - WEST CROSS SECTION, VIEW NORTHERLY



EAST - WEST CROSS SECTION, VIEW NORTHERLY

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CAD File No.	HBC101
Date Drawn	NOV 27, 1996
Drawn By	DEG
Revised	JAN 30, 1997
Revised	MAR 10, 1997
Approved	

PLANS PREPARED BY:
DAVID E. GAUTSCHY, INC.
2698 JUNIPERO AVE. # 201B
SIGNAL HILL, CALIFORNIA 90806
(562) 427-0419

PLANS PREPARED FOR:
MACPHERSON OIL COMPANY
2716 OCEAN PARK BLVD., NO. 3080
SANTA MONICA, CALIFORNIA 90405

HERMOSA BEACH PROJECT

TEST PHASE - CROSS SECTION
FINAL PHASE - CROSS SECTION
555 SIXTH STREET, HERMOSA BEACH, CA.

Dwg Scale 1" = 10'-0"
Plot Date MAR 10, 1997

A-1.05

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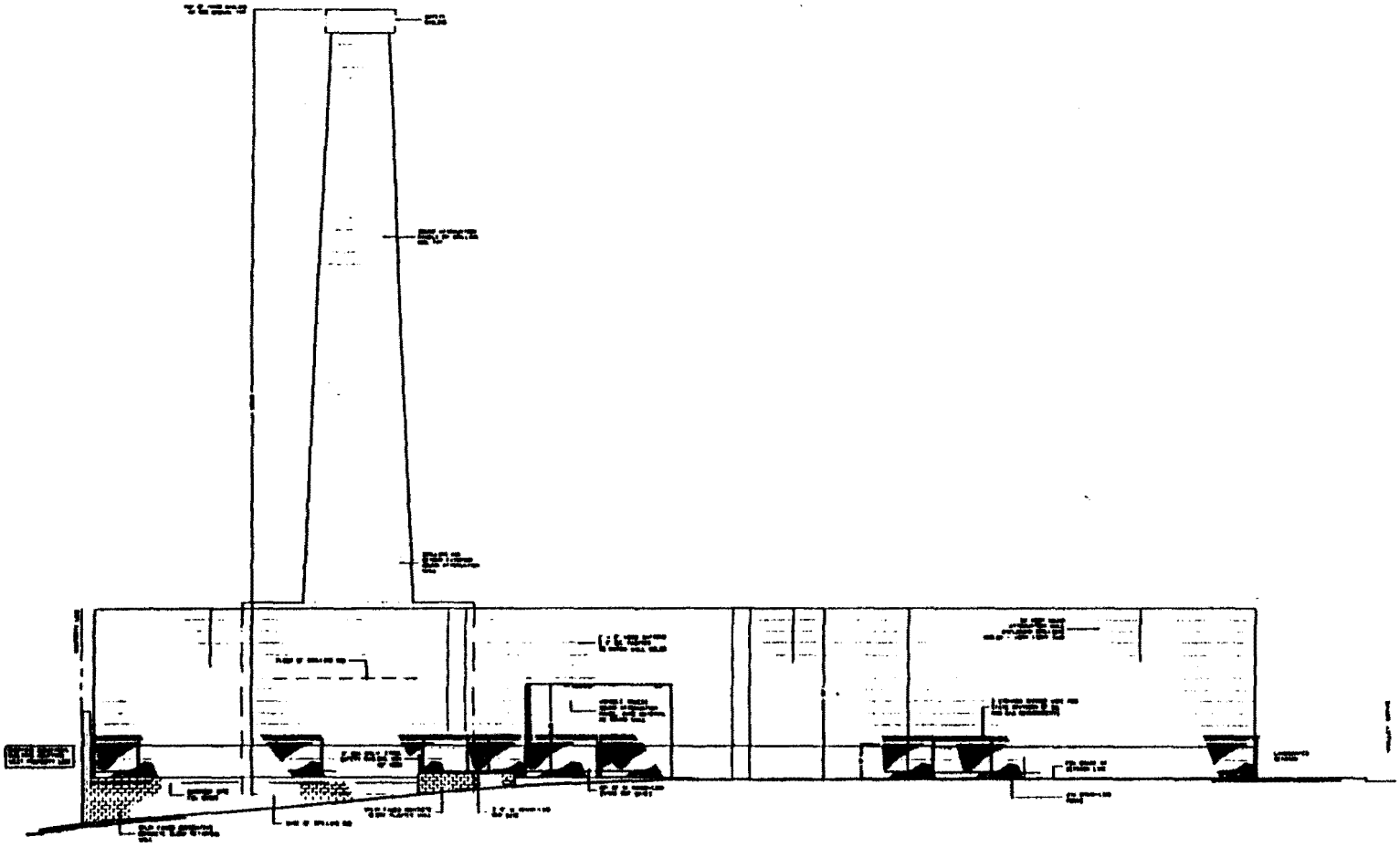

SOUTHERLY ELEVATION

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NO. / DATE / DESCRIPTION / APPROVAL	CAD File No. MBELEV00	DAVID E. GAUTSCHY, INC.	MACPHERSON OIL COMPANY	TEST PHASE
	Date Drawn: MAR 7, 1997	2699 JUNIPERO AVE. # 2019	2716 OCEAN PARK BLVD., NO. 3080	DRILLING RIG ELEVATION
	Drawn By: RES	SIGNAL HILL, CALIFORNIA 90806	SANTA MONICA, CALIFORNIA 90405	555 SIXTH STREET, HERMOSA BEACH, CA.
	Revised	(562) 427-0419		
	Revised			
	Approved			

Dwg. Scale: 1" = 10'-0"
Plot Date: MAR 7, 1997

A-1.06

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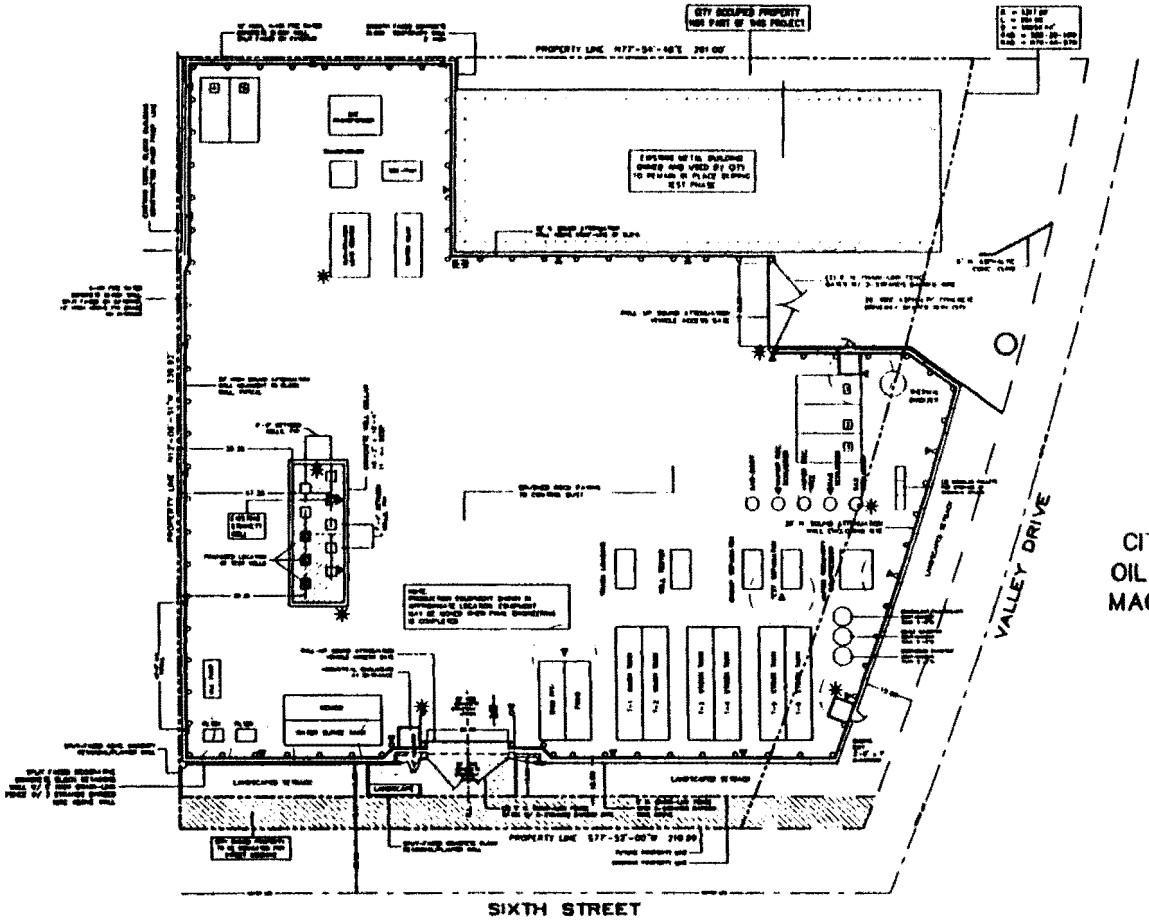

H2S EQUIPMENT LEGEND

H2S EQUIPMENT LIST, TYPICAL

CITY OF HERMOSA BEACH
OIL DEVELOPMENT PROJECT
MACPHERSON OIL COMPANY

TEST PHASE, CONCEPTUAL HYDROGEN SULFIDE DETECTION PLAN

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REVISIONS TO APPROVED PLANS					
No	DATE	DESCRIPTION	APPROVAL BY MOC	DEG	DATE
1	7/28/97	MONITORING EQUIPMENT DESCRIPTION			

ORIGINAL DRAWING	
CAD File No.	HDSP078
Date Drawn	JULY 10, 1997
Drawn By	DEG
Revised	
Revised	
Approved	

PLANS PREPARED BY:
DAVID E. GAUTSCHY, INC.
2698 JUNIPERO AVE. # 201B
SIGNAL HILL, CALIFORNIA 90806
(562) 427-0419

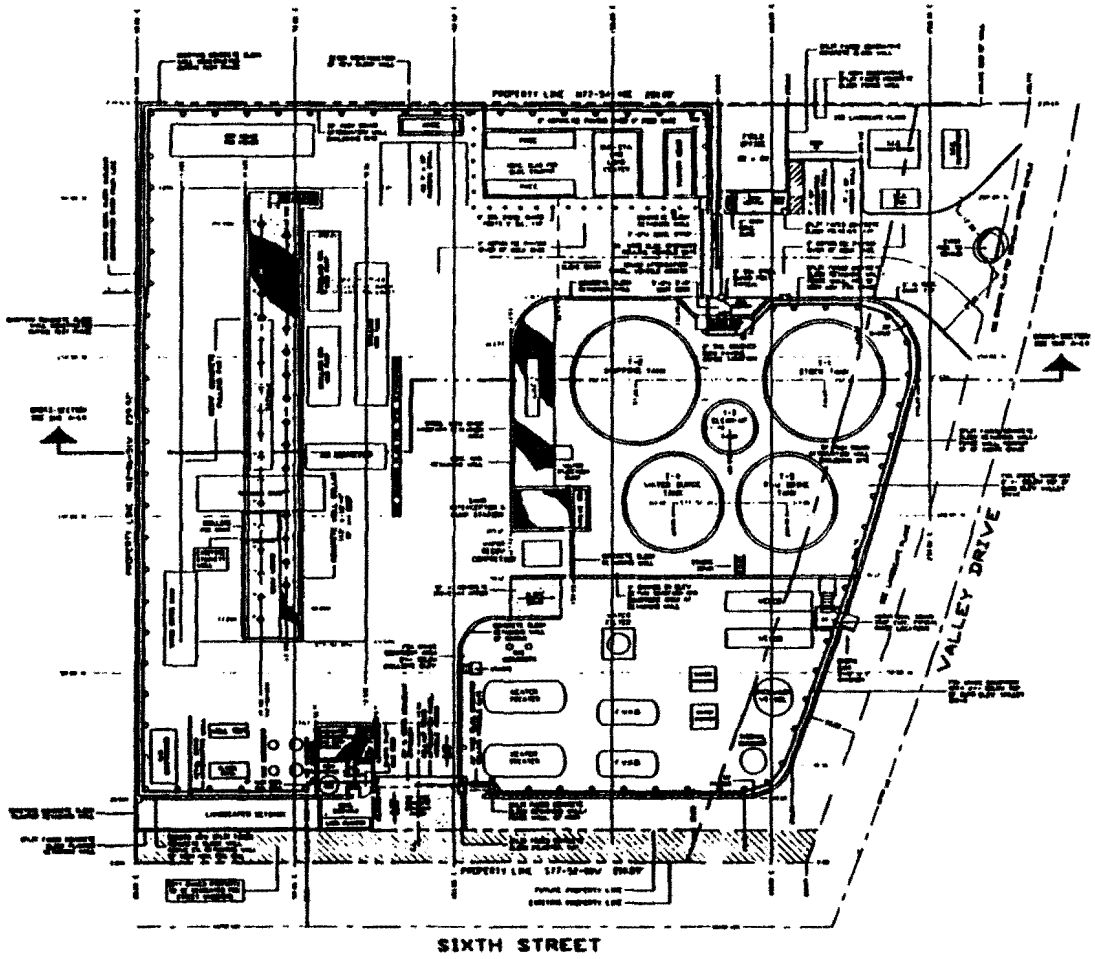
PLANS PREPARED FOR:
MACPHERSON OIL COMPANY
2716 OCEAN PARK BLVD., NO. 3080
SANTA MONICA, CALIFORNIA 90405

HERMOSA BEACH PROJECT
TEST PHASE
H2S DETECTION SYSTEM PLAN
555 SIXTH STREET, HERMOSA BEACH, CA.

Dwg Scale 1" = 20'-0"
Plot Date JULY 10, 1997

A-1.10

Sheet of



STORAGE TANK SPECIFICATIONS:

CITY OF HERMOSA BEACH
OIL DEVELOPMENT PROJECT
MACPHERSON OIL COMPANY

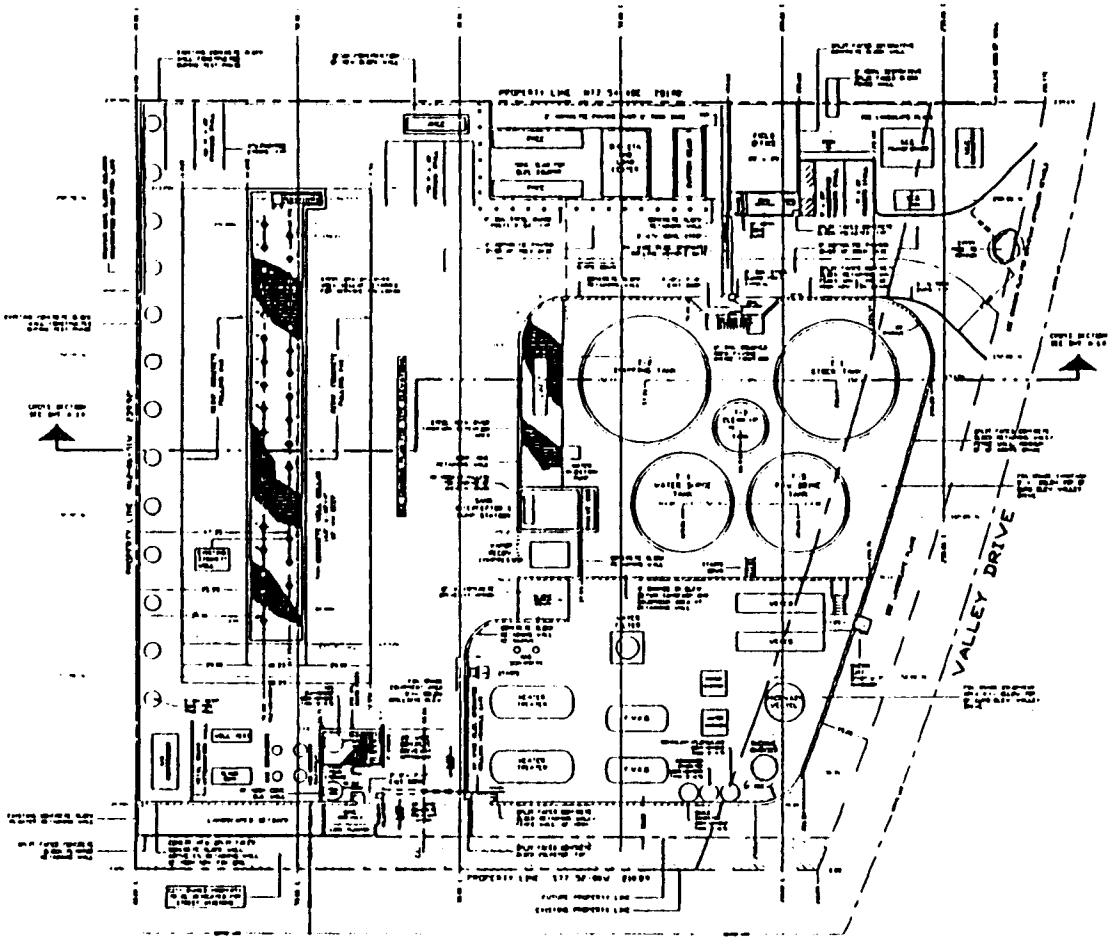
FINAL PHASE, CONCEPTUAL SITE PLAN, DRILLING

REVISIONS TO APPROVED PLANS	ORIGINAL DRAWING	PLANS PREPARED BY:	PLANS PREPARED FOR:	HERMOSA BEACH PROJECT
△ NO. / BY / DATE / DESCRIPTION / APPROVAL BY MOC / BOP / DATE	CAD File No. HOMPO410 Date Drawn: DEC 12, 1996 Drawn By: DEG Revised: FEB 20, 1997 Revised: MAR 7, 1997 Approved:	DAVID E. GAUTSCHY, INC. 2698 JUNIPERO AVE. # 201B SIGNAL HILL, CALIFORNIA 90806 (562) 427-0419	MACPHERSON OIL COMPANY 2716 OCEAN PARK BLVD., NO. 3080 SANTA MONICA, CALIFORNIA 90405	FINAL PHASE PRODUCTION FACILITY SITE PLAN 555 SIXTH STREET, HERMOSA BEACH, CA.

Dwg. Scale: 1" = 20'-0"
Plot Date: MAR 10, 1997

A-2.01

Sheet of



STORAGE TANK SPECIFICATIONS:

CITY OF HERMOSA BEACH
OIL DEVELOPMENT PROJECT
MACPHERSON OIL COMPANY

FINAL PHASE, CONCEPTUAL SITE PLAN, PRODUCTION

REVISIONS TO APPROVED PLANS						
△	NO	DATE	DESCRIPTION	APPROVAL BY MOC	DEO	DATE

ORIGINAL DRAWING	
CAD File No.	HBSPO118
Date Drawn	DEC 12, 1996
Drawn By	DEG
Revised	MAR 10, 1997
Revised	JUL 1 6, 1997
Approved	

PLANS PREPARED BY:
DAVID E. GAUTSCHY, INC.
2698 JUNIPERO AVE. # 2018
SIGNAL HILL, CALIFORNIA 90806
(562) 427-0419

PLANS PREPARED FOR:
MACPHERSON OIL COMPANY
2716 OCEAN PARK BLVD., NO. 3080
SANTA MONICA, CALIFORNIA 90405

HERMOSA BEACH PROJECT
FINAL PHASE
PRODUCTION FACILITY SITE PLAN
555 SIXTH STREET, HERMOSA BEACH, CA.

Dwg Scale 1" = 20'-0"
Plot Date MAR 10, 1997

A-2.02

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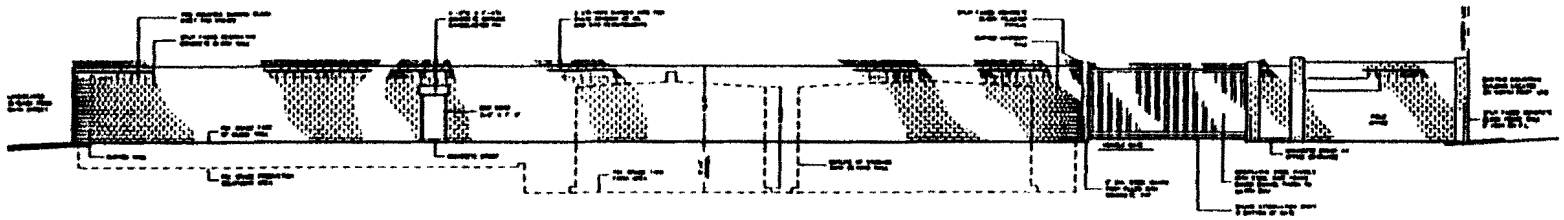
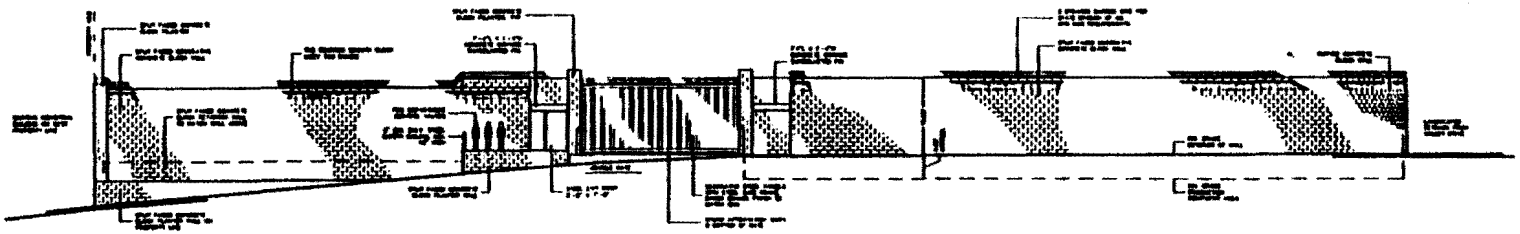
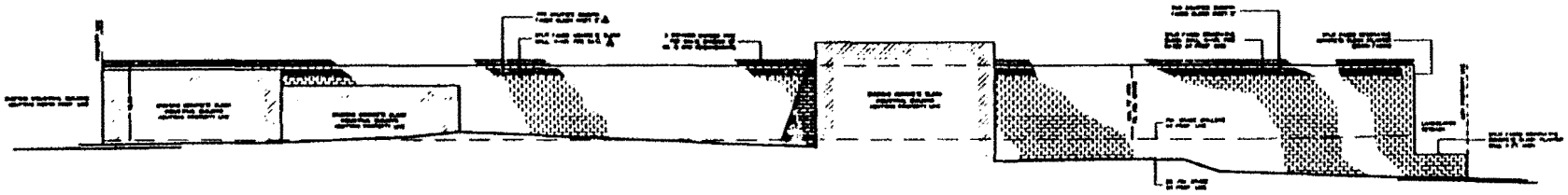


EASTERLY ELEVATION

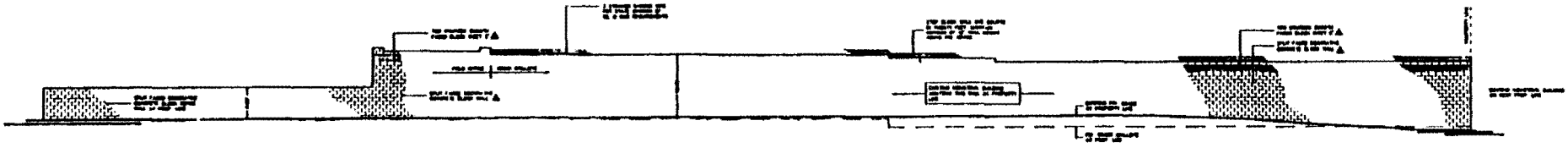


SOUTHERLY ELEVATION

REVISIONS TO APPROVED PLANS	ORIGINAL DRAWING	PLANS PREPARED BY.	PLANS PREPARED FOR:	HERMOSA BEACH PROJECT	
△ NO. / DATE / DESCRIPTION / APPROVAL BY MOC / BB / DATE	CAD File No. HBEL2.VOH Date Drawn NOV 27, 1997 Drawn By DEG Reviewed FEB 27, 1997 Revised Approved	DAVID E. GAUTSCHY, INC. 2698 JUNIPERO AVE. # 201B SIGNAL HILL, CALIFORNIA 90806 (562) 427-0419	MACPHERSON OIL COMPANY 2716 OCEAN PARK BLVD., NO. 3080 SANTA MONICA, CALIFORNIA 90405	FINAL PHASE ELEVATIONS, PRODUCTION FACILITY 555 SIXTH STREET, HERMOSA BEACH, CA.	Dwg Scale 1" = 10'-0" Plot Date April 3, 1997 A-2.03 Sheet of



WEST ELEVATION



NORTH ELEVATION

REVISIONS TO APPROVED PLANS					
△ NO	BY NO	DATE	DESCRIPTION	APPROVAL BY MOC	DEG	DATE
1		3/1/97	ALL LEXROP BLF TO BE SPLIT FACED			

ORIGINAL DRAWING	
CAD File No.	HBELEV02
Date Drawn	NOV 27, 1996
Drawn By	DEG
Revised	JAN 27, 1997
Revised	
Approved	

PLANS PREPARED BY:

DAVID E. GAUTSCHY, INC.
2698 JUNIPERO AVE. # 201B
SIGNAL HILL, CALIFORNIA 90806
(562) 427-0418

PLANS PREPARED FOR:

MACPHERSON OIL COMPANY
2716 OCEAN PARK BLVD., NO. 3080
SANTA MONICA, CALIFORNIA 90405

HERMOSA BEACH PROJECT

FINAL PHASE

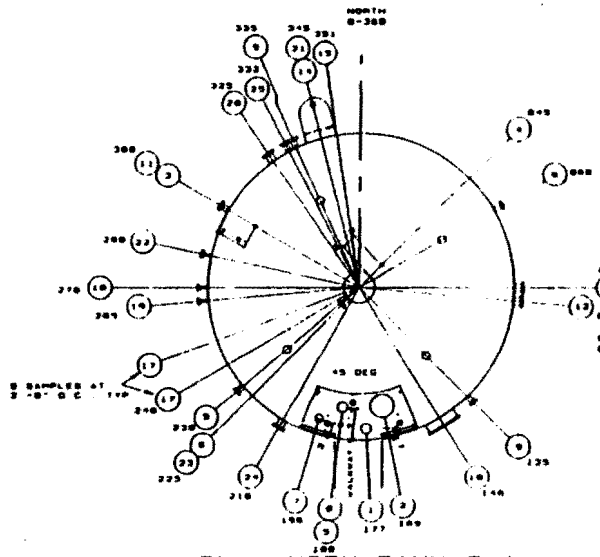
ELEVATIONS, PRODUCTION FACILITY

555 SIXTH STREET, HERMOSA BEACH, CA.

Dwg Scale 1" = 10'-0"
Plot Date JAN 7, 1997

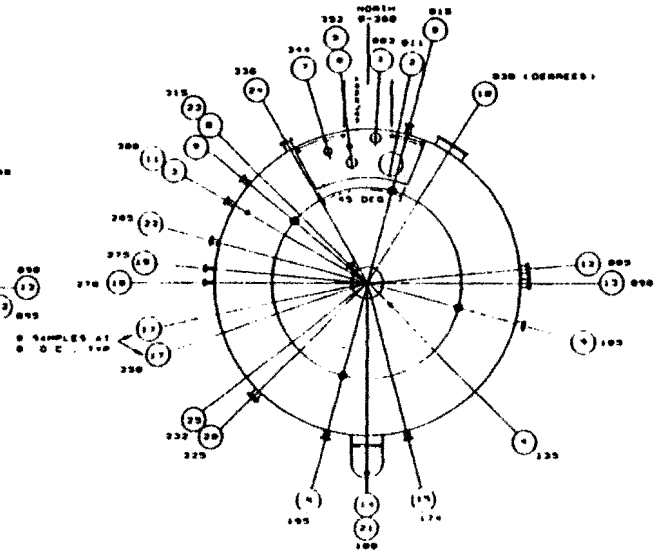
A-2.04

Sheet of



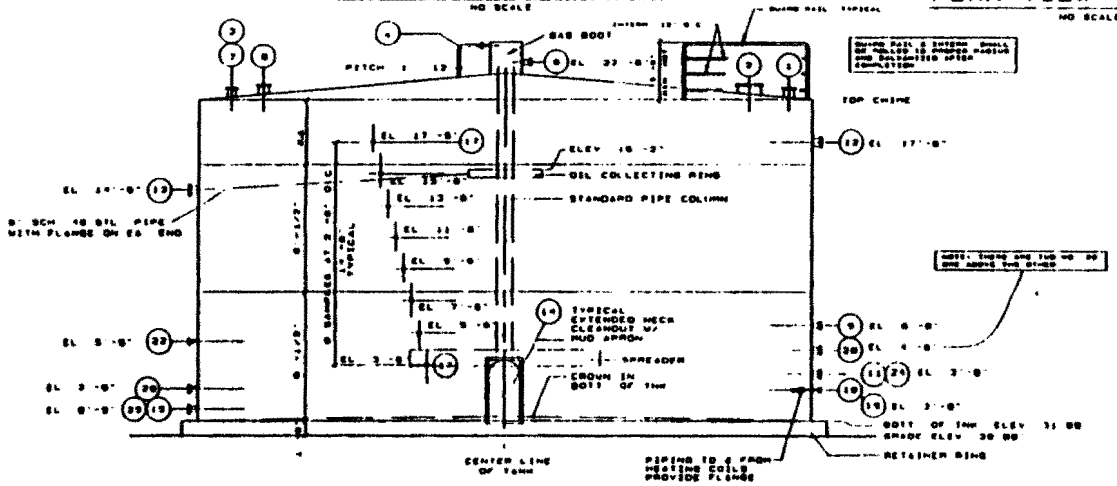
PLAN VIEW TANK T-1

NO SCALE



PLAN VIEW TANK T-2

NO SCALE



T-1 & T-2 WASH TANK

4,000 BBL NOM 38'-7 5/8" ID. 16'-1" SHELL HGT

SCALE 1/4" = 1'-0"

WASH TANK T-1 & T-2

NO.	QTY.	SIZE	TYPE	SERVICE	REMARKS
1	1	8"	FLG	GAUGE HATCH	FOR VAREC F10 [illegible]
2	1	20"	FLG	ROOF MANWAY	FOR VAREC F10 3211-PV
3	1	1-1/2	CPLG	GAS BLEED	
4	1	3"	FLG	GAS CONNECTION	
5	1	4"	FLG	HIGH LIQUID LEVEL ALARM	FOR FISHER LEVEL SWITCH
6	1	4"	FLG	OIL IN	
7	1	8"	FLG	VAPOR RECOVERY	
8	1	8"	FLG	PRESSURE - VACUUM VALVE	FOR VAREC F10 3010-01
9	1	8"	FLG	ANODE	WITH BLIND FLANGED
10	1	24"	-	CLEAN OUT	
11	1	4"	FLG	WATER LEG	
12	1	6"	FLG	OIL OVERFLOW	
13	1	8"	FLG	OIL OUT	
14	1	24"	FLG	CLEAN - OUT WITH APRON	
15	1	4"	FLG	DRAIN	WITH DETAIL 'D'
16	-	-	-	NOT USED	
17	1	1"	CPLG	SAMPLE	
18	1	3"	FLG	HOT WATER	
19	1	3"	FLG	HOT WATER	
20	1	8"	FLG	RECYCLE OUT	WITH DETAIL 'A'
21	1	4"	FLG	APRON DRAIN	
22	1	1"	CPLG	TEMPERATURE INDICATOR	
23	1	-	SUPPORT	PIPE SUPPORT BRACKETS	SEE ITEM #8
24	1	8"	FLG	SPARE	
25	1	4"	FLG	WATER OUT	WITH DETAIL 'B'

TYPICAL OIL PRODUCTION TANKS

SIMILAR TO PROPOSED TANKS, HERMOSA BCH. PROJECT

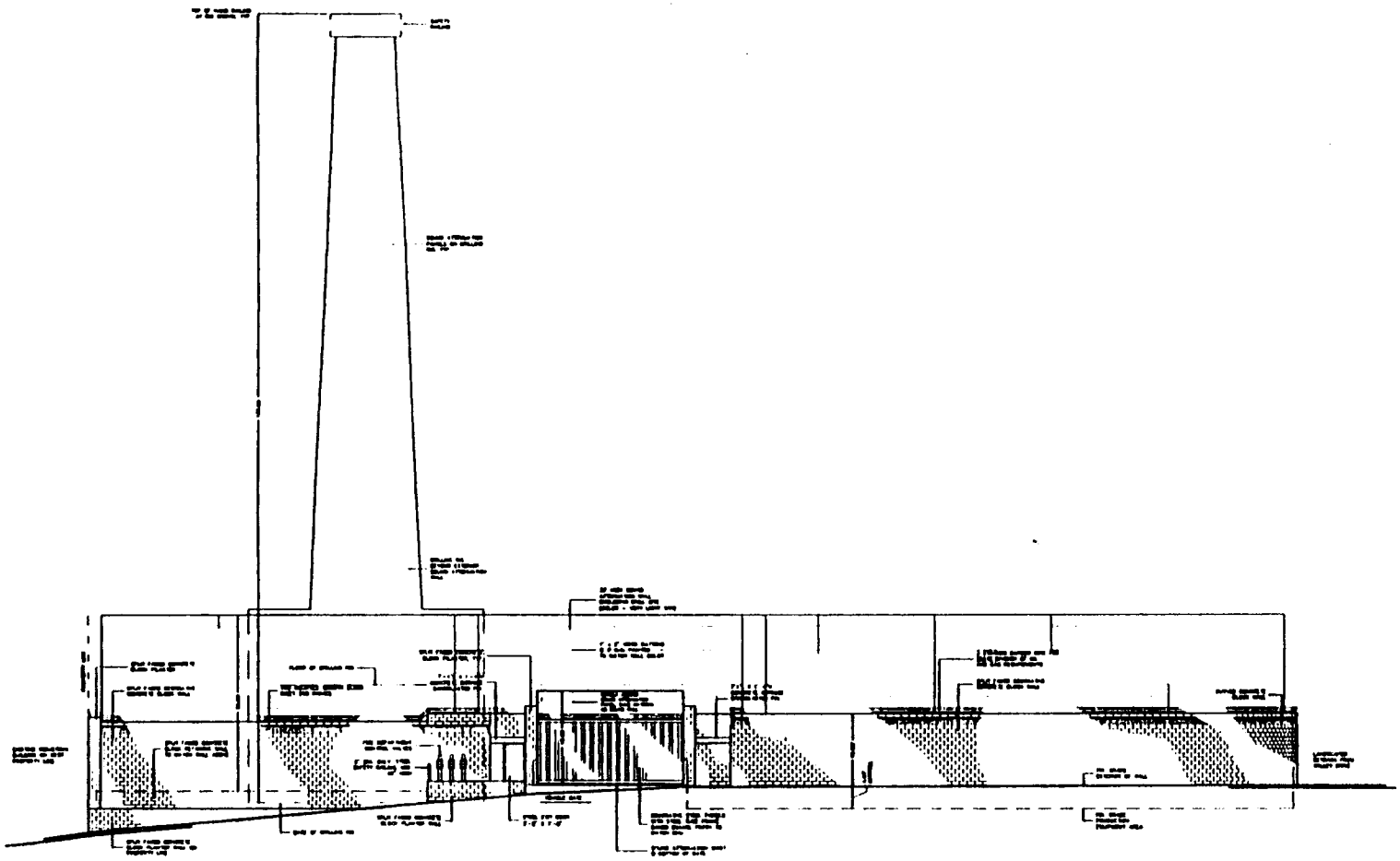
DEGI

REVISIONS TO APPROVED PLANS	ORIGINAL DRAWING	PLANS PREPARED BY:	PLANS PREPARED FOR:	HERMOSA BEACH PROJECT
△ NO. / BY NO. / DATE / DESCRIPTION / APPROVAL BY MGC / BEB / DATE	CAD File No. HOTANK Date Drawn APR 21, 1993 Drawn By BEG Revised MAR 3, 1997 Revised Approved	DAVID E. GAUTSCHY, INC. 2698 JUNIPERO AVE. # 201B SIGNAL HILL, CALIFORNIA 90806 (562) 427-0419	MACPHERSON OIL COMPANY 2716 OCEAN PARK BLVD., NO. 3080 MONICA, CALIFORNIA 90405	TYPICAL OIL PRODUCTION TANK 556 SIXTH STREET, HERMOSA BEACH, CA.

Dwg. Date 9-00 BG
Plot Date MAR 3, 1997

A-2.05

Sheet of



SOUTHERLY ELEVATION

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REVISIONS TO APPROVED PLANS						
△NO	BY NO	DATE	DESCRIPTION	APPROVAL BY MOC	DEG	DATE

ORIGINAL DRAWING	
CAD File No.	HBELEV06
Date Drawn	MAR 7, 1997
Drawn By	DEG
Revised	
Revised	
Approved	

PLANS PREPARED BY:
DAVID E. GAUTSCHY, INC.
2698 JUNIPERO AVE. # 201B
SIGNAL HILL, CALIFORNIA 90806
(562) 427-0419

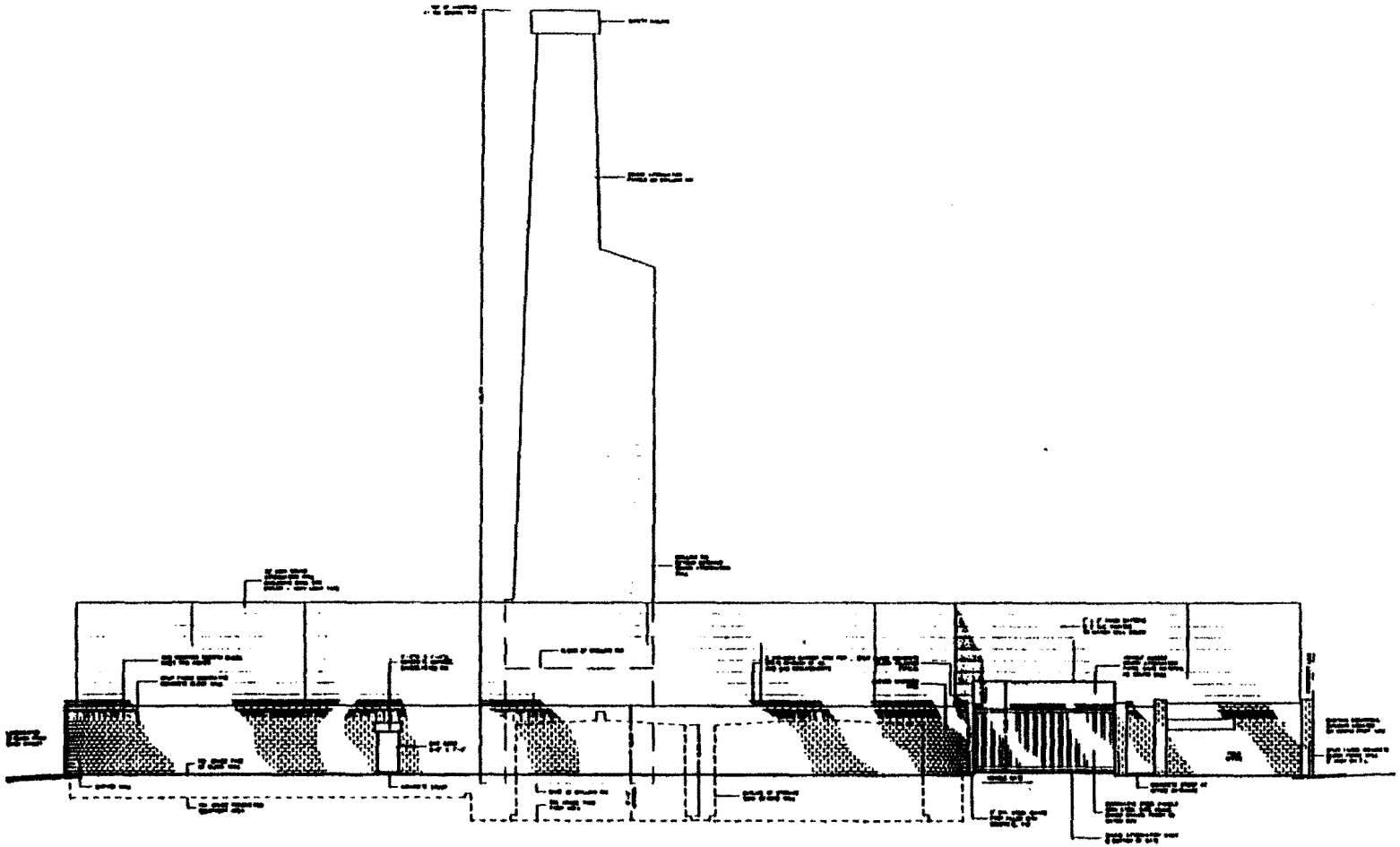
PLANS PREPARED FOR:
MACPHERSON OIL COMPANY
2716 OCEAN PARK BLVD., NO. 3080
SANTA MONICA, CALIFORNIA 90405

HERMOSA BEACH PROJECT
FINAL PHASE
DRILLING RIG ELEVATION
555 SIXTH STREET, HERMOSA BEACH, CA.

Dwg Scale 1" = 10'-0"
Plot Date MAR 7, 1997

A-2.06

Sheet of



EASTERLY ELEVATION

REVISIONS TO APPROVED PLANS						
△ NO	DATE NO	DATE	DESCRIPTION	APPROVAL BY MOC	BG	DATE

ORIGINAL DRAWING	
CAD File No.	HBDLEV08
Date Drawn	MAR 7, 1997
Drawn By	BG
Revised	
Revised	
Approved	

PLANS PREPARED BY:

DAVID E. GAUTSCHY, INC.
2698 JUNIPERO AVE. # 201B
SIGNAL HILL, CALIFORNIA 90806
(562) 427-0419

PLANS PREPARED FOR:

MACPHERSON OIL COMPANY
2716 OCEAN PARK BLVD., NO. 3080
SANTA MONICA, CALIFORNIA 90405

HERMOSA BEACH PROJECT

FINAL PHASE

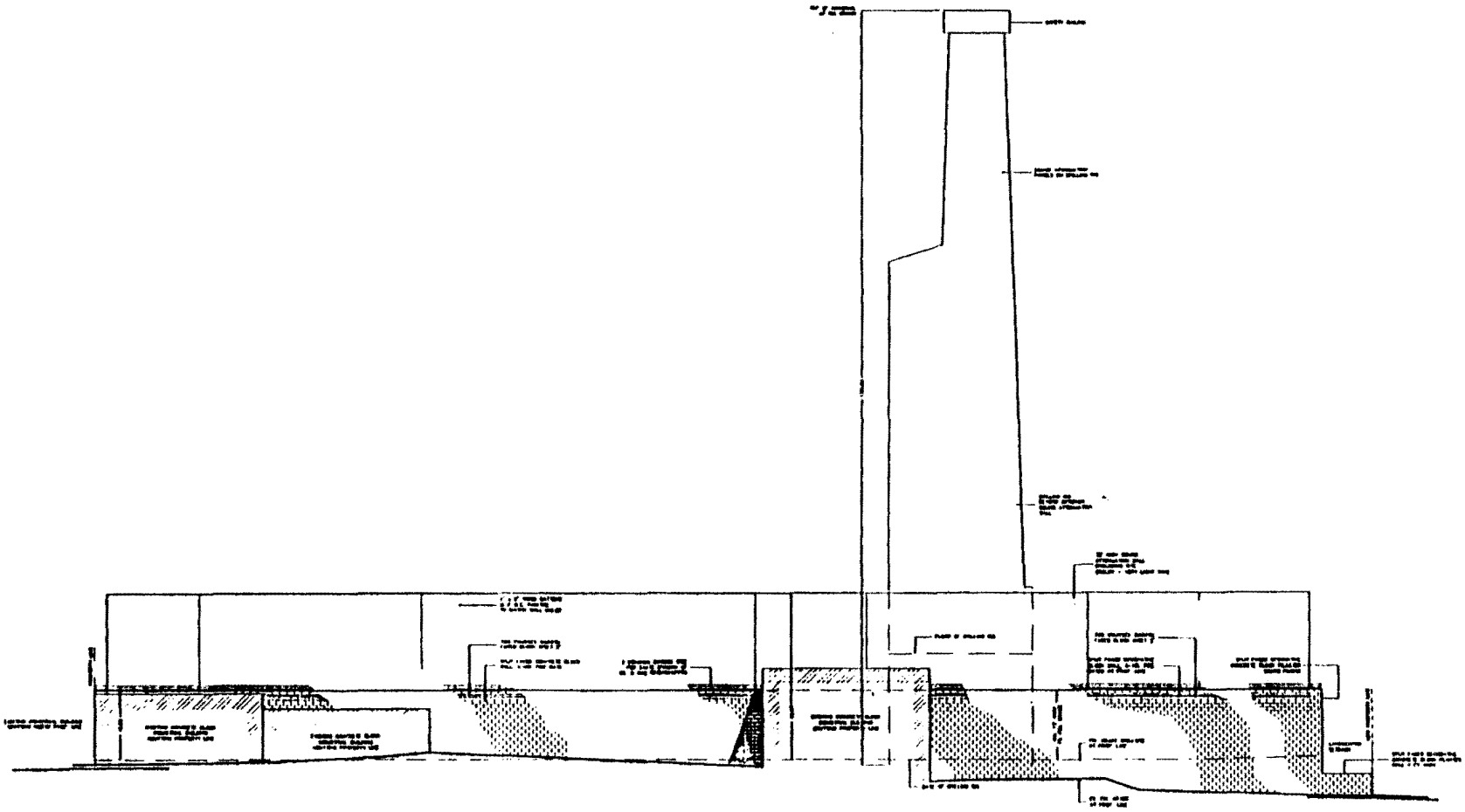
DRILLING RIG ELEVATION

555 SIXTH STREET, HERMOSA BEACH, CA.

Dwg. Scale: 1" = 10'-0"
Plot Date: MAR 7, 1997

A-2.07

Sheet of



WEST ELEVATION

REVISIONS TO APPROVED PLANS						
△ NO	APP NO	DATE	DESCRIPTION	APPROVAL BY ACOC	MCB	DATE

ORIGINAL DRAWING	
CAD File No	HBELEV07
Date Drawn	MAR 7, 1997
Drawn By	DEG
Revised	
Revised	
Approved	

PLANS PREPARED BY:

DAVID E. GAUTSCHY, INC.
2698 JUNIPERO AVE. # 201B
SIGNAL HILL, CALIFORNIA 90806
(562) 427-0419

PLANS PREPARED FOR:

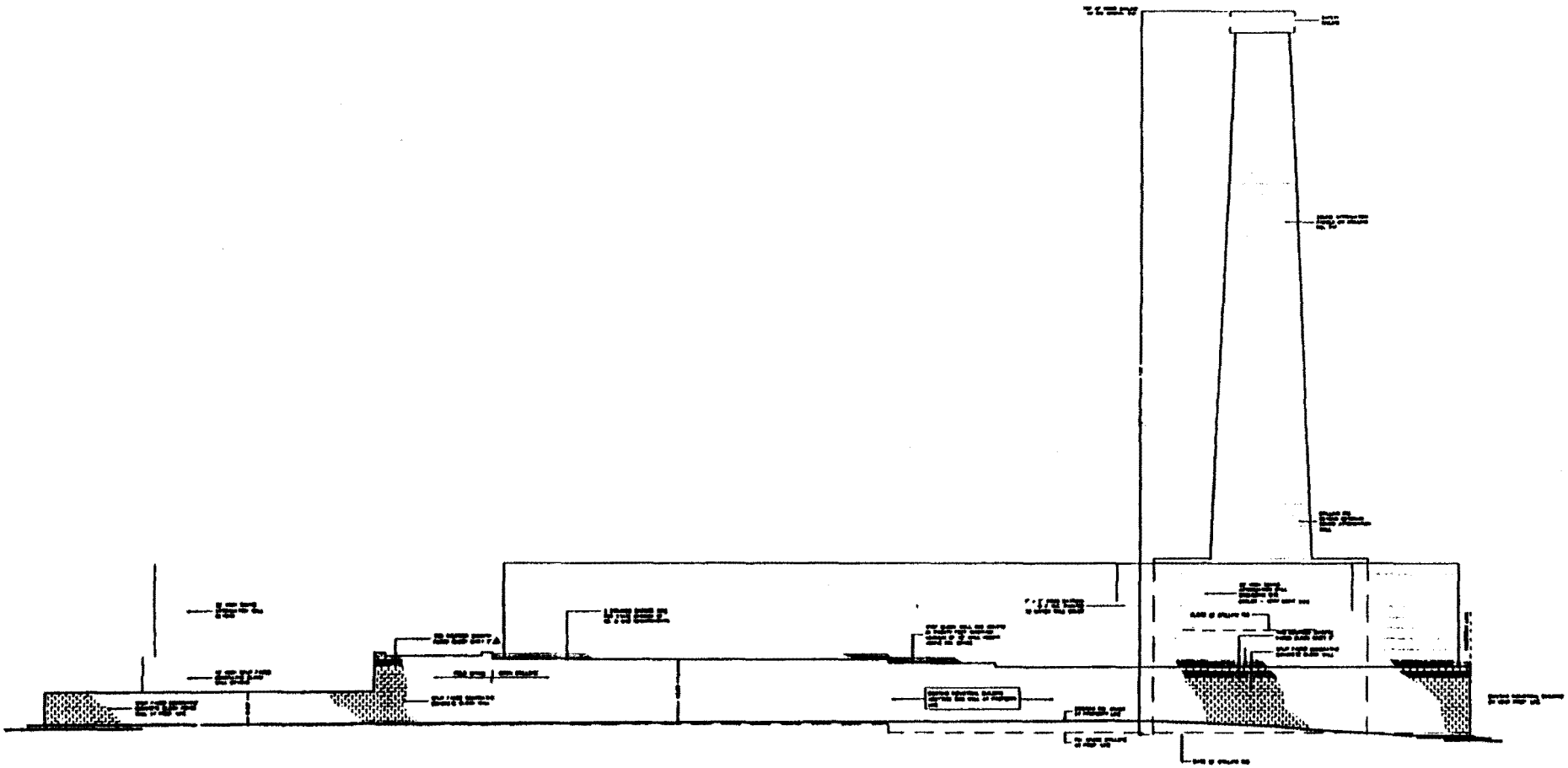
MACPHERSON OIL COMPANY
2716 OCEAN PARK BLVD., NO. 3080
SANTA MONICA, CALIFORNIA 90405

HERMOSA BEACH PROJECT
FINAL PHASE
DRILLING RIG ELEVATION
555 SIXTH STREET, HERMOSA BEACH, CA.

Dwg Scale 1" = 10'-0"
Plot Date MAR 7, 1997

A-2.08

Sheet of



NORTH ELEVATION

REVISIONS TO APPROVED PLANS						
△NO	BY NO	DATE	DESCRIPTION	APPROVAL BY MOC	BEB	DATE

ORIGINAL DRAWING
CAD File No. HBELEV00
Date Drawn MAR 7, 1987
Drawn By DEG
Revised
Revised
Approved

PLANS PREPARED BY:
DAVID E. GAUTSCHY, INC.
2698 JUNIPERO AVE. # 201B
SIGNAL HILL, CALIFORNIA 90806
(562) 427-0419

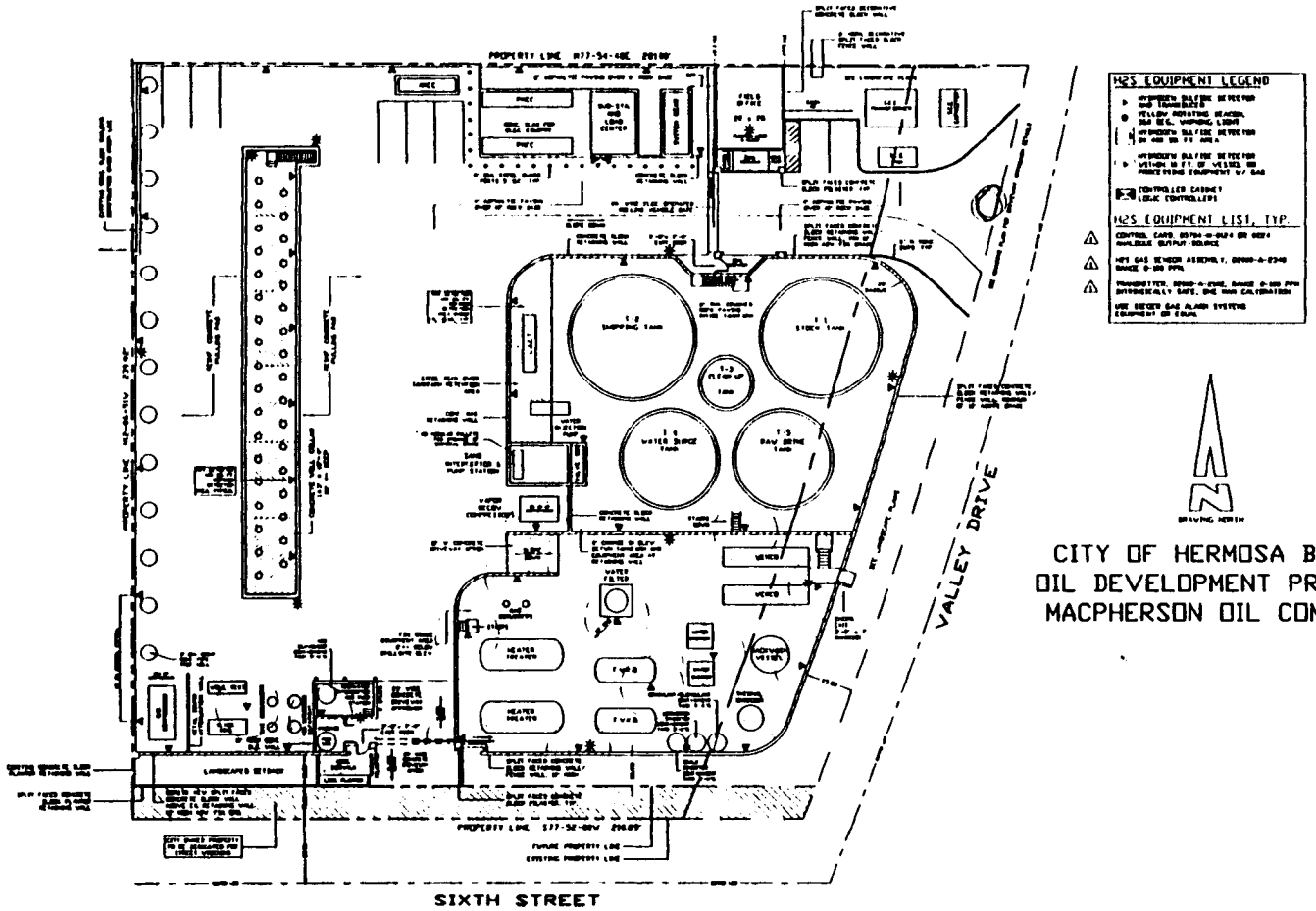
PLANS PREPARED FOR:
MACPHERSON OIL COMPANY
OCEAN PARK BLVD., NO. 3080
A MONICA, CALIFORNIA 90405

HERMOSA BEACH PROJECT
FINAL PHASE
DRILLING RIG ELEVATION
555 SIXTH STREET, HERMOSA BEACH, CA.

Dwg. Scale 1" = 10'-0"
Plot Date MAR 7, 1987

A-2.09

Sheet of



CITY OF HERMOSA BEACH
OIL DEVELOPMENT PROJECT
MACPHERSON OIL COMPANY

FINAL PHASE, CONCEPTUAL HYDROGEN SULFIDE DETECTION PLAN

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REVISIONS TO APPROVED PLANS					
NO	DATE	DESCRIPTION	APPROVAL BY MOC	DEG	DATE
1	7/28/97	REVISED MONITORING EQUIPMENT			

ORIGINAL DRAWING	
CAD File No.	H2SPOSHS.DWG
Date Drawn	JULY 9, 1997
Drawn By	DEG
Redrawn	
Revised	
Approved	

PLANS PREPARED BY:
DAVID E. GAUTSCHY, INC.
2698 JUNIPERO AVE. # 201B
SIGNAL HILL, CALIFORNIA 90806
(562) 427-0419

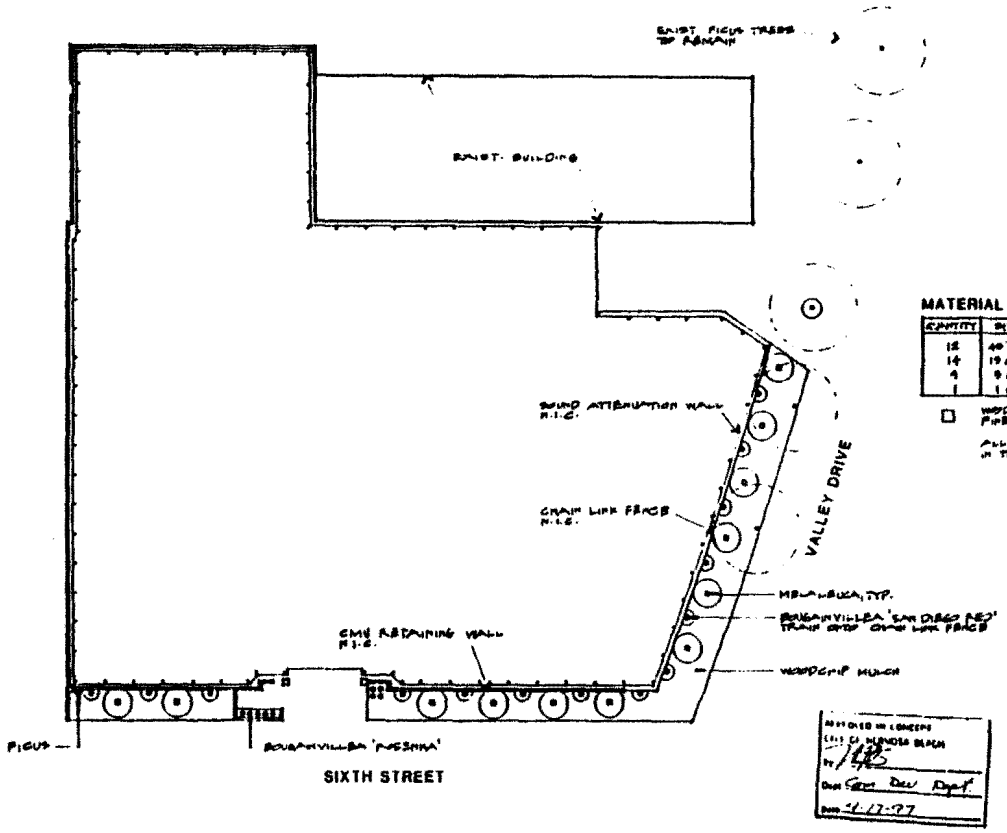
PLANS PREPARED FOR:
MACPHERSON OIL COMPANY
2716 OCEAN PARK BLVD., NO. 3080
SANTA MONICA, CALIFORNIA 90405

HERMOSA BEACH PROJECT
FINAL PHASE
H2S DETECTION SYSTEM PLAN
555 SIXTH STREET, HERMOSA BEACH, CA.

Dwg Scale 1" = 20'-0"
Plot Date JULY 9, 199

A-2.11

Sheet of



MATERIAL LIST

QUANTITY	SIZE	BOTANICAL NAME
12	48 BOX	MELALEUCA QUINQUENERVIA
14	15 GAL.	BOUGAINVILLEA 'SAN DIEGO RED'
4	5 GAL	BOUGAINVILLEA 'PUERKINA'
1	1 GAL	FICUS REPENS

☐ WOODCHIP MULCH SHALL BE OF EUCALYPTUS & FIR WOODCHIPS INSTALLED TO A DEPTH OF 2".

ALL PLANTS SHALL BE PLACED IN GRADE IN THEIR NURSERY CONTAINERS.

APPROVED IN CONCEPT
CITY OF MONROVIA BEACH
BY
DATE Com Dev Dept
DATE 4-17-97

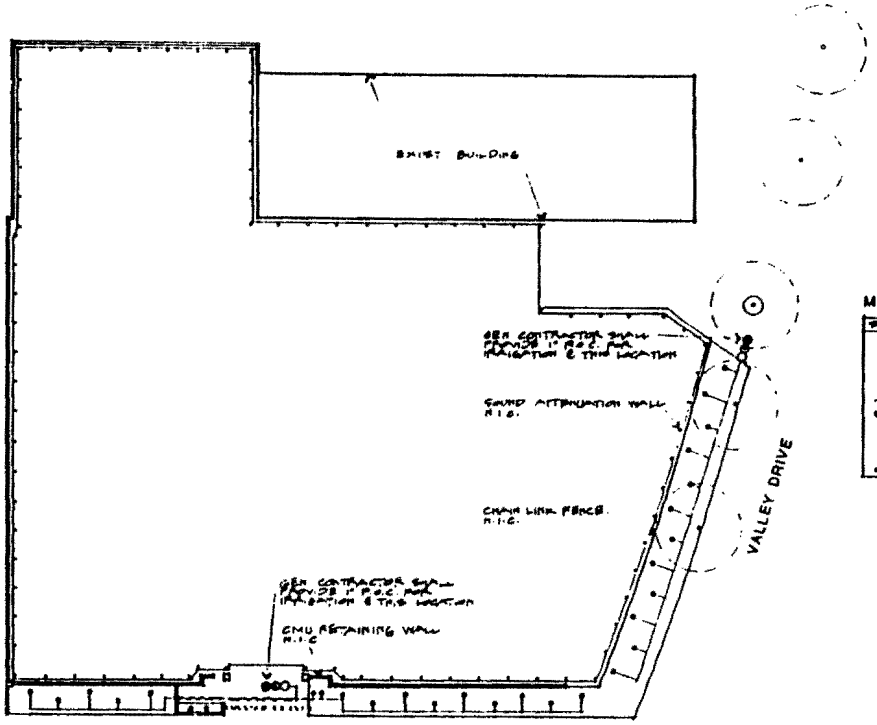
CNA

PLANS PREPARED FOR
MACPHERSON OIL COMPANY

PLANS PREPARED BY
CRAIG WEBER & ASSOCIATES
CA LANDSCAPE ARCHITECTS
PH: (310) 546-3131

OIL DEVELOPMENT PROJECT
MONROVIA BEACH
PHASE 1 PLANTING PLAN

L-1.01



MATERIAL LIST

SYMBOL	MANUFACTURER / MODEL NO. / DESCRIPTION
●	RAINBIRD PVC 3/4" QUICK COUPLER
O	HARDIE 3/4" COMBINATION VALVE
•	RAINBIRD XB-10G MULTI-JET: JET: 360 PROVIDE 2 SPRINKLERS PER PLANT
———	3/4" POLYETHYLENE TUBING
————	3/4" POLYETHYLENE TUBING INSTALLED IN 1" SCH. 40 PVC SLEEVE BURIED 18" DEEP
□	RAINBIRD PSP4 4 STATION CONTROLLER
●	HAMMOND 1" GATE VALVE
————	1" SCH. 40 PVC SLEEVE BURIED 18" DEEP

NORTH

REVISIONS

CNA

PLANS PREPARED FOR
MACPHERSON OIL COMPANY

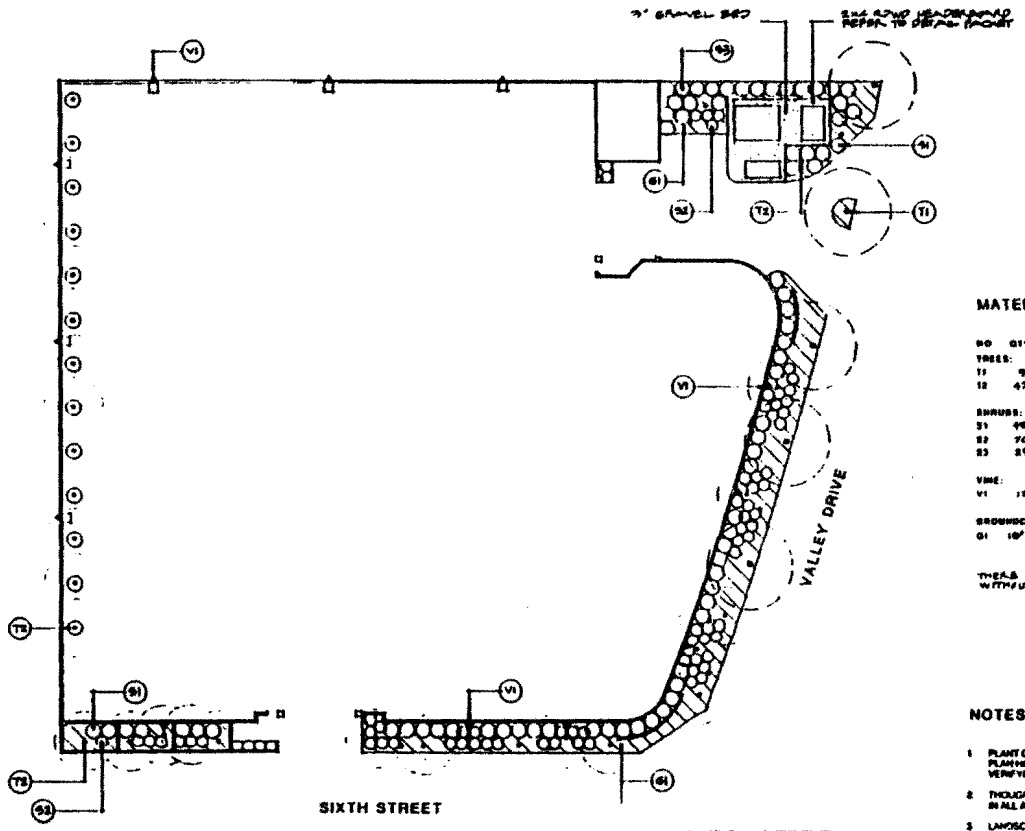
PLANS PREPARED BY
CRAIG WEBER & ASSOCIATES
CA LICENSE NO. 1294
PH. (310) 438-3131

OIL DEVELOPMENT PROJECT
HERMOSA BEACH, CALIFORNIA

PHASE 1 IRRIGATION PLAN

DATE
SCALE 1" = 20'

L-1.02



APPROVED IN CONCEPT
CITY OF HUNTINGTON BEACH
BY
FOR Com. Dev. Dept.
DATE 8-17-77

MATERIAL LIST

NO	QTY	SIZE	BOTANICAL NAME	COMMON NAME
TREES:				
T1	9		EXISTING FICUS	
T2	42	48" BOX	MELALEUCA QUINQUENERVIA	CAJEPUT TREE
SHRUBS:				
S1	49	5 GAL	ECHIUM FASTUOSUM	PRIDE OF MADEIRA
S2	70	5 GAL	LANTANA "SPREADING SUNSHINE"	
S3	29	5 GAL	LIGUSTRUM "TEXANUM"	TEXAS PRIVET
VINE:				
V1	15	1 GAL	FICUS PUMILA "MINIMA"	CREEPING FIG
GROUNDCOVER:				
G1	10" o.c.	FLAT	CARPOBROTUS EDULIS	ICE PLANT

THERE WILL BE NO SUBSTITUTION OF PLANT MATERIAL WITHOUT PRIOR APPROVAL BY THE CITY.

NOTES

1. PLANT QUANTITIES ON MATERIALS LIST ARE ONLY A GUIDE. PLANTS ON PLAN HAVE PRECEDENCE. CONTRACTOR IS RESPONSIBLE FOR VERIFYING EXACT QUANTITIES
2. THOUGH NOT GRAPHICALLY CLEAR, GROUND COVER SHALL BE PLANTED IN ALL AREAS
3. LANDSCAPE CONTRACTOR SHALL HAVE SOIL TESTED TO DETERMINE THE REQUIRED AMENDMENTS FOR THIS PARTICULAR SITE. THE FOLLOWING AMENDMENTS SHALL BE USED AT THE TIME SOD IS SUBMITTED. THEN MODIFIED AS REQUIRED BY FINDINGS OF THE TEST:

   GROPOWER 100 LBS PER 1000 SQUARE FEET
   AGRICULTURAL GYPSUM: 50 LBS PER 1000 SQUARE FEET
   ORGANIC MULCH: 3 CUBIC YARDS PER 1000 SQUARE FEET
4. ALL TREES WITHIN 5 FEET OF PAVING SHALL BE INSTALLED WITH A PROTECTIVE ROOT BARRIER DEVICE.

NORTH

REVISIONS

CNA

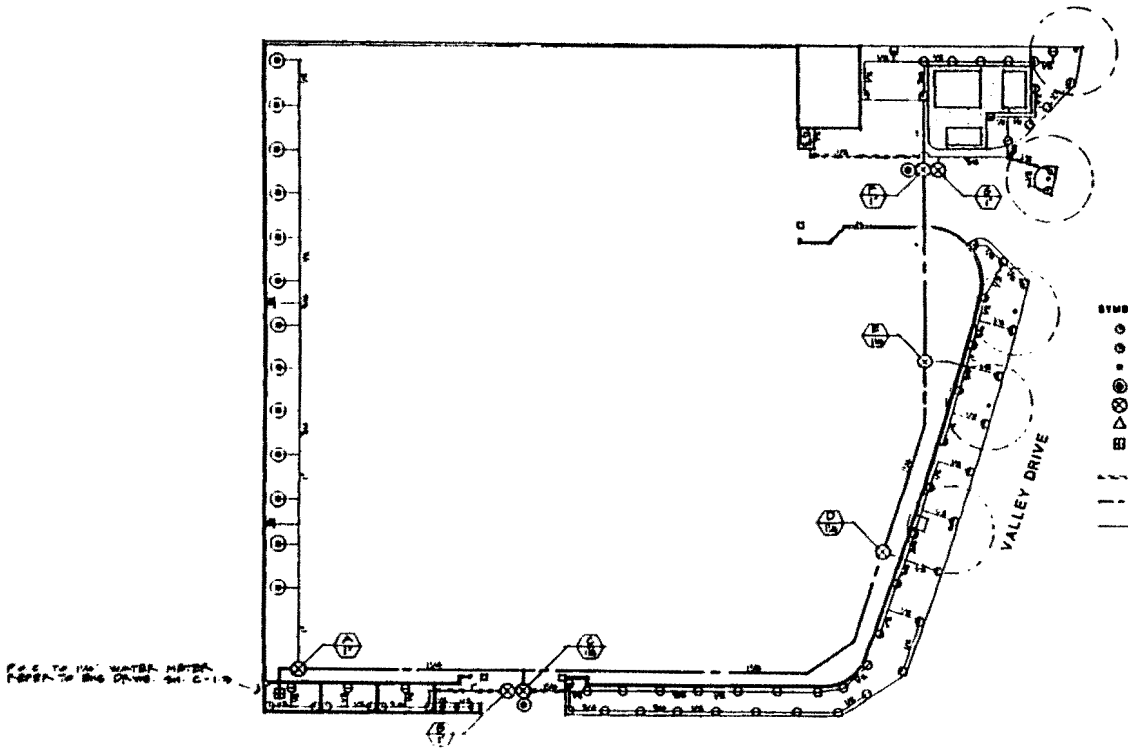
MACPHERSON OIL COMPANY

CRAIG WEBER & ASSOCIATES

OIL DEVELOPMENT PROJECT
HUNTINGTON BEACH
PHASE 2 & 3 PLANTING PLAN

1" = 20'

L-2.01



MATERIAL LIST

SYMBOL	MANUFACTURER	MODEL	DESCRIPTION	RADIUS	P.S.I.	G.P.M.
	TORO	570C 6P	6" POP UP SPRAY	15'	30	1.2
	TORO	570C 8P	8" POP UP SPRAY	18'	30	2.1
	TORO	570C 8P	8" POP UP BUBBLER		30	5
	RAINBIRD	3/4C	QUICK COUPLER			
	RAINBIRD	GB	ELECTRIC VALVE			
	[illegible]	DAK6	6 STATION CONTROLLER			
	FEBCO	825Y	1 1/4" REDUCED PRESSURE DEVICE			

LINE SLEEVES AT PAVING, 2 1/2 TIMES THE SIZE OF THE LATERAL LINE SHOWN

SCHEDULE 40 P.V.C. PRESSURE MAINLINE (SLEEVED UNDER PAVING)

SCHEDULE 40 P.V.C. NONPRESSURE LATERAL LINE

VALVE STATION

VALVE SIZE

NOTES

1. IT IS THE RESPONSIBILITY OF THE IRRIGATION CONTRACTOR TO FAMILIARIZE HIMSELF WITH ALL GRADE DIFFERENCES, LOCATIONS OF WALKS, RETAINING WALLS, ETC. HE SHALL COORDINATE HIS WORK WITH THE GENERAL CONTRACTOR AND OTHER SUB-CONTRACTORS FOR THE LOCATION AND INSTALLATION OF PIPE SLEEVES THROUGH WALLS UNDER ROAD-WAYS, PAVING, STRUCTURES, ETC.
2. IRRIGATION DESIGN IS DIAGRAMMATIC. ALL PIPING SHOWN WITH THE PAVED AREAS IS FOR DESIGN CLARIFICATION ONLY. INSTALL IN PLANTING AREAS WHERE POSSIBLE.
3. ALL PIPING UNDER PAVED AREAS SHALL BE INSTALLED PRIOR TO PAVING. USE SCHEDULE 40 FOR ALL NON-PRESSURE LATERAL LINES INSTALLED UNDER PAVED AREAS.
4. ALL PIPING BETWEEN THE POINT OF CONNECTION AND BACKFLOW PREVENTER SHALL BE OF MATERIALS AND INSTALLATION METHODS REQUIRED BY LOCAL CODES.
5. FINAL LOCATION OF THE AUTOMATIC CONTROLLER SHALL BE APPROVED BY THE OWNER'S AUTHORIZED REPRESENTATIVE.
6. 120 VOLT ELECTRICAL POWER OUTLET AT THE AUTOMATIC CONTROLLER LOCATION SHALL BE PROVIDED BY OTHERS. IT IS THE RESPONSIBILITY OF THE IRRIGATION CONTRACTOR TO MAKE THE FINAL HOOK-UP FROM THE ELECTRICAL OUTLET TO THE AUTOMATIC CONTROLLER.
7. IRRIGATION SYSTEM DESIGN BASED ON 60-70 PSI AT P.O.C. VERIFY PRIOR TO START OF WORK.

NORTH

REVISIONS	
MAR 97	

CNA

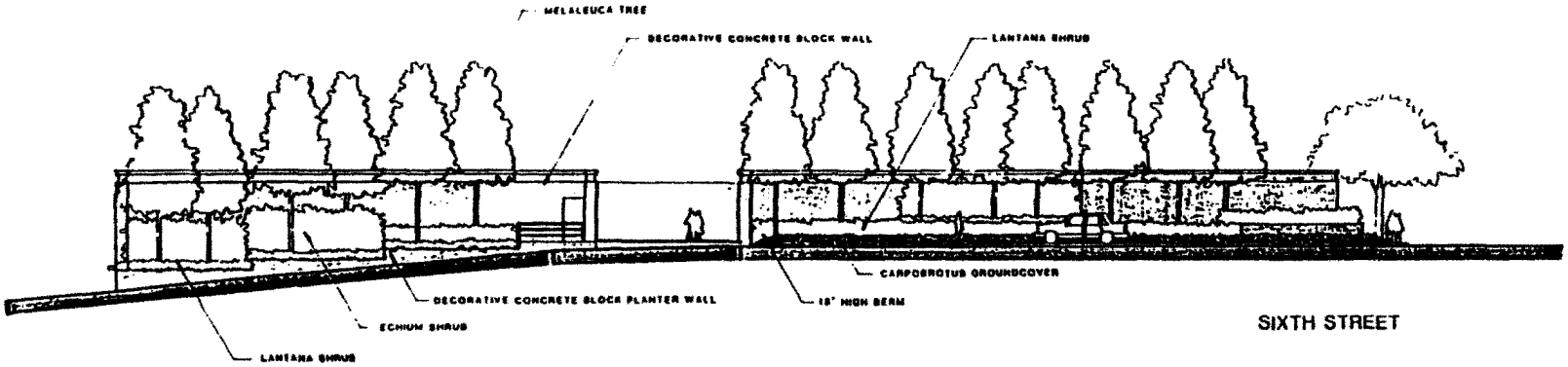
MACPHERSON OIL COMPANY

PLANS PREPARED BY
CRAIG WEBER & ASSOCIATES
[illegible]

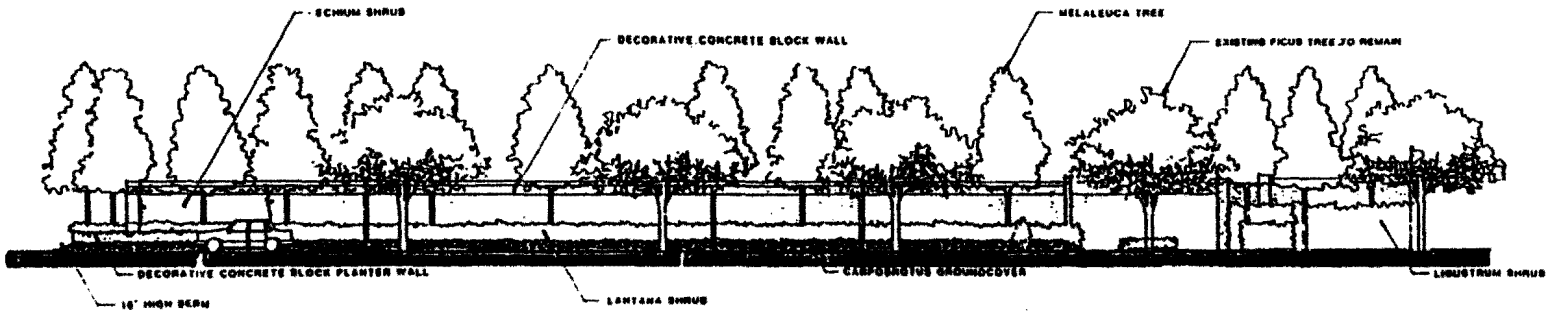
OIL DEVELOPMENT PROJECT
HUNTINGTON BEACH
PHASE 2 & 3 IRRIGATION PLAN

DATE MAR. 97
SCALE 1" = 20'

L-2.02



SIXTH STREET



VALLEY DRIVE

PLANTS INDICATED REFLECT GROWTH & DEVELOPMENT AT 5 YEARS

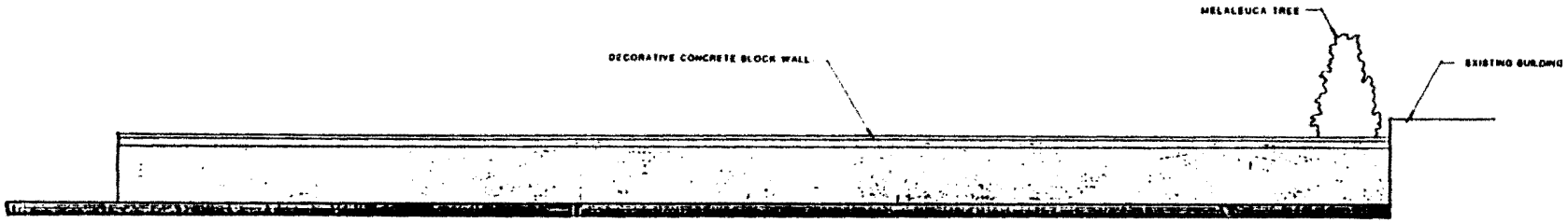
PLANS PREPARED FOR
MACPHERSON OIL COMPANY

PLANS PREPARED BY
CRAIG WEBER & ASSOCIATES
[illegible]

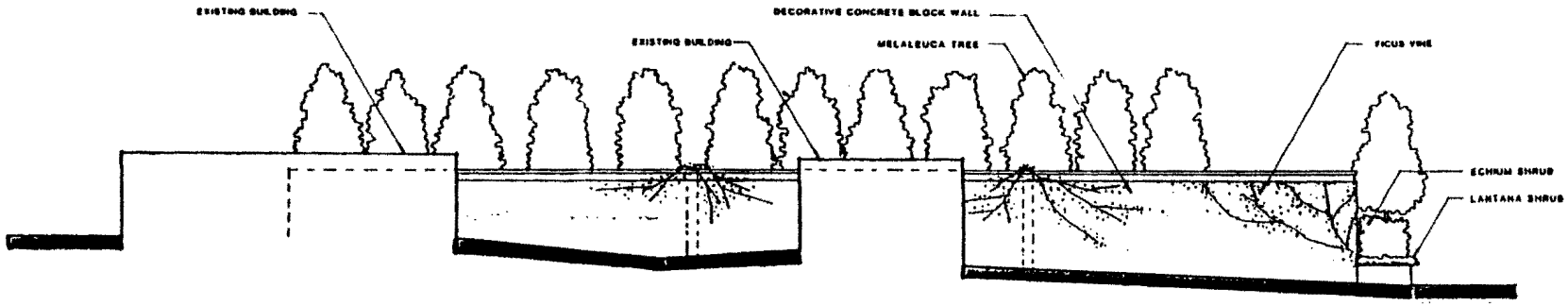
CWA

OIL DEVELOPMENT PROJECT
HUNTINGTON BEACH
PHASE 2 & 3 ELEVATIONS

L-2.03



NORTH-WEST ELEVATION



SOUTH-WEST ELEVATION

PLANTS INDICATED REFLECT GROWTH & DEVELOPMENT AT 6 YEARS

REVISIONS

CWA

PLANS PREPARED FOR
MACPHERSON OIL COMPANY

PLANS PREPARED BY
CRAIG WEBER & ASSOCIATES

OIL DEVELOPMENT PROJECT
HERMOSA BEACH
PHASE 2 & 3 ELEVATIONS

L-2.04

GENERAL NOTES:

1. ALL WORK AND MATERIAL REQUIRED BY THESE PLANS SHALL BE IN ACCORDANCE WITH THE "STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION" LATEST EDITION, INCLUDING AMENDMENTS AND SUPPLEMENTS THERETO AS PROMULGATED BY A.G.C. AND A.P.W.A. THE UNIFORM BUILDING CODE CHAPTER 70 (EXCAVATION AND GRADING) AND CALIFORNIA ADMINISTRATIVE CODE, TITLE 8 AND 24.

2. APPLICABLE GEOLOGIC AND/OR SOILS REPORTS WHICH HAVE BEEN REVIEWED AND APPROVED BY THE BUILDING OFFICIAL, INCLUDING ALL SUPPLEMENTS, ADDENDA, AND AMENDMENTS THERETO ARE INCLUDED AS PART OF THESE PLANS BY REFERENCE. COPIES OF THESE REPORTS ARE ON FILE IN THE OFFICES OF THE ARCHITECT. ALL RECOMMENDATIONS CONTAINED THEREIN MUST BE FOLLOWED.

3. THE CONTRACTOR IS REQUIRED TO FAMILIARIZE HIMSELF WITH THE PLANS, THE SOILS AND/OR GEOLOGIC REPORTS, CONDITIONS OF THE GRADING PERMIT AND THE SITE PRIOR TO COMMENCING ANY WORK.

4. PROPOSED STARTING DATE IS SEE BID
PROPOSED COMPLETION DATE IS [illegible]

5. ESTIMATED QUANTITY OF CUT IS 3000 CYDS
ESTIMATED QUANTITY OF FILL IS [illegible]

6. NO WORK WHATSOEVER SHALL BE STARTED IN OR ABOUT A GRADING PROJECT WITHOUT FIRST GIVING AT LEAST TWO (2) WORKING DAYS NOTICE TO THE BUILDING OFFICIAL AND THE ENGINEER.

7. THE EXISTENCE AND LOCATION OF ANY UNDERGROUND UTILITY PIPES, CONDUITS, OR STRUCTURES SHOWN ON THESE PLANS ARE OBTAINED BY A SEARCH OF THE AVAILABLE RECORDS. TO THE BEST KNOWLEDGE OF THE CIVIL ENGINEER THERE ARE NO EXISTING UTILITIES EXCEPT AS SHOWN ON THESE PLANS. THE CONTRACTOR IS REQUIRED TO TAKE DUE PRECAUTIONARY MEASURES TO PROTECT THE UTILITY LINES SHOWN AND ANY OTHER LINES NOT OF RECORD OR NOT SHOWN ON THESE DRAWINGS. THE CONTRACTOR FURTHER ASSUMES ALL LIABILITY AND RESPONSIBILITY FOR THE UTILITY PIPES, CONDUITS, AND STRUCTURES SHOWN OR NOT SHOWN ON THIS DRAWING. THE CIVIL ENGINEER TAKES NO RESPONSIBILITY FOR UNDERGROUND STRUCTURES AND LINES NOT SHOWN ON THE PLANS.

8. THE OWNERS OF POLE LINES, PIPELINES, AND OTHER SUBSTRUCTURES IN THE AREA COVERED BY THESE PLANS SHALL BE NOTIFIED BY THE CONTRACTOR AT LEAST TWO (2) WORKING DAYS PRIOR TO COMMENCING WORK. IN ADDITION, THE CONTRACTOR SHALL NOTIFY THE UNDERGROUND SERVICE ALERT AT 1-800-422-4133 AT LEAST 48 HOURS PRIOR TO THE START OF WORK.

9. SECURE PERMISSION FROM THE CITY ENGINEER FOR CONSTRUCTION, GRADING AND/OR DISCHARGE OF DRAINAGE WITHIN THE PUBLIC STREET RIGHT OF WAY.

10. NO GRADING WORK, INCLUDING IMPORT AND EXPORT, SHALL BE DONE BETWEEN THE HOURS OF 7:00 PM AND 8:00 AM ON ANY DAY, AND NO WORK SHALL BE DONE ON SUNDAY AT ANY TIME.

11. THE CONTRACTOR SHALL KEEP THE CONSTRUCTION AREA SUFFICIENTLY DAMPENED TO CONTROL DUST CAUSED BY GRADING AND CONSTRUCTION. CONTRACTOR SHALL AT ALL TIMES PROVIDE REASONABLE CONTROL OF DUST CAUSED BY WIND.

12. ALL DEBRIS, EXCAVATED VEGETATION, AND/OR CONSTRUCTION MATERIALS ARE TO BE REMOVED FROM THE SITE. ALL EXCAVATED EARTH AND ROCK, REGARDLESS OF ITS SOURCE, NOT USED IN THE PLANNED FILLS WILL BE REMOVED FROM THE SITE. DEBRIS OR EARTH MUST BE REMOVED TO AN APPROVED FILL SITE, COUNTY DUMP, OR OTHER AUTHORIZED DUMPING LOCATION.

13. THE APPROVED SET OF PLANS AND GRADING PERMIT, INCLUDING ALL APPROVED REVISIONS THERETO, SHALL BE ON THE JOB SITE AT ALL TIMES.

14. THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE CIVIL ENGINEER AND THE BUILDING OFFICIAL UPON DISCOVERING ANY DISCREPANCIES, ERRORS, OR OMISSIONS IN THE PLANS AND SHALL RECEIVE CLARIFICATION ON THOSE ITEMS PRIOR TO PROCEEDING.

15. NO CHANGES IN THE APPROVED PLANS WILL BE MADE NO EXTRA WORK PERFORMED UNLESS SO APPROVED BY THE ENGINEER AND THE BUILDING OFFICIAL.

16. WHEN EXPANSIVE SOILS ARE ENCOUNTERED ON THE SITE, THE SOILS ENGINEER SHALL BE CONSULTED FOR RECOMMENDATIONS AS TO ITS SUITABILITY TO ACCEPT FILL OR TO BE USED AS FILL, OR POSSIBLE REMOVAL FROM BENEATH BUILDING SITES.

17. EXISTING GROUND TO BE FILLED SHALL FIRST BE STRIPPED OF VEGETATION, NONCOMPLYING FILL, OR OTHER INCOMPETENT MATERIAL. NO FILL SHALL BE PLACED UNLESS THE UNDERLYING SOIL OR BEDROCK HAS BEEN INVESTIGATED AND APPROVED BY THE SOILS ENGINEER AND/OR GEOLOGIST. SUBDRAINS WILL BE REQUIRED IN ALL NATURAL DRAINAGE COURSES OR SEEPAGE AREAS TO BE COVERED BY THE FILL, EXCEPT WHERE RECOMMENDED BY THE SOILS ENGINEER OR GEOLOGIST AS NOT BEING NECESSARY. THE LOCATION OF SUBDRAINS MUST BE RECORDED IN PLAN AND ELEVATION AS SHOWN ON "AS-BUILT" PLANS.

18. NO ROCK OR SIMILAR MATERIAL GREATER THAN 6" IN DIAMETER WILL BE PLACED IN THE FILL UNLESS RECOMMENDATIONS FOR SUCH PLACEMENT HAVE BEEN SUBMITTED BY THE SOILS ENGINEER IN ADVANCE AND APPROVED BY THE BUILDING OFFICIAL.

19. THE CONTRACTOR IS RESPONSIBLE FOR NOTIFYING THE CIVIL ENGINEER, SOILS ENGINEER, ENGINEERING GEOLOGIST, AND BUILDING OFFICIAL AT LEAST TWO (2) WORKING DAYS IN ADVANCE OF ANY REQUIRED INSPECTION AND/OR TESTS.

20. CONTINUOUS INSPECTION SHALL BE PROVIDED BY THE SOILS ENGINEER OR HIS RESPONSIBLE REPRESENTATIVE FOR ALL FILLS THAT WILL EXCEED A VERTICAL HEIGHT OR DEPTH OF THIRTY (30) FEET OR WILL RESULT IN A SLOPE SURFACE STEEPER THAN 2:1.

21. FILL IS TO BE COMPACTED TO NOT LESS THAN 90% OF MAXIMUM DENSITY AS DETERMINED BY UBC STD. 70-1. (FILL IS TO BE PLACED IN LEVEL LAYERS NOT EXCEEDING 6" IN DEPTH AND MECHANICALLY COMPACTED WITH SHEEPSFOOT ROLLER, CRAWLER TRACTOR, AND WATER.)

22. TESTS TO DETERMINE FIELD DENSITY OF COMPACTED FILL SOILS SHALL BE MADE ON THE BASIS OF NOT LESS THAN ONE TEST FOR EACH 2-FOOT VERTICAL LIFT OF THE FILL, BUT NOT LESS THAN ONE TEST FOR EACH 500 CUBIC YARDS OF MATERIAL PLACED. AT LEAST ONE-HALF OF THE REQUIRED TESTS SHALL BE MADE AT THE LOCATION OF THE FINAL FILL SLOPE, EXCEPT THAT NOT MORE THAN ONE SUCH TEST NEED BE MADE FOR EACH 50 HORIZONTAL FEET OF SLOPE IN EACH 2-FOOT VERTICAL LIFT. ADDITIONAL TESTS SHALL BE PERFORMED WHERE DEEMED NECESSARY BY THE SOILS ENGINEER OR THE THE BUILDING OFFICIAL. ALL SUCH DENSITY TESTS SHALL BE REASONABLY UNIFORMLY DISTRIBUTED WITHIN THE FILL OR FILL SLOPE SURFACE. RESULTS OF SUCH TESTING AND LOCATION OF TESTS SHALL BE PRESENTED IN THE SOIL ENGINEER'S REPORT.

23. FIELD DENSITY WILL BE DETERMINED IN ACCORDANCE WITH UBC STD. NO. 70-2. OTHER METHODS MAY BE USED IF RECOMMENDED BY THE SOILS ENGINEER AND APPROVED IN ADVANCE BY THE BUILDING OFFICIAL.

24. SUFFICIENT TESTS OF SOIL PROPERTIES, INCLUDING SOIL TYPES AND SHEAR STRENGTH SHALL BE MADE DURING GRADING OPERATIONS TO VERIFY COMPLIANCE WITH DESIGN CRITERIA. THE RESULTS OF SUCH TESTING SHALL BE FURNISHED TO THE BUILDING OFFICIAL UPON THE COMPLETION OF GRADING OPERATIONS OR, WHEN NECESSITATED BY VARYING FIELD CONDITIONS, UPON REQUEST BY THE BUILDING OFFICIAL.

25. GRADING SHALL NOT VARY MORE THAN 0.02 FEET UNDER AREAS TO BE PAVED FOR WALKS, DRIVEWAYS, CURB AND GUTTER, AND BUILDING OR STRUCTURE SLABS.

26. LICENSED SURVEYOR MUST SET GRADE STAKES FOR ALL DRAINAGE DEVICES AND CONTRACTOR SHALL OBTAIN INSPECTION BY THE BUILDING OFFICIAL BEFORE POURING.

27. PROVISIONS WILL BE MADE FOR CONTRIBUTORY DRAINAGE AT ALL TIMES.

28. SEPARATE PLANS FOR TEMPORARY DRAINAGE AND EROSION CONTROL MEASURES TO BE USED DURING THE RAINY SEASON WILL BE SUBMITTED AND APPROVAL OBTAINED PRIOR TO OCTOBER 1. THE CONTROL DEVICES SHOWN ON SAID PLANS WILL BE INSTALLED BY NOT LATER THAN NOVEMBER 1, AND MAINTAINED IN OPERABLE CONDITION UNTIL APRIL 15TH. PLANS ARE TO BE PREPARED BY A CIVIL ENGINEER.

29. FINISHED GRADING WILL BE COMPLETED AND APPROVED AND SLOPE PLANTING AND IRRIGATION SYSTEMS INSTALLED BEFORE OCCUPANCY OF BUILDINGS.

30. INSPECTION OF EXCAVATION AND FILLS. THE PERMITTEE OR HIS AGENT SHALL NOTIFY THE BUILDING OFFICIAL A MINIMUM OF TWENTY-FOUR HOURS BEFORE THE GRADING OPERATION IS READY FOR EACH OF THE FOLLOWING INSPECTIONS:

A) INITIAL INSPECTION: WHEN THE PERMITTEE IS READY TO BEGIN WORK, BUT BEFORE ANY GRADING OR BRUSHING IS STARTED.
B) TOE INSPECTION: AFTER THE NATURAL GROUND IS EXPOSED AND PREPARED TO RECEIVE FILL BUT BEFORE ANY FILL IS PLACED.
C) EXCAVATION INSPECTION: AFTER THE EXCAVATION EMPLACEMENT IS STARTED, BUT BEFORE THE VERTICAL DEPTH OF THE EXCAVATION EXCEEDS TEN FEET.
D) FILL INSPECTION: AFTER THE FILL EMPLACEMENT IS STARTED, BUT BEFORE THE VERTICAL HEIGHT OF THE LIFTS EXCEEDS TEN FEET.
E) DRAINAGE DEVICE INSPECTION: AFTER FORMS PIPES ARE IN PLACE, BUT BEFORE ANY CONCRETE IS PLACED.
F) ROUGH GRADING: THE SITE WILL BE CONSIDERED READY FOR ROUGH GRADING CERTIFICATION WHEN THE FOLLOWING ITEMS ARE COMPLETE:
1) GRADING TO APPROXIMATE FINAL ELEVATION, (WITHIN 0.1 FT.);
2) STAKING OF PROPERTY LINES;
3) LOCATION AND GRADIENT OF CUT AND FILL SLOPES.
4) LOCATION, CROSS-SECTIONAL CONFIGURATION AND FLOWLINE GRADIENT OF DRAINAGE SWALES AND TERRACES (GRADED READY FOR PAVING);
5) BERMS INSTALLED WHERE INDICATED;
6) REQUIRED DRAINAGE SLOPES PROVIDED ON BUILDING PADS;
7) APPROVED IRRIGATION SYSTEM PLANS (WHERE REQUIRED);
8) RECEIPT OF GRADING INSPECTION CERTIFICATION (ROUGH GRADING).
G) FINAL GRADING: THE SITE WILL BE CONSIDERED READY FOR FINAL GRADING CERTIFICATION WHEN THE FOLLOWING ITEMS ARE COMPLETE:
1) ALL REQUIRED DEVICES HAVE BEEN INSTALLED;
2) SLOPE PLANTING ESTABLISHED AND IRRIGATION SYSTEMS PROVIDED (WHERE REQUIRED);
3) ADEQUATE PROVISIONS HAVE BEEN MADE FOR DRAINAGE OF SURFACE WATERS FROM EACH BUILDING SITE;
4) AS-GRADED PLAN AND REQUIRED REPORTS HAVE BEEN SUBMITTED;
5) THE GRADING CONTRACTOR SHALL SUBMIT A STATEMENT IN WRITING THAT THE WORK UNDER HIS DIRECTION WAS PERFORMED IN ACCORDANCE WITH THE APPROVED PLANS AND REQUIREMENTS OF THIS CODE OR WHEREIN SUCH WORK WAS NOT IN ACCORDANCE WITH SUCH PLANS AND CODE (GRADING CONTRACTOR'S STATEMENT).

31. THE INSPECTOR WILL APPROVE THE WORK INSPECTED OR WILL NOTIFY THE PERMITTEE OR HIS AGENT WHEREIN IT FAILS TO COMPLY WITH THE APPROVED PLANS AND SPECIFICATIONS.

32. ALL EXISTING WATER WELLS SHALL BE CAPPED IN ACCORDANCE WITH THE ORDINANCES AND STANDARDS OF THE STATE OF CALIFORNIA.

33. ALL CISTERNS, CESSPOOLS, SEPTIC TANKS, UNDERGROUND VAULTS, BURIED TANKS, PIPELINES OR SIMILAR UNDERGROUND STRUCTURES FOUND TO EXIST DURING GRADING OPERATION SHALL BE REMOVED AND/OR FILLED TO THE SATISFACTION OF THE INSPECTOR AND/OR FIRE DEPARTMENT.

34. ALL ELEVATIONS, CONTOURS, CULTURAL FEATURES AND STRUCTURES SHOWN AS EXISTING ARE SHOWN ACCURATELY AS THEY EXISTED ON 10-20-?? AS DETERMINED BY A SURVEY PERFORMED BY SOLOFF SURVEYING DATED 10-26-??

35. ALL OIL CONTAMINATED SOIL, OR OTHER HAZARDOUS MATERIAL SHALL BE DISPOSED AT AN APPROVED DUMP SITE IN A LEGAL MANNER.

36. ANY ABANDONED OIL WELLS SHALL BE TREATED IN ACCORDANCE WITH STATE PROCEDURES.

37. DIRT ACCESS RAMPS OVER CURB AND GUTTER TO CONSTRUCTION SITES ARE NOT ALLOWED. WHEN NECESSARY FOR ENTRANCE TO SUCH CONSTRUCTION SITES, ASPHALT RAMPS WITH A MINIMUM 4" DIAMETER PIPE WILL BE CONSTRUCTED. ALL BASE, GRAVEL, SPOIL OR OTHER MATERIAL CARRIED INTO THE ROADWAY BY THE CONTRACTOR'S PERSONNEL OR EQUIPMENT WILL BE CLEANED AS NECESSARY AND NO LESS THAN ONCE A DAY. TRUCKS HAULING BASE, GRAVEL, FILL OR EXPORT MATERIALS WITHIN THE CITY WILL BE TARPED AS NECESSARY TO PREVENT MATERIALS FROM SPILLING INTO THE ROADWAY.

38. THE STOCKPILING OF EXCESS MATERIAL SHALL BE APPROVED BY THE ENGINEER PRIOR TO EXCAVATION.

39. THE GRADING SHALL NOT BE PERFORMED WHEN WIND SPEEDS EXCEED 20 MPH.

EROSION CONTROL:

44. In case of emergency Call: ____________
at work Tel. No. ____________
Home Tel. No. ____________

45. Equipment and workers for emergency work shall be made available at all times during the rainy season. Necessary materials shall be available on site and stockpiled at convenient locations to facilitate rapid construction of temporary devices when rain is imminent.

46. Erosion control devices shall not be moved or modified without the approval of the Building Official.

47. All removable erosion protective devices shall be in place at the end of each working day when the 5-Day Rain Probability Forecast exceeds 40%.

48. After a rainstorm all silt and debris shall be removed from streets, check berms and basins.

49. Graded areas on the permitted area perimeter must drain away from the face of slopes at the conclusion of each working day. Drainage to be directed toward desilting facilities.

50. The permittee and contractor shall be responsible and shall take necessary precautions to prevent public trespass onto areas where impounded water creates a hazardous condition.

51. The undersigned Civil Engineer shall inspect the erosion control work and insure that the work is in accordance with the approved plans.

By ____________ Date ____________

UNDERGROUND STORAGE TANK REMOVAL:

52. In the event that soil contamination is discovered during excavation and removal of an existing tank, work shall be stopped until a site assessment and mitigation plan has been prepared, submitted and approved by Environmental Health and Grading.

53. Issuance of a grading permit does not eliminate the need for permits from other agencies with regulatory responsibilities for construction activities associated with the work authorized on this plan.

PAVING NOTES:

1. Sealcoat shall be an asphaltic emulsion fog type conforming to the provisions of Section 37 and 94 of the Caltrans Standard Specifications, and shall be applied at the rate of 0.12 gallons per square yard.

2. Asphalt concrete shall be class C2 (3/4" max.) conforming to Section 203-6.3.2 of the Standard Specifications. The paving asphalt shall be AR-4000. The amount of asphalt binder to be mixed with the mineral aggregate shall be 6% by weight of dry mineral aggregate.

3. Paint binder (tackcoat) shall conform to the provisions of Section 203.3 of the Standard Specifications and shall be SS-1h type asphalt emulsion with a bituminous base grade 60-70 paving asphalt. Prime coat shall be SC-250 liquid asphalt conforming to the provisions of Section 203-2.4 of the Standard Specifications. Application shall be at the rate of 0.25 gallons per square yard for prime coat and 0.10 gallons per square yard for tack coat.

4. Aggregate base shall be crushed aggregate base and shall conform to the provisions specified in Section 200-2 "Untreated Base Materials", of the Standard Specifications. The grading limits shall be 3/4" maximum. R-value 80, SE>35.
No aggregate base shall be placed on the subgrade until the Engineer has verified the elevations of the subgrade. All aggregate base materials shall be compacted to not less than 95% of maximum density.

5. Spreading and compacting shall utilize self-propelled mechanical spreading equipment. Compacting effort shall be such that not less than 95% relative compaction is obtained.

6. Prior to rough grade release by the City, the Soils Engineer shall submit for approval, pavement section recommendations based on "R" value analysis of the site subgrade soils and expected traffic indices.

LEGEND

Abr.	Description	Symbol
PL	Property Line	
RW	Right of Way	
CL	Centerline	
FL	Flowline	
CF	Curbface	
TC	Top of Curb	
PCC	Portland Cement Concrete	
TW	Top of Wall	
AC	Asphalt Concrete Pavement	
EP	Edge of Pavement	
BL	Building Line	
PB	Pull Box	
MH	Manhole	
S	Sanitary Sewer	
D	Storm Drain	
W	Waterline	
G	Gasline	
E	Electrical line and Conduit	
T	Telephone Cable and Conduit	
LTG	Street lighting	
WM	Water Meter	
PP	Power or Telephone pole	
FH	Fire Hydrant	
BW	Back of Walk	
FS	Finished Surface of Pavement	
CB	Catch Basin	
PA	Planter Area	
FF	Finished Floor Elevation	
GB	Grade Break	
HP	High Point	
BS	Beam Spout	
INV	Invert Elevation	
TG	Top of Grate	
S/W	Concrete walk/sidewalk	
WS	Water Service	
GS	Gas Service	
HC	House Connection	
( )	Existing Elevation	
VB	Vault Box	
TV	Cabletelevision	
GM	Gas Meter	
	PCC Removals	
	AC Removals	

OWNER:
MACPHERSON OIL COMPANY
2716 OCEAN PARK BLVD. #3080
SANTA MONICA, CALIFORNIA 90405

GEOTECHNICAL ENGINEER:
ASSOCIATED SOILS ENGINEERING, INC.
3330 AIRPORT WAY
LONG BEACH, CA 90806
310-426-7990

SURVEYOR:
SOLOFF SURVEYING & CONSULTING
1300 S. BEACON STREET, SUITE 210
SAN PEDRO, CALIFORNIA 90731
310-514-3331

BENCH MARK:
TEMPORARY BENCHMARK AS SHOWN ON THE PLAN, TOP OF EXISTING FIRE HYDRANT ASSUMED ELEVATION 100.00, SOUTH SIDE OF 6th ST. 130' W/O CL OF VALLEY DRIVE.

BASIS OF BEARINGS:
BASED ON THE CENTERLINE OF SIXTH STREET, BEING S77-52-00W AS SHOWN ON TRACT NO. 2002, M.B. 22/134.

PROJECT DESCRIPTION:
LOTS 11-18 IN BLOCK 8 AND LOTS 11-18 IN BLOCK 9 OF TRACT NO 2002 AS RECORDED IN BOOK 22 PAGE 134 OF MAPS IN THE COUNTY RECORDER'S OFFICE COUNTY OF LOS ANGELES TOGETHER WITH THAT PORTION OF SAID STREET VACATED BY ORD. NO. 308, 8-26-22 AS INSTRUMENT NO 634 AND RECORDED IN BOOK 1407 PAGE OF OFFICIAL RECORDS OF SAID COUNTY

DESIGNER:
DAVID E. GAUTSCHY, INC.
2690 JUNIPERO AVENUE, STE 201
SIGNAL HILL, CALIFORNIA 90806
562-427-0419

INDEX OF SHEETS:

GRADING GENERAL NOTES	C-1.0
EXISTING CONDITIONS	C-1.1
PHASE I--SITE DEMOLITION	C-1.2
PHASE I--ROUGH GRADING	C-1.3
PHASE II--PRECISE GRADING	C-2.1

VICINITY MAP:

FILE NO. 7308
ASHBA

REVISIONS

REFERENCES

PREPARED UNDER THE SUPERVISION OF | DATE

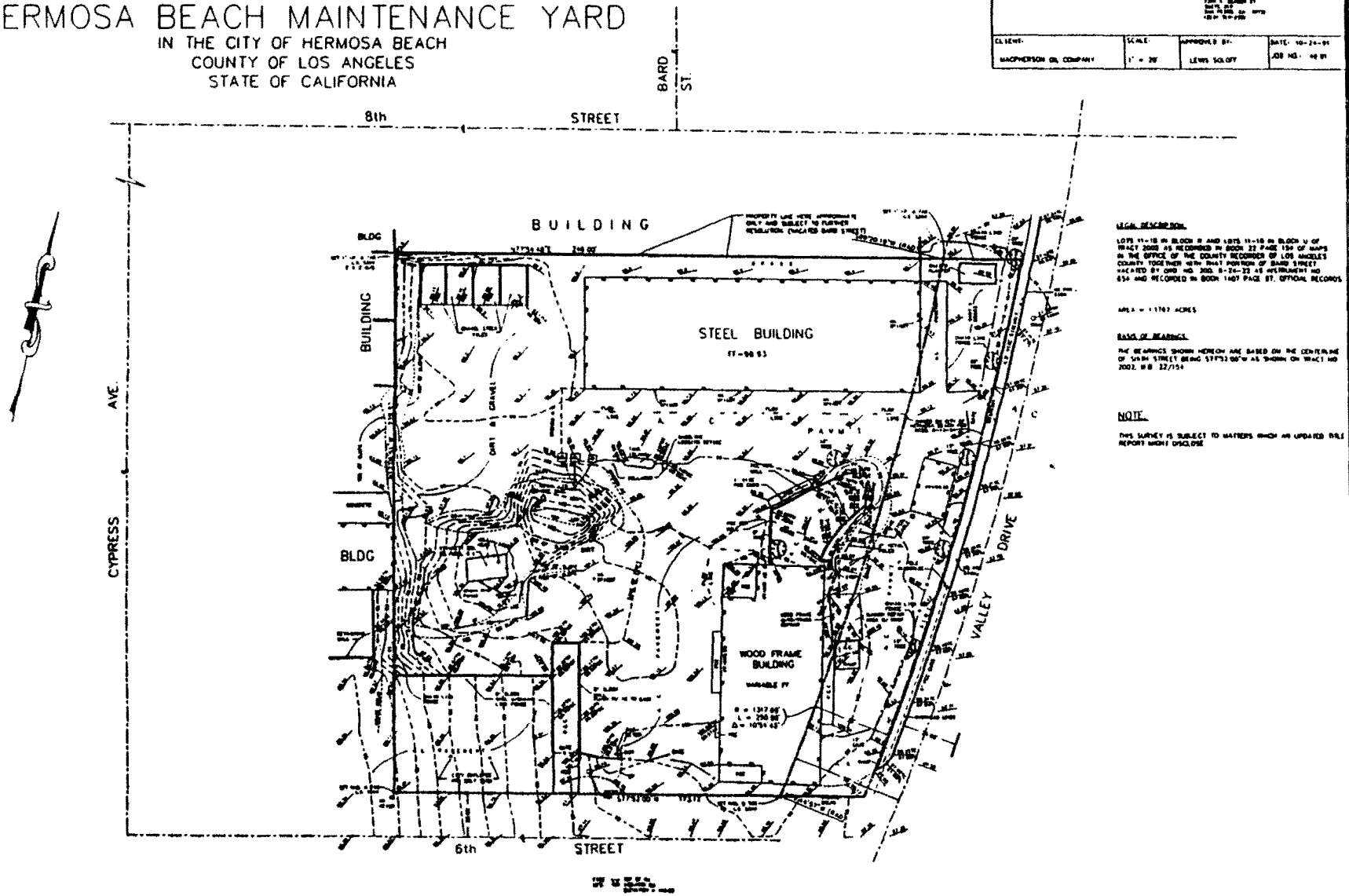
DIRECTOR OF PUBLIC WORKS

C.U.P. No. 93-5038
HERMOSA BEACH PROJECT
MACPHERSON OIL COMPANY
GRADING PLAN
CITY OF HERMOSA BEACH, C[illegible]

SHEET
C-1.0
OF 1 SHEETS
93-CP-1

BOUNDARY & TOPOGRAPHIC SURVEY
HERMOSA BEACH MAINTENANCE YARD

IN THE CITY OF HERMOSA BEACH
COUNTY OF LOS ANGELES
STATE OF CALIFORNIA



SOLOFF SURVEYING & CONSULTING
LAND SURVEYING, MAPPING AND CONSTRUCTION STAKING

CLIENT:	SCALE:	APPROVED BY:	DATE: 10-26-93
MACPHERSON OIL COMPANY	1" = 20'	LEWIS SOLOFF	JOB NO: 4491

LEGAL DESCRIPTION

LOTS 11-18 IN BLOCK R AND LOTS 11-18 IN BLOCK V OF TRACT 2002 AS RECORDED IN BOOK 22 PAGE 154 OF MAPS IN THE OFFICE OF THE COUNTY RECORDER OF LOS ANGELES COUNTY TOGETHER WITH THAT PORTION OF BARD STREET VACATED BY ORD NO. 300, 8-26-23 AS INSTRUMENT NO 654 AND RECORDED IN BOOK 1407 PAGE 87, OFFICIAL RECORDS

AREA = 1.1767 ACRES

BASIS OF BEARINGS

THE BEARINGS SHOWN HEREON ARE BASED ON THE CENTERLINE OF BARD STREET BEING S77°53'00"W AS SHOWN ON TRACT NO 2002, M B 22/154

NOTE

THIS SURVEY IS SUBJECT TO MATTERS WHICH AN UPDATED TITLE REPORT MIGHT DISCLOSE

CONSTRUCTION SCHEDULE

☐ CONSTRUCT NEW ☐ REMOVE EXIST.
☐ PROTECT EXIST ☐ RELOCATE EXIST

#	Description	Size	Detail
1	Curb	APWA	120
2	Curb & Gutter Vert S	APWA	120
3	Longitudinal Gutter	APWA	122
4	Concrete Flume	Berm	0
5	PCC Paving	APWA	154
6	Driveway Apr paving	APWA	110
7	4" Conc walk	APWA	112
8	1"AC over "CAB Paved	LACDPW	1066
9	CIP Curb Drain	APWA	150
10	Wheelchair Ramp	APWA	111
11	AC Access Ramp	Berm	11
12	Grate Inlet	Certain	u32
13	Utility Trench	Berm	13
14	Trafficbeat Barrier	APWA	123
15	Parking Culvert	APWA	195
16	Masonry Wall	Arch	0
17	Chain Link Fence	APWA	600
18	Trench Drain	ACB	w100
19	PVC Pipe Storm Drain	ASTM	F794
20	CI Pipe	ASTM	0
21	VCP Pipe	ASTM	C700
22	Reclamp CIP & adapter	AFCo	A670
23	Clean out	APWA	204
24	Crushed Aggregate Base	Spec	Specs
25	Var Thickness AC Cap	APWA	130
26	Street Light	APWA	0
27	Street Light Pull Box	APWA	460
28	St Lig Conn & wires	APWA	0
29	Reg Sign & Post	APWA	0
30	Traffic Signal	APWA	122
31	Catch Basin	APWA	300
32	Local Depression	APWA	313
33	Reinforced Conc Pipe	ASTM	C76
34	Concrete Collar	APWA	123
35	Water Meter	CVE	0
36	Fire Service Conn	CVE	0
37	Fire Hydrant	CVE	0
38	Building		
39	Backflow Prev	APWA	302
40	Water Vault	APWA	102
41	Elect Vault	SCE	0
42	Outlet Structure	APWA	120
43	Guardrail/ Posts		
44	Oil Tank System		
45	Irrigation System	APWA	100
46	Flag Pole		102
47	Power Pole	SCE	0
48	Geotechnical Points	ASTM	0
49	Basement Wooper	Spec	Specs
50	Vault Cover	APWA	102
51	Gas Service/Meter	SCG	0
52	Septic System		
53	Water Valve		
54	Oil well		
55			
56			

SURVEY DATA

#	ANGLE	D	L	T
1				
2				
3				
4				
5				

0 10' 20' 40'

FILE NO. 7308

ASHBA

REVISIONS				
NO.	DATE	BY	DESCRIPTION	APPROVED

REFERENCES	

PREPARED UNDER THE SUPERVISION OF | DATE

REC. NO. 3187
RECORD
R/W INFO
RECOMMENDED
APPROVED

DIRECTOR OF PUBLIC WORKS

CUP No 93-3032

HERMOSA BEACH PROJECT
MACPHERSON OIL COMPANY

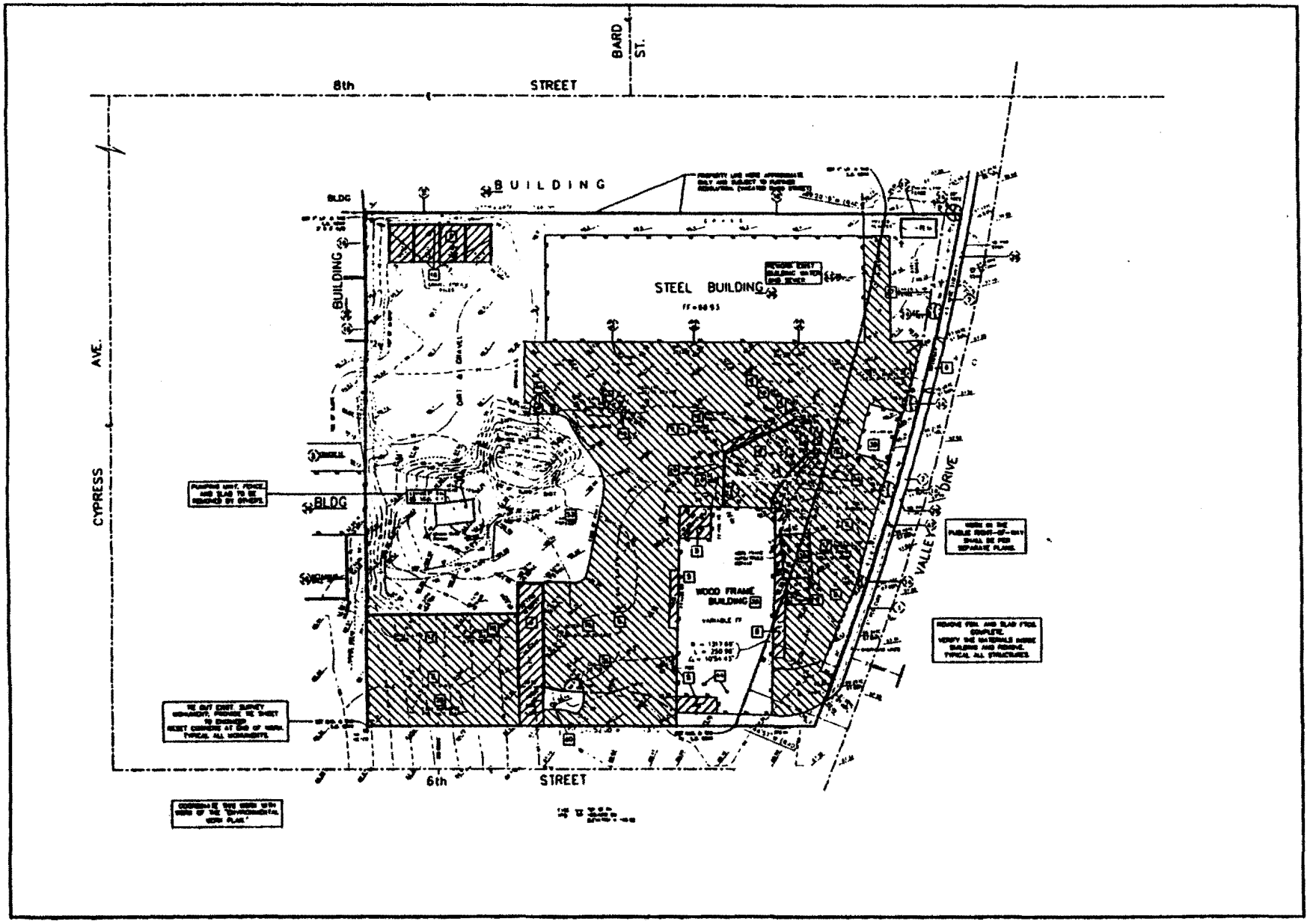
GRADING PLAN

CITY OF HERMOSA BEACH, CA.

SHEET C-1.1

OF SHEETS

93-CP-1



CONSTRUCTION SCHEDULE

CONSTRUCT NEW... REMOVE EXIST...
PROTECT EXIST... RELOCATE EXIST...

#	Description	Size	Detail
1	Curb	APWA	120
2	Curb & Gutter Vert. 3'	APWA	120
3	Longitudinal Gutter	APWA	120
4	Concrete Flume	Sect	4
5	PCC Paving	APWA	134
6	Driveway Conc. Apron	APWA	110
7	4" Conc. Walk	APWA	110
8	"AC over "CAB Pave	LACBPW	1004
9	CIP Curb Drain	APWA	130
10	Wheelchair Ramp	APWA	111
11	AC Access Ramp	Sect	11
12	Grate Inlet	CMP Grty	1000
13	Utility Trench	Sect	13
14	Tree/Well/Root Barrier	APWA	100
15	Parking Cutwert	APWA	130
16	Masonry Wall	Arch	0
17	Chain Link Fence	APWA	200
18	Trench Drain	ACB	HS130
19	PVC Pipe Storm Drain	ASTM	F794
20	CI Pipe	ASTM	0
21	VCP Pipe	ASTM	C700
22	Backing, CIP & Adapter	APCA	4010
23	Clean out	APWA	204
24	Crushed Aggregate Base	Sec	26003
25	Var. Thickness AC Cap	APWA	130
26	Street Light	APWA	0
27	Street Light Pull Box	APWA	460
28	St. Lig. Cond. & Wires	APWA	0
29	Reg. Sign & Post	APWA	0
30	Traffic Signal	APWA	132
31	Catch Basin	APWA	300
32	Local Depression	APWA	313
33	Reinforced Conc. Pipe	ASTM	C76
34	Concrete Collar	APWA	100
35	Water Meter	CVS	0
36	Fire Service Conn.	CVS	0
37	Fire Hydrant	CVS	0
38	Building		
39	Backflow Prev.	APWA	513
40	Water Vault	APWA	100
41	Check Vault	SCE	0
42	Buried Structure	APWA	100
43	Guardrail/ Posts		
44	Oil Tank System		
45	Irrigation System	APWA	100
46	Flag Pole		100
47	Power Pole	SCE	0
48	Construction Fabric	ASTM	0
49	Redwood Header	Sec	26003
50	Vault Cover	APWA	100
51	Gas Service/Meter	SCG	0
52	Septic System		
53	Water Valve		
54	Oil Well		
55			
56			

SURVEY DATA

#	ANGLE	D	L	T
1				
2				
3				
4				
5				

FILE NO. 7308

ASHBA

REVISIONS

REFERENCES

DIRECTOR OF PUBLIC WORKS

DATE

C.U.P. No. 93-0032

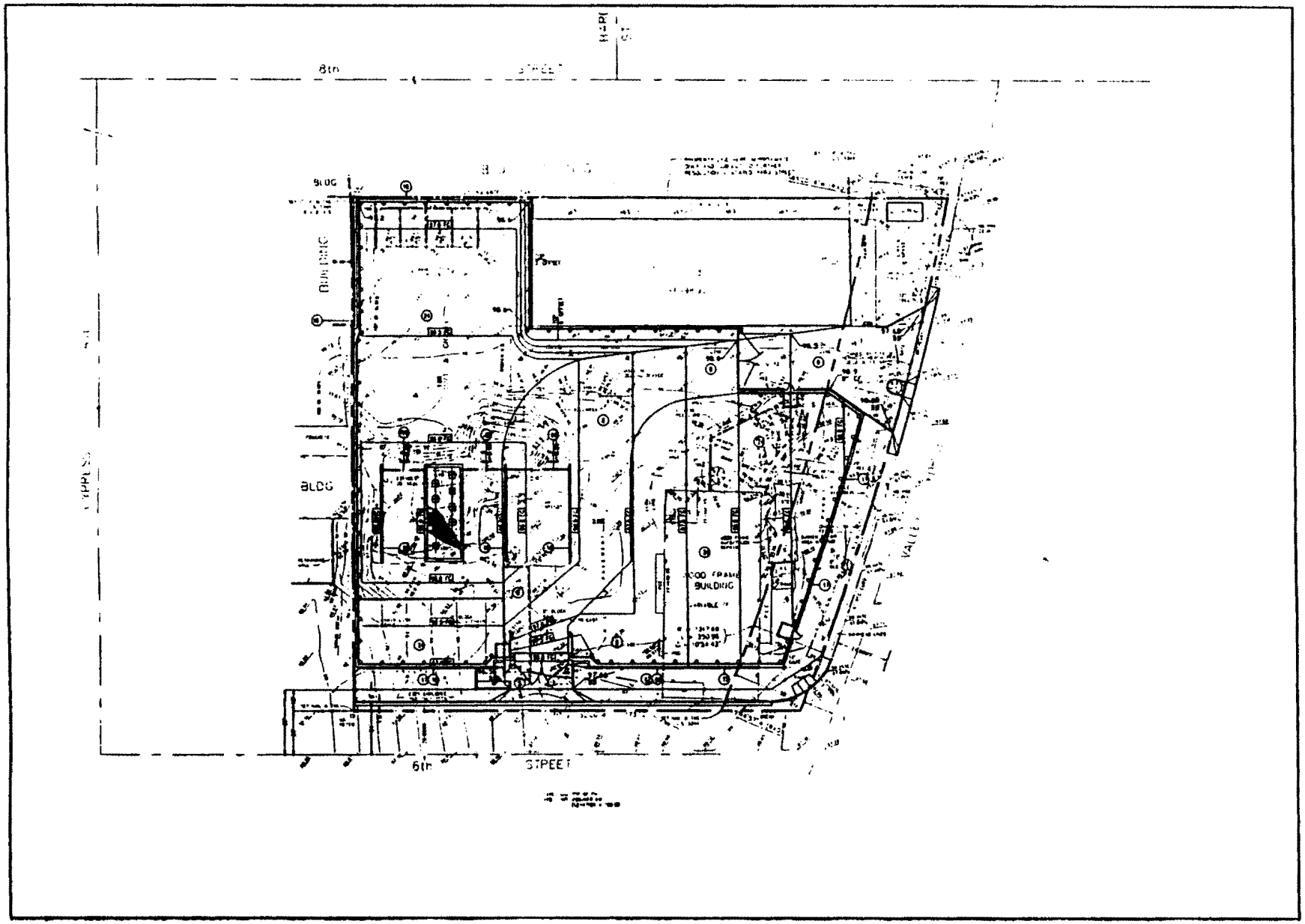
HERMOSA BEACH PROJECT
MACPHERSON OIL COMPANY

GRADING PLAN

CITY OF HERMOSA BEACH, C

SHEET C-1.2

93-GP-1



CONSTRUCTION SCHEDULE

- CONSTRUCT NEW
- PROTECT EXIST
- REMOVE EXIST...
- RELOCATE EXIST

#	Description	Size	Remarks
1	Curb	APWA	120
2	Curb & Gutter Vol 5	APWA	140
3	Longitudinal Gutter	APWA	122
4	Concrete Flume	Sec	6
5	PCC Paving	APWA	130
6	Driveway End Apron	APWA	110
7	4" Conc walk	APWA	112
8	"AC over "CAB Pave	LACBPW	1060
9	CIP Curb Drain	APWA	150
10	Wheelchair Ramp	APWA	111
11	AC Access Ramp	Sec	11
12	Grate Inlet	Carroll	420
13	Utility Trench	Sec	13
14	Tree/Wall/Post Barrier	APWA	122
15	Parkway Culvert	APWA	132
16	Masonry Wall	Arch	6
17	Chain Link Fence	APWA	600
18	Trench Drain	ACO	16400
19	PVC Pipe, Storm Drain	ASTM	7700
20	CI Pipe	ASTM	0
21	RCP Pipe	ASTM	2700
22	Backing CIP & Adapter	AFCO	4470
23	Clean out	APWA	204
24	Crushed Aggregate Base	Sec	Space
25	Var Thickness AC Cap	APWA	122
26	Street Light	APWA	0
27	Street Light Pull Box	APWA	460
28	St. Ltg. Conc. & Wires	APWA	0
29	Reg. Sign & Post	APWA	0
30	Traffic Signal	APWA	122
31	Catch Basin	APWA	200
32	Local Depression	APWA	313
33	Reinforced Conc. Pipe	ASTM	C76
34	Concrete Cutter	APWA	122
35	Water Meter	CVS	0
36	Fire Service Conn.	CVS	0
37	Fire Hydrant	CVS	0
38	Building		
39	Backflow Prev	APWA	312
40	Water Vault	APWA	122
41	Elect Vault	SCE	0
42	Bubble Structure	APWA	122
43	Guardhouse/ Post		
44	Oil Tank System		
45	Irrigation System	APWA	122
46	Flag Pole		122
47	Power Pole	SCE	0
48	Geotechnical Fabric	ASTM	0
49	Redwood Header	Sec	Space
50	Vault Cover	APWA	122
51	Gas Service/Meter	SCG	0
52	Septic System		
53	Water Valve		
54	Oil Well		
55			
56			

SURVEY DATA

#	ANGLE	R	L	T
A				
B				
C				
D				

0 10' 20' 40'

FILE NO. 7308

ASHBA

REVISIONS	
NO.	DESCRIPTION

REFERENCES

PREPARED UNDER THE SUPERVISION OF

DATE

DIRECTOR OF PUBLIC WORKS

CUP No. 93-0632

HERMOSA BEACH PROJECT
MACPHERSON OIL COMPANY

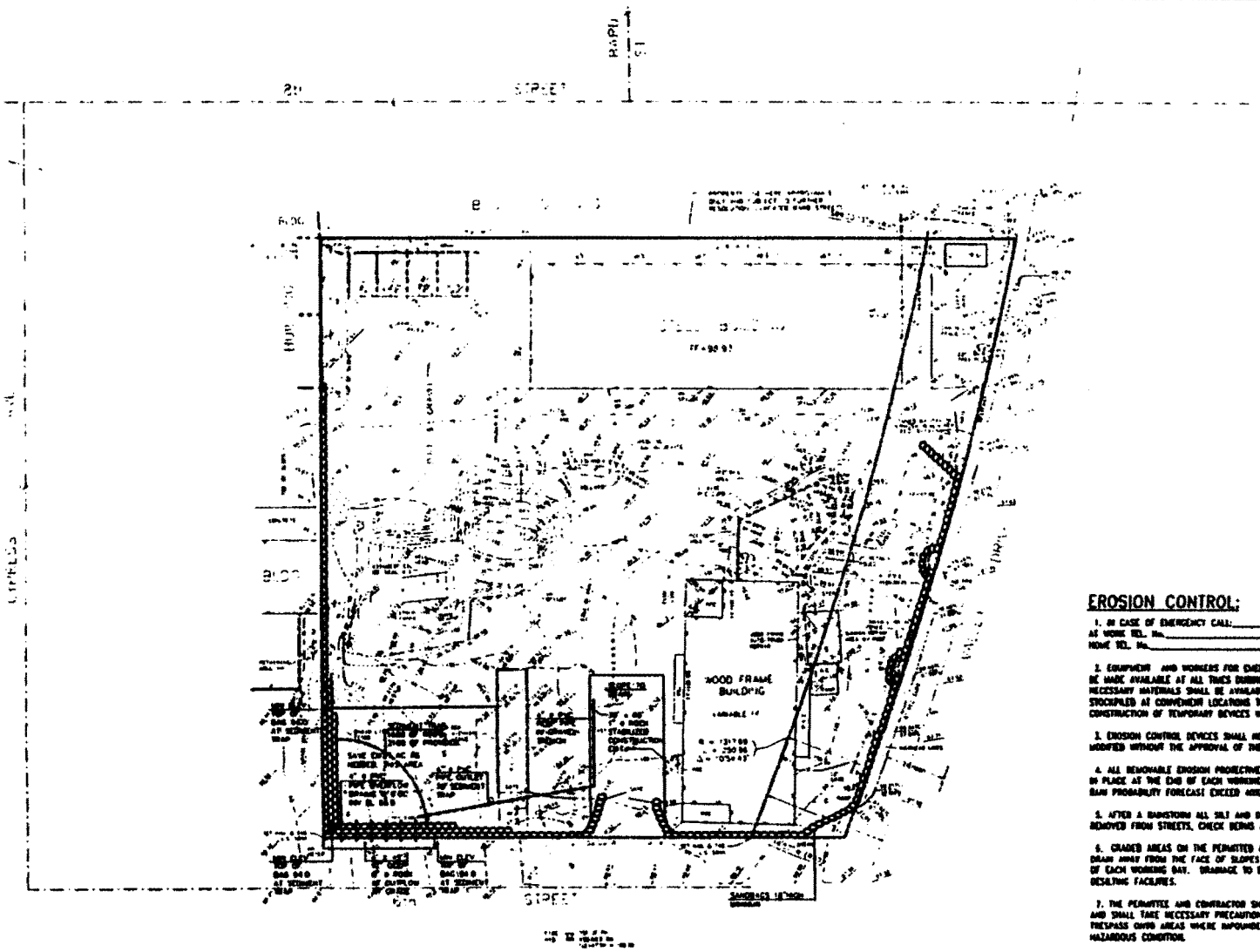
GRADING PLAN

CITY OF HERMOSA BEACH, CA.

SHEET C-1.3

OF SHEETS

93-GP-1



EROSION CONTROL:

1. IN CASE OF EMERGENCY CALL:_____
AT WORK TEL. No._____
HOME TEL. No._____

2. EQUIPMENT AND WORKERS FOR EMERGENCY WORK SHALL BE MADE AVAILABLE AT ALL TIMES DURING THE RAINY SEASON. NECESSARY MATERIALS SHALL BE AVAILABLE ON SITE AND STOCKPILED AT CONVENIENT LOCATIONS TO FACILITATE RAPID CONSTRUCTION OF TEMPORARY DEVICES WHEN RAIN IS IMMINENT.

3. EROSION CONTROL DEVICES SHALL NOT BE MOVED OR MODIFIED WITHOUT THE APPROVAL OF THE BUILDING OFFICIAL.

4. ALL REMOVABLE EROSION PROTECTIVE DEVICES SHALL BE IN PLACE AT THE END OF EACH WORKING DAY WHEN THE 5-DAY RAIN PROBABILITY FORECAST EXCEEDS 40%.

5. AFTER A RAINSTORM ALL SILT AND DEBRIS SHALL BE REMOVED FROM STREETS, CHECK DERMS AND BASINS.

6. GRADED AREAS ON THE PERMITTED AREA PERIMETER MUST DRAIN AWAY FROM THE FACE OF SLOPES AT THE CONCLUSION OF EACH WORKING DAY. DRAINAGE TO BE DIRECTED TOWARD DESILTING FACILITIES.

7. THE PERMITTEE AND CONTRACTOR SHALL BE RESPONSIBLE AND SHALL TAKE NECESSARY PRECAUTIONS TO PREVENT PUBLIC TRESPASS OVER AREAS WHERE IMPOUNDED WATER CREATES A HAZARDOUS CONDITION.

8. THE UNDERSIGNED CIVIL ENGINEER SHALL INSPECT THE EROSION CONTROL WORK AND INSURE THAT THE WORK IS IN ACCORDANCE WITH THE APPROVED PLANS.

BY:_____DATE:_____

CONSTRUCTION SCHEDULE

CONSTRUCT NEW . REMOVE EXIST. . .
PROTECT EXIST . . RELOCATE EXIST. . .

#	Description	Unit	Detail
1	Curb	APWA	120
2	Curb & Gutter Vol 5	APWA	120
3	Longitudinal Gutter	APWA	120
4	Concrete Flume	Sand	0
5	PCC Paving	APWA	134
6	Driveway Surf. Detail	APWA	110
7	4" Conc walk	APWA	112
8	3"AC over 6"CAB Pave	LACBPW	1000
9	CIP Curb Drain	APWA	150
10	Wheelchair Ramp	APWA	111
11	AC Access Ramp	Sand	11
12	Grate Inlet	Concrete	400
13	Utility Trench	Sand	13
14	Tree/Root/Root Barrier	APWA	122
15	Parkway Culvert	APWA	150
16	Masonry Wall	Arch	0
17	Chain Link Fence	APWA	600
18	Trench Drain	ACO	[illegible]
19	PVC Pipe, Storm Drain	ASTM	F794
20	CI Pipe	ASTM	0
21	VCP Pipe	ASTM	C700
22	Packing CIP & Adapter	AFGA	[illegible]
23	Clean out	APWA	204
24	Crushed Aggregate Base	Sand	[illegible]
25	Per Thickness AC Cap	APWA	122
26	Street Light	APWA	0
27	Street Light Pull Box	APWA	400
28	El. Ltg. Conn & Wires	APWA	0
29	Reg. Sign & Post	APWA	0
30	Traffic Signal	APWA	120
31	Catch Basin	APWA	200
32	Local Depression	APWA	213
33	Reinforced Conc. Pipe	ASTM	C76
34	Concrete Collar	APWA	122
35	Water Meter	CVE	0
36	Fire Service Conn	CVE	0
37	Fire Hydrant	CVE	0
38	Building		
39	Backflow Prev	APWA	312
40	Water Vault	APWA	122
41	Elect Vault	SCE	0
42	Burial Structure	APWA	122
43	Guardrail Post		
44	Oil Tank System		
45	Irrigation System	APWA	122
46	Flag Pole		122
47	Power Pole	SCE	0
48	Geotechnical Fabric	ASTM	0
49	Removal Hedge	Sand	[illegible]
50	Vault Cover	APWA	122
51	Gas Service/Meter	SCG	0
52	Septic System		
53	Water Valve		
54	Oil Well		
55			
56			

CO SURVEY DATA

#	ANGLE	D	L	T
A				
B				
C				
D				

FILE NO. 7308

ASHBA

REVISIONS

REFERENCES

PREPARED UNDER THE SUPERVISION OF

DATE

DIRECTOR OF PUBLIC WORKS

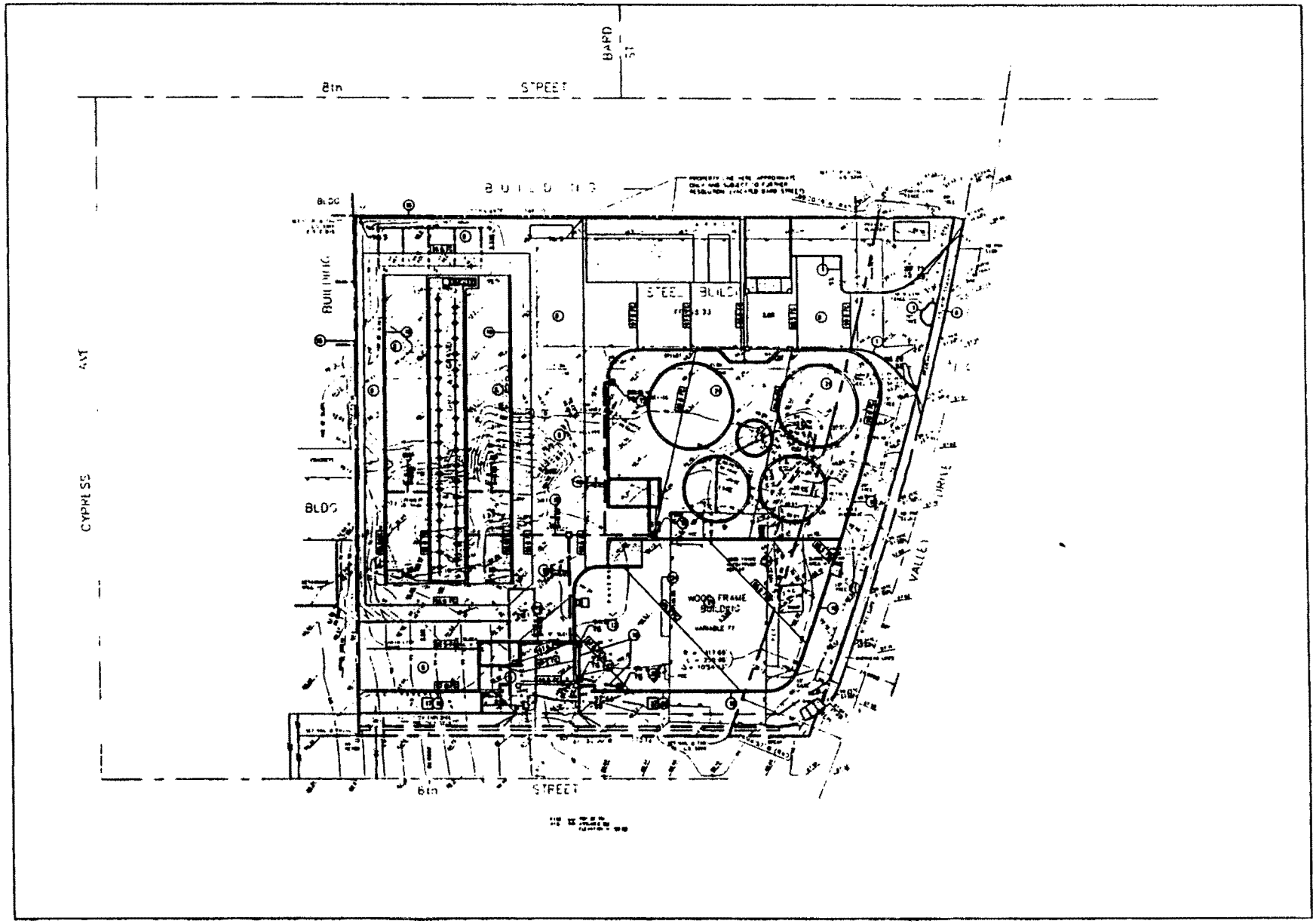
E.M.P. No. 93-3832

HERMOSA BEACH PROJECT
MACPHERSON OIL COMPANY
GRADING PLAN

CITY OF HERMOSA BEACH, C

SHEET C-1.4

93-CP-1



CONSTRUCTION SCHEDULE

- CONSTRUCT NEW
- REMOVE EXIST...
- PROTECT EXIST
- RELOCATE EXIST...

#	Description	Size	Detail
1	Curb	APWA	120
2	Curb & Gutter Vol 5'	APWA	120
3	Longitudinal Gutter	APWA	122
4	Concrete Flume	Std	4
5	PCC Paving	APWA	130
6	Driveway Drs', Aprng'	APWA	110
7	4' Conc Walk	APWA	113
8	"AC over "CAB Pvmt	LACDPW	1000
9	CIP Curb Drain	APWA	130
10	Wheelchair Ramp	APWA	111
11	AC Access Ramp	Std	11
12	Grate Inlet	Certify	200
13	Utility Trench	Std	13
14	Tree/Soil/Root Barrier	APWA	120
15	Parkway Culvert	APWA	130
16	Masonry Wall	Arch	6
17	Chain Link Fence	APWA	600
18	Trench Drain	ACB	HS20
19	PVC Pipe, Storm Drain	ASTM	F794
20	CI Pipe	ASTM	6
21	VCP Pipe	ASTM	C700
22	Rocking CIP & Adapter	APCA	A4.70
23	Clean out	APWA	304
24	Crushed Aggregate Base	Sno	Sonco
25	Var. Thickness AC Cap	APWA	132
26	Street Light	APWA	9
27	Street Light Pull Box	APWA	400
28	St. Lig. Cond. & Wires	APWA	9
29	Reg. Sign & Post	APWA	9
30	Traffic Signal	APWA	132
31	Catch Basin	APWA	300
32	Local Depression	APWA	313
33	Reinforced Conc. Pipe	ASTM	C76
34	Concrete Collar	APWA	122
35	Water Meter	CVS	9
36	Fire Service Conn.	CVS	9
37	Fire Hydrant	CVS	9
38	Building		
39	Backflow Prev	APWA	302
40	Water Vault	APWA	100
41	Elect Vault	SCE	9
42	Guard Structure	APWA	100
43	Guardrail/ Post		
44	Oil Tank System		
45	Irrigation System	APWA	102
46	Flag Pole		120
47	Power Pole	SCE	9
48	Geotechnical Equip	ASTM	9
49	Redwood Header	Sno	Sonco
50	Vault Cover	APWA	102
51	Gas Service/Meter	SCG	9
52	Septic System		
53	Water Valve		
54	Oil Well		
55			
56			

SURVEY DATA

#	ANGLE	R	L	T
A				
B				
C				
D				

0 10' 20' 40'

FILE NO. 7308

ASHBA

REVISIONS			
NO.	DATE	DESCRIPTION	APPR.

REFERENCES	

PREPARED UNDER THE SUPERVISION OF

DATE

DIRECTOR OF PUBLIC WORKS

CUP No. 93-3032

HERMOSA BEACH PROJECT
MACPHERSON OIL COMPANY

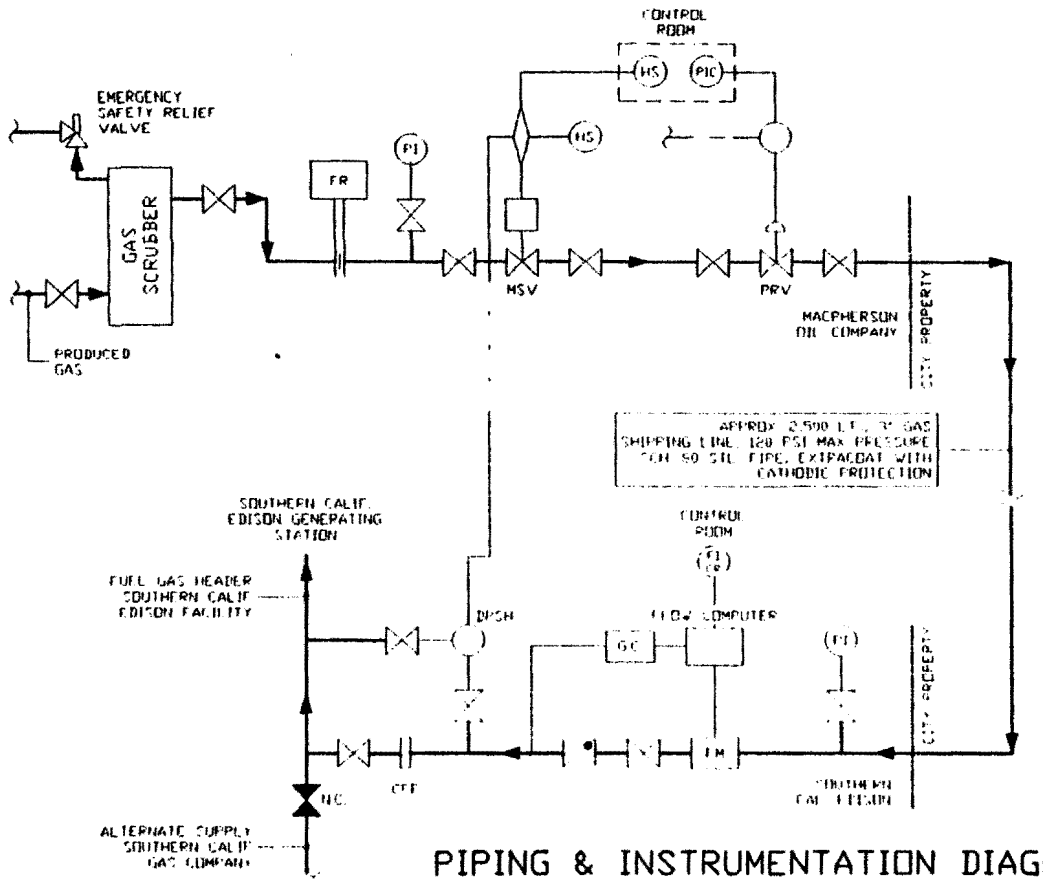
GRADING PLAN

CITY OF HERMOSA BEACH, CA.

SHEET C-2.1

OF SHEETS

93-GP-1



LEGEND

CPF	CATHODIC PROTECTION ISO FLANGE
CR	CONTROL ROOM
DPSH	DIFFERENTIAL PRESSURE SWITCH, HIGH
FI	FLOW INDICATOR
FM	FLOW METER
FR	FLOW RECORDER
GC	GAS CHROMATOGRAPH
HS	HAND SWITCH
MSV	MAIN SHUT OFF VALVE
PI	PRESSURE INDICATOR
PIC	PRESSURE INDICATOR CONTROLLER
PRV	PRESSURE REGULATING VALVE

PIPING & INSTRUMENTATION DIAGRAM
GAS SHIPPING FACILITIES

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REVISIONS TO APPROVED PLANS							
No.	Date	Description	APPROVAL BY MOC	DEG	DATE

ORIGINAL DRAWING
CAD File No. MBPSTRGAS
Date Drawn MAR 5, 1997
Drawn By DEG
Revised
Revised

PLANS PREPARED BY
DAVID E. GAUTSCHY, INC.
2698 JUNIPERO AVE. # 201B
SIGNAL HILL, CALIFORNIA 90806
(562) 427-0419

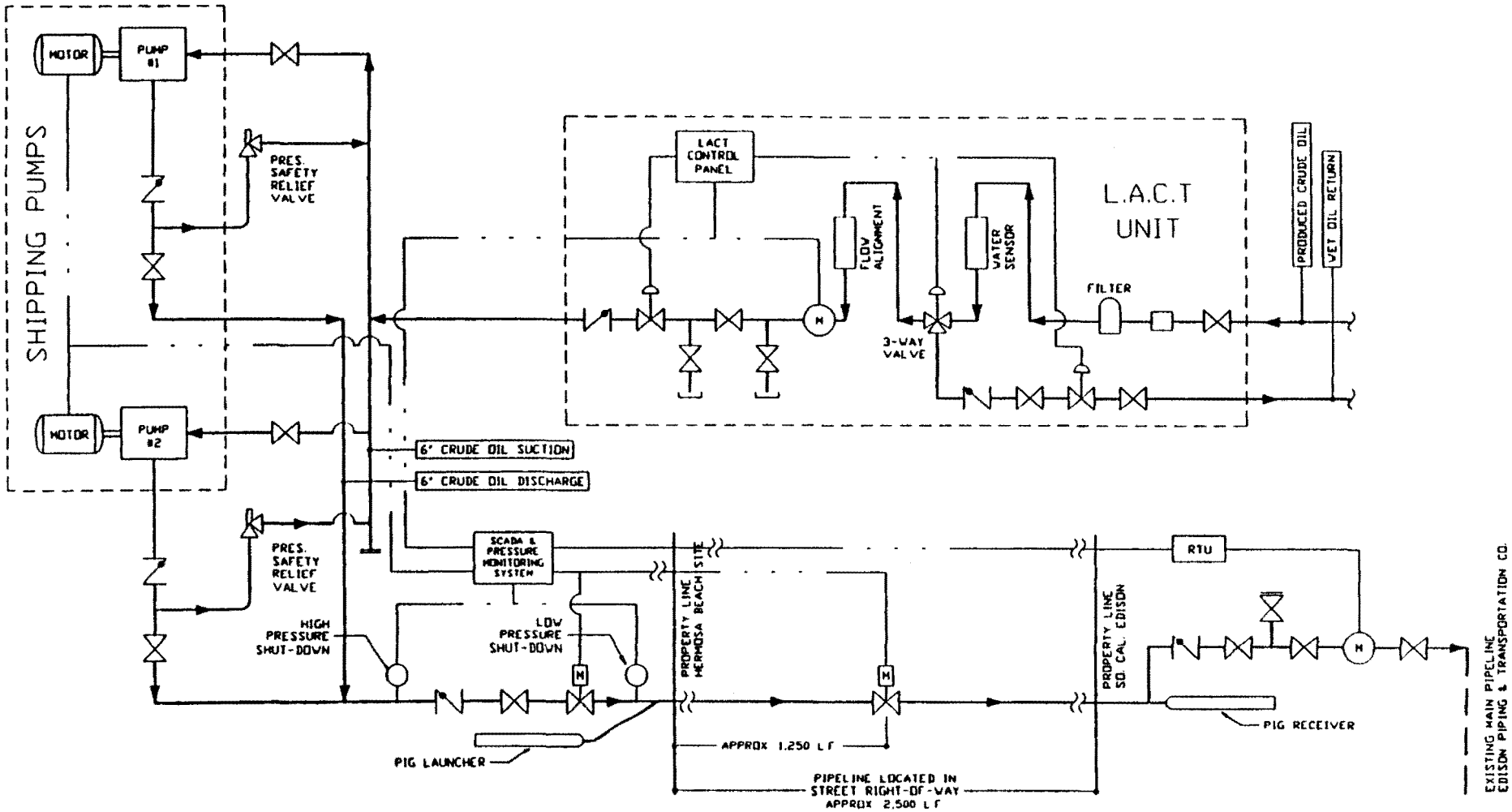
PLANS PREPARED FOR
MACPHERSON OIL COMPANY
27[illegible] OCEAN PARK BLVD., NO. 3080
SANTA MONICA, CALIFORNIA 90405

HERMOSA BEACH PROJECT
GAS SHIPPING LINE
PIPING & INSTRUMENTATION DIAGRAM
555 SIXTH STREET, HERMOSA BEACH, CA.

Drawn Date N.A.
Pub. Date MAR 5, 1997

M-1.02

Sheet 1 of 1



PIPING & INSTRUMENTATION DIAGRAM
CRUDE OIL SHIPPING FACILITIES

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REVISIONS TO APPROVED PLANS					
NO.	DATE	DESCRIPTION	APPROVAL BY MOC	BEG	DATE
01	11/3/97	CHANGE CONNECTION TO EDISON ADD SCADA SYSTEM FOR HBC SITE			

ORIGINAL DRAWING	
CAD File No.	HBHIB.DWG
Date Drawn	MAR 3, 1997
Drawn By	BEG
Reviewed	NOV 3, 1997
Revised	
Approved	

PLANS PREPARED BY

DAVID E. GAUTSCHY, INC.
2698 JUNIPERO AVE. # 2018
SIGNAL HILL, CALIFORNIA 90806
(562) 427-0410

PLANS PREPARED FOR

MACPHERSON OIL COMPANY
2716 OCEAN PARK BLVD., NO. 3080
SANTA MONICA, CALIFORNIA 90405

HERMOSA BEACH PROJECT
CRUDE OIL SHIPPING LINE
PIPING & INSTRUMENTATION DIAGRAM
555 SIXTH STREET, HERMOSA BEACH, CA.

Dwg Scale NA
Plot Date NOV 3 1997

M-2.08

Sheet 1 of 1

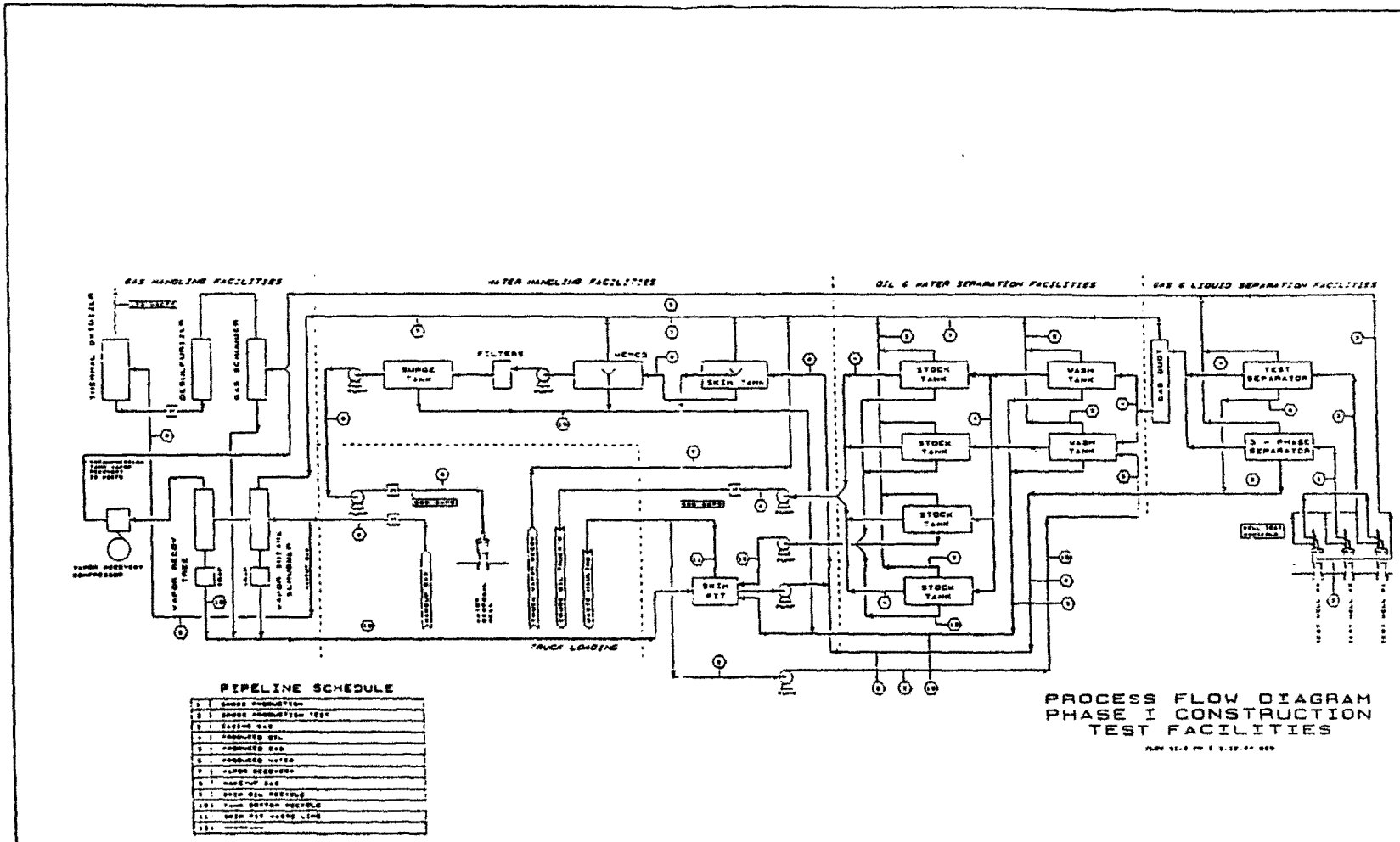
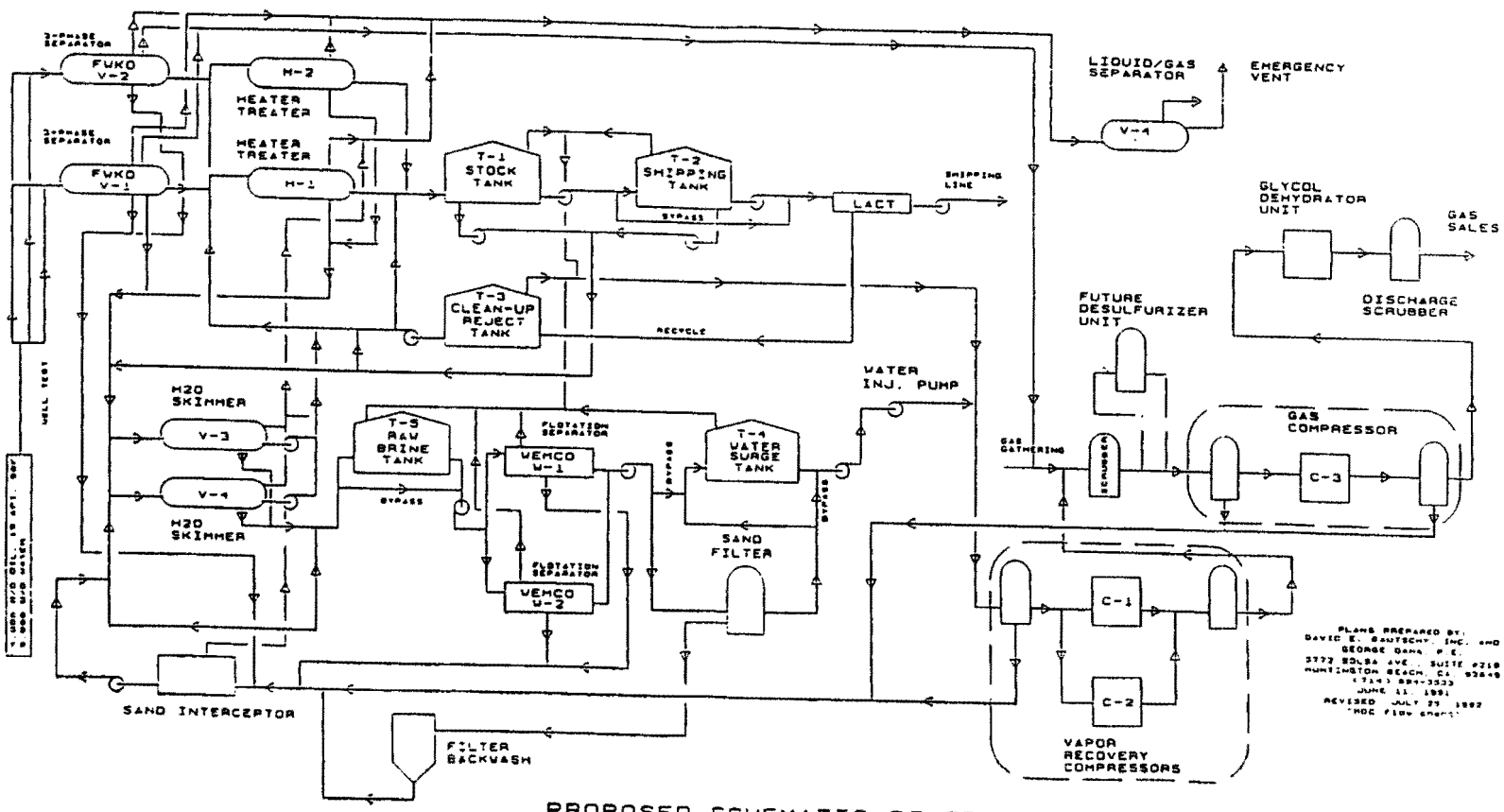
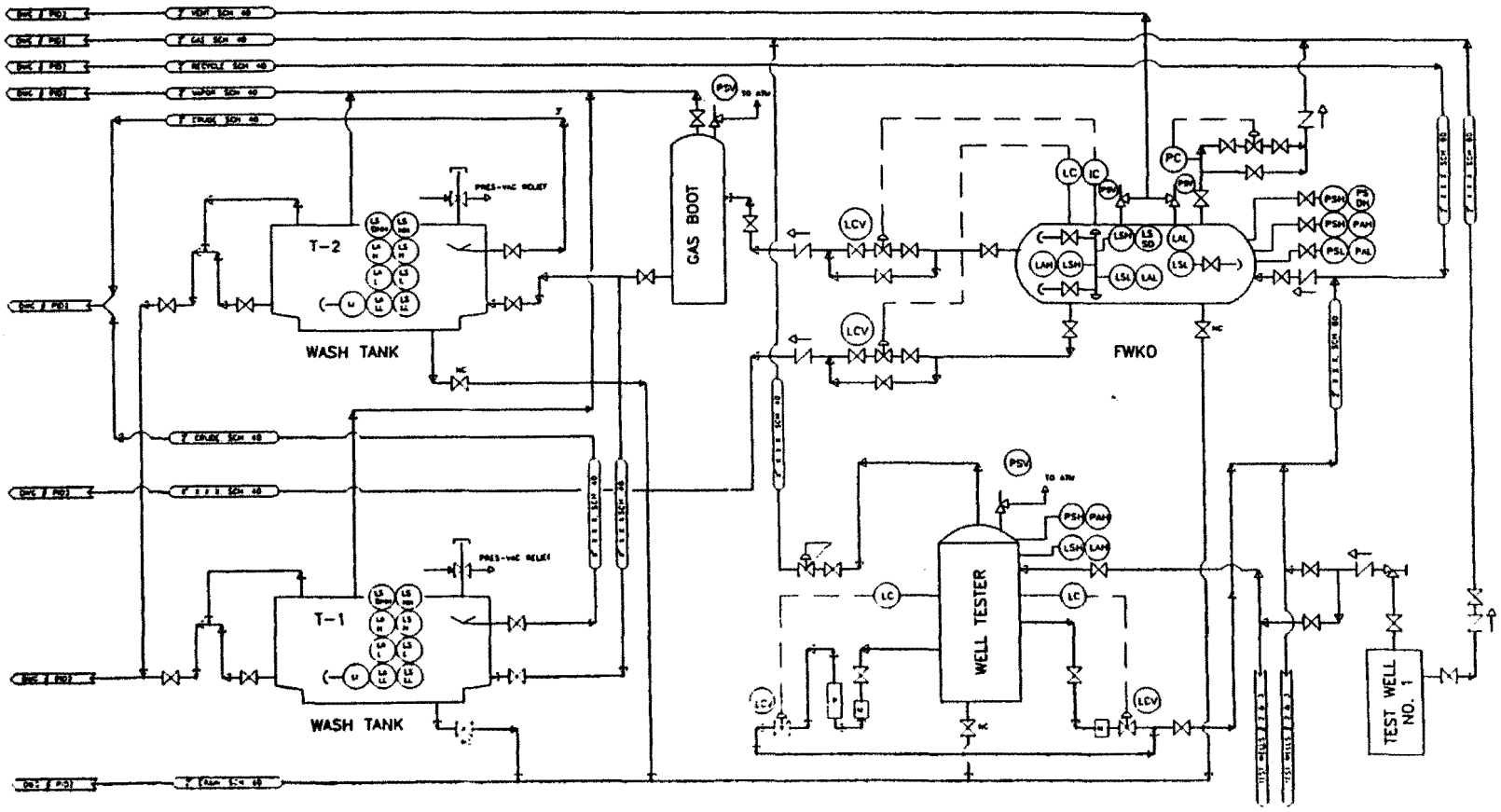


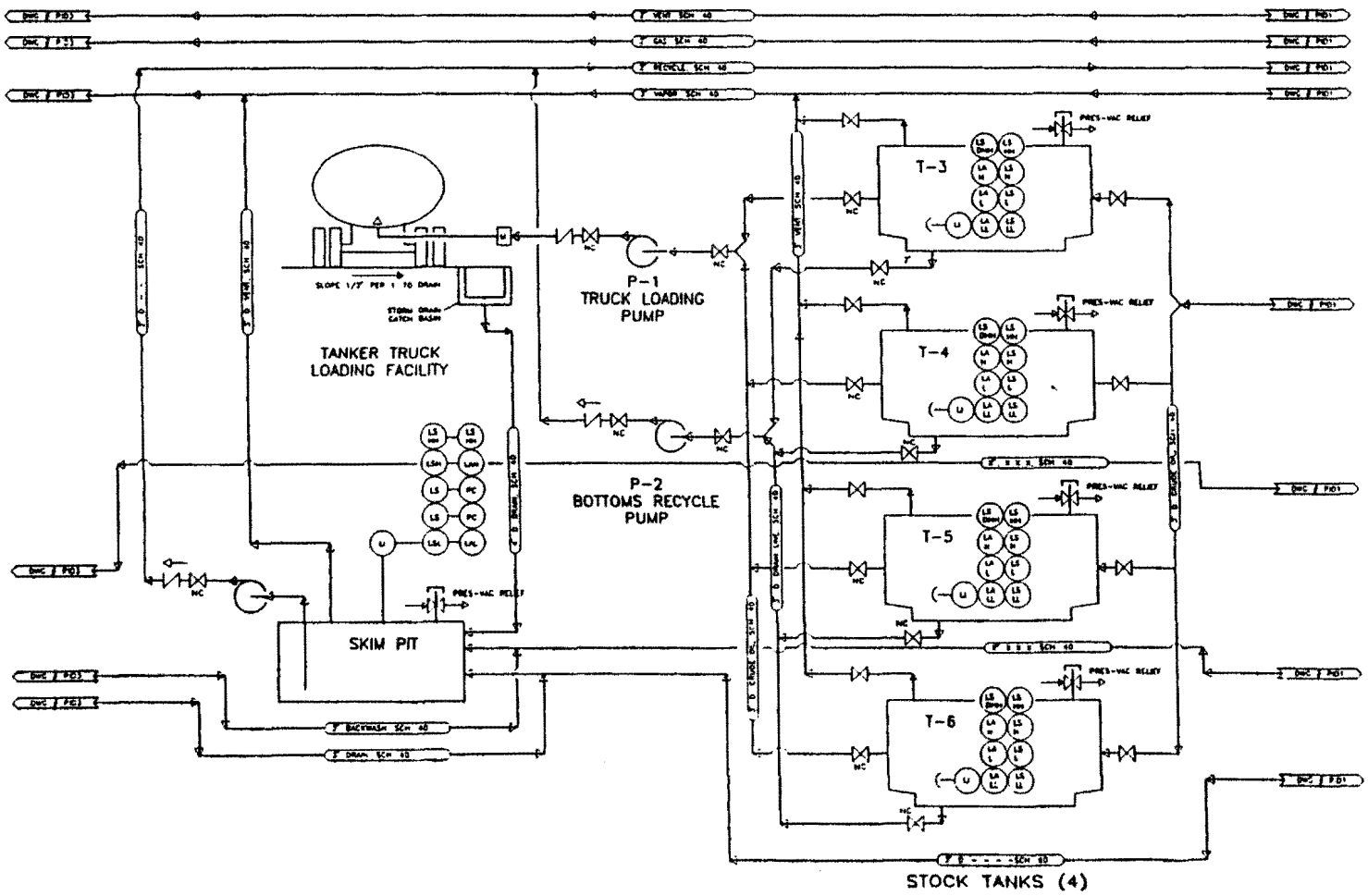
FIGURE 2-2. PROCESS FLOW - PHASE I



PROPOSED SCHEMATIC DIAGRAM
HERMOSA BEACH PROJECT
MACPHERSON OIL COMPANY



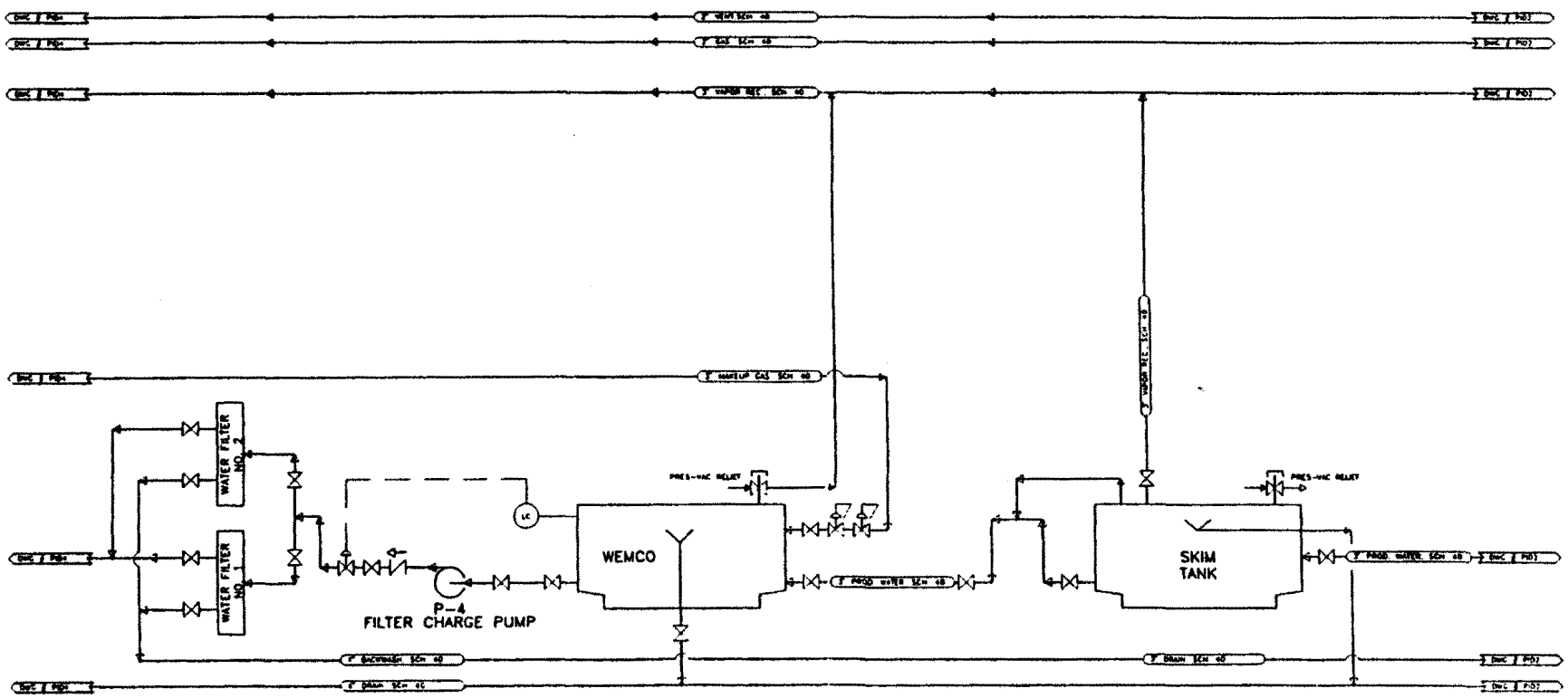
REVISIONS	REFERENCES	PLANS PREPARED BY DAVID E. G[illegible]CHY, INC.	SCALE NOT TO SCALE	TEST PHASE PIPING & INSTRUMENTATION DIA[illegible]M HERMOSA BEACH PROJECT	SHEET NO PID 1 OF SHEETS



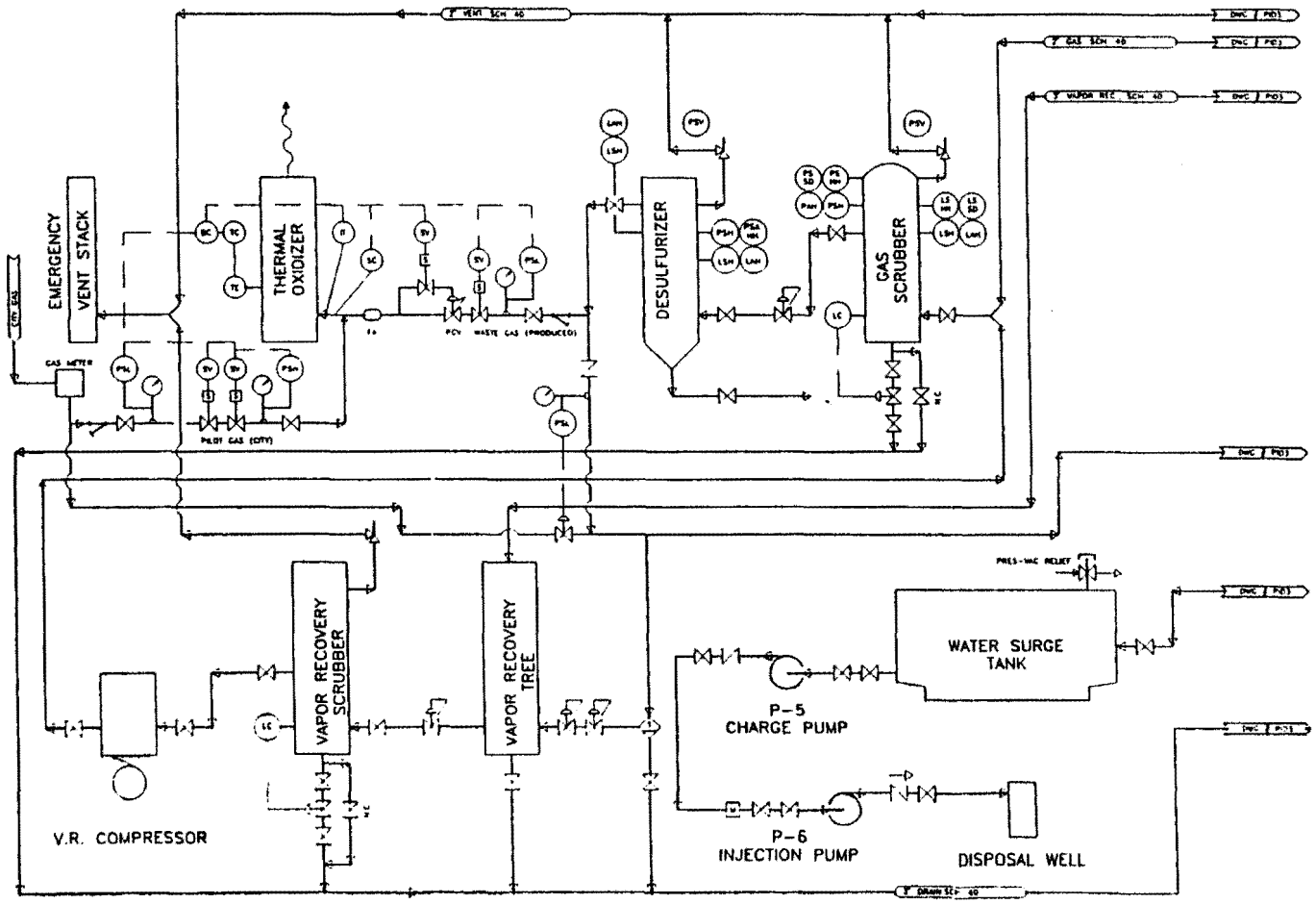
REVISIONS	REFERENCES				
NO / BY / DATE		PLANS PREPARED BY DAVID E. GAUTSCHY, INC. 16531 BOLSA CHICA, #301 HUNTINGTON BEACH, CA 92649 (714) 377-4434	SCALE: NOT TO SCALE	DATE: 10/12/91	TEST PHASE PIPING & INSTRUMENTATION DIAGRAM

SHEET NO PID 2

HERMOSA BEACH PROJECT

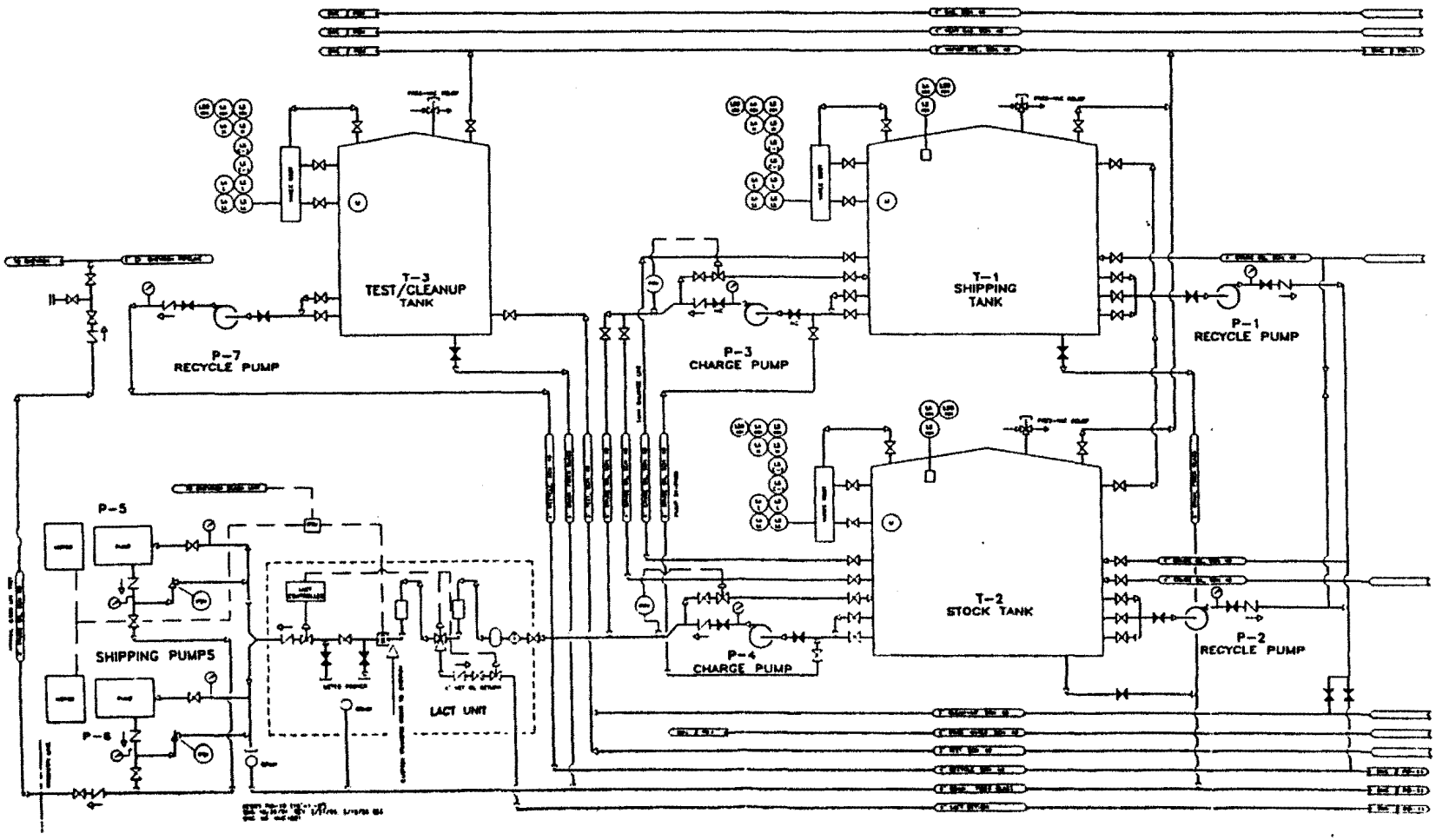


REVISIONS	REFERENCES	PLANS PREPARED BY DAVID E. GA[redacted]CHY, INC.		TEST PHASE PIPING & INSTRUMENTATION DIA[redacted]	SHEET NO PID 3
NO SHT DAT			NOT TO SCALE	HERMOSA BEACH PROJECT	

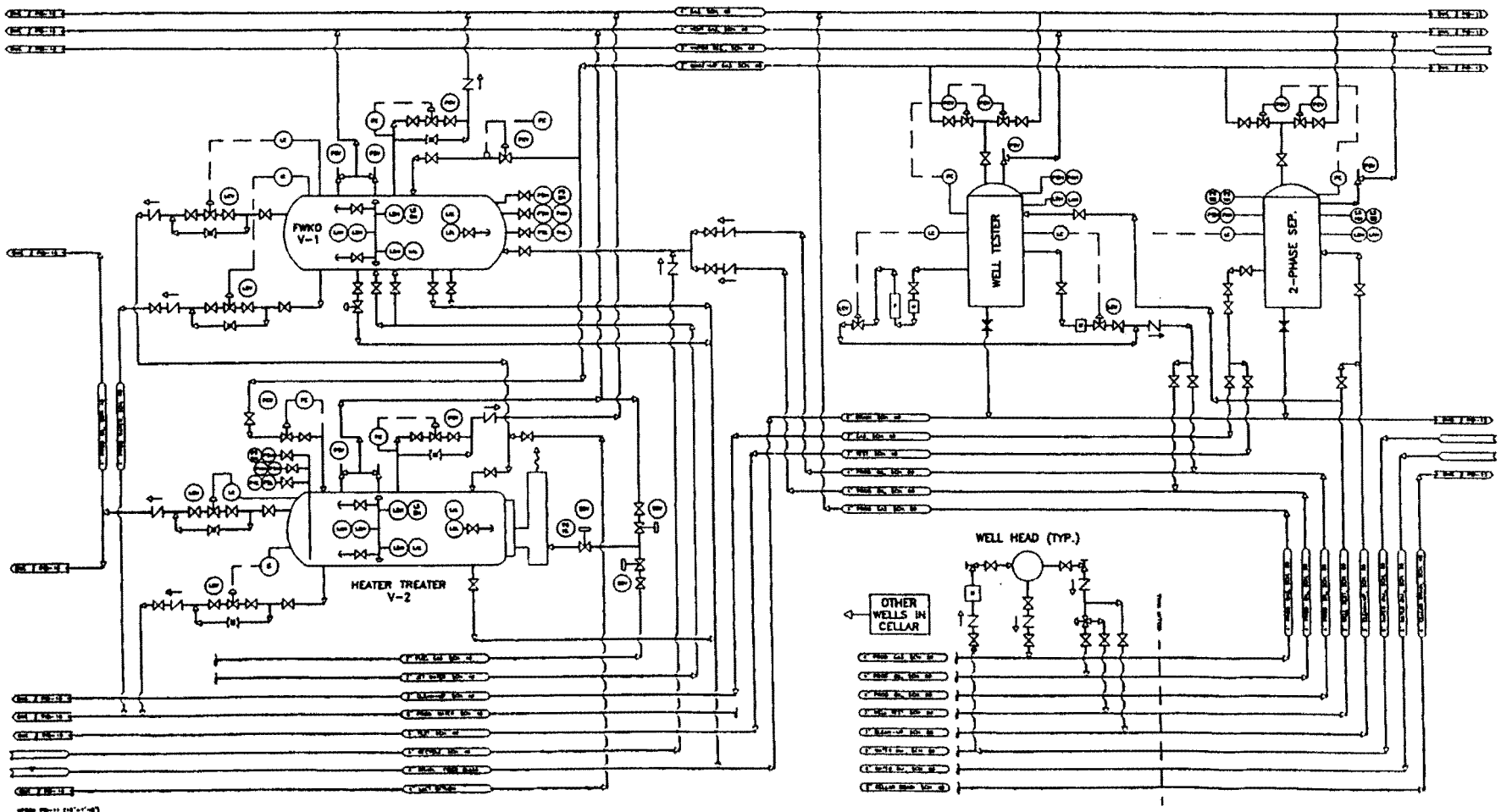


REVISIONS	REFERENCES	PLANS PREPARED BY: DAVID E. GAUTSCHY, INC. 16531 BOLSA CHICA, #301 HUNTINGTON BEACH, CA 92649	SCALE: NOT TO SCALE	DATE: 10/12/94	TEST PHASE PIPING & INSTRUMENTATION DIAGRAM	SHEET NO. PID 4

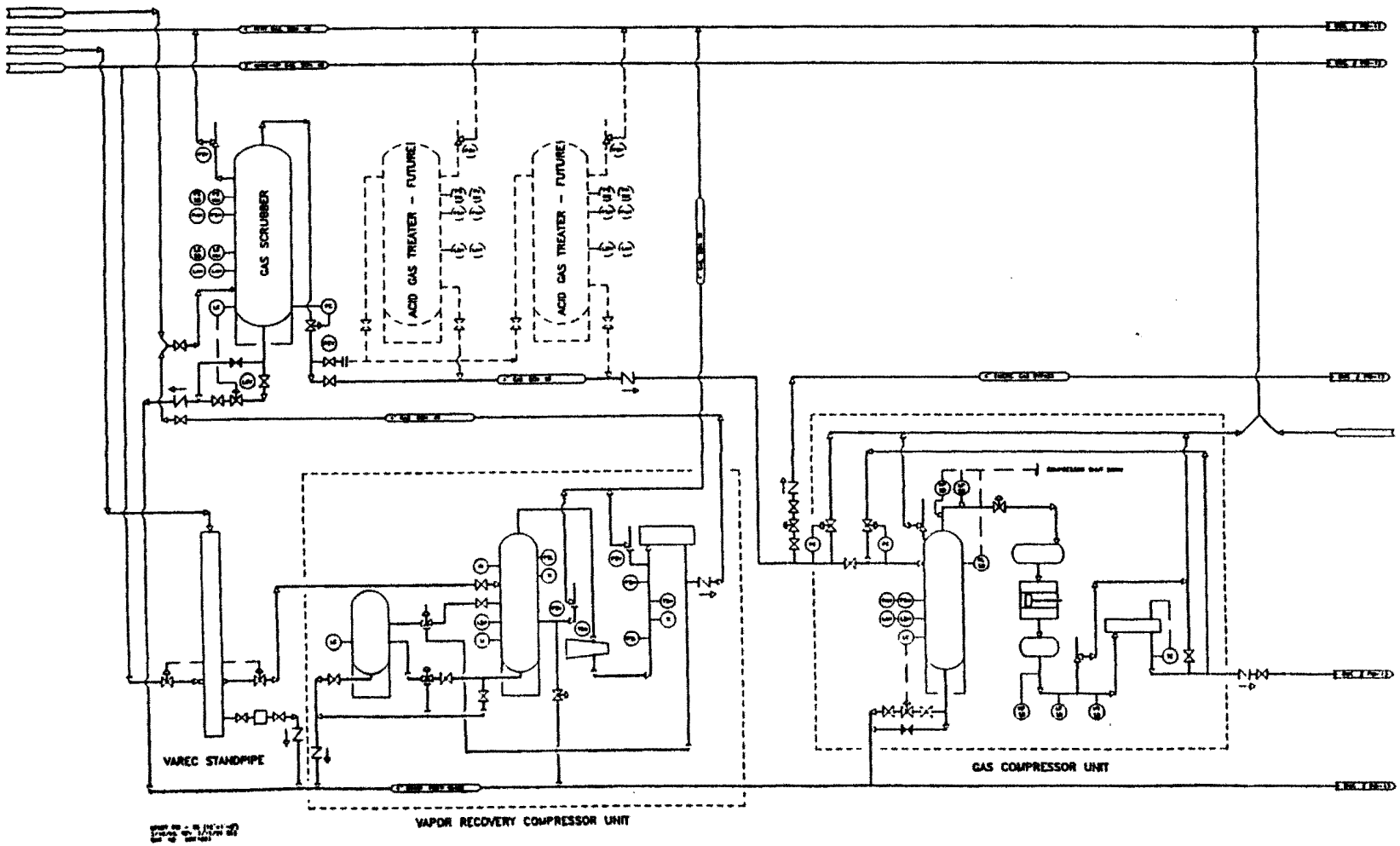
HERMOSA BEACH PROJECT



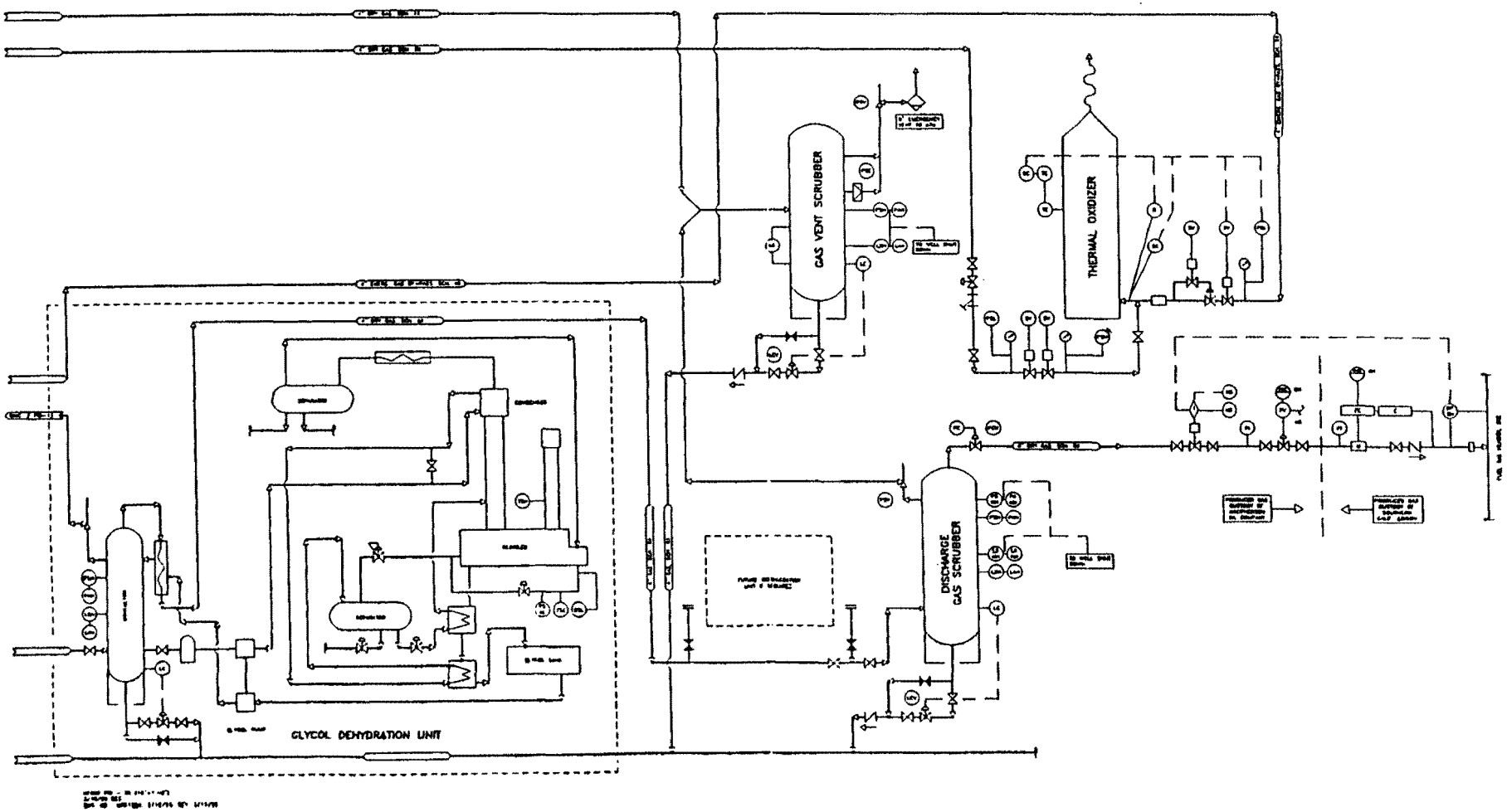
REVISIONS	MACPHERSON OIL COMPANY 2716 OCEAN PARK BLVD. SUITE NO 3080 SANTA MONICA, CALIFORNIA 90405	DAVID E. [illegible]SCHY, INC. 16531 BOLS[illegible], SUITE NO 301 HUNTINGTON BEACH, CA 92649	MECHANICAL ENGINEERING DGJ, LIMITED 619 S. VULCAN AVENUE, NO 2038 ENCINITAS, CALIFORNIA 92024	FINAL PHASE PIPING & INSTRUMENTATION [illegible]AGRAM HERMOSA BEACH PROJECT	SHEET NO PID-1



REVISIONS	MACPHERSON OIL COMPANY 2716 OCEAN PARK BLVD., SUITE NO 3080 SANTA MONICA, CALIFORNIA 90405	PLANS PREPARED BY: DAVID E. GAUTSCHY, INC. 16531 BOLSA CHICA, SUITE NO 301 HUNTINGTON BEACH, CA 92649	MECHANICAL ENGINEERING DGJ, LIMITED 619 S. VULCAN AVENUE, NO 203B ENCINITAS, CALIFORNIA 92024	FINAL PHASE PIPING & INSTRUMENTATION DIAGRAM HERMOSA BEACH PROJECT	SHEET NO PID-1



REVISIONS	MACPHERSON OIL COMPANY 2716 OCEAN PARK BLVD., SUITE NO 3080 SANTA MONICA CALIFORNIA 90405	PLANNED BY DAVID E. [redacted]CHY, INC. 16531 BOLSA [redacted] SUITE NO 301 HUNTINGTON BEACH, CA 92649	MECHANICAL ENGINEERING DGJ, LIMITED 619 S. VULCAN AVENUE, NO 2038 ENCINITAS, CALIFORNIA 92024	FINAL PHASE PIPING & INSTRUMENTATION [redacted]GRAM HERMOSA BEACH PROJECT	SHEET NO PID-12



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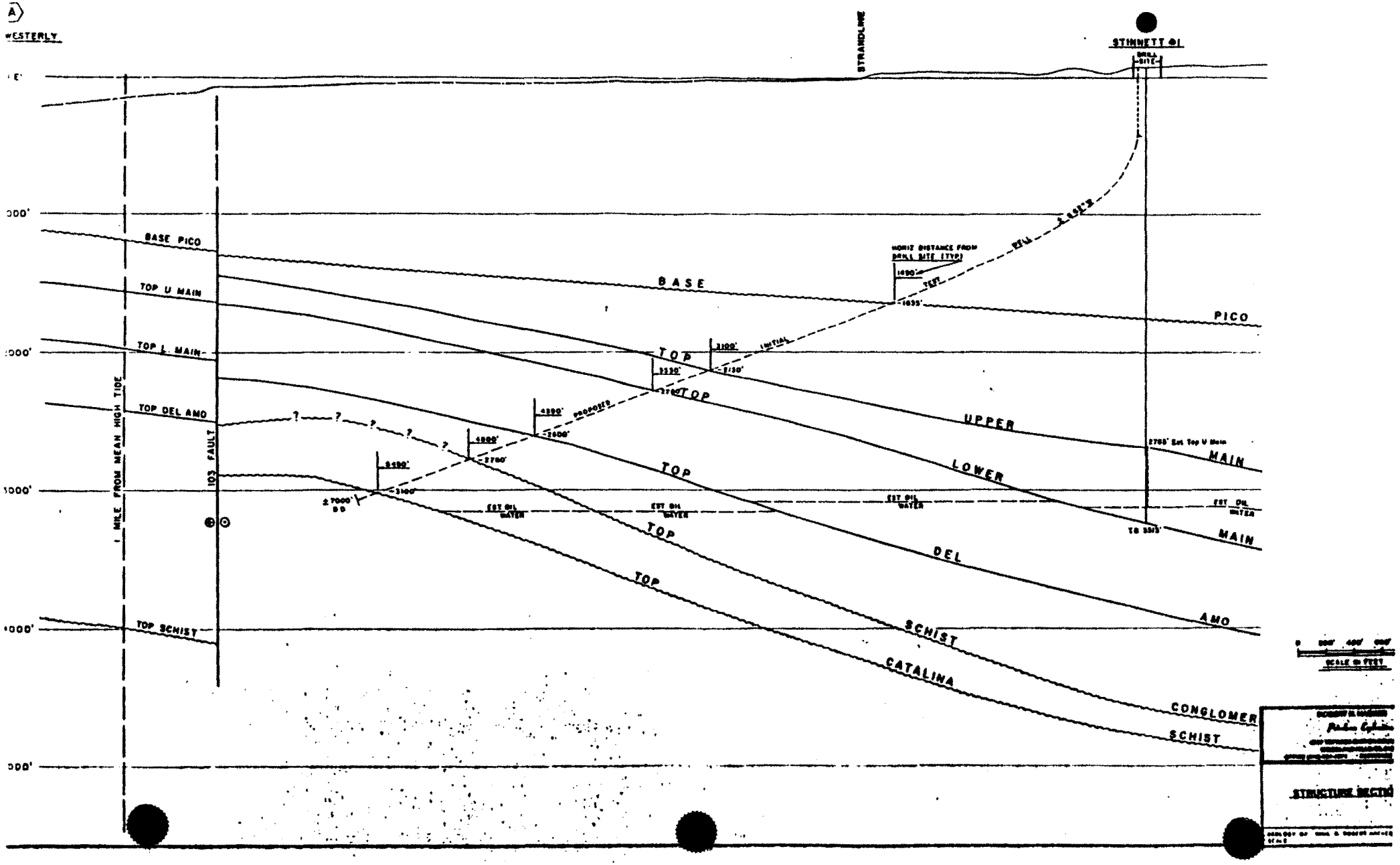

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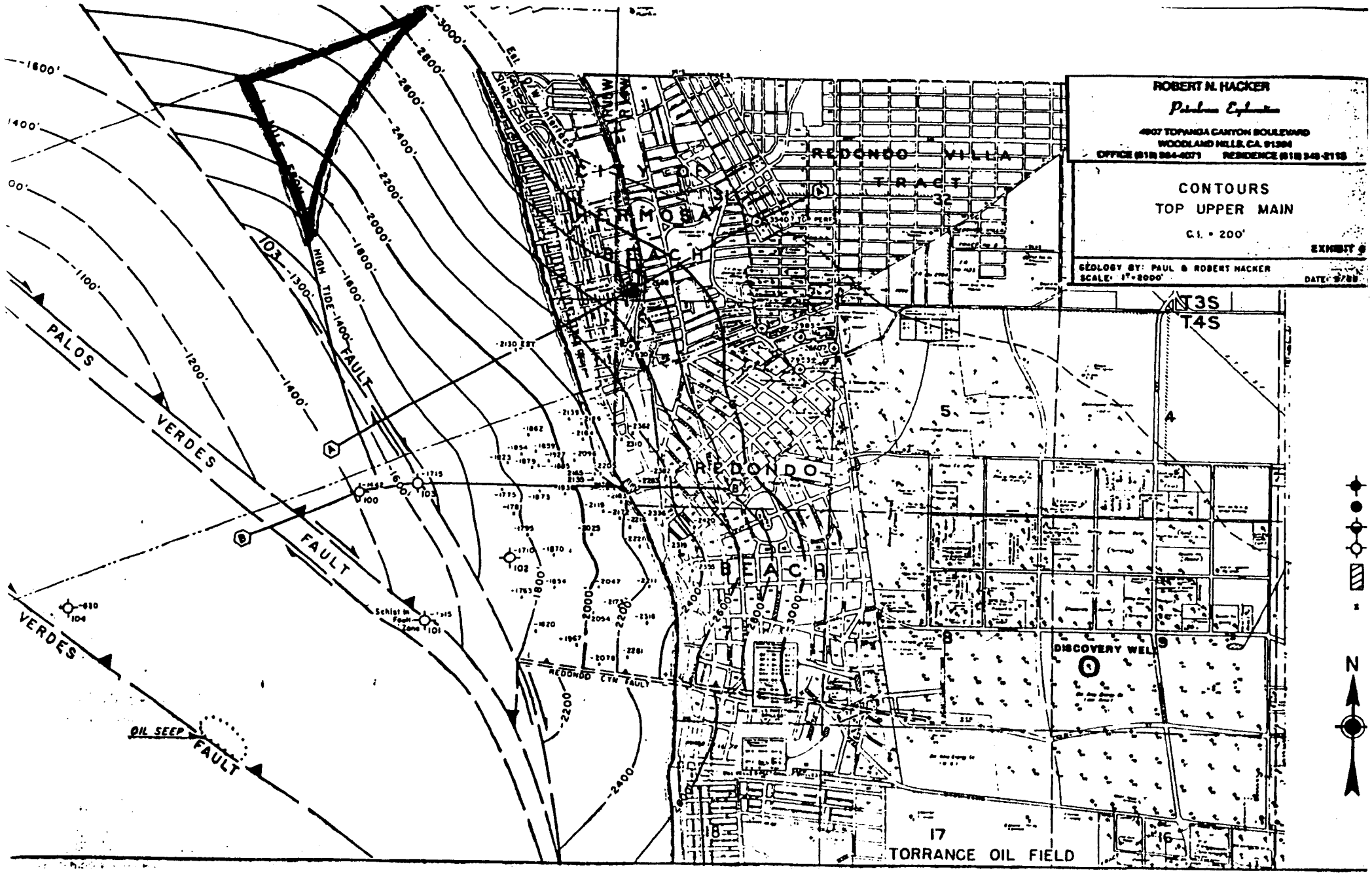
ROBERT N. HACKER
Petroleum Exploration
4907 TOPANGA CANYON BOULEVARD
WOODLAND HILLS, CA. 91364
OFFICE (818) 884-4071 RESIDENCE (818) 348-2198
CONTOURS
TOP UPPER MAIN
C.I. = 200'
EXHIBIT 6
GEOLOGY BY: PAUL & ROBERT HACKER
SCALE: 1"=2000'
DATE: 5/88
REDONDO VILLA TRACT 32
HERMOSA BEACH
REDONDO BEACH
PALOS VERDES FAULT
VERDES FAULT
HIGH TIDE FAULT
OIL SEEP FAULT
REDONDO CTN FAULT
DISCOVERY WELL
TORRANCE OIL FIELD
T3S
T4S
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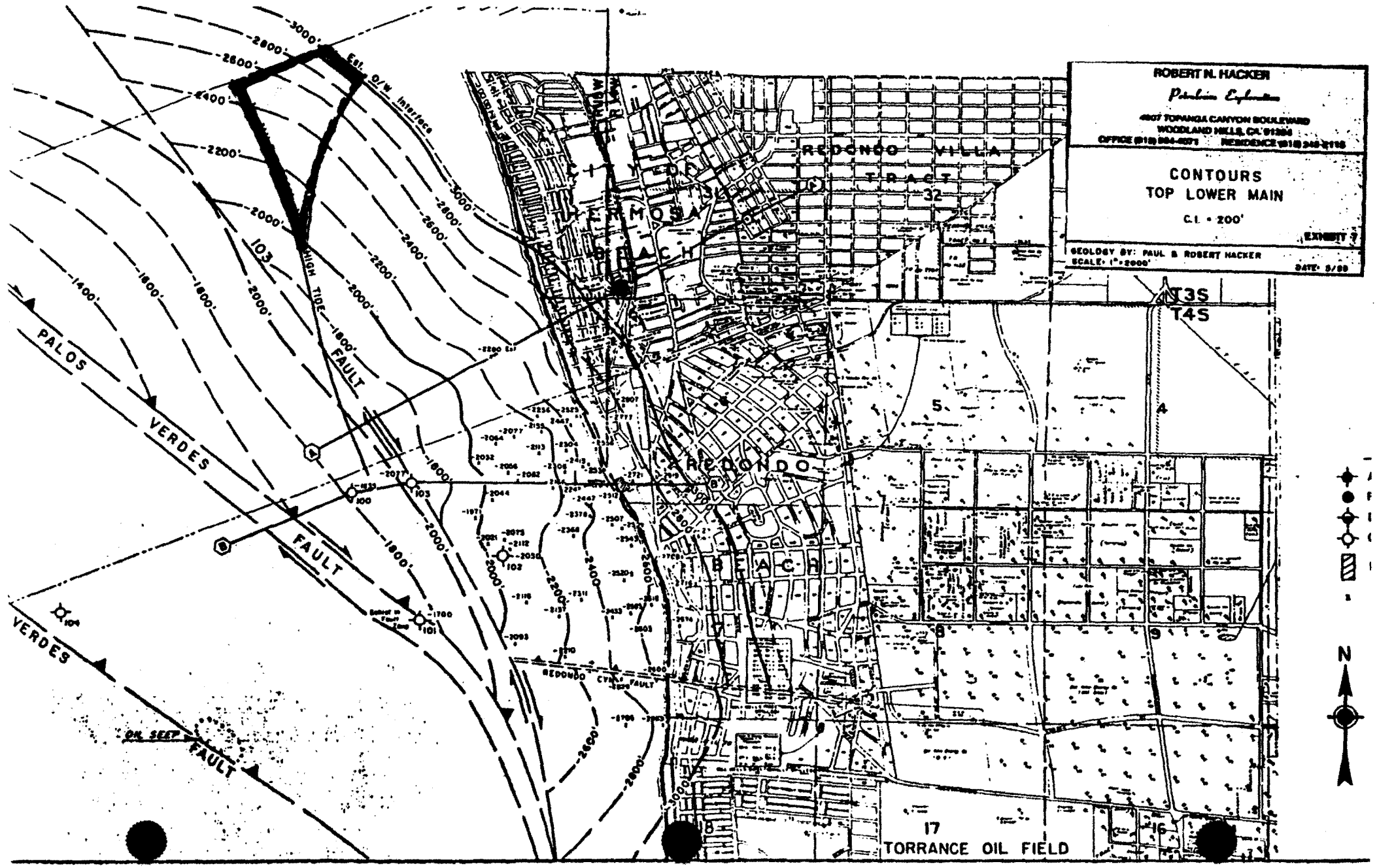
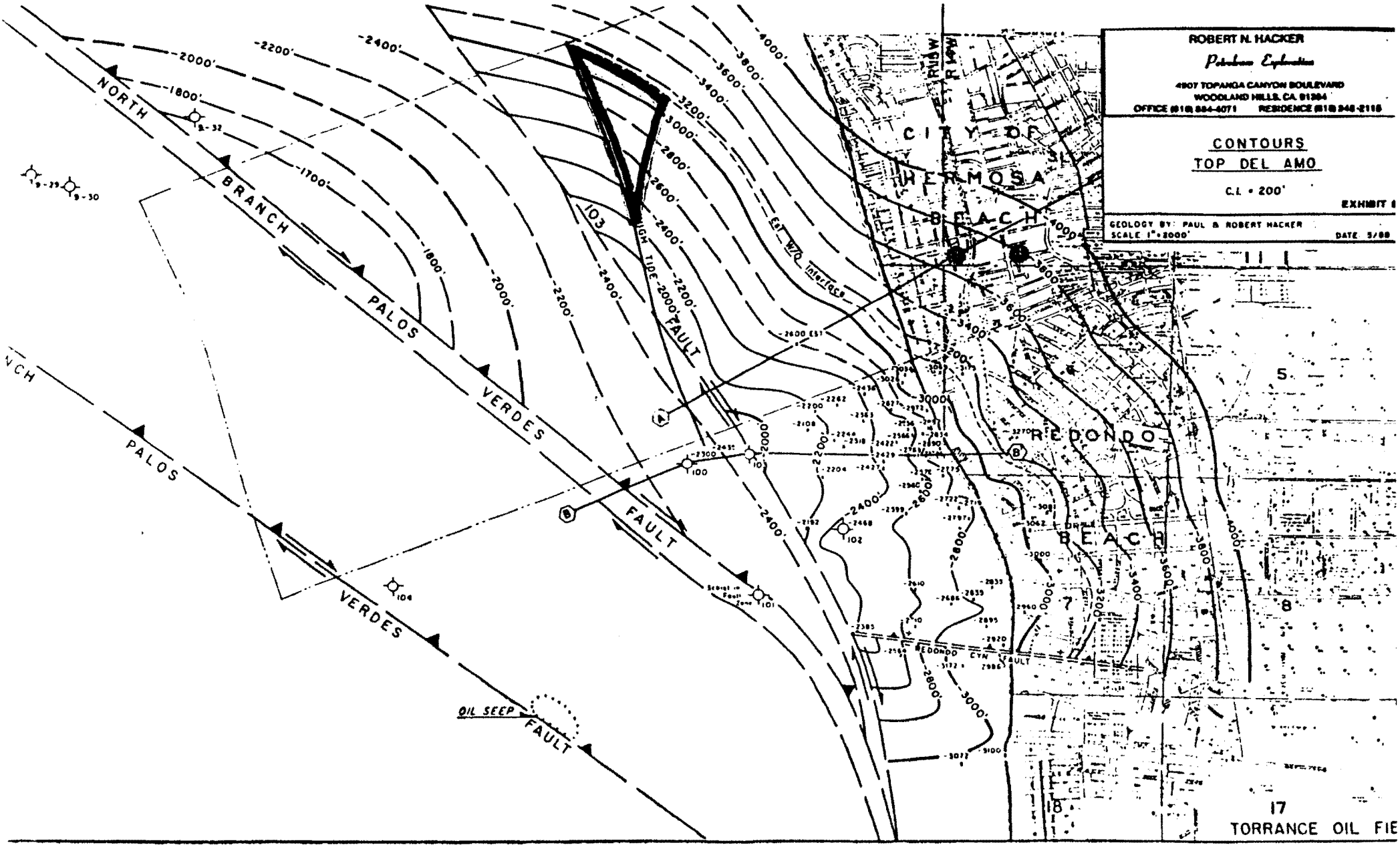

ROBERT N. HACKER
Petroleum Exploration
4807 TOPANGA CANYON BOULEVARD
WOODLAND HILLS, CA. 91364
OFFICE (818) 884-6571 RESIDENCE (818) 348-2118
CONTOURS
TOP LOWER MAIN
C.I. = 200'
EXHIBIT 7
GEOLOGY BY: PAUL & ROBERT HACKER
SCALE: 1" = 2000'
DATE: 5/89
REDONDO VILLA TRACT 32
HERMOSA BEACH
REDONDO BEACH
PALOS VERDES FAULT
VERDES FAULT
OIL SEEP FAULT
REDONDO CYNAR FAULT
HIGH TIDE
Est. O/W Interface
T3S
T4S
TORRANCE OIL FIELD
N


ROBERT N. HACKER
Petroleum Exploration
4907 TOPANGA CANYON BOULEVARD
WOODLAND HILLS, CA. 91364
OFFICE (818) 884-4071 RESIDENCE (818) 346-2116
CONTOURS
TOP DEL AMO
C.I. = 200'
EXHIBIT 1
GEOLOGY BY: PAUL & ROBERT HACKER
SCALE 1" = 2000'
DATE 5/89
NORTH BRANCH PALOS VERDES FAULT
PALOS VERDES FAULT
OIL SEEP FAULT
HIGH TIDE 2000' FAULT
REDONDO CYN FAULT
CITY OF HERMOSA BEACH
REDONDO BEACH
Est. W/R Interface
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102
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9-29
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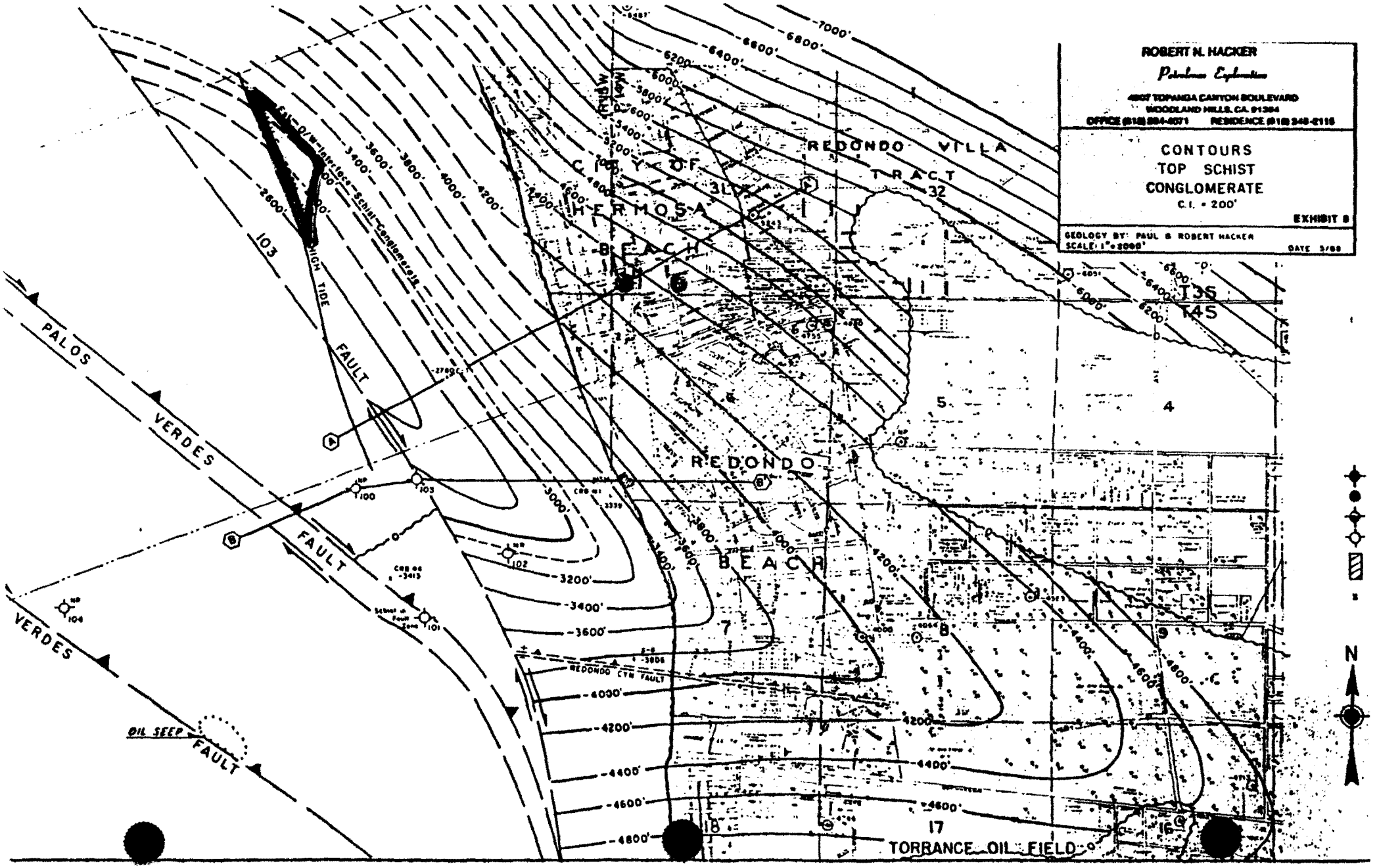
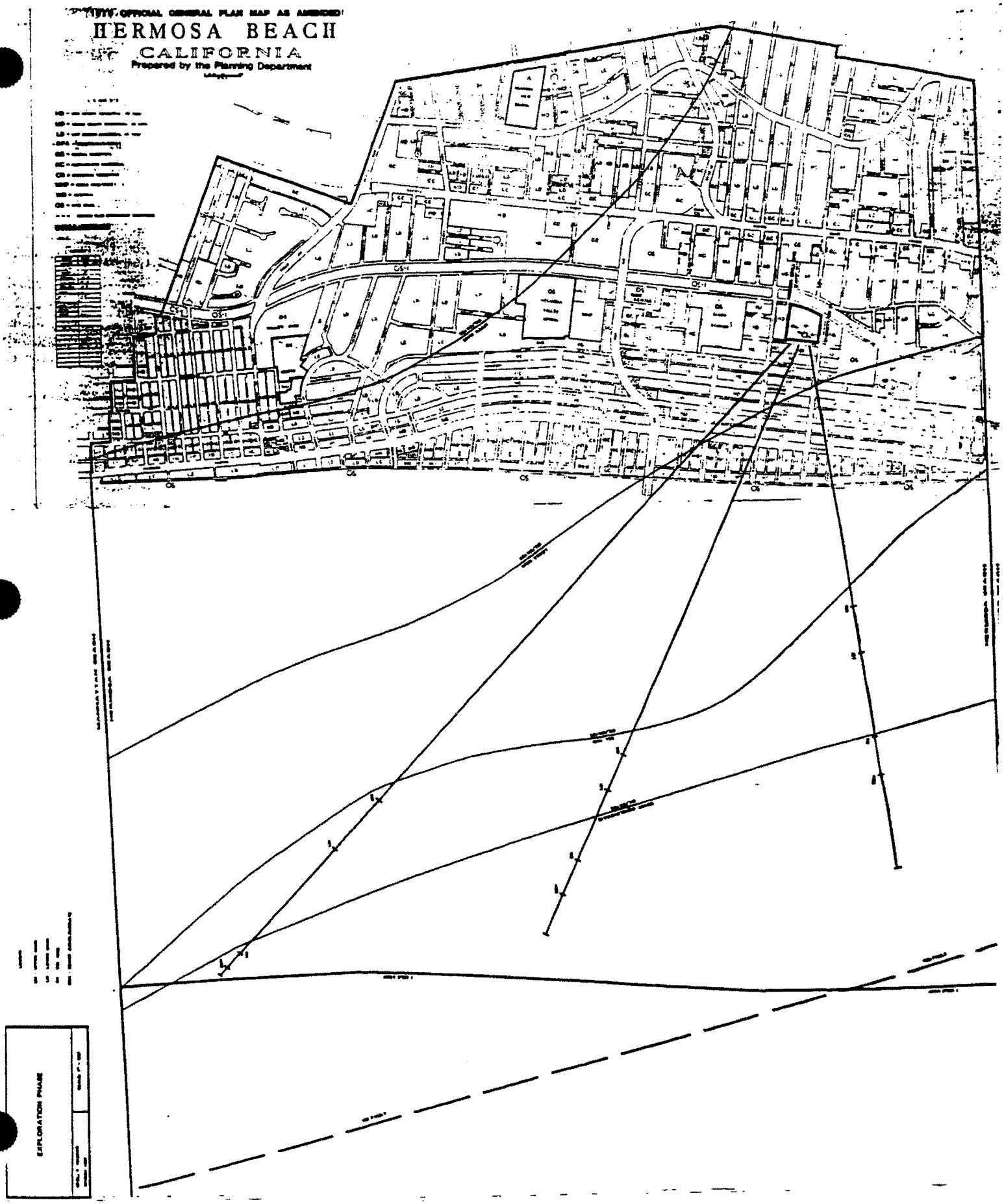
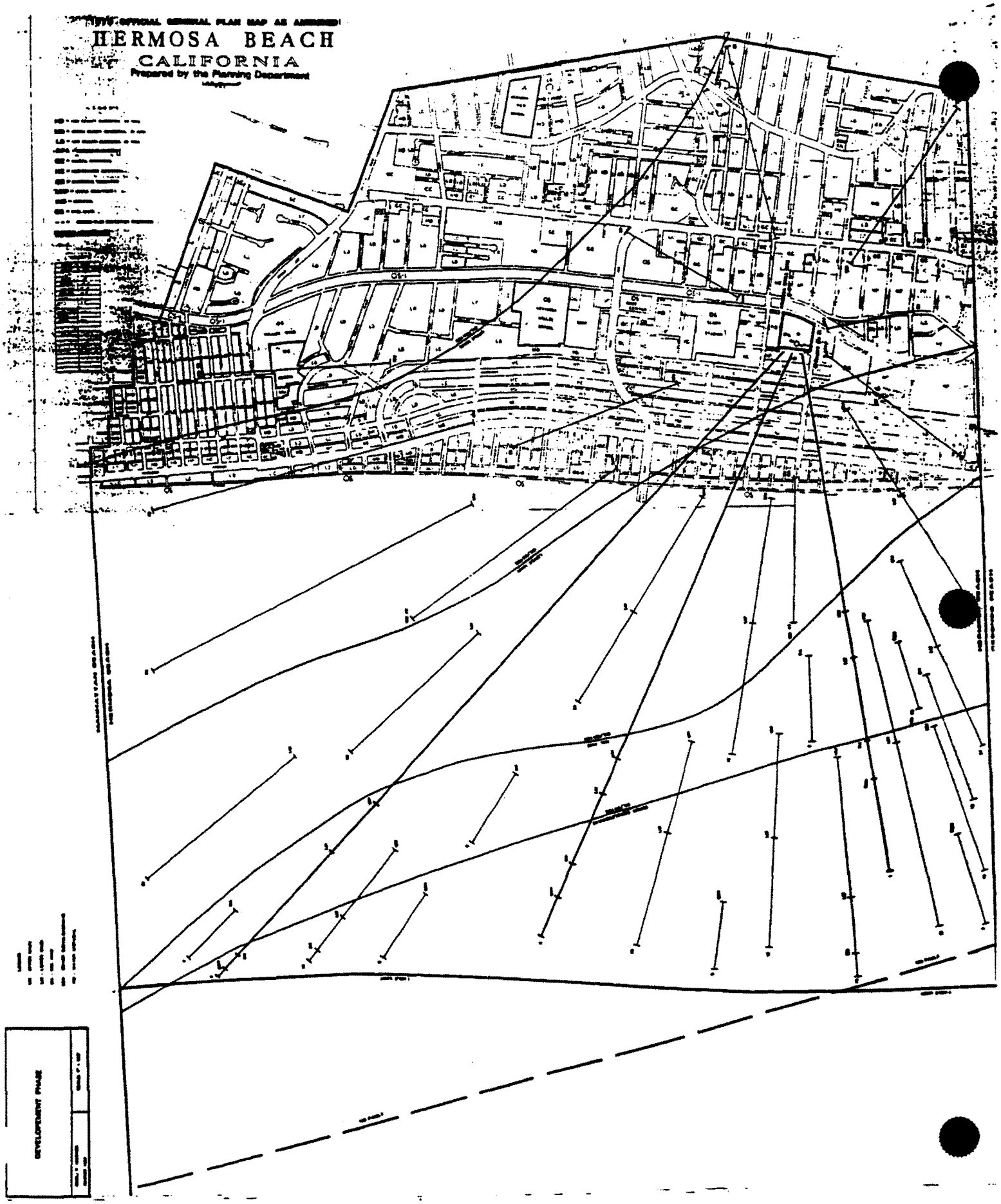
TORRANCE OIL FIE


ROBERT N. HACKER
Petroleum Exploration
4807 TOPANGA CANYON BOULEVARD
WOODLAND HILLS, CA. 91364
OFFICE (818) 884-6071 RESIDENCE (818) 348-6116
CONTOURS
TOP SCHIST
CONGLOMERATE
C.I. = 200'
EXHIBIT B
GEOLOGY BY: PAUL & ROBERT HACKER
SCALE: 1" = 2000'
DATE 5/88
REDONDO VILLA TRACT
CITY OF HERMOSA BEACH
REDONDO BEACH
PALOS VERDES FAULT
VERDES FAULT
OIL SEEP FAULT
HIGH TIDE
REDONDO CYN FAULT
TORRANCE OIL FIELD
T3S
T4S
N


OFFICIAL GENERAL PLAN MAP AS AMENDED
HERMOSA BEACH
CALIFORNIA
Prepared by the Planning Department
EXPLORATION PHASE

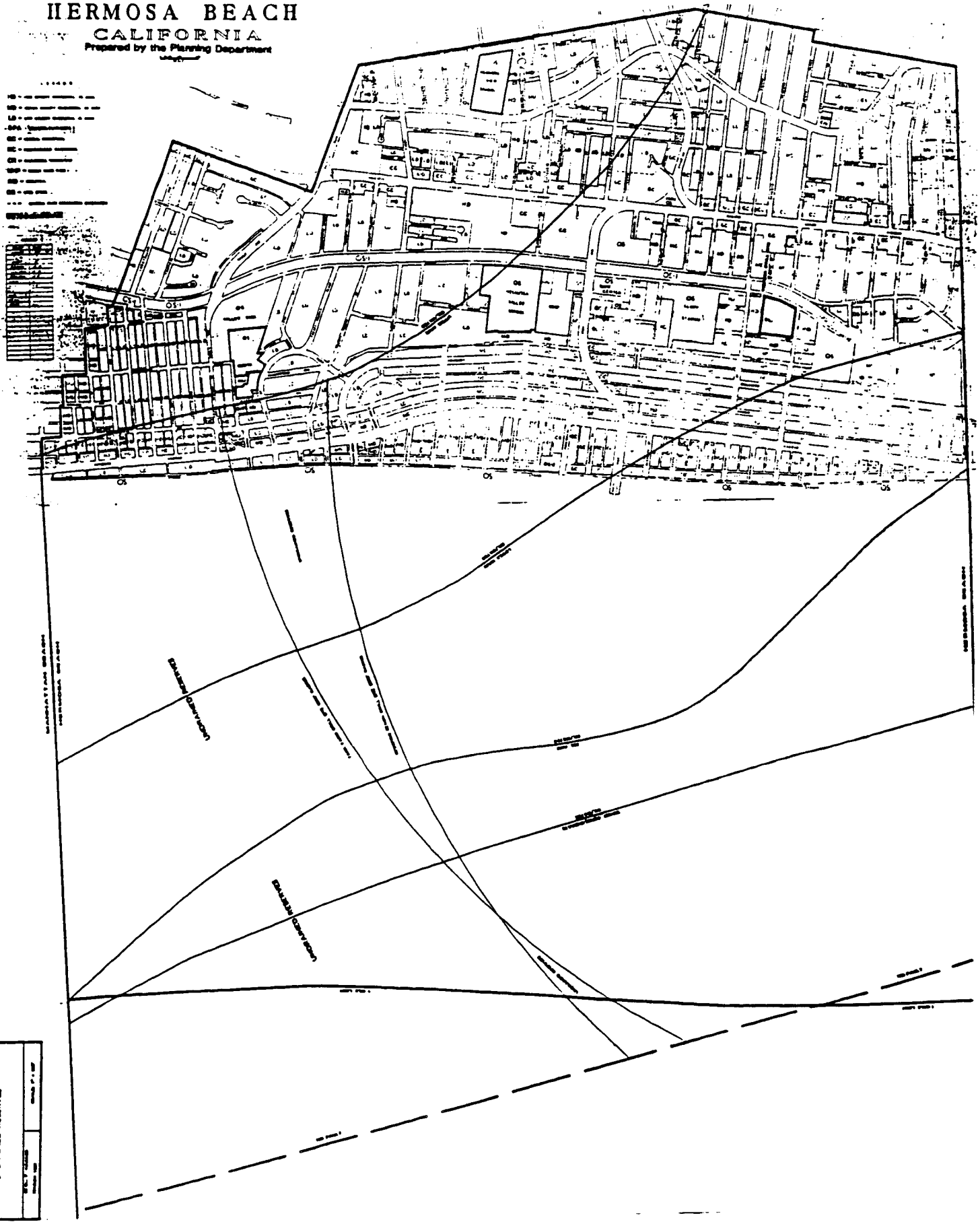

OFFICIAL GENERAL PLAN MAP AS AMENDED
HERMOSA BEACH
CALIFORNIA
Prepared by the Planning Department
DEVELOPMENT PHASE

1979 OFFICIAL GENERAL PLAN MAP AS AMENDED

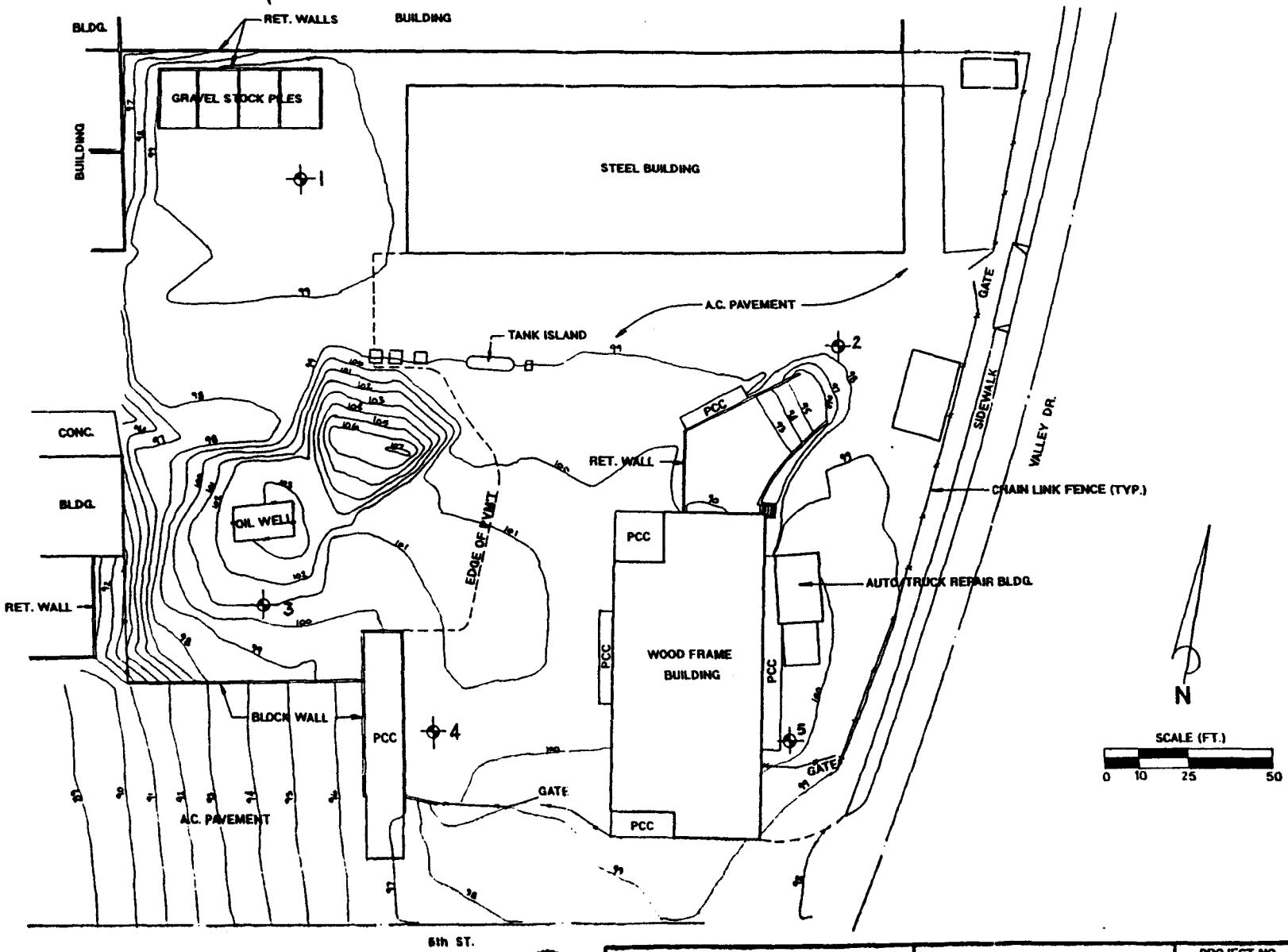
HERMOSA BEACH

CALIFORNIA

Prepared by the Planning Department



ALTERNATE DRILL SITES
UNDAMMED RESERVOIR



DENOTES APPROX. BORING LOCATIONS

SOURCE: BOUNDARY & TOPOGRAPHIC SURVEY, SOLOFF SURVEYING & CONSULT., JOB NO. 49.94, DATED 10/24/91

Associated Soils Engineering, Inc.	BORING LOCATION PLAN	PROJECT NO. -4796	PLATE A

Redondo Beach Alternative Sites

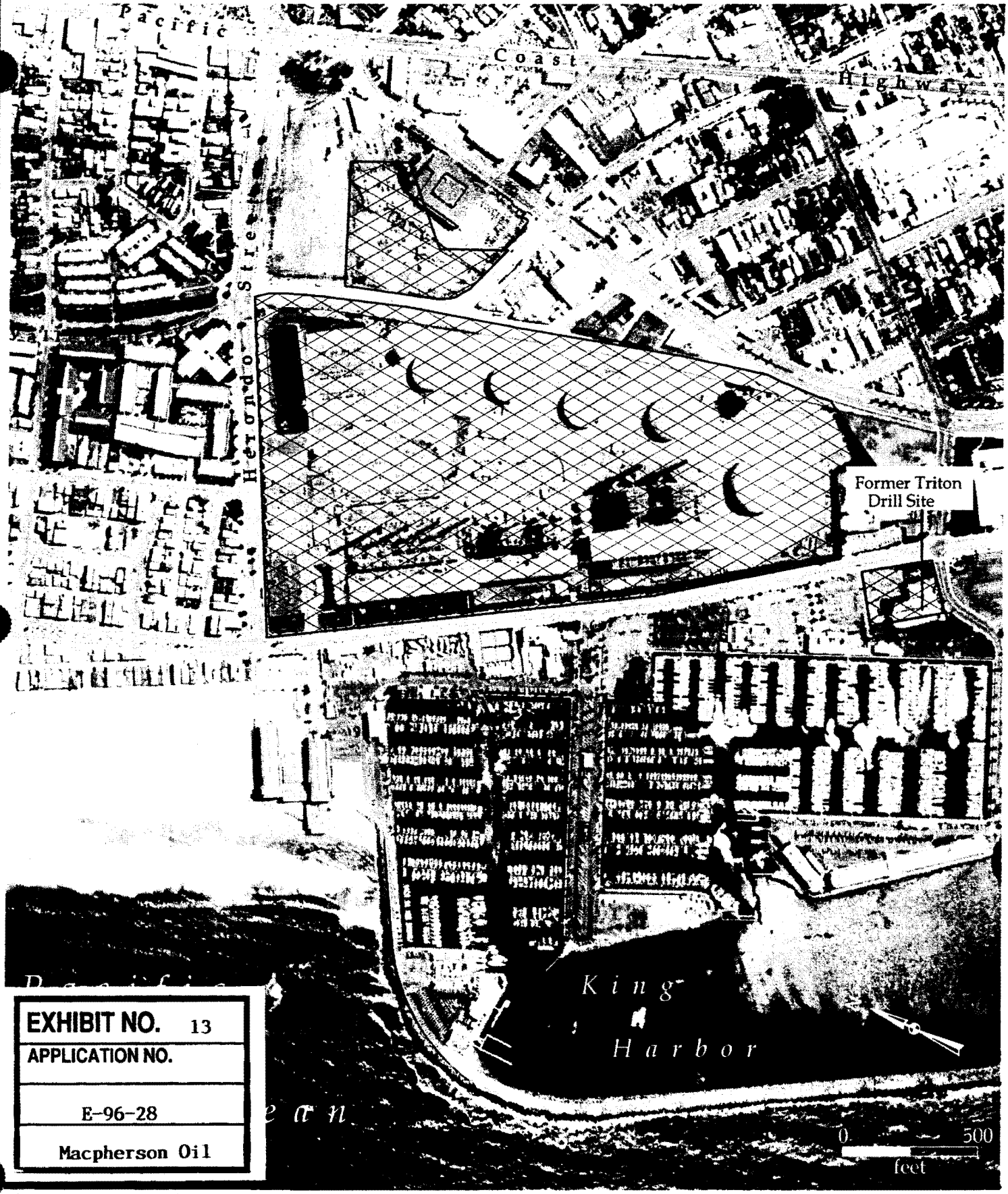


EXHIBIT NO. 13
APPLICATION NO.
E-96-28
Macpherson Oil

Photo Source: California Department of Boating and Waterways, Original Scale 1:12000, 4/14/93.
All locations approximate. For illustrative purposes only.

Industrial designation, City of Redondo Beach Land Use Plan, 1980

California Coastal Commission
Technical Services Division

JAY 7/97

ALTERNATIVE LAND USE SITE ANALYSIS
FOR
MACPHERSON OIL COMPANY PROJECT
HERMOSA BEACH, CALIFORNIA

AUGUST 22, 1997

PREPARED FOR THE CALIFORNIA COASTAL COMMISSION
CDP APPLICATION E-96-28

EXHIBIT NO. 14
APPLICATION NO.
E-96-28
Macpherson Oil

ALTERNATIVE LAND USE SITE ANALYSIS FOR THE MACPHERSON OIL COMPANY PROJECT

INTRODUCTION

The Macpherson Oil Company has submitted a coastal permit application (CDP-E-96-28) to the California Coastal Commission for an oil development and production project. The project has been approved by the City of Hermosa Beach at the City Maintenance Yard located at 555 Sixth Street, which is over 1/4 of a mile from the ocean. The project will involve the exploration for oil and the potential for full-scale oil production over a period of 35 years. Approximately 1.3 acres will be utilized for all the project's facilities. The project site is surrounded by existing light industrial uses on three sides and the Valley Drive open space corridor on the east side. The project has undergone extensive review and analysis by the city. It has been conditioned to address all the operational and environmental issues. Further, it will provide significant open space and coastal resource enhancement funds.

As part of the project review, the Coastal Commission staff has questioned whether there is another nearby alternative location that is feasible and less environmentally damaging per the Coastal Act Section 30263 (a) (1).

Based on this question, eight sites in the adjacent city of Redondo Beach were evaluated to determine if any of these locations were feasible or had the potential to eliminate or reduce any of the project's environmental impacts. The sites that were reviewed included the following locations in Redondo Beach:

Site 1 - Herondo St. & North Pacific Coast Highway

Site 2 - Herondo St. & Francisca Ave.

Site 3 - North along Francisca Ave. & Gertruda Ave.

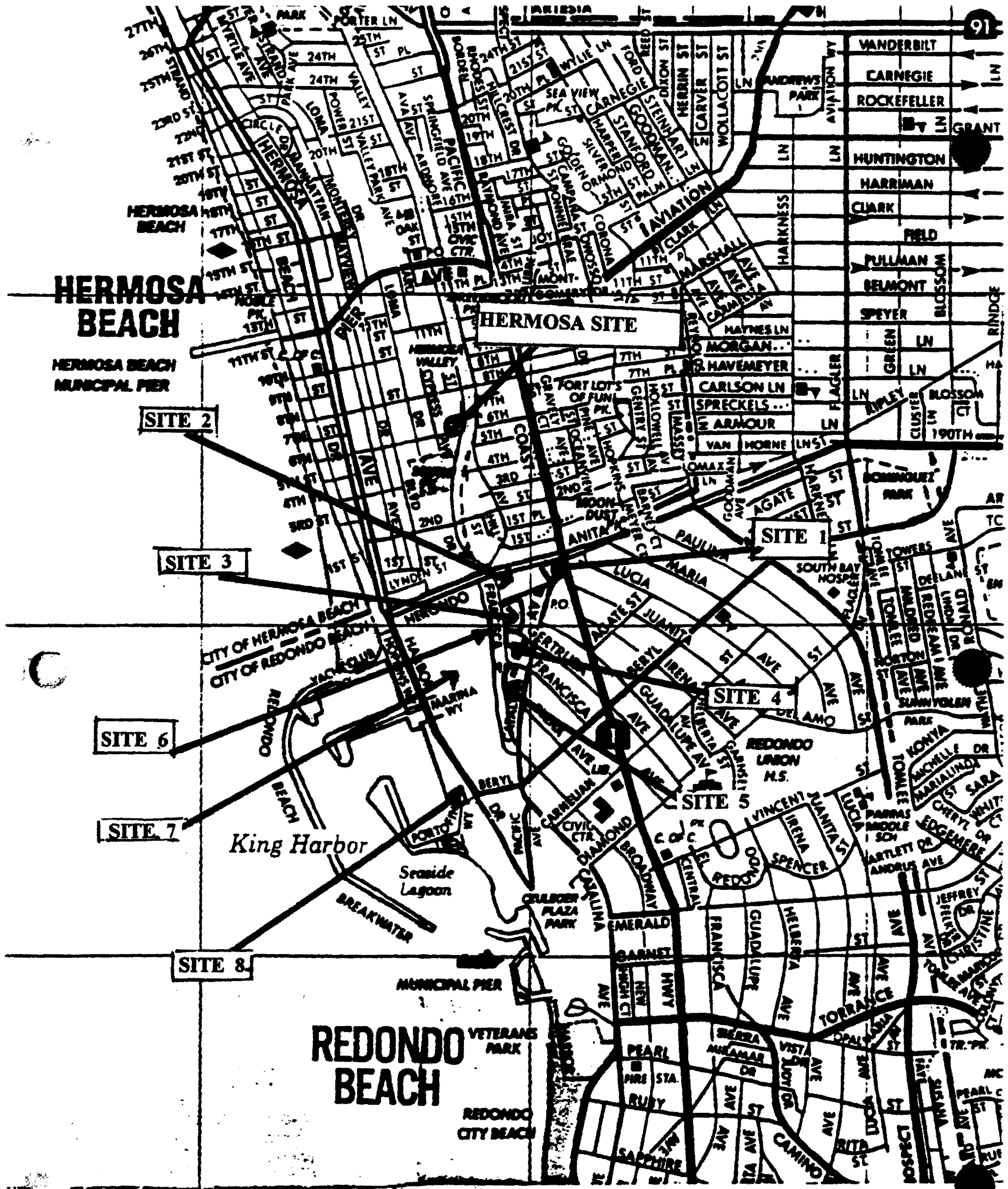
Site 4 - Between Gertruda & Francisca Ave.

Site 5 - Francisca Ave. & Catalina Ave.

Site 6 - Railroad Row between Herondo & Catalina Ave.

Site 7 - Southern California Edison (SCE) generating plant between Herondo & Beryl along Harbor Drive

Site 8 - Harbor Drive & Portofino Way


HERMOSA BEACH
HERMOSA BEACH MUNICIPAL PIER
HERMOSA SITE
SITE 1
SITE 2
SITE 3
SITE 4
SITE 5
SITE 6
SITE 7
SITE 8
CITY OF HERMOSA BEACH
CITY OF REDONDO BEACH
King Harbor
Seaside Lagoon
BREAKWATER
MUNICIPAL PIER
REDONDO BEACH
VETERANS PARK
REDONDO CITY BEACH
SOUTH BAY HOSP.
REDONDO UNION H.S.
DOMINGUEZ PARK
AVIATION
PACIFIC COAST HWY
TORRANCE

The analysis of these alternative sites, reveals that none of these sites are feasible nor less environmentally damaging than the Hermosa site for numerous reasons. Most notably, the City of Redondo Beach zoning ordinance does not allow oil and gas development in any of the zones. Strict height requirements would preclude a tall drilling rig. The General Plan does not provide for any new future oil development. Projects have already been approved on several sites. The City is considering commercial projects on at least three other sites. Three of the sites are too small or narrow to accommodate the project's minimum physical land needs. The Southern California Edison generating station is for sale as part of a bundle of several sites intended for purchase by competitor energy providers. Additionally, the plant is still operating. Any other use of the site is extremely speculative at this time.

None of the sites were found to be less environmentally damaging. In all cases, the sites present a greater potential for conflicts with the immediately adjacent existing and proposed surrounding uses than does the Hermosa site.

The attached documentation provides detailed findings of this alternative land use analysis.

SITE NAME: Site 1

SITE LOCATION: The site is near the southwest intersection of Herondo Street and the Pacific Coast Highway. (See attached map.) It is approximately 1/2 mile from Harbor Drive and King Harbor.

SITE SIZE: Less than one acre

EXISTING LAND USES: The site is occupied by four (4) Southern California Edison transmission power poles with overhead lines along the eastern edge of the site. It is immediately adjacent to residential and commercial uses located to the north along Herondo Street (100' to 200'). A nursery lies to the west of the site and a small City park on the east side of the area. There is a bank on the south side. (See attached photos.)

EXISTING ZONING AND GENERAL PLAN SITE DESIGNATIONS:

Zoning - P-ROW Public and Institutional Right-of-Way Zone (See Attachment 1.)
General Plan - P Public or Institutional (See Attachment 2.)

FEASIBILITY OF OIL AND GAS DEVELOPMENT:

Permissibility - Oil well drilling and production is not permitted in Redondo Beach. On May 26, 1992, the City adopted a major General Plan update. They adopted a new comprehensive zoning ordinance for the entire City on January 18, 1996 which included rezoning of numerous properties in the City. These documents do not contain any provisions for oil and gas development. The P-ROW zone does not allow for oil well drilling and production. Uses permitted or permitted with a Conditional Use Permit in this zone include parks, parkettes, open space, recreational facilities; public buildings in parks, recreation areas, and open space areas; agricultural and horticultural uses; nurseries; parking lots; public utility facilities; railroad uses; and accessory uses/structures. Oil and gas developments are not listed as permitted uses and therefore according to the zoning ordinance are not permitted in the P-ROW zone. (See Attachment 3.) The City has indicated that unless the zoning ordinance and General Plan were amended, oil and gas wells could not be drilled in Redondo Beach. (See Attachment 4.) However, City staff have also informed us that obtaining City approval for development of a drill site and production facility on this or any other property in Redondo Beach would be politically impossible because of the citizens' strong desire not to have any additional oil development in their city.

In addition, the General Plan (p. 2-88) Policy 1.46.7 requires that "only passive secondary uses of public transmission right-of-way be permitted (e.g. uses where groups of people are not permitted to congregate)." (See Attachment 5). The General Plan further states (p. 3-139) that "The City has designated Southern California Edison Company transmission lines rights-of-way as open space and recreational areas. This has been done through the cooperation of the Southern California Edison Company. It is recognized that the primary purpose of these rights-of-way are developed and designated for utility purposes, any open space recreational uses that will not interfere with the utility functions may be allowed through the issuance of a grant of a license by the Southern

California Edison Company." (See Attachment 6.)

Other Existing, Proposed, or Approved Land Uses - In addition to the regulatory restrictions, there are already land use proposals for this area which would be incompatible with oil use. A 15-screen theater and parking complex is planned for the nearby Sites 2 and 3. No applications have been filed as of August 1997; however, discussions are ongoing with the City Planning Department. (See attachment 7.) The site also has existing Southern California Edison power poles (four large metal poles) which are located within their transmission right-of-way.

Compatibility with Surrounding Land Uses - Since the site is directly across from residences along Herondo Street, constructing the oil drilling and production project here would have potentially greater impacts on residential areas than the Hermosa Beach site, which is buffered from residential uses on all sides. Traffic congestion would increase at the intersection of Herondo and Pacific Coast Highway which is already a busy commercial area. In addition, Herondo Street is a direct access point to King Harbor visitor serving uses (1/2 mile to the west). The City Park users would be impacted by the facility's exploration and production operations that would border on the park. In conclusion, the location of this site presents greater possibilities for conflicts with the immediately surrounding uses than the Hermosa site.

Environmental Issues - The site has no sensitive habitats. As with all sites, mitigation measures would be required for drainage control, air emissions, health and safety issues, and noise generation during construction and operations. Any and all geologic and seismic hazards would have to be appropriately mitigated at the site. Given the site's location immediately adjacent to residential uses, the concern about the potential severity of these impacts will be greater than it is for the Hermosa site that is buffered by industrial uses.

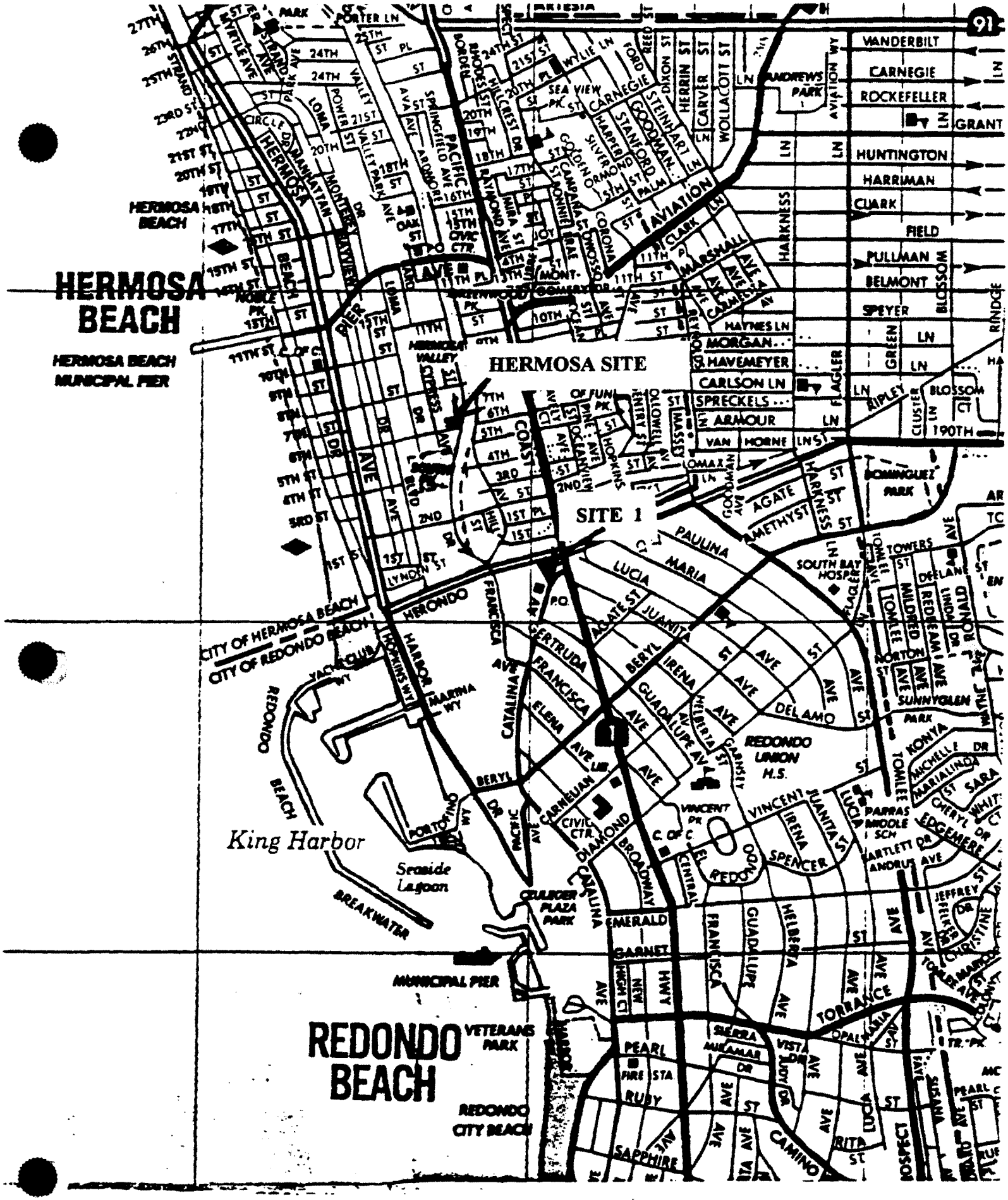
Physical Land Restrictions - In addition to the existing four power poles, the site is less than an acre in size. The Macpherson oil and gas facility cannot be developed at this site and still meet its project objectives. The project requires a minimum of one acre to accommodate the necessary exploration and production facilities including the five tanks (40' diameter), test facilities, shipping pipelines, well cellar, fencing, offices, parking, and city setback and landscape requirements. Also, there are zoning height restrictions (15' maximum) in the power transmission right-of-way that would not allow a 135 foot drilling rig with the overhead power lines. (See Attachment 3.)

Technological and Financial Issues - As outlined in the previously prepared attached report, the physical technological limits of extended reach wells are limited to horizontal reach verses true vertical depth of 5 to 1. A more feasible ratio of 3 to 1 is attainable with a reduction of risk intrinsic in high angle well holes. The oil/water interface is located approximately -3,000 feet. Therefore, the reasonable drilling radius around the drill site is 9,000 feet. Drilling from Redondo Beach would reduce ultimate recovery by as much as 29%. (See Attachment 8, Geological and Financial Impacts of an Alternative Drill Site.)

CONCLUSION: This alternative site is not feasible nor less environmentally damaging.

- **The City of Redondo Beach zoning does not allow oil and gas development.**
- **Other uses permitted in the zoning district are incompatible with oil development.**
- **It is not large enough to accommodate the facility and still meet the project's objectives.**

- The transmission right-of-way allows only open space uses.
- A drilling rig (135' in height) would not be allowed with the right-of-way zoning height restrictions.
- There is greater potential for conflicts with the immediate surrounding uses than the Hermosa site.
- A large theater complex is already being proposed for the area which would be incompatible with an oil facility.


HERMOSA BEACH
HERMOSA BEACH MUNICIPAL PIER
HERMOSA SITE
SITE 1
CITY OF HERMOSA BEACH
CITY OF REDONDO BEACH
King Harbor
Seaside Lagoon
BREAKWATER
MUNICIPAL PIER
REDONDO BEACH
VETERANS PARK
REDONDO CITY BEACH
REDONDO UNION H.S.
VANDERBILT
CARNEGIE
ROCKEFELLER
GRANT
HUNTINGTON
HARRIMAN
CLARK
FIELD
PULLMAN
BELMONT
SPEYER
HAYNES LN
MORGAN
HAVEMEYER
CARLSON LN
SPRECKELS
ARMOUR
VAN HORNE
PAULINA
LUCIA
MARIA
JUANITA
BERYL
IRENA
GUADALUPE
DELAMO
VINCENT
SPENCER
TORRANCE
PEARL
RUBY
SAPPHIRE
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GARNET
BROADWAY
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FRANCISCA
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PIER
AVIATION
MARSHALL
HARKNESS
FLAGLER
BLOSSOM
RIPLEY
GREEN
AGATE
AMETHYST
DOMINGUEZ PARK
SOUTH BAY HOSPITAL
TOWERS
DELANE
WILDRED
REDFEAM
LINDA
TOMLEE
NORTON
SUNNYGLEN PARK
KONYA
MICHELLE
MARIALINDA
SARA
CHERYL
EDGEMERE
PARRAS MIDDLE SCH
BARTLETT
ANDRUS
JEFFREY
CHRISTINE
HERMOSA VALLEY
CITY OF FUN PK
HERMOSA AVE
PACIFIC AVE
HERMOSA BEACH
HARBOR
HOPKINS
HERONDO
PORTOFINO
MARINA
YACHT CLUB
REDONDO BEACH
CIVIC CTR
C. OF C
CULVER PLAZA PARK
FIRE STA
SIERRA MIRAMAR
VISTA
JUDY
LUCIA
RITA
ROSECRANS
PEARL
HIGH CT
NEW
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CENTRAL
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GARSLEY
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AVIATION WY
WOLLACOTT ST
CARVER ST
HERRIN ST
DIXON ST
STEINHART
GOODMAN
STANFORD
HARPER
SILVER
ORMOND
PALM
CORONA
CAMPANA
COLDEN
SEA VIEW PK
WYLIE LN
FORD
REED
HILLCREST DR
RAYMOND AVE
BORDEN
RHODES ST
SPRINGFIELD AVE
ARMORY
OAK ST
VALLEY PARK AVE
POWER
LOMA
MANHATTAN
MONTEREY
HAYVIEW
BEACH
NOBLE PK
GREENWOOD
MONTGOMERY
PORTER LN
STRAND
PARK AVE
EVELYN AVE
PRIESTA
MARK
91

SITE 1

**Looking east along Herondo St.
at City Park**

**Looking south towards bank and
City Park along the east side**

SITE 1

Looking east and northeast along Herondo Street

Looking south at the bank and nursery along the west side

SITE NAME: Site 2

SITE LOCATION: The site is located on the southeast intersection of Herondo Street and Francisca Avenue. (See attached map.) It is approximately 1/4 of a mile from Harbor Drive and King Harbor.

SITE SIZE: Approximately 2.6 acres

EXISTING LAND USES: The site is occupied by four (4) Southern California Edison transmission power poles and overhead lines in the middle and along the eastern border. Residential uses are directly across (100' to 200') on Herondo Street. A nursery lies to the east of the site. A bank and U.S. Post Office are located (100' to 200') to the southeast of the site. Vacant land borders on the south side of the area. The Southern California Edison generating plant is located on the west side (See attached photos.)

EXISTING ZONING AND GENERAL PLAN SITE DESIGNATIONS:

Zoning - P-ROW Public and Institutional Right-of-Way Zone (See Attachment 1.)
General Plan - P Public or Institutional (See Attachment 2.)

FEASIBILITY OF OIL AND GAS DEVELOPMENT:

Permissibility - Oil well drilling and production is not permitted in Redondo Beach. On May 26, 1992, the City adopted a major General Plan update. They adopted a new comprehensive zoning ordinance for the entire City on January 18, 1996 which included rezoning of numerous properties in the City. These documents do not contain any provisions for oil and gas development. The P-ROW zone does not allow for oil well drilling and production. Uses permitted or permitted with a Conditional Use Permit in this zone include parks, parkettes, open space, recreational facilities; public buildings in parks, recreation areas, and open space areas; agricultural and horticultural uses; nurseries; parking lots; public utility facilities; railroad uses; and accessory uses/structures. Oil and gas developments are not listed as permitted uses and therefore, according to the zoning ordinance are not permitted in the P-ROW zone. (See Attachment 3.) The City has indicated that unless the zoning ordinance and General Plan were amended, oil and gas wells could not be drilled in Redondo Beach. (See Attachment 4.) However, City staff have also informed us that obtaining City approval for development of a drill site and production facility on this or any other property in Redondo Beach would be politically impossible because of the citizens' strong desire not to have any additional oil development in their city.

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utility functions may be allowed through the issuance of a grant of a license by the Southern California Edison Company." (See Attachment 6.)

Other Existing, Proposed, or Approved Land Uses - In addition to the regulatory restrictions, there are already land use proposals for this location which would be incompatible with oil use. A 15-screen theater and parking complex is planned for the area that includes both Sites 2 and 3. No applications have been filed as of August 1997; however, discussions are ongoing with the City Planning Department. (See attachment 7.) The site also has existing Southern California Edison power poles (four large split metal poles) which are located within their transmission right-of-way.

Compatibility with Surrounding Land Uses - As with Site 1, this location presents greater potential for conflicts with the immediately surrounding uses than the Hermosa site. At this location, there would be noise, traffic, and visual impacts to residences directly across (100' to 200') along Herondo Street. Traffic congestion would increase at the intersection of Herondo and Francisca which is only 1/4 mile east of the major King Harbor visitor serving uses. Without any industrial buffers, as with the Hermosa Maintenance Yard, public safety issues could potentially be significant given the proposed theater complex and adjacent residential units.

Environmental Issues - The site has no sensitive habitats. As with all sites, mitigation measures would be required for drainage control, air emissions, health and safety issues, and noise generation during construction and operations. Any and all geologic and seismic hazards would have to be appropriately mitigated at the site. Given the site's location immediately adjacent to residential uses, the concern about the potential severity of these impacts is greater than it is for the Hermosa site, which is buffered by industrial uses.

Physical Land Restrictions - The site is more than an acre in size and would meet the size requirements for the Macpherson oil and gas facility. Technological limitations and financial impacts would result given the site's distance from the oil reserves. Additionally, the zoning height restrictions in the power transmission right-of-way would not allow a 135 foot drilling rig with the overhead power lines. (See Attachment 3.) Further, oil development is not legally permissible at this site.

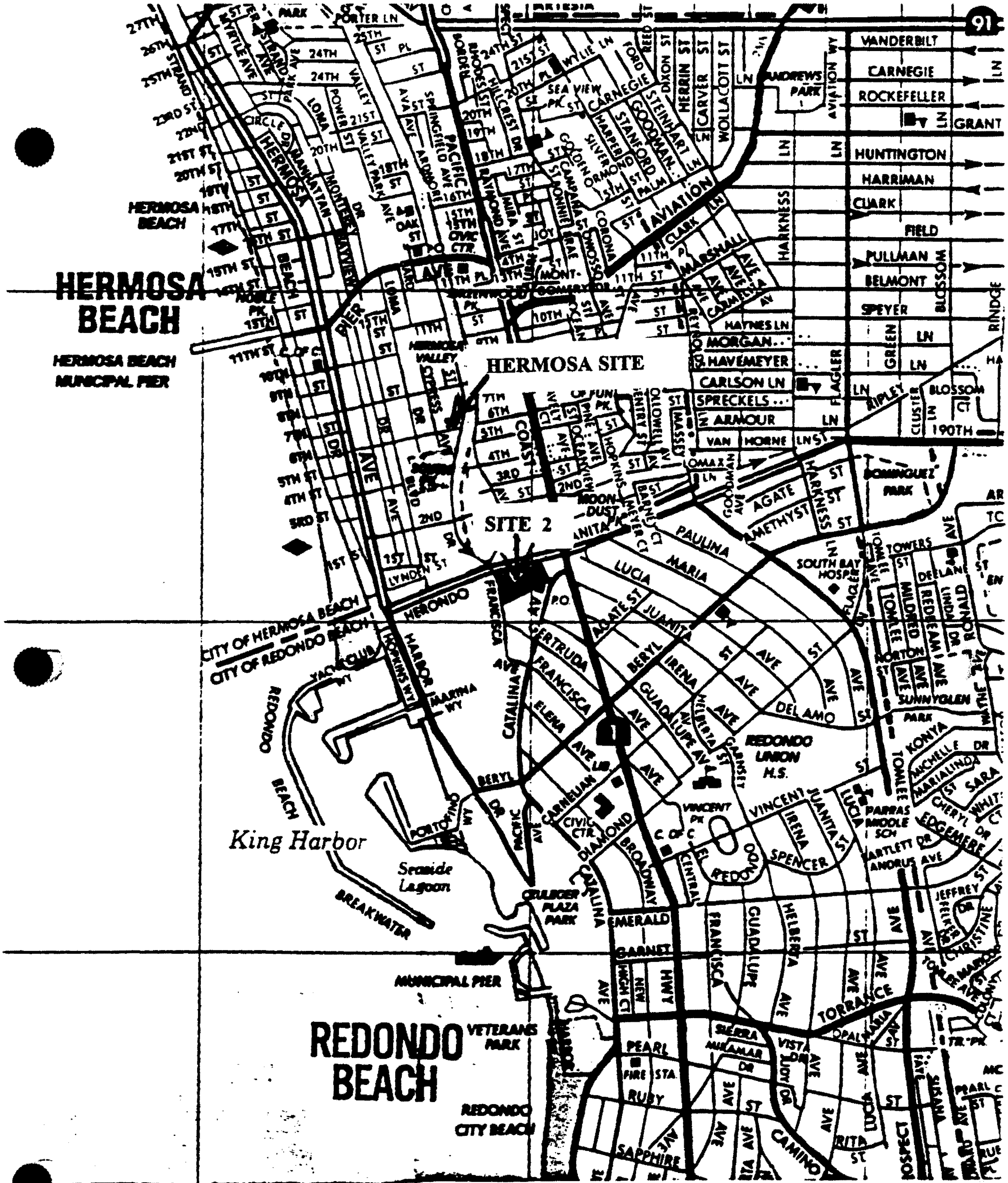
Technological and Financial Issues - As outlined in the attached report, the physical technological limits of extended reach wells are limited to horizontal reach verses true vertical depth of 5 to 1. A more feasible ratio of 3 to 1 is attainable with a reduction of risk intrinsic in high angle well holes. The oil/water interface is located approximately -3,000 feet. Therefore, the reasonable drilling radius around the drill site is 9,000 feet. Drilling from Redondo Beach would reduce ultimate recovery by as much as 29%. (See Attachment 8 - Geological and Financial Impacts of Alternative Drill Sites.)

CONCLUSION: This site is not feasible nor less environmentally damaging.

- **The zoning does not allow oil and gas development.**
- **It is large enough to accommodate the facility, but there are technological limitations, economic costs, height restrictions, and other legal considerations.**
- **The transmission right-of-way allows only open space uses.**
- **A drilling rig (135' in height) would not be allowed with the right-of-way zoning height**

restrictions.

- Other uses permitted in the zoning district are incompatible with oil development.
- There is greater potential for conflicts with the immediately surrounding uses than the Hermosa site.
- A large theater and parking complex is planned for this location and Site 3.


91
HERMOSA BEACH
HERMOSA BEACH MUNICIPAL PIER
HERMOSA SITE
SITE 2
CITY OF HERMOSA BEACH
CITY OF REDONDO BEACH
King Harbor
Seaside Lagoon
BREAKWATER
MUNICIPAL PIER
REDONDO BEACH
VETERANS PARK
REDONDO CITY BEACH
REDONDO UNION H.S.
SOUTH BAY HOSP
DOMINGUEZ PARK
ANDREWS PARK
VINCENT PK
CIVIC CTR.
AVIATION
PACIFIC COAST HWY
HARBOR DR
TORRANCE
DEL AMO
VANDERBILT
CARNEGIE
ROCKEFELLER
GRANT
HUNTINGTON
HARRIMAN
CLARK
FIELD
PULLMAN
BELMONT
SPEYER
MORGAN
HAVEMEYER
CARLSON LN
SPRECKELS
ARMOUR
VAN HORNE
190TH
HERONDO
PAULINA
MARIA
LUCIA
JUANITA
BERYL
GUADALUPE
FRANCISCA
GERTRUDA
ELENA
CATALINA
DIAMOND
BROADWAY
EMERALD
GARNET
PEARL
RUBY
SAPPHIRE
VINCENT
SPENCER
CAMINO
PROSPECT

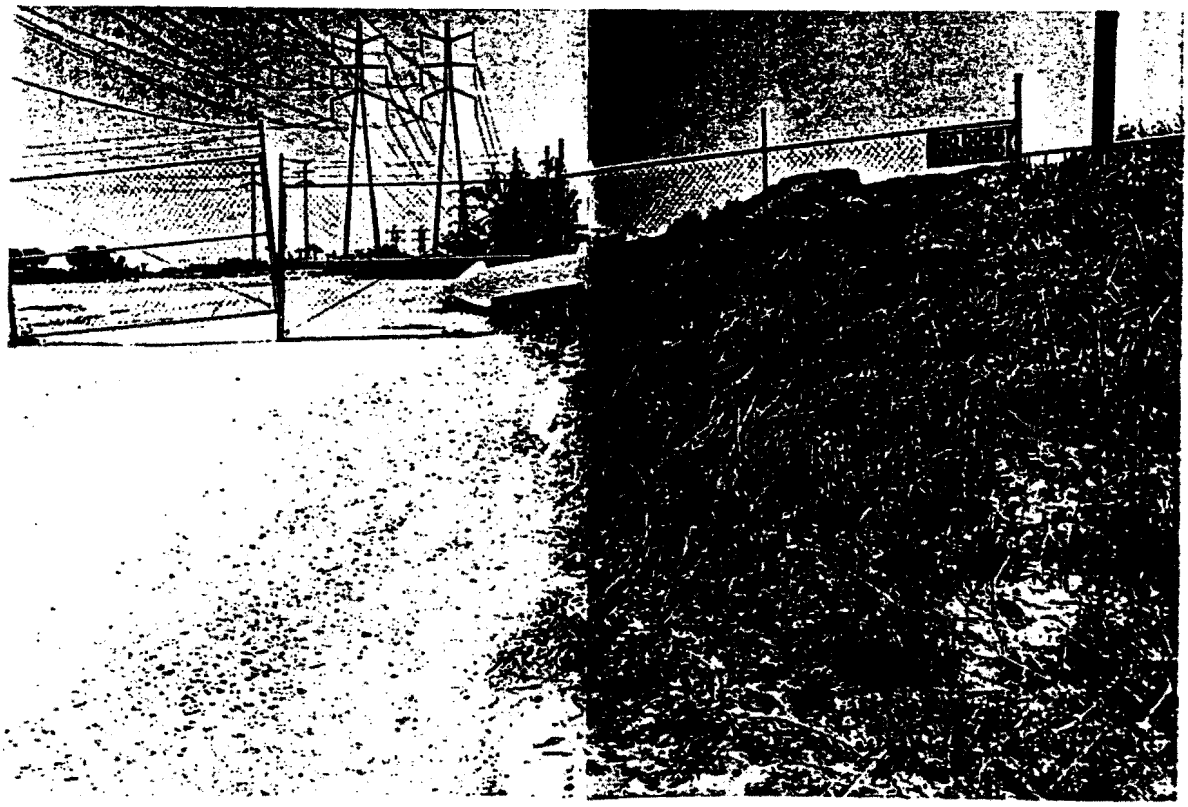
SITE 2

Looking north and northeast along Francisca Ave.

Looking north along Francisca Ave.

SITE 2

Looking southeast from Herondo Street



Looking east from Francisca Ave.

SITE NAME: Site 3

SITE LOCATION: The site is located at the northeastern intersection of Francisca Avenue and Gertruda Avenue. (See attached map.) It is approximately 1/4 mile from Harbor Drive and King Harbor.

SITE SIZE: Approximately 2.4 acres

EXISTING LAND USES: The site is vacant land that is being used for a dirt storage yard. Vacant land with power poles (Site 2) borders it on the north. The U.S. Post Office and a bank are located to the east of the site. The Southern California Edison generating plant is on the west side. There are old abandoned industrial buildings to the south (Site 4) along Gertruda Avenue. (See attached photos.)

EXISTING ZONING AND GENERAL PLAN SITE DESIGNATIONS:

Zoning - I-2A Industrial Zone (See Attachment 1.)
General Plan - I-2 Industrial (See Attachment 2.)

FEASIBILITY OF OIL AND GAS DEVELOPMENT:

Permissibility - Oil well drilling and production is not permitted in Redondo Beach. On May 26, 1992, the City adopted a major General Plan update. They adopted a new comprehensive zoning ordinance for the entire City on January 18, 1996 which included rezoning of numerous properties in the City. These documents do not contain any provisions for oil and gas development. The I-2A zoning does not allow for oil well drilling and production. Uses permitted or permitted with a Conditional Use Permit in this zone include light manufacturing, research and development, aerospace, business park offices, recycling facilities, and trucking terminals. Oil and gas developments are not listed as permitted uses and therefore according to the zoning ordinance are not permitted in the I-2A zone. (See Attachment 9.) The City has indicated that unless the zoning ordinance and General Plan were amended, oil and gas wells could not be drilled in Redondo Beach. (See Attachment 4.) However, City staff have also informed us that obtaining City approval for development of a drill site and production facility on this or any other property in Redondo Beach would be politically impossible because of the citizens' strong desire not to have any additional oil development in their city.

Other Existing, Proposed, or Approved Land Uses - Together with Site 2 part of the 15 screen theater and parking complex is proposed for this site. As stated under Site 2, no applications have been filed as of August 1997; however, discussions are ongoing with the City Planning Department (See Attachment 7.) This land use proposal would be incompatible with oil development.

Compatibility with Surrounding Land Uses - This site presents greater possibilities for conflicts with the immediate surrounding uses than the Hermosa site. At this location, there would be direct noise, traffic, and visual impacts to residences (400' to 600') along Herondo Street at Francisca. Traffic congestion would increase at the intersection of Francisca and Herondo Street which is a

1/4 mile from King Harbor visitor serving area. Without any industrial buffers, as with the Hermosa Maintenance Yard, public safety issues could potentially be significant given the proposed theater complex, adjacent residential units, and the bordering commercial uses.

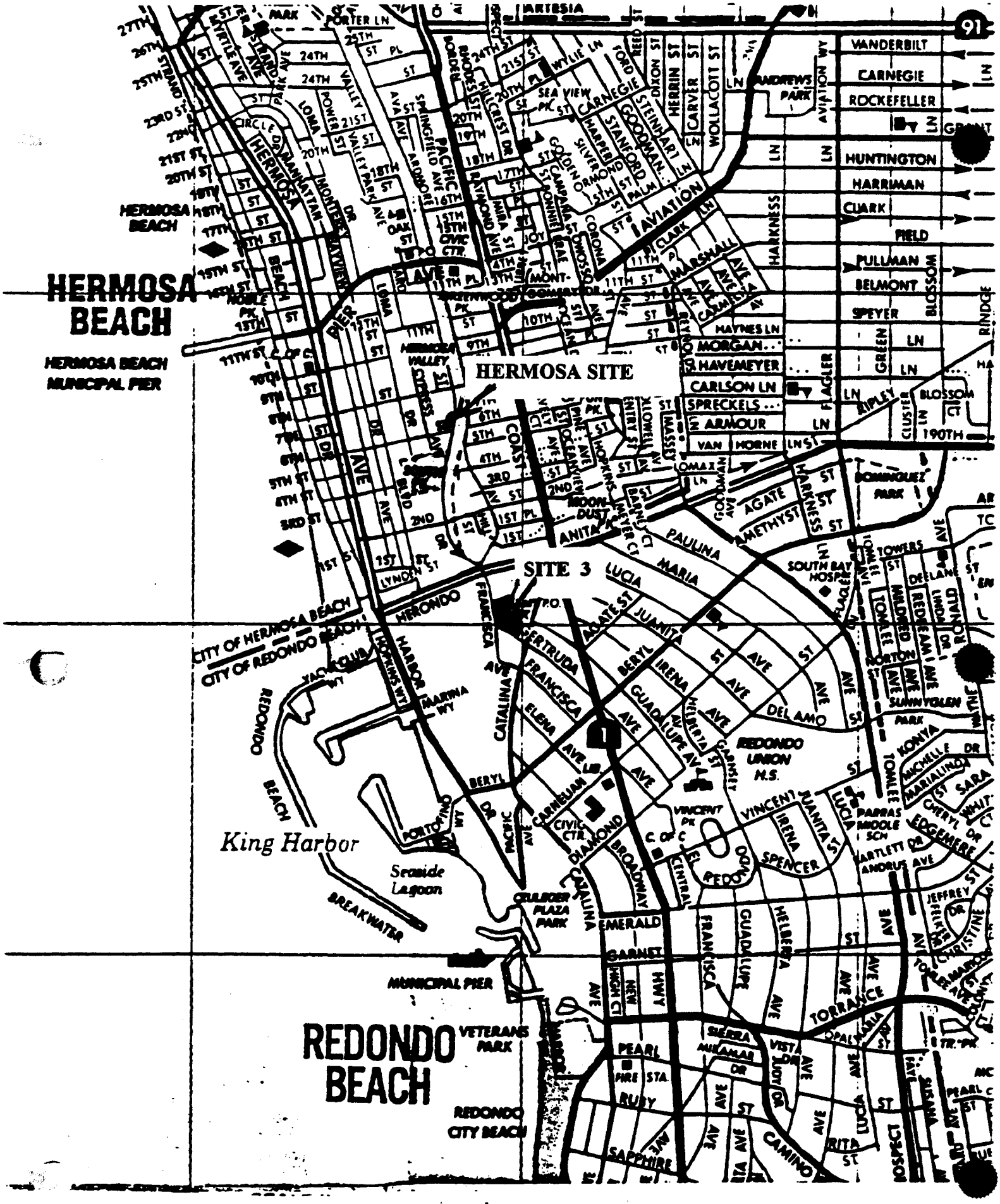
Environmental Issues - The site has no sensitive habitats. As with all sites, mitigation measures would be required for drainage control, air emissions, health and safety issues, and noise generation during construction and operations. Any and all geologic and seismic hazards would have to be appropriately mitigated at the site. Overall, the concern about the potential severity of these impacts would be greater than it is for the Hermosa site which is buffered by industrial uses.

Physical Land Restrictions - The site is approximately 2.4 acres in size. The Macpherson oil and gas facility theoretically could be accommodated at this site, but with technological limitations and financial impacts. Moreover, it is not legally permissible at this site.

Technological and Financial Issues - As outlined in the previously prepared attached report, the physical technological limits of extended reach wells are limited to horizontal reach verses true vertical depth of 5 to 1. A more feasible ratio of 3 to 1 is attainable with a reduction of risk intrinsic in high angle well holes. The oil/water interface is located approximately -3,000 feet. Therefore, the reasonable drilling radius around the drill site is 9,000 feet. Drilling from Redondo Beach would reduce ultimate recovery by as much as 29%. (See Attachment 8 - Geological and Financial Impacts of Alternative Drill Site.)

CONCLUSION: This site is not feasible nor less environmentally damaging.

- **The I-2A zoning does not allow oil and gas development.**
- **It can physically accommodate the facility's needs, but with reduced oil recovery.**
- **Without an industrial buffer, there are direct impacts to adjacent residential and commercial land uses.**
- **There are plans for a 15-screen theater and parking complex for this site.**
- **Other uses permitted in the zoning district are incompatible with oil development.**
- **There is greater potential for conflicts with the immediately surrounding uses than the Hermosa site.**


HERMOSA BEACH
HERMOSA BEACH MUNICIPAL PIER
HERMOSA SITE
SITE 3
CITY OF HERMOSA BEACH
CITY OF REDONDO BEACH
King Harbor
Seaside Lagoon
BREAKWATER
MUNICIPAL PIER
REDONDO BEACH
VETERANS PARK
REDONDO CITY BEACH
REDONDO UNION H.S.
ARTESIA
VANDERBILT
CARNEGIE
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HUNTINGTON
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CLARK
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PULLMAN
BELMONT
SPEYER
MORGAN
S. HAVEMEYER
CARLSON LN
SPRECKELS
ARMOUR
VAN MORNE
HAYNES LN
AVIATION
HARKNESS
FLAGLER
GREEN
BLOSSOM
RIDGE
RIPLEY
190TH
DOMINGUEZ PARK
SOUTH BAY HOSPITAL
ANDREWS PARK
PORTER LN
PACIFIC
HERMOSA
MANHATTAN
MONTEREY
PIER
HERMOSA VALLEY
COAST
HERONDO
HARBOR
MARINA WY
YACHT CLUB
REDONDO BEACH
PORTOFINO
PACIFIC
CATALINA
FRANCISCA
GERTRUDA
ELENA
BERYL
IRENA
GUADALUPE
HELBERTA
DEL AMO
JUANITA
LUCIA
MARIA
PAULINA
ANITA
AGATE
AMETHYST
VINCENT
SPENCER
EL REDO
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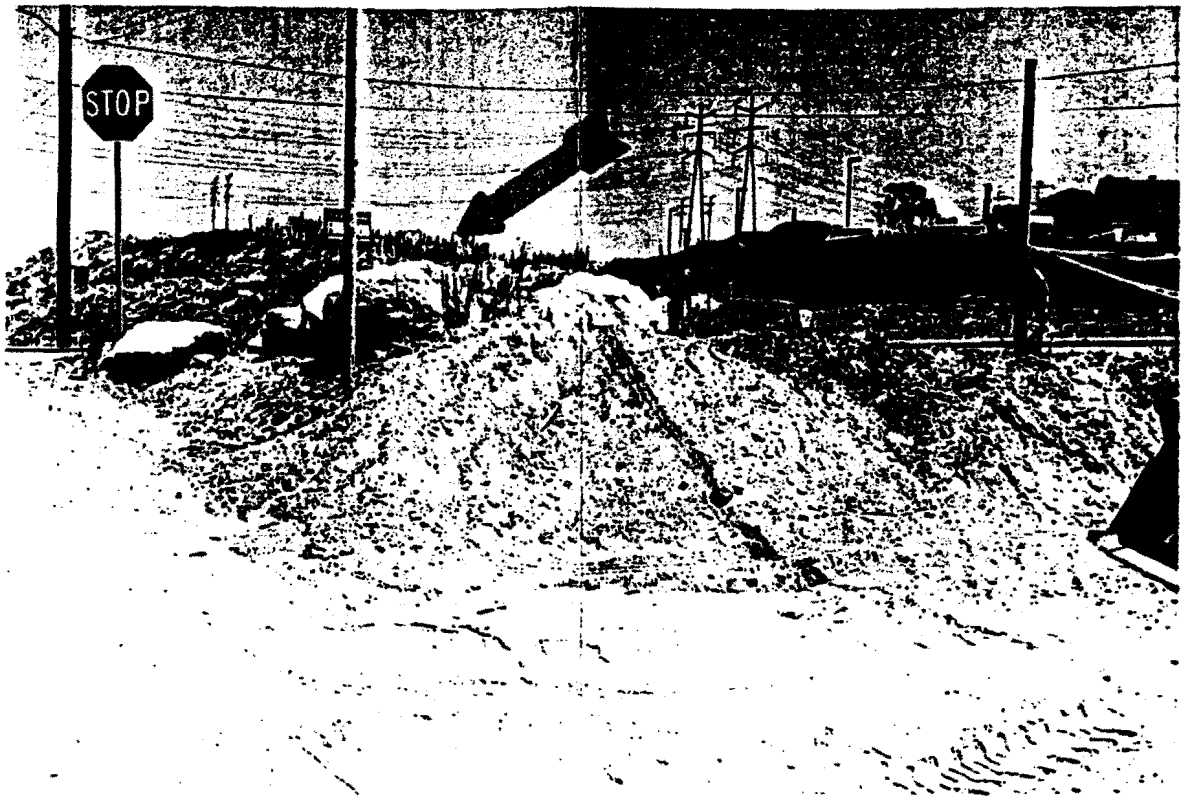
VINCENT PK
PARRAS MIDDLE SCH
CHRISTINE
JEFFREY
SUNNYGLEN PARK
KONYA
MICHELLE DR
MARIALINDA
SARA
CHERYL DR
EDGEMERE
HARTLETT
ANDRUS AVE
TOWLEE
MILDRED
REDFEAN
DEELANE
NORTON
TOWERS
SIERRA
MIRAMAR
VISTA
LUCY DR
PALMARIA
FIRE STA.
TR. PK.
SUSANA
POSCHI
RITA
LUCIA
PEARL
CULBER PLAZA PARK
CITY OF REDONDO BEACH

SITE 3

Looking east towards Post Office

Looking south along Francisca Ave.

SITE 3



Looking north from Gertruda Ave.

Looking north along Francisca Ave.

SITE NAME: Site 4

SITE LOCATION: The site is bordered on the north by Gertruda Avenue, Catalina Avenue to the east, and Francisca Avenue to the south and west. (See attached map.) It is approximately 1/4 mile from Harbor Drive and King Harbor.

SITE SIZE: Approximately .62 acres

EXISTING LAND USES: The site is the abandoned Redondo Beach tank farm site that contained the production equipment for the "Marina drill site" (Site 8). The eastern and northeastern portions of the site contain older abandoned buildings. The northwest portion is vacant and the southern portion contains a few buildings that contain light industrial uses. Vacant land and the U.S. Post Office are located to the north. A light industrial use building lies to the southeast of the site. The Southern California Edison generating plant is on the west side. (See attached photos.)

EXISTING ZONING AND GENERAL PLAN SITE DESIGNATIONS:

Zoning - C-5A Commercial Zone (See Attachment 1.)
General Plan - C-5 Commercial (See Attachment 2.)

FEASIBILITY OF OIL AND GAS DEVELOPMENT:

Permissibility - Oil well drilling and production is not permitted in Redondo Beach. On May 26, 1992, the City adopted a major General Plan update. They adopted a new comprehensive zoning ordinance for the entire City on January 18, 1996 which included rezoning of numerous properties in the City. These documents do not contain any provisions for oil and gas development. The C-5A zone does not allow for oil and gas development. Uses permitted or permitted with a Conditional Use Permit in this zone include commercial uses such as banks, offices, marine sales and service, restaurants, retail sales, and industrial uses such as electronics manufacturing, laboratories, professional offices, marine facilities, construction-related uses, mini-warehousing and self-storage, motor vehicle-related uses, recycling facilities and other uses such as adult day care centers, child day care centers, public utilities, governmental offices. parking lots, schools, and recreational facilities. Oil and gas developments are not listed as permitted uses and therefore, according to the zoning ordinance are not permitted in the C-5A zone. (See Attachment 10.) The City has indicated that unless the zoning ordinance and General Plan were amended, oil and gas wells could not be drilled in Redondo Beach. (See Attachment 4.) However, City staff have informed us that obtaining City approval for development of a drill site and production facility on this or any other property in Redondo Beach would be politically impossible due to the citizens' strong desire not to have any additional oil development in their city.

Other Existing, Proposed, or Approved Land Uses - This site is proposed to be part of the new theater complex development, which would be incompatible with oil drilling and production. (See Attachment 7.) As stated under Site 3, no applications have been filed as of August 1997; however, discussions are ongoing with the City Planning Department.

Compatibility with Surrounding Land Uses - This location has greater potential for conflicts with the surrounding land uses than the Hermosa site. Even if the project could be developed at this location, there would be noise, traffic, and visual impacts to commercial uses and the Post Office immediately adjacent to the site (200' to north and east). Without any industrial buffers, as with the Hermosa Maintenance Yard, public safety issues potentially could be much greater than the Hermosa site if the theater complex or some other high intensity use is developed in this area along with the existing and approved commercial uses to the south and east including the Site 5 Technology Center. There would be additional traffic generation to Francisca Avenue and Herondo Street, which is a direct route to King Harbor 1/4 mile to the west.

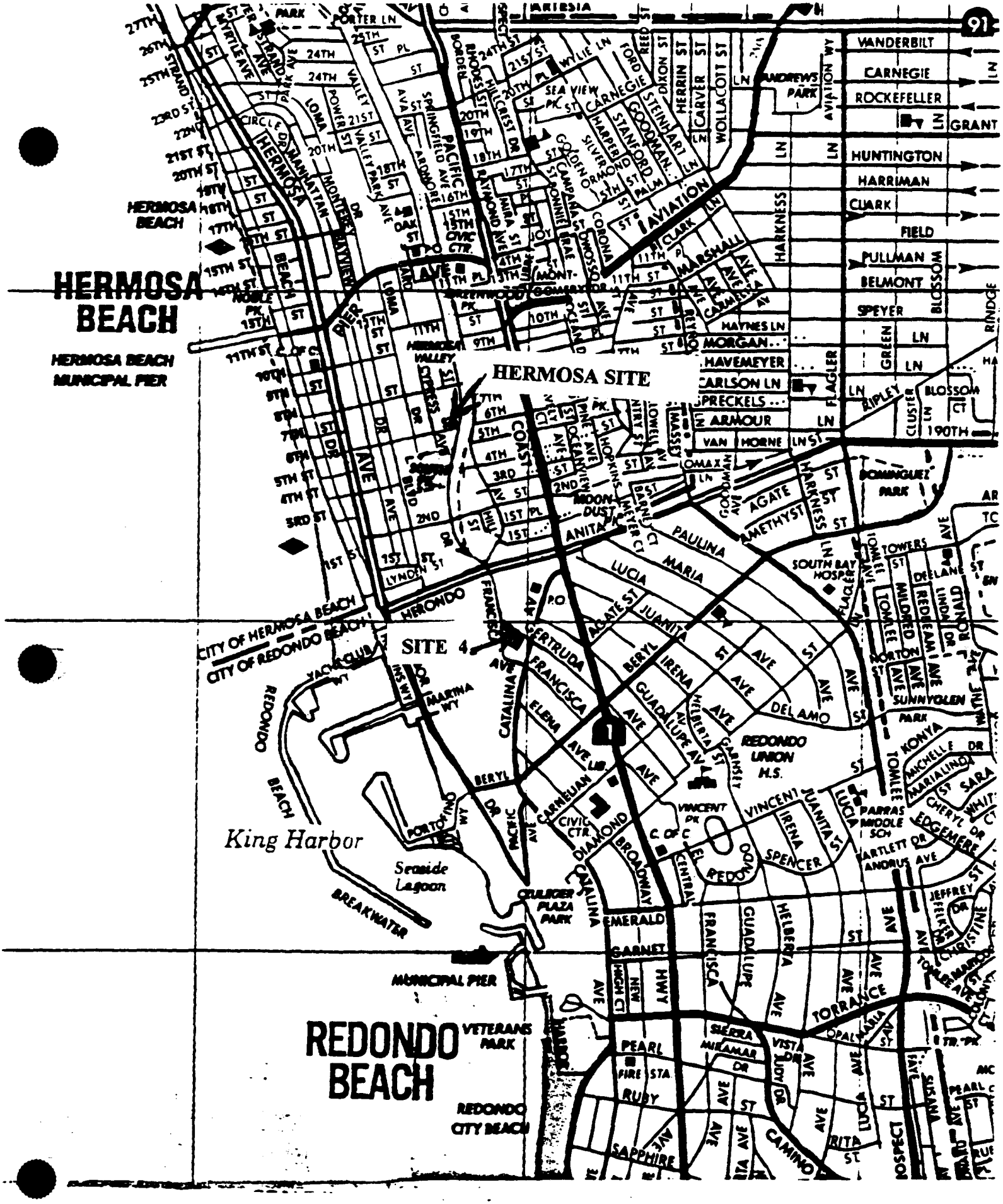
Environmental Issues - The site has no sensitive habitats since it was an industrial site. As with all sites, mitigation measures would be required for drainage control, air emissions, health and safety issues, and noise generation during construction and operations. Any and all geologic and seismic hazards would have to be appropriately mitigated at the site. The potential severity of these issues is greater than it would be for the Hermosa site, which is buffered by light industrial uses.

Physical Land Restrictions - The site is approximately .62 acres in size. The Macpherson oil and gas facility could not be developed at this site since it requires a minimum one acre site for all facilities. The site requires a minimum of one acre to accommodate the necessary exploration and production facilities including the five tanks (40' diameter), test facilities, shipping pipelines, well cellar, fencing, offices, parking, and city setback and landscape requirements. In addition, it is not legally permissible at this site.

Technological and Financial Issues - The site is located approximately 1,550 feet horizontally from potential productive horizons in Hermosa Beach. The reasonable drilling radius around the tank farm site is 9,000 feet. Drilling from the tank farm site would require a greater number of maximum length wells to recover only 83% of the oil available in the reserves in Hermosa Beach. The risk and difficulties are increased with a decrease in production. Therefore, reduced royalty and income and greater development costs would be expected at this site even if it could be developed with city approval. (See Attachment 8 - Geological and Financial Impacts of Alternative Drill Site.)

CONCLUSION: The site is not feasible nor less environmentally damaging.

- **The zoning does not allow oil and gas development.**
- **Given its size, it can not accommodate the project's minimum physical needs/objectives.**
- **There would be greater potential for conflicts with the immediately surrounding uses than the Hermosa site.**
- **This site is located in the area where the new theater complex is being proposed for Redondo Beach which would be incompatible with an oil facility.**
- **There would be less oil recovery and thus less income and greater costs at this site.**
- **Other uses permitted in the zoning district are incompatible with oil developments.**


HERMOSA BEACH
HERMOSA BEACH MUNICIPAL PIER
HERMOSA SITE
SITE 4
CITY OF HERMOSA BEACH
CITY OF REDONDO BEACH
King Harbor
Seaside Lagoon
BREAKWATER
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CIVIC CTR.
CRULKSHER PLAZA PARK
SOUTH BAY HOSPT.
DOMINGUEZ PARK
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FIRE STA.
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CARLSON LN
SPRECKELS
ARMOUR
VAN HORNE
LOMAX
AVIATION
HARKNESS
FLAGLER
BLOSSOM
190TH
PACIFIC AVE
HERMOSA AVE
HERONDO
PAULINA
MARIA
LUCIA
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JUANITA
BERYL
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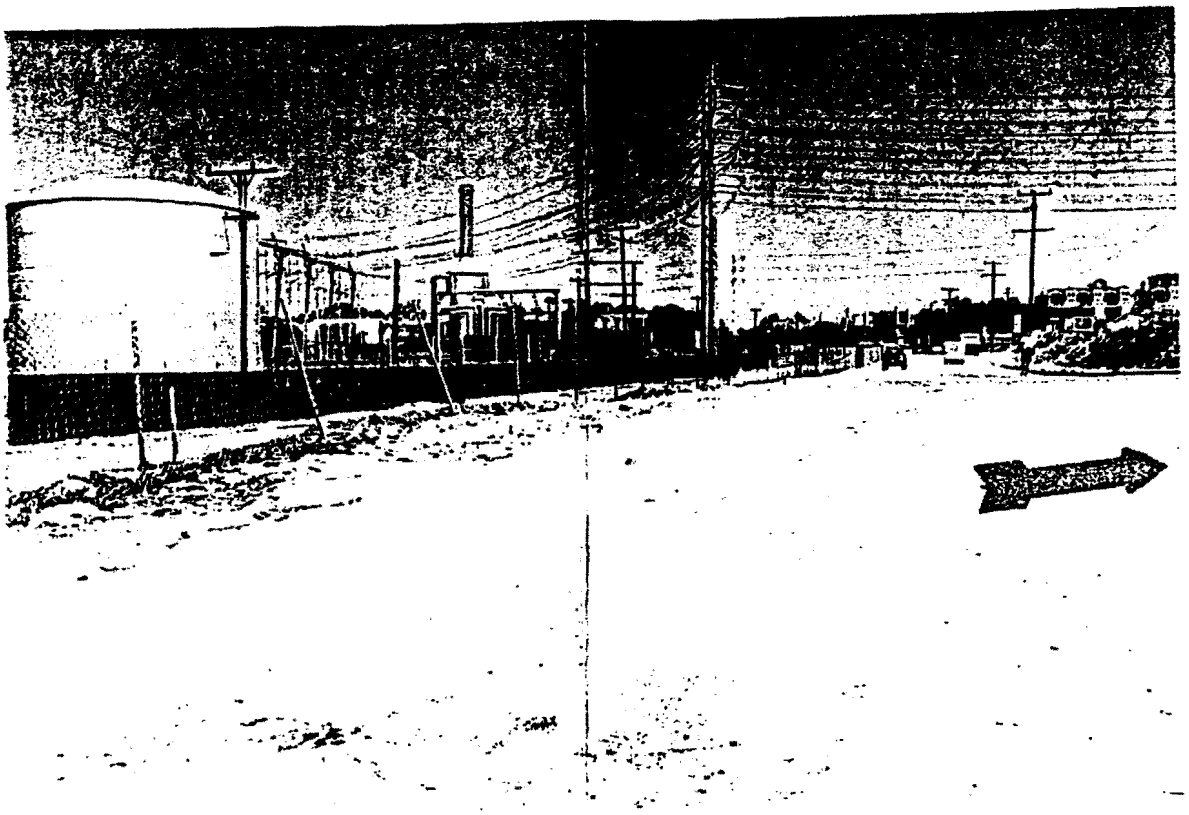
DELAMO
VINCENT
SPENCER
PEDRO
BROADWAY
EMERALD
GARNET
PEARL
RUBY
SAPPHIRE
TORRANCE
CAMINO
ARTESIA
PORTER LN
PARK

SITE 4

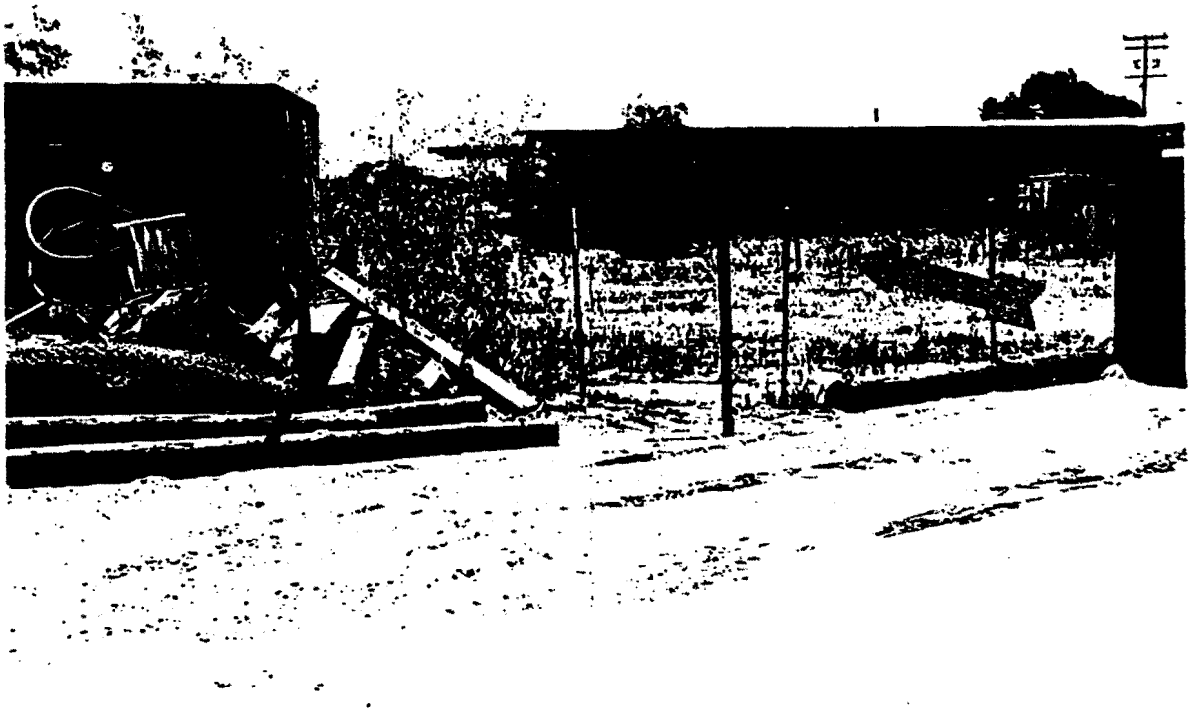
Looking northeast from Francisca Ave.

Looking north and northeast at the Post Office from Francisca Ave.

SITE 4



Looking north along Francisca Ave. with
SCE generating plant to the west



Looking east at the industrial buildings

SITE NAME: Site 5

SITE LOCATION: The site is bordered on the north by Francisca Avenue and Catalina Avenue to the east. (See attached map.) It is approximately 1000 feet from Harbor Drive behind the Southern California Edison plant.

SITE SIZE: Approximately 3.2 acres

EXISTING LAND USES: The site is vacant land. The Southern California Edison generating plant facilities are located to the west. Commercial uses are located to the east including a cafe, light industrial uses, and residential units. There are light industrial uses and vacant land (Site 4) to the north. (See attached photos.) A Salvation Army Senior Residential Center is located to the south.

EXISTING ZONING AND GENERAL PLAN SITE DESIGNATIONS:

Zoning - C-5A Commercial Zone (See Attachment 1.)
General Plan - C-5 Commercial (See Attachment 2.)

FEASIBILITY OF OIL AND GAS DEVELOPMENT:

Permissibility - Oil well drilling and production is not permitted in Redondo Beach. On May 26, 1992, the City adopted a major General Plan update. They adopted a new comprehensive zoning ordinance for the entire City on January 18, 1996 which included rezoning of numerous properties in the City. These documents do not contain any provisions for oil and gas development. The C-5A zone does not allow for oil and gas development. Uses permitted or permitted with a Conditional Use Permit in this zone include commercial uses such as banks, offices, marine sales and service, restaurants, retail sales, and industrial uses such as electronics manufacturing, laboratories, professional offices, marine facilities, construction-related uses, mini-warehousing and self-storage, motor vehicle-related uses, recycling facilities and other uses such as adult day care centers, child day care centers, public utilities, governmental offices. parking lots, schools, and recreational facilities. Oil and gas developments are not listed as permitted uses and therefore, according to the zoning ordinance are not permitted in the C-5A zone. (See Attachment 10.) The City has indicated that unless the zoning ordinance and General Plan were amended, oil and gas wells could not be drilled in Redondo Beach. (See Attachment 4.) However, City staff have informed us that obtaining City approval for development of a drill site and production facility on this or any other property in Redondo Beach would be politically impossible because the citizens' strong desire not to have any additional oil development in their city.

Other Existing, Proposed, or Approved Land Uses - The Catalina Information Technology Center has been approved by the City for this site and Site 6. It includes 295,000 square feet of retail, office, incubator industrial, mini storage, and warehouse facilities. (See Attachments 7 and 11.)

Compatibility with Surrounding Land Uses - This location has greater potential for conflicts with the immediate surrounding land uses than the Hermosa site. There would be increased traffic

impacts at Beryl and North Catalina Avenue, which is 400 feet from Harbor Drive where there are numerous visitor-serving facilities at King Harbor. The Hermosa site is 1600 to 1800 feet from visitor-serving uses near the beach along Harbor Drive. Without other industrial buffers like Hermosa, this site would have direct noise, traffic, and visual impacts to the commercial and residential uses directly across to the east (100' to 200') along Catalina Avenue and the Senior Center to the south. Also, given the close proximity of the commercial and residential uses without other industrial buffers, public safety issues could be potentially significant.

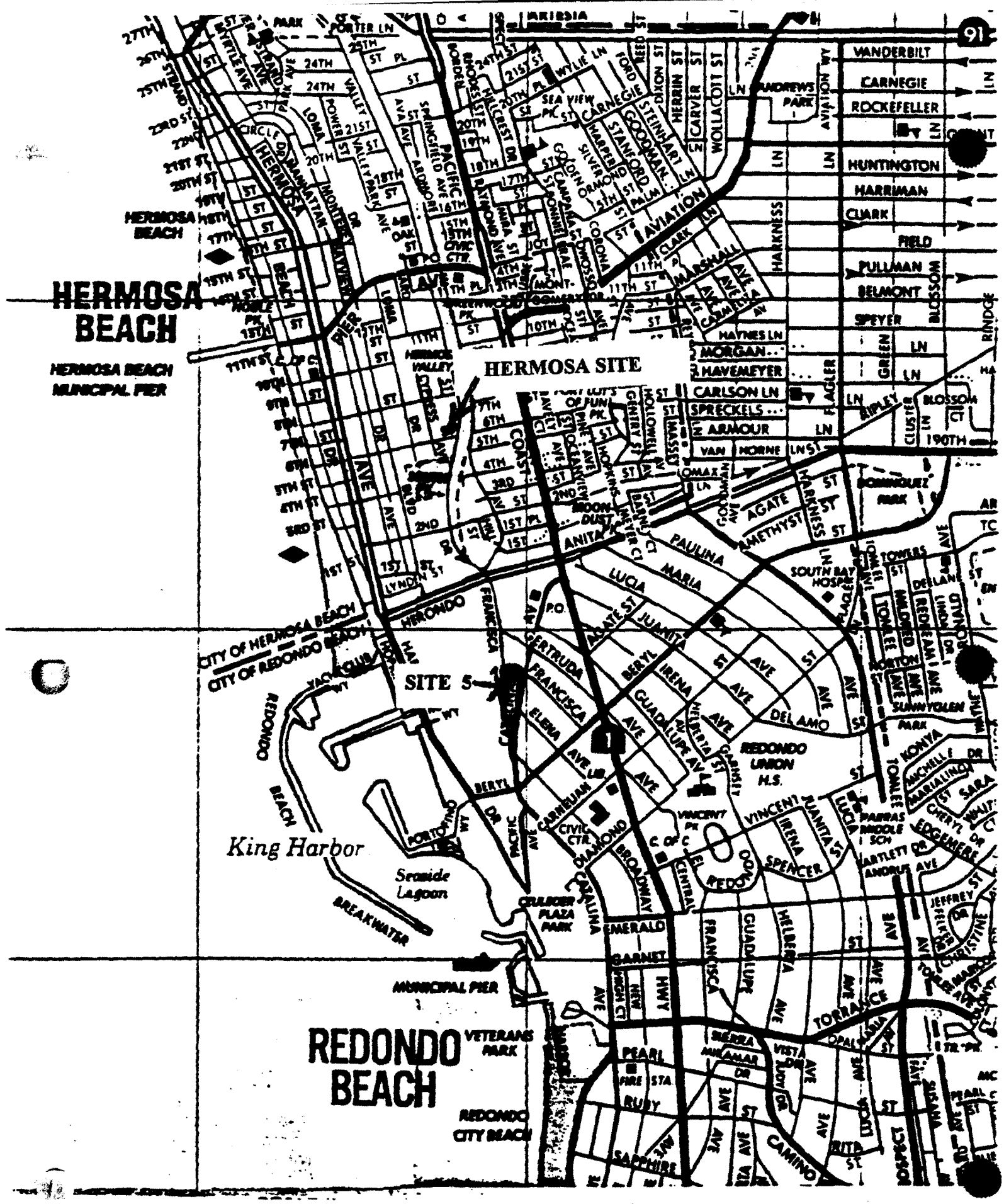
Environmental Issues - The site has no sensitive habitats. It is graded vacant land. As with all sites, mitigation measures would be required for drainage control, air emissions, health and safety issues, and noise generation during construction and operations. Any and all geologic and seismic hazards would have to be appropriately mitigated at the site. Given the site's location immediately adjacent to residential uses, the concern about the potential severity of these impacts would be greater than it is for the Hermosa site that is buffered by industrial uses.

Physical Land Restrictions - The site is approximately 3.2 acres in size excluding the Site 6 area. The Macpherson oil and gas facility theoretically could be developed at this site, but with technological limitations and economic impacts. However, as already stated, it is not legally possible to obtain zoning approval for an oil project at this site.

Technological and Financial Issues - As outlined in the attached report, the physical technological limits of extended reach wells are limited to horizontal reach verses true vertical depth of 5 to 1. A more feasible ratio of 3 to 1 is attainable with a reduction of risk intrinsic in high angle well holes. The oil/water interface is located approximately -3,000 feet. Therefore, the reasonable drilling radius around the drill site is 9,000 feet. Drilling from Redondo Beach would reduce ultimate recovery by as much as 29%. (See Attachment 8 - Geological and Financial Impacts of an Alternative Drill site.)

CONCLUSION: Site 5 is not feasible nor less environmentally damaging.

- **Zoning does not allow oil and gas development.**
- **The City has already approved the Catalina Information Technology Center for this location which would be incompatible with an oil facility.**
- **There is greater potential for conflicts with the adjacent land uses than the Hermosa site including the King Harbor visitor-serving uses.**
- **Other uses permitted in the zoning district are incompatible with oil development.**
- **The site can accommodate the project's physical needs, but with less oil recovery.**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CARLSON LN
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ARMOUR
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HERMOSA
PACIFIC
SPRINGFIELD
ARDMORE
MONTEREY
MANHATTAN
VALLEY PARK
POWER
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PIER
HERMOSA VALLEY
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FRANCISCA
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CARNELIAN
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EMERALD
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IRENA
GUADALUPE
HELBERTA
DEL AMO
VINCENT
SPENCER
EL PEDO
CENTRAL
HARKNESS
FLAGER
AVIATION
MARSHALL
CARVER
WOLLACOTT
HERRIN
STEINHART
GOODMAN
STANFORD
CORONA
ORMOND
SILVER
CARNEGIE
SEA VIEW PK
ANDREWS PARK
DOMINGUEZ PARK
SOUTH BAY HOSPITAL
TOWERS
TONNELE
MILDRED
REDFEAM
LINDA
OTTAWA
NORTON
SUNNYGLEN PARK
KONYA
MICHELLE
MARIALINDA
SARA
CHERYL
EDGEMERE
PARRAS MIDDLE SCH
BARTLETT
ANDRUS
JEFFREY
CHRISTINE
BIRDIE
BLOSSOM
RIPLEY
GREEN
RINDGE
CLUSTER
PACIFIC
PORTSMOUTH
BERYL
VISTA DEL MAR
RITA
LOMITA

SITE 5

Looking south along Catalina Ave.

Looking west and northwest at SCE plant and industrial buildings from Catalina Ave.

SITE 5

Looking west at SCE plant from Catalina Ave.

Looking south along Catalina Ave. at the Senior Residential Center

SITE NAME: Site 6

SITE LOCATION: The site is a long narrow strip that runs from Herondo Street on the north to North Catalina on the south. (See attached map.) It varies from approximately 600' to 1200' from Harbor Drive behind the Southern California Edison plant.

SITE SIZE: Approximately 2 acres

EXISTING LAND USES: The site is a vacant railroad right-of-way. The Southern California Edison generating plant facilities are located to the west. Vacant land borders the site on the east including Sites 2, 3, 4, and 5. (See attached photos.)

EXISTING ZONING AND GENERAL PLAN SITE DESIGNATIONS:

Zoning - C-5A Commercial Zone (See Attachment 1.)
General Plan - C-5 Commercial (See Attachment 2.)

FEASIBILITY OF OIL AND GAS DEVELOPMENT:

Permissibility - Oil well drilling and production is not permitted in Redondo Beach. On May 26, 1992, the City adopted a major General Plan update. They adopted a new comprehensive zoning ordinance for the entire City on January 18, 1996 which included rezoning of numerous properties in the City. These documents do not contain any provisions for oil and gas development. The C-5A zone does not allow for oil and gas development. Uses permitted or permitted with a Conditional Use Permit in this zone include commercial uses such as banks, offices, marine sales and service, restaurants, retail sales, and industrial uses such as electronics manufacturing, laboratories, professional offices, marine facilities, construction-related uses, mini-warehousing and self-storage, motor vehicle-related uses, recycling facilities and other uses such as adult day care centers, child day care centers, public utilities, governmental offices. parking lots, schools and recreational facilities. Oil and gas developments are not listed as permitted uses and therefore, according to the zoning ordinance are not permitted in the C-5A zone. (See Attachment 10.) The City has indicated that unless the zoning ordinance and General Plan were amended, oil and gas wells could not be drilled in Redondo Beach. (See Attachment 4.) However, City staff have informed us that obtaining City approval for development of a drill site and production facility on this or any other property in Redondo Beach would be politically impossible because of the citizens' strong desire not to have any additional oil development in their city.

Other Existing, Proposed, or Approved Land Uses - The site has been approved by the City for a mini storage facility which is part of the Catalina Information Technology Center that has been approved by the City for this site and Site 5. (See Attachments 7 and 11.)

Compatibility with Surrounding Land Uses - The location of this site could potentially have greater conflicts with the immediate surrounding existing and planned land uses than the Hermosa site, which is surrounded by light industrial buffers. If the Macpherson oil and gas facility were located on this property, it could potentially cause significant visual, noise, traffic, and public safety

impacts to residential uses along Herondo Street at Francisca (100' to 200'), the proposed theater complex directly across along Francisca Avenue, the approved Catalina Information Technology Center to the east, and the Salvation Army Senior Residential Center to the south.

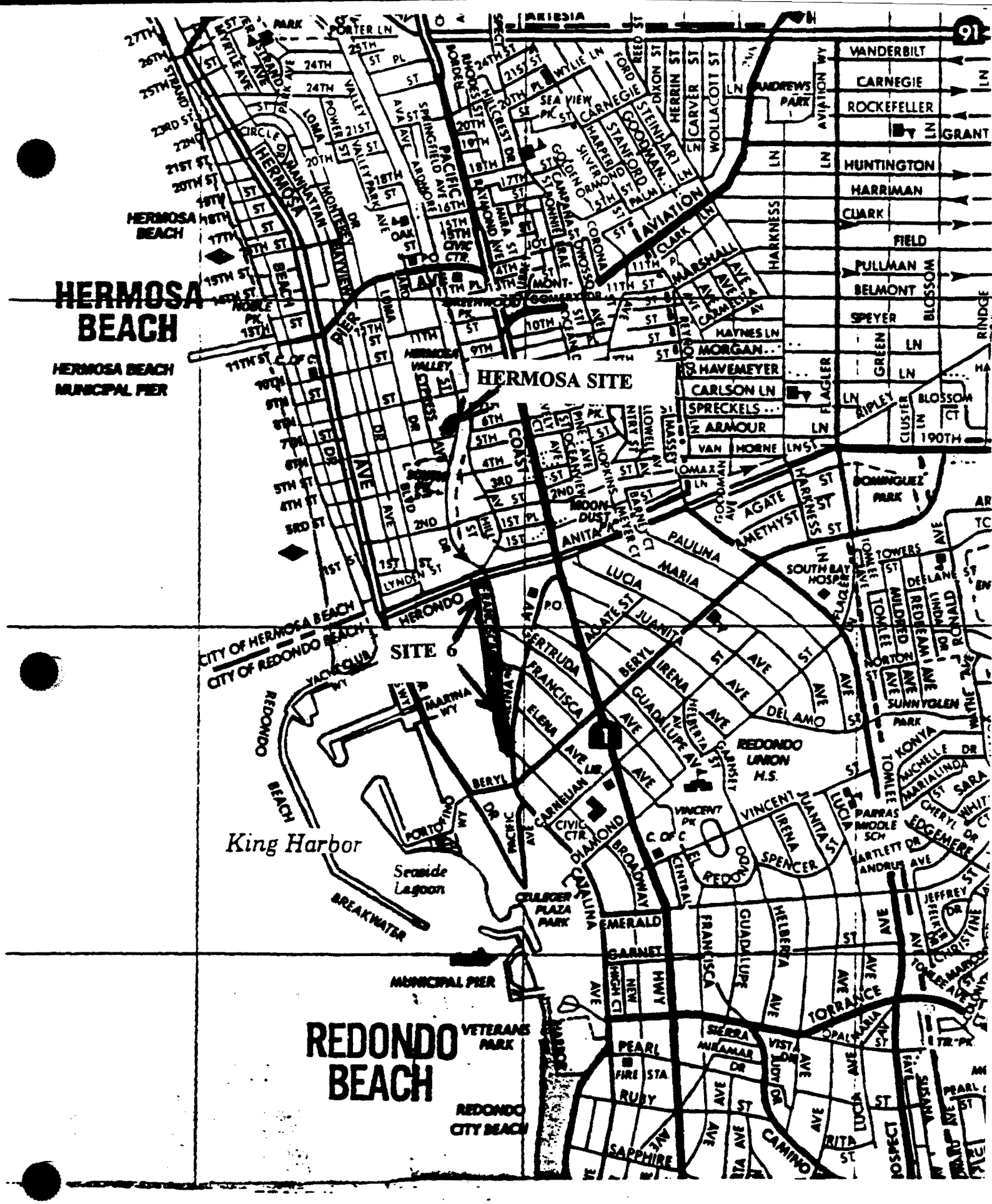
Environmental Issues - The site has no sensitive habitats. It is a graded vacant railroad right-of-way. As with all sites, mitigation measures would be required for drainage control, air emissions, health and safety issues, and noise generation during construction and operations. Any and all geologic and seismic hazards would have to be appropriately mitigated at the site. Given the site's location immediately adjacent to residential uses, the concern about the potential severity of these impacts would be greater than it is for the Hermosa site that is buffered by industrial uses.

Physical Land Restrictions - The site is approximately 2 acres in size. The Macpherson oil and gas facility could not be accommodated at this site. This long narrow strip of land would be extremely difficult to develop for oil production facilities due to minimum setbacks for drilling oil wells. The Uniform Fire Code requires a minimum setback of 75 feet from any street (Francisca Ave). In addition, it is necessary to have a clear space in front of each well of 90 feet to permit a well servicing rig to work on the well. Moreover, it is not legally possible to obtain zoning approval for an oil facility at this site.

Technological and Financial Issues - As outlined in the attached report, the physical technological limits of extended reach wells are limited to horizontal reach verses true vertical depth of 5 to 1. A more feasible ratio of 3 to 1 is attainable with a reduction of risk intrinsic in high angle well holes. The oil/water interface is located approximately -3,000 feet. Therefore, the reasonable drilling radius around the drill site is 9,000 feet. Drilling from Redondo Beach would reduce ultimate recovery by as much as 29%. (See Attachment 9 - Geological and Financial Impacts of an Alternative Drill Site.)

CONCLUSION: This site is not feasible nor less environmentally damaging.

- **Zoning does not allow oil drilling and production.**
- **The City has already approved a mini-storage facility for this site.**
- **The site has a greater potential for conflicts with the immediate surrounding uses than the Hermosa site.**
- **Other uses permitted in the zoning district or being planned for the area are incompatible with oil development.**
- **Site could not accommodate the project's physical needs due its very long narrow configuration.**


HERMOSA BEACH
HERMOSA BEACH MUNICIPAL PIER
HERMOSA SITE
SITE 6
CITY OF HERMOSA BEACH
CITY OF REDONDO BEACH
King Harbor
Seaside Lagoon
BREAKWATER
MUNICIPAL PIER
REDONDO BEACH
VETERANS PARK
REDONDO CITY BEACH
REDONDO UNION H.S.
PARKS MIDDLE SCH
ANDREWS PARK
DOMINGUEZ PARK
SOUTH BAY HOSP
CULVER PLAZA PARK
CIVIC CTR
FIRE STA
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PRIETSIA
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DIAMOND
BROADWAY
EMERALD
GARNET
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CARNEGIE
ROCKEFELLER
GRANT
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CARLSON LN
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ARMOUR
VAN HORNE
LOMAX
AGATE
AMETHYST
PAULINA
MARIA
LUCIA
JUANITA
BERYL
IRENA
GUADALUPE
HELBERTA
DEL AMO
VINCENT
SPENCER
SIERRA
VISTA
PALOS VERDES
190TH
BLOSSOM
RIPLEY
FLAGLER
HARKNESS
GREEN
CLUSTER
TOMLEE
MILDRED
REDEAN
LINDA
DIVAN
NORTON
SUNNYGLEN
KONYA
MICHELLE
MARIALINDA
SARA
CHERYL
EDGEMERE
JEFFREY
CHRISTINE
BARTLETT
ANDRUS
LUCIA
PACIFIC
FRANCISCA
GERTRUDA
ELENA
MARINA WY
YACHT CLUB WY
ANITA
MOONDUST
HOPKINS
MONTGOMERY
CORONA
SILVER
ORMOND
PALM
STANFORD
GOODMAN
STEINBART
HARPER
CARNEGIE
SEA VIEW PK
WILLIE LN
FORD
DIXON
HERRIN
CARVER
WOLLACOTT
MARSHALL
CAMPBELL
CLARK
OWOSSO
MIRA
JOY
RAYMOND
BRAE
HILLCREST DR
BORDER
RHODES
SPRINGFIELD AVE
ARDMORE
PACIFIC
CIVIC CTR
OAK
MANHATTAN
MONTEREY
BAYVIEW
LOMA
POWER
VALLEY
VALLEY PARK
CIRCLE DR
PORTER LN
MARK
BEACH
NOBLE PK
HERMOSA VALLEY
CYPRESS
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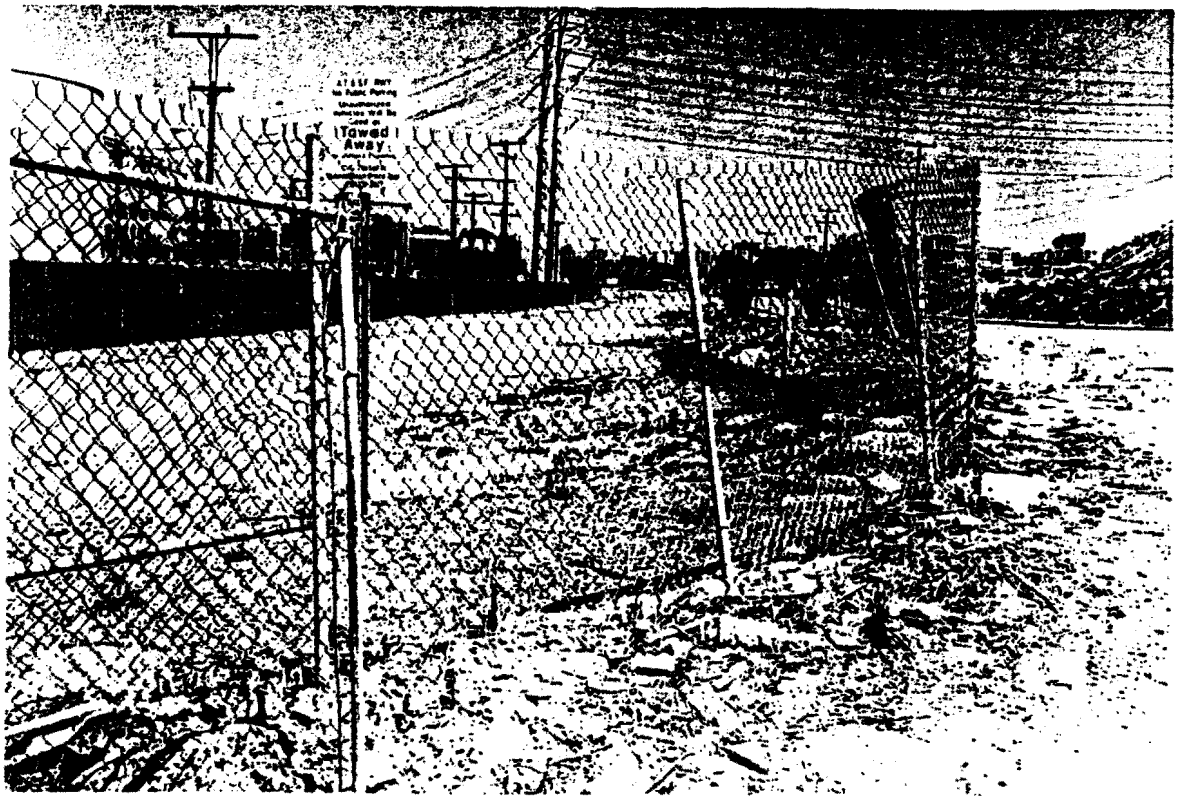
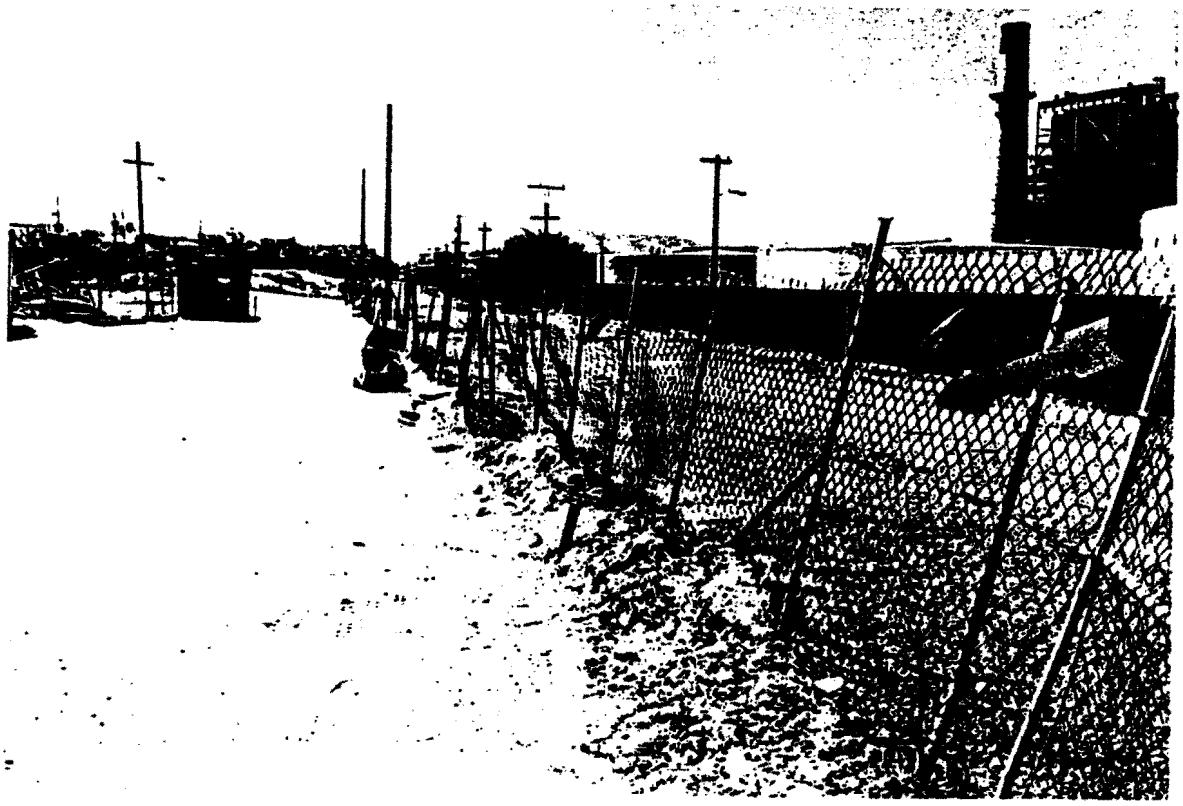
SITE 6



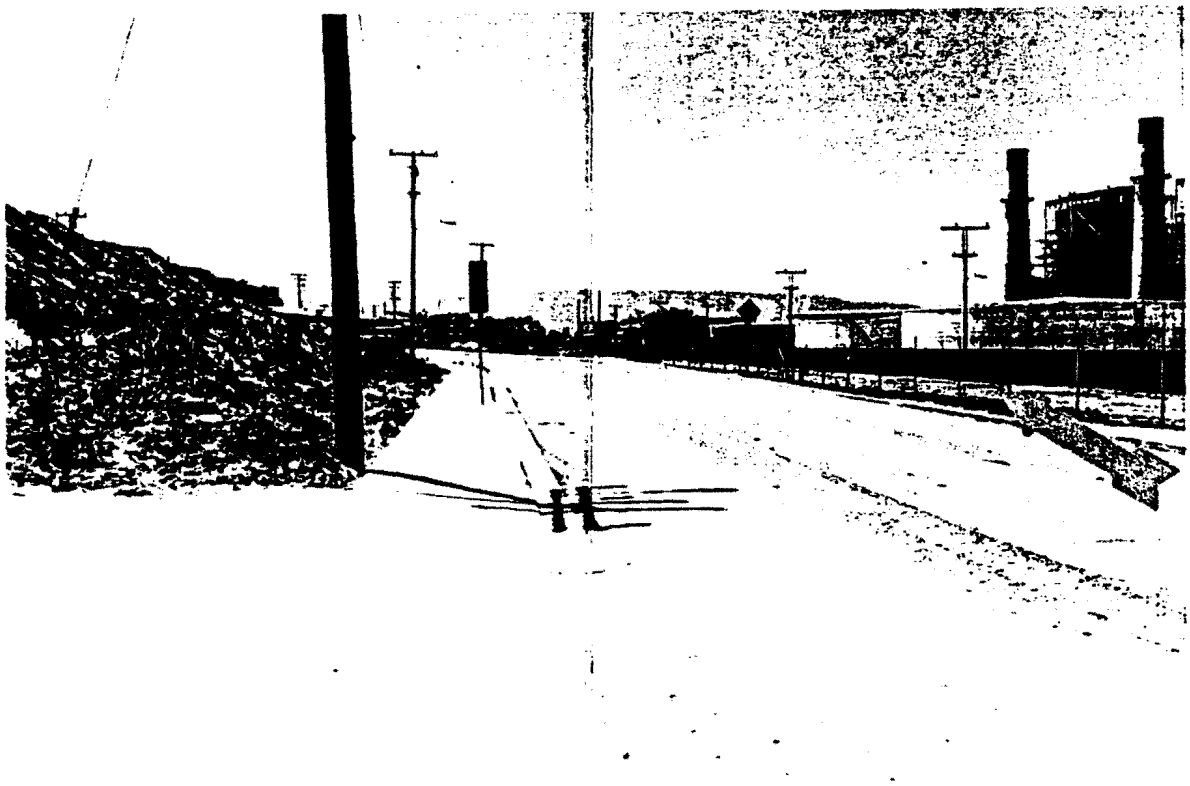
Looking north along railroad ROW from Francisca Ave.



Looking south along railroad ROW from Francisca Ave.

SITE 6

**Looking north along Francisca Ave.
SCE Plant to the west and Sites 2 and 3
to the east**



**Looking south along Francisca at Site 2 with SCE Plant to
the west**

SITE NAME: Site 7

SITE LOCATION: It is bordered by Harbor Drive to the west, Herondo Street to the north, the abandoned railroad right-of-way along the west side of Francisca Avenue, North Catalina Avenue to the east, and Beryl Street to the south. (See attached map). It is located directly across from the King Harbor area, along Harbor Drive.

SITE SIZE: Approximately 41 acres

EXISTING LAND USES: The site includes the Southern California Edison power generation facilities including storage tanks. According to the General Plan (p.3-70), the plant is currently operating at approximately 30% capacity with only four of the eight generators "on-line." The King Harbor Marina and various commercial visitor serving uses are west of the site along Harbor Drive. A restaurant and hotel and the Salvation Army Senior Residential Center border on the south side of the plant. Residential uses lie to the north along Herondo Street. (See attached photos.)

EXISTING ZONING AND GENERAL PLAN SITE DESIGNATIONS:

Zoning - P-GP Generating Plant Zone (See Attachment 1.)
General Plan - P Public or Institutional (See Attachment 2.)

FEASIBILITY OF OIL AND GAS DEVELOPMENT:

Permissibility - Oil well drilling and production is not permitted in Redondo Beach. On May 26, 1992, the City adopted a major General Plan update. They adopted a new comprehensive zoning ordinance for the entire City on January 18, 1996 which included rezoning of numerous properties in the City. These documents do not contain any provisions for oil and gas development. The zoning designation does not allow for oil and gas development. Uses permitted or permitted with a Conditional Use Permit in this zone include parks, parkettes, open space, recreational facilities; public buildings in parks, recreation areas, and open space areas; and public utility facilities. Oil and gas developments are not listed as permitted uses and therefore according to the zoning ordinance are not permitted in the P-GP zone. (See Attachment 3.) The City has indicated that unless the zoning ordinance and General Plan were amended, oil and gas wells could not be drilled in Redondo Beach. (See Attachment 4.) However, City staff have informed us that obtaining City approval for development of a drill site and production facility on this or any other property in Redondo Beach would be politically impossible because of the citizens' strong desire not to have any additional oil development in their city.

Other Existing, Proposed, or Approved Land Uses - Edison is selling this plant as part of a multiple plant package, but is keeping the storage tanks. All the plants must be sold together in one sale which is planned to be completed by the end of 1997 (Application of Southern California Edison Company for Authority to sell Gas-Fired Electrical Generating Facilities U-388-E). It is not known as to whether the plant will continue to operate in the future if it is sold, but the sale is a response to the deregulation of energy services and it is expected that a competitor energy provider would be the purchaser. (See Attachment 14.) Considering this site for an oil facility

would be very speculative. At this time it is being used as a generating plant by Southern California Edison. If it is sold as part of a package, it could continue to operate at the same or higher capacity. Another use could be proposed if it is closed in the future, but there will be a lengthy process of demolition, site clean-up, and City approvals. Given its location, there would be development competition as well as community controversy. It is certainly not an area that would be available in the near future for an oil and gas facility.

Compatibility with Surrounding Land Uses - Since this site is directly across from King Harbor, the location presents far greater potential for significant conflicts with the immediate uses than the Hermosa site. If the Macpherson oil and gas facility were located on this property, it would be located directly across from the existing King Harbor major coastal visitor serving area with a marina, hotels, restaurants, and recreational facilities. Also, as with Site 6, it would be located directly across from the proposed theater complex and the approved Catalina Information Technology Center. An oil and gas facility at this site could potentially have significant impacts on these surrounding land uses from increased noise, traffic generation, visual effects, and public safety issues.

Environmental Issues - The site has no sensitive habitats given its present uses. As with all sites, mitigation measures would be required for drainage control, air emissions, health and safety issues, and noise generation during construction and operations. Any and all geologic and seismic hazards would have to be appropriately mitigated at the site. Given the site's location immediately adjacent to numerous visitor-serving facilities and residential uses, the concern about the potential severity of these impacts would be greater than it is for the Hermosa site that is buffered by industrial uses.

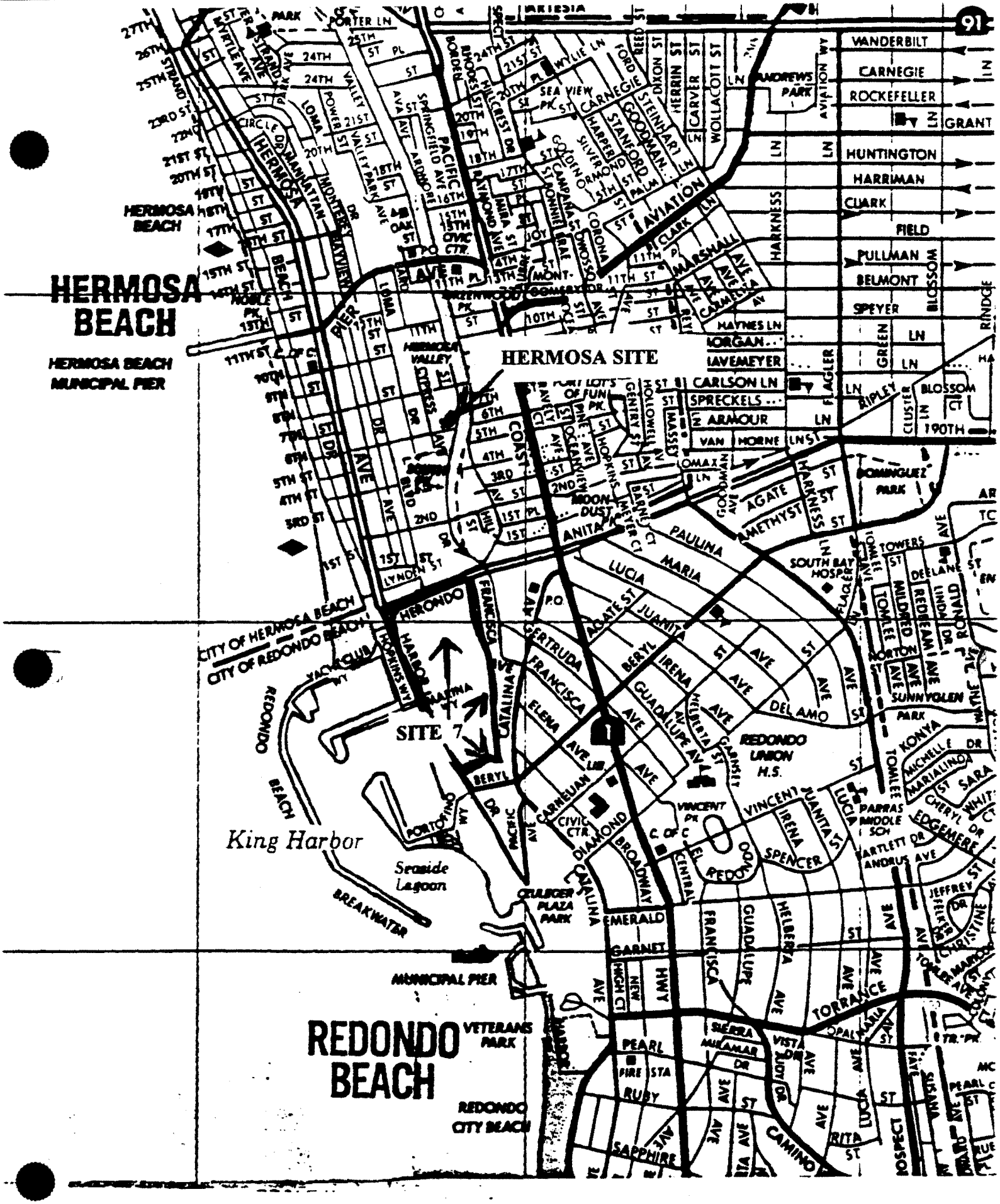
Physical Land Restrictions - The site is approximately 41 acres in size and could accommodate the Macpherson oil and gas facility, if the existing facilities on site are demolished. Technological limitations and economic impacts would result due to the distance between this site and the oil reserves in Hermosa. In addition, it is not legally possible to obtain zoning approval for an oil facility at this site.

Technological and Financial Issues - As outlined in the attached report, the physical technological limits of extended reach wells are limited to horizontal reach verses true vertical depth of 5 to 1. A more feasible ratio of 3 to 1 is attainable with a reduction of risk intrinsic in high angle well holes. The oil/water interface is located approximately -3,000 feet. Therefore, the reasonable drilling radius around the drill site is 9,000 feet. Drilling from Redondo Beach would reduce ultimate recovery by as much as 29%. (See Attachment 8.)

CONCLUSION: This is not a feasible site nor is it less environmentally damaging.

- **The zoning does not allow oil and gas development.**
- **A Southern California Edison generating plant is presently operating at this location.**
- **It is being sold as part of a package and its future use is highly speculative.**
- **Unlike the Hermosa site, an oil facility at this site would have direct impacts to existing visitor serving uses at King Harbor, residential uses to the north and south, and proposed commercial uses to the east.**
- **The site could accommodate the oil project's physical needs if the existing facilities are**

demolished, but due to technological limitations there would be oil recovery losses.


HERMOSA BEACH
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HERMOSA SITE
SITE 7
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King Harbor
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HERMOSA AVE
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CLARK
FIELD
PULLMAN
BELMONT
SPEYER
MAYNES LN
MORGAN
MAVEMEYER
CARLSON LN
SPRECKELS
ARMOUR
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SOUTH BAY HOSP
SUNNYGLEN PARK
PARKAS MIDDLE SCH
ANDRUS AVE
EDGEMERE
CHERYL DR
MICHELLE DR
MARIALINDA
KONYA
SARA
CHRISTINE
JEFFREY
CLUSTER
RINDGE
BIPLEY
GREEN LN
TOWERS
DEELANE
MILDRED
REDBEAM
LINDA DR
ROLAND
NORTON
TOWLEE
CARNEGIE
GOODMAN
STEINHART
STANFORD
HARPER
SILVERMOND
CORONA
MARSHALL
CLARK
MONTGOMERY
HERMOSA VALLEY
CYPRESS
PACIFIC
SPRINGFIELD
ARDMORE
RAYMOND
HILLCREST DR
BORDEN
BROOKS
SEA VIEW PK
WYLIE LN
FORD
DIXON ST
REED
ANDREWS PARK
AVIATION WY
PORTER LN
PARK
STRAND
VALLEY
POWER
LOMA
CIRCLE DR
MANHATTAN
MONTEREY
PIER
BEACH
MOBILE PK
OAK ST
PO
OCEANVIEW
PINE AVE
HOPKINS
GENTRY ST
HOLLOWELL
MASSEY
PORT LOTS OF FUN PK
MOON DUST
ANITA
LYNDON
HERONDO
HARBOR
HOPKINS WY
YACHT CLUB
MARINA
REDONDO BEACH
FRANCISCA
GERTRUDA
ELENA
CATALINA
CARNELIAN
CIVIC CTR
DIAMOND
BROADWAY
PORTOFINO
BERYL
VINCENT PK
CENTRAL
GABRIELE
GOODMAN
CHULBIGER PLAZA PARK
MIDWAY
HIGH CT
NEW
HWY
SIERRA
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RITA
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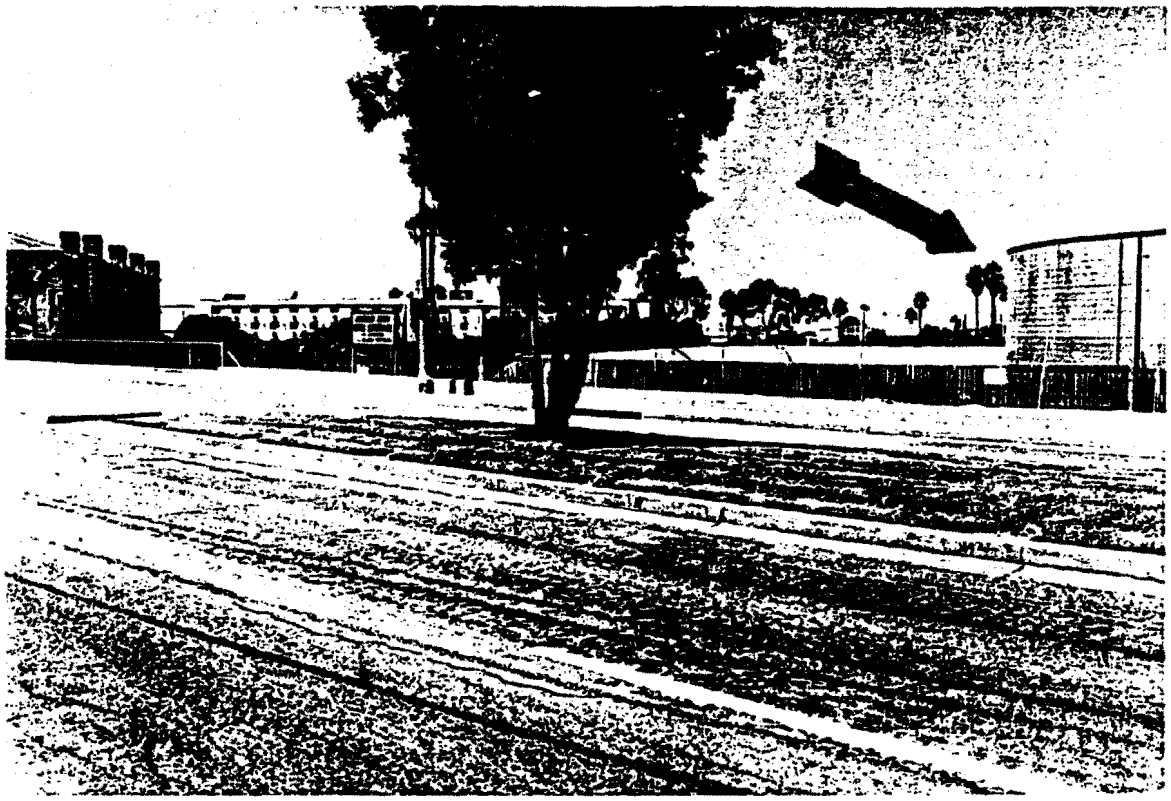
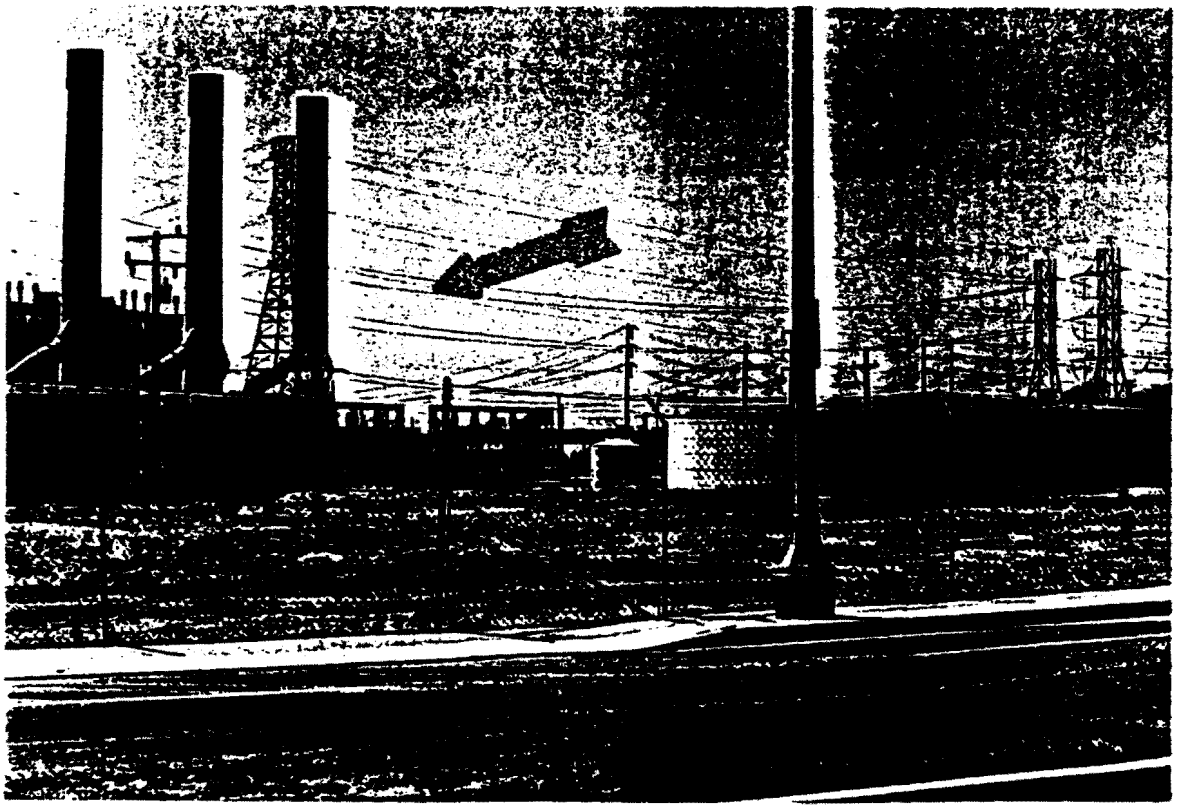
SISSANA
PEARL
FIRE STA
PARK
TR. PK
MC

SITE 7

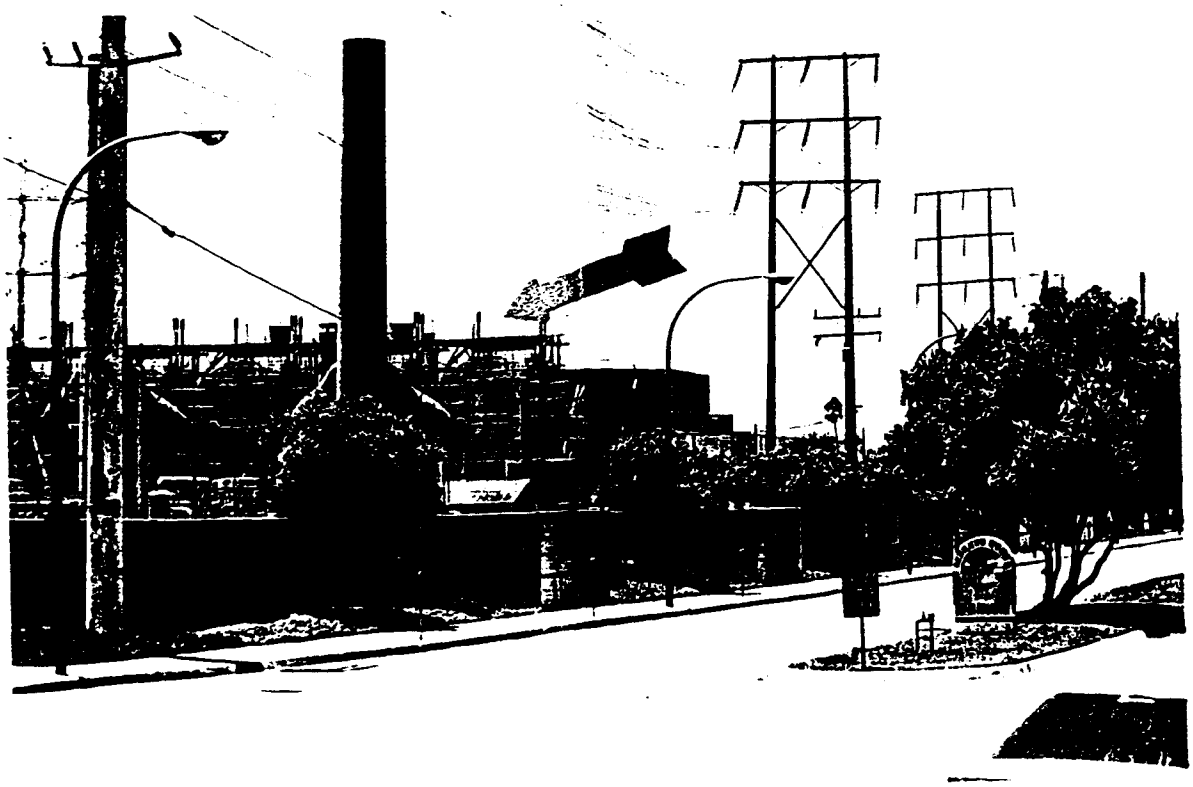


Looking south and southwest from Catalina Ave.

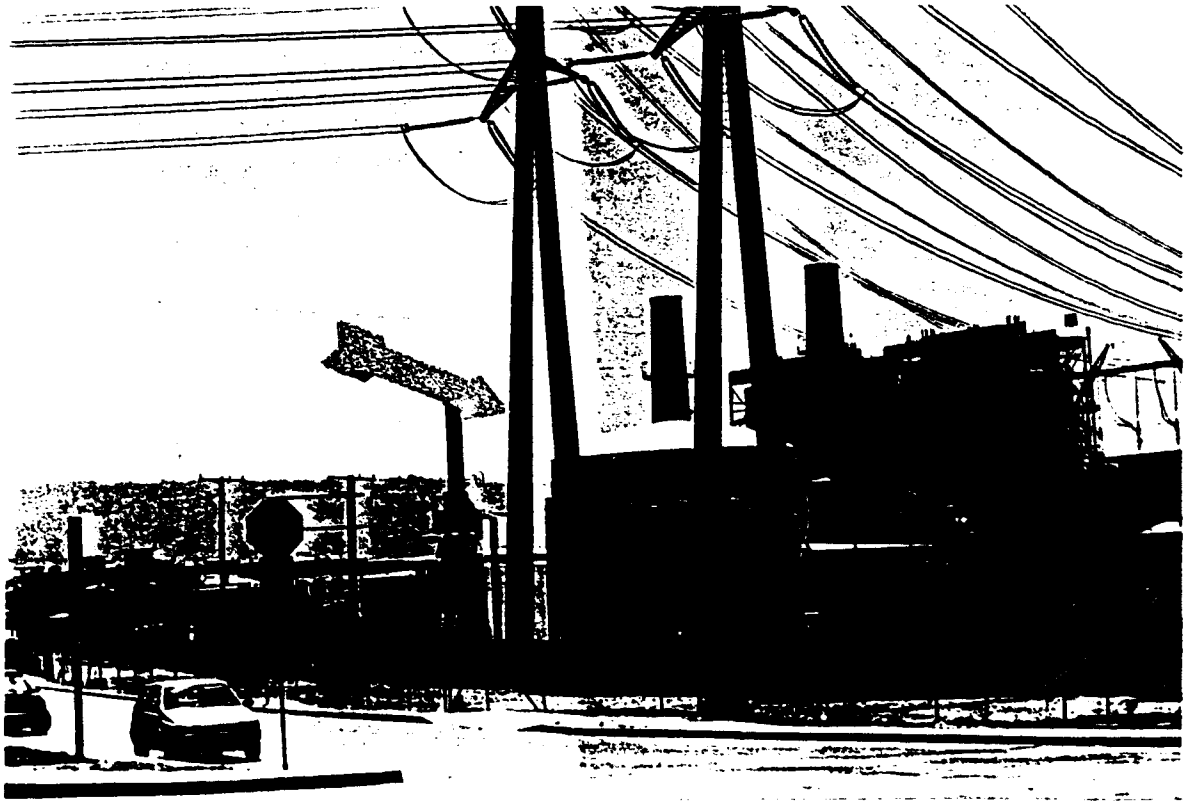


Looking west from Catalina Ave.

SITE 7



Looking west and southwest from Herondo St.



Looking southwest and west from Herondo St. and Francisca Ave.

SITE NAME: Site 8

SITE LOCATION: Northwest intersection of Harbor Drive and Portofino Way in King Harbor.(See attached map.)

SITE SIZE: .85 acres

EXISTING LAND USES: The parcel is the Triton Oil Company's abandoned drill site. It is presently vacant with a surrounding wooden fence. There is a skate and bike rental shop immediately adjacent to the east of the site, parking lot and boat berths to the west, parking lot to the south, and several restaurants to the north. There are additional restaurants and hotels to the east of Harbor Drive.(See attached photos.)

EXISTING ZONING AND GENERAL PLAN SITE DESIGNATIONS:

Zoning - CC-4 Coastal Commercial Zone (See Attachment 1.)
General Plan - CC Coastal Commercial (See Attachment 2.)

FEASIBILITY OF OIL AND GAS DEVELOPMENT:

Permissibility - Oil well drilling and production is not permitted in Redondo Beach. On May 26, 1992, the City adopted a major General Plan update. They adopted a new comprehensive zoning ordinance for the entire City on January 18, 1996 which included rezoning of numerous properties in the City. These documents do not contain any provisions for oil and gas development. The CC-4 zone does not allow for oil well drilling and production. Uses permitted subject to the issuance of a Conditional Use Permit in the CC-4 zone are commercial recreation, food and beverage sales, hotels and motels, marina related facilities, offices, restaurants, retail sales, parking lots, public safety and utilities, and recreational facilities. Oil and gas developments are not listed as permitted uses and therefore according to the zoning ordinance are not permitted in the CC-4 zone. (See Attachment 12.) The City has indicated that unless the zoning ordinance and General Plan were amended, oil and gas wells could not be drilled in Redondo Beach. (See Attachment 4.) However, City staff have informed us that obtaining City approval for development of a drill site and production facility on this or any other property in Redondo Beach would be politically impossible due to the citizens' strong desire not to have any additional oil development in their city.

Other Existing, Proposed, or Approved Land Uses - In addition to the regulatory restrictions, there are already land use proposals for this site. The City of Redondo Beach owns the drill site property and intends to use the property for a restaurant. However, at this time no specific proposal has been filed with the City.

Compatibility with Surrounding Land Uses - This site presents a much greater potential for conflicts with the immediate surrounding land uses than the Hermosa site. An oil and gas facility at this location would have a very direct impact on the existing recreational and visitor serving uses. There would be additional traffic generation and parking demands on the King Harbor Marina

which is an important public access area. Views to and along the ocean would be directly impacted by such a facility with a 135' drilling rig located west of Harbor Drive. The City's General Plan on page 3-113 states that, " Of all the locations of oil drilling sites in the community the tank battery and well sites adjacent to King Harbor are the most exposed to public view and the most incompatible with adjoining land uses...." (See Attachment 13.)

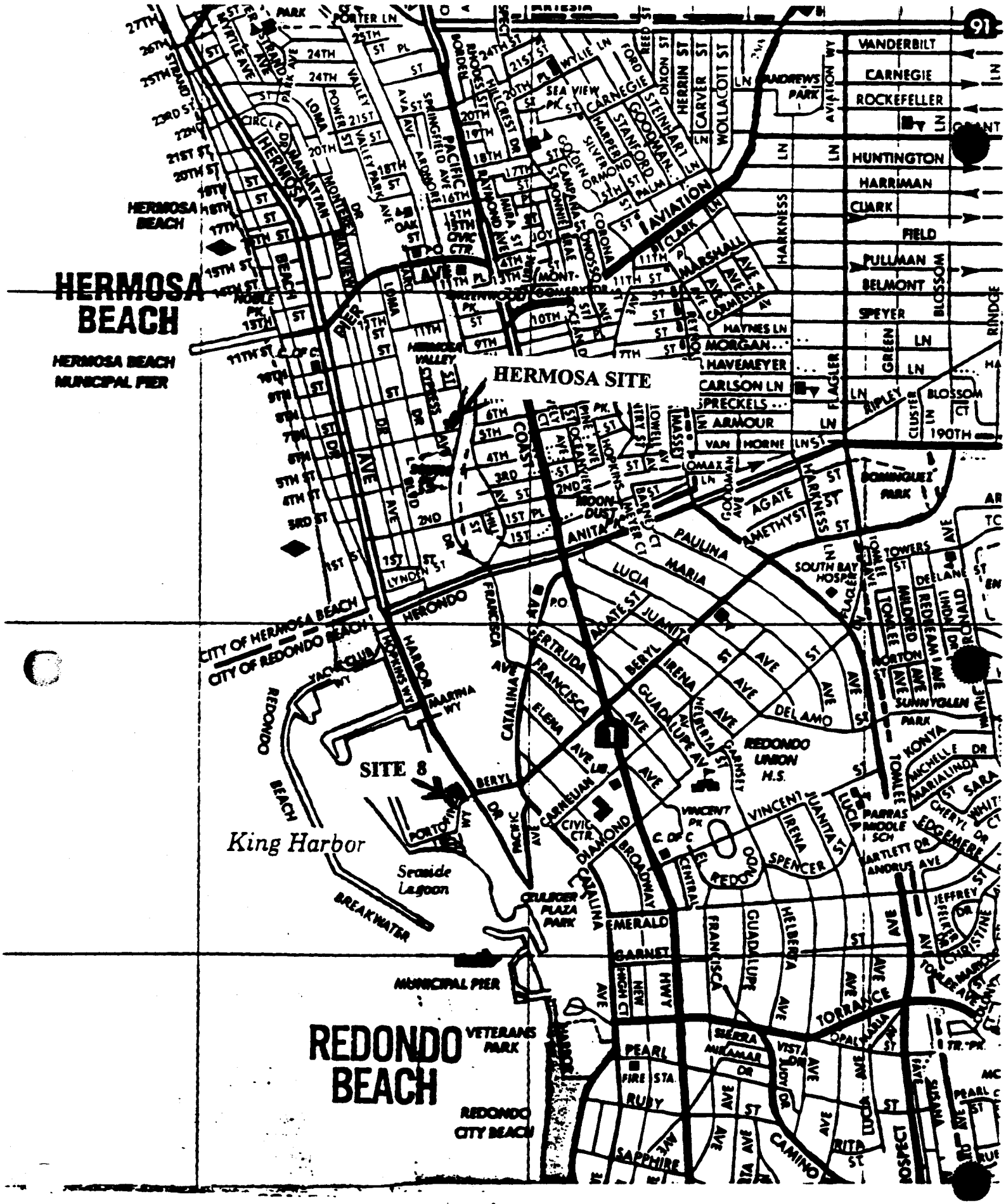
Environmental Issues - The site has no sensitive habitats since it was an industrial site. As with all sites, mitigation measures would be required for drainage control, air emissions, health and safety issues, and noise generation during construction and operations. Any and all geologic and seismic hazards would have to be appropriately mitigated at the site. With this location, the concern about the extent of impacts would be greater than it is for the Hermosa site, which is buffered by surrounding light industrial uses.

Physical Land Restrictions - The site is approximately .85 acres in size. The project requires a minimum of one acre to accommodate the necessary exploration and production facilities including the five tanks (40' diameter), test facilities, shipping pipelines, well cellar, fencing, offices, parking, and city setback and landscape requirements. Without significant City concessions (i. e. no setbacks or landscaping and increased heights for equipment), the Macpherson oil and gas facility cannot be developed at this site. In addition, it is not legally possible to obtain zoning approval for an oil facility at this site.

Technological and Financial Issues - The site is located approximately 3,050 feet horizontally from potential productive horizons in Hermosa Beach. Geologic review shows that only 71% of all recoverable reserves could be developed from this site. There would be a loss of income and greater costs from this site. In addition, with existing well bores on the property, there may be a high incident rate of collision while drilling on this site. (See Attachment 8 - Geological and Financial Impacts of an Alternative Drill Site.)

CONCLUSION: Site 8 is not feasible nor less environmentally damaging.

- **The zoning does not allow oil and gas projects.**
- **The City intends to propose a restaurant for this site.**
- **Unlike the Hermosa site, this location would have direct significant impacts on public access and existing visitor serving uses at King Harbor.**
- **The site cannot accommodate the oil facility's physical land needs even if it were allowed by the City.**
- **Other uses permitted in the zoning district are incompatible with oil development.**
- **Due to technological imitations, there would be significant oil recovery losses.**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BLOSSOM
DOMINGUEZ PARK
ANDREWS PARK
SUNNYGLEN PARK
CIVIC CTR.
SEA VIEW PK
VINCENT PK
FIRE STA.

SITE 8

Looking west from Harbor Drive and Portofino Way

Looking west from Harbor Drive at adjacent bike and skate rental shop

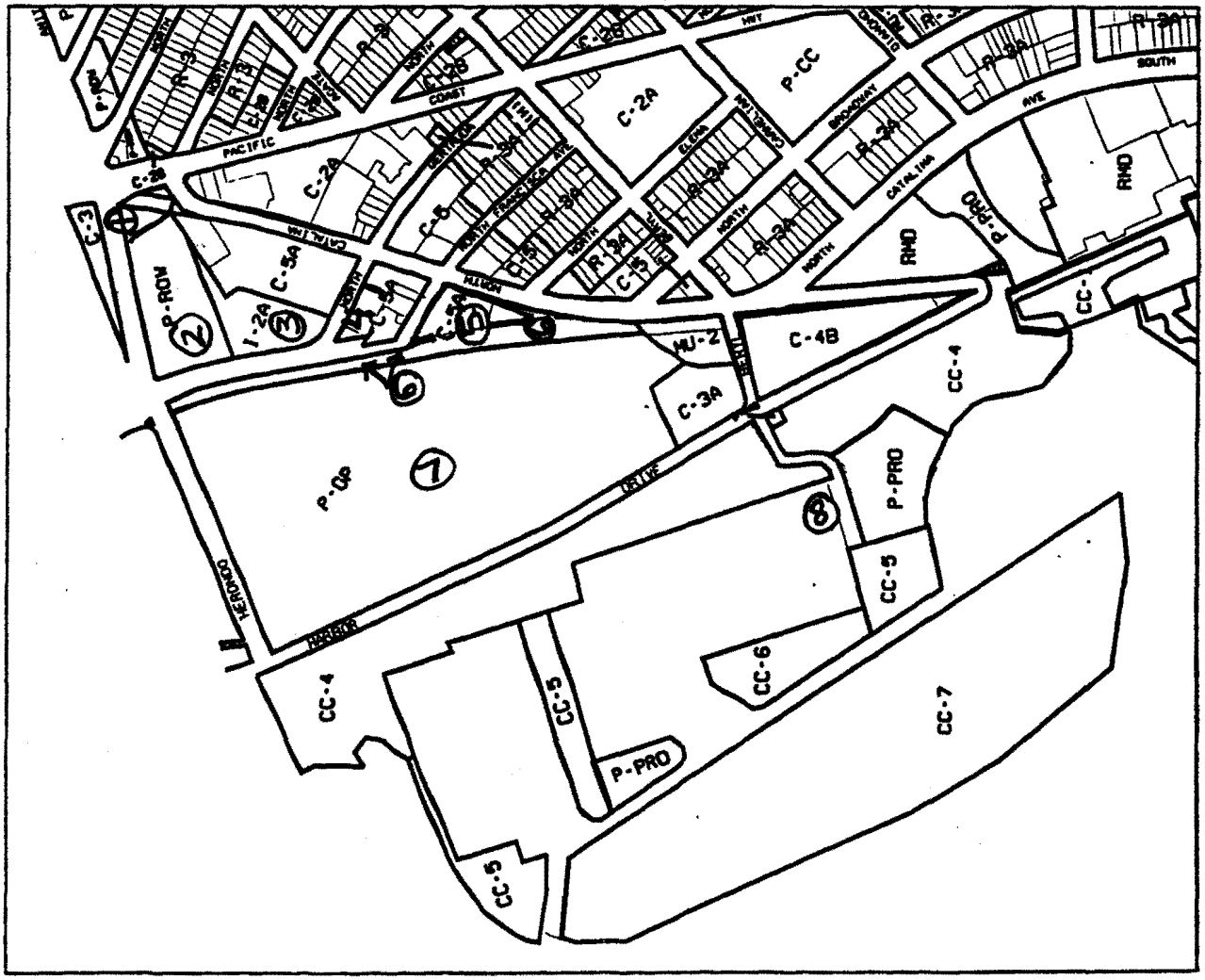
SITE 8

Looking west from Harbor Drive at restaurant on the north side

Looking west and northwest at restaurants from Harbor Drive

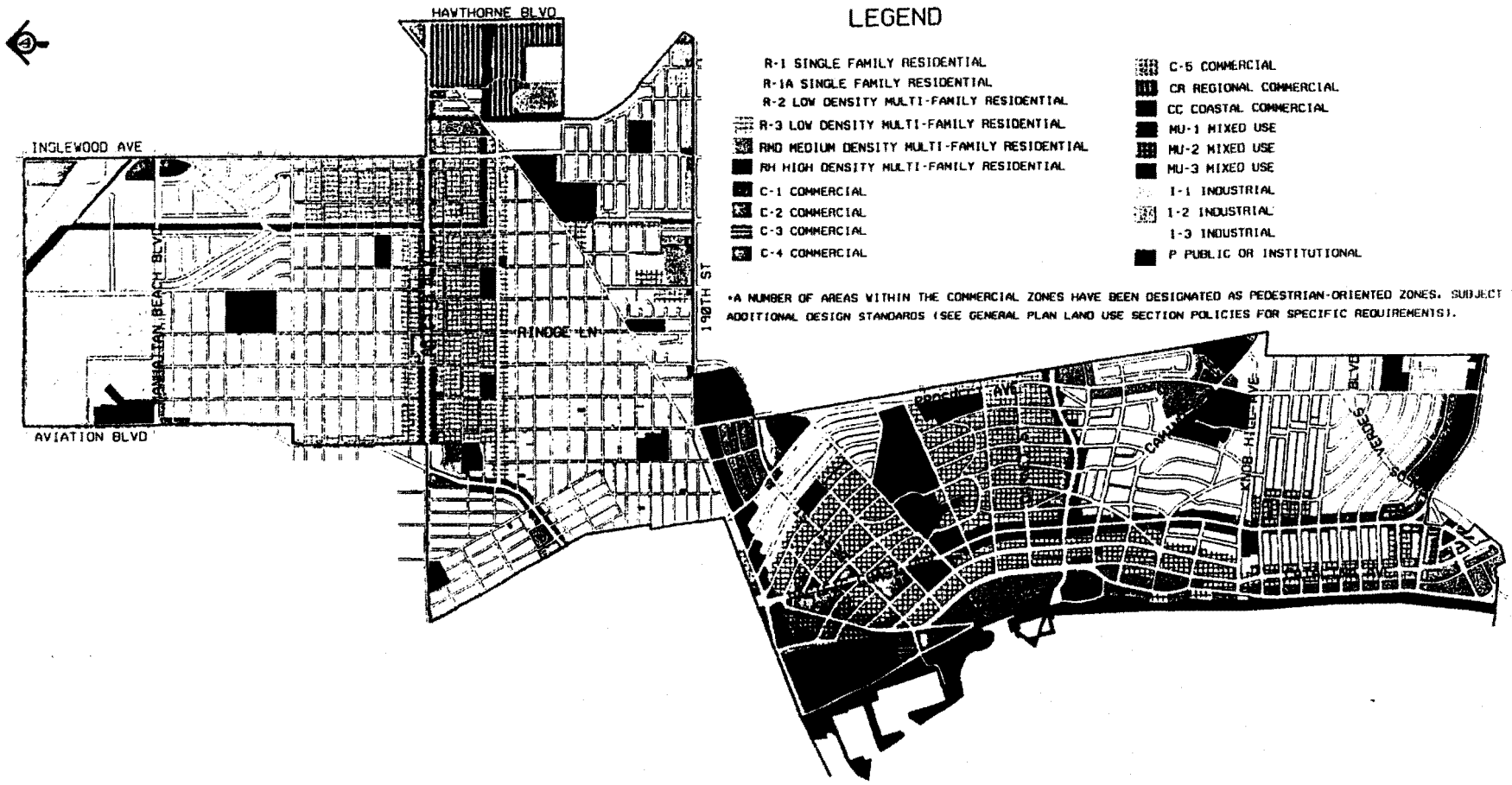
ATTACHMENT 1

MAP 9



(Ord. 2756 c.s., eff. January 18, 1996, as amended by Ord. 2759, eff. April 18, 1996 and Ord. 2784, eff. January 2, 1997)

ATTACHMENT 2



REDONDO BEACH GENERAL PLAN (LAND USE PLAN) 1/2/97

FIGURE 4

ATTACHMENT 3

PUBLIC AND INSTITUTIONAL ZONES

Sections

10-2.1100 Specific purposes, P Public and Institutional zones.
10-2.1110 Land use regulations: P-CIV Civic Center zone, P-RVP Riviera Village Parking zone, P-GP Generating Plant zone, P-ROW Right-of-Way zone, P-CF Community Facility
10-2.1111 Additional land use regulations, P Public and Institutional zones.
10-2.1112 Development standards: P-CIV Civic Center zone.
10-2.1113 Development standards: P-RVP Riviera Village Parking zone.
10-2.1114 Development standards: P-GP Generating Plant zone.
10-2.1115 Development standards: P-ROW Right-of-Way zone.
10-2.1116 Development standards: P-CF Community Facility zone.
10-2.1117 Development standards: P-PRO Parks, Recreation, and Open Space zone.
10-2.1118 Development standards: P-SF School Facility zone.

10-2.1100 Specific purposes, P Public and Institutional zones.

In addition to the general purposes listed in Section 10-2.102, the specific purposes of the P Public and Institutional zone regulations are to:

A. Provide lands for park, recreation and open space areas, schools, civic center uses, cultural facilities, public safety facilities, and other public uses which are beneficial to the community.

B. Establish appropriate and flexible development standards for the development of necessary public uses and facilities.

C. Allow the Planning Commission and City Council to consider the most appropriate use of a site following discontinuance of a public or utility use without the encumbrance of a pre-determined zoning designation that may or may not provide appropriate regulations for the development of the site.

D. Ensure that public buildings and uses are designed to be compatible with other buildings and uses on the site and with the neighborhood in which they are located.

(Ord. 2756 c.s., eff. January 18, 1996)

10-2.1110 Land use regulations: P-CIV Civic Center zone, P-RVP Riviera Village Parking zone, P-GP Generating Plant zone, P-ROW Right-of-Way zone, P-CF Community Facility zone, P-PRO Parks, Recreation, and Open Space zone, and P-SF School Facility zone.

In the following schedule the letter "P" designates use classifications permitted in the specified zone and the letter "C" designates use classifications permitted subject to approval of a Conditional Use Permit, as provided in Section 10-2.2506. Where there is neither a "P" nor a "C" indicated under a specified zone, or where a use classification is not listed, that classification is not permitted. The "Additional Regulations" column references regulations located elsewhere in the Municipal Code.

10-2.1111 Additional land use regulations, P Public and Institutional zones.

A. **Recreation and Parks Commission Review, P-PRO zone.** In the P-PRO Parks, Recreation, and Open Space zone, all applications for uses and development shall be referred to the Recreation and Parks Commission for its study and recommendations before submission to the appropriate decision-making body.

B. **Recreational uses, P-ROW zone.** In the P-ROW Right-of-Way zone, recreational uses shall be limited to only passive type uses.

C. **Accessory uses and structures.**

1. **Development standards.** Permitted accessory uses and structures, including, but not limited to, storage sheds, maintenance buildings, lighting fixtures, view decks, rest rooms, flag poles, and concession stands, shall be subject to the height, setback, and floor area ratio standards of the zone in which it is located, except that height and setback standards may be modified subject to Planning Commission Review. In zones where no height standard is specified, permitted accessory uses and structures exceeding a height of 30 feet shall be subject to Planning Commission Review, except that flag poles, lighting fixtures, and similar structures which do not contain floor area and which exceed a height of 30 feet may be approved by the Chief of Planning. In zones where no maximum floor area ratio is specified, any building exceeding 1,000 square feet shall be subject to Planning Commission Review.

2. **P-GP Generating Plant zone.** In the P-GP Generating Plant zone, accessory uses and structures shall be subject to the special use regulations for public utility facilities pursuant to Section 10-2.1614.

(Ord. 2756 c.s., eff. January 18, 1996)

10-2.1112 Development standards: P-CIV Civic Center zone.

A. **Floor area ratio.** The floor area ratio (F.A.R.) of all buildings on a lot shall not exceed 1.25 (see definition of floor area ratio in Section 10-2.402).

B. **Building height.** No building or structure shall exceed a height of 45 feet (see definition of building height in Section 10-2.402).

C. **Stories.** No building shall exceed three (3) stories (see definition of story in Section 10-2.402).

D. **Setbacks.** The minimum setback requirements shall be as follows:

1. **Abutting Pacific Coast Highway.**

a. There shall be a minimum setback of ten (10) feet from the property line abutting Pacific Coast Highway.

b. There shall be a minimum setback of 20 feet from the property line abutting Pacific Coast Highway for portions of the building where the building height exceeds 20 feet.

2. **Abutting Broadway.** There shall be a minimum setback of 20 feet from the property line abutting Broadway.

3. **Abutting Carnelian Street.** There shall be a minimum setback of 20 feet from the property line abutting Carnelian Street.

4. **Abutting Diamond Street.**

a. There shall be a minimum setback of ten (10) feet from the property line abutting Diamond Street.

b. There shall be a minimum setback of 20 feet from the property line abutting Diamond Street for portions of the building where the building height exceeds 20 feet.

E. **General regulations.** See Article 3 of this chapter.

F. **Parking regulations.** See Article 5 of this chapter.

G. **Sign regulations.** See Article 6 of this chapter.

H. **Landscaping regulations.** See Article 7 of this chapter.

1. **Antennae for public utilities.** The height of antennae for public utilities shall be subject to a Conditional Use Permit, pursuant to Section 10-2.2506 of this chapter.

C. **Stories.** No building shall exceed two (2) stories (see definition of story in Section 10-2.402).

D. **Setbacks.** The minimum setback requirements shall be as follows:

1. **Front setback.** There shall be a minimum front setback of ten (10) feet the full width of the lot, except where a lot is contiguous to a residentially zoned lot fronting on the same street, the required front setback shall be the same as required for the contiguous residential lot.

2. **Side setback.** There shall be a minimum side setback of ten (10) feet the full length of the lot on the street side of a corner or reverse corner lot. No side setback shall be required along the interior lot lines, except where the interior side lot line is adjacent to a residential zone, structures shall be set back a minimum of 25 feet from such lot line.

3. **Rear setback.** No rear setback shall be required, except where the rear lot line is adjacent to a residential zone, structures shall be set back a minimum of 25 feet from such lot line.

E. **General regulations.** See Article 3 of this chapter.

F. **Parking regulations.** See Article 5 of this chapter.

G. **Sign regulations.** See Article 6 of this chapter.

H. **Landscaping regulations.** See Article 7 of this chapter.

I. **Procedures.** See Article 12 of this chapter.

(Ord. 2756 c.s., eff. January 18, 1996)

10-2.1016 Development standards: I-2A Industrial zone.

A. **Floor area ratio.** The floor area ratio (F.A.R.) of all buildings on a lot shall not exceed 1.0 (see definition of floor area ratio in Section 10-2.402).

B. **Building height.** No building or structure shall exceed a height of 30 feet, except as follows (see definition of building height in Section 10-2.402):

1. **Antennae for public utilities.** The height of antennae for public utilities shall be subject to the determination of the decision-making body pursuant to the procedures for a Conditional Use Permit.

C. **Stories.** No building shall exceed two (2) stories (see definition of story in Section 10-2.402).

D. **Setbacks.** The minimum setback requirements shall be as follows:

1. **Front setback.** There shall be a minimum front setback of 15 feet the full width of the lot.

2. **Side setback.** There shall be a minimum side setback of 15 feet the full length of the lot on the street side of a corner or reverse corner lot. No side setback shall be required along the interior lot lines.

3. **Rear setback.** No rear setback shall be required.

E. **General regulations.** See Article 3 of this chapter.

F. **Parking regulations.** See Article 5 of this chapter.

G. **Sign regulations.** See Article 6 of this chapter.

H. **Landscaping regulations.** See Article 7 of this chapter.

I. **Procedures.** See Article 12 of this chapter.

(Ord. 2756 c.s., eff. January 18, 1996)

10-2.1116 Development standards: P-CF Community Facility zone.

A. **Floor area ratio.** The floor area ratio shall be determined subject to Planning Commission Review.

B. **Building height.** Height of buildings or structures shall be determined subject to Planning Commission Review.

C. **Stories.** The number of stories of any building shall be determined subject to Planning Commission Review.

D. **Setbacks.** Setbacks shall be determined subject to Planning Commission Review.

E. **General regulations.** See Article 3 of this chapter.

F. **Parking regulations.** See Article 5 of this chapter.

G. **Sign regulations.** See Article 6 of this chapter.

H. **Landscaping regulations.** See Article 7 of this chapter.

I. **Procedures.** See Article 12 of this chapter.

(Ord. 2756 c.s., eff. January 18, 1996)

10-2.1117 Development standards: P-PRO Parks, Recreation, and Open Space zone.

A. **Floor area ratio.** The floor area ratio (F.A.R.) of all buildings on a lot shall not exceed 0.25 (see definition of floor area ratio in Section 10-2.402).

B. **Building height.** No building or structure shall exceed a height of 30 feet (see definition of building height in Section 10-2.402).

C. **Stories.** No building shall exceed two (2) stories (see definition of story in Section 10-2.402).

D. **Setbacks.** Setbacks shall be determined subject to Planning Commission Review.

E. **General regulations.** See Article 3 of this chapter.

F. **Parking regulations.** See Article 5 of this chapter.

G. **Sign regulations.** See Article 6 of this chapter.

H. **Landscaping regulations.** See Article 7 of this chapter.

I. **Procedures.** See Article 12 of this chapter.

(Ord. 2756 c.s., eff. January 18, 1996)

10-2.1118 Development standards: P-SF School Facility zone.

A. **Floor area ratio.** The floor area ratio shall be determined subject to Planning Commission Review.

B. **Building height.** Height of buildings or structures shall be determined subject to Planning Commission Review.

C. **Stories.** The number of stories of any building shall be determined subject to Planning Commission Review.

D. **Setbacks.** Setbacks shall be determined subject to Planning Commission Review.

E. **General regulations.** See Article 3 of this chapter.

F. **Parking regulations.** See Article 5 of this chapter.

G. **Sign regulations.** See Article 6 of this chapter.

H. **Landscaping regulations.** See Article 7 of this chapter.

I. **Procedures.** See Article 12 of this chapter.

(Ord. 2756 c.s., eff. January 18, 1996)

ATTACHMENT 4

OFFICE OF
THE CITY MANAGER

TELEPHONE
(310) 372-1171
FAX: (310) 379-9268

CITY OF REDONDO BEACH
CALIFORNIA

415 DIAMOND STREET
P.O. BOX 270
REDONDO BEACH, CALIFORNIA 90277-0270

July 2, 1997

David E. Gautschy, Incorporated
Petroleum Consulting Services
2698 Junipero Avenue, Suite 201B
Signal Hill, California 90806

Dear Mr. Gautschy:

I have received your inquiry regarding the drilling of oil wells in Redondo Beach. The situation is the same as it was several years ago when you made a similar inquiry to our Planning Department. Redondo Beach's Zoning Ordinance does not list oil wells as a permitted use in any zone. In addition, the Zoning Ordinance specifies that any use not listed is thereby not permitted.

Unless the Zoning Ordinance, and perhaps the City's General Plan and Harbor-Civic Center Specific Plan are amended, an oil well could not be drilled in Redondo Beach.

Should you have any further questions, please feel free to contact this office.

Sincerely,

PAUL CONNOLLY
City Manager

cjl

gautschy.797

ATTACHMENT 5

1.45.6 Encourage and provide incentives for the reconfiguration of parcels and development to create a unified seaside "village," siting buildings adjacent to one another and orienting them along common pedestrian promenades and public plazas *(I1.1, I1.3, I1.5, I1.6, I1.13).*

1.45.7 Require that commercial structures be designed at a uniform and high level of architectural design quality which reflects the unique setting of the Harbor on the coastline *(I1.1, I1.3, I1.10, I1.13, I1.18).*

1.45.8 Require that signage be integrated in style, materials, and placement with the design of the structures; minimizing their number and size *(I1.1, I 1.3, I1.10, I1.13, I1.18).*

1.45.9 Provide a consistent and well-designed system of public informational signage for the harbor, identifying entries and key activity locations and uses *(I1.13, I1.17).*

1.45.10 Install pedestrian-oriented and scaled amenities, including benches, street and pedestrian lighting, landscape, and similar elements *(I1.13, I 1.17).*

1.45.11 Install additional street trees and landscape along the Harbor Drive frontage and in parking lots *(I1.13, I1.17).*

PUBLIC AND INSTITUTIONAL USES

The Public and Institutional ("P") designation is comprised of lands that are owned by public agencies, special use districts, and public utilities. Although this designation encompasses a range of different public and quasi-public uses, they share a common thread in that these uses do not fit well under the typical standards for residential, commercial, or industrial uses.

Since this designation includes a variety of uses with a variety of characteristics, no attempt has been made to establish specific development standards within the General Plan. The Zoning Ordinance, however, will implement the Public/Institutional designation through multiple zoning districts more focused on the different classes of public/quasi-public uses. These zones will also contain more specific development standards.

Reference should also be made to the Harbor/Civic Center Specific Plan, Civic Center Sub-Area; Harbor/Pier Sub-Area, Zone 1; and Catalina Avenue Sub-Area, Zones 1 and 2, which establishes additional standards and policies for certain areas designated as "P."

Goal *It shall be the goal of the City of Redondo Beach to:*

1K Provide for public uses which support the needs and functions of the residents and businesses of the City.

Objective *It shall be the objective of the City of Redondo Beach to:*

1.46 Provide for the continuation of existing and expansion of governmental administrative and capital, recreation, public safety, human service, cultural and educational, infrastructure, and other public land uses and facilities to support the existing and future population and development of the City.

Policies *It shall be the policy of the City of Redondo Beach to:*

Permitted Uses

1.46.1 Accommodate governmental administrative and maintenance facilities, parks and recreation, public open space, police, fire, educational (schools), cultural (libraries, museums, performing and visual arts, etc.), human health, human services, public utility and infrastructure (transmission corridors, etc.), public and private secondary uses, and other public uses in areas designated as "P" *(I1.1).*

1.46.2 Allow for the reuse of public and utility properties and facilities for private use (and the reuse of school sites subject to the provisions of California Government Code Section 65852.9), with the type and density/intensity of use to be permitted on the site determined by:

a. their compatibility with the type, character, and density/intensity of adjacent uses;

b. objectives for the area defined by the General Plan;

c. contribution of public benefits (e.g., affordable housing);

d. revenue contribution to the City; and

e. formulation and approval of a specific or development plan *(I1.5, I 1.6, I1.7).*

1.46.3 Accommodate religious facilities in residential and commercial areas of the City and in the portion of the industrial zone adjacent to the north side of Manhattan Beach Boulevard, east of Redondo Beach Avenue and provided that they are compatible in function, scale, and character with adjacent uses *(I1.1, I1.7).*

Design and Development

1.46.4 Establish standards for the City and coordinate with other public agencies to ensure that public buildings and sites are designed to be compatible in scale, mass, character, and architecture with the existing buildings and pertinent design characteristics prescribed by this Plan for the district or neighborhood in which they are located *(I1.18)*.

1.46.5 Require, where the City has jurisdiction, that public sites be designed to incorporate landscaped setbacks, walls, and other appropriate elements to mitigate operational and visual impacts on adjacent land uses *(I1.18)*.

1.46.6 Monitor the operations of public uses and facilities and periodically review the adequacy of and, as necessary, implement additional impact mitigation measures *(I1.18)*.

1.46.7 Require that only passive secondary uses of public transmission rights-of-way be permitted (e.g., uses where groups of people are not permitted to congregate).

TARGETED REVITALIZATION SITES

In a few areas of the City that were developed before current zoning patterns were established, the existing uses raise issues of inconsistency with the surrounding area. These areas were the subject of special scrutiny during the formulation of the General Plan to determine the approach that would create the most beneficial and harmonious land use pattern.

Goal *It shall be the goal of the City of Redondo Beach to:*

1L Promote the revitalization and more effective use of properties characterized by economic underutilization or uses and buildings which are incompatible with the district or neighborhood in which they are located.

Ruxton Lane

This area of approximately five acres is situated between the Redondo Beach Villa Tract to the west and the Santa Fe Railroad to the east, just south of Artesia Boulevard. Because of its juxtaposition, it became a leftover piece of land. Consequently, it was divided into three large parcels and devoted to light industrial uses. The largest parcel has access to Artesia Boulevard via a "panhandle" strip of property and supports a large warehouse building.

ATTACHMENT 6

supported by metal towers, and also contain underground pipelines. The Southern California Edison Company estimates that they own a total of approximately 54.2 acres of right-of-way area in the City of Redondo Beach.

In the flatter areas of these rights-of-way in North Redondo Beach, the City has beautified a portion (14.78 acres) of the long linear corridor with turf and regularly maintains the turfed areas. This acreage represents approximately 8.2 percent of all recreation and parkland area in the community. The corridor runs through several neighborhoods and is used extensively for passive recreation. While the turf is an important aesthetic improvement over having no landscaping at all in these areas, the corridors still create long monotonous strips of turf open space which offer little recreational use. The remainder of the corridors are primarily used for commercial landscape plant propagation.

The City has designated Southern California Edison Company transmission line rights-of-way as open space and recreational areas. This has been done through the cooperation of the Southern California Edison Company. It is recognized that the primary purpose of these rights-of-way are developed and designated for utility purposes, any open space recreational uses that will not interfere with the utility functions may be allowed through the issuance of a grant of a license by the Southern California Edison Company.

G. Redondo State Beach

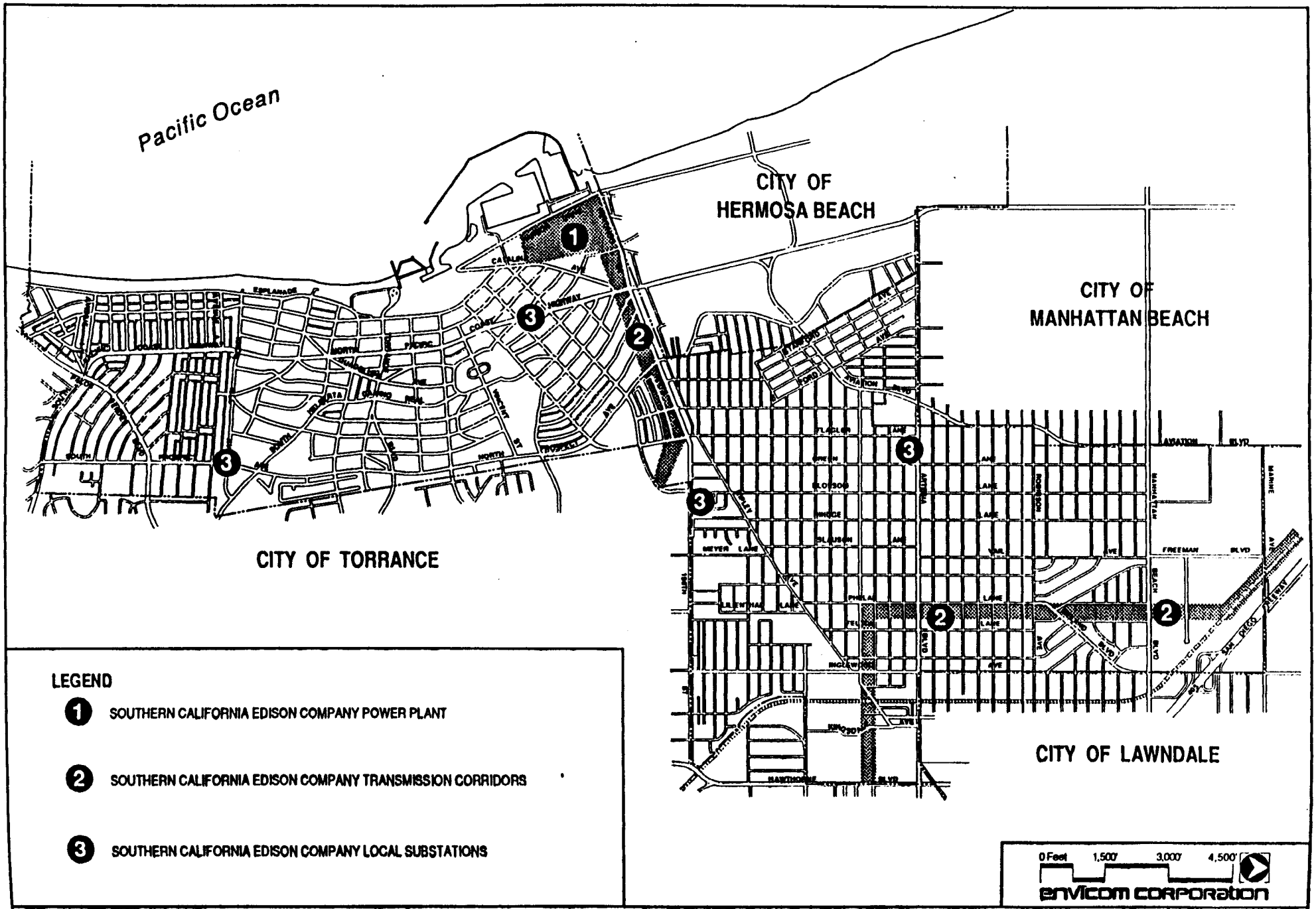
The State of California-owned and Los Angeles County Department of Beaches-operated regional beach facility totals 36.2 acres (representing approximately 20,0 percent of all recreation and parkland area in the community. This facility includes restrooms, life guard facilities, parking and related facilities. It is easily the most frequently visited recreation area in the city. The County Department of Beaches estimates that approximately 3.4 million persons visited Redondo State Beach during 1990. Many residents also jog along the Esplanade directly overlooking the beach area. Adjacent high-rise units along with beach-goers create typical beachfront traffic jams and congestion. As with most beach communities, the beach is the principal recreational focus of the city, especially for young people.

Descriptions of Supplemental Existing Local Recreational and Parkland Facility

In addition to the variety of public recreational and parkland facilities described above, the community contains a number of supplemental recreational, park, and open space resources and facilities which are used by local residents and visitors, and serve as important components of the overall community system. These facilities include, but are not limited to:

A. King Harbor

Recreational use of the King Harbor area is predominantly limited to the combination of private boat marinas (totaling approximately 1,500 slips, which is



EXISTING LOCAL ELECTRICITY SERVICE AND TRANSMISSION FACILITIES

FIGURE 23

not open to the general public. However, there are other public uses, including the Municipal Pier, which allow free access and public fishing. Other public uses include the Seaside Lagoon and City sailboat rentals at Moonstone Park (see descriptions above). There is also an area available for public boat launching. Several restaurants, hotels and other commercial recreation facilities make King Harbor a unique recreation resource within the region.

While highly successful in a regional-tourist attraction sense, development of the harbor has also created additional traffic congestion problems, and has limited resident access to the beach area. King Harbor is generally regarded as the symbol of Redondo Beach for many residents and visitors.

However, due to the traffic congestion and non-resident use, many "locals" voiced a preference for avoiding the harbor area, particularly in the summer. Additional public access to the harbor area should be considered and provided if possible.

B. Community Centers and Senior Centers

The City of Redondo Beach currently contains two different community centers: 1) The Hayward Community Center, located at the intersection of Blossom Lane and Artesia Boulevard, serving North Redondo Beach; and 2) the Community Resources Center, located at the intersection of Pacific Coast Highway and Knob Hill Avenue (the former Patterson School), serving South Redondo Beach. The "community" centers are used for a broad range of public uses, including education, health, public meeting space, recreation, and the local historical museum.

The City, however, has never developed a true community center solely for recreational use. These facilities are typically a building or cluster of buildings, usually located within parks which house recreation classrooms, health-fitness facilities, pool, gymnasium, racquetball courts, and art facilities. Typically, a formula of 25,000 square feet of recreation building floor space for each 25,000 in population is used. Redondo Beach, because of the availability of surplus classroom space, has decentralized its classroom space into many city-wide locations. These include: surplus and operating public school classrooms and cafeterias; trailers set up at parks; community buildings within Perry Park; churches; private recreation and learning facilities; and senior centers. There is a current need for new classroom space, which is continuing to grow over time. The addition of the former Aviation High School facility offers the opportunity to create a true community recreation center.

There are also four well-organized senior citizen centers in the City, operated by the City Community Services Department, including centers at Anderson Park, Perry Park, Veterans Park, and the Community Resources Center at the former Patterson School. These centers host daily activities for senior citizens, and help meet the recreational, educational, and social needs of the local senior community. There a

ATTACHMENT 7

Daily Breeze
25¢ TUESDAY July 1, 1997

Theater complex planned for RB

Krikorian seeks re-entry to area

By Alison Skratt
BUSINESS WRITER

Krikorian Theatres wants to build a 15-screen megaplex in Redondo Beach near the Edison International power plant — a complex that would sit across the street from the biggest development under way in the city, a high-tech business center and mini-storage facility.

The theater plan, which would signal South Bay cinema entrepreneur George Krikorian's re-entry into the local market, targets nine acres off North Francisca Avenue behind the city's main post office, said Steve Deming, vice president at C.B. Commercial Real Estate in Torrance.

The proposal — which includes retail space that has sparked interest from In 'N Out Burger and Hollywood Video — is in its preliminary stages and must survive several rigorous government reviews before moving forward, Deming said.

Across the street, toward the ocean, another developer is much further along and expects to break ground later this month on the 293,000-square-foot Catalina Information Technology Center.

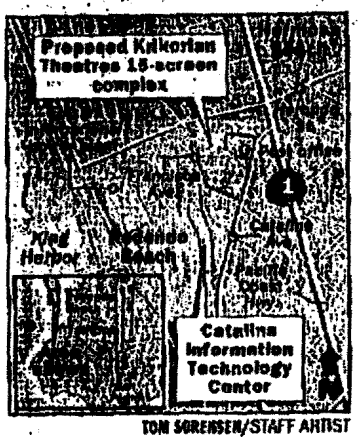
Believed to be a 1st

City officials believe the center might be the first in the South Bay to contain special office space designed and wired specifically for high-tech start-up companies.

The two ventures would be the first new commercial projects in 30 years along what City Hall calls the "Catalina corridor" — a somewhat barren stretch of Catalina Avenue between Beryl Street and Pacific Coast Highway.

"It's been in the doldrums for a long time, and ideally it should not be," said interim City Manager Paul Connolly,

THEATER/A2



TOM SORENSEN/STAFF ARTIST

07/01/97 TUE 16:39 FAX 213 655 6178
003

07/01/97 TUE 10:40 FAX 213 655 8479 ☑004

Theater

FROM PAGE A1

who is expected to be named to the permanent post today.

"It has decent traffic counts of local people, who presumably have some disposable income if they manage to live around here. Why isn't someone taking advantage of that? Well, someone finally is. And once you get someone doing something of (the technology center's) scale, it begins a snowball effect."

If it comes together, Krikorian's proposal would be the latest in a string of new or expanded South Bay multiplexes. In November, Beach Cities Cinema, a new 16-screen theater, opened in El Segundo. Another 80 screens have been proposed in Torrance, Redondo Beach, Hawthorne, Gardena and Rolling Hills Estates.

Krikorian did not return repeated calls for comment about his decision to enter the seemingly crowded contest for South Bay movie viewers.

Started in 1984

A Palos Verdes Peninsula resident, he started his Torrance-based chain of movie theaters in 1984 on the Peninsula out of frustration with the lack of theaters there. In February 1996, he sold eight of his 10 theaters to Regal Cinemas Inc. in a deal valued at $29.2 million.

Among those sold were the ones in Rancho Palos Verdes and Rolling Hills Estates. Today, Krikorian Theatres owns just two theaters, in La Habra and La Mirada.

Krikorian is one of three property owners at the Redondo Beach site off North Francisca. The other two are Edison and a family trust.

Negotiations have been on-going for almost three years among the landholders, but Deming said he's hopeful that, if all goes well, the theaters might be open for business in another two years. Preliminary plans call for 50,000 square feet of theaters and 15,000 square feet of retail space.

The future site of the Catalina Information Technology Center is also a result of consolidating property ownership. Years ago, Edison bought a railroad right-of-way from Atchison, Topeka & Santa Fe Railway and combined it with a former woodworking shop to create a buffer behind its plant, Edison spokesman Bob Jensen said.

It recently sold the narrow, quarter-mile-long plot to American Standard Development Co. of Los Angeles, which designed a complex that snakes along its length. The two-thirds of the project closest to Herondo Street will be a two-story mini-storage facility. The main complex, at North Gertruda Avenue and Catalina, will be four stories tall and have some parking on its roof.

Bob Abernathy, president of American Standard, said the center's crowning jewel will be a set of offices designed specifically to cater to fledgling high-tech companies — a so-called business incubator.

The incubator will offer communication links that high-tech start-ups require, such as built-in wiring that can provide lightning fast internet access, which would ordinarily be too much of a financial burden for new companies to shoulder.

"We're going to provide them with telecommunications capacity that isn't available in most other buildings," Abernathy said. "We're going to do that through fiber optics. We're going to do that through satellite links and through wireless links in the building."

The complex will offer companies the option of expanding by checker-boarding office space with month-to-month storage space, Abernathy said. If a company decides to grow, the complex terminates the adjacent storage space's lease and the walls can move to accommodate the expansion, he said.

Modeled after N.Y. project

The incubator is modeled after a similar project in New York City called 55 Broad Street, but it will not target the high-end tenants that Broad Street does, he said.

Both the Catalina Information Technology Center and the Krikorian theaters would fall under the jurisdiction of the Coastal Commission, which recently signed off on the former. The theater project would also need an environmental impact review, zoning changes and long-term permission from Edison to build under its power line towers.

Developers plan to put a parking lot under the power lines that cross the property's northern end and would like to have it double as a park-and-ride for the Metropolitan Transportation Authority.

But they must get approval from Edison first.

Edison owns the land underneath its power line towers and regularly rents it out to businesses in five- and 10-year increments as a way to bring rates down, Jensen said.

"Those properties and those facilities were purchased and paid for by our ratepayers for the purpose of transmission and distribution of electricity," Jensen said.

"Any other use of that property needs to go through a rather rigorous review to ensure that we're not hurting our ability to maintain those factors, or putting them in jeopardy."

Edison has agreed to give the theater project a 10-year lease on the property, but developers want at least 35 years.

The inclusion of a park-and-ride at the location may help sway the Public Utilities Commission, which must approve the proposal, Jensen said.

The theater project does not include taking down the towering blue King Harbor sign that sits at the intersection of Herondo Street and Pacific Coast Highway. Deming said developers would be interested in using the land, and taking down the sign, if the community and its owner, the King Harbor Association, were amenable.

The King Harbor Association owns the deteriorating sign, which at one time served as an arch over a road that led to the harbor. Today, the road is long since gone and the association no longer lights the sign because of the expense involved. The association has long wanted to take it down, but has not because a small vocal group in the community wants to keep it as a landmark.

SOUTH BAY AT THE MOVIES

Not including the possible Krikorian the[illegible] in Redondo Beach, theater developers have proposed building 80 new or additional screens in five South Bay cities.

- **The Galleria at South Bay,** Redondo Beach: 16 additional screens
- **Pacific Theatres,** Gardena (at Vermont Drive-In site): 18 screens
- **Rolling Hills Plaza,** Torrance: 14 additional screens
- **Shops at Palos Verdes,** Rolling Hills Estates: 7 additional screens
- **Del Amo Fashion Center,** Torrance: 16 additional screens
- **Hawthorne Plaza,** Hawthorne: 9 additional screens

orian Theatres wants to
15-screen megaplex in
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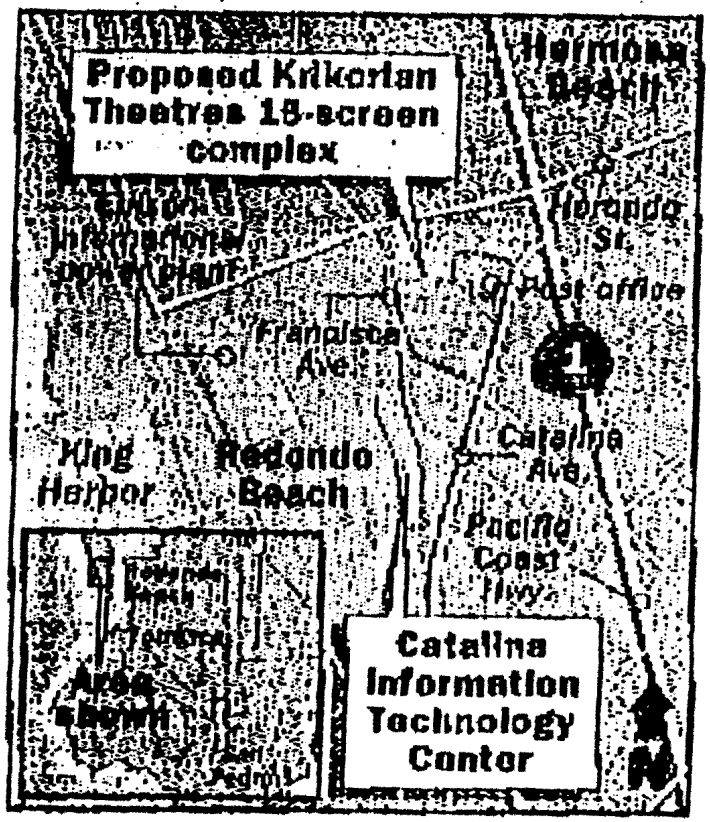
nent under way in the
high-tech business center
ini-storage facility.

theater plan, which
signal South Bay cine-
ntrepreneur George Kri-
n's re-entry into the local
et, targets nine acres off
n Francisca Avenue be-
the city's main post of-
said Steve Deming, vice
dent at C.B. Commercial
Estate in Torrance.

e proposal — which in-
es retail space that has
ked interest from In 'N
Burger and Hollywood
— is in its preliminary
s and must survive sever-
gorous government re-
before moving forward,
ng said.

"It's been in the doldrums for a long time, and ideally it should not be," said interim City Manager Paul Connolly,

THEATER/A2



TOM SORENSEN/STAFF ARTIST

ATTACHMENT 8

GEOLOGICAL and FINANCIAL IMPACTS
of an
ALTERNATIVE DRILL SITE

Written by:
Francis Barker
and
Paul Hacker

TECHNICAL ANALYSIS

Introduction:

Three possible drill site locations have been considered as alternatives to the City of Hermosa Beach City Maintenance Yard drillsite:

1. The abandoned Redondo Beach tank farm site near Francisca Avenue and Catalina in the City of Redondo Beach.

2. The abandoned Redondo Beach drillsite, commonly referred to as the "Marina" drillsite near the corner of Portofino Way and Harbor Drive in the City of Redondo Beach.

3. The South School site in the City of Hermosa Beach.

From a technological standpoint, the South School site, due to its proximity to the City Maintenance Yard, can be considered to have the same potential recovery as the City Maintenance Yard. Therefore, no separate analysis will be made.

The major geologic points to consider in drilling wells for this project are:

1. The technological drilling limits.

2. Drainage/Recovery.

In assessing the feasibility of the alternate drill sites, from a geologic perspective, it is important to realize that any reduction in potential recoverable reserves (crude oil reserves in the ground with a potential for recovery) could have an extremely adverse effect on the economic return. Loss of recoverable reserves detracts from the gross revenue, increases the unit cost per barrel, decreases the rate of return for the investor and decreases the income for the royalty owner (mineral rights owner and City of Hermosa Beach).

Technological Limits:

The following estimated drilling costs were derived from the opinions of several different operators, service companies and petroleum consultants. The estimates are based on drilling depth given a range of costs for various development wells of different horizontal and vertical reach.

Measured Depth	Cost per Lineal Foot	Total Completed Well Cost
6500 Ft.	$125/Ft.	$812,500
9000 Ft.	$110/Ft.	$990,000
12,000 Ft.	$100/Ft.	$1,200,000

The reduced cost per lineal foot for deeper wells is the result of decreased unit cost for surface preparation, the drilling rig and equipment.

At present, the physical technological limits of extended reach wells are limited to a Horizontal Reach (HR) verses True Vertical Depth (TVD) of five (5) to one (1). This ratio of HR/TVD is pushing the envelope of present drilling technology. A more comfortable ratio of three (3) to one (1) is attainable with a reduction of risk intrinsic in high angle holes with ratios more than three (3) to one (1). These risks include, but are not limited to, lost circulation (no returns to surface), hole failure, and formation damage. Hole failures can result in stuck pipe, lost hole or decreased production from formation damage.

In terms of developing the Hermosa Beach onshore and offshore oil reserves, which we feel has an oil/water interface at approximately -3,000 feet TVD, and using the three (3) to one (1) HR to TVD ratio, we can calculate the reasonable drilling radius or Horizontal Reach as follows:

$$\frac{HR}{3{,}000 \text{ Ft. TVD}} = \frac{3}{1} \quad \text{or} \quad HR = 9{,}000 \text{ Ft.}$$

Therefore, the *reasonable* drilling radius around each drill site is 9,000 feet horizontally.

It should be noted that estimating the additional risk of drilling deeper extended reach (high angle holes) and horizontal wells is virtually impossible.

Use of one of the alternative drill site in the City of Redondo Beach requires drilling wells with a much longer horizontal reach. Each well must be drilled from the alternative drill site to the Hermosa Beach/Redondo Beach City boundary line plus extend additional 300 feet beyond the boundary line to avoid any previously drained areas. The additional horizontal drilling length for each well drilled from the abandoned tank farm site is 1,550 feet and from the abandoned drill site is 3,050 feet.

Drainage/Recovery

An arch with a radius of 9,000 feet drawn drawn on each of the four (4) production zones from the one (1) mile high tide boundary to the oil/water contact from each of the alternative drill sites. The percentage of unrecoverable reserves and the number of unrecoverable barrels of oil has been computed for each of the four (4) potential producing horizons.

Drill Site Location	Horizon Producing	Percentage Unrecoverable	Barrels Unrecoverable
Maintenance Yard	Upper Main	0%	0
	Lower Main	0%	0
	Del Amo	0%	0
	Schist Congl.	0%	0
	Total		0
Tank Farm, R.B.	Upper Main	17%	2,116,500
	Lower Main	21%	966,000
	Del Amo	22%	484,000
	Schist Congl.	19%	1,938,000
	Sub Total		5,504,500
	Site Location*		363,281
	Total		5,856,781
Drill Site, R.B.	Upper Main	29%	3,610,500
	Lower Main	28%	1,288,000
	Del Amo	28%	616,000
	Schist Congl.	24%	2,488,000
	Sub Total		8,002,500
	Site Location*		714,844
	Total		8,717,344

* Indicates the number of unrecoverable barrels due to technical difficulties of maintaining and operating long reach high angle wells from a remote drill site.

The estimates above are based on potential recoverable reserves of 30,000,000 barrels.

FINANCIAL ANALYSIS

A proposal to drill and produce oil reserves lying under Hermosa Beach has been under development for many years. The City of Hermosa Beach has designated the City Maintenance Yard Facility as the only location where a drill site can be developed in Hermosa Beach. The California Coastal Commission Staff has requested that alternative drill site locations be analyzed for possible use other than the City Maintenance Yard site.

Basically, four possible locations for drilling have been identified. Two sites are within the City of Hermosa Beach and two lie outside the City in Redondo Beach. The two sites in Hermosa Beach are the City Maintenance Yard, mentioned previously, and the South School Site. Since the City Maintenance Yard and the South School sites are very close to each other, there is virtually no economic/financial difference from either site, assuming the same drilling rights are allowed. (The Tidelands area cannot be drilled from the South School site). Therefore, a financial analysis will not be made for the South School site.

Drilling from an alternate site in Redondo Beach will breach the present lease between the City of Hermosa Beach and Windward and Associates. Both Lessor and Lessees are legally bound by the terms of this lease. One provision of the lease, is that drilling and production of oil must be from the City Maintenance Yard site. For the breach of that covenant the City would be entitled to the damages provided by California Civil Code. The estimated potential judgement for this breach of contract would be $29,000,000. (See Legal pages L-3, L-4 and L-5 of this report). This project could not be developed if subjected to a $29,000,000 breach of contract judgement.

City Maintenance Yard Drill Site

Since this site is the closest to all potential recoverable reserves, the cash flow projection for it is the best and it is used as the basis to compare alternate sites. The estimated potential reserves including the Schist Conglomerate are 30,000,000 barrels of oil. Using an average value of $17.00 per barrel of oil, not including the income from associated gas, equates to $510,000,000 gross revenue. Of this approximately 20% or $102,000,000 goes to royalty owners that are primarily the City and State.

Redondo Beach Drill Site

This site is in the City of Redondo Beach, very near the coast line and is furthest from the oil reserves. Correspondingly it has the worst cash flow projection. Geologic review for this site shows that only 71% of all recoverable reserves could be developed and produced from this site. Therefore, the minimum royalty and income and maximum development costs are seen here.

The estimated potential reserves are 30,000,000 barrels oil less 8,717,344 unrecoverable barrels or a total of 21,283,000 barrels of oil. Using again the average value of $17.00 per barrel of crude oil, not including the income from associated gas, equates to a loss of approximately $30,000,000 to royalty owners.

A conservative estimate of the cost to drill wells from the alternative Redondo Beach Drill site would be $200,000 each. This would increase the drilling costs approximately $6,600,000 depending on the final number of wells to be drilled which is expected to be thirty-three. This extra cost to drill wells does not include the additional cost for production equipment designed for longer reach holes and the subsequent higher costs for maintenance.

Redondo Beach Tank Farm Drill Site

This location is also across the city boundary line in the City of Redondo Beach, but is further inland, almost as far inland as the Hermosa Beach Maintenance yard site.

The estimated potential reserves are 30,000,000 barrels of oil less 5,867,781 unrecoverable barrels or a total of 24,132,219 barrels of oil. Using again the average value of $17.00 per barrel of crude oil, not including the income from associated gas, equates to a loss of approximately $17,000,000 to royalty owners.

A conservative estimate of the cost to drill wells from the alternative Redondo Beach Tank Farm site would be $100,000 each. This would increase the drilling costs approximately $3,300,000 depending on the final number of wells to be drilled which is expected to be thirty-three. Again, this extra cost to drill wells does not include the additional cost for production equipment designed for longer reach holes and the subsequent higher costs for maintenance.

In addition to limited recovery of potential reserves from the two alternative drill sites in the City of Redondo Beach, the following detrimental financial aspects of these sites must be considered.

1. Unrecoverable costs to permit the project a second time in another city.
2. Increased costs to drill and complete wells for a project with a greater number of long reach wells.
3. Overall increased production and repair costs due to greater length of all wells.
4. Loss of the Stinnett well on the City Maintenance Yard as a water injection well. This may require drilling one additional well if a drill site is located in Redondo Beach.

Conclusion

Geologically, all the known producible horizons can be reached and developed from the Hermosa Beach Maintenance Yard site. The Hermosa Beach site represents the least amount of expense and risk to develop both the Tidelands and Uplands reserves in Hermosa Beach.

Economically, the ability to recover all of the reserves from this one site adds immensely to the ultimate cash flow and extends the producing life of the field. Breach of a contract with the City of Hermosa Beach and the potential liability from it, would stop the project. Financial the project cannot be developed in the City of Redondo Beach.

The added drilling costs and risks of the alternate sites are not in the best interest of the people of the State of California. The Hermosa Beach Maintenance Yard site is the most logical in terms of economics, reduced risk and having the greatest potential of recovering all crude oil reserves.

ATTACHMENT 9

INDUSTRIAL ZONES

Sections

10-2.1000 Specific purposes, I-1 and I-2 Industrial zones, and IC Industrial-Commercial zone.
10-2.1010 Land use regulations: I-1, I-1A, I-1B, I-2 and I-2A Industrial zones.
10-2.1011 Additional land use regulations: I-1, I-1A, I-1B, I-2 and I-2A Industrial zones.
10-2.1012 Development standards: I-1 Industrial zone.
10-2.1013 Development standards: I-1A Industrial zone.
10-2.1014 Development standards: I-1B Industrial zone.
10-2.1015 Development standards: I-2 Industrial zone.
10-2.1016 Development standards: I-2A Industrial zone.
10-2.1020 Land use regulations: IC-1 Industrial-Commercial zone.
10-2.1021 Additional land use regulations: IC-1 Industrial-Commercial zone.
10-2.1022 Development standards: IC-1 Industrial-Commercial zone.

10-2.1000 Specific purposes, I-1 and I-2 Industrial zones, and IC Industrial-Commercial zone.

In addition to the general purposes listed in Section 10-2.102, the specific purposes of the I-1 and I-2 Industrial zone and I-C Industrial-Commercial zone regulations are to:

A. Provide appropriately located areas consistent with the General Plan for a broad range of light industrial uses including light manufacturing, research and development, spacecraft manufacturing and associated aerospace operations, and business park offices.

B. Strengthen the city's economic base, and provide employment opportunities close to home for residents of the city.

C. Provide a suitable environment for light industrial uses, and protect them from the adverse impacts of inharmonious uses.

D. Permit commercial uses which are compatible with the over-all character and economic health of the industrial area.

E. Ensure that the appearance and effects of industrial and commercial uses are compatible with the character of the area in which they are located.

F. Minimize the impact of industrial and commercial uses on adjacent residential zones.

G. Ensure the provision of adequate off-street parking and loading facilities.

(Ord. 2756 c.s., eff. January 18, 1996)

10-2.1010 Land use regulations: I-1, I-1A, I-1B, I-2, and I-2A Industrial zones.

In the following schedule the letter "P" designates use classifications permitted in the specified zone and the letter "C" designates use classifications permitted subject to approval of a Conditional Use Permit, as provided in Section 10-2.2506. Where there is neither a "P" nor a "C" indicated under a specified zone, or where a use classification is not listed, that classification is not permitted. The "Additional Regulations" column references regulations located elsewhere in the Municipal Code.

Notwithstanding the designation of a classification as a permitted use, a use permit may be denied for any proposed use which in the opinion of the Chief of Planning may in their maintenance, assembly, or operation create smoke, gas, odor, dust, sound, vibration, soot, or lighting of any degree which might harmfully impact surrounding land uses. The applicant for any such use denied by the Chief of Planning may apply for a Conditional Use Permit.

USE CLASSIFICATIONS	I-1	I-1A	I-1B	I-2	I-2A	Additional Regulations See Section:
INDUSTRIAL USES						
Manufacturing and fabrication:						
Aerospace manufacturing	P	P	P	P	P	
Custom manufacturing	P	P	P	P	P	
Electronics manufacturing	P	P	P	P	P	
Fabricating products from finished rubber	P	P	P	P	P	
Garment manufacturing	P	P	P	P	P	
Instrument manufacturing	P	P	P	P	P	
Office and related machinery	P	P	P	P	P	
Plastics fabrication	P	P	P	P	P	
Shoe manufacturing	P	P	P	P	P	
Sign manufacturing	P	P	P	P	P	
Textile manufacturing	P	P	P	P	P	
Laboratories	P	P	P	P	P	
Professional offices	P	P	P	P	P	10-2.1011
Computer and data processing facilities	P	P	P	P	P	
Coastal-related uses:						
Ships chandlers	P	P	P	P	P	
Sail manufacturing	P	P	P	P	P	
Boat fittings	P	P	P	P	P	
Marine research and labs	P	P	P	P	P	
Boat building	C	C	C	C	C	
Construction-related uses:						
Building material storage yards	C	C	C	C	C	
Contractor's plants, offices, and storage yards	C	C	C	C	C	
Cement products manufacturing	C	C	C	C	C	10-2.1011
Equipment leasing and rentals	C	C	C	C	C	
Lumber yards	C	C	C	C	C	
Stone monument works	C	C	C	C	C	
Woodworking	C	C	C	C	C	
Wholesaling/distribution/storage	P	P	P	P	P	
Mini-warehousing and self-storage	C	C	C	C	C	
Motor vehicle-related uses:						
Motor vehicle body and fender shops	C	C	C	C	C	10-2.1606
Motor vehicle repair garages	C	C	C	C	C	10-2.1604
Motor vehicle towing and storage	C	C	C	C	C	
Automobile dismantling	C	C	C	C	C	10-2.1011

USE CLASSIFICATIONS	I-1	I-1A	I-1B	I-2	I-2A	Additional Regulations See Section:
Recycling facilities:						10-2.1616
Reverse vending machines	P	P	P	P	P	
Small collection facilities	P	P	P	P	P	
Large collection facilities	C	C	C	C	C	
Light processing facilities	C	C	C	C	C	
Trucking terminals	C	C	C	C	C	
Other industrial uses:						
Ambulance services	C	C	C	C	C	
Beverage manufacturing	P	P	P	P	P	
with ancillary retail sales and/or tasting facilities for the public	C	C	C	C	C	
Carpet cleaning plants	P	P	P	P	P	
Communications facilities	C	C	C	C	C	
Facilities maintenance and construction shops	P	P	P	P	P	
Food products manufacturing	C	C	C	C	C	
Foundries	C	C	C	C	C	
Furniture manufacturing	C	C	C	C	C	
Heliports and helistops	C	C	C	C	C	
Household products manufacturing	P	P	P	P	P	
Laundries and wholesale dry cleaning plants	P	P	P	P	P	
Machine shops	P	P	P	P	P	
Motion picture and sound studios	P	P	P	P	P	
Pharmaceuticals manufacturing	P	P	P	P	P	
Photo processing	P	P	P	P	P	
Sheet metal shops	P	P	P	P	P	
Spray painting businesses	C	C	C	C	C	
Warehouse retail	C	C	C	C	C	
Warehouse retail, specialty	C	C	C	C	C	
Welding shops	C	C	C	C	C	
COMMERCIAL USES						
Adult businesses	P	P	P	—	—	10-2.1620
Amusement centers	—	—	C	—	—	
Ancillary uses	C	C	C	C	C	10-2.1011
Service stations	C	C	C	C	C	10-2.1602
OTHER USES	C	C	C	C	C	
Antennae for public communications	C	C	C	C	C	
Child day care centers	C	C	C	C	C	

USE CLASSIFICATIONS	I-1	I-1A	I-1B	I-2	I-2A	Additional Regulations See Section:
Government maintenance facilities	C	C	C	C	C	
Government offices	C	C	C	C	C	
Public safety facilities	C	C	C	C	C	
Public utility facilities	C	C	C	C	C	10-2.1614
Recreation facilities	C	C	C	C	C	
Schools, public or private	C	C	C	C	C	

(Ord. 2756 c.s., eff. January 18, 1996, as amended by Ord. 2802, eff. July 3, 1997)

10-2.1011 Additional land use regulations, I-1, I-1A, I-1B, I-2, and I-2A Industrial zones.

A **Professional offices.** Professional offices shall be located in a building designed and intended for office uses.

B. **Concrete ready-mix plants.** Concrete ready-mix plants are prohibited.

C **Automobile dismantling.** Automobile dismantling shall only be permitted in an enclosed building.

D. **Ancillary commercial uses.** Ancillary commercial uses may include banks, restaurants, photocopy services, and similar uses supporting to the primary industrial uses.

(Ord. 2756 c.s., eff. January 18, 1996)

10-2.1012 Development standards: I-1 Industrial zone.

A. **Floor area ratio.** The floor area ratio (F.A.R.) of all buildings on a lot shall not exceed 0.7 (see definition of floor area ratio in Section 10-2.402).

B. **Building height.** No building or structure shall exceed a height of 110 feet. Further, no building or structure shall exceed one (1) foot of height for each two (2) feet of depth from the industrial zone property lines abutting Marine Avenue, Inglewood Avenue, Manhattan Beach Boulevard, and Aviation Boulevard. (See definition of building height in Section 10-2.402).

C. **Setbacks.** The minimum yard requirements shall be as follows:

1. **Front setback.** There shall be a minimum front setback of ten (10) feet the full width of the lot.

2. **Side setback.** There shall be a minimum side setback of ten (10) feet the full length of the lot on the street side of a corner or reverse corner lot. No side setback shall be required along the interior lot lines.

3. **Rear setback.** No rear setback shall be required.

D. **General regulations.** See Article 3 of this chapter.

E. **Parking regulations.** See Article 5 of this chapter.

F. **Sign regulations.** See Article 6 of this chapter.

G. **Landscaping regulations.** See Article 7 of this chapter.

H. **Procedures.** See Article 12 of this chapter.

(Ord. 2756 c.s., eff. January 18, 1996)

10-2.1013 Development standards: I-1A Industrial zone.

A. **Floor area ratio.** The floor area ratio (F.A.R.) of all buildings on a lot shall not exceed 0.7, except that the F.A.R. may be increased to a maximum of 1.0 on individual lots subject to the approval of a development agreement containing provisions limiting the cumulative floor area ratio of all parcels in the zone to a maximum of 0.7. (See definition of floor area ratio in Section 10-2.402).

B. **Building height.** No building or structure shall exceed a height of 110 feet. Further, no building or structure shall exceed one (1) foot of height for each two (2) feet of depth from the industrial zone property lines abutting Marine Avenue, Inglewood Avenue, Manhattan Beach Boulevard, and Aviation Boulevard. (See definition of building height in Section 10-2.402).

C. **Setbacks.** The minimum setback requirements shall be as follows:

1. **Front setback.** There shall be a minimum front setback of ten (10) feet the full width of the lot.

2. **Side setback.** There shall be a minimum side setback of ten (10) feet the full length of the lot on the street side of a corner or reverse corner lot. No side setback shall be required along the interior lot lines.

3. **Rear setback.** No rear setback shall be required.

D. **General regulations.** See Article 3 of this chapter.

E. **Parking regulations.** See Article 5 of this chapter.

F. **Sign regulations.** See Article 6 of this chapter.

G. **Landscaping regulations.** See Article 7 of this chapter.

H. **Procedures.** See Article 12 of this chapter.

(Ord. 2756 c.s., eff. January 18, 1996)

10-2.1014 Development standards: I-1B Industrial zone.

A. **Floor area ratio.** The floor area ratio (F.A.R.) of all buildings on a lot shall not exceed 0.7 (see definition of floor area ratio in Section 10-2.402).

B. **Building height.** No building or structure shall exceed a height of 110 feet. Further, no building or structure shall exceed one (1) foot of height for each two (2) feet of depth from the industrial zone property lines abutting Marine Avenue, Inglewood Avenue, Manhattan Beach Boulevard, and Aviation Boulevard. (See definition of building height in Section 10-2.402).

C. **Setbacks.** The minimum setback requirements shall be as follows:

1. **Front setback.** There shall be a minimum front setback of ten (10) feet the full width of the lot.

2. **Side setback.** There shall be a minimum side setback of ten (10) feet the full length of the lot on the street side of a corner or reverse corner lot. No side setback shall be required along the interior lot lines.

3. **Rear setback.** No rear setback shall be required.

D. **General regulations.** See Article 3 of this chapter.

E. **Parking regulations.** See Article 5 of this chapter.

F. **Sign regulations.** See Article 6 of this chapter.

G. **Landscaping regulations.** See Article 7 of this chapter.

H. **Procedures.** See Article 12 of this chapter.

(Ord. 2756 c.s., eff. January 18, 1996)

10-2.1015 Development standards: I-2 Industrial zone.

A. **Floor area ratio.** The floor area ratio (F.A.R.) of all buildings on a lot shall not exceed 1.0 (see definition of floor area ratio in Section 10-2.402).

B. **Building height.** No building or structure shall exceed a height of 30 feet, except as follows (see definition of building height in Section 10-2.402):

ATTACHMENT 10

C-5 COMMERCIAL ZONES

Sections

10-2.700 Specific purposes, C-5 Commercial zones.
10-2.710 Land use regulations: C-5 and C-5A Commercial zones.
10-2.711 Additional land use regulations: C-5 and C-5A Commercial zones.
10-2.712 Development standards: C-5 Commercial zone.
10-2.713 Development standards: C-5A Commercial zone.

10-2.700 Specific purposes, C-5 Commercial zones.

In addition to the general purposes listed in Section 10-2.102, the specific purposes of the C-5 commercial zone regulations are to:

A. Provide appropriately located areas consistent with the General Plan for a community and marine-oriented commercial area containing commercial retail and services, restaurants, marine-related commerce and services, automobile-related services, and similar uses.

B. Provide opportunities for light industrial uses that have impacts comparable to those of permitted retail and service uses to locate in areas not in demand for commercial uses within the portions of the zone adjacent to the Edison plant.

C. Strengthen the city's economic base, and provide employment opportunities close to home for residents of the City.

D. Minimize the impact of commercial and light industrial development on adjacent residential districts.

E. Ensure that the appearance and effects of commercial and industrial buildings and uses are harmonious with the character of the area in which they are located.

(Ord. 2756 c.s., eff. January 18, 1996)

10-2.710 Land use regulations: C-5 and C-5A Commercial zones.

In the following schedule the letter "P" designates use classifications permitted in the specified zone and the letter "C" designates use classifications permitted subject to approval of a Conditional Use Permit, as provided in Section 10-2.2506. Where there is neither a "P" nor a "C" indicated under a specified zone, or where a use classification is not listed, that classification is not permitted. The "Additional Regulations" column references regulations located elsewhere in the Municipal Code.

USE CLASSIFICATIONS	C-5	C-5A	Additional Regulations See Section:
COMMERCIAL USES			
Ambulance services	C	C	
Animal sales and services:			
Animal feed and supplies	P	P	
Animal grooming	C	C	
Animal hospitals	C	C	
Animal sales	C	C	
Artist's studios	P	P	

USE CLASSIFICATIONS	C-5	C-5A	Additional Regulations See Section:
Banks and savings and loans with drive-up service	P C	P C	
Bars and cocktail lounges	C	C	10-2.1600
Building material sales	C	C	
Business and trade schools	C	C	
Check-cashing businesses	C	C	10-2.1600
Commercial printing Commercial printing, limited	P P	P P	
Commercial recreation	C	C	10-2.1600
Communications facilities	C	C	
Drive-up services	C	C	
Fire arm sales	C	C	10-2.1600
Food and beverage sales	P	P	
Hotels and motels	C	C	
Laboratories	C	C	
Liquor stores	C	C	
Maintenance and repair services	P	P	
Marine sales and services	C	C	
Mortuaries	C	C	
Offices	P	P	
Personal convenience services	P	P	
Personal improvement services	C	C	
Plant nurseries	C	C	
Recycling collection facilities: Reverse vending machines Small collection facilities	 P C	 P C	10-2.1616
Restaurants: 2,000 sq. ft. or less floor area with no drive-up service more than 2,000 sq. ft. floor area or with drive-up service	 P C	 P C	
Retail sales	P	P	
Snack shops	P	P	
Thrift shops	C	C	10-2.1600

USE CLASSIFICATIONS	C-5	C-5A	Additional Regulations See Section:
Vehicle sales and services:			
Sales, leasing, and rentals	C	C	
Automobile washing	C	C	
Service stations	C	C	10-2.1602
Motor vehicle repair garages	–	C	10-2.711 10-2.1604
INDUSTRIAL USES			10-2.711
Manufacturing and fabrication:			10-2.711
Custom manufacturing	—	C	
Electronics manufacturing	—	C	
Fabricating products from finished rubber	—	C	
Garment manufacturing	—	C	
Instrument manufacturing	—	C	
Office and related machinery	—	C	
Plastics fabrication	—	C	
Shoe manufacturing	—	C	
Sign manufacturing	—	C	
Textile manufacturing	—	C	
Laboratories	—	C	10-2.711
Professional offices	—	P	10-2.711
Computer and data processing facilities	—	P	
Coastal-related uses:			10-2.711
Ships chandlers	—	C	
Sail manufacturing	—	C	
Boat fittings	—	C	
Marine research and labs	—	C	
Boat building	—	C	
Construction-related uses:			10-2.711
Building material storage yards	—	C	
Contractor's plants, offices, and storage yards	—	C	
Equipment leasing and rentals	—	C	
Lumber yards	—	C	
Stone monument works	—	C	
Woodworking	—	C	
Wholesaling/distribution/storage	—	C	10-2.711
Mini-warehousing and self-storage	—	C	10-2.711
Motor vehicle-related uses:			10-2.711
Motor vehicle body and fender shops	—	C	10-2.1606
Motor vehicle repair garages	—	C	10-2.1604
Motor vehicle towing and storage	—	C	
Recycling facilities:			10-2.1616
Large collection facilities	—	C	10-2.711
Light processing facilities	—	C	10-2.711

USE CLASSIFICATIONS	C-5	C-5A	Additional Regulations See Section:
Other industrial uses:			10-2.711
Beverage manufacturing	—	C	
Carpet cleaning plants	—	C	
Facilities maintenance and construction shops	—	C	
Food products manufacturing	—	C	
Furniture manufacturing	—	C	
Heliports and helistops	—	C	
Household products manufacturing	—	C	
Laundries and wholesale dry cleaning plants	—	C	
Machine shops	—	C	
Motion picture and sound studios	—	C	
Pharmaceuticals manufacturing	—	C	
Photo processing	—	C	
Sheet metal shops	—	C	
Spray painting businesses	—	C	
Warehouse retail	—	C	
Warehouse retail, specialty	—	C	
Welding shops	—	C	
OTHER USES			
Adult day care centers	C	C	
Antennae for public communications	C	C	
Child day care centers	C	C	
Churches	C	C	
Clubs and lodges	C	C	
Cultural institutions	C	C	
Government offices	P	P	
Parking lots	C	C	
Public safety facilities	C	C	
Public utility facilities	C	C	10-2.1614
Recreation facilities	C	C	
Schools, public or private	C	C	

(Ord. 2756 c.s., eff. January 18, 1996, as amended by Ord. 2801, eff. June 5, 1997, and Ord. 2802, eff. July 3, 1997)

10-2.711 Additional land use regulations.

A. **C-5A zone.**

1. **Motor vehicle repair garages.** Structures for this use shall:

a. be designed to convey the visual character of retail commercial uses, including the incorporation of architectural elements and landscape which make them attractive to possible future pedestrian use of the corridor;

b. be functionally and physically convertible to a retail use; and

c. be designed so that repair facility service bays do not face any street including side streets.

2. **Industrial uses.** No industrial use shall be allowed on the front half of lots adjacent to the west side of Catalina Avenue, except that this standard may be modified subject to a Conditional Use Permit (pursuant to Section 10-2.2506) under the following circumstances:

a. the industrial use is located to the rear of a structure occupied by other permitted commercial uses; or

b. there is insufficient lot depth to accommodate the intended use on the rear half of the lot, and the street-facing frontage of the structure is designed to convey the visual and architectural character of a retail commercial use.

3. **Offices.** Offices shall be located in a building designed and intended for office uses.

(Ord. 2756 c.s., eff. January 18, 1996)

10-2.712 Development standards: C-5 Commercial zone.

A. **Floor area ratio.** No buildings on a lot shall exceed a floor area to lot area ratio (F.A.R.) of 0.7 (see definition of floor area ratio in Section 10-2.402).

B. **Building height.** No building or structure shall exceed a height of 30 feet (see definition of building height in Section 10-2.402).

C. **Stories.** No building shall exceed two (2) stories (see definition of story in Section 10-2.402).

D. **Setbacks.** The minimum setback requirements shall be as follows:

1. **Front setback.** There shall be a minimum front setback of ten (10) feet the full width of the lot, except where a lot is contiguous to a residential zone, in which case the required front setback shall be the same as required for the adjacent residential lots which have front yards on the same street.

2. **Side setback.** There shall be a minimum side setback of ten (10) feet the full length of the lot on the street side of a corner or reverse corner lot. No side setback shall be required along the interior lot lines, except where the side lot line is contiguous to a residential zone, in which case there shall be a minimum five (5) foot side setback the full length of the lot (with no openings in the building wall except as required by the Building Codes), and a minimum 15 foot setback for all building height exceeding 20 feet.

3. **Rear setback.** No rear setback shall be required, except where the rear lot line is contiguous to a residential zone, in which case there shall be a minimum five (5) foot side setback the full width of the lot (with no openings in the building wall except as required by the Building Codes), and a minimum 15 foot setback for all building height exceeding 20 feet.

4. **Second story setback.** The second story shall have a minimum setback of 15 feet from any property line abutting a street.

E. **General regulations.** See Article 3 of this chapter.

F. **Parking regulations.** See Article 5 of this chapter.

G. **Sign regulations.** See Article 6 of this chapter.

H. **Landscaping regulations.** See Article 7 of this chapter.

I. **Procedures.** See Article 12 of this chapter.

(Ord. 2756 c.s., eff. January 18, 1996)

10-2.713 Development standards: C-5A Commercial zone.

A. **Floor area ratio.** No buildings on a lot shall exceed a floor area to lot area ratio (F.A.R.) of 0.7, except as follows: (See definition of floor area ratio in Section 10-2.402).

1. **Mini-warehousing and self-storage.** For portions of a site used for mini-warehousing and self-storage the floor area ratio shall not exceed 1.5.

2. **Other industrial uses.** For portions of a site used for any other industrial use the floor area ratio shall not exceed 1.0.

B. **Building height.** No building or structure shall exceed a height of 30 feet, except that buildings or structures up to a maximum of 65 feet may be approved on portions of the lot, subject to Planning Commission Review (Section 10-2.2502), where it is determined that the impacts of the additional height on the character of the frontage along Catalina Avenue are adequately mitigated by the change in topography or distance from the street frontage. (See definition of building height in Section 10-2.402).

C. **Stories.** No building shall exceed two (2) stories, except that buildings up to a maximum of four (4) stories may be approved on portions of the lot, subject to Planning Commission Review (Section 10-2.2502), where it is determined that the impacts of the additional story on the character of the frontage along Catalina Avenue are adequately mitigated by the change in topography or distance from the street frontage. (See definition of story in Section 10-2.402).

D. **Setbacks.** The minimum setback requirements shall be as follows:

1. **Front setback.** There shall be a minimum front setback of ten (10) feet the full width of the lot.

2. **Side setback.** There shall be a minimum side setback of ten (10) feet the full length of the lot on the street side of a corner or reverse corner lot. No side setback shall be required along the interior lot lines.

3. **Rear setback.** No rear setback shall be required.

4. **Second story setback.** The second story shall have a minimum setback of 15 feet from any property line abutting a street.

E. **General regulations.** See Article 3 of this chapter.

F. **Parking regulations.** See Article 5 of this chapter.

G. **Sign regulations.** See Article 6 of this chapter.

H. **Landscaping regulations.** See Article 7 of this chapter.

I. **Procedures.** See Article 12 of this chapter.

(Ord. 2756 c.s., eff. January 18, 1996, as amended by Ord. 2784, eff. January 2, 1997)

ATTACHMENT 11

EXHIBIT "B"

CITY OF REDONDO BEACH, CALIFORNIA

MITIGATED NEGATIVE DECLARATION NO. 96-24 AND MITIGATION MONITORING PROGRAM

In accordance with Chapter 3, Title 10, of the Redondo Beach Municipal Code (Environmental Review Pursuant to the California Environmental Quality Act), a Mitigated Negative Declaration is hereby issued for the following project:

1. **PROJECT LOCATION:**

811-819 North Catalina Avenue. Pacific Coast Highway, Redondo Beach, California, and C-5A zone.

2. **PROJECT DESCRIPTION:**

The proposed project consists of the construction of three buildings totaling 295,000 gross square feet with 271 parking spaces on a 5.05 acre vacant site. The project provides 209,000 leasable square feet which would be distributed between the proposed uses as follows: 15,000 square feet of retail commercial, 44,000 square feet of business office, 47,000 square feet of limited industrial, 3,000 square feet of caretaker's units and 100,000 square feet of storage units.

Three buildings would be constructed. The primary building is a 223,300 square foot, 4-story, 61 foot high structure. The building employs a flexible space plan which permits each level to accommodate various uses in a variety of configurations. The conceptual utilization would place office, storage, incubator industrial and warehouse uses on the first level of the structure which is semi subterranean. The second through fourth levels would permit similar utilization throughout all floors with the exception that the second level would provide up to 15,000 square feet of retail commercial storefront.

The second structure is 65,800 square feet in two stories. This 980' long building is constructed on the railroad right of way portion of the site which extends along North Francisca Avenue. Only mini-storage uses are contained in this structure.

The final building is also a two story structure designed solely for mini-storage use. This 4,650 square foot building is located at the north end of the project site closest to the intersection of Herondo Avenue and North Francisca Avenue.

The project provides 271 parking spaces through a combination of on grade and roof-top parking. Plans submitted show 40 surface spaces immediately adjacent to the main building entry, and 25 spaces immediately south of the main building. The 144 roof parking spaces are accessible by means of spiral access ramp structure which provides vehicular access to all floors of the structure. The balance of the parking is provided along the access drives for the buildings.

The project includes land use entitlement actions on a conditional use permit, a Planning Commission review, a variance to exceed the allowable 6' maximum fence/wall height, and a request for amendment to the General Plan Map to apply a C-5 (Commercial) designation to portions of the site currently designated P (Public/Institutional) and an amendment to the Zoning Map to apply a C-5A (Commercial) designation to portions of the site currently designated P-ROW

(Right-of-Way zone). Coastal Development Permits and the vacation of a portion of public street (South Francisca Avenue) are also included in the overall project.

The project is also contingent on amendments to the Zoning Ordinance, General Plan and Harbor Civic Center Specific Plan to permit a maximum building height of 4 stories, 75 feet in the C-5A zone. This initial study includes an evaluation of the environmental impacts of these amendments to the Zoning Ordinance, General Plan and Harbor Civic Center Specific Plan in addition to an evaluation of the specific proposed project.

3. PROJECT SPONSOR:

American Standard Development Company
301 East Ocean Boulevard
Long Beach CA 90277

4. FINDING(S) OF THE DECISION-MAKING BODY:

The City of Redondo Beach Planning Commission, as decision-making body, has reviewed Initial Environmental Study 96-24 (IES 96-24) and has considered all comments and responses to comments received during the 21-day public review period. On the basis of these documents and public testimony presented at the public hearing held on October 17, 1996, the Planning Commission finds that the proposed project (described above), as modified by design and conditions of approval, and as a result of other mitigation measures, will not result in any potential significant impacts upon the environment, according to the criteria for determining significant effect, as set forth in Article 2 of Chapter 3, Title 10 of the Redondo Beach Municipal Code. This finding is supported by the discussion provided in the IES which states, in part, as provided below:

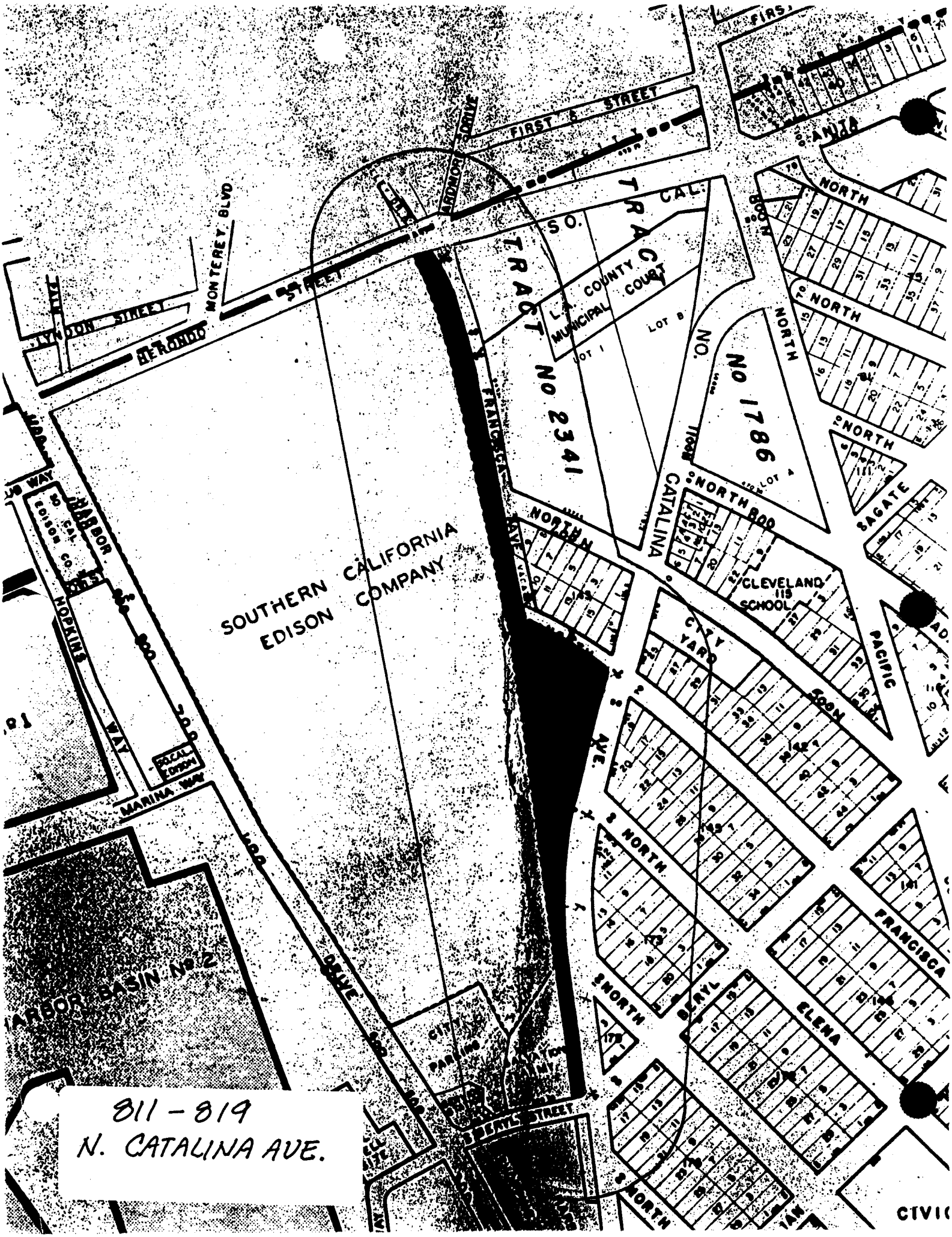
5. DISCUSSION, MITIGATION MEASURES AND MITIGATION MONITORING PLAN:

A. EARTH:

There are no unusual geologic conditions known to exist in the area. However, the site is known to have areas of loosely consolidated material. The depth of this marginally compacted soil is such that removal and recompaction cannot entirely prepare the site for development. Therefore, recommendations of the soils engineer require employment of special construction methods including the use of a piling type support structure. By closely following the recommendations of the soils and geotechnical report and through the use of proper construction technology, all impacts can be reduced to a less than significant level. Grading activities associated with the project involve exportation of earth material. However, the quantities of soil export are not considered significant.

The proposed amendments to the General Plan, Harbor/Civic Center Specific Plan, and Zoning Ordinance relate to building height, and do not impact earth conditions.

Mitigation Measures:



811 - 819
N. CATALINA AVE.

RESOLUTION NO. 7871

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF REDONDO BEACH ADOPTING MITIGATED NEGATIVE DECLARATION NO. 96-24 AND A MITIGATION MONITORING PROGRAM, FOR A PROJECT LOCATED AT 811-819 NORTH CATALINA AVENUE; INCLUDING, VARIOUS AMENDMENTS TO THE MUNICIPAL CODE, GENERAL PLAN AND HARBOR/CIVIC CENTER SPECIFIC PLAN PERTAINING TO THE C-5A ZONE AND C-5 GENERAL PLAN LAND USE DESIGNATION.

CASE No. (PC) 96-70

WHEREAS, the Planning Commission of the City of Redondo Beach held a public hearing on October 17, 1996 with respect to the proposed Conditional Use Permit, Planning Commission Review, Variance, Vacation of Public street Right-of Way, General Plan and Harbor/Civic Center Specific Plan Amendments and Zoning Map and Zoning Text Amendments for 811-819 North Catalina Avenue (the "Project"); and

WHEREAS, notice of the public review period and circulation of the Initial Study relating to the project was provided pursuant to State and local laws; and

WHEREAS, at the public hearing, the Planning Commission reviewed Mitigated Negative Declaration No. 96-24 and the Mitigation Monitoring Program which include an evaluation of the environmental impacts of the project and contain mitigation measures to reduce the identified impacts of the project to a less than significant level; and

WHEREAS, following the public hearing, the Planning Commission adopted Resolution No. 8384 recommending that the City Council adopt Mitigated Negative Declaration No. 96-24 and the Mitigation Monitoring Program; and

WHEREAS, the City Council held a public hearing on November 19, 1996, and considered the recommendation of the Planning Commission pertaining to adoption of Mitigated Negative Declaration No. 96-24 and the Mitigation Monitoring Program.

NOW, THEREFORE, THE CITY COUNCIL OF THE CITY OF REDONDO BEACH DOES HEREBY RESOLVE, DECLARE, DETERMINE AND ORDER AS FOLLOWS:

SECTION 1. The City Council hereby finds that in compliance with the California environmental Act of 1970, as amended, and State and local guidelines adopted pursuant thereto ("CEQA"), the City of Redondo beach prepared an Initial Study IES 96-24 of the environmental effects of the Project. Pursuant to Chapter 3, Title 10 of the Redondo Beach Municipal code, a Mitigated Negative Declaration (Mitigated Negative Declaration No, 96-24) has been prepared pursuant to Section 15070 of the CEQA Guidelines.

SECTION 2. The City Council has considered the Mitigated Negative Declaration (which is incorporated by reference herein) with respect to the Project and finds that it adequately addresses all potential significant environmental impacts of the Project and meets the requirements of CEQA and the CEQA Guidelines.

SECTION 3. The City Council finds that revisions to the Project in the form of mitigation measures agreed to by the Applicant will avoid or mitigate the significant impacts identified in the Initial Study to a level of less than significant and that therefore the Project as revised by the proposed conditions of mitigation will not have a significant effect on the environment. These findings are based on the Initial Study and the Mitigated Negative Declaration, and other substantial evidence in the administrative record.

SECTION 4. The only potentially significant impacts on the environment identified by the Initial study consist of impacts associated with the Project in the areas of: Earth, Water, Noise, Transportation and Circulation, Utilities and Service Systems and Cultural Resources.

SECTION 5. Staff has prepared conditions to the approval of the Project to mitigate the identified potentially significant effects on the environment to a level of less than significant.

SECTION 6. The evidence in support of the Mitigated Negative Declaration is based upon technical and scientific evidence prepared by experts. Said evidence was not controverted by any technical or scientific evidence prepared by any experts.

SECTION 7. The specific conditions of approval of this Project including conditions mitigating potentially significant effects on the environment to a level of insignificance are set forth in Exhibit "A" and incorporated herein by reference. The City Council further finds that the proposed amendment will have a de minimis impact on Fish and Game resources pursuant to Section 21089(b) of the Public Resources Code.

SECTION 8. The City council hereby approves Mitigated Negative Declaration No. 96-24 and finds that it adequately addresses all potential significant environmental impacts of the Projects and meets the requirements of CEQA and the CEQA Guidelines.

SECTION 9. The City Clerk shall certify to the passage and adoption of this resolution, shall enter the same in the Book of Resolutions of said City, and shall cause the action of the City Council in adopting the same to be entered in the official minutes of said City Council.

Passed, approved, and adopted this 19 day of Nov., 1996.

W. Brad Pace
Mayor

ATTEST:

City Clerk

(SEAL)

APPROVED AS TO FORM:

John Eastman
Assistant City Attorney

STATE OF CALIFORNIA)
COUNTY OF LOS ANGELES) ss
CITY OF REDONDO BEACH)

I, JOHN OLIVER, City Clerk of the City of Redondo Beach, California, do hereby certify that the foregoing resolution, being **Resolution No. 7871** was passed and adopted by the City Council, at a regular meeting of said Council held on the **19th day of November, 1996, and thereafter signed and approved** by the Mayor and attested to by the City Clerk of said City, and that said resolution was adopted by the following vote:

YES: Councilmembers Dawidziak, Hill, Gin, and White.
NOES: Councilmember Pinzler.
ABSENT: None.

(SEAL)

City Clerk of the City of
Redondo Beach, California

agn$>vote.resolution

TO: Mayor and City Council

FROM: Paul Connolly, Chief of Planning

SUBJECT: PUBLIC HEARING TO CONSIDER:

A. APPROVAL OF MITIGATED NEGATIVE DECLARATION NO. 96-24. AND THE MITIGATION MONITORING PLAN FOR A PROJECT LOCATED AT 811-819 NORTH CATALINA AVENUE INCLUDING:

1. AMENDMENTS TO THE GENERAL PLAN TO CHANGE THE LAND USE DESIGNATION OF PORTIONS OF PROPERTY TO COMMERCIAL (C-5)

2. AMENDMENTS TO THE GENERAL PLAN AND HARBOR/CIVIC CENTER SPECIFIC PLAN WITH RESPECT TO BUILDING HEIGHTS

3. AMENDMENTS TO THE HARBOR/CIVIC CENTER SPECIFIC PLAN TO REVISE THE CATALINA SUB-AREA MAP TO INCLUDE THE PROPOSED DEVELOPMENT SITE

4. AMENDMENTS TO THE ZONING MAP TO CHANGE THE ZONING ON PORTIONS OF PROPERTY TO COMMERCIAL (C-5A) AND

5. AND AMENDMENTS TO THE ZONING ORDINANCE WITH RESPECT TO THE HEIGHT OF BUILDINGS WITHIN THE COMMERCIAL (C-5A) ZONE.

RECOMMENDATION:

Staff recommends that the City Council:

A. adopt the following two resolutions, by title only, waiving further reading:

1. A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF REDONDO BEACH APPROVING MITIGATED NEGATIVE DECLARATION NO. 96-24 AND THE MITIGATION MONITORING PLAN FOR A PROJECT LOCATED AT 811-819 NORTH CATALINA AVENUE INCLUDING VARIOUS AMENDMENTS TO THE MUNICIPAL CODE, GENERAL PLAN AND HARBOR/CIVIC CENTER SPECIFIC PLAN PERTAINING TO THE C-5A ZONE AND C-5 GENERAL PLAN LAND USE DESIGNATION

2. A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF REDONDO BEACH (1) AMENDING THE GENERAL PLAN LAND USE MAP REDESIGNATING ASSESSOR PARCEL NO. 7503013800 FROM P (PUBLIC/INSTITUTIONAL) TO C-5 (COMMERCIAL); AND (2) AMENDING THE GENERAL PLAN AND HARBOR/CIVIC CENTER SPECIFIC PLAN RELATING TO DEVELOPMENT STANDARDS APPLICABLE TO THE C-5 (COMMERCIAL) DISTRICT

B. introduce the following ordinance, by title only, waiving further reading:

1. AN ORDINANCE OF THE CITY COUNCIL OF THE CITY OF REDONDO BEACH AMENDING THE ZONING ORDINANCE RELATING TO BUILDING HEIGHT AND STORIES IN THE C-5A COMMERCIAL ZONE; AND AN AMENDING THE ZONING MAP, REDESIGNATING TO C-5A THAT PORTION OF ASSESSOR PARCEL NO. 7503013800 CURRENTLY DESIGNATED P-ROW.

SUMMARY:

On October 17, 1996 the Planning Commission conducted a public hearing and granted various land use approvals for the Catalina Technology Center, an approximately 295,000 square foot retail, office, incubator industrial, mini-storage and warehouse facility. The granting of these entitlements were contingent upon several actions of the City Council including: amendments to code to permit consideration of taller structures within the zone, rezoning of a portion of the subject property, and the vacation of a portion of public street right of way. An agenda item pertaining to the street vacation has been placed on this City Council Agenda by the Engineering Division. Following the public hearing the Planning Commission adopted Resolution No. 8381 recommending to the City Council the adoption of the required amendments.

DISCUSSION OF AMENDMENTS:

The proposed amendments to the Zoning Code, General Plan and Harbor Civic Center Specific Plan would modify existing development standards to permit, under limited

circumstances, the consideration of permitting four-story structures with an overall maximum height of 75' exclusively in the C-5A zone.

A second amendment involves consideration of rezoning the northern portion of the Atchison Topeka and Santa Fe Railroad right of way from the present Public Right of Way (P-ROW) designation to Commercial (C-5A)

The C-5A zone is located solely on the west side of Catalina Avenue and generally includes that land from the Southern California Edison Generating Station eastward to Pacific Coast Highway. The northern boundary of the C-5A zone is Herondo Street and the southern boundary extends to Catalina Avenue. Several large land parcels exist in the area including: the former Weddle Woodcraft site, the AT&SF Railroad right of way, the Home Bank site and the United States Post Office. Other smaller parcels generally developed with older industrial uses in need of renovation exist surrounding these larger sites.m

Perhaps the most dominant and notable feature of the area is rear side of the Generating Station. This industrial use backdrops the C-5A zone. The back lot industrial uses include: fuel storage tanks, a switching yard, water treatment ponds and the power generating units themselves.

In considering these amendments it is important to note that staff is typically concerned with permitting taller structures throughout the City. However, under certain circumstances, having the ability to consider taller buildings with adequate controls can have significant area and community benefit. The current code permits commercial and industrial structures to a maximum of 3 stories and 45 feet subject to the control mechanism of Planning Commission Review. The proposed amendment would permit the consideration of projects containing 4 stories with a maximum height of 75 feet on a case by case basis. Findings would be required to be made regarding each project as to the appropriateness of the relative scale of the project, the size and bulk of the structures, and the compatibility of the project with the adjacent neighborhood.

Permitting structures of 4 stories and 75 feet may not be appropriate everywhere in the C-5A zone or on portions of properties in close proximity to street frontage. However, the additional height with appropriate controls, will offer the necessary design freedom for

innovative projects to be considered which will accomplish visual screening and sound attenuation goals for the area.

In staff's analysis, the change of land use district for the portion of the AT&SF Railroad right of way is appropriate and justified in that it will apply a consistent C-5A zoning designation to the entire property. The amendment also permits viable Commercial and Industrial uses of property formerly usable for only public utility purposes. The change in development standards to permit the consideration of taller structures containing a potential fourth story and corresponding amendments to the General Plan and Harbor Civic Center Specific Plan appear to be appropriate considering the review mechanisms which are in place and considering the unique surroundings to the C-5A zone.

ENVIRONMENTAL ANALYSIS:

In Compliance with the California environmental Quality Act of 1970, as amended, and State and local guidelines, the city of Redondo Beach prepared an Initial study IES 96-24 of the environmental effects of the Project. A mitigated Negative declaration has been prepared pursuant to Section 15070 of the CEQA Guidelines. The Initial Study identified potentially significant impact on the environment associated with the project in the areas of Earth, Water, Noise, Transportation and Circulation, Utilities and Service Systems and Cultural Resources. However, staff has prepared conditions to the approval of the Project to mitigate the identified potentially significant effects to a level of less than significant. The Planning Commission reviewed the Mitigated Negative Declaration at their meeting of October 17, 1996 and has recommended City Council approval of the document.

Prepared by:

Aaron Jones
Economic Development Administrator

Approved by:

PAUL CONNOLLY
Chief of Planning

Attachments:

1. Recommended resolution adopting Mitigated Negative Declaration No. 96-24
2. Recommended resolution amending the General Plan.
3. Recommended ordinance amending the Zoning Ordinance.
4. Planning Commission Resolution No. 8381 including:
    a. Exhibit "A" Use Permit Conditions
    b. Exhibit "B" Mitigated Negative Declaration and Monitoring Program
    c. Initial Environmental Study IES No. 96-24
5. Minutes from Planning Commission meeting of October 17, 1996. (Unavailable as of distribution)
6. Staff report to Planning Commission, October 17, 1996.

s:/aaron/c-5a.cc

CA-96-01

APPLICATION FOR COASTAL DEVELOPMENT PERMIT

APPENDIX B

LOCAL AGENCY REVIEW FORM

SECTION A (TO BE COMPLETED BY APPLICANT)

Applicant American Standard Development Co.

Project Description Construction of a 295,000 Square footretail, office, warehouse Storage and incubator industrial facility, amendments to the General Pl

Location 811-819 North Catalina Avenue

Assessor's Parcel Number 7503-021 various parcels

SECTION B (TO BE COMPLETED BY LOCAL PLANNING OR BUILDING INSPECTION DEPARTMENT)

Zoning Designation C-5A N/A du/ac

General or Community Plan Designation Commmercial N/A du/ac

Local Discretionary Approvals

- ☐ Proposed development meets all zoning requirements and needs no local permits other than building permits.
- ☒ Proposed development needs local discretionary approvals noted below.

Needed	*Received*	
☐	☒	Design/Architectural review
☐	☐	Variance for
☐	☒	Rezone from P-ROW TO C-5A
☐	☐	Tentative Subdivision/Parcel Map No.
☐	☐	Grading/Land Development Permit No.
☐	☐	Planned Residential/Commercial Development Approval
☐	☒	Site Plan Review
☐	☐	Condominium Conversion Permit
☐	☒	Conditional, Special, or Major Use Permit No. 96-24
☐	☒	Other Planning Commission Review

CEQA Status

- ☐ Categorically Exempt *Class* _____ *Item* _____
- ☒ Negative Declaration Granted (Date) December 3, 1996
- ☐ Environmental Impact Report Required, Final Report Certified (Date)
- ☐ Other

Prepared for the City/County of Redondo Beach **by** Aaron Jones

Date December 10, 1996 **Title** Economic Development Administrator

ATTACHMENT 12

CC COASTAL COMMERCIAL ZONES

Sections

10-2.800 Specific purposes, CC Coastal Commercial zones.
10-2.810 Land use regulations: CC-1, CC-2, CC-3, CC-4, CC-5, CC-6, and CC-7 Coastal Commercial zones.
10-2.811 Additional land use regulations: Coastal Commercial zones.
10-2.812 Development standards: CC-1 Coastal Commercial zone.
10-2.813 Development standards: CC-2 Coastal Commercial zone.
10-2.814 Development standards: CC-3 Coastal Commercial zone.
10-2.815 Development standards: CC-4 Coastal Commercial zone.
10-2.816 Development standards: CC-5 Coastal Commercial zone.
10-2.817 Development standards: CC-6 Coastal Commercial zone.
10-2.818 Development standards: CC-7 Coastal Commercial zone.

10-2.800 Specific purposes, CC Coastal Commercial zones.

In addition to the general purposes listed in Section 10-2.102, the specific purposes of the CC coastal commercial zone regulations are to:

A. Provide for the continued evolution and use of the City's coastal-related commercial-recreational facilities and resources for the residents of Redondo Beach and surrounding communities, while ensuring that uses and development are compatible with adjacent residential neighborhoods and commercial areas.

B. Provide for the development of coastal-dependent land uses and uses designed to enhance public opportunities for coastal recreation, including commercial retail and service facilities supporting recreational boating and fishing, and to encourage uses which:

1. Are primarily oriented toward meeting the service and recreational needs of coastal visitors, boat users, and coastal residents seeking recreation;
2. Are active and pedestrian-oriented while meeting the need for safe and efficient automobile access and parking;
3. Have a balanced diversity of uses providing for both public and commercial recreational facilities;
4. Provide regional-serving recreational facilities for all income groups by including general commercial and recreational use categories;
5. Provide public access to nearby coastal areas; and
6. Protect coastal resources.

C. Strengthen the city's economic base, and provide employment opportunities close to home for residents of the City.

(Ord. 2756 c.s., eff. January 18, 1996)

10-2.810 Land use regulations: CC-1, CC-2, CC-3, CC-4, CC-5, CC-6, and CC-7 Coastal Commercial zones.

The following schedule designates use classifications permitted in the specified coastal commercial zones. All use classifications in the coastal commercial zones are subject to approval of a Conditional Use Permit, as provided in Section 10-2.2506. Where there is not a "C" indicated under a specified zone, or where a use classification is not listed, that classification is not permitted. The "Additional Regulations" column references regulations located elsewhere in the Municipal Code.

USE CLASSIFICATIONS	CC-1	CC-2	CC-3	CC-4	CC-5	CC-6	CC-7	Additional Regulations See Section:
COMMERCIAL USES								
Bars and cocktail lounges	C	C	C	C	C	C	—	10-2.1600
Commercial recreation	C	C	C	C	C	C	—	10-2.1600
Food and beverage sales	C	C	C	C	C	C	—	
Hotels and motels	—	—	—	C	C	C	—	
Marinas	C	—	—	C	C	C	C	
Marina-related facilities:								
Boating facilities	C	—	—	C	C	C	C	
Marine sales and services	C	C	C	C	C	C	C	
Yacht and boating clubs	—	—	—	C	C	C	—	
Offices	—	C	C	C	C	C	—	10-2.811
Personal convenience services	C	C	C	C	C	C	—	
Personal improvement services	—	—	C	C	C	C	—	
Restaurants	C	C	C	C	C	C	—	
Retail sales	C	C	C	C	C	C	—	
Snack shops	C	C	C	C	C	C	—	
OTHER USES								
Cultural institutions	C	C	C	C	C	C	C	
Government offices	C	C	C	—	—	—	—	10-2.811
Parking lots	—	—	C	C	C	C	—	
Public safety facilities	C	C	C	C	C	C	C	
Public utility facilities	C	C	C	C	C	C	C	10-2.1614
Recreation facilities	C	C	C	C	C	C	C	

(Ord. 2756 c.s., eff. January 18, 1996)

10-2.811 Additional land use regulations, CC Coastal Commercial zones.

A. **Offices.**

1. **CC-2 zone.** Ground floor offices are prohibited.

2. **CC-4, CC-5, and CC-6 zones.** Offices are prohibited, except where the office is solely for the administration of a master lease.

(Ord. 2756 c.s., eff. January 18, 1996)

10-2.815 Development standards: CC-4 Coastal Commercial zone.

A. **Floor area ratio.** (See definition of floor area ratio in Section 10-2.402)

1. Cumulative development on the entire master leasehold area within the CC-1, CC-3, CC-4, CC-5, and CC-6 zones is limited to a maximum floor area ratio of 0.35. The floor area ratio on individual parcels or leasehold areas within these zones shall be subject to a Conditional Use Permit (pursuant to Section 10-2.2506), and consistent with the Harbor/Civic Center Specific Plan.

B. **Building height.** No building or structure shall exceed a height of 38 feet, except for vested developments approved prior to May 26, 1992 (see definition of building height in Section 10-2.402).

C. **Stories.** No building shall exceed two (2) stories, except for vested developments approved prior to May 26, 1992 (see definition of story in Section 10-2.402).

D. **Setbacks.**

1. There shall be a minimum setback of 15 feet from Harbor Drive.

2. New structures shall be located in close proximity to the western edge of the bulkhead, unless deemed infeasible or inappropriate pursuant to the applicable review process, to limit the potential for large expanses of asphalt and surface parking areas to be located close to the water's edge. This shall not be interpreted to reduce requirements for the dedication and construction of public walkways along the waterside perimeter.

E. **Minor additions or alterations.** Minor additions or alterations to existing structures which do not result in a cumulative increase in the gross floor area of more than five (5) percent or 500 square feet, whichever is less, within any five (5) year period may be approved by the Harbor Director provided the addition or alteration is architecturally compatible with the existing structure and does not result in the net loss of any parking spaces or create a deficiency with respect to required parking spaces. The Harbor Director may decline to make a decision on such minor addition or alteration in which case the applicant may apply for a Conditional Use Permit and/or Harbor Commission Review, as applicable.

F. **Architectural design.** The architectural design of buildings shall be consistent with the Harbor/Civic Center Specific Plan.

G. **Public walkways.** Public walkways are required adjacent to the water's edge in conjunction with new construction or major rehabilitation (defined as reconstruction with a total cost of 51 percent or more of the pre-rehabilitation building value).

H. **Undergrounding of utilities.** All utilities shall be located underground, unless determined by the Building Official to be infeasible. Any utilities that must be located above ground shall be screened or buffered with appropriate landscaping or design features to decrease the adverse aesthetic impacts.

I. **Parking.** The parking provisions of Article 5 of this chapter shall apply, except that an allowance for overlapping the parking requirements of activities having non-simultaneous usage peaks may be permitted pursuant to Harbor Commission Review.

J. **General regulations.** See Article 3 of this chapter.

K. **Sign regulations.** See Article 6 of this chapter.

L. **Landscaping regulations.** See Article 7 of this chapter.

M. **Procedures.** See Article 12 of this chapter.

(Ord. 2756 c.s., eff. January 18, 1996)

10-2.816 Development standards: CC-5 Coastal Commercial zone.

A. **Floor area ratio.** (See definition of floor area ratio in Section 10-2.402).

1. Cumulative development on the entire master leasehold area within the CC-1, CC-3, CC-4, CC-5, and CC-6 zones is limited to a maximum floor area ratio of 0.35. The floor area ratio on individual parcels or leasehold areas within these zones shall be subject to a Conditional Use Permit (pursuant to Section 10-2.2506), and consistent with the Harbor/Civic Center Specific Plan.

ATTACHMENT 13

Oil Wells Redondo Beach is situated in one of the areas of the Los Angeles Basin where significant oil deposits and supplies are located. The City has entered into long-term agreements whereby these petroleum deposits can be safely extracted, transported, and used for commercial purposes. The State's Comprehensive Ocean Area Plan has developed policies relative to these activities through the State of California Division of Oil and Gas

> "To so supervise oil operations as to prevent damage to the resource, fresh waters, life, health, property, and natural resources. The Division of Oil & Gas is charged with ameliorating subsidence of land overlying or adjacent to oil or gas fields when such land is threatened by inundation by the sea."

Locations in the City of Redondo Beach where working oil wells are located must be given maximum protection from the effects of these operations with respect to visual appearance, safety, spillage, odor, and noise. These areas are all located in the southerly part of the City, in the five following locations.

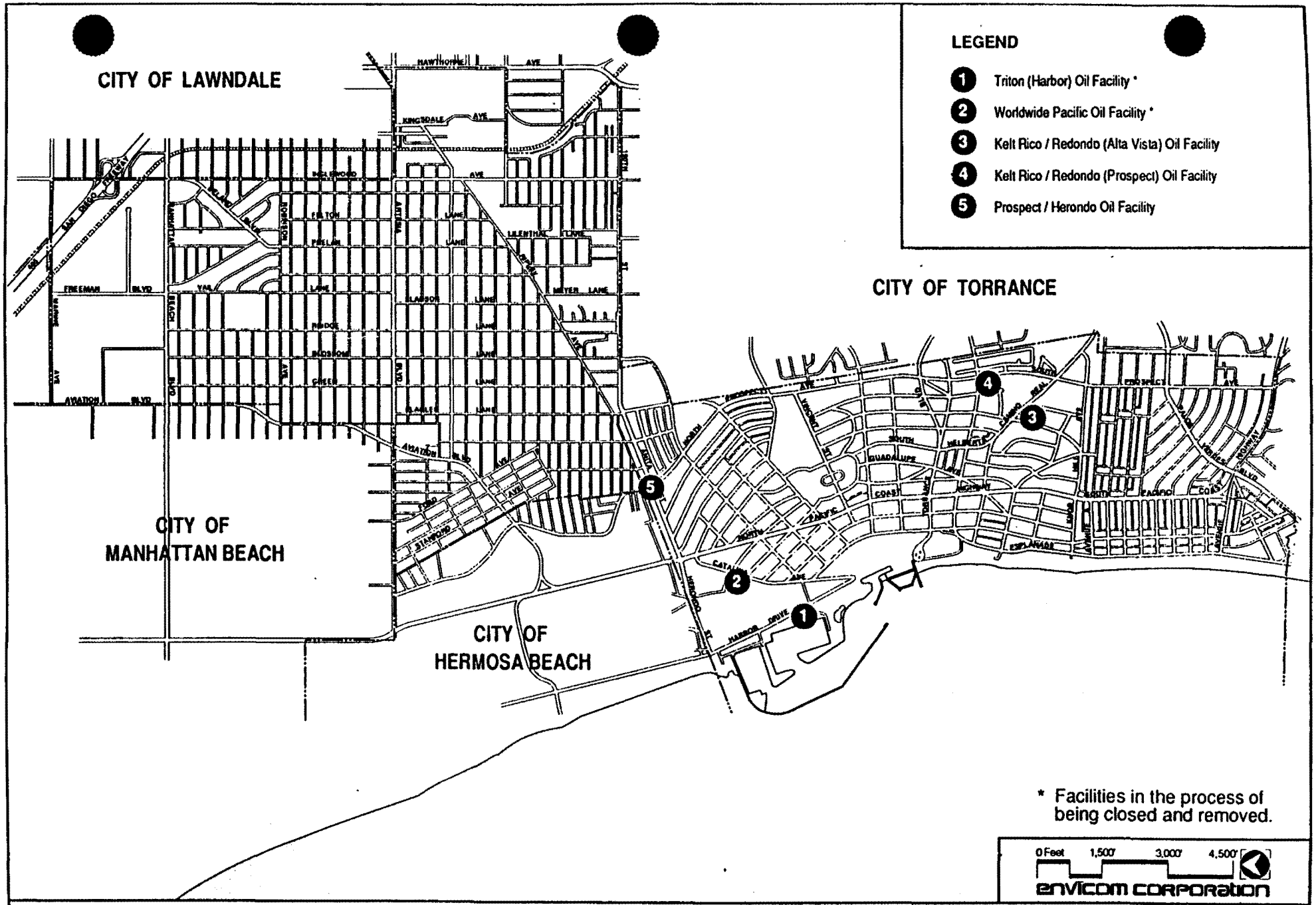
The facilities and locations, all in South Redondo Beach, are: 1) the Triton (Harbor) oil pumping facility, located at the southwestern intersection of Beryl Street and Portofino Way; 2) the Worldwide Pacific Oil oil separation facility, located due southeast of the intersection of Francisca Avenue and North Gertruda Avenue; 3) the Kelt/Rico Redondo (Alta Vista) oil pumping facility, located near the southeastern intersection of Camino Real and Juanita Avenue within Alta Vista Park; 4) the Kelt/Rico Redondo (Prospect) oil pumping facility, located at the southwestern intersection of North Prospect Avenue and Pearl Street; and 5) the Prospect/Anita oil pumping facility, located due west of North Prospect Avenue north of Anita Street. The general locations of these oil facilities in the community are noted (Figure 25). The State of California's specific policies regarding oil and gas extraction have a direct application to Redondo Beach. These are that:

a. Maximum recovery of oil and gas shall be encouraged through various methods of secondary recovery and unit agreements.

b. Environmental protection must be afforded all parts of the community. These include scenic values and damage due to oil and gas extraction operations.

c. Multiple and sequential uses of land should be encouraged by well spacing, unit agreements, and abandonment of wells no longer capable of economic production.

Of all the locations of oil drilling sites in the community, the tank battery and well sites adjacent to King Harbor are the most exposed to public view and the most incompatible with adjoining land uses. Continuing efforts must be made at these locations to make their operations more compatible with continuing urban development occurring in these areas.



EXISTING LOCAL OIL WELL / FACILITY LOCATIONS

FIGURE 25

ATTACHMENT 14

I.

INTRODUCTION

Edison has voluntarily decided to divest by auction all of its gas-fired generation facilities, consisting of twelve stations in Southern California. Edison views this decision as a major step in the transformation of the electric utility industry in California, as well as the transformation of Edison's own business structure. Neither Edison International nor any of its subsidiaries will bid to purchase these facilities.

Edison has commenced the divestiture process on the basis of certain clear understandings, embodied in the Commission's Restructuring Policy Decision[1] and Assembly Bill (AB) 1890: (1) Edison will have a fair opportunity to fully recover the costs associated with Commission approved generation-related assets and obligations, and (2) Edison will be given a fair opportunity to compete on a level playing field in the new market structure. Edison reserves the right to withdraw its divestiture Application and to discontinue its divestiture if, in its judgment, the overall restructuring process does not continue on a satisfactory path toward these objectives and the other key principles reflected in the Restructuring Policy Decision and AB 1890.

Edison believes that the Commission should approve this Application as an integral part of the restructuring effort for a number of reasons, which are discussed below.

A. Divestiture Of The Gas-Fired Stations Will Promote Competition

The Commission should support Edison's voluntary decision to divest Edison's gas-fired generation stations. Divestiture of these facilities will increase competition in the new market structure. As a result of divestiture, Edison's gas-fired generation stations will be owned by unaffiliated parties, potentially including parties who otherwise might not own generation assets in the California market. Edison has structured its divestiture process to advance this objective. As described more fully below and in Exhibit SCE-3,

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[1] D. 95-12-063, as modified by D. 96-01-009.

I. INTRODUCTION

Edison will auction its twelve generation stations in four bundles. No bidder will be allowed to purchase more than two of these four bundles of Edison's gas-fired generation capacity. This approach will substantially promote the Commission's objective of decreasing market concentration and increasing competition. Attempting to decrease market concentration even further -- for example, by prohibiting any entity from purchasing more than one generation facility -- would be unnecessary and would threaten other objectives, such as price maximization, speed of sale, and minimization of regulatory proceedings.[2/] Accordingly, the Commission should support Edison's decision to divest these facilities.

B. Edison's Selection Of An Auction As A Divestiture Method Is Reasonable

Once Edison decided to divest its gas-fired generation facilities, it considered alternative methods of divestiture. The three methods primarily considered were sale by auction, spin-off, and negotiated sale. Each of these methods has certain advantages, and Edison considers each of them to be reasonable alternatives. Edison has concluded, however, that an auction is the preferred method for divesting these facilities at this time.

As compared to a spin-off, an auction is more likely to produce an accurate and certain measure of the market value of the generation stations themselves. A spin, even if viable, would require a complex analysis to segregate the portion of the market value of the spun company attributable to the generation assets from the value attributable to other factors extrinsic to the assets themselves, such as actions taken by the spun company's management. In addition, an auction seems more likely to maximize the value of the generation facilities than a spin, primarily because the purchaser of the assets can control their use (which should lead purchasers to pay a "control premium").

Edison also concluded that an auction was preferable to a negotiated sale for these generation stations. In some contexts, a negotiated sale with one or a small number of

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2/ See Exhibit SCE-3 for a further explanation of Edison's decision to sell the plants in four bundles.

BEFORE THE PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA

In the Matter of the Application of SOUTHERN CALIFORNIA EDISON COMPANY (U 338-E) for Authority to Sell Gas-Fired Electrical Generation Facilities.	)))))	Application No. 96-11-___

APPLICATION OF SOUTHERN CALIFORNIA EDISON COMPANY (U 338-E) FOR AUTHORITY TO SELL GAS-FIRED ELECTRICAL GENERATION FACILITIES

I.

INTRODUCTION

Pursuant to section 851 of the California Public Utilities Code (PU Code), Southern California Edison Company (Edison) respectfully requests an order from the California Public Utilities Commission (Commission) that authorizes Edison to sell, through an auction process, all twelve of its gas-fired electrical generation stations. Edison seeks authorization to accomplish this divestiture in accordance with the terms and conditions contained in the Description of the Proposed Auction Process and the Terms and Conditions of Sale and Proposed Sales Contract, submitted as Exhibits SCE-3 and SCE-4, respectively, to this Application, and in the other Exhibits to this Application.

I.

INTRODUCTION

This testimony provides a detailed description of the assets being divested, as well as a brief description of significant assets at each facility that are being retained by Edison. Assets described as being retained may nevertheless involve changes in title as described elsewhere in this testimony.

Edison's gas-fired stations have various types and sizes of power generating units, including conventional drum type units, conventional once-through type units and gas turbine type units. All but one of the units utilize gas fuel as their primary fuel source and have back-up fuel oil or distillate burning capability (depending on unit type) that is intended to be employed only in emergency situations. The type of cooling water system at each station varies, with some stations having channel-fed cooling systems, others having ocean intake/outfall systems and still others having cooling tower systems. A number of the stations have state-of-the-art Selective Catalytic Reduction Systems (SCRS) to control air emissions. The total dependable summer operating capacity of the gas-fired stations being divested is 9562 MW.[1] The dependable summer capacity of each station, and the estimated net book value and original cost of the assets to be sold are presented in the following Table.

[1] Dependable operating capacity as used herein represents the capacity that may be available for system use from the individual resources listed, under favorable conditions. Where common facilities are shared between units, capacity ratings are based on Edison's operating experience and exclude capacity associated with auxiliary and house turbine-generators, and emergency engine-generators. The "summer" period is June through September. The "winter" period is October through May. The total dependable winter operating capacity of the gas-fired stations being divested is 9678 MW.

LEGEND:

ROAD EASEMENT TO CITY OF REDONDO BEACH PER SCE DOC. NO. 294459

(2) PUMPING PLANT EASEMENT TO SOUTH BAY CITIES SANITATION DISTRICT OF LOS LOS ANGELES PER SCE DOC. NO. 294673

(3) LICENSE TO CALIFORNIA WATER SERVICE COMPANY PER SCE DOC. NO. 112703

(4) AN AGREEMENT TO MAINTAIN & OPERATE A SPUR TRACK PER SCE DOC. NO. 107588

(5) LICENSE TO SOUTHERN CALIFORNIA GAS COMPANY PER SCE DOC. NO. 278029

(6) LICENSE TO TRITON OIL & GAS CORP. PER RP FILE NO. P58W036-4-44 (LICENSE TERMINATED & PIPELINE NEVER REMOVED)

(7) LICENSE TO GANNETT OUTDOOR COMPANY OF SOUTHERN CALIFORNIA PER RP FILE NO. P58W045-4-44

(8) LICENSE TO THE SALVATION ARMY PER RP FILE NO. P58W024-4-44

(9) QUIT CLAIM (UNDERGROUND TUNNELS & PIPELINES) TO CITY OF REDONDO BEACH PER SCE DOC. NO. 64027

(10) EASEMENT (TEL. GAS WATER) TO CITY OF REDONDO BEACH PER SCE DOC. NO. 190279

(11) PENDING LICENSE TO CITY OF REDONDO BEACH FOR ST. LIGHTS, BICYCLE PATH AND LANDSCAPING, PREVIOUSLY LICENSED UNDER DOC. 378295, FILE NO. P75W041-4-44

(12) RIGHT TO DRILL & MAINTAIN PER SCE DOC. NO. 448450, ITEM #3

(13) WATER PIPELINE EASEMENT TO CALIFORNIA SERVICE PER SCE DOC. NO. 448450, ITEM #4

(14) OIL & GAS LEASE TO AMERICAN PACIFIC INTERNATIONAL PER SCE DOC. NO. 448450, ITEM #5

(15) ROAD EASEMENT TO CITY OF REDONDO BEACH PER SCE DOC. NO. 448481, ITEM #5

(16) FACILITIES EASEMENT PER SCE DOC. NO. 448481, ITEM #4

(17) LICENSE TO SOUTHERN CALIFORNIA GAS COMPANY PER SCE DOC. NO. 265263 (LOCATION OF EXTENSION TO GENERATION STATION IS NOT KNOWN)

(18) LICENSE TO PETRO LEWIS CORPORATION PER SCE DOC. NO. 105588 (LOCATION OF EXTENSION TO GENERATION STATION IS NOT KNOWN)

(19) LICENSE TO SOCONY MOBIL OIL COMPANY PER SCE DOC. NO. 108888 (LOCATION OF EXTENSION TO GENERATION STATION IS NOT KNOWN)

(20) EDISON LEASE AREA PER SCE DOC. NO. 90588

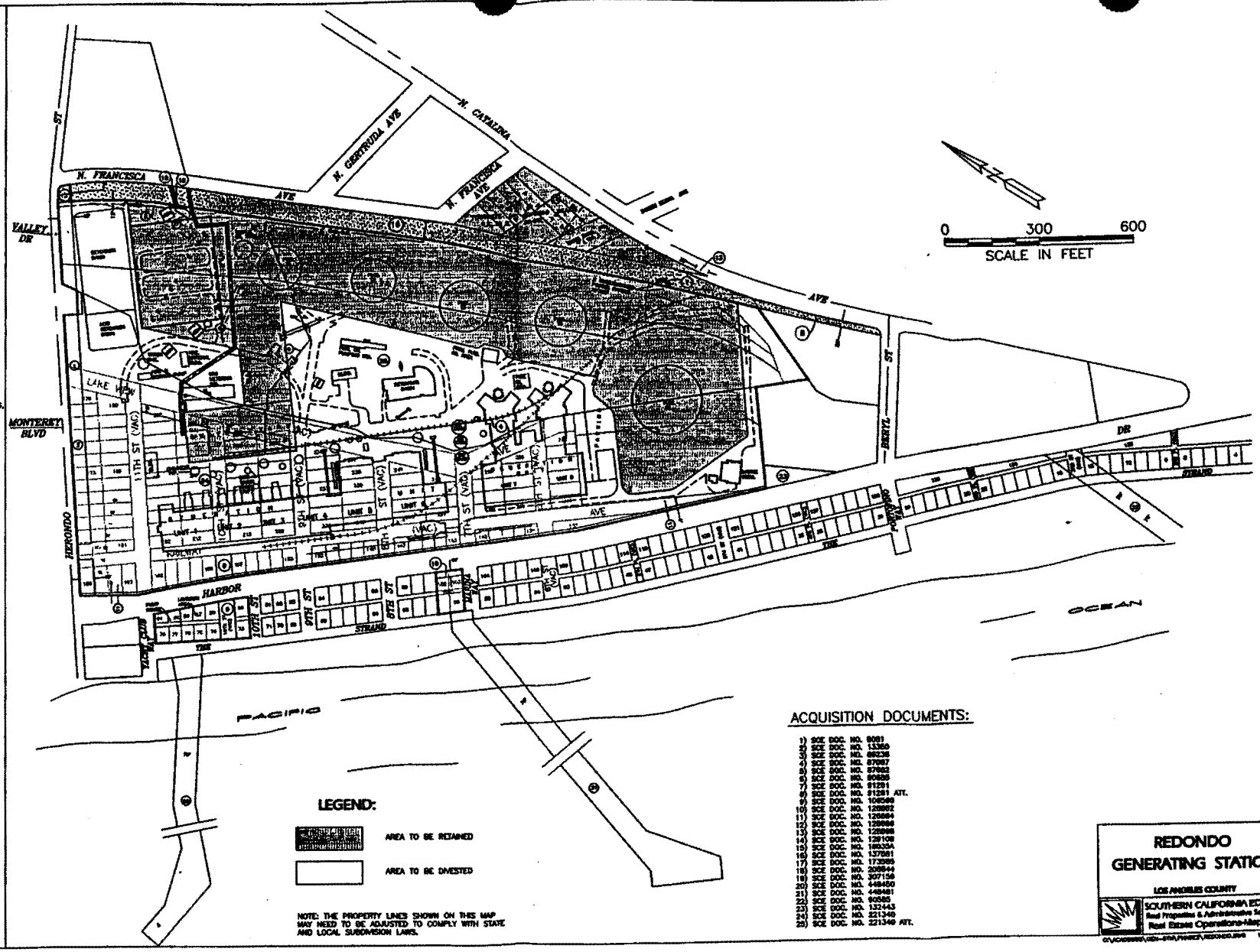
(21) EDISON LEASE AREA PER SCE DOC. NO. 132443

(22) EDISON LEASE AREA PER SCE DOC. NO. 221340

CONSENT TO ENCROACHMENT FOR IMPROVEMENTS TO SUNRISE-HARBOR LTD PER SCE DOC. NO. 221340 ATT.

(24) USE PERMIT (OIL STORAGE) FROM CITY OF REDONDO BEACH PER SCE DOC. NO. 104618

(25) USE PERMIT (OIL STORAGE) FROM CITY OF REDONDO BEACH PER SCE DOC. NO. 104617



damage. Developing a project with a significant risk factor necessitates a greater return on the investment.

18. Please map the range of alternatives by using the City's certified land use plan map overlain with an arc representing the technical reach of directional drilling.

Response:

See plan prepared by Paul Hacker, project geologist entitled "Alternate Drill Sites, Undrained Reserves."

19. Please provide us with the proportion of the reserves that you believe must be recovered for this project to be financially feasible. Please explain the economic justification for your conclusion.

Response:

The drilling for oil and gas under any situation has an element of risk. While it is believed that substantial quantities of oil are contained in the Hermosa Beach Tidelands, until a well or wells are drilled that test this area, any estimate made before drilling must be tempered by some uncertainty. No responsible operator would drill a well based on economics of a minimum return for the cost of the well. There must be incorporated in the economics a "risk factor".

If an operator was assured that a well, if drilled, would ultimately produce enough oil to pay for the cost of the well and its operation, plus a small percentage base on the cost of money involved, the well might be justified but probably would never be drilled because of the inherent risk factor.

Based on studies, in turn based on judgement, an analysis of the potential production would seem to show that the minimal production of fifteen million (15,000,000) barrels would pay for the cost of drilling and producing the necessary wells to recover such amount of oil with a 30% return on investment. This estimate assumes no drilling problems, no risk factors and that the oil is producible.

Submitted herewith is a Property Cash Flow Analysis for the Hermosa Beach Oil Development Project.

Oil Spills

20. The project's Oil Spill Contingency Plan (OSCP) acknowledges that the most significant potential accident associated with well drilling is a blowout. The plan concludes, however, that there is "virtually no possibility" that drilling or well-

EXHIBIT NO. 15
APPLICATION NO.
E-96-28
Macpherson Oil

EXHIBIT NO. 16
APPLICATION NO.
E-96-28
Macpherson Oil

DAVID E. GAUTSCHY, INC.
PETROLEUM CONSULTING SERVICE
7122 BLUESAILS DRIVE
HUNTINGTON BEACH, CALIFORNIA 92647
(562) 427-0419 FAX 427-6129

November 18, 1997

Ms. Alison Dettmer
Supervisor
Energy and Ocean Resources Unit
California Coastal Commission
45 Fremont, Suite 2000
San Francisco, California 94105-2219

RE: Hermosa Beach Oil Development Project
Coastal Development Permit Application No. E. 96-28

Dear Ms. Dettmer:

This letter is written to confirm Macpherson Oil Company's proposed actions with regard to levels of hydrogen sulfide (H_2S) that might be encountered in the production stream of the Hermosa Beach Project. Given that, the project will not require hydrogen sulfide treatment vessels, and our air quality permits allow up to a maximum of 40 ppm of hydrogen sulfide in the produced gas, (a level well below concentrations that would pose a health risk); and Edison can accept our produced gas, Macpherson Oil Company establishes the following policies for the handling of H_2S in the production stream by the Hermosa Beach Project:

1) Any production well found to contain H_2S in excess of 40 ppm in the casing gas will be shut-in (master valves sealed shut), recompleted in a zone with less than 40 ppm, or abandoned according to the regulations of the State Division of Oil, Gas and Geothermal Resources.

2) The "Hydrogen Sulfide Contingency Plan for The Hermosa Beach Oil Development Project" (HSCP), dated May 23, 1997, as previously submitted, is established as the policy standard to be followed if H_2S is encountered in the production flow stream.

3) In addition to the detection and monitoring program established in the HSCP, Macpherson Oil Company will test the casing gas stream from each individual production well to determine the H_2S content. They will conduct tests on initial production startup of the well and monthly thereafter. Macpherson Oil Company will document and maintain the results of H2S testing of each well at the production facility.

4) No hydrogen sulfide treatment vessels (SufaTreat system), will be installed at the site for the purpose of reducing H_2S content in the produced sales gas. If it becomes necessary in the future to further reduce the H_2S content in the produced sales gas, Macpherson Oil Company understands the need to obtain project modification approvals and further environmental review as may be required.

In response to the Commission staff's concern regarding the maximum permitted level of hydrogen sulfide that can be burned in a thermal oxidizer or the maximum level that can be sold to Southern California Edison, please note the following:

1) The "Permits to Construct", issued by the South Coast Air Quality Management District, Application No(s). 306269 and 306275 require Macpherson Oil Company to comply with rule #431.1.

2) Rule #431.1 (c) (3) Other Gaseous fuels, reads as follows:

   "On or after the applicable compliance dates specified in Table 1, a person shall not burn, purchase, sell or offer for sale for use in the jurisdiction of the District, any gaseous fuel containing sulfur compounds calculated as ppmv hydrogen sulfide, in excess of the concentration limits as measured over the averaging periods for various gaseous fuels as specified in Table 1."

   Table 1 establishes the sulfur limits at 40 ppmv, averaged over 4-hours and that compliance must be on or after May 4, 1996.

   This information can be confirmed by Mr. John T. Yee, District Engineer, South Coast Air Quality Management District at (909) 396-2531.

Please call me at (562) 427-0419 if you have any questions about this information.

Sincerely,

David E. Gautschy
Project Manager

cc Donald Macpherson, Jr.
Maria Pracher

STATE OF CALIFORNIA PETE WILSON, *Governor*

CALIFORNIA STATE LANDS COMMISSION
MINERAL RESOURCES MANAGEMENT DIVISION
200 Oceangate, 12th Floor
Long Beach, CA 90802-4331

PAUL B. MOUNT II, *Chief*

Contact Phone: (562) 590-5205
Contact FAX: (562) 590-5210

California Relay Service From TDD Phone 1-800-735-2922
Voice Phone 1-800-735-2929

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DEC 03 1997
CALIFORNIA
COASTAL COMMISSION

December 3, 1997

File Ref: W40015

EXHIBIT NO. 17
APPLICATION NO.
E-96-28
Macpherson Oil

Ms. Susan Hansch
California Coastal Commission
45 Fremont, Suite 2000
San Francisco, CA 94105-2219

Subject: Mapherson/Hermosa Beach Oil Development Project

Dear Ms. Hansch:

I have had an opportunity to review your letter of November 14, to Donald R. Macpherson, Jr., concerning the discussion in our October 17, 1997 meeting. I agree with you about the difficulty of correctly restating the substance of such a roundtable discussion. In any event, it is clear from your letter that we did not adequately convey to you our technical conclusions concerning the potential for elevated levels of H_2S in the production stream of the contemplated Hermosa Beach project.

It is our opinion that there is no reasonable basis for a concern that any Macpherson/Hermosa Beach project well will produce a dangerously high concentration of H_2S. The best available evidence of the "native" reservoir H_2S concentration is the laboratory analysis of the Marble #102 well, which reflected 6 ppm H_2S. Such concentrations of H_2S unquestionably present no public health hazard.

Given the existing operating constraints and monitoring requirements of the City's use permit, and with the additional project oversight of the staff of the State Lands Commission, it is improbable the reservoir H_2S concentrations will ever be significantly increased throughout the duration of the Hermosa Beach project. It is a technical certainty that any potential increase in reservoir H_2S from native concentrations in the 6-10 ppm range to a level presenting any public health hazard would of necessity be extremely gradual, over a period of years. In any case, because of the operating constraints and monitoring requirements of the City's use permit,and with the additional project oversight of the staff of the State Lands Commission, any such potential increase in H_2S concentrations would be detected and required corrective action could be taken (including the abandonment of an offending well, if necessary) long before H_2S concentrations presented such a hazard.

The other technical discussion in your letter make reference to a potential for the Hermosa Beach project wells to produce high levels of H_2S due to reservoir fluid migration. H_2S has been found to exist in elevated concentrations (as high as 5,000 ppm) in production from wells in the southerly portions of the previously produced, and now abandoned, Redondo Beach portion of this field. This increase over "native" H_2S levels was caused by improper operation of just the type that the use permit conditions and State Lands Commission oversight are designed to prevent. Increased H_2S levels in the southerly portion of the Redondo Beach area were found near the end of the 34-year productive life of those wells.

The State Lands Commission, in its approval of the Hermosa Beach project lease found that the operation of the Redondo Beach wells over that period of time had created an area of low pressure in the Redondo Beach portion of the field relative to the Hermosa Beach portion of the field, to the north. This reservoir pressure differential results in the gradual movement of fluids, including oil, from the higher pressure area in the north to the area of lower pressure in the south. Such migration or movement of oil is often referred to as "drainage" when the oil crosses property lines. The State Lands Commission, in approving Hermosa Beach project lease, found that the Hermosa Beach portion of the field was being drained as a result of the Redondo Beach operations.

This drainage determination and the conclusion, in your words, is a "hydraulic connection between" the Redondo Beach and Hermosa Beach portions of this field do not make certain that the Hermosa Beach project will either initially or ultimately result in the production of the elevated H_2S concentrations now in place in and around one or more wells in the southern portions of the Redondo Beach area. In the first place, the pressure gradient is the wrong way. The relatively lower pressure created in the Redondo Beach portion of the field by over 30 years of operations is not going to be instantaneously equalized by the completion of the Hermosa Beach wells.

Only after years, if at all, will the operation of Hermosa Beach wells begin to restore the reservoir pressure to equilibrium.

Even if extended operation of the Hermosa Beach wells resulted in a reversal of the existing pressure differential, the offending liquid would have to travel a distance of hundreds of yards and up to a mile or more, to the extreme, commingling with virgin reservoir liquids before it is produced. The time involved would be years. Even assuming that the offending fluids in question would migrate across the boundary, the mixing action in that movement would blend or distribute such highly localized elevated H_2S concentrations throughout the reservoir fluid resulting in well effluents in Hermosa Beach that should be more or less typical of the native production.

All of the Redondo Beach wells have been abandoned as uneconomic. This means that the portion of the Redondo Beach area between the southerly margin of Hermosa Beach and the elevated H_2S concentrations in the southerly portion of the Redondo Beach area no longer include economically recoverable reserves. From this we conclude that the Hermosa Beach wells might be abandoned as uneconomic long before they could draw to the north and produce the elevated H_2S concentrations that are now in place, approximately a mile distant, in the southerly portion of the Redondo Beach area of the field.

For these reasons, the staff of the State Lands Commission has concluded that there is no evidence to support a reasonable concern that the contemplated operations of the Hermosa Beach project will present a public health hazard associated with elevated H_2S concentrations.

Sincerely,

for Paul B. Mount II, P.E.
Chief, Mineral Resources Management Division

EXHIBIT NO. 18
APPLICATION NO.
E-96-28
Macpherson Oil

SUBSIDENCE MONITORING AND CONTROL PLAN PREPARED FOR THE CITY OF HERMOSA BEACH

Introduction:

It is generally accepted, that under certain geologic conditions, oil operations can cause surface subsidence above the oil reservoirs. It is also generally accepted that replacing the fluids that are withdrawn from the oil reservoirs will stop this subsidence. This replacement of reservoir fluids is generally done by injecting water into the reservoir.

The operational plan for the Hermosa Beach oil project contains a provision to set up a subsidence monitoring program prior to oil production. Any evidence of subsidence attributable to the oil operations will be immediately followed by water injection.

The basic monitoring plan consists of setting up a benchmark network covering the land area and pier above the prospective oil reservoirs. This network will be established prior to oil production and will be surveyed on an annual basis thereafter.

Since the current oil plan calls for injection wells to dispose of the produced water the surface elements for the water injection system will be operative in the event that subsidence is detected.

Subsidence Monitoring Plan:

The details of subsidence monitoring plan are as follows:

In order to properly detect and then monitor any possible subsidence it is necessary to set up a series of benchmarks that cover, where possible, the area above the oil reservoirs and to tie into adjacent stable areas including a stable benchmark. This network of benchmarks will be established as a base prior to oil production and then surveyed annually thereafter.

The attached map Exhibit A shows the location of these benchmarks, and their relationship to the prospective oil reservoirs below. As shown, these lines will incorporate many of the benchmarks recently set up by the Public Works Department.

The other benchmarks, set by the Public Works Department, will be monitored if it is warranted. Note that these benchmarks cover, and extend outside the limits of the prospective oil reservoirs except offshore, and there the pier points should be adequate.

These benchmarks will be surveyed by qualified land surveyors using First Order Class II specifications. This is generally considered to be with an accuracy of .02 to .05 feet (.24 inches to .6 inches) this is an accuracy more than adequate for the purpose of this system.

After all relative elevation survey data has been collected, from the various city, county, state, and federal agencies, it may be advisable to incorporate some additional benchmarks to tie into historic data. While not really necessary, this could possibly give a better insight into the historic stability of this area.

In addition to these surface measurement, selected wells will have the casing measured "on the hook". In other words, when the casing is run in the well, it will be measured accurately while standing in the derrick ready to be run into the well. These wells will establish a base for detecting compaction in the producing reservoirs by means of collar count surveys. This system was developed in Long Beach, and was successful in detecting compaction in the producing intervals. Exhibit D details this system, and some results in the Long Beach Wilmington Oil Field subsidence area.

It is not realistic to develop a full scale water injection program prior to the delineation of the oil pools. However, the monitoring system, and the fact that some water injection facilities will be installed will allow ample time to prevent any subsidence damage.

I believe this subsidence monitoring, and control plan satisfies the conditional use permit. It will safeguard the city against subsidence damages, and will satisfy the coastal zone commission requirements.

In my judgment, if this plan is properly followed, there will be no subsidence damages, nor any realistic liabilities created by oil related land settling.

Discussion:

In order to substantiate some of the facts stated above, and to elaborate on subsidence in general, the following discussion and appendix has been compiled.

Exhibit A is a map detailing where the lines of benchmarks will be located and the relationship to the prospective oil reservoirs. The exact position of the benchmarks in these lines will be determined after all available historical data and surveys have been collected.

Exhibit B outlines some of the many cases where experts have attributed subsidence to oil, and other operations. Of the two most important features, the strength of the overburden and the compaction of oil reservoirs, only the reservoir compaction, from pressure reduction, can be controlled. While nothing practical can be done to strengthen the overburden, or change the physical components of oil reservoirs, it is possible to eliminate the pressure reduction by replacing the fluid withdrawals with water injection.

The compaction in the reservoirs is caused by the pressure losses created by the volume of fluid produced. This volume of fluid can be oil, water, gas, or any combination of these. Replacing this volume with an equal amount of water will maintain the reservoir pressures, and eliminate any compaction in the oil zones.

Exhibit C is excerpts from some of the many articles and reports written on the Long Beach subsidence problems. This, and the following exhibit confirm the fact that water injection can stop, and prevent subsidence related to oil production.

Exhibit D further confirms the fact that water injection can prevent and stop oil production related subsidence. It also details the collar count logging system that was used to detect which reservoirs were compacting.

There have been law suits filed in Redondo Beach contending that the sinking of the breakwater in Redondo Beach was caused by the oil operations. We have been unable to obtain adequate data to ascertain if, and to what extent the subsidence was caused by the oil operation. The operations in Redondo were, from a subsidence standpoint, very different then those proposed for the Hermosa project.

1. Hermosa project will have a detailed subsidence monitoring program that will detect the first signs of sinkage and adequate water injection will be started immediately.

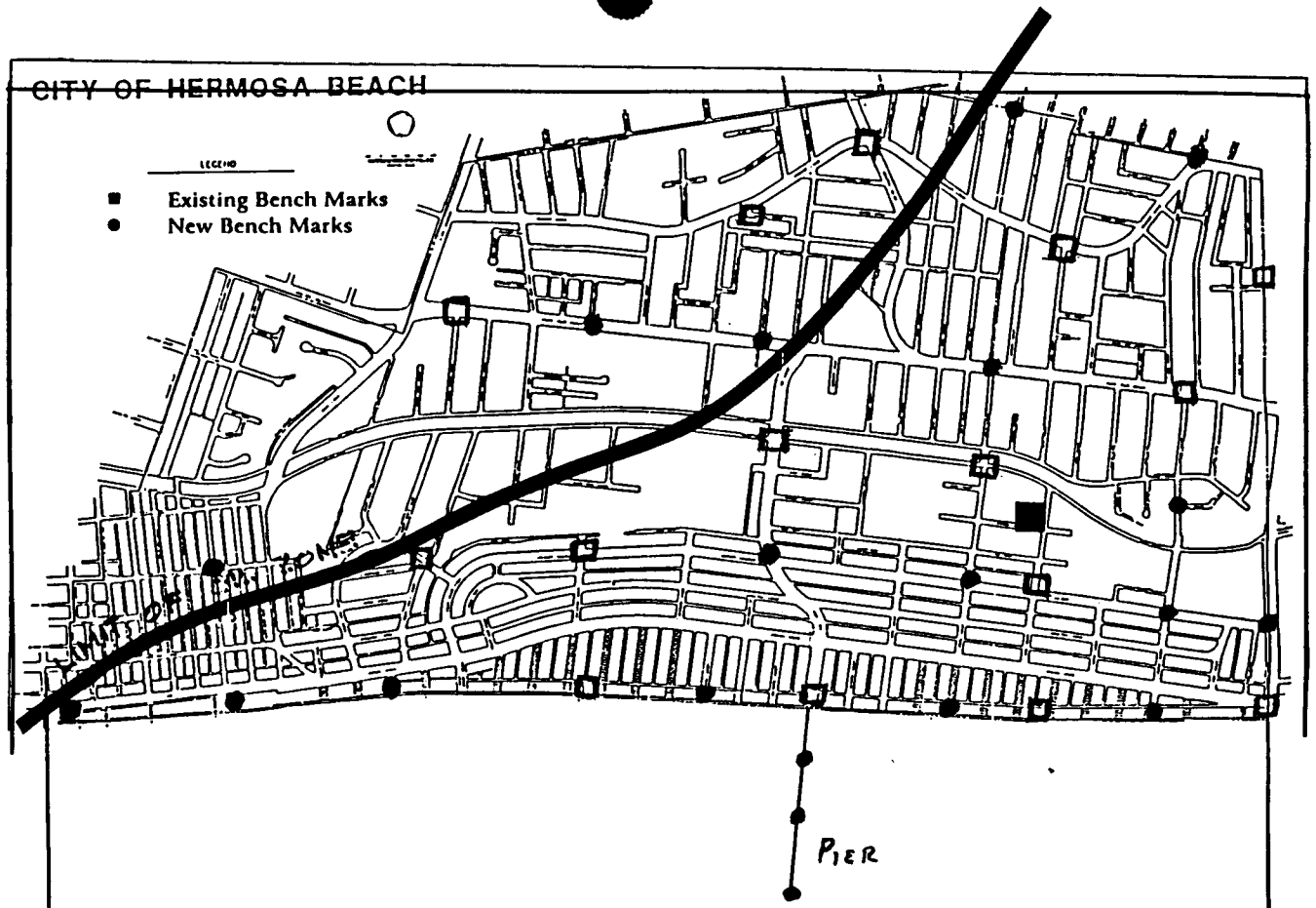
2. The operation in the Redondo Beach project disposed of the produced water at the surface. The Hermosa Beach plan calls for the injection of all produced water into the oil reservoirs.

   For most of the project life, in Redondo Beach, the water production was considerably larger than the oil production. As stated above, any subsidence due to oil operations is due to the volume of fluid withdrawal. In the Redondo Beach case, most of the subsidence, if due to the oil operations, would be from water production. In the Hermosa Project all produced water will be reinjected into the reservoirs.

3. The results of the water disposal program will be carefully monitored, and many of the factors required in designing a water flood such as well injection rates, pressures, water quality control, chemical treatment, and other pertinent items will have been ascertained. These data will be available if the shift to full scale water flooding is required.

   As stated above, any subsidence related to oil operations is caused the pressure reduction due to fluid withdrawals. Thus, in this Redondo case most of the subsidence, if due to those operations, would be due to water production. In Hermosa, the produced water will be returned to the reservoir eliminating this phase of the problem.

4. Although not directly related to the Redondo operation, the Hermosa project will start development in the offshore, and any possibility of subsidence should be detected on the pier and be corrected before any land settling reached the shoreline, or the City itself.



ONE MILE FROM MEAN HIGH TIDE

SUBSIDENCE MONITORING BENCHMARKS

EXHIBIT NO. 19
APPLICATION NO.
E-96-28
Macpherson Oil

PIPELINE DESCRIPTION

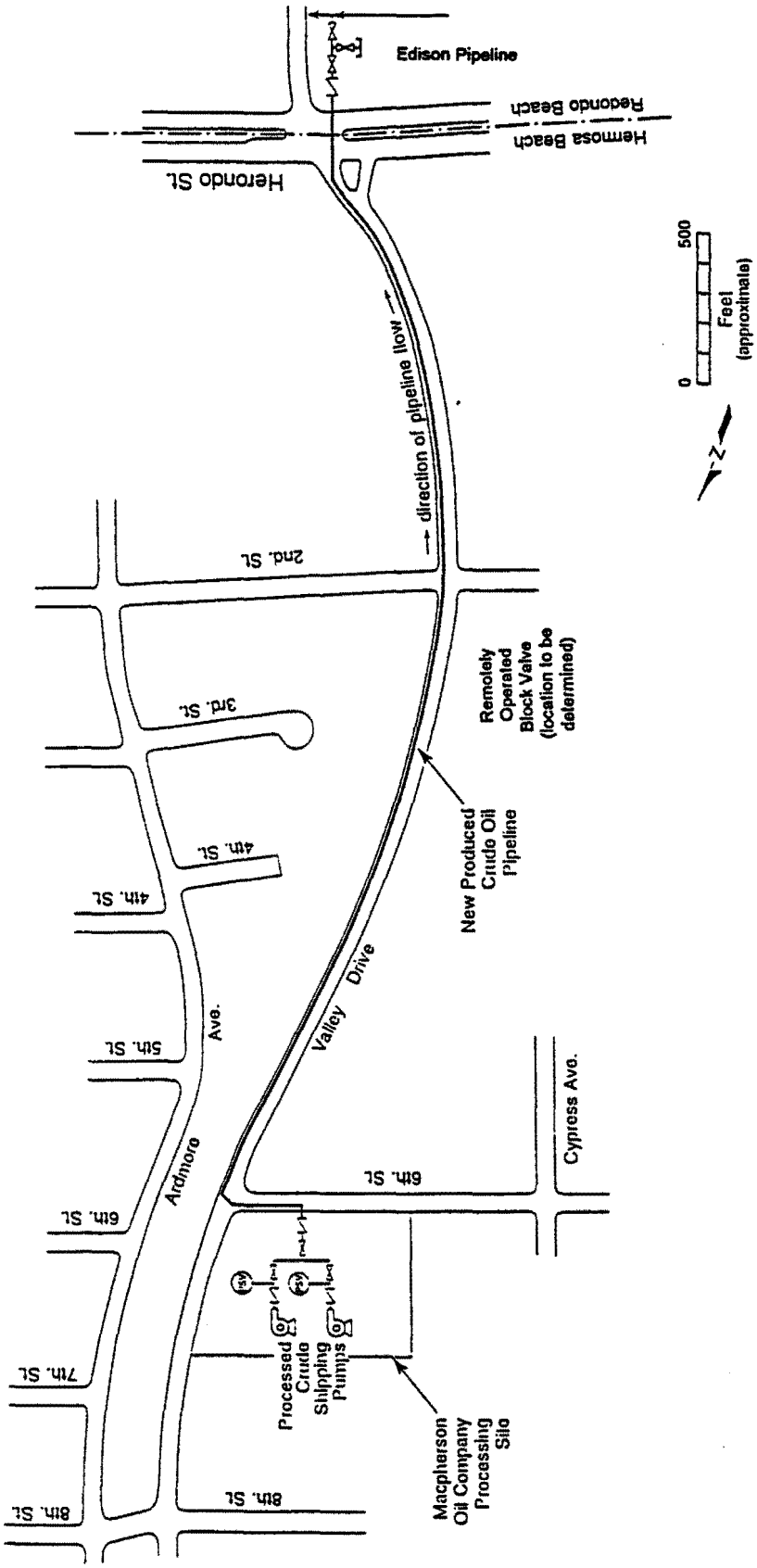
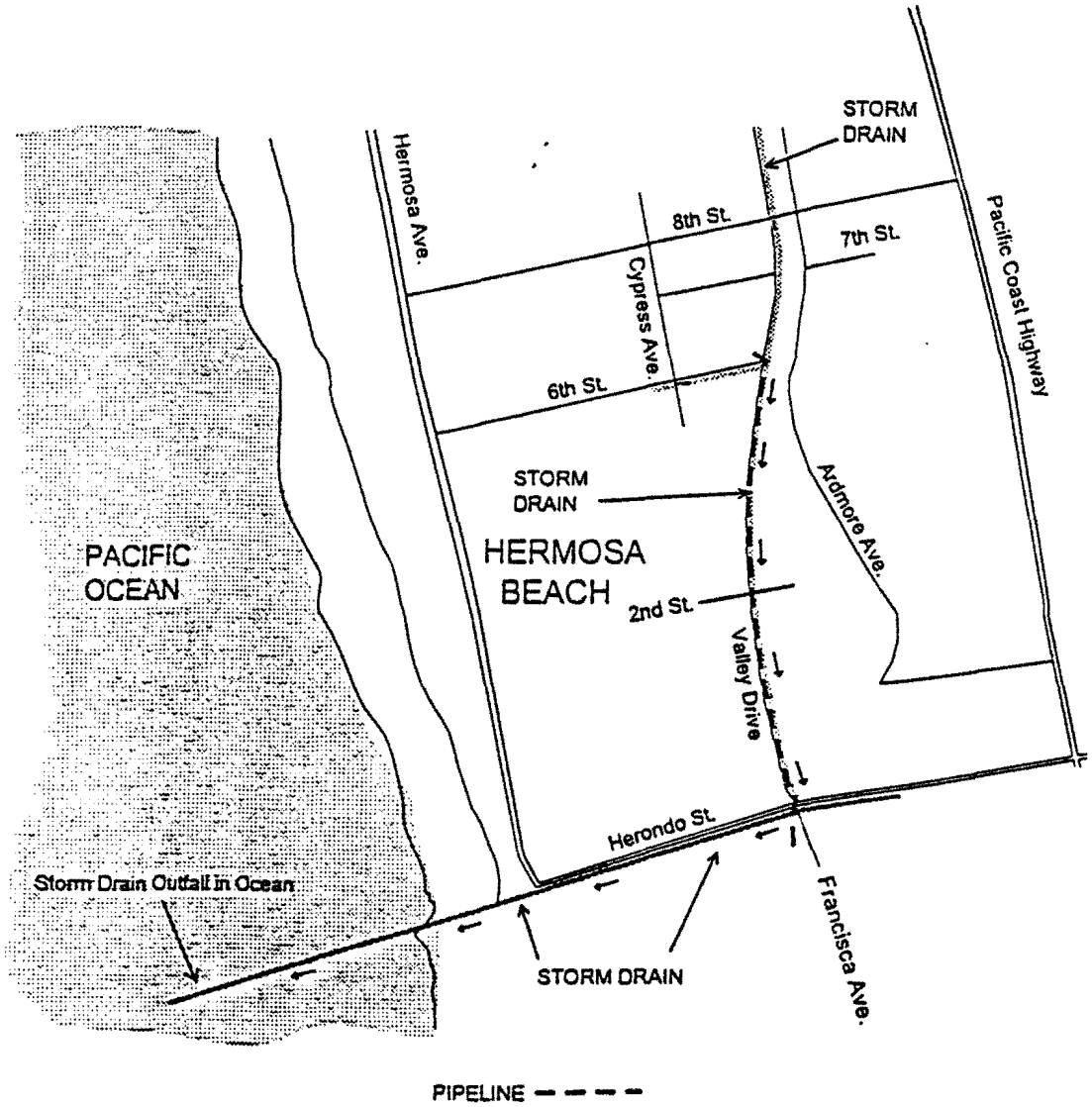


EXHIBIT NO. 20
APPLICATION NO.
E-96-28
Macpherson Oil

STORM DRAIN SYSTEM



MACPHERSON
OIL COMPANY
2716 OCEAN PARK BOULEVARD, SUITE 3080
SANTA MONICA, CALIFORNIA 90405
TEL 310 452 3880 FAX 310 452 0058

January 6, 1998

Mr. Steven Burrell, City Manager
City of Hermosa Beach
1315 Valley Drive
Hermosa Beach, California 90254

RE: Visual Resource Component of Coastal Resource Enhancement Fund

Dear Steve:

In response to the Coastal Commission staff's request that we supplement the Hermosa Beach Oil Development Project Coastal Resource Enhancement Fund, established by our letter agreement with you dated July 2, 1997, to include a provision for enhancing visual resources in open space areas in the City based on the limited and temporary visibility of the drilling and other rigs, we agree to the following:

In connection with the construction of the oil development project at the City Maintenance Yard site located at 55 - 6th Street, Hermosa Beach, California, as approved pursuant to Resolution No. 93-5632, Macpherson Oil Company agrees to contribute additional sums to the previously established Coastal Resource Enhancement Fund for the specific purpose of assisting the City in implementing landscaping and other visual enhancement activities for the Hermosa Greenbelt Improvement Project (CIP 96-508) approved by the City Council in December 1997. Macpherson Oil Company shall contribute to the Fund $1,000 per month, or a sum pro-rated based on the number of days per month, that any rigs are standing on the site for any reason.

Please confirm the City's willingness to administer these funds as described above by signing below.

Sincerely,

Donald R. Macpherson, Jr.
President
Macpherson Oil Company

DRMj/mt

Steven Burrell, City Manager
City of Hermosa Beach

Date: 1-8-98

EXHIBIT NO. 21
APPLICATION NO.
E-96-28
Macpherson Oil

RECEIVED
DEC 04 1997
CALIFORNIA
COASTAL COMMISSION

STATE LANDS COMMISSION
MINERAL RESOURCES MANAGEMENT DIVISION

MONTHLY INSPECTION
MACPHERSON OIL CO.
HERMOSA BEACH SITE

CALIFORNIA STATE LANDS COMMISSION
MINERAL RESOURCES MANAGEMENT DIVISION
200 Oceangate 12th Floor
Long Beach, California 90802
Telephone (562) 590-5201

HUNTINGTON BEACH FIELD OFFICE
1700 Pacific Coast Highway
Huntington Beach, California 92648
Telephone (714) 536-3018

EXHIBIT NO. 22
APPLICATION NO.
E-96-28
Macpherson Oil

State of California *State Lands Commission*

MONTHLY INSPECTION
DEFICIENCY SUMMARY

FACILITY: Hermosa Beach

Page: ____ of ____

OPERATOR: Macpherson Oil Co.

*INSPECTION DATE: _____

LEASE NO.: _____

*LAST INSPECTION: _____

DEFICIENCIES						
DEFIC. NO.	DEFIC. PAGE NO.	WELL NO. OR LOCATION	TYPE OF EQUIPMENT	TYPE OF DEFICIENCY	CORRECTION DATE	CORRECTIVE ACTION TAKEN

REMARKS: _____

OPER. SAFETY REPRESENTATIVE: _____

Date: _____

Copy Recieved: ☐ Yes ☐ No

SLC INSPECTOR: _____

Date: _____

* FOR STATE LANDS COMMISSION USE ONLY

Revised: 10/ 20/97

DEC-04-97 THU 03:07 PM SL LANDS FAX NO. 3023302210

State L[illegible] Commission

MONTHLY I[illegible]CTION
OIL SPILL RESPONSE EQUIPMENT

FACILITY: Hermosa Beach

Page: 1 of 12

OPERATOR: Macpherson Oil Co.

*INSPECTION DATE: _____

LEASE NO.: _____

*LAST INSPECTION: _____

STATION/LOCATION	TYPE OF EQUIPMENT	QUANTITY REQUIRED	QUANTITY AVAILABLE	INITIAL & DATE	INSP. APPD*
	Sorbent Boom				
	Sorbent Pads				
	Cellular Phone				
	Regular Phone Line				
	Fax Phone Line				

OIL SPILL RESPONSE DRILL: *LAST DRILL DATE - _____

*( ) SLC Drill
*( ) OSPR Drill
*( ) Company Drill
*( ) Table Top Drill

REMARKS: _____

OPER. SAFETY REPRESENTATIVE: _____

SLC INSPECTOR: _____

* FOR STATE LANDS COMMISSION USE ONLY

Revised:10/ 20/97

MONTHLY INSPECTION

PRODUCTION HANDLING and OTHER PROCESSING EQUIPMENT

FACILITY: Hermosa Beach

OPERATOR: Macpherson Oil Co.

*INSPECTION DATE: _____

LEASE NO.: _____

*LAST INSPECTION: _____

EQUIPMENT	LEVEL								PRESSURE								INITIAL & DATE	INSP. APPD*
	ALARM				SAFETY				ALARM				SAFETY					
	LOW		HIGH		LOW		HIGH		LOW		HIGH		LOW		HIGH			
	SET	TRIP	SET	TRIP	SET	TRIP	SET	TRIP	SET	TRIP	SET	TRIP	SET	TRIP	SET	TRIP		
Well Tester				X								X						
FWKO		X						X		X		X				X		
FWKO - INTERFACE		X		X														
GAS BOOT																		
T-1 WASH TANK		X		X		X		X										
T-2 WASH TANK		X		X		X		X										
T-3 WASH TANK		X		X		X		X										
T-4 STOCK TANK		X		X		X		X										
T-5 STOCK TANK		X		X		X		X										
T-6 STOCK TANK		X		X		X		X										

REMARKS: _____

OPER. SAFETY REPRESENTATIVE: _____

SLC INSPECTOR: _____

* FOR STATE LANDS COMMISSION USE ONLY

Revised:10/20/97

MONTHLY INSPECTION
PRODUCTION HANDLING and OTHER PROCESSING EQUIPMENT

FACILITY: Hermosa Beach

OPERATOR: Macpherson Oil Co.

*INSPECTION DATE: _____

LEASE NO.: _____

*LAST INSPECTION: _____

	LEVEL								PRESSURE									
	ALARM				SAFETY				ALARM				SAFETY					
	LOW		HIGH		LOW		HIGH		LOW		HIGH		LOW		HIGH		INITIAL	INSP.
EQUIPMENT	SET	TRIP	SET	TRIP	SET	TRIP	SET	TRIP	SET	TRIP	SET	TRIP	SET	TRIP	SET	TRIP	& DATE	APPD*
SKIM PIT		X		X				X										
GAS SCRUBBER				X				X				X				X		
DESULFURIZER				X				X								X		
WASTE GAS										X								
THERMAL OXIDIZER- BC-																		
- TC-																		
CITY SUPPLY GAS										X		X						

REMARKS: _____

OPER. SAFETY REPRESENTATIVE: _____

SLC INSPECTOR: _____

* FOR STATE LANDS COMMISSION USE ONLY

Revised:10/ 20/97

DEC-04-97 THU 03:08 PM ST LANDS FAX NO. 3026390210

MONTHLY INSPECTION
WELLS and FLOWLINES/INJECTION LINES

FACILITY: Hermosa Beach

OPERATOR: Macpherson Oil Co.

*INSPECTION DATE: _____

LEASE NO.: _____

*LAST INSPECTION: _____

	WELLHEAD PRESSURE			PRESSURE SAFETY				OPERATIONAL				
	PRODUCTION		SURF	LOW		HIGH		VALVES			INITIAL	INSP.
WELL NO.	TBG	CSG	CSG	SET	TRIP	SET	TRIP	SSV	SSSV	FSV	& DATE	APPD*
TEST WELL # 1	X	X	X		X		X			X		
TEST WELL # 2	X	X	X		X		X			X		
TEST WELL # 3	X	X	X		X		X			X		
STINNETT INJECTION WELL	X	X	X							X		

REMARKS: _____

OPER. SAFETY REPRESENTATIVE: _____

SLC INSPECTOR: _____

* FOR STATE LANDS COMMISSION USE ONLY

Revised:10/ 20/97

State of California

State Lands Commission

MONTHLY INSPECTION
GAS DETECTION EQUIPMENT

FACILITY: Hermosa Beach

Page: 5 of 12

OPERATOR: Macpherson Oil Co.

*INSPECTION DATE: _____

LEASE NO.: _____

*LAST INSPECTION: _____

	H_2S SENSORS				LEL SENSORS					
	H_2S @ __ PPM		H_2S @ __ PPM		25% of LEL		45% of LEL		INITIAL &	INSP.
STATION/LOCATION	TRIP	ALARM	TRIP	ALARM	TRIP	ALARM	TRIP	ALARM	& DATE	APPD*
#1- @ THERMAL OXIDIZER, BY EXIT		X		X						
#2- ALONG WALL BY CHEM. STORAGE		X		X						
#3- @ GAS SCRUBBER		X		X						
#4- @ VAPOR REC. COMP. SCRUBBER		X		X						
#5- @ VAPOR COMP., ALONG WALL		X		X						
#6- NORTH OF T-5 & T-6 STOCK TKS.		X		X						
#7- AT EMERGENCY EXIT BY T-6		X		X						
#8- ALONG WALL, REAR OF T-4		X		X						
#9- ALONG WALL, REAR OF T-1		X		X						
#10- NORTH OF SKIM PIT, FWKO		X		X						
#11- AT SOUTH DRIVEWAY		X		X						
#12- SE CORNER OF WATER SURGE TK.		X		X						
#13- BETWEEN H2o SURGE TK & FILTER		X		X						
#14- ALONG WEST WALL, BEHIND FILT.		X		X						
#15- ALONG WEST WALL, BEHIND CELL.		X		X						

REMARKS: CHECK H2S BEACON OPERATION AT SENSOR #'s 5- 7- 11- 15

OPER. SAFETY REPRESENTATIVE: _____

SLC INSPECTOR: _____

* FOR STATE LANDS COMMISSION USE ONLY

Revised:10/ 20/97

MONTHLY INSPECTION
GAS DETECTION EQUIPMENT

FACILITY: Hermosa Beach

OPERATOR: Macpherson Oil Co.

*INSPECTION DATE: _____

LEASE NO.: _____

*LAST INSPECTION: _____

	H_2S SENSORS				LEL SENSORS					
	H_2S @ __ PPM		H_2S @ __ PPM		25% of LEL		45% of LEL		INITIAL &	INSP.
STATION/LOCATION	TRIP	ALARM	TRIP	ALARM	TRIP	ALARM	TRIP	ALARM	& DATE	APPD*
#16- SOUTH WELL CELLER										
#17- NORTH WELL CELLER										
#18- ALONG WEST WALL, BEHIND CELL.										
#19- ALONG WEST WALL										
#20- ALONG WEST WALL										
#21- ALONG WEST WALL, NW CORNER										
#22- ALONG NO. WALL, BY SCE TRANS.										
#23- ALONG NO. WALL, E. OF SCE TRAN										
#24- ALONG WALL, NEAR SCE- PMH										
#25- ALONG NORTH WALL										
#26- ALONG NO. WALL, W. OF E. GATE										
#27- ALONG NO. WALL, S. OF E. GATE										

REMARKS: CHECK H2S BEACON OPERATION AT SENSOR #'s 17- 20- 27

OPER. SAFETY REPRESENTATIVE: _____

SLC INSPECTOR: _____

* FOR STATE LANDS COMMISSION USE ONLY

Revised:10/20/97

DEC-04-97 THU 03:09 PM ST LANDS FAX NO. 3062552310

State Lands Commission

MONTHLY INSPECTION
FIRE and SMOKE DETECTION EQUIPMENT

FACILITY: Hermosa Beach

Page: 7 of 12

OPERATOR: Macpherson Oil Co.

*INSPECTION DATE: _____

LEASE NO.: _____

*LAST INSPECTION: _____

FIRE DETECTORS				
STATION/LOCATION	TYPE OF DETECTOR	DETECTOR STATUS	INITIAL & DATE	INSP. APPD*

SMOKE DETECTORS			
STATION/LOCATION	DETECTOR STATUS	INITIAL & DATE	INSP. APPD*

REMARKS: _____

OPER. SAFETY REPRESENTATIVE: _____

SLC INSPECTOR: _____

* FOR STATE LANDS COMMISSION USE ONLY

Revised:10/20/87

MONTHLY INSPECTION
FIRE ALARMS

FACILITY: Hermosa Beach

OPERATOR: Macpherson Oil Co.

LEASE NO.: _____

*INSPECTION DATE: _____

*LAST INSPECTION: _____

STATION/LOCATION	FIRE ALARM STATUS	FIRE INITIAL & DATE	FIRE INSP. APPD*	ALARM STATUS	INITIAL & DATE	INSP. APPD*	ALARM STATUS	INITIAL & DATE	INSP. APPD*

REMARKS: _____

OPER. SAFETY REPRESENTATIVE: _____

SLC INSPECTOR: _____

* FOR STATE LANDS COMMISSION USE ONLY

Revised:10/ 20/97

DEC-04-91 MON 03:10 PM SMMJ JS FAX NO. 3062330219

State of California *State Lands Commission*

MONTHLY INSPECTION
EMERGENCY SHUT-DOWN (ESD) SYSTEM

FACILITY Hermosa Beach

Page: 9 of 12

OPERATOR: Macpherson Oil Co.

*INSPECTION DATE: _____

LEASE NO.: _____

*LAST INSPECTION: _____

STATION/LOCATION	OPERATIONAL	INITIAL & DATE	INSP. APPD*

SEMI-ANNUAL ESD TEST:

*LAST TEST DATE - _____

*NEXT TEST DATE - _____

*ESD STA. USED FOR LAST TEST - _____

REMARKS: _____

OPER. SAFETY REPRESENTATIVE: _____ SLC INSPECTOR: _____

R STATE LANDS COMMISSION USE ONLY

State of California *State Lands Commission*

MONTHLY INSPECTION
FIRE DELUGE and FOAM SYSTEM

FACILITY: Hermosa Beach

Page: 10 of 12

OPERATOR: Macpherson Oil Co.

*INSPECTION DATE: _____

LEASE NO.: _____

*LAST INSPECTION: _____

DELUGE AND FOAM SYSTEM		INITIAL	INSP.
STATION/LOCATION	OPERATIONAL	& DATE	APPD*

REMARKS: _____

OPER. SAFETY REPRESENTATIVE: _____ SLC INSPECTOR: _____

* FOR STATE LANDS COMMISSION USE ONLY

State of California *State Lands Commission*

MONTHLY INSPECTION
RECORDS REVIEW

FACILITY: Hermosa Beach

Page: 11 of 12

OPERATOR: Macpherson Oil Co.

INSPECTION DATE: _____

LEASE NO.: _____

LAST INSPECTION: _____

RECORD/DOCUMENTATION	AVAILABLE FOR REVIEW YES	NO	N/A
1. FIRE FIGHTING EQUIPMENT:			
Fire Hose Reels - Inspection Check List	☐	☐	☐
Fire Extinguishers - Inspection Check List	☐	☐	☐
Weekly Fire Pump Tests	☐	☐	☐
2. EMERGENCY GENERATOR:			
Monthly Emergency Generator Tests	☐	☐	☐
3. LIFE SAVING EQUIPMENT:			
First Aid kit	☐	☐	☐
Bloodborne Pathogen kit	☐	☐	☐
Stretcher / Litter	☐	☐	☐
Breathing Apparatus (H_2S Environments) - Inspection Check List	☐	☐	☐
4. H_2S CONTINGENCY PLAN:	☐	☐	☐
5. OIL SPILL CONTINGENCY PLAN:	☐	☐	☐
6. DRILLS and TRAINING:			
Weekly Fire Drills	☐	☐	☐
Oil Spill Drills and Training	☐	☐	☐
Monthly H_2S Drills and Training	☐	☐	☐
7. PIPELINE CORROSION CONTROL:			
Daily Rectifier Readings - Cathodic Protection System	☐	☐	☐
Corrosion Coupon Reports (Internal Corrosion)	☐	☐	☐
Corrosion Monitoring Equipment Reports (Internal Corrosion)	☐	☐	☐
8. OTHER REPORTS/RECORDS:			
PSV Car Seals & Number Tags	☐	☐	☐
PSV Testing & Maintenance	☐	☐	☐
Weekly (Visual) Pipeline Inspection	☐	☐	☐
_____	☐	☐	☐

REMARKS: _____

SLC INSPECTOR: _____

STATE LANDS COMMISSION USE ONLY

State of California | *State Lands Commission*

MONTHLY INSPECTION
REMARKS - CONTINUATION SHEET

FACILITY: Hermosa Beach

Page: 12 of 12

OPERATOR: Macpherson Oil Co.

INSPECTION DATE: _____

LEASE NO.: _____

LAST INSPECTION: _____

PAGE NO.	REMARKS

SLC INSPECTOR: _____

* FOR STATE LANDS COMMISSION USE ONLY

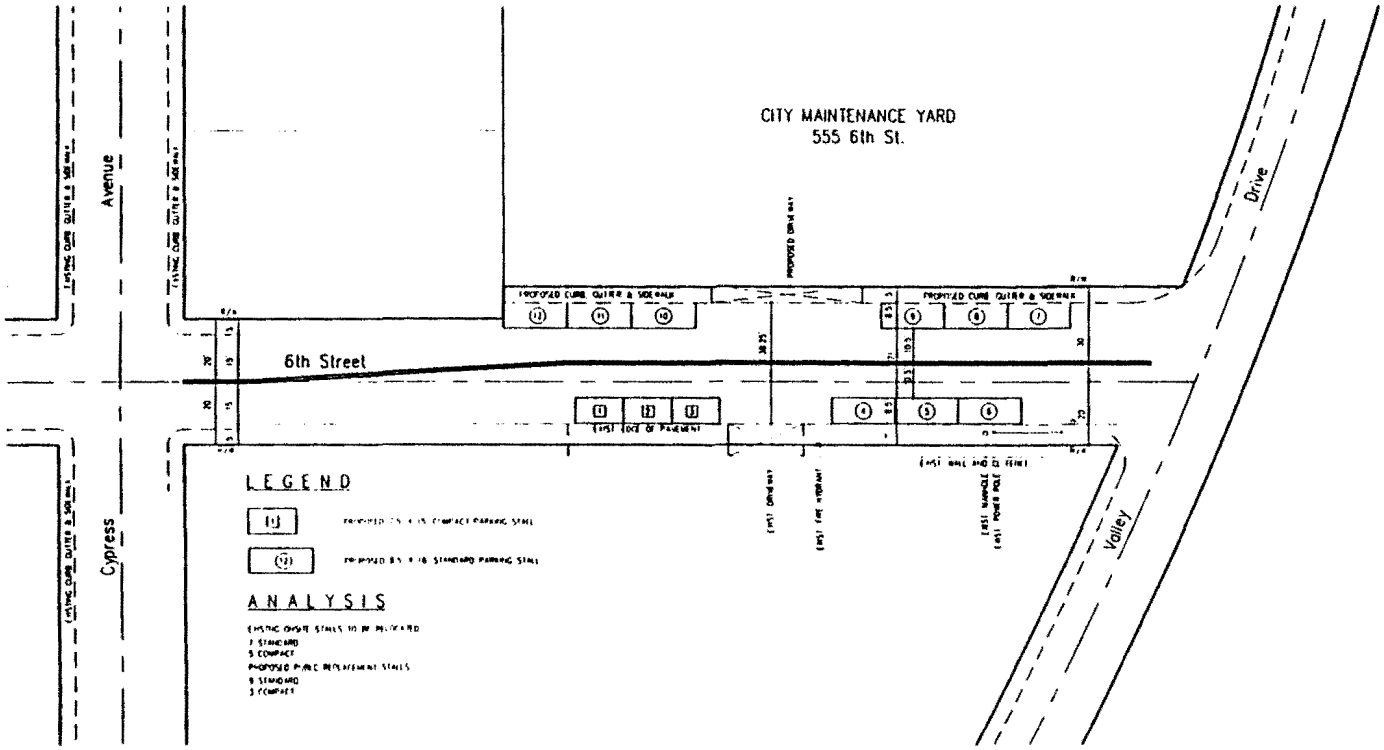


EXHIBIT NO. 23
APPLICATION NO.
E-96-28
MACPHERSON OIL

SCALE: 1" = 20'

JOB # 7382

CITY OF HERMOSA BEACH
APPROVAL IN CONCEPT
DIRECTOR, COMMUNITY DEVELOPMENT — DATE

PREPARED UNDER THE SUPERVISION OF:
ASHBA ENGINEERS LTD
P.O. BOX 90832
LONG BEACH, CA 90809
(562)988-9154
R. E. ASHBA, RCE 31417 — DATE

Hermosa Beach Oil Development Project
REPLACEMENT PUBLIC PARKING
CITY OF HERMOSA BEACH

Sheet
PK-1
of 1 Sheets

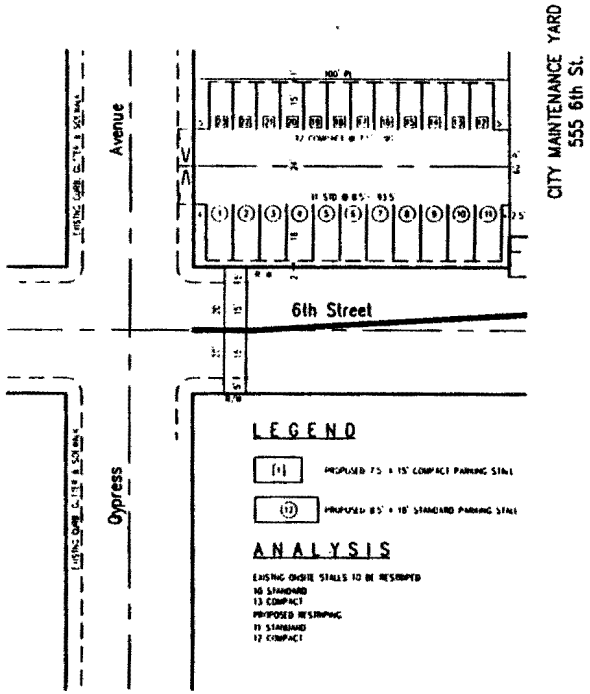


EXHIBIT NO. 24
APPLICATION NO.
E-96-28
MACPHERSON OIL

SCALE 1"=20'

JOB # 7382

PREPARED UNDER THE SUPERVISION OF:
ASHBA ENGINEERS LTD
P.O. BOX 90655
LONG BEACH, CA 90809
(562)988-9194

Hermosa Beach Oil Development Project

PARKING LOT RESTRIPING

CITY OF HERMOSA BEACH

Sheet PK-2 of 1 Sheets

Exhibit 25
CORRESPONDENCE

E-96-28
Macpherson Oil Company

EXHIBIT NO. 25
APPLICATION NO.
E-96-28
MACPHERSON OIL

E-96-28 Proposed Macpherson Oil Company Project
Summary of Opposition Form Letters

631 form letters (see attached for example) were received by the Coastal Commission in opposition to the proposed Macpherson Oil Company Hermosa Beach project.

Several persons listed additional concerns with the proposed project in the letters. These additional concerns are summarized as follows:

- Long term impact - setting a precedent for large industrial uses in Hermosa Beach
- Potential impacts to beaches and marine life
- Visual impacts
- Pollution
- Potential for oil spills on beaches
- Human health impacts
- Quality of life issues - Opinion that Macpherson is "forcing" project on the city against public opinion and existing laws
- Inadequacy of project Environmental Impact Report
- Inappropriateness of project in Hermosa Beach (one square mile residential beach community)/community character issues
- Decreased property values
- Traffic impacts
- Noise impacts
- Concern that will of voters (re: Proposition E) is being ignored
- Air quality impacts - including odors
- Impacts on nearby parks
- Potential for accidents at or caused by drilling site
- Potential subsidence or structural damage to properties resulting from slant drilling
- City use of resulting revenues limited
- Cost to taxpayers
- Water quality impacts
- Possible fire danger

California Coastal Commission
c/o A. Dettmer
45 Fremont Street, Suite 2000
San Francisco, CA 94105

RECEIVED
JUL 28 1997
CALIFORNIA
COASTAL COMMISSION

Dear Commissioner:

I respectfully request that the Commission deny a permit to Macpherson Oil Company for drilling in Hermosa Beach for the following reasons:

- Under the law, hazardous, new industrial development must be located away from existing developed areas, and there are alternative sites in the area (ξ30250(b)).
- This development is not appropriate for this area. It will negatively impact parkland and public recreational areas and threaten the health and safety of Hermosa Beach residents and the visiting public (ξ30240(b)).
- The development does not meet current requirements of the local air pollution control district. It does not utilize the best available control technology. This is important because of the potential cancer-causing effect of the project's emissions (ξ30253(3)).
- Our city does not have a certified local coastal plan, and the existing plan does not have an energy development policy (ξ30604).
- Subsidence (sinking land) has not been adequately addressed. One need only look at Redondo Beach's experience of land sinking two to three feet because of oil drilling to realize how serious a problem this is in the beach area (ξ30262(e)).

I am also concerned about:

the long term impact that this type of development will have on the Hermosa Beach area. This type of industrial precedent is counter to the direction that most residents + small businesses in this community want the city to take. In fact, I believe most people would encourage the buy back of lands for increase public use not INDUSTRIAL ABUSE.

Sincerely,

Name: DAVID J SCANLAN David J Scanlan

Address: 2121 PACIFIC COAST HWY APT #1

City: HERMOSA BEACH CA 90254

California Coastal Commission
c/o A. Dettmer
45 Fremont Street, Suite 2000
San Francisco, CA 94105

Dear Commissioner:

I respectfully request that the Commission deny a permit to Macpherson Oil Company for drilling in Hermosa Beach for the following reasons:

- Under the law, hazardous, new industrial development must be located away from existing developed areas, and there are alternative sites in the area (ξ30250(b)).
- This development is not appropriate for this area. It will negatively impact parkland and public recreational areas and threaten the health and safety of Hermosa Beach residents and the visiting public (ξ30240(b)).
- The development does not meet current requirements of the local air pollution control district. It does not utilize the best available control technology. This is important because of the potential cancer-causing effect of the project's emissions (ξ30253(3)).
- Our city does not have a certified local coastal plan, and the existing plan does not have an energy development policy (ξ30604).
- Subsidence (sinking land) has not been adequately addressed. One need only look at Redondo Beach's experience of land sinking two to three feet because of oil drilling to realize how serious a problem this is in the beach area (ξ30262(e)).

I am also concerned about:

Sincerely,

Name: Jamie Or

Address: 2900 Strand

City: Hermosa Bch. CA 90254

YES ON E

Hermosa Beach Stop Oil Coalition •

610 Sixth Street • Hermosa Beach, CA 90254 • (310) 379-5698

November 24, 1997

^F1^ ^F2^
^F3^
^F4^
^F5^ ^F6^
^F7^, ^F8^ ^F9^

RECEIVED
NOV 26 1997
CALIFORNIA
COASTAL COMMISSION

Honorable Commissioner ^F2^:

In re Coastal Permit Application #E-93-17):

Hermosa Beach Stop Oil has compiled the enclosed information on above project, highlighting areas we believe conflict with the intent of the Coastal Act. Prior Commissions have denied oil and gas projects a permit based on inconsistency with Coastal Act policies and we believe an abundance of data exists to support a permit denial in the instant case.

This applicant's project negatively impacts public recreation areas, the environment both specifically and cumulatively, and prejudices preparation of Local Coastal Programs. In addition, it bears repeating that Section 1 of Measure E, passed by Hermosa Beach voters in 1995 found oil drilling *ipso facto* to be a public nuisance.

After you have carefully reviewed the application and related information we believe your Commission will also deny a development permit to the applicant in this case. I will gladly make available to you any portion of the documents and memoranda discussed in the enclosed material if you make your fax number available to me.

Additional background information, specific commentary on the Macpherson application and mitigations we believe should be mandatory if all or part of the project is approved will be supplied prior to the hearing.

Again, on behalf of Stop Oil, I appreciate the time you have taken to understand the full scop of this issue.

My best,

Rosamond Fogg

Rosamond Fogg

'The Stop Oil Coalition is a handful of people that are trying to stop this project for their own personal gain.'

Don Macpherson, president of Macpherson Oil, on the legal attempts of the Hermosa Beach-based Stop Oil Coalition to stop the company's drilling project.

'If you interpret the law to mean that any movement of oil can be considered oil drainage, then every sancturary area on the California coast could be violated. Not in my backyard, not in your backyard.'

Rosamond Fogg of the Stop Oil Coalition. The organization holds that the lease agreement between Macpherson Oil Co. and Hermosa Beach is illegal.

DISCUSSION OF MACPHERSON OIL CO APPLICATION FOR A CDP

- - -

THE BASIS FOR DENIAL UNDER THE COASTAL ACT AND CIVIL AND MUNICIPAL CODES

Prepared by Hermosa Beach Stop Oil, November 24, 1997

TABLE OF CONTENTS

PART I - THE COASTAL ACT 1

Granting Any CDP Would Conflict with the Coastal Act and Civil and Municipal Codes 1

§30005(a),(b) (1)

Public Safety, Health and Welfare Would be Compromised 4

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PART I - THE COASTAL ACT

Granting Any CDP Would Conflict with the Coastal Act and Civil and Municipal Codes

The people of Hermosa Beach, exercising their legislative powers of initiative, have prohibited oil drilling and oil production, having found them to be a public nuisance.

The California State Supreme Court said "the people's reserved power of initiative is greater than the power of the legislative body."[1] The people's power to legislate has been described as "one of the most precious rights of the democratic process". . . [and] that the courts] are required to resolve any reasonable doubts in favor of the exercise of this precious right."[2]

In other words, the citizens *are* the local government and the term should be used interchangeably at §30005(a),(b) of the Coastal Act which clearly states that no provision of the Coastal Act may limit the power of a city (the citizens) to impose restrictions or prohibit nuisances. And with good reason, for if the Coastal Act did not allow legislation at the local level to impose stricter conditions or prohibit public nuisances, the Act would conflict with §3490 through §3496 of the California Civil Code which allows private citizens and public officials to abate a public nuisance.

The issue of whether the city's drilling ban applies to the Macpherson project is currently being tested in the courts. Stop Oil, a Hermosa Beach citizen's group, Heal the Bay, American Oceans Campaign and Santa Monica Baykeeper are seeking relief to ensure the city applies the 1995 people's initiative (Measure E) that found oil drilling to be a public nuisance, reinstated Hermosa's 60+ year old drilling ban and banned oil production.

We believe the government's obligation to act as an oversight agency on behalf of its citizens to carry greater weight than its role as a partner or facilitator of a speculative oil drilling venture. We believe there is no unconstitutional breach of contract issue in applying the ban to the Macpherson project. The oil lease and other city law actually empowers the city to disallow oil activities. Even if it did not, the California Constitution holds that the city cannot contract away its powers to police so a refusal to apply the drilling ban to Macpherson amounts to a breach of the local government's good faith obligation to carry out the will of the people.

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[1] Rossi, 9 Cal. 4th at 715.

[2] Raven, 52 Cal.3d at 341 (citing Amador Valley Joint Union High School Dist. v State Board of Equalization, (1978) 22 Cal.3d 208, 219-220); Rossi, 9 Cal.4th at 715.

- 04-11-32 - Ord. 506 - prohibits oil drilling in the City of Hermosa Beach (passed by electorate)

- 11-06-84 - Measures P & Q allow oil drilling at the City Yard and South School. The City Attorney wrote: These ordinances . . . allow oil drilling activities to the discretion of the City[3]

- 06-10-86 - Resolution of Intention to drill for oil and authorizing a Request for Proposal Process - ¶8 of Hermosa Resolution 86-4943 states in part: . . . the lease will be entered into. . . provided. . . the City Council reserves the right. . .to withdraw the property from lease or contract if said City Council should deem such action to be in the best public interest;

- 08-18-86 - Macpherson/Windward Associates, the only bidder, wins with 10% of bonus ($10,000)

- 11-03-87 - Voter's Pamphlet, Proposition L regarding funds derived from hydrocarbon recovery - this was not a referendum on oil drilling. Prop. L only designated any and all funds would be spent on open space acquisition and maintenance.

- 09/25/89 - City Attorney Memo to Hermosa Beach City Manager states in part: The terms of the lease are clear that the proposed oil drilling operations must comply with applicable laws, regulations and municipal ordinances. The fact that the City has entered into the Lease and is considering a conditional use permit under the City's "Oil Code" (Ord. No. 85-803) does not predetermine the outcome of these subsequent City actions to which the Lease is specifically made subject.

- Later in the above-mentioned memo the City Attorney writes, citing People vs. County of Kern (1974) Cal. App. 3d 830, 838; 115 Cal. Rptr. 67. Planning and zoning are independent powers of the City granted under state law and are not derived from the City's proprietary interest in property.

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[3] Contrary to the misrepresentation by the City Attorney to the State Lands Commission, Measure P was a City Council-sponsored initiative. The City Attorney, even after having been corrected at a city hearing, persisted in testifying to the State Lands Commission that Measure P, to allow drilling, was a People's Initiative. It is a matter of public record the City Attorney made this false allegation not once but twice to the State Lands Commission. Citing "the will of the people" Commissioner McCarthy voted to allow drilling and the matter passed 2-1.

- 01-14-92 - Oil and Gas Lease #2 - supersedes Lease #1 and provides for both uplands and tidelands drilling. Also includes GLG Energy, L.P. (GLG was a completely bankrupt shell, as it turns out) as a lessee in addition to Windward Associates. Lease requires compliance with all federal, state and local laws. If this clause is read to mean only existing law, then one must conclude the city unconstitutionally contracted away its powers to police.

- Driller's lease does not confer a vested right to drill. Driller does not have a development agreement[4];

- 08-12-93 - Resolution No. 93-5632 - approving a Conditional Use Permit for Oil Development at the City Maintenance Yard and construction of a pipeline along Valley Drive. The Planning Commission, when it approved the CUP, advised the City Council that if Macpherson appealed the conditions and the City Council deleted any of the conditions added by the Planning Commission, the Commission was on record as withdrawing their approval. Macpherson appealed and had the stricter conditions withdrawn.

- 11-07-95 - Voters pass Measure E, repealing their 1984 exception to the drilling ban, finding drilling and production activities not to be in the public interest, that a ban protects public safety, environmental quality and guards against damage to public and private property.

- The passage of Measure E is timely and does apply to Macpherson. Article 9 of the California Constitution prohibits the State from passing laws impairing obligation of contract; however, unconstitutional impairment has only been applied to contracts for vested, established activities usually economic in nature (pensions for retired government workers, for instance). When E passed, the Macpherson Oil project did not have a Coastal Development Permit, a building permit, and various other permits from other state agencies and therefore the project clearly was not even vested, let alone an activity already underway.

  Vesting aside, the Macpherson contract would not be impaired in any event. The contract subjects the project's operation to federal, state and local laws. Resolution 86-4943 and Measure E are local laws. It bears repeating that State Constitution prohibits a city from contracting away its police powers. The city may take any measures necessary protect the public.

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[4] As set forth in Government Code §65867.5. A development agreement is a legislative act which shall be approved by ordinance and is subject to referendum. [emphasis added]

The Coastal Commission is urged to use its discretion to energetically seek out and consider those features of the application that conflict with the Coastal Act.

Public Safety, Health and Welfare Would be Compromised

The California legislature, enacting §30001(a) and §30001(b) of the Public Resources Code, recognized the coastal zone is a vital resource of enduring interest and that the permanent protection of natural and scenic resources is a paramount concern. Furthermore, in §30001(c), the state recognizes that preventing deterioration and destruction of the coastal zone promotes **public safety, health and welfare, and protects public and private property, and the natural environment.**

Hermosa Beach voters share these ideals and concerns, which are reflected in their November, 1995 passage of Measure E. Finding oil drilling an activity contrary to the **public's right to enjoy clean air, water and a safe environment, that the safety and protection of the lives of both citizens and the general public, and the protection of persons and property** from the dangers and hazards associated with oil drilling operations required the reinstatement of the city's drilling ban on two coastal zone sites. We respectfully ask the coastal commission to deny the applicant a permit because the project would conflict with both state and municipal policies.

The Project Was Not Carefully Planned

The proposed operation fails to meet the goals expressed in §30001(d). First, *careful planning* of future development is required. The evolution of the project design has been dictated not by careful planning methods, but hasty improvisations that that amount to nothing more than circumvention of regulations and *post hoc* rationalization for a decision already made when the city entered into a lease with the driller <u>before</u> any environmental or planning studies were made.

No Benefit to the Economic and Social Well-being of the Public Can Reasonably be Quantified

Accommodating oil drilling to fund already-funded parks is like burning down your house to get rid of termites that have already been eradicated.

Conjecture about the stimulation to the state economy is entirely hypothetical because the fundamental worth of the project is unknown. Simply pledging money for a few already financed enhancements and hypothesizing stimulation to the state economy based on questionable fundamentals does not guarantee a net improvement to the economic and social well-being of the people of the state - even those working within the coastal zone.

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Macpherson's project clashes with §30001(d) due to the lack of evidence it would promote the economic and social well-being of the people of the state. In fact, many comments made by State Lands Commissioners and, Macpherson itself tend to support the argument that there would *not* be a state-wide benefit. This is reflected in the following remarks:

State Lands Commission hearings, June 30, 1992

CHAIRMAN MCCARTHY: What part of the revenue would come to the State of California?

MR. HIGHT: The State would get none.

COMMISSIONER ZIEGLER: I'm concerned about the State bearing sort of none of the prospective gain and yet, in the back of my mind I'm not completely convinced that there aren't some safety issues here that we've missed. I'm not prepared to vote affirmatively on it.

CHAIRMAN MCCARTHY: I'd love to have the State get a piece of this change short of violating the Penal Code.

COMMISSIONER BURTON: It's not enough.

State Lands Commission hearings, March 8, 1994

CHAIRMAN DAVIS: Is there any revenue at all for the state?

MR. MACPHERSON: I believe that there is revenue that benefits the state, yes.

GENERAL COUNSEL HIGHT: There will be no revenue coming to the state general fund, no revenue -- the only revenue to the state will be through income tax and the like.

CHAIRMAN DAVIS: Perhaps keep in mind that this is a granted, these lands are granted to the city without any mineral reservation. That is not always the case up and down the coast. That's why we get no revenues.

A confidential city memorandum states "While this office recognizes that the proposed oil drilling operations may result in economic or social consequences, the purpose of the EIR is to assess the potential for significant physical impacts to the area. Questions on the economic and social consequences of oil drilling, therefore, are only appropriately raised in the context of a public hearing on the EIR to decide of potential physical changes are significant. A more detailed analysis of social and economic factors relate to the merits of a decision to allow oil drilling rather than to the environmental impacts created from such activity. Certainly

Macpherson and the city would not have aggressively thwarted every opportunity to analyze or even entertain a meaningful public discussion of social and economic impacts if they believed benefits would outweigh adverse consequences arising from this drilling project.

The city would not allow discussion of the socio-economic topic during the EIR hearings, and did not even permit a discussion regarding any environmental effects that might arise from economic influences. The city stated the Conditional Use Permit (CUP) hearing process would be the appropriate venue for a meaningful dialogue on the economic prospects, if any. At the CUP hearings the public was informed by the Assistant City Attorney that the CUP hearing were an unsuitable forum to debate the economic and social concerns and that the lease negotiations were the proper forum to discuss economic consequences. This anachronistic advice completed the city's effort to obstruct any public airing because the city had already committed itself in a lease that had been negotiated and entered in a closed session prior to the EIR hearings. One big circle.

The complaint that no economic or social impacts were quantified before the city committed itself to this course was raised when the matter was remanded to the State Lands Commission. There, a Hermosa citizen protested that no meaningful analysis or public discussion of the economic impact of the project on the residents had been done, the City attorney denied this, saying it had been publicly discussed at the CUP hearing. The Commissioner appeared to be satisfied with the City Attorney's answer. Read on. . .

State Lands Commission hearings, March 8, 1994

COMMISSIONER MCCARTHY: My question is, have any of the opponents of this project had the opportunity to challenge those numbers, the numbers as to the barrels that could be extracted, numbers as to the revenues projected on that?

MR. LEE: We have had innumerable public hearings at any of which they could raise that issue. At the point in time of approval, consideration of this oil and gas lease before the CIty Council, that was conducted in a public hearing into which a number of the opponents had attended and provided testimony. The issue of economics of this project could have been attacked and contested at that point without any problem on their part.

CHAIRMAN DAVIS: Do you recall if it was?

MR. LEE: My recollection was yes,

COMMISSIONER MCCARTHY: Mr. Morley says flatly that that is not the case, that opponents of the oil drilling project were not allowed to contest these numbers. [goes on to state Mr. Morely was confused]

MS. CHATTEN-BROWN: Mr. Chairman.

CHAIRMAN DAVIS: Let's, let's hear from Mr. Macpherson and that will wrap it up.

MR. MACPHERSON: [states Mr. Morely is mistaken or confused, lengthily restates reasons to drill]

MS. CHATTEN-BROWN: Mr. Chairman, could I have just two minutes [to] make three points?

[Commissioners reluctantly agree to allow Ms. Chatten Brown to speak]

MS. CHATTEN-BROWN: Thank you. First, I was present at the Planning Commission hearing, and I confirmed my recollection with Rosamond Fogg who was also present, that Mr. Morley attempted and was denied the opportunity to make a presentation.

CHAIRMAN DAVIS: You were at the Planning Commission in Hermosa Beach?

MS. CHATTEN-BROWN: I was at the Planning Commission hearing in Hermosa Beach when Mr. Morley attempted to raise the issue of the economics and he was told not to.

Macpherson has submitted a report on economic impacts compiled by Giles and Company. The author of this report is very candid in its disclaimer, acknowledging is has not provided an audit of costs associated with the project and that it cannot attest to the accuracy of the underlying documents, and cannot warrant the outcome of the analysis contained in its report. This report uses hypothetical numbers that have little relationship to the true value and quantity of oil that is likely to lie in the Hermosa Beach tidelands. Furthermore, the economic effect is really very slight, given that it is spread over 30 years. The net present value of money that will arrive years and decades from today has not been factored. Given that the basic data provided to the preparer is questionable, the question of whether the economic model was applied correctly becomes moot. In computer-speak, the term is GIGO, garbage in, garbage out.

The report erroneously distinguishes monies coming to the Hermosa Beach General Fund and monies designated for parks. 1986's Prop L mandates all oil monies would go for parks regardless of their origin. Second, the report describes Tidelands Trust monies as being

designated for "coastal projects". While not exactly false, this description tends to support the Macpherson public relations effort to convince Hermosa Beach residents that tidelands monies can be spent in a variety of ways that are prohibited by the very narrow terms of Hermosa's Tidelands Trust.

Whether the Giles model was applied correctly to the Macpherson data is a matter of conjecture. That the Macpherson data is absurdly inflated is a virtual certainty.

The Giles Report did not factor in potential losses due to adverse impacts on human health and productivity, the environment, lowered property values, detrimental effects on aesthetics that could in turn deter visitors to the region. Also not considered is the potential cost of catastrophic loss, through fire, spills or explosion.

Given the fact that even disasters stimulate the economy (Hurricane Andrew was great for the construction industry), it is worth noting that the State Lands Commission staff, having carefully studied all of Macpherson's data, found that the economic benefits were unlikely to outweigh the negative consequences.

Developments with potential adverse effects on coastal resources are sometimes permitted but, as described in §30001.2, they are then limited to those that assure the preservation of inland *and* coastal resources or ensure orderly economic development in the state. As to orderly economic development, not even the maximum anticipated recovery for this project would amount to a significant percentage of total statewide oil production. Macpherson contemplates employing only 8 people. Macpherson's project, being exploratory in nature, can not assure anything. Furthermore, the project can not assure the preservation of any resource, inland or coastal.

The Coastal Commission should note that the State Lands Commission Staff reported the following findings: ". . .**potential benefits of the proposed oil development project are meager and are outweighed by the adverse environmental impacts. . .**" and ". . .**prospect for commercial oil production from the Hermosa Beach tidelands is slight. Coupled with the adverse environmental impacts the project would have on the community, to go forward with it would not be in the best interests of the State.**" (*the staff ALSO said* ***"There is no indication of any significant quantities of commercially recoverable oil in the Hermosa Beach Tidelands. . .the economic outlook for the project looks very bleak. Assuming that the proponents of the project expect some favorable return on their investment, the environmental impacts militate against the project. . . operations will have a significant impact on the residents of the area. . .the drill tower will be a high profile visual intrusion. Throughout the life of the project, there will be noise from the site and traffic from trucks servicing the wells and removing the produced oil.***")

The City's LCP Has No Provision for Coastal Related Development

The City's Coastal Element of its uncertified LCP contains one reference to encouraging coastal dependent development. No further specification is made. The Macpherson project is obviously not coastal dependent, as it is located several blocks inland. No provision is made in the LCP for coastal related development. Because Measure E prohibits any future inclusion of such, the Commission should find it cannot provide a development permit to the applicant.

Alternatives

The Macpherson oil project qualifies as a new hazardous industrial development. §30250(b) directs that where feasible, it shall be located away from existing developed areas.

Stop Oil opposes this project regardless of its location but recognizes the Commission may evaluate the possibility of using an alternate site. Depending on the author, estimates of the project's value range between the hugely profitable and the hugely disappointing[5]. Even if the applicant has grossly overestimated the size of the reserve, 30 million barrels remains a relatively modest amount. Notwithstanding, a project a fraction that size could still be feasibly sited adjacent to like heavy industry, less than ¼ of a mile away, on vacant industrial land in Redondo Beach. Redondo Beach's LCP allows oil drilling but although its zoning code does not, Redondo Beach is a charter city and not legally bound to conforming its general plan and zoning code. Drilling from any of a number of sites may be economically and technically feasible although politically difficult at the present time. However, the oil isn't going anywhere and in the future a more suitable location may become available that would enable a project to better conform to the intent of §30001.5(b). Although present Redondo Beach policy may preclude oil drilling it should be noted that in 1984, drilling in Hermosa Beach was entirely illegal. Macpherson's 1984 campaign costs to lift the Hermosa Beach ban was approximately $23,000. If Macpherson were to similarly lobby Redondo Beach, describing its proposed project in terms similar to those that were used to persuade Hermosa Beach voters, Redondo might welcome an opportunity to reap such fabulous benefits. On the other hand, it might be tough to guarantee Redondo that today's recovery techniques would not amplify the ongoing net loss, damage and decade-plus of litigation already suffered by Redondo Beach.

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5 Macpherson Oil's Robert Hacker study, Hermosa's Richard Hester report, the State Lands Commission staff report and the evaluation done for Stop Oil by Don Hallinger all estimate the maximum Hermosa recovery at 1/10 to 1/3 of the Macpherson estimate of 30,000,000 barrels. In addition, the dollar value of the oil in Macpherson's estimates are too high.

Irony aside, it bears emphasizing that nowhere in the Coastal Act is it written that an energy development application must be permitted, no matter how inappropriate, if no alternate site exists to accommodate it at that point in time. The majority of onshore oil wells reviewed by the Commission have been in sparsely populated rural areas, usually located on agricultural lands, and for the most part within already developed oil fields.

Voters Never Permitted Oil Tanks and Other Production Facilities and Banned Production in Its 1995 Initiative

The City, aware that only oil drilling was approved but oil tanks and production equipment were not an allowable operation in the city's industrial zone, received the following advice in a confidential memorandum from the City Attorney dated 9/25/89:

> A determination whether or not the permanent production facilities are an accessory use to the principal purpose of oil drilling would be appropriately within the discretion of the Planning Commission. The standard to be used by the Planning Commission in deciding if this would be a valid use is outlined in the case of In re Scarpitti (1981) 124 Cal.App 3d 434, 440. 177 Cal. Rptr. 387, which refers to "our common sense, judicial and personal knowledge of what dwellings are customarily and ordinarily used for--what the ordinary man of the street would consider to be [oil drilling]." The case further states that "without such reasonable connection. . . no violation could be found, for a conviction would then violate the requirement penal statutes be reasonably certain and give common sense notice of the proscribed activity."

The City Attorney's argument relies on the erroneous supposition that the "man on the street" believes oil wells are always accompanied by adjacent oil tanks.

This, in fact, was first mentioned by the applicant's attorney. A portion of the trial transcript[6] reads as follows:

> "The point of this is that they approved the use of as much of an acre of this 1.38 acre site for a drill site, the drilling of wells. Nothing they did had anything to do in 1984 with where these other improvements could be located. And changed the law related to that."

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[6] Los Angeles Superior Court, Tues. September 20, 1994, Department No. 86, before Hon. Diane Wayne, Judge

"None of these have to be here, none of these improvements, the tanks, the parking, the office. These wells could be drilled and completed here and produced for centuries, assuming they'd hold out, and none of these improvements are required to be here."

"The orange area is the well cellar. And if you understand, Your Honor, an area will be excavated below grade within which the actual 50 well bores will be housed.

"All the rest of these improvements could be located anywhere else. It's true that logically in terms of CEQA they're part of this project. And if they were located down the street, across the street, in another city, they'd be part of the project.

"The tanks could be 10 miles away."

Clearly the commission should deny the Macpherson project, finding it is inconsistent with the provisions of this division per §30263(a); should it determine otherwise, we urge the commission to find an alternative location feasible and less environmentally damaging per §30263(a)(1); and find that the Macpherson facility is not sited so as to provide a sufficient buffer area to minimize adverse impacts on surrounding property §30263(a)(5).

If this Commission decides to permit the project and finds there are no alternative drill sites, *it could mitigate the project by relocating the production facilities* to a safer area, away from vulnerable populations and coastal resources. This would at least uphold that portion of §1 of Measure E banning oil production.

Impacts of the City Yard Relocation Have Not Been Considered

Relocating the City Yard was to have been a part of the Environmental Review but according to a Planning Department memorandum the contractor, Ultra Systems, claimed it overlooked that aspect of the RFP when it bid the job. Although the City should have insisted the contractor fulfill the agreement, the City Yard study was instead eliminated to oblige the contractor.

The oil project will displace the city yard operations to an *as-yet undetermined* site. This issue was to have been addressed in the EIR but never was. The new city yard site or sites will almost certainly be located in the coastal zone. As a matter of fact paving a portion of Centennial park at 4th and Ardmore and using the park for truck storage has already been proposed. The commission should not approve the oil project without properly addressing relocation of the city yard.

Last, the question of the pipeline is unsettled. Although not a part of this LCP, the AD Little Draft Independent Review raised numerous troubling questions regarding the condition of the Chevron pipeline to which the Macpherson pipeline would be connected. The Edison pipeline, offered as an alternative, requires further study. In addition to liquefaction is a concern in the area.

Visual Imapcts

Hermosa Beach's terrain consists mainly of three hills paralleling the coastline, each successively smaller than the last going toward the ocean. Because the drill site is at the last gully, or wash, numerous surrounding streets and residences would be forced to look down on a wide array of industrial tanks and production apparatus when they are not forced to look up at the drill and work rigs piercing the blue Pacific sky, shockingly incompatible with the character of surrounding area.

Hermosa Beach is a small beach community. A nonindustrial coastal city 1-square mile in size, it has a low building height limit of 30 feet for homes and 35 feet for most businesses. It is the most densely populated city in the state. Its LCP at page G-13 states "New development should result in a revitalization of a neighborhood . . . guidelines must be established to insure that the existing fabric of the neighborhood is not destroyed in the process." §30251 mirrors Hermosa Beach's belief that scenic and visual qualities in coastal areas should be considered and protected as a resource of public importance. As Hermosa's uncertified LCP states, "*Hermosa Beach is blessed with an ocean beach and the topography to provide multiple views of the ocean. The city has a series of 60 and 140 foot dunes which traverse north to south paralleling the beach. The view provided by the height of the dune areas is utilized in many instances to advantage in residential construction. The vistas provide an open airy and pleasant westward view corridor. Any viewshed areas exist within the Coastal Zone.*" **Unfortunately, this works to a disadvantage when the view is reversed and the beachgoing public must view oil apparatus from the ocean and beach areas.**

Included with this report are some of the pictures and materials Macpherson circulated before the 1984 election. Even the highly sanitized renderings submitted by the applicant to the commission are more accurate than what was represented to the public as an accurate depiction of the project's appearance. If voters had been given accurate information it is impossible to believe they would have approved an industry that could not be situated and designed in accordance with the policies in §30251.

When the rig is up, the project will be visible from Palos Verdes to Malibu, and seen from the visitor-serving beachfront motels in the recently approved coastal hotel area. The drill rig will be used for 55 months. Workover rigs are allowed on-site 25% of the time. The lease allows not for merely drilling in the initial phase but re-drilling, deepening, and re-directioning wells

throughout the life of the project. Even when the so-called "temporary" derrick is down, the project will spoil views to and along the ocean and scenic coastal areas. The definition of "grade" was changed by city ordinance at this driller's convenience. Unlike other developers, it is now not forced to measure the project from the sidewalk, measuring insted instead from the ground elevation inside the City Yard - which is much higher. In other words, the oil tanks and their appurtenances will be more visible above the fire wall (when it is finally built) than the public was led to believe. In court the developer gave the nonsensical and entirely false explanation that this change in grade definition was to allow it to measure its development from the bottom of the 6-foot cavities that will be dug to hold the storage tanks.

The commission is asked to find, as the State Lands Commission did [7], that the "temporary" adverse impacts are not temporary and are inconsistent with the public recreation and access policies of the Coastal Act.

Hermosa's (still uncertified) LCP also makes **view preservation and preservation of existing residential stock and the "informal beach cottage" neighborhood character** a top priority. Fully half of Hermosa Beach residents will see the rig from their residences.

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[7] The State Lands Commission wrote a letter to the City stating the rig presence cannot be considered temporary.

The proposed site is approximately 1200 feet (equivalent to 3 normal-sized city blocks) from the beach.[8] The site is directly adjacent the Hermosa Valley Greenbelt section of the longest continuous linear park in the region. A part of the Rails-to-Trails national network, the greenbelt is a valuable "passive urban open space", per the RUDAT[9] study. In its application Macpherson referred to this area as a "strip park on an abandoned railroad right-of-way" and suggested would create a buffer between oil drilling and some residences to the east. Macpherson would like this commission to avoid considering the fact that the greenbelt itself needs a buffer from the drill site.

The site is also about two hundred feet from the 4-acre South Park, which houses a regional resource roller hockey rink, generous open space and play equipment. Nearby are the smaller Centennial Park and the larger Clark Stadium, little league field, lawn bowling area, and tennis and basketball courts.

Geologic Hazards - Driller Should Remediate All Subsidence and Employ a More Precise Monitoring System

§30262 permits oil and gas development accordance with Section 30260, if such development will not cause or contribute to subsidence hazards unless, per §30262(e), it is determined that adequate measures will be undertaken to prevent damage from such subsidence.

The city engineer noted the conditions in Hermosa Beach are such that if immediate subsidence remediation were not immediately performed, it could not be successfully performed at all.

Macpherson has hedged its obligation to remediate subsidence by inserting the language "due to oil drilling". This qualifying language is a naked attempt to shift onto the city the burden of proving any subsidence was solely caused by oil drilling. Other possible causes would have to be studied and eliminated - something on the same level difficulty as proving smoking caused someone's lung cancer.

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[8] Macpherson's application exaggerates the distance from the beach by counting alleys as streets and counts from the strand all the way through the project site. The result is the number of "blocks" are doubled. It's interesting to note that Hermosa's City Hall, also on Valley Drive, is described in the RUDAT study as being <u>four</u> blocks from the beach.

[9] Regional Urban Development Assistance Team. A city-approved planning exercise led by architects and urban planners with public and city participation to formulate a design concept for Hermosa Beach to improve its commercial tourist features and make it a more liveable city. No consideration if oil drilling is to be found in the RUDAT analysis or in the city's LCP.

As numerous coastal communities have unhappily discovered drilling can result in major net *losses* from lapsed oversight and/or a driller's refusal to accept responsibility and take the necessary action.

The subsidence damage from drilling and its astronomical remediation costs in Long Beach, Huntington Beach and Redondo Beach and the unwillingness of the oil companies and the oversight agencies to assume responsibility is well documented. Similar evasion of responsibility must not be permitted to occur in Hermosa Beach.

The EIR approved by the Hermosa Beach city council indicates subsidence in adjacent Redondo Beach was nil. Nothing could be further from the truth.

Adjacent to Hermosa, in Redondo Beach, 60 tidelands wells brought the city $14 million dollars over 33 years. In the last years of operation the fluid recovery was over 99% water.

Its tidelands revenue afforded Redondo Beach's harbor improvements, pier and sea wall construction. During a storm in 1988, a sea wall failed, and resulted in severe damage to a number of businesses. The businesses' insurance companies are suing the federal government, arguing that the Army Corps of Engineers' faulty construction led to the collapse of the sea wall. The federal government, in turn, is suing Redondo Beach because the sea wall was compromised when subsidence from the drilling caused the earth to sink somewhere between 2-1/2 and 3 feet.

Notwithstanding the fact that Redondo Beach lengthened its pier pilings by 3 feet, this city would not acknowledge this was due to any subsidence problems. In 1997, after years of denying subsidence had occurred Redondo Beach filed suit against the driller for causing extensive subsidence damage. The city may expend more money than it ever received from drilling in litigation and compensation to property owners and tenants for the damage caused by the collapse of a wall built with oil money and then destroyed by the very oil drilling that provided Redondo with the funds to have it constructed.

In addition to the benchmarks in the uplands, near-shore ocean floor movement should be monitored, at the developer's expense, before operations begin and be monitored at the project's beginning, and continue to be measured until the project ends.

The commission could consider approving the exploration phase only, as has been its practice in the past. It is difficult to determine all production impacts, particularly the potential for subsidence and liquefaction, until data is obtained from the exploration and test phases.

Without concrete data, it is difficult to make siting determinations or to balance full field production with environmental considerations.

Commission findings based on conjecture would be incomplete. Also, the success of the dewatering and water injection system would need to be proven before commitment of the site to a production facility is considered.

Air Quality

Macpherson has repeatedly promised public that there will be no pollution from the project, that oil is harmless. In fact, as recently as October of 1997 a newspaper reported the following Macpherson statement: "There will be no harmful emissions." Macpherson testified at numerous public hearing that air pollution was not a feature of oil drilling.

The Macpherson permit application shows the project would violate §30253(3) if it fails to meet *current* requirements imposed by an air pollution control district. *For years* Macpherson assured citizens its project had won the "approval" of the South Coast Air Quality Management District[10]. Merely renewing *construction* applications[11] it submitted years ago just prior to the enactment of stricter air quality standards does not constitute "winning project approval".

The applicant offers no real mitigating measures or any innovative odor control method to address adverse odor impact. If odor problems do occur, operating permits should be denied, abatement orders should be sought, permits revoked; whatever is appropriate.

We believe the EPA allowable emissions are too high. First, they are based on the effects of 8-hour exposure on healthy adult males. Continuous exposure to the presently allowed emissions would present too great an impact on sensitive people and children.

Far more will be emitted than the releases from the production equipment; pipe and tank leakage, uncontrollable emissions during workover periods (allowed 25% of the time throughout the life of the project), and diesel and other fumes from trucking operations. None of these have been quantified or addressed.

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[10] Based in part on Macpherson's brazenly false claims that the both the Coastal Commission and AQMD had already approved the drilling project, Macpherson obtained citizens' support on ballot arguments and other material.

[11] These applications clearly state No approval or opinion concerning safety and other factors in design, construction or operation of the equipment is expressed or implied and Approval or denial of this application will be made after an inspection to determine if the equipment can be operated in compliance with the SCAQMD.

If the project is to be approved, we urge the commission to require the developer to file new SCAQMD applications which should be evaluated using current BACT, the standards which should be required for the project.

The emissions standard for the project should also contain the following:

1) electrification of the welding machines during the construction phase;
2) a complete electrification during the drilling and testing phase;
3) all electric pumps (as promised by the developer) during production;
4) the use of paraformaldehyde-based drilling mud additives, hydrochloric and hydrofluoric acids, and any biocide or other organic material containing paraformaldehyde should be prohibited;
5) permanent project shut-down when H_2S levels exceed 4ppm

Water Quality

The project is inconsistent with §30230 and §30232 because no information has been submitted to enable a determination that pipelines would be designed and operated to avoid or minimize adverse impacts on marine resources and nearby groundwater basins and aquifers.

Traffic and Safety - Truck Traffic and Pipeline Impacts

The new South Park has significantly increased the foot traffic on Valley Drive. People with strollers, children on skateboards, bikes and roller blades stream past the City Yard throughout the day, right through the truck turn-in. The EIR did not take into account the impact of siting oil development so close to a high-use public park.

The oil trucks are to enter the city from PCH, travel westward downhill on Pier Avenue, proceed southward on Valley down a narrow two-way street (each lane is only 15 feet wide) to the site. Trucks leaving the site will exit and continue south (where Valley becomes one-way) to Herondo Boulevard, turn left and travel east and re-enter PCH. The narrow streets in Hermosa Beach present a variety of problems such as turning difficulty, accidents, deteriorating paving. The lack of an emergency truck lane at the project site. Next, fire and other safety personnel may have difficulty negotiating an effective rescue operation at the site because of its location. Last, the contemplated pipeline is to be installed on Valley-- the same street as the approved truck route, requiring an as-yet unknown alternate plan.

The driller may require an encroachment permit from Caltrans, requiring acceleration and decelerations off of and onto PCH. No traffic disrupting left turns should be allowed into or out of the city, and flagmen should be employed to warn pedestrians and traffic at the site.

If approved, provisions should be made to remediate any spills from trucks, and no remediation is currently possible for the inherent dangers of 80,000 lb. trucks with braking capabilities far less than automobiles.

The A.D. Little Draft Independent Review of the project identified serious problems related to using the Chevron pipeline as planned. Proposed was using the Edison pipeline as an alternative. Areas with known and potential liquefaction characteristics have been identified in and around the proposed drill and pipeline site.

Because little has been done in the way of study, Hermosa Beach's environmental review and its CUP both lack sufficient data upon which the commission could base a determination that the pipeline would be stable or contribute to stability, would have structural integrity, would minimize the possibilities of leaks or spills or that the city would minimize risk to life and property.

Should the reservoir size fail to meet Macpherson's expectations it may not be economically feasible to construct a pipeline. Oil may continue to be trucked out of the city with no assessment having been done on the safety of a permanent trucking operation. Based on the information now available, the project could not be found consistent with §30253 and §30262 of the Coastal Act.

Incompatibility

Also worth noting is that §30240(b) requires development in areas adjacent to parks and recreation areas to be sited and designed to prevent impacts which would significantly degrade those areas, and be compatible with the continuance of those areas. Unfortunately, even the most radical mitigations are insufficient safeguards against the inherent dangers of so intensive an activity in such a singularly compressed layout.

Unlike the §30250(a) guidelines, this industrial development is not located within, contiguous with, or in close proximity to, existing developed areas able to accommodate it. Instead it is planned for an area upon which it will have significant adverse effects, individually and cumulatively, on coastal resources. If Macpherson truly believed its project would be compatible with the community, the impacts would have been truthfully represented.

In addition to stricter emissions controls discussed at §30253(3), a fire wall surrounding 100% of the property at the beginning of the exploration phase and fire protection of the remaining City Yard building[12], noise remediation based upon detailed acoustical study of the specific site[13], installation of vibration isolators, prohibiting weekend, holiday, and night-time drilling during all project phases would be a step toward minimally acceptable mitigations.

Procedural Issues - Macpherson Has No Development Agreement

The commission is requested to consider making a finding that Macpherson Oil Company erred when it stated on its application that its project is governed by a Development Agreement.

Development Agreements confer vested rights at the time of approval[14]. Please note that the Macpherson coastal application incorrectly identifies its Conditional Use Permit Resolution No. 93-5632 as a Development Agreement. The Coastal Commission should carefully avoid taking any formal action to approve the applicant's Conditional Use Permit as though it *were* a Development Agreement[15] in order to avoid unintentionally buttressing a possible future court argument that the project is vested by having a Development Agreement.

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[12] Uniform Fire Code §79.1102(c)(1): Wells shall not be drilled within 100 feet of buildings not necessary to the operation of the well. The Hermosa Beach fire department granted a variance allowing a wall in lieu of the required distance. Whether the wall meets the necessary criteria is unknown, but at present, a City Yard building not necessary to the well operation will remain on site, unprotected, within 100 feet of the drilling area.

[13] The site is in an amphitheater-like area. Sounds and their echoes carry over long distances. Had there been a careful study during the EIR process, it would be known at this time whether the project would require remediation beyond a sound blanket.

[14] Gov. Code §65866

[15] Government Code §65869 A development agreement shall not be applicable to any development project located in an area for which a local coastal program is required . . . unless . . . (2) in the event that the required local coastal program has not been certified, the California Coastal Commission approves such development agreement by formal commission action.

Procedural Issues - Permit Denial would Protect Resources

In any event, conflicts must be settled in the way that would be most protective of coastal resources as set forth in §30007.5. This section directs that the resolution of conflicts between policies be reached in a way that is ultimately the most protective of significant coastal resources. Allowing drilling would create enduring negative impacts on Hermosa Beach coastal public recreation resources, upon workers employed in the coastal zone and on the general public.

Denial of a permit, however, would actually be protective of the oil as a resource, which would remain available until such time, for instance, a national emergency requires its recovery, as in PRC §6240-44[16] (the O'Connell bill). The options of either a denial or an alternate site, would protect both the oil and the open space as significant coastal resources.

Recreation and Public Access

§30001.5(a) calls for the *protection and maintenance*, and where feasible, *enhancement and restoration* of the overall quality *of the coastal zone environment and its natural and artificial resources*.
The Hermosa Beach public would like the Commission to understand that it too supports these policies, having accomplished much in the way of *protecting, maintaining, enhancing and restoring natural and artificial resources in the coastal zone*.

Macpherson attempts to rationalize the compatibility of its project and the intent of §30001.5(a) by arguing that oil royalty is earmarked to purchase and maintain open space but all the open space in the city has already been purchased and preserved without recourse to drilling. In 1984 Hermosa Beach citizens allowed oil drilling solely because its open space was threatened and Macpherson misrepresented the impacts of its drilling project. Voters believed the project would be safe, quiet and invisible, that the site would have between four and eight wells. Macpherson's artwork represented the derrick would be about the height of a telephone pole. Since that time, every need for which oil drilling was supposedly required has been met. Presently all open space available in the city has been purchased and there is no longer any

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[16] §6243. Notwithstanding any provision of Article 4 (commencing with §6870) of Chapter 3 of Part 2 or any other provision of law, no state agency or state officer shall enter into any new lease for the extraction of oil or gas from the California Coastal Sanctuary, unless the President of the United States has found a severe energy supply interruption and has ordered distribution of the Strategic Petroleum Reserve pursuant to §6241(d) of Title 42 of the United States Code, the Governor finds that the energy resources of the sanctuary will contribute significantly to the alleviation of that interrupt and the Legislature subsequently acts to amend this chapter to allow that extraction.

need for further acquisition. We therefore ask this commission to support Hermosa Beach's coastal open space and public recreation areas without needlessly degrading them with three decades of continual, day-and-night oil industrial activity in the coastal zone of a small, densely populated beach city which would adversely affect its most vital recreational resources in the adjacent area.

When the Commission determines whether the overall quality will be improved, it should note that the conclusion of the EIR was that the project would have permanent, negative effects which cannot be mitigated. The city adopted a Statement of Overriding Considerations that found the acquisition of open space using oil royalty outweighed the negative impacts. Again, all the available open space in the city has been acquired with other funds. Therefore, there cannot be a net benefit, or improvement to the overall quality of *the coastal zone environment and its natural and artificial resources* as set forth in §30001.5(a)

LCP Prejudice

According to §30604, a CDP may be issued prior to certification of the local coastal program if two conditions are met: First, the proposed development is found to conform with Chapter 3. Second, the permitted development will not prejudice the ability of the local government to prepare a local coastal program that is also in conformity with Chapter 3.
First, the planned drill site was originally zoned Open Space. The land was rezoned to Manufacturing by the City to accommodate drilling before the Coastal Commission had the opportunity to consider the site's potential to support coastal visitor-serving or recreational uses under §30223 of the Coastal Act and in spite of the numerous requests that the city conduct more extensive environmental study of the project[17].

The commission is urged to use its discretion to find that permitting the Macpherson project would deny Hermosa Beach sufficient latitude to form a comprehensive overall LCP capable of meeting the requirements of Chapter 3. **Please note also that Hermosa Beach, on advice of its counsel, recently declined to comply with the commission staff's request to add an energy management policy to its currently uncertified LCP.**

[17] The State Lands Commission and Coastal Commission staffs both urged subsequent or Supplemental environmental review. Stop Oil's court action challenging the legality of the EIR was found not to have been filed timely. The FEIR, it should be noted, was never circulated for public review and comment, as was noted in our lawsuit and by the State Lands Commission in correspondence to the city.

At present, the city's LUP designates the oil drilling site for "Open Space". The city's LCP is silent on the matter of oil drilling; nor does it provide for coastal-related industry. **The LUP contains a single line stating the city would encourage coastal dependent industry According to its application, the Macpherson project is proposed for a site 9 blocks inland. Obviously the Macpherson project is not a coastal dependent project.**

There are two observable trends in the M-1 zone. One is that the uses are growing lighter rather than heavier. An auto body shop leaves, an architectural studio appears. Several light manufacturing properties in the area were rezoned residential and developed accordingly. The owner of the Body Glove warehouse, the only structure separating the oil site from South Park, applied for a residential zone change[18].

The City Yard site is used for parking and has recreational and visitor-serving potential. While presumably the city has no plans to move the city yard if the oil project does not proceed, the potential to use some or all of the the City Yard quarters for future open space and visitor-serving use would be lost to a generation.

Oil drilling is glaringly dissimilar to the allowable M-1 operations.
If the site is committed to heavy industry for the next 30 years the city will be denied the opportunity to freely consider the wide range of planning decisions currently available to it, and the likelihood that it would be forced to permit tenants with more intense operations more compatible with oil operations but clashing with the recreational and visitor-serving activities and facilities in the area.

Many of these difficulties arose out of the disordered planning process at the local level in the past. Nevertheless, the city is now much better equipped to address the totality of its local planning goals and ought to be allowed the opportunity exercise all its planning options so as to best comply with the policies of Chapter 3.

The effect of an oil project on future planning for the area needs to be addressed in the context of planning for the city. Incongruously shoe-horning "oil drilling" into the category of uses allowed by the city's M-1 zone will subject small business owners (print shops, window tinters and the like) to an existence alongside the nuisances and dangers of oil drilling, an intense and highly industrial operation.

While completing its certification process, the city would be prejudiced in its ability to comply with Chapter 3 and the public would again be denied the chance to provide meaningful input if there is no opportunity for another local review of the oil drilling in a broader planning context.

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[18] The tenant has postponed the process pending the resolution of the drilling dispute.

The concept of potential negative impacts on workers employed in the coastal zone as set forth in §30007.5 need to be considered, as do the larger issues, i.e. the negative impacts on recreational open space and small businesses. Heavy industries compatible with oil operations would be likely to replace the existing lower-impact businesses. Permitting the project beforehand would prejudice the city by eliminating crucial planning options.

Light manufacturing is the most intensive zone in Hermosa Beach, and only a small amount of that exists. Hermosa Beach is not an industrial city and could not readily assimilate oil drilling operations without risking significant negative repercussions.

Zoning designations are as follows: Open Space 1 & 2, Residential 1 & 2, Commercial 1, 2, & 3, M-1 and P-D (Planned Development) Residential, Commercial, Industrial. A map in the uncertified LCP shows the city yard area is marked with the letters "IND", which, if intended to be a zone designation, is meaningless.

First of all, if "IND" and M-1 are interchangeable, it is noteworthy that no other site in the entire city has a similar notation even though some other M-1 spaces exist. Formerly zoned "Open Space", the city intended to rezone the City Yard to light manufacturing (M-1). Nevertheless, oil drilling and tank farm operations are not permitted in either open space or M-1 zones.

While the Coastal Act does not require the commission consider the appropriateness of placing energy development adjacent to incompatible businesses, allowing drilling would prejudice the city's ability to comply with many of the policies in Chapter 3, particularly: 30001(c), 30001.5(c) & (e), 30004(a)&(b), 30005(b), 30006, and 30010.

According to §1403(a) of the Hermosa Zoning Code, CUPs are issued to planned developments. All developments shall be in compliance with the minimum standards of the zoning ordinance. Rather than demanding compliance with minimum standards, the oil CUP granted liberal concessions with regard to compatibility, height, grade, setbacks, traffic, noise, vibration and pollution and hours of operation.

If this project is permitted, the city would be put in the untenable position of having a coastal development for which it lacks a policy. Worse, it would limit the effectiveness of the public input, which is strongly encouraged elsewhere in the Act. The city also would be unable to seamlessly combine its other elements into a sound coastal plan.

Funding may soon be made available for cities to complete their certification process, allowing greater local planning discretion in the coastal area. Granting a CDP to Macpherson so legally and politically sensitive a juncture would severely limit the city's planning freedom.

While the city has been advised by its counsel that any public objection to the project could constitute a breach of good faith, the following points are noteworthy:

- The city council withdrew as co-applicant for this CDP
- Pre-election polls showed that of 12 city council candidates, only 2 supported the Macpherson lease.
- Numerous former council members who once voiced support for the project publicly opposed it after leaving office, even the councilman who negotiated Lease No. 2.

Coastal Access

Contrary to the intent of §30211 coastal access would be diminished without the relocation of the 12 striped parking spaces at the City Yard which are now used for weekend and holiday parking by the beach-going public.

Provision of Indirect Public Recreational Opportunities Cannot Be Quantified

At #7 of its application Macpherson claims oil drilling would meet the intent of §30001.5(c) (indirectly provide public recreational opportunities in the coastal zone) and §30213 (protect and encourage lower cost visitor and recreational facilities). Recreational opportunities, if any, would derive from the city's expenditure of royalty payments[19]. Analysis shows that even with optimal volumes, revenue available for low cost recreational open space is relatively small. Fortunately, the critical need for open space conservation funding has passed. Money is available for enhancements. The maintenance costs are well within the city's budget.

A recent contract with the County for increased parking and an approved hotel development will meet beach lifeguard and maintenance costs. These and the ongoing Downtown Enhancement Program are expected to generate about $1 million in annual revenue to the city and make a meaningful increase in visitor-serving accommodations.

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[19] It is not likely the city will receive much in the way of unrestricted royalty. Macpherson denied this at the local level but admits it in its Coastal Application when it argues against alternate site and where it acknowledges 90% or more of its recovery will take place in the tide lands.

Macpherson's ridiculous and untrue claims that the city is in a financial crisis and cannot afford "the loss of" oil revenues have destroyed its tenuous credibility. The negative effects of drilling on recreational resources would far outweigh any benefits. It bears repeating: **This project is exploratory and it cannot be said to have a value or benefit. Because all the available open space in Hermosa Beach has been acquired it is impossible for oil drilling to provide more.**

Public recreational opportunities deriving from tidelands resources are nil. Hermosa Beach tidelands revenue is limited to harbor maintenance items. A standing Attorney General opinion even prohibited using tidelands revenue to level the tidelands beach, terming it a "recreational" use. Pier renovation, too, would, in all probability, also be found to have a recreational rather than a navigational function.

Reliance on Local Government and Public Participation

If this commission follows the intent of §30004(a), and heavily relies on local government (and its electorate) and local land use planning procedures and §30005(b), which recognizes the power of any city (and electorate) to declare, prohibit, and abate nuisances, it cannot find a basis to permit oil drilling[20].

In part, §30006 states that the Legislature finds and declares that the public has a right to participate fully in decisions affecting coastal planning, conservation, and development; **Surely no form of public participation could send a clearer message than through the voting process as it banned oil drilling in 1995.** The city, unfortunately is silenced due to its counsel that any public objection to the project will constitute a breach of good faith and prompt a lawsuit by Macpherson. The Coastal Commission is asked to take note of the city's withdrawal of its name from the coastal application. A portion of one of Macpherson's threatening messages to the city is attached.

The Macpherson Oil Co. Project Could Trigger Widespread Circumvention of the "Rules of Capture" and Precipitate Widespread Drilling in Areas Formerly Protected

On June 30, 1992, despite the prohibition on removing oil and gas deposits from tide lands and state waters unless oil was <u>being drained by means of wells on adjacent lands</u>, Macpherson successfully argued to the commission that past well operations triggered continuing oil migration.

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[20] In this instance, the electorate has declared oil drilling a nuisance and has prohibited this activity. The city, unfortunately, perceives itself to be in a position in which it is unable to exercise its police powers. The commission, therefore, should recognize it cannot rely on Hermosa Beach to use the powers described in this code section.

The State Lands Commission voted 2-1 to allow Macpherson to drill when no oil was being removed by wells on adjacent lands. The following is taken from the transcript of that meeting.[21]

> MR MOUNT: Under § of PRC 6872(a) the Commission must find that drainage is occurring in order to permit leasing of sanctuary lands. The staff has found drainage is not currently occurring and recommends denying the lease.
>
> MR FERRIN (HB City Mgr.) This method [slant drilling] Charles Warren referred to in his letter to Commissioner Davis as having "real potential for application to fields offshore in California. . ." Ladies and gentlemen, what I bring you today is clearly a winner.
>
> If you let this one get away, Hermosa Beach and the State of California will truly lose a great opportunity [for increased slant drilling]". I think we see there's a semantical problem between the term "drainage" and that of "migration". The act of pumping oil at Redondo each created that is causing what we now have termed "drainage". We are now calling it "migration". <u>It is still the same thing.</u>
>
> MR MOUNT: Fluids are still migrating across the lease line from Hermosa Beach to the Redondo Beach side. But there is not currently any production on the Redondo Beach side.
>
> COMMISSIONER ZIEGLER: Well, given the life of the Redondo Beach wells and the closure dates on that side, I guess the question I have is why are we talking about this now for Hermosa Beach?
>
> MR MOUNT: Well, you understand, this process was started many years ago when, in fact, there was no doubt about drainage occurring and that oil being produced and Redondo Beach recovering that oil that came from Hermosa Beach. That's not the situation today.

[21] As with other excerpts in this paper, the entire statement may not be given, but the meaning and context are accurate.

Hermosa Beach Stop Oil retained a petroleum engineer who confirmed what is in fact intuitively obvious even to a non-engineer: 1) The Redondo Beach wells were pumping 99% water; 2) Oil is thick and sludgy, 30 water is more fluid than oil; 4) When the well stops pumping, the oil and water quickly stop drifting; 5) Even if oil and water continued to migrate, it certainly isn't being removed by wells and therefore is not being lost to well production. The intent of the code was to keep the state's resources from being removed from the ground, by an adjacent driller. When Mr. Ferrin blended the terms "drainage" and "migration" a Pandora's Box was opened - one that could precipitate extensive and indiscriminate drilling in coastal waters and along the coastline.

Stop Oil won a Writ of Mandate and the matter of a State Lands Commission approval of the Macpherson project was re-heard in 1994. Because the Writ didn't explicitly order them to do so, the State Lands Commission did not reconsider the drainage issue and, over the objections of thier staff, again approved the project 2-1, with Gray Davis dissenting.

The cumulative impacts from Macpherson's project could be enormous. Oil migrates all the time for all sorts of reasons. Water currents and subtle seismic shifts cause migration. If oil companies are allowed to The novel interpretation used by the State Lands Commission in approving the tidelands lease sets the stage for future widespread circumvention of the Coastal Sanctuary Act. Although we recognize the coastal commission is not responsible for curing all the numerous mistakes, poor decisions, and deliberate oversights by other agencies, we ask that you carefully evaluate the wisdom of proceeding with this project in light of its precedent-setting characteristics.

Credibility of the Applicant

> 'While the City has entered into a[n] Oil and Gas Lease with Macpherson Oil for the City Yard site, that Oil and Gas Lease in no way obligates the City to review solicitation letters sent out by Macpherson Oil. Any actions for fraud or misrepresentation or false statements could, in our opinion, only be brought against Macpherson OIl and not the City.'
>
> City Attorney of Hermosa Beach
> Confidential memo to the City Manager
> (dated 09-25-89)

Typical assurances delivered by Macpherson and engineer David Gautschey are never exactly lies consisting of a series of separate, partially true statements that when taken as a whole tend to produce a misdirection worthy of Seigfried and Roy.

In 1995, more than two years before its application was placed on this Commission's agenda, Macpherson's ballot argument was written. It stated in part:

> These Hermosans have examined the proposed project - as did the Air Quality Management District, **Coastal Commission**, State Lands Commission and the City itself - and **found it environmentally safe**.

Other creatively misleading verbal linkages have resulted in such claims as "our vapor recovery system will capture any harmful gasses"; "the asphalt that covers all your roads is made of oil and it can't hurt you"; "fires are not a concern. Crude oil is almost impossible to ignite"; Worldwide, most tank fires are from lightening strikes. Since lightening is rare on the coast, tank fires are inconceivable;" "We've always said hydrogen sulfide is not a problem"; "the voters intended to allow only the Macpherson project".

Compare just one portion of Macpherson's anti-Measure E campaign literature with the excerpted portion of the State Lands Commission hearing transcript. Both read exactly as follows:

Macpherson Campaign Literature	**State Lands Commission hearings, March 8, 1994**
WRONG! The promoters of Measure E claim that the California State Lands Commission staff opposed the Hermosa oil project. (Yes on E official ballot argument)	EXECUTIVE OFFICER WARREN: The staff recommendation, Mr. Chairman, is set forth on pages seven and eight which is to deny the application.

The Coastal Commission is strongly urged to deny the permit; however, if it were to only go so far as to ensure that the *sum and substance* of each and every Macpherson promise that has been made to the citizens of Hermosa Beach were memorialized in mitigation measures, the citizens' vigorous decade-plus effort will have been made worthwhile.

Prepared by Hermosa Beach Stop Oil
Ph: 310-379-5698 Fx: 310-376-1298

June 19, 1997

RECEIVED
JUN 23 1997
CALIFORNIA
COASTAL COMMISSION

625 Monterey Blvd.
Hermosa Beach, CA 90254

Coastal Commissioners
c/o A. Dettmer
45 Fremont St. #2000
San Francisco, CA 94195

Subject: Hermosa Beach oil drilling

Dear Commissioners,

I am writing to ask that you reject the permit for oil drilling in Hermosa Beach. The people have voted the project down, realizing that the potential dangers are many and the potential benefits are strictly pie-in-the-sky. You are perhaps our last best hope to end this folly. Please do not let this project happen. Thank you.

Sincerely,

Allan Mason

PACIFICA VILLAS HOMEOWNERS ASSOCIATION, INC.
451 2nd STREET • HERMOSA BEACH, CALIF. • 90254

Pacifica Villas Homeowners Association
451 2nd St.
Hemosa Beach, CA 90254
July 14, 1997

RECEIVED
JUL 31 1997
CALIFORNIA
COASTAL COMMISSION

California Coastal Commission
c/o A. Dettmer
45 Fremont St., Suite 2000
San Francisco, CA 94105

Dear Commissioner,

The Pacifica Villas Homeowners Association urges you to deny a permit to Macpherson Oil Company for drilling in Hermosa Beach.

This proposed project negatively impacts our nearby townhome community. Our residents enjoyment of their homes and the adjacent public park is directly threatened.

In addition to the negative impact on our community, this project is in direct contradiction to the will of the voters of Hermosa Beach as expressed in a 1995 vote to ban oil drilling in the city.

The project is also inadvisable for a number of technical reasons including:

- The law requiring that new industrial development be located away from developed areas.
- The project does not meet current air pollution requirements.
- Hermosa Beach does not have a certified coastal plan.
- Subsistence, or sinking land, has not been sufficiently addressed.

Sincerely,

The Pacifica Villas Homeowners Association Board of Directors

Alan Zabel, Secretary

Tina Kerrigan, Vice President

Mike Webb, Treasurer

Hank Toso, Maintenance Director

6/27/97

Dear Coastal Commission,

Please **deny** Don Macpherson's permit application.

I have lived in the South Bay since I was 2 years old - over 34 years - and I do not want more pollution to come our way. No oil drilling, & toxic releases!!!

(Check the EPA records for Macpherson's Kern Co. project shut down for toxic releases, please.)

No drilling here on our coast PLEASE!

Sincerely, Vicki + Eric Goldbach + family of 2.

Vicki Goldbach
544 S. Gertruda Ave.
Redondo Beach, CA 90277

Coastal Commissioners
c/o A. Dettmer
45 Fremont St. #2000
San Francisco, CA 94105

34103/2213

600 Ardmore Avenue
Hermosa Beach, CA 90254
June 22, 1997

California Coastal Commission
%Ms. A. Dettmer
45 Fremont Street, Suite 2000
San Francisco, CA 94105

RECEIVED
JUN 27 1997
CALIFORNIA
COASTAL COMMISSION

Dear Commissioners:

RE: Macpherson Oil Company
Potential Drilling in Hermosa Beach

I respectfully request that the Commission deny a permit to Macpherson Oil Company for drilling in Hermosa Beach for the following reasons:

1. Under the law, hazardous, new industrial development must be located away from existing developed areas, and there are alternative sites in the area (ξ30250(b)).

2. This development is not appropriate for this area. It will negatively impact parkland and public recreational areas and **THREATEN the HEALTH and SAFETY** of Hermosa Beach residents and the visiting public (ξ30240(b)).

3. The development does not meet current requirements of the local air pollution control district. It does not utilize the best available control technology (BACT). This is important because of the **potential cancer-causing effect of the project's emissions** (ξ30253(3)).

   A. Attached is a copy of the published "WARNING" required by Prop. 65 regarding chemicals known to the State to cause cancer, birth defects, or other reproductive harm found in and around gasoline, crude oil, and many other petroleum products and their vapors, or result from their use: "Other facilities covered by this warning include, for example, oil and gas wells, oil and gas treating plants, petroleum and chemical storage tanks, pipeline systems,..., tank trucks and tank cars, loading and unloading facilities and refueling facilities."

      1. Attached is a copy of a letter from Dr. Michael Ross, now Professor and Chairman of Obstetrics and Gynecology, Harbor-UCLA Medical Center, regarding reproductive harm during the first trimester of pregnancy due to exposure of oil based solvents and hydrocarbon materials.

      2. Attached is a copy of a letter from Dr. Frans Walther, Professor of Pediatrics, King-Drew Medical Center, regarding the hazards of oil drilling on children with asthma.

4. Our city does not have a certified local coastal plan, and the existing plan does not have an energy development policy (ξ30604).

5. Subsidence (sinking land) has not been adequately addressed. One need only look at Redondo Beach's experience of land sinking two to three feet because of oil drilling to realize how serious a problem this is in the beach area (ξ30262(e)).

As my family and I live only 60 yards directly across the greenbelt from the potential drilling site, I am also concerned about:

1. **Nearly FIVE YEARS** (55 months) of drilling, noise, odors, trucks, dust and dirt.

2. **Accidents** - Should an explosion occur, our family, pets and home will be blown up or burned. This, of course, includes my neighbors.

3. **Property Value Protection** - This major issue was approved by the Planning Commission as a mitigating factor. However, our then City Council removed this condition when Mr. Macpherson stated that the project would have no negative impact on property values.

   A. Attached is a copy of a letter my ex-neighbor, Glen Vondrick, sent my husband after he sold his house in 1992. The negative impact of the potential oil drilling's effect on Glen's property value resulted in a $35,000 loss.

My family and I are totally opposed to this oil drilling project. However, even if my arguments listed above do not sway your decision, following are some mitigating measures that should be required of the Macpherson Oil Project if it is approved:

1. **MANDATE THAT THE BEST AVAILABLE CONTROL TECHNOLOGY (BACT) IS USED IN ALL ASPECTS OF THIS PROJECT AND ENFORCE IT.**

2. Cover expenses to residences due to 55 months of noise, odor, dust, and dirt for the following:

   A. Install double-pane windows.
   B. Install air conditioning.
   C. Maintain exterior paint.
   D. Routinely wash windows.
   E. Replace dying plants, shrubs and trees.

3. The Macpherson Oil Project should cover any increase in insurance rates because of the risk this project places on residences.

4. The Macpherson Oil Project should be held responsible for all health problems resulting from this project as published: "known to the State to cause cancer or reproductive toxicity," or other health problems exacerbated by oil drilling.

5. A formula should be implemented to protect home owners in the southwest section of the City from any loss of property value due to this oil drilling project. Southwest section homeowners' values should be consistant with the rise and fall of property value in other Hermosa Beach areas. A similar property value protection condition was required by the Coastal Commission on a Huntington Beach oil drilling project.

With all the changes in laws (i.e. Measure E here in Hermosa Beach), new knowledge of health care, and improvements in the City of Hermosa Beach just since I moved here in June, 1986, I cannot believe that this oil drilling project should be anywhere near a residential area, let alone in a tiny beach community as congested with people as Hermosa Beach. At a public hearing a few years ago I asked Chris Williamson, an engineer for Macpherson Oil, if he would have his family live next to this oil drilling project. He said "no way." What is everyone thinking? Please turn this project down.

Sincerely,

Nancy Reviczky

Nancy Reviczky

nr

Attachments

Daily Breeze

(USPS 501-940)

A Copley Newspaper

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The foregoing warning is provided pursuant to Proposition 65. This law requires the Governor of California to publish a list of chemicals "known to the State to cause cancer or reproductive toxicity." This list is compiled in accordance with a procedure established by the Proposition, and can be obtained from the California Environmental Protection Agency. Proposition 65 requires that a clear and reasonable warning be given to persons exposed to the listed chemicals in certain situations.

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2-93

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DEPARTMENT OF OBSTETRICS AND GYNECOLOGY
UCLA SCHOOL OF MEDICINE
Please Reply to: HARBOR/UCLA MEDICAL CENTER
1000 WEST CARSON STREET
TORRANCE, CALIFORNIA 90509

July 8, 1993

Ms. Nancy Reviczky
REI
1000 W. Carson St.
Torrance, CA 90509

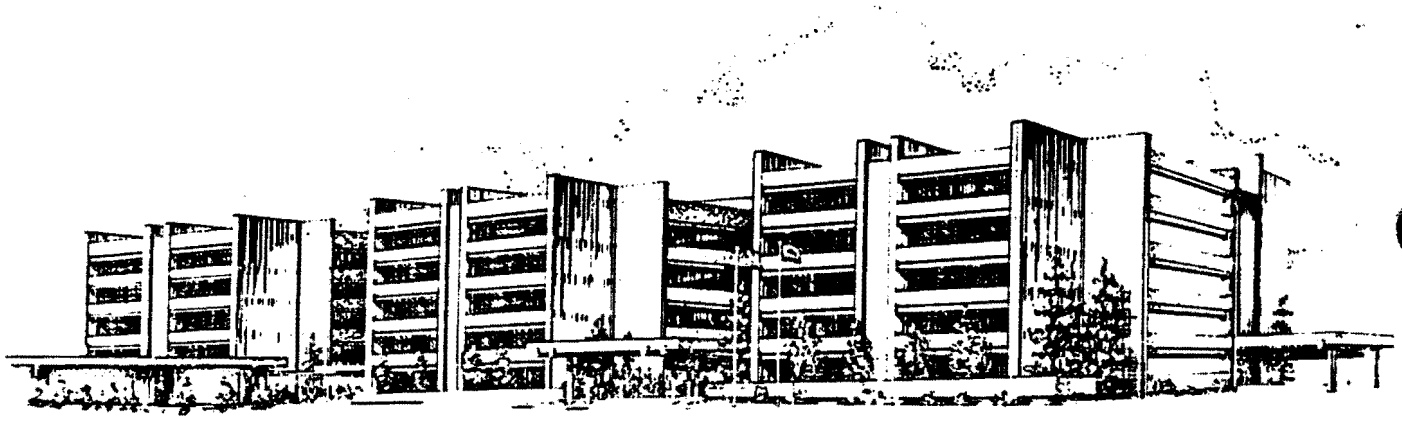
Dear Nancy,

As per your request I have investigated whether oil drilling and collection in proximity to community homes would result in any potential adverse pregnancy outcome. The literature is replete with numerous reports of the teratogenic effects of oil based solvents and hydrocarbon materials. Exposure to these solvents, particularly in the first trimester of pregnancy, may result in fetal anomalies and/or growth deprivations. I would certainly be concerned for women considering pregnancy who live in the immediate vicinity of the proposed drilling.

Please do not hesitate to call me if I can be of further assistance.

Sincerely,

Michael G. Ross, M.D.
Chief, Division of Obstetrics



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EDWARD J. RENFORD, Hospital Administrator JAMES G. HAUGHTON, M.D., Medical Director BETTYE J. MOSLEY, R.N., Director of Nursing

July 12, 1993

To: Karen Sprice
602 Ardmore Ave
Hermosa Beach, CA 90254

From: Frans J. Walther, M.D., Ph.D.
Professor of Pediatrics

I followed up on your question about the effects of oil drilling in the close vicinity of your home on the asthma of your daughter.

Oil mists and aerosols of machining fluids can cause asthma and pose a definite hazard of worsening already existing asthma as has been shown in 3 recent studies[1-3]. Children are generally more sensitive to pollution induced asthma than adults.

I hope this answers your question.

Sincerely.

[1] Robertson AS, Weir DC, Burge PA: Occupational asthma due to oil mists. Thorax 1988;43:200-205.
[2] Kennedy SM, Greaves IA, Kriebel D, Eisen EA, et al: Acute pulmonary responses among automobile workers exposed to aerosols of machining fluis. Am J Ind Med 1989;15:627-641.
[3] Gannon PF, Burge PS: A preliminary report of a surveillance scheme of occupational asthma in the West Midlands. Br J Ind Med 1991;48:579-582

tensometer (tens-om′ĕ-ter) an apparatus by which the tensile strength of materials can be determined.

tensor (ten′sor) [L., "stretcher," "puller"] any muscle that stretches or makes tense.

tent (tent) [L. *tenta*, from *tendere* to stretch] 1. a covering of fabric designed to enclose an open space, especially such an arrangement over a patient's bed for the purpose of administering oxygen or vaporized medication by inhalation. 2. a conical and expansible plug of soft material, as lint, gauze, etc., for dilating an orifice or for keeping a wound open, so as to prevent its healing except at the bottom. **oxygen t.**, a tent erected over a bed into which a constant flow of oxygen can be maintained. **sponge t.**, a slender, cone-shaped piece of compressed sponge used for dilating the os uteri. **steam t.**, a tent erected over a bed into which steam is passed: used in certain respiratory conditions.

tentacle (ten′tah-k'l) a slender whiplike appendage in animals that may function in prehension and feeding or as a sense organ.

tentative (ten′tah-tiv) experimental and subject to change.

tenthmeter (tenth-me′ter) one ten-millionth of a meter.

tentoria (ten-to′re-ah) plural of *tentorium*.

tentorial (ten-to′re-al) pertaining to the tentorium of the cerebellum.

tentorium (ten-to′re-um), pl. *tento′ria* [L. "tent"] an anatomical part resembling a tent or a covering. **t. cerebel′li** [NA], **t. of cerebellum**, the process of dura mater that supports the occipital lobes and covers the cerebellum. Its internal border is free and bounds the tentorial notch; its external border is attached to the skull and encloses the transverse sinus behind. **t. of hypophysis**, diaphragma sellae.

tentum (ten′tum) the penis.

Tenuate (ten′u-āt) trademark for preparations of diethylpropion hydrochloride.

tenulin (ten′u-lin) a crystalline principle, $C_{17}H_{22}O_5$, from the bitter weed, *Helenium tenuifolium*, and other species that is mildly sternutatory and poisonous to fish.

Tepanil (tep′ah-nil) trademark for preparations of diethylpropion hydrochloride.

tephromalacia (tef″ro-mah-la′she-ah) [Gr. *tephros* ash-colored + *malakia* softening] softening of the gray matter of the brain or cord.

tephromyelitis (tef″ro-mi″ĕ-li′tis) [Gr. *tephros* ash-colored + *myelos* marrow + *-itis*] inflammation of the gray substance of the spinal cord.

tephrosis (tef-ro′sis) [Gr. *tephrōsis*] incineration or cremation.

tephrylometer (tef″ril-om′ĕ-ter) [Gr. *tephros* ash-colored + *hylē* matter + *metron* measure] a graduated glass tube for measuring the thickness of the gray matter of the brain.

tepidarium (tep″ĭ-da′re-um) [L., from *tepidus* lukewarm] a warm bath: more correctly, a place for a warm bath.

tepor (te′por) [L. "lukewarmness"] gentle heat.

ter- [L. *ter* thrice] a prefix meaning three, three-fold.

tera- [Gr. *teras* monster] a combining form used in naming units of measurement to indicate a quantity one trillion (10^{12}) times the unit specified by the root with which it is combined.

teracurie (ter″ah-ku′re) a unit of radioactivity, being one trillion (10^{12}) curies.

teras (ter′as), pl. *ter′ata* [L.; Gr.] a monster. **ter′ata anadid′yma**, anadidymus; sometimes applied to a double monster with duplication of the cephalic pole and single toward the podalic pole. **ter′ata kata-anadid′yma**, anakatadidymus. **ter′ata katadid′yma**, katadidymus; sometimes applied to a double monster with duplication of the podalic pole and single toward the cephalic pole.

terata (ter′ah-tah) [Gr.] plural of *teras*.

teratic (ter-at′ik) [Gr. *teratikos*] monstrous; having the character of a monster.

See under *teras*, *monster*, and *monstrum*, and names of specific monsters.

terato- [Gr. *teras*, *teratos* monster] a combining form denoting relationship to a monster.

teratoblastoma (ter″ah-to-blas-to′mah) a neoplasm containing embryonic elements and differing from a teratoma in that its tissue does not represent all the germinal layers.

teratocarcinogenesis (ter″ah-to-kar″sĭ-no-jen′ĕ-sis) the production of teratomas.

teratogen (ter′ah-to-jen) an agent or factor that causes the production of physical defects in the developing embryo.

teratogenesis (ter″ah-to-jen′ĕ-sis) [*terato-* + Gr. *genesis* production] the production of physical defects in offspring in utero.

teratogenetic (ter″ah-to-jĕ-net′ik) pertaining to teratogenesis.

teratogenic (ter″ah-to-jen′ik) tending to produce anomalies of formation, or teratism.

teratogenous (ter″ah-toj′ĕ-nus) developed from fetal remains.

teratogeny (ter″ah-toj′ĕ-ne) teratogenesis.

teratoid (ter′ah-toid) [*terato-* + Gr. *eidos* form] resembling a monster.

teratologic, teratological (ter″ah-to-loj′ik; ter″ah-to-loj′ĭ-kal) pertaining to teratology.

teratology (ter″ah-tol′o-je) that division of embryology and pathology which deals with abnormal development and congenital malformations.

teratoma (ter″ah-to′mah), pl. *teratomas* or *terato′mata*. A true neoplasm made up of a number of different types of tissue, none of which is native to the area in which it occurs; most often found in the ovary or testis.

teratomata (ter″ah-to′mah-tah) plural of *teratoma*.

teratomatous (ter″ah-to′mah-tus) pertaining to or of the nature of teratoma.

teratosis (ter″ah-to′sis) [Gr. *teras* monster + *-osis*] teratism.

teratospermia (ter″ah-to-sper′me-ah) the presence of malformed spermatozoa in the semen.

terbium (ter′be-um) a rare metallic element; symbol, Tb; atomic number, 65; atomic weight, 158.924.

terbutaline sulfate (ter-bu′tah-lēn) chemical name: α-[(*tert*-butylamino)methyl]-3,5-dihydroxybenzyl alcohol sulfate (2:1) (salt); a bronchodilator, $(C_{12}H_{19}NO_3)_2 \cdot H_2SO_4$.

terchloride (ter-klo′rīd) trichloride.

tere (te′re) rub.

terebene (ter′ĕ-bēn) [L. *terebenum*, from *terebinthus* turpentine] a thin, yellowish, fragrant mixture of terpene hydrocarbons, $C_{10}H_{16}$, obtained from oil of turpentine by the action of sulfuric acid. It is antiseptic and expectorant, and has been used in catarrh, bronchitis, cystitis, fermentative dyspepsia, genitourinary disease, and as an application to gangrenous wounds, etc.

terebenthene (ter″ĕ-ben′thēn) oil of turpentine.

terebinth (ter′ĕ-binth) [L. *terebinthus*] 1. the tree *Pistacia terebinthus*, which affords Chian turpentine. 2. turpentine.

terebinthina (ter″ĕ-bin′thĭ-nah) [L.] turpentine.

terebinthinate (ter″ĕ-bin′thĭ-nāt) resembling or containing turpentine.

terebinthinism (ter″ĕ-bin′thĭ-nizm) poisoning with oil of turpentine; symptoms include hemoglobinemia, pulmonary edema, convulsions, and damage to nervous system and kidneys.

terebrachesis (ter″ĕ-bra-ke′sis) the operation of shortening the round ligament of the uterus.

terebrant, terebrating (ter′ĕ-brant; ter′ĕ-brāt″ing) [L. *terebrans* boring] of a boring or piercing quality.

terebration (ter″e-bra′shun) [L. *terebratio*] an act of boring or trephining; also a boring pain.

teres (te′rēz) [L.] long and round, as a muscle.

Terfonyl (ter′fo-nil) trademark for preparations of sulfamethazine, sulfadiazine, and sulfamerazine (trisul-

Glen D. Vondrick • 5711 Harbord Drive • Oakland, California 94611

July 13, 1993

Mr. Julius Reviczky
600 Ardmore Ave.
Hermosa Beach, CA 90254

Dear J.R.:

I understand that there is an effort underway to continue to try to call attention to the harm which the oil well drilling project is causing Hermosa Beach neighbors which live adjacent to the drilling site. Although we are no longer citizens of Hermosa Beach, please feel free to use our names, and this letter, if it helps, to call attention to the problems the plans are creating.

We owned and lived at 602 Ardmore Ave. from 1986 to 1992. This property is located directly across the greenbelt from the oil well drilling site. Due to relocation to the San Francisco Bay Area in 1991, we were forced to put our home up for sale. Our home was appraised at that time to have a market value of $310-320,000 by local realtors. This appeared to be an accurate listing price as we had many interested buyers. We received and accepted an offer in 1991 for $315,000 for the property and it was placed in escrow. This deal eventually fell through due to the buyer's inability to sell their own property which they needed to do before buying ours. Later, in early 1992 after the effects of the weak real estate market were accepted, we received and accepted an offer for $295,000 for the same property. While in escrow, a seried of articles about the ill effects of the oil well drilling project were published in the Easy Reader. We had exposed the City's intended plans for oil drilling to the buyers previous to this, but the articles were so negative in nature that our buyers had second thoughts about their "dream property". The potential buyers did extensive research about the City's plans including meeting with the Easy Reader reporters, city councilmen, and talking to representatives of the oil company before cancelling their escrow instructions to buy the property.

There is no question that the oil well project was responsible for a continuing decrease in our property value. Interest in the property by prospective buyers virtually vanished after the negative publicity regarding the oil well. Finally, out of desperation, we were forced to accept an offer of $260,000 for the property in order to sell it and relocate to Northern California. Everyone involved with this transaction or that was aware of the property knows that the selling price was negatively affected by the oil well plans. This represents a $35,000 drop in value within 90 days of the previous accepted offer that was in escrow. This is a significant decrease even with the affects of the poor real estate market factored in.

I hope this factual evidence will help my former neighbors call attention to the real negative affects this project is having to local property values. There are emotional arguments and there are factual ones. I believe our example is a factual one.

Please feel free to contact us if we can assist the citizens of Hermosa Beach gain an accurate and realistic impact assessment on the oil well drilling project.

Sincerely,

Glen D. Vondrick

RE. ENERGY + OCEAN RESOURCES December 2, 1997
JANUARY. E-96-28 (MacPherson)

Please send agenda materials.
Where the Coastal Commission have CASE NUMBER FOR LITIGATION/SETTLEMENT BETWEEN CITY OF REDONDO BEACH + OIL COMPANIES IN THE ACTION RESULTING FROM SUBSIDENCE + LIQUEFACTION DAMAGES TO REDONDO BEACH KING HARBOR + COMMERCIAL PROPERTIES?
I would hope that E-96-28 will be held over until it can be scheduled for a meeting here locally.
Our original contract with MacPherson Oil required electronic state of the art machinery — not on-site crude fuelled.

Sincerely
ETTA SIMPSON

310-379-4753

RE. JANUARY - E-96-28 (MacPherson) December 3, 1997
OIL DRILLING

CASE No. for the litigation - settlement between oil companies and the city of Redondo Beach — L.A. SUPERIOR COURT - YC011628.
Jerry Bolland, City Attny, R. BCH, has a full file. His number: (310) 318-0655.
I would hope that Coastal Commission will be fully informed of Hermosa Beach General Plan goals and inconsistencies in the L.C.P. given the extremely high residential density existing in our city. * WITH OIL DEVELOPMENT
Are you informed on the apparent negotiations between MacPherson oil and the EDISON plant - declared surplus and sold - over connecting Edison oil pipe lines to H.B. proposed location for drilling. I would hope that our dedicated open space GREENBELT is not under consideration for oil pipe lines.

Sincerely,
Etta Simpson

310-379-4753

December 7, 1997

RECEIVED
DEC 10 1997
CALIFORNIA
COASTAL COMMISSION

625 Monterey Blvd.
Hermosa Beach, CA 90254

Allison Dettmer
California Coastal Commission
Energy Department
45 Fremont St. Suite 2000
San Francisco, CA 94105-2219

Subject: Oil drilling permit in Hermosa Beach

Dear Ms. Dettmer,

I am writing in regard to the Commission's pending decision regarding the granting of an oil drilling permit to the Macpherson Oil Company to drill multiple wells in Hermosa Beach. The potential negative impact on our community is terrifying. The potential for leaks, emissions, and explosions in one of the most densely populated communities in California is simply too great to offset any possible benefits.

The residents of this city voted solidly against this project when it's true nature and risks were understood, and yet our maverick city council refuses to acknowledge this fact. I urge the Commission to do the right thing and reject this permit. Thank you.

Sincerely,

Allan Mason

City of Huntington Beach

2000 MAIN STREET CALIFORNIA 92648

OFFICE OF THE MAYOR

Telephone (714) 536-5553

DRUG USE IS LIFE ABUSE

July 3, 1997

JUL 11 1997

CALIFORNIA COASTAL COMMISSION

Ms. Alison Dettmer, Supervisor
Energy and Ocean Resources Unit
California Coastal Commission
45 Fremont Avenue, Suite 2000
San Francisco, CA 94105-2219

Dear Ms. Dettmer:

My name is Peter Green. I served on the Huntington Beach City Council during the approval process for the ANGUS Oil Development Project, and I am still a member of the City Council. I was very concerned about development of this project in our city. However, after careful analysis of all aspects of this project, I determined it could be developed in a residential neighborhood in our city with minimal impact, and voted in favor of the project.

These are the issues, as best I can remember, that concerned me during the approval process for the ANGUS project.

1. **AIR QUALITY**
   The ANGUS project met the stringent requirements for approval by the South Coast Air Quality Management District.

2. **POTENTIAL FOR OIL SPILLS**
   A major concern was the potential for a crude oil or other hazardous waste spill from the site reaching a storm drain and out to the ocean. After a careful study of the project I was assured that this was not a concern because all storm water and accidental spill materials are completely contained on the site and recycled through the production facilities. All storm water is collected on the site and reinjected into the oil producing reservoir. To the best of my knowledge in the past six years since the project has been operational, this has held true.

3. **FIRE PROTECTION**
   The ANGUS project met all requirements of the Huntington Beach Fire Department and provided additional protection with tank foam injection systems and water deluge systems for cooling tanks.

4. **TRAFFIC**

Traffic has not been a problem. Truck traffic was restricted to not coincide with school bus operations. Truck traffic generated by this project is minimal.

5. **NOISE**

The city has a very restrictive Noise Ordinance under which they developed this project. The drill site and drilling rig were enclosed by sound attenuation materials that reduced noise emanating from the site to a level consistent with our City Noise Ordinance. ANGUS immediately responded to noise problems and took measures to eliminate the cause.

For your information, during the 11 years that I have served on the Huntington Beach City Council, environmental protection and enhancement has been one of my primary interests. I hold a Ph.D. in Ecology and am a veteran faculty member at Golden West College. I also serve on the following Boards and Commissions that are oriented towards environmental issues: The Orange County Marine Institute; the Orange County Commission for Harbors, Beaches, and Parks; the Santa Ana River Flood Protection Agency; the Environmental Quality Commission of the California League of Cities; and the Bolsa Chica Conservancy.

If there are any further questions, please call me at (714) 536-5553.

Sincerely,

Peter Green, Ph.D.
City Council Member

PG:paj

Local Union 250

JORGE J. RIVERA
President
LAWRENCE A. JONES
Business Manager
TOMMY SPARKS SR.
Fin. Sec'y-Treas.
JAMES STEINMETZ
Chief Bus. Agent-Ref. Div.

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RALPH ROUNDY
ROGER ROUNDY
JOSEPH F. SCAVO
GEORGE VASQUEZ JR.

August 9, 1997

Ms. Alison Dettmer
Supervisor, Energy and Ocean Resources Unit
California Coastal Commission
45 Fremont, Suite 2000
San Francisco, CA 94105-2219

Reference: Coastal Development Permit Application E-96-28; Hermosa Beach Urban Slant Drilling Project

Dear Ms. Dettmer:

Air Conditioning, Refrigeration & Steamfitters Local 250, with 4,600 members in the Los Angeles Basin, encourages the Hermosa Beach Oil Development Project.

This project will generate much needed jobs in the area. These jobs create spending that, in turn, generates taxes received by the state.

This project is environmentally and socio-economically correct. We encourage you to approve and expedite this important project for the City of Hermosa Beach and to help maintain the livelihood of local workers and businesses.

Sincerely Yours,

Larry Jones,
Business Manager,
Local Union 250

LJ:cj opeiu 537/afl-cio

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SEP 12 1997
CALIFORNIA
COASTAL COMMISSION

RECEIVED
SEP 17 1997
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COASTAL COMMISSION

CPMCA

California Plumbing & Mechanical
Contractors Association

September 15, 1997

Alison Dettmer
California Coastal Commission
45 Fremont Street, Suite 2000
San Francisco, CA 9105-2219

RE: Hermosa Beach Urban Slant Drilling Project

Dear Ms. Dettmer:

The California Plumbing and Mechanical Contractors Association, a non profit trade association representing large mechanical contractors in Southern California, supports the Hermosa Beach Urban Slant Drilling Project.

This project would provide desperately needed job opportunities for our skilled craftsmen in the construction industry along with opportunities for our local material suppliers. Unlike many other areas of California, the Southern California construction economy has continued to struggle through our recession. The lingering recession has continued its damaging toll on our tradesmen and vendors. This project would enable hundreds of workers to build the most environmentally controlled oil production facility ever developed in the Los Angeles Basin. The positive economic impact would greatly benefit the local workers, suppliers and the Hermosa Beach community.

Our association seeks your support in approving this project for the benefit of Hermosa Beach and the local work force.

Sincerely,

Scott W. Strawbridge
Executive Director

SS:nw

Suite 201 • 14920 S. San Pedro St. • Gardena, CA 90248
Ph: 310-538-8955 • 800-640-5152 • Fax: 310-217-1109

Department of Energy

Washington, DC 20585

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CALIFORNIA
COASTAL COMMISSION

Ms. Susan Hansch
Deputy Director for Energy, Ocean
Resources and Technical Services
California Coastal Commission
45 Fremont Street, Suite 2000
San Francisco, California 94105

Dear Ms. Hansch:

I am writing at the request of the Macpherson Oil Company regarding the Hermosa Beach Oil Development Project. The U.S. Department of Energy joins with the City of Hermosa Beach in supporting this project because it is consistent with the strategic goals of the Department. The Department has a strong Federal role in ensuring that reliable, competitively priced oil and gas supplies are available to support a strong U.S. economy while protecting the environment and providing energy security through the 21st century. The United States is dependent on oil and gas for approximately 65 percent of the energy it consumes. Forecasts indicate continuing dependence on these energy sources well into the next century. One strategy to achieve this goal is through the development and dissemination of advanced technology.

The Department invests in a portfolio of technologies that play a key role in developing a secure, clean, and sustainable energy system. It helps the Nation meet its environmental challenges by administering the largest pollution prevention and energy efficiency program in the world, with partners from every sector of the economy. The Department enhances National energy security by increasing the diversity energy and fuel choices and sources, bringing renewable energy sources into the market, enhancing domestic production of oil and gas, and enhancing the efficiency with which energy is used and electricity generated.

This project involves the appropriate use of proven advanced frilling technology and provides for extensive environmental protection measures. Macpherson Oil's approach of drilling one to three wells initially, for the purpose of geologic and petrophysical examination, is standard practice in the oil and gas industry.

Deviated well, high-angle well, and horizontal well technology have been successfully applied all over the world. Current applications of this technology in California include the THUMS Long Beach Development. This project is regarded by the oil and gas industry, City of Long Beach and the local community as an excellent example of careful, environmentally sound extraction of oil and gas

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while preserving the aesthetic value of the Long Beach shoreline. The Tincon Island Ltd. Partnership located offshore in the Ventura area is also an excellent example of mutual respect for the environment and the Nation's energy needs.

The unique capabilities of the drilling technology proposed for the project will enable the City of Hermosa Beach to achieve goals that in the past were considered mutually exclusive: protection of the environment and recovery of valuable energy resources that provide fuel and jobs for our citizens and revenue to city and State treasuries. The Department is proud that its investment in this technology makes projects like this possible. Advanced technology helps sustain domestic oil and gas production through increasing ultimate recovery of energy resources from known reservoirs, as well as increasing the likelihood of discovering new reservoirs, while protecting the coastal environment.

In summary, the U.S. Department of Energy recognizes the appropriate application of the advanced drilling technology described by Macpherson Oil Company and supports the potential contribution of the Hermosa Beach Oil Development Project to the National goals of increased energy security, benefit to the economy, protection of the environment, and reduction of imported oil.

Very truly yours,

Patricia Fry Godley
Assistant Secretary
for Fossil Energy

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CALIFORNIA
COASTAL COMMISSION

Ms. Alison Dettmer
Supervisor, Energy and Ocean Resources Unit
California Coastal Commission
45 Fremont, Suite 1900-2000
San Francisco, CA 94105-2219

Reference: Coastal Development Permit Application E-96-28
Hermosa Beach Crude Oil Development Project

Our legislators eliminated development of coastal oil reserves in the Santa Monica Bay from off-shore facilities to protect the coastal environment (no off-shore drilling platforms). Eliminating the use of coastal reserves has reduced production in the Los Angeles basin and forced local refineries to import more crude via tankers to meet production needs. The Hermosa Beach Crude Oil Development Project, using slant drilling technology from an on-shore facility to recover oil reserves off-shore, is the best method to recover needed crude oil reserves while still protecting the coastal environment. Increase production in the Los Angeles basin reduces crude oil tankering and the associated risk of oil spills damaging our coastal environment.

This project can provide critically needed employment for the construction industry and the associated benefits to local businesses and suppliers. As a local construction company, we urge the California Coastal Commission to support the construction industry by approving this beneficial project.

Sincerely,

Paul F. Conrad
Vice President